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Technical Memorandum

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Subject: **Bilberry Creek Flood Risk Mapping from Innes Road to Ottawa River**

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Executive Summary

This report provides a summary of the analytical methods used and underlying assumptions applied in the preparation of flood plain mapping for Bilberry Creek from Innes Road to the Ottawa River. The project has been completed in accordance with the technical guidelines set out under the Canada-Ontario Flood Damage Reduction Program (FDRP) (MNR, 1986), and the technical guide for the flood hazard delineation in Ontario (MNR, 2002) as laid out by the Ontario Ministry of Natural Resources. The 1:100 year flood lines delineated here are suitable for use in the RVCA's regulation limits mapping (as per Ontario Regulation 174/06) and in municipal land use planning and development approval processes under the Planning Act.

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1. Introduction

In 2012, The City of Ottawa and three conservation authorities (Mississippi, Rideau and South Nation) initiated a program for flood risk mapping within the boundary of the City. A multi-year plan for mapping a number of high priority rivers and streams was made. As part of this program, the RVCA has identified 12 stream reaches, where the existing mapping would be updated or mapping will be created for the first time.

Mapping along several large rivers has largely been completed, and smaller streams are now being mapped within the RVCA. Bilberry Creek is one of them.

There is no previous flood mapping of Bilberry Creek. However, engineered flood risk mapping is available for the Ottawa River (RVCA, 2014). Information from this study, when found useful, is used in the present study. Summary of available information has recently been compiled by RVCA in a catchment report card of Bilberry Creek (RVCA, 2015).

This report provides a summary of the analytical methods used and underlying assumptions applied in the preparation of flood plain mapping for Bilberry Creek from Innes Road to the confluence with the Ottawa River (Figures 1 and 2). The project has been done in accordance with the technical guidelines set out under the Canada-Ontario Flood Damage Reduction Program (FDRP) (MNR, 1986), and the technical guide for the flood hazard delineation in Ontario (MNR, 2002) as laid out by the Ontario Ministry of Natural Resources. It also conforms to the 'generic regulation' guidelines of Conservation Ontario (2005). The 1:100 year flood lines delineated here are suitable for use in the RVCA's regulation limits mapping (as per Ontario Regulation 174/06) and in municipal land use planning and development approval processes under the Planning Act.

2. Study Area

A 6 km reach of the Bilberry Creek has been mapped (Figures 2 and 17). The study area is almost fully urbanized and is a part of eastern Ottawa (Figure 4). About 45% of the area is residential, 7% commercial, 4% institutional, 22% streets, and 16% recreational. Only about 5% is vacant.

Although the original plan was to start the mapping from the Innes Road in the south, current circumstances and available information only permitted the mapping from about 400 m downstream of Des Epinettes Avenue. The creek upstream of this point was affected by a slope failure in April 2017. Corrective works, including slope stabilization, retaining walls, channel modification and an underground pipe, have been undertaken by the City of Ottawa and were completed in September 2017. This situation warranted the upstream limit of the study to be relocated at a point just downstream of the channel modification. Information on the slope failure and corrective measures is available in RVCA's permit file number RV8-5317.

3. Data Used

LIDAR: High quality topography is the key to high quality flood risk mapping. Digital Elevation Models (DEM) were derived from LIDAR data procured by the City of Ottawa. The LIDAR was flown in November 11 through December 7, 2014. This data set has a density of about 4 to 10 points per square meter, and an estimated consolidated vertical accuracy (CVA) of 20-25 cm (Airborne Imagery, 2015). As shown in Figure C.3 in Appendix C, the Bilberry Creek watershed is entirely covered with the 2014 LIDAR data. The City also provided 0.25 m contour lines that were derived from LIDAR data. However, we only used the LIDAR points directly for this study, and the contour lines were never used.

The accuracy of the LIDAR data was checked in the field by RVCA staff in August-September 2014[1]. The true elevations of on-the-ground features that are identifiable on the mapping were determined using RVCA's survey grade GPS equipment (Trimble R8), and were compared with the elevations indicated by the LIDAR spot heights, to determine that any differences between mapped and true elevations were within the accuracy prescribed by the FDRP standards.

In total, 175 spot heights were verified (see Table C.1 and Figure C.1 in Appendix C). As described in the FDRP guidelines (MNR 1986), the spot height checks are considered satisfactory when 90% of the data points are within 0.33 m of the field measurement. As shown in Table C.1, this criterion has been adequately met[2]. On average, the spot heights are within 2.3 cm (Table C.1).

Drape Imagery: The Drape imagery was collected in April-June 2014 with a horizontal accuracy of ±0.5 metre. This high quality colored photo clearly shows the rivers, creeks, land use, houses, buildings, roads, infrastructure, vegetation and other details.

[1] This field data was originally collected to check the 2006 LIDAR data (which was the best available information at that time). But later on, when 2014 LIDAR data became available, the same field data was used to check the 2014 LIDAR data.

[2] FDRP (1986) Manual also specifies criteria for checking contour crossings. However, in this study we used only LIDAR spot heights, not contour lines. Therefore, we did not check the accuracy of contour lines supplied by the City of Ottawa.

2017 Aerial photo: The 2017 aerial photo was captured during May 16-20, 2017. It was provided to us by the City of Ottawa. It is accurate, sharp and in colour, and shows various natural and man-made features clearly.

Building footprint: The 'building footprint' layer was provided by the City of Ottawa for the area inside the urban boundary (Figure 6). It enables us to accurately draw flood lines around buildings. This data layer contained information collected over a number of years.

Land use: A GIS-based land use data set, based on information up to 2010, was obtained from the City of Ottawa. It has 39 categories of land use (see Table 1 and Figure 4). This data set was used in the hydrologic parameter estimation.

Imperviousness: A GIS-based data layer showing the impervious surfaces was obtained from the City of Ottawa. It identified various impervious surfaces such as roads, parking lots, buildings, etc. (Figure 5). This data was based on information collected over a number of years up to 2011. The imperviousness varied in the range from 22% to 48% for the sub-catchments, with an average of 40.2% for the entire Bilberry catchment (Table 3a). This data set was used in the hydrologic analysis.

Soil classification: A soils classification layer was obtained from MNRF's LIO (Land Information Ontario) database, details of which are documented in a report by MNR (2012). Soil is classified into four categories (A, B, C and D) based on infiltration capacity.

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

Group B soils have a moderate infiltration rate and consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture; these soils have a moderate rate of water transmission.

Group C soils have a slow infiltration rate and consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture; these soils have a slow rate of water transmission.

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

This report (MNR, 2012) describes the infiltration rate in qualitative terms without giving numerical values. However, it appears to be based on the SCS's original classification. USDA-SCS (1986) gives specific range of infiltration or transmission rate (Group A: greater than 0.30 inch/hour; Group B: 0.15-0.30 inch/hour; Group C: 0.05-0.15 inch/hour; Group D: 0-0.05 inch/hour). This soil information was used in hydrological parameter estimation.

As shown in Table 2a and Figure 3a, Soil Group D is predominant (54%) in the Bilberry catchment, followed by Group C (5%), Group B (3%) and Group A (2%). Thus, the soil in this area is mainly clay, and has a very slow infiltration rate. It also has a very slow rate of water transmission.

About 36% of the watershed area was 'unclassified' or has missing soil group information (Table 2a). The soil permeability information was used to estimate the missing soil group information.

Soil Permeability: A GIS-based data layer showing the soil permeability was obtained from the Ontario Geological Survey (2010). Four categories of soil permeability were identified: high, low-medium, variable and low. These categories roughly coincided with the soil groups (A, B, C and D). Table 2b and Figure 3b show soil permeability information in Bilberry catchment. This information was used only indirectly where soil group information was missing. For this study area, the unclassified area coincided with low permeability area, and was therefore assumed to have Group D soil.

4. Hydrological Computations

4.1 Overall Methodology

In the absence of any streamflow measurement – a common situation in many small catchments – we have used a single-event hydrological model to estimate flood flows at key locations along Bilberry Creek. This approach is sometimes referred to as the 'return period design storm' method and is one of the acceptable flow estimation procedures discussed in the provincial guidelines (MNR, 1986, 2002). In this method, a synthetic design storm (hyetograph) of specified return period is fed into a rainfall-runoff model to generate the corresponding peak flow, which is generally assumed to have the same return period. This procedure is quite popular and is regularly used in studies related to drainage, stormwater, flooding, and so on. This method is also accepted by FEMA (2009), although they call it simply 'rainfall-runoff modeling'.

For small catchments of this size, floods generated by summer storms are expected to be larger compared to spring freshet and should therefore be used in flood risk mapping. Past studies in this area support this notion[3].

Suitable data for calibrating the SWMHYMO model was not available. Therefore, we have estimated the flood quantiles based on theoretical (or synthetic) storms and uncalibrated hydrologic modeling as the best available methodology at the present time. As described later in the report, lack of data also prevented calibration of the hydraulic model.

Synthetic storms of various types and durations were first used to estimate the 1:100 year flood flows. Based largely on engineering judgement, one of the storms was selected as suitable for the flood mapping purposes within the Bilberry Creek basin. The selected storm was then used to estimate the flood quantiles for various return periods (2, 5, 10, 20, 50, 100, 200, 350 and 500 years).

[3] For example, the 1:100 year summer and spring floods of Flowing Creek (with an area of 49.5 km^2) were estimated at 51 and 46 cms respectively by PRS/JFSA (2005) during a larger mapping study on the Jock watershed; it was recommended that the summer flows be used for flood mapping. MVCA (2015) analyzed snowmelt events using the Ottawa Airport data and concluded that 'if a location on a river has a response time somewhat longer than 12 hours, it would be expected that snow melt would govern" (as opposed to summer rainfall). Bilberry Creek catchment's response time is much lower (0.2-3.0 hours) than 12 hours; therefore, summer rainfall is expected to produce larger runoff than spring snowmelt.

4.2 SWMHYMO Model

We have used version 4.02 of SWMHYMO model (JFSA 2000) for estimating the summer floods. This model is used widely in Ontario for both urban and rural catchments.

As shown in Figures 2 and 7, the Bilberry Creek basin has been divided into fifteen catchments[4], and flood quantiles have been estimated at sixteen nodes and fifteen catchment outlets along the creek and its tributaries (Figure 13). A schematic of the SWMHYMO model is shown in Figure 8, where both the catchments and channel segments used for flow routing are included.

The Bilberry catchment is within the urban core of the city and is fully developed. The City of Ottawa Official Plan (2003) indicates no significant additional change in this area in the foreseeable future. However, the amended OPA 150 released in 2013 envisages some small land use changes along the southern fringe of Bilberry Creek catchment; we have used this information for the hydrologic analysis,

Among the available runoff-generating modules in SWMHYMO model, two commands (CALIB NASHYD and CALIB STANDHYD) were considered for calculating runoff from rural and urban catchments respectively. In case of Bilberry Creek, all catchments are urban with imperviousness greater than 20%. Therefore, only the CALIB STANDHYD command was used. The CALIB STANDHYD command requires the following input parameters:

$AREA$ = area of the catchment (hectares),

DWF = dry weather flow component (m^3/s),

CN or $CN*$ = original or conjugate (modified) curve number,

$TIMP$ = total imperviousness ratio (between 0.0 and 1.0),

$XIMP$ = directly connected imperviousness ratio (between 0.0 and 1.0),

$LOSS$ = type of loss over impervious surface,

DT = computational time step (minutes),

$IAper$ = initial abstraction on pervious surface (mm),

[4] In this highly urbanized area, sewershed nodes are generally close but not exactly coincident with watershed nodes. However, since the HEC-RAS model was setup to use the higher of the flows at two ends of a stream reach, the flood risk modeling was always on the conservative side irrespective of the sewershed outlet locations.

$SLPP$ = average pervious surface slope (%),

LGP = average lot depth (m),

MNP = roughness coefficient for pervious surface,

SCP = linear reservoir storage coefficient for pervious surface (minutes),

$IAimp$ = initial abstraction on impervious surface (mm),

$SLPI$ = average impervious surface slope (%),

LGI = average overflow travel length (m),

MNI = roughness coefficient for impervious surface, and

SCI = linear reservoir storage coefficient for impervious surface (minutes).

Table 3a-b lists the parameters for all catchments. The dry weather flow or base flow was assumed to be zero (DWF = 0.0). A one minute time step was used (DT = 1.0 minute). These are typical values that hydrologists use in the absence of more site-specific information. Physical parameters such as channel length and slope were estimated from available topography and aerial photo. The rest of the parameters and how they were estimated are explained in Table 3b.

Curve Number Method: The curve number (CN) method of estimating runoff was first introduced by US Department of Agriculture's Soil Conservation Service (USDA-SCS 1986) and is widely used in North America and elsewhere. This method is used in the SWMHYMO model too. The curve number (CN) was calculated based on land use and soil type (Tables 1 and 2a). Equivalent land use and associated CN from TR-55 were first selected for each of the 39 land use and 4 soils types found in this region (Table 4). For each elemental area with a particular land use-soil combination, the appropriate CN value was chosen; these CN values were then area-averaged over the whole catchment to find the aggregate CN for the catchment. CN values varied from 83 to 94 for different sub-catchments, with an average value of 87.1 for the entire Bilberry catchment (Table 3a).

Both the original SCS curve number method and its 'conjugate' or modified version can be used in SWMHYMO. For this study, we have used the modified method – commonly known as the $CN*$ method. For parameter estimation and calculation procedures, we have closely followed the original SCS manual (USDA-SCS, 1986) and a

recent, comprehensive state-of-the-art review done by a task committee (Hawkins et al., 2009).

The first step is estimating the CN value based on land use and soil type as given in the SCS manual (USDA-SCS, 1986). We have used the following information:

- 2010 land use data set from the City of Ottawa
- 2012 soil classification by LIO/OMAFRA/MNR (MNR, 2012)

Both data sets were available in digital format. Tables 1, 2a and 4 summarizes parameters related to the estimation of CN and $CN*$. This process was automated in the GIS system.

Once CN was estimated, then the 'conjugate' or modified curve number $CN*$ was calculated using the following equation:

$$CN* = \frac{100}{1.879(\frac{100}{CN} - 1)^{1.15} + 1}$$

Soil storage capacity (S) in mm was related to $CN*$ by the relation:

$$CN* = \frac{25400}{254 + S}$$

And the initial abstraction (IA) in mm was calculated as:

$$IA = 0.05S$$

The above equations were taken from Hawkins et al. (2009; page 35, 9 and 34 respectively).

While the original CN was estimated based on the assumption of an initial abstraction equal to 20% of the soil moisture capacity, later research revealed that the initial abstraction equal to 5% of the soil moisture capacity is more appropriate, the new curve number was called $CN*$, and the relationship between CN and $CN*$ was established. At present, both the original and the modified methods are widely used, with

more and more practitioners preferring the latter. However, given that they can be readily converted to each other, one has the option to use any of them.

Time to Peak: The time of concentration (T_c) of a watershed is defined as the time required for water to move from the most remote part of the watershed to its outlet. Many methods are available, mostly empirical and developed for specific conditions, to estimate T_c. Here, we have used the 'velocity method' originally introduced by Soil Conservation Service (USDA-SCS, 1986) and later elaborated by Natural Resources Conservation Service (USDA-NRCS, 2010). This method has a sound physical basis[5], i.e., the movement of water over the land and along the channel, although estimating parameters – as the case frequently is in hydrology – is at best an approximation.

The time to peak (T_p) is defined as the time between rainfall event and the corresponding peak flow. It is related to the time of concentration as (USDA-CSC 1986, page 15-3):

$$T_p = 0.6T_c$$

Both T_c and T_p were calculated using the method detailed in the USDA-NRCS (2010) manual. The time to peak (T_p) was an input to SWMHYMO model (Table 3a). It varied from 0.17 to 2.88 hours for different sub-catchments.

All estimated parameters necessary for the SWMHYMO modeling of the Bilberry Creek catchment are listed in Tables 3a-b.

[5] The SCS velocity method is generally considered to have a sound physical basis and is often used as a yardstick to evaluate other methods (see, for instance, McCuen et al. 1984; Grimaldi et al. 2012 and Sharifi and Hosseini 2011). Grimaldi et al. found that as much as 500% variation is quite common when using different methods to estimate time of concentration. They also made an interesting remark: "Indeed, it a paradox that advanced hydraulic models, such as 2-D flood propagation models for hydraulic risk mapping based on very expensive topographic and remote sensing data, are actually limited by design hydrographs based on anachronistic parameters, such as Tc." This is consistent with the commonly observed fact that hydraulic calculations are much more accurate than hydrologic calculations. Also, from the practitioner's point of view, "as a general rule, methods that compute individual travel times for various types of flow segments (for example, overland flows and channelized flows), and then sum the individual travel times to estimate the total travel time, are thought to be the most reliable" (Bentley Systems 2007b).

Channel Routing: The ROUTE CHANNEL command of the SWMHYMO model was used for routing the flow along rivers and streams. The model requires channel length, slope, roughness and a typical channel cross-section. Channel length and slope are given in Table 3a. Figure 8 shows how the channels fit within the overall model structure. Typical cross-section for each channel was based on the characteristic main channel and adjacent floodplains where applicable. Manning's roughness coefficients for the main channel and floodplain were also assigned based on land use and expected flow conditions. Care was taken to ensure that parameter values used in SWMHYMO were consistent with those used in HEC-RAS model.

4.3 Selection of Design Storm

A wide variety of design (or synthetic) storms are available. However, a particular storm is generally selected for flood mapping purposes after appropriate scrutiny. For this study, synthetic storms of two types (Chicago and SCS Type II) and four durations (3, 6, 12 and 24 hours) were considered for hydrologic modeling (Table 5). These storms are routinely used in Canada for both stormwater management and flood risk studies. Recent studies in neighboring conservation authorities (SNCA 2014; MVCA 2015) as well as within the RVCA (RVCA 2016b, 2017a, 2017b) confirm the suitability of these storms for the purposes of floodplain mapping in small basins.

The following synthetic storms were considered:

- 3 hour SCS Type II storm
- 6 hour SCS Type II storm
- 12 hour SCS Type II storm
- 24 hour SCS Type II storm
- 3 hour Chicago storm
- 6 hour Chicago storm
- 12 hour Chicago storm
- 24 hour Chicago storm

Hyetographs corresponding to these storms were generated from the most recent IDF curve at Ottawa Airport (Station ID 6106000), obtained from Environment Canada[6]. This IDF curve was based on the most recent analysis using 39 years of data from 1967 to 2007 (with 2001 and 2005 data missing)[7]. Generally, the curve for a certain return period follows an equation like:

$$I = \frac{a}{(b+t)^c}$$

where,

I = rainfall intensity (mm/hour), and

a, b, c = constants.

From the EC IDF curve (Figure 9), equations were fitted via the STORM software and constants determined for all return periods (Figure 10). These equations were then used to generate rainfall hyetographs, for which we used the STORMS 2010 utility software (version 3.0.1) from JFSA (2011). Figure 11 shows the storm hyetographs. Hyetographs were input to SWMHYMO model, where they drive the rainfall-runoff computation. This procedure was followed for all Chicago storms and the SCS 24 hour storm. For all other SCS storms (3, 6, 12 hour durations), the distribution was taken from the City Sewer Guidelines (2012; page 5.18).

Using the eight synthetic storms, the 1:100 year flows were computed for all sub-catchments and at key locations along the stream (Table 6), which were then scrutinized to select an appropriate storm for the purposes of flood mapping. This step is somewhat subjective and requires engineering judgement. As expected, the longer duration storms produced higher flows; usually the flow corresponding to a 3 hour storm was about 74-83% of that produced by a 24 hour storm. The SCS storms produced slightly higher flows (by about 2-7%) compared to Chicago storms. The estimated flows from various storms

[6] Information on IDF curve was obtained from Environment Canada's website [http://climate.weather.gc.ca/prods_servs/engineering_e.html].

[7] City of Ottawa's Sewer Design Guidelines (2012) contain an old IDF curve based on 1961-1990 data, which yields somewhat smaller storm depths than the more recent IDF curve (based on 1967-2007 data). We have opted to use the most recent IDF curve because it reflects recent climatic conditions, is based on more data (39 years as opposed to 31 years), and is slightly conservative (produces bigger storms). The FDRP Manual (MNR 1986) also recommends the use of most recent IDF information.

were thus within the typical variation associated with hydrologic computation; no storm produced extremely high or low flows. This appears to endorse the notion that all storms considered here and associated flows were within the realm of hydrological plausibility. No storm stood out as an outlier or as unrealistic. In the selection of a storm for flood mapping purposes, we wanted to be as close as possible to reality with a slight degree of conservatism. Considering all, we selected the 24 hour SCS Type II storm as the most suitable for Bilberry Creek flood mapping[8]. As can be seen in Table 6 and Figure 12, it produced the higher flows, but only marginally so (2-7% higher than those produced by the Chicago storm). This selection was consistent with our philosophy of being as close as possible to reality, with only a slight degree of conservatism to account for the uncertainty.

4.4 Estimated Flood Quantiles

After the 24 hour SCS Type II storm was selected for the flood mapping purposes, the SYMHYMO model was run for all events with return periods from 2 to 500 years (Table 7). Input and output files of the SWMHYMO model are included in Appendix D. Estimated flood quantiles at key locations were tabulated (Table 8 and Figures 13 and 14). Flood flows from this table were then used in the hydraulic modeling; thus, this table is the link between hydrologic and hydraulic computations.

4.5 Comparison with Other Methods

In order to assess the reasonableness of the flood quantiles computed here (with SCS Type II 24 hour storm), a comparison was made to those computed at other small catchments elsewhere (Figures 15 and 16). Besides comparing the data points to each other, three lines were drawn to provide the context. They are:

- Area pro-rating: based on Jock River at Moodie Drive; 1:100 year spring flood of 196 cms based on measured data (PSR/JFSA 2004a)

[8] The hydrological analyses done here and the results obtained therefrom are considered suitable for the purposes of floodplain mapping of Bilberry Creek only, and for no other purpose. It should be emphasized that the methodology, storms considered and selected, modeling, and the estimated flood quantiles may not be suitable for any other purpose, including land drainage, stormwater management and infrastructure design. Any subsequent use of the data, model and other information contained in this report should be made only after independent verification and scrutiny by qualified engineers/hydrologists.

- 1:100 year floods computed by the Index Flood Method (MNR, 1986)
- Creager envelope curve with a coefficient of 30 (Watt et al. 1989)

Figures 15 and 16 show that, in general, the Bilberry Creek flows are higher than those from other catchments within the RVCA (taken from PSR/JFSA 2005; JFSA 2010; RVCA 2016, 2017a, 2017b, 2017c, 2018) and from adjacent conservation authorities (SNCA, 2014; MVCA, 2015). This is not unexpected since the Bilberry basin is fully urbanized with soils composed clay with low infiltration rate. Some of the urban catchments within the Jock watershed also have higher flows comparable to those in Bilberry basin.

We note that all of the estimated floods within the Bilberry basin are higher than those given by the Index Flood Method, which was based on measured streamflow data and was prescribed by MNR (1986) for estimating floods in the absence of better information. All data points are below the Creager envelope curve, which is the upper-most limit of extreme flood flows in Canada. On the balance, we found that the estimated Bilberry flows are congruent with other information and are within the confines of pertinent estimation methods.

5. Hydraulic Computations

5.1 HEC-RAS Model

Following standard procedures (MNR, 1986; USACE, 1990, 2010), a steady-state hydraulic model of Bilberry Creek was built. The HEC-RAS software (version 4.1.0) developed by the US Army Corps of Engineers (USACE, 2010) was used. It uses the same back water calculation procedure as HEC-2 (USACE, 1990), which has been the industry standard since the 1970s, but with improved data processing and graphical capabilities. About 6 km of Bilberry Creek was included in the HEC-RAS model.

Cross-Sections: The cross-sections used in the modeling were generated from the latest topography (2014 LIDAR) using GIS tools. While, the above-water part of the cross-sections generated from LIDAR is accurate, the under-water portion of the channel is sometimes not adequate. In such cases, the under-water portion of the cross-section was adjusted from field observation. Since the LIDAR were flown during low flow conditions, the adjustment required for under-water channel was usually minor (less than 30-50 cm). The probable impact of such minor adjustments on 1:100 year flood level is expected to be insignificant as well. Therefore, the cross-sectional data was considered adequate for the purposes of flood mapping.

In total, 83 cross-sections were used in our HEC-RAS model. Figure 17 shows a schematic of the HEC-RAS model. Drawing BB-1 in Appendix F shows the cross-sections in greater detail, along with the computed Regulatory Flood Levels (RFLs) and flood risk limits. The location and alignment of river cross-sections within the model were based on engineering judgment as related to the expected flow during high flood events.

Channel Roughness: Based on our best understanding of the expected channel, flow and vegetation conditions, the Manning's roughness coefficient was estimated to be 0.035 in the main channel and 0.08 for the overbank areas[9] (Table B.1 in Appendix B). These values were consistent with standard values, such as those recommended by Chow (1959).

[9] We note that for the cross-sections within the Ottawa River valley, low roughness values were used. This is because this area is affected by the backwater and we do not expect any head loss of the Bilberry Creek in this area.

Bridges/Culverts: Within the study area there are eight road crossings (Table 11). As-built drawings were obtained from the City. Moreover, field survey by RVCA technicians during Fall 2015 were used for determining bridge/culvert dimensions. Road crossings and associated cross-sections were updated to match the as-built information.

Flood Quantiles: The estimated design flows from the hydrologic analysis (discussed above), with return periods ranging from 2 to 500 years (Table 8), were used in the HEC-RAS model. Table 9 shows the flows that were input to the HEC-RAS model.

For each channel reach, flows at both upstream and downstream ends were estimated from the SWMHYMO model, as listed in Table 8. As is the usual practice, the higher of these two flows – almost always the downstream one – was used for the hydraulic calculation in the HEC-RAS model.

Downstream Boundary Condition: Known or estimated water levels are usually used as downstream boundary conditions in HEC-RAS models. In this case, Bilberry Creek drains into the Ottawa River. So, the computed the water level of the Ottawa River during floods (RVCA, 2014) were used as the downstream boundary condition of the Bilberry Creek model[10] (Table 10).

Once the model was set up, the computed profiles and other parameters were scrutinized to assess the reasonableness of model outputs. Special attention was given to the computed water level and energy profiles near road crossings. Adjustments of model parameters – mainly the channel resistance and contraction and expansion coefficients – were made as necessary.

Suitable data to calibrate or validate the HEC-RAS model was not available. Therefore, no calibration was done[11]. However, we exercised professional judgement and

[10] It is plausible that, due to the difference in size and hydrologic response time, the spring flood in the Ottawa River will happen at the same time as a severe rainfall event in Bilberry Creek. That is why we combined 100 year events. Admittedly, this is conservative, but only slightly because of the backwater effect from the Ottawa River.

[11] Given the constraints, this HEC-RAS model is the best we could build for the limited purpose of floodplain mapping at this time. We recognize that this model may not be suitable for other purposes. Further model improvement/adjustment/modification may be necessary for other purposes; it all depends on the purpose of the modeling and the features and phenomena a model is meant to capture. We therefore caution against using this model for other purposes without first confirming its suitability.

tried to be slightly on the conservative side. Our approach of slight conservatism (a combination of hydrologic and hydraulic computations) is also congruent with the current notion of the Precautionary Principle, which applies when there exist considerable scientific uncertainties about causality, magnitude, probability, and consequences of different course of action (UNESCO 2005). The Precautionary Principle is also a key policy of Environment Canada[12].

5.2 Computed Water Surface Profiles

The HEC-RAS model was run with the design floods. The 1:100 year computed water surface elevations and other parameters are shown in Table 13. Typical water surface profiles and all cross-sections are included in Appendix B.

Computed water surface elevations for various flood events with return periods ranging from 2 to 500 years are presented in Tables 14 and 15. It should be pointed out that the model has been built for the expected conditions prevailing during intense rainfall-generated flood events in the summer. Caution should be used when applying this model to simulate water surface profiles for events of other magnitude and during other seasons of the year.

Computed head losses across road crossings are listed in Table 12.

In cold climate areas like Ontario, spring floods may also be accompanied by ice jams. Here we have only analyzed the summer floods, not the spring floods. We are unaware of any ice-related flooding that caused significant concern in this area.

5.3 Sensitivity Analysis

Flood quantiles have the highest degree of uncertainty in our computation and is most likely to affect the water surface profile. Therefore, we decided to test the sensitivity of water surface profile to a wide variation in flow.

[12] Canada's environmental policy is also guided by the precautionary principle and is reflected in the Federal Sustainable Development Act (2008), which states that the Minister of Environment must "develop a Federal Sustainable Development Strategy based on the precautionary principle". The precautionary principle states that: "Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation". In other words, the absence of complete scientific evidence to take precautions does not mean that precautions should not be taken – especially when there is a possibility of irreversible damage (Environment Canada, 2010).

The sensitivity analysis was conducted to determine how much the computed water surface elevations will vary with changes in the value used for the 1:100 year discharge. Six flow conditions were tested:

- 1:100 year flow increased by 10%
- 1:100 year flow increased by 25%
- 1:100 year flow increased by 50%
- 1:100 year flows decreased by 10%
- 1:100 year flow decreased by 25%
- 1:100 year flow decreased by 50%

Figures 18 and 19 show the computed water surface profiles and the differences in computed water levels for each condition. Figure 18 indicates that the computed water surface elevations are less sensitive to the discharge value in the steeper portions of the reach and more sensitive upstream of road crossings. The sensitivity analysis indicates that the computed water level can vary by about 0.10 m for a 10% variation in flow along most of the river reach, which is typical in the hydrologic estimation of design flow. For a 25% increase in flow, the water level, on average, can go up by about 0.25 m.

The sensitivity analysis provides an indication of the potential implications of inaccuracies in flow estimation, and changes in the expected flood flows that might result from urbanization and climate change.

6. Selection of Regulatory Flood Levels

As per Section 3 of the Provincial Policy Statement under the Planning Act (MMAH, 2005, 2014), the regulatory flood in Zone 2, which includes the RVCA, is the 1:100 year flood. Depending on the local hydraulic conditions, the computed water surface elevation, the energy grade or a value in between is generally taken as the Regulatory Flood Level (RFL). Engineering judgment is applied to recommend an appropriate value for the regulatory flood level at each cross-section, using the model outputs and considering hydraulic characteristics of the river reach, and the inherent limitations of numerical modeling.

When the stream velocity is relatively low and varies only gradually over relatively long river reaches, the water surface can generally be taken as the RFL.

However, near bridges, culverts and other water control structures and on steeper reaches where streamflow velocities are higher, and may change more abruptly, the computed water surface elevation may be substantially lower than the energy grade level, with the possibility that the water level may rise to the energy grade near obstacles and irregularities in the channel profile or cross-section which may not be represented in the hydraulic model. In such cases, the regulatory flood level is generally based on the computed energy grade as a conservative approach, given that the model-generated water surface elevation is less likely to be a true representation of flood risk in such situations.

Another possible situation arises when the computed water surface profile is undulating, with downstream water levels occasionally higher than upstream levels. When this occurs, it is more often an artifact from the simplifying assumptions of the modeling scheme than a reliable prediction of the actual differences in streamflow velocity and depth (and hence energy grade) from one cross-section to the next. Accordingly, the regulatory flood level at the upstream cross-section is taken to be equivalent to the downstream water surface elevation in these situations.

In all cases, the RFL is always between the computed water level and energy grade line. Hence, for the sake of simplicity and consistency, the energy grade elevation is often used as the RFL as a standard practice in delineating flood hazard areas.

For the present study, the regulatory flood levels were set equal to the computed energy grade and are tabulated in Table 13, along with the computed water surface elevations and energy grades at each cross-section in the model.

7. Flood Line Delineation

7.1 General

Once the RFLs are established, the plotting of 1:100 year flood lines or flood risk limits is a relatively straightforward matter. Given the topographical information in the form of LIDAR spot heights, the inundated area below the RFLs can be easily delineated manually or by using automated computer programs. In the present case, it was done manually with a focus on areas with complex topography, infrastructure, and overbank flow paths. The raw LIDAR spot heights were extensively used in the plotting the flood risk limit.

Field surveys were conducted by RVCA staff in August 2015 and in May 2018 to verify hydraulic connectivity through culvert openings and flood prone areas.

The record of site-specific information associated with RVCA's regulatory approval process since 1977 was checked (Table 16). It was found that no site-specific work affects the flood risk lines.

Drawings BB-1 and BB-2 in Appendix F depict the delineated floodplain.

7.2 Buildings in the Floodplain

Presence of existing buildings within the floodplain and associated variation in the way a building could be exposed to flood risk required special attention. Recently, RVCA has consolidated a few rules for drawing flood lines in the vicinity of buildings (Appendix A), which have been followed in this study. Due to the limitations of the data and methodology used in the current mapping done at a large scale, and the small degree of (inevitable) subjectivity in drawing flood lines around buildings at a smaller scale, RVCA recommends that, should the need arise for accurate flood line delineation near buildings, site-specific information be taken into account when dealing with flood risk at these locations. It is the practice of RVCA to refine flood lines when more accurate information becomes available.

7.3 Islands in the Floodplain

Presence of small islands, especially those associated with septic beds, within the floodplain also requires special attention. Recently, RVCA has decided to show small

islands with an area less than 1000 m^2 as flood risk area (Appendix C) This guidance was followed during this study.

7.4 Spill Section near Regional Road 174

Regional Road 174 (also known as Queensway) crosses Bilberry Creek about 2.5 km upstream of its outfall with the Ottawa River. There is a 101 m long, 3.12 m wide and 1.81 m high box culvert at this crossing[13].

The road stands as a significant barrier to the natural flow of the creek and causes the water to spill to the west along the southern side of the Regional Road 174. The local topography suggests that the spilled water would then move north and cross Regional Road 174 near the Orleans Boulevard overpass; it would then follow the lowest path along the natural topography and be captured in a tributary that ultimately joins Bilberry Creek. This appears to be the general path of the spill flow; however, determining the exact path is beyond the scope of this project. It is likely that, in the absence of the highway, the creek would have been confined within its narrow valley (about 50 m wide).

The current HEC-RAS modeling uses an assumption that all flow is retained in the creek, i.e., no water escapes the creek. Therefore, the floodplain delineated here (from downstream of Regional Road 174 to the Ottawa River) is conservative.

7.5 Flood Mapping Data in GIS

The regulatory flood lines and cross-sections have been incorporated as separate layers in RVCA's Geographical Information System (GIS). In this system, one can view the flood lines, cross-sections, design flow, water level, energy grade, RFL, and other computed parameters. The flood lines can be overlain on the aerial photography or any other base mapping layers that are in the system and at any scale that suits the user's need.

The regulatory flood line layer is maintained and updated as required according to the established procedures of the RVCA (RVCA 2005).

[13] The 101 m long culvert under Regional Road 174 has three different configurations with a zig-zag alignment. The HEC-RAS cannot easily model this type of culverts. Therefore, we have used the simplified configuration (straight culvert, most restrictive section) in the model.

Drawings BB-1 and BB-2 show the flood risk limits as delineated in this study. At all cross-section locations, the RFL is indicated. The general surroundings and land marks are also included for easy referencing.

8. Project Deliverables

The key information or knowledge products generated from this project are:

1) The Flood Mapping Report (this Technical Memorandum) – which summarizes the analytical methods that were used and the underlying assumptions
2) SWMHYMO model files
3) HEC-RAS model files
4) The flood risk limit lines in GIS format (shape files) – identifying the extent of lands which are considered to be vulnerable to flooding during a regulatory flood event (1:100 year flood)
5) The position and orientation of cross-sections used in the HEC-RAS model, in GIS format (shape files) – which, when used in conjunction with the HEC-RAS model output files, informs the user as to the estimated 1:100 year water surface elevation and the regulatory flood level for any location in the study area

A "documentation folder" containing working notes and relevant background information accumulated during the study process is maintained by the water resources engineering unit within RVCA's Watershed Science and Engineering Services department.

9. Closure

The hydrotechnical and cartographic procedures used in this study generally conform to present day standards for flood hazard delineation, as set out in the MNR's Natural Hazards Technical Guide (MNR, 2002). The resulting 1:100 year flood lines are suitable for use in the RVCA's regulation limits mapping (as per Ontario Regulation 174/06) and in municipal land use planning and development approval processes under the Planning Act.

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Senior Water Resources Engineer

10. References:

1. Airborne Imagery (2015). LiDAR for City of Ottawa Mapping Program – RFT No. 27614-92033-T01 – Final Report. Prepared for the City of Ottawa by Airborne Imagery, Calgary, Alberta, July 2015.

2. Bentley Systems (2007a). Floodplain Modeling Using HEC-RAS. Bentley Institute Press, Exton, PA.

3. Bentley Systems (2007b). Stormwater Conveyance Modeling and Design. Bentley Institute Press, Exton, PA.

4. Chow, V. T. (1959). Open-Channel Hydraulics. McGraw-Hill, New York, NY.

5. City of Ottawa (2003). Official Plan 2003 as amended in amendment #150 in 2013. (http://ottawa.ca/en/city-hall/planning-and-development/official-plan-and-master-plans/official-plan).

6. City of Ottawa (2012). Sewer Design Guidelines. Second Edition, October 2012.

7. Conservation Ontario (2005). Guidelines for Developing Schedules of Regulated Areas. October 2005.

8. Environment Canada (2010). Planning for a Sustainable Future: A Federal Sustainable Development Strategy for Canada. Sustainable Development Office, Environment Canada, (https://www.ec.gc.ca/dd-sd/F93CD795-0035-4DAF-86D1-53099BD303F9/FSDS_v4_EN.pdf).

9. Federal Sustainable Development Act (2008). Published by the Minister of Justice, Government of Canada. (http://laws-lois.justice.gc.ca/PDF/F-8.6.pdf).

10. FEMA (2009). Guidelines and Specifications for Flood Hazard Mapping Partners, Appendix C: Guidance for Riverine Flooding Analysis and mapping. Federal Emergency Management Agency, Washington DC.

11. Grimaldi, S., Petroselli, A., Tauro, F., and Porfiri, M. (2012). Time of concentration: a paradox in modern hydrology. Hydrological Sciences Journal 57(2):217-228. (http://dx.doi.org/10.1080/02626667.2011.644244)

12. Hawkins, R. H., Ward, T. J., Woodward, D. E., and Van Mullem, J. A. (2009). Curve Number Hydrology – State of the Practice. Prepared by ASCE/EWRI Curve Number Hydrology Task Committee. American Society of Civil Engineers, Reston, VA.

13. Heastad Methods (2003). Floodplain Modeling Using HEC-RAS. Heastad Press, Waterbury, CT.

14. JFSA (2000). SWMHYMO User's Manual. JF Sabourin and Associates Inc., Ottawa.

15. JFSA (2009). Floodplain Mapping Report for the Van Gaal and Arbuckle Municipal Drains in the Village of Richmond. Prepared for Rideau Valley Conservation Authority by JF Sabourin and Associates Inc., Ottawa. (https://www.rvca.ca/media/k2/attachments/P709Z-ZRichmondZFloodplainZMappingZReportZ-ZFINAL.pdf)

16. JFSA (2011). STORMS 2010 v. 3.0.0 User Manual. JF Sabourin and Associates Inc., Ottawa.

17. JFSA (2014). Flood Risk Mapping (Year 1) – Hydrologic Model (SWMHYMO) Update. Prepared for South Nation Conservation by JF Sabourin and Associates Inc., Ottawa, 23 May 2014. [Appendix F of SNCA (2014). Osgoode Garden Cedar Acres Municipal Drain Flood Risk Mapping Final Report, 14 November 2014]

18. McCuen, R. H., Wong, S. L., and Rawls, W. J. (1984). Estimating urban time of concentration. ASCE Journal of Hydraulic Engineering 110(7):887-904.

19. MMAH (2005). 2005 Provincial Policy Statement. Ontario Ministry of Municipal Affairs and Housing, Queen's Printer, Toronto, Ontario, 2005. (http://www.mah.gov.on.ca/AssetFactory.aspx?did=11112)

20. MMAH (2014). 2014 Provincial Policy Statement. Ontario Ministry of Municipal Affairs and Housing, Queen's Printer, Toronto, Ontario, 30 April 2014. (http://www.mah.gov.on.ca/AssetFactory.aspx?did=10463)

21. MNR (1986). Flood Plain Management in Ontario – Technical Guidelines. Ontario Ministry of Natural Resources, Conservation Authorities and Water Management Branch, Toronto.

22. MNR (2002). Technical Guide – River & Stream systems: Flooding Hazard Limit. Ontario Ministry of Natural Resources, Water Resources Section, Peterborough, Ontario, 2002.

23. MNR (2012). Land Information Ontario Data Description – Soils Survey Complex. Ontario Ministry of Natural Resources, Ontario, 2012. (https://www.sse.gov.on.ca/sites/MNR-PublicDocs/EN/CMID/Soil%20Survey%20Complex%20-%20Data%20Description.pdf)

24. MVCA (2015). Poole Creek Regulatory Flood Plain Mapping Study. Mississippi Valley Conservation Authority, Carleton Place, Ontario. (http://mvc.on.ca/wp-content/uploads/2015/01/Poole-Creek-Regulatory-Flood-Plain-Mapping-Study.pdf)

25. Ontario Geological Survey 2010. Surficial geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data 128-REV ISBN 978-1-4435-2483-4 [DVD] ISBN 978-1-4435-2482-7 [zip file] (http://www.geologyontario.mndm.gov.on.ca/mndmfiles/pub/data/imaging/MRD128-REV/MRD128-REV_metadata.pdf)

26. PSR/JFSA (2004). Hydrology Report – July 2004: Jock River Flood Risk Mapping (within the City of Ottawa). Prepared for Rideau Valley Conservation Authority by PSR Group Limited and JF Sabourin and Associates Inc., Ottawa. (https://www.rvca.ca/media/k2/attachments/Jock_River_Mapping_Hydrology_Report_July_2004.pdf)

27. Ontario Regulation 97/04 (2004). CONTENT OF CONSERVATION AUTHORITY REGULATIONS UNDER SUBSECTION 28 (1) OF THE ACT: DEVELOPMENT, INTERFERENCE WITH WETLANDS AND ALTERATIONS TO SHORELINES AND WATERCOURSES. (http://www.ontario.ca/laws/regulation/040097).

28. Ontario Regulation 174/06 (2006). RIDEAU VALLEY CONSERVATION AUTHORITY: REGULATION OF DEVELOPMENT, INTERFERENCE WITH WETLANDS AND ALTERATIONS TO SHORELINES AND WATERCOURSES. (http://www.ontario.ca/laws/regulation/060174).

29. RVCA (2005). RVCA Methods for Delineation of Regulation Limits in Accordance with Ontario Regulation 97/04. Rideau Valley Conservation Authority, Manotick, Ontario, November 16, 2005.

30. RVCA (2014). Ottawa River Flood Risk Mapping from Shirley's Bay to Cumberland. Rideau Valley Conservation Authority, Manotick, Ontario, 14 October 2014. (https://www.rvca.ca/media/k2/attachments/Ottawa2014Mapping.pdf)

31. RVCA (2015). Bilberry Creek 2015 Summary Report, City Stream Watch. Rideau Valley Conservation Authority, Manotick, Ontario. (https://www.rvca.ca/media/k2/attachments/CSW2015_Bilberry_FINAL.pdf)

32. RVCA (2016). Flood Risk and Generic Regulation Limits Mapping along Otter and Hutton Creeks. Rideau Valley Conservation Authority, Manotick, Ontario, 5 August 2016. (https://www.rvca.ca/media/k2/attachments/OtterHuttonMapping.pdf)

33. RVCA (2017a). Kings Creek Flood Risk Mapping from Brunton Side Road to Jock River. Rideau Valley Conservation Authority, Manotick, Ontario. 6 September 2017. (https://www.rvca.ca/media/k2/attachments/KingsMapping2017.pdf)

34. RVCA (2017b). Flowing Creek Flood Risk Mapping from Flewellyn Road to Jock River. Rideau Valley Conservation Authority, Manotick, Ontario. 8 May 2017. (https://www.rvca.ca/images/Mapping_Studies/FlowingMapping-ReportPt1.pdf)

35. RVCA (2017c). Hobbs Drain Flood Risk Mapping from Fallowfield Road to Jock River. Rideau Valley Conservation Authority, Manotick, Ontario. 20 June 2017. (https://www.rvca.ca/images/Mapping_Studies/HobbsMapping.pdf)

36. RVCA (2018). Becketts Creek Flood Risk Mapping from Sarsfield Road to Ottawa River. Rideau Valley Conservation Authority, Manotick, Ontario. 15 October 2018. (https://www.rvca.ca/media/k2/attachments/BeckettsMapping2018.pdf)

37. Sharifi, S., and Hosseini, M. (2011). Methodology for Identifying the Best Equations for estimating the Time of Concentration of Watersheds in a Particular Region. Journal of Irrigation and Drainage Engineering 137(11):712-719.

38. SNCA (2014). Osgoode Garden Cedar Acres Municipal Drain Flood Risk Mapping Final Report. South Nations Valley Conservation Authority, Finch, Ontario, 14 November 2014.

39. UNESCO (2005). The Precautionary Principle. World Commission on the Ethics of Science and Technology (COMEST), UNESCO, Paris, France. (http://unesdoc.unesco.org/images/0013/001395/139578e.pdf)

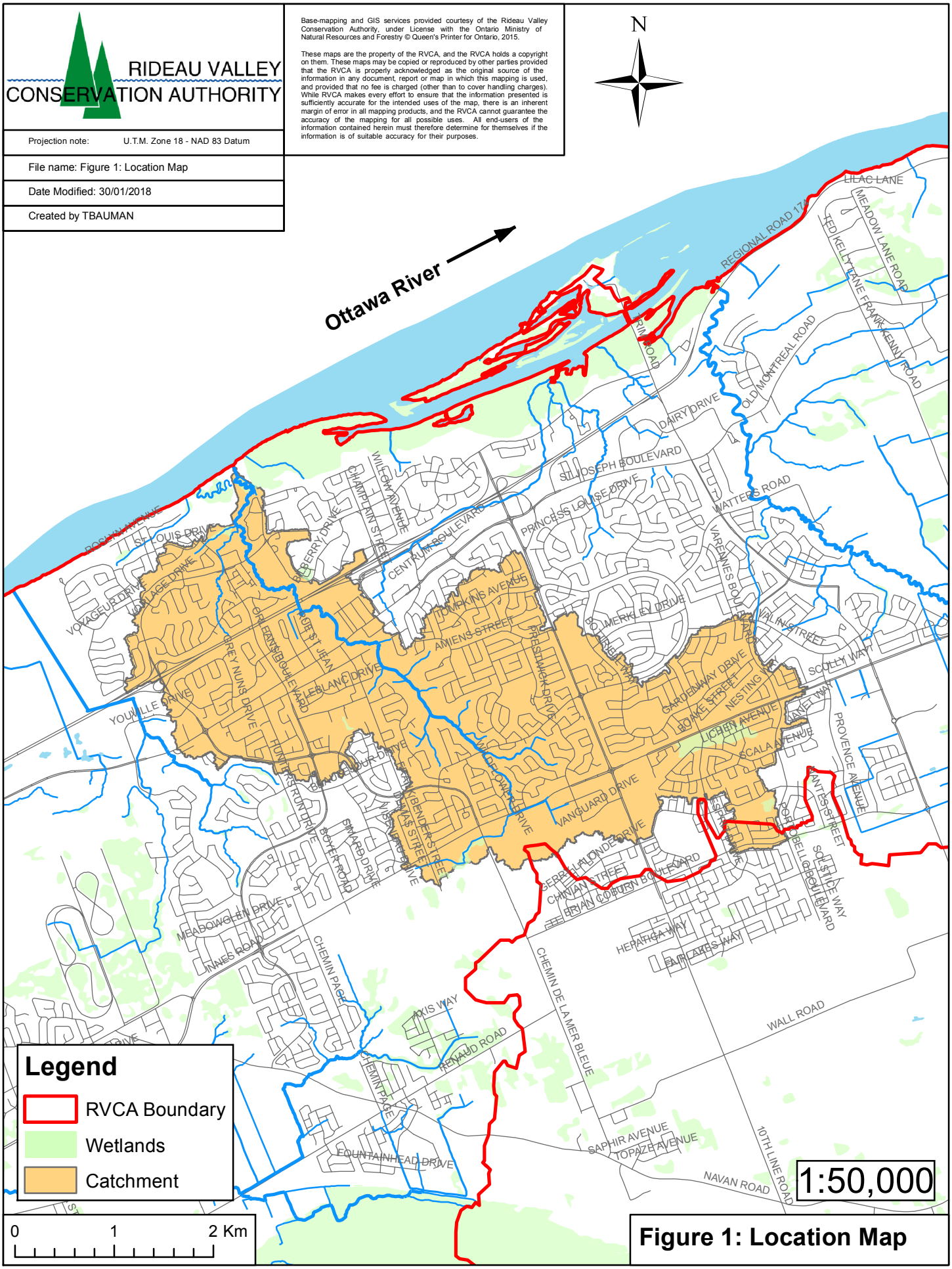
40. USACE (1990). HEC-2 – Water Surface Profiles – User's Manual. US Army Corps of Engineers, Hydrologic Engineering Center, Davis, CA, September 1990.

41. USACE (2010). HEC-RAS – River Analysis System – Hydraulic Reference Manual version 4.1.0, US Army Corps of Engineers, Hydrologic Engineering Center, Davis, CA, January 2010.

42. USDA-SCS (1986). Urban Hydrology for Small watersheds, Technical Release 55. US Department of Agriculture, Soil Conservation Service, Washington DC. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1044171.pdf)

43. USDA-NRCS (2010). National Engineering Handbook, Part 630, Chapter 15, Time of Concentration. US Department of Agriculture, Natural Resources Conservation Service, Washington DC. (http://www.wcc.nrcs.usda.gov/ftpref/wntsc/H&H/NEHhydrology/ch15.pdf)

44. Watt, W. E., Lathem, K. W., Neill, C. R., Richards, T. L., and Rousselle, J. (ed). (1989). Hydrology of floods in Canada: A guide to planning and design. National Research Council of Canada, Ottawa, 245 pp. (http://nparc.cisti-icist.nrc-cnrc.gc.ca/eng/view/accepted/?id=7b18d8c9-6c5f-425f-8338-ac4a24f8170b)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TED KELLY LANE
FRANK KENNY ROAD
OLD MONTREAL ROAD
DAIRY DRIVE
ST-JOSEPH BOULEVARD
PRINCESS LOUISE DRIVE
WATTERS ROAD
VARENNES BOULEVARD
VALIN STREET
SCOLLY WAY
NESTING WAY
LANEL WAY
PROVENCE AVENUE
ANTES STREET
SOLSTICE WAY
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GARDENWAY DRIVE
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VANGUARD DRIVE
CHEMIN DE LA MER BLEUE
WALL ROAD
HEPATICA WAY
FAIRLAKES WAY
SAPHIR AVENUE
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10TH LINE ROAD
NAVAN ROAD
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RENAUD ROAD
FOUNTAINHEAD DRIVE
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INNES ROAD
BOYER ROAD
SIMARD DRIVE
BRIAN COBURN BOULEVARD
CHINIAN STREET
GERRY KELLY DRIVE
ROSEMARY DRIVE
ST-LOUIS DRIVE
VOYAGEUR DRIVE
VILLAGE DRIVE
YOUVILLE DRIVE
GREY NUNS DRIVE
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LEBLANC DRIVE
DE MERKLEY DRIVE
DE MERKLEY PLACE
DOMKINS AVENUE
AMIENS STREET
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WOODCHUCK DRIVE
BERRY BENDER STREET
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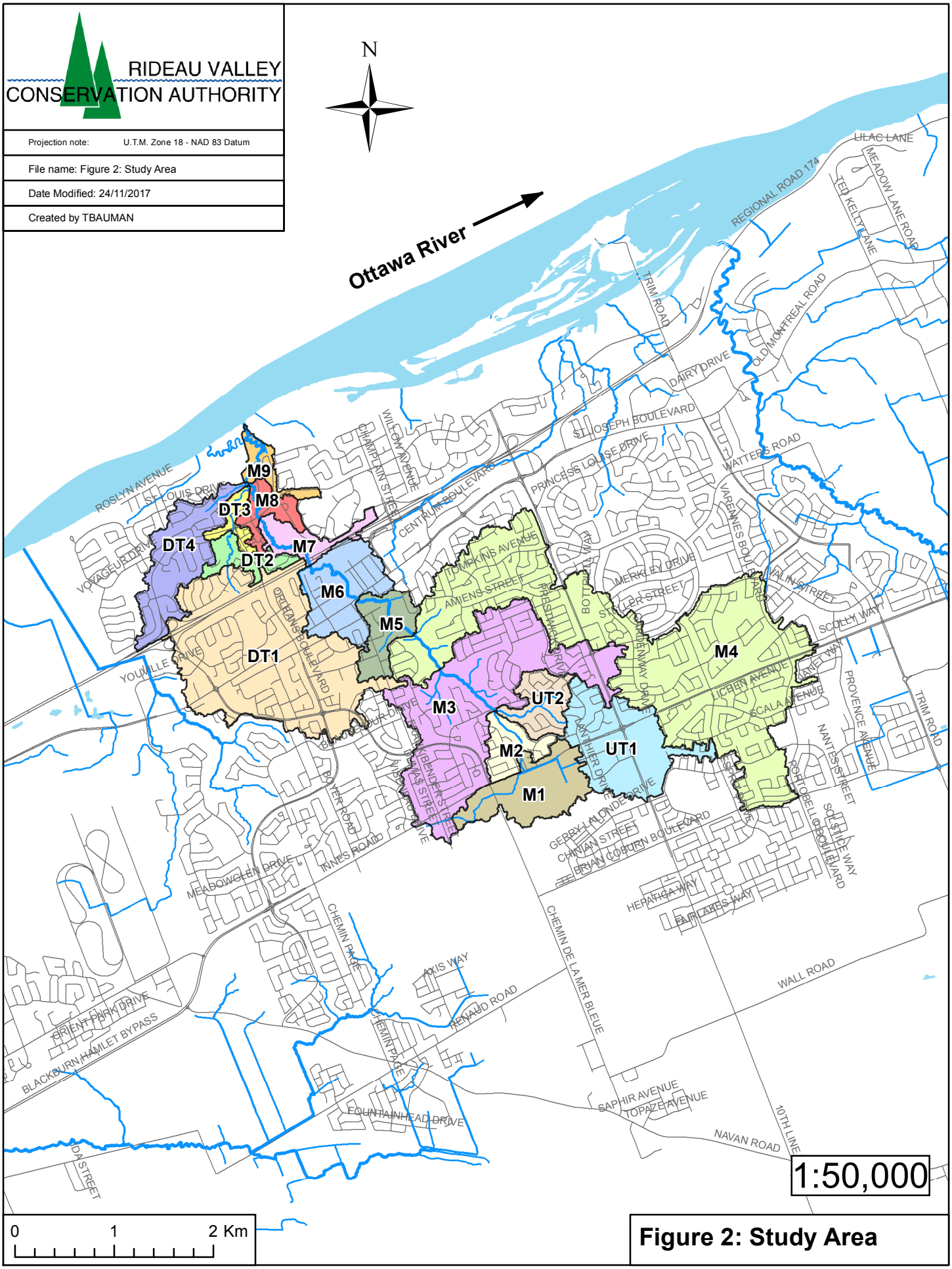
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SOLSTICE WAY
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CHEMIN PAGE
CHEMIN DE LA MER BLEUE
WALL ROAD
AXIS WAY
RENAUD ROAD
ORIENT PARK DRIVE
BLACKBURN HAMLET BYPASS
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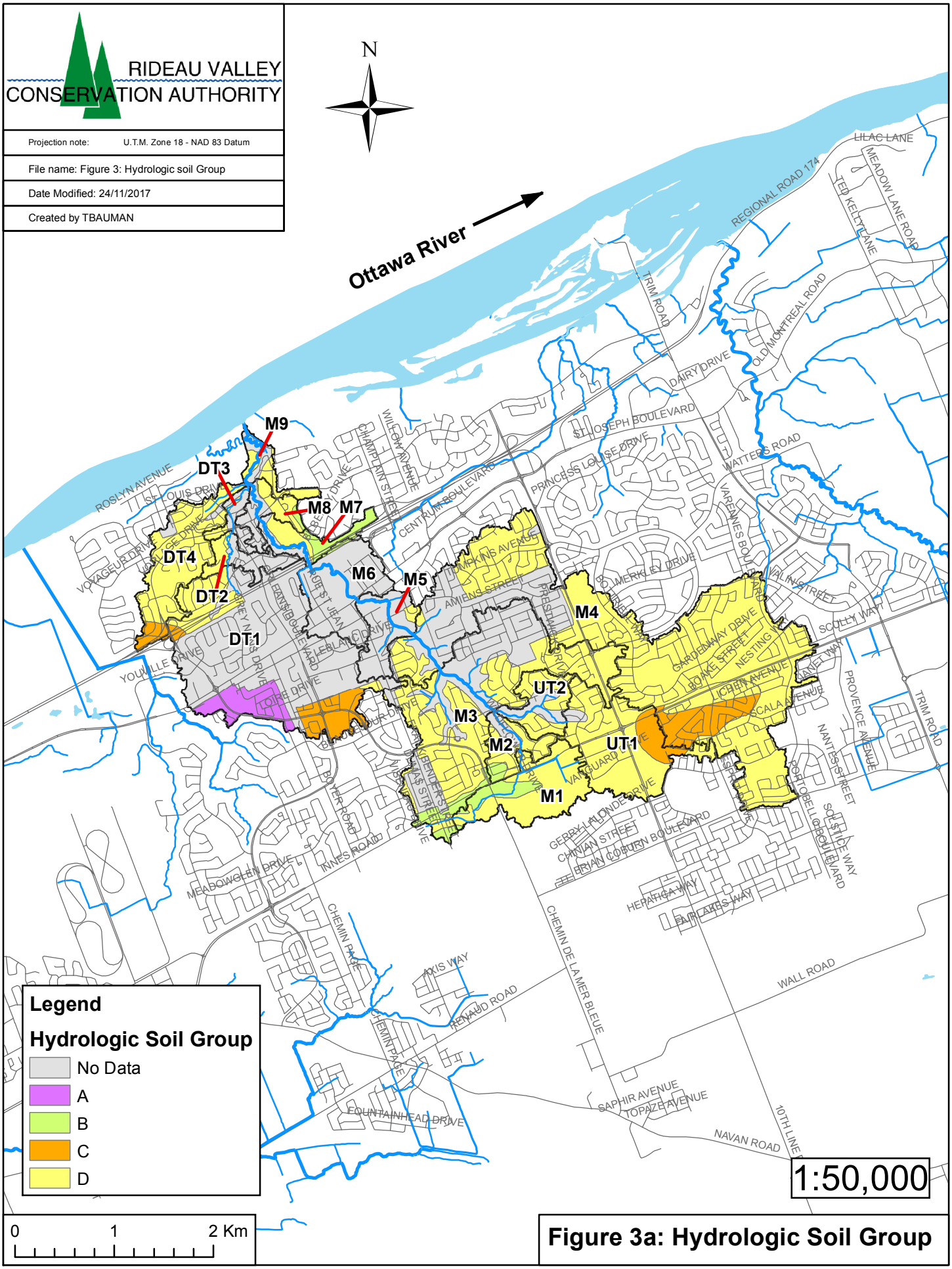

Figure 3a: Hydrologic Soil Group

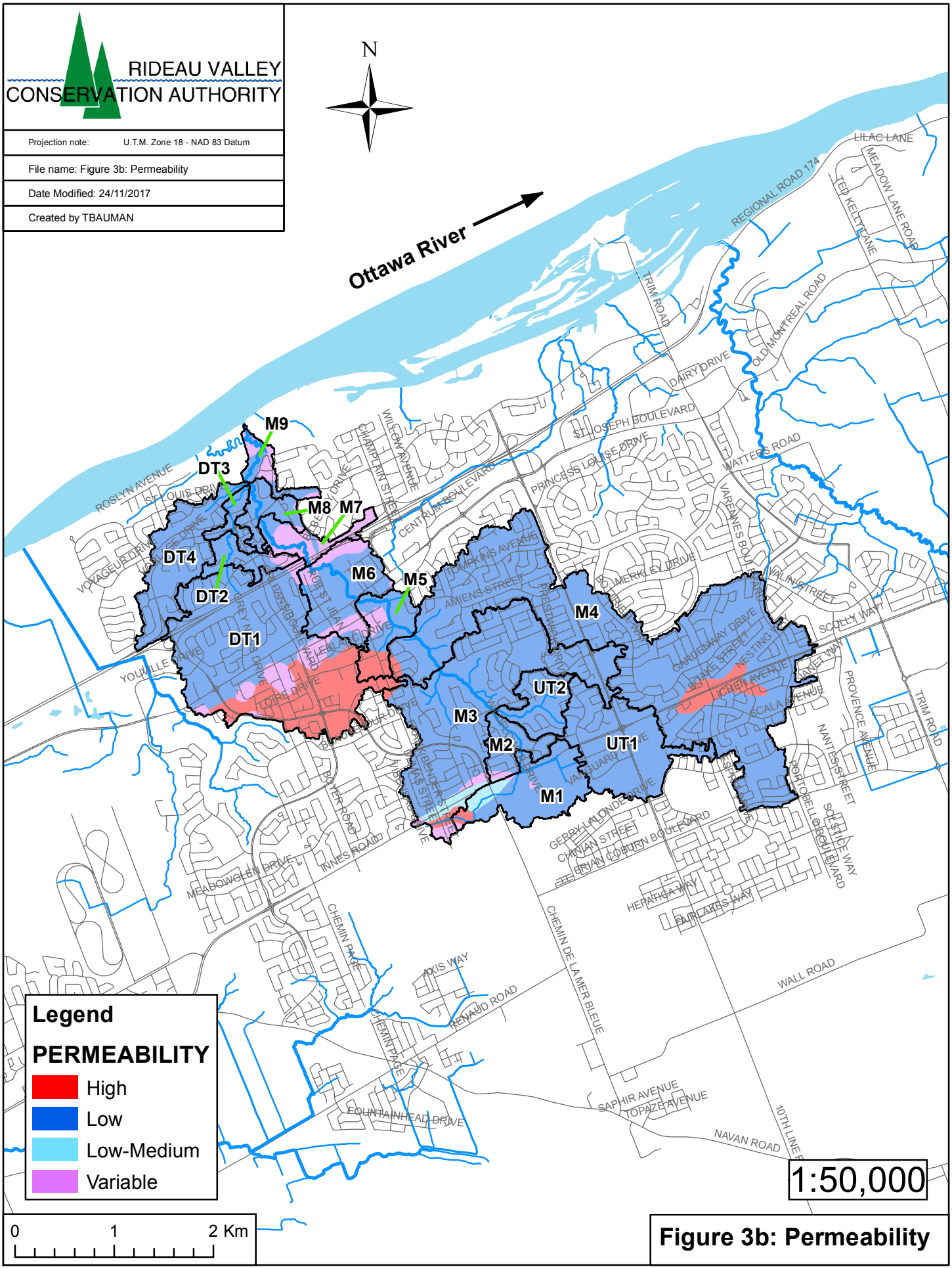
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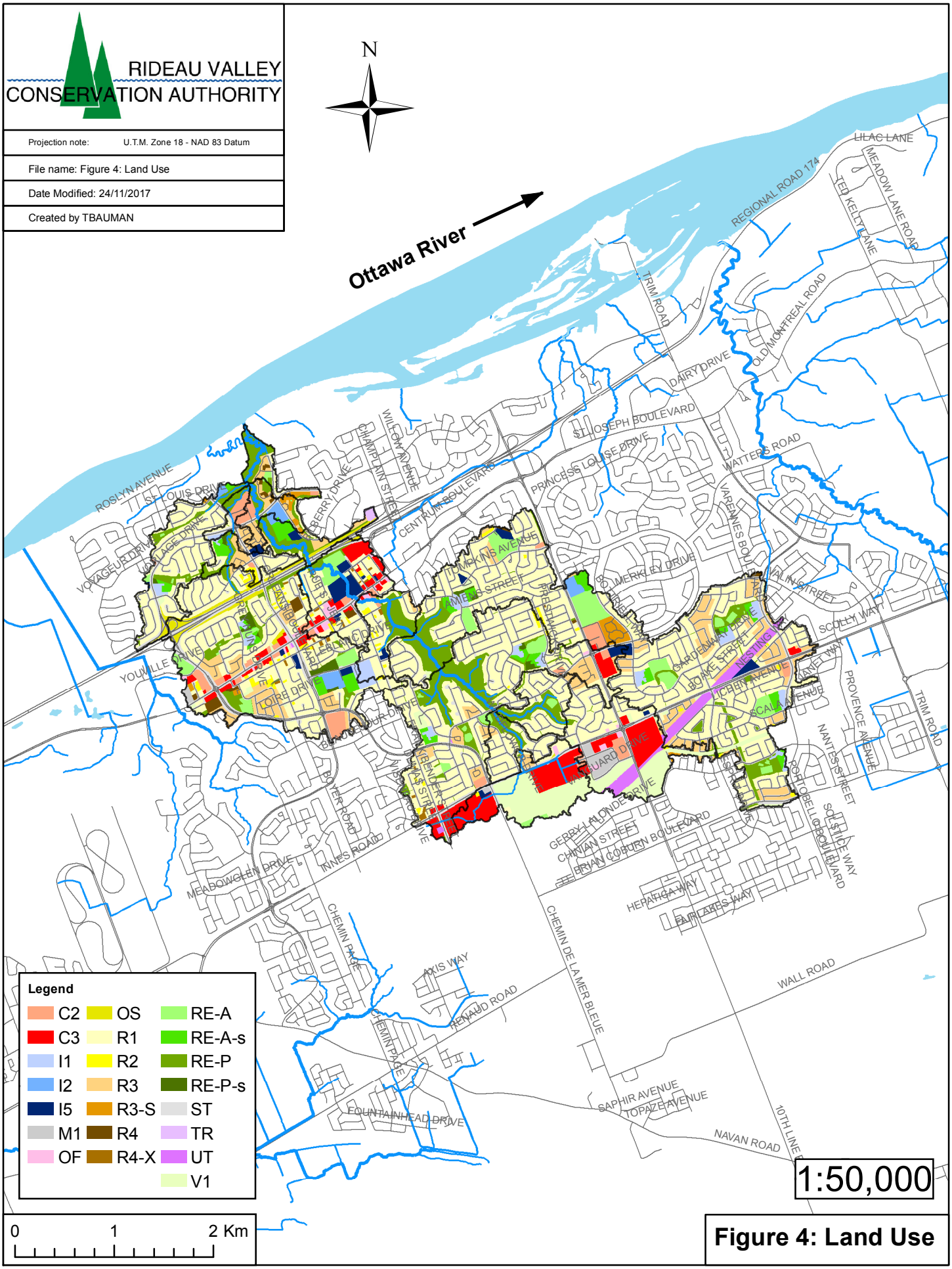
Figure 3b: Permeability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Ottawa River
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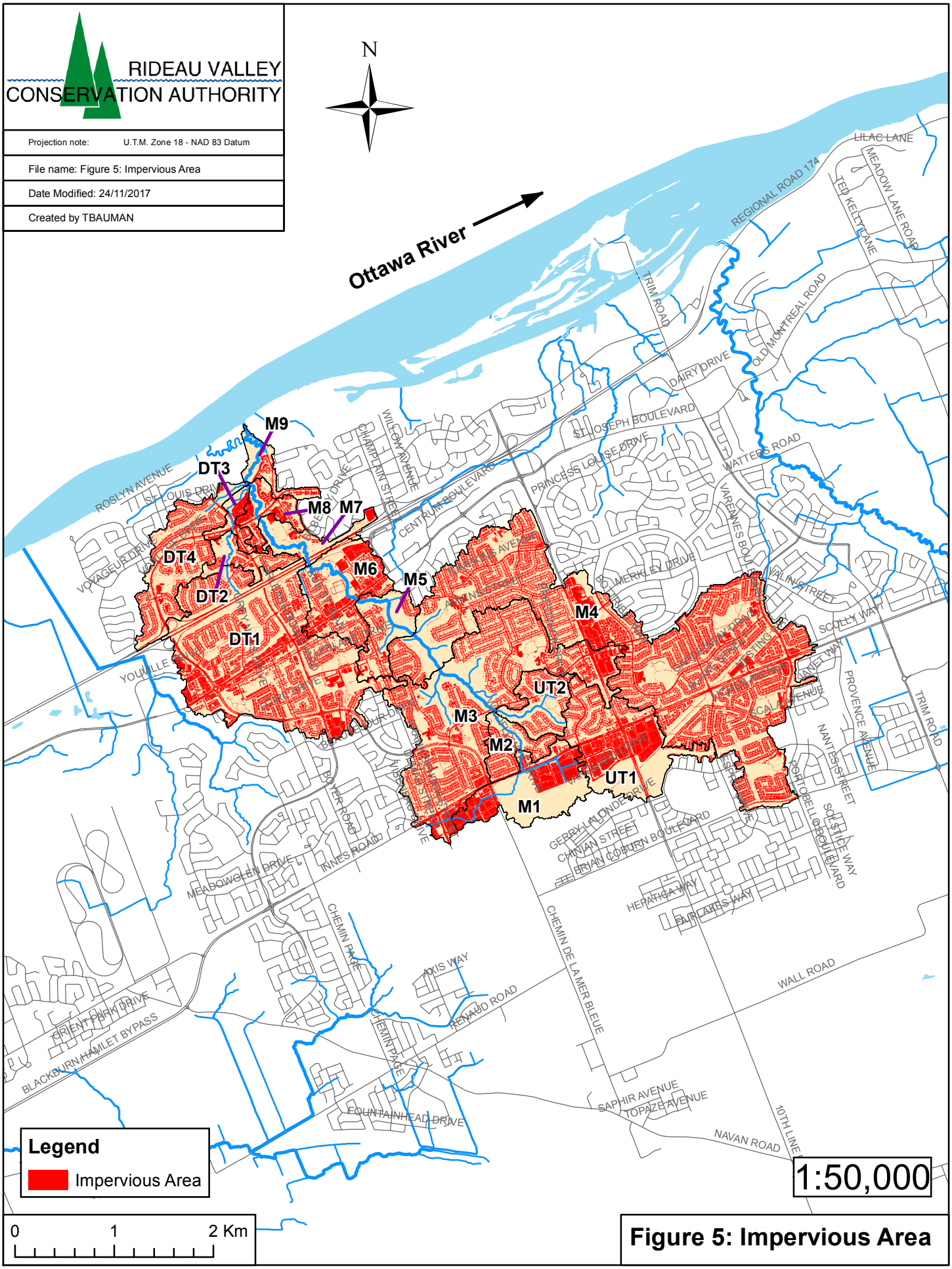
Figure 4: Land Use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ST LOUIS DRIVE
VOYAGEUR DRIVE
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WILLOW AVENUE
CENTRUM BOULEVARD
PRINCESS LOUISE DRIVE
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DAIRY DRIVE
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REGIONAL ROAD 174
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WATTERS ROAD
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MERKLEY DRIVE
VALIN STREET
SCULLY WAY
PROVENCE AVENUE
TRIM ROAD
YOUVILLE DRIVE
BOYER ROAD
INNES ROAD
MEADOWGLEN DRIVE
CHEMIN PAGE
AXIS WAY
RENAUD ROAD
ORIENT PARK DRIVE
BLACKBURN HAMLET BYPASS
FOUNTAINHEAD DRIVE
GERRY LALONDE DRIVE
CHINIAN STREET
BRIAN COBURN BOULEVARD
HEPATICA WAY
FAIRLAKES WAY
CHEMIN DE LA MER BLEUE
SOUTH MODEL WAY
ORTONA BELL BOULEVARD
NANTES STREET
WALL ROAD
SAPHIR AVENUE
TOPAZE AVENUE
NAVAN ROAD
10TH LINE
Legend
Impervious Area
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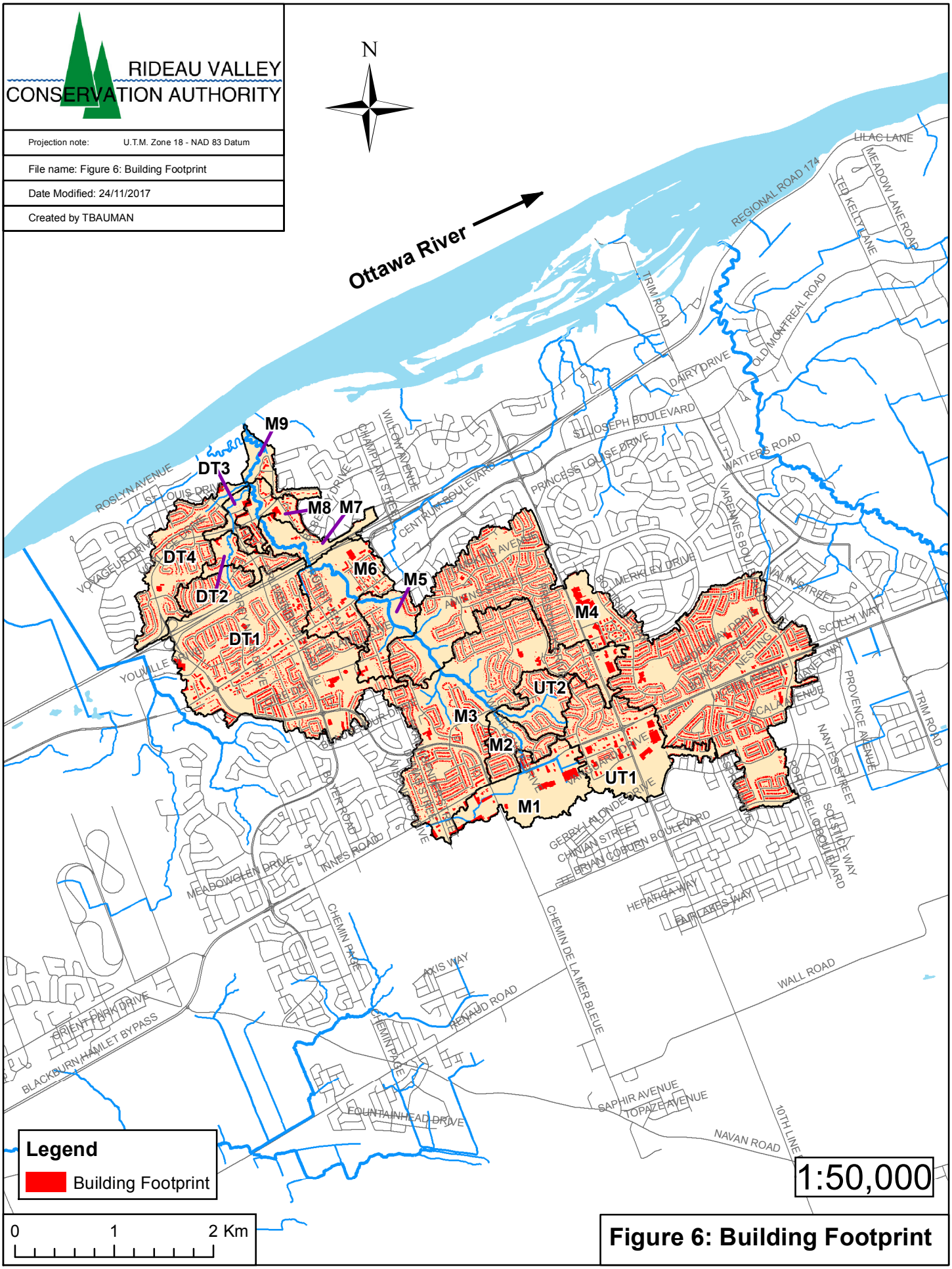
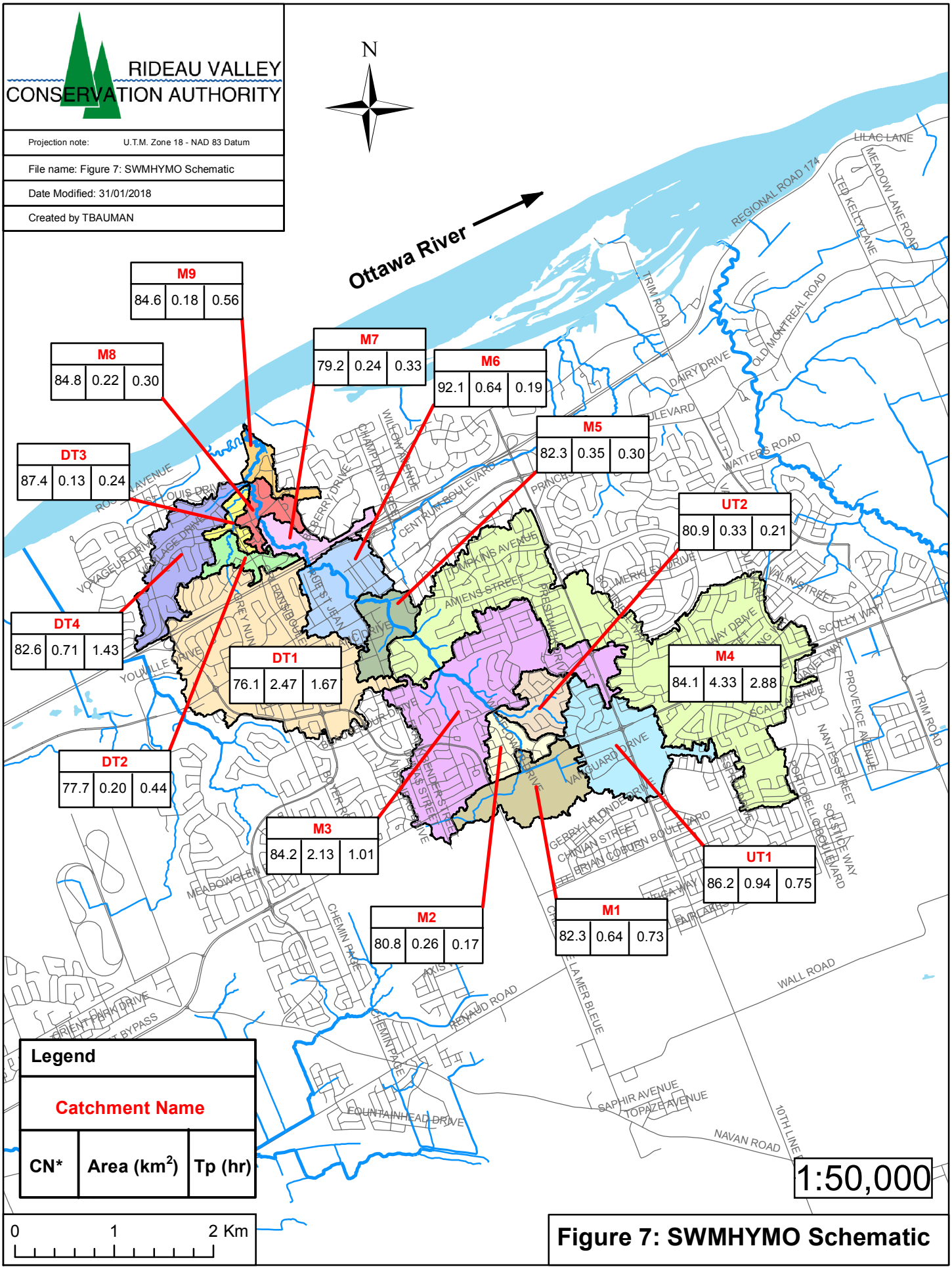
2 Km
1:50,000
Figure 5: Impervious Area


RIDEAU VALLEY CONSERVATION AUTHORITY
Projection note: U.T.M. Zone 18 - NAD 83 Datum
File name: Figure 6: Building Footprint
Date Modified: 24/11/2017
Created by TBAUMAN
N
Ottawa River
M9
DT3
M8
M7
DT4
M6
M5
DT2
M4
DT1
UT2
M3
M2
UT1
M1
ROSLYN AVENUE
ST LOUIS DRIVE
VOYAGEUR DRIVE
WILLOW AVENUE
CHAMPLAIN STREET
CENTRUM BOULEVARD
PRINCESS LOUISE DRIVE
ST JOSEPH BOULEVARD
DAIRY DRIVE
REGIONAL ROAD 174
TRIM ROAD
OLD MONTREAL ROAD
LILAC LANE
TED KELLY LANE
MEADOW LANE ROAD
WATTERS ROAD
VARENNES BOULEVARD
VALIN STREET
SCULLY WAY
PROVENCE AVENUE
NANTES STREET
JOSEPH-ROBELLO BOULEVARD
SOUTH EDGE WAY
YOUVILLE DRIVE
BOYER ROAD
INNES ROAD
MEADOWGLEN DRIVE
GERRY LALONDE DRIVE
CHANIAN STREET
BRIAN COBURN BOULEVARD
HEPATICA WAY
FAIRLAKES WAY
CHEMIN PAGE
CHEMIN DE LA MER BLEUE
AXIS WAY
RENAUD ROAD
WALL ROAD
ORIENT PARK DRIVE
BLACKBURN HAMLET BYPASS
FOUNTAINHEAD DRIVE
SAPHIR AVENUE
TOPAZE AVENUE
NAVAN ROAD
10TH LINE
Legend
Building Footprint
0
1
2 Km
1:50,000
Figure 6: Building Footprint


RIDEAU VALLEY CONSERVATION AUTHORITY
Projection note: U.T.M. Zone 18 - NAD 83 Datum
File name: Figure 7: SWMHYMO Schematic
Date Modified: 31/01/2018
Created by TBAUMAN
N
Ottawa River
M9 84.6 0.18 0.56
M8 84.8 0.22 0.30
M7 79.2 0.24 0.33
M6 92.1 0.64 0.19
M5 82.3 0.35 0.30
DT3 87.4 0.13 0.24
UT2 80.9 0.33 0.21
DT4 82.6 0.71 1.43
DT1 76.1 2.47 1.67
M4 84.1 4.33 2.88
DT2 77.7 0.20 0.44
M3 84.2 2.13 1.01
UT1 86.2 0.94 0.75
M2 80.8 0.26 0.17
M1 82.3 0.64 0.73
Legend
Catchment Name
CN*
Area (km2)
Tp (hr)
0 1 2 Km
1:50,000
Figure 7: SWMHYMO Schematic

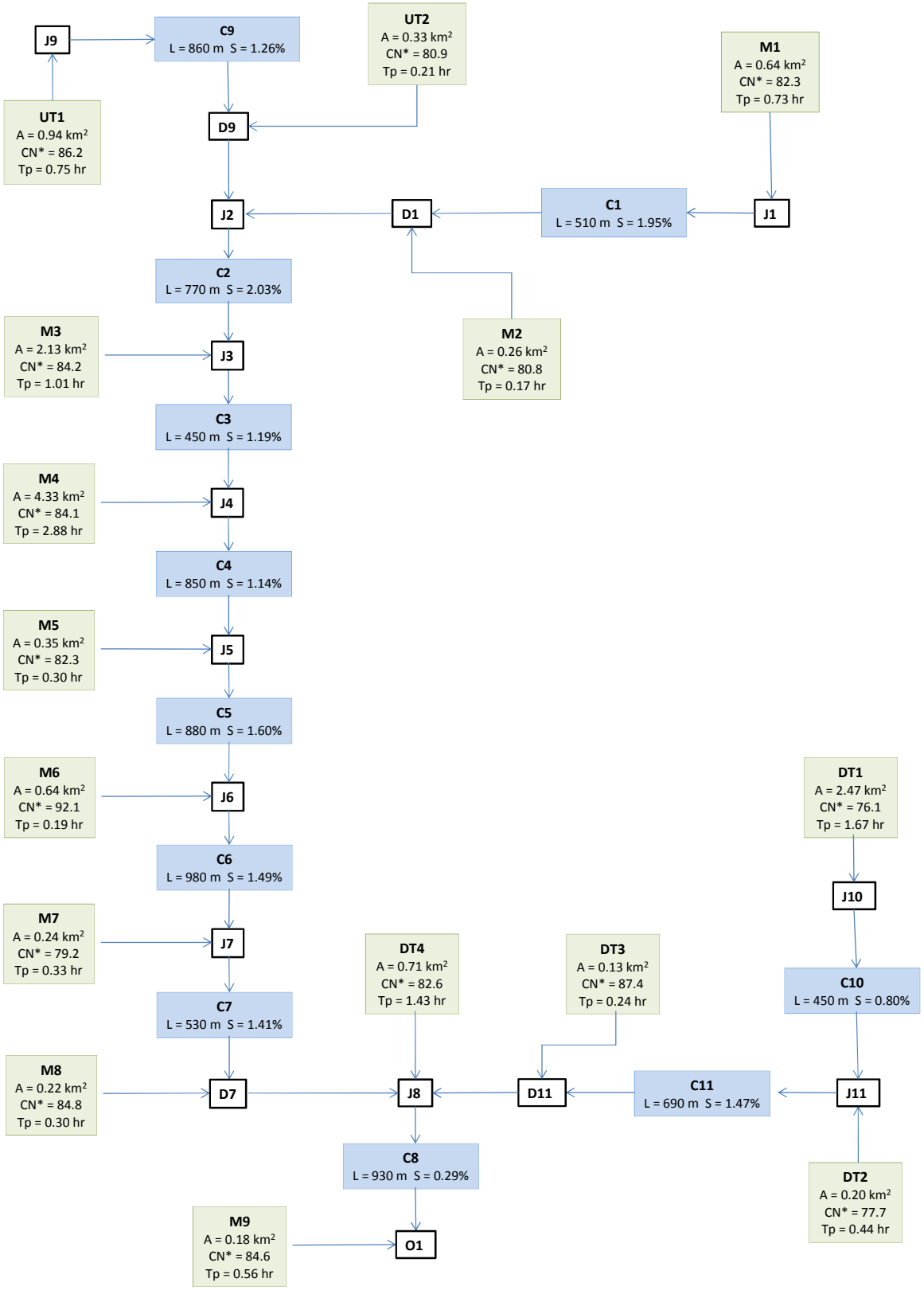


Figure 8 SWMHYMO Flow Chart

Figure 9 IDF curve for Ottawa Airport based on 1967-2007 data

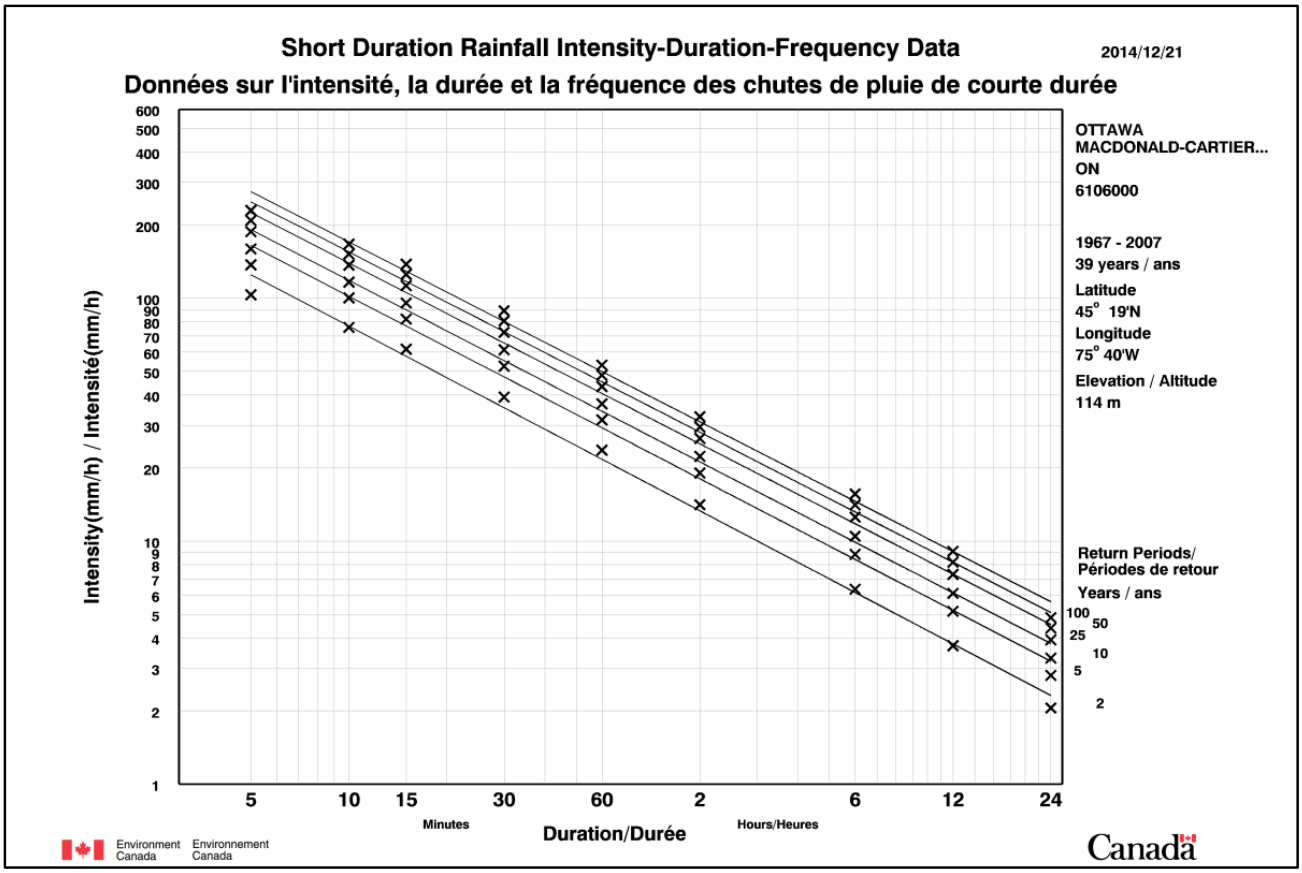


Figure 10 Fitted IDF curves for Ottawa Airport generated by STORMS software

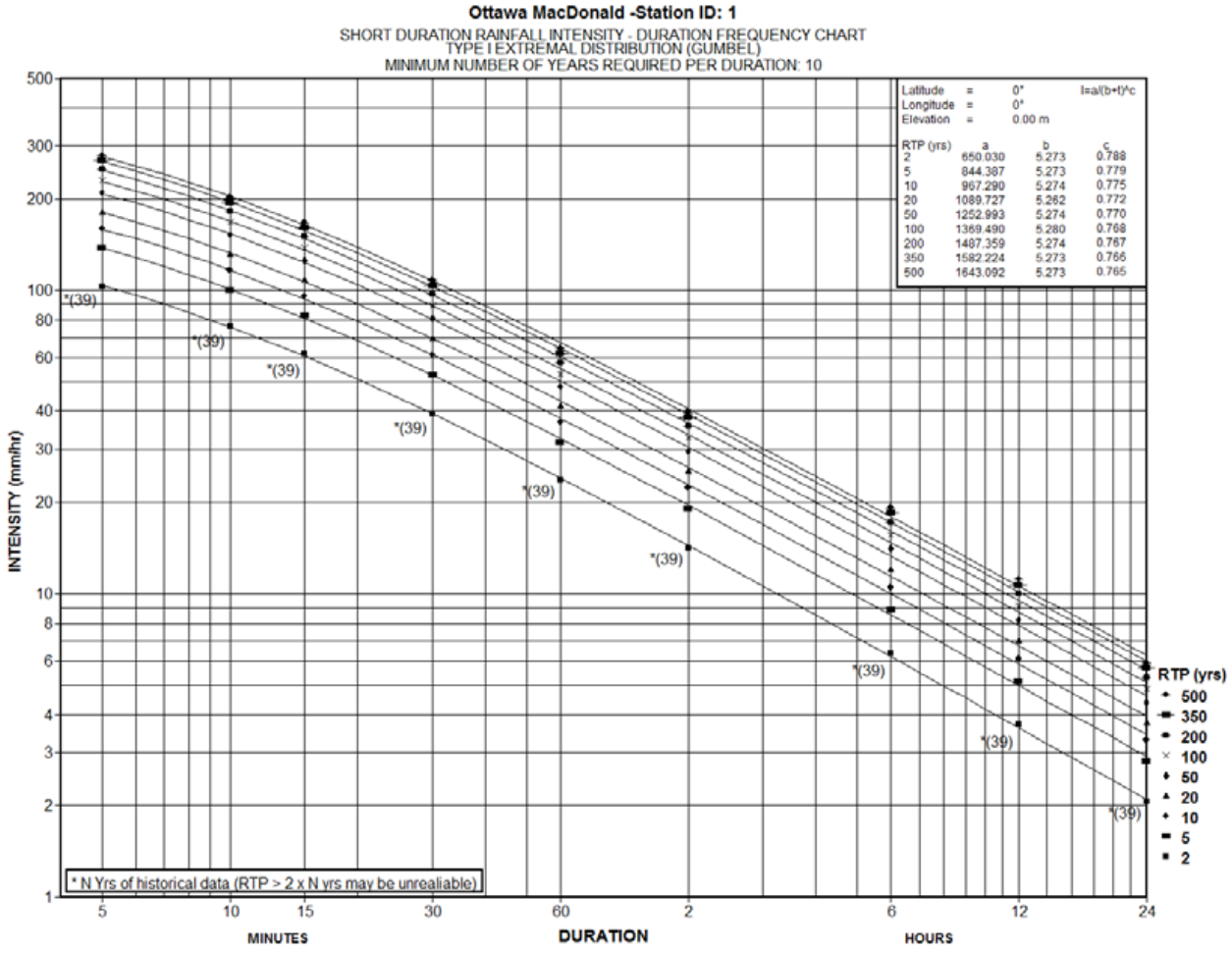
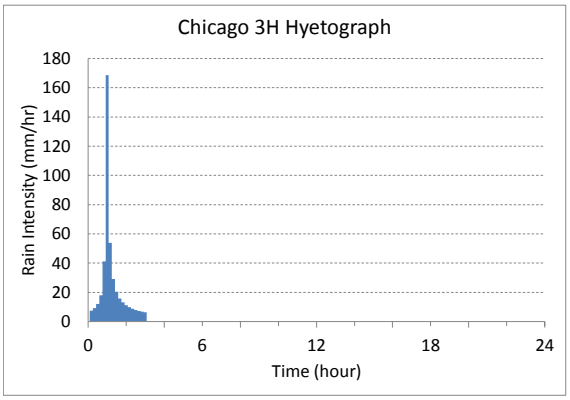
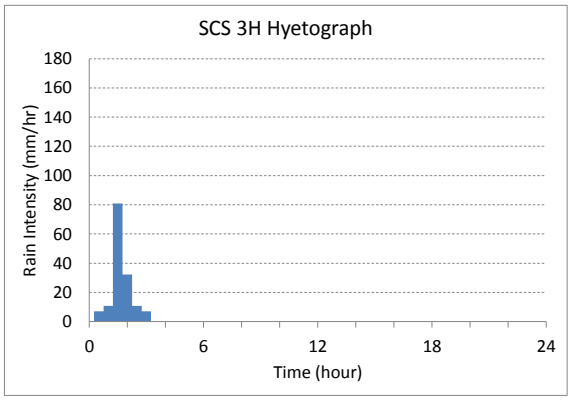
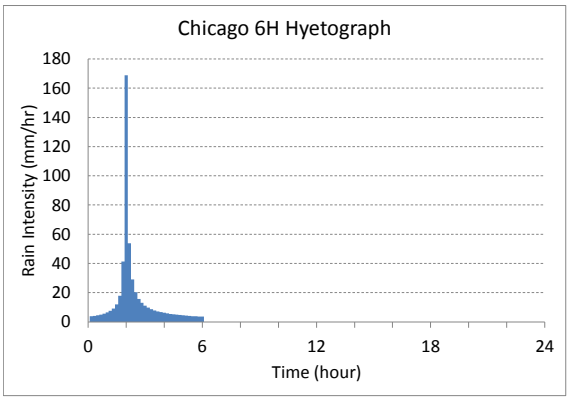
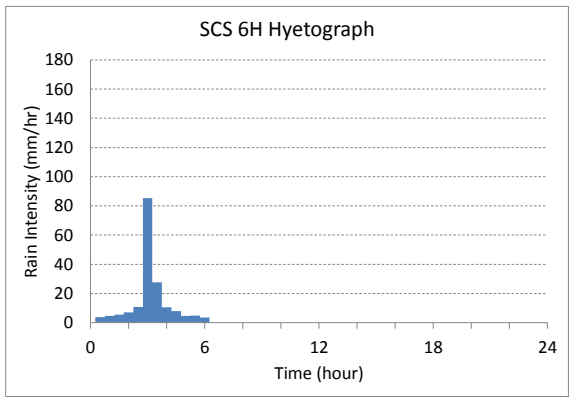


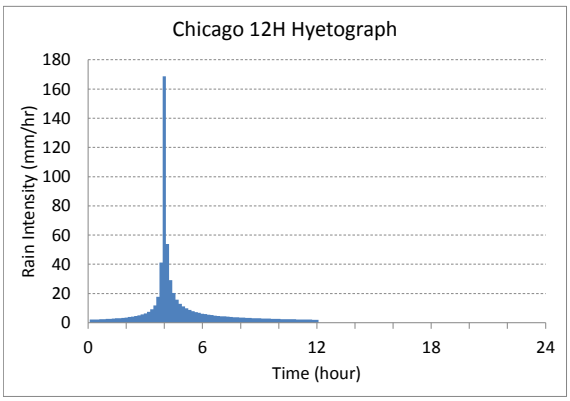
Figure 11 Hyetographs of various design storms

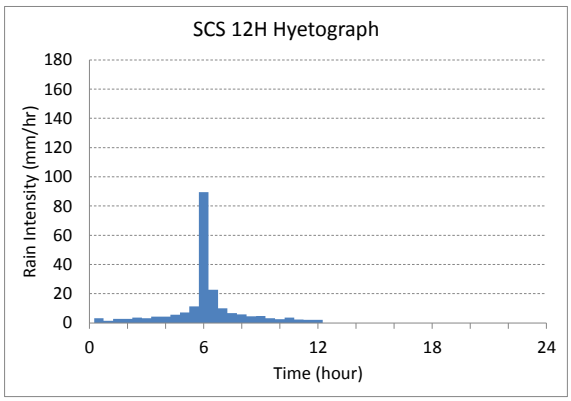


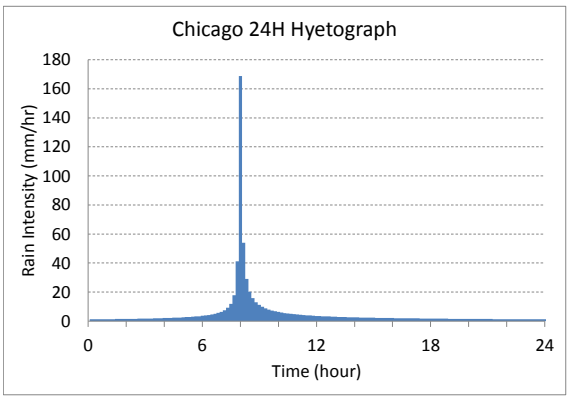












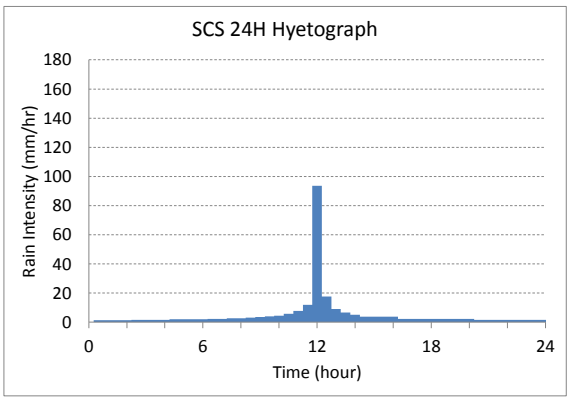
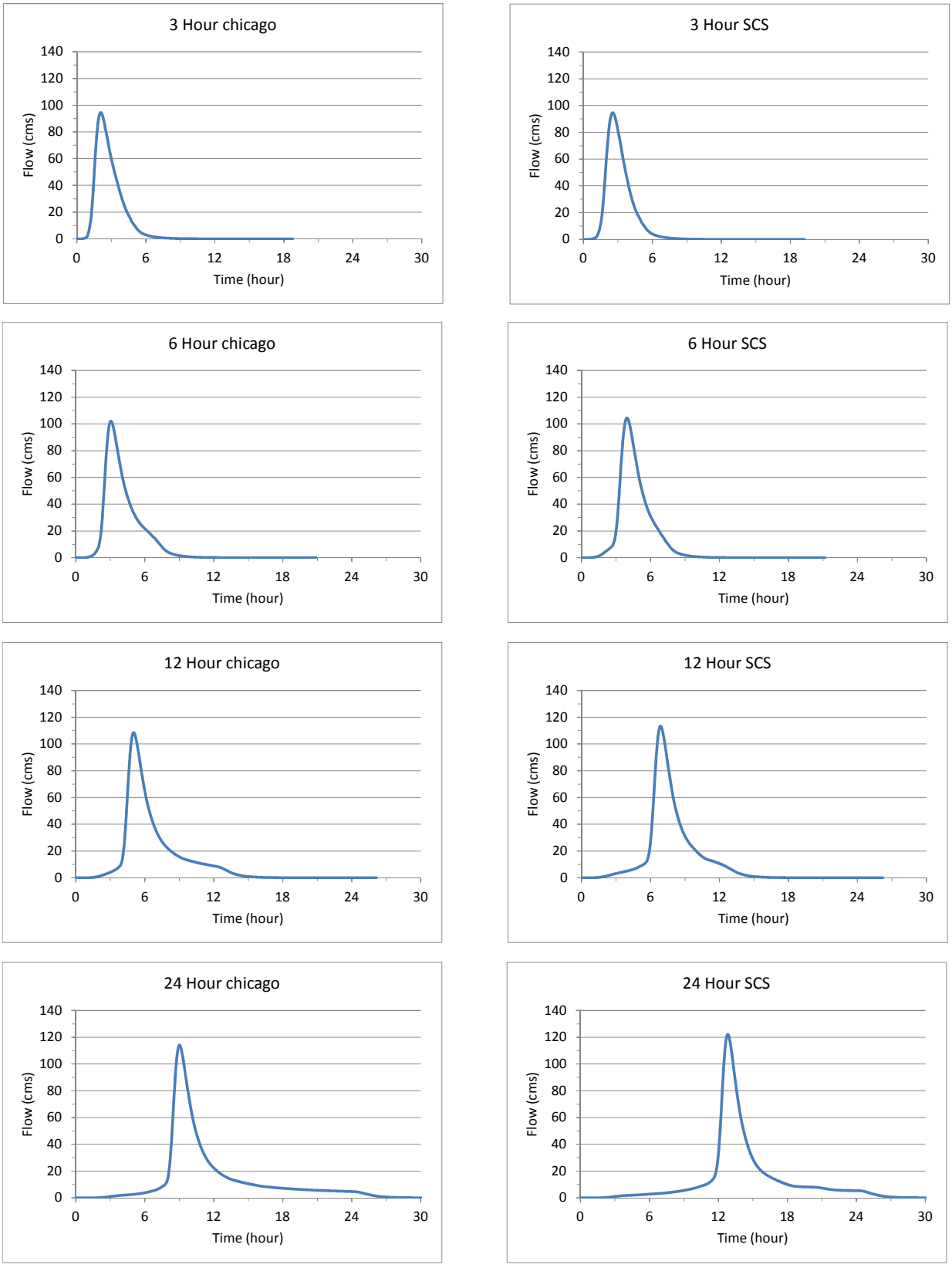


Figure 12 SWMHYMO generated flow at node O1 for different design storms



RIDEAU VALLEY CONSERVATION AUTHORITY

Projection note: U.T.M. Zone 18 - NAD 83 Datum

File name: Figure 13: Flow at key locations

Date Modified: 02/02/2018

Created by TBAUMAN

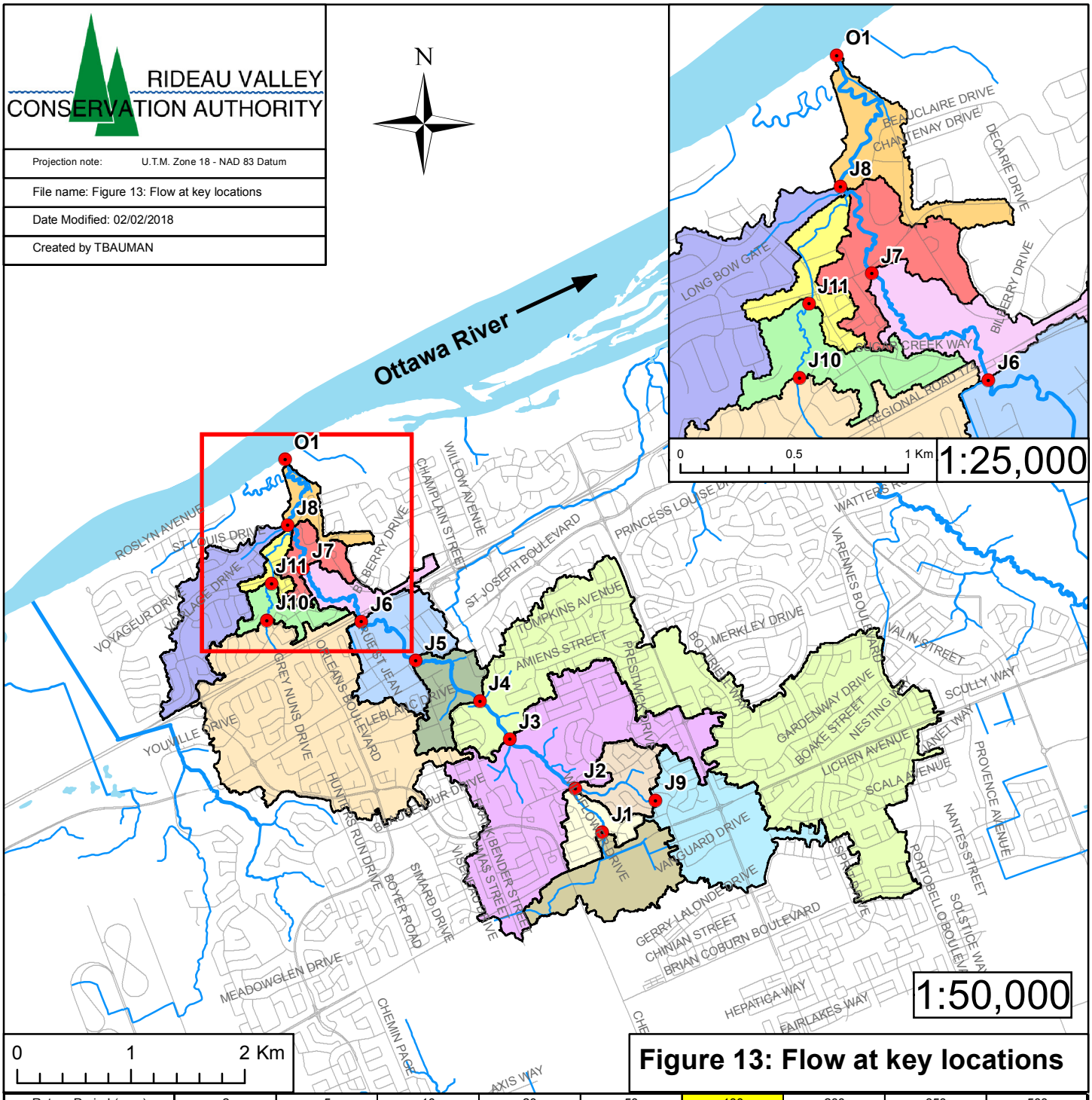


Figure 13: Flow at key locations

Return Period (year)	2	5	10	20	50	100	200	350	500
Nodes	Flow (cms)								
J1	1.88	3.28	4.30	5.36	6.81	7.98	9.16	10.14	10.75
J2	5.99	10.97	14.26	17.72	22.52	26.43	30.29	33.50	35.63
J3	10.76	19.44	25.76	32.22	41.29	48.62	55.61	61.45	65.60
J4	19.02	34.13	45.06	56.76	73.29	86.22	99.16	109.95	118.06
J5	19.62	35.30	46.65	58.74	75.79	89.28	102.51	113.66	122.07
J6	21.35	38.29	50.29	63.08	80.95	95.29	109.13	120.82	129.56
J7	21.63	38.76	50.91	63.78	81.79	96.12	110.05	121.78	130.57
J8	28.88	51.72	67.90	85.18	109.43	128.76	147.50	163.49	175.10
J9	2.86	5.05	6.56	8.11	10.22	11.89	13.46	14.82	15.84
J10	4.88	8.78	11.70	14.87	19.40	23.01	26.55	29.72	31.81
J11	5.23	9.43	12.49	15.99	20.83	24.71	28.48	31.90	34.14
O1	27.45	48.90	64.48	80.89	103.77	122.18	139.99	155.24	166.11
D1	2.62	4.64	6.02	7.54	9.61	11.26	12.95	14.35	15.24
D7	22.01	39.41	51.70	64.71	82.95	97.48	111.60	123.45	132.38
D9	3.47	6.42	8.31	10.30	13.06	15.31	17.51	19.28	20.56
D11	7.10	12.58	16.65	21.35	27.82	32.82	37.72	42.19	45.25

Figure 14 Estimated 1:100 year flows along Bilberry Creek

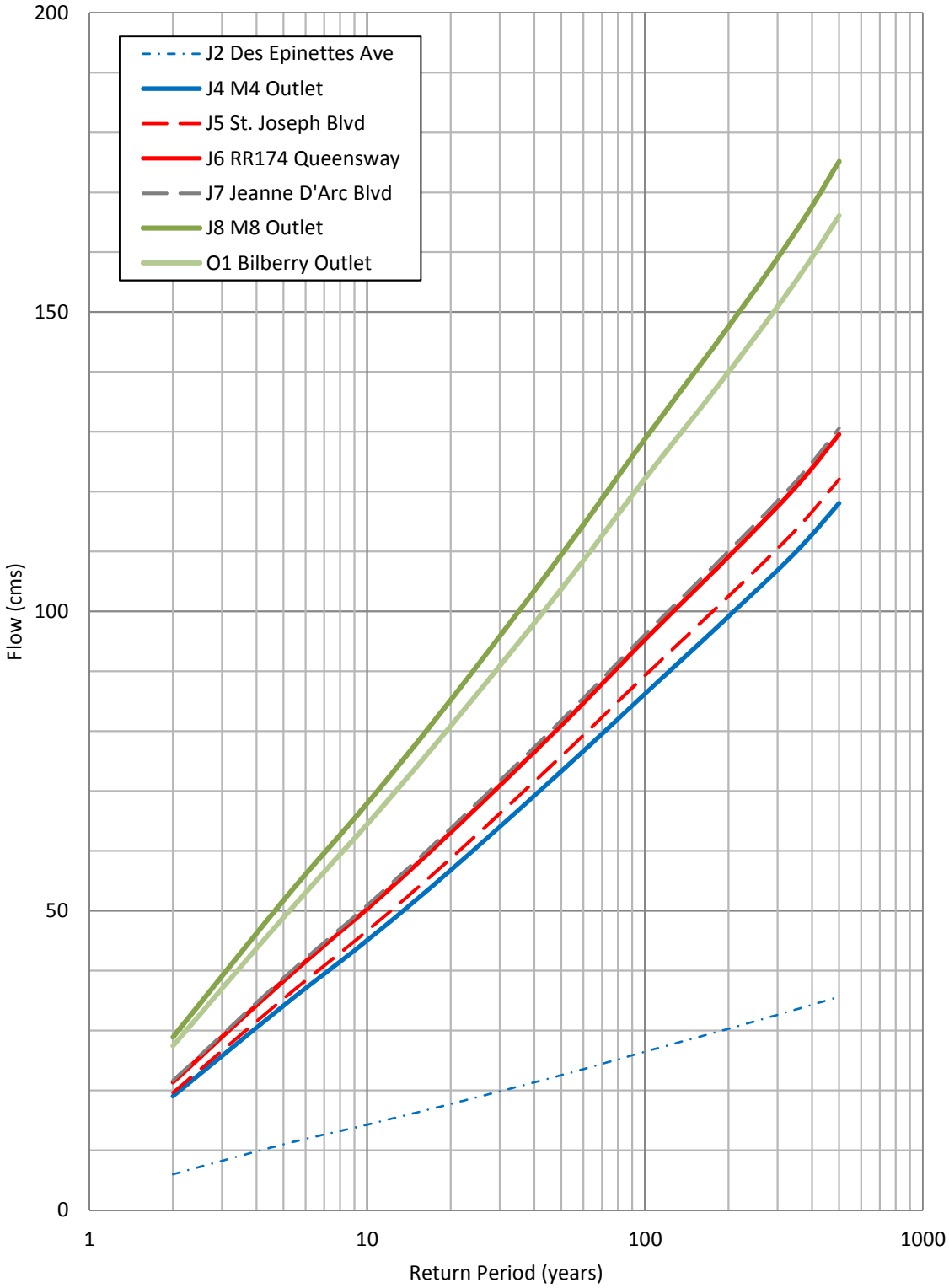


Figure 15 Comparison of estimated 1:100 year flows

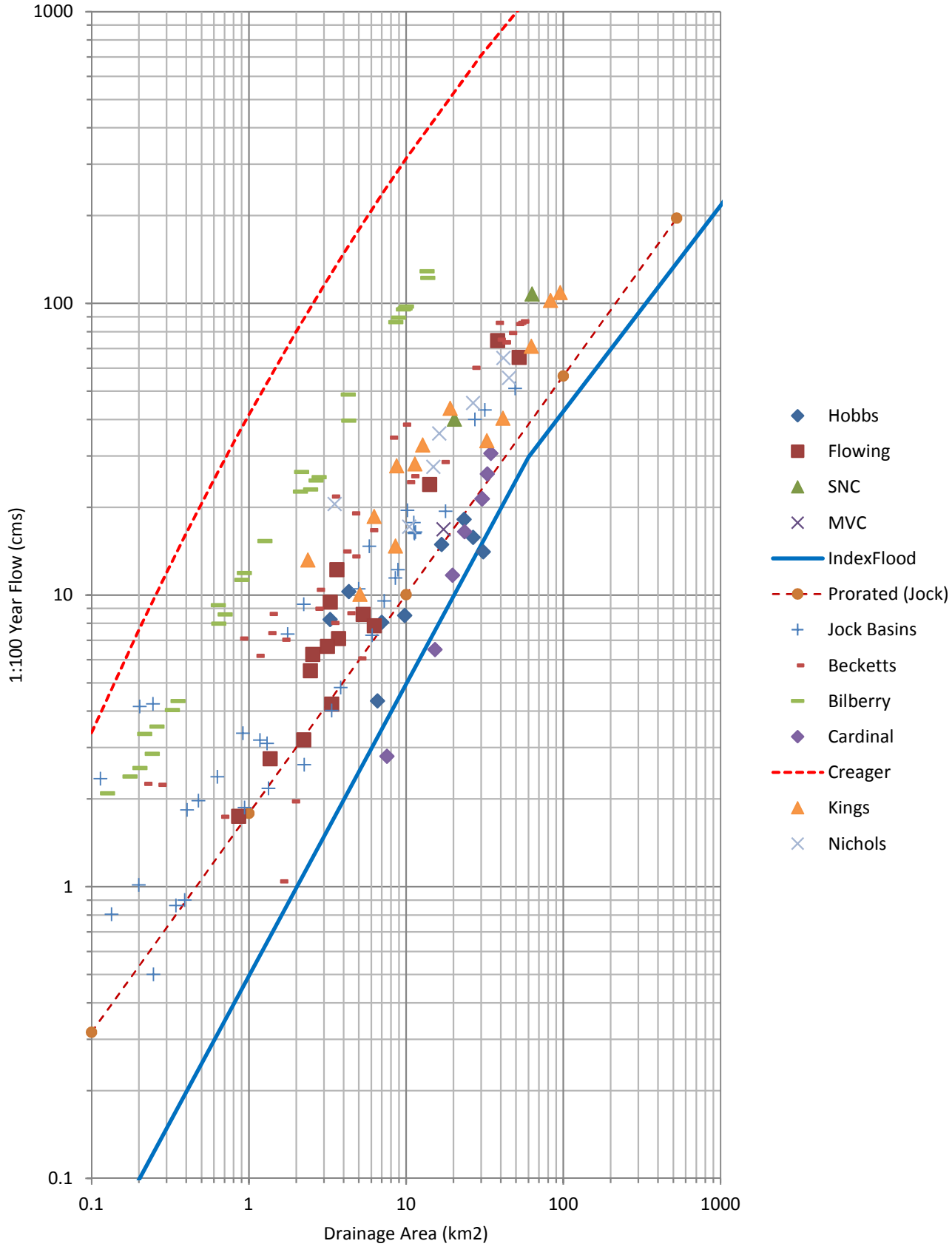
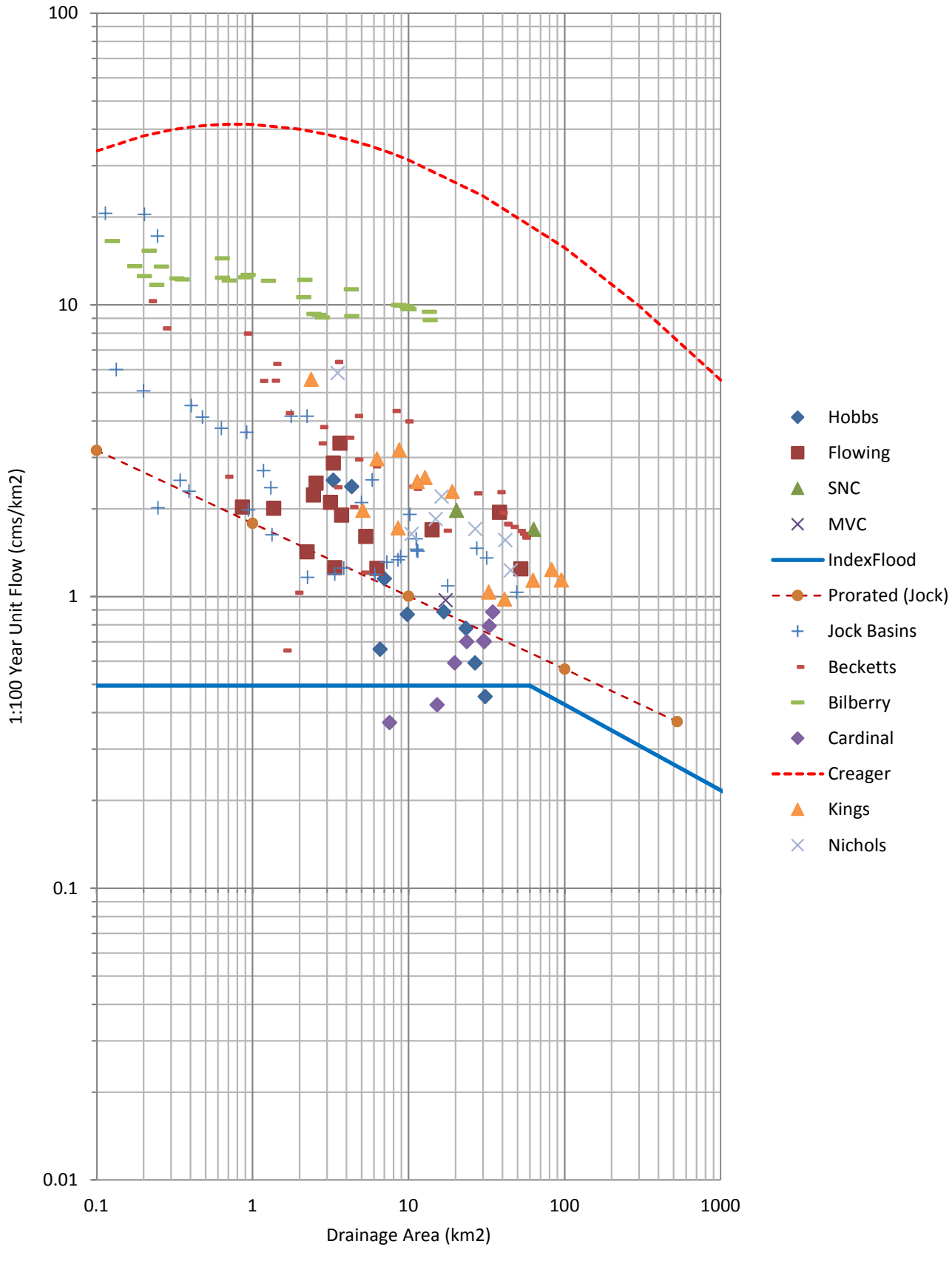


Figure 16 Comparison of 1:100 year flows per unit area



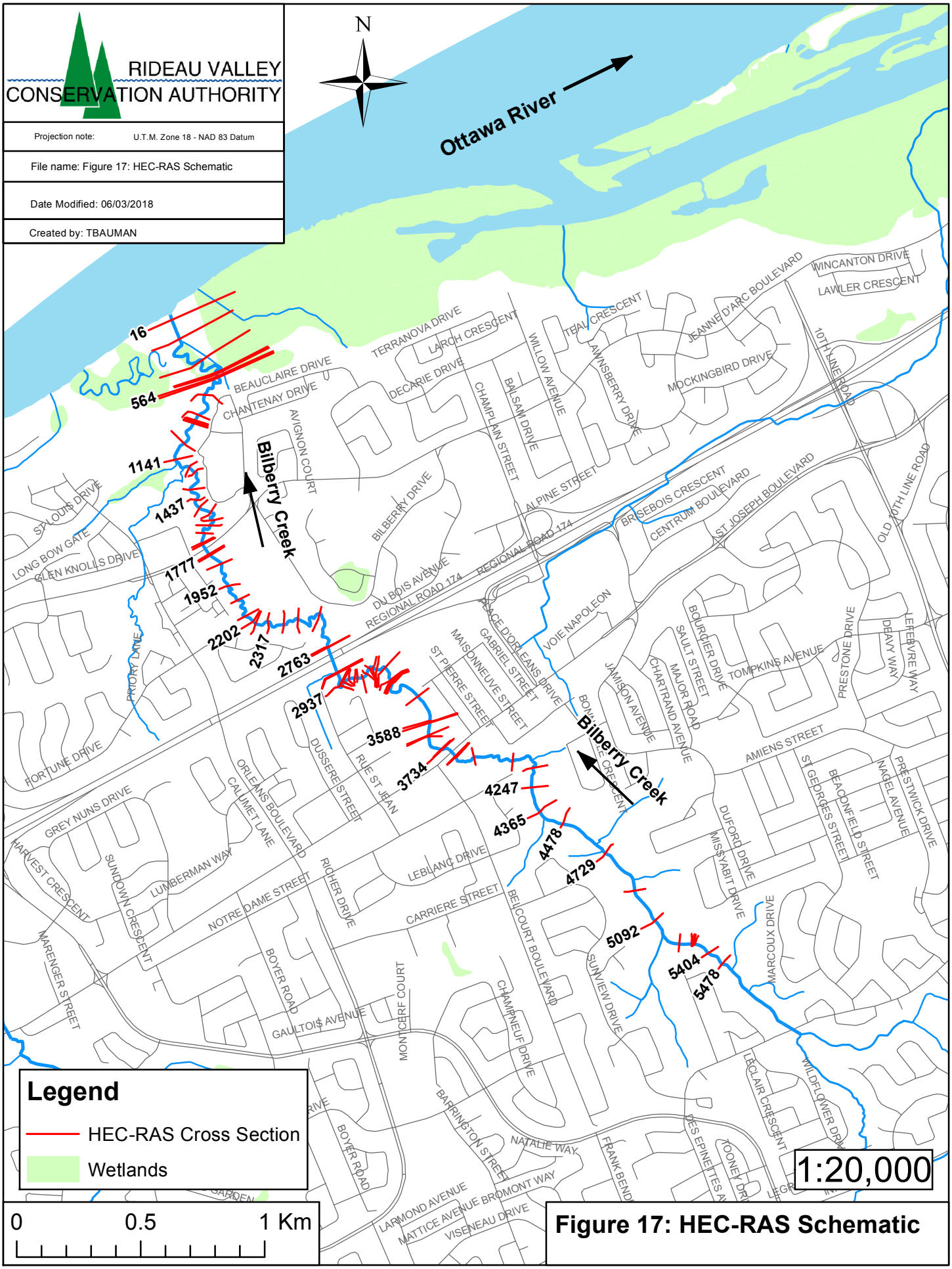

RIDEAU VALLEY CONSERVATION AUTHORITY
Projection note: U.T.M. Zone 18 - NAD 83 Datum
File name: Figure 17: HEC-RAS Schematic
Date Modified: 06/03/2018
Created by: TBAUMAN
N
Ottawa River
Bilberry Creek
Bilberry Creek
16
564
1141
1437
1777
1952
2202
2317
2763
2937
3588
3734
4247
4365
4478
4729
5092
5404
5478
Legend
HEC-RAS Cross Section
Wetlands
0
0.5
1 Km
1:20,000
Figure 17: HEC-RAS Schematic

Figure 18 Sensitivity analysis of the computed water level for the design flow (Bilberry Creek)

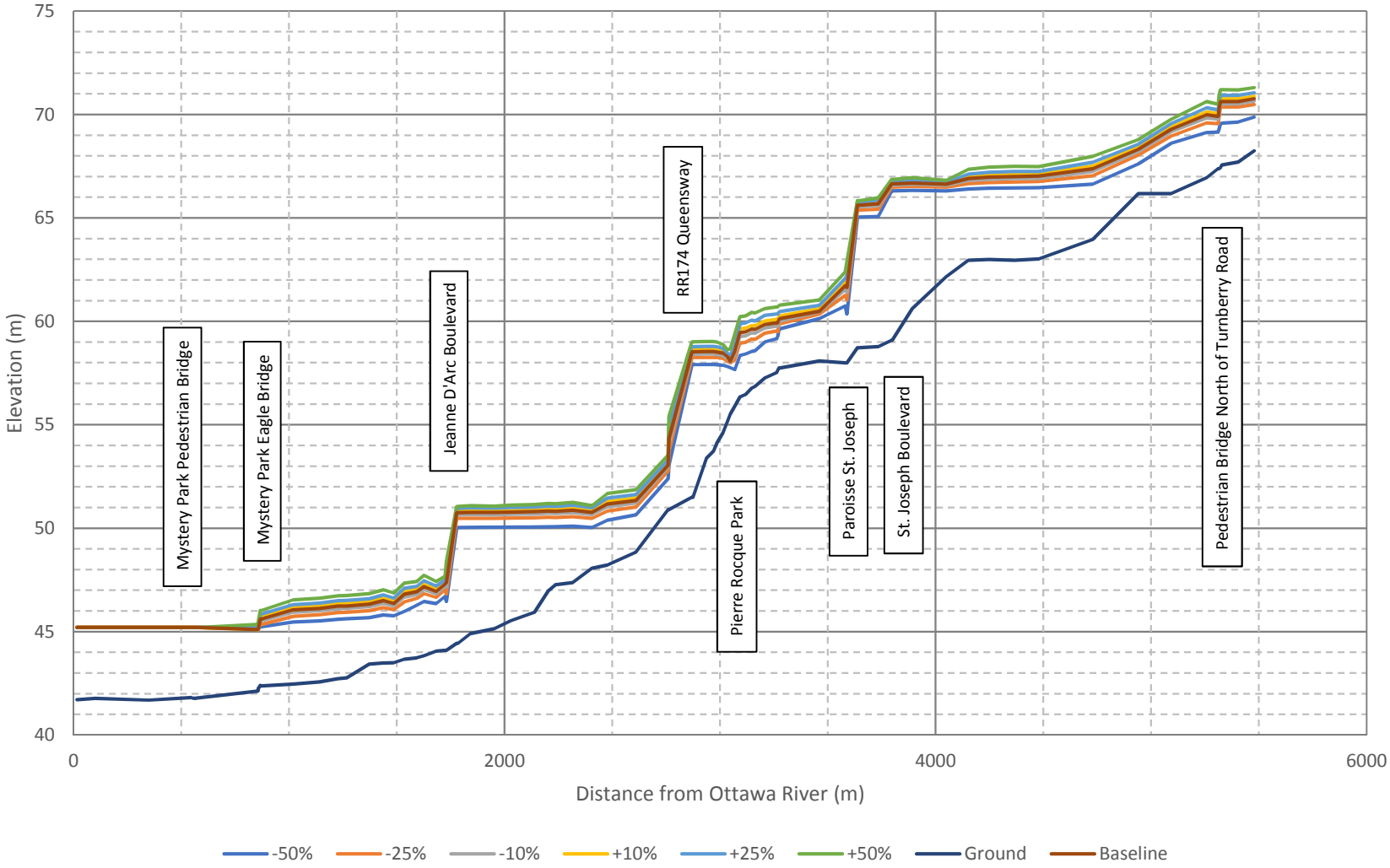


Figure 19 Sensitivity analysis of water level differences (Bilberry Creek)

Table 1 Land use breakdown in the Bilberry Basin

		Catchment	M1		M2		*M3*		M4	
	Code	Land use description	Area (km^2)	%	Area (km^2)	%	Area (km^2)	%	Area (km^2)	%
1	R1	Single -detached residential	0.03	*5.04*	0.13	*51.42*	0.91	*42.89*	1.76	*40.61*
2	R1-L	Linked Single	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
3	R2	Semi -detached residential	0.00	*0.24*	0.00	*0.00*	0.01	*0.55*	0.02	*0.54*
4	R3	Row and townhouse	0.02	*2.38*	0.01	*2.49*	0.13	*5.98*	0.33	*7.63*
5	R3-S	Stacked townhouse	0.00	*0.00*	0.00	*0.00*	0.00	*0.08*	0.05	*1.25*
6	R4-X	Duplex, triplex, single dwelling with apartment unit	0.00	*0.00*	0.00	*0.00*	0.01	*0.39*	0.00	*0.01*
7	R4	Apartment	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.01	*0.19*
8	R5	Mobile	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
9	C1	Regional shopping center	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
10	C2	Community shopping center	0.01	*0.98*	0.00	*0.00*	0.02	*1.10*	0.06	*1.31*
11	C3	Other Commercial	0.22	*34.24*	0.00	*0.00*	0.10	*4.48*	0.01	*0.25*
12	I1	Elementary school	0.00	*0.00*	0.00	*0.00*	0.03	*1.30*	0.09	*2.04*
13	I2	Secondary school	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.03	*0.60*
14	I3	Post-secondary school	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
15	I3-r	Student campus residences	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
16	I4	Hospital, rehabilitation, nursing home	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
17	I5	Other Institution	0.01	*0.82*	0.00	*0.00*	0.01	*0.68*	0.04	*1.00*
18	M1	Industrial	0.00	*0.57*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
19	M2	Industrial mall-condo	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
20	TR	Transportation	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
21	UT	Utility	0.00	*0.00*	0.00	*0.00*	0.00	*0.19*	0.13	*3.10*
22	COMM	Communications	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
23	OF	Office	0.00	*0.61*	0.00	*0.00*	0.00	*0.09*	0.00	*0.00*
24	RE-A	Active recreation	0.01	*1.59*	0.00	*1.60*	0.05	*2.38*	0.27	*6.12*
25	RE-A-s	Active recreation on school property	0.00	*0.00*	0.00	*0.00*	0.03	*1.60*	0.09	*2.16*
26	RE-P	Passive Recreation	0.00	*0.37*	0.05	*17.21*	0.29	*13.60*	0.31	*7.18*
27	RE-P-s	Passive recreation on school property	0.00	*0.00*	0.00	*0.00*	0.01	*0.51*	0.01	*0.27*
28	OS	Open space	0.00	*0.13*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
29	ROS	Idle and shrub Land	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
30	AG	Agriculture	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
31	V1	Vacant Land	0.30	*46.22*	0.00	*0.00*	0.03	*1.19*	0.04	*0.99*
32	V2	Vacant building	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
33	FT	Forest	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
34	ST	Street	0.04	*6.80*	0.07	*27.29*	0.49	*22.99*	1.07	*24.75*
35	QS	Quarry	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
36	WL	Wetland	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
37	WL-FT	Wetland	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
38	WATER	Water	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
39	IW	Water	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
		Total	0.64	*100*	0.26	*100*	2.13	*100*	4.33	*100*

		Catchment	M5		M6		*M7*		M8	
	Code	Land use description	Area (km2)	%	Area (km2)	%	Area (km2)	%	Area (km2)	%
1	R1	Single -detached residential	0.14	*38.27*	0.18	*28.17*	0.01	*6.00*	0.01	*4.40*
2	R1-L	Linked Single	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
3	R2	Semi -detached residential	0.01	*3.37*	0.01	*1.85*	0.00	*0.00*	0.00	*0.00*
4	R3	Row and townhouse	0.01	*1.92*	0.00	*0.14*	0.03	*11.12*	0.06	*26.24*
5	R3-S	Stacked townhouse	0.00	*0.00*	0.00	*0.00*	0.00	*0.25*	0.02	*8.25*
6	R4-X	Duplex, triplex, single dwelling with apartment unit	0.00	*0.60*	0.01	*1.18*	0.00	*0.00*	0.00	*0.00*
7	R4	Apartment	0.00	*0.00*	0.01	*1.05*	0.00	*0.00*	0.01	*3.66*
8	R5	Mobile	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
9	C1	Regional shopping center	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
10	C2	Community shopping center	0.01	*1.86*	0.02	*2.89*	0.00	*0.00*	0.03	*11.87*
11	C3	Other Commercial	0.00	*0.54*	0.09	*14.63*	0.00	*0.00*	0.00	*0.00*
12	I1	Elementary school	0.03	*8.23*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
13	I2	Secondary school	0.00	*0.00*	0.00	*0.00*	0.01	*3.21*	0.02	*9.61*
14	I3	Post-secondary school	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
15	I3-r	Student campus residences	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
16	I4	Hospital, rehabilitation, nursing home	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
17	I5	Other Institution	0.01	*1.89*	0.08	*12.77*	0.01	*3.77*	0.01	*2.43*
18	M1	Industrial	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
19	M2	Industrial mall-condo	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
20	TR	Transportation	0.00	*0.00*	0.00	*0.00*	0.01	*4.86*	0.00	*0.00*
21	UT	Utility	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
22	COMM	Communications	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
23	OF	Office	0.01	*1.89*	0.03	*3.94*	0.00	*0.00*	0.00	*0.00*
24	RE-A	Active recreation	0.00	*0.00*	0.05	*7.98*	0.00	*0.00*	0.00	*0.45*
25	RE-A-s	Active recreation on school property	0.00	*0.00*	0.00	*0.00*	0.03	*12.69*	0.00	*1.15*
26	RE-P	Passive Recreation	0.10	*27.90*	0.02	*3.82*	0.09	*37.46*	0.04	*20.45*
27	RE-P-s	Passive recreation on school property	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
28	OS	Open space	0.00	*0.00*	0.00	*0.16*	0.02	*8.12*	0.00	*0.00*
29	ROS	Idle and shrub Land	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
30	AG	Agriculture	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
31	V1	Vacant Land	0.01	*2.28*	0.01	*1.72*	0.00	*0.01*	0.00	*0.00*
32	V2	Vacant building	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
33	FT	Forest	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
34	ST	Street	0.04	*11.24*	0.13	*19.69*	0.03	*12.52*	0.03	*11.48*
35	QS	Quarry	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
36	WL	Wetland	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
37	WL-FT	Wetland	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
38	WATER	Water	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
39	IW	Water	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
		Total	0.35	*100*	0.64	*100*	0.24	*100*	0.22	*100*

Note: Land use is based on City of Ottawa parcels which conform to the projected land use zoning according to the Official Plan of 2003 and Official Plan Amendment #150 in 2013

Table 1 Land use breakdown in the Bilberry Basin (continued)

		Catchment	M9		UT1		UT2		DT1	
	Code	Land use description	Area (km^2)	%	Area (km^2)	%	Area (km^2)	%	Area (km^2)	%
1	R1	Single -detached residential	0.01	*7.75*	0.19	*20.50*	0.17	*51.01*	0.84	*33.99*
2	R1-L	Linked Single	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
3	R2	Semi -detached residential	0.00	*0.00*	0.00	*0.14*	0.00	*0.00*	0.05	*2.21*
4	R3	Row and townhouse	0.02	*11.37*	0.04	*3.95*	0.01	*1.71*	0.20	*8.21*
5	R3-S	Stacked townhouse	0.01	*6.90*	0.00	*0.41*	0.00	*0.00*	0.01	*0.32*
6	R4-X	Duplex, triplex, single dwelling with apartment unit	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.01	*0.42*
7	R4	Apartment	0.00	*2.50*	0.00	*0.00*	0.00	*0.00*	0.04	*1.45*
8	R5	Mobile	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
9	C1	Regional shopping center	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
10	C2	Community shopping center	0.00	*2.35*	0.03	*3.13*	0.00	*0.00*	0.10	*3.84*
11	C3	Other Commercial	0.00	*0.00*	0.15	*15.95*	0.00	*0.00*	0.06	*2.49*
12	I1	Elementary school	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.03	*1.38*
13	I2	Secondary school	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.03	*1.34*
14	I3	Post-secondary school	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
15	I3-r	Student campus residences	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
16	I4	Hospital, rehabilitation, nursing home	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
17	I5	Other Institution	0.00	*0.00*	0.00	*0.26*	0.00	*0.00*	0.02	*0.73*
18	M1	Industrial	0.00	*0.00*	0.06	*6.02*	0.00	*0.00*	0.01	*0.47*
19	M2	Industrial mall-condo	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
20	TR	Transportation	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
21	UT	Utility	0.00	*0.00*	0.06	*6.15*	0.00	*0.00*	0.00	*0.03*
22	COMM	Communications	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
23	OF	Office	0.00	*0.00*	0.01	*1.40*	0.00	*0.00*	0.01	*0.40*
24	RE-A	Active recreation	0.01	*3.04*	0.00	*0.00*	0.01	*2.36*	0.08	*3.11*
25	RE-A-s	Active recreation on school property	0.00	*0.18*	0.00	*0.00*	0.00	*0.00*	0.05	*2.20*
26	RE-P	Passive Recreation	0.09	*51.77*	0.01	*0.84*	0.09	*26.33*	0.12	*4.81*
27	RE-P-s	Passive recreation on school property	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.04	*1.61*
28	OS	Open space	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.08	*3.32*
29	ROS	Idle and shrub Land	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
30	AG	Agriculture	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
31	V1	Vacant Land	0.00	*0.23*	0.21	*22.49*	0.00	*0.00*	0.02	*0.67*
32	V2	Vacant building	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
33	FT	Forest	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
34	ST	Street	0.02	*13.90*	0.18	*18.74*	0.06	*18.59*	0.67	*27.00*
35	QS	Quarry	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
36	WL	Wetland	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
37	WL-FT	Wetland	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
38	WATER	Water	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
39	IW	Water	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
		Total	0.18	*100*	0.94	*100*	0.33	*100*	2.47	*100*

		Catchment	DT2		DT3		*DT4*		Entire Bilberry	
	Code	Land use description	Area (km^2)	%	Area (km^2)	%	Area (km^2)	%	Area (km^2)	%
1	R1	Single -detached residential	0.06	*30.57*	0.01	*8.42*	0.36	*51.05*	4.83	*35.04*
2	R1-L	Linked Single	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
3	R2	Semi -detached residential	0.01	*4.87*	0.00	*0.00*	0.00	*0.04*	0.13	*0.92*
4	R3	Row and townhouse	0.03	*15.02*	0.02	*17.72*	0.00	*0.00*	0.89	*6.46*
5	R3-S	Stacked townhouse	0.00	*0.00*	0.00	*0.00*	0.00	*0.27*	0.10	*0.73*
6	R4-X	Duplex, triplex, single dwelling with apartment unit	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.03	*0.21*
7	R4	Apartment	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.06	*0.46*
8	R5	Mobile	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
9	C1	Regional shopping center	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
10	C2	Community shopping center	0.00	*1.37*	0.03	*22.14*	0.00	*0.17*	0.30	*2.16*
11	C3	Other Commercial	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.63	*4.60*
12	I1	Elementary school	0.00	*1.63*	0.01	*4.85*	0.01	*1.63*	0.20	*1.45*
13	I2	Secondary school	0.00	*0.00*	0.00	*0.00*	0.01	*1.51*	0.10	*0.72*
14	I3	Post-secondary school	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
15	I3-r	Student campus residences	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
16	I4	Hospital, rehabilitation, nursing home	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
17	I5	Other Institution	0.00	*1.65*	0.00	*2.66*	0.00	*0.20*	0.19	*1.41*
18	M1	Industrial	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.07	*0.52*
19	M2	Industrial mall-condo	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
20	TR	Transportation	0.00	*0.00*	0.00	*0.00*	0.00	*0.13*	0.01	*0.09*
21	UT	Utility	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.20	*1.43*
22	COMM	Communications	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
23	OF	Office	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.06	*0.44*
24	RE-A	Active recreation	0.00	*0.00*	0.00	*0.00*	0.01	*0.93*	0.48	*3.48*
25	RE-A-s	Active recreation on school property	0.02	*9.21*	0.00	*0.00*	0.02	*2.22*	0.25	*1.82*
26	RE-P	Passive Recreation	0.03	*15.74*	0.03	*19.95*	0.08	*11.25*	1.35	*9.79*
27	RE-P-s	Passive recreation on school property	0.00	*2.39*	0.00	*0.36*	0.00	*0.27*	0.07	*0.50*
28	OS	Open space	0.00	*0.17*	0.00	*0.00*	0.01	*1.44*	0.11	*0.83*
29	ROS	Idle and shrub Land	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
30	AG	Agriculture	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
31	V1	Vacant Land	0.00	*0.00*	0.00	*0.00*	0.00	*0.51*	0.62	*4.48*
32	V2	Vacant building	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
33	FT	Forest	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
34	ST	Street	0.04	*17.38*	0.03	*23.90*	0.20	*28.39*	3.09	*22.46*
35	QS	Quarry	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
36	WL	Wetland	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
37	WL-FT	Wetland	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
38	WATER	Water	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
39	IW	Water	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
		Total	0.20	*100*	0.13	*100*	0.71	*100*	13.78	*100*

Note: Land use is based on City of Ottawa parcels which conform to the projected land use zoning according to the Official Plan of 2003 and Official Plan Amendment #150 in 2013

Table 2a Hydrological Soil Groups in Billberry Basin

		Soil Group area (km^2)					as percent (%) of catchment area				
Catchment	Area (km^2)	A	B	C	D	Unclassified	A	B	C	D	Unclassified
M1	0.64	0.00	0.12	0.00	0.53	0.00	0.00	18.01	0.00	81.99	0.00
M2	0.26	0.00	0.03	0.00	0.18	0.05	0.00	11.81	0.00	68.17	20.01
M3	2.13	0.00	0.11	0.00	1.19	0.83	0.00	5.01	0.00	55.88	39.11
M4	4.33	0.00	0.00	0.27	3.31	0.74	0.00	0.00	6.35	76.47	17.18
M5	0.35	0.00	0.00	0.00	0.02	0.33	0.00	0.00	0.00	5.96	94.04
M6	0.64	0.00	0.01	0.00	0.00	0.63	0.00	2.05	0.00	0.00	97.95
M7	0.24	0.00	0.09	0.00	0.08	0.07	0.00	35.40	0.00	34.52	30.08
M8	0.22	0.00	0.01	0.00	0.09	0.11	0.00	5.72	0.00	43.02	51.26
M9	0.18	0.00	0.00	0.00	0.11	0.07	0.00	0.36	0.00	61.31	38.33
UT1	0.94	0.00	0.00	0.13	0.78	0.03	0.00	0.00	14.10	83.20	2.70
UT2	0.33	0.00	0.00	0.00	0.22	0.11	0.00	0.00	0.00	65.81	34.19
DT1	2.47	0.26	0.00	0.25	0.26	1.70	10.36	0.00	10.17	10.60	68.86
DT2	0.20	0.00	0.00	0.00	0.07	0.14	0.00	0.00	0.00	33.06	66.94
DT3	0.13	0.00	0.00	0.00	0.03	0.10	0.00	0.00	0.00	24.25	75.75
DT4	0.71	0.00	0.00	0.06	0.61	0.04	0.00	0.00	8.03	86.41	5.57
Entire Billberry	13.78	0.26	0.37	0.72	7.48	4.95	1.86	2.66	5.20	54.32	35.97

Note: Based on MNRF's LIO (Land Information System) database and documentation by MNR (2012)

Note: Unclassified soils were treated as HSG D. This was guided by a general relation between soil groups and permeability, the later of which had data for unclassified soil areas. This approach was deemed the most conservative.

Table 2b Premeability in Billberry Basin

		Premeability area (km^2)				as percent (%) of catchment area			
Catchment	Area (km^2)	High	Low-medium	Variable	Low	High	Low-medium	Variable	Low
M1	0.64	0.03	0.06	0.01	0.54	3.99	9.87	1.75	84.39
M2	0.26	0.00	0.00	0.02	0.24	0.00	1.40	6.11	92.49
M3	2.13	0.04	0.08	0.06	1.95	1.94	3.54	2.97	91.54
M4	4.33	0.21	0.00	0.00	4.12	4.94	0.00	0.00	95.06
M5	0.35	0.09	0.00	0.04	0.22	25.15	0.00	11.97	62.88
M6	0.64	0.00	0.00	0.16	0.48	0.22	0.00	25.47	74.31
M7	0.24	0.00	0.00	0.19	0.06	0.00	0.00	76.33	23.67
M8	0.22	0.00	0.00	0.01	0.21	0.00	0.00	4.44	95.56
M9	0.18	0.00	0.00	0.09	0.09	0.00	0.00	51.44	48.56
UT1	0.94	0.00	0.00	0.00	0.94	0.00	0.00	0.00	100.00
UT2	0.33	0.00	0.00	0.00	0.33	0.00	0.00	0.00	100.00
DT1	2.47	0.76	0.00	0.23	1.48	30.66	0.00	9.38	59.96
DT2	0.20	0.00	0.00	0.03	0.17	0.00	0.00	15.10	84.90
DT3	0.13	0.00	0.00	0.00	0.13	0.00	0.00	0.00	100.00
DT4	0.71	0.00	0.00	0.00	0.71	0.00	0.00	0.00	100.00
Entire Billberry	13.78	1.13	0.14	0.85	11.66	8.20	1.03	6.14	84.62

Note: Based on Ontario Geological Survey surficial geology layer (OGS 2010)

Table 3a Estimated watershed parameters

Catchment	Area (km^2)	Imperviousness (%)	CN [1]	CN* [2]	IA (mm)	Channel Slope (%)	Channel Length (m)	Tc [3] (hr)	Tp [4] (hr)
M1	0.64	40.34	86.8	82.3	2.73	0.50	1470	1.21	0.73
M2	0.26	40.25	85.8	80.8	3.01	1.95	510	0.28	0.17
M3	2.13	38.87	88.1	84.2	2.39	2.03	770	1.69	1.01
M4	4.33	42.33	88.1	84.1	2.40	1.19	450	4.79	2.88
M5	0.35	26.35	86.8	82.3	2.72	1.14	850	0.50	0.30
M6	0.64	45.77	93.6	92.1	1.09	1.60	880	0.31	0.19
M7	0.24	22.08	84.7	79.2	3.34	1.49	980	0.55	0.33
M8	0.22	47.99	88.5	84.8	2.28	1.41	530	0.51	0.30
M9	0.18	24.37	88.4	84.6	2.31	0.29	920	0.93	0.56
UT1	0.94	43.54	89.5	86.2	2.04	0.50	1780	1.26	0.75
UT2	0.33	29.37	85.9	80.9	2.99	1.26	860	0.36	0.21
DT1	2.47	41.10	82.6	76.1	3.98	0.86	4570	2.79	1.67
DT2	0.20	32.49	83.7	77.7	3.65	0.80	460	0.73	0.44
DT3	0.13	47.21	90.3	87.4	1.83	1.47	690	0.40	0.24
DT4	0.71	38.25	87.0	82.6	2.68	3.84	50	2.39	1.43
Entire Bilberry	13.78	40.16	87.1	82.7	2.69	0.60	7360	3.11	1.87

1) Calculated from land use and TR-55 Curve Number tables (Urban Hydrology for Small Watersheds by USDA-SCS, 1986)

2) Calculated based on equation $CN^*=100/(1.879((100/CN)-1)^{1.15}+1)$ (Curve Number Hydrology by Hawkins et al., 2009)

3) Calculated based on the velocity method (National engineering handbook Chapter 15 by USDA-NRCS, 2010)

4) Calculated based on $t_p = 0.6 \times t_c$

Table 3b SWMHYMO catchment input values

Parameter	SWMHYMO Catchment ID														
	M1	**M2**	**M3**	**M4**	**M5**	**M6**	**M7**	**M8**	**M9**	**UT1**	**UT2**	**DT1**	**DT2**	**DT3**	**DT4**
AREA (ha)	64.39	26.14	212.90	432.99	35.47	64.01	24.39	21.78	17.59	93.87	32.73	247.46	20.34	12.63	70.81
TIMP	0.4034	0.4025	0.3887	0.4233	0.2635	0.4577	0.2208	0.4799	0.2437	0.4354	0.2937	0.4110	0.3249	0.4721	0.3825
XIMP	0.3227	0.3220	0.3109	0.3387	0.2108	0.3662	0.1766	0.3839	0.1950	0.3483	0.2350	0.3288	0.2599	0.3777	0.3060
LOSS	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
CN	82.3	80.8	84.2	84.1	82.3	92.1	79.2	84.8	84.6	86.2	80.9	76.1	77.7	87.4	82.6
Pervious surface															
IAper (mm)	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67
SLPP (%)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
LGP (m)	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
MNP	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
SCP (min)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Impervious surface															
IAimp (mm)	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57
SLPI (%)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
LGI (m)	655.2	417.5	1191.3	1699.0	486.3	653.2	403.3	381.1	342.4	791.1	467.1	1284.4	368.3	290.2	687.1
MNI	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045
SCI (min)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Parameter	Description
AREA (ha)	Catchment area. Calculated based on topography.
TIMP	Ratio of total impervious area to catchment area. Calculated based on bulding footprint, roads, and the projected land use.
XIMP	Ratio of directly connected impervious area to catchment area. Usually taken as 80% of TIMP as per the SWMHYMO Maunal (2000). This value is typical in the City of Ottawa and widely used by others (SNCA 2014, JFSA 2014)
LOSS	A pointer used to select the procedure to be used to calculate the losses over pervious surface. Optoins are: 1= Horton infiltration equation; 2= SCS CN procedure; 3= proportional loss coeffient). We used option 2, which ties well with the overall CN-based calculation.
CN	Curve number. Calculated based on land use and soil types.
Pervious surface	
IAper (mm)	Initial abstraction for pervious surface. Typical value selected as per the City of Ottawa Sewer Design Guideline (2012).
SLPP (%)	Average pervious surface slope over which runoff travels. The values of SLPP usually represents the value of an average lot in rural subdivisions. This value is typical in the City of Ottawa and widely used by others (SNCA 2014, JFSA 2014).
LGP (m)	The average lot depth which surface water has to travel before it reaches the street or the sewer system. Typical taken as the slope of lots in rural subdivisions. This value is typical in the City of Ottawa and widely used by others (SNCA 2014, JFSA 2014).
MNP	The representative roughness coefficient of the pervious surface over which water travels before reaching the street or the sewer system. Value selected is typical for SWMHYMO to represent sheet flow over a residential lot, as Iidentified by the SWMHYMO Manual (2000).
SCP (min)	The storage coefficient for the linear reservoir of the pervious portion of the area. When set to '0', the model will compute the value of SCP based on the values of LGP, MNP, SLPP and maximum effective rainfall intensity over the pervious area/ SWMHYMO Manual (2000).
Impervious surface	
IAimp (mm)	Initial abstraction for impervious surface. Typical value selected as per the City of Ottawa Sewer Design Guideline (2012).
SLPI (%)	Average impervious surface slope over which runoff travels. The values of SLPI usually represents the slope of conveyance pipes. This value is typical in the City of Ottawa and widely used by others (SNCA 2014, JFSA 2014).
LGI (m)	The drainage area's average representative overflow travel length of the main conveyance system which usually includes sewer pipes and roadside ditches. Calculated as (AREA/CLI)^(0.5); CLI = 1.5; as per SWMHYMO Manual (2000).
MNI	The average roughness coefficient of the impervious surface over which water travels. Values are a weighted average for typical road and ditch systems in the City of Ottawa. Typical taken as the slope of lots in rural subdivisions. This value is typical in the City of Ottawa and widely used by others (SNCA 2014, JFSA 2014).
SCI (min)	The storage coefficient for the linear reservoir of the impervious portion of the area. When set to '0', the model will compute the value of SCI based on the values of LGI, MNI, SLPI and maximum effective rainfall intensity as per SWMHYMO Manual (2000). No other option is available.

Table 4 Curve number for different land use and soil groups

	City of Ottawa Land Use [1]		Corresponding TR-55 land cover category [2]		Assigned Curve Number (CN)			
			Cover description		Soil group			
	LU_2010 code	Land use description	Cover type	Hydrologic condition	A	B	C	D
1	R1	Single -detached residential	Residential district (average lot size 2 acres)	N/A	46	65	77	82
2	R1-L	Linked Single	Residential district (average lot size 2 acres)	N/A	46	65	77	82
3	R2	Semi -detached residential	Residential district (average lot size 1/4 acre)	N/A	61	75	83	87
4	R3	Row and townhouse	Residential district (average lot size 1/8 acre or less (townhouse))	N/A	77	85	90	92
5	R3-S	Stacked townhouse	Residential district (average lot size 1/8 acre or less (townhouse))	N/A	77	85	90	92
6	R4-X	Duplex, triplex, single dwelling with apartment unit	Residential district (average lot size 1/4 acre)	N/A	61	75	83	87
7	R4	Apartment	Residential district (average lot size 1 acre)	N/A	51	68	79	84
8	R5	Mobile	Residential district (average lot size 1/8 acre or less (townhouse))	N/A	77	85	90	92
9	C1	Regional shopping center	Commercial and business	N/A	89	92	94	95
10	C2	Community shopping center	Commercial and business	N/A	89	92	94	95
11	C3	Other Commercial	Commercial and business	N/A	89	92	94	95
12	I1	Elementary school	Commercial and business	N/A	89	92	94	95
13	I2	Secondary school	Commercial and business	N/A	89	92	94	95
14	I3	Post-secondary school	Commercial and business	N/A	89	92	94	95
15	I3-r	Student campus residences	Commercial and business	N/A	89	92	94	95
16	I4	Hospital, rehabilitation, nursing home	Commercial and business	N/A	89	92	94	95
17	I5	Other Institution	Commercial and business	N/A	89	92	94	95
18	M1	Industrial	Industrial	N/A	81	88	91	93
19	M2	Industrial mall-condo	Industrial	N/A	81	88	91	93
20	TR	Transportation	Paved Parking lots, roofs, driveways. Etc (excluding right of way)	N/A	98	98	98	98
21	UT	Utility	Industrial	N/A	81	88	91	93
22	COMM	Communications	Industrial	N/A	81	88	91	93
23	OF	Office	Industrial	N/A	81	88	91	93
24	RE-A	Active recreation	Open space (lawns, parks, golf courses, cemeteries, etc)	Good condition (grass cover >75%)	39	61	74	80
25	RE-A-s	Active recreation on school property	Open space (lawns, parks, golf courses, cemeteries, etc)	Good condition (grass cover >75%)	39	61	74	80
26	RE-P	Passive Recreation	Open space (lawns, parks, golf courses, cemeteries, etc)	Fair condition (Grass cover 50% to 75%)	49	69	79	84
27	RE-P-s	Passive recreation on school property	Open space (lawns, parks, golf courses, cemeteries, etc)	Fair condition (Grass cover 50% to 75%)	49	69	79	84
28	OS	Open space	Open space (lawns, parks, golf courses, cemeteries, etc)	Fair condition (Grass cover 50% to 75%)	49	69	79	84
29	ROS	Idle and shrub Land	Brush--brush weed grass mixture with brush the major element	Good (>75% ground cover)	30	48	65	73
30	AG	Agriculture	Row Crops	Good	64	75	82	85
31	V1	Vacant Land	Brush--brush weed grass mixture with brush the major element	Good (>75% ground cover)	30	48	65	73
32	V2	Vacant building	Residential district (average lot size 1/8 acre or less (townhouse))	N/A	77	85	90	92
33	FT	Forest	Wood	Good	30	55	70	77
34	ST	Street	Streets and roads	N/A	98	98	98	98
35	QS	Quarry	Industrial	N/A	81	88	91	93
36	WL	Wetland	N/A	N/A	98	98	98	98
37	WL-FT	Wetland	N/A	N/A	98	98	98	98
38	WATER	Water	N/A	N/A	98	98	98	98
39	IW	Water	N/A	N/A	98	98	98	98

1) Land use codes based on City of Ottawa Parcels LU_2010 recived in 2015

2) Values and descriptors extracted from TR-55 "Urban Hydrology for Small Watersheds", USDA, Natural Resources Conservation Service, June 1986

Table 5 Characteristics of design storms

	Duration	Total volume	Peak intensity	Time step	Source of hyetograph shape
	(hour)	(mm)	(mm/hr)	(minutes)	
Chicago 3 hour	3	74.43	168.71	10	Generated by STORMS software
Chicago 6 hour	6	88.42	168.71	10	Generated by STORMS software
Chicago 12 hour	12	104.44	168.71	10	Generated by STORMS software
Chicago 24 hour	24	123.02	168.71	10	Generated by STORMS software
SCS 3 hour	3	74.47	80.87	30	City of Ottawa Sewer Design Guidelines 2012
SCS 6 hour	6	88.43	85.25	30	City of Ottawa Sewer Design Guidelines 2012
SCS 12 hour	12	104.44	89.40	30	City of Ottawa Sewer Design Guidelines 2012
SCS 24 hour	24	123.01	93.49	30	Generated by STORMS software

Table 6 Estimated peak flows generated by various storms

Storm	3H Chicago	6H Chicago	12H Chicago	24H Chicago	3H SCS	6H SCS	12H SCS	24H SCS
Return Period	100 year	100 year	100 year	100 year	100 year	100 year	100 year	100 year
Flow	(cms)	(cms)	(cms)	(cms)	(cms)	(cms)	(cms)	(cms)
Catchments								
M1	6.45	6.90	7.31	7.78	5.60	6.43	7.19	7.98
M2	2.89	3.08	3.33	3.50	2.40	2.79	3.16	3.54
M3	17.47	18.90	20.04	21.06	16.68	18.64	20.69	22.61
M4	31.31	33.76	35.72	37.44	30.81	33.90	36.84	39.65
M5	3.36	3.66	3.94	4.26	2.88	3.33	3.83	4.33
M6	8.26	8.72	9.07	9.44	7.08	7.90	8.58	9.23
M7	2.08	2.33	2.54	2.78	1.81	2.10	2.49	2.85
M8	2.94	3.15	3.29	3.42	2.38	2.72	3.03	3.34
M9	1.88	2.09	2.25	2.39	1.57	1.84	2.12	2.39
UT1	9.77	10.40	11.08	11.55	8.72	9.83	10.88	11.89
UT2	3.09	3.41	3.66	3.90	2.63	3.08	3.56	4.03
DT1	17.34	18.73	20.04	21.14	16.82	18.80	20.77	23.01
DT2	1.93	2.13	2.33	2.48	1.62	1.92	2.25	2.55
DT3	1.93	2.04	2.13	2.20	1.52	1.72	1.92	2.09
DT4	6.84	7.34	7.90	8.32	6.03	6.87	7.73	8.58
Nodes								
J1	6.45	6.90	7.31	7.78	5.60	6.43	7.19	7.98
J2	21.14	22.69	24.23	25.56	18.98	21.45	23.89	26.43
J3	37.99	40.96	43.51	45.77	35.50	39.85	44.24	48.62
J4	67.74	73.05	77.38	81.18	65.75	72.82	79.49	86.22
J5	69.97	75.42	79.94	83.88	68.07	75.37	82.29	89.28
J6	75.11	80.80	85.52	89.62	73.33	80.98	88.09	95.29
J7	75.75	81.51	86.23	90.36	74.21	81.94	89.00	96.12
J8	100.62	108.27	114.74	120.43	99.10	109.46	118.96	128.76
J9	9.77	10.40	11.08	11.55	8.72	9.83	10.88	11.89
J10	17.34	18.73	20.04	21.14	16.82	18.80	20.77	23.01
J11	18.58	20.04	21.42	22.59	18.18	20.25	22.33	24.71
O1	94.50	102.07	108.47	114.12	94.62	104.44	113.29	122.18
D1	9.09	9.73	10.34	10.99	7.88	9.03	10.12	11.26
D7	76.80	82.61	87.41	91.59	75.42	83.26	90.36	97.48
D9	12.25	13.14	14.06	14.76	11.16	12.53	13.92	15.31
D11	19.16	20.67	22.03	23.20	18.95	21.05	23.05	25.36

Table 7 SCS Type II 24 hour design storms for different return periods

Return Period	Total volume	Peak intensity	Time step	hyetograph genarated by
(year)	(mm)	(mm/hr)	(minutes)	
2	50.48	38.08	30	STORMS software
5	70.01	53.21	30	STORMS software
10	82.57	62.75	30	STORMS software
20	95.07	72.25	30	STORMS software
50	110.92	84.3	30	STORMS software
100	123.01	93.49	30	STORMS software
200	134.57	102.27	30	STORMS software
350	144.20	109.59	30	STORMS software
500	150.84	114.64	30	STORMS software

Table 8 Estimated peak flows for SCS Type II 24 hour design storm

Storm	24 hour SCS Type II								
Return Period (year)	2	5	10	20	50	100	200	350	500
Flow	(cms)	(cms)	(cms)	(cms)	(cms)	(cms)	(cms)	(cms)	(cms)
Catchments									
M1	1.88	3.28	4.30	5.36	6.81	7.98	9.16	10.14	10.75
M2	0.84	1.46	1.90	2.39	3.04	3.54	4.06	4.46	4.77
M3	4.90	8.86	11.81	14.86	19.15	22.61	25.87	28.54	30.54
M4	8.73	15.72	20.73	26.22	33.72	39.65	45.68	50.79	54.64
M5	0.91	1.68	2.25	2.85	3.69	4.33	5.01	5.55	5.91
M6	2.51	4.17	5.30	6.48	8.06	9.23	10.47	11.49	12.12
M7	0.55	1.06	1.43	1.84	2.39	2.85	3.28	3.67	3.94
M8	0.86	1.46	1.87	2.30	2.90	3.34	3.78	4.16	4.40
M9	0.50	0.95	1.26	1.61	2.05	2.39	2.73	3.02	3.24
UT1	2.86	5.05	6.56	8.11	10.22	11.89	13.46	14.82	15.84
UT2	0.86	1.58	2.07	2.64	3.41	4.03	4.63	5.13	5.51
DT1	4.88	8.78	11.70	14.87	19.40	23.01	26.55	29.72	31.81
DT2	0.56	1.00	1.32	1.68	2.16	2.55	2.92	3.25	3.50
DT3	0.56	0.94	1.20	1.46	1.82	2.09	2.36	2.59	2.76
DT4	1.98	3.50	4.58	5.75	7.32	8.58	9.85	10.89	11.67
Nodes									
J1	1.88	3.28	4.30	5.36	6.81	7.98	9.16	10.14	10.75
J2	5.99	10.97	14.26	17.72	22.52	26.43	30.29	33.50	35.63
J3	10.76	19.44	25.76	32.22	41.29	48.62	55.61	61.45	65.60
J4	19.02	34.13	45.06	56.76	73.29	86.22	99.16	109.95	118.06
J5	19.62	35.30	46.65	58.74	75.79	89.28	102.51	113.66	122.07
J6	21.35	38.29	50.29	63.08	80.95	95.29	109.13	120.82	129.56
J7	21.63	38.76	50.91	63.78	81.79	96.12	110.05	121.78	130.57
J8	28.88	51.72	67.90	85.18	109.43	128.76	147.50	163.49	175.10
J9	2.86	5.05	6.56	8.11	10.22	11.89	13.46	14.82	15.84
J10	4.88	8.78	11.70	14.87	19.40	23.01	26.55	29.72	31.81
J11	5.23	9.43	12.49	15.99	20.83	24.71	28.48	31.90	34.14
O1	27.45	48.90	64.48	80.89	103.77	122.18	139.99	155.24	166.11
D1	2.62	4.64	6.02	7.54	9.61	11.26	12.95	14.35	15.24
D7	22.01	39.41	51.70	64.71	82.95	97.48	111.60	123.45	132.38
D9	3.47	6.42	8.31	10.30	13.06	15.31	17.51	19.28	20.56
D11	5.42	9.66	12.83	16.42	21.46	25.36	29.22	32.74	35.08

Table 9 Estimated flows for hydraulic modeling (HEC-RAS)

			Return Period (year)	2	5	10	20	50	100	200	350	500
Stream	Reach	Nearest Cross Section	Distance from Ottawa Confluence (m)	Flow (cms)								
Bilberry Main	Main	5480	5480	10.76	19.44	25.76	32.22	41.29	48.62	55.61	61.45	65.60
Bilberry Main	Main	5093	5093	19.02	34.13	45.06	56.76	73.29	86.22	99.16	109.95	118.06
Bilberry Main	Main	4730	4730	19.62	35.30	46.65	58.74	75.79	89.28	102.51	113.66	122.07
Bilberry Main	Main	3801	3801	21.35	38.29	50.29	63.08	80.95	95.29	109.13	120.82	129.56
Bilberry Main	Main	2875	2875	21.63	38.76	50.91	63.78	81.79	96.12	110.05	121.78	130.57
Bilberry Main	Main	1784	1784	22.01	39.41	51.70	64.71	82.95	97.48	111.60	123.45	132.38
Bilberry Main	Main	1142	1142	28.88	51.72	67.90	85.18	109.43	128.76	147.50	163.49	175.10
Bilberry Main	Main	100	100	28.88	51.72	67.90	85.18	109.43	128.76	147.50	163.49	175.10

Table 10 Downstream boundary conditions at Ottawa River

Return Period (years)	Water Level in Ottawa River Cross Section 1021 (m)	Source
2	43.06	RVCA 2014 [1]
5	43.69	RVCA 2014 [1]
10	44.07	RVCA 2014 [1]
20	44.43	RVCA 2014 [1]
50	44.88	RVCA 2014 [1]
100	45.20	RVCA 2014 [1]
200	45.51	RVCA 2014 [1]
350	45.75	Interpolated
500	45.91	RVCA 2014 [1]

1) Ottawa River Flood Risk Mapping from Shirley's Bay to Cumberland, RVCA, October 2014.

Table 11 Structures on Bilberry Creek

Stream	Location	Bridge or Culvert	Chainage (m)	Bounding Cross Sections	Width[1] (m)	Height[1] (m)	Length[2] (m)	Upstream Invert[1] (m)	Downstream Invert[1] (m)	Upstream Obvert[1] (m)	Downstream Obvert[1] (m)	Source(s)
Bilberry Creek	Mystery Park Ped Bridge	B	558	553 & 564	20.00	1.58	5.60	41.89	41.88	43.46	43.46	RVCA Survey September 9th 2015, and City of Ottawa drawing: Mystery Park Pedestrian Bridge # 2, Drawing # B22121002-001. February 2012
Bilberry Creek	Mystery Park Eagle Bridge	B	862	858 & 866	15.00	2.32	1.80	42.21	42.33	44.53	44.53	RVCA Survey September 9th 2015, and City of Ottawa drawing: Mystery Park Pedestrian Bridge No. 1, Drawing # SN-221200-1 IBI Group. June 2012
Bilberry Creek	Jeanne D'Arc Boulevard	C	1754	1731 & 1778	4.46	2.75	39.76	44.44	44.10	47.19	46.85	RVCA Survey September 9th 2015
Bilberry Creek	RR174 Queensway	C	2805	2764 & 2870	3.12	1.81	101.00	51.50	50.90	53.31	52.71	City of Ottawa drawing: HWY 174 Bilberry Creek Culvert Renewal, Drawing # B22451003-004 R.V. Anderson. September 2008
Bilberry Creek	Pierre Rocque Park	B	3271	3268 & 3274	7.54	1.50	2.40	57.72	57.64	59.14	59.14	City of Ottawa drawing: Replacement of Pedestrian Bridges - Pierre Rocque Park, Drawing # B-221030-003 CIMA. June 2012
Bilberry Creek	Paroisse St.Joseph	C	3613	3589 & 3638	circular	3.00	43.20	58.73	57.99	66.90	66.86	RVCA Survey September 9th 2015
Bilberry Creek	St.Joseph Boulevard	C	3767	3736 & 3797	circular	2.40	55.50	59.09	58.77	61.49	61.17	RVCA Survey August 24th 2015, and City of Ottawa drawing: Bilberry Creek Culvert Replacement, Drawing # B-280403-003 Cumming Cockburn Ltd. September 1990
Bilberry Creek	Ped Bridge North of Turnberry	B	5321	5317 & 5324	7.13	2.05	1.34	67.12	67.12	69.17	69.17	RVCA Survey August 24th 2015

1) RVCA Surveys 2013/2015 as well as design drawings
2) From DRAPE imagery as well as GPS coordinates from RVCA Survey 2013/2015

Table 12 Calculated head loss at road crossings (during 1:100 Year flood)

Stream	Location	Chainage (m)	Bounding Cross Sections	Upstream Energy Grade (m)	Downstream Energy Grade (m)	Head Loss (cm)	Road Overtopped
Bilberry Creek	Mystery Park Ped Bridge	558	553 & 564	45.20	45.20	0	Yes
Bilberry Creek	Mystery Park Eagle Bridge	862	858 & 866	45.87	45.64	23	Yes
Bilberry Creek	Jeanne D'Arc Boulevard	1754	1731 & 1778	50.77	48.92	185	Yes
Bilberry Creek	RR174 Queensway	2805	2764 & 2870	58.55	56.04	251	Yes
Bilberry Creek	Pierre Rocque Park	3270	3268 & 3274	60.23	60.12	11	Yes
Bilberry Creek	Paroisse St. Joseph	3612	3589 & 3638	65.68	63.42	226	Yes
Bilberry Creek	St Joseph Boulevard	3766	3736 & 3797	66.72	65.71	101	Yes
Bilberry Creek	Pedestrian Bridge North of Turnberry	5319	5317 & 5324	70.70	70.45	25	Yes

Table 13 Regulatory Flood Levels for 100 Year Flood Event

River	Reach	Xsec ID #	Q (total) (cms)	Computed WSEL (m)	EGL (m)	RFL (m)
Bilberry Creek	Main Reach	16	128.76	45.20	45.20	-
	Main Reach	100	128.76	45.20	45.20	-
	Main Reach	349	128.76	45.20	45.20	-
	Main Reach	546	128.76	45.20	45.20	-
	Main Reach	553	128.76	45.20	45.20	-
	Main Reach	558	Mystery Park Pedestrian Bridge			
	Main Reach	564	128.76	45.20	45.20	-
	Main Reach	570	128.76	45.20	45.20	-
	Main Reach	716	128.76	45.17	45.22	45.22
	Main Reach	830	128.76	45.09	45.36	45.36
	Main Reach	855	128.76	45.10	45.53	45.53
	Main Reach	858	128.76	45.14	45.64	45.64
	Main Reach	862	Mystery Park Eagle Bridge			
	Main Reach	866	128.76	45.61	45.87	45.87
	Main Reach	869	128.76	45.60	45.88	45.88
	Main Reach	1019	128.76	46.05	46.12	46.12
	Main Reach	1141	128.76	46.12	46.24	46.24
	Main Reach	1227	97.48	46.23	46.32	46.32
	Main Reach	1268	97.48	46.24	46.36	46.36
	Main Reach	1372	97.48	46.33	46.51	46.51
	Main Reach	1437	97.48	46.49	46.61	46.61
	Main Reach	1486	97.48	46.35	46.81	46.81
	Main Reach	1535	97.48	46.81	47.02	47.02
	Main Reach	1592	97.48	46.93	47.18	47.18
	Main Reach	1626	97.48	47.17	47.25	47.25
	Main Reach	1682	97.48	46.94	47.50	47.50
	Main Reach	1724	97.48	47.29	47.75	47.75
	Main Reach	1730	97.48	47.37	48.92	48.92
	Main Reach	1754	Jeanne D'Arc Boulevard			
	Main Reach	1777	97.48	50.74	50.77	50.77
	Main Reach	1784	97.48	50.75	50.78	50.78
	Main Reach	1842	96.12	50.77	50.78	50.78
	Main Reach	1952	96.12	50.76	50.80	50.80
	Main Reach	2030	96.12	50.78	50.82	50.82
	Main Reach	2138	96.12	50.80	50.85	50.85
	Main Reach	2202	96.12	50.83	50.87	50.87
	Main Reach	2236	96.12	50.82	50.89	50.89
	Main Reach	2317	96.12	50.87	50.93	50.93
	Main Reach	2405	96.12	50.77	51.12	51.12
	Main Reach	2477	96.12	51.17	51.28	51.28
	Main Reach	2610	96.12	51.34	51.49	51.49
	Main Reach	2759	96.12	53.05	53.70	53.70
	Main Reach	2763	96.12	54.33	56.04	56.04
	Main Reach	2805	RR174 Queensway			
	Main Reach	2869	96.12	58.52	58.55	58.55
	Main Reach	2874	96.12	58.53	58.55	58.55
	Main Reach	2937	95.29	58.54	58.55	58.55
	Main Reach	2969	95.29	58.54	58.56	58.56
	Main Reach	2986	95.29	58.52	58.57	58.57

River	Reach	Xsec ID #	Q (total) (cms)	Computed WSEL (m)	EGL (m)	RFL (m)
Bilberry Creek	Main Reach	3013	95.29	58.46	58.61	58.61
	Main Reach	3035	95.29	58.29	58.75	58.75
	Main Reach	3047	95.29	58.07	58.95	58.95
	Main Reach	3068	95.29	58.55	59.49	59.49
	Main Reach	3092	95.29	59.46	59.67	59.67
	Main Reach	3119	95.29	59.49	59.72	59.72
	Main Reach	3146	95.29	59.63	59.79	59.79
	Main Reach	3162	95.29	59.61	59.85	59.85
	Main Reach	3207	95.29	59.85	59.94	59.94
	Main Reach	3263	95.29	59.93	60.08	60.08
	Main Reach	3267	95.29	59.93	60.12	60.12
	Main Reach	3270	Pierre Rocque Park			
	Main Reach	3272	95.29	60.08	60.23	60.23
	Main Reach	3277	95.29	60.13	60.25	60.25
	Main Reach	3460	95.29	60.49	61.31	61.31
	Main Reach	3581	95.29	61.73	62.06	62.06
	Main Reach	3588	95.29	61.64	63.42	63.42
	Main Reach	3612	Paroisse St. Joseph			
	Main Reach	3637	95.29	65.62	65.68	65.68
	Main Reach	3643	95.29	65.61	65.69	65.69
	Main Reach	3731	95.29	65.68	65.71	65.71
	Main Reach	3734	95.29	65.68	65.71	65.71
	Main Reach	3766	St. Joseph Boulevard			
	Main Reach	3796	95.29	66.65	66.72	66.72
	Main Reach	3799	95.29	66.64	66.73	66.73
	Main Reach	3892	89.28	66.69	66.76	66.76
	Main Reach	4050	89.28	66.63	66.89	66.89
	Main Reach	4152	89.28	66.90	66.99	66.99
	Main Reach	4247	89.28	66.97	67.04	67.04
	Main Reach	4365	89.28	67.00	67.10	67.10
	Main Reach	4478	89.28	67.02	67.22	67.22
	Main Reach	4729	89.28	67.38	67.71	67.71
	Main Reach	4940	86.22	68.32	68.84	68.84
	Main Reach	5092	86.22	69.28	69.67	69.67
	Main Reach	5257	48.62	69.98	70.13	70.13
	Main Reach	5311	48.62	69.91	70.36	70.36
	Main Reach	5315	48.62	70.27	70.45	70.45
	Main Reach	5319	Pedestrian Bridge North of Turnberry Road			
	Main Reach	5322	48.62	70.61	70.70	70.70
	Main Reach	5328	48.62	70.63	70.70	70.70
	Main Reach	5404	48.62	70.63	70.82	70.82
	Main Reach	5478	48.62	70.76	71.08	71.08

Table 14 Flows and computed water levels for the 2, 5, 10, and 20 year flood events

River	Reach	Xsec ID	Flow (m^3/s) and Computed WSEL (m) for Different Flood Events							
			Q2	WL2	Q5	WL5	Q10	WL10	Q20	WL20
Bilberry Creek	Main Reach	16	28.88	43.06	51.72	43.69	67.90	44.07	85.18	44.43
	Main Reach	100	28.88	43.06	51.72	43.69	67.90	44.07	85.18	44.43
	Main Reach	349	28.88	43.06	51.72	43.69	67.90	44.07	85.18	44.43
	Main Reach	546	28.88	43.08	51.72	43.69	67.90	44.07	85.18	44.43
	Main Reach	553	28.88	43.10	51.72	43.69	67.90	44.07	85.18	44.43
	Main Reach	558	Mystery Park Pedestrian Bridge							
	Main Reach	564	28.88	43.31	51.72	43.69	67.90	44.07	85.18	44.43
	Main Reach	570	28.88	43.36	51.72	43.69	67.90	44.07	85.18	44.43
	Main Reach	716	28.88	43.75	51.72	43.96	67.90	44.06	85.18	44.33
	Main Reach	830	28.88	44.11	51.72	44.31	67.90	44.44	85.18	44.49
	Main Reach	855	28.88	44.18	51.72	44.40	67.90	44.52	85.18	44.69
	Main Reach	858	28.88	44.17	51.72	44.34	67.90	44.64	85.18	44.81
	Main Reach	862	Mystery Park Eagle Bridge							
	Main Reach	866	28.88	44.23	51.72	44.83	67.90	45.07	85.18	45.22
	Main Reach	869	28.88	44.29	51.72	44.87	67.90	45.09	85.18	45.24
	Main Reach	1019	28.88	44.63	51.72	45.18	67.90	45.42	85.18	45.62
	Main Reach	1141	28.88	44.75	51.72	45.25	67.90	45.49	85.18	45.69
	Main Reach	1227	22.01	44.89	39.41	45.35	51.70	45.59	64.71	45.79
	Main Reach	1268	22.01	44.90	39.41	45.37	51.70	45.60	64.71	45.81
	Main Reach	1372	22.01	44.97	39.41	45.43	51.70	45.67	64.71	45.88
	Main Reach	1437	22.01	45.14	39.41	45.58	51.70	45.82	64.71	46.03
	Main Reach	1486	22.01	45.16	39.41	45.57	51.70	45.77	64.71	45.96
	Main Reach	1535	22.01	45.28	39.41	45.76	51.70	46.03	64.71	46.29
	Main Reach	1592	22.01	45.79	39.41	46.16	51.70	46.31	64.71	46.48
	Main Reach	1626	22.01	45.89	39.41	46.32	51.70	46.51	64.71	46.70
	Main Reach	1682	22.01	45.89	39.41	46.24	51.70	46.39	64.71	46.54
	Main Reach	1724	22.01	46.14	39.41	46.56	51.70	46.76	64.71	46.94
	Main Reach	1730	22.01	46.09	39.41	46.40	51.70	46.47	64.71	46.62
	Main Reach	1754	Jeanne D'Arc Boulevard							
	Main Reach	1777	22.01	47.07	39.41	48.83	51.70	50.13	64.71	50.36
	Main Reach	1784	22.01	47.07	39.41	48.86	51.70	50.13	64.71	50.37
	Main Reach	1842	21.63	47.14	38.76	48.87	50.91	50.14	63.78	50.38
	Main Reach	1952	21.63	47.22	38.76	48.87	50.91	50.14	63.78	50.37
	Main Reach	2030	21.63	47.34	38.76	48.89	50.91	50.15	63.78	50.39
	Main Reach	2138	21.63	47.68	38.76	48.93	50.91	50.16	63.78	50.40
	Main Reach	2202	21.63	47.92	38.76	48.97	50.91	50.17	63.78	50.42
	Main Reach	2236	21.63	48.26	38.76	48.95	50.91	50.17	63.78	50.41
	Main Reach	2317	21.63	48.86	38.76	49.18	50.91	50.20	63.78	50.45
	Main Reach	2405	21.63	49.12	38.76	49.51	50.91	50.13	63.78	50.37
	Main Reach	2477	21.63	49.75	38.76	50.15	50.91	50.46	63.78	50.70
	Main Reach	2610	21.63	50.13	38.76	50.47	50.91	50.69	63.78	50.90
	Main Reach	2759	21.63	51.86	38.76	52.21	50.91	52.45	63.78	52.65
	Main Reach	2763	21.63	52.17	38.76	52.77	50.91	53.15	63.78	53.51
	Main Reach	2805	RR174 Queensway							
	Main Reach	2869	21.63	55.26	38.76	57.78	50.91	57.95	63.78	58.15
	Main Reach	2874	21.63	55.28	38.76	57.78	50.91	57.96	63.78	58.16
	Main Reach	2937	21.35	55.28	38.29	57.79	50.29	57.97	63.08	58.17
	Main Reach	2969	21.35	55.29	38.29	57.79	50.29	57.97	63.08	58.17
	Main Reach	2986	21.35	55.25	38.29	57.78	50.29	57.96	63.08	58.15
	Main Reach	3013	21.35	55.70	38.29	57.76	50.29	57.93	63.08	58.12
	Main Reach	3035	21.35	56.40	38.29	57.71	50.29	57.86	63.08	58.02

River	Reach	Xsec ID	Flow (m^3/s) and Computed WSEL (m) for Different Flood Events							
			Q2	WL2	Q5	WL5	Q10	WL10	Q20	WL20
Bilberry Creek	Main Reach	3047	21.35	56.63	38.29	57.68	50.29	57.81	63.08	57.95
	Main Reach	3068	21.35	57.01	38.29	57.61	50.29	57.73	63.08	57.99
	Main Reach	3092	21.35	57.48	38.29	58.06	50.29	58.43	63.08	58.75
	Main Reach	3119	21.35	57.78	38.29	58.17	50.29	58.49	63.08	58.79
	Main Reach	3146	21.35	57.96	38.29	58.29	50.29	58.62	63.08	58.94
	Main Reach	3162	21.35	58.16	38.29	58.39	50.29	58.65	63.08	58.95
	Main Reach	3207	21.35	58.50	38.29	58.86	50.29	59.05	63.08	59.27
	Main Reach	3263	21.35	58.82	38.29	59.02	50.29	59.20	63.08	59.40
	Main Reach	3267	21.35	58.94	38.29	59.20	50.29	59.31	63.08	59.42
	Main Reach	3270	Pierre Rocque Park							
	Main Reach	3272	21.35	59.07	38.29	59.47	50.29	59.62	63.08	59.75
	Main Reach	3277	21.35	59.29	38.29	59.52	50.29	59.68	63.08	59.81
	Main Reach	3460	21.35	59.70	38.29	60.01	50.29	60.17	63.08	60.29
	Main Reach	3581	21.35	60.04	38.29	60.52	50.29	60.81	63.08	61.08
	Main Reach	3588	21.35	59.96	38.29	60.27	50.29	60.41	63.08	60.79
	Main Reach	3612	Paroisse St. Joseph							
	Main Reach	3637	21.35	62.04	38.29	64.68	50.29	65.10	63.08	65.30
	Main Reach	3643	21.35	62.05	38.29	64.68	50.29	65.09	63.08	65.29
	Main Reach	3731	21.35	62.08	38.29	64.70	50.29	65.12	63.08	65.33
	Main Reach	3734	21.35	62.01	38.29	64.70	50.29	65.12	63.08	65.33
	Main Reach	3766	St. Joseph Boulevard							
	Main Reach	3796	21.35	64.10	38.29	66.19	50.29	66.33	63.08	66.46
	Main Reach	3799	21.35	64.10	38.29	66.19	50.29	66.33	63.08	66.45
	Main Reach	3892	19.62	64.12	35.30	66.21	46.65	66.35	58.74	66.48
	Main Reach	4050	19.62	64.07	35.30	66.20	46.65	66.33	58.74	66.45
	Main Reach	4152	19.62	64.47	35.30	66.26	46.65	66.43	58.74	66.59
	Main Reach	4247	19.62	64.69	35.30	66.28	46.65	66.45	58.74	66.63
	Main Reach	4365	19.62	64.83	35.30	66.29	46.65	66.48	58.74	66.65
	Main Reach	4478	19.62	64.96	35.30	66.31	46.65	66.49	58.74	66.67
	Main Reach	4729	19.62	65.45	35.30	66.43	46.65	66.67	58.74	66.90
	Main Reach	4940	19.02	67.15	34.13	67.35	45.06	67.66	56.76	67.90
	Main Reach	5092	19.02	67.87	34.13	68.40	45.06	68.63	56.76	68.84
	Main Reach	5257	10.76	68.32	19.44	68.88	25.76	69.17	32.22	69.43
	Main Reach	5311	10.76	68.47	19.44	68.94	25.76	69.19	32.22	69.42
	Main Reach	5315	10.76	68.65	19.44	69.09	25.76	69.47	32.22	69.72
	Main Reach	5319	Pedestrian Bridge North of Turnberry Road							
	Main Reach	5322	10.76	68.75	19.44	69.25	25.76	69.72	32.22	70.11
	Main Reach	5328	10.76	68.77	19.44	69.28	25.76	69.73	32.22	70.12
	Main Reach	5404	10.76	68.91	19.44	69.37	25.76	69.77	32.22	70.14
	Main Reach	5478	10.76	69.27	19.44	69.66	25.76	69.96	32.22	70.28

Table 15 Flows and computed water levels for the 50, 100, 200, 350, and 500 year flood events

River	Reach	Xsec ID	Flow (m^3/s) and Computed WSEL (m) for Different Flood Events									
			Q50	WL50	Q100	WL100	Q200	WL200	Q350	WL350	Q500	WL500
Bilberry Creek	Main Reach	16	109.43	44.88	128.76	45.20	147.50	45.51	163.49	45.75	175.10	45.91
	Main Reach	100	109.43	44.88	128.76	45.20	147.50	45.51	163.49	45.75	175.10	45.91
	Main Reach	349	109.43	44.88	128.76	45.20	147.50	45.51	163.49	45.75	175.10	45.91
	Main Reach	546	109.43	44.88	128.76	45.20	147.50	45.51	163.49	45.75	175.10	45.91
	Main Reach	553	109.43	44.88	128.76	45.20	147.50	45.51	163.49	45.75	175.10	45.91
	Main Reach	558	Mystery Park Pedestrian Bridge									
	Main Reach	564	109.43	44.88	128.76	45.20	147.50	45.51	163.49	45.75	175.10	45.91
	Main Reach	570	109.43	44.88	128.76	45.20	147.50	45.51	163.49	45.75	175.10	45.91
	Main Reach	716	109.43	44.83	128.76	45.17	147.50	45.49	163.49	45.73	175.10	45.89
	Main Reach	830	109.43	44.77	128.76	45.09	147.50	45.40	163.49	45.65	175.10	45.81
	Main Reach	855	109.43	44.85	128.76	45.10	147.50	45.43	163.49	45.67	175.10	45.83
	Main Reach	858	109.43	45.01	128.76	45.14	147.50	45.39	163.49	45.65	175.10	45.81
	Main Reach	862	Mystery Park Eagle Bridge									
	Main Reach	866	109.43	45.46	128.76	45.61	147.50	45.72	163.49	45.87	175.10	46.00
	Main Reach	869	109.43	45.46	128.76	45.60	147.50	45.71	163.49	45.86	175.10	45.99
	Main Reach	1019	109.43	45.87	128.76	46.05	147.50	46.19	163.49	46.33	175.10	46.43
	Main Reach	1141	109.43	45.95	128.76	46.12	147.50	46.27	163.49	46.41	175.10	46.51
	Main Reach	1227	82.95	46.05	97.48	46.23	111.60	46.38	123.45	46.52	132.38	46.62
	Main Reach	1268	82.95	46.07	97.48	46.24	111.60	46.39	123.45	46.53	132.38	46.63
	Main Reach	1372	82.95	46.14	97.48	46.33	111.60	46.48	123.45	46.62	132.38	46.72
	Main Reach	1437	82.95	46.30	97.48	46.49	111.60	46.65	123.45	46.79	132.38	46.89
	Main Reach	1486	82.95	46.19	97.48	46.35	111.60	46.51	123.45	46.64	132.38	46.75
	Main Reach	1535	82.95	46.59	97.48	46.81	111.60	46.98	123.45	47.11	132.38	47.21
	Main Reach	1592	82.95	46.74	97.48	46.93	111.60	47.08	123.45	47.21	132.38	47.30
	Main Reach	1626	82.95	46.97	97.48	47.17	111.60	47.34	123.45	47.48	132.38	47.58
	Main Reach	1682	82.95	46.77	97.48	46.94	111.60	47.09	123.45	47.22	132.38	47.30
	Main Reach	1724	82.95	47.15	97.48	47.29	111.60	47.41	123.45	47.50	132.38	47.56
	Main Reach	1730	82.95	47.05	97.48	47.37	111.60	47.66	123.45	47.90	132.38	48.07
	Main Reach	1754	Jeanne D'Arc Boulevard									
	Main Reach	1777	82.95	50.58	97.48	50.74	111.60	50.87	123.45	50.97	132.38	51.02
	Main Reach	1784	82.95	50.59	97.48	50.75	111.60	50.88	123.45	50.98	132.38	51.04
	Main Reach	1842	81.79	50.60	96.12	50.77	110.05	50.90	121.78	51.00	130.57	51.06
	Main Reach	1952	81.79	50.60	96.12	50.76	110.05	50.89	121.78	50.99	130.57	51.05
	Main Reach	2030	81.79	50.61	96.12	50.78	110.05	50.92	121.78	51.02	130.57	51.08
	Main Reach	2138	81.79	50.63	96.12	50.80	110.05	50.94	121.78	51.04	130.57	51.10
	Main Reach	2202	81.79	50.66	96.12	50.83	110.05	50.98	121.78	51.08	130.57	51.15
	Main Reach	2236	81.79	50.65	96.12	50.82	110.05	50.97	121.78	51.07	130.57	51.14
	Main Reach	2317	81.79	50.69	96.12	50.87	110.05	51.02	121.78	51.13	130.57	51.20
	Main Reach	2405	81.79	50.60	96.12	50.77	110.05	50.91	121.78	51.01	130.57	51.07
	Main Reach	2477	81.79	50.97	96.12	51.17	110.05	51.34	121.78	51.47	130.57	51.57
	Main Reach	2610	81.79	51.15	96.12	51.34	110.05	51.51	121.78	51.64	130.57	51.73
	Main Reach	2759	81.79	52.90	96.12	53.05	110.05	53.17	121.78	53.30	130.57	53.34
	Main Reach	2763	81.79	53.98	96.12	54.33	110.05	54.65	121.78	54.92	130.57	55.10
	Main Reach	2805	RR174 Queensway									
	Main Reach	2869	81.79	58.36	96.12	58.52	110.05	58.66	121.78	58.78	130.57	58.88
	Main Reach	2874	81.79	58.37	96.12	58.53	110.05	58.67	121.78	58.79	130.57	58.89
	Main Reach	2937	80.95	58.38	95.29	58.54	109.13	58.68	120.82	58.80	129.56	58.91
	Main Reach	2969	80.95	58.38	95.29	58.54	109.13	58.68	120.82	58.80	129.56	58.91
	Main Reach	2986	80.95	58.36	95.29	58.52	109.13	58.66	120.82	58.78	129.56	58.88
	Main Reach	3013	80.95	58.31	95.29	58.46	109.13	58.58	120.82	58.69	129.56	58.78
	Main Reach	3035	80.95	58.17	95.29	58.29	109.13	58.38	120.82	58.47	129.56	58.55
	Main Reach	3047	80.95	58.04	95.29	58.07	109.13	58.23	120.82	58.39	129.56	58.49
	Main Reach	3068	80.95	58.29	95.29	58.55	109.13	58.74	120.82	58.91	129.56	59.02
	Main Reach	3092	80.95	59.17	95.29	59.46	109.13	59.71	120.82	59.91	129.56	60.05
	Main Reach	3119	80.95	59.20	95.29	59.49	109.13	59.75	120.82	59.95	129.56	60.10
	Main Reach	3146	80.95	59.35	95.29	59.63	109.13	59.88	120.82	60.09	129.56	60.24
	Main Reach	3162	80.95	59.33	95.29	59.61	109.13	59.84	120.82	60.04	129.56	60.21
	Main Reach	3207	80.95	59.60	95.29	59.85	109.13	60.11	120.82	60.31	129.56	60.45
	Main Reach	3263	80.95	59.69	95.29	59.93	109.13	60.17	120.82	60.37	129.56	60.50

River	Reach	Xsec ID	Flow (m^3/s) and Computed WSEL (m) for Different Flood Events									
			Q50	WL50	Q100	WL100	Q200	WL200	Q350	WL350	Q500	WL500
Bilberry Creek	Main Reach	3267	80.95	59.68	95.29	59.93	109.13	60.18	120.82	60.38	129.56	60.51
	Main Reach	3270	Pierre Rocque Park									
	Main Reach	3272	80.95	59.90	95.29	60.08	109.13	60.28	120.82	60.46	129.56	60.58
	Main Reach	3277	80.95	59.97	95.29	60.13	109.13	60.32	120.82	60.49	129.56	60.61
	Main Reach	3460	80.95	60.44	95.29	60.49	109.13	60.65	120.82	60.79	129.56	60.90
	Main Reach	3581	80.95	61.44	95.29	61.73	109.13	61.94	120.82	62.10	129.56	62.22
	Main Reach	3588	80.95	61.28	95.29	61.64	109.13	61.98	120.82	62.25	129.56	62.45
	Main Reach	3612	Paroisse St. Joseph									
	Main Reach	3637	80.95	65.49	95.29	65.62	109.13	65.73	120.82	65.80	129.56	65.83
	Main Reach	3643	80.95	65.49	95.29	65.61	109.13	65.72	120.82	65.78	129.56	65.82
	Main Reach	3731	80.95	65.54	95.29	65.68	109.13	65.81	120.82	65.88	129.56	65.93
	Main Reach	3734	80.95	65.54	95.29	65.68	109.13	65.81	120.82	65.88	129.56	65.93
	Main Reach	3766	St. Joseph Boulevard									
	Main Reach	3796	80.95	66.56	95.29	66.65	109.13	66.73	120.82	66.77	129.56	66.80
	Main Reach	3799	80.95	66.56	95.29	66.64	109.13	66.72	120.82	66.76	129.56	66.79
	Main Reach	3892	75.79	66.60	89.28	66.69	102.51	66.78	113.66	66.84	122.07	66.87
	Main Reach	4050	75.79	66.56	89.28	66.63	102.51	66.70	113.66	66.74	122.07	66.76
	Main Reach	4152	75.79	66.76	89.28	66.90	102.51	67.04	113.66	67.15	122.07	67.22
	Main Reach	4247	75.79	66.82	89.28	66.97	102.51	67.12	113.66	67.23	122.07	67.32
	Main Reach	4365	75.79	66.85	89.28	67.00	102.51	67.16	113.66	67.27	122.07	67.36
	Main Reach	4478	75.79	66.86	89.28	67.02	102.51	67.16	113.66	67.28	122.07	67.35
	Main Reach	4729	75.79	67.18	89.28	67.38	102.51	67.57	113.66	67.72	122.07	67.83
	Main Reach	4940	73.29	68.16	86.22	68.32	99.16	68.47	109.95	68.59	118.06	68.67
	Main Reach	5092	73.29	69.10	86.22	69.28	99.16	69.45	109.95	69.58	118.06	69.66
	Main Reach	5257	41.29	69.75	48.62	69.98	55.61	70.20	61.45	70.36	65.60	70.48
	Main Reach	5311	41.29	69.71	48.62	69.91	55.61	70.11	61.45	70.26	65.60	70.36
	Main Reach	5315	41.29	70.04	48.62	70.27	55.61	70.48	61.45	70.64	65.60	70.75
	Main Reach	5319	Pedestrian Bridge North of Turnberry Road									
	Main Reach	5322	41.29	70.45	48.62	70.61	55.61	70.79	61.45	70.93	65.60	71.03
	Main Reach	5328	41.29	70.47	48.62	70.63	55.61	70.80	61.45	70.95	65.60	71.04
	Main Reach	5404	41.29	70.47	48.62	70.63	55.61	70.80	61.45	70.94	65.60	71.04
	Main Reach	5478	41.29	70.59	48.62	70.76	55.61	70.93	61.45	71.07	65.60	71.16

Table 16 List of RVCA Regulation Permit Files (1977 to 23 Feb, 2018)

RVCA File #	Location	Year of Application	Flood Line Change Required?	Breif Description
RV8-5317	500 DES EPINETTES AVE	2017	No	SLOPE RESTORATION & STALIZATION OF CREEK
RV8-1417	2025 MER BLEUE RD	2017	No	COMMERCIAL RETAIL SITE - SERVICING WATER, SANITARY & STORM
RV8-4215	4100 INNES RD	2015	No	MAINTENANCE OF THE INTERIM DITCH WHICH WAS COMPLETED IN 2013 AS PART OF PHASE 1
RV8-0715	FORTUNE DRIVE	2015	No	ENLARGEMENT OF EXISTING CULVERT FROM 900MM TO 1200-1500MM SECTIONS
RV8-1014	500 DES EPINETTES AVE	2014	No	TO REPLACE FOUR PEDESTRIAN BRIDGE STRUCTURES WITH SINGLE SPAN STRUCTURES SUPPORTED ON GABION WALL ABUTMENTS
RV8-3513	JEANNE DARC BLVD	2013	No	REPAIR CULVERT
RV8-2913	1461 YOUVILLE DR	2013	No	CONSTRUCT WATERMAIN UNDER DRAINAGE DITCH
RV8-4212T	NOT AVAILABLE	2012	No	REPLACE EXISTING PEDESTRIAN BRIDGE CROSSING ON BILBERRY CREEK
RV8-3612T	4100 INNES RD	2012	No	PHASE 1 = INSTALLATION OF TWO TEMPORARY CULVERTS PHASE 2 - PORTION OF BILBERRY CREEK TO BE FILLED IN AND CULVERTS AND DITCH TO BE DECOMMISSIONED
RV8-3712T	NOT AVAILABLE	2012	No	PEDESTRIAN BRIDGE REPLACEMENT
RV8-2812	1241 JOSEPH DROUIN	2012	No	STABILIZE ARMOUR STONE RETAINING WAL WITH ADDITION OF CONCRETE TOE AT BASE
RV8-1612T	NOT AVAILABLE	2012	No	PEDESTRIAN BRIDGE REPLACEMENT
RV8-3311T	DES EPINETTES	2011	No	DEBRIS REMOVAL (LOG JAM) IN CREEK - CONSTRUCT TEMP ACCESS RD
RV8-1909T	1241 JOSEPH DROUIN	2009	No	EROSION CONTROL ON PORTION OF BILBERRY CREEK
RV8-1009T	2802 ST JOSEPH BLV	2009	No	OUTLET FOR STORMWATER INTO BILBERRY CREEK
RV8-2708T	HIGHWAY 174	2008	No	BOX CULVERT REHABILITATION
RV8-3507T	DES EPINETTES	2007	No	REPAIR BANK BENEATH PEDESTRIAN BRIDGE
RV8-3206T	1452 YOUVILLE DR	2006	No	RIP RAP AT STORM WATER OUTLETS
RV8-2006T	ORLEANS BLVD	2006	No	REPLACE PEDESTRIAN BRIDGES
RV8-1404T	4300 INNES RD	2004	No	TO CONSTRUCT NEW FUTURE LOBLAWS SITE
RV8-1004T	ST JOSEPH	2004	No	RELINE EXISTING STORM SEWER THAT OUTFALLS IN BILBERRY CREEK
RV8-0204T	NOT AVAILABLE	2004	No	MULTIPLE PEDESTRIAN BRIDGES - MULTIPLE LOCATIONS
RV8-1903	4195 INNES RD	2003	No	EXISTING CULVERT NORTH OF SITE TO BE LOWERED TO AVOID BACKWATER EFFECTS.
RV8-1603T	INNES RD	2003	No	ROAD WIDENING
RV8-1602T	1131 SUGARBUSH CRT	2002	No	SLOPE STABILIZATION RE. FAILURE.
RV8T-0999	SILVER BARK	1999	No	RVCA GRANTS PERMISSION BUT WITH CONDITIONS
RV8-0999T	SILVER BARK	1999	No	PLACEMENT AND REMOVAL OF FILL TO STABILIZE THE SLOPE
RV8-0288	ROCQUE	1988	No	UNDEFINED
RV3-7777	BILBERRY CREEK	1977	No	STREAM DIVERSION, CULVERT INSTALLATION, BRIDGE

Appendix A

Buildings and Islands in Floodplain – RVCA Policy

Ferdous Ahmed

From: Ewan Hardie
Sent: Wednesday, June 29, 2016 10:35 AM
To: Ferdous Ahmed
Subject: Buildings in the Floodplain Guidelines

Hi Ferdous,
As discussed at recent meetings please consider the following guidelines when undertaking floodplain mapping projects

Effective June 13th 2016, when plotting floodlines RVCA staff will use the following guidelines in order to apply a conservative approach to the delineation of the regulatory floodplain, specifically in areas that have buildings that are in the floodplain or affected by the floodplain:

1. Include any buildings in the floodplain that have any part of the footprint touching the floodplain. This is done to be conservative based on the lack of knowledge on the conditions around the buildings: soil conditions, window wells, walk out doors, building egress are all not known at the time of a floodplain mapping study so it is wise to adopt a conservative approach and include building footprints in the floodplain.
2. With regards to dry islands in and around buildings, islands will be removed if they did not meet the minimum mapping unit acceptable for the data. An envelope of 2 metres around building footprints is to be considered. If the floodplain comes close to or is in this 2m building envelope the entire envelope should be included in the floodplain. This approach is also consistent with the above approach (building footprints) in that the lack of knowledge of the conditions around the building forces the uses of a conservative approach, which is to remove the islands
3. In cases where a building has been included in the floodplain (because of the above criteria), the adjacent building will need to be included in the floodplain as well because of a lack of data in between the buildings and/or the 2m building envelope rule.
4. In the case of townhome or connected type buildings and the floodplain touching the foundations, the building footprint should be included up to the next visible unit partition where the elevation changes

Thanks

Ewan Hardie

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Watershed Science and Engineering Services
Rideau Valley Conservation Authority
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Fax: 613 692-0334

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3889 Rideau Valley Drive, Manotick, ON
K4M 1A5
www.rvca.ca

Ferdous Ahmed

From: Ewan Hardie
Sent: Thursday, July 6, 2017 5:12 PM
To: Ferdous Ahmed
Cc: Brian Stratton
Subject: Floodplain delineation guidance

Good Afternoon Ferdous,

As discussed here is the documentation of the guidance that was given to RVCA staff when it comes to plotting floodlines using LiDAR data for this most recent project.

Guidance:

When delineating the regulatory flood water levels, RVCA staff will follow a precautionary principle to include island areas in the floodplain that are up to 1000 square metres.

Ewan Hardie

Director
Watershed Science and Engineering Services
Rideau Valley Conservation Authority
ewan.hardie@rvca.ca
Tel: 613 692-3571 ext 1130
Fax: 613 692-0334

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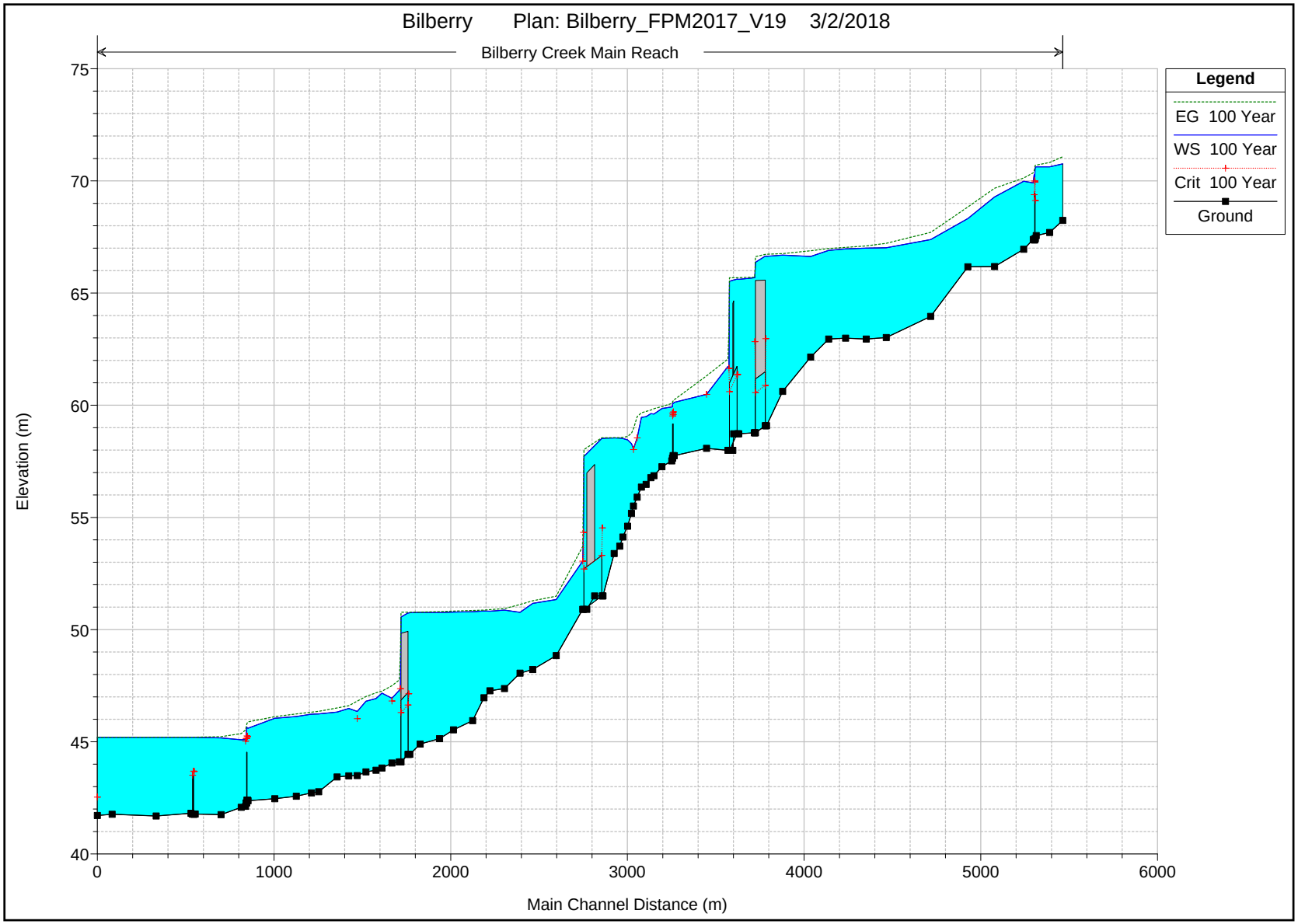
Appendix B

HEC-RAS Profiles and Cross-Sections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Bilberry Creek Main Reach
Legend
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WS 100 Year
Crit 100 Year
Ground
Elevation (m)
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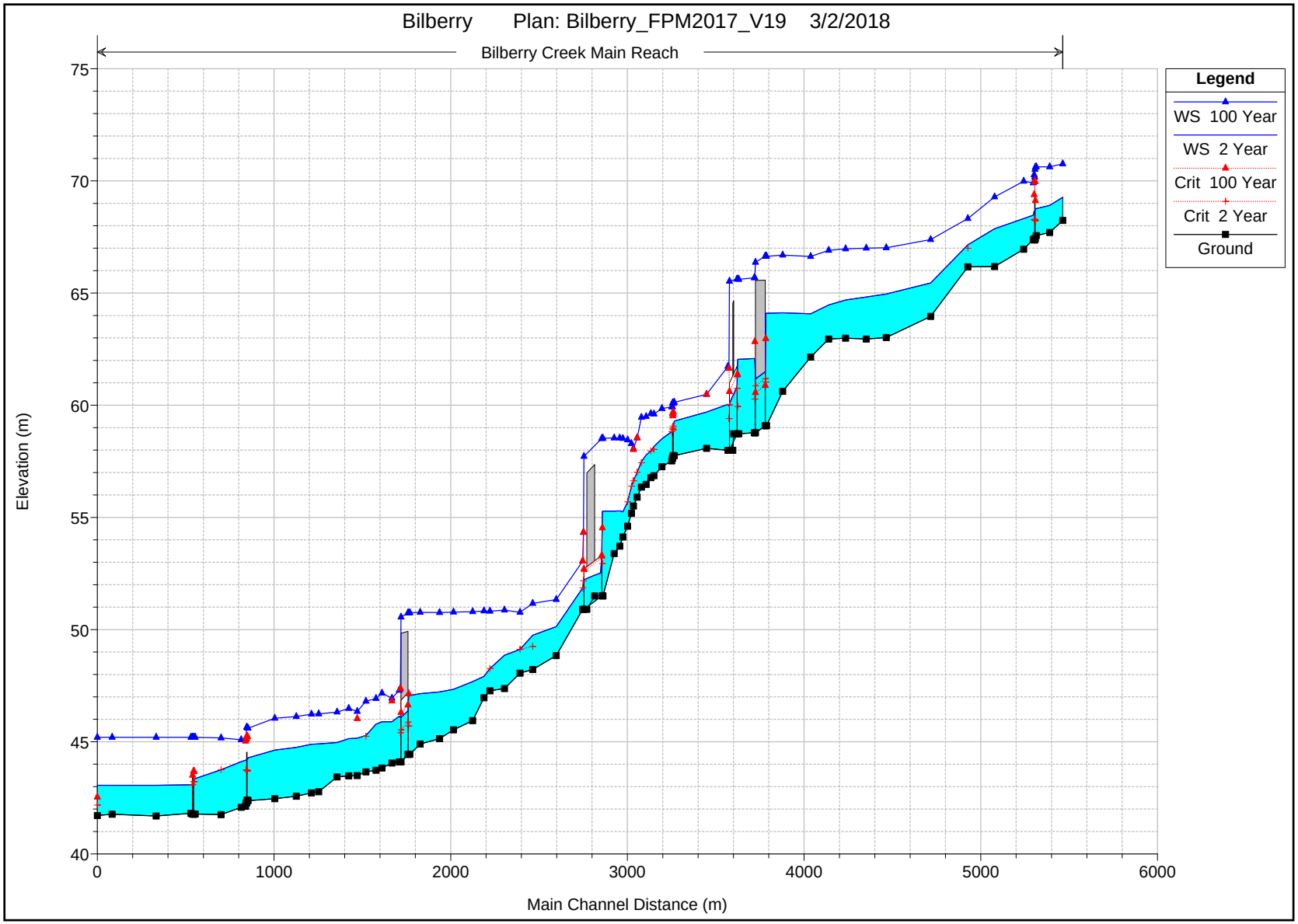
70
65
60
55
50
45
40
0
1000
2000
3000
4000
5000
6000
Main Channel Distance (m)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Bilberry Creek Main Reach
Legend
WS 100 Year
WS 2 Year
Crit 100 Year
Crit 2 Year
Ground
Elevation (m)
Main Channel Distance (m)
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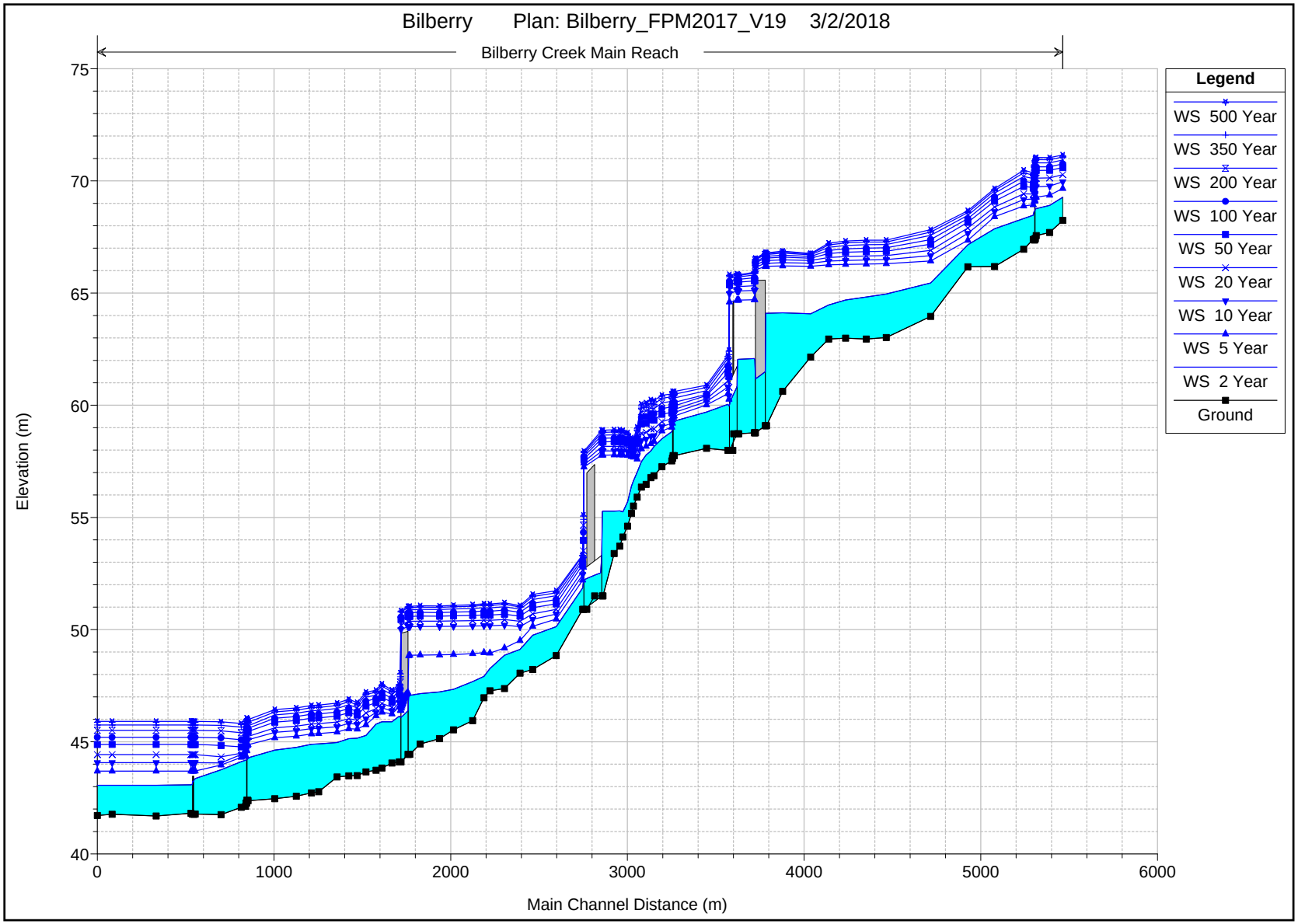
70
65
60
55
50
45
40
0
1000
2000
3000
4000
5000
6000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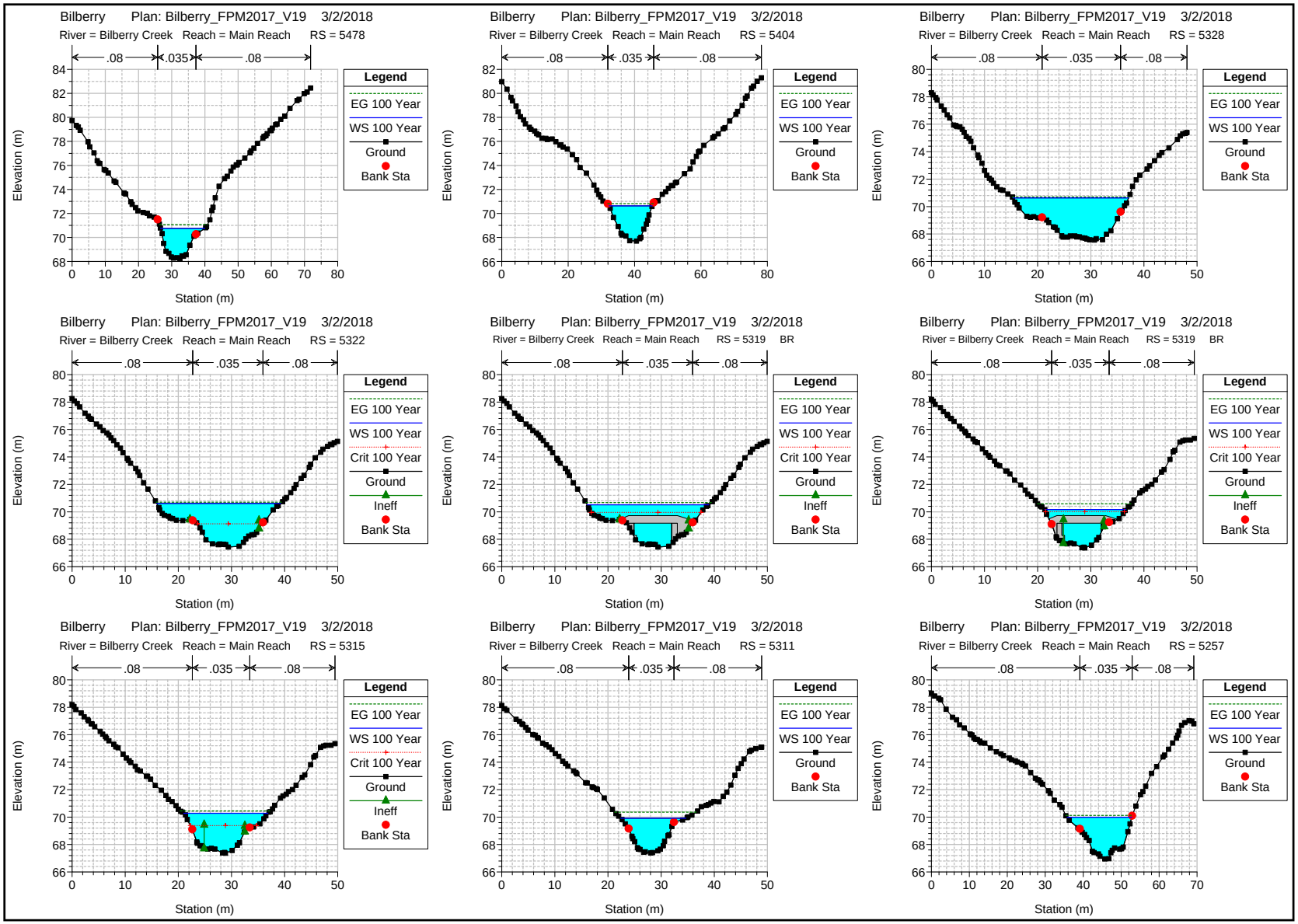
Bilberry Creek Main Reach
Elevation (m)
Main Channel Distance (m)
75
70
65
60
55
50
45
40
0
1000
2000
3000
4000
5000
6000
Legend
WS 500 Year
WS 350 Year
WS 200 Year
WS 100 Year
WS 50 Year
WS 20 Year
WS 10 Year
WS 5 Year
WS 2 Year
Ground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Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 5404
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 5328
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
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River = Bilberry Creek Reach = Main Reach RS = 5322
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 5319 BR
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 5319 BR
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 5315
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
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River = Bilberry Creek Reach = Main Reach RS = 5311
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
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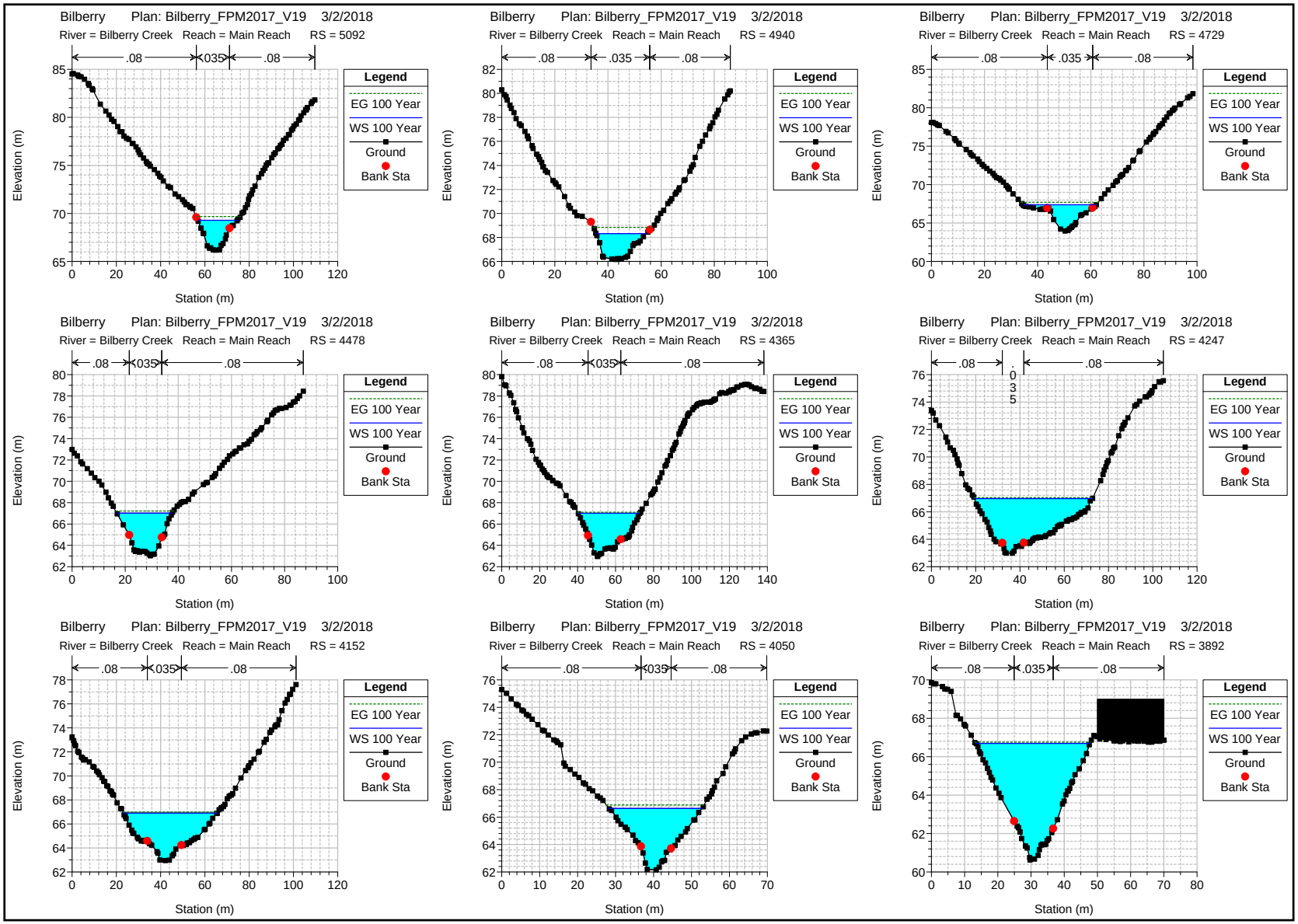
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)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WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
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.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
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.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 4478
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
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River = Bilberry Creek Reach = Main Reach RS = 4365
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
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River = Bilberry Creek Reach = Main Reach RS = 4247
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
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.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
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River = Bilberry Creek Reach = Main Reach RS = 4050
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
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Legend
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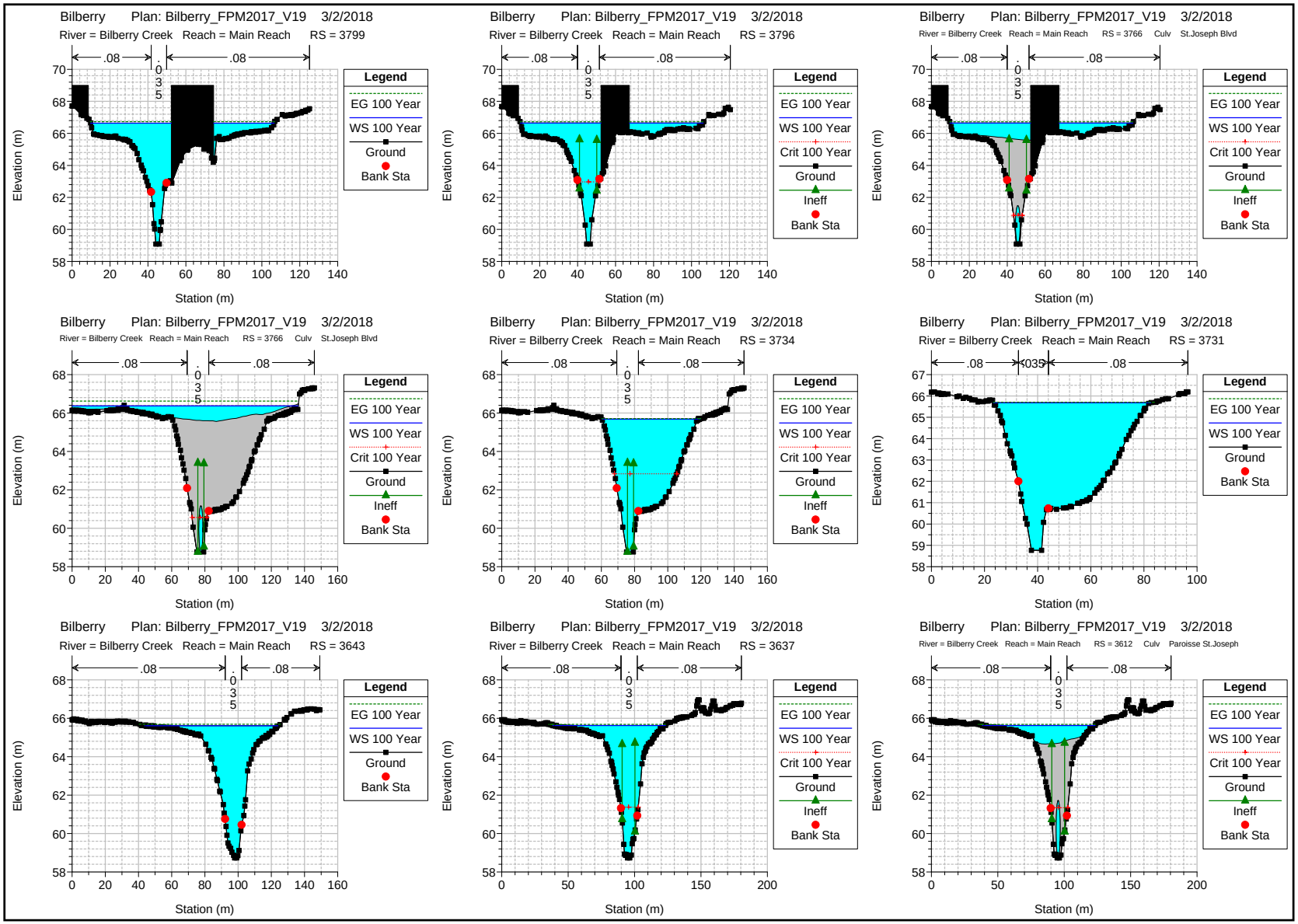
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)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WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
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WS 100 Year
Crit 100 Year
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
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.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
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.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
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EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
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WS 100 Year
Ground
Bank Sta
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Station (m)
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WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
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EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Ineff
Bank Sta
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Station (m)
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Crit 100 Year
Ground
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Bank Sta
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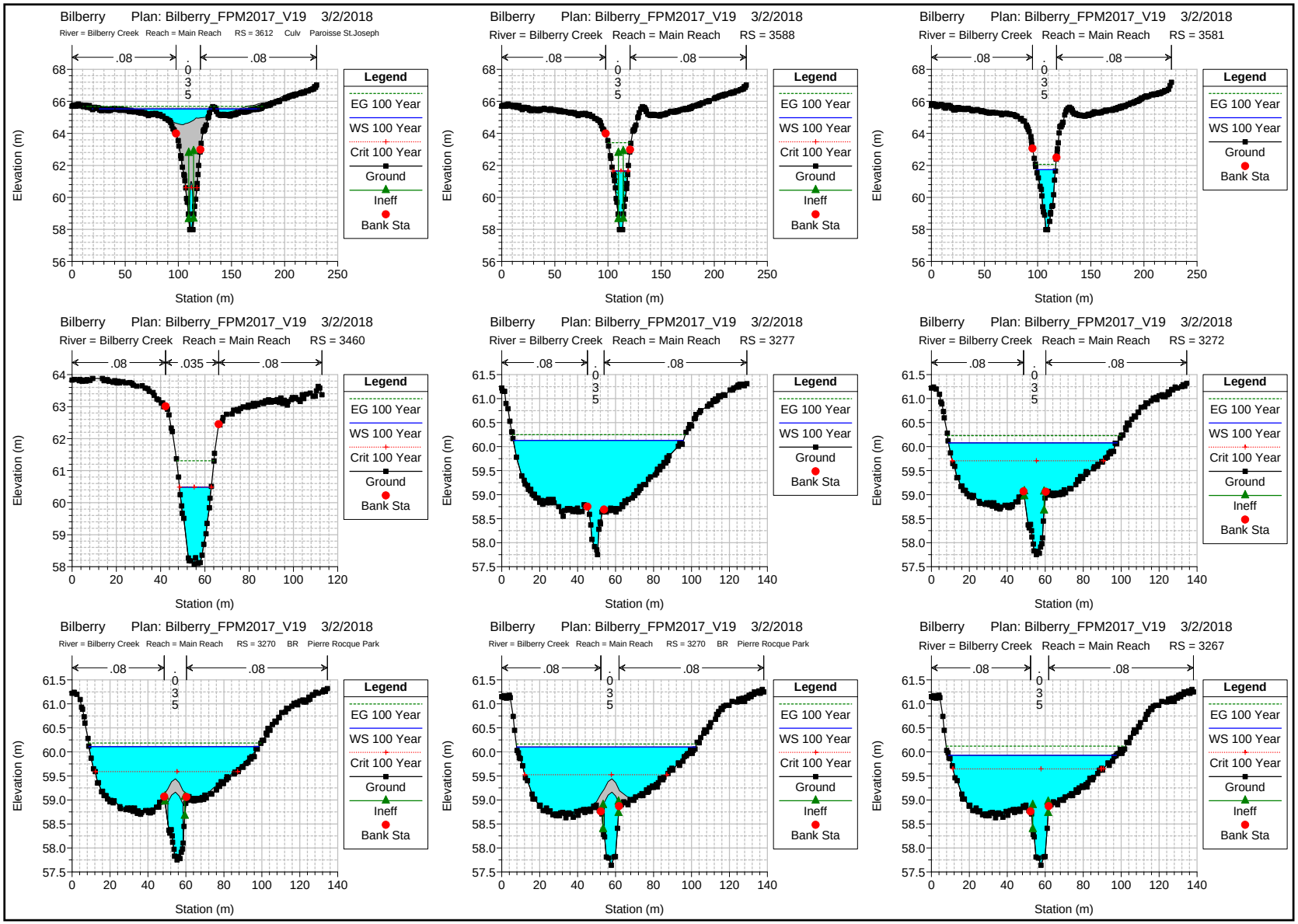
Station (m)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Crit 100 Year
Ground
Ineff
Bank Sta
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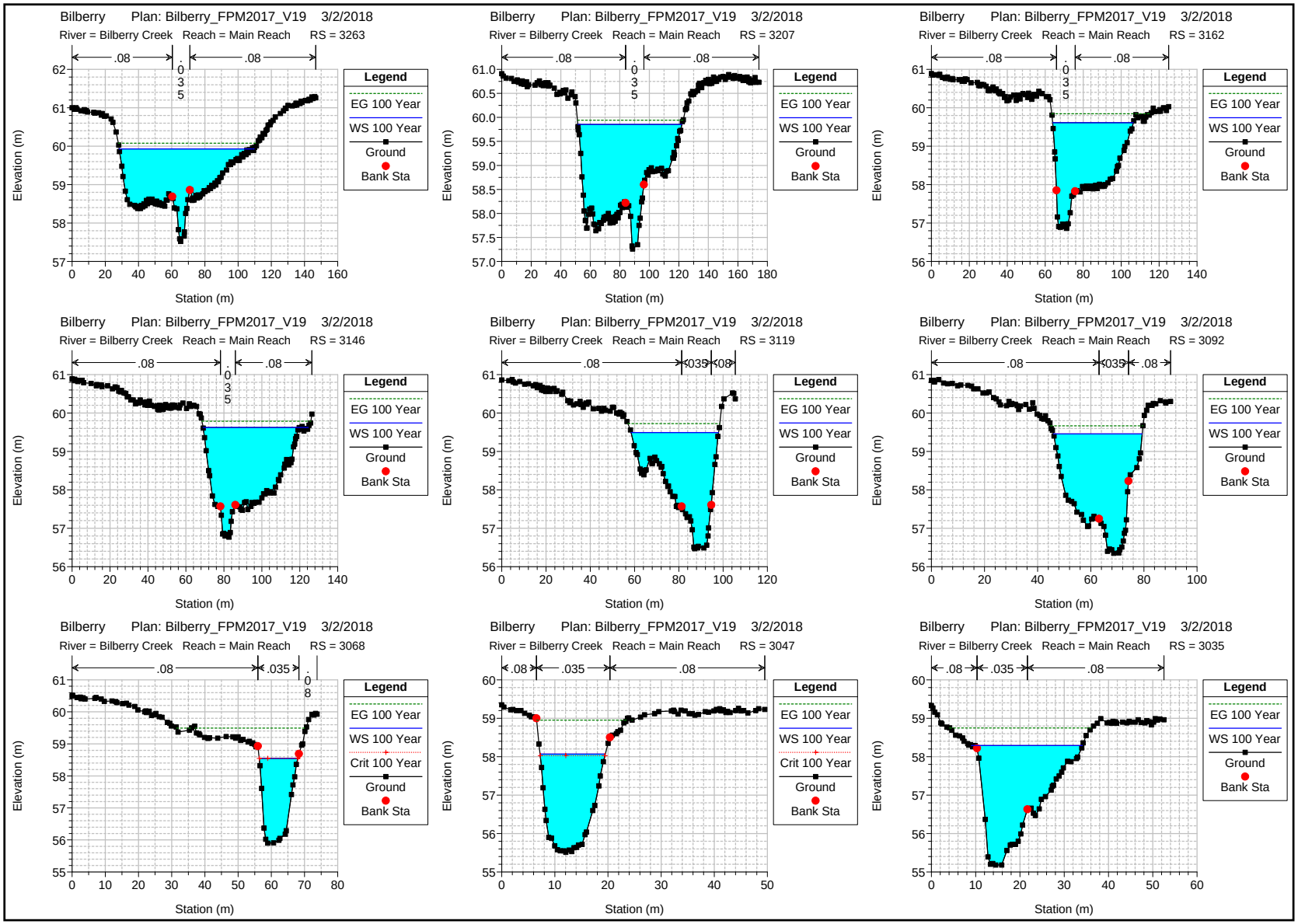
Station (m)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WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
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Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
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Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
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Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
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Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 3092
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
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River = Bilberry Creek Reach = Main Reach RS = 3068
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
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.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
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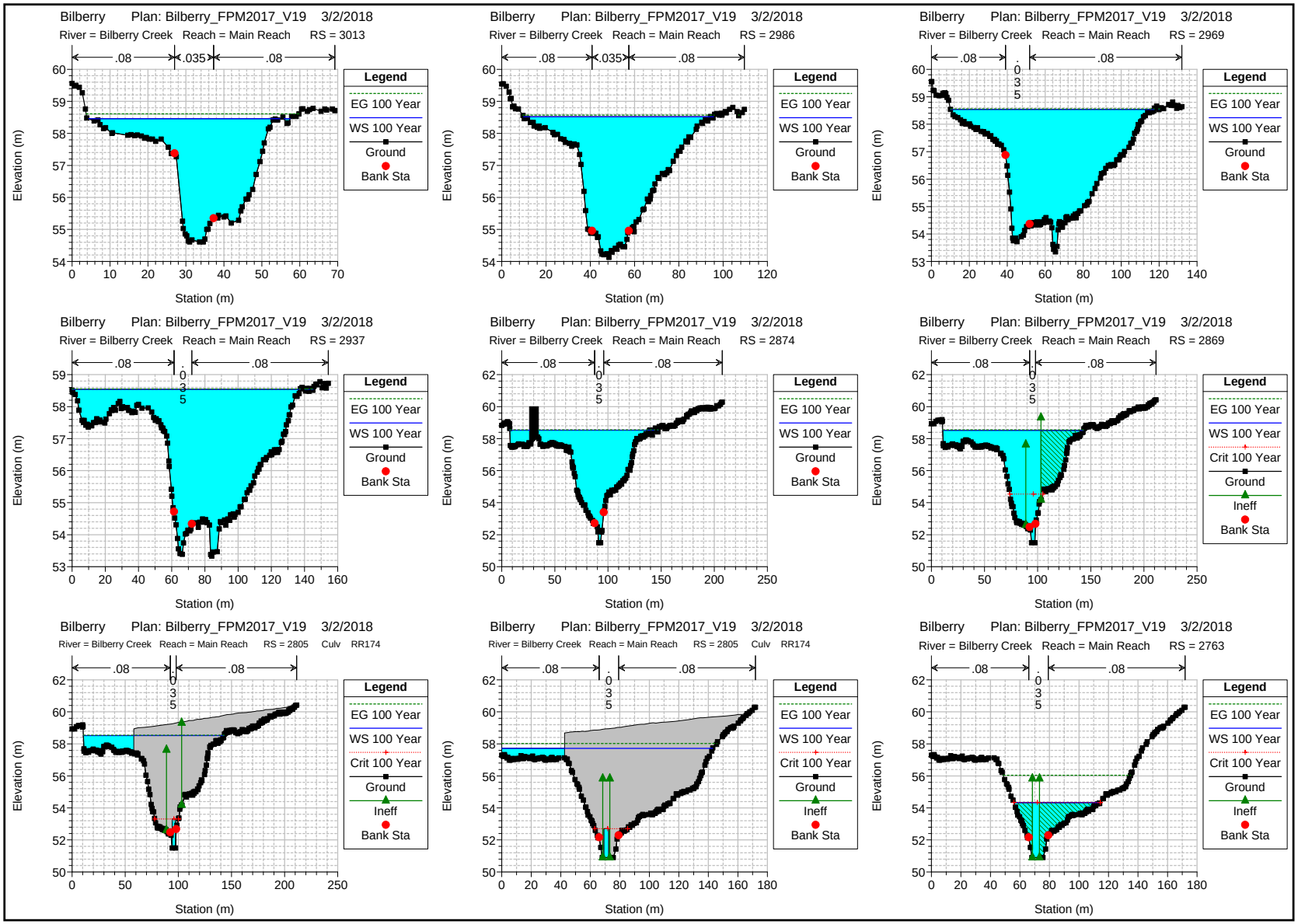
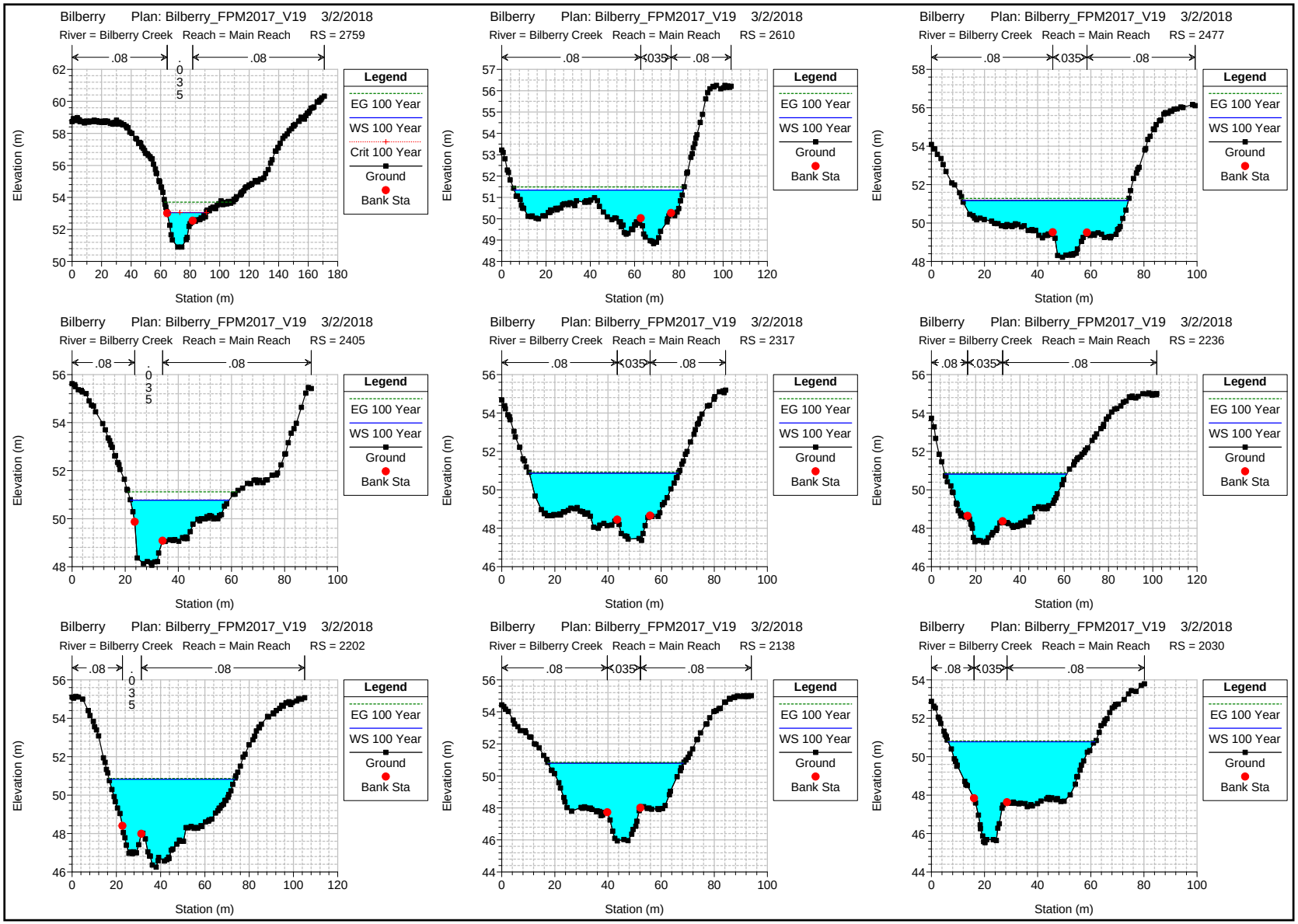
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)


Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 3013
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 2986
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 2969
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 2937
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 2874
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 2869
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 2805 Culv RR174
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 2805 Culv RR174
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 2763
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)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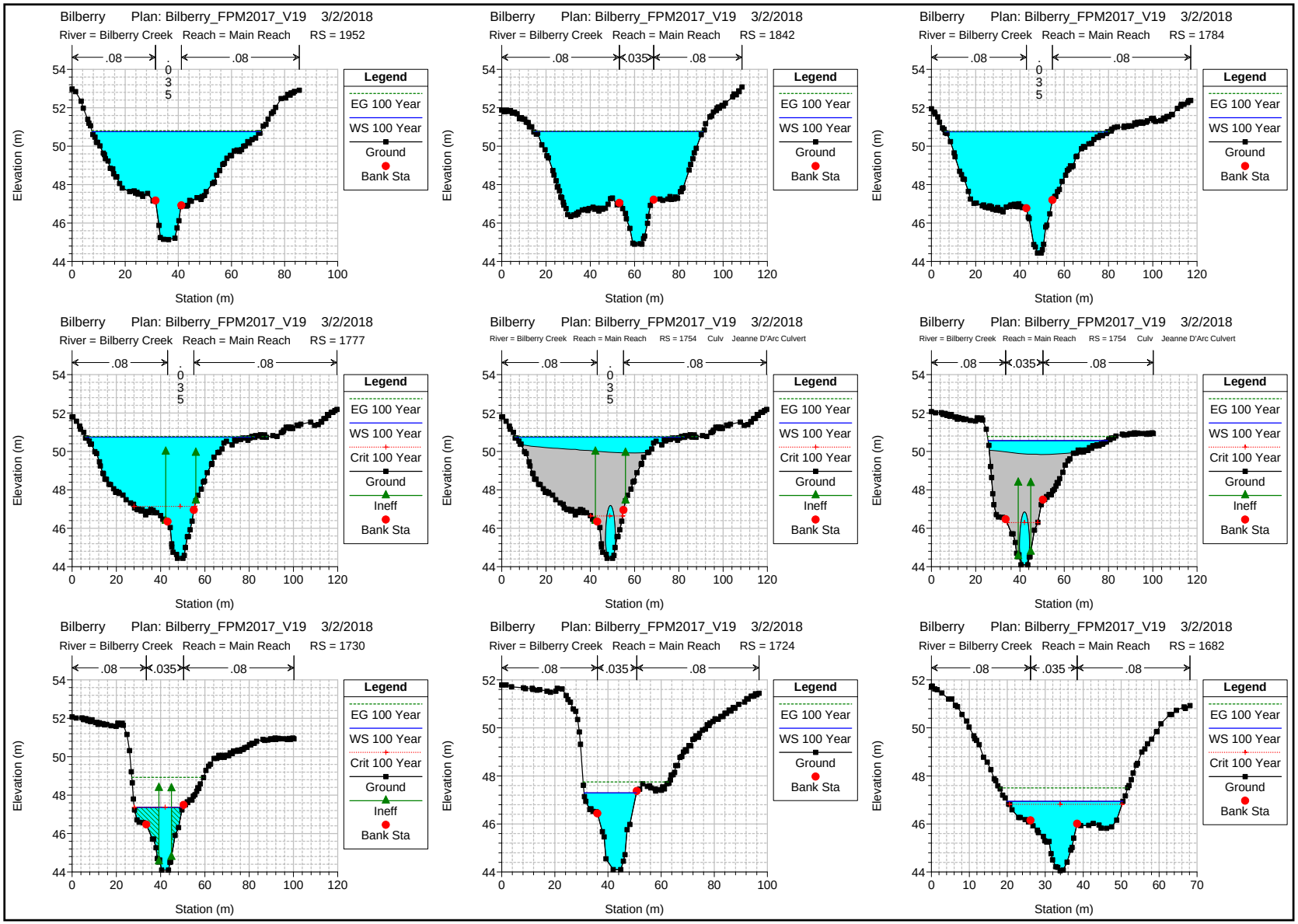
River = Bilberry Creek Reach = Main Reach RS = 2759
.08
.035
.08
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 2610
.08
.035
.08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 2477
.08
.035
.08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 2405
.08
.035
.08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 2317
.08
.035
.08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 2236
.08
.035
.08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 2202
.08
.035
.08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 2138
.08
.035
.08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 2030
.08
.035
.08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)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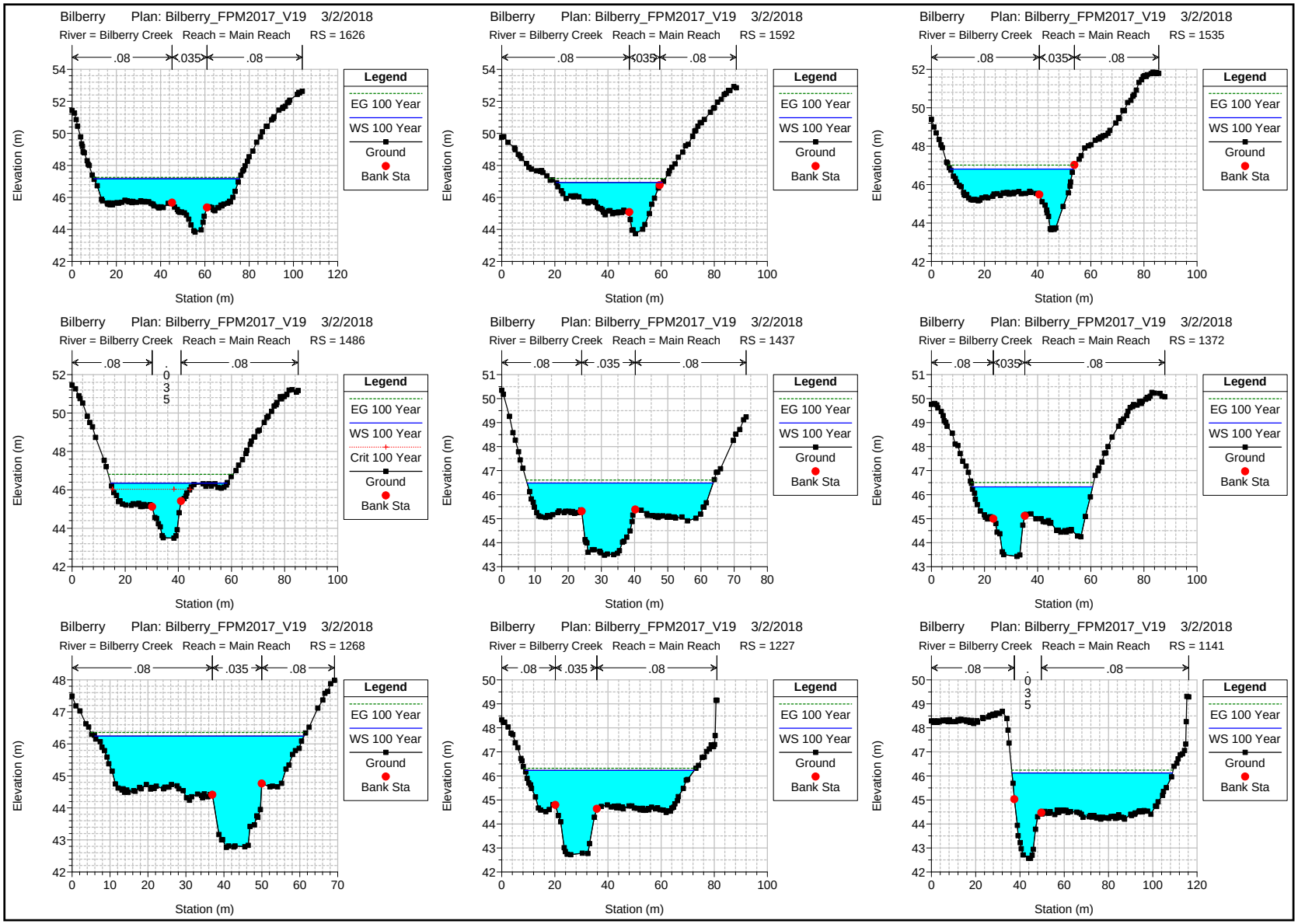
River = Bilberry Creek Reach = Main Reach RS = 1952
.08
.035
.08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 1842
.08
.035
.08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 1784
.08
.035
.08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 1777
.08
.035
.08
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 1754 Culv Jeanne D'Arc Culvert
.08
.035
.08
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 1754 Culv Jeanne D'Arc Culvert
.08
.035
.08
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 1730
.08
.035
.08
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 1724
.08
.035
.08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 1682
.08
.035
.08
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)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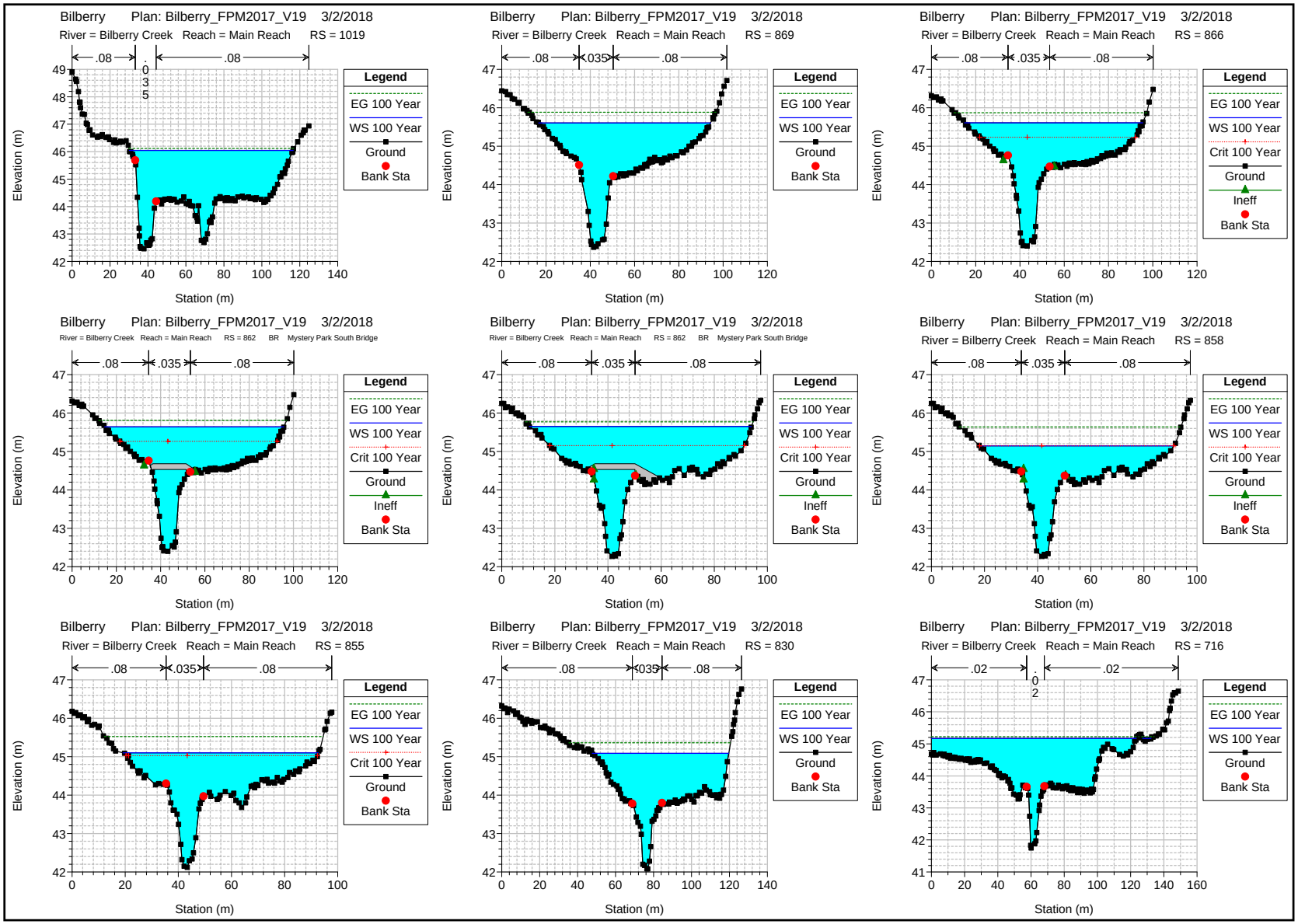
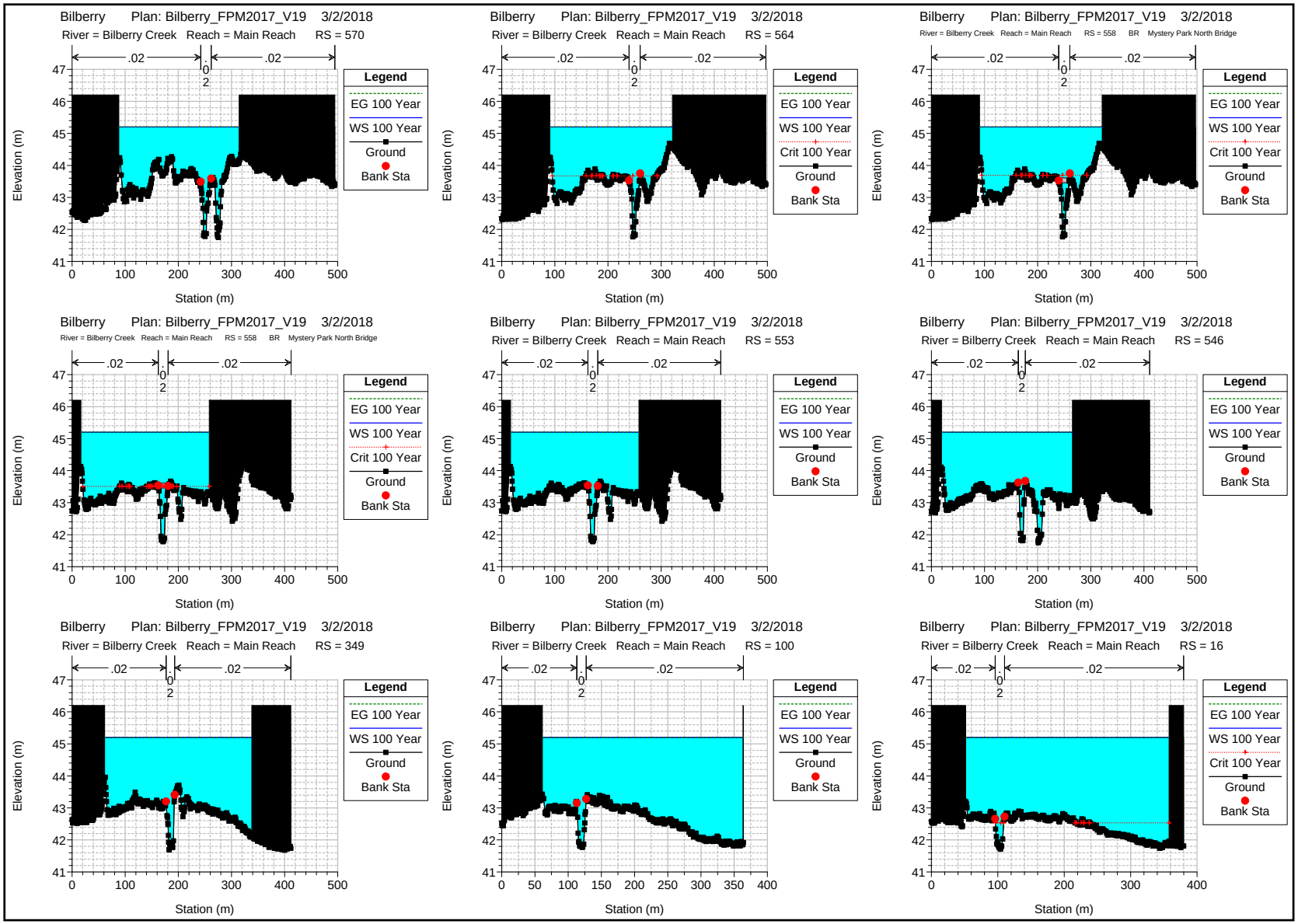
River = Bilberry Creek Reach = Main Reach RS = 1626
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 1592
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 1535
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 1486
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 1437
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 1372
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 1268
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 1227
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 1141
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)


Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 1019
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 869
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 866
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 862 BR Mystery Park South Bridge
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 862 BR Mystery Park South Bridge
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 858
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 855
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 830
.08 .035 .08
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 716
.02 .02
Legend
EG 100 Year
WS 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)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River = Bilberry Creek Reach = Main Reach RS = 570
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 564
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 558 BR Mystery Park North Bridge
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 558 BR Mystery Park North Bridge
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 553
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 546
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 349
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 100
Bilberry Plan: Bilberry_FPM2017_V19 3/2/2018
River = Bilberry Creek Reach = Main Reach RS = 16
Legend
EG 100 Year
WS 100 Year
Crit 100 Year
Ground
Bank Sta
Elevation (m)
Station (m)
.02
.02
.02

Table B1 Manning n values

River	Reach	Xsec ID #	Left Overbank n	Channel n	Right Overbank n
Billberry Creek	Main Reach	16	0.020	0.020	0.020
	Main Reach	100	0.020	0.020	0.020
	Main Reach	349	0.020	0.020	0.020
	Main Reach	546	0.020	0.020	0.020
	Main Reach	553	0.020	0.020	0.020
	Main Reach	558	Mystery Park Pedestrian Bridge		
	Main Reach	564	0.020	0.020	0.020
	Main Reach	570	0.020	0.020	0.020
	Main Reach	716	0.020	0.020	0.020
	Main Reach	830	0.080	0.035	0.080
	Main Reach	855	0.080	0.035	0.080
	Main Reach	858	0.080	0.035	0.080
	Main Reach	862	Mystery Park Eagle Bridge		
	Main Reach	866	0.080	0.035	0.080
	Main Reach	869	0.080	0.035	0.080
	Main Reach	1019	0.080	0.035	0.080
	Main Reach	1141	0.080	0.035	0.080
	Main Reach	1227	0.080	0.035	0.080
	Main Reach	1268	0.080	0.035	0.080
	Main Reach	1372	0.080	0.035	0.080
	Main Reach	1437	0.080	0.035	0.080
	Main Reach	1486	0.080	0.035	0.080
	Main Reach	1535	0.080	0.035	0.080
	Main Reach	1592	0.080	0.035	0.080
	Main Reach	1626	0.080	0.035	0.080
	Main Reach	1682	0.080	0.035	0.080
	Main Reach	1724	0.080	0.035	0.080
	Main Reach	1730	0.080	0.035	0.080
	Main Reach	1754	Jeanne D'Arc Boulevard		
	Main Reach	1777	0.080	0.035	0.080
	Main Reach	1784	0.080	0.035	0.080
	Main Reach	1842	0.080	0.035	0.080
	Main Reach	1952	0.080	0.035	0.080
	Main Reach	2030	0.080	0.035	0.080
	Main Reach	2138	0.080	0.035	0.080
	Main Reach	2202	0.080	0.035	0.080
	Main Reach	2236	0.080	0.035	0.080
	Main Reach	2317	0.080	0.035	0.080
	Main Reach	2405	0.080	0.035	0.080
	Main Reach	2477	0.080	0.035	0.080
	Main Reach	2610	0.080	0.035	0.080
	Main Reach	2759	0.080	0.035	0.080
	Main Reach	2763	0.080	0.035	0.080
	Main Reach	2805	RR174 Queensway		
	Main Reach	2869	0.080	0.035	0.080
	Main Reach	2874	0.080	0.035	0.080
	Main Reach	2937	0.080	0.035	0.080
	Main Reach	2969	0.080	0.035	0.080
	Main Reach	2986	0.080	0.035	0.080

River	Reach	Xsec ID #	Left Overbank n	Channel n	Right Overbank n
Bilberry Creek	Main Reach	3013	0.080	0.035	0.080
	Main Reach	3035	0.080	0.035	0.080
	Main Reach	3047	0.080	0.035	0.080
	Main Reach	3068	0.080	0.035	0.080
	Main Reach	3092	0.080	0.035	0.080
	Main Reach	3119	0.080	0.035	0.080
	Main Reach	3146	0.080	0.035	0.080
	Main Reach	3162	0.080	0.035	0.080
	Main Reach	3207	0.080	0.035	0.080
	Main Reach	3263	0.080	0.035	0.080
	Main Reach	3267	0.080	0.035	0.080
	Main Reach	3270	Pierre Rocque Park		
	Main Reach	3272	0.080	0.035	0.080
	Main Reach	3277	0.080	0.035	0.080
	Main Reach	3460	0.080	0.035	0.080
	Main Reach	3581	0.080	0.035	0.080
	Main Reach	3588	0.080	0.035	0.080
	Main Reach	3612	Paroisse St. Joseph		
	Main Reach	3637	0.080	0.035	0.080
	Main Reach	3643	0.080	0.035	0.080
	Main Reach	3731	0.080	0.035	0.080
	Main Reach	3734	0.080	0.035	0.080
	Main Reach	3766	St. Joseph Boulevard		
	Main Reach	3796	0.080	0.035	0.080
	Main Reach	3799	0.080	0.035	0.080
	Main Reach	3892	0.080	0.035	0.080
	Main Reach	4050	0.080	0.035	0.080
	Main Reach	4152	0.080	0.035	0.080
	Main Reach	4247	0.080	0.035	0.080
	Main Reach	4365	0.080	0.035	0.080
	Main Reach	4478	0.080	0.035	0.080
	Main Reach	4729	0.080	0.035	0.080
	Main Reach	4940	0.080	0.035	0.080
	Main Reach	5092	0.080	0.035	0.080
	Main Reach	5257	0.080	0.035	0.080
	Main Reach	5311	0.080	0.035	0.080
	Main Reach	5315	0.080	0.035	0.080
	Main Reach	5319	Pedestrian Bridge North of Turnberry Road		
	Main Reach	5322	0.080	0.035	0.080
	Main Reach	5328	0.080	0.035	0.080
	Main Reach	5404	0.080	0.035	0.080
	Main Reach	5478	0.080	0.035	0.080

Table B2 HEC-RAS Detailed Output

HEC-RAS Plan: V19 River: Bilberry Creek Reach: Main Reach Profile: 100 Year

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Main Reach	16	100 Year	128.76	41.71	45.20	42.53	45.20	0.000002	0.17	851.64	306.25	0.03
Main Reach	100	100 Year	128.76	41.77	45.20		45.20	0.000003	0.18	782.57	302.03	0.03
Main Reach	349	100 Year	128.76	41.69	45.20		45.20	0.000006	0.24	632.88	276.70	0.04
Main Reach	546	100 Year	128.76	41.81	45.20		45.20	0.000010	0.29	506.61	246.49	0.06
Main Reach	553	100 Year	128.76	41.78	45.20		45.20	0.000012	0.32	477.25	241.40	0.06
Main Reach	558		Bridge									
Main Reach	564	100 Year	128.76	41.77	45.20	43.67	45.20	0.000019	0.39	404.13	230.83	0.08
Main Reach	570	100 Year	128.76	41.78	45.20		45.20	0.000021	0.42	389.22	226.31	0.08
Main Reach	716	100 Year	128.76	41.75	45.17		45.22	0.000280	1.43	137.17	128.54	0.29
Main Reach	830	100 Year	128.76	42.08	45.09		45.36	0.003968	2.77	85.01	71.90	0.62
Main Reach	855	100 Year	128.76	42.12	45.10	45.03	45.53	0.005994	3.35	71.80	73.49	0.76
Main Reach	858	100 Year	128.76	42.27	45.14	45.14	45.64	0.007033	3.45	63.54	73.09	0.81
Main Reach	862		Bridge									
Main Reach	866	100 Year	128.76	42.40	45.61	45.23	45.87	0.003094	2.54	86.39	80.55	0.56
Main Reach	869	100 Year	128.76	42.37	45.60		45.88	0.002849	2.65	87.52	77.64	0.54
Main Reach	1019	100 Year	128.76	42.46	46.05		46.12	0.001039	1.67	161.40	86.34	0.31
Main Reach	1141	100 Year	128.76	42.57	46.12		46.24	0.001459	2.01	128.62	72.53	0.39
Main Reach	1227	100 Year	97.48	42.72	46.23		46.32	0.000737	1.53	110.99	63.70	0.28
Main Reach	1268	100 Year	97.48	42.77	46.24		46.36	0.000952	1.74	98.46	55.15	0.32
Main Reach	1372	100 Year	97.48	43.43	46.33		46.51	0.002147	2.25	74.60	45.39	0.46
Main Reach	1437	100 Year	97.48	43.48	46.49		46.61	0.001202	1.77	90.34	56.01	0.35
Main Reach	1486	100 Year	97.48	43.49	46.35	46.03	46.81	0.004619	3.23	45.29	43.76	0.67
Main Reach	1535	100 Year	97.48	43.66	46.81		47.02	0.003257	2.45	67.52	46.35	0.55
Main Reach	1592	100 Year	97.48	43.73	46.93		47.18	0.003551	2.67	60.77	39.83	0.58
Main Reach	1626	100 Year	97.48	43.83	47.17		47.25	0.000964	1.59	111.15	65.77	0.32
Main Reach	1682	100 Year	97.48	44.05	46.94	46.82	47.50	0.007170	3.55	38.24	30.54	0.82
Main Reach	1724	100 Year	97.48	44.10	47.29		47.75	0.004671	3.03	34.65	19.70	0.66
Main Reach	1730	100 Year	97.48	44.10	47.37	47.37	48.92	0.008891	5.53	17.64	21.95	1.00
Main Reach	1754		Culvert									
Main Reach	1777	100 Year	97.48	44.44	50.74	47.14	50.77	0.000135	0.96	197.88	75.31	0.13
Main Reach	1784	100 Year	97.48	44.44	50.75		50.78	0.000128	0.91	213.08	73.48	0.13
Main Reach	1842	100 Year	96.12	44.90	50.77		50.78	0.000081	0.71	257.39	76.61	0.10
Main Reach	1952	100 Year	96.12	45.14	50.76		50.80	0.000225	1.17	168.84	63.42	0.16
Main Reach	2030	100 Year	96.12	45.53	50.78		50.82	0.000248	1.12	155.53	55.29	0.17
Main Reach	2138	100 Year	96.12	45.94	50.80		50.85	0.000286	1.21	141.35	50.98	0.19
Main Reach	2202	100 Year	96.12	46.96	50.83		50.87	0.000406	1.27	153.05	56.85	0.22
Main Reach	2236	100 Year	96.12	47.27	50.82		50.89	0.000532	1.37	118.39	55.06	0.25
Main Reach	2317	100 Year	96.12	47.37	50.87		50.93	0.000599	1.45	123.31	56.07	0.26
Main Reach	2405	100 Year	96.12	48.06	50.77		51.12	0.003792	2.95	52.85	37.16	0.61
Main Reach	2477	100 Year	96.12	48.22	51.17		51.28	0.001293	1.84	98.96	62.40	0.37
Main Reach	2610	100 Year	96.12	48.84	51.34		51.49	0.002378	2.15	89.77	76.41	0.49
Main Reach	2759	100 Year	96.12	50.90	53.05	53.05	53.70	0.009793	3.62	29.48	26.57	0.94
Main Reach	2763	100 Year	96.12	50.90	54.33	54.33	56.04	0.007970	5.80	16.57	58.57	1.00
Main Reach	2805		Culvert									
Main Reach	2869	100 Year	96.12	51.50	58.52	54.53	58.55	0.000146	1.10	240.40	132.42	0.14
Main Reach	2874	100 Year	96.12	51.50	58.53		58.55	0.000091	0.87	299.47	128.69	0.11
Main Reach	2937	100 Year	95.29	53.39	58.54		58.55	0.000101	0.78	301.22	140.95	0.12
Main Reach	2969	100 Year	95.29	53.72	58.54		58.56	0.000135	0.80	254.66	107.64	0.13
Main Reach	2986	100 Year	95.29	54.13	58.52		58.57	0.000239	1.11	155.11	85.54	0.18
Main Reach	3013	100 Year	95.29	54.61	58.46		58.61	0.001173	2.01	81.24	52.10	0.35
Main Reach	3035	100 Year	95.29	55.18	58.29		58.75	0.004564	3.15	39.16	25.08	0.65
Main Reach	3047	100 Year	95.29	55.51	58.07	58.03	58.95	0.011123	4.17	22.88	12.27	0.97
Main Reach	3068	100 Year	95.29	55.90	58.55	58.55	59.49	0.012008	4.32	22.08	11.61	1.00
Main Reach	3092	100 Year	95.29	56.35	59.46		59.67	0.001911	2.32	64.35	33.42	0.45
Main Reach	3119	100 Year	95.29	56.47	59.49		59.72	0.001935	2.32	61.74	39.49	0.46
Main Reach	3146	100 Year	95.29	56.77	59.63		59.79	0.002146	2.39	84.35	55.07	0.48
Main Reach	3162	100 Year	95.29	56.86	59.61		59.85	0.002723	2.60	66.60	42.50	0.53
Main Reach	3207	100 Year	95.29	57.26	59.85		59.94	0.001545	1.77	104.29	70.47	0.40
Main Reach	3263	100 Year	95.29	57.52	59.93		60.08	0.003359	2.37	86.46	80.64	0.56
Main Reach	3267	100 Year	95.29	57.64	59.93	59.65	60.12	0.003921	2.64	84.31	88.42	0.61
Main Reach	3270		Bridge									
Main Reach	3272	100 Year	95.29	57.75	60.08	59.70	60.23	0.003035	2.30	91.11	88.93	0.54
Main Reach	3277	100 Year	95.29	57.75	60.13		60.25	0.002955	2.28	99.47	89.70	0.53
Main Reach	3460	100 Year	95.29	58.08	60.49	60.48	61.31	0.011371	4.02	23.70	14.37	1.00
Main Reach	3581	100 Year	95.29	57.99	61.73		62.06	0.003542	2.56	37.20	18.05	0.57
Main Reach	3588	100 Year	95.29	57.99	61.64	61.64	63.42	0.009121	5.90	16.15	14.21	1.00
Main Reach	3612		Culvert									
Main Reach	3637	100 Year	95.29	58.73	65.62	61.37	65.68	0.000170	1.15	137.76	83.68	0.15
Main Reach	3643	100 Year	95.29	58.73	65.61		65.69	0.000213	1.33	130.92	79.62	0.17
Main Reach	3731	100 Year	95.29	58.77	65.68		65.71	0.000104	0.86	209.41	59.21	0.11
Main Reach	3734	100 Year	95.29	58.77	65.68	62.84	65.71	0.000096	0.83	205.54	58.47	0.11
Main Reach	3766		Culvert									
Main Reach	3796	100 Year	95.29	59.09	66.65	62.97	66.72	0.000303	1.31	123.07	81.36	0.18
Main Reach	3799	100 Year	95.29	59.09	66.64		66.73	0.000414	1.51	126.85	74.47	0.20
Main Reach	3892	100 Year	89.28	60.62	66.69		66.76	0.000220	1.22	109.84	34.35	0.17
Main Reach	4050	100 Year	89.28	62.15	66.63		66.89	0.001420	2.43	55.12	24.51	0.39
Main Reach	4152	100 Year	89.28	62.95	66.90		66.99	0.000520	1.42	95.08	42.48	0.25

HEC-RAS Plan: V19 River: Bilberry Creek Reach: Main Reach Profile: 100 Year (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Main Reach	4247	100 Year	89.28	62.99	66.97		67.04	0.000472	1.45	123.61	53.34	0.24
Main Reach	4365	100 Year	89.28	62.95	67.00		67.10	0.000557	1.45	77.51	32.50	0.26
Main Reach	4478	100 Year	89.28	63.02	67.02		67.22	0.001099	2.04	51.28	20.79	0.35
Main Reach	4729	100 Year	89.28	63.96	67.38		67.71	0.003467	2.55	38.53	27.53	0.57
Main Reach	4940	100 Year	86.22	66.17	68.32		68.84	0.008278	3.18	27.10	19.01	0.85
Main Reach	5092	100 Year	86.22	66.18	69.28		69.67	0.003873	2.78	32.38	17.84	0.61
Main Reach	5257	100 Year	48.62	66.95	69.98		70.13	0.001499	1.68	30.26	17.04	0.37
Main Reach	5311	100 Year	48.62	67.39	69.91		70.36	0.005555	2.97	17.16	12.26	0.69
Main Reach	5315	100 Year	48.62	67.37	70.27	69.38	70.45	0.001606	1.89	28.36	15.84	0.40
Main Reach	5319		Bridge									
Main Reach	5322	100 Year	48.62	67.43	70.61	69.13	70.70	0.000714	1.36	42.67	23.33	0.27
Main Reach	5328	100 Year	48.62	67.56	70.63		70.70	0.000612	1.25	43.96	21.77	0.25
Main Reach	5404	100 Year	48.62	67.70	70.63		70.82	0.002229	1.93	25.21	13.04	0.44
Main Reach	5478	100 Year	48.62	68.24	70.76		71.08	0.004120	2.50	20.06	13.33	0.59

Appendix C

Field Verification of LIDAR Data

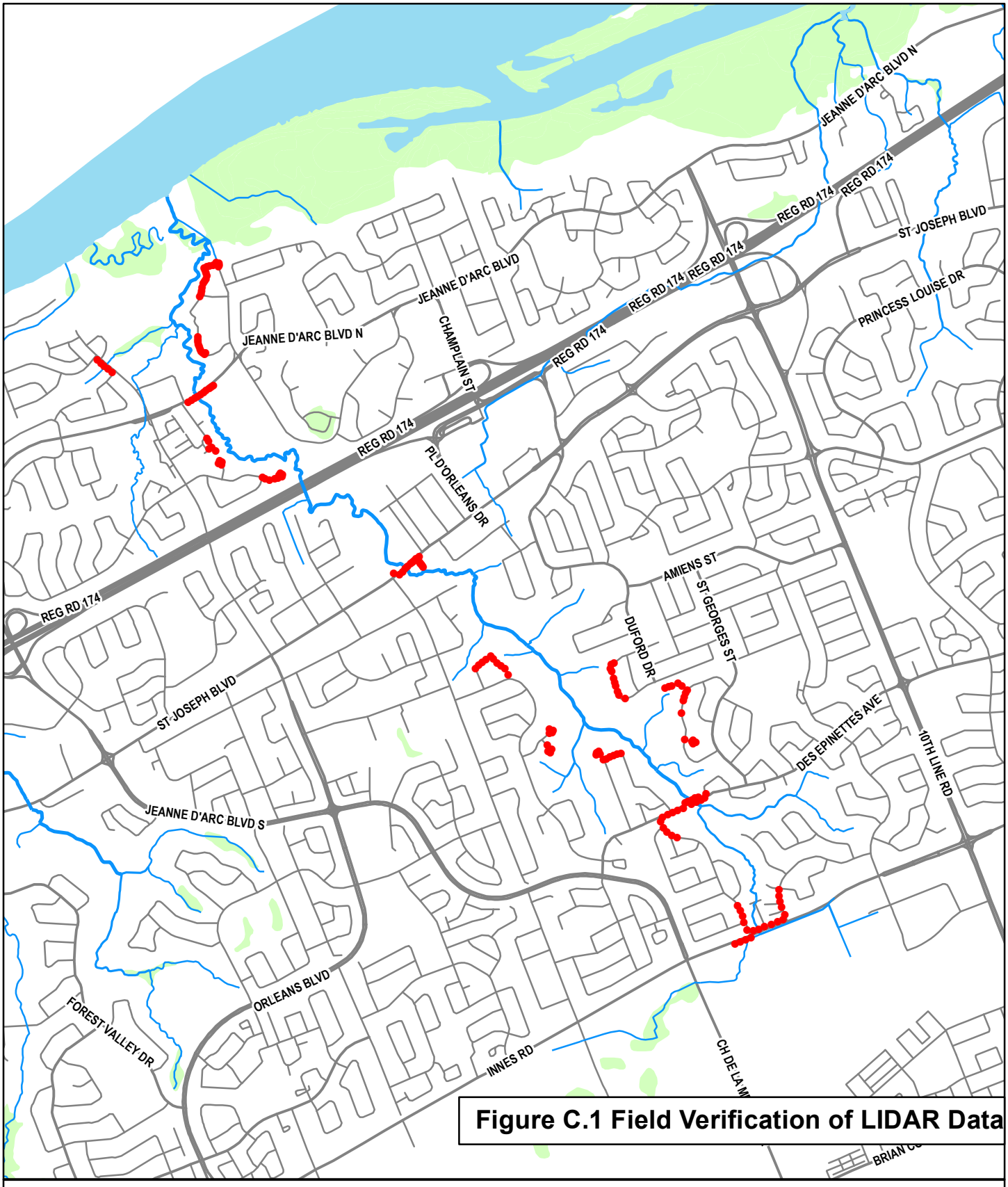


Figure C.1 Field Verification of LIDAR Data

RIDEAU VALLEY CONSERVATION AUTHORITY

0 0.25 0.5 1 Kilometers

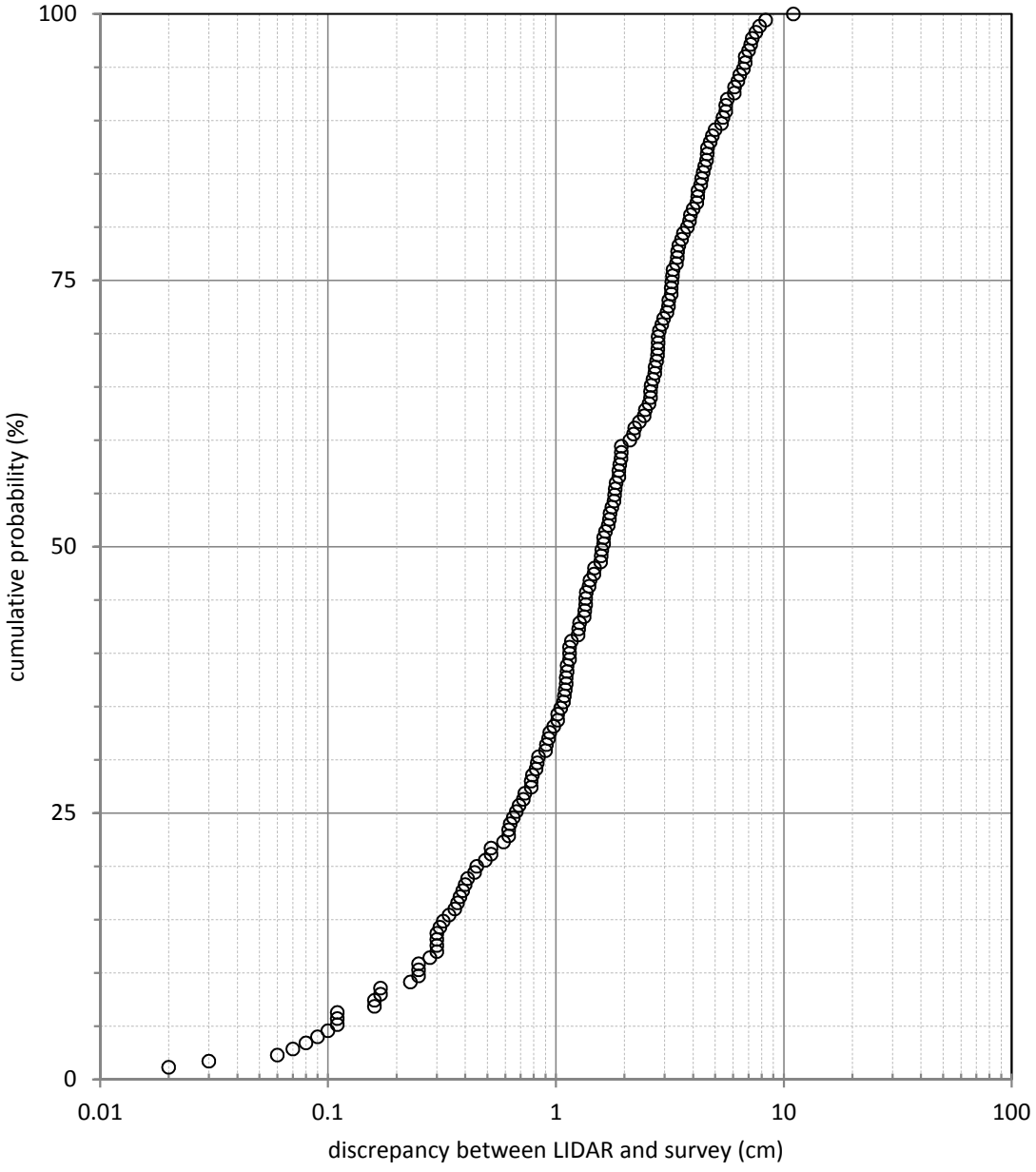
N

Trimble points

Wetlands

Map Scale:1:25,000 Date Modified: 14/02/2018

Figure C.2 Field verification of LIDAR data
(Bilberry Creek - October 2014)



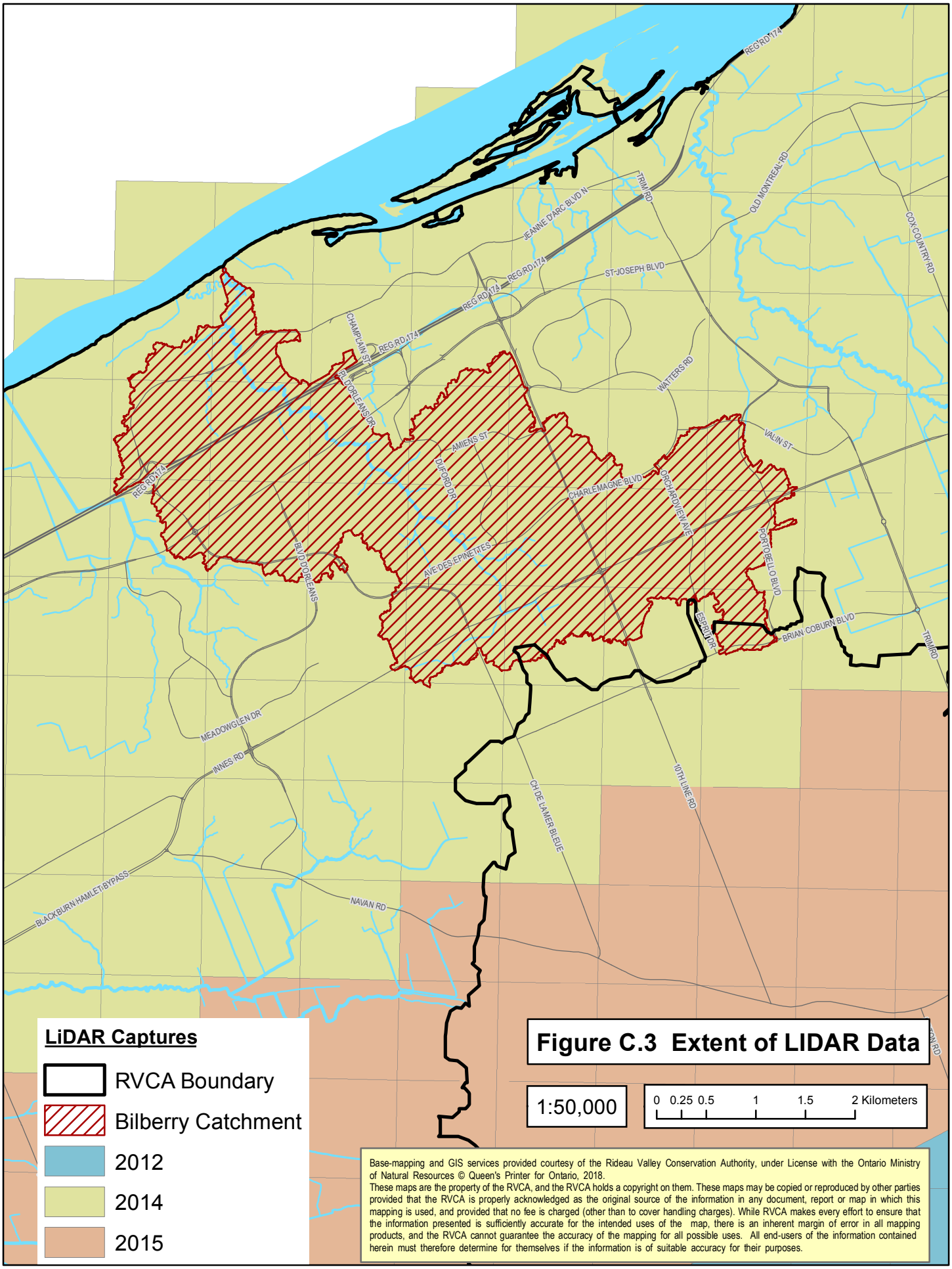


Table C.1 Field verification of LIDAR data (spot heights)

	RVCA Field Survey (October 9, 2014)							Nearest Lidar Point	Comparison		
Location ID	X (m)	Y (m)	Z (m)	Horizontal Accuracy (m)	Veritcal Accuracy (m)	Date/Time	Field Observations	Z (m)	△z (m)	|△z| (cm)	|△z| > 0.33m
du gr bois1	460970.534	5034031.970	87.06	0.010	0.012	10/9/2014 10:00	road centre line	87.063	-0.003	0.3	
du gr bois2	460970.462	5034002.609	87.19	0.011	0.014	10/9/2014 10:01	road centre line	87.193	0.000	0.0	
du gr bois3	460973.796	5033975.909	87.34	0.013	0.018	10/9/2014 10:02	road centre line	87.343	-0.003	0.3	
du gr bois4	460982.702	5033948.826	87.55	0.015	0.020	10/9/2014 10:04	road centre line	87.521	0.026	2.6	
du gr bois5	460997.975	5033912.408	87.76	0.015	0.020	10/9/2014 10:06	road centre line	87.780	-0.017	1.7	
innes1	460988.952	5033888.413	87.65	0.015	0.020	10/9/2014 10:09	road centre line	87.704	-0.053	5.3	
innes2	460963.314	5033878.940	87.81	0.015	0.020	10/9/2014 10:11	road centre line	87.866	-0.056	5.6	
innes3	460934.837	5033868.386	87.89	0.015	0.020	10/9/2014 10:11	road centre line	87.905	-0.018	1.8	
innes4	460900.045	5033855.595	87.74	0.015	0.020	10/9/2014 10:12	road centre line	87.773	-0.036	3.6	
innes5	460872.405	5033845.400	87.70	0.015	0.018	10/9/2014 10:13	road centre line	87.776	-0.072	7.2	
innes6	460847.368	5033836.178	87.79	0.015	0.019	10/9/2014 10:14	road centre line	87.818	-0.033	3.3	
innes7	460837.409	5033803.967	87.87	0.015	0.019	10/9/2014 10:17	road centre line	87.891	-0.021	2.1	
innes8	460810.119	5033793.380	88.28	0.015	0.019	10/9/2014 10:17	road centre line	88.251	0.028	2.8	
innes9	460785.083	5033783.453	88.60	0.012	0.015	10/9/2014 10:18	road centre line	88.569	0.026	2.6	
innes10	460761.329	5033774.116	88.82	0.013	0.016	10/9/2014 10:19	road centre line	88.807	0.008	0.8	
wildflower1	460818.388	5033840.821	87.59	0.015	0.020	10/9/2014 10:22	road centre line	87.541	0.046	4.6	
wildflower2	460803.512	5033876.312	87.30	0.015	0.020	10/9/2014 10:23	road centre line	87.280	0.016	1.6	
wildflower3	460796.891	5033905.489	87.07	0.014	0.020	10/9/2014 10:23	road centre line	87.049	0.019	1.9	
wildflower4	460785.727	5033932.263	87.06	0.014	0.020	10/9/2014 10:24	road centre line	87.071	-0.013	1.3	
wildflower5	460773.955	5033957.629	87.17	0.013	0.019	10/9/2014 10:25	road centre line	87.182	-0.010	1.0	
wildflower6	460484.864	5034280.263	86.10	0.013	0.019	10/9/2014 10:41	road centre line	86.078	0.026	2.6	
wildflower7	460459.787	5034289.755	85.92	0.012	0.018	10/9/2014 10:42	road centre line	85.933	-0.015	1.5	
wildflower8	460436.041	5034306.294	85.63	0.012	0.017	10/9/2014 10:42	road centre line	85.636	-0.003	0.3	
wildflower9	460419.407	5034328.154	85.23	0.010	0.015	10/9/2014 10:44	road centre line	85.261	-0.028	2.8	
wildflower10	460407.683	5034354.510	84.69	0.010	0.015	10/9/2014 10:45	road centre line	84.663	0.026	2.6	
epinettes1	460414.536	5034376.530	84.82	0.009	0.014	10/9/2014 10:46	sidewalk	84.888	-0.068	6.8	
epinettes2	460440.075	5034387.897	84.74	0.011	0.016	10/9/2014 10:47	sidewalk	84.770	-0.028	2.8	
epinettes3	460464.206	5034398.656	84.20	0.009	0.014	10/9/2014 10:47	sidewalk	84.206	-0.008	0.8	
epinettes4	460488.297	5034409.499	83.00	0.013	0.020	10/9/2014 10:48	sidewalk	82.985	0.011	1.1	
epinettes5	460513.902	5034421.031	81.89	0.013	0.019	10/9/2014 10:48	sidewalk	81.870	0.017	1.7	
epinettes6	460522.435	5034445.370	81.65	0.012	0.019	10/9/2014 10:49	sidewalk	81.652	-0.004	0.4	
epinettes7	460538.130	5034452.449	81.11	0.011	0.017	10/9/2014 10:49	sidewalk	81.099	0.011	1.1	
epinettes8	460554.114	5034459.566	81.56	0.013	0.020	10/9/2014 10:50	sidewalk	81.572	-0.013	1.3	
epinettes9	460570.094	5034466.703	82.06	0.011	0.017	10/9/2014 10:50	sidewalk	82.062	-0.007	0.7	
epinettes10	460586.686	5034474.160	82.78	0.011	0.018	10/9/2014 10:51	sidewalk	82.753	0.029	2.9	
epinettes11	460622.329	5034489.275	84.54	0.011	0.018	10/9/2014 10:52	road centre line	84.519	0.024	2.4	
epinettes12	460615.993	5034466.875	83.82	0.011	0.017	10/9/2014 10:52	sidewalk	83.812	0.008	0.8	
epinettes13	460600.036	5034459.721	82.95	0.012	0.017	10/9/2014 10:53	sidewalk	82.955	-0.006	0.6	
epinettes14	460576.494	5034448.930	81.88	0.010	0.016	10/9/2014 10:53	sidewalk	81.904	-0.022	2.2	
epinettes15	460553.926	5034437.837	81.47	0.011	0.017	10/9/2014 10:54	sidewalk	81.456	0.013	1.3	
silverbark1	460113.273	5034689.515	85.51	0.008	0.013	10/9/2014 11:04	road centre line	85.513	-0.001	0.1	
silverbark2	460101.924	5034684.282	85.40	0.008	0.013	10/9/2014 11:04	road centre line	85.414	-0.016	1.6	
silverbark3	460100.530	5034672.599	85.41	0.008	0.014	10/9/2014 11:04	road centre line	85.433	-0.025	2.5	
silverbark4	460119.657	5034676.844	85.46	0.008	0.014	10/9/2014 11:05	road centre line	85.476	-0.013	1.3	
silverbark5	460134.573	5034651.350	85.25	0.009	0.015	10/9/2014 11:05	road centre line	85.254	-0.007	0.7	
turnberry1	460147.675	5034656.512	85.18	0.011	0.016	10/9/2014 11:06	road centre line	85.157	0.022	2.2	

Table C.1 Field verification of LIDAR data (spot heights)

	RVCA Field Survey (October 9, 2014)							Nearest Lidar Point	Comparison		
Location ID	X (m)	Y (m)	Z (m)	Horizontal Accuracy (m)	Veritcal Accuracy (m)	Date/Time	Field Observations	Z (m)	△z (m)	|△z| (cm)	|△z| > 0.33m
turnberry2	460165.214	5034663.271	85.40	0.011	0.017	10/9/2014 11:07	road centre line	85.400	0.001	0.1	
turnberry3	460182.863	5034670.018	85.56	0.011	0.020	10/9/2014 11:07	road centre line	85.517	0.039	3.9	
turnberry4	460200.025	5034676.456	85.46	0.010	0.017	10/9/2014 11:07	road centre line	85.498	-0.043	4.3	
turnberry5	460218.279	5034678.257	85.48	0.012	0.020	10/9/2014 11:08	road centre line	85.370	0.110	11.0	
silvertree1	459877.753	5034796.005	85.95	0.008	0.016	10/9/2014 11:19	road centre line	85.948	0.000	0.0	
silvertree2	459877.899	5034777.066	86.10	0.009	0.016	10/9/2014 11:19	road centre line	86.123	-0.019	1.9	
silvertree3	459891.167	5034778.786	86.00	0.008	0.016	10/9/2014 11:20	road centre line	86.005	-0.004	0.4	
silvertree4	459893.824	5034789.160	86.01	0.009	0.017	10/9/2014 11:20	road centre line	86.016	-0.011	1.1	
silvertree5	459883.285	5034786.054	86.08	0.011	0.020	10/9/2014 11:21	road centre line	86.100	-0.017	1.7	
silvertree6	459870.931	5034690.271	85.87	0.009	0.016	10/9/2014 11:24	road centre line	85.862	0.004	0.4	
silvertree7	459882.586	5034684.419	85.88	0.010	0.020	10/9/2014 11:24	road centre line	85.878	-0.001	0.1	
silvertree8	459888.981	5034699.052	85.72	0.010	0.020	10/9/2014 11:25	road centre line	85.732	-0.008	0.8	
silvertree9	459880.252	5034694.847	85.98	0.010	0.020	10/9/2014 11:25	road centre line	85.994	-0.015	1.5	
silvertree10	459866.376	5034722.252	86.09	0.010	0.020	10/9/2014 11:26	road centre line	86.081	0.006	0.6	
larkhaven1	459526.448	5035084.969	86.55	0.011	0.020	10/9/2014 11:33	road centre line	86.567	-0.016	1.6	
larkhaven2	459541.127	5035099.847	86.58	0.011	0.019	10/9/2014 11:34	road centre line	86.591	-0.014	1.4	
larkhaven3	459557.523	5035113.614	86.71	0.011	0.020	10/9/2014 11:35	road centre line	86.689	0.019	1.9	
larkhaven4	459573.996	5035127.625	86.56	0.011	0.020	10/9/2014 11:35	road centre line	86.554	0.007	0.7	
larkhaven5	459598.404	5035143.934	86.38	0.010	0.019	10/9/2014 11:36	road centre line	86.317	0.061	6.1	
larkhaven6	459611.130	5035130.934	86.27	0.011	0.020	10/9/2014 11:37	road centre line	86.212	0.054	5.4	
larkhaven7	459628.576	5035111.534	86.16	0.011	0.020	10/9/2014 11:37	road centre line	86.171	-0.012	1.2	
larkhaven8	459646.934	5035097.981	86.30	0.011	0.020	10/9/2014 11:38	road centre line	86.285	0.016	1.6	
larkhaven9	459665.700	5035084.658	86.18	0.011	0.020	10/9/2014 11:39	road centre line	86.174	0.002	0.2	
larkhaven10	459681.220	5035055.827	86.02	0.010	0.018	10/9/2014 11:39	road centre line	85.941	0.083	8.3	
brook pl1	460573.601	5034734.965	86.37	0.008	0.013	10/9/2014 12:12	road centre line	86.350	0.019	1.9	
brook pl2	460561.672	5034727.733	86.49	0.008	0.013	10/9/2014 12:12	road centre line	86.476	0.014	1.4	
brook pl3	460561.823	5034743.700	86.39	0.008	0.014	10/9/2014 12:13	road centre line	86.399	-0.009	0.9	
brook pl4	460554.975	5034739.101	86.42	0.008	0.013	10/9/2014 12:13	road centre line	86.361	0.056	5.6	
brook pl5	460521.451	5034746.925	86.03	0.009	0.013	10/9/2014 12:14	road centre line	86.000	0.032	3.2	
marcoux1	460428.949	5034989.952	85.65	0.015	0.017	10/9/2014 12:19	bicycle path	85.626	0.027	2.7	
marcoux2	460445.946	5034997.095	85.67	0.013	0.018	10/9/2014 12:19	bicycle path	85.662	0.006	0.6	
marcoux3	460458.734	5035002.340	85.60	0.013	0.020	10/9/2014 12:20	bicycle path	85.554	0.049	4.9	
marcoux4	460489.529	5035012.512	85.90	0.011	0.016	10/9/2014 12:20	bicycle path	85.879	0.023	2.3	
marcoux5	460509.435	5035001.865	85.97	0.012	0.019	10/9/2014 12:21	bicycle path	85.971	0.001	0.1	
marcoux6	460533.568	5034981.446	86.12	0.010	0.015	10/9/2014 12:21	road centre line	86.088	0.036	3.6	
marcoux7	460525.138	5034966.906	86.04	0.012	0.020	10/9/2014 12:22	road centre line	86.059	-0.019	1.9	
marcoux8	460518.950	5034950.346	86.15	0.012	0.020	10/9/2014 12:23	road centre line	86.168	-0.018	1.8	
marcoux9	460515.163	5034932.975	86.26	0.012	0.020	10/9/2014 12:23	road centre line	86.214	0.042	4.2	
marcoux10	460506.364	5034874.240	86.13	0.011	0.020	10/9/2014 12:25	road centre line	86.126	0.001	0.1	
missyabit1	460238.267	5034941.502	85.46	0.009	0.013	10/9/2014 12:33	road centre line	85.449	0.014	1.4	
missyabit2	460207.240	5034958.844	85.72	0.009	0.017	10/9/2014 12:33	road centre line	85.709	0.009	0.9	
missyabit3	460202.410	5034974.557	85.86	0.011	0.020	10/9/2014 12:34	road centre line	85.838	0.018	1.8	
missyabit4	460193.830	5035002.597	86.00	0.011	0.019	10/9/2014 12:35	road centre line	86.000	0.004	0.4	
missyabit5	460188.999	5035018.540	85.90	0.010	0.020	10/9/2014 12:36	road centre line	85.861	0.039	3.9	
missyabit6	460183.126	5035037.650	85.75	0.011	0.020	10/9/2014 12:37	road centre line	85.720	0.028	2.8	
missyabit7	460173.188	5035069.608	85.92	0.010	0.019	10/9/2014 12:38	road centre line	85.851	0.067	6.7	

Table C.1 Field verification of LIDAR data (spot heights)

	RVCA Field Survey (October 9, 2014)							Nearest Lidar Point	Comparison		
Location ID	X (m)	Y (m)	Z (m)	Horizontal Accuracy (m)	Veritcal Accuracy (m)	Date/Time	Field Observations	Z (m)	△z (m)	|△z| (cm)	|△z| > 0.33m
missyabit8	460168.337	5035086.071	86.03	0.011	0.018	10/9/2014 12:38	road centre line	85.983	0.046	4.6	
missyabit9	460172.465	5035102.706	86.11	0.010	0.020	10/9/2014 12:38	road centre line	86.050	0.063	6.3	
missyabit10	460184.532	5035111.675	86.22	0.010	0.020	10/9/2014 12:39	road centre line	86.150	0.070	7.0	
st-joseph1	459137.372	5035536.393	66.18	0.012	0.020	10/9/2014 12:55	sidewalk	66.179	-0.003	0.3	
st-joseph2	459164.947	5035529.054	66.28	0.012	0.020	10/9/2014 12:56	sidewalk	66.332	-0.057	5.7	
st-joseph3	459179.621	5035545.021	66.00	0.012	0.020	10/9/2014 12:57	sidewalk	65.969	0.033	3.3	
st-joseph4	459192.042	5035558.501	65.70	0.012	0.020	10/9/2014 12:58	sidewalk	65.772	-0.068	6.8	
st-joseph5	459203.545	5035569.395	65.84	0.012	0.019	10/9/2014 12:58	sidewalk	65.838	-0.002	0.2	
st-joseph6	459216.878	5035581.801	66.00	0.012	0.020	10/9/2014 12:58	sidewalk	65.979	0.018	1.8	
st-joseph7	459225.822	5035589.963	66.13	0.012	0.019	10/9/2014 12:59	sidewalk	66.137	-0.011	1.1	
st-joseph8	459233.665	5035596.884	66.35	0.012	0.019	10/9/2014 12:59	sidewalk	66.385	-0.038	3.8	
st-joseph9	459243.482	5035605.478	66.57	0.012	0.018	10/9/2014 13:00	sidewalk	66.619	-0.048	4.8	
st-joseph10	459257.427	5035617.088	66.91	0.012	0.019	10/9/2014 13:00	sidewalk	66.984	-0.073	7.3	
st-joseph11	459259.090	5035590.710	66.93	0.012	0.020	10/9/2014 13:01	parking lot	66.882	0.044	4.4	
st-joseph12	459263.702	5035584.454	66.77	0.012	0.019	10/9/2014 13:02	parking lot	66.766	-0.001	0.1	
st-joseph13	459268.341	5035578.182	66.75	0.012	0.018	10/9/2014 13:02	parking lot	66.762	-0.017	1.7	
st-joseph14	459272.883	5035571.956	66.78	0.012	0.019	10/9/2014 13:02	parking lot	66.782	-0.003	0.3	
st-joseph15	459275.945	5035567.781	66.88	0.012	0.019	10/9/2014 13:02	parking lot	66.872	0.004	0.4	
sugar creek1	458308.201	5036072.437	55.09	0.013	0.019	10/9/2014 13:19	road centre line	55.072	0.014	1.4	
sugar creek2	458302.937	5036060.326	54.99	0.012	0.018	10/9/2014 13:19	road centre line	54.977	0.011	1.1	
sugar creek3	458310.394	5036062.978	55.10	0.014	0.019	10/9/2014 13:19	road centre line	55.099	-0.002	0.2	
sugar creek4	458318.697	5036053.131	54.89	0.013	0.017	10/9/2014 13:20	road centre line	54.863	0.031	3.1	
sugar creek5	458318.996	5036066.491	55.03	0.013	0.018	10/9/2014 13:20	road centre line	55.021	0.011	1.1	
sugar creek6	458605.665	5035995.860	56.60	0.010	0.013	10/9/2014 13:23	road centre line	56.521	0.078	7.8	
sugar creek7	458608.197	5036006.876	56.62	0.011	0.015	10/9/2014 13:23	road centre line	56.604	0.014	1.4	
sugar creek8	458597.708	5036014.377	56.57	0.011	0.015	10/9/2014 13:24	road centre line	56.581	-0.009	0.9	
sugar creek9	458597.719	5036004.742	56.71	0.012	0.017	10/9/2014 13:24	road centre line	56.709	0.003	0.3	
sugar creek10	458590.416	5036004.841	56.51	0.011	0.015	10/9/2014 13:24	road centre line	56.493	0.012	1.2	
sugar creek11	458586.385	5035991.417	56.47	0.013	0.018	10/9/2014 13:25	road centre line	56.470	0.003	0.3	
sugar creek12	458572.461	5035986.352	56.38	0.013	0.017	10/9/2014 13:25	road centre line	56.342	0.034	3.4	
sugar creek13	458546.885	5035980.579	56.24	0.013	0.017	10/9/2014 13:25	road centre line	56.205	0.034	3.4	
sugar creek14	458525.558	5035987.219	56.01	0.012	0.017	10/9/2014 13:26	road centre line	56.008	0.003	0.3	
sugar creek15	458511.998	5035993.772	55.96	0.013	0.018	10/9/2014 13:26	road centre line	55.990	-0.035	3.5	
orleans1	457796.340	5036492.503	50.84	0.008	0.011	10/9/2014 13:32	sidewalk	50.827	0.010	1.0	
orleans2	457777.127	5036508.730	50.86	0.009	0.012	10/9/2014 13:32	sidewalk	50.851	0.007	0.7	
orleans3	457759.876	5036523.334	51.08	0.012	0.016	10/9/2014 13:33	sidewalk	51.123	-0.042	4.2	
orleans4	457743.813	5036536.770	51.28	0.012	0.016	10/9/2014 13:33	sidewalk	51.314	-0.034	3.4	
orleans5	457726.470	5036551.489	51.19	0.012	0.016	10/9/2014 13:33	sidewalk	51.218	-0.031	3.1	
milwood1	458247.864	5036178.465	53.60	0.009	0.014	10/9/2014 13:39	road centre line	53.612	-0.013	1.3	
milwood2	458256.054	5036167.200	53.68	0.009	0.014	10/9/2014 13:39	road centre line	53.685	-0.008	0.8	
milwood3	458271.199	5036137.428	53.85	0.010	0.014	10/9/2014 13:40	road centre line	53.845	0.007	0.7	
milwood4	458258.716	5036128.265	53.95	0.010	0.014	10/9/2014 13:40	road centre line	53.913	0.040	4.0	
milwood5	458289.603	5036119.504	53.87	0.012	0.015	10/9/2014 13:41	road centre line	53.860	0.012	1.2	
jeanne-darc	458158.902	5036350.865	50.77	0.008	0.011	10/9/2014 13:44	sidewalk	50.785	-0.011	1.1	
jeanne-dard	458174.856	5036360.382	50.35	0.008	0.011	10/9/2014 13:45	sidewalk	50.421	-0.075	7.5	
jeanne-dare	458189.695	5036369.449	50.22	0.008	0.013	10/9/2014 13:45	sidewalk	50.216	0.004	0.4	

Table C.1 Field verification of LIDAR data (spot heights)

	RVCA Field Survey (October 9, 2014)							Nearest Lidar Point	Comparison		
Location ID	X (m)	Y (m)	Z (m)	Horizontal Accuracy (m)	Veritcal Accuracy (m)	Date/Time	Field Observations	Z (m)	△z (m)	|△z| (cm)	|△z| > 0.33m
jeanne-darf	458204.092	5036378.381	49.95	0.009	0.012	10/9/2014 13:45	sidewalk	49.993	-0.045	4.5	
jeanne-dar5	458217.838	5036387.399	50.06	0.010	0.015	10/9/2014 13:46	sidewalk	50.016	0.042	4.2	
jeanne-dar6	458232.729	5036397.673	50.39	0.009	0.013	10/9/2014 13:46	sidewalk	50.389	-0.001	0.1	
jeanne-dar7	458243.343	5036405.051	50.64	0.009	0.014	10/9/2014 13:47	sidewalk	50.666	-0.028	2.8	
jeanne-dar8	458260.446	5036416.954	50.95	0.010	0.014	10/9/2014 13:47	sidewalk	50.956	-0.003	0.3	
jeanne-dar9	458269.864	5036423.480	51.14	0.013	0.020	10/9/2014 13:47	sidewalk	51.144	-0.008	0.8	
jeanne-dar10	458280.409	5036430.716	51.34	0.009	0.014	10/9/2014 13:48	sidewalk	51.375	-0.032	3.2	
bilberry1	458307.985	5037001.488	45.62	0.008	0.012	10/9/2014 13:51	road centre line	45.646	-0.027	2.7	
bilberry2	458304.543	5037013.370	45.27	0.009	0.015	10/9/2014 13:51	road centre line	45.264	0.010	1.0	
bilberry3	458292.487	5037015.908	45.00	0.011	0.016	10/9/2014 13:52	road centre line	44.999	0.000	0.0	
bilberry4	458297.964	5037007.919	45.42	0.011	0.016	10/9/2014 13:52	road centre line	45.437	-0.019	1.9	
bilberry5	458303.100	5036995.927	45.73	0.012	0.018	10/9/2014 13:52	road centre line	45.745	-0.018	1.8	
bilberry6	458289.765	5037006.331	45.27	0.013	0.018	10/9/2014 13:53	road centre line	45.276	-0.004	0.4	
bilberry7	458276.977	5037002.964	45.54	0.012	0.018	10/9/2014 13:53	parking lot	45.545	-0.003	0.3	
bilberry8	458261.129	5036998.176	45.06	0.013	0.019	10/9/2014 13:53	parking lot	45.087	-0.032	3.2	
bilberry9	458247.575	5036993.964	44.75	0.012	0.018	10/9/2014 13:54	parking lot	44.791	-0.046	4.6	
bilberry10	458235.667	5036990.619	44.59	0.013	0.020	10/9/2014 13:54	parking lot	44.541	0.050	5.0	
bilberry11	458239.284	5036977.362	45.03	0.014	0.020	10/9/2014 13:55	parking lot	45.005	0.027	2.7	
bilberry12	458242.707	5036967.605	45.39	0.013	0.018	10/9/2014 13:55	parking lot	45.454	-0.064	6.4	
bilberry13	458247.716	5036952.493	45.88	0.013	0.020	10/9/2014 13:55	parking lot	45.880	-0.005	0.5	
bilberry14	458243.282	5036938.176	46.43	0.012	0.019	10/9/2014 13:56	parking lot	46.477	-0.044	4.4	
bilberry15	458236.642	5036926.915	46.62	0.012	0.020	10/9/2014 13:56	parking lot	46.623	-0.001	0.1	
bilberry16	458229.964	5036915.947	46.67	0.013	0.020	10/9/2014 13:57	parking lot	46.663	0.005	0.5	
bilberry17	458224.534	5036894.476	46.53	0.013	0.020	10/9/2014 13:58	parking lot	46.496	0.029	2.9	
bilberry18	458221.583	5036879.487	46.63	0.013	0.019	10/9/2014 13:58	parking lot	46.638	-0.009	0.9	
bilberry19	458219.546	5036866.515	47.14	0.013	0.019	10/9/2014 13:59	parking lot	47.142	0.002	0.2	
bilberry20	458213.676	5036855.782	47.41	0.013	0.020	10/9/2014 13:59	parking lot	47.424	-0.011	1.1	
bilberry21	458240.731	5036586.424	51.28	0.012	0.019	10/9/2014 14:02	parking lot	51.282	-0.004	0.4	
bilberry22	458237.476	5036578.564	51.31	0.013	0.020	10/9/2014 14:02	parking lot	51.310	-0.003	0.3	
bilberry23	458228.327	5036583.208	51.02	0.011	0.017	10/9/2014 14:03	parking lot	51.031	-0.012	1.2	
bilberry24	458220.446	5036593.147	50.74	0.013	0.020	10/9/2014 14:03	parking lot	50.755	-0.016	1.6	
bilberry25	458217.060	5036600.957	50.53	0.013	0.020	10/9/2014 14:05	parking lot	50.532	-0.006	0.6	
bilberry26	458211.963	5036613.461	50.22	0.013	0.019	10/9/2014 14:06	parking lot	50.278	-0.061	6.1	
bilberry27	458207.211	5036624.814	50.03	0.013	0.020	10/9/2014 14:07	parking lot	50.063	-0.031	3.1	
bilberry28	458204.555	5036637.728	49.77	0.010	0.016	10/9/2014 14:07	parking lot	49.770	-0.002	0.2	
bilberry29	458204.597	5036648.256	49.32	0.012	0.018	10/9/2014 14:07	parking lot	49.345	-0.030	3.0	
bilberry30	458204.563	5036661.329	48.94	0.011	0.016	10/9/2014 14:08	parking lot	48.945	-0.005	0.5	

Mean △z :	2.3	0 Yes out of 175
Median△z :	1.6	
Max △z :	11.0	
Min △z :	0.0	

Appendix D

SWMHYMO Model Files

```
2     Metric units
*#*************************************************************************
*#  Project Name: [Bilberry Creek FPM Study] Project Number:[M800_200_030_209]
*#  Date        : 05-12-2017
*#  Modeller    : [AA, TB, SN]
*#  Company     : Rideau Valley Conservation Authority
*#  License #   :  5329846
*#*************************************************************************
*%100 Year 3 Hour Chicago Design Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[3]
*%                   ["100YC3H.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------|
READ STORM          STORM_FILENAME=["storm.001"]
*%-----------------|-------------------------------------------------------|
DEFAULT VALUES      ICASEdef=[1],  read and print values
                    DEFVAL_FILENAME=["BilVal.val"]
*%-----------------|-------------------------------------------------------|
*# Upstream Tributary
CALIB STANDHYD      ID=[1], NHYD=["UT1"], DT=[1]min, AREA=[93.87](ha),
                    XIMP=[0.3483], TIMP=[0.4354], DWF=[0](cms),  LOSS=[2],
                    SCS curve number CN=[86.2],
                    Pervious Surfaces:   IAper=[4.67](mm), SLPP=[2](%)
                                         LGP=[90](m), MNP=[0.25], SCP=[0](min),
                    Impervious Surfaces: IAimp=[1.57](mm), SLPI=[0.5](%),
                                         LGI=[791.1](m), MNI=[0.045], SCI=[0](min),
                    RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|-------------------------------------------------------|
SAVE HYD            ID=[1],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Runoff Hydrograph for UT1"]
*%-----------------|-------------------------------------------------------|
ROUTE CHANNEL       IDout=[2], NHYD=["C9"], IDin=[1],
                    RDT=[1](min),
                    CHLGTH=[860](m),  CHSLOPE=[1.26](%),
                                      FPSLOPE=[1.26](%),
                    SECNUM=[46.9425],       NSEG=[3]
                    (SEGROUGH,SEGDIST(m))=[0.08, 23.54] NSEG times
                                           -0.035, 34.85
                                           0.08, 56.09
                    ( DISTANCE (m), ELEVATION (m))=[0.00, 85.86]
                                                   9.68, 84.35
                                                   17.77, 82.09
                                                   23.54, 79.75
                                                   24.88, 78.89
                                                   32.45, 79.22
                                                   34.85, 79.93
                                                   47.44, 84.67
                                                   51.96, 85.96
                                                   56.09, 86.48
*%-----------------|-------------------------------------------------------|
SAVE HYD            ID=[2],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Routing Hydrograph for C9"]
*%-----------------|-------------------------------------------------------|
CALIB STANDHYD      ID=[3], NHYD=["UT2"], DT=[1]min, AREA=[32.73](ha),
                    XIMP=[0.2350], TIMP=[0.2937], DWF=[0](cms),  LOSS=[2],
                    SCS curve number CN=[80.9],
                    Pervious Surfaces:   IAper=[4.67](mm), SLPP=[2](%)
                                         LGP=[90](m), MNP=[0.25], SCP=[0](min),
                    Impervious Surfaces: IAimp=[1.57](mm), SLPI=[0.5](%),
                                         LGI=[467.1](m), MNI=[0.045], SCI=[0](min),
                    RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|-------------------------------------------------------|
SAVE HYD            ID=[3],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Runoff Hydrograph for UT2"]
*%-----------------|-------------------------------------------------------|
ADD HYD             IDsum=[4], NHYD=["D9"], IDs to add=[2 + 3]
*%-----------------|-------------------------------------------------------|
SAVE HYD            ID=[4],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Downstream Hydrograph for C9"]
*%-----------------|-------------------------------------------------------|
*# Downstream Tributary
CALIB STANDHYD      ID=[1], NHYD=["DT1"], DT=[1]min, AREA=[247.46](ha),
                    XIMP=[0.3288], TIMP=[0.4110], DWF=[0](cms),  LOSS=[2],
                    SCS curve number CN=[76.1],
                    Pervious Surfaces:   IAper=[4.67](mm), SLPP=[2](%)
                                         LGP=[90](m), MNP=[0.25], SCP=[0](min),
```

```
                    Impervious Surfaces: IAimp=[1.57](mm), SLPI=[0.5](%),
                                         LGI=[1284.4](m), MNI=[0.045], SCI=[0](min),
                    RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|-----------------------------------------------------------|
SAVE HYD            ID=[1],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Runoff Hydrograph for DT1"]
*%-----------------|-----------------------------------------------------------|
ROUTE CHANNEL       IDout=[2], NHYD=["C10"], IDin=[1],
                    RDT=[1](min),
                    CHLGTH=[460](m),  CHSLOPE=[0.80](%),
                                       FPSLOPE=[0.80](%),
                    SECNUM=[1002.48],       NSEG=[3]
                    ( SEGROUGH, SEGDIST (m))=[0.08, 12.76] NSEG times
                                             -0.035, 23.12
                                             0.08, 34.25
                    ( DISTANCE (m), ELEVATION (m))=[0.00, 51.17]
                                                   2.42, 49.85
                                                   6.86, 48.94
                                                   12.76, 48.72
                                                   15.22, 48.56
                                                   17.49, 47.70
                                                   21.56, 47.71
                                                   23.12, 48.78
                                                   27.20, 49.55
                                                   34.25, 50.52
*%-----------------|-----------------------------------------------------------|
SAVE HYD            ID=[2],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Routing Hydrograph for C10"]
*%-----------------|-----------------------------------------------------------|
CALIB STANDHYD      ID=[3], NHYD=["DT2"], DT=[1]min, AREA=[20.34](ha),
                    XIMP=[0.2599], TIMP=[0.3249], DWF=[0](cms),  LOSS=[2],
                    SCS curve number CN=[77.7],
                    Pervious Surfaces:   IAper=[4.67](mm), SLPP=[2](%)
                                         LGP=[90](m), MNP=[0.25], SCP=[0](min),
                    Impervious Surfaces: IAimp=[1.57](mm), SLPI=[0.5](%),
                                         LGI=[368.3](m), MNI=[0.045], SCI=[0](min),
                    RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|-----------------------------------------------------------|
SAVE HYD            ID=[3],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Runoff Hydrograph for DT2"]
*%-----------------|-----------------------------------------------------------|
ADD HYD             IDsum=[5], NHYD=["J11"], IDs to add=[2 + 3]
*%-----------------|-----------------------------------------------------------|
SAVE HYD            ID=[5],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Hydrograph for J11"]
*%-----------------|-----------------------------------------------------------|
ROUTE CHANNEL       IDout=[1], NHYD=["C11"], IDin=[5],
                    RDT=[1](min),
                    CHLGTH=[690](m),  CHSLOPE=[1.47](%),
                                       FPSLOPE=[1.47](%),
                    SECNUM=[220.3747],       NSEG=[3]
                    ( SEGROUGH, SEGDIST (m))=[0.08, 24.15] NSEG times
                                             -0.035, 33.21
                                             0.08, 50.36
                    ( DISTANCE (m), ELEVATION (m))=[0.00, 48.62]
                                                   7.78, 46.39
                                                   11.02, 44.64
                                                   24.15, 45.00
                                                   25.57, 44.85
                                                   28.66, 44.04
                                                   33.21, 44.98
                                                   38.59, 45.53
                                                   42.25, 46.48
                                                   50.36, 50.19
*%-----------------|-----------------------------------------------------------|
SAVE HYD            ID=[1],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Routing Hydrograph for C11"]

*%-----------------|-----------------------------------------------------------|
CALIB STANDHYD      ID=[2], NHYD=["DT3"], DT=[1]min, AREA=[12.63](ha),
                    XIMP=[0.3777], TIMP=[0.4721], DWF=[0](cms),  LOSS=[2],
                    SCS curve number CN=[87.4],
                    Pervious Surfaces:   IAper=[4.67](mm), SLPP=[2](%)
                                         LGP=[90](m), MNP=[0.25], SCP=[0](min),
                    Impervious Surfaces: IAimp=[1.57](mm), SLPI=[0.5](%),
```

```
                                    LGI=[290.2](m), MNI=[0.045], SCI=[0](min),
                    RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|-------------------------------------------------------|
SAVE HYD            ID=[2],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Runoff Hydrograph for DT3"]
*%-----------------|-------------------------------------------------------|
CALIB STANDHYD      ID=[7], NHYD=["DT4"], DT=[1]min, AREA=[70.81](ha),
                    XIMP=[0.3060], TIMP=[0.3825], DWF=[0](cms),  LOSS=[2],
                    SCS curve number CN=[82.6],
                    Pervious Surfaces:   IAper=[4.67](mm), SLPP=[2](%)
                                         LGP=[90](m), MNP=[0.25], SCP=[0](min),
                    Impervious Surfaces: IAimp=[1.57](mm), SLPI=[0.5](%),
                                         LGI=[687.1](m), MNI=[0.045], SCI=[0](min),
                    RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|-------------------------------------------------------|
SAVE HYD            ID=[7],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Runoff Hydrograph for DT4"]
*%-----------------|-------------------------------------------------------|
ADD HYD             IDsum=[5], NHYD=["D11"], IDs to add=[1 + 2]
*%-----------------|-------------------------------------------------------|
SAVE HYD            ID=[5],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Downstream Hydrograph for C11"]
*%-----------------|-------------------------------------------------------|
*# Main Channel
CALIB STANDHYD      ID=[1], NHYD=["M1"], DT=[1]min, AREA=[64.39](ha),
                    XIMP=[0.3227], TIMP=[0.4034], DWF=[0](cms),  LOSS=[2],
                    SCS curve number CN=[82.3],
                    Pervious Surfaces:   IAper=[4.67](mm), SLPP=[2](%)
                                         LGP=[90](m), MNP=[0.25], SCP=[0](min),
                    Impervious Surfaces: IAimp=[1.57](mm), SLPI=[0.5](%),
                                         LGI=[655.2](m), MNI=[0.045], SCI=[0](min),
                    RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|-------------------------------------------------------|
SAVE HYD            ID=[1],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Runoff Hydrograph for M1"]
*%-----------------|-------------------------------------------------------|
ROUTE CHANNEL       IDout=[2], NHYD=["C1"], IDin=[1],
                    RDT=[1](min),
                    CHLGTH=[510](m),  CHSLOPE=[1.95](%),
                                    FPSLOPE=[1.95](%),
                    SECNUM=[6120.75],       NSEG=[3]
                    ( SEGROUGH, SEGDIST (m))=[0.08, 31.11] NSEG times
                                              -0.035, 42.89
                                              0.08, 72.17
                    ( DISTANCE (m), ELEVATION (m))=[0.00, 85.08]
                                                   12.51, 84.20
                                                   31.11, 79.24
                                                   36.54, 77.15
                                                   42.89, 79.06
                                                   44.99, 79.05
                                                   52.14, 81.08
                                                   60.27, 84.79
                                                   67.46, 85.44
                                                   72.17, 85.43
*%-----------------|-------------------------------------------------------|
SAVE HYD            ID=[2],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Routing Hydrograph for C1"]
*%-----------------|-------------------------------------------------------|
CALIB STANDHYD      ID=[3], NHYD=["M2"], DT=[1]min, AREA=[26.14](ha),
                    XIMP=[0.3220], TIMP=[0.4025], DWF=[0](cms),  LOSS=[2],
                    SCS curve number CN=[80.8],
                    Pervious Surfaces:   IAper=[4.67](mm), SLPP=[2](%)
                                         LGP=[90](m), MNP=[0.25], SCP=[0](min),
                    Impervious Surfaces: IAimp=[1.57](mm), SLPI=[0.5](%),
                                         LGI=[417.5](m), MNI=[0.045], SCI=[0](min),
                    RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|-------------------------------------------------------|
SAVE HYD            ID=[3],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Runoff Hydrograph for M2"]
*%-----------------|-------------------------------------------------------|
ADD HYD             IDsum=[6], NHYD=["D1"], IDs to add=[2 + 3]
*%-----------------|-------------------------------------------------------|
SAVE HYD            ID=[6],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Downstream Hydrograph for C1"]
*%-----------------|-------------------------------------------------------|
```

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ADD HYD             IDsum=[1], NHYD=["J2"], IDs to add=[4 + 6]
*%-----------------|-----------------------------------------------------------|
SAVE HYD            ID=[1],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Hydrograph for J2"]
*%-----------------|-----------------------------------------------------------|
ROUTE CHANNEL       IDout=[2], NHYD=["C2"], IDin=[1],
                    RDT=[1](min),
                    CHLGTH=[770](m),  CHSLOPE=[2.03](%),
                                        FPSLOPE=[2.03](%),
                    SECNUM=[5405.816],       NSEG=[3]
                    ( SEGROUGH, SEGDIST (m))=[0.08, 32.22] NSEG times
                                             -0.035, 46.85
                                             0.08, 78.24
                    ( DISTANCE (m), ELEVATION (m))=[0.00, 80.94]
                                                   7.29, 77.42
                                                   16.82, 76.05
                                                   26.87, 72.49
                                                   32.22, 71.19
                                                   35.38, 68.98
                                                   40.58, 67.84
                                                   46.85, 71.20
                                                   66.35, 76.99
                                                   78.24, 81.50
*%-----------------|-----------------------------------------------------------|
SAVE HYD            ID=[2],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Routing Hydrograph for C2"]
*%-----------------|-----------------------------------------------------------|
CALIB STANDHYD      ID=[3], NHYD=["M3"], DT=[1]min, AREA=[212.90](ha),
                    XIMP=[0.3109], TIMP=[0.3887], DWF=[0](cms),  LOSS=[2],
                    SCS curve number CN=[84.2],
                    Pervious Surfaces:   IAper=[4.67](mm), SLPP=[2](%)
                                         LGP=[90](m), MNP=[0.25], SCP=[0](min),
                    Impervious Surfaces: IAimp=[1.57](mm), SLPI=[0.5](%),
                                         LGI=[1191.3](m), MNI=[0.045], SCI=[0](min),
                    RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|-----------------------------------------------------------|
SAVE HYD            ID=[3],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Runoff Hydrograph for M3"]
*%-----------------|-----------------------------------------------------------|
ADD HYD             IDsum=[1], NHYD=["J3"], IDs to add=[2 + 3]
*%-----------------|-----------------------------------------------------------|
SAVE HYD            ID=[1],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Hydrograph for J3"]
*%-----------------|-----------------------------------------------------------|
ROUTE CHANNEL       IDout=[2], NHYD=["C3"], IDin=[1],
                    RDT=[1](min),
                    CHLGTH=[450](m),  CHSLOPE=[1.19](%),
                                        FPSLOPE=[1.19](%),
                    SECNUM=[4051.275],       NSEG=[3]
                    ( SEGROUGH, SEGDIST (m))=[0.08, 33.43] NSEG times
                                             -0.035, 49.63
                                             0.08, 69.85
                    ( DISTANCE (m), ELEVATION (m))=[0.00, 75.31]
                                                   15.14, 71.37
                                                   16.29, 69.83
                                                   24.01, 67.9
                                                   33.43, 64.93
                                                   38.51, 62.51
                                                   42.41, 62.71
                                                   49.63, 65.58
                                                   63.80, 71.84
                                                   69.85, 72.31
*%-----------------|-----------------------------------------------------------|
SAVE HYD            ID=[2],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Routing Hydrograph for C3"]
*%-----------------|-----------------------------------------------------------|
CALIB STANDHYD      ID=[3], NHYD=["M4"], DT=[1]min, AREA=[432.99](ha),
                    XIMP=[0.3387], TIMP=[0.4233], DWF=[0](cms),  LOSS=[2],
                    SCS curve number CN=[84.1],
                    Pervious Surfaces:   IAper=[4.67](mm), SLPP=[2](%)
                                         LGP=[90](m), MNP=[0.25], SCP=[0](min),
                    Impervious Surfaces: IAimp=[1.57](mm), SLPI=[0.5](%),
                                         LGI=[1699](m), MNI=[0.045], SCI=[0](min),
                    RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|-----------------------------------------------------------|
```

```
SAVE HYD            ID=[3],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Runoff Hydrograph for M4A"]
*%-----------------|-----------------------------------------------------------|
ADD HYD             IDsum=[1], NHYD=["J4"], IDs to add=[2 + 3]
*%-----------------|-----------------------------------------------------------|
SAVE HYD            ID=[1],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Hydrograph for J4"]
*%-----------------|-----------------------------------------------------------|
ROUTE CHANNEL       IDout=[2], NHYD=["C4"], IDin=[1],
                    RDT=[1](min),
                    CHLGTH=[850](m),  CHSLOPE=[1.14](%),
                                      FPSLOPE=[1.14](%),
                    SECNUM=[3640.185],       NSEG=[3]
                    ( SEGROUGH, SEGDIST (m))=[0.08, 14.42] NSEG times
                                             -0.035, 31.78
                                             0.08, 68.42
                    ( DISTANCE (m), ELEVATION (m))=[0.00, 65.00]
                                                   6.71, 64.63
                                                   14.42, 62.82
                                                   18.17, 61.63
                                                   20.59, 59.48
                                                   26.03, 58.90
                                                   31.78, 62.52
                                                   36.67, 64.64
                                                   61.96, 66.39
                                                   68.42, 66.43
*%-----------------|-----------------------------------------------------------|
SAVE HYD            ID=[2],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Routing Hydrograph for C4"]
*%-----------------|-----------------------------------------------------------|
CALIB STANDHYD      ID=[3], NHYD=["M5"], DT=[1]min, AREA=[35.47](ha),
                    XIMP=[0.2108], TIMP=[0.2635], DWF=[0](cms),  LOSS=[2],
                    SCS curve number CN=[82.3],
                    Pervious Surfaces:   IAper=[4.67](mm), SLPP=[2](%)
                                         LGP=[90](m), MNP=[0.25], SCP=[0](min),
                    Impervious Surfaces: IAimp=[1.57](mm), SLPI=[0.5](%),
                                         LGI=[486.3](m), MNI=[0.045], SCI=[0](min),
                    RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|-----------------------------------------------------------|
SAVE HYD            ID=[3],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Runoff Hydrograph for M5"]
*%-----------------|-----------------------------------------------------------|
ADD HYD             IDsum=[1], NHYD=["J5"], IDs to add=[2 + 3]
*%-----------------|-----------------------------------------------------------|
SAVE HYD            ID=[1],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Hydrograph for J5"]
*%-----------------|-----------------------------------------------------------|
ROUTE CHANNEL       IDout=[2], NHYD=["C5"], IDin=[1],
                    RDT=[1](min),
                    CHLGTH=[880](m),  CHSLOPE=[1.60](%),
                                      FPSLOPE=[1.60](%),
                    SECNUM=[2138.777],       NSEG=[3]
                    ( SEGROUGH, SEGDIST (m))=[0.08, 40.57] NSEG times
                                             -0.035, 51.39
                                             0.08, 94.02
                    ( DISTANCE (m), ELEVATION (m))=[0.00, 54.51]
                                                   19.50, 50.24
                                                   24.94, 47.89
                                                   40.57, 47.64
                                                   43.88, 46.13
                                                   49.89, 46.34
                                                   51.39, 48.10
                                                   61.10, 48.04
                                                   78.06, 53.72
                                                   94.02, 55.04
*%-----------------|-----------------------------------------------------------|
SAVE HYD            ID=[2],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Routing Hydrograph for C5"]
*%-----------------|-----------------------------------------------------------|
CALIB STANDHYD      ID=[3], NHYD=["M6"], DT=[1]min, AREA=[64.01](ha),
                    XIMP=[0.3662], TIMP=[0.4577], DWF=[0](cms),  LOSS=[2],
                    SCS curve number CN=[92.1],
                    Pervious Surfaces:   IAper=[4.67](mm), SLPP=[2](%)
                                         LGP=[90](m), MNP=[0.25], SCP=[0](min),
                    Impervious Surfaces: IAimp=[1.57](mm), SLPI=[0.5](%),
```

```
                                    LGI=[653.2](m), MNI=[0.045], SCI=[0](min),
                    RAINFALL=[ , , , , ](mm/hr), END=-1
*%------------------|-----------------------------------------------------------|
SAVE HYD            ID=[3],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Runoff Hydrograph for M6"]
*%------------------|-----------------------------------------------------------|
ADD HYD             IDsum=[1], NHYD=["J6"], IDs to add=[2 + 3]
*%------------------|-----------------------------------------------------------|
SAVE HYD            ID=[1],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Hydrograph for J6"]
*%------------------|-----------------------------------------------------------|
ROUTE CHANNEL       IDout=[2], NHYD=["C6"], IDin=[1],
                    RDT=[1](min),
                    CHLGTH=[980](m),  CHSLOPE=[1.49](%),
                                    FPSLOPE=[1.49](%),
                    SECNUM=[1952.314],       NSEG=[3]
                    ( SEGROUGH, SEGDIST (m))=[0.08, 30.07] NSEG times
                                         -0.035, 41.96
                                         0.08, 85.56
                    ( DISTANCE (m), ELEVATION (m))=[0.00, 53.08]
                                              19.67, 47.73
                                              30.07, 47.48
                                              34.53, 45.53
                                              41.96, 46.99
                                              48.54, 47.27
                                              57.75, 49.36
                                              68.66, 50.37
                                              77.84, 52.36
                                              85.56, 53.03
*%------------------|-----------------------------------------------------------|
SAVE HYD            ID=[2],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Routing Hydrograph for C6"]
*%------------------|-----------------------------------------------------------|
CALIB STANDHYD      ID=[3], NHYD=["M7"], DT=[1]min, AREA=[24.39](ha),
                    XIMP=[0.1766], TIMP=[0.2208], DWF=[0](cms),  LOSS=[2],
                    SCS curve number CN=[79.2],
                    Pervious Surfaces:   IAper=[4.67](mm), SLPP=[2](%)
                                         LGP=[90](m), MNP=[0.25], SCP=[0](min),
                    Impervious Surfaces: IAimp=[1.57](mm), SLPI=[0.5](%),
                                         LGI=[403.3](m), MNI=[0.045], SCI=[0](min),
                    RAINFALL=[ , , , , ](mm/hr), END=-1
*%------------------|-----------------------------------------------------------|
SAVE HYD            ID=[3],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Runoff Hydrograph for M7"]
*%------------------|-----------------------------------------------------------|
ADD HYD             IDsum=[1], NHYD=["J7"], IDs to add=[2 + 3]
*%------------------|-----------------------------------------------------------|
SAVE HYD            ID=[1],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Hydrograph for J7"]
*%------------------|-----------------------------------------------------------|
ROUTE CHANNEL       IDout=[2], NHYD=["C7"], IDin=[1],
                    RDT=[1](min),
                    CHLGTH=[530](m),  CHSLOPE=[1.41](%),
                                    FPSLOPE=[1.41](%),
                    SECNUM=[1682.715],       NSEG=[3]
                    ( SEGROUGH, SEGDIST (m))=[0.08, 28.70] NSEG times
                                         -0.035, 38.58
                                         0.08, 68.16
                    ( DISTANCE (m), ELEVATION (m))=[0.00, 51.70]
                                              12.23, 49.33
                                              20.82, 46.56
                                              28.70, 45.53
                                              31.58, 44.50
                                              38.58, 45.99
                                              49.11, 46.34
                                              55.74, 49.24
                                              62.36, 50.63
                                              68.16, 50.91
*%------------------|-----------------------------------------------------------|
SAVE HYD            ID=[2],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Routing Hydrograph for C7"]
*%------------------|-----------------------------------------------------------|
CALIB STANDHYD      ID=[3], NHYD=["M8"], DT=[1]min, AREA=[21.78](ha),
                    XIMP=[0.3839], TIMP=[0.4799], DWF=[0](cms),  LOSS=[2],
                    SCS curve number CN=[84.8],
```

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                    Pervious Surfaces:   IAper=[4.67](mm), SLPP=[2](%)
                                         LGP=[90](m), MNP=[0.25], SCP=[0](min),
                    Impervious Surfaces: IAimp=[1.57](mm), SLPI=[0.5](%),
                                         LGI=[381.1](m), MNI=[0.045], SCI=[0](min),
                    RAINFALL=[ , , , , ](mm/hr), END=-1
*%------------------|-------------------------------------------------------------|
SAVE HYD            ID=[3],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Runoff Hydrograph for M8"]
*%------------------|-------------------------------------------------------------|
ADD HYD             IDsum=[4], NHYD=["D7"], IDs to add=[2 + 3]
*%------------------|-------------------------------------------------------------|
SAVE HYD            ID=[4],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Downstream Hydrograph for C7"]
*%------------------|-------------------------------------------------------------|
ADD HYD             IDsum=[1], NHYD=["J8"], IDs to add=[4 + 5 + 7]
*%------------------|-------------------------------------------------------------|
SAVE HYD            ID=[1],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Hydrograph for J8"]
*%------------------|-------------------------------------------------------------|
ROUTE CHANNEL       IDout=[2], NHYD=["C8"], IDin=[1],
                    RDT=[1](min),
                    CHLGTH=[920](m),  CHSLOPE=[0.29](%),
                                       FPSLOPE=[0.29](%),
                    SECNUM=[716.1163],       NSEG=[3]
                    ( SEGROUGH, SEGDIST (m))=[0.08, 32.93] NSEG times
                                             -0.035, 47.28
                                             0.08, 84.03
                    ( DISTANCE (m), ELEVATION (m))=[0.00, 46.63]
                                                   8.69, 44.47
                                                   21.98, 44.01
                                                   31.19, 43.39
                                                   32.93, 43.82
                                                   36.13, 43.56
                                                   37.37, 42.01
                                                   47.28, 43.76
                                                   74.37, 43.56
                                                   84.03, 46.63
*%------------------|-------------------------------------------------------------|
SAVE HYD            ID=[2],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Routing Hydrograph for C8"]
*%------------------|-------------------------------------------------------------|
CALIB STANDHYD      ID=[3], NHYD=["M9"], DT=[1]min, AREA=[17.59](ha),
                    XIMP=[0.1950], TIMP=[0.2437], DWF=[0](cms),  LOSS=[2],
                    SCS curve number CN=[84.6],
                    Pervious Surfaces:   IAper=[4.67](mm), SLPP=[2](%)
                                         LGP=[90](m), MNP=[0.25], SCP=[0](min),
                    Impervious Surfaces: IAimp=[1.57](mm), SLPI=[0.5](%),
                                         LGI=[342.4](m), MNI=[0.045], SCI=[0](min),
                    RAINFALL=[ , , , , ](mm/hr), END=-1
*%------------------|-------------------------------------------------------------|
SAVE HYD            ID=[3],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Runoff Hydrograph for M9"]
*%------------------|-------------------------------------------------------------|
ADD HYD             IDsum=[1], NHYD=["O1"], IDs to add=[2 + 3]
*%------------------|-------------------------------------------------------------|
SAVE HYD            ID=[1],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Hydrograph for O1"]
*%------------------|-------------------------------------------------------------|
*% 100 Year 3 Hour SCS Design Storm
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[4]
*                   ["100YS3.stm"] <--storm filename, one per line for NSTORM time
*%------------------|-------------------------------------------------------------|
*% 100 Year 6 Hour Chicago Design Storm
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[6]
*                   ["100YC6H.stm"] <--storm filename, one per line for NSTORM time
*%------------------|-------------------------------------------------------------|
*%100 Year 6 Hour SCS Design Storm
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1], NRUN=[7]
*                   ["100YS6.stm"] <--storm filename, one per line for NSTORM time
*%------------------|-------------------------------------------------------------|
*%100 Year 12 Hour Chicago Design Storm
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1], NRUN=[12]
*                   ["100YC12H.stm"] <--storm filename, one per line for NSTORM time
*%------------------|-------------------------------------------------------------|
*%100 Year 12 Hour SCS Design Storm
```

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START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1], NRUN=[13]
*                   ["100YS12.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-----------------------------------------------------------|
*%100 Year 24 Hour Chicago Design Storm
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1], NRUN=[24]
*                   ["100YC24H.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-----------------------------------------------------------|
*%100 Year 24 Hour SCS Design Storm
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1], NRUN=[25]
*                   ["100YS24.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-----------------------------------------------------------|
*%2 Year 24 Hour SCS Design Storm
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1], NRUN=[241]
*                   ["2YS24.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-----------------------------------------------------------|
*%5 Year 24 Hour SCS Design Storm
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1], NRUN=[242]
*                   ["5YS24.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-----------------------------------------------------------|
*%10 Year 24 Hour SCS Design Storm
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1], NRUN=[243]
*                   ["10YS24.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-----------------------------------------------------------|
*%20 Year 24 Hour SCS Design Storm
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1], NRUN=[244]
*                   ["20YS24.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-----------------------------------------------------------|
*%50 Year 24 Hour SCS Design Storm
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1], NRUN=[245]
*                   ["50YS24.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-----------------------------------------------------------|
*%200 Year 24 Hour SCS Design Storm
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1], NRUN=[246]
*                   ["200YS24.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-----------------------------------------------------------|
*%350 Year 24 Hour SCS Design Storm
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1], NRUN=[247]
*                   ["350YS24.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-----------------------------------------------------------|
*%500 Year 24 Hour SCS Design Storm
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1], NRUN=[248]
*                   ["500YS24.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-----------------------------------------------------------|
FINISH
```

```
================================================================================

   SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO       999    999    =========
   S      W W W  MM MM  H   H   Y Y   MM MM  O   O     9   9  9   9
   SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
      S   W W    M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
   SSSSS   W W   M   M  H   H    Y    M   M   OOO          9      9    =========
                                                        9   9  9   9   # 5329846
        StormWater Management HYdrologic Model           999    999    =========

 ********************************************************************************
 ****************************** SWMHYMO Ver/4.05  *******************************
 *********  A single event and continuous hydrologic simulation model  *********
 *********     based on the principles of HYMO and its successors      *********
 *********                  OTTHYMO-83 and OTTHYMO-89.                  *********
 ********************************************************************************
 ********* Distributed by:  J.F. Sabourin and Associates Inc.           *********
 *********                  Ottawa,  Ontario: (613) 836-3884            *********
 *********                  Gatineau, Quebec: (819) 243-6858            *********
 *********                  E-Mail: swmhymo@jfsa.Com                    *********
 ********************************************************************************

 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 +++++++++ Licensed user: Rideau Valley Conservation Authority          +++++++++
 +++++++++                Manotick              SERIAL#:5329846        +++++++++
 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 ********************************************************************************
 *********           ++++++ PROGRAM ARRAY DIMENSIONS ++++++             *********
 *********           Maximum value for ID numbers  :     10            *********
 *********           Max. number of rainfall points: 105408            *********
 *********           Max. number of flow points    : 105408            *********
 ********************************************************************************

 ***** DESCRIPTION SUMMARY TABLE HEADERS (units depend on METOUT in START) *****
 *****-------------------------------------------------------------------*****
 *****    ID:  Hydrograph IDentification numbers, (1-10).                *****
 *****  NHYD:  Hydrograph reference numbers, (6 digits or characters).   *****
 *****  AREA:  Drainage area associated with hydrograph, (ac.) or (ha.).  *****
 ***** QPEAK:  Peak flow of simulated hydrograph, (ft^3/s) or (m^3/s).   *****
 ***** TpeakDate_hh:mm is the date and time of the peak flow.            *****
 *****  R.V.:  Runoff Volume of simulated hydrograph, (in) or (mm).      *****
 *****  R.C.:  Runoff Coefficient of simulated hydrograph, (ratio).      *****
 *****     *:  see WARNING or NOTE message printed at end of run.        *****
 *****    **:  see  ERROR  message printed at end of run.                *****
 ********************************************************************************
 ********************************************************************************

::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::

 ********************************************************************************

 **********************   S U M M A R Y   O U T P U T   **********************
 ********************************************************************************
 *         DATE: 2017-12-05     TIME: 14:10:04     RUN COUNTER: 000362          *
 ********************************************************************************
 * Input   filename: C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\Bil_CN.dat*
 * Output  filename: C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\Bil_CN.out*
 * Summary filename: C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\Bil_CN.sum*
 * User comments:                                                             *
 * 1:_____________________________________________________________________*
 * 2:_____________________________________________________________________*
 * 3:_____________________________________________________________________*
 ********************************************************************************


#*******************************************************************************
#  Project Name: [Bilberry Creek FPM Study] Project Number:[M800_200_030_209]
#  Date        : 01-12-2017
#  Modeller    : [AA, TB, SN]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#*******************************************************************************
  ** END OF RUN :   2

********************************************************************************




 RUN:COMMAND#
 003:0001----------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on       0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   3 ]
#*******************************************************************************
#  Project Name: [Bilberry Creek FPM Study] Project Number:[M800_200_030_209]
#  Date        : 01-12-2017
#  Modeller    : [AA, TB, SN]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#*******************************************************************************
 003:0002----------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=10.00:SDUR=   3.00:PTOT=  74.43]
 003:0003----------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\BilVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [Bilberry Creek Default Value File]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      Horton's infiltration equation parameters:
      [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
      Parameters for PERVIOUS surfaces in STANDHYD:
      [IAper=   4.67 mm] [LGP=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Upstream Tributary
 003:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:UT1           93.87    9.766 No_date    1:30   55.94 .752
      [XIMP=.35:TIMP=.44]
      [LOSS= 2 :CN= 86.2]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 791.:MNI=.045:SCI=   .0]
 003:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:UT1           93.87    9.766 No_date    1:30   55.94  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT1.003
      remark:Runoff Hydrograph for UT1
 003:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:UT1           93.87    9.766 No_date    1:30   55.94  n/a
      [RDT= 1.00] out<- 02:C9            93.87    9.444 No_date    1:35   55.94  n/a
      [L/S/n=  860./1.260/.035]
      {Vmax= 1.876:Dmax=  .716}
 003:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C9            93.87    9.444 No_date    1:35   55.94  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C9.003
      remark:Routing Hydrograph for C9
 003:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:UT2           32.73    3.085 No_date    1:24   47.09 .633
      [XIMP=.23:TIMP=.29]
      [LOSS= 2 :CN= 80.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 467.:MNI=.045:SCI=   .0]
 003:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:UT2           32.73    3.085 No_date    1:24   47.09  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT2.003
      remark:Runoff Hydrograph for UT2
 003:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C9            93.87    9.444 No_date    1:35   55.94  n/a
                      + 03:UT2           32.73    3.085 No_date    1:24   47.09  n/a
      [DT= 1.00]  SUM=  04:D9           126.60   12.250 No_date    1:32   53.66  n/a
 003:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:D9           126.60   12.250 No_date    1:32   53.66  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D9.003
      remark:Downstream Hydrograph for C9
# Downstream Tributary
 003:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:DT1          247.46   17.341 No_date    1:42   47.61 .640
      [XIMP=.33:TIMP=.41]
      [LOSS= 2 :CN= 76.1]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1284.:MNI=.045:SCI=   .0]
 003:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:DT1          247.46   17.341 No_date    1:42   47.61  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT1.003
      remark:Runoff Hydrograph for DT1
 003:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:DT1          247.46   17.341 No_date    1:42   47.61  n/a
      [RDT= 1.00] out<- 02:C10          247.46   17.266 No_date    1:45   47.61  n/a
      [L/S/n=  460./ .800/.035]
      {Vmax= 2.016:Dmax= 1.188}
 003:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C10          247.46   17.266 No_date    1:45   47.61  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C10.003
      remark:Routing Hydrograph for C10
 003:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:DT2           20.34    1.925 No_date    1:19   45.60 .613
      [XIMP=.26:TIMP=.32]
      [LOSS= 2 :CN= 77.7]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 368.:MNI=.045:SCI=   .0]
 003:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:DT2           20.34    1.925 No_date    1:19   45.60  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT2.003
      remark:Runoff Hydrograph for DT2
 003:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C10          247.46   17.266 No_date    1:45   47.61  n/a
                      + 03:DT2           20.34    1.925 No_date    1:19   45.60  n/a
      [DT= 1.00]  SUM=  05:J11          267.80   18.577 No_date    1:43   47.46  n/a
 003:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:J11          267.80   18.577 No_date    1:43   47.46  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J11.003
      remark:Hydrograph for J11
 003:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 05:J11          267.80   18.577 No_date    1:43   47.46  n/a
      [RDT= 1.00] out<- 01:C11          267.80   18.311 No_date    1:48   47.46  n/a
      [L/S/n=  690./1.470/.035]
      {Vmax= 1.658:Dmax= 1.144}
 003:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:C11          267.80   18.311 No_date    1:48   47.46  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C11.003
      remark:Routing Hydrograph for C11
 003:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     02:DT3           12.63    1.928 No_date    1:09   57.95 .779
      [XIMP=.38:TIMP=.47]
      [LOSS= 2 :CN= 87.4]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 290.:MNI=.045:SCI=   .0]
 003:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:DT3           12.63    1.928 No_date    1:09   57.95  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT3.003
      remark:Runoff Hydrograph for DT3
 003:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     07:DT4           70.81    6.843 No_date    1:28   51.37 .690
      [XIMP=.31:TIMP=.38]
      [LOSS= 2 :CN= 82.6]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 687.:MNI=.045:SCI=   .0]
 003:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:DT4           70.81    6.843 No_date    1:28   51.37  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT4.003
      remark:Runoff Hydrograph for DT4
 003:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:C11          267.80   18.311 No_date    1:48   47.46  n/a
                      + 02:DT3           12.63    1.928 No_date    1:09   57.95  n/a
      [DT= 1.00]  SUM=  05:D11          280.43   19.159 No_date    1:47   47.93  n/a
 003:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:D11          280.43   19.159 No_date    1:47   47.93  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D11.003
      remark:Downstream Hydrograph for C11
# Main Channel
 003:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:M1            64.39    6.452 No_date    1:26   51.79 .696
      [XIMP=.32:TIMP=.40]
      [LOSS= 2 :CN= 82.3]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 655.:MNI=.045:SCI=   .0]
 003:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:M1            64.39    6.452 No_date    1:26   51.79  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M1.003
      remark:Runoff Hydrograph for M1
 003:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:M1            64.39    6.452 No_date    1:26   51.79  n/a
      [RDT= 1.00] out<- 02:C1            64.39    6.401 No_date    1:29   51.79  n/a
      [L/S/n=  510./1.950/.035]
      {Vmax= 2.257:Dmax=  .929}
 003:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C1            64.39    6.401 No_date    1:29   51.79  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C1.003
```

```
     remark:Routing Hydrograph for C1
003:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M2            26.14    2.891 No_date    1:13   50.60 .680
     [XIMP=.32:TIMP=.40]
     [LOSS= 2 :CN= 80.8]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 418.:MNI=.045:SCI=   .0]
003:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M2            26.14    2.891 No_date    1:13   50.60  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M2.003
     remark:Runoff Hydrograph for M2
003:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C1            64.39    6.401 No_date    1:29   51.79  n/a
                   +   03:M2            26.14    2.891 No_date    1:13   50.60  n/a
     [DT= 1.00]  SUM=  06:D1            90.53    9.090 No_date    1:25   51.44  n/a
003:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           06:D1            90.53    9.090 No_date    1:25   51.44  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D1.003
     remark:Downstream Hydrograph for C1
003:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:D9           126.60   12.250 No_date    1:32   53.66  n/a
                   +   06:D1            90.53    9.090 No_date    1:25   51.44  n/a
     [DT= 1.00]  SUM=  01:J2           217.13   21.141 No_date    1:29   52.73  n/a
003:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J2            217.13   21.141 No_date    1:29   52.73  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J2.003
     remark:Hydrograph for J2
003:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J2            217.13   21.141 No_date    1:29   52.73  n/a
     [RDT= 1.00] out<- 02:C2            217.13   20.930 No_date    1:33   52.73  n/a
     [L/S/n=  770./2.030/.035]
     {Vmax= 3.207:Dmax= 1.409}
003:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C2            217.13   20.930 No_date    1:33   52.73  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C2.003
     remark:Routing Hydrograph for C2
003:0040--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M3            212.90   17.465 No_date    1:41   52.89 .711
     [XIMP=.31:TIMP=.39]
     [LOSS= 2 :CN= 84.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1191.:MNI=.045:SCI=   .0]
003:0041--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M3            212.90   17.465 No_date    1:41   52.89  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M3.003
     remark:Runoff Hydrograph for M3
003:0042--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C2            217.13   20.930 No_date    1:33   52.73  n/a
                   +   03:M3            212.90   17.465 No_date    1:41   52.89  n/a
     [DT= 1.00]  SUM=  01:J3           430.03   37.988 No_date    1:36   52.81  n/a
003:0043--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J3            430.03   37.988 No_date    1:36   52.81  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J3.003
     remark:Hydrograph for J3
003:0044--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J3            430.03   37.988 No_date    1:36   52.81  n/a
     [RDT= 1.00] out<- 02:C3            430.03   37.904 No_date    1:38   52.81  n/a
     [L/S/n=  450./1.190/.035]
     {Vmax= 3.094:Dmax= 1.676}
003:0045--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C3            430.03   37.904 No_date    1:38   52.81  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C3.003
     remark:Routing Hydrograph for C3
003:0046--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M4            432.99   31.309 No_date    1:52   53.84 .723
     [XIMP=.34:TIMP=.42]
     [LOSS= 2 :CN= 84.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1699.:MNI=.045:SCI=   .0]
003:0047--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M4            432.99   31.309 No_date    1:52   53.84  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M4.003
     remark:Runoff Hydrograph for M4A
003:0048--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C3            430.03   37.904 No_date    1:38   52.81  n/a
                   +   03:M4            432.99   31.309 No_date    1:52   53.84  n/a
     [DT= 1.00]  SUM=  01:J4           863.02   67.741 No_date    1:42   53.33  n/a
003:0049--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J4            863.02   67.741 No_date    1:42   53.33  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J4.003
     remark:Hydrograph for J4
003:0050--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J4            863.02   67.741 No_date    1:42   53.33  n/a
     [RDT= 1.00] out<- 02:C4            863.02   67.408 No_date    1:46   53.33  n/a
     [L/S/n=  850./1.140/.035]
     {Vmax= 3.814:Dmax= 2.382}
003:0051--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C4            863.02   67.408 No_date    1:46   53.33  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C4.003
     remark:Routing Hydrograph for C4
003:0052--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M5            35.47    3.355 No_date    1:25   47.37 .636
     [XIMP=.21:TIMP=.26]
     [LOSS= 2 :CN= 82.3]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 486.:MNI=.045:SCI=   .0]
003:0053--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M5            35.47    3.355 No_date    1:25   47.37  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M5.003
     remark:Runoff Hydrograph for M5
003:0054--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C4           863.02   67.408 No_date    1:46   53.33  n/a
                   +   03:M5            35.47    3.355 No_date    1:25   47.37  n/a
     [DT= 1.00]  SUM=  01:J5           898.49   69.968 No_date    1:45   53.09  n/a
003:0055--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J5            898.49   69.968 No_date    1:45   53.09  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J5.003
     remark:Hydrograph for J5
003:0056--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J5            898.49   69.968 No_date    1:45   53.09  n/a
     [RDT= 1.00] out<- 02:C5            898.49   69.353 No_date    1:50   53.09  n/a
     [L/S/n=  880./1.600/.035]
     {Vmax= 3.571:Dmax= 1.862}
003:0057--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C5            898.49   69.353 No_date    1:50   53.09  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C5.003
     remark:Routing Hydrograph for C5
003:0058--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M6             64.01    8.256 No_date    1:25   61.98 .833
     [XIMP=.37:TIMP=.46]
     [LOSS= 2 :CN= 92.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 653.:MNI=.045:SCI=   .0]
003:0059--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M6             64.01    8.256 No_date    1:25   61.98  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M6.003
     remark:Runoff Hydrograph for M6
003:0060--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C5           898.49   69.353 No_date    1:50   53.09  n/a
                   +   03:M6            64.01    8.256 No_date    1:25   61.98  n/a
     [DT= 1.00]  SUM=  01:J6           962.50   75.108 No_date    1:47   53.69  n/a
003:0061--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J6           962.50   75.108 No_date    1:47   53.69  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J6.003
     remark:Hydrograph for J6
003:0062--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J6           962.50   75.108 No_date    1:47   53.69  n/a
     [RDT= 1.00] out<- 02:C6           962.50   74.358 No_date    1:53   53.69  n/a
     [L/S/n=  980./1.490/.035]
     {Vmax= 3.301:Dmax= 2.207}
003:0063--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C6           962.50   74.358 No_date    1:53   53.69  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C6.003
     remark:Routing Hydrograph for C6
003:0064--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M7            24.39    2.084 No_date    1:24   43.18 .580
     [XIMP=.18:TIMP=.22]
     [LOSS= 2 :CN= 79.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 403.:MNI=.045:SCI=   .0]
003:0065--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M7            24.39    2.084 No_date    1:24   43.18  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M7.003
     remark:Runoff Hydrograph for M7
003:0066--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C6           962.50   74.358 No_date    1:53   53.69  n/a
                   +   03:M7            24.39    2.084 No_date    1:24   43.18  n/a
     [DT= 1.00]  SUM=  01:J7           986.89   75.745 No_date    1:52   53.43  n/a
003:0067--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J7           986.89   75.745 No_date    1:52   53.43  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J7.003
     remark:Hydrograph for J7
003:0068--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J7           986.89   75.745 No_date    1:52   53.43  n/a
     [RDT= 1.00] out<- 02:C7           986.89   75.481 No_date    1:55   53.43  n/a
     [L/S/n=  530./1.410/.035]
     {Vmax= 2.954:Dmax= 2.180}
003:0069--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C7           986.89   75.481 No_date    1:55   53.43  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C7.003
     remark:Routing Hydrograph for C7
003:0070--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M8            21.78    2.935 No_date    1:12   56.07 .753
     [XIMP=.38:TIMP=.48]
     [LOSS= 2 :CN= 84.8]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 381.:MNI=.045:SCI=   .0]
003:0071--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M8            21.78    2.935 No_date    1:12   56.07  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M8.003
     remark:Runoff Hydrograph for M8
003:0072--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C7           986.89   75.481 No_date    1:55   53.43  n/a
                   +   03:M8            21.78    2.935 No_date    1:12   56.07  n/a
     [DT= 1.00]  SUM=  04:D7          1008.67   76.795 No_date    1:54   53.48  n/a
003:0073--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           04:D7          1008.67   76.795 No_date    1:54   53.48  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D7.003
     remark:Downstream Hydrograph for C7
003:0074--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:D7          1008.67   76.795 No_date    1:54   53.48  n/a
                   +   05:D11          280.43   19.159 No_date    1:47   47.93  n/a
                   +   07:DT4           70.81    6.843 No_date    1:28   51.37  n/a
     [DT= 1.00]  SUM=  01:J8          1359.91  100.617 No_date    1:52   52.23  n/a
003:0075--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J8          1359.91  100.617 No_date    1:52   52.23  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J8.003
     remark:Hydrograph for J8
003:0076--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J8          1359.91  100.617 No_date    1:52   52.23  n/a
     [RDT= 1.00] out<- 02:C8          1359.91   93.630 No_date    2:04   52.23  n/a
     [L/S/n=  920./ .290/.035]
     {Vmax= 1.166:Dmax= 2.896}
003:0077--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C8          1359.91   93.630 No_date    2:04   52.23  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C8.003
     remark:Routing Hydrograph for C8
003:0078--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M9            17.59    1.880 No_date    1:21   49.01 .658
     [XIMP=.19:TIMP=.24]
     [LOSS= 2 :CN= 84.6]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 342.:MNI=.045:SCI=   .0]
003:0079--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M9            17.59    1.880 No_date    1:21   49.01  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M9.003
     remark:Runoff Hydrograph for M9
003:0080--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C8          1359.91   93.630 No_date    2:04   52.23  n/a
                   +   03:M9            17.59    1.880 No_date    1:21   49.01  n/a
     [DT= 1.00]  SUM=  01:O1          1377.50   94.504 No_date    2:04   52.19  n/a
003:0081--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:O1          1377.50   94.504 No_date    2:04   52.19  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-O1.003
     remark:Hydrograph for O1
  ** END OF RUN :   3

********************************************************************************




 RUN:COMMAND#
 004:0001--------------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   4 ]
 #*******************************************************************************
 #  Project Name: [Bilberry Creek FPM Study] Project Number:[M800_200_030_209]
 #  Date        : 01-12-2017
 #  Modeller    : [AA, TB, SN]
 #  Company     : Rideau Valley Conservation Authority
 #  License #   :  5329846
```

```
#*******************************************************************************
 004:0002----------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=30.00:SDUR=   3.00:PTOT=  74.46]
 004:0003----------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\BilVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [Bilberry Creek Default Value File]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      Horton's infiltration equation parameters:
      [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
      Parameters for PERVIOUS surfaces in STANDHYD:
      [IAper=   4.67 mm] [LGP=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Upstream Tributary
 004:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:UT1           93.87    8.723 No_date    1:58   55.98 .752
      [XIMP=.35:TIMP=.44]
      [LOSS= 2 :CN= 86.2]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 791.:MNI=.045:SCI=   .0]
 004:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:UT1           93.87    8.723 No_date    1:58   55.98  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT1.004
      remark:Runoff Hydrograph for UT1
 004:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:UT1           93.87    8.723 No_date    1:58   55.98  n/a
      [RDT= 1.00] out<- 02:C9            93.87    8.570 No_date    2:05   55.98  n/a
      [L/S/n=  860./1.260/.035]
      {Vmax= 1.808:Dmax=  .680}
 004:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C9            93.87    8.570 No_date    2:05   55.98  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C9.004
      remark:Routing Hydrograph for C9
 004:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:UT2           32.73    2.632 No_date    1:57   47.13 .633
      [XIMP=.23:TIMP=.29]
      [LOSS= 2 :CN= 80.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 467.:MNI=.045:SCI=   .0]
 004:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:UT2           32.73    2.632 No_date    1:57   47.13  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT2.004
      remark:Runoff Hydrograph for UT2
 004:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C9            93.87    8.570 No_date    2:05   55.98  n/a
                      +  03:UT2           32.73    2.632 No_date    1:57   47.13  n/a
      [DT= 1.00]  SUM=  04:D9           126.60   11.156 No_date    2:02   53.69  n/a
 004:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:D9           126.60   11.156 No_date    2:02   53.69  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D9.004
      remark:Downstream Hydrograph for C9
# Downstream Tributary
 004:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:DT1          247.46   16.817 No_date    2:10   47.64 .640
      [XIMP=.33:TIMP=.41]
      [LOSS= 2 :CN= 76.1]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1284.:MNI=.045:SCI=   .0]
 004:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:DT1          247.46   16.817 No_date    2:10   47.64  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT1.004
      remark:Runoff Hydrograph for DT1
 004:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:DT1          247.46   16.817 No_date    2:10   47.64  n/a
      [RDT= 1.00] out<- 02:C10          247.46   16.767 No_date    2:13   47.64  n/a
      [L/S/n=  460./ .800/.035]
      {Vmax= 2.008:Dmax= 1.175}
 004:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C10          247.46   16.767 No_date    2:13   47.64  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C10.004
      remark:Routing Hydrograph for C10
 004:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:DT2           20.34    1.624 No_date    1:45   45.63 .613
      [XIMP=.26:TIMP=.32]
      [LOSS= 2 :CN= 77.7]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 368.:MNI=.045:SCI=   .0]
 004:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:DT2           20.34    1.624 No_date    1:45   45.63  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT2.004
      remark:Runoff Hydrograph for DT2
 004:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C10          247.46   16.767 No_date    2:13   47.64  n/a
                      +  03:DT2           20.34    1.624 No_date    1:45   45.63  n/a
      [DT= 1.00]  SUM=  05:J11          267.80   18.179 No_date    2:10   47.49  n/a
 004:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:J11          267.80   18.179 No_date    2:10   47.49  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J11.004
      remark:Hydrograph for J11
 004:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 05:J11          267.80   18.179 No_date    2:10   47.49  n/a
      [RDT= 1.00] out<- 01:C11          267.80   17.969 No_date    2:16   47.49  n/a
      [L/S/n=  690./1.470/.035]
      {Vmax= 1.646:Dmax= 1.135}
 004:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:C11          267.80   17.969 No_date    2:16   47.49  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C11.004
      remark:Routing Hydrograph for C11
 004:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     02:DT3           12.63    1.516 No_date    1:40   57.99 .779
      [XIMP=.38:TIMP=.47]
      [LOSS= 2 :CN= 87.4]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 290.:MNI=.045:SCI=   .0]
 004:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:DT3           12.63    1.516 No_date    1:40   57.99  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT3.004
      remark:Runoff Hydrograph for DT3
 004:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     07:DT4           70.81    6.034 No_date    1:59   51.40 .690
      [XIMP=.31:TIMP=.38]
      [LOSS= 2 :CN= 82.6]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 687.:MNI=.045:SCI=   .0]
 004:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:DT4           70.81    6.034 No_date    1:59   51.40  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT4.004
      remark:Runoff Hydrograph for DT4
 004:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:C11          267.80   17.969 No_date    2:16   47.49  n/a
                      +  02:DT3           12.63    1.516 No_date    1:40   57.99  n/a
      [DT= 1.00]  SUM=  05:D11          280.43   18.949 No_date    2:15   47.96  n/a
 004:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:D11          280.43   18.949 No_date    2:15   47.96  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D11.004
      remark:Downstream Hydrograph for C11
# Main Channel
 004:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:M1            64.39    5.597 No_date    1:55   51.82 .696
      [XIMP=.32:TIMP=.40]
      [LOSS= 2 :CN= 82.3]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 655.:MNI=.045:SCI=   .0]
 004:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:M1            64.39    5.597 No_date    1:55   51.82  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M1.004
      remark:Runoff Hydrograph for M1
 004:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:M1            64.39    5.597 No_date    1:55   51.82  n/a
      [RDT= 1.00] out<- 02:C1            64.39    5.583 No_date    2:00   51.82  n/a
      [L/S/n=  510./1.950/.035]
      {Vmax= 2.184:Dmax=  .881}
 004:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C1            64.39    5.583 No_date    2:00   51.82  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C1.004
      remark:Routing Hydrograph for C1
 004:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M2            26.14    2.395 No_date    1:45   50.63 .680
      [XIMP=.32:TIMP=.40]
      [LOSS= 2 :CN= 80.8]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 418.:MNI=.045:SCI=   .0]
 004:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M2            26.14    2.395 No_date    1:45   50.63  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M2.004
      remark:Runoff Hydrograph for M2
 004:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C1            64.39    5.583 No_date    2:00   51.82  n/a
                      +  03:M2            26.14    2.395 No_date    1:45   50.63  n/a
      [DT= 1.00]  SUM=  06:D1            90.53    7.882 No_date    1:56   51.48  n/a
 004:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:D1            90.53    7.882 No_date    1:56   51.48  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D1.004
      remark:Downstream Hydrograph for C1
 004:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:D9           126.60   11.156 No_date    2:02   53.69  n/a
                      +  06:D1            90.53    7.882 No_date    1:56   51.48  n/a
      [DT= 1.00]  SUM=  01:J2           217.13   18.980 No_date    2:01   52.77  n/a
 004:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:J2           217.13   18.980 No_date    2:01   52.77  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J2.004
      remark:Hydrograph for J2
 004:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:J2           217.13   18.980 No_date    2:01   52.77  n/a
      [RDT= 1.00] out<- 02:C2           217.13   18.888 No_date    2:04   52.77  n/a
      [L/S/n=  770./2.030/.035]
      {Vmax= 3.150:Dmax= 1.364}
 004:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C2           217.13   18.888 No_date    2:04   52.77  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C2.004
      remark:Routing Hydrograph for C2
 004:0040--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M3           212.90   16.679 No_date    2:09   52.93 .711
      [XIMP=.31:TIMP=.39]
      [LOSS= 2 :CN= 84.2]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1191.:MNI=.045:SCI=   .0]
 004:0041--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M3           212.90   16.679 No_date    2:09   52.93  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M3.004
      remark:Runoff Hydrograph for M3
 004:0042--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C2           217.13   18.888 No_date    2:04   52.77  n/a
                      +  03:M3           212.90   16.679 No_date    2:09   52.93  n/a
      [DT= 1.00]  SUM=  01:J3           430.03   35.496 No_date    2:06   52.85  n/a
 004:0043--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:J3           430.03   35.496 No_date    2:06   52.85  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J3.004
      remark:Hydrograph for J3
 004:0044--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:J3           430.03   35.496 No_date    2:06   52.85  n/a
      [RDT= 1.00] out<- 02:C3           430.03   35.437 No_date    2:08   52.85  n/a
      [L/S/n=  450./1.190/.035]
      {Vmax= 3.041:Dmax= 1.624}
 004:0045--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C3           430.03   35.437 No_date    2:08   52.85  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C3.004
      remark:Routing Hydrograph for C3
 004:0046--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M4           432.99   30.814 No_date    2:19   53.88 .724
      [XIMP=.34:TIMP=.42]
      [LOSS= 2 :CN= 84.1]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1699.:MNI=.045:SCI=   .0]
 004:0047--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M4           432.99   30.814 No_date    2:19   53.88  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M4.004
      remark:Runoff Hydrograph for M4A
 004:0048--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C3           430.03   35.437 No_date    2:08   52.85  n/a
                      +  03:M4           432.99   30.814 No_date    2:19   53.88  n/a
      [DT= 1.00]  SUM=  01:J4           863.02   65.752 No_date    2:12   53.36  n/a
 004:0049--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:J4           863.02   65.752 No_date    2:12   53.36  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J4.004
      remark:Hydrograph for J4
 004:0050--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:J4           863.02   65.752 No_date    2:12   53.36  n/a
      [RDT= 1.00] out<- 02:C4           863.02   65.504 No_date    2:15   53.36  n/a
      [L/S/n=  850./1.140/.035]
      {Vmax= 3.778:Dmax= 2.347}
 004:0051--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C4           863.02   65.504 No_date    2:15   53.36  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C4.004
      remark:Routing Hydrograph for C4
 004:0052--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M5            35.47    2.878 No_date    1:58   47.40 .637
      [XIMP=.21:TIMP=.26]
      [LOSS= 2 :CN= 82.3]
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     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 486.:MNI=.045:SCI=   .0]
004:0053--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M5            35.47    2.878 No_date    1:58   47.40  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M5.004
     remark:Runoff Hydrograph for M5
004:0054--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C4           863.02   65.504 No_date    2:15   53.36  n/a
                    +  03:M5             35.47    2.878 No_date    1:58   47.40  n/a
     [DT= 1.00]  SUM=  01:J5           898.49   68.074 No_date    2:14   53.13  n/a
004:0055--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J5            898.49   68.074 No_date    2:14   53.13  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J5.004
     remark:Hydrograph for J5
004:0056--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J5            898.49   68.074 No_date    2:14   53.13  n/a
     [RDT= 1.00] out<- 02:C5            898.49   67.595 No_date    2:19   53.13  n/a
     [L/S/n=  880./1.600/.035]
     {Vmax= 3.578:Dmax= 1.838}
004:0057--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C5            898.49   67.595 No_date    2:19   53.13  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C5.004
     remark:Routing Hydrograph for C5
004:0058--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M6             64.01    7.076 No_date    1:51   62.01 .833
     [XIMP=.37:TIMP=.46]
     [LOSS= 2 :CN= 92.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 653.:MNI=.045:SCI=   .0]
004:0059--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M6            64.01    7.076 No_date    1:51   62.01  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M6.004
     remark:Runoff Hydrograph for M6
004:0060--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C5            898.49   67.595 No_date    2:19   53.13  n/a
                    +  03:M6             64.01    7.076 No_date    1:51   62.01  n/a
     [DT= 1.00]  SUM=  01:J6           962.50   73.333 No_date    2:17   53.72  n/a
004:0061--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J6            962.50   73.333 No_date    2:17   53.72  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J6.004
     remark:Hydrograph for J6
004:0062--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J6            962.50   73.333 No_date    2:17   53.72  n/a
     [RDT= 1.00] out<- 02:C6            962.50   72.740 No_date    2:22   53.72  n/a
     [L/S/n=  980./1.490/.035]
     {Vmax= 3.293:Dmax= 2.186}
004:0063--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C6            962.50   72.740 No_date    2:22   53.72  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C6.004
     remark:Routing Hydrograph for C6
004:0064--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M7             24.39    1.805 No_date    1:59   43.21 .580
     [XIMP=.18:TIMP=.22]
     [LOSS= 2 :CN= 79.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 403.:MNI=.045:SCI=   .0]
004:0065--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M7             24.39    1.805 No_date    1:59   43.21  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M7.004
     remark:Runoff Hydrograph for M7
004:0066--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C6            962.50   72.740 No_date    2:22   53.72  n/a
                    +  03:M7             24.39    1.805 No_date    1:59   43.21  n/a
     [DT= 1.00]  SUM=  01:J7           986.89   74.206 No_date    2:21   53.46  n/a
004:0067--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J7            986.89   74.206 No_date    2:21   53.46  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J7.004
     remark:Hydrograph for J7
004:0068--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J7            986.89   74.206 No_date    2:21   53.46  n/a
     [RDT= 1.00] out<- 02:C7            986.89   73.996 No_date    2:24   53.46  n/a
     [L/S/n=  530./1.410/.035]
     {Vmax= 2.946:Dmax= 2.166}
004:0069--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C7            986.89   73.996 No_date    2:24   53.46  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C7.004
     remark:Routing Hydrograph for C7
004:0070--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M8             21.78    2.383 No_date    1:42   56.11 .753
     [XIMP=.38:TIMP=.48]
     [LOSS= 2 :CN= 84.8]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 381.:MNI=.045:SCI=   .0]
004:0071--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M8             21.78    2.383 No_date    1:42   56.11  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M8.004
     remark:Runoff Hydrograph for M8
004:0072--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C7            986.89   73.996 No_date    2:24   53.46  n/a
                    +  03:M8             21.78    2.383 No_date    1:42   56.11  n/a
     [DT= 1.00]  SUM=  04:D7          1008.67   75.422 No_date    2:23   53.52  n/a
004:0073--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           04:D7          1008.67   75.422 No_date    2:23   53.52  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D7.004
     remark:Downstream Hydrograph for C7
004:0074--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:D7          1008.67   75.422 No_date    2:23   53.52  n/a
                    +  05:D11            280.43   18.949 No_date    2:15   47.96  n/a
                    +  07:DT4             70.81    6.034 No_date    1:59   51.40  n/a
     [DT= 1.00]  SUM=  01:J8           1359.91   99.102 No_date    2:21   52.26  n/a
004:0075--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J8          1359.91   99.102 No_date    2:21   52.26  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J8.004
     remark:Hydrograph for J8
004:0076--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J8          1359.91   99.102 No_date    2:21   52.26  n/a
     [RDT= 1.00] out<- 02:C8          1359.91   93.661 No_date    2:32   52.26  n/a
     [L/S/n=  920./ .290/.035]
     {Vmax= 1.161:Dmax= 2.883}
004:0077--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C8          1359.91   93.661 No_date    2:32   52.26  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C8.004
     remark:Routing Hydrograph for C8
004:0078--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M9             17.59    1.571 No_date    1:52   49.04 .659
     [XIMP=.19:TIMP=.24]
     [LOSS= 2 :CN= 84.6]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 342.:MNI=.045:SCI=   .0]
004:0079--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M9             17.59    1.571 No_date    1:52   49.04  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M9.004
     remark:Runoff Hydrograph for M9
004:0080--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C8          1359.91   93.661 No_date    2:32   52.26  n/a
                    +  03:M9             17.59    1.571 No_date    1:52   49.04  n/a
     [DT= 1.00]  SUM=  01:O1          1377.50   94.621 No_date    2:32   52.22  n/a
004:0081--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:O1          1377.50   94.621 No_date    2:32   52.22  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-O1.004
     remark:Hydrograph for O1
 ** END OF RUN :   5

************************************************************************************




 RUN:COMMAND#
 006:0001--------------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   6 ]
#*************************************************************************
#  Project Name: [Bilberry Creek FPM Study] Project Number:[M800_200_030_209]
#  Date       : 01-12-2017
#  Modeller   : [AA, TB, SN]
#  Company    : Rideau Valley Conservation Authority
#  License #  :  5329846
#*************************************************************************
 006:0002--------------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=10.00:SDUR=   6.00:PTOT=  88.42]
 006:0003--------------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\BilVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [Bilberry Creek Default Value File]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      Horton's infiltration equation parameters:
      [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
      Parameters for PERVIOUS surfaces in STANDHYD:
      [IAper=   4.67 mm] [LGP=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Upstream Tributary
 006:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:UT1            93.87   10.403 No_date    2:29   69.04 .781
      [XIMP=.35:TIMP=.44]
      [LOSS= 2 :CN= 86.2]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 791.:MNI=.045:SCI=   .0]
 006:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:UT1            93.87   10.403 No_date    2:29   69.04  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT1.006
      remark:Runoff Hydrograph for UT1
 006:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:UT1          93.87   10.403 No_date    2:29   69.04  n/a
      [RDT= 1.00] out<- 02:C9           93.87   10.074 No_date    2:34   69.04  n/a
      [L/S/n=  860./1.260/.035]
      {Vmax= 1.920:Dmax=  .738}
 006:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C9            93.87   10.074 No_date    2:34   69.04  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C9.006
      remark:Routing Hydrograph for C9
 006:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:UT2            32.73    3.407 No_date    2:23   59.21 .670
      [XIMP=.23:TIMP=.29]
      [LOSS= 2 :CN= 80.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 467.:MNI=.045:SCI=   .0]
 006:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:UT2            32.73    3.407 No_date    2:23   59.21  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT2.006
      remark:Runoff Hydrograph for UT2
 006:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C9            93.87   10.074 No_date    2:34   69.04  n/a
                     +  03:UT2           32.73    3.407 No_date    2:23   59.21  n/a
      [DT= 1.00]  SUM=  04:D9           126.60   13.139 No_date    2:32   66.50  n/a
 006:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:D9           126.60   13.139 No_date    2:32   66.50  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D9.006
      remark:Downstream Hydrograph for C9
# Downstream Tributary
 006:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:DT1          247.46   18.728 No_date    2:42   59.48 .673
      [XIMP=.33:TIMP=.41]
      [LOSS= 2 :CN= 76.1]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1284.:MNI=.045:SCI=   .0]
 006:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:DT1          247.46   18.728 No_date    2:42   59.48  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT1.006
      remark:Runoff Hydrograph for DT1
 006:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:DT1          247.46   18.728 No_date    2:42   59.48  n/a
      [RDT= 1.00] out<- 02:C10          247.46   18.630 No_date    2:44   59.48  n/a
      [L/S/n=  460./ .800/.035]
      {Vmax= 2.038:Dmax= 1.222}
 006:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C10          247.46   18.630 No_date    2:44   59.48  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C10.006
      remark:Routing Hydrograph for C10
 006:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:DT2           20.34    2.126 No_date    2:19   57.37 .649
      [XIMP=.26:TIMP=.32]
      [LOSS= 2 :CN= 77.7]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 368.:MNI=.045:SCI=   .0]
 006:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:DT2           20.34    2.126 No_date    2:19   57.37  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT2.006
      remark:Runoff Hydrograph for DT2
 006:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C10          247.46   18.630 No_date    2:44   59.48  n/a
                     +  03:DT2           20.34    2.126 No_date    2:19   57.37  n/a
      [DT= 1.00]  SUM=  05:J11          267.80   20.038 No_date    2:42   59.32  n/a
 006:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:J11          267.80   20.038 No_date    2:42   59.32  n/a
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     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J11.006
     remark:Hydrograph for J11
006:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 05:J11          267.80   20.038 No_date    2:42   59.32  n/a
     [RDT= 1.00] out<- 01:C11          267.80   19.764 No_date    2:47   59.32  n/a
     [L/S/n=  690./1.470/.035]
     {Vmax= 1.700:Dmax= 1.173}
006:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:C11          267.80   19.764 No_date    2:47   59.32  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C11.006
     remark:Routing Hydrograph for C11
006:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    02:DT3            12.63    2.037 No_date    2:09   71.23 .806
     [XIMP=.38:TIMP=.47]
     [LOSS= 2 :CN= 87.4]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 290.:MNI=.045:SCI=   .0]
006:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:DT3            12.63    2.037 No_date    2:09   71.23  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT3.006
     remark:Runoff Hydrograph for DT3
006:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    07:DT4            70.81    7.342 No_date    2:27   63.95 .723
     [XIMP=.31:TIMP=.38]
     [LOSS= 2 :CN= 82.6]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 687.:MNI=.045:SCI=   .0]
006:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          07:DT4            70.81    7.342 No_date    2:27   63.95  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT4.006
     remark:Runoff Hydrograph for DT4
006:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:C11          267.80   19.764 No_date    2:47   59.32  n/a
                  +  02:DT3            12.63    2.037 No_date    2:09   71.23  n/a
     [DT= 1.00]  SUM=  05:D11          280.43   20.665 No_date    2:46   59.86  n/a
006:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          05:D11          280.43   20.665 No_date    2:46   59.86  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D11.006
     remark:Downstream Hydrograph for C11
# Main Channel
006:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    01:M1             64.39    6.902 No_date    2:26   64.38 .728
     [XIMP=.32:TIMP=.40]
     [LOSS= 2 :CN= 82.3]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 655.:MNI=.045:SCI=   .0]
006:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:M1             64.39    6.902 No_date    2:26   64.38  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M1.006
     remark:Runoff Hydrograph for M1
006:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:M1           64.39    6.902 No_date    2:26   64.38  n/a
     [RDT= 1.00] out<- 02:C1           64.39    6.849 No_date    2:28   64.38  n/a
     [L/S/n=  510./1.950/.035]
     {Vmax= 2.297:Dmax=  .954}
006:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C1           64.39    6.849 No_date    2:28   64.38  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C1.006
     remark:Routing Hydrograph for C1
006:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M2             26.14    3.083 No_date    2:18   63.02 .713
     [XIMP=.32:TIMP=.40]
     [LOSS= 2 :CN= 80.8]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 418.:MNI=.045:SCI=   .0]
006:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M2             26.14    3.083 No_date    2:18   63.02  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M2.006
     remark:Runoff Hydrograph for M2
006:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C1           64.39    6.849 No_date    2:28   64.38  n/a
                  +  03:M2            26.14    3.083 No_date    2:18   63.02  n/a
     [DT= 1.00]  SUM=  06:D1           90.53    9.731 No_date    2:25   63.99  n/a
006:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          06:D1           90.53    9.731 No_date    2:25   63.99  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D1.006
     remark:Downstream Hydrograph for C1
006:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           04:D9          126.60   13.139 No_date    2:32   66.50  n/a
                  +  06:D1            90.53    9.731 No_date    2:25   63.99  n/a
     [DT= 1.00]  SUM=  01:J2          217.13   22.688 No_date    2:28   65.45  n/a
006:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J2           217.13   22.688 No_date    2:28   65.45  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J2.006
     remark:Hydrograph for J2
006:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J2           217.13   22.688 No_date    2:28   65.45  n/a
     [RDT= 1.00] out<- 02:C2           217.13   22.471 No_date    2:32   65.45  n/a
     [L/S/n=  770./2.030/.035]
     {Vmax= 3.250:Dmax= 1.441}
006:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C2           217.13   22.471 No_date    2:32   65.45  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C2.006
     remark:Routing Hydrograph for C2
006:0040--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M3           212.90   18.902 No_date    2:40   65.68 .743
     [XIMP=.31:TIMP=.39]
     [LOSS= 2 :CN= 84.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1191.:MNI=.045:SCI=   .0]
006:0041--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M3           212.90   18.902 No_date    2:40   65.68  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M3.006
     remark:Runoff Hydrograph for M3
006:0042--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C2           217.13   22.471 No_date    2:32   65.45  n/a
                  +  03:M3           212.90   18.902 No_date    2:40   65.68  n/a
     [DT= 1.00]  SUM=  01:J3          430.03   40.956 No_date    2:35   65.56  n/a
006:0043--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J3           430.03   40.956 No_date    2:35   65.56  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J3.006
     remark:Hydrograph for J3
006:0044--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J3           430.03   40.956 No_date    2:35   65.56  n/a
     [RDT= 1.00] out<- 02:C3           430.03   40.875 No_date    2:37   65.56  n/a
     [L/S/n=  450./1.190/.035]
     {Vmax= 3.160:Dmax= 1.738}
006:0045--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C3           430.03   40.875 No_date    2:37   65.56  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C3.006
     remark:Routing Hydrograph for C3
006:0046--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M4           432.99   33.761 No_date    2:50   66.69 .754
     [XIMP=.34:TIMP=.42]
     [LOSS= 2 :CN= 84.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1699.:MNI=.045:SCI=   .0]
006:0047--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M4           432.99   33.761 No_date    2:50   66.69  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M4.006
     remark:Runoff Hydrograph for M4A
006:0048--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C3           430.03   40.875 No_date    2:37   65.56  n/a
                  +  03:M4           432.99   33.761 No_date    2:50   66.69  n/a
     [DT= 1.00]  SUM=  01:J4          863.02   73.046 No_date    2:41   66.13  n/a
006:0049--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J4           863.02   73.046 No_date    2:41   66.13  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J4.006
     remark:Hydrograph for J4
006:0050--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J4           863.02   73.046 No_date    2:41   66.13  n/a
     [RDT= 1.00] out<- 02:C4           863.02   72.638 No_date    2:45   66.13  n/a
     [L/S/n=  850./1.140/.035]
     {Vmax= 3.893:Dmax= 2.468}
006:0051--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C4           863.02   72.638 No_date    2:45   66.13  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C4.006
     remark:Routing Hydrograph for C4
006:0052--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M5            35.47    3.657 No_date    2:24   59.61 .674
     [XIMP=.21:TIMP=.26]
     [LOSS= 2 :CN= 82.3]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 486.:MNI=.045:SCI=   .0]
006:0053--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M5            35.47    3.657 No_date    2:24   59.61  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M5.006
     remark:Runoff Hydrograph for M5
006:0054--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C4           863.02   72.638 No_date    2:45   66.13  n/a
                  +  03:M5            35.47    3.657 No_date    2:24   59.61  n/a
     [DT= 1.00]  SUM=  01:J5          898.49   75.422 No_date    2:44   65.87  n/a
006:0055--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J5           898.49   75.422 No_date    2:44   65.87  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J5.006
     remark:Hydrograph for J5
006:0056--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J5           898.49   75.422 No_date    2:44   65.87  n/a
     [RDT= 1.00] out<- 02:C5           898.49   74.724 No_date    2:49   65.87  n/a
     [L/S/n=  880./1.600/.035]
     {Vmax= 3.550:Dmax= 1.933}
006:0057--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C5           898.49   74.724 No_date    2:49   65.87  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C5.006
     remark:Routing Hydrograph for C5
006:0058--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M6            64.01    8.716 No_date    2:24   75.64 .855
     [XIMP=.37:TIMP=.46]
     [LOSS= 2 :CN= 92.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 653.:MNI=.045:SCI=   .0]
006:0059--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M6            64.01    8.716 No_date    2:24   75.64  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M6.006
     remark:Runoff Hydrograph for M6
006:0060--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C5           898.49   74.724 No_date    2:49   65.87  n/a
                  +  03:M6            64.01    8.716 No_date    2:24   75.64  n/a
     [DT= 1.00]  SUM=  01:J6          962.50   80.799 No_date    2:47   66.52  n/a
006:0061--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J6           962.50   80.799 No_date    2:47   66.52  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J6.006
     remark:Hydrograph for J6
006:0062--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J6           962.50   80.799 No_date    2:47   66.52  n/a
     [RDT= 1.00] out<- 02:C6           962.50   80.019 No_date    2:52   66.52  n/a
     [L/S/n=  980./1.490/.035]
     {Vmax= 3.329:Dmax= 2.269}
006:0063--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C6           962.50   80.019 No_date    2:52   66.52  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C6.006
     remark:Routing Hydrograph for C6
006:0064--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M7            24.39    2.331 No_date    2:23   54.83 .620
     [XIMP=.18:TIMP=.22]
     [LOSS= 2 :CN= 79.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 403.:MNI=.045:SCI=   .0]
006:0065--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M7            24.39    2.331 No_date    2:23   54.83  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M7.006
     remark:Runoff Hydrograph for M7
006:0066--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C6           962.50   80.019 No_date    2:52   66.52  n/a
                  +  03:M7            24.39    2.331 No_date    2:23   54.83  n/a
     [DT= 1.00]  SUM=  01:J7          986.89   81.507 No_date    2:51   66.23  n/a
006:0067--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J7           986.89   81.507 No_date    2:51   66.23  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J7.006
     remark:Hydrograph for J7
006:0068--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J7           986.89   81.507 No_date    2:51   66.23  n/a
     [RDT= 1.00] out<- 02:C7           986.89   81.235 No_date    2:54   66.23  n/a
     [L/S/n=  530./1.410/.035]
     {Vmax= 2.986:Dmax= 2.233}
006:0069--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C7           986.89   81.235 No_date    2:54   66.23  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C7.006
     remark:Routing Hydrograph for C7
006:0070--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M8            21.78    3.146 No_date    2:12   69.12 .782
     [XIMP=.38:TIMP=.48]
     [LOSS= 2 :CN= 84.8]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 381.:MNI=.045:SCI=   .0]
006:0071--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M8            21.78    3.146 No_date    2:12   69.12  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M8.006
     remark:Runoff Hydrograph for M8
006:0072--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C7           986.89   81.235 No_date    2:54   66.23  n/a
                  +  03:M8            21.78    3.146 No_date    2:12   69.12  n/a
     [DT= 1.00]  SUM=  04:D7         1008.67   82.614 No_date    2:53   66.30  n/a
006:0073--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          04:D7         1008.67   82.614 No_date    2:53   66.30  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D7.006
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     remark:Downstream Hydrograph for C7
 006:0074--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:D7          1008.67   82.614 No_date    2:53   66.30  n/a
                    +  05:D11          280.43   20.665 No_date    2:46   59.86  n/a
                    +  07:DT4           70.81    7.342 No_date    2:27   63.95  n/a
      [DT= 1.00]  SUM=  01:J8          1359.91  108.273 No_date    2:51   64.85  n/a
 006:0075--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:J8          1359.91  108.273 No_date    2:51   64.85  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J8.006
      remark:Hydrograph for J8
 006:0076--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:J8          1359.91  108.273 No_date    2:51   64.85  n/a
      [RDT= 1.00] out<- 02:C8          1359.91  101.132 No_date    3:02   64.85  n/a
      [L/S/n=  920./ .290/.035]
      {Vmax= 1.190:Dmax= 2.962}
 006:0077--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C8          1359.91  101.132 No_date    3:02   64.85  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C8.006
      remark:Routing Hydrograph for C8
 006:0078--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M9            17.59    2.089 No_date    2:20   61.53 .696
      [XIMP=.19:TIMP=.24]
      [LOSS= 2 :CN= 84.6]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 342.:MNI=.045:SCI=   .0]
 006:0079--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M9            17.59    2.089 No_date    2:20   61.53  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M9.006
      remark:Runoff Hydrograph for M9
 006:0080--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C8          1359.91  101.132 No_date    3:02   64.85  n/a
                    +  03:M9            17.59    2.089 No_date    2:20   61.53  n/a
      [DT= 1.00]  SUM=  01:O1          1377.50  102.071 No_date    3:02   64.80  n/a
 006:0081--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:O1          1377.50  102.071 No_date    3:02   64.80  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-O1.006
      remark:Hydrograph for O1
  ** END OF RUN :   6

********************************************************************************




 RUN:COMMAND#
 007:0001--------------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   7 ]
#*******************************************************************************
#  Project Name: [Bilberry Creek FPM Study] Project Number:[M800_200_030_209]
#  Date        : 01-12-2017
#  Modeller    : [AA, TB, SN]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#*******************************************************************************
 007:0002--------------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=30.00:SDUR=   6.00:PTOT=  88.43]
 007:0003--------------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\BilVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [Bilberry Creek Default Value File]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      Horton's infiltration equation parameters:
      [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
      Parameters for PERVIOUS surfaces in STANDHYD:
      [IAper=   4.67 mm] [LGP=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Upstream Tributary
 007:0004--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:UT1           93.87    9.829 No_date    3:22   69.05 .781
      [XIMP=.35:TIMP=.44]
      [LOSS= 2 :CN= 86.2]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 791.:MNI=.045:SCI=   .0]
 007:0005--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:UT1           93.87    9.829 No_date    3:22   69.05  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT1.007
      remark:Runoff Hydrograph for UT1
 007:0006--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:UT1           93.87    9.829 No_date    3:22   69.05  n/a
      [RDT= 1.00] out<- 02:C9            93.87    9.558 No_date    3:29   69.05  n/a
      [L/S/n=  860./1.260/.035]
      {Vmax= 1.880:Dmax=  .718}
 007:0007--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C9            93.87    9.558 No_date    3:29   69.05  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C9.007
      remark:Routing Hydrograph for C9
 007:0008--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:UT2           32.73    3.075 No_date    3:17   59.22 .670
      [XIMP=.23:TIMP=.29]
      [LOSS= 2 :CN= 80.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 467.:MNI=.045:SCI=   .0]
 007:0009--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:UT2           32.73    3.075 No_date    3:17   59.22  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT2.007
      remark:Runoff Hydrograph for UT2
 007:0010--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C9            93.87    9.558 No_date    3:29   69.05  n/a
                    +  03:UT2           32.73    3.075 No_date    3:17   59.22  n/a
      [DT= 1.00]  SUM=  04:D9           126.60   12.527 No_date    3:26   66.51  n/a
 007:0011--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:D9            126.60   12.527 No_date    3:26   66.51  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D9.007
      remark:Downstream Hydrograph for C9
# Downstream Tributary
 007:0012--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:DT1           247.46   18.795 No_date    3:33   59.49 .673
      [XIMP=.33:TIMP=.41]
      [LOSS= 2 :CN= 76.1]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1284.:MNI=.045:SCI=   .0]
 007:0013--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:DT1           247.46   18.795 No_date    3:33   59.49  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT1.007
      remark:Runoff Hydrograph for DT1
 007:0014--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:DT1           247.46   18.795 No_date    3:33   59.49  n/a
      [RDT= 1.00] out<- 02:C10           247.46   18.685 No_date    3:38   59.49  n/a
      [L/S/n=  460./ .800/.035]
      {Vmax= 2.039:Dmax= 1.224}
 007:0015--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C10           247.46   18.685 No_date    3:38   59.49  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C10.007
      remark:Routing Hydrograph for C10
 007:0016--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:DT2            20.34    1.918 No_date    3:12   57.38 .649
      [XIMP=.26:TIMP=.32]
      [LOSS= 2 :CN= 77.7]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 368.:MNI=.045:SCI=   .0]
 007:0017--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:DT2            20.34    1.918 No_date    3:12   57.38  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT2.007
      remark:Runoff Hydrograph for DT2
 007:0018--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C10           247.46   18.685 No_date    3:38   59.49  n/a
                    +  03:DT2            20.34    1.918 No_date    3:12   57.38  n/a
      [DT= 1.00]  SUM=  05:J11          267.80   20.252 No_date    3:36   59.33  n/a
 007:0019--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:J11           267.80   20.252 No_date    3:36   59.33  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J11.007
      remark:Hydrograph for J11
 007:0020--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 05:J11           267.80   20.252 No_date    3:36   59.33  n/a
      [RDT= 1.00] out<- 01:C11           267.80   19.983 No_date    3:42   59.33  n/a
      [L/S/n=  690./1.470/.035]
      {Vmax= 1.706:Dmax= 1.178}
 007:0021--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:C11           267.80   19.983 No_date    3:42   59.33  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C11.007
      remark:Routing Hydrograph for C11
 007:0022--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     02:DT3            12.63    1.723 No_date    3:08   71.24 .806
      [XIMP=.38:TIMP=.47]
      [LOSS= 2 :CN= 87.4]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 290.:MNI=.045:SCI=   .0]
 007:0023--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:DT3            12.63    1.723 No_date    3:08   71.24  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT3.007
      remark:Runoff Hydrograph for DT3
 007:0024--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     07:DT4            70.81    6.873 No_date    3:20   63.96 .723
      [XIMP=.31:TIMP=.38]
      [LOSS= 2 :CN= 82.6]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 687.:MNI=.045:SCI=   .0]
 007:0025--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:DT4            70.81    6.873 No_date    3:20   63.96  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT4.007
      remark:Runoff Hydrograph for DT4
 007:0026--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:C11           267.80   19.983 No_date    3:42   59.33  n/a
                    +  02:DT3            12.63    1.723 No_date    3:08   71.24  n/a
      [DT= 1.00]  SUM=  05:D11          280.43   21.045 No_date    3:40   59.87  n/a
 007:0027--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:D11           280.43   21.045 No_date    3:40   59.87  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D11.007
      remark:Downstream Hydrograph for C11
# Main Channel
 007:0028--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:M1             64.39    6.430 No_date    3:19   64.39 .728
      [XIMP=.32:TIMP=.40]
      [LOSS= 2 :CN= 82.3]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 655.:MNI=.045:SCI=   .0]
 007:0029--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:M1             64.39    6.430 No_date    3:19   64.39  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M1.007
      remark:Runoff Hydrograph for M1
 007:0030--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:M1             64.39    6.430 No_date    3:19   64.39  n/a
      [RDT= 1.00] out<- 02:C1            64.39    6.370 No_date    3:22   64.39  n/a
      [L/S/n=  510./1.950/.035]
      {Vmax= 2.255:Dmax=  .928}
 007:0031--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C1             64.39    6.370 No_date    3:22   64.39  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C1.007
      remark:Routing Hydrograph for C1
 007:0032--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M2             26.14    2.794 No_date    3:13   63.03 .713
      [XIMP=.32:TIMP=.40]
      [LOSS= 2 :CN= 80.8]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 418.:MNI=.045:SCI=   .0]
 007:0033--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M2             26.14    2.794 No_date    3:13   63.03  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M2.007
      remark:Runoff Hydrograph for M2
 007:0034--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C1             64.39    6.370 No_date    3:22   64.39  n/a
                    +  03:M2             26.14    2.794 No_date    3:13   63.03  n/a
      [DT= 1.00]  SUM=  06:D1           90.53    9.030 No_date    3:20   64.00  n/a
 007:0035--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:D1             90.53    9.030 No_date    3:20   64.00  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D1.007
      remark:Downstream Hydrograph for C1
 007:0036--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:D9           126.60   12.527 No_date    3:26   66.51  n/a
                    +  06:D1             90.53    9.030 No_date    3:20   64.00  n/a
      [DT= 1.00]  SUM=  01:J2           217.13   21.445 No_date    3:24   65.46  n/a
 007:0037--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:J2            217.13   21.445 No_date    3:24   65.46  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J2.007
      remark:Hydrograph for J2
 007:0038--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:J2            217.13   21.445 No_date    3:24   65.46  n/a
      [RDT= 1.00] out<- 02:C2            217.13   21.298 No_date    3:28   65.46  n/a
      [L/S/n=  770./2.030/.035]
      {Vmax= 3.216:Dmax= 1.416}
 007:0039--------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C2            217.13   21.298 No_date    3:28   65.46  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C2.007
      remark:Routing Hydrograph for C2
```

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007:0040--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M3           212.90   18.641 No_date    3:32   65.69 .743
     [XIMP=.31:TIMP=.39]
     [LOSS= 2 :CN= 84.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1191.:MNI=.045:SCI=   .0]
007:0041--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M3           212.90   18.641 No_date    3:32   65.69  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M3.007
     remark:Runoff Hydrograph for M3
007:0042--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C2           217.13   21.298 No_date    3:28   65.46  n/a
                   +  03:M3           212.90   18.641 No_date    3:32   65.69  n/a
     [DT= 1.00]  SUM=  01:J3           430.03   39.848 No_date    3:30   65.58  n/a
007:0043--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J3           430.03   39.848 No_date    3:30   65.58  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J3.007
     remark:Hydrograph for J3
007:0044--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J3           430.03   39.848 No_date    3:30   65.58  n/a
     [RDT= 1.00] out<- 02:C3           430.03   39.768 No_date    3:32   65.58  n/a
     [L/S/n=  450./1.190/.035]
     {Vmax= 3.135:Dmax= 1.715}
007:0045--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C3           430.03   39.768 No_date    3:32   65.58  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C3.007
     remark:Routing Hydrograph for C3
007:0046--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M4           432.99   33.897 No_date    3:43   66.70 .754
     [XIMP=.34:TIMP=.42]
     [LOSS= 2 :CN= 84.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1699.:MNI=.045:SCI=   .0]
007:0047--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M4           432.99   33.897 No_date    3:43   66.70  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M4.007
     remark:Runoff Hydrograph for M4A
007:0048--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C3           430.03   39.768 No_date    3:32   65.58  n/a
                   +  03:M4           432.99   33.897 No_date    3:43   66.70  n/a
     [DT= 1.00]  SUM=  01:J4           863.02   72.820 No_date    3:37   66.14  n/a
007:0049--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J4           863.02   72.820 No_date    3:37   66.14  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J4.007
     remark:Hydrograph for J4
007:0050--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J4           863.02   72.820 No_date    3:37   66.14  n/a
     [RDT= 1.00] out<- 02:C4           863.02   72.527 No_date    3:40   66.14  n/a
     [L/S/n=  850./1.140/.035]
     {Vmax= 3.890:Dmax= 2.465}
007:0051--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C4           863.02   72.527 No_date    3:40   66.14  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C4.007
     remark:Routing Hydrograph for C4
007:0052--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M5            35.47    3.327 No_date    3:18   59.62 .674
     [XIMP=.21:TIMP=.26]
     [LOSS= 2 :CN= 82.3]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 486.:MNI=.045:SCI=   .0]
007:0053--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M5            35.47    3.327 No_date    3:18   59.62  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M5.007
     remark:Runoff Hydrograph for M5
007:0054--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C4           863.02   72.527 No_date    3:40   66.14  n/a
                   +  03:M5            35.47    3.327 No_date    3:18   59.62  n/a
     [DT= 1.00]  SUM=  01:J5           898.49   75.372 No_date    3:40   65.88  n/a
007:0055--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J5           898.49   75.372 No_date    3:40   65.88  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J5.007
     remark:Hydrograph for J5
007:0056--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J5           898.49   75.372 No_date    3:40   65.88  n/a
     [RDT= 1.00] out<- 02:C5           898.49   74.794 No_date    3:44   65.88  n/a
     [L/S/n=  880./1.600/.035]
     {Vmax= 3.550:Dmax= 1.933}
007:0057--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C5           898.49   74.794 No_date    3:44   65.88  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C5.007
     remark:Routing Hydrograph for C5
007:0058--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M6            64.01    7.895 No_date    3:18   75.65 .855
     [XIMP=.37:TIMP=.46]
     [LOSS= 2 :CN= 92.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 653.:MNI=.045:SCI=   .0]
007:0059--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M6            64.01    7.895 No_date    3:18   75.65  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M6.007
     remark:Runoff Hydrograph for M6
007:0060--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C5           898.49   74.794 No_date    3:44   65.88  n/a
                   +  03:M6            64.01    7.895 No_date    3:18   75.65  n/a
     [DT= 1.00]  SUM=  01:J6           962.50   80.979 No_date    3:43   66.53  n/a
007:0061--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J6           962.50   80.979 No_date    3:43   66.53  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J6.007
     remark:Hydrograph for J6
007:0062--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J6           962.50   80.979 No_date    3:43   66.53  n/a
     [RDT= 1.00] out<- 02:C6           962.50   80.327 No_date    3:47   66.53  n/a
     [L/S/n=  980./1.490/.035]
     {Vmax= 3.330:Dmax= 2.271}
007:0063--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C6           962.50   80.327 No_date    3:47   66.53  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C6.007
     remark:Routing Hydrograph for C6
007:0064--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M7            24.39    2.102 No_date    3:19   54.84 .620
     [XIMP=.18:TIMP=.22]
     [LOSS= 2 :CN= 79.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 403.:MNI=.045:SCI=   .0]
007:0065--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M7            24.39    2.102 No_date    3:19   54.84  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M7.007
     remark:Runoff Hydrograph for M7
007:0066--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C6           962.50   80.327 No_date    3:47   66.53  n/a
                   +  03:M7            24.39    2.102 No_date    3:19   54.84  n/a
     [DT= 1.00]  SUM=  01:J7           986.89   81.942 No_date    3:47   66.24  n/a
007:0067--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J7           986.89   81.942 No_date    3:47   66.24  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J7.007
     remark:Hydrograph for J7
007:0068--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J7           986.89   81.942 No_date    3:47   66.24  n/a
     [RDT= 1.00] out<- 02:C7           986.89   81.714 No_date    3:49   66.24  n/a
     [L/S/n=  530./1.410/.035]
     {Vmax= 2.989:Dmax= 2.237}
007:0069--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C7           986.89   81.714 No_date    3:49   66.24  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C7.007
     remark:Routing Hydrograph for C7
007:0070--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M8            21.78    2.719 No_date    3:11   69.13 .782
     [XIMP=.38:TIMP=.48]
     [LOSS= 2 :CN= 84.8]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 381.:MNI=.045:SCI=   .0]
007:0071--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M8            21.78    2.719 No_date    3:11   69.13  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M8.007
     remark:Runoff Hydrograph for M8
007:0072--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C7           986.89   81.714 No_date    3:49   66.24  n/a
                   +  03:M8            21.78    2.719 No_date    3:11   69.13  n/a
     [DT= 1.00]  SUM=  04:D7          1008.67   83.264 No_date    3:49   66.31  n/a
007:0073--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           04:D7          1008.67   83.264 No_date    3:49   66.31  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D7.007
     remark:Downstream Hydrograph for C7
007:0074--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:D7          1008.67   83.264 No_date    3:49   66.31  n/a
                   +  05:D11           280.43   21.045 No_date    3:40   59.87  n/a
                   +  07:DT4            70.81    6.873 No_date    3:20   63.96  n/a
     [DT= 1.00]  SUM=  01:J8          1359.91  109.464 No_date    3:46   64.86  n/a
007:0075--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J8          1359.91  109.464 No_date    3:46   64.86  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J8.007
     remark:Hydrograph for J8
007:0076--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J8          1359.91  109.464 No_date    3:46   64.86  n/a
     [RDT= 1.00] out<- 02:C8          1359.91  103.363 No_date    3:57   64.86  n/a
     [L/S/n=  920./ .290/.035]
     {Vmax= 1.193:Dmax= 2.972}
007:0077--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C8          1359.91  103.363 No_date    3:57   64.86  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C8.007
     remark:Routing Hydrograph for C8
007:0078--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M9            17.59    1.841 No_date    3:14   61.54 .696
     [XIMP=.19:TIMP=.24]
     [LOSS= 2 :CN= 84.6]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 342.:MNI=.045:SCI=   .0]
007:0079--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M9            17.59    1.841 No_date    3:14   61.54  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M9.007
     remark:Runoff Hydrograph for M9
007:0080--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C8          1359.91  103.363 No_date    3:57   64.86  n/a
                   +  03:M9            17.59    1.841 No_date    3:14   61.54  n/a
     [DT= 1.00]  SUM=  01:O1          1377.50  104.437 No_date    3:56   64.81  n/a
007:0081--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:O1          1377.50  104.437 No_date    3:56   64.81  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-O1.007
     remark:Hydrograph for O1
 ** END OF RUN :  11

************************************************************************




 RUN:COMMAND#
 012:0001--------------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =  12 ]
 #*************************************************************************
 #  Project Name: [Bilberry Creek FPM Study] Project Number:[M800_200_030_209]
 #  Date        : 01-12-2017
 #  Modeller    : [AA, TB, SN]
 #  Company     : Rideau Valley Conservation Authority
 #  License #   :  5329846
 #*************************************************************************
 012:0002--------------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=10.00:SDUR=  12.00:PTOT= 104.44]
 012:0003--------------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\BilVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [Bilberry Creek Default Value File]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      Horton's infiltration equation parameters:
      [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
      Parameters for PERVIOUS surfaces in STANDHYD:
      [IAper=   4.67 mm] [LGP=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
 # Upstream Tributary
 012:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:UT1           93.87   11.075 No_date    4:28   84.26 .807
      [XIMP=.35:TIMP=.44]
      [LOSS= 2 :CN= 86.2]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 791.:MNI=.045:SCI=   .0]
 012:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:UT1           93.87   11.075 No_date    4:28   84.26  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT1.012
      remark:Runoff Hydrograph for UT1
 012:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:UT1           93.87   11.075 No_date    4:28   84.26  n/a
      [RDT= 1.00] out<- 02:C9           93.87   10.727 No_date    4:33   84.26  n/a
      [L/S/n=  860./1.260/.035]
      {Vmax= 1.969:Dmax=  .761}
```

```
012:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C9            93.87   10.727 No_date    4:33   84.26  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C9.012
     remark:Routing Hydrograph for C9
012:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:UT2           32.73    3.662 No_date    4:22   73.50 .704
     [XIMP=.23:TIMP=.29]
     [LOSS= 2 :CN= 80.9]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 467.:MNI=.045:SCI=   .0]
012:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:UT2           32.73    3.662 No_date    4:22   73.50  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT2.012
     remark:Runoff Hydrograph for UT2
012:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C9            93.87   10.727 No_date    4:33   84.26  n/a
                     + 03:UT2           32.73    3.662 No_date    4:22   73.50  n/a
      [DT= 1.00]  SUM=  04:D9           126.60   14.057 No_date    4:31   81.48  n/a
012:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           04:D9            126.60   14.057 No_date    4:31   81.48  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D9.012
     remark:Downstream Hydrograph for C9
# Downstream Tributary
012:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     01:DT1           247.46   20.040 No_date    4:41   73.50 .704
     [XIMP=.33:TIMP=.41]
     [LOSS= 2 :CN= 76.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1284.:MNI=.045:SCI=   .0]
012:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:DT1           247.46   20.040 No_date    4:41   73.50  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT1.012
     remark:Runoff Hydrograph for DT1
012:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:DT1           247.46   20.040 No_date    4:41   73.50  n/a
     [RDT= 1.00] out<- 02:C10           247.46   19.920 No_date    4:44   73.50  n/a
     [L/S/n=  460./ .800/.035]
     {Vmax= 2.059:Dmax= 1.254}
012:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C10           247.46   19.920 No_date    4:44   73.50  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C10.012
     remark:Routing Hydrograph for C10
012:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:DT2            20.34    2.326 No_date    4:18   71.30 .683
     [XIMP=.26:TIMP=.32]
     [LOSS= 2 :CN= 77.7]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 368.:MNI=.045:SCI=   .0]
012:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:DT2            20.34    2.326 No_date    4:18   71.30  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT2.012
     remark:Runoff Hydrograph for DT2
012:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C10           247.46   19.920 No_date    4:44   73.50  n/a
                     + 03:DT2            20.34    2.326 No_date    4:18   71.30  n/a
      [DT= 1.00]  SUM=  05:J11          267.80   21.421 No_date    4:42   73.33  n/a
012:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           05:J11           267.80   21.421 No_date    4:42   73.33  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J11.012
     remark:Hydrograph for J11
012:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 05:J11           267.80   21.421 No_date    4:42   73.33  n/a
     [RDT= 1.00] out<- 01:C11           267.80   21.101 No_date    4:47   73.33  n/a
     [L/S/n=  690./1.470/.035]
     {Vmax= 1.728:Dmax= 1.196}
012:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:C11           267.80   21.101 No_date    4:47   73.33  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C11.012
     remark:Routing Hydrograph for C11
012:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     02:DT3            12.63    2.128 No_date    4:09   86.62 .829
     [XIMP=.38:TIMP=.47]
     [LOSS= 2 :CN= 87.4]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 290.:MNI=.045:SCI=   .0]
012:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:DT3            12.63    2.128 No_date    4:09   86.62  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT3.012
     remark:Runoff Hydrograph for DT3
012:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     07:DT4            70.81    7.896 No_date    4:27   78.67 .753
     [XIMP=.31:TIMP=.38]
     [LOSS= 2 :CN= 82.6]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 687.:MNI=.045:SCI=   .0]
012:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           07:DT4            70.81    7.896 No_date    4:27   78.67  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT4.012
     remark:Runoff Hydrograph for DT4
012:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:C11           267.80   21.101 No_date    4:47   73.33  n/a
                     + 02:DT3            12.63    2.128 No_date    4:09   86.62  n/a
      [DT= 1.00]  SUM=  05:D11          280.43   22.031 No_date    4:46   73.93  n/a
012:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           05:D11           280.43   22.031 No_date    4:46   73.93  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D11.012
     remark:Downstream Hydrograph for C11
# Main Channel
012:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     01:M1             64.39    7.314 No_date    4:26   79.12 .758
     [XIMP=.32:TIMP=.40]
     [LOSS= 2 :CN= 82.3]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 655.:MNI=.045:SCI=   .0]
012:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:M1             64.39    7.314 No_date    4:26   79.12  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M1.012
     remark:Runoff Hydrograph for M1
012:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:M1             64.39    7.314 No_date    4:26   79.12  n/a
     [RDT= 1.00] out<- 02:C1            64.39    7.260 No_date    4:28   79.12  n/a
     [L/S/n=  510./1.950/.035]
     {Vmax= 2.335:Dmax=  .978}
012:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C1             64.39    7.260 No_date    4:28   79.12  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C1.012
     remark:Routing Hydrograph for C1
012:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M2             26.14    3.326 No_date    4:18   77.58 .743
     [XIMP=.32:TIMP=.40]
     [LOSS= 2 :CN= 80.8]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 418.:MNI=.045:SCI=   .0]
012:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M2             26.14    3.326 No_date    4:18   77.58  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M2.012
     remark:Runoff Hydrograph for M2
012:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C1             64.39    7.260 No_date    4:28   79.12  n/a
                     + 03:M2             26.14    3.326 No_date    4:18   77.58  n/a
      [DT= 1.00]  SUM=  06:D1           90.53   10.338 No_date    4:24   78.67  n/a
012:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           06:D1            90.53   10.338 No_date    4:24   78.67  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D1.012
     remark:Downstream Hydrograph for C1
012:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:D9            126.60   14.057 No_date    4:31   81.48  n/a
                     + 06:D1            90.53   10.338 No_date    4:24   78.67  n/a
      [DT= 1.00]  SUM=  01:J2           217.13   24.225 No_date    4:28   80.31  n/a
012:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J2            217.13   24.225 No_date    4:28   80.31  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J2.012
     remark:Hydrograph for J2
012:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J2           217.13   24.225 No_date    4:28   80.31  n/a
     [RDT= 1.00] out<- 02:C2           217.13   23.959 No_date    4:31   80.31  n/a
     [L/S/n=  770./2.030/.035]
     {Vmax= 3.293:Dmax= 1.473}
012:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C2            217.13   23.959 No_date    4:31   80.31  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C2.012
     remark:Routing Hydrograph for C2
012:0040--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M3            212.90   20.041 No_date    4:39   80.60 .772
     [XIMP=.31:TIMP=.39]
     [LOSS= 2 :CN= 84.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1191.:MNI=.045:SCI=   .0]
012:0041--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M3            212.90   20.041 No_date    4:39   80.60  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M3.012
     remark:Runoff Hydrograph for M3
012:0042--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C2            217.13   23.959 No_date    4:31   80.31  n/a
                     + 03:M3            212.90   20.041 No_date    4:39   80.60  n/a
      [DT= 1.00]  SUM=  01:J3           430.03   43.513 No_date    4:35   80.45  n/a
012:0043--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J3            430.03   43.513 No_date    4:35   80.45  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J3.012
     remark:Hydrograph for J3
012:0044--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J3           430.03   43.513 No_date    4:35   80.45  n/a
     [RDT= 1.00] out<- 02:C3           430.03   43.424 No_date    4:36   80.45  n/a
     [L/S/n=  450./1.190/.035]
     {Vmax= 3.219:Dmax= 1.791}
012:0045--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C3            430.03   43.424 No_date    4:36   80.45  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C3.012
     remark:Routing Hydrograph for C3
012:0046--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M4            432.99   35.715 No_date    4:50   81.67 .782
     [XIMP=.34:TIMP=.42]
     [LOSS= 2 :CN= 84.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1699.:MNI=.045:SCI=   .0]
012:0047--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M4            432.99   35.715 No_date    4:50   81.67  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M4.012
     remark:Runoff Hydrograph for M4A
012:0048--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C3            430.03   43.424 No_date    4:36   80.45  n/a
                     + 03:M4            432.99   35.715 No_date    4:50   81.67  n/a
      [DT= 1.00]  SUM=  01:J4           863.02   77.377 No_date    4:40   81.07  n/a
012:0049--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J4            863.02   77.377 No_date    4:40   81.07  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J4.012
     remark:Hydrograph for J4
012:0050--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J4           863.02   77.377 No_date    4:40   81.07  n/a
     [RDT= 1.00] out<- 02:C4           863.02   76.943 No_date    4:44   81.07  n/a
     [L/S/n=  850./1.140/.035]
     {Vmax= 3.952:Dmax= 2.535}
012:0051--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C4            863.02   76.943 No_date    4:44   81.07  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C4.012
     remark:Routing Hydrograph for C4
012:0052--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M5             35.47    3.941 No_date    4:24   74.01 .709
     [XIMP=.21:TIMP=.26]
     [LOSS= 2 :CN= 82.3]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 486.:MNI=.045:SCI=   .0]
012:0053--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M5             35.47    3.941 No_date    4:24   74.01  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M5.012
     remark:Runoff Hydrograph for M5
012:0054--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C4            863.02   76.943 No_date    4:44   81.07  n/a
                     + 03:M5             35.47    3.941 No_date    4:24   74.01  n/a
      [DT= 1.00]  SUM=  01:J5           898.49   79.941 No_date    4:43   80.79  n/a
012:0055--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J5            898.49   79.941 No_date    4:43   80.79  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J5.012
     remark:Hydrograph for J5
012:0056--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J5           898.49   79.941 No_date    4:43   80.79  n/a
     [RDT= 1.00] out<- 02:C5           898.49   79.161 No_date    4:48   80.79  n/a
     [L/S/n=  880./1.600/.035]
     {Vmax= 3.537:Dmax= 1.983}
012:0057--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C5            898.49   79.161 No_date    4:48   80.79  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C5.012
     remark:Routing Hydrograph for C5
012:0058--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M6             64.01    9.069 No_date    4:24   91.37 .875
     [XIMP=.37:TIMP=.46]
     [LOSS= 2 :CN= 92.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 653.:MNI=.045:SCI=   .0]
012:0059--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M6             64.01    9.069 No_date    4:24   91.37  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M6.012
     remark:Runoff Hydrograph for M6
012:0060--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C5            898.49   79.161 No_date    4:48   80.79  n/a
                     + 03:M6             64.01    9.069 No_date    4:24   91.37  n/a
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     [DT= 1.00]  SUM=  01:J6           962.50   85.523 No_date    4:46   81.49  n/a
 012:0061---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          01:J6           962.50   85.523 No_date    4:46   81.49  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J6.012
      remark:Hydrograph for J6
 012:0062---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:J6           962.50   85.523 No_date    4:46   81.49  n/a
      [RDT= 1.00] out<- 02:C6           962.50   84.636 No_date    4:51   81.49  n/a
      [L/S/n=  980./1.490/.035]
      {Vmax= 3.343:Dmax= 2.307}
 012:0063---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          02:C6           962.50   84.636 No_date    4:51   81.49  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C6.012
      remark:Routing Hydrograph for C6
 012:0064---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD    03:M7            24.39    2.538 No_date    4:22   68.66 .657
      [XIMP=.18:TIMP=.22]
      [LOSS= 2 :CN= 79.2]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 403.:MNI=.045:SCI=   .0]
 012:0065---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          03:M7            24.39    2.538 No_date    4:22   68.66  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M7.012
      remark:Runoff Hydrograph for M7
 012:0066---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           02:C6           962.50   84.636 No_date    4:51   81.49  n/a
                    +  03:M7            24.39    2.538 No_date    4:22   68.66  n/a
      [DT= 1.00]  SUM=  01:J7           986.89   86.233 No_date    4:51   81.17  n/a
 012:0067---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          01:J7           986.89   86.233 No_date    4:51   81.17  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J7.012
      remark:Hydrograph for J7
 012:0068---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:J7           986.89   86.233 No_date    4:51   81.17  n/a
      [RDT= 1.00] out<- 02:C7           986.89   85.949 No_date    4:53   81.17  n/a
      [L/S/n=  530./1.410/.035]
      {Vmax= 3.013:Dmax= 2.277}
 012:0069---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          02:C7           986.89   85.949 No_date    4:53   81.17  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C7.012
      remark:Routing Hydrograph for C7
 012:0070---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD    03:M8            21.78    3.292 No_date    4:12   84.28 .807
      [XIMP=.38:TIMP=.48]
      [LOSS= 2 :CN= 84.8]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 381.:MNI=.045:SCI=   .0]
 012:0071---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          03:M8            21.78    3.292 No_date    4:12   84.28  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M8.012
      remark:Runoff Hydrograph for M8
 012:0072---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           02:C7           986.89   85.949 No_date    4:53   81.17  n/a
                    +  03:M8            21.78    3.292 No_date    4:12   84.28  n/a
      [DT= 1.00]  SUM=  04:D7          1008.67   87.405 No_date    4:53   81.24  n/a
 012:0073---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          04:D7          1008.67   87.405 No_date    4:53   81.24  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D7.012
      remark:Downstream Hydrograph for C7
 012:0074---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           04:D7          1008.67   87.405 No_date    4:53   81.24  n/a
                    +  05:D11           280.43   22.031 No_date    4:46   73.93  n/a
                    +  07:DT4            70.81    7.896 No_date    4:27   78.67  n/a
      [DT= 1.00]  SUM=  01:J8          1359.91  114.736 No_date    4:51   79.60  n/a
 012:0075---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          01:J8          1359.91  114.736 No_date    4:51   79.60  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J8.012
      remark:Hydrograph for J8
 012:0076---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:J8          1359.91  114.736 No_date    4:51   79.60  n/a
      [RDT= 1.00] out<- 02:C8          1359.91  107.469 No_date    5:01   79.60  n/a
      [L/S/n=  920./ .290/.035]
      {Vmax= 1.211:Dmax= 3.017}
 012:0077---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          02:C8          1359.91  107.469 No_date    5:01   79.60  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C8.012
      remark:Routing Hydrograph for C8
 012:0078---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD    03:M9            17.59    2.249 No_date    4:20   76.22 .730
      [XIMP=.19:TIMP=.24]
      [LOSS= 2 :CN= 84.6]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 342.:MNI=.045:SCI=   .0]
 012:0079---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          03:M9            17.59    2.249 No_date    4:20   76.22  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M9.012
      remark:Runoff Hydrograph for M9
 012:0080---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           02:C8          1359.91  107.469 No_date    5:01   79.60  n/a
                    +  03:M9            17.59    2.249 No_date    4:20   76.22  n/a
      [DT= 1.00]  SUM=  01:O1          1377.50  108.466 No_date    5:01   79.56  n/a
 012:0081---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          01:O1          1377.50  108.466 No_date    5:01   79.56  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-O1.012
      remark:Hydrograph for O1
  ** END OF RUN :  12

*******************************************************************************




 RUN:COMMAND#
 013:0001---------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on       0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =  13 ]
#*****************************************************************************
#  Project Name: [Bilberry Creek FPM Study] Project Number:[M800_200_030_209]
#  Date        : 01-12-2017
#  Modeller    : [AA, TB, SN]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#*****************************************************************************
 013:0002---------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=30.00:SDUR=  12.00:PTOT= 104.44]
 013:0003---------------------------------------------------------------------------
      DEFAULT VALUES
       Filename = C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\BilVal.val
       ICASEdv  = 1 (read and print data)
       FileTitle= File comment: [Bilberry Creek Default Value File]
                  THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
       Horton's infiltration equation parameters:
       [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
       Parameters for PERVIOUS surfaces in STANDHYD:
       [IAper=   4.67 mm] [LGP=90.00 m] [MNP= .250]
       Parameters for IMPERVIOUS surfaces in STANDHYD:
       [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
       Parameters used in NASHYD:
       [Ia=   1.50 mm] [N= 3.00]
# Upstream Tributary
 013:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD    01:UT1           93.87   10.882 No_date    6:19   84.27 .807
      [XIMP=.35:TIMP=.44]
      [LOSS= 2 :CN= 86.2]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 791.:MNI=.045:SCI=   .0]
 013:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          01:UT1           93.87   10.882 No_date    6:19   84.27  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT1.013
      remark:Runoff Hydrograph for UT1
 013:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:UT1           93.87   10.882 No_date    6:19   84.27  n/a
      [RDT= 1.00] out<- 02:C9           93.87   10.565 No_date    6:25   84.27  n/a
      [L/S/n=  860./1.260/.035]
      {Vmax= 1.955:Dmax=  .754}
 013:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          02:C9           93.87   10.565 No_date    6:25   84.27  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C9.013
      remark:Routing Hydrograph for C9
 013:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD    03:UT2           32.73    3.560 No_date    6:14   73.50 .704
      [XIMP=.23:TIMP=.29]
      [LOSS= 2 :CN= 80.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 467.:MNI=.045:SCI=   .0]
 013:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          03:UT2           32.73    3.560 No_date    6:14   73.50  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT2.013
      remark:Runoff Hydrograph for UT2
 013:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           02:C9           93.87   10.565 No_date    6:25   84.27  n/a
                    +  03:UT2           32.73    3.560 No_date    6:14   73.50  n/a
      [DT= 1.00]  SUM=  04:D9          126.60   13.915 No_date    6:22   81.48  n/a
 013:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          04:D9          126.60   13.915 No_date    6:22   81.48  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D9.013
      remark:Downstream Hydrograph for C9
# Downstream Tributary
 013:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD    01:DT1          247.46   20.771 No_date    6:30   73.50 .704
      [XIMP=.33:TIMP=.41]
      [LOSS= 2 :CN= 76.1]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1284.:MNI=.045:SCI=   .0]
 013:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          01:DT1          247.46   20.771 No_date    6:30   73.50  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT1.013
      remark:Runoff Hydrograph for DT1
 013:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:DT1          247.46   20.771 No_date    6:30   73.50  n/a
      [RDT= 1.00] out<- 02:C10          247.46   20.618 No_date    6:34   73.50  n/a
      [L/S/n=  460./ .800/.035]
      {Vmax= 2.071:Dmax= 1.272}
 013:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          02:C10          247.46   20.618 No_date    6:34   73.50  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C10.013
      remark:Routing Hydrograph for C10
 013:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD    03:DT2           20.34    2.245 No_date    6:11   71.30 .683
      [XIMP=.26:TIMP=.32]
      [LOSS= 2 :CN= 77.7]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 368.:MNI=.045:SCI=   .0]
 013:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          03:DT2           20.34    2.245 No_date    6:11   71.30  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT2.013
      remark:Runoff Hydrograph for DT2
 013:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           02:C10          247.46   20.618 No_date    6:34   73.50  n/a
                    +  03:DT2           20.34    2.245 No_date    6:11   71.30  n/a
      [DT= 1.00]  SUM=  05:J11         267.80   22.330 No_date    6:32   73.33  n/a
 013:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          05:J11          267.80   22.330 No_date    6:32   73.33  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J11.013
      remark:Hydrograph for J11
 013:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 05:J11          267.80   22.330 No_date    6:32   73.33  n/a
      [RDT= 1.00] out<- 01:C11          267.80   21.958 No_date    6:38   73.33  n/a
      [L/S/n=  690./1.470/.035]
      {Vmax= 1.742:Dmax= 1.209}
 013:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          01:C11          267.80   21.958 No_date    6:38   73.33  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C11.013
      remark:Routing Hydrograph for C11
 013:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD    02:DT3           12.63    1.922 No_date    6:07   86.62 .829
      [XIMP=.38:TIMP=.47]
      [LOSS= 2 :CN= 87.4]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 290.:MNI=.045:SCI=   .0]
 013:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          02:DT3           12.63    1.922 No_date    6:07   86.62  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT3.013
      remark:Runoff Hydrograph for DT3
 013:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD    07:DT4           70.81    7.731 No_date    6:18   78.68 .753
      [XIMP=.31:TIMP=.38]
      [LOSS= 2 :CN= 82.6]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 687.:MNI=.045:SCI=   .0]
 013:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          07:DT4           70.81    7.731 No_date    6:18   78.68  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT4.013
      remark:Runoff Hydrograph for DT4
 013:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:C11          267.80   21.958 No_date    6:38   73.33  n/a
                    +  02:DT3           12.63    1.922 No_date    6:07   86.62  n/a
      [DT= 1.00]  SUM=  05:D11         280.43   23.046 No_date    6:37   73.93  n/a
 013:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
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    SAVE HYD          05:D11         280.43   23.046 No_date    6:37   73.93  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D11.013
     remark:Downstream Hydrograph for C11
# Main Channel
013:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    01:M1            64.39    7.194 No_date    6:17   79.13 .758
     [XIMP=.32:TIMP=.40]
     [LOSS= 2 :CN= 82.3]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 655.:MNI=.045:SCI=   .0]
013:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:M1            64.39    7.194 No_date    6:17   79.13  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M1.013
     remark:Runoff Hydrograph for M1
013:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:M1            64.39    7.194 No_date    6:17   79.13  n/a
     [RDT= 1.00] out<- 02:C1            64.39    7.126 No_date    6:20   79.13  n/a
     [L/S/n=  510./1.950/.035]
     {Vmax= 2.323:Dmax=  .971}
013:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C1            64.39    7.126 No_date    6:20   79.13  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C1.013
     remark:Routing Hydrograph for C1
013:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M2            26.14    3.161 No_date    6:11   77.58 .743
     [XIMP=.32:TIMP=.40]
     [LOSS= 2 :CN= 80.8]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 418.:MNI=.045:SCI=   .0]
013:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M2            26.14    3.161 No_date    6:11   77.58  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M2.013
     remark:Runoff Hydrograph for M2
013:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C1            64.39    7.126 No_date    6:20   79.13  n/a
                  +   03:M2            26.14    3.161 No_date    6:11   77.58  n/a
     [DT= 1.00]  SUM=  06:D1            90.53   10.118 No_date    6:17   78.68  n/a
013:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          06:D1            90.53   10.118 No_date    6:17   78.68  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D1.013
     remark:Downstream Hydrograph for C1
013:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           04:D9           126.60   13.915 No_date    6:22   81.48  n/a
                  +   06:D1            90.53   10.118 No_date    6:17   78.68  n/a
     [DT= 1.00]  SUM=  01:J2           217.13   23.894 No_date    6:20   80.31  n/a
013:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J2            217.13   23.894 No_date    6:20   80.31  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J2.013
     remark:Hydrograph for J2
013:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J2            217.13   23.894 No_date    6:20   80.31  n/a
     [RDT= 1.00] out<- 02:C2            217.13   23.693 No_date    6:24   80.31  n/a
     [L/S/n=  770./2.030/.035]
     {Vmax= 3.284:Dmax= 1.467}
013:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C2            217.13   23.693 No_date    6:24   80.31  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C2.013
     remark:Routing Hydrograph for C2
013:0040--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M3            212.90   20.685 No_date    6:28   80.61 .772
     [XIMP=.31:TIMP=.39]
     [LOSS= 2 :CN= 84.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1191.:MNI=.045:SCI=   .0]
013:0041--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M3            212.90   20.685 No_date    6:28   80.61  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M3.013
     remark:Runoff Hydrograph for M3
013:0042--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C2           217.13   23.693 No_date    6:24   80.31  n/a
                  +   03:M3           212.90   20.685 No_date    6:28   80.61  n/a
     [DT= 1.00]  SUM=  01:J3           430.03   44.239 No_date    6:26   80.46  n/a
013:0043--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J3            430.03   44.239 No_date    6:26   80.46  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J3.013
     remark:Hydrograph for J3
013:0044--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J3            430.03   44.239 No_date    6:26   80.46  n/a
     [RDT= 1.00] out<- 02:C3            430.03   44.145 No_date    6:28   80.46  n/a
     [L/S/n=  450./1.190/.035]
     {Vmax= 3.237:Dmax= 1.806}
013:0045--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C3            430.03   44.145 No_date    6:28   80.46  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C3.013
     remark:Routing Hydrograph for C3
013:0046--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M4            432.99   36.841 No_date    6:40   81.68 .782
     [XIMP=.34:TIMP=.42]
     [LOSS= 2 :CN= 84.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1699.:MNI=.045:SCI=   .0]
013:0047--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M4            432.99   36.841 No_date    6:40   81.68  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M4.013
     remark:Runoff Hydrograph for M4A
013:0048--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C3           430.03   44.145 No_date    6:28   80.46  n/a
                  +   03:M4           432.99   36.841 No_date    6:40   81.68  n/a
     [DT= 1.00]  SUM=  01:J4           863.02   79.491 No_date    6:33   81.07  n/a
013:0049--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J4            863.02   79.491 No_date    6:33   81.07  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J4.013
     remark:Hydrograph for J4
013:0050--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J4            863.02   79.491 No_date    6:33   81.07  n/a
     [RDT= 1.00] out<- 02:C4            863.02   79.136 No_date    6:36   81.07  n/a
     [L/S/n=  850./1.140/.035]
     {Vmax= 3.981:Dmax= 2.568}
013:0051--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C4            863.02   79.136 No_date    6:36   81.07  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C4.013
     remark:Routing Hydrograph for C4
013:0052--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M5             35.47    3.832 No_date    6:16   74.02 .709
     [XIMP=.21:TIMP=.26]
     [LOSS= 2 :CN= 82.3]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 486.:MNI=.045:SCI=   .0]
013:0053--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M5             35.47    3.832 No_date    6:16   74.02  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M5.013
     remark:Runoff Hydrograph for M5
013:0054--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C4           863.02   79.136 No_date    6:36   81.07  n/a
                  +   03:M5            35.47    3.832 No_date    6:16   74.02  n/a
     [DT= 1.00]  SUM=  01:J5           898.49   82.286 No_date    6:35   80.79  n/a
013:0055--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J5            898.49   82.286 No_date    6:35   80.79  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J5.013
     remark:Hydrograph for J5
013:0056--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J5            898.49   82.286 No_date    6:35   80.79  n/a
     [RDT= 1.00] out<- 02:C5            898.49   81.571 No_date    6:40   80.79  n/a
     [L/S/n=  880./1.600/.035]
     {Vmax= 3.533:Dmax= 2.001}
013:0057--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C5            898.49   81.571 No_date    6:40   80.79  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C5.013
     remark:Routing Hydrograph for C5
013:0058--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M6             64.01    8.583 No_date    6:16   91.37 .875
     [XIMP=.37:TIMP=.46]
     [LOSS= 2 :CN= 92.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 653.:MNI=.045:SCI=   .0]
013:0059--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M6             64.01    8.583 No_date    6:16   91.37  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M6.013
     remark:Runoff Hydrograph for M6
013:0060--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C5           898.49   81.571 No_date    6:40   80.79  n/a
                  +   03:M6            64.01    8.583 No_date    6:16   91.37  n/a
     [DT= 1.00]  SUM=  01:J6           962.50   88.087 No_date    6:38   81.50  n/a
013:0061--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J6            962.50   88.087 No_date    6:38   81.50  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J6.013
     remark:Hydrograph for J6
013:0062--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J6            962.50   88.087 No_date    6:38   81.50  n/a
     [RDT= 1.00] out<- 02:C6            962.50   87.255 No_date    6:43   81.50  n/a
     [L/S/n=  980./1.490/.035]
     {Vmax= 3.351:Dmax= 2.328}
013:0063--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C6            962.50   87.255 No_date    6:43   81.50  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C6.013
     remark:Routing Hydrograph for C6
013:0064--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M7             24.39    2.486 No_date    6:14   68.66 .657
     [XIMP=.18:TIMP=.22]
     [LOSS= 2 :CN= 79.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 403.:MNI=.045:SCI=   .0]
013:0065--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M7             24.39    2.486 No_date    6:14   68.66  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M7.013
     remark:Runoff Hydrograph for M7
013:0066--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C6           962.50   87.255 No_date    6:43   81.50  n/a
                  +   03:M7            24.39    2.486 No_date    6:14   68.66  n/a
     [DT= 1.00]  SUM=  01:J7           986.89   89.002 No_date    6:43   81.18  n/a
013:0067--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J7            986.89   89.002 No_date    6:43   81.18  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J7.013
     remark:Hydrograph for J7
013:0068--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J7            986.89   89.002 No_date    6:43   81.18  n/a
     [RDT= 1.00] out<- 02:C7            986.89   88.744 No_date    6:45   81.18  n/a
     [L/S/n=  530./1.410/.035]
     {Vmax= 3.029:Dmax= 2.302}
013:0069--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C7            986.89   88.744 No_date    6:45   81.18  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C7.013
     remark:Routing Hydrograph for C7
013:0070--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M8             21.78    3.030 No_date    6:09   84.28 .807
     [XIMP=.38:TIMP=.48]
     [LOSS= 2 :CN= 84.8]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 381.:MNI=.045:SCI=   .0]
013:0071--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M8             21.78    3.030 No_date    6:09   84.28  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M8.013
     remark:Runoff Hydrograph for M8
013:0072--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C7           986.89   88.744 No_date    6:45   81.18  n/a
                  +   03:M8            21.78    3.030 No_date    6:09   84.28  n/a
     [DT= 1.00]  SUM=  04:D7          1008.67   90.360 No_date    6:45   81.25  n/a
013:0073--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          04:D7          1008.67   90.360 No_date    6:45   81.25  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D7.013
     remark:Downstream Hydrograph for C7
013:0074--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           04:D7          1008.67   90.360 No_date    6:45   81.25  n/a
                  +   05:D11          280.43   23.046 No_date    6:37   73.93  n/a
                  +   07:DT4           70.81    7.731 No_date    6:18   78.68  n/a
     [DT= 1.00]  SUM=  01:J8          1359.91  118.963 No_date    6:42   79.60  n/a
013:0075--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J8          1359.91  118.963 No_date    6:42   79.60  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J8.013
     remark:Hydrograph for J8
013:0076--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J8          1359.91  118.963 No_date    6:42   79.60  n/a
     [RDT= 1.00] out<- 02:C8          1359.91  112.156 No_date    6:52   79.60  n/a
     [L/S/n=  920./ .290/.035]
     {Vmax= 1.225:Dmax= 3.053}
013:0077--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C8          1359.91  112.156 No_date    6:52   79.60  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C8.013
     remark:Routing Hydrograph for C8
013:0078--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M9             17.59    2.123 No_date    6:12   76.22 .730
     [XIMP=.19:TIMP=.24]
     [LOSS= 2 :CN= 84.6]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 342.:MNI=.045:SCI=   .0]
013:0079--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M9             17.59    2.123 No_date    6:12   76.22  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M9.013
     remark:Runoff Hydrograph for M9
013:0080--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C8          1359.91  112.156 No_date    6:52   79.60  n/a
                  +   03:M9            17.59    2.123 No_date    6:12   76.22  n/a
     [DT= 1.00]  SUM=  01:O1          1377.50  113.287 No_date    6:52   79.56  n/a
013:0081--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:O1          1377.50  113.287 No_date    6:52   79.56  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-O1.013
```

```
     remark:Hydrograph for O1
  ** END OF RUN :  23

********************************************************************************




 RUN:COMMAND#
 024:0001--------------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on       0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =  24 ]
#*******************************************************************************
#  Project Name: [Bilberry Creek FPM Study] Project Number:[M800_200_030_209]
#  Date        : 01-12-2017
#  Modeller    : [AA, TB, SN]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#*******************************************************************************
 024:0002--------------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=10.00:SDUR=  24.00:PTOT= 123.02]
 024:0003--------------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\BilVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [Bilberry Creek Default Value File]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      Horton's infiltration equation parameters:
      [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
      Parameters for PERVIOUS surfaces in STANDHYD:
      [IAper=   4.67 mm] [LGP=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Upstream Tributary
 024:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:UT1           93.87   11.552 No_date    8:28  102.12 .830
      [XIMP=.35:TIMP=.44]
      [LOSS= 2 :CN= 86.2]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 791.:MNI=.045:SCI=   .0]
 024:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:UT1           93.87   11.552 No_date    8:28  102.12  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT1.024
      remark:Runoff Hydrograph for UT1
 024:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:UT1           93.87   11.552 No_date    8:28  102.12  n/a
      [RDT= 1.00] out<- 02:C9            93.87   11.208 No_date    8:33  102.12  n/a
      [L/S/n=  860./1.260/.035]
      {Vmax= 2.005:Dmax=  .777}
 024:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C9            93.87   11.208 No_date    8:33  102.12  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C9.024
      remark:Routing Hydrograph for C9
 024:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:UT2           32.73    3.902 No_date    8:22   90.46 .735
      [XIMP=.23:TIMP=.29]
      [LOSS= 2 :CN= 80.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 467.:MNI=.045:SCI=   .0]
 024:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:UT2           32.73    3.902 No_date    8:22   90.46  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT2.024
      remark:Runoff Hydrograph for UT2
 024:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C9            93.87   11.208 No_date    8:33  102.12  n/a
                      + 03:UT2           32.73    3.902 No_date    8:22   90.46  n/a
      [DT= 1.00]  SUM=  04:D9           126.60   14.761 No_date    8:30   99.11  n/a
 024:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:D9            126.60   14.761 No_date    8:30   99.11  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D9.024
      remark:Downstream Hydrograph for C9
# Downstream Tributary
 024:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:DT1           247.46   21.140 No_date    8:41   90.17 .733
      [XIMP=.33:TIMP=.41]
      [LOSS= 2 :CN= 76.1]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1284.:MNI=.045:SCI=   .0]
 024:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:DT1           247.46   21.140 No_date    8:41   90.17  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT1.024
      remark:Runoff Hydrograph for DT1
 024:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:DT1           247.46   21.140 No_date    8:41   90.17  n/a
      [RDT= 1.00] out<- 02:C10           247.46   21.011 No_date    8:44   90.17  n/a
      [L/S/n=  460./ .800/.035]
      {Vmax= 2.077:Dmax= 1.281}
 024:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C10           247.46   21.011 No_date    8:44   90.17  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C10.024
      remark:Routing Hydrograph for C10
 024:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:DT2            20.34    2.480 No_date    8:18   87.91 .715
      [XIMP=.26:TIMP=.32]
      [LOSS= 2 :CN= 77.7]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 368.:MNI=.045:SCI=   .0]
 024:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:DT2            20.34    2.480 No_date    8:18   87.91  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT2.024
      remark:Runoff Hydrograph for DT2
 024:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C10           247.46   21.011 No_date    8:44   90.17  n/a
                      + 03:DT2            20.34    2.480 No_date    8:18   87.91  n/a
      [DT= 1.00]  SUM=  05:J11          267.80   22.594 No_date    8:42   90.00  n/a
 024:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:J11           267.80   22.594 No_date    8:42   90.00  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J11.024
      remark:Hydrograph for J11
 024:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 05:J11           267.80   22.594 No_date    8:42   90.00  n/a
      [RDT= 1.00] out<- 01:C11           267.80   22.242 No_date    8:47   90.00  n/a
      [L/S/n=  690./1.470/.035]
      {Vmax= 1.746:Dmax= 1.213}
 024:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:C11           267.80   22.242 No_date    8:47   90.00  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C11.024
      remark:Routing Hydrograph for C11
 024:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     02:DT3            12.63    2.204 No_date    8:09  104.63 .851
      [XIMP=.38:TIMP=.47]
      [LOSS= 2 :CN= 87.4]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 290.:MNI=.045:SCI=   .0]
 024:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:DT3            12.63    2.204 No_date    8:09  104.63  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT3.024
      remark:Runoff Hydrograph for DT3
 024:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     07:DT4            70.81    8.315 No_date    8:26   96.06 .781
      [XIMP=.31:TIMP=.38]
      [LOSS= 2 :CN= 82.6]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 687.:MNI=.045:SCI=   .0]
 024:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:DT4            70.81    8.315 No_date    8:26   96.06  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT4.024
      remark:Runoff Hydrograph for DT4
 024:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:C11           267.80   22.242 No_date    8:47   90.00  n/a
                      + 02:DT3            12.63    2.204 No_date    8:09  104.63  n/a
      [DT= 1.00]  SUM=  05:D11          280.43   23.195 No_date    8:46   90.66  n/a
 024:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:D11           280.43   23.195 No_date    8:46   90.66  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D11.024
      remark:Downstream Hydrograph for C11
# Main Channel
 024:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:M1             64.39    7.783 No_date    8:25   96.52 .785
      [XIMP=.32:TIMP=.40]
      [LOSS= 2 :CN= 82.3]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 655.:MNI=.045:SCI=   .0]
 024:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:M1             64.39    7.783 No_date    8:25   96.52  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M1.024
      remark:Runoff Hydrograph for M1
 024:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:M1             64.39    7.783 No_date    8:25   96.52  n/a
      [RDT= 1.00] out<- 02:C1            64.39    7.725 No_date    8:27   96.52  n/a
      [L/S/n=  510./1.950/.035]
      {Vmax= 2.379:Dmax= 1.004}
 024:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C1             64.39    7.725 No_date    8:27   96.52  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C1.024
      remark:Routing Hydrograph for C1
 024:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M2             26.14    3.501 No_date    8:18   94.80 .771
      [XIMP=.32:TIMP=.40]
      [LOSS= 2 :CN= 80.8]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 418.:MNI=.045:SCI=   .0]
 024:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M2             26.14    3.501 No_date    8:18   94.80  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M2.024
      remark:Runoff Hydrograph for M2
 024:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C1             64.39    7.725 No_date    8:27   96.52  n/a
                      + 03:M2             26.14    3.501 No_date    8:18   94.80  n/a
      [DT= 1.00]  SUM=  06:D1           90.53   10.989 No_date    8:24   96.02  n/a
 024:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:D1             90.53   10.989 No_date    8:24   96.02  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D1.024
      remark:Downstream Hydrograph for C1
 024:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:D9            126.60   14.761 No_date    8:30   99.11  n/a
                      + 06:D1             90.53   10.989 No_date    8:24   96.02  n/a
      [DT= 1.00]  SUM=  01:J2           217.13   25.562 No_date    8:28   97.82  n/a
 024:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:J2            217.13   25.562 No_date    8:28   97.82  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J2.024
      remark:Hydrograph for J2
 024:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:J2            217.13   25.562 No_date    8:28   97.82  n/a
      [RDT= 1.00] out<- 02:C2            217.13   25.284 No_date    8:31   97.82  n/a
      [L/S/n=  770./2.030/.035]
      {Vmax= 3.332:Dmax= 1.501}
 024:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C2            217.13   25.284 No_date    8:31   97.82  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C2.024
      remark:Routing Hydrograph for C2
 024:0040---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M3            212.90   21.059 No_date    8:39   98.18 .798
      [XIMP=.31:TIMP=.39]
      [LOSS= 2 :CN= 84.2]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1191.:MNI=.045:SCI=   .0]
 024:0041---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M3            212.90   21.059 No_date    8:39   98.18  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M3.024
      remark:Runoff Hydrograph for M3
 024:0042---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C2            217.13   25.284 No_date    8:31   97.82  n/a
                      + 03:M3            212.90   21.059 No_date    8:39   98.18  n/a
      [DT= 1.00]  SUM=  01:J3           430.03   45.768 No_date    8:34   98.00  n/a
 024:0043---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:J3            430.03   45.768 No_date    8:34   98.00  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J3.024
      remark:Hydrograph for J3
 024:0044---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:J3            430.03   45.768 No_date    8:34   98.00  n/a
      [RDT= 1.00] out<- 02:C3            430.03   45.685 No_date    8:36   98.00  n/a
      [L/S/n=  450./1.190/.035]
      {Vmax= 3.273:Dmax= 1.838}
 024:0045---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C3            430.03   45.685 No_date    8:36   98.00  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C3.024
      remark:Routing Hydrograph for C3
 024:0046---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M4            432.99   37.435 No_date    8:50   99.31 .807
      [XIMP=.34:TIMP=.42]
      [LOSS= 2 :CN= 84.1]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1699.:MNI=.045:SCI=   .0]
 024:0047---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M4            432.99   37.435 No_date    8:50   99.31  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M4.024
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     remark:Runoff Hydrograph for M4A
024:0048--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C3          430.03   45.685 No_date    8:36   98.00  n/a
                  +  03:M4           432.99   37.435 No_date    8:50   99.31  n/a
     [DT= 1.00]  SUM=  01:J4          863.02   81.182 No_date    8:40   98.66  n/a
024:0049--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J4          863.02   81.182 No_date    8:40   98.66  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J4.024
     remark:Hydrograph for J4
024:0050--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J4          863.02   81.182 No_date    8:40   98.66  n/a
     [RDT= 1.00] out<- 02:C4          863.02   80.705 No_date    8:43   98.66  n/a
     [L/S/n=  850./1.140/.035]
     {Vmax= 4.005:Dmax= 2.594}
024:0051--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C4          863.02   80.705 No_date    8:43   98.66  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C4.024
     remark:Routing Hydrograph for C4
024:0052--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M5            35.47    4.257 No_date    8:23   91.10 .741
     [XIMP=.21:TIMP=.26]
     [LOSS= 2 :CN= 82.3]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 486.:MNI=.045:SCI=   .0]
024:0053--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M5            35.47    4.257 No_date    8:23   91.10  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M5.024
     remark:Runoff Hydrograph for M5
024:0054--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C4          863.02   80.705 No_date    8:43   98.66  n/a
                  +  03:M5            35.47    4.257 No_date    8:23   91.10  n/a
     [DT= 1.00]  SUM=  01:J5          898.49   83.876 No_date    8:42   98.36  n/a
024:0055--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J5          898.49   83.876 No_date    8:42   98.36  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J5.024
     remark:Hydrograph for J5
024:0056--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J5          898.49   83.876 No_date    8:42   98.36  n/a
     [RDT= 1.00] out<- 02:C5          898.49   83.076 No_date    8:47   98.36  n/a
     [L/S/n=  880./1.600/.035]
     {Vmax= 3.530:Dmax= 2.014}
024:0057--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C5          898.49   83.076 No_date    8:47   98.36  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C5.024
     remark:Routing Hydrograph for C5
024:0058--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M6            64.01    9.442 No_date    8:23  109.69 .892
     [XIMP=.37:TIMP=.46]
     [LOSS= 2 :CN= 92.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 653.:MNI=.045:SCI=   .0]
024:0059--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M6            64.01    9.442 No_date    8:23  109.69  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M6.024
     remark:Runoff Hydrograph for M6
024:0060--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C5          898.49   83.076 No_date    8:47   98.36  n/a
                  +  03:M6            64.01    9.442 No_date    8:23  109.69  n/a
     [DT= 1.00]  SUM=  01:J6          962.50   89.622 No_date    8:46   99.11  n/a
024:0061--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J6          962.50   89.622 No_date    8:46   99.11  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J6.024
     remark:Hydrograph for J6
024:0062--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J6          962.50   89.622 No_date    8:46   99.11  n/a
     [RDT= 1.00] out<- 02:C6          962.50   88.668 No_date    8:51   99.11  n/a
     [L/S/n=  980./1.490/.035]
     {Vmax= 3.356:Dmax= 2.340}
024:0063--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C6          962.50   88.668 No_date    8:51   99.11  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C6.024
     remark:Routing Hydrograph for C6
024:0064--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M7            24.39    2.775 No_date    8:21   85.18 .692
     [XIMP=.18:TIMP=.22]
     [LOSS= 2 :CN= 79.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 403.:MNI=.045:SCI=   .0]
024:0065--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M7            24.39    2.775 No_date    8:21   85.18  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M7.024
     remark:Runoff Hydrograph for M7
024:0066--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C6          962.50   88.668 No_date    8:51   99.11  n/a
                  +  03:M7            24.39    2.775 No_date    8:21   85.18  n/a
     [DT= 1.00]  SUM=  01:J7          986.89   90.362 No_date    8:50   98.77  n/a
024:0067--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J7          986.89   90.362 No_date    8:50   98.77  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J7.024
     remark:Hydrograph for J7
024:0068--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J7          986.89   90.362 No_date    8:50   98.77  n/a
     [RDT= 1.00] out<- 02:C7          986.89   90.067 No_date    8:53   98.77  n/a
     [L/S/n=  530./1.410/.035]
     {Vmax= 3.037:Dmax= 2.315}
024:0069--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C7          986.89   90.067 No_date    8:53   98.77  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C7.024
     remark:Routing Hydrograph for C7
024:0070--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M8            21.78    3.418 No_date    8:12  102.08 .830
     [XIMP=.38:TIMP=.48]
     [LOSS= 2 :CN= 84.8]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 381.:MNI=.045:SCI=   .0]
024:0071--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M8            21.78    3.418 No_date    8:12  102.08  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M8.024
     remark:Runoff Hydrograph for M8
024:0072--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C7          986.89   90.067 No_date    8:53   98.77  n/a
                  +  03:M8            21.78    3.418 No_date    8:12  102.08  n/a
     [DT= 1.00]  SUM=  04:D7         1008.67   91.586 No_date    8:52   98.84  n/a
024:0073--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          04:D7         1008.67   91.586 No_date    8:52   98.84  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D7.024
     remark:Downstream Hydrograph for C7
024:0074--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           04:D7         1008.67   91.586 No_date    8:52   98.84  n/a
                  +  05:D11          280.43   23.195 No_date    8:46   90.66  n/a
                  +  07:DT4           70.81    8.315 No_date    8:26   96.06  n/a
     [DT= 1.00]  SUM=  01:J8         1359.91  120.425 No_date    8:50   97.01  n/a
024:0075--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J8          1359.91  120.425 No_date    8:50   97.01  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J8.024
     remark:Hydrograph for J8
024:0076--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J8          1359.91  120.425 No_date    8:50   97.01  n/a
     [RDT= 1.00] out<- 02:C8          1359.91  113.066 No_date    9:00   97.01  n/a
     [L/S/n=  920./ .290/.035]
     {Vmax= 1.229:Dmax= 3.064}
024:0077--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C8          1359.91  113.066 No_date    9:00   97.01  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C8.024
     remark:Routing Hydrograph for C8
024:0078--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M9            17.59    2.393 No_date    8:19   93.58 .761
     [XIMP=.19:TIMP=.24]
     [LOSS= 2 :CN= 84.6]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 342.:MNI=.045:SCI=   .0]
024:0079--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M9            17.59    2.393 No_date    8:19   93.58  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M9.024
     remark:Runoff Hydrograph for M9
024:0080--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C8          1359.91  113.066 No_date    9:00   97.01  n/a
                  +  03:M9            17.59    2.393 No_date    8:19   93.58  n/a
     [DT= 1.00]  SUM=  01:O1          1377.50  114.119 No_date    9:00   96.96  n/a
024:0081--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:O1          1377.50  114.119 No_date    9:00   96.96  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-O1.024
     remark:Hydrograph for O1
  ** END OF RUN :  24

************************************************************************************




 RUN:COMMAND#
 025:0001--------------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =  25 ]
#************************************************************************
#  Project Name: [Bilberry Creek FPM Study] Project Number:[M800_200_030_209]
#  Date        : 01-12-2017
#  Modeller    : [AA, TB, SN]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#************************************************************************
 025:0002--------------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=30.00:SDUR=  24.00:PTOT= 123.01]
 025:0003--------------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\BilVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [Bilberry Creek Default Value File]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      Horton's infiltration equation parameters:
      [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
      Parameters for PERVIOUS surfaces in STANDHYD:
      [IAper=   4.67 mm] [LGP=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Upstream Tributary
 025:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD    01:UT1           93.87   11.889 No_date   12:18  102.11 .830
      [XIMP=.35:TIMP=.44]
      [LOSS= 2 :CN= 86.2]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 791.:MNI=.045:SCI=   .0]
 025:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          01:UT1           93.87   11.889 No_date   12:18  102.11  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT1.025
      remark:Runoff Hydrograph for UT1
 025:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:UT1          93.87   11.889 No_date   12:18  102.11  n/a
      [RDT= 1.00] out<- 02:C9           93.87   11.547 No_date   12:22  102.11  n/a
      [L/S/n=  860./1.260/.035]
      {Vmax= 2.032:Dmax=  .789}
 025:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          02:C9           93.87   11.547 No_date   12:22  102.11  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C9.025
      remark:Routing Hydrograph for C9
 025:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD    03:UT2           32.73    4.031 No_date   12:13   90.46 .735
      [XIMP=.23:TIMP=.29]
      [LOSS= 2 :CN= 80.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 467.:MNI=.045:SCI=   .0]
 025:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          03:UT2           32.73    4.031 No_date   12:13   90.46  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT2.025
      remark:Runoff Hydrograph for UT2
 025:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           02:C9           93.87   11.547 No_date   12:22  102.11  n/a
                   +  03:UT2           32.73    4.031 No_date   12:13   90.46  n/a
      [DT= 1.00]  SUM=  04:D9          126.60   15.312 No_date   12:20   99.10  n/a
 025:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          04:D9          126.60   15.312 No_date   12:20   99.10  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D9.025
      remark:Downstream Hydrograph for C9
# Downstream Tributary
 025:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD    01:DT1          247.46   23.014 No_date   12:27   90.17 .733
      [XIMP=.33:TIMP=.41]
      [LOSS= 2 :CN= 76.1]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1284.:MNI=.045:SCI=   .0]
 025:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          01:DT1          247.46   23.014 No_date   12:27   90.17  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT1.025
      remark:Runoff Hydrograph for DT1
 025:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:DT1          247.46   23.014 No_date   12:27   90.17  n/a
      [RDT= 1.00] out<- 02:C10          247.46   22.838 No_date   12:31   90.17  n/a
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     [L/S/n=  460./ .800/.035]
     {Vmax= 2.107:Dmax= 1.326}
025:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C10          247.46   22.838 No_date   12:31   90.17  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C10.025
     remark:Routing Hydrograph for C10
025:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:DT2           20.34    2.552 No_date   12:10   87.90 .715
     [XIMP=.26:TIMP=.32]
     [LOSS= 2 :CN= 77.7]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 368.:MNI=.045:SCI=   .0]
025:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:DT2           20.34    2.552 No_date   12:10   87.90  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT2.025
     remark:Runoff Hydrograph for DT2
025:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C10          247.46   22.838 No_date   12:31   90.17  n/a
                  +   03:DT2           20.34    2.552 No_date   12:10   87.90  n/a
     [DT= 1.00]  SUM=  05:J11          267.80   24.709 No_date   12:29   90.00  n/a
025:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          05:J11          267.80   24.709 No_date   12:29   90.00  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J11.025
     remark:Hydrograph for J11
025:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 05:J11          267.80   24.709 No_date   12:29   90.00  n/a
     [RDT= 1.00] out<- 01:C11          267.80   24.243 No_date   12:35   90.00  n/a
     [L/S/n=  690./1.470/.035]
     {Vmax= 1.779:Dmax= 1.244}
025:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:C11          267.80   24.243 No_date   12:35   90.00  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C11.025
     remark:Routing Hydrograph for C11
025:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    02:DT3           12.63    2.089 No_date   12:06  104.62 .851
     [XIMP=.38:TIMP=.47]
     [LOSS= 2 :CN= 87.4]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 290.:MNI=.045:SCI=   .0]
025:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:DT3           12.63    2.089 No_date   12:06  104.62  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT3.025
     remark:Runoff Hydrograph for DT3
025:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    07:DT4           70.81    8.575 No_date   12:17   96.06 .781
     [XIMP=.31:TIMP=.38]
     [LOSS= 2 :CN= 82.6]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 687.:MNI=.045:SCI=   .0]
025:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          07:DT4           70.81    8.575 No_date   12:17   96.06  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT4.025
     remark:Runoff Hydrograph for DT4
025:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           01:C11          267.80   24.243 No_date   12:35   90.00  n/a
                  +   02:DT3           12.63    2.089 No_date   12:06  104.62  n/a
     [DT= 1.00]  SUM=  05:D11          280.43   25.362 No_date   12:34   90.66  n/a
025:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          05:D11          280.43   25.362 No_date   12:34   90.66  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D11.025
     remark:Downstream Hydrograph for C11
# Main Channel
025:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    01:M1            64.39    7.978 No_date   12:15   96.52 .785
     [XIMP=.32:TIMP=.40]
     [LOSS= 2 :CN= 82.3]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 655.:MNI=.045:SCI=   .0]
025:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:M1            64.39    7.978 No_date   12:15   96.52  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M1.025
     remark:Runoff Hydrograph for M1
025:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:M1            64.39    7.978 No_date   12:15   96.52  n/a
     [RDT= 1.00] out<- 02:C1            64.39    7.906 No_date   12:18   96.52  n/a
     [L/S/n=  510./1.950/.035]
     {Vmax= 2.398:Dmax= 1.015}
025:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C1            64.39    7.906 No_date   12:18   96.52  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C1.025
     remark:Routing Hydrograph for C1
025:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M2            26.14    3.535 No_date   12:10   94.80 .771
     [XIMP=.32:TIMP=.40]
     [LOSS= 2 :CN= 80.8]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 418.:MNI=.045:SCI=   .0]
025:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M2            26.14    3.535 No_date   12:10   94.80  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M2.025
     remark:Runoff Hydrograph for M2
025:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C1            64.39    7.906 No_date   12:18   96.52  n/a
                  +   03:M2            26.14    3.535 No_date   12:10   94.80  n/a
     [DT= 1.00]  SUM=  06:D1            90.53   11.261 No_date   12:15   96.02  n/a
025:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          06:D1            90.53   11.261 No_date   12:15   96.02  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D1.025
     remark:Downstream Hydrograph for C1
025:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           04:D9           126.60   15.312 No_date   12:20   99.10  n/a
                  +   06:D1            90.53   11.261 No_date   12:15   96.02  n/a
     [DT= 1.00]  SUM=  01:J2           217.13   26.428 No_date   12:18   97.82  n/a
025:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J2           217.13   26.428 No_date   12:18   97.82  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J2.025
     remark:Hydrograph for J2
025:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J2           217.13   26.428 No_date   12:18   97.82  n/a
     [RDT= 1.00] out<- 02:C2           217.13   26.160 No_date   12:22   97.82  n/a
     [L/S/n=  770./2.030/.035]
     {Vmax= 3.357:Dmax= 1.519}
025:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C2            217.13   26.160 No_date   12:22   97.82  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C2.025
     remark:Routing Hydrograph for C2
025:0040--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M3            212.90   22.613 No_date   12:26   98.18 .798
     [XIMP=.31:TIMP=.39]
     [LOSS= 2 :CN= 84.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1191.:MNI=.045:SCI=   .0]
025:0041--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M3            212.90   22.613 No_date   12:26   98.18  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M3.025
     remark:Runoff Hydrograph for M3
025:0042--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C2            217.13   26.160 No_date   12:22   97.82  n/a
                  +   03:M3            212.90   22.613 No_date   12:26   98.18  n/a
     [DT= 1.00]  SUM=  01:J3           430.03   48.621 No_date   12:23   97.99  n/a
025:0043--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J3            430.03   48.621 No_date   12:23   97.99  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J3.025
     remark:Hydrograph for J3
025:0044--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J3           430.03   48.621 No_date   12:23   97.99  n/a
     [RDT= 1.00] out<- 02:C3           430.03   48.522 No_date   12:25   97.99  n/a
     [L/S/n=  450./1.190/.035]
     {Vmax= 3.344:Dmax= 1.897}
025:0045--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C3            430.03   48.522 No_date   12:25   97.99  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C3.025
     remark:Routing Hydrograph for C3
025:0046--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M4            432.99   39.651 No_date   12:37   99.30 .807
     [XIMP=.34:TIMP=.42]
     [LOSS= 2 :CN= 84.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1699.:MNI=.045:SCI=   .0]
025:0047--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M4            432.99   39.651 No_date   12:37   99.30  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M4.025
     remark:Runoff Hydrograph for M4A
025:0048--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C3            430.03   48.522 No_date   12:25   97.99  n/a
                  +   03:M4            432.99   39.651 No_date   12:37   99.30  n/a
     [DT= 1.00]  SUM=  01:J4           863.02   86.223 No_date   12:30   98.65  n/a
025:0049--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J4            863.02   86.223 No_date   12:30   98.65  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J4.025
     remark:Hydrograph for J4
025:0050--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J4           863.02   86.223 No_date   12:30   98.65  n/a
     [RDT= 1.00] out<- 02:C4           863.02   85.821 No_date   12:33   98.65  n/a
     [L/S/n=  850./1.140/.035]
     {Vmax= 4.077:Dmax= 2.672}
025:0051--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C4            863.02   85.821 No_date   12:33   98.65  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C4.025
     remark:Routing Hydrograph for C4
025:0052--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M5             35.47    4.333 No_date   12:14   91.10 .741
     [XIMP=.21:TIMP=.26]
     [LOSS= 2 :CN= 82.3]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 486.:MNI=.045:SCI=   .0]
025:0053--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M5             35.47    4.333 No_date   12:14   91.10  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M5.025
     remark:Runoff Hydrograph for M5
025:0054--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C4            863.02   85.821 No_date   12:33   98.65  n/a
                  +   03:M5             35.47    4.333 No_date   12:14   91.10  n/a
     [DT= 1.00]  SUM=  01:J5           898.49   89.282 No_date   12:32   98.35  n/a
025:0055--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J5            898.49   89.282 No_date   12:32   98.35  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J5.025
     remark:Hydrograph for J5
025:0056--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J5           898.49   89.282 No_date   12:32   98.35  n/a
     [RDT= 1.00] out<- 02:C5           898.49   88.405 No_date   12:36   98.35  n/a
     [L/S/n=  880./1.600/.035]
     {Vmax= 3.522:Dmax= 2.056}
025:0057--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C5            898.49   88.405 No_date   12:36   98.35  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C5.025
     remark:Routing Hydrograph for C5
025:0058--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M6             64.01    9.230 No_date   12:14  109.69 .892
     [XIMP=.37:TIMP=.46]
     [LOSS= 2 :CN= 92.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 653.:MNI=.045:SCI=   .0]
025:0059--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M6             64.01    9.230 No_date   12:14  109.69  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M6.025
     remark:Runoff Hydrograph for M6
025:0060--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C5            898.49   88.405 No_date   12:36   98.35  n/a
                  +   03:M6             64.01    9.230 No_date   12:14  109.69  n/a
     [DT= 1.00]  SUM=  01:J6           962.50   95.289 No_date   12:35   99.11  n/a
025:0061--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J6            962.50   95.289 No_date   12:35   99.11  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J6.025
     remark:Hydrograph for J6
025:0062--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J6           962.50   95.289 No_date   12:35   99.11  n/a
     [RDT= 1.00] out<- 02:C6           962.50   94.230 No_date   12:39   99.11  n/a
     [L/S/n=  980./1.490/.035]
     {Vmax= 3.373:Dmax= 2.386}
025:0063--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C6            962.50   94.230 No_date   12:39   99.11  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C6.025
     remark:Routing Hydrograph for C6
025:0064--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M7             24.39    2.854 No_date   12:13   85.17 .692
     [XIMP=.18:TIMP=.22]
     [LOSS= 2 :CN= 79.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 403.:MNI=.045:SCI=   .0]
025:0065--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M7             24.39    2.854 No_date   12:13   85.17  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M7.025
     remark:Runoff Hydrograph for M7
025:0066--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C6            962.50   94.230 No_date   12:39   99.11  n/a
                  +   03:M7             24.39    2.854 No_date   12:13   85.17  n/a
     [DT= 1.00]  SUM=  01:J7           986.89   96.121 No_date   12:39   98.76  n/a
025:0067--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J7            986.89   96.121 No_date   12:39   98.76  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J7.025
     remark:Hydrograph for J7
025:0068--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J7           986.89   96.121 No_date   12:39   98.76  n/a
     [RDT= 1.00] out<- 02:C7           986.89   95.793 No_date   12:41   98.76  n/a
     [L/S/n=  530./1.410/.035]
```

```
     {Vmax= 3.071:Dmax= 2.368}
 025:0069---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C7          986.89   95.793 No_date   12:41   98.76  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C7.025
      remark:Routing Hydrograph for C7
 025:0070---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M8            21.78    3.337 No_date   12:08  102.08 .830
      [XIMP=.38:TIMP=.48]
      [LOSS= 2 :CN= 84.8]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 381.:MNI=.045:SCI=   .0]
 025:0071---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M8            21.78    3.337 No_date   12:08  102.08  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M8.025
      remark:Runoff Hydrograph for M8
 025:0072---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C7           986.89   95.793 No_date   12:41   98.76  n/a
                      + 03:M8            21.78    3.337 No_date   12:08  102.08  n/a
      [DT= 1.00]  SUM=  04:D7          1008.67   97.476 No_date   12:41   98.83  n/a
 025:0073---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:D7          1008.67   97.476 No_date   12:41   98.83  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D7.025
      remark:Downstream Hydrograph for C7
 025:0074---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:D7          1008.67   97.476 No_date   12:41   98.83  n/a
                      + 05:D11           280.43   25.362 No_date   12:34   90.66  n/a
                      + 07:DT4            70.81    8.575 No_date   12:17   96.06  n/a
      [DT= 1.00]  SUM=  01:J8          1359.91  128.755 No_date   12:38   97.00  n/a
 025:0075---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:J8          1359.91  128.755 No_date   12:38   97.00  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J8.025
      remark:Hydrograph for J8
 025:0076---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:J8          1359.91  128.755 No_date   12:38   97.00  n/a
      [RDT= 1.00] out<- 02:C8          1359.91  121.011 No_date   12:48   97.00  n/a
      [L/S/n=  920./ .290/.035]
      {Vmax= 1.250:Dmax= 3.128}
 025:0077---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C8          1359.91  121.011 No_date   12:48   97.00  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C8.025
      remark:Routing Hydrograph for C8
 025:0078---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M9            17.59    2.385 No_date   12:10   93.58 .761
      [XIMP=.19:TIMP=.24]
      [LOSS= 2 :CN= 84.6]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 342.:MNI=.045:SCI=   .0]
 025:0079---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M9            17.59    2.385 No_date   12:10   93.58  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M9.025
      remark:Runoff Hydrograph for M9
 025:0080---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C8          1359.91  121.011 No_date   12:48   97.00  n/a
                      + 03:M9            17.59    2.385 No_date   12:10   93.58  n/a
      [DT= 1.00]  SUM=  01:O1          1377.50  122.179 No_date   12:48   96.96  n/a
 025:0081---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:O1          1377.50  122.179 No_date   12:48   96.96  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-O1.025
      remark:Hydrograph for O1
  ** END OF RUN : 240

************************************************************************************




 RUN:COMMAND#
 241:0001---------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 241 ]
#************************************************************************
#  Project Name: [Bilberry Creek FPM Study] Project Number:[M800_200_030_209]
#  Date        : 01-12-2017
#  Modeller    : [AA, TB, SN]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#************************************************************************
 241:0002---------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=30.00:SDUR=  24.00:PTOT=  50.07]
 241:0003---------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\BilVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [Bilberry Creek Default Value File]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      Horton's infiltration equation parameters:
      [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
      Parameters for PERVIOUS surfaces in STANDHYD:
      [IAper=   4.67 mm] [LGP=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Upstream Tributary
 241:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:UT1           93.87    2.864 No_date   12:32   33.89 .677
      [XIMP=.35:TIMP=.44]
      [LOSS= 2 :CN= 86.2]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 791.:MNI=.045:SCI=   .0]
 241:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:UT1           93.87    2.864 No_date   12:32   33.89  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT1.241
      remark:Runoff Hydrograph for UT1
 241:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:UT1           93.87    2.864 No_date   12:32   33.89  n/a
      [RDT= 1.00] out<- 02:C9           93.87    2.698 No_date   12:45   33.89  n/a
      [L/S/n=  860./1.260/.035]
      {Vmax= 1.082:Dmax=  .407}
 241:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C9            93.87    2.698 No_date   12:45   33.89  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C9.241
      remark:Routing Hydrograph for C9
 241:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:UT2           32.73     .855 No_date   12:22   27.24 .544
      [XIMP=.23:TIMP=.29]
      [LOSS= 2 :CN= 80.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 467.:MNI=.045:SCI=   .0]
 241:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:UT2           32.73     .855 No_date   12:22   27.24  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT2.241
      remark:Runoff Hydrograph for UT2
 241:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C9            93.87    2.698 No_date   12:45   33.89  n/a
                      + 03:UT2           32.73     .855 No_date   12:22   27.24  n/a
      [DT= 1.00]  SUM=  04:D9           126.60    3.473 No_date   12:41   32.17  n/a
 241:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:D9           126.60    3.473 No_date   12:41   32.17  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D9.241
      remark:Downstream Hydrograph for C9
# Downstream Tributary
 241:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:DT1           247.46    4.875 No_date   12:49   28.18 .563
      [XIMP=.33:TIMP=.41]
      [LOSS= 2 :CN= 76.1]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1284.:MNI=.045:SCI=   .0]
 241:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:DT1           247.46    4.875 No_date   12:49   28.18  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT1.241
      remark:Runoff Hydrograph for DT1
 241:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:DT1           247.46    4.875 No_date   12:49   28.18  n/a
      [RDT= 1.00] out<- 02:C10          247.46    4.849 No_date   12:53   28.18  n/a
      [L/S/n=  460./ .800/.035]
      {Vmax= 1.528:Dmax=  .602}
 241:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C10           247.46    4.849 No_date   12:53   28.18  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C10.241
      remark:Routing Hydrograph for C10
 241:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:DT2            20.34     .555 No_date   12:15   26.44 .528
      [XIMP=.26:TIMP=.32]
      [LOSS= 2 :CN= 77.7]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 368.:MNI=.045:SCI=   .0]
 241:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:DT2            20.34     .555 No_date   12:15   26.44  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT2.241
      remark:Runoff Hydrograph for DT2
 241:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C10           247.46    4.849 No_date   12:53   28.18  n/a
                      + 03:DT2            20.34     .555 No_date   12:15   26.44  n/a
      [DT= 1.00]  SUM=  05:J11          267.80    5.234 No_date   12:51   28.05  n/a
 241:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:J11           267.80    5.234 No_date   12:51   28.05  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J11.241
      remark:Hydrograph for J11
 241:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 05:J11           267.80    5.234 No_date   12:51   28.05  n/a
      [RDT= 1.00] out<- 01:C11          267.80    5.149 No_date   13:01   28.05  n/a
      [L/S/n=  690./1.470/.035]
      {Vmax= 1.516:Dmax=  .778}
 241:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:C11           267.80    5.149 No_date   13:01   28.05  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C11.241
      remark:Routing Hydrograph for C11
 241:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     02:DT3            12.63     .557 No_date   12:12   35.47 .708
      [XIMP=.38:TIMP=.47]
      [LOSS= 2 :CN= 87.4]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 290.:MNI=.045:SCI=   .0]
 241:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:DT3            12.63     .557 No_date   12:12   35.47  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT3.241
      remark:Runoff Hydrograph for DT3
 241:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     07:DT4            70.81    1.984 No_date   12:27   30.49 .609
      [XIMP=.31:TIMP=.38]
      [LOSS= 2 :CN= 82.6]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 687.:MNI=.045:SCI=   .0]
 241:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:DT4            70.81    1.984 No_date   12:27   30.49  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT4.241
      remark:Runoff Hydrograph for DT4
 241:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:C11           267.80    5.149 No_date   13:01   28.05  n/a
                      + 02:DT3           12.63     .557 No_date   12:12   35.47  n/a
      [DT= 1.00]  SUM=  05:D11          280.43    5.415 No_date   12:57   28.38  n/a
 241:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:D11           280.43    5.415 No_date   12:57   28.38  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D11.241
      remark:Downstream Hydrograph for C11
# Main Channel
 241:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:M1             64.39    1.875 No_date   12:26   30.86 .616
      [XIMP=.32:TIMP=.40]
      [LOSS= 2 :CN= 82.3]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 655.:MNI=.045:SCI=   .0]
 241:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:M1             64.39    1.875 No_date   12:26   30.86  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M1.241
      remark:Runoff Hydrograph for M1
 241:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:M1             64.39    1.875 No_date   12:26   30.86  n/a
      [RDT= 1.00] out<- 02:C1           64.39    1.849 No_date   12:30   30.86  n/a
      [L/S/n=  510./1.950/.035]
      {Vmax= 1.530:Dmax=  .553}
 241:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C1             64.39    1.849 No_date   12:30   30.86  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C1.241
      remark:Routing Hydrograph for C1
 241:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M2             26.14     .837 No_date   12:17   30.06 .600
      [XIMP=.32:TIMP=.40]
      [LOSS= 2 :CN= 80.8]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 418.:MNI=.045:SCI=   .0]
 241:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M2             26.14     .837 No_date   12:17   30.06  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M2.241
      remark:Runoff Hydrograph for M2
 241:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C1             64.39    1.849 No_date   12:30   30.86  n/a
                      + 03:M2             26.14     .837 No_date   12:17   30.06  n/a
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     [DT= 1.00]  SUM=  06:D1            90.53    2.624 No_date   12:27   30.63  n/a
241:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           06:D1            90.53    2.624 No_date   12:27   30.63  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D1.241
     remark:Downstream Hydrograph for C1
241:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:D9           126.60    3.473 No_date   12:41   32.17  n/a
                     +  06:D1            90.53    2.624 No_date   12:27   30.63  n/a
     [DT= 1.00]  SUM=  01:J2           217.13    5.985 No_date   12:36   31.53  n/a
241:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J2            217.13    5.985 No_date   12:36   31.53  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J2.241
     remark:Hydrograph for J2
241:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J2           217.13    5.985 No_date   12:36   31.53  n/a
     [RDT= 1.00] out<- 02:C2           217.13    5.916 No_date   12:41   31.53  n/a
     [L/S/n=  770./2.030/.035]
     {Vmax= 2.069:Dmax=  .815}
241:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C2            217.13    5.916 No_date   12:41   31.53  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C2.241
     remark:Routing Hydrograph for C2
241:0040--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M3            212.90    4.901 No_date   12:50   31.56 .630
     [XIMP=.31:TIMP=.39]
     [LOSS= 2 :CN= 84.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1191.:MNI=.045:SCI=   .0]
241:0041--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M3            212.90    4.901 No_date   12:50   31.56  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M3.241
     remark:Runoff Hydrograph for M3
241:0042--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C2            217.13    5.916 No_date   12:41   31.53  n/a
                     +  03:M3            212.90    4.901 No_date   12:50   31.56  n/a
     [DT= 1.00]  SUM=  01:J3           430.03   10.756 No_date   12:45   31.54  n/a
241:0043--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J3            430.03   10.756 No_date   12:45   31.54  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J3.241
     remark:Hydrograph for J3
241:0044--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J3           430.03   10.756 No_date   12:45   31.54  n/a
     [RDT= 1.00] out<- 02:C3           430.03   10.743 No_date   12:47   31.54  n/a
     [L/S/n=  450./1.190/.035]
     {Vmax= 2.155:Dmax=  .923}
241:0045--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C3            430.03   10.743 No_date   12:47   31.54  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C3.241
     remark:Routing Hydrograph for C3
241:0046--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M4            432.99    8.727 No_date   13:08   32.35 .646
     [XIMP=.34:TIMP=.42]
     [LOSS= 2 :CN= 84.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1699.:MNI=.045:SCI=   .0]
241:0047--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M4            432.99    8.727 No_date   13:08   32.35  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M4.241
     remark:Runoff Hydrograph for M4A
241:0048--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C3            430.03   10.743 No_date   12:47   31.54  n/a
                     +  03:M4            432.99    8.727 No_date   13:08   32.35  n/a
     [DT= 1.00]  SUM=  01:J4           863.02   19.018 No_date   12:55   31.95  n/a
241:0049--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J4            863.02   19.018 No_date   12:55   31.95  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J4.241
     remark:Hydrograph for J4
241:0050--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J4           863.02   19.018 No_date   12:55   31.95  n/a
     [RDT= 1.00] out<- 02:C4           863.02   18.922 No_date   13:00   31.95  n/a
     [L/S/n=  850./1.140/.035]
     {Vmax= 2.599:Dmax= 1.305}
241:0051--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C4            863.02   18.922 No_date   13:00   31.95  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C4.241
     remark:Routing Hydrograph for C4
241:0052--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M5             35.47     .905 No_date   12:24   27.28 .545
     [XIMP=.21:TIMP=.26]
     [LOSS= 2 :CN= 82.3]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 486.:MNI=.045:SCI=   .0]
241:0053--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M5             35.47     .905 No_date   12:24   27.28  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M5.241
     remark:Runoff Hydrograph for M5
241:0054--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C4            863.02   18.922 No_date   13:00   31.95  n/a
                     +  03:M5             35.47     .905 No_date   12:24   27.28  n/a
     [DT= 1.00]  SUM=  01:J5           898.49   19.618 No_date   12:59   31.77  n/a
241:0055--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J5            898.49   19.618 No_date   12:59   31.77  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J5.241
     remark:Hydrograph for J5
241:0056--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J5           898.49   19.618 No_date   12:59   31.77  n/a
     [RDT= 1.00] out<- 02:C5           898.49   19.558 No_date   13:02   31.77  n/a
     [L/S/n=  880./1.600/.035]
     {Vmax= 2.803:Dmax=  .990}
241:0057--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C5            898.49   19.558 No_date   13:02   31.77  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C5.241
     remark:Routing Hydrograph for C5
241:0058--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M6             64.01    2.511 No_date   12:26   38.56 .770
     [XIMP=.37:TIMP=.46]
     [LOSS= 2 :CN= 92.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 653.:MNI=.045:SCI=   .0]
241:0059--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M6             64.01    2.511 No_date   12:26   38.56  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M6.241
     remark:Runoff Hydrograph for M6
241:0060--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C5            898.49   19.558 No_date   13:02   31.77  n/a
                     +  03:M6             64.01    2.511 No_date   12:26   38.56  n/a
     [DT= 1.00]  SUM=  01:J6           962.50   21.345 No_date   13:01   32.22  n/a
241:0061--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J6            962.50   21.345 No_date   13:01   32.22  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J6.241
     remark:Hydrograph for J6
241:0062--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J6           962.50   21.345 No_date   13:01   32.22  n/a
     [RDT= 1.00] out<- 02:C6           962.50   21.235 No_date   13:04   32.22  n/a
     [L/S/n=  980./1.490/.035]
     {Vmax= 2.738:Dmax= 1.451}
241:0063--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C6            962.50   21.235 No_date   13:04   32.22  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C6.241
     remark:Routing Hydrograph for C6
241:0064--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M7             24.39     .550 No_date   12:21   24.34 .486
     [XIMP=.18:TIMP=.22]
     [LOSS= 2 :CN= 79.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 403.:MNI=.045:SCI=   .0]
241:0065--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M7             24.39     .550 No_date   12:21   24.34  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M7.241
     remark:Runoff Hydrograph for M7
241:0066--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C6            962.50   21.235 No_date   13:04   32.22  n/a
                     +  03:M7             24.39     .550 No_date   12:21   24.34  n/a
     [DT= 1.00]  SUM=  01:J7           986.89   21.632 No_date   13:03   32.02  n/a
241:0067--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J7            986.89   21.632 No_date   13:03   32.02  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J7.241
     remark:Hydrograph for J7
241:0068--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J7           986.89   21.632 No_date   13:03   32.02  n/a
     [RDT= 1.00] out<- 02:C7           986.89   21.592 No_date   13:06   32.02  n/a
     [L/S/n=  530./1.410/.035]
     {Vmax= 2.615:Dmax= 1.429}
241:0069--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C7            986.89   21.592 No_date   13:06   32.02  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C7.241
     remark:Routing Hydrograph for C7
241:0070--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M8             21.78     .859 No_date   12:15   34.13 .681
     [XIMP=.38:TIMP=.48]
     [LOSS= 2 :CN= 84.8]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 381.:MNI=.045:SCI=   .0]
241:0071--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M8             21.78     .859 No_date   12:15   34.13  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M8.241
     remark:Runoff Hydrograph for M8
241:0072--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C7            986.89   21.592 No_date   13:06   32.02  n/a
                     +  03:M8             21.78     .859 No_date   12:15   34.13  n/a
     [DT= 1.00]  SUM=  04:D7          1008.67   22.009 No_date   13:06   32.07  n/a
241:0073--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           04:D7          1008.67   22.009 No_date   13:06   32.07  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D7.241
     remark:Downstream Hydrograph for C7
241:0074--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:D7          1008.67   22.009 No_date   13:06   32.07  n/a
                     +  05:D11          280.43    5.415 No_date   12:57   28.38  n/a
                     +  07:DT4           70.81    1.984 No_date   12:27   30.49  n/a
     [DT= 1.00]  SUM=  01:J8          1359.91   28.880 No_date   13:02   31.23  n/a
241:0075--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J8          1359.91   28.880 No_date   13:02   31.23  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J8.241
     remark:Hydrograph for J8
241:0076--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J8          1359.91   28.880 No_date   13:02   31.23  n/a
     [RDT= 1.00] out<- 02:C8          1359.91   27.191 No_date   13:21   31.23  n/a
     [L/S/n=  920./ .290/.035]
     {Vmax=  .905:Dmax= 2.080}
241:0077--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C8          1359.91   27.191 No_date   13:21   31.23  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C8.241
     remark:Routing Hydrograph for C8
241:0078--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M9             17.59     .502 No_date   12:19   28.31 .565
     [XIMP=.19:TIMP=.24]
     [LOSS= 2 :CN= 84.6]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 342.:MNI=.045:SCI=   .0]
241:0079--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M9             17.59     .502 No_date   12:19   28.31  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M9.241
     remark:Runoff Hydrograph for M9
241:0080--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C8          1359.91   27.191 No_date   13:21   31.23  n/a
                     +  03:M9             17.59     .502 No_date   12:19   28.31  n/a
     [DT= 1.00]  SUM=  01:O1          1377.50   27.449 No_date   13:20   31.19  n/a
241:0081--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:O1          1377.50   27.449 No_date   13:20   31.19  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-O1.241
     remark:Hydrograph for O1
 ** END OF RUN : 241

************************************************************************************




 RUN:COMMAND#
 242:0001--------------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 242 ]
#*********************************************************************************
#  Project Name: [Bilberry Creek FPM Study] Project Number:[M800_200_030_209]
#  Date        : 01-12-2017
#  Modeller    : [AA, TB, SN]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#*********************************************************************************
 242:0002--------------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=30.00:SDUR=  24.00:PTOT=  70.01]
 242:0003--------------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\BilVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [Bilberry Creek Default Value File]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      Horton's infiltration equation parameters:
      [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
```

```
      Parameters for PERVIOUS surfaces in STANDHYD:
      [IAper=   4.67 mm] [LGP=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Upstream Tributary
 242:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:UT1           93.87    5.052 No_date   12:25   51.86 .741
      [XIMP=.35:TIMP=.44]
      [LOSS= 2 :CN= 86.2]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 791.:MNI=.045:SCI=   .0]
 242:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:UT1           93.87    5.052 No_date   12:25   51.86  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT1.242
      remark:Runoff Hydrograph for UT1
 242:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:UT1           93.87    5.052 No_date   12:25   51.86  n/a
      [RDT= 1.00] out<- 02:C9            93.87    4.905 No_date   12:29   51.86  n/a
      [L/S/n=  860./1.260/.035]
      {Vmax= 1.476:Dmax=  .539}
 242:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C9            93.87    4.905 No_date   12:29   51.86  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C9.242
      remark:Routing Hydrograph for C9
 242:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:UT2           32.73    1.575 No_date   12:19   43.35 .619
      [XIMP=.23:TIMP=.29]
      [LOSS= 2 :CN= 80.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 467.:MNI=.045:SCI=   .0]
 242:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:UT2           32.73    1.575 No_date   12:19   43.35  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT2.242
      remark:Runoff Hydrograph for UT2
 242:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C9            93.87    4.905 No_date   12:29   51.86  n/a
                      + 03:UT2           32.73    1.575 No_date   12:19   43.35  n/a
      [DT= 1.00]  SUM=  04:D9           126.60    6.415 No_date   12:27   49.66  n/a
 242:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:D9            126.60    6.415 No_date   12:27   49.66  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D9.242
      remark:Downstream Hydrograph for C9
# Downstream Tributary
 242:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:DT1           247.46    8.775 No_date   12:42   43.95 .628
      [XIMP=.33:TIMP=.41]
      [LOSS= 2 :CN= 76.1]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1284.:MNI=.045:SCI=   .0]
 242:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:DT1           247.46    8.775 No_date   12:42   43.95  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT1.242
      remark:Runoff Hydrograph for DT1
 242:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:DT1           247.46    8.775 No_date   12:42   43.95  n/a
      [RDT= 1.00] out<- 02:C10           247.46    8.725 No_date   12:45   43.95  n/a
      [L/S/n=  460./ .800/.035]
      {Vmax= 1.812:Dmax=  .837}
 242:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C10           247.46    8.725 No_date   12:45   43.95  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C10.242
      remark:Routing Hydrograph for C10
 242:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:DT2            20.34     .996 No_date   12:14   41.98 .600
      [XIMP=.26:TIMP=.32]
      [LOSS= 2 :CN= 77.7]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 368.:MNI=.045:SCI=   .0]
 242:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:DT2            20.34     .996 No_date   12:14   41.98  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT2.242
      remark:Runoff Hydrograph for DT2
 242:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C10           247.46    8.725 No_date   12:45   43.95  n/a
                      + 03:DT2            20.34     .996 No_date   12:14   41.98  n/a
      [DT= 1.00]  SUM=  05:J11          267.80    9.434 No_date   12:43   43.80  n/a
 242:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:J11           267.80    9.434 No_date   12:43   43.80  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J11.242
      remark:Hydrograph for J11
 242:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 05:J11           267.80    9.434 No_date   12:43   43.80  n/a
      [RDT= 1.00] out<- 01:C11           267.80    9.217 No_date   12:51   43.80  n/a
      [L/S/n=  690./1.470/.035]
      {Vmax= 1.434:Dmax=  .957}
 242:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:C11           267.80    9.217 No_date   12:51   43.80  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C11.242
      remark:Routing Hydrograph for C11
 242:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     02:DT3            12.63     .940 No_date   12:10   53.80 .769
      [XIMP=.38:TIMP=.47]
      [LOSS= 2 :CN= 87.4]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 290.:MNI=.045:SCI=   .0]
 242:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:DT3            12.63     .940 No_date   12:10   53.80  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT3.242
      remark:Runoff Hydrograph for DT3
 242:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     07:DT4            70.81    3.503 No_date   12:23   47.46 .678
      [XIMP=.31:TIMP=.38]
      [LOSS= 2 :CN= 82.6]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 687.:MNI=.045:SCI=   .0]
 242:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:DT4            70.81    3.503 No_date   12:23   47.46  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT4.242
      remark:Runoff Hydrograph for DT4
 242:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:C11           267.80    9.217 No_date   12:51   43.80  n/a
                      + 02:DT3            12.63     .940 No_date   12:10   53.80  n/a
      [DT= 1.00]  SUM=  05:D11          280.43    9.659 No_date   12:49   44.25  n/a
 242:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:D11           280.43    9.659 No_date   12:49   44.25  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D11.242
      remark:Downstream Hydrograph for C11
# Main Channel
 242:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:M1            64.39    3.277 No_date   12:22   47.88 .684
      [XIMP=.32:TIMP=.40]
      [LOSS= 2 :CN= 82.3]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 655.:MNI=.045:SCI=   .0]
 242:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:M1            64.39    3.277 No_date   12:22   47.88  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M1.242
      remark:Runoff Hydrograph for M1
 242:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:M1            64.39    3.277 No_date   12:22   47.88  n/a
      [RDT= 1.00] out<- 02:C1            64.39    3.262 No_date   12:23   47.88  n/a
      [L/S/n=  510./1.950/.035]
      {Vmax= 1.939:Dmax=  .735}
 242:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C1            64.39    3.262 No_date   12:23   47.88  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C1.242
      remark:Routing Hydrograph for C1
 242:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M2            26.14    1.459 No_date   12:15   46.75 .668
      [XIMP=.32:TIMP=.40]
      [LOSS= 2 :CN= 80.8]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 418.:MNI=.045:SCI=   .0]
 242:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M2            26.14    1.459 No_date   12:15   46.75  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M2.242
      remark:Runoff Hydrograph for M2
 242:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C1            64.39    3.262 No_date   12:23   47.88  n/a
                      + 03:M2            26.14    1.459 No_date   12:15   46.75  n/a
      [DT= 1.00]  SUM=  06:D1           90.53    4.641 No_date   12:21   47.55  n/a
 242:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:D1            90.53    4.641 No_date   12:21   47.55  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D1.242
      remark:Downstream Hydrograph for C1
 242:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:D9           126.60    6.415 No_date   12:27   49.66  n/a
                      + 06:D1            90.53    4.641 No_date   12:21   47.55  n/a
      [DT= 1.00]  SUM=  01:J2           217.13   10.974 No_date   12:26   48.78  n/a
 242:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:J2            217.13   10.974 No_date   12:26   48.78  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J2.242
      remark:Hydrograph for J2
 242:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:J2           217.13   10.974 No_date   12:26   48.78  n/a
      [RDT= 1.00] out<- 02:C2           217.13   10.814 No_date   12:30   48.78  n/a
      [L/S/n=  770./2.030/.035]
      {Vmax= 2.412:Dmax= 1.036}
 242:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C2            217.13   10.814 No_date   12:30   48.78  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C2.242
      remark:Routing Hydrograph for C2
 242:0040--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M3           212.90    8.857 No_date   12:40   48.92 .699
      [XIMP=.31:TIMP=.39]
      [LOSS= 2 :CN= 84.2]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1191.:MNI=.045:SCI=   .0]
 242:0041--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M3           212.90    8.857 No_date   12:40   48.92  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M3.242
      remark:Runoff Hydrograph for M3
 242:0042--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C2           217.13   10.814 No_date   12:30   48.78  n/a
                      + 03:M3           212.90    8.857 No_date   12:40   48.92  n/a
      [DT= 1.00]  SUM=  01:J3           430.03   19.442 No_date   12:35   48.85  n/a
 242:0043--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:J3            430.03   19.442 No_date   12:35   48.85  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J3.242
      remark:Hydrograph for J3
 242:0044--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:J3           430.03   19.442 No_date   12:35   48.85  n/a
      [RDT= 1.00] out<- 02:C3           430.03   19.391 No_date   12:37   48.85  n/a
      [L/S/n=  450./1.190/.035]
      {Vmax= 2.538:Dmax= 1.211}
 242:0045--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C3            430.03   19.391 No_date   12:37   48.85  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C3.242
      remark:Routing Hydrograph for C3
 242:0046--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M4           432.99   15.720 No_date   12:54   49.84 .712
      [XIMP=.34:TIMP=.42]
      [LOSS= 2 :CN= 84.1]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1699.:MNI=.045:SCI=   .0]
 242:0047--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M4            432.99   15.720 No_date   12:54   49.84  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M4.242
      remark:Runoff Hydrograph for M4A
 242:0048--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C3           430.03   19.391 No_date   12:37   48.85  n/a
                      + 03:M4           432.99   15.720 No_date   12:54   49.84  n/a
      [DT= 1.00]  SUM=  01:J4           863.02   34.127 No_date   12:44   49.35  n/a
 242:0049--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:J4            863.02   34.127 No_date   12:44   49.35  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J4.242
      remark:Hydrograph for J4
 242:0050--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:J4           863.02   34.127 No_date   12:44   49.35  n/a
      [RDT= 1.00] out<- 02:C4           863.02   33.979 No_date   12:48   49.35  n/a
      [L/S/n=  850./1.140/.035]
      {Vmax= 3.118:Dmax= 1.715}
 242:0051--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C4            863.02   33.979 No_date   12:48   49.35  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C4.242
      remark:Routing Hydrograph for C4
 242:0052--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M5            35.47    1.675 No_date   12:20   43.59 .623
      [XIMP=.21:TIMP=.26]
      [LOSS= 2 :CN= 82.3]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 486.:MNI=.045:SCI=   .0]
 242:0053--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M5            35.47    1.675 No_date   12:20   43.59  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M5.242
      remark:Runoff Hydrograph for M5
 242:0054--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C4           863.02   33.979 No_date   12:48   49.35  n/a
                      + 03:M5            35.47    1.675 No_date   12:20   43.59  n/a
      [DT= 1.00]  SUM=  01:J5           898.49   35.302 No_date   12:46   49.12  n/a
 242:0055--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:J5            898.49   35.302 No_date   12:46   49.12  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J5.242
      remark:Hydrograph for J5
```

```
242:0056--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J5           898.49   35.302 No_date   12:46   49.12  n/a
     [RDT= 1.00] out<- 02:C5           898.49   35.183 No_date   12:49   49.12  n/a
     [L/S/n=  880./1.600/.035]
     {Vmax= 3.417:Dmax= 1.352}
242:0057--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD            02:C5           898.49   35.183 No_date   12:49   49.12  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C5.242
     remark:Routing Hydrograph for C5
242:0058--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M6             64.01    4.173 No_date   12:21   57.68 .824
     [XIMP=.37:TIMP=.46]
     [LOSS= 2 :CN= 92.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 653.:MNI=.045:SCI=   .0]
242:0059--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD            03:M6             64.01    4.173 No_date   12:21   57.68  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M6.242
     remark:Runoff Hydrograph for M6
242:0060--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             02:C5           898.49   35.183 No_date   12:49   49.12  n/a
                      + 03:M6            64.01    4.173 No_date   12:21   57.68  n/a
     [DT= 1.00]  SUM=  01:J6           962.50   38.292 No_date   12:48   49.69  n/a
242:0061--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD            01:J6           962.50   38.292 No_date   12:48   49.69  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J6.242
     remark:Hydrograph for J6
242:0062--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J6           962.50   38.292 No_date   12:48   49.69  n/a
     [RDT= 1.00] out<- 02:C6           962.50   38.013 No_date   12:52   49.69  n/a
     [L/S/n=  980./1.490/.035]
     {Vmax= 3.033:Dmax= 1.752}
242:0063--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD            02:C6           962.50   38.013 No_date   12:52   49.69  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C6.242
     remark:Routing Hydrograph for C6
242:0064--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M7             24.39    1.056 No_date   12:18   39.60 .566
     [XIMP=.18:TIMP=.22]
     [LOSS= 2 :CN= 79.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 403.:MNI=.045:SCI=   .0]
242:0065--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD            03:M7             24.39    1.056 No_date   12:18   39.60  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M7.242
     remark:Runoff Hydrograph for M7
242:0066--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             02:C6           962.50   38.013 No_date   12:52   49.69  n/a
                      + 03:M7            24.39    1.056 No_date   12:18   39.60  n/a
     [DT= 1.00]  SUM=  01:J7           986.89   38.764 No_date   12:51   49.44  n/a
242:0067--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD            01:J7           986.89   38.764 No_date   12:51   49.44  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J7.242
     remark:Hydrograph for J7
242:0068--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J7           986.89   38.764 No_date   12:51   49.44  n/a
     [RDT= 1.00] out<- 02:C7           986.89   38.673 No_date   12:54   49.44  n/a
     [L/S/n=  530./1.410/.035]
     {Vmax= 2.846:Dmax= 1.751}
242:0069--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD            02:C7           986.89   38.673 No_date   12:54   49.44  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C7.242
     remark:Routing Hydrograph for C7
242:0070--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M8             21.78    1.456 No_date   12:13   52.00 .743
     [XIMP=.38:TIMP=.48]
     [LOSS= 2 :CN= 84.8]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 381.:MNI=.045:SCI=   .0]
242:0071--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD            03:M8             21.78    1.456 No_date   12:13   52.00  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M8.242
     remark:Runoff Hydrograph for M8
242:0072--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             02:C7           986.89   38.673 No_date   12:54   49.44  n/a
                      + 03:M8            21.78    1.456 No_date   12:13   52.00  n/a
     [DT= 1.00]  SUM=  04:D7          1008.67   39.407 No_date   12:54   49.50  n/a
242:0073--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD            04:D7          1008.67   39.407 No_date   12:54   49.50  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D7.242
     remark:Downstream Hydrograph for C7
242:0074--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             04:D7          1008.67   39.407 No_date   12:54   49.50  n/a
                      + 05:D11          280.43    9.659 No_date   12:49   44.25  n/a
                      + 07:DT4           70.81    3.503 No_date   12:23   47.46  n/a
     [DT= 1.00]  SUM=  01:J8          1359.91   51.724 No_date   12:51   48.31  n/a
242:0075--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD            01:J8          1359.91   51.724 No_date   12:51   48.31  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J8.242
     remark:Hydrograph for J8
242:0076--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J8          1359.91   51.724 No_date   12:51   48.31  n/a
     [RDT= 1.00] out<- 02:C8          1359.91   48.430 No_date   13:06   48.31  n/a
     [L/S/n=  920./ .290/.035]
     {Vmax=  .995:Dmax= 2.403}
242:0077--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD            02:C8          1359.91   48.430 No_date   13:06   48.31  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C8.242
     remark:Routing Hydrograph for C8
242:0078--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M9             17.59     .948 No_date   12:16   45.13 .645
     [XIMP=.19:TIMP=.24]
     [LOSS= 2 :CN= 84.6]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 342.:MNI=.045:SCI=   .0]
242:0079--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD            03:M9             17.59     .948 No_date   12:16   45.13  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M9.242
     remark:Runoff Hydrograph for M9
242:0080--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             02:C8          1359.91   48.430 No_date   13:06   48.31  n/a
                      + 03:M9            17.59     .948 No_date   12:16   45.13  n/a
     [DT= 1.00]  SUM=  01:O1          1377.50   48.898 No_date   13:06   48.27  n/a
242:0081--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD            01:O1          1377.50   48.898 No_date   13:06   48.27  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-O1.242
     remark:Hydrograph for O1
  ** END OF RUN : 242

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 RUN:COMMAND#
 243:0001--------------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 243 ]
 #*******************************************************************************
 #  Project Name: [Bilberry Creek FPM Study] Project Number:[M800_200_030_209]
 #  Date        : 01-12-2017
 #  Modeller    : [AA, TB, SN]
 #  Company     : Rideau Valley Conservation Authority
 #  License #   :  5329846
 #*******************************************************************************
 243:0002--------------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=30.00:SDUR=  24.00:PTOT=  82.59]
 243:0003--------------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\BilVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [Bilberry Creek Default Value File]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      Horton's infiltration equation parameters:
      [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
      Parameters for PERVIOUS surfaces in STANDHYD:
      [IAper=   4.67 mm] [LGP=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
 # Upstream Tributary
 243:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:UT1           93.87    6.558 No_date   12:23   63.56 .770
      [XIMP=.35:TIMP=.44]
      [LOSS= 2 :CN= 86.2]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 791.:MNI=.045:SCI=   .0]
 243:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD            01:UT1           93.87    6.558 No_date   12:23   63.56  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT1.243
      remark:Runoff Hydrograph for UT1
 243:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:UT1           93.87    6.558 No_date   12:23   63.56  n/a
      [RDT= 1.00] out<- 02:C9           93.87    6.360 No_date   12:29   63.56  n/a
      [L/S/n=  860./1.260/.035]
      {Vmax= 1.681:Dmax=  .605}
 243:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD            02:C9           93.87    6.360 No_date   12:29   63.56  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C9.243
      remark:Routing Hydrograph for C9
 243:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:UT2           32.73    2.074 No_date   12:17   54.11 .655
      [XIMP=.23:TIMP=.29]
      [LOSS= 2 :CN= 80.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 467.:MNI=.045:SCI=   .0]
 243:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD            03:UT2           32.73    2.074 No_date   12:17   54.11  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT2.243
      remark:Runoff Hydrograph for UT2
 243:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             02:C9           93.87    6.360 No_date   12:29   63.56  n/a
                       + 03:UT2          32.73    2.074 No_date   12:17   54.11  n/a
      [DT= 1.00]  SUM=  04:D9          126.60    8.310 No_date   12:27   61.12  n/a
 243:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD            04:D9          126.60    8.310 No_date   12:27   61.12  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D9.243
      remark:Downstream Hydrograph for C9
 # Downstream Tributary
 243:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:DT1          247.46   11.703 No_date   12:37   54.49 .660
      [XIMP=.33:TIMP=.41]
      [LOSS= 2 :CN= 76.1]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1284.:MNI=.045:SCI=   .0]
 243:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD            01:DT1          247.46   11.703 No_date   12:37   54.49  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT1.243
      remark:Runoff Hydrograph for DT1
 243:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:DT1          247.46   11.703 No_date   12:37   54.49  n/a
      [RDT= 1.00] out<- 02:C10          247.46   11.567 No_date   12:41   54.49  n/a
      [L/S/n=  460./ .800/.035]
      {Vmax= 1.814:Dmax= 1.023}
 243:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD            02:C10          247.46   11.567 No_date   12:41   54.49  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C10.243
      remark:Routing Hydrograph for C10
 243:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:DT2           20.34    1.322 No_date   12:13   52.41 .635
      [XIMP=.26:TIMP=.32]
      [LOSS= 2 :CN= 77.7]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 368.:MNI=.045:SCI=   .0]
 243:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD            03:DT2           20.34    1.322 No_date   12:13   52.41  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT2.243
      remark:Runoff Hydrograph for DT2
 243:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             02:C10          247.46   11.567 No_date   12:41   54.49  n/a
                       + 03:DT2          20.34    1.322 No_date   12:13   52.41  n/a
      [DT= 1.00]  SUM=  05:J11          267.80   12.494 No_date   12:40   54.33  n/a
 243:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD            05:J11          267.80   12.494 No_date   12:40   54.33  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J11.243
      remark:Hydrograph for J11
 243:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 05:J11          267.80   12.494 No_date   12:40   54.33  n/a
      [RDT= 1.00] out<- 01:C11          267.80   12.253 No_date   12:47   54.33  n/a
      [L/S/n=  690./1.470/.035]
      {Vmax= 1.502:Dmax= 1.019}
 243:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD            01:C11          267.80   12.253 No_date   12:47   54.33  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C11.243
      remark:Routing Hydrograph for C11
 243:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     02:DT3           12.63    1.195 No_date   12:09   65.68 .795
      [XIMP=.38:TIMP=.47]
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     [LOSS= 2 :CN= 87.4]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 290.:MNI=.045:SCI=   .0]
243:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:DT3          12.63    1.195 No_date   12:09   65.68  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT3.243
     remark:Runoff Hydrograph for DT3
243:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     07:DT4           70.81    4.583 No_date   12:21   58.67 .710
     [XIMP=.31:TIMP=.38]
     [LOSS= 2 :CN= 82.6]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 687.:MNI=.045:SCI=   .0]
243:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           07:DT4           70.81    4.583 No_date   12:21   58.67  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT4.243
     remark:Runoff Hydrograph for DT4
243:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:C11         267.80   12.253 No_date   12:47   54.33  n/a
                     +  02:DT3          12.63    1.195 No_date   12:09   65.68  n/a
     [DT= 1.00]  SUM=  05:D11         280.43   12.825 No_date   12:46   54.84  n/a
243:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           05:D11         280.43   12.825 No_date   12:46   54.84  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D11.243
     remark:Downstream Hydrograph for C11
# Main Channel
243:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     01:M1            64.39    4.295 No_date   12:20   59.09 .716
     [XIMP=.32:TIMP=.40]
     [LOSS= 2 :CN= 82.3]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 655.:MNI=.045:SCI=   .0]
243:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:M1            64.39    4.295 No_date   12:20   59.09  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M1.243
     remark:Runoff Hydrograph for M1
243:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:M1            64.39    4.295 No_date   12:20   59.09  n/a
     [RDT= 1.00] out<- 02:C1            64.39    4.247 No_date   12:24   59.09  n/a
     [L/S/n=  510./1.950/.035]
     {Vmax= 2.083:Dmax=  .808}
243:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C1            64.39    4.247 No_date   12:24   59.09  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C1.243
     remark:Routing Hydrograph for C1
243:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M2            26.14    1.900 No_date   12:13   57.80 .700
     [XIMP=.32:TIMP=.40]
     [LOSS= 2 :CN= 80.8]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 418.:MNI=.045:SCI=   .0]
243:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M2            26.14    1.900 No_date   12:13   57.80  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M2.243
     remark:Runoff Hydrograph for M2
243:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C1            64.39    4.247 No_date   12:24   59.09  n/a
                     +  03:M2            26.14    1.900 No_date   12:13   57.80  n/a
     [DT= 1.00]  SUM=  06:D1            90.53    6.019 No_date   12:21   58.72  n/a
243:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           06:D1            90.53    6.019 No_date   12:21   58.72  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D1.243
     remark:Downstream Hydrograph for C1
243:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:D9          126.60    8.310 No_date   12:27   61.12  n/a
                     +  06:D1            90.53    6.019 No_date   12:21   58.72  n/a
     [DT= 1.00]  SUM=  01:J2          217.13   14.256 No_date   12:24   60.12  n/a
243:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J2          217.13   14.256 No_date   12:24   60.12  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J2.243
     remark:Hydrograph for J2
243:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J2          217.13   14.256 No_date   12:24   60.12  n/a
     [RDT= 1.00] out<- 02:C2          217.13   14.177 No_date   12:26   60.12  n/a
     [L/S/n=  770./2.030/.035]
     {Vmax= 2.707:Dmax= 1.182}
243:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C2          217.13   14.177 No_date   12:26   60.12  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C2.243
     remark:Routing Hydrograph for C2
243:0040--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M3           212.90   11.808 No_date   12:35   60.32 .730
     [XIMP=.31:TIMP=.39]
     [LOSS= 2 :CN= 84.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1191.:MNI=.045:SCI=   .0]
243:0041--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M3           212.90   11.808 No_date   12:35   60.32  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M3.243
     remark:Runoff Hydrograph for M3
243:0042--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C2          217.13   14.177 No_date   12:26   60.12  n/a
                     +  03:M3          212.90   11.808 No_date   12:35   60.32  n/a
     [DT= 1.00]  SUM=  01:J3          430.03   25.755 No_date   12:31   60.22  n/a
243:0043--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J3          430.03   25.755 No_date   12:31   60.22  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J3.243
     remark:Hydrograph for J3
243:0044--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J3          430.03   25.755 No_date   12:31   60.22  n/a
     [RDT= 1.00] out<- 02:C3          430.03   25.721 No_date   12:33   60.21  n/a
     [L/S/n=  450./1.190/.035]
     {Vmax= 2.806:Dmax= 1.407}
243:0045--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C3          430.03   25.721 No_date   12:33   60.21  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C3.243
     remark:Routing Hydrograph for C3
243:0046--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M4           432.99   20.731 No_date   12:49   61.30 .742
     [XIMP=.34:TIMP=.42]
     [LOSS= 2 :CN= 84.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1699.:MNI=.045:SCI=   .0]
243:0047--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M4           432.99   20.731 No_date   12:49   61.30  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M4.243
     remark:Runoff Hydrograph for M4A
243:0048--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C3          430.03   25.721 No_date   12:33   60.21  n/a
                     +  03:M4          432.99   20.731 No_date   12:49   61.30  n/a
     [DT= 1.00]  SUM=  01:J4          863.02   45.061 No_date   12:40   60.76  n/a
243:0049--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J4          863.02   45.061 No_date   12:40   60.76  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J4.243
     remark:Hydrograph for J4
243:0050--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J4          863.02   45.061 No_date   12:40   60.76  n/a
     [RDT= 1.00] out<- 02:C4          863.02   44.887 No_date   12:43   60.76  n/a
     [L/S/n=  850./1.140/.035]
     {Vmax= 3.386:Dmax= 1.957}
243:0051--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C4          863.02   44.887 No_date   12:43   60.76  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C4.243
     remark:Routing Hydrograph for C4
243:0052--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M5            35.47    2.250 No_date   12:18   54.46 .659
     [XIMP=.21:TIMP=.26]
     [LOSS= 2 :CN= 82.3]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 486.:MNI=.045:SCI=   .0]
243:0053--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M5            35.47    2.250 No_date   12:18   54.46  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M5.243
     remark:Runoff Hydrograph for M5
243:0054--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C4          863.02   44.887 No_date   12:43   60.76  n/a
                     +  03:M5           35.47    2.250 No_date   12:18   54.46  n/a
     [DT= 1.00]  SUM=  01:J5          898.49   46.650 No_date   12:42   60.51  n/a
243:0055--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J5          898.49   46.650 No_date   12:42   60.51  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J5.243
     remark:Hydrograph for J5
243:0056--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J5          898.49   46.650 No_date   12:42   60.51  n/a
     [RDT= 1.00] out<- 02:C5          898.49   46.387 No_date   12:46   60.51  n/a
     [L/S/n=  880./1.600/.035]
     {Vmax= 3.663:Dmax= 1.559}
243:0057--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C5          898.49   46.387 No_date   12:46   60.51  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C5.243
     remark:Routing Hydrograph for C5
243:0058--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M6            64.01    5.300 No_date   12:19   69.93 .847
     [XIMP=.37:TIMP=.46]
     [LOSS= 2 :CN= 92.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 653.:MNI=.045:SCI=   .0]
243:0059--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M6            64.01    5.300 No_date   12:19   69.93  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M6.243
     remark:Runoff Hydrograph for M6
243:0060--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C5          898.49   46.387 No_date   12:46   60.51  n/a
                     +  03:M6           64.01    5.300 No_date   12:19   69.93  n/a
     [DT= 1.00]  SUM=  01:J6          962.50   50.291 No_date   12:44   61.14  n/a
243:0061--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J6          962.50   50.291 No_date   12:44   61.14  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J6.243
     remark:Hydrograph for J6
243:0062--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J6          962.50   50.291 No_date   12:44   61.14  n/a
     [RDT= 1.00] out<- 02:C6          962.50   49.929 No_date   12:49   61.14  n/a
     [L/S/n=  980./1.490/.035]
     {Vmax= 3.181:Dmax= 1.927}
243:0063--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C6          962.50   49.929 No_date   12:49   61.14  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C6.243
     remark:Routing Hydrograph for C6
243:0064--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M7            24.39    1.430 No_date   12:16   49.92 .604
     [XIMP=.18:TIMP=.22]
     [LOSS= 2 :CN= 79.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 403.:MNI=.045:SCI=   .0]
243:0065--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M7            24.39    1.430 No_date   12:16   49.92  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M7.243
     remark:Runoff Hydrograph for M7
243:0066--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C6          962.50   49.929 No_date   12:49   61.14  n/a
                     +  03:M7           24.39    1.430 No_date   12:16   49.92  n/a
     [DT= 1.00]  SUM=  01:J7          986.89   50.909 No_date   12:48   60.86  n/a
243:0067--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J7          986.89   50.909 No_date   12:48   60.86  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J7.243
     remark:Hydrograph for J7
243:0068--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J7          986.89   50.909 No_date   12:48   60.86  n/a
     [RDT= 1.00] out<- 02:C7          986.89   50.769 No_date   12:51   60.86  n/a
     [L/S/n=  530./1.410/.035]
     {Vmax= 2.873:Dmax= 1.900}
243:0069--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C7          986.89   50.769 No_date   12:51   60.86  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C7.243
     remark:Routing Hydrograph for C7
243:0070--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M8            21.78    1.872 No_date   12:11   63.65 .771
     [XIMP=.38:TIMP=.48]
     [LOSS= 2 :CN= 84.8]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 381.:MNI=.045:SCI=   .0]
243:0071--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M8            21.78    1.872 No_date   12:11   63.65  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M8.243
     remark:Runoff Hydrograph for M8
243:0072--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C7          986.89   50.769 No_date   12:51   60.86  n/a
                     +  03:M8           21.78    1.872 No_date   12:11   63.65  n/a
     [DT= 1.00]  SUM=  04:D7         1008.67   51.701 No_date   12:50   60.92  n/a
243:0073--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           04:D7         1008.67   51.701 No_date   12:50   60.92  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D7.243
     remark:Downstream Hydrograph for C7
243:0074--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:D7         1008.67   51.701 No_date   12:50   60.92  n/a
                     +  05:D11         280.43   12.825 No_date   12:46   54.84  n/a
                     +  07:DT4          70.81    4.583 No_date   12:21   58.67  n/a
     [DT= 1.00]  SUM=  01:J8         1359.91   67.901 No_date   12:48   59.55  n/a
243:0075--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J8         1359.91   67.901 No_date   12:48   59.55  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J8.243
     remark:Hydrograph for J8
243:0076--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J8         1359.91   67.901 No_date   12:48   59.55  n/a
     [RDT= 1.00] out<- 02:C8         1359.91   63.869 No_date   13:01   59.55  n/a
     [L/S/n=  920./ .290/.035]
```

```
     {Vmax= 1.054:Dmax= 2.588}
 243:0077---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C8          1359.91   63.869 No_date   13:01   59.55  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C8.243
      remark:Routing Hydrograph for C8
 243:0078---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M9            17.59    1.261 No_date   12:14   56.27 .681
      [XIMP=.19:TIMP=.24]
      [LOSS= 2 :CN= 84.6]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 342.:MNI=.045:SCI=   .0]
 243:0079---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M9            17.59    1.261 No_date   12:14   56.27  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M9.243
      remark:Runoff Hydrograph for M9
 243:0080---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C8          1359.91   63.869 No_date   13:01   59.55  n/a
                      +  03:M9            17.59    1.261 No_date   12:14   56.27  n/a
      [DT= 1.00]  SUM=  01:O1          1377.50   64.478 No_date   13:01   59.51  n/a
 243:0081---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:O1          1377.50   64.478 No_date   13:01   59.51  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-O1.243
      remark:Hydrograph for O1
  ** END OF RUN : 243

************************************************************************************




 RUN:COMMAND#
 244:0001---------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on       0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 244 ]
#************************************************************************************
#  Project Name: [Bilberry Creek FPM Study] Project Number:[M800_200_030_209]
#  Date        : 01-12-2017
#  Modeller    : [AA, TB, SN]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#************************************************************************************
 244:0002---------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=30.00:SDUR=  24.00:PTOT=  95.06]
 244:0003---------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\BilVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [Bilberry Creek Default Value File]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      Horton's infiltration equation parameters:
      [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
      Parameters for PERVIOUS surfaces in STANDHYD:
      [IAper=   4.67 mm] [LGP=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Upstream Tributary
 244:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:UT1           93.87    8.113 No_date   12:21   75.32 .792
      [XIMP=.35:TIMP=.44]
      [LOSS= 2 :CN= 86.2]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 791.:MNI=.045:SCI=   .0]
 244:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:UT1           93.87    8.113 No_date   12:21   75.32  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT1.244
      remark:Runoff Hydrograph for UT1
 244:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:UT1           93.87    8.113 No_date   12:21   75.32  n/a
      [RDT= 1.00] out<- 02:C9            93.87    7.825 No_date   12:27   75.32  n/a
      [L/S/n=  860./1.260/.035]
      {Vmax= 1.770:Dmax=  .659}
 244:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C9            93.87    7.825 No_date   12:27   75.32  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C9.244
      remark:Routing Hydrograph for C9
 244:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:UT2           32.73    2.638 No_date   12:15   65.09 .685
      [XIMP=.23:TIMP=.29]
      [LOSS= 2 :CN= 80.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 467.:MNI=.045:SCI=   .0]
 244:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:UT2           32.73    2.638 No_date   12:15   65.09  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT2.244
      remark:Runoff Hydrograph for UT2
 244:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C9            93.87    7.825 No_date   12:27   75.32  n/a
                      +  03:UT2           32.73    2.638 No_date   12:15   65.09  n/a
      [DT= 1.00]  SUM=  04:D9          126.60   10.295 No_date   12:25   72.68  n/a
 244:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:D9          126.60   10.295 No_date   12:25   72.68  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D9.244
      remark:Downstream Hydrograph for C9
# Downstream Tributary
 244:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:DT1          247.46   14.874 No_date   12:33   65.24 .686
      [XIMP=.33:TIMP=.41]
      [LOSS= 2 :CN= 76.1]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1284.:MNI=.045:SCI=   .0]
 244:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:DT1          247.46   14.874 No_date   12:33   65.24  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT1.244
      remark:Runoff Hydrograph for DT1
 244:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:DT1          247.46   14.874 No_date   12:33   65.24  n/a
      [RDT= 1.00] out<- 02:C10          247.46   14.782 No_date   12:37   65.24  n/a
      [L/S/n=  460./ .800/.035]
      {Vmax= 1.933:Dmax= 1.118}
 244:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C10          247.46   14.782 No_date   12:37   65.24  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C10.244
      remark:Routing Hydrograph for C10
 244:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:DT2           20.34    1.681 No_date   12:11   63.09 .664
      [XIMP=.26:TIMP=.32]
      [LOSS= 2 :CN= 77.7]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 368.:MNI=.045:SCI=   .0]
 244:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:DT2           20.34    1.681 No_date   12:11   63.09  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT2.244
      remark:Runoff Hydrograph for DT2
 244:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C10          247.46   14.782 No_date   12:37   65.24  n/a
                      +  03:DT2           20.34    1.681 No_date   12:11   63.09  n/a
      [DT= 1.00]  SUM=  05:J11          267.80   15.985 No_date   12:35   65.08  n/a
 244:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:J11          267.80   15.985 No_date   12:35   65.08  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J11.244
      remark:Hydrograph for J11
 244:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 05:J11          267.80   15.985 No_date   12:35   65.08  n/a
      [RDT= 1.00] out<- 01:C11          267.80   15.673 No_date   12:41   65.08  n/a
      [L/S/n=  690./1.470/.035]
      {Vmax= 1.587:Dmax= 1.091}
 244:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:C11          267.80   15.673 No_date   12:41   65.08  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C11.244
      remark:Routing Hydrograph for C11
 244:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     02:DT3           12.63    1.463 No_date   12:08   77.59 .816
      [XIMP=.38:TIMP=.47]
      [LOSS= 2 :CN= 87.4]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 290.:MNI=.045:SCI=   .0]
 244:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:DT3           12.63    1.463 No_date   12:08   77.59  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT3.244
      remark:Runoff Hydrograph for DT3
 244:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     07:DT4           70.81    5.746 No_date   12:19   70.01 .737
      [XIMP=.31:TIMP=.38]
      [LOSS= 2 :CN= 82.6]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 687.:MNI=.045:SCI=   .0]
 244:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:DT4           70.81    5.746 No_date   12:19   70.01  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT4.244
      remark:Runoff Hydrograph for DT4
 244:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:C11          267.80   15.673 No_date   12:41   65.08  n/a
                      +  02:DT3           12.63    1.463 No_date   12:08   77.59  n/a
      [DT= 1.00]  SUM=  05:D11          280.43   16.419 No_date   12:40   65.64  n/a
 244:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:D11          280.43   16.419 No_date   12:40   65.64  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D11.244
      remark:Downstream Hydrograph for C11
# Main Channel
 244:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:M1            64.39    5.357 No_date   12:18   70.45 .741
      [XIMP=.32:TIMP=.40]
      [LOSS= 2 :CN= 82.3]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 655.:MNI=.045:SCI=   .0]
 244:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:M1            64.39    5.357 No_date   12:18   70.45  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M1.244
      remark:Runoff Hydrograph for M1
 244:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:M1            64.39    5.357 No_date   12:18   70.45  n/a
      [RDT= 1.00] out<- 02:C1            64.39    5.298 No_date   12:22   70.45  n/a
      [L/S/n=  510./1.950/.035]
      {Vmax= 2.165:Dmax=  .868}
 244:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C1            64.39    5.298 No_date   12:22   70.45  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C1.244
      remark:Routing Hydrograph for C1
 244:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M2            26.14    2.386 No_date   12:12   69.01 .726
      [XIMP=.32:TIMP=.40]
      [LOSS= 2 :CN= 80.8]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 418.:MNI=.045:SCI=   .0]
 244:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M2            26.14    2.386 No_date   12:12   69.01  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M2.244
      remark:Runoff Hydrograph for M2
 244:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C1            64.39    5.298 No_date   12:22   70.45  n/a
                      +  03:M2            26.14    2.386 No_date   12:12   69.01  n/a
      [DT= 1.00]  SUM=  06:D1           90.53    7.537 No_date   12:18   70.04  n/a
 244:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:D1            90.53    7.537 No_date   12:18   70.04  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D1.244
      remark:Downstream Hydrograph for C1
 244:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:D9          126.60   10.295 No_date   12:25   72.68  n/a
                      +  06:D1            90.53    7.537 No_date   12:18   70.04  n/a
      [DT= 1.00]  SUM=  01:J2          217.13   17.717 No_date   12:22   71.58  n/a
 244:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:J2          217.13   17.717 No_date   12:22   71.58  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J2.244
      remark:Hydrograph for J2
 244:0038---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:J2          217.13   17.717 No_date   12:22   71.58  n/a
      [RDT= 1.00] out<- 02:C2          217.13   17.660 No_date   12:23   71.58  n/a
      [L/S/n=  770./2.030/.035]
      {Vmax= 3.108:Dmax= 1.336}
 244:0039---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C2          217.13   17.660 No_date   12:23   71.58  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C2.244
      remark:Routing Hydrograph for C2
 244:0040---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M3          212.90   14.864 No_date   12:32   71.83 .756
      [XIMP=.31:TIMP=.39]
      [LOSS= 2 :CN= 84.2]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1191.:MNI=.045:SCI=   .0]
 244:0041---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M3          212.90   14.864 No_date   12:32   71.83  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M3.244
      remark:Runoff Hydrograph for M3
 244:0042---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C2          217.13   17.660 No_date   12:23   71.58  n/a
                      +  03:M3          212.90   14.864 No_date   12:32   71.83  n/a
      [DT= 1.00]  SUM=  01:J3          430.03   32.217 No_date   12:28   71.70  n/a
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244:0043--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J3          430.03   32.217 No_date   12:28   71.70  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J3.244
     remark:Hydrograph for J3
244:0044--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J3          430.03   32.217 No_date   12:28   71.70  n/a
     [RDT= 1.00] out<- 02:C3          430.03   32.129 No_date   12:30   71.70  n/a
     [L/S/n=  450./1.190/.035]
     {Vmax= 2.974:Dmax= 1.556}
244:0045--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C3          430.03   32.129 No_date   12:30   71.70  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C3.244
     remark:Routing Hydrograph for C3
244:0046--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M4          432.99   26.215 No_date   12:45   72.87 .767
     [XIMP=.34:TIMP=.42]
     [LOSS= 2 :CN= 84.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1699.:MNI=.045:SCI=   .0]
244:0047--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M4          432.99   26.215 No_date   12:45   72.87  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M4.244
     remark:Runoff Hydrograph for M4A
244:0048--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C3          430.03   32.129 No_date   12:30   71.70  n/a
                  +   03:M4          432.99   26.215 No_date   12:45   72.87  n/a
     [DT= 1.00]  SUM=  01:J4          863.02   56.762 No_date   12:36   72.29  n/a
244:0049--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J4          863.02   56.762 No_date   12:36   72.29  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J4.244
     remark:Hydrograph for J4
244:0050--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J4          863.02   56.762 No_date   12:36   72.29  n/a
     [RDT= 1.00] out<- 02:C4          863.02   56.509 No_date   12:39   72.29  n/a
     [L/S/n=  850./1.140/.035]
     {Vmax= 3.624:Dmax= 2.187}
244:0051--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C4          863.02   56.509 No_date   12:39   72.29  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C4.244
     remark:Routing Hydrograph for C4
244:0052--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M5           35.47    2.852 No_date   12:16   65.53 .689
     [XIMP=.21:TIMP=.26]
     [LOSS= 2 :CN= 82.3]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 486.:MNI=.045:SCI=   .0]
244:0053--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M5           35.47    2.852 No_date   12:16   65.53  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M5.244
     remark:Runoff Hydrograph for M5
244:0054--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C4          863.02   56.509 No_date   12:39   72.29  n/a
                  +   03:M5           35.47    2.852 No_date   12:16   65.53  n/a
     [DT= 1.00]  SUM=  01:J5          898.49   58.739 No_date   12:38   72.02  n/a
244:0055--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J5          898.49   58.739 No_date   12:38   72.02  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J5.244
     remark:Hydrograph for J5
244:0056--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J5          898.49   58.739 No_date   12:38   72.02  n/a
     [RDT= 1.00] out<- 02:C5          898.49   58.329 No_date   12:43   72.02  n/a
     [L/S/n=  880./1.600/.035]
     {Vmax= 3.614:Dmax= 1.716}
244:0057--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C5          898.49   58.329 No_date   12:43   72.02  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C5.244
     remark:Routing Hydrograph for C5
244:0058--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M6           64.01    6.483 No_date   12:17   82.14 .864
     [XIMP=.37:TIMP=.46]
     [LOSS= 2 :CN= 92.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 653.:MNI=.045:SCI=   .0]
244:0059--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M6           64.01    6.483 No_date   12:17   82.14  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M6.244
     remark:Runoff Hydrograph for M6
244:0060--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C5          898.49   58.329 No_date   12:43   72.02  n/a
                  +   03:M6           64.01    6.483 No_date   12:17   82.14  n/a
     [DT= 1.00]  SUM=  01:J6          962.50   63.083 No_date   12:40   72.69  n/a
244:0061--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J6          962.50   63.083 No_date   12:40   72.69  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J6.244
     remark:Hydrograph for J6
244:0062--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J6          962.50   63.083 No_date   12:40   72.69  n/a
     [RDT= 1.00] out<- 02:C6          962.50   62.541 No_date   12:46   72.69  n/a
     [L/S/n=  980./1.490/.035]
     {Vmax= 3.242:Dmax= 2.071}
244:0063--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C6          962.50   62.541 No_date   12:46   72.69  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C6.244
     remark:Routing Hydrograph for C6
244:0064--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M7           24.39    1.844 No_date   12:15   60.50 .636
     [XIMP=.18:TIMP=.22]
     [LOSS= 2 :CN= 79.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 403.:MNI=.045:SCI=   .0]
244:0065--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M7           24.39    1.844 No_date   12:15   60.50  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M7.244
     remark:Runoff Hydrograph for M7
244:0066--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C6          962.50   62.541 No_date   12:46   72.69  n/a
                  +   03:M7           24.39    1.844 No_date   12:15   60.50  n/a
     [DT= 1.00]  SUM=  01:J7          986.89   63.776 No_date   12:45   72.39  n/a
244:0067--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J7          986.89   63.776 No_date   12:45   72.39  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J7.244
     remark:Hydrograph for J7
244:0068--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J7          986.89   63.776 No_date   12:45   72.39  n/a
     [RDT= 1.00] out<- 02:C7          986.89   63.573 No_date   12:48   72.39  n/a
     [L/S/n=  530./1.410/.035]
     {Vmax= 2.902:Dmax= 2.058}
244:0069--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C7          986.89   63.573 No_date   12:48   72.39  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C7.244
     remark:Routing Hydrograph for C7
244:0070--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M8           21.78    2.302 No_date   12:10   75.37 .793
     [XIMP=.38:TIMP=.48]
     [LOSS= 2 :CN= 84.8]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 381.:MNI=.045:SCI=   .0]
244:0071--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M8           21.78    2.302 No_date   12:10   75.37  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M8.244
     remark:Runoff Hydrograph for M8
244:0072--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C7          986.89   63.573 No_date   12:48   72.39  n/a
                  +   03:M8           21.78    2.302 No_date   12:10   75.37  n/a
     [DT= 1.00]  SUM=  04:D7          1008.67   64.709 No_date   12:47   72.46  n/a
244:0073--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          04:D7          1008.67   64.709 No_date   12:47   72.46  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D7.244
     remark:Downstream Hydrograph for C7
244:0074--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           04:D7          1008.67   64.709 No_date   12:47   72.46  n/a
                  +   05:D11          280.43   16.419 No_date   12:40   65.64  n/a
                  +   07:DT4           70.81    5.746 No_date   12:19   70.01  n/a
     [DT= 1.00]  SUM=  01:J8          1359.91   85.179 No_date   12:44   70.92  n/a
244:0075--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:J8          1359.91   85.179 No_date   12:44   70.92  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J8.244
     remark:Hydrograph for J8
244:0076--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J8          1359.91   85.179 No_date   12:44   70.92  n/a
     [RDT= 1.00] out<- 02:C8          1359.91   80.127 No_date   12:56   70.92  n/a
     [L/S/n=  920./ .290/.035]
     {Vmax= 1.116:Dmax= 2.759}
244:0077--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:C8          1359.91   80.127 No_date   12:56   70.92  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C8.244
     remark:Routing Hydrograph for C8
244:0078--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    03:M9           17.59    1.607 No_date   12:13   67.58 .711
     [XIMP=.19:TIMP=.24]
     [LOSS= 2 :CN= 84.6]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 342.:MNI=.045:SCI=   .0]
244:0079--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:M9           17.59    1.607 No_date   12:13   67.58  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M9.244
     remark:Runoff Hydrograph for M9
244:0080--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:C8          1359.91   80.127 No_date   12:56   70.92  n/a
                  +   03:M9           17.59    1.607 No_date   12:13   67.58  n/a
     [DT= 1.00]  SUM=  01:O1          1377.50   80.892 No_date   12:56   70.88  n/a
244:0081--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:O1          1377.50   80.892 No_date   12:56   70.88  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-O1.244
     remark:Hydrograph for O1
  ** END OF RUN : 244

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 RUN:COMMAND#
 245:0001--------------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 245 ]
#*************************************************************************
#  Project Name: [Bilberry Creek FPM Study] Project Number:[M800_200_030_209]
#  Date        : 01-12-2017
#  Modeller    : [AA, TB, SN]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#*************************************************************************
 245:0002--------------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=30.00:SDUR=  24.00:PTOT= 110.93]
 245:0003--------------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\BilVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [Bilberry Creek Default Value File]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      Horton's infiltration equation parameters:
      [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
      Parameters for PERVIOUS surfaces in STANDHYD:
      [IAper=   4.67 mm] [LGP=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Upstream Tributary
 245:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD    01:UT1           93.87   10.216 No_date   12:19   90.48 .816
      [XIMP=.35:TIMP=.44]
      [LOSS= 2 :CN= 86.2]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 791.:MNI=.045:SCI=   .0]
 245:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          01:UT1           93.87   10.216 No_date   12:19   90.48  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT1.245
      remark:Runoff Hydrograph for UT1
 245:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:UT1           93.87   10.216 No_date   12:19   90.48  n/a
      [RDT= 1.00] out<- 02:C9           93.87    9.884 No_date   12:25   90.47  n/a
      [L/S/n=  860./1.260/.035]
      {Vmax= 1.907:Dmax=  .731}
 245:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          02:C9           93.87    9.884 No_date   12:25   90.47  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C9.245
      remark:Routing Hydrograph for C9
 245:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD    03:UT2           32.73    3.409 No_date   12:14   79.38 .716
      [XIMP=.23:TIMP=.29]
      [LOSS= 2 :CN= 80.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 467.:MNI=.045:SCI=   .0]
 245:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          03:UT2           32.73    3.409 No_date   12:14   79.38  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT2.245
      remark:Runoff Hydrograph for UT2
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245:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C9            93.87    9.884 No_date   12:25   90.47  n/a
                  +  03:UT2             32.73    3.409 No_date   12:14   79.38  n/a
     [DT= 1.00]  SUM=  04:D9           126.60   13.058 No_date   12:22   87.61  n/a
245:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           04:D9           126.60   13.058 No_date   12:22   87.61  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D9.245
     remark:Downstream Hydrograph for C9
# Downstream Tributary
245:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     01:DT1          247.46   19.402 No_date   12:30   79.27 .715
     [XIMP=.33:TIMP=.41]
     [LOSS= 2 :CN= 76.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1284.:MNI=.045:SCI=   .0]
245:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:DT1          247.46   19.402 No_date   12:30   79.27  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT1.245
     remark:Runoff Hydrograph for DT1
245:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:DT1          247.46   19.402 No_date   12:30   79.27  n/a
     [RDT= 1.00] out<- 02:C10          247.46   19.251 No_date   12:33   79.27  n/a
     [L/S/n=  460./ .800/.035]
     {Vmax= 2.049:Dmax= 1.238}
245:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C10          247.46   19.251 No_date   12:33   79.27  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C10.245
     remark:Routing Hydrograph for C10
245:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:DT2           20.34    2.160 No_date   12:11   77.05 .695
     [XIMP=.26:TIMP=.32]
     [LOSS= 2 :CN= 77.7]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 368.:MNI=.045:SCI=   .0]
245:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:DT2           20.34    2.160 No_date   12:11   77.05  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT2.245
     remark:Runoff Hydrograph for DT2
245:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C10          247.46   19.251 No_date   12:33   79.27  n/a
                  +  03:DT2            20.34    2.160 No_date   12:11   77.05  n/a
     [DT= 1.00]  SUM=  05:J11          267.80   20.830 No_date   12:31   79.10  n/a
245:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           05:J11          267.80   20.830 No_date   12:31   79.10  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J11.245
     remark:Hydrograph for J11
245:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 05:J11          267.80   20.830 No_date   12:31   79.10  n/a
     [RDT= 1.00] out<- 01:C11          267.80   20.506 No_date   12:37   79.10  n/a
     [L/S/n=  690./1.470/.035]
     {Vmax= 1.719:Dmax= 1.188}
245:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:C11          267.80   20.506 No_date   12:37   79.10  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C11.245
     remark:Routing Hydrograph for C11
245:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     02:DT3           12.63    1.815 No_date   12:07   92.89 .837
     [XIMP=.38:TIMP=.47]
     [LOSS= 2 :CN= 87.4]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 290.:MNI=.045:SCI=   .0]
245:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:DT3           12.63    1.815 No_date   12:07   92.89  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT3.245
     remark:Runoff Hydrograph for DT3
245:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     07:DT4           70.81    7.317 No_date   12:18   84.71 .764
     [XIMP=.31:TIMP=.38]
     [LOSS= 2 :CN= 82.6]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 687.:MNI=.045:SCI=   .0]
245:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           07:DT4           70.81    7.317 No_date   12:18   84.71  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT4.245
     remark:Runoff Hydrograph for DT4
245:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:C11          267.80   20.506 No_date   12:37   79.10  n/a
                  +  02:DT3            12.63    1.815 No_date   12:07   92.89  n/a
     [DT= 1.00]  SUM=  05:D11          280.43   21.456 No_date   12:36   79.72  n/a
245:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           05:D11          280.43   21.456 No_date   12:36   79.72  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D11.245
     remark:Downstream Hydrograph for C11
# Main Channel
245:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     01:M1            64.39    6.811 No_date   12:17   85.16 .768
     [XIMP=.32:TIMP=.40]
     [LOSS= 2 :CN= 82.3]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 655.:MNI=.045:SCI=   .0]
245:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:M1            64.39    6.811 No_date   12:17   85.16  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M1.245
     remark:Runoff Hydrograph for M1
245:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:M1            64.39    6.811 No_date   12:17   85.16  n/a
     [RDT= 1.00] out<- 02:C1           64.39    6.743 No_date   12:19   85.16  n/a
     [L/S/n=  510./1.950/.035]
     {Vmax= 2.288:Dmax=  .949}
245:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C1            64.39    6.743 No_date   12:19   85.16  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C1.245
     remark:Routing Hydrograph for C1
245:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M2            26.14    3.044 No_date   12:11   83.56 .753
     [XIMP=.32:TIMP=.40]
     [LOSS= 2 :CN= 80.8]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 418.:MNI=.045:SCI=   .0]
245:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M2            26.14    3.044 No_date   12:11   83.56  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M2.245
     remark:Runoff Hydrograph for M2
245:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C1            64.39    6.743 No_date   12:19   85.16  n/a
                  +  03:M2             26.14    3.044 No_date   12:11   83.56  n/a
     [DT= 1.00]  SUM=  06:D1           90.53    9.612 No_date   12:16   84.70  n/a
245:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           06:D1            90.53    9.612 No_date   12:16   84.70  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D1.245
     remark:Downstream Hydrograph for C1
245:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:D9           126.60   13.058 No_date   12:22   87.61  n/a
                  +  06:D1            90.53    9.612 No_date   12:16   84.70  n/a
     [DT= 1.00]  SUM=  01:J2          217.13   22.522 No_date   12:20   86.39  n/a
245:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J2           217.13   22.522 No_date   12:20   86.39  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J2.245
     remark:Hydrograph for J2
245:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J2           217.13   22.522 No_date   12:20   86.39  n/a
     [RDT= 1.00] out<- 02:C2           217.13   22.305 No_date   12:23   86.39  n/a
     [L/S/n=  770./2.030/.035]
     {Vmax= 3.245:Dmax= 1.438}
245:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C2           217.13   22.305 No_date   12:23   86.39  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C2.245
     remark:Routing Hydrograph for C2
245:0040--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M3           212.90   19.148 No_date   12:28   86.71 .782
     [XIMP=.31:TIMP=.39]
     [LOSS= 2 :CN= 84.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1191.:MNI=.045:SCI=   .0]
245:0041--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M3           212.90   19.148 No_date   12:28   86.71  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M3.245
     remark:Runoff Hydrograph for M3
245:0042--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C2           217.13   22.305 No_date   12:23   86.39  n/a
                  +  03:M3           212.90   19.148 No_date   12:28   86.71  n/a
     [DT= 1.00]  SUM=  01:J3          430.03   41.287 No_date   12:25   86.55  n/a
245:0043--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J3           430.03   41.287 No_date   12:25   86.55  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J3.245
     remark:Hydrograph for J3
245:0044--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J3           430.03   41.287 No_date   12:25   86.55  n/a
     [RDT= 1.00] out<- 02:C3           430.03   41.178 No_date   12:27   86.55  n/a
     [L/S/n=  450./1.190/.035]
     {Vmax= 3.168:Dmax= 1.745}
245:0045--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C3           430.03   41.178 No_date   12:27   86.55  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C3.245
     remark:Routing Hydrograph for C3
245:0046--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M4           432.99   33.717 No_date   12:40   87.80 .792
     [XIMP=.34:TIMP=.42]
     [LOSS= 2 :CN= 84.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1699.:MNI=.045:SCI=   .0]
245:0047--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M4           432.99   33.717 No_date   12:40   87.80  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M4.245
     remark:Runoff Hydrograph for M4A
245:0048--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C3           430.03   41.178 No_date   12:27   86.55  n/a
                  +  03:M4           432.99   33.717 No_date   12:40   87.80  n/a
     [DT= 1.00]  SUM=  01:J4          863.02   73.286 No_date   12:32   87.18  n/a
245:0049--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J4           863.02   73.286 No_date   12:32   87.18  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J4.245
     remark:Hydrograph for J4
245:0050--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J4           863.02   73.286 No_date   12:32   87.18  n/a
     [RDT= 1.00] out<- 02:C4           863.02   72.912 No_date   12:35   87.18  n/a
     [L/S/n=  850./1.140/.035]
     {Vmax= 3.897:Dmax= 2.472}
245:0051--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C4           863.02   72.912 No_date   12:35   87.18  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C4.245
     remark:Routing Hydrograph for C4
245:0052--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M5            35.47    3.688 No_date   12:15   79.94 .721
     [XIMP=.21:TIMP=.26]
     [LOSS= 2 :CN= 82.3]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 486.:MNI=.045:SCI=   .0]
245:0053--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M5            35.47    3.688 No_date   12:15   79.94  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M5.245
     remark:Runoff Hydrograph for M5
245:0054--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C4           863.02   72.912 No_date   12:35   87.18  n/a
                  +  03:M5            35.47    3.688 No_date   12:15   79.94  n/a
     [DT= 1.00]  SUM=  01:J5          898.49   75.792 No_date   12:34   86.89  n/a
245:0055--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J5           898.49   75.792 No_date   12:34   86.89  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J5.245
     remark:Hydrograph for J5
245:0056--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J5           898.49   75.792 No_date   12:34   86.89  n/a
     [RDT= 1.00] out<- 02:C5           898.49   75.100 No_date   12:39   86.89  n/a
     [L/S/n=  880./1.600/.035]
     {Vmax= 3.548:Dmax= 1.938}
245:0057--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C5           898.49   75.100 No_date   12:39   86.89  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C5.245
     remark:Routing Hydrograph for C5
245:0058--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M6            64.01    8.059 No_date   12:15   97.76 .881
     [XIMP=.37:TIMP=.46]
     [LOSS= 2 :CN= 92.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 653.:MNI=.045:SCI=   .0]
245:0059--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M6            64.01    8.059 No_date   12:15   97.76  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M6.245
     remark:Runoff Hydrograph for M6
245:0060--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C5           898.49   75.100 No_date   12:39   86.89  n/a
                  +  03:M6            64.01    8.059 No_date   12:15   97.76  n/a
     [DT= 1.00]  SUM=  01:J6          962.50   80.947 No_date   12:38   87.62  n/a
245:0061--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J6           962.50   80.947 No_date   12:38   87.62  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J6.245
     remark:Hydrograph for J6
245:0062--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J6           962.50   80.947 No_date   12:38   87.62  n/a
     [RDT= 1.00] out<- 02:C6           962.50   80.209 No_date   12:42   87.62  n/a
     [L/S/n=  980./1.490/.035]
     {Vmax= 3.330:Dmax= 2.270}
245:0063--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C6           962.50   80.209 No_date   12:42   87.62  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C6.245
     remark:Routing Hydrograph for C6
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 245:0064--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M7            24.39    2.386 No_date   12:14   74.37 .670
      [XIMP=.18:TIMP=.22]
      [LOSS= 2 :CN= 79.2]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 403.:MNI=.045:SCI=   .0]
 245:0065--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M7            24.39    2.386 No_date   12:14   74.37  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M7.245
      remark:Runoff Hydrograph for M7
 245:0066--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C6           962.50   80.209 No_date   12:42   87.62  n/a
                    +  03:M7             24.39    2.386 No_date   12:14   74.37  n/a
      [DT= 1.00]  SUM=  01:J7           986.89   81.791 No_date   12:42   87.29  n/a
 245:0067--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:J7            986.89   81.791 No_date   12:42   87.29  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J7.245
      remark:Hydrograph for J7
 245:0068--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:J7           986.89   81.791 No_date   12:42   87.29  n/a
      [RDT= 1.00] out<- 02:C7           986.89   81.530 No_date   12:44   87.29  n/a
      [L/S/n=  530./1.410/.035]
      {Vmax= 2.988:Dmax= 2.236}
 245:0069--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C7            986.89   81.530 No_date   12:44   87.29  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C7.245
      remark:Routing Hydrograph for C7
 245:0070--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M8            21.78    2.895 No_date   12:09   90.47 .816
      [XIMP=.38:TIMP=.48]
      [LOSS= 2 :CN= 84.8]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 381.:MNI=.045:SCI=   .0]
 245:0071--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M8            21.78    2.895 No_date   12:09   90.47  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M8.245
      remark:Runoff Hydrograph for M8
 245:0072--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C7           986.89   81.530 No_date   12:44   87.29  n/a
                    +  03:M8             21.78    2.895 No_date   12:09   90.47  n/a
      [DT= 1.00]  SUM=  04:D7          1008.67   82.952 No_date   12:44   87.36  n/a
 245:0073--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:D7           1008.67   82.952 No_date   12:44   87.36  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D7.245
      remark:Downstream Hydrograph for C7
 245:0074--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:D7           1008.67   82.952 No_date   12:44   87.36  n/a
                    +  05:D11            280.43   21.456 No_date   12:36   79.72  n/a
                    +  07:DT4             70.81    7.317 No_date   12:18   84.71  n/a
      [DT= 1.00]  SUM=  01:J8           1359.91  109.425 No_date   12:41   85.65  n/a
 245:0075--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:J8           1359.91  109.425 No_date   12:41   85.65  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J8.245
      remark:Hydrograph for J8
 245:0076--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:J8           1359.91  109.425 No_date   12:41   85.65  n/a
      [RDT= 1.00] out<- 02:C8           1359.91  102.779 No_date   12:51   85.65  n/a
      [L/S/n=  920./ .290/.035]
      {Vmax= 1.193:Dmax= 2.971}
 245:0077--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C8           1359.91  102.779 No_date   12:51   85.65  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C8.245
      remark:Routing Hydrograph for C8
 245:0078--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M9            17.59    2.046 No_date   12:11   82.25 .741
      [XIMP=.19:TIMP=.24]
      [LOSS= 2 :CN= 84.6]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 342.:MNI=.045:SCI=   .0]
 245:0079--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M9            17.59    2.046 No_date   12:11   82.25  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M9.245
      remark:Runoff Hydrograph for M9
 245:0080--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C8           1359.91  102.779 No_date   12:51   85.65  n/a
                    +  03:M9             17.59    2.046 No_date   12:11   82.25  n/a
      [DT= 1.00]  SUM=  01:O1          1377.50  103.766 No_date   12:51   85.60  n/a
 245:0081--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:O1           1377.50  103.766 No_date   12:51   85.60  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-O1.245
      remark:Hydrograph for O1
  ** END OF RUN : 245

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 RUN:COMMAND#
 246:0001--------------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 246 ]
#*******************************************************************************
#  Project Name: [Bilberry Creek FPM Study] Project Number:[M800_200_030_209]
#  Date        : 01-12-2017
#  Modeller    : [AA, TB, SN]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#*******************************************************************************
 246:0002--------------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=30.00:SDUR=  24.00:PTOT= 134.54]
 246:0003--------------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\BilVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [Bilberry Creek Default Value File]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      Horton's infiltration equation parameters:
      [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
      Parameters for PERVIOUS surfaces in STANDHYD:
      [IAper=   4.67 mm] [LGP=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Upstream Tributary
 246:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:UT1           93.87   13.461 No_date   12:17   113.28 .842
      [XIMP=.35:TIMP=.44]
      [LOSS= 2 :CN= 86.2]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 791.:MNI=.045:SCI=   .0]
 246:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:UT1           93.87   13.461 No_date   12:17   113.28  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT1.246
      remark:Runoff Hydrograph for UT1
 246:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:UT1           93.87   13.461 No_date   12:17   113.28  n/a
      [RDT= 1.00] out<- 02:C9           93.87   13.138 No_date   12:20   113.28  n/a
      [L/S/n=  860./1.260/.035]
      {Vmax= 2.165:Dmax=  .843}
 246:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C9            93.87   13.138 No_date   12:20   113.28  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C9.246
      remark:Routing Hydrograph for C9
 246:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:UT2           32.73    4.625 No_date   12:12   101.15 .752
      [XIMP=.23:TIMP=.29]
      [LOSS= 2 :CN= 80.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 467.:MNI=.045:SCI=   .0]
 246:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:UT2           32.73    4.625 No_date   12:12   101.15  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT2.246
      remark:Runoff Hydrograph for UT2
 246:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C9            93.87   13.138 No_date   12:20   113.28  n/a
                    +  03:UT2           32.73    4.625 No_date   12:12   101.15  n/a
      [DT= 1.00]  SUM=  04:D9          126.60   17.514 No_date   12:19   110.14  n/a
 246:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:D9           126.60   17.514 No_date   12:19   110.14  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D9.246
      remark:Downstream Hydrograph for C9
# Downstream Tributary
 246:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:DT1          247.46   26.551 No_date   12:26   100.70 .748
      [XIMP=.33:TIMP=.41]
      [LOSS= 2 :CN= 76.1]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1284.:MNI=.045:SCI=   .0]
 246:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:DT1          247.46   26.551 No_date   12:26   100.70  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT1.246
      remark:Runoff Hydrograph for DT1
 246:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:DT1          247.46   26.551 No_date   12:26   100.70  n/a
      [RDT= 1.00] out<- 02:C10          247.46   26.341 No_date   12:29   100.70  n/a
      [L/S/n=  460./ .800/.035]
      {Vmax= 2.152:Dmax= 1.400}
 246:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C10          247.46   26.341 No_date   12:29   100.70  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C10.246
      remark:Routing Hydrograph for C10
 246:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:DT2           20.34    2.921 No_date   12:09   98.40 .731
      [XIMP=.26:TIMP=.32]
      [LOSS= 2 :CN= 77.7]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 368.:MNI=.045:SCI=   .0]
 246:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:DT2           20.34    2.921 No_date   12:09   98.40  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT2.246
      remark:Runoff Hydrograph for DT2
 246:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C10          247.46   26.341 No_date   12:29   100.70  n/a
                    +  03:DT2           20.34    2.921 No_date   12:09   98.40  n/a
      [DT= 1.00]  SUM=  05:J11         267.80   28.480 No_date   12:28   100.52  n/a
 246:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:J11          267.80   28.480 No_date   12:28   100.52  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J11.246
      remark:Hydrograph for J11
 246:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 05:J11          267.80   28.480 No_date   12:28   100.52  n/a
      [RDT= 1.00] out<- 01:C11          267.80   27.942 No_date   12:33   100.52  n/a
      [L/S/n=  690./1.470/.035]
      {Vmax= 1.842:Dmax= 1.299}
 246:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:C11          267.80   27.942 No_date   12:33   100.52  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C11.246
      remark:Routing Hydrograph for C11
 246:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     02:DT3           12.63    2.355 No_date   12:06   115.87 .861
      [XIMP=.38:TIMP=.47]
      [LOSS= 2 :CN= 87.4]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 290.:MNI=.045:SCI=   .0]
 246:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:DT3           12.63    2.355 No_date   12:06   115.87  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT3.246
      remark:Runoff Hydrograph for DT3
 246:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     07:DT4           70.81    9.847 No_date   12:15   106.97 .795
      [XIMP=.31:TIMP=.38]
      [LOSS= 2 :CN= 82.6]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 687.:MNI=.045:SCI=   .0]
 246:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:DT4           70.81    9.847 No_date   12:15   106.97  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT4.246
      remark:Runoff Hydrograph for DT4
 246:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:C11          267.80   27.942 No_date   12:33   100.52  n/a
                    +  02:DT3           12.63    2.355 No_date   12:06   115.87  n/a
      [DT= 1.00]  SUM=  05:D11         280.43   29.224 No_date   12:31   101.21  n/a
 246:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:D11          280.43   29.224 No_date   12:31   101.21  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D11.246
      remark:Downstream Hydrograph for C11
# Main Channel
 246:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:M1            64.39    9.157 No_date   12:14   107.44 .799
      [XIMP=.32:TIMP=.40]
      [LOSS= 2 :CN= 82.3]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 655.:MNI=.045:SCI=   .0]
 246:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:M1            64.39    9.157 No_date   12:14   107.44  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M1.246
      remark:Runoff Hydrograph for M1
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246:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:M1           64.39    9.157 No_date   12:14  107.44  n/a
     [RDT= 1.00] out<- 02:C1           64.39    9.087 No_date   12:16  107.44  n/a
     [L/S/n=  510./1.950/.035]
     {Vmax= 2.520:Dmax= 1.081}
246:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C1           64.39    9.087 No_date   12:16  107.44  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C1.246
     remark:Routing Hydrograph for C1
246:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M2           26.14    4.058 No_date   12:09  105.63 .785
     [XIMP=.32:TIMP=.40]
     [LOSS= 2 :CN= 80.8]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 418.:MNI=.045:SCI=   .0]
246:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M2           26.14    4.058 No_date   12:09  105.63  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M2.246
     remark:Runoff Hydrograph for M2
246:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C1           64.39    9.087 No_date   12:16  107.44  n/a
                   +  03:M2           26.14    4.058 No_date   12:09  105.63  n/a
     [DT= 1.00]  SUM=  06:D1           90.53   12.951 No_date   12:14  106.92  n/a
246:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           06:D1           90.53   12.951 No_date   12:14  106.92  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D1.246
     remark:Downstream Hydrograph for C1
246:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:D9          126.60   17.514 No_date   12:19  110.14  n/a
                   +  06:D1           90.53   12.951 No_date   12:14  106.92  n/a
     [DT= 1.00]  SUM=  01:J2          217.13   30.286 No_date   12:16  108.80  n/a
246:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J2          217.13   30.286 No_date   12:16  108.80  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J2.246
     remark:Hydrograph for J2
246:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J2          217.13   30.286 No_date   12:16  108.80  n/a
     [RDT= 1.00] out<- 02:C2          217.13   29.965 No_date   12:20  108.80  n/a
     [L/S/n=  770./2.030/.035]
     {Vmax= 3.475:Dmax= 1.599}
246:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C2          217.13   29.965 No_date   12:20  108.80  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C2.246
     remark:Routing Hydrograph for C2
246:0040--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M3          212.90   25.870 No_date   12:24  109.19 .812
     [XIMP=.31:TIMP=.39]
     [LOSS= 2 :CN= 84.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1191.:MNI=.045:SCI=   .0]
246:0041--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M3          212.90   25.870 No_date   12:24  109.19  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M3.246
     remark:Runoff Hydrograph for M3
246:0042--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C2          217.13   29.965 No_date   12:20  108.80  n/a
                   +  03:M3          212.90   25.870 No_date   12:24  109.19  n/a
     [DT= 1.00]  SUM=  01:J3          430.03   55.608 No_date   12:22  108.99  n/a
246:0043--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J3          430.03   55.608 No_date   12:22  108.99  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J3.246
     remark:Hydrograph for J3
246:0044--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J3          430.03   55.608 No_date   12:22  108.99  n/a
     [RDT= 1.00] out<- 02:C3          430.03   55.436 No_date   12:23  108.99  n/a
     [L/S/n=  450./1.190/.035]
     {Vmax= 3.459:Dmax= 2.013}
246:0045--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C3          430.03   55.436 No_date   12:23  108.99  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C3.246
     remark:Routing Hydrograph for C3
246:0046--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M4          432.99   45.676 No_date   12:35  110.35 .820
     [XIMP=.34:TIMP=.42]
     [LOSS= 2 :CN= 84.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1699.:MNI=.045:SCI=   .0]
246:0047--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M4          432.99   45.676 No_date   12:35  110.35  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M4.246
     remark:Runoff Hydrograph for M4A
246:0048--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C3          430.03   55.436 No_date   12:23  108.99  n/a
                   +  03:M4          432.99   45.676 No_date   12:35  110.35  n/a
     [DT= 1.00]  SUM=  01:J4          863.02   99.158 No_date   12:28  109.67  n/a
246:0049--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J4          863.02   99.158 No_date   12:28  109.67  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J4.246
     remark:Hydrograph for J4
246:0050--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J4          863.02   99.158 No_date   12:28  109.67  n/a
     [RDT= 1.00] out<- 02:C4          863.02   98.545 No_date   12:31  109.67  n/a
     [L/S/n=  850./1.140/.035]
     {Vmax= 4.200:Dmax= 2.867}
246:0051--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C4          863.02   98.545 No_date   12:31  109.67  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C4.246
     remark:Routing Hydrograph for C4
246:0052--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M5           35.47    5.005 No_date   12:13  101.86 .757
     [XIMP=.21:TIMP=.26]
     [LOSS= 2 :CN= 82.3]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 486.:MNI=.045:SCI=   .0]
246:0053--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M5           35.47    5.005 No_date   12:13  101.86  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M5.246
     remark:Runoff Hydrograph for M5
246:0054--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C4          863.02   98.545 No_date   12:31  109.67  n/a
                   +  03:M5           35.47    5.005 No_date   12:13  101.86  n/a
     [DT= 1.00]  SUM=  01:J5          898.49  102.509 No_date   12:30  109.37  n/a
246:0055--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J5          898.49  102.509 No_date   12:30  109.37  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J5.246
     remark:Hydrograph for J5
246:0056--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J5          898.49  102.509 No_date   12:30  109.37  n/a
     [RDT= 1.00] out<- 02:C5          898.49  101.385 No_date   12:34  109.37  n/a
     [L/S/n=  880./1.600/.035]
     {Vmax= 3.501:Dmax= 2.161}
246:0057--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C5          898.49  101.385 No_date   12:34  109.37  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C5.246
     remark:Routing Hydrograph for C5
246:0058--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M6           64.01   10.467 No_date   12:13  121.09 .900
     [XIMP=.37:TIMP=.46]
     [LOSS= 2 :CN= 92.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 653.:MNI=.045:SCI=   .0]
246:0059--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M6           64.01   10.467 No_date   12:13  121.09  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M6.246
     remark:Runoff Hydrograph for M6
246:0060--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C5          898.49  101.385 No_date   12:34  109.37  n/a
                   +  03:M6           64.01   10.467 No_date   12:13  121.09  n/a
     [DT= 1.00]  SUM=  01:J6          962.50  109.134 No_date   12:33  110.15  n/a
246:0061--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J6          962.50  109.134 No_date   12:33  110.15  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J6.246
     remark:Hydrograph for J6
246:0062--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J6          962.50  109.134 No_date   12:33  110.15  n/a
     [RDT= 1.00] out<- 02:C6          962.50  107.875 No_date   12:38  110.15  n/a
     [L/S/n=  980./1.490/.035]
     {Vmax= 3.416:Dmax= 2.497}
246:0063--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C6          962.50  107.875 No_date   12:38  110.15  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C6.246
     remark:Routing Hydrograph for C6
246:0064--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M7           24.39    3.281 No_date   12:12   95.62 .711
     [XIMP=.18:TIMP=.22]
     [LOSS= 2 :CN= 79.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 403.:MNI=.045:SCI=   .0]
246:0065--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M7           24.39    3.281 No_date   12:12   95.62  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M7.246
     remark:Runoff Hydrograph for M7
246:0066--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C6          962.50  107.875 No_date   12:38  110.15  n/a
                   +  03:M7           24.39    3.281 No_date   12:12   95.62  n/a
     [DT= 1.00]  SUM=  01:J7          986.89  110.050 No_date   12:37  109.79  n/a
246:0067--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J7          986.89  110.050 No_date   12:37  109.79  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J7.246
     remark:Hydrograph for J7
246:0068--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J7          986.89  110.050 No_date   12:37  109.79  n/a
     [RDT= 1.00] out<- 02:C7          986.89  109.674 No_date   12:39  109.79  n/a
     [L/S/n=  530./1.410/.035]
     {Vmax= 3.151:Dmax= 2.491}
246:0069--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C7          986.89  109.674 No_date   12:39  109.79  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C7.246
     remark:Routing Hydrograph for C7
246:0070--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M8           21.78    3.778 No_date   12:08  113.21 .841
     [XIMP=.38:TIMP=.48]
     [LOSS= 2 :CN= 84.8]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 381.:MNI=.045:SCI=   .0]
246:0071--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M8           21.78    3.778 No_date   12:08  113.21  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M8.246
     remark:Runoff Hydrograph for M8
246:0072--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C7          986.89  109.674 No_date   12:39  109.79  n/a
                   +  03:M8           21.78    3.778 No_date   12:08  113.21  n/a
     [DT= 1.00]  SUM=  04:D7         1008.67  111.600 No_date   12:39  109.86  n/a
246:0073--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           04:D7         1008.67  111.600 No_date   12:39  109.86  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D7.246
     remark:Downstream Hydrograph for C7
246:0074--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:D7         1008.67  111.600 No_date   12:39  109.86  n/a
                   +  05:D11          280.43   29.224 No_date   12:31  101.21  n/a
                   +  07:DT4           70.81    9.847 No_date   12:15  106.97  n/a
     [DT= 1.00]  SUM=  01:J8          1359.91  147.502 No_date   12:37  107.93  n/a
246:0075--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J8          1359.91  147.502 No_date   12:37  107.93  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J8.246
     remark:Hydrograph for J8
246:0076--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J8          1359.91  147.502 No_date   12:37  107.93  n/a
     [RDT= 1.00] out<- 02:C8          1359.91  138.631 No_date   12:46  107.93  n/a
     [L/S/n=  920./ .290/.035]
     {Vmax= 1.301:Dmax= 3.270}
246:0077--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C8          1359.91  138.631 No_date   12:46  107.93  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C8.246
     remark:Routing Hydrograph for C8
246:0078--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M9           17.59    2.731 No_date   12:10  104.48 .777
     [XIMP=.19:TIMP=.24]
     [LOSS= 2 :CN= 84.6]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 342.:MNI=.045:SCI=   .0]
246:0079--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M9           17.59    2.731 No_date   12:10  104.48  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M9.246
     remark:Runoff Hydrograph for M9
246:0080--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C8          1359.91  138.631 No_date   12:46  107.93  n/a
                   +  03:M9           17.59    2.731 No_date   12:10  104.48  n/a
     [DT= 1.00]  SUM=  01:O1          1377.50  139.991 No_date   12:45  107.88  n/a
246:0081--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:O1          1377.50  139.991 No_date   12:45  107.88  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-O1.246
     remark:Hydrograph for O1
  ** END OF RUN : 246

********************************************************************************




RUN:COMMAND#
247:0001--------------------------------------------------------------------------------
    START
     [TZERO =    .00 hrs on       0]
     [METOUT=   2    (1=imperial, 2=metric output)]
```

```
     [NSTORM=   1 ]
     [NRUN  = 247 ]
#*******************************************************************************
#  Project Name: [Bilberry Creek FPM Study] Project Number:[M800_200_030_209]
#  Date       : 01-12-2017
#  Modeller   : [AA, TB, SN]
#  Company    : Rideau Valley Conservation Authority
#  License #  :  5329846
#*******************************************************************************
 247:0002-------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=30.00:SDUR=  24.00:PTOT= 144.23]
 247:0003-------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\BilVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [Bilberry Creek Default Value File]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      Horton's infiltration equation parameters:
      [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
      Parameters for PERVIOUS surfaces in STANDHYD:
      [IAper=   4.67 mm] [LGP=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Upstream Tributary
 247:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:UT1           93.87   14.822 No_date   12:16  122.70 .851
      [XIMP=.35:TIMP=.44]
      [LOSS= 2 :CN= 86.2]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 467.:MNI=.045:SCI=   .0]
 247:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:UT1           93.87   14.822 No_date   12:16  122.70  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT1.247
      remark:Runoff Hydrograph for UT1
 247:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:UT1           93.87   14.822 No_date   12:16  122.70  n/a
      [RDT= 1.00] out<- 02:C9            93.87   14.464 No_date   12:20  122.70  n/a
      [L/S/n=  860./1.260/.035]
      {Vmax= 2.237:Dmax=  .879}
 247:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C9            93.87   14.464 No_date   12:20  122.70  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C9.247
      remark:Routing Hydrograph for C9
 247:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:UT2           32.73    5.129 No_date   12:11  110.21 .764
      [XIMP=.23:TIMP=.29]
      [LOSS= 2 :CN= 80.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 467.:MNI=.045:SCI=   .0]
 247:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:UT2           32.73    5.129 No_date   12:11  110.21  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT2.247
      remark:Runoff Hydrograph for UT2
 247:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C9            93.87   14.464 No_date   12:20  122.70  n/a
                    +   03:UT2           32.73    5.129 No_date   12:11  110.21  n/a
      [DT= 1.00]  SUM=  04:D9           126.60   19.283 No_date   12:18  119.47  n/a
 247:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:D9            126.60   19.283 No_date   12:18  119.47  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D9.247
      remark:Downstream Hydrograph for C9
# Downstream Tributary
 247:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:DT1           247.46   29.722 No_date   12:25  109.63 .760
      [XIMP=.33:TIMP=.41]
      [LOSS= 2 :CN= 76.1]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1284.:MNI=.045:SCI=   .0]
 247:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:DT1           247.46   29.722 No_date   12:25  109.63  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT1.247
      remark:Runoff Hydrograph for DT1
 247:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:DT1           247.46   29.722 No_date   12:25  109.63  n/a
      [RDT= 1.00] out<- 02:C10           247.46   29.487 No_date   12:28  109.63  n/a
      [L/S/n=  460./ .800/.035]
      {Vmax= 2.194:Dmax= 1.466}
 247:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C10           247.46   29.487 No_date   12:28  109.63  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C10.247
      remark:Routing Hydrograph for C10
 247:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:DT2            20.34    3.253 No_date   12:09  107.30 .744
      [XIMP=.26:TIMP=.32]
      [LOSS= 2 :CN= 77.7]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 368.:MNI=.045:SCI=   .0]
 247:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:DT2            20.34    3.253 No_date   12:09  107.30  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT2.247
      remark:Runoff Hydrograph for DT2
 247:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C10           247.46   29.487 No_date   12:28  109.63  n/a
                    +   03:DT2            20.34    3.253 No_date   12:09  107.30  n/a
      [DT= 1.00]  SUM=  05:J11           267.80   31.899 No_date   12:26  109.45  n/a
 247:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:J11           267.80   31.899 No_date   12:26  109.45  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J11.247
      remark:Hydrograph for J11
 247:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 05:J11           267.80   31.899 No_date   12:26  109.45  n/a
      [RDT= 1.00] out<- 01:C11           267.80   31.318 No_date   12:31  109.45  n/a
      [L/S/n=  690./1.470/.035]
      {Vmax= 1.904:Dmax= 1.349}
 247:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:C11           267.80   31.318 No_date   12:31  109.45  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C11.247
      remark:Routing Hydrograph for C11
 247:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     02:DT3            12.63    2.589 No_date   12:05  125.34 .869
      [XIMP=.38:TIMP=.47]
      [LOSS= 2 :CN= 87.4]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 290.:MNI=.045:SCI=   .0]
 247:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:DT3            12.63    2.589 No_date   12:05  125.34  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT3.247
      remark:Runoff Hydrograph for DT3
 247:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     07:DT4           70.81   10.885 No_date   12:14  116.20 .806
      [XIMP=.31:TIMP=.38]
      [LOSS= 2 :CN= 82.6]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 687.:MNI=.045:SCI=   .0]
 247:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:DT4           70.81   10.885 No_date   12:14  116.20  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT4.247
      remark:Runoff Hydrograph for DT4
 247:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:C11          267.80   31.318 No_date   12:31  109.45  n/a
                    +   02:DT3           12.63    2.589 No_date   12:05  125.34  n/a
      [DT= 1.00]  SUM=  05:D11          280.43   32.744 No_date   12:30  110.16  n/a
 247:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:D11           280.43   32.744 No_date   12:30  110.16  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D11.247
      remark:Downstream Hydrograph for C11
# Main Channel
 247:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:M1            64.39   10.141 No_date   12:14  116.67 .809
      [XIMP=.32:TIMP=.40]
      [LOSS= 2 :CN= 82.3]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 655.:MNI=.045:SCI=   .0]
 247:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:M1            64.39   10.141 No_date   12:14  116.67  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M1.247
      remark:Runoff Hydrograph for M1
 247:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:M1            64.39   10.141 No_date   12:14  116.67  n/a
      [RDT= 1.00] out<- 02:C1            64.39   10.082 No_date   12:15  116.67  n/a
      [L/S/n=  510./1.950/.035]
      {Vmax= 2.632:Dmax= 1.136}
 247:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C1            64.39   10.082 No_date   12:15  116.67  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C1.247
      remark:Routing Hydrograph for C1
 247:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M2            26.14    4.456 No_date   12:09  114.79 .796
      [XIMP=.32:TIMP=.40]
      [LOSS= 2 :CN= 80.8]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 418.:MNI=.045:SCI=   .0]
 247:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M2            26.14    4.456 No_date   12:09  114.79  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M2.247
      remark:Runoff Hydrograph for M2
 247:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C1            64.39   10.082 No_date   12:15  116.67  n/a
                    +   03:M2            26.14    4.456 No_date   12:09  114.79  n/a
      [DT= 1.00]  SUM=  06:D1            90.53   14.353 No_date   12:13  116.13  n/a
 247:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:D1            90.53   14.353 No_date   12:13  116.13  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D1.247
      remark:Downstream Hydrograph for C1
 247:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:D9           126.60   19.283 No_date   12:18  119.47  n/a
                    +   06:D1            90.53   14.353 No_date   12:13  116.13  n/a
      [DT= 1.00]  SUM=  01:J2           217.13   33.500 No_date   12:15  118.08  n/a
 247:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:J2            217.13   33.500 No_date   12:15  118.08  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J2.247
      remark:Hydrograph for J2
 247:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:J2            217.13   33.500 No_date   12:15  118.08  n/a
      [RDT= 1.00] out<- 02:C2            217.13   33.161 No_date   12:18  118.08  n/a
      [L/S/n=  770./2.030/.035]
      {Vmax= 3.581:Dmax= 1.666}
 247:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C2            217.13   33.161 No_date   12:18  118.08  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C2.247
      remark:Routing Hydrograph for C2
 247:0040---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M3            212.90   28.543 No_date   12:23  118.50 .822
      [XIMP=.31:TIMP=.39]
      [LOSS= 2 :CN= 84.2]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1191.:MNI=.045:SCI=   .0]
 247:0041---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M3            212.90   28.543 No_date   12:23  118.50  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M3.247
      remark:Runoff Hydrograph for M3
 247:0042---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C2            217.13   33.161 No_date   12:18  118.08  n/a
                    +   03:M3            212.90   28.543 No_date   12:23  118.50  n/a
      [DT= 1.00]  SUM=  01:J3           430.03   61.446 No_date   12:21  118.29  n/a
 247:0043---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:J3            430.03   61.446 No_date   12:21  118.29  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J3.247
      remark:Hydrograph for J3
 247:0044---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:J3            430.03   61.446 No_date   12:21  118.29  n/a
      [RDT= 1.00] out<- 02:C3            430.03   61.271 No_date   12:22  118.29  n/a
      [L/S/n=  450./1.190/.035]
      {Vmax= 3.538:Dmax= 2.101}
 247:0045---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C3            430.03   61.271 No_date   12:22  118.29  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C3.247
      remark:Routing Hydrograph for C3
 247:0046---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M4            432.99   50.790 No_date   12:33  119.68 .830
      [XIMP=.34:TIMP=.42]
      [LOSS= 2 :CN= 84.1]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1699.:MNI=.045:SCI=   .0]
 247:0047---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M4            432.99   50.790 No_date   12:33  119.68  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M4.247
      remark:Runoff Hydrograph for M4A
 247:0048---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C3            430.03   61.271 No_date   12:22  118.29  n/a
                    +   03:M4            432.99   50.790 No_date   12:33  119.68  n/a
      [DT= 1.00]  SUM=  01:J4           863.02  109.950 No_date   12:27  118.99  n/a
 247:0049---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:J4            863.02  109.950 No_date   12:27  118.99  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J4.247
      remark:Hydrograph for J4
 247:0050---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:J4            863.02  109.950 No_date   12:27  118.99  n/a
      [RDT= 1.00] out<- 02:C4            863.02  109.282 No_date   12:29  118.99  n/a
      [L/S/n=  850./1.140/.035]
      {Vmax= 4.289:Dmax= 3.027}
```

```
247:0051--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C4           863.02  109.282 No_date   12:29  118.99  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C4.247
     remark:Routing Hydrograph for C4
247:0052--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M5            35.47    5.550 No_date   12:12  110.97 .769
     [XIMP=.21:TIMP=.26]
     [LOSS= 2 :CN= 82.3]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 486.:MNI=.045:SCI=   .0]
247:0053--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M5            35.47    5.550 No_date   12:12  110.97  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M5.247
     remark:Runoff Hydrograph for M5
247:0054--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C4           863.02  109.282 No_date   12:29  118.99  n/a
                  +  03:M5             35.47    5.550 No_date   12:12  110.97  n/a
     [DT= 1.00]  SUM=  01:J5           898.49  113.664 No_date   12:28  118.67  n/a
247:0055--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J5           898.49  113.664 No_date   12:28  118.67  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J5.247
     remark:Hydrograph for J5
247:0056--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J5           898.49  113.664 No_date   12:28  118.67  n/a
     [RDT= 1.00] out<- 02:C5           898.49  112.323 No_date   12:33  118.67  n/a
     [L/S/n=  880./1.600/.035]
     {Vmax= 3.484:Dmax= 2.248}
247:0057--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C5           898.49  112.323 No_date   12:33  118.67  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C5.247
     remark:Routing Hydrograph for C5
247:0058--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M6            64.01   11.485 No_date   12:13  130.69 .906
     [XIMP=.37:TIMP=.46]
     [LOSS= 2 :CN= 92.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 653.:MNI=.045:SCI=   .0]
247:0059--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M6            64.01   11.485 No_date   12:13  130.69  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M6.247
     remark:Runoff Hydrograph for M6
247:0060--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C5           898.49  112.323 No_date   12:33  118.67  n/a
                  +  03:M6             64.01   11.485 No_date   12:13  130.69  n/a
     [DT= 1.00]  SUM=  01:J6           962.50  120.821 No_date   12:32  119.47  n/a
247:0061--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J6           962.50  120.821 No_date   12:32  119.47  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J6.247
     remark:Hydrograph for J6
247:0062--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J6           962.50  120.821 No_date   12:32  119.47  n/a
     [RDT= 1.00] out<- 02:C6           962.50  119.371 No_date   12:36  119.47  n/a
     [L/S/n=  980./1.490/.035]
     {Vmax= 3.453:Dmax= 2.591}
247:0063--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C6           962.50  119.371 No_date   12:36  119.47  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C6.247
     remark:Routing Hydrograph for C6
247:0064--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M7            24.39    3.668 No_date   12:11  104.50 .725
     [XIMP=.18:TIMP=.22]
     [LOSS= 2 :CN= 79.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 403.:MNI=.045:SCI=   .0]
247:0065--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M7            24.39    3.668 No_date   12:11  104.50  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M7.247
     remark:Runoff Hydrograph for M7
247:0066--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C6           962.50  119.371 No_date   12:36  119.47  n/a
                  +  03:M7             24.39    3.668 No_date   12:11  104.50  n/a
     [DT= 1.00]  SUM=  01:J7           986.89  121.781 No_date   12:36  119.10  n/a
247:0067--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J7           986.89  121.781 No_date   12:36  119.10  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J7.247
     remark:Hydrograph for J7
247:0068--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J7           986.89  121.781 No_date   12:36  119.10  n/a
     [RDT= 1.00] out<- 02:C7           986.89  121.361 No_date   12:38  119.10  n/a
     [L/S/n=  530./1.410/.035]
     {Vmax= 3.210:Dmax= 2.580}
247:0069--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C7           986.89  121.361 No_date   12:38  119.10  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C7.247
     remark:Routing Hydrograph for C7
247:0070--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M8            21.78    4.155 No_date   12:07  122.61 .850
     [XIMP=.38:TIMP=.48]
     [LOSS= 2 :CN= 84.8]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 381.:MNI=.045:SCI=   .0]
247:0071--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M8            21.78    4.155 No_date   12:07  122.61  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M8.247
     remark:Runoff Hydrograph for M8
247:0072--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C7           986.89  121.361 No_date   12:38  119.10  n/a
                  +  03:M8             21.78    4.155 No_date   12:07  122.61  n/a
     [DT= 1.00]  SUM=  04:D7          1008.67  123.449 No_date   12:38  119.17  n/a
247:0073--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           04:D7          1008.67  123.449 No_date   12:38  119.17  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D7.247
     remark:Downstream Hydrograph for C7
247:0074--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:D7          1008.67  123.449 No_date   12:38  119.17  n/a
                  +  05:D11            280.43   32.744 No_date   12:30  110.16  n/a
                  +  07:DT4             70.81   10.885 No_date   12:14  116.20  n/a
     [DT= 1.00]  SUM=  01:J8          1359.91  163.485 No_date   12:35  117.16  n/a
247:0075--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J8          1359.91  163.485 No_date   12:35  117.16  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J8.247
     remark:Hydrograph for J8
247:0076--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J8          1359.91  163.485 No_date   12:35  117.16  n/a
     [RDT= 1.00] out<- 02:C8          1359.91  153.760 No_date   12:44  117.16  n/a
     [L/S/n=  920./ .290/.035]
     {Vmax= 1.341:Dmax= 3.383}
247:0077--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C8          1359.91  153.760 No_date   12:44  117.16  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C8.247
     remark:Routing Hydrograph for C8
247:0078--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M9            17.59    3.023 No_date   12:09  113.71 .788
     [XIMP=.19:TIMP=.24]
     [LOSS= 2 :CN= 84.6]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 342.:MNI=.045:SCI=   .0]
247:0079--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M9            17.59    3.023 No_date   12:09  113.71  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M9.247
     remark:Runoff Hydrograph for M9
247:0080--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C8          1359.91  153.760 No_date   12:44  117.16  n/a
                  +  03:M9             17.59    3.023 No_date   12:09  113.71  n/a
     [DT= 1.00]  SUM=  01:O1          1377.50  155.243 No_date   12:44  117.12  n/a
247:0081--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:O1          1377.50  155.243 No_date   12:44  117.12  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-O1.247
     remark:Hydrograph for O1
 ** END OF RUN : 247

*******************************************************************************




 RUN:COMMAND#
 248:0001--------------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 248 ]
 #*******************************************************************************
 #  Project Name: [Bilberry Creek FPM Study] Project Number:[M800_200_030_209]
 #  Date        : 01-12-2017
 #  Modeller    : [AA, TB, SN]
 #  Company     : Rideau Valley Conservation Authority
 #  License #   :  5329846
 #*******************************************************************************
 248:0002--------------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=30.00:SDUR=  24.00:PTOT= 150.87]
 248:0003--------------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\BilVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [Bilberry Creek Default Value File]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      Horton's infiltration equation parameters:
      [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F=  .00 mm]
      Parameters for PERVIOUS surfaces in STANDHYD:
      [IAper=   4.67 mm] [LGP=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
 # Upstream Tributary
 248:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:UT1           93.87   15.837 No_date   12:15  129.17 .856
      [XIMP=.35:TIMP=.44]
      [LOSS= 2 :CN= 86.2]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 791.:MNI=.045:SCI=   .0]
 248:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:UT1           93.87   15.837 No_date   12:15  129.17  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT1.248
      remark:Runoff Hydrograph for UT1
 248:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:UT1           93.87   15.837 No_date   12:15  129.17  n/a
      [RDT= 1.00] out<- 02:C9           93.87   15.413 No_date   12:20  129.17  n/a
      [L/S/n=  860./1.260/.035]
      {Vmax= 2.270:Dmax=  .900}
 248:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C9           93.87   15.413 No_date   12:20  129.17  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C9.248
      remark:Routing Hydrograph for C9
 248:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:UT2           32.73    5.512 No_date   12:11  116.46 .772
      [XIMP=.23:TIMP=.29]
      [LOSS= 2 :CN= 80.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 467.:MNI=.045:SCI=   .0]
 248:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:UT2           32.73    5.512 No_date   12:11  116.46  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-UT2.248
      remark:Runoff Hydrograph for UT2
 248:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C9           93.87   15.413 No_date   12:20  129.17  n/a
                   +  03:UT2           32.73    5.512 No_date   12:11  116.46  n/a
      [DT= 1.00]  SUM=  04:D9          126.60   20.555 No_date   12:18  125.88  n/a
 248:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:D9           126.60   20.555 No_date   12:18  125.88  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D9.248
      remark:Downstream Hydrograph for C9
 # Downstream Tributary
 248:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     01:DT1          247.46   31.813 No_date   12:24  115.79 .767
      [XIMP=.33:TIMP=.41]
      [LOSS= 2 :CN= 76.1]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1284.:MNI=.045:SCI=   .0]
 248:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:DT1          247.46   31.813 No_date   12:24  115.79  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT1.248
      remark:Runoff Hydrograph for DT1
 248:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:DT1          247.46   31.813 No_date   12:24  115.79  n/a
      [RDT= 1.00] out<- 02:C10          247.46   31.554 No_date   12:27  115.79  n/a
      [L/S/n=  460./ .800/.035]
      {Vmax= 2.217:Dmax= 1.505}
 248:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C10          247.46   31.554 No_date   12:27  115.79  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C10.248
      remark:Routing Hydrograph for C10
 248:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:DT2           20.34    3.498 No_date   12:08  113.45 .752
      [XIMP=.26:TIMP=.32]
      [LOSS= 2 :CN= 77.7]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 368.:MNI=.045:SCI=   .0]
 248:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:DT2           20.34    3.498 No_date   12:08  113.45  n/a
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     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT2.248
     remark:Runoff Hydrograph for DT2
248:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C10          247.46   31.554 No_date   12:27  115.79  n/a
                   +  03:DT2            20.34    3.498 No_date   12:08  113.45  n/a
     [DT= 1.00]  SUM=  05:J11          267.80   34.139 No_date   12:25  115.61  n/a
248:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           05:J11          267.80   34.139 No_date   12:25  115.61  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J11.248
     remark:Hydrograph for J11
248:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 05:J11          267.80   34.139 No_date   12:25  115.61  n/a
     [RDT= 1.00] out<- 01:C11          267.80   33.550 No_date   12:29  115.61  n/a
     [L/S/n=  690./1.470/.035]
     {Vmax= 1.946:Dmax= 1.381}
248:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:C11          267.80   33.550 No_date   12:29  115.61  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C11.248
     remark:Routing Hydrograph for C11
248:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     02:DT3           12.63    2.760 No_date   12:05  131.85 .874
     [XIMP=.38:TIMP=.47]
     [LOSS= 2 :CN= 87.4]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 290.:MNI=.045:SCI=   .0]
248:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:DT3           12.63    2.760 No_date   12:05  131.85  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT3.248
     remark:Runoff Hydrograph for DT3
248:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     07:DT4           70.81   11.670 No_date   12:14  122.56 .812
     [XIMP=.31:TIMP=.38]
     [LOSS= 2 :CN= 82.6]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 687.:MNI=.045:SCI=   .0]
248:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           07:DT4           70.81   11.670 No_date   12:14  122.56  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-DT4.248
     remark:Runoff Hydrograph for DT4
248:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:C11          267.80   33.550 No_date   12:29  115.61  n/a
                   +  02:DT3            12.63    2.760 No_date   12:05  131.85  n/a
     [DT= 1.00]  SUM=  05:D11          280.43   35.079 No_date   12:28  116.34  n/a
248:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           05:D11          280.43   35.079 No_date   12:28  116.34  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D11.248
     remark:Downstream Hydrograph for C11
# Main Channel
248:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     01:M1            64.39   10.751 No_date   12:13  123.03 .815
     [XIMP=.32:TIMP=.40]
     [LOSS= 2 :CN= 82.3]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 655.:MNI=.045:SCI=   .0]
248:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:M1            64.39   10.751 No_date   12:13  123.03  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M1.248
     remark:Runoff Hydrograph for M1
248:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:M1            64.39   10.751 No_date   12:13  123.03  n/a
     [RDT= 1.00] out<- 02:C1            64.39   10.663 No_date   12:16  123.03  n/a
     [L/S/n=  510./1.950/.035]
     {Vmax= 2.671:Dmax= 1.160}
248:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C1            64.39   10.663 No_date   12:16  123.03  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C1.248
     remark:Routing Hydrograph for C1
248:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M2            26.14    4.774 No_date   12:09  121.10 .803
     [XIMP=.32:TIMP=.40]
     [LOSS= 2 :CN= 80.8]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 418.:MNI=.045:SCI=   .0]
248:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M2            26.14    4.774 No_date   12:09  121.10  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M2.248
     remark:Runoff Hydrograph for M2
248:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C1            64.39   10.663 No_date   12:16  123.03  n/a
                   +  03:M2            26.14    4.774 No_date   12:09  121.10  n/a
     [DT= 1.00]  SUM=  06:D1           90.53   15.242 No_date   12:13  122.48  n/a
248:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           06:D1            90.53   15.242 No_date   12:13  122.48  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D1.248
     remark:Downstream Hydrograph for C1
248:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:D9           126.60   20.555 No_date   12:18  125.88  n/a
                   +  06:D1            90.53   15.242 No_date   12:13  122.48  n/a
     [DT= 1.00]  SUM=  01:J2           217.13   35.628 No_date   12:15  124.46  n/a
248:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J2           217.13   35.628 No_date   12:15  124.46  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J2.248
     remark:Hydrograph for J2
248:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J2           217.13   35.628 No_date   12:15  124.46  n/a
     [RDT= 1.00] out<- 02:C2           217.13   35.323 No_date   12:18  124.46  n/a
     [L/S/n=  770./2.030/.035]
     {Vmax= 3.654:Dmax= 1.710}
248:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C2           217.13   35.323 No_date   12:18  124.46  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C2.248
     remark:Routing Hydrograph for C2
248:0040--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M3           212.90   30.538 No_date   12:23  124.91 .828
     [XIMP=.31:TIMP=.39]
     [LOSS= 2 :CN= 84.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1191.:MNI=.045:SCI=   .0]
248:0041--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M3           212.90   30.538 No_date   12:23  124.91  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M3.248
     remark:Runoff Hydrograph for M3
248:0042--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C2           217.13   35.323 No_date   12:18  124.46  n/a
                   +  03:M3           212.90   30.538 No_date   12:23  124.91  n/a
     [DT= 1.00]  SUM=  01:J3           430.03   65.598 No_date   12:20  124.68  n/a
248:0043--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J3           430.03   65.598 No_date   12:20  124.68  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J3.248
     remark:Hydrograph for J3
248:0044--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J3           430.03   65.598 No_date   12:20  124.68  n/a
     [RDT= 1.00] out<- 02:C3           430.03   65.424 No_date   12:22  124.68  n/a
     [L/S/n=  450./1.190/.035]
     {Vmax= 3.597:Dmax= 2.164}
248:0045--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C3           430.03   65.424 No_date   12:22  124.68  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C3.248
     remark:Routing Hydrograph for C3
248:0046--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M4           432.99   54.641 No_date   12:32  126.10 .836
     [XIMP=.34:TIMP=.42]
     [LOSS= 2 :CN= 84.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1699.:MNI=.045:SCI=   .0]
248:0047--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M4           432.99   54.641 No_date   12:32  126.10  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M4.248
     remark:Runoff Hydrograph for M4A
248:0048--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C3           430.03   65.424 No_date   12:22  124.68  n/a
                   +  03:M4           432.99   54.641 No_date   12:32  126.10  n/a
     [DT= 1.00]  SUM=  01:J4           863.02  118.064 No_date   12:25  125.39  n/a
248:0049--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J4           863.02  118.064 No_date   12:25  125.39  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J4.248
     remark:Hydrograph for J4
248:0050--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J4           863.02  118.064 No_date   12:25  125.39  n/a
     [RDT= 1.00] out<- 02:C4           863.02  117.320 No_date   12:28  125.39  n/a
     [L/S/n=  850./1.140/.035]
     {Vmax= 4.347:Dmax= 3.131}
248:0051--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C4           863.02  117.320 No_date   12:28  125.39  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C4.248
     remark:Routing Hydrograph for C4
248:0052--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M5            35.47    5.909 No_date   12:12  117.25 .777
     [XIMP=.21:TIMP=.26]
     [LOSS= 2 :CN= 82.3]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 486.:MNI=.045:SCI=   .0]
248:0053--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M5            35.47    5.909 No_date   12:12  117.25  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M5.248
     remark:Runoff Hydrograph for M5
248:0054--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C4           863.02  117.320 No_date   12:28  125.39  n/a
                   +  03:M5            35.47    5.909 No_date   12:12  117.25  n/a
     [DT= 1.00]  SUM=  01:J5           898.49  122.068 No_date   12:28  125.07  n/a
248:0055--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J5           898.49  122.068 No_date   12:28  125.07  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J5.248
     remark:Hydrograph for J5
248:0056--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J5           898.49  122.068 No_date   12:28  125.07  n/a
     [RDT= 1.00] out<- 02:C5           898.49  120.550 No_date   12:32  125.07  n/a
     [L/S/n=  880./1.600/.035]
     {Vmax= 3.471:Dmax= 2.315}
248:0057--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C5           898.49  120.550 No_date   12:32  125.07  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C5.248
     remark:Routing Hydrograph for C5
248:0058--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M6            64.01   12.121 No_date   12:12  137.28 .910
     [XIMP=.37:TIMP=.46]
     [LOSS= 2 :CN= 92.1]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 653.:MNI=.045:SCI=   .0]
248:0059--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M6            64.01   12.121 No_date   12:12  137.28  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M6.248
     remark:Runoff Hydrograph for M6
248:0060--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C5           898.49  120.550 No_date   12:32  125.07  n/a
                   +  03:M6            64.01   12.121 No_date   12:12  137.28  n/a
     [DT= 1.00]  SUM=  01:J6           962.50  129.558 No_date   12:31  125.88  n/a
248:0061--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J6           962.50  129.558 No_date   12:31  125.88  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J6.248
     remark:Hydrograph for J6
248:0062--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J6           962.50  129.558 No_date   12:31  125.88  n/a
     [RDT= 1.00] out<- 02:C6           962.50  128.001 No_date   12:35  125.88  n/a
     [L/S/n=  980./1.490/.035]
     {Vmax= 3.481:Dmax= 2.661}
248:0063--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C6           962.50  128.001 No_date   12:35  125.88  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C6.248
     remark:Routing Hydrograph for C6
248:0064--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M7            24.39    3.939 No_date   12:10  110.63 .733
     [XIMP=.18:TIMP=.22]
     [LOSS= 2 :CN= 79.2]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 403.:MNI=.045:SCI=   .0]
248:0065--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M7            24.39    3.939 No_date   12:10  110.63  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M7.248
     remark:Runoff Hydrograph for M7
248:0066--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:C6           962.50  128.001 No_date   12:35  125.88  n/a
                   +  03:M7            24.39    3.939 No_date   12:10  110.63  n/a
     [DT= 1.00]  SUM=  01:J7           986.89  130.571 No_date   12:35  125.51  n/a
248:0067--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:J7           986.89  130.571 No_date   12:35  125.51  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J7.248
     remark:Hydrograph for J7
248:0068--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:J7           986.89  130.571 No_date   12:35  125.51  n/a
     [RDT= 1.00] out<- 02:C7           986.89  130.132 No_date   12:37  125.51  n/a
     [L/S/n=  530./1.410/.035]
     {Vmax= 3.256:Dmax= 2.646}
248:0069--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:C7           986.89  130.132 No_date   12:37  125.51  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C7.248
     remark:Routing Hydrograph for C7
248:0070--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     03:M8            21.78    4.400 No_date   12:07  129.07 .855
     [XIMP=.38:TIMP=.48]
     [LOSS= 2 :CN= 84.8]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 381.:MNI=.045:SCI=   .0]
248:0071--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M8            21.78    4.400 No_date   12:07  129.07  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M8.248
```

```
     remark:Runoff Hydrograph for M8
 248:0072--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C7           986.89  130.132 No_date   12:37  125.51  n/a
                    +   03:M8             21.78    4.400 No_date   12:07  129.07  n/a
      [DT= 1.00]  SUM=  04:D7          1008.67  132.375 No_date   12:37  125.58  n/a
 248:0073--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:D7          1008.67  132.375 No_date   12:37  125.58  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-D7.248
      remark:Downstream Hydrograph for C7
 248:0074--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:D7          1008.67  132.375 No_date   12:37  125.58  n/a
                    +   05:D11           280.43   35.079 No_date   12:28  116.34  n/a
                    +   07:DT4            70.81   11.670 No_date   12:14  122.56  n/a
      [DT= 1.00]  SUM=  01:J8          1359.91  175.103 No_date   12:34  123.52  n/a
 248:0075--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:J8          1359.91  175.103 No_date   12:34  123.52  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-J8.248
      remark:Hydrograph for J8
 248:0076--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:J8          1359.91  175.103 No_date   12:34  123.52  n/a
      [RDT= 1.00] out<- 02:C8          1359.91  164.533 No_date   12:43  123.52  n/a
      [L/S/n=  920./ .290/.035]
      {Vmax= 1.368:Dmax= 3.463}
 248:0077--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:C8          1359.91  164.533 No_date   12:43  123.52  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-C8.248
      remark:Routing Hydrograph for C8
 248:0078--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     03:M9            17.59    3.244 No_date   12:09  120.06 .796
      [XIMP=.19:TIMP=.24]
      [LOSS= 2 :CN= 84.6]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 342.:MNI=.045:SCI=   .0]
 248:0079--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M9            17.59    3.244 No_date   12:09  120.06  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-M9.248
      remark:Runoff Hydrograph for M9
 248:0080--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:C8          1359.91  164.533 No_date   12:43  123.52  n/a
                    +   03:M9            17.59    3.244 No_date   12:09  120.06  n/a
      [DT= 1.00]  SUM=  01:O1          1377.50  166.108 No_date   12:43  123.48  n/a
 248:0081--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:O1          1377.50  166.108 No_date   12:43  123.48  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\BILLBE~3\BILBER~1\H-O1.248
      remark:Hydrograph for O1
 248:0002--------------------------------------------------------------------------------
      FINISH
-------------------------------------------------------------------------------
*******************************************************************************
     WARNINGS / ERRORS / NOTES
     -------------------------
   Simulation ended on 2017-12-05     at 14:11:17
===============================================================================
```

Appendix E

Road Crossings - Photographs

N of Turnberry Pedestrian Bridge (Upstream)

N of Turnberry Pedestrian Bridge (Downstream)

St.Joseph Boulevard (Upstream)

St.Joseph Boulevard (Downstream)

Paroisse St.Joseph (Upstream)

Paroisse St.Joseph (Downstream)

Pierre Rocque Park (Upstream)

Pierre Rocque Park (Downstream)

RR174 Queensway (Upstream)

RR174 Queensway (Downstream)

Jeanne D'Arc (Upstream)

Jeanne D'Arc (Downstream)

Mystery Park Eagle Bridge (Upstream)

Mystery Park Eagle Bridge (Downstream)

Mystery Park Pedestrian Bridge (Upstream)

Mystery Park Pedestrian Bridge (Downstream)

Appendix F

Full-Size Drawings

(Drawings BB-1 and BB-2)

LiDAR captured between November 11 - December 7, 2014.

The information in this drawing is for information purposes only. Authoritative information on flood hazard is maintained in RVCA's GIS system and is updated from time to time based on new data.

RIDEAU VALLEY CONSERVATION AUTHORITY

Projection note: U.T.M. Zone 18 - NAD 83 Datum

File name: Drawing BB-1

Modified by: TB

Date Modified: 10/18/2018 9:24:13 AM

Location:
Z:\GIS_Data\CA_Data\FPM\RVCA\Bilberry_Creek\Drawing_BB-1.mxd

1:5,000
0 250 500
Meters

Ottawa River

Bilberry Creek

Study Limit

Study Limit
Spill Section

16
100
349
546
564
716: 45.22
1019: 46.12
1141: 46.24
1372: 46.51
1437: 46.61
1626: 47.25
1682: 47.5
1730: 48.92
1777: 50.77
1842: 50.78
1952: 50.8
2039: 50.82
2138: 50.85
2202: 50.87
2236: 50.89
2317: 50.93
2405: 51.12
2610: 51.49
2763: 56.04
2695: 58.55
3263: 60.09
3460: 61.31
3588: 63.42
3643: 65.69
3734: 65.71
3799: 66.73
3892: 66.76
4152: 66.99
4247: 67.04
4365: 67.1
4478: 67.22
4729: 67.71
4940: 68.84
5092: 69.67
5257: 70.13
5404: 70.82
5476: 71.08

2759: 53.7
2874: 58.55
2869: 58.55
2937: 58.55
2986: 58.57
2969: 58.56
3068: 59.49
3202: 59.67
3162: 59.85
3207: 59.94
3267: 60.12
3277: 60.25
3272: 60.23
3460: 61.31
3581: 62.06
3588: 63.42
3643: 65.69
3637: 65.68
3734: 65.71
3799: 66.73
3796: 66.72
3892: 66.76

1:2,000
0 100 200
Meters

Drawing BB-1
Bilberry Creek
cross-sections and regulatory flood levels

- Cross Section
- Study Limit
- 1m LiDAR-derived contours
- 100yr Floodline
- 100yr Floodplain

18 OCT 2018

Export Date: 18 OCT 2018 9:25:17 AM

Aerial photography captured between May 16 - 20, 2017.

The information in this drawing is for information purposes only. Authoritative information on flood hazard is maintained in RVCA's GIS system and is updated from time to time based on new data.

Ottawa River

Study Limit

Bilberry Creek

Study Limit
Spill Section

ST-JOSEPH BLVD

Bilberry Creek

Study Limit

Study Limit
Spill Section

Bilberry Creek

INNES RD

RIDEAU VALLEY CONSERVATION AUTHORITY

Projection note: U.T.M. Zone 18 - NAD 83 Datum

File name: Drawing BB-2

N

Modified by: TB

Date Modified: 10/18/2018 9:33:51 AM

Location:
Z:\GIS_Data\CA_Data\FPM\RVCA\Bilberry_Creek\Drawing_BB-2.mxd

1:5,000

0 250 500

Meters

1:2,000

0 100 200

Meters

Drawing BB-2
Bilberry Creek
flood hazard area

Study Limit
100yr Floodline
100yr Floodplain

18 OCT 2018

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