J.F. Sabourin and Associates Inc.
52 Springbrook Drive,
Ottawa, ON K2S 1B9
T 613-836-3884 F 613-836-0332

jfsa.com

Ottawa. ON
Paris. ON
Gatineau. QC
Montréal. QC
Québec. QC

June 28, 2023 Project Number: 2468-23

Acadia Engineering
121 Dundas Street East, Suite 103A
Belleville, Ontario
K8N 1C3

Attention: Steve Harvey, P.Eng

Subject: Hogan Properties, Belleville– Preliminary SWM Facility Sizing

INTRODUCTION

J.F Sabourin and Associates Inc. (JFSA) has been commissioned by Acadia Engineering to complete preliminary Storm Water Management (SWM) facility sizing for the proposed development referred to as Hogan Properties. The site is located on the northern outskirts of the town of Belleville, Ontario and is just west of the intersection of Farnham Road and Scott Drive. The proposed development site is approximately **4.71 ha** and will consist primarily of single family homes. **Figure 1** provides an overview of the proposed development limits and their respective location. The following memo outlines the preliminary SWM facility sizing requirements for this site to ensure that the future development does not have any adverse impacts on existing developments, infrastructure, or flood-prone areas.

Figure 1: Site Overview

BACKGROUND DATA

The following outlines the data used to support this analysis:

- LiDAR data at 1.0 m x 1.0 m resolution
- Conceptual development plan – provided by Acadia.
- Ontario Soils Mapping Data - Land Information Ontario (LIO)
- Southern Ontario Land Resource Information System (SOLRIS) 3.0 - LIO

DESIGN STORMS

The 3-hour Chicago and 24-hour SCS type II distribution artificial rainfall events have been used as design standards to ensure that infrastructure, such as drainage systems and stormwater management structures, can adequately handle anticipated rainfall events and prevent flooding or other water-related issues. The IDF curves from the Belleville (6150689) Environment and Climate Change Canada (ECCC) gauge has been used for this analysis. This gauge has been intermittently operational since 1960 – 2016 and provides 44 years of historical rainfall data. Design storms were produced using the IDF data from the Bellville gauge and processed using STORMS 2010 (Software developed by JFSA) to convert this IDF data into full rainfall hyetographs. **Table 1** below outlines the total rainfall volumes for the various return periods and design storms. These rainfall hyetographs have been applied to both the pre- and post-development models. Copies of the Bellville IDF data and the hyetographs applied in the model have been provided in **Attachment A** of this report.

Table 1: Belleville Total Rainfall Depths (mm) for 3-Hour CHI and 12-Hour SCS Type II Storms

Return Period	2-Year	5-Year	10 Year	25-Year	50-Year	100-Year
CHI 3 Hour	31	40	46	53	59	65
SCS 24 Hour	51	65	74	86	95	104

PRE-DEVELOPMENT

Drainage Area

The total drainage area for this location is **5.89 ha** with the future development lands occupying approximately **4.71 ha** of the total drainage area. There is a drainage divide that runs through the centre of the site, resulting in the north half of the drainage area (**2.56 ha**) draining northeast to an existing ditch network located along Farnham Road, passing under Farnham Road through a culvert running west to east and outletting to the Moira River. The south half (**2.14 ha**) will drain southeast through a residential lot and into the existing ditch system on Farnham Road, and then run south along Farnham Road before reaching the Moira River. There are also two external drainage areas located to the west of the site, with **0.1 ha** draining north of the divide into the site, and **1.09 ha** draining south into the development area. The entire **5.89 ha**, despite initially draining to separate subcatchments, ultimately discharges to the Moira River and then into the Bay of Quinte. Refer to **Figure A1** in **Attachment A**, for the pre-development drainage divide.

Land Use

Under pre-development conditions, the site is undeveloped and consists primarily of farmlands with small areas of trees and roadways. **Figure A2** in **Attachment A** provides a visual overview of the respective land use data for each of the subcatchments within the study area.

Soil/Infiltration Data

Soil data from Land Information Ontario indicated that the soils are predominantly **clay loam** soils, which are considered a **Type C** SCS soil group. **Figure A3** in **Attachment A** provides a visual overview of the soil type data for each of the subcatchments within the study area.

Curve Number (CN)

Curve Numbers (CN) were calculated, based on underlying Land Use Type and Soil Classification at each location within the subcatchments based on values outlined in **Tables A2** and **A3** in the SWMHYMO Manual. Each Curve Number was then weighted based on the total area within a given subcatchment to determine the weighted CN for that subcatchment. **Table A1** in **Attachment A** provides a full summary of the CN calculations for each of the pre-development subcatchments.

Time to Peak (t_p)

For natural areas within the study area, the time-to-peak values for each of the subcatchments have been calculated based on existing topography. Flow paths have been discretized based on the topographic data using GIS tools and the longest major flow path within each subcatchment identified; refer to **Figure A4** in **Attachment A** for the flow paths discretized for each subcatchment. The upstream and downstream topographic elevations and flow lengths were identified for each subcatchment and used in the calculations. For these natural subcatchments, the Federal Aviation Administration (FFA) method was determined to be the most appropriate method to calculate the Time to Peak. Full details of these calculations have been provided in **Table A2** in **Attachment A**, along with other time-to-peak values using alternative t_p calculation methods.

Initial Abstraction

For undeveloped lands, an initial abstraction value of **4.67 mm** has been assumed which is typical for undeveloped lands commonly used throughout Ontario (parameters are in line with typical rates applied in Ontario per Ministry of Environment Stormwater Management Planning and Design Manual and the City of Ottawa Storm Sewer Design Guidelines). Full SWMHYMO modelling input and summary files for pre-development conditions have been provided in **Attachment A.**

Results

Table 2 below presents the peak flows from the various development area under pre-development conditions:

Table 2:Pre-Development Peak Flows (m^3/s)

DESIGN STORM	Ext-FarnS (1.09 ha)	Ext-FarnN (0.1 ha)	Dev-FarnS (2.14 ha)	Dev-FarnN (2.56 ha)
25mmCHI4Hr	0.010	0.001	0.014	0.016
2YRCHI3Hr	0.016	0.002	0.022	0.026
5YRCHI3HR	0.027	0.004	0.037	0.043
10YRCHI3HR	0.036	0.005	0.049	0.057
25YRCHI3HR	0.047	0.006	0.064	0.074
50YRCHI3HR	0.056	0.008	0.077	0.089
100YRCHI3HR	0.066	0.009	0.091	0.104
2YRSCS24HR	0.033	0.005	0.043	0.049
5YRSCS24HR	0.050	0.007	0.068	0.077
10YRSCS24HR	0.063	0.009	0.086	0.097
25YRSCS24HR	0.080	0.011	0.110	0.123
50YRSCS24HR	0.093	0.013	0.129	0.144
100YRSCS24HR	0.107	0.015	0.148	0.165

POST-DEVELOPMENT

Drainage Area

The post-development model has been developed to reflect the proposed draft plan development grades and respective SWM outlet locations. The proposed development draft plan and the associated drainage areas have been provided in **Figure B1** of **Attachment B**. Under post-development conditions, the entirety of the **4.71 ha** site will drain east and northeast to a SWM facility which will attenuate peak flows to pre-development rates. Note that as the entire development will be draining to the north outlet the post-development flows for the site have been set to match the pre-development peak flows to the north (Catchment Dev-FarnN), as outlined in **Table 2** above.

Under post-development conditions, it is assumed that runoff from the two external areas (Ext-FarnS and Ext-FarnN) will be conveyed around the subdivision to the south. As the **2.14 ha** of drainage area from area Dev-FarnS will go to the SWM pond within the subdivision, the addition of Ext-FarnN (**0.1 ha**) draining south does not have any adverse impacts on peak flows to the southern portion of the Farnham Roadside ditch.

Land Use/ Imperviousness

Under post-development conditions, it was assumed that the site would have an average imperviousness of **67%,** which is typical for a residential subdivision of this type. Note that for this study it is assumed that **57%** of all impervious areas will be directly connected to the storm sewer infrastructure, which is a conservative assumption.

Soil/Infiltration Data

To represent the proposed developed land infiltration rates, Horton's infiltration has been used. For these lands, the following Horton's Infiltration parameters have been applied: Fo=76.2 mm/hr, Fc=13.2 mm/hr, DCAY=4.14 /hr, F=0 mm. These Horton infiltration rates are typical for urban grassed areas and are commonly used throughout Ontario (infiltration parameters are in line with typical rates per City of Ottawa Storm Sewer Design Guidelines)

Time to Peak (t_p)

Under post-development conditions, the flow lengths of the subcatchments have been represented through LGI (Flow Length Impervious) and LGP (Flow Length Pervious) parameters. LGP has been set at 40 m for all subcatchments, which is reflective of the average typical rear yard lot length. LGI has been calculated as follows, as per the SWMHYMO manual:

$$LGI = \sqrt{\frac{Area\ (m^2)}{1.5}},$$

Initial Abstraction

For pervious and impervious surfaces an initial abstraction value of **4.67 mm** and **1.57 mm** respectively has been assumed which is typical for natural and developed lands commonly used throughout Ontario (parameters are in line with typical rates per City of Ottawa Storm Sewer Design Guidelines).

SWM Facility

The SWM facility within the development has been iteratively sized to ensure that the post-development runoff from the site will be attenuated in the facility to the rates under predevelopment. The SWM facility has been conceptually sized using a ROUTE RESERVOIR command in SWMHYMO, which represents the facility simply as an outflow/storage curve. A detailed stage storage/curve of the pond has been provided by Acadia and included in **Table B1 in Attachment B**. To produce an outflow/storage curve to place in the model the pond outlet configuration has been iteratively designed using various orifice and weir equations, see **Table B5** in **Attachment B** for the outlet structure calculations.

Sediment Forebay

The proposed facility has been equipped with a sediment forebay to improve pollutant removal by allowing the larger particles to settle out before entering the main cell of the pond. The forebay enters the pond from the west before spilling into the main cell.

The forebay has been provided with a permanent pool depth of 1.45 m to minimize the potential for re-suspension. Per the MOE design criteria, the forebay has been graded at a 3H:1V slope, and the forebay berm has been set at the permanent pool elevation. The forebay berm will separate the forebay from the rest of the facility to reduce the transfer of sediment to the main cell of the pond. The forebay is sized to meet the greater of the settling and dispersion criteria, as stated in the SWMP Design Manual. Calculations for the minimum dispersion length, settling length and average velocity have been included in **Calculation Sheet B-1** of **Appendix B**.

Permanent Pool

The pond should have a permanent pool depth between 1.0 and 3.0 m, as stipulated in the SWMP Design Manual. Therefore, the proposed facility has been designed with a permanent pool depth of **1.45 m** at an elevation of **110.70 m**. The permanent pool has been sized based on enhanced protection per Table 3.2 (enhanced protection level for a wet pond) in the SWMP Design Manual. Based on a **4.71 ha** drainage area with an average imperviousness of **67%** (refer to **Tables B2 & B3** of **Appendix B**), a minimum of **218 m^3/ha** must be provided. The required permanent pool storage volume is calculated as follows:

(218 – 40) m^3/ha x 4.71 ha = 838 m^3

The proposed pond has been designed with a permanent pool volume of **915 m^3**, which is more than the minimum permanent pool volume the SWMP Design Manual requires.

Quality Control

The quality control volume is based on a volume of 40 m^3/ha. The required quality control volume is calculated as follows:

40 m^3/ha x 4.71 ha = 188 m^3

The proposed facility provides **599 m^3** of extended detention volume at an elevation of **111.25 m**, with a maximum extended detention storage depth of **0.55 m** above the permanent pool elevation of **110.70 m**. Refer to **Table B4 of Appendix B**. The quality control orifice is **110 mm** in diameter and is set at **117.0 m**. The quality control orifice is in the outlet structure at the west end of the pond.

Quantity Control

Quantity control will be provided by one **160 mm** diameter vertical circular orifice, and one **240 mm** diameter vertical circular orifice, set at inverts of **111.25 m** and **111.75 m**, respectively. The orifices will be in the outlet structure at the west end of the pond. The top of the outlet structure will be set above the 100-year pond level. Calculations in support of the quantity control orifice are provided in **Table B5 of Appendix B**. The proposed SWM pond will outlet to the existing roadside ditch on Farnham Road.

Conveyance of Emergency Overflows

In the event of a blockage or a storm greater than the 100-year event, a **20 m**-wide emergency overflow weir has been provided for the pond. Its crest elevation has been set at an elevation of **112.20 m**, which is above the maximum 100-year pond level under free outlet conditions, and provides 0.3 m of freeboard to the top of the pond at **112.50 m**.

SWM Pond Operation

As mentioned above the SWM facility will be designed to ensure peak flows to the existing storm sewer network do not exceed pre-development conditions. **Table 3** below outlines the pre-and post-development flows and the associated required SWM facility storage volumes and associated water levels in the pond to ensure that the proposed development meets these rates. Full SWMHYMO modelling input and summary files for post-development conditions have been provided in **Attachment B**.

From **Table 3** below it is seen that the development will need approximately **2,140 m³** of active storage to attenuate post-development flows to less than or equal to **955 L/s** for up to and including the 100-year event. It is also important to note that the proposed development will result in peak flows to the storm sewer decreasing for events larger than the 5-year for the 12-hour SCS storm and increasing for all events for the 3-hour Chicago storms. For both 100-year events, the peak outflow is less than the capacity of the pipe ensuring that the proposed development will not have any adverse impacts on existing developments, infrastructure, or flood-prone areas.

Table 3: SWM Facility Sizing

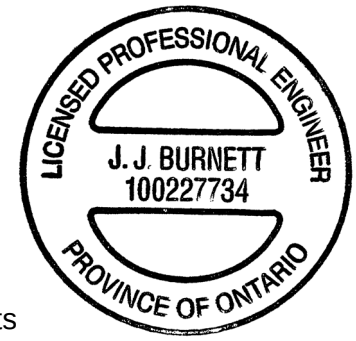
DESIGN STORM	Pre Dev (2.562 ha) Peak Flows (m^3/s)	Post Dev (4.71 ha) Peak Flow (m^3/s)	Peak Flow Difference (m^3/s)	Required storage volume (m^3)	Pond Elevation (m)	Active Storage Depth (m)
Quality Control*	-	0.002	-	188	110.87	0.17
25mmCHI4Hr	0.016	0.016	0.000	566	111.17	0.47
2YRCHI3Hr	0.026	0.023	-0.003	729	111.29	0.59
5YRCHI3HR	0.043	0.042	-0.001	980	111.47	0.77
10YRCHI3HR	0.057	0.052	-0.005	1,169	111.59	0.89
25YRCHI3HR	0.074	0.064	-0.010	1,399	111.73	1.03
50YRCHI3HR	0.089	0.083	-0.006	1,577	111.84	1.14
100YRCHI3HR	0.104	0.104	0.000	1,738	111.93	1.23
2YRSCS24HR	0.049	0.041	-0.008	971	111.46	0.76
5YRSCS24HR	0.077	0.057	-0.020	1,293	111.67	0.97
10YRSCS24HR	0.097	0.074	-0.023	1,513	111.80	1.10
25YRSCS24HR	0.123	0.108	-0.015	1,766	111.95	1.25
50YRSCS24HR	0.144	0.128	-0.016	1,951	112.05	1.35
100YRSCS24HR	0.165	0.146	-0.019	2,140	112.15	1.45

* Quality control volume Per MOE design guidelines

Conclusion

A preliminary SWM facility sizing has been completed for the proposed development site referred to as Hogan Properties, Belleville. The SWM facility has been sized to mitigate post-development flows to pre-development conditions. Based on this analysis it was found that the development will need approximately **2,140 m³** of active storage to attenuate post-development flows to less than or equal to pre-development conditions up to and including the 100-year event.

Yours truly,
J.F Sabourin and Associates Inc.



Jonathon Burnett, B. Eng, P.Eng
Water Resources Engineer

cc: J. F Sabourin, M.Eng, P.Eng
Director of Water Resources Projects

Figures
Figure 1: Site Overview

Tables
Table 1: Total Rainfall Depths (mm) for 3-Hour CHI and 12-Hour SCS Type II Storms
Table 2: Pre-Development Peak Flows (m³/s)
Table 3: SWM Facility Sizing

Attachments
Attachment A: Pre-Development
Attachment B: Post Development

J.F. Sabourin and Associates Inc.
52 Springbrook Drive,
Ottawa, ON K2S 1B9
T 613-836-3884 F 613-836-0332

jfsa.com

Ottawa. ON
Paris. ON
Gatineau. QC
Montréal. QC
Québec. QC

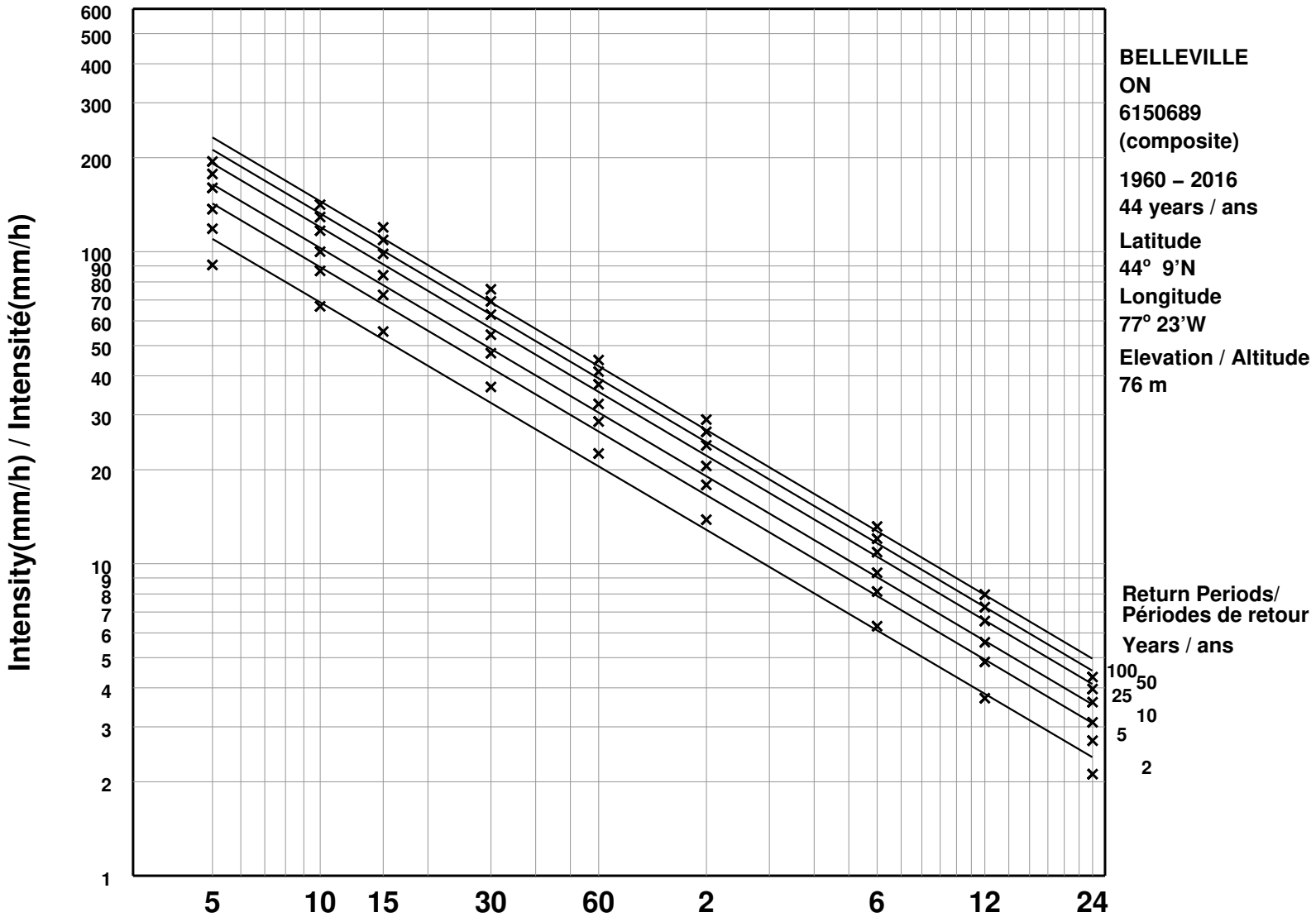
Attachment A

Pre-Development

Short Duration Rainfall Intensity–Duration–Frequency Data

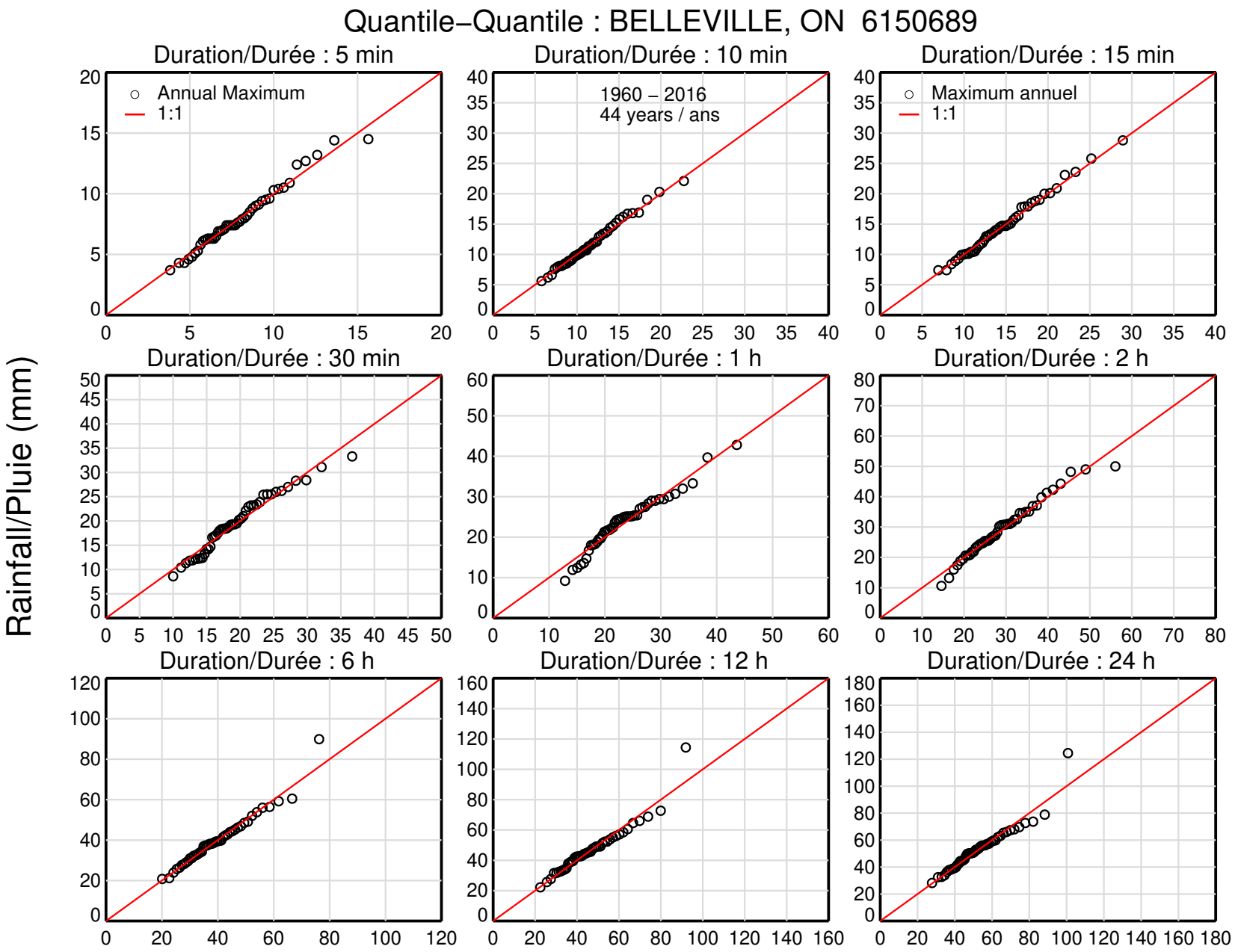
2022/10/31

Données sur l'intensité, la durée et la fréquence des chutes de pluie de courte durée



Environment Canada Environnement Canada

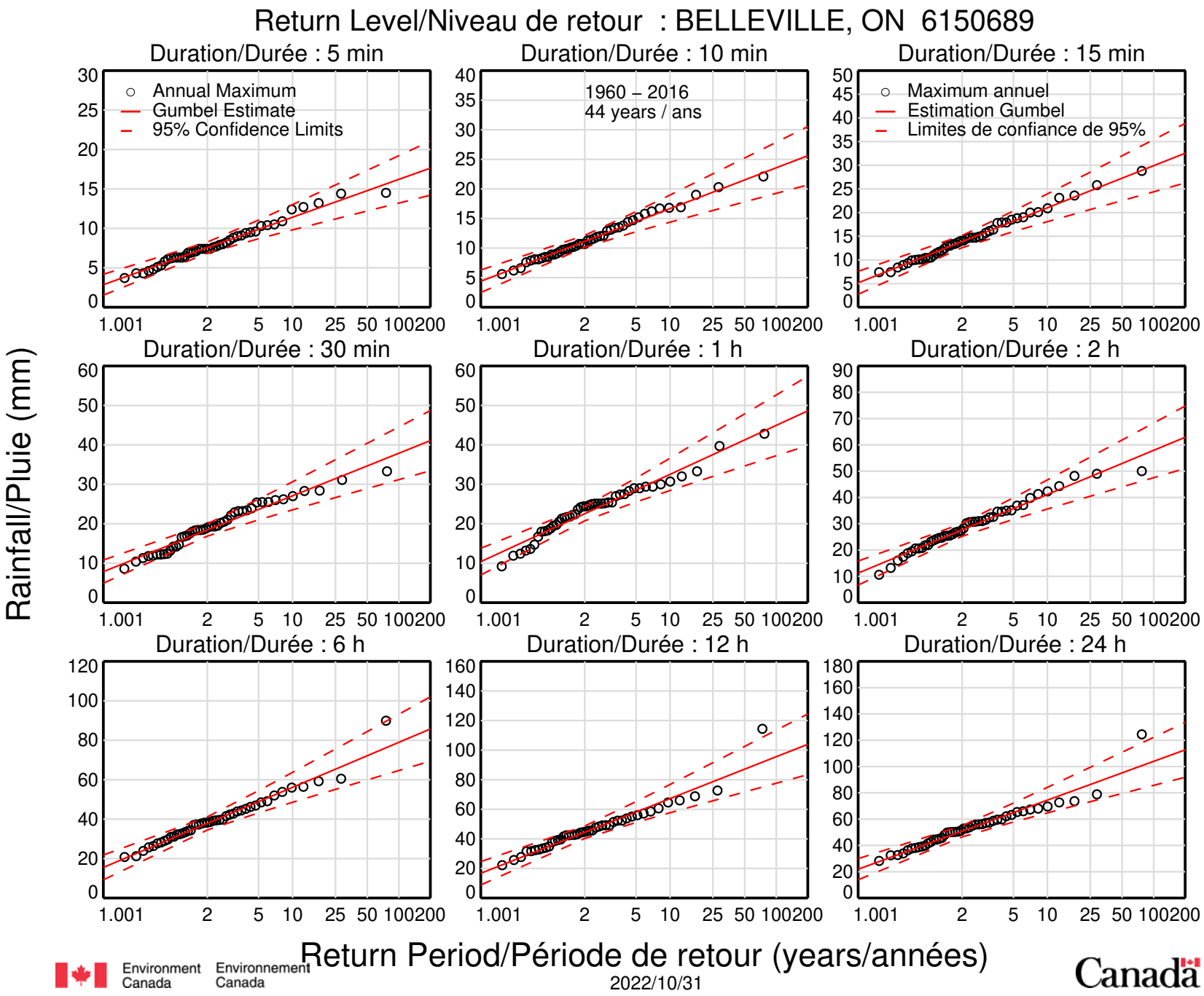
Canada



Environment Canada Environnement Canada

2022/10/31

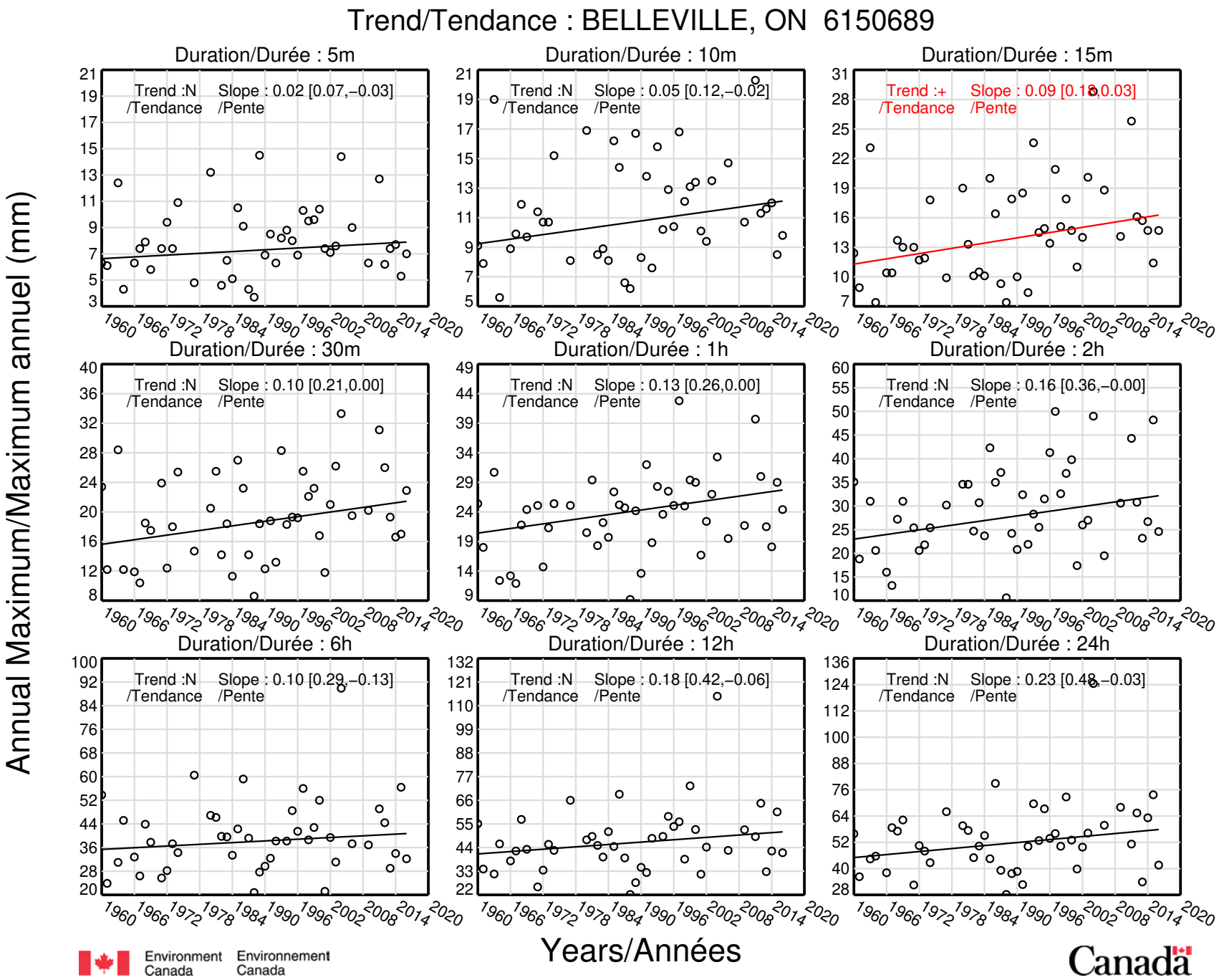
Canada



Environment Canada Environnement Canada

2022/10/31

Canada


Trend/Tendance : BELLEVILLE, ON 6150689
Duration/Durée : 5m
Trend :N Slope : 0.02 [0.07,−0.03]
/Tendance /Pente
Duration/Durée : 10m
Trend :N Slope : 0.05 [0.12,−0.02]
/Tendance /Pente
Duration/Durée : 15m
Trend :+ Slope : 0.09 [0.18,0.03]
/Tendance /Pente
Duration/Durée : 30m
Trend :N Slope : 0.10 [0.21,0.00]
/Tendance /Pente
Duration/Durée : 1h
Trend :N Slope : 0.13 [0.26,0.00]
/Tendance /Pente
Duration/Durée : 2h
Trend :N Slope : 0.16 [0.36,−0.00]
/Tendance /Pente
Duration/Durée : 6h
Trend :N Slope : 0.10 [0.29,−0.13]
/Tendance /Pente
Duration/Durée : 12h
Trend :N Slope : 0.18 [0.42,−0.06]
/Tendance /Pente
Duration/Durée : 24h
Trend :N Slope : 0.23 [0.48,−0.03]
/Tendance /Pente
Annual Maximum/Maximum annuel (mm)
Years/Années
Environment Canada
Environnement Canada
Canada

Environment and Climate Change Canada
Environnement et Changement climatique Canada

Short Duration Rainfall Intensity-Duration-Frequency Data
Données sur l'intensité, la durée et la fréquence des chutes de pluie de courte durée

Gumbel - Method of moments/Méthode des moments

2022/10/31

BELLEVILLE ON 6150689
(composite)
Latitude: 44 9'N Longitude: 77 23'W Elevation/Altitude: 76 m

Years/Années : 1960 - 2016 # Years/Années : 44

Table 1 : Annual Maximum (mm)/Maximum annuel (mm)

Year / Année	5 min	10 min	15 min	30 min	1 h	2 h	6 h	12 h	24 h
1960	6.3	9.1	12.4	23.4	25.4	35.1	53.8	55.1	55.9
1961	6.1	7.9	8.9	12.2	18.0	18.8	23.9	34.0	36.3
1963	12.4	19.0	23.1	28.4	30.7	31.0	31.0	31.7	44.4
1964	4.3	5.6	7.4	12.2	12.4	20.6	45.2	45.7	45.7
1966	6.3	8.9	10.4	11.9	13.2	16.0	32.8	37.8	38.1
1967	7.4	9.9	10.4	10.4	11.9	13.2	26.4	42.4	58.7
1968	7.9	11.9	13.7	18.5	21.8	27.2	43.9	57.1	57.1
1969	5.8	9.7	13.0	17.5	24.4	31.0	37.8	43.2	62.2
1971	7.4	11.4	13.0	23.9	25.1	25.4	25.7	25.7	32.5
1972	9.4	10.7	11.7	12.4	14.7	20.6	28.2	33.5	50.5
1973	7.4	10.7	11.9	18.0	21.3	21.8	37.3	45.5	48.0
1974	10.9	15.2	17.8	25.4	25.4	25.4	34.3	42.7	42.7
1977	4.8	8.1	9.9	14.7	25.1	30.2	60.5	66.0	66.0
1980	13.2	16.9	19.0	20.5	20.5	34.6	46.9	47.6	59.6
1981	-99.9	-99.9	13.3	25.5	29.4	34.6	46.2	49.2	57.4
1982	4.6	8.5	10.1	14.2	18.3	24.7	39.8	45.0	45.0
1983	6.5	8.9	10.5	18.4	22.2	30.7	39.6	39.6	50.3
1984	5.1	8.1	10.1	11.3	19.7	23.7	33.4	51.4	55.1
1985	10.5	16.2	20.0	27.0	27.4	42.3	42.3	44.5	44.5
1986	9.1	14.4	16.4	23.2	25.2	35.0	59.2	68.8	78.9
1987	4.3	6.6	9.3	14.2	24.7	37.1	39.2	39.2	39.2
1988	3.7	6.2	7.4	8.6	9.2	10.6	20.8	22.2	28.2
1989	14.5	16.7	17.9	18.4	24.2	24.2	27.7	27.7	37.7
1990	6.9	8.3	10.0	12.3	13.6	20.8	29.7	34.8	38.7
1991	8.5	13.8	18.5	18.8	32.0	32.4	32.4	32.4	32.7
1992	6.3	7.6	8.4	13.2	18.8	21.9	38.2	48.3	50.1
1993	8.2	15.8	23.6	28.3	28.3	28.3	-99.9	-99.9	69.6
1994	8.8	10.2	14.5	18.3	23.6	25.5	38.2	49.2	52.8
1995	8.0	12.9	14.9	19.3	27.5	31.5	48.5	58.5	67.3
1996	6.9	10.4	13.4	19.2	25.1	41.3	41.5	53.8	53.8
1997	10.3	16.8	20.9	25.5	42.8	50.0	56.0	56.0	56.0
1998	9.5	12.1	15.1	22.1	25.0	32.6	38.6	38.6	50.2
1999	9.6	13.1	17.9	23.2	29.4	36.9	42.8	72.7	72.7
2000	10.4	13.4	14.7	16.8	29.0	39.8	52.0	52.4	53.0
2001	7.4	10.1	11.0	11.8	16.7	17.4	21.2	31.6	39.8
2002	7.1	9.4	14.0	21.0	22.4	26.0	39.4	44.2	49.8
2003	7.6	13.5	20.1	26.2	27.0	27.0	31.1	-99.9	56.2
2004	14.4	22.1	28.8	33.3	33.3	49.0	89.9	114.4	124.5
2006	9.0	14.7	18.8	19.5	19.5	19.5	37.3	42.7	59.8
2009	6.3	10.7	14.1	20.2	21.7	30.6	36.9	52.3	68.0

2011	12.7	20.3	25.8	31.1	39.7	44.3	49.1	49.1	51.2
2012	6.2	11.3	16.1	26.0	30.0	30.8	44.4	64.6	65.4
2013	7.4	11.6	15.7	19.3	21.5	23.2	29.0	32.8	33.9
2014	7.7	12.0	14.7	16.6	18.1	26.7	34.0	42.4	63.2
2015	5.3	8.5	11.4	17.0	29.0	48.2	56.4	60.6	73.7
2016	7.0	9.8	14.7	22.9	24.4	24.6	32.2	41.6	41.6
# Yrs. Années	45	45	46	46	46	46	45	44	46
Mean Moyenne	8.0	11.8	14.7	19.4	23.7	29.2	39.9	47.0	53.4
Std. Dev. Écart-type	2.6	3.8	4.9	5.9	6.8	9.2	12.5	15.5	16.1
Skew. Dissymétrie	0.80	0.78	0.86	0.26	0.30	0.43	1.54	1.96	1.88
Kurtosis	3.48	3.43	3.72	2.61	3.95	3.11	7.71	10.31	10.23

*-99.9 Indicates Missing Data/Données manquantes

Warning: annual maximum amount greater than 100-yr return period amount
Avertissement : la quantité maximale annuelle excède la quantité pour une période de retour de 100 ans

Year/Année	Duration/Durée	Data/Données	100-yr/ans
2004	6 h	89.9	78.9
2004	12 h	114.4	95.6
2004	24 h	124.5	104.0

****

Table 2a : Return Period Rainfall Amounts (mm)
Quantité de pluie (mm) par période de retour

****

Duration/Durée	2 yr/ans	5 yr/ans	10 yr/ans	25 yr/ans	50 yr/ans	100 yr/ans	#Years Années
5 min	7.6	9.9	11.4	13.3	14.8	16.2	45
10 min	11.1	14.5	16.7	19.5	21.5	23.6	45
15 min	13.9	18.2	21.0	24.6	27.3	29.9	46
30 min	18.4	23.6	27.1	31.4	34.7	37.9	46
1 h	22.6	28.5	32.5	37.5	41.3	45.0	46
2 h	27.7	35.8	41.1	47.9	52.9	57.9	46
6 h	37.8	48.8	56.1	65.3	72.2	78.9	45
12 h	44.5	58.1	67.2	78.6	87.1	95.6	44
24 h	50.8	65.0	74.5	86.4	95.2	104.0	46

****

Table 2b :

Return Period Rainfall Rates (mm/h) - 95% Confidence limits
Intensité de la pluie (mm/h) par période de retour - Limites de confiance de 95%

****

Duration/Durée	2 yr/ans	5 yr/ans	10 yr/ans	25 yr/ans	50 yr/ans	100 yr/ans	#Years Années
5 min	90.7	118.5	136.9	160.1	177.4	194.5	45
	+/- 8.4	+/- 14.2	+/- 19.2	+/- 25.9	+/- 31.0	+/- 36.1	45
10 min	66.8	86.8	100.0	116.7	129.1	141.4	45
	+/- 6.1	+/- 10.2	+/- 13.8	+/- 18.6	+/- 22.2	+/- 25.9	45
15 min	55.5	72.7	84.0	98.4	109.1	119.6	46
	+/- 5.2	+/- 8.7	+/- 11.7	+/- 15.8	+/- 18.9	+/- 22.0	46
30 min	36.9	47.3	54.2	62.9	69.3	75.8	46
	+/- 3.1	+/- 5.3	+/- 7.1	+/- 9.6	+/- 11.5	+/- 13.4	46
1 h	22.6	28.5	32.5	37.5	41.3	45.0	46
	+/- 1.8	+/- 3.0	+/- 4.1	+/- 5.5	+/- 6.6	+/- 7.7	46
2 h	13.8	17.9	20.6	24.0	26.5	29.0	46
	+/- 1.2	+/- 2.0	+/- 2.8	+/- 3.7	+/- 4.5	+/- 5.2	46

6 h		6.3		8.1		9.4		10.9		12.0		13.2	45
	+/-	0.6	+/-	0.9	+/-	1.3	+/-	1.7	+/-	2.0	+/-	2.4	45
12 h		3.7		4.8		5.6		6.6		7.3		8.0	44
	+/-	0.3	+/-	0.6	+/-	0.8	+/-	1.1	+/-	1.3	+/-	1.5	44
24 h		2.1		2.7		3.1		3.6		4.0		4.3	46
	+/-	0.2	+/-	0.3	+/-	0.4	+/-	0.5	+/-	0.7	+/-	0.8	46

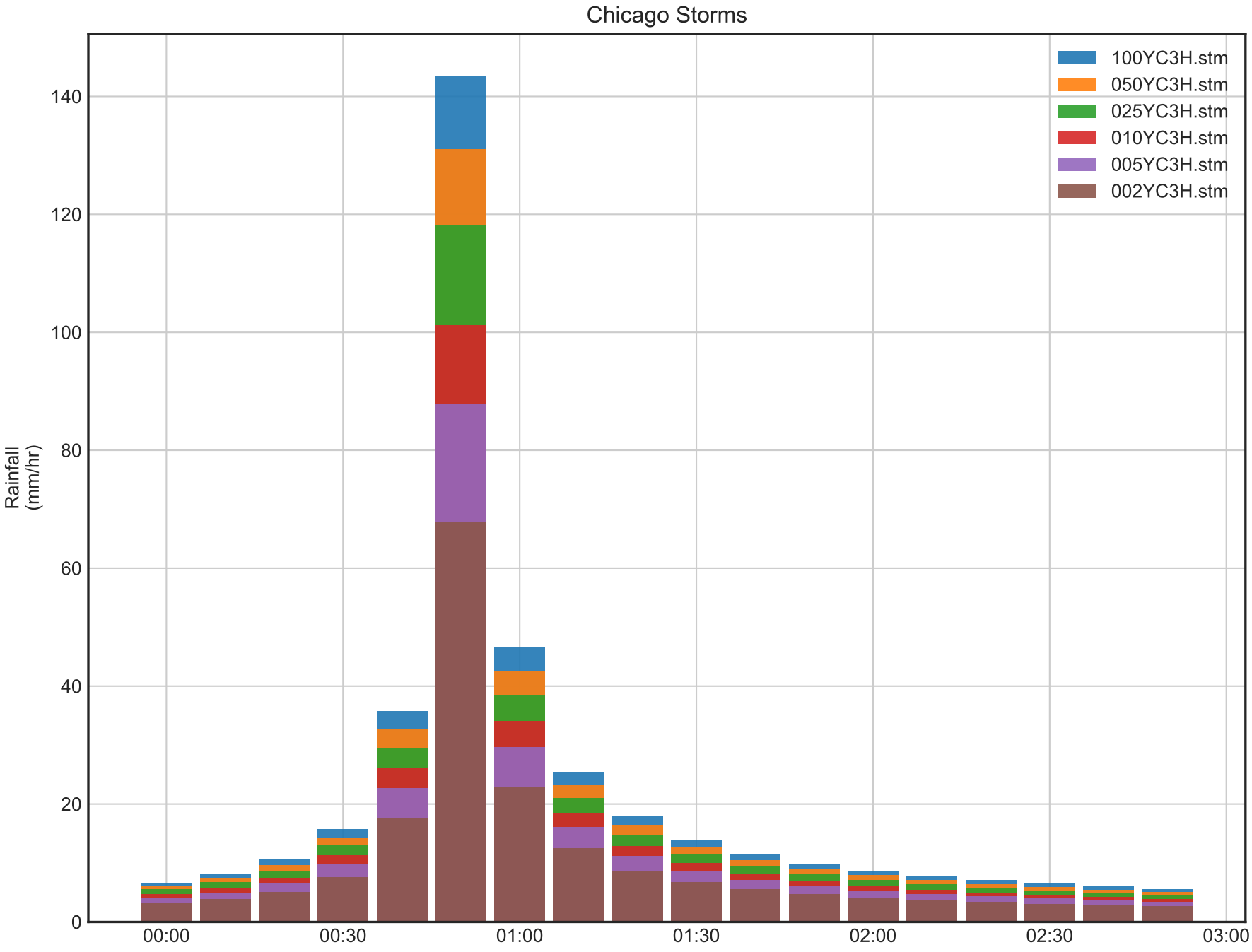
****

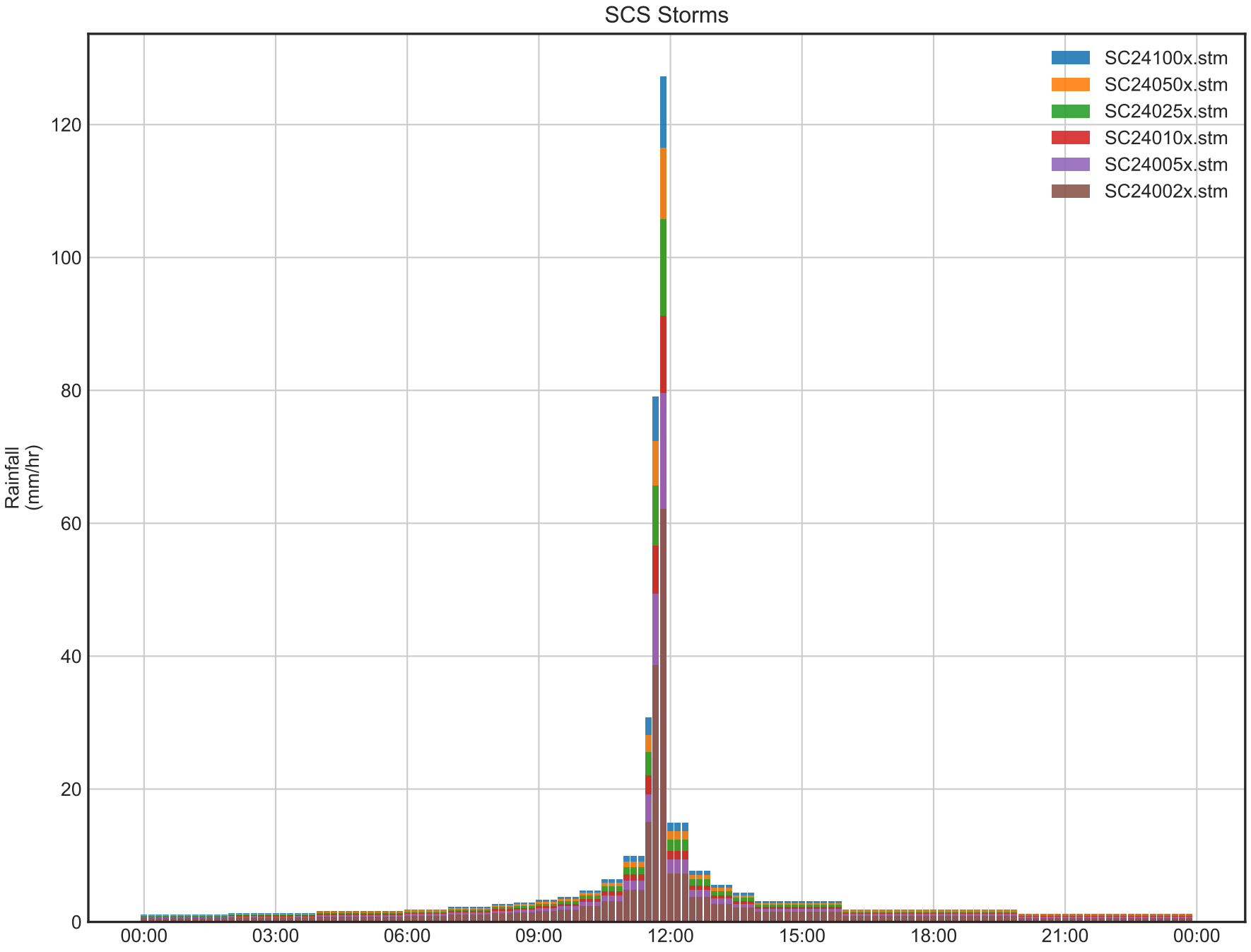
Table 3 : Interpolation Equation / Équation d'interpolation: R = A*T^B

R = Interpolated Rainfall rate (mm/h)/Intensité interpolée de la pluie (mm/h)
RR = Rainfall rate (mm/h) / Intensité de la pluie (mm/h)
T = Rainfall duration (h) / Durée de la pluie (h)

****

Statistics/Statistiques	2 yr/ans	5 yr/ans	10 yr/ans	25 yr/ans	50 yr/ans	100 yr/ans
Mean of RR/Moyenne de RR	33.1	43.0	49.6	57.9	64.0	70.1
Std. Dev. /Écart-type (RR)	31.6	41.3	47.7	55.8	61.9	67.8
Std. Error/Erreur-type	7.6	9.6	10.9	12.6	13.9	15.1
Coefficient (A)	20.5	26.5	30.5	35.5	39.3	43.0
Exponent/Exposant (B)	-0.676	-0.677	-0.678	-0.679	-0.679	-0.679
Mean % Error/% erreur moyenne	8.5	8.1	8.0	7.8	7.7	7.7


Chicago Storms
100YC3H.stm
050YC3H.stm
025YC3H.stm
010YC3H.stm
005YC3H.stm
002YC3H.stm
Rainfall
(mm/hr)
0
20
40
60
80
100
120
140
00:00
00:30
01:00
01:30
02:00
02:30
03:00


SCS Storms
SC24100x.stm
SC24050x.stm
SC24025x.stm
SC24010x.stm
SC24005x.stm
SC24002x.stm
Rainfall
(mm/hr)
0
20
40
60
80
100
120
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00

N

Legend

Drainage Area
[Name]
[Area]

SCALE: 1:2500

0 50 100 m

J.F. Sabourin and Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
52 Springbrook Drive
Ottawa, ON, K2S 1B9
(613) 836-3884
www.jfsa.com

ACADIA ENGINEERING

Hogan Properties

Figure A1: Pre Dev Areas

PROJECT	2468-23
DRAWN	BT
DATE	June 2023

C:\Users\BrennanThomas\J.F. Sabourin and Associates Inc\JFSA-OTTAWA-SERVER - Documents\PROJ\2468-23\Design\GIS\20230509-Pre Dev CN and Tp

N

Legend

- Drainage Area

Land Use

- Built Up Area - Pervious
- Hedge Rows
- Tilled
- Transportation

SCALE: 1:2500

0 50 100 m

J.F. Sabourin and Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
52 Springbrook Drive
Ottawa, ON, K2S 1B9
(613) 836-3884
www.jfsa.com

ACADIA ENGINEERING

Hogan Properties

Figure A2: Land Use

PROJECT	2468-23
DRAWN	BT
DATE	June 2023

C:\Users\BrennanThomas\J.F. Sabourin and Associates Inc\JFSA-OTTAWA-SERVER - Documents\PROJ\2468-23\Design\GIS\20230509-Pre Dev CN and Tp

N

Legend

- Drainage Area

Soils

- OTONABEE LOAM
- SOLMESVILLE CLAY LOAM

SCALE: 1:2500

0 50 100 m

J.F. Sabourin and Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
52 Springbrook Drive
Ottawa, ON, K2S 1B9
(613) 836-3884
www.jfsa.com

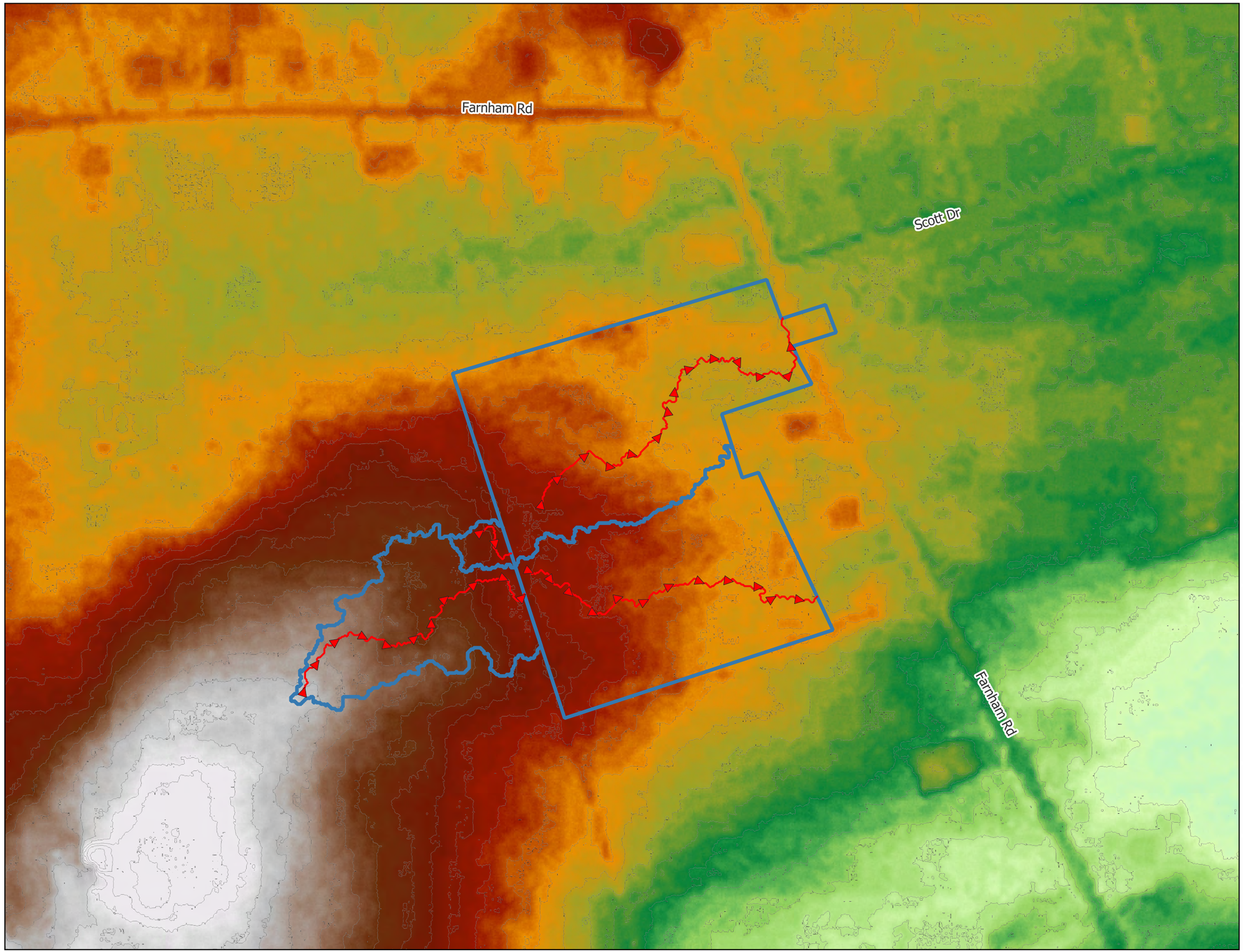
ACADIA ENGINEERING

Hogan Properties

Figure A3: Soils Map

PROJECT	2468-23
DRAWN	BT
DATE	June 2023

C:\Users\BrennanThomas\J.F. Sabourin and Associates Inc\JFSA-OTTAWA-SERVER - Documents\PROJ\2468-23\Design\GIS\20230509-Pre Dev CN and Tp



Legend

- Drainage Area
- Flow Lengths

Terrain (m)

- 108
- 109
- 110
- 111
- 112
- 113
- 114
- 115
- 116
- 117
- 118
- 119

N

SCALE: 1:2500

0 50 100 m

J.F. Sabourin and Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
52 Springbrook Drive
Ottawa, ON, K2S 1B9
(613) 836-3884
www.jfsa.com

ACADIA ENGINEERING

Hogan Properties

Figure A4: Flow Lengths

PROJECT	2468-23
DRAWN	BT
DATE	June 2023

Table A1: Calculation of SCS Curve Number (CN)

Dev-FarnN (2.562 ha)							
Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
0.066	Transportation	SOLMESVILLE CLAY LOAM	C	Fair	98	2.6%	2.5
0.216	Hedge Rows	SOLMESVILLE CLAY LOAM	C	Fair	70	8.4%	5.9
0.029	Built Up Area - Pervious	SOLMESVILLE CLAY LOAM	C	Fair	79	1.1%	0.9
2.252	Tilled	SOLMESVILLE CLAY LOAM	C	Fair	79	87.9%	69.4
						CN	**79**

Dev-FarnS (2.142 ha)							
Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
0.296	Hedge Rows	SOLMESVILLE CLAY LOAM	C	Fair	70	13.8%	9.7
1.831	Tilled	SOLMESVILLE CLAY LOAM	C	Fair	79	85.5%	67.5
0.015	Built Up Area - Pervious	SOLMESVILLE CLAY LOAM	C	Fair	79	0.7%	0.6
						CN	**78**

Ext-FarnN (0.096 ha)							
Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
0.047	Hedge Rows	SOLMESVILLE CLAY LOAM	C	Fair	70	49.0%	34.3
0.049	Tilled	SOLMESVILLE CLAY LOAM	C	Fair	79	51.0%	40.3
						CN	**75**

Ext-FarnS (1.094 ha)							
Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
0.861	Tilled	SOLMESVILLE CLAY LOAM	C	Fair	79	78.7%	62.2
0.029	Hedge Rows	SOLMESVILLE CLAY LOAM	C	Fair	70	2.7%	1.9
0.204	Tilled	OTONABEE LOAM	B	Fair	69	18.6%	12.9
						CN	**77**

Table A2: Time to Peak Calculations

Parameter	Units	Ext-FarnS	Ext-FarnN	Dev-FarnS	Dev-FarnN
Area	ha	1.09	0.10	2.14	2.56
CN	-	79	78	75	77
Ptotal to calc C from CN, use 2 yr 3 hr Chicago stom	P(mm)	31.05	31.05	31.05	31.05
	Ia(mm)	4.67	4.67	4.67	4.67
	RV(mm)	7.3	7.0	6.2	6.8
Ptotal to calc C from CN, use 2 yr 24 hr SCS stom	P(mm)	50.77	50.77	50.77	50.77
	RV(mm)	18.5	17.9	16.0	17.4
C (From Chicago storm)	-	0.24	0.23	0.20	0.22
C (From SCS storm)	-	0.37	0.35	0.32	0.34
Length of Channel	m	253	46	290	348
	ft	829	150	953	1141
Elevation of Head Water	m	118.12	115.05	114.56	114.24
	ft	388	377	376	375
Elevation of Outlet	m	114.52	114.64	112.33	112.36
	ft	376	376	369	369
Average Slope	m/m	1.42%	0.89%	0.77%	0.54%
	ft/ft	1.42%	0.89%	0.77%	0.54%
Kirpich					
Time of Concentration	mins	7	2	10	13
Time to Peak	min	5	2	7	9
Time to Peak	Hours	0.08	0.03	0.11	0.15
FAA (From Chicago storm)					
Time of Concentration	mins	40	20	55	66
Time to Peak	mins	27	13	36	44
Time to Peak	Hours	0.44	0.22	0.61	0.73
FAA (From SCS storm)					
Time of Concentration	mins	34	17	48	57
Time to Peak	mins	23	11	32	38
Time to Peak	Hours	0.38	0.19	0.53	0.63
Barnsby Williams					
Time of Concentration	mins	13	3	16	21
Time to Peak	mins	9	2	11	14
Time to Peak	Hours	0.15	0.04	0.18	0.23
SCS					
Time of Concentration	mins	24	8	41	53
Time to Peak	mins	16	5	27	35
Time to Peak	Hours	0.26	0.09	0.46	0.59
Selected Method					
FAA (From SCS storm)					
Time to Peak	min	23	11	32	38
Time to Peak	Hours	0.38	0.19	0.53	0.63

Note:

All methods calculated as per Appendix A of the SWMHYMO manual

Time to Peak calculated as 2/3 Time of concentration

```
20     Metric units
*#*************************************************************************
*#  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
*#  Date        : 2023-05
*#  Modeller    : JB
*#  Company     : JFSA
*#  License #   :  2582634
*#*************************************************************************
*#*************************************************************************
*%  25mm, 3-Hour Chicago Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[001]
                   ["25mmC3H.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------|
READ STORM          STORM_FILENAME=["storm.001"]
*%-----------------|-------------------------------------------------------|
*=========================================================================
CALIB NASHYD          NHYD=["Ext-FarnS"], DT=[1]min, AREA=[1.09](ha)
                      DWF=[0.0](cms),  CN=[79], IA=[4.67](mm), N=[3.0]
                      Tp=[0.38]hrs, END=-1
*%-----------------|-------------------------------------------------------|
CALIB NASHYD          NHYD=["Ext-FarnN"], DT=[1]min, AREA=[0.10](ha)
                      DWF=[0.0](cms),  CN=[78], IA=[4.67](mm), N=[3.0]
                      Tp=[0.19]hrs, END=-1
*%-----------------|-------------------------------------------------------|
CALIB NASHYD          NHYD=["Dev-FarnS"], DT=[1]min, AREA=[2.14](ha)
                      DWF=[0.0](cms),  CN=[75], IA=[4.67](mm), N=[3.0]
                      Tp=[0.53]hrs, END=-1
*%-----------------|-------------------------------------------------------|
CALIB NASHYD          NHYD=["Dev-FarnN"], DT=[1]min, AREA=[2.56](ha)
                      DWF=[0.0](cms),  CN=[77], IA=[4.67](mm), N=[3.0]
                      Tp=[0.63]hrs, END=-1
*%-----------------|-------------------------------------------------------|
**% STORMS
*%-----------------|-------------------------------------------------------|
*%  2-Year, 3-Hour Chicago Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[002]
                   ["002YC3H.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------|
*%  5-Year, 3-Hour Chicago Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[005]
                   ["005YC3H.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------|
*%  10-Year, 3-Hour Chicago Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[010]
                   ["010YC3H.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------|
*%  25-Year, 3-Hour Chicago Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[025]
                   ["025YC3H.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------|
*%  50-Year, 3-Hour Chicago Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[050]
                   ["050YC3H.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------|
*%  100-Year, 3-Hour Chicago Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[099]
                   ["100YC3H.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------|
*%  2-Year, 24-Hour SCS Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[102]
                   ["SC24002x.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------|
*%  5-Year, 24-Hour SCS Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[105]
                   ["SC24005x.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------|
*%  10-Year, 24-Hour SCS Storm
```

```
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[110]
                   ["SC24010x.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
*%  25-Year, 24-Hour SCS Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[125]
                   ["SC24025x.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
*%  50-Year, 24-Hour SCS Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[150]
                   ["SC24050x.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
*%  100-Year, 24-Hour SCS Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[199]
                   ["SC24100x.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
FINISH
```

```
00001>  ================================================================================
00002>
00003>  SSSSS   W   W   M   M   H   H   Y   Y   M   M    OOO          222    000    11   5555   =========
00004>  S       W W W   MM MM   H   H    Y Y    MM MM   O   O          2   0   0   11   5
00005>  SSSSS   W W W   M M M   HHHHH     Y     M M M   O   O          2   0   0   11   5       Ver 5.500
00006>      S   W W     M   M   H   H     Y     M   M   O   O      222   0   0   11   555     FEB  2015
00007>  SSSSS    W W     M   M   H   H     Y     M   M    OOO       2     0   0   11     5     =========
00008>                                                              2     0   0   11     5   # 2549237
00009>         StormWater Management HYdrologic Model                222    000    11   555    =========
00010>
00011>  ***************************************************************************************************
00012>  ******************************************  SWMHYMO Ver 5.500  ********************************
00013>  ******************  A single event and continuous hydrologic simulation model  ********************
00014>  ******************     based on the principles of HYMO and its successors      ********************
00015>  ******************                    OTTHYMO-83 and OTTHYMO-89.                ********************
00016>  ***************************************************************************************************
00017>  ****************** Distributed by:  J.F. Sabourin and Associates Inc.          ********************
00018>  ******************                   Ottawa,  Ontario: (613) 836-3884          ********************
00019>  ******************                   Gatineau, Quebec: (819) 243-6858          ********************
00020>  ******************                   E-Mail: swmhymo@jfsa.com                  ********************
00021>  ***************************************************************************************************
00022>
00023>  ***************************************************************************************************
00024>  ****************** Licensed user: JFSAinc.                                    ********************
00025>  ******************                 Ottawa                 SERIAL#:2549237     ********************
00026>  ***************************************************************************************************
00027>
00028>  ***************************************************************************************************
00029>  ******************                ****** PROGRAM ARRAY DIMENSIONS ******     ********************
00030>  ******************               Maximum value for ID numbers  :    11        ********************
00031>  ******************               Max. number of rainfall points: 105408       ********************
00032>  ******************               Max. number of flow points   : 105408        ********************
00033>  ***************************************************************************************************
00034>
00035>
00036>  ********************************  S U M M A R Y   O U T P U T  ********************************
00037>  ***************************************************************************************************
00038>  *                    RUN DATE: 2023-06-20    TIME: 12:05:42     RUN COUNTER: 004839                 *
00039>  ***************************************************************************************************
00040>  * Input   file: C:\Temp\2468\20230511-Pre-Dev\HOG_v01-Ex.dat                                        *
00041>  * Output  file: C:\Temp\2468\20230511-Pre-Dev\HOG_v01-Ex.out                                        *
00042>  * Summary file: C:\Temp\2468\20230511-Pre-Dev\HOG_v01-Ex.sum                                        *
00043>  * User comments:                                                                                   *
00044>  * 1:_____________________________________________________________________________________________*
00045>  * 2:_____________________________________________________________________________________________*
00046>  * 3:_____________________________________________________________________________________________*
00047>  ***************************************************************************************************
00048>
00049>
00050> #*************************************************************************
00051> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00052> #  Date        : 2023-05
00053> #  Modeller    : JB
00054> #  Company     : JFSA
00055> #  License #   :  2582634
00056> #*************************************************************************
00057> #*************************************************************************
00058>  RUN#:COMMAND#
00059> R0001:C00001------------------------------------------------------------------------------
00060>      START
00061>       [TZERO =    .00 hrs on       0]
00062>       [METOUT=   2   (1=imperial, 2=metric output)]
00063>       [NSTORM=   1 ]
00064>       [NRUN  = 0001 ]
00065> R0001:C00002------------------------------------------------------------------------------
00066>      READ STORM
00067>       Filename = storm.001
00068>       Comment  = CHICAGO STORM 25mm Event, 3 Hours
00069>       [SDT=10.00:SDUR=   3.00:PTOT=  25.44]
00070> R0001:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00071>     CALIB NASHYD            1.0 01:Ext-FarnS      1.09     .010 No_date    1:33    4.88 .192     .000
00072>       [CN= 79.0: N= 3.00: Tp=  .38]
00073> R0001:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00074>     CALIB NASHYD            1.0 01:Ext-FarnN       .10     .001 No_date    1:15    4.66 .183     .000
00075>       [CN= 78.0: N= 3.00: Tp=  .19]
00076> R0001:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00077>     CALIB NASHYD            1.0 01:Dev-FarnS      2.14     .014 No_date    1:47    4.09 .161     .000
00078>       [CN= 75.0: N= 3.00: Tp=  .53]
00079> R0001:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00080>     CALIB NASHYD            1.0 01:Dev-FarnN      2.56     .016 No_date    1:55    4.46 .175     .000
00081>       [CN= 77.0: N= 3.00: Tp=  .63]
00082>   ** END OF RUN :    1
00083>
00084> ***************************************************************************************************
00085>
00086>
00087>
00088>
00089>
00090>  RUN#:COMMAND#
00091> R0002:C00001------------------------------------------------------------------------------
00092>      START
00093>       [TZERO =    .00 hrs on       0]
00094>       [METOUT=   2   (1=imperial, 2=metric output)]
00095>       [NSTORM=   1 ]
00096>       [NRUN  = 0002 ]
00097> #*************************************************************************
00098> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00099> #  Date        : 2023-05
00100> #  Modeller    : JB
00101> #  Company     : JFSA
00102> #  License #   :  2582634
00103> #*************************************************************************
00104> #*************************************************************************
00105> R0002:C00002------------------------------------------------------------------------------
00106>      READ STORM
00107>       Filename = storm.001
00108>       Comment  = CHICAGO STORM 2 Year, 3 Hours
00109>       [SDT=10.00:SDUR=   3.00:PTOT=  31.05]
00110> R0002:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00111>     CALIB NASHYD            1.0 01:Ext-FarnS      1.09     .016 No_date    1:31    7.41 .239     .000
00112>       [CN= 79.0: N= 3.00: Tp=  .38]
00113> R0002:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00114>     CALIB NASHYD            1.0 01:Ext-FarnN       .10     .002 No_date    1:14    7.10 .229     .000
00115>       [CN= 78.0: N= 3.00: Tp=  .19]
00116> R0002:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00117>     CALIB NASHYD            1.0 01:Dev-FarnS      2.14     .022 No_date    1:45    6.27 .202     .000
00118>       [CN= 75.0: N= 3.00: Tp=  .53]
00119> R0002:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00120>     CALIB NASHYD            1.0 01:Dev-FarnN      2.56     .026 No_date    1:54    6.81 .219     .000
00121>       [CN= 77.0: N= 3.00: Tp=  .63]
00122>   ** END OF RUN :    4
00123>
00124> ***************************************************************************************************
00125>
00126>
00127>
00128>
00129>
00130>  RUN#:COMMAND#
00131> R0005:C00001------------------------------------------------------------------------------
00132>      START
00133>       [TZERO =    .00 hrs on       0]
00134>       [METOUT=   2   (1=imperial, 2=metric output)]
00135>       [NSTORM=   1 ]
00136>       [NRUN  = 0005 ]
00137> #*************************************************************************
00138> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00139> #  Date        : 2023-05
00140> #  Modeller    : JB
00141> #  Company     : JFSA
00142> #  License #   :  2582634
00143> #*************************************************************************
00144> #*************************************************************************
00145> R0005:C00002------------------------------------------------------------------------------
00146>      READ STORM
00147>       Filename = storm.001
00148>       Comment  = CHICAGO STORM 5 Year, 3 Hours
00149>       [SDT=10.00:SDUR=   3.00:PTOT=  40.07]
00150> R0005:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00151>     CALIB NASHYD            1.0 01:Ext-FarnS      1.09     .027 No_date    1:30   12.18 .304     .000
00152>       [CN= 79.0: N= 3.00: Tp=  .38]
00153> R0005:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00154>     CALIB NASHYD            1.0 01:Ext-FarnN       .10     .004 No_date    1:13   11.71 .292     .000
00155>       [CN= 78.0: N= 3.00: Tp=  .19]
00156> R0005:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00157>     CALIB NASHYD            1.0 01:Dev-FarnS      2.14     .037 No_date    1:43   10.44 .261     .000
00158>       [CN= 75.0: N= 3.00: Tp=  .53]
00159> R0005:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00160>     CALIB NASHYD            1.0 01:Dev-FarnN      2.56     .043 No_date    1:51   11.26 .281     .000
00161>       [CN= 77.0: N= 3.00: Tp=  .63]
00162>   ** END OF RUN :    9
00163>
00164> ***************************************************************************************************
00165>
00166>
00167>
00168>
00169>
00170>  RUN#:COMMAND#
00171> R0010:C00001------------------------------------------------------------------------------
00172>      START
00173>       [TZERO =    .00 hrs on       0]
00174>       [METOUT=   2   (1=imperial, 2=metric output)]
00175>       [NSTORM=   1 ]
00176>       [NRUN  = 0010 ]
00177> #*************************************************************************
00178> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00179> #  Date        : 2023-05
00180> #  Modeller    : JB
00181> #  Company     : JFSA
00182> #  License #   :  2582634
00183> #*************************************************************************
00184> #*************************************************************************
00185> R0010:C00002------------------------------------------------------------------------------
00186>      READ STORM
00187>       Filename = storm.001
00188>       Comment  = CHICAGO STORM 10 Year, 3 Hours
00189>       [SDT=10.00:SDUR=   3.00:PTOT=  46.11]
00190> R0010:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00191>     CALIB NASHYD            1.0 01:Ext-FarnS      1.09     .036 No_date    1:29   15.76 .342     .000
00192>       [CN= 79.0: N= 3.00: Tp=  .38]
00193> R0010:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00194>     CALIB NASHYD            1.0 01:Ext-FarnN       .10     .005 No_date    1:13   15.18 .329     .000
00195>       [CN= 78.0: N= 3.00: Tp=  .19]
00196> R0010:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00197>     CALIB NASHYD            1.0 01:Dev-FarnS      2.14     .049 No_date    1:42   13.62 .295     .000
00198>       [CN= 75.0: N= 3.00: Tp=  .53]
00199> R0010:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00200>     CALIB NASHYD            1.0 01:Dev-FarnN      2.56     .057 No_date    1:50   14.64 .317     .000
00201>       [CN= 77.0: N= 3.00: Tp=  .63]
00202>   ** END OF RUN :   24
00203>
00204> ***************************************************************************************************
00205>
00206>
00207>
00208>
00209>
00210>  RUN#:COMMAND#
00211> R0025:C00001------------------------------------------------------------------------------
00212>      START
00213>       [TZERO =    .00 hrs on       0]
00214>       [METOUT=   2   (1=imperial, 2=metric output)]
00215>       [NSTORM=   1 ]
00216>       [NRUN  = 0025 ]
00217> #*************************************************************************
00218> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00219> #  Date        : 2023-05
00220> #  Modeller    : JB
00221> #  Company     : JFSA
00222> #  License #   :  2582634
00223> #*************************************************************************
00224> #*************************************************************************
00225> R0025:C00002------------------------------------------------------------------------------
00226>      READ STORM
00227>       Filename = storm.001
00228>       Comment  = CHICAGO STORM 25 Year, 3 Hours
00229>       [SDT=10.00:SDUR=   3.00:PTOT=  53.24]
00230> R0025:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00231>     CALIB NASHYD            1.0 01:Ext-FarnS      1.09     .047 No_date    1:28   20.32 .382     .000
00232>       [CN= 79.0: N= 3.00: Tp=  .38]
00233> R0025:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00234>     CALIB NASHYD            1.0 01:Ext-FarnN       .10     .006 No_date    1:12   19.62 .369     .000
00235>       [CN= 78.0: N= 3.00: Tp=  .19]
00236> R0025:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00237>     CALIB NASHYD            1.0 01:Dev-FarnS      2.14     .064 No_date    1:41   17.71 .333     .000
00238>       [CN= 75.0: N= 3.00: Tp=  .53]
00239> R0025:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00240>     CALIB NASHYD            1.0 01:Dev-FarnN      2.56     .074 No_date    1:49   18.96 .356     .000
00241>       [CN= 77.0: N= 3.00: Tp=  .63]
00242>   ** END OF RUN :   49
00243>
00244> ***************************************************************************************************
00245>
00246>
00247>
00248>
00249>
00250>  RUN#:COMMAND#
00251> R0050:C00001------------------------------------------------------------------------------
00252>      START
00253>       [TZERO =    .00 hrs on       0]
00254>       [METOUT=   2   (1=imperial, 2=metric output)]
00255>       [NSTORM=   1 ]
00256>       [NRUN  = 0050 ]
00257> #*************************************************************************
00258> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00259> #  Date        : 2023-05
00260> #  Modeller    : JB
00261> #  Company     : JFSA
00262> #  License #   :  2582634
00263> #*************************************************************************
00264> #*************************************************************************
00265> R0050:C00002------------------------------------------------------------------------------
00266>      READ STORM
00267>       Filename = storm.001
00268>       Comment  = CHICAGO STORM 50 Year, 3 Hours
00269>       [SDT=10.00:SDUR=   3.00:PTOT=  58.95]
00270> R0050:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00271>     CALIB NASHYD            1.0 01:Ext-FarnS      1.09     .056 No_date    1:28   24.19 .410     .000
00272>       [CN= 79.0: N= 3.00: Tp=  .38]
00273> R0050:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00274>     CALIB NASHYD            1.0 01:Ext-FarnN       .10     .008 No_date    1:12   23.39 .397     .000
00275>       [CN= 78.0: N= 3.00: Tp=  .19]
00276> R0050:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00277>     CALIB NASHYD            1.0 01:Dev-FarnS      2.14     .077 No_date    1:41   21.20 .360     .000
00278>       [CN= 75.0: N= 3.00: Tp=  .53]
00279> R0050:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00280>     CALIB NASHYD            1.0 01:Dev-FarnN      2.56     .089 No_date    1:49   22.63 .384     .000
00281>       [CN= 77.0: N= 3.00: Tp=  .63]
00282>   ** END OF RUN :   98
00283>
00284> ***************************************************************************************************
00285>
00286>
00287>
00288>
00289>
00290>  RUN#:COMMAND#
00291> R0099:C00001------------------------------------------------------------------------------
00292>      START
00293>       [TZERO =    .00 hrs on       0]
00294>       [METOUT=   2   (1=imperial, 2=metric output)]
00295>       [NSTORM=   1 ]
00296>       [NRUN  = 0099 ]
00297> #*************************************************************************
00298> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00299> #  Date        : 2023-05
00300> #  Modeller    : JB
00301> #  Company     : JFSA
00302> #  License #   :  2582634
00303> #*************************************************************************
00304> #*************************************************************************
00305> R0099:C00002------------------------------------------------------------------------------
00306>      READ STORM
00307>       Filename = storm.001
00308>       Comment  = CHICAGO STORM 100 Year, 3 Hours
00309>       [SDT=10.00:SDUR=   3.00:PTOT=  64.54]
00310> R0099:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00311>     CALIB NASHYD            1.0 01:Ext-FarnS      1.09     .066 No_date    1:27   28.13 .436     .000
00312>       [CN= 79.0: N= 3.00: Tp=  .38]
00313> R0099:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00314>     CALIB NASHYD            1.0 01:Ext-FarnN       .10     .009 No_date    1:12   27.25 .422     .000
00315>       [CN= 78.0: N= 3.00: Tp=  .19]
00316> R0099:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00317>     CALIB NASHYD            1.0 01:Dev-FarnS      2.14     .091 No_date    1:40   24.80 .384     .000
00318>       [CN= 75.0: N= 3.00: Tp=  .53]
00319> R0099:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00320>     CALIB NASHYD            1.0 01:Dev-FarnN      2.56     .104 No_date    1:48   26.40 .409     .000
00321>       [CN= 77.0: N= 3.00: Tp=  .63]
00322>   ** END OF RUN :  101
00323>
00324> ***************************************************************************************************
00325>
00326>
00327>
00328>
00329>
00330>  RUN#:COMMAND#
00331> R0102:C00001------------------------------------------------------------------------------
00332>      START
00333>       [TZERO =    .00 hrs on       0]
00334>       [METOUT=   2   (1=imperial, 2=metric output)]
00335>       [NSTORM=   1 ]
00336>       [NRUN  = 0102 ]
00337> #*************************************************************************
00338> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00339> #  Date        : 2023-05
00340> #  Modeller    : JB
00341> #  Company     : JFSA
00342> #  License #   :  2582634
00343> #*************************************************************************
00344> #*************************************************************************
00345> R0102:C00002------------------------------------------------------------------------------
00346>      READ STORM
00347>       Filename = storm.001
00348>       Comment  = 2 years SCS Type 2 Storm 24 Hours step 10 min, Belleville
00349>       [SDT=10.00:SDUR=  24.00:PTOT=  50.77]
00350> R0102:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00351>     CALIB NASHYD            1.0 01:Ext-FarnS      1.09     .033 No_date    12:17   18.71 .368     .000
00352>       [CN= 79.0: N= 3.00: Tp=  .38]
00353> R0102:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00354>     CALIB NASHYD            1.0 01:Ext-FarnN       .10     .005 No_date    12:06   18.05 .355     .000
00355>       [CN= 78.0: N= 3.00: Tp=  .19]
00356> R0102:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00357>     CALIB NASHYD            1.0 01:Dev-FarnS      2.14     .043 No_date    12:28   16.25 .320     .000
00358>       [CN= 75.0: N= 3.00: Tp=  .53]
00359> R0102:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00360>     CALIB NASHYD            1.0 01:Dev-FarnN      2.56     .049 No_date    12:36   17.43 .343     .000
```

```
00361>       [CN= 77.0: N= 3.00: Tp=  .63]
00362>   ** END OF RUN :  104
00363>
00364> ************************************************************************************************
00365>
00366>
00367>
00368>
00369>
00370>  RUN#:COMMAND#
00371> R0105:C00001------------------------------------------------------------------------------------
00372>       START
00373>       [TZERO =    .00 hrs on        0]
00374>       [METOUT=   2    (1=imperial, 2=metric output)]
00375>       [NSTORM=   1 ]
00376>       [NRUN  = 0105 ]
00377> #*************************************************************************
00378> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00379> #  Date        : 2023-05
00380> #  Modeller    : JB
00381> #  Company     : JFSA
00382> #  License #   :  2582634
00383> #*************************************************************************
00384> #*************************************************************************
00385> R0105:C00002------------------------------------------------------------------------------------
00386>       READ STORM
00387>       Filename = storm.001
00388>       Comment  = 5 years SCS Type 2 Storm 24 Hours step 10 min, Belleville
00389>       [SDT=10.00:SDUR=  24.00:PTOT=  65.00]
00390> R0105:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00391>     CALIB NASHYD           1.0 01:Ext-FarnS      1.09     .050 No_date   12:17   28.47 .438     .000
00392>       [CN= 79.0: N= 3.00: Tp=  .38]
00393> R0105:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00394>     CALIB NASHYD           1.0 01:Ext-FarnN       .10     .007 No_date   12:06   27.57 .424     .000
00395>       [CN= 78.0: N= 3.00: Tp=  .19]
00396> R0105:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00397>     CALIB NASHYD           1.0 01:Dev-FarnS      2.14     .068 No_date   12:28   25.10 .386     .000
00398>       [CN= 75.0: N= 3.00: Tp=  .53]
00399> R0105:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00400>     CALIB NASHYD           1.0 01:Dev-FarnN      2.56     .077 No_date   12:35   26.72 .411     .000
00401>       [CN= 77.0: N= 3.00: Tp=  .63]
00402>   ** END OF RUN :  109
00403>
00404> ************************************************************************************************
00405>
00406>
00407>
00408>
00409>
00410>  RUN#:COMMAND#
00411> R0110:C00001------------------------------------------------------------------------------------
00412>       START
00413>       [TZERO =    .00 hrs on        0]
00414>       [METOUT=   2    (1=imperial, 2=metric output)]
00415>       [NSTORM=   1 ]
00416>       [NRUN  = 0110 ]
00417> #*************************************************************************
00418> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00419> #  Date        : 2023-05
00420> #  Modeller    : JB
00421> #  Company     : JFSA
00422> #  License #   :  2582634
00423> #*************************************************************************
00424> #*************************************************************************
00425> R0110:C00002------------------------------------------------------------------------------------
00426>       READ STORM
00427>       Filename = storm.001
00428>       Comment  = 10 years SCS Type 2 Storm 24 Hours step 10 min, Belleville
00429>       [SDT=10.00:SDUR=  24.00:PTOT=  74.47]
00430> R0110:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00431>     CALIB NASHYD           1.0 01:Ext-FarnS      1.09     .063 No_date   12:17   35.48 .476     .000
00432>       [CN= 79.0: N= 3.00: Tp=  .38]
00433> R0110:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00434>     CALIB NASHYD           1.0 01:Ext-FarnN       .10     .009 No_date   12:06   34.44 .462     .000
00435>       [CN= 78.0: N= 3.00: Tp=  .19]
00436> R0110:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00437>     CALIB NASHYD           1.0 01:Dev-FarnS      2.14     .086 No_date   12:27   31.54 .424     .000
00438>       [CN= 75.0: N= 3.00: Tp=  .53]
00439> R0110:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00440>     CALIB NASHYD           1.0 01:Dev-FarnN      2.56     .097 No_date   12:35   33.45 .449     .000
00441>       [CN= 77.0: N= 3.00: Tp=  .63]
00442>   ** END OF RUN :  124
00443>
00444> ************************************************************************************************
00445>
00446>
00447>
00448>
00449>
00450>  RUN#:COMMAND#
00451> R0125:C00001------------------------------------------------------------------------------------
00452>       START
00453>       [TZERO =    .00 hrs on        0]
00454>       [METOUT=   2    (1=imperial, 2=metric output)]
00455>       [NSTORM=   1 ]
00456>       [NRUN  = 0125 ]
00457> #*************************************************************************
00458> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00459> #  Date        : 2023-05
00460> #  Modeller    : JB
00461> #  Company     : JFSA
00462> #  License #   :  2582634
00463> #*************************************************************************
00464> #*************************************************************************
00465> R0125:C00002------------------------------------------------------------------------------------
00466>       READ STORM
00467>       Filename = storm.001
00468>       Comment  = 25 years SCS Type 2 Storm 24 Hours step 10 min, Belleville
00469>       [SDT=10.00:SDUR=  24.00:PTOT=  86.41]
00470> R0125:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00471>     CALIB NASHYD           1.0 01:Ext-FarnS      1.09     .080 No_date   12:17   44.77 .518     .000
00472>       [CN= 79.0: N= 3.00: Tp=  .38]
00473> R0125:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00474>     CALIB NASHYD           1.0 01:Ext-FarnN       .10     .011 No_date   12:05   43.56 .504     .000
00475>       [CN= 78.0: N= 3.00: Tp=  .19]
00476> R0125:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00477>     CALIB NASHYD           1.0 01:Dev-FarnS      2.14     .110 No_date   12:27   40.15 .465     .000
00478>       [CN= 75.0: N= 3.00: Tp=  .53]
00479> R0125:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00480>     CALIB NASHYD           1.0 01:Dev-FarnN      2.56     .123 No_date   12:34   42.40 .491     .000
00481>       [CN= 77.0: N= 3.00: Tp=  .63]
00482>   ** END OF RUN :  149
00483>
00484> ************************************************************************************************
00485>
00486>
00487>
00488>
00489>
00490>  RUN#:COMMAND#
00491> R0150:C00001------------------------------------------------------------------------------------
00492>       START
00493>       [TZERO =    .00 hrs on        0]
00494>       [METOUT=   2    (1=imperial, 2=metric output)]
00495>       [NSTORM=   1 ]
00496>       [NRUN  = 0150 ]
00497> #*************************************************************************
00498> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00499> #  Date        : 2023-05
00500> #  Modeller    : JB
00501> #  Company     : JFSA
00502> #  License #   :  2582634
00503> #*************************************************************************
00504> #*************************************************************************
00505> R0150:C00002------------------------------------------------------------------------------------
00506>       READ STORM
00507>       Filename = storm.001
00508>       Comment  = 50 years SCS Type 2 Storm 24 Hours step 10 min, Belleville
00509>       [SDT=10.00:SDUR=  24.00:PTOT=  95.19]
00510> R0150:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00511>     CALIB NASHYD           1.0 01:Ext-FarnS      1.09     .093 No_date   12:16   51.84 .545     .000
00512>       [CN= 79.0: N= 3.00: Tp=  .38]
00513> R0150:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00514>     CALIB NASHYD           1.0 01:Ext-FarnN       .10     .013 No_date   12:05   50.52 .531     .000
00515>       [CN= 78.0: N= 3.00: Tp=  .19]
00516> R0150:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00517>     CALIB NASHYD           1.0 01:Dev-FarnS      2.14     .129 No_date   12:27   46.77 .491     .000
00518>       [CN= 75.0: N= 3.00: Tp=  .53]
00519> R0150:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00520>     CALIB NASHYD           1.0 01:Dev-FarnN      2.56     .144 No_date   12:34   49.24 .517     .000
00521>       [CN= 77.0: N= 3.00: Tp=  .63]
00522>   ** END OF RUN :  198
00523>
00524> ************************************************************************************************
00525>
00526>
00527>
00528>
00529>
00530>  RUN#:COMMAND#
00531> R0199:C00001------------------------------------------------------------------------------------
00532>       START
00533>       [TZERO =    .00 hrs on        0]
00534>       [METOUT=   2    (1=imperial, 2=metric output)]
00535>       [NSTORM=   1 ]
00536>       [NRUN  = 0199 ]
00537> #*************************************************************************
00538> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00539> #  Date        : 2023-05
00540> #  Modeller    : JB
00541> #  Company     : JFSA
00542> #  License #   :  2582634
00543> #*************************************************************************
00544> #*************************************************************************
00545> R0199:C00002------------------------------------------------------------------------------------
00546>       READ STORM
00547>       Filename = storm.001
00548>       Comment  = 100 years SCS Type 2 Storm 24 Hours step 10 min, Belleville
00549>       [SDT=10.00:SDUR=  24.00:PTOT= 103.98]
00550> R0199:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00551>     CALIB NASHYD           1.0 01:Ext-FarnS      1.09     .107 No_date   12:16   59.12 .569     .000
00552>       [CN= 79.0: N= 3.00: Tp=  .38]
00553> R0199:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00554>     CALIB NASHYD           1.0 01:Ext-FarnN       .10     .015 No_date   12:05   57.69 .555     .000
00555>       [CN= 78.0: N= 3.00: Tp=  .19]
00556> R0199:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00557>     CALIB NASHYD           1.0 01:Dev-FarnS      2.14     .148 No_date   12:27   53.61 .516     .000
00558>       [CN= 75.0: N= 3.00: Tp=  .53]
00559> R0199:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00560>     CALIB NASHYD           1.0 01:Dev-FarnN      2.56     .165 No_date   12:34   56.30 .541     .000
00561>       [CN= 77.0: N= 3.00: Tp=  .63]
00562> R0199:C00002------------------------------------------------------------------------------------
00563>     FINISH
00564> ------------------------------------------------------------------------------------------------
00565> ************************************************************************************************
00566>       WARNINGS / ERRORS / NOTES
00567>       -------------------------
00568>    Simulation ended on 2023-06-20     at 12:05:44
00569> ================================================================================================
00570>
```

Ottawa. ON
Paris. ON
Gatineau. QC
Montréal. QC
Québec. QC

Attachment B

Post Development

N

Legend

- Development Area
- Parcel Lines

SCALE: 1:2500

0 50 100 m

J.F. Sabourin and Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
52 Springbrook Drive
Ottawa, ON, K2S 1B9
(613) 836-3884
www.jfsa.com

ACADIA ENGINEERING

Hogan Properties

Figure B1: Post Development

PROJECT	2468-23
DRAWN	BT
DATE	June 2023

C:\Users\BrennanThomas\J.F. Sabourin and Associates Inc\JFSA-OTTAWA-SERVER - Documents\PROJ\2468-23\Design\GIS\20230509-Pre Dev CN and Tp

Table B1 - Hogan Property - SWM Pond Stage/Storage Curve

Elevation	Note	Incremental Area (m^2)	Cumulative Area (m^2)	Incremental Volume (m^3)	Cumulative Volume (m^3)	Active Storage (m^3)
109.25	Pond Bottom	43.72	43.7	0	0	-
109.3		7.83	51.5	2	2	-
109.4		8.34	59.9	6	8	-
109.5		380.51	440.4	22	30	-
109.6		45.98	486.4	46	76	-
109.7		46.96	533.3	51	127	-
109.8		47.92	581.3	56	183	-
109.9		48.89	630.1	61	244	-
110		49.86	680.0	65	309	-
110.1		50.82	730.8	71	380	-
110.2		51.79	782.6	76	455	-
110.3		52.75	835.3	81	536	-
110.4		53.73	889.1	86	622	-
110.5		54.69	943.8	92	714	-
110.6		62.21	1,006.0	97	811	-
110.7	Perm Pool	54.07	1,060.0	103	915	0
110.8		54.73	1,114.8	109	1,023	109
110.9	Extened Detention	55.45	1,170.2	114	1,138	223
111		56.18	1,226.4	120	1,258	343
111.1		56.89	1,283.3	125	1,383	468
111.2		57.62	1,340.9	131	1,514	599
111.3		58.33	1,399.3	137	1,651	736
111.4		59.06	1,458.3	143	1,794	879
111.5		59.77	1,518.1	149	1,943	1,028
111.6		60.49	1,578.6	155	2,098	1,183
111.7		61.21	1,639.8	161	2,259	1,344
111.8		61.93	1,701.7	167	2,426	1,511
111.9		62.65	1,764.4	173	2,599	1,684
112		63.37	1,827.7	180	2,779	1,864
112.1		64.09	1,891.8	186	2,965	2,050
112.2		64.80	1,956.6	192	3,157	2,242
112.3		65.52	2,022.1	199	3,356	2,441
112.4		66.09	2,088.2	206	3,561	2,647
112.5	Top of Pond	1.30	2,089.5	209	3,770	2,856

Table B-2: Criteria for Required Storage Volumes

Pond	Area [1] (ha)	Imperviousness (%)	Storage Volume for Impervious Level [1] (m^3/ha)
SWM Pond	4.71	55	190
		67.0	218
		70	225

[1] Protection Level for Wet Pond: Enhanced 80% long-term S.S. removal.
SWM Planning & Design Manual, Table 3.2, p.3-10 (March 2003).

Table B-3: Required Storage Volumes for SWM Facility

Pond Component	Required Volume (m^3)	Provided Volume [4] (m^3)	Volume Ratio	Elevation (m)
Permanent Pool (PP) [1]	838	915	1.09	110.70
Extended Detention [2]	188	599	3.18	111.25
Forebay (20% PP)	168	N/A	N/A	-
PP - Forebay	671	N/A	N/A	-

[1] Required PP volume based on Table B-1.
[2] Required quality control volume based on 40 m^3/ha.
[4] Provided volume based on stage-storage curve and extended detention (refer to Tables B-3 and B-4).
[6] As per MOE, Maximum Forebay Area: 33% of Total Permanent Pool.

Table B-4: Extended Detention Drawdown Time for SWM Facility

Elev.	Active Storage			C2	Drawdown Time	Drawdown Time	Flow	Demarkation
(m)	V (m^3)	A (m^2)	depth (m)	(m^2/m)	(h)	(days)	(m^3/s)	Point
110.70	0	1,060	0.00		0.00		0.000	PP Elev
110.80	109	1,115	0.10	547.34	10.86	0.45	0.006	
110.90	223	1,170	0.20	550.93	14.95	0.62	0.010	QC Elev
111.00	343	1,226	0.30	554.55	17.86	0.74	0.013	
111.10	468	1,283	0.40	558.15	20.33	0.85	0.015	
111.20	599	1,341	0.50	561.75	22.56	0.94	0.017	Ext. Det.
111.30	736	1,399	0.60	565.34	24.39	1.02	0.024	
111.40	879	1,458	0.70	568.94	25.72	1.07	0.036	
111.50	1028	1,518	0.80	572.54	26.74	1.11	0.045	
111.60	1183	1,579	0.90	576.14	27.62	1.15	0.053	
111.70	1344	1,640	1.00	579.73	28.42	1.18	0.059	
111.80	1511	1,702	1.10	583.33	29.12	1.21	0.074	
111.90	1684	1,764	1.20	586.93	29.68	1.24	0.097	
112.00	1864	1,828	1.30	590.52	30.15	1.26	0.119	
112.10	2050	1,892	1.40	594.12	30.55	1.27	0.138	
112.20	2242	1,957	1.50	597.72	30.91	1.29	0.154	
112.30	2441	2,022	1.60	601.31	31.00	1.29	1.167	
112.40	2647	2,088	1.70	604.82	31.02	1.29	3.002	
112.50	2856	2,090	1.80	571.94	31.04	1.29	5.370	Top Of Pond

Notes:
- C2 is the slope coefficient from the area-depth linear regression.
- PP Elev indicates the elevation of the permanent pool.
- QC Elev indicates the elevation of the storage volume required by MOE for quality control.
- Ext Det indicates the elevation of extended detention.

Table B-5: Stage-Storage-Outflow Curve for SWM Facility (Free Outfall Conditions)

			Quality Control Vertical Orifice		Quantity Control 1 Vertical Orifice		Quantity Control 2 Vertical Orifice		Emergency Overflow Broad Crested Weir			
			Dia (m)	0.110	Dia (m)	0.160	Dia (m)	0.240	L (m)	20.000		
			Area (m^2)	0.010	Area (m^2)	0.020	Area (m^2)	0.045				
			Invert (m)	110.70	Invert (m)	111.25	Invert (m)	111.75	C_w	1.58		
			C_o	0.62	C_o	0.62	C_o	0.62	Invert (m)	112.20		
			Q @ D	0.006	Q @ D	0.016	Q @ D	0.043	n contr.	2.000		
Elevation	Active Sto.	Demarkation	Depth	Outflow	Depth	Outflow	Depth	Outflow	Depth	Outflow	Outflow	Storage
(m)	(m^3)	Points	(m)	(m^3/s)	(m)	(m^3/s)	(m)	(m^3/s)	(m)	(m^3/s)	(m^3/s)	(ha·m)
110.70	0	PP Elev	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
110.80	109		0.100	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.011
110.90	223	QC Elev	0.200	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.022
111.00	343		0.300	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.034
111.10	468		0.400	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.047
111.20	599	Ext. Det.	0.500	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.017	0.060
111.30	736		0.600	0.019	0.050	0.005	0.000	0.000	0.000	0.000	0.024	0.074
111.40	879		0.700	0.021	0.150	0.015	0.000	0.000	0.000	0.000	0.036	0.088
111.50	1028		0.800	0.023	0.250	0.023	0.000	0.000	0.000	0.000	0.045	0.103
111.60	1183		0.900	0.024	0.350	0.029	0.000	0.000	0.000	0.000	0.053	0.118
111.70	1344		1.000	0.025	0.450	0.034	0.000	0.000	0.000	0.000	0.059	0.134
111.80	1511		1.100	0.027	0.550	0.038	0.050	0.009	0.000	0.000	0.074	0.151
111.90	1684		1.200	0.028	0.650	0.042	0.150	0.027	0.000	0.000	0.097	0.168
112.00	1864		1.300	0.029	0.750	0.045	0.250	0.045	0.000	0.000	0.119	0.186
112.10	2050		1.400	0.030	0.850	0.048	0.350	0.060	0.000	0.000	0.138	0.205
112.20	2242		1.500	0.031	0.950	0.052	0.450	0.071	0.000	0.000	0.154	0.224
112.30	2441		1.600	0.032	1.050	0.054	0.550	0.081	0.100	0.998	1.167	0.244
112.40	2647	Ovf Elev	1.700	0.033	1.150	0.057	0.650	0.090	0.200	2.821	3.002	0.265
112.50	2856	Top of Pond	1.800	0.034	1.250	0.060	0.750	0.099	0.300	5.177	5.370	0.286

Notes :
- PP Elev indicates the elevation of the permanent pool.
- QC Elev indicates the elevation of the storage volume required by MOE for quality control.
- Ext Det indicates the elevation of extended detention provided.
- Ovf Elev indicates the elevation of the overflow provided above the 100-year water level.
- Top of Berm indicates the elevation at the top of the berm.

CALCULATION SHEET B-1: FOREBAY SIZING FOR SWM FACILITY

Settling Criteria

From the SWMP Manual, the required length for settling is as follows:

$$Lmin = \left(\frac{rQp}{Vs}\right)^{0.5}$$

where:
- r = length to width ratio, at the invert of the inlet pipe.
- Q_p = peak outflow during design quality storm
- V_s = settling velocity

Input:

r =	1.67	(15 m / 9 m)
Q_p =	0.010 m^3/s	(at elevation 65.0m)
V_s =	0.0003 m/s	

L_{min} = 7.43 m

The peak flow rate from the pond during the quality storm is taken as the flow that would occur just below the quantity controls (Refer to Table B-5 of Appendix B)

Dispersion Criteria

From the SWMP Manual, the required length for dispersion is as follows:

$$Lmin = \frac{8Q}{dVf}$$

where:
- Q = Inlet flowrate (10-Year, 24-Hour SCS Storm)
- d = depth of permanent pool (forebay)
- V_f = desired final velocity

Input:

Q =	0.867 m^3/s
d =	2.55 m
Vf =	0.5 m/s

L_{min} = 5.44 m

The minimum forebay length is determined by the larger of the settling or dispersion criteria.

Minimum Length of Forebay Required	7.43 m	
Length of Forebay Provided	**15.00 m**	(at elevation 109.85m)

Average Forebay Velocity - 25mm Event

From the SWMP Manual, the maximum allowable average velocity is 0.15 m/s:

$$V_{avg} = \frac{Q}{d\ W_{avg}}$$

where:
- Q = Inlet flowrate (25mm, 4-Hour CHI Storm)
- d = depth of forebay during peak
- W_{avg} = average width of forebay

Input:

Q =	0.338 m^3/s	
d =	1.92 m	
W_{avg} =	9 m	(8 m bottom, 17 m permanent pool)

V = 0.02 m/s < 0.15 m/s

Average Forebay Velocity - 10 Year Event

From the SWMP Manual, the maximum allowable average velocity is 0.15 m/s:

$$V_{avg} = \frac{Q}{d\ W_{avg}}$$

where:
- Q = Inlet flowrate (10-Year, 24-Hour SCS Storm)
- d = depth of forebay during peak
- W_{avg} = average width of forebay

Input:

Q =	0.867 m^3/s	
d =	2.55 m	
W_{avg} =	9 m	(8 m bottom, 17 m permanent pool)

V = 0.04 m/s ≤ 0.15 m/s

```
20     Metric units
*#*****************************************************************************
*#  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
*#  Date        : 2023-05
*#  Modeller    : JB
*#  Company     : JFSA
*#  License #   :  2582634
*#*****************************************************************************
*#*****************************************************************************
*%  25mm, 3-Hour Chicago Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[001]
*                   ["25mmC3H.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
READ STORM          STORM_FILENAME=["storm.001"]
*%-----------------|-------------------------------------------------------------|
*==============================================================================
*Development Lands
CALIB STANDHYD      NHYD=["Post"], DT=[1](min), AREA=[4.710](ha), XIMP=[0.57],
TIMP=[0.67], DWF=[0.](cms),
                    LOSS=[1] Horton Equ: Fo=[76.2](mm/hr), Fc=[13.2](mm/hr),
                    DCAY=[4.14](/hr), F=[0.00](mm),
                    Pervious   areas: IAper=[4.67](mm), SLPP=[2.0](%), LGP=[40](m),
                    MNP=[0.25], SCP=[0](min),
                    Impervious areas: IAimp=[1.57](mm), SLPI=[0.5](%), LGI=[177](m),
                    MNI=[0.013], SCI=[0](min),
                    RAINFALL=[ ,  ,  -1](mm/hr)
*%-----------------|-------------------------------------------------------------|
ROUTE RESERVOIR     NHYDout=["SWM-Out"], NHYDin=["POST"], RDT=[1](min),
                         TABLE of ( OUTFLOW-STORAGE ) values
                                  (cms) - (ha-m)
                                   [ 0 , 0 ]
                                   [ 0.006 , 0.011 ]
                                   [ 0.01 , 0.022 ]
                                   [ 0.013 , 0.034 ]
                                   [ 0.015 , 0.047 ]
                                   [ 0.017 , 0.06 ]
                                   [ 0.024 , 0.074 ]
                                   [ 0.036 , 0.088 ]
                                   [ 0.045 , 0.103 ]
                                   [ 0.053 , 0.118 ]
                                   [ 0.059 , 0.134 ]
                                   [ 0.074 , 0.151 ]
                                   [ 0.097 , 0.168 ]
                                   [ 0.119 , 0.186 ]
                                   [ 0.138 , 0.205 ]
                                   [ 0.154 , 0.224 ]
                                   [ 1.167 , 0.244 ]
                                   [ 3.002 , 0.265 ]
                                   [ 5.37 , 0.286 ]
                                [   -1  ,  -1  ]  (maximum one hundred pairs of points)
                                NHYDovf=["SWM-Over"],
*%-----------------|-------------------------------------------------------------|
ADD HYD             NHYDsum=["Total"], NHYDs to add=["SWM-Out"+"SWM-Over"]
*%-----------------|-------------------------------------------------------------|
**% STORMS
*%-----------------|-------------------------------------------------------------|
*%  2-Year, 3-Hour Chicago Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[002]
                   ["002YC3H.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
*%  5-Year, 3-Hour Chicago Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[005]
                   ["005YC3H.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
*%  10-Year, 3-Hour Chicago Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[010]
                   ["010YC3H.stm"] <--storm filename, one per line for NSTORM time
```

```
*%-----------------|---------------------------------------------------------|
*%  25-Year, 3-Hour Chicago Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[025]
                   ["025YC3H.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|---------------------------------------------------------|
*%  50-Year, 3-Hour Chicago Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[050]
                   ["050YC3H.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|---------------------------------------------------------|
*%  100-Year, 3-Hour Chicago Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[099]
                   ["100YC3H.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|---------------------------------------------------------|
*%  2-Year, 24-Hour SCS Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[102]
                   ["SC24002x.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|---------------------------------------------------------|
*%  5-Year, 24-Hour SCS Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[105]
                   ["SC24005x.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|---------------------------------------------------------|
*%  10-Year, 24-Hour SCS Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[110]
                   ["SC24010x.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|---------------------------------------------------------|
*%  25-Year, 24-Hour SCS Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[125]
                   ["SC24025x.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|---------------------------------------------------------|
*%  50-Year, 24-Hour SCS Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[150]
                   ["SC24050x.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|---------------------------------------------------------|
*%  100-Year, 24-Hour SCS Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[199]
                   ["SC24100x.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|---------------------------------------------------------|
FINISH
```

```
00001>  ================================================================================
00002>
00003>  SSSSS   W   W   M   M   H   H   Y   Y   M   M    OOO          222    000    11   5555   =========
00004>  S       W W W   MM MM   H   H    Y Y    MM MM   O   O        2   2  0   0  111  5       
00005>  SSSSS   W W W   M M M   HHHHH     Y     M M M   O   O          2    0   0   11  5       Ver 5.500
00006>      S   W W     M   M   H   H     Y     M   M   O   O      222    0   0   11  555     FEB  2015
00007>  SSSSS    W W     M   M   H   H     Y     M   M    OOO      2      0   0  111    5    =========
00008>                                                            2      0   0   11    5    # 2549237
00009>         StormWater Management HYdrologic Model              222    000   11  555    =========
00010>
00011>  ***************************************************************************************
00012>  ********************************************  SWMHYMO Ver 5.500  ********************
00013>  ********************  A single event and continuous hydrologic simulation model  ********
00014>  ********************     based on the principles of HYMO and its successors      ********
00015>  ********************                OTTHYMO-83 and OTTHYMO-89.                   ********
00016>  ***************************************************************************************
00017>  ********************* Distributed by:  J.F. Sabourin and Associates Inc.          ********
00018>  ********************                  Ottawa,  Ontario: (613) 836-3884           ********
00019>  ********************                  Gatineau, Quebec: (819) 243-6858           ********
00020>  ********************                  E-Mail: swmhymo@jfsa.com                   ********
00021>  ***************************************************************************************
00022>
00023>  ***************************************************************************************
00024>  ********************* Licensed user: JFSAinc.                     ********************
00025>  ********************               Ottawa              SERIAL#:2549237          ********
00026>  ***************************************************************************************
00027>
00028>  ********************                                                       ********
00029>  ********************           ****** PROGRAM ARRAY DIMENSIONS ******       ********
00030>  ********************          Maximum value for ID numbers  :    11         ********
00031>  ********************          Max. number of rainfall points: 105408        ********
00032>  ********************          Max. number of flow points   : 105408        ********
00033>  ***************************************************************************************
00034>
00035>
00036>  ********************************  S U M M A R Y   O U T P U T  ********************************
00037>  ***************************************************************************************
00038>  *                    RUN DATE: 2023-06-28     TIME: 15:10:22     RUN COUNTER: 004941     *
00039>  ***************************************************************************************
00040>  * Input   file: C:\Temp\2468\20230511-Post Dev\HOG_v01.2-PRO.dat                        *
00041>  * Output  file: C:\Temp\2468\20230511-Post Dev\HOG_v01.2-PRO.out                        *
00042>  * Summary file: C:\Temp\2468\20230511-Post Dev\HOG_v01.2-PRO.sum                        *
00043>  * User comments:                                                                       *
00044>  * 1:_____________________________________________________________________________     *
00045>  * 2:_____________________________________________________________________________     *
00046>  * 3:_____________________________________________________________________________     *
00047>  ***************************************************************************************
00048>
00049>
00050> #*************************************************************************
00051> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00052> #  Date        : 2023-05
00053> #  Modeller    : JB
00054> #  Company     : JFSA
00055> #  License #   :  2582634
00056> #*************************************************************************
00057> #*************************************************************************
00058>  RUN#:COMMAND#
00059> R0001:C00001-------------------------------------------------------------------------
00060>      START
00061>        [TZERO =    .00 hrs on       0]
00062>        [METOUT=   2   (1=imperial, 2=metric output)]
00063>        [NSTORM=   1 ]
00064>        [NRUN  = 0001 ]
00065> R0001:C00002-------------------------------------------------------------------------
00066>      READ STORM
00067>        Filename = storm.001
00068>        Comment  = CHICAGO STORM 25mm Event, 3 Hours
00069>        [SDT=10.00:SDUR=   3.00:PTOT=  25.44]
00070> R0001:C00003-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00071>     CALIB STANDHYD         1.0 01:Post          4.71     .338 No_date    1:02   14.63 .575     .000
00072>        [XIMP=.57:TIMP=.67]
00073>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00074>        [Pervious    area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00075>        [Impervious  area: IAimp= 1.57:SLPI= .50:LGI= 177.:MNI=.013:SCI=   .0]
00076> R0001:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00077>     ROUTE RESERVOIR ->     1.0 02:POST          4.71     .338 No_date    1:02   14.63  n/a     .000
00078>                out <=     1.0 01:SWM-Out       4.71     .016 No_date    3:01   14.63  n/a     .000
00079>          overflow <=      1.0 03:SWM-Over       .00     .000 No_date    0:00    .00  n/a     .000
00080>      {MxStoUsed=.5663E-01  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00081> R0001:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00082>     ADD HYD                1.0 02:SWM-Out       4.71     .016 No_date    3:01   14.63  n/a     .000
00083>                      +     1.0 02:SWM-Over       .00     .000 No_date    0:00    .00  n/a     .000
00084>                    SUM=    1.0 01:Total         4.71     .016 No_date    3:01   14.63  n/a     .000
00085>   ** END OF RUN :    1
00086>
00087> ***************************************************************************************
00088>
00089>
00090>
00091>
00092>
00093>  RUN#:COMMAND#
00094> R0002:C00001-------------------------------------------------------------------------
00095>      START
00096>        [TZERO =    .00 hrs on       0]
00097>        [METOUT=   2   (1=imperial, 2=metric output)]
00098>        [NSTORM=   1 ]
00099>        [NRUN  = 0002 ]
00100> #*************************************************************************
00101> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00102> #  Date        : 2023-05
00103> #  Modeller    : JB
00104> #  Company     : JFSA
00105> #  License #   :  2582634
00106> #*************************************************************************
00107> #*************************************************************************
00108> R0002:C00002-------------------------------------------------------------------------
00109>      READ STORM
00110>        Filename = storm.001
00111>        Comment  = CHICAGO STORM 2 Year, 3 Hours
00112>        [SDT=10.00:SDUR=   3.00:PTOT=  31.05]
00113> R0002:C00003-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00114>     CALIB STANDHYD         1.0 01:Post          4.71     .443 No_date    1:01   18.93 .609     .000
00115>        [XIMP=.57:TIMP=.67]
00116>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00117>        [Pervious    area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00118>        [Impervious  area: IAimp= 1.57:SLPI= .50:LGI= 177.:MNI=.013:SCI=   .0]
00119> R0002:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00120>     ROUTE RESERVOIR ->     1.0 02:POST          4.71     .443 No_date    1:01   18.93  n/a     .000
00121>                out <=     1.0 01:SWM-Out       4.71     .023 No_date    2:43   18.93  n/a     .000
00122>          overflow <=      1.0 03:SWM-Over       .00     .000 No_date    0:00    .00  n/a     .000
00123>      {MxStoUsed=.7292E-01  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00124> R0002:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00125>     ADD HYD                1.0 02:SWM-Out       4.71     .023 No_date    2:43   18.93  n/a     .000
00126>                      +     1.0 02:SWM-Over       .00     .000 No_date    0:00    .00  n/a     .000
00127>                    SUM=    1.0 01:Total         4.71     .023 No_date    2:43   18.93  n/a     .000
00128>   ** END OF RUN :    4
00129>
00130> ***************************************************************************************
00131>
00132>
00133>
00134>
00135>
00136>  RUN#:COMMAND#
00137> R0005:C00001-------------------------------------------------------------------------
00138>      START
00139>        [TZERO =    .00 hrs on       0]
00140>        [METOUT=   2   (1=imperial, 2=metric output)]
00141>        [NSTORM=   1 ]
00142>        [NRUN  = 0005 ]
00143> #*************************************************************************
00144> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00145> #  Date        : 2023-05
00146> #  Modeller    : JB
00147> #  Company     : JFSA
00148> #  License #   :  2582634
00149> #*************************************************************************
00150> #*************************************************************************
00151> R0005:C00002-------------------------------------------------------------------------
00152>      READ STORM
00153>        Filename = storm.001
00154>        Comment  = CHICAGO STORM 5 Year, 3 Hours
00155>        [SDT=10.00:SDUR=   3.00:PTOT=  40.07]
00156> R0005:C00003-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00157>     CALIB STANDHYD         1.0 01:Post          4.71     .629 No_date    1:02   26.31 .657     .000
00158>        [XIMP=.57:TIMP=.67]
00159>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00160>        [Pervious    area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00161>        [Impervious  area: IAimp= 1.57:SLPI= .50:LGI= 177.:MNI=.013:SCI=   .0]
00162> R0005:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00163>     ROUTE RESERVOIR ->     1.0 02:POST          4.71     .629 No_date    1:02   26.31  n/a     .000
00164>                out <=     1.0 01:SWM-Out       4.71     .042 No_date    2:13   26.31  n/a     .000
00165>          overflow <=      1.0 03:SWM-Over       .00     .000 No_date    0:00    .00  n/a     .000
00166>      {MxStoUsed=.9797E-01  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00167> R0005:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00168>     ADD HYD                1.0 02:SWM-Out       4.71     .042 No_date    2:13   26.31  n/a     .000
00169>                      +     1.0 02:SWM-Over       .00     .000 No_date    0:00    .00  n/a     .000
00170>                    SUM=    1.0 01:Total         4.71     .042 No_date    2:13   26.31  n/a     .000
00171>   ** END OF RUN :    9
00172>
00173> ***************************************************************************************
00174>
00175>
00176>
00177>
00178>
00179>  RUN#:COMMAND#
00180> R0010:C00001-------------------------------------------------------------------------
00181>      START
00182>        [TZERO =    .00 hrs on       0]
00183>        [METOUT=   2   (1=imperial, 2=metric output)]
00184>        [NSTORM=   1 ]
00185>        [NRUN  = 0010 ]
00186> #*************************************************************************
00187> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00188> #  Date        : 2023-05
00189> #  Modeller    : JB
00190> #  Company     : JFSA
00191> #  License #   :  2582634
00192> #*************************************************************************
00193> #*************************************************************************
00194> R0010:C00002-------------------------------------------------------------------------
00195>      READ STORM
00196>        Filename = storm.001
00197>        Comment  = CHICAGO STORM 10 Year, 3 Hours
00198>        [SDT=10.00:SDUR=   3.00:PTOT=  46.11]
00199> R0010:C00003-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00200>     CALIB STANDHYD         1.0 01:Post          4.71     .777 No_date    1:01   31.57 .685     .000
00201>        [XIMP=.57:TIMP=.67]
00202>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00203>        [Pervious    area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00204>        [Impervious  area: IAimp= 1.57:SLPI= .50:LGI= 177.:MNI=.013:SCI=   .0]
00205> R0010:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00206>     ROUTE RESERVOIR ->     1.0 02:POST          4.71     .777 No_date    1:01   31.57  n/a     .000
00207>                out <=     1.0 01:SWM-Out       4.71     .052 No_date    2:05   31.57  n/a     .000
00208>          overflow <=      1.0 03:SWM-Over       .00     .000 No_date    0:00    .00  n/a     .000
00209>      {MxStoUsed=.1169E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00210> R0010:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00211>     ADD HYD                1.0 02:SWM-Out       4.71     .052 No_date    2:05   31.57  n/a     .000
00212>                      +     1.0 02:SWM-Over       .00     .000 No_date    0:00    .00  n/a     .000
00213>                    SUM=    1.0 01:Total         4.71     .052 No_date    2:05   31.57  n/a     .000
00214>   ** END OF RUN :   24
00215>
00216> ***************************************************************************************
00217>
00218>
00219>
00220>
00221>
00222>  RUN#:COMMAND#
00223> R0025:C00001-------------------------------------------------------------------------
00224>      START
00225>        [TZERO =    .00 hrs on       0]
00226>        [METOUT=   2   (1=imperial, 2=metric output)]
00227>        [NSTORM=   1 ]
00228>        [NRUN  = 0025 ]
00229> #*************************************************************************
00230> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00231> #  Date        : 2023-05
00232> #  Modeller    : JB
00233> #  Company     : JFSA
00234> #  License #   :  2582634
00235> #*************************************************************************
00236> #*************************************************************************
00237> R0025:C00002-------------------------------------------------------------------------
00238>      READ STORM
00239>        Filename = storm.001
00240>        Comment  = CHICAGO STORM 25 Year, 3 Hours
00241>        [SDT=10.00:SDUR=   3.00:PTOT=  53.24]
00242> R0025:C00003-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00243>     CALIB STANDHYD         1.0 01:Post          4.71     .960 No_date    1:01   37.80 .710     .000
00244>        [XIMP=.57:TIMP=.67]
00245>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00246>        [Pervious    area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00247>        [Impervious  area: IAimp= 1.57:SLPI= .50:LGI= 177.:MNI=.013:SCI=   .0]
00248> R0025:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00249>     ROUTE RESERVOIR ->     1.0 02:POST          4.71     .960 No_date    1:01   37.80  n/a     .000
00250>                out <=     1.0 01:SWM-Out       4.71     .064 No_date    2:03   37.80  n/a     .000
00251>          overflow <=      1.0 03:SWM-Over       .00     .000 No_date    0:00    .00  n/a     .000
00252>      {MxStoUsed=.1399E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00253> R0025:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00254>     ADD HYD                1.0 02:SWM-Out       4.71     .064 No_date    2:03   37.80  n/a     .000
00255>                      +     1.0 02:SWM-Over       .00     .000 No_date    0:00    .00  n/a     .000
00256>                    SUM=    1.0 01:Total         4.71     .064 No_date    2:03   37.80  n/a     .000
00257>   ** END OF RUN :   49
00258>
00259> ***************************************************************************************
00260>
00261>
00262>
00263>
00264>
00265>  RUN#:COMMAND#
00266> R0050:C00001-------------------------------------------------------------------------
00267>      START
00268>        [TZERO =    .00 hrs on       0]
00269>        [METOUT=   2   (1=imperial, 2=metric output)]
00270>        [NSTORM=   1 ]
00271>        [NRUN  = 0050 ]
00272> #*************************************************************************
00273> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00274> #  Date        : 2023-05
00275> #  Modeller    : JB
00276> #  Company     : JFSA
00277> #  License #   :  2582634
00278> #*************************************************************************
00279> #*************************************************************************
00280> R0050:C00002-------------------------------------------------------------------------
00281>      READ STORM
00282>        Filename = storm.001
00283>        Comment  = CHICAGO STORM 50 Year, 3 Hours
00284>        [SDT=10.00:SDUR=   3.00:PTOT=  58.95]
00285> R0050:C00003-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00286>     CALIB STANDHYD         1.0 01:Post          4.71    1.117 No_date    1:01   43.03 .730     .000
00287>        [XIMP=.57:TIMP=.67]
00288>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00289>        [Pervious    area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00290>        [Impervious  area: IAimp= 1.57:SLPI= .50:LGI= 177.:MNI=.013:SCI=   .0]
00291> R0050:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00292>     ROUTE RESERVOIR ->     1.0 02:POST          4.71    1.117 No_date    1:01   43.03  n/a     .000
00293>                out <=     1.0 01:SWM-Out       4.71     .083 No_date    1:55   43.03  n/a     .000
00294>          overflow <=      1.0 03:SWM-Over       .00     .000 No_date    0:00    .00  n/a     .000
00295>      {MxStoUsed=.1577E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00296> R0050:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00297>     ADD HYD                1.0 02:SWM-Out       4.71     .083 No_date    1:55   43.03  n/a     .000
00298>                      +     1.0 02:SWM-Over       .00     .000 No_date    0:00    .00  n/a     .000
00299>                    SUM=    1.0 01:Total         4.71     .083 No_date    1:55   43.03  n/a     .000
00300>   ** END OF RUN :   98
00301>
00302> ***************************************************************************************
00303>
00304>
00305>
00306>
00307>
00308>  RUN#:COMMAND#
00309> R0099:C00001-------------------------------------------------------------------------
00310>      START
00311>        [TZERO =    .00 hrs on       0]
00312>        [METOUT=   2   (1=imperial, 2=metric output)]
00313>        [NSTORM=   1 ]
00314>        [NRUN  = 0099 ]
00315> #*************************************************************************
00316> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00317> #  Date        : 2023-05
00318> #  Modeller    : JB
00319> #  Company     : JFSA
00320> #  License #   :  2582634
00321> #*************************************************************************
00322> #*************************************************************************
00323> R0099:C00002-------------------------------------------------------------------------
00324>      READ STORM
00325>        Filename = storm.001
00326>        Comment  = CHICAGO STORM 100 Year, 3 Hours
00327>        [SDT=10.00:SDUR=   3.00:PTOT=  64.54]
00328> R0099:C00003-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00329>     CALIB STANDHYD         1.0 01:Post          4.71    1.250 No_date    1:01   48.10 .745     .000
00330>        [XIMP=.57:TIMP=.67]
00331>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00332>        [Pervious    area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00333>        [Impervious  area: IAimp= 1.57:SLPI= .50:LGI= 177.:MNI=.013:SCI=   .0]
00334> R0099:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00335>     ROUTE RESERVOIR ->     1.0 02:POST          4.71    1.250 No_date    1:01   48.10  n/a     .000
00336>                out <=     1.0 01:SWM-Out       4.71     .104 No_date    1:53   48.10  n/a     .000
00337>          overflow <=      1.0 03:SWM-Over       .00     .000 No_date    0:00    .00  n/a     .000
00338>      {MxStoUsed=.173BE+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00339> R0099:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00340>     ADD HYD                1.0 02:SWM-Out       4.71     .104 No_date    1:53   48.10  n/a     .000
00341>                      +     1.0 02:SWM-Over       .00     .000 No_date    0:00    .00  n/a     .000
00342>                    SUM=    1.0 01:Total         4.71     .104 No_date    1:53   48.10  n/a     .000
00343>   ** END OF RUN :  101
00344>
00345> ***************************************************************************************
00346>
00347>
00348>
00349>
00350>
00351>  RUN#:COMMAND#
00352> R0102:C00001-------------------------------------------------------------------------
00353>      START
00354>        [TZERO =    .00 hrs on       0]
00355>        [METOUT=   2   (1=imperial, 2=metric output)]
00356>        [NSTORM=   1 ]
00357>        [NRUN  = 0102 ]
00358> #*************************************************************************
00359> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00360> #  Date        : 2023-05
```

```
00361> #  Modeller    : JB
00362> #  Company     : JFSA
00363> #  License #   :  2582634
00364> #*******************************************************************************
00365> #*******************************************************************************
00366> R0102:C00002----------------------------------------------------------------------------------
00367>       READ STORM
00368>        Filename = storm.001
00369>        Comment  = 2 years SCS Type 2 Storm 24 Hours step 10 min, Belleville
00370>        [SDT=10.00:SDUR=  24.00:PTOT=  50.77]
00371> R0102:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00372>      CALIB STANDHYD         1.0 01:Post           4.71      .523 No_date   12:01   33.26 .655     .000
00373>        [XIMP=.57:TIMP=.67]
00374>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00375>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00376>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 177.:MNI=.013:SCI=   .0]
00377> R0102:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00378>      ROUTE RESERVOIR ->     1.0 02:POST           4.71      .523 No_date   12:01   33.26  n/a     .000
00379>                  out <=     1.0 01:SWM-Out        4.71      .041 No_date   12:47   33.26  n/a     .000
00380>             overflow <=     1.0 03:SWM-Over        .00      .000 No_date    0:00     .00  n/a     .000
00381>      {MxStoUsed=.9714E-01  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00382> R0102:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00383>      ADD HYD                1.0 02:SWM-Out        4.71      .041 No_date   12:47   33.26  n/a     .000
00384>                       +     1.0 02:SWM-Over        .00      .000 No_date    0:00     .00  n/a     .000
00385>                     SUM=    1.0 01:Total          4.71      .041 No_date   12:47   33.26  n/a     .000
00386>   ** END OF RUN :  104
00387>
00388> ***********************************************************************************************
00389>
00390>
00391>
00392>
00393>
00394>  RUN#:COMMAND#
00395> R0105:C00001----------------------------------------------------------------------------------
00396>       START
00397>        [TZERO =    .00 hrs on        0]
00398>        [METOUT=   2    (1=imperial, 2=metric output)]
00399>        [NSTORM=   1 ]
00400>        [NRUN  = 0105 ]
00401> #*******************************************************************************
00402> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00403> #  Date        : 2023-05
00404> #  Modeller    : JB
00405> #  Company     : JFSA
00406> #  License #   :  2582634
00407> #*******************************************************************************
00408> #*******************************************************************************
00409> R0105:C00002----------------------------------------------------------------------------------
00410>       READ STORM
00411>        Filename = storm.001
00412>        Comment  = 5 years SCS Type 2 Storm 24 Hours step 10 min, Belleville
00413>        [SDT=10.00:SDUR=  24.00:PTOT=  65.00]
00414> R0105:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00415>      CALIB STANDHYD         1.0 01:Post           4.71      .724 No_date   12:01   44.02 .677     .000
00416>        [XIMP=.57:TIMP=.67]
00417>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00418>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00419>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 177.:MNI=.013:SCI=   .0]
00420> R0105:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00421>      ROUTE RESERVOIR ->     1.0 02:POST           4.71      .724 No_date   12:01   44.02  n/a     .000
00422>                  out <=     1.0 01:SWM-Out        4.71      .057 No_date   12:42   44.02  n/a     .000
00423>             overflow <=     1.0 03:SWM-Over        .00      .000 No_date    0:00     .00  n/a     .000
00424>      {MxStoUsed=.1293E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00425> R0105:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00426>      ADD HYD                1.0 02:SWM-Out        4.71      .057 No_date   12:42   44.02  n/a     .000
00427>                       +     1.0 02:SWM-Over        .00      .000 No_date    0:00     .00  n/a     .000
00428>                     SUM=    1.0 01:Total          4.71      .057 No_date   12:42   44.02  n/a     .000
00429>   ** END OF RUN :  109
00430>
00431> ***********************************************************************************************
00432>
00433>
00434>
00435>
00436>
00437>  RUN#:COMMAND#
00438> R0110:C00001----------------------------------------------------------------------------------
00439>       START
00440>        [TZERO =    .00 hrs on        0]
00441>        [METOUT=   2    (1=imperial, 2=metric output)]
00442>        [NSTORM=   1 ]
00443>        [NRUN  = 0110 ]
00444> #*******************************************************************************
00445> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00446> #  Date        : 2023-05
00447> #  Modeller    : JB
00448> #  Company     : JFSA
00449> #  License #   :  2582634
00450> #*******************************************************************************
00451> #*******************************************************************************
00452> R0110:C00002----------------------------------------------------------------------------------
00453>       READ STORM
00454>        Filename = storm.001
00455>        Comment  = 10 years SCS Type 2 Storm 24 Hours step 10 min, Belleville
00456>        [SDT=10.00:SDUR=  24.00:PTOT=  74.47]
00457> R0110:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00458>      CALIB STANDHYD         1.0 01:Post           4.71      .867 No_date   12:01   51.38 .690     .000
00459>        [XIMP=.57:TIMP=.67]
00460>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00461>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00462>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 177.:MNI=.013:SCI=   .0]
00463> R0110:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00464>      ROUTE RESERVOIR ->     1.0 02:POST           4.71      .867 No_date   12:01   51.38  n/a     .000
00465>                  out <=     1.0 01:SWM-Out        4.71      .074 No_date   12:39   51.38  n/a     .000
00466>             overflow <=     1.0 03:SWM-Over        .00      .000 No_date    0:00     .00  n/a     .000
00467>      {MxStoUsed=.1513E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00468> R0110:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00469>      ADD HYD                1.0 02:SWM-Out        4.71      .074 No_date   12:39   51.38  n/a     .000
00470>                       +     1.0 02:SWM-Over        .00      .000 No_date    0:00     .00  n/a     .000
00471>                     SUM=    1.0 01:Total          4.71      .074 No_date   12:39   51.38  n/a     .000
00472>   ** END OF RUN :  124
00473>
00474> ***********************************************************************************************
00475>
00476>
00477>
00478>
00479>
00480>  RUN#:COMMAND#
00481> R0125:C00001----------------------------------------------------------------------------------
00482>       START
00483>        [TZERO =    .00 hrs on        0]
00484>        [METOUT=   2    (1=imperial, 2=metric output)]
00485>        [NSTORM=   1 ]
00486>        [NRUN  = 0125 ]
00487> #*******************************************************************************
00488> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00489> #  Date        : 2023-05
00490> #  Modeller    : JB
00491> #  Company     : JFSA
00492> #  License #   :  2582634
00493> #*******************************************************************************
00494> #*******************************************************************************
00495> R0125:C00002----------------------------------------------------------------------------------
00496>       READ STORM
00497>        Filename = storm.001
00498>        Comment  = 25 years SCS Type 2 Storm 24 Hours step 10 min, Belleville
00499>        [SDT=10.00:SDUR=  24.00:PTOT=  86.41]
00500> R0125:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00501>      CALIB STANDHYD         1.0 01:Post           4.71     1.046 No_date   12:01   60.68 .702     .000
00502>        [XIMP=.57:TIMP=.67]
00503>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00504>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00505>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 177.:MNI=.013:SCI=   .0]
00506> R0125:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00507>      ROUTE RESERVOIR ->     1.0 02:POST           4.71     1.046 No_date   12:01   60.68  n/a     .000
00508>                  out <=     1.0 01:SWM-Out        4.71      .108 No_date   12:35   60.68  n/a     .000
00509>             overflow <=     1.0 03:SWM-Over        .00      .000 No_date    0:00     .00  n/a     .000
00510>      {MxStoUsed=.1766E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00511> R0125:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00512>      ADD HYD                1.0 02:SWM-Out        4.71      .108 No_date   12:35   60.68  n/a     .000
00513>                       +     1.0 02:SWM-Over        .00      .000 No_date    0:00     .00  n/a     .000
00514>                     SUM=    1.0 01:Total          4.71      .108 No_date   12:35   60.68  n/a     .000
00515>   ** END OF RUN :  149
00516>
00517> ***********************************************************************************************
00518>
00519>
00520>
00521>
00522>
00523>  RUN#:COMMAND#
00524> R0150:C00001----------------------------------------------------------------------------------
00525>       START
00526>        [TZERO =    .00 hrs on        0]
00527>        [METOUT=   2    (1=imperial, 2=metric output)]
00528>        [NSTORM=   1 ]
00529>        [NRUN  = 0150 ]
00530> #*******************************************************************************
00531> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00532> #  Date        : 2023-05
00533> #  Modeller    : JB
00534> #  Company     : JFSA
00535> #  License #   :  2582634
00536> #*******************************************************************************
00537> #*******************************************************************************
00538> R0150:C00002----------------------------------------------------------------------------------
00539>       READ STORM
00540>        Filename = storm.001
00541>        Comment  = 50 years SCS Type 2 Storm 24 Hours step 10 min, Belleville
00542>        [SDT=10.00:SDUR=  24.00:PTOT=  95.19]
00543> R0150:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00544>      CALIB STANDHYD         1.0 01:Post           4.71     1.186 No_date   12:00   67.45 .709     .000
00545>        [XIMP=.57:TIMP=.67]
00546>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00547>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00548>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 177.:MNI=.013:SCI=   .0]
00549> R0150:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00550>      ROUTE RESERVOIR ->     1.0 02:POST           4.71     1.186 No_date   12:00   67.45  n/a     .000
00551>                  out <=     1.0 01:SWM-Out        4.71      .128 No_date   12:34   67.45  n/a     .000
00552>             overflow <=     1.0 03:SWM-Over        .00      .000 No_date    0:00     .00  n/a     .000
00553>      {MxStoUsed=.1951E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00554> R0150:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00555>      ADD HYD                1.0 02:SWM-Out        4.71      .128 No_date   12:34   67.45  n/a     .000
00556>                       +     1.0 02:SWM-Over        .00      .000 No_date    0:00     .00  n/a     .000
00557>                     SUM=    1.0 01:Total          4.71      .128 No_date   12:34   67.45  n/a     .000
00558>   ** END OF RUN :  198
00559>
00560> ***********************************************************************************************
00561>
00562>
00563>
00564>
00565>
00566>  RUN#:COMMAND#
00567> R0199:C00001----------------------------------------------------------------------------------
00568>       START
00569>        [TZERO =    .00 hrs on        0]
00570>        [METOUT=   2    (1=imperial, 2=metric output)]
00571>        [NSTORM=   1 ]
00572>        [NRUN  = 0199 ]
00573> #*******************************************************************************
00574> #  Project Name: [P2468-JB Hogan Property - Bellville]    Project Number: [2468]
00575> #  Date        : 2023-05
00576> #  Modeller    : JB
00577> #  Company     : JFSA
00578> #  License #   :  2582634
00579> #*******************************************************************************
00580> #*******************************************************************************
00581> R0199:C00002----------------------------------------------------------------------------------
00582>       READ STORM
00583>        Filename = storm.001
00584>        Comment  = 100 years SCS Type 2 Storm 24 Hours step 10 min, Belleville
00585>        [SDT=10.00:SDUR=  24.00:PTOT= 103.98]
00586> R0199:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00587>      CALIB STANDHYD         1.0 01:Post           4.71     1.312 No_date   12:00   74.21 .714     .000
00588>        [XIMP=.57:TIMP=.67]
00589>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00590>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00591>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 177.:MNI=.013:SCI=   .0]
00592> R0199:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00593>      ROUTE RESERVOIR ->     1.0 02:POST           4.71     1.312 No_date   12:00   74.21  n/a     .000
00594>                  out <=     1.0 01:SWM-Out        4.71      .146 No_date   12:34   74.21  n/a     .000
00595>             overflow <=     1.0 03:SWM-Over        .00      .000 No_date    0:00     .00  n/a     .000
00596>      {MxStoUsed=.2140E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00597> R0199:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00598>      ADD HYD                1.0 02:SWM-Out        4.71      .146 No_date   12:34   74.21  n/a     .000
00599>                       +     1.0 02:SWM-Over        .00      .000 No_date    0:00     .00  n/a     .000
00600>                     SUM=    1.0 01:Total          4.71      .146 No_date   12:34   74.21  n/a     .000
00601> R0199:C00002----------------------------------------------------------------------------------
00602>      FINISH
00603> ***********************************************************************************************
00604> ***********************************************************************************************
00605>      WARNINGS / ERRORS / NOTES
00606>      -------------------------
00607>    Simulation ended on 2023-06-28     at 15:10:26
00608> ===============================================================================================
00609>
```