C.C. Tatham & Associates Ltd.
Consulting Engineers

BURL'S CREEK EVENT GROUNDS

Township of Oro Medonte

Functional Servicing & Preliminary Stormwater Management Report

Final Report

prepared by:

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prepared for

Burl's Creek Event Grounds

June 2015
(Revised December 10, 2015)

CCTA File 115032-02

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1 Introduction

C. C. Tatham & Associates Ltd. (CCTA) has been retained by Burl's Creek Event Grounds to prepare a Functional Servicing and Preliminary Stormwater Management (SWM) Report in support of pending Official Plan Amendment (OPA) and Zoning Bylaw Amendment (ZBA) applications for their property located in the Township of Oro- Medonte.

1.1 Site Description

The site consists of 228.7 ha of land in the Township of Oro-Medonte. The original Burl's Creek property consists of 41.8 ha of land located east of Line 8 South. Additional lands east and west of the original property have recently been purchased by Burl's Creek. The site is bisected by Burl's Creek which flows in a southerly direction and eventually outlets to Lake Simcoe. The site is bounded by Highway 11 to the north, Line 9 South to the east, Line 7 South to the west, farmer's fields to the south with Line 8 South bisecting the property. Access to the site is provided via numerous field entrances off of Lines 7, 8 and 9 South. The property is legally described as Concession 8, Lot 21 and 22 as well as Concession 9, Lot 22 and 23 (Geographic Township of Medonte) Township of Oro-Medonte.

A Key Plan illustrating the site location is included overleaf.

1.2 Objectives

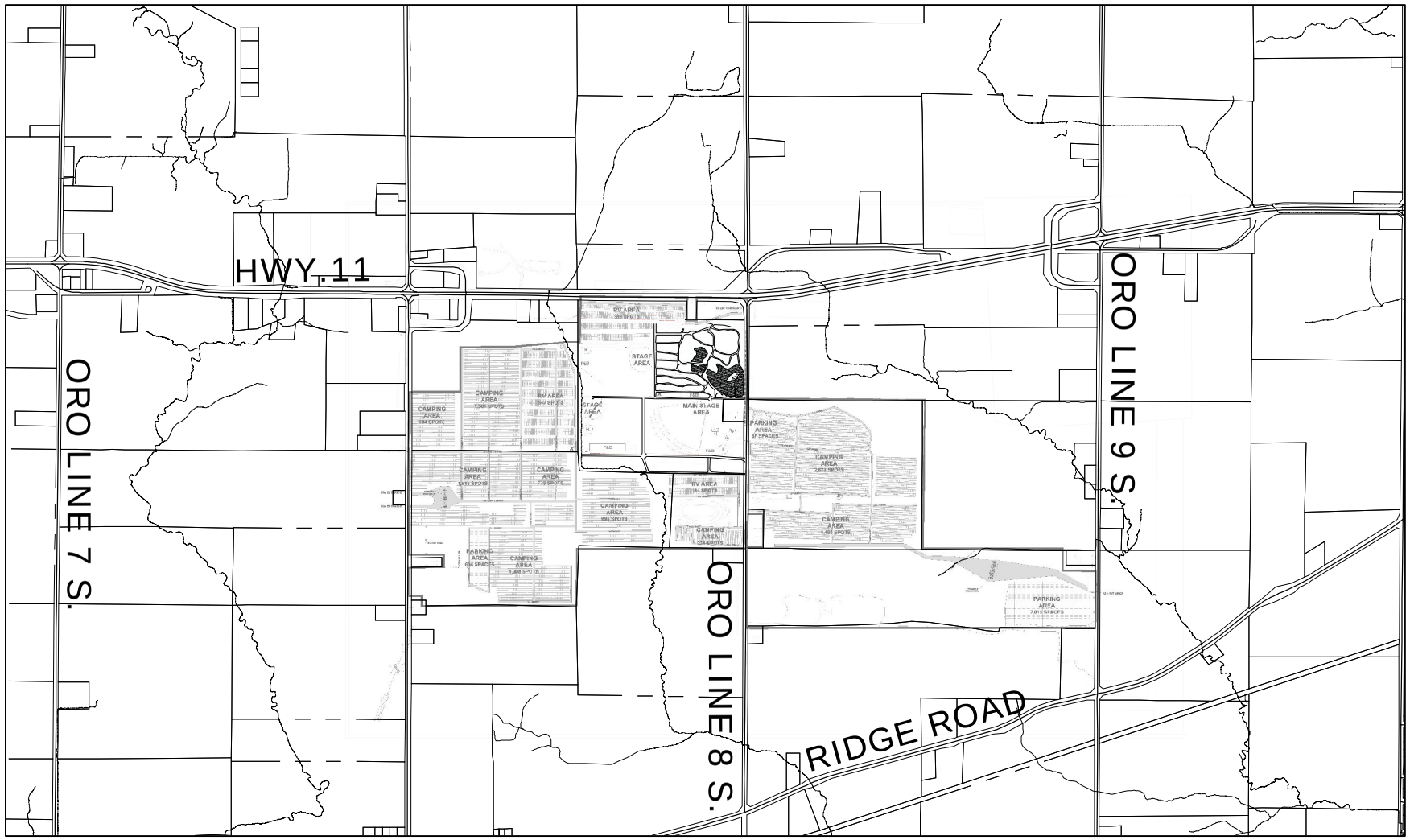
The primary objective of this report is to assess the feasibility of the proposed development with respect to servicing and stormwater management (SWM) and to ensure satisfactory information on these items is presented in support of pending OPA and ZBA applications. This will involve an evaluation of existing and future site conditions. Opportunities and constraints will be evaluated and a preferred SWM plan recommended. The plan will also have regard for the recent grading activity that has been completed on-site and provide recommendations in this regard to ensure compliance with this SWM plan.

1.3 Guidelines & Background Reports

This report was prepared recognizing provincial guidelines on water resources and the environment, including the following publications:

- Ministry of Environment (MOE) Stormwater Management Practices Planning and Design Manual (2003);
- Ministry of Natural Resources (MNR) Natural Hazards Training Manual: Provincial Policy Statement, Public Health and Safety Policies 3.1 (1997);

- Lake Simcoe Regional Conservation Authority (LSRCA) Technical Guidelines for Stormwater Management Submissions (April 26, 2013); and
- MOE Lake Simcoe Protection Plan (LSPP) (2009).



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Consulting Engineers
Collingwood Bracebridge Orillia Barrie

BURL'S CREEK EVENT GROUNDS

KEY PLAN

SCALE: NTS	DATE: MAY 2015	DWG. No. FIG–1

2 Existing Drainage Conditions

2.1 Background Information

Information regarding the existing topography, ground cover and drainage patterns was obtained through a review of relevant background studies, available plans and base mapping and was confirmed with topographic survey of selected features and field review.

2.2 Existing Conditions

Topographic information obtained indicates that part of the site slopes gently towards Burl's Creek, which traverses the site. The remaining site area slopes towards Allingham Creek located east of the site. Catchment 101 accounts for the majority of the site between Line 7 and 8 South and drains directly into Burl's Creek which bisects the catchment. A small portion of area south of Catchment 101 (Catchment 104) drains overland as sheet flow onto the neighbouring property and ultimately into a tributary to Burl's Creek and then to Burl's Creek just upstream of Line 8 South. Along the west edge of the property, Line 7 South has minor roadside ditches that collect stormwater from the road and convey it south towards Lake Simcoe. The subject property contributes little to no drainage to the Line 7 South roadside ditch.

The northeast corner of the site, west of Line 8 South (Catchment 106), drains east to a system of on-site ponds that collects water and outlets intermittently to the Line 8 roadside ditch. We note that these ponds have been identified by LSRCA as a wetland. The ditch then flows west under Line 8 South through a 1.25 m x 1.65 m corrugated steel pipe arch culvert. Runoff from Catchment 106 combines with Catchment 102 east of Line 8 where it drains overland towards Allingham Creek. The remaining portion of the site between Line 8 and 9 South (Catchments 103 and 105) flow overland towards the Line 9 roadside ditch, through a cross culvert across Line 9 South and then to Allingham Creek. Drainage from Line 8 is collected in roadside ditches with the northern portion draining north towards the Line 8 wetland outlet location and then to Allingham Creek and the southern portion draining south and discharging to Burl's Creek. The subject site does not contribute drainage to the Highway 11 drainage system. Existing drainage patterns as described above are depicted on the appended Drawing ODP-1.

215.27 ha of external drainage from north of Highway 11 (Catchment 301) flows into Burl's Creek and is conveyed under Highway 11 through a culvert and through the subject site.

Soil mapping shows the site soils to be predominantly Vasey sandy loam, which is characterized by good drainage. Smaller areas of Sargeant gravelly sand loam, which has excellent drainage properties, are also present. The area of the existing ponds is identified as Allston sandy loam.

Table 1: Summary of Existing Condition Peak Flow Rates

Storm Event	Peak Flow to Burl's Creek Outlet A (m^3/s)		Peak Flow from to Allingham Creek Outlet B (m^3/s)	
	SCS	CHI	SCS	CHI
2-year	1.05	0.76	0.47	0.36
5-year	1.85	1.43	0.83	0.67
10-year	2.46	1.93	1.12	0.91
25-year	3.32	2.65	1.51	1.27
50-year	4.01	3.28	1.83	1.58
100-year	4.74	3.91	2.18	1.89
Timmins	-	11.80	-	4.40

3 Recent Grading

3.1 Overall Site Grading

The goal of the site alteration work that was recently carried out was to create a workable event space while limiting disturbance as much as possible. Mass grading operations were avoided and minor regrading was carried out only as required to even out grassed surfaces to serve as camping and parking areas. Gravel driveways and laneways were generally constructed at grade. As a result, existing drainage patterns will generally be maintained.

Additional site grading is proposed only for the purpose of constructing the proposed stormwater management facilities. A preliminary Site Grading Plan (Drawing SG-1) is appended to show the overall grading plan and general drainage patterns.

3.2 Site Grading Adjacent to MTO Lands

A berm was constructed adjacent to Highway 11, between Line 7 and Line 8 South. This berm represents the only site alteration with the potential to impact the Highway 11 drainage system, as it could direct a small amount of drainage (originating from the berm itself) to the Highway 11 ditch. While the quantity of runoff that could be directed to Highway 11 is very small, we nonetheless have designed a cutoff swale to intercept runoff from the berm and direct it easterly and then south to the on-site wetland. The details of this swale are shown on the attached Drawing MTO-1.

4 Servicing

4.1 Water Supply & Sanitary Sewage Disposal

The provision of on-site water treatment is not proposed at this time. For larger scale events, potable water will be trucked to the site to meet event demands. A qualified contractor will be selected to provide the required potable water service for the larger events. Between 70 and 80 large plastic storage tanks will be located throughout the site to store the water during these events. Tanker trucks will replenish the water supply as needed prior to and during the events. The City of Barrie Water Supply Department has agreed to provide the water supply and a hydrant located approximately 10 minutes from the site has been identified as the supply location.

Sanitary servicing requirements for larger events will be met using portable washroom facilities. A qualified contractor will be selected to provide the portable washroom facilities for these events. Approximately 700 portable toilets will be provided throughout the site during larger events. These units will be pumped as required and sanitary waste hauled off-site throughout the events as required. The Orillia Waste Water Treatment Centre will serve as the disposal location for the hauled sanitary waste and has agreed to provide 24 hour access to their facility for the duration of these events. The washroom units will be trucked in and out of the site as required.

4.2 Roadways & Transportation

A transportation review has been completed by CCTA to investigate impacts from the proposed development on surrounding roads.

The Traffic Impact Study, dated June 12, 2015, identifies that access to the event grounds will be provided from Line 7, 8 and 9 South. No access to Highway 11 is proposed.

4.3 Utilities

A qualified contractor will be selected to provide the electrical servicing required for the larger scale events. The RV campsites will be powered by silent generators. Each generator will have the necessary distribution panels, waterproof receptacles and cabling.

5 Future Drainage Conditions

5.1 Design Criteria

Criteria to be met with respect to water quantity and water quality control related to the development of the site are summarized as follows:

- the site will be developed in accordance with Township of Oro-Medonte Standards;
- provide "Enhanced" level water quality control, to ensure the development will have no negative impacts on the water quality of downstream watercourses;
- ensure post-development runoff rates will not increase from pre-development rates for storms up to and including the 1:100 year event, while maintaining current flow rates beyond the property boundary;
- address safe conveyance of storm flows from the Regional (Timmins) Storm event; and
- per LSPP Designated Policy 6.26, for site alteration that occurs within 120 m of a key hydrologic feature (which includes all permanent watercourses) it should be demonstrated that the alteration will result in no adverse effects on the hydrologic function of the feature

We note that the Township of Oro-Medonte's Comprehensive Stormwater Management Master Plan, which has recently been finalized, offers no specific recommendations for development in the Burl's Creek and Allingham Creek watersheds, as they do not contain settlement areas, however the general recommendations of that document with regard to stormwater management will be referenced and adhered to.

5.2 Proposed Development

The development includes an expansion to the existing Burl's Creek Event Grounds. As referenced in Section 3, site alteration has taken place and includes the creation of additional gravel driveways and pedestrian paths, gravel pads for temporary stages, minor grading works as required to even out grassed camping/parking areas. No new permanent structures have been constructed. Limited areas of the site have had tile drains installed to allow for improved drainage from low lying/flatter sloped areas without mass grading operations. The total gravel/impervious cover for the site, after the recent site alterations is approximately 10%. Asphalt surfaces are not proposed and would not be desirable given the intended use of the property. We note that the area of new gravel surface was approximated using a site plan provided by Burl's Creek and we recommend that the actual gravel surface be confirmed in the field at the detailed design stage. This will allow the required water quantity and quality storage volumes to be refined to more accurately reflect the extent of site alterations undertaken.

Existing drainage patterns will generally be maintained, with the site continuing to drain towards the existing site outlets (Burl's Creek or Allingham Creek). At present, flows from the site are higher than under existing conditions. Through the provision of appropriate SWM controls, peak flow rates will be maintained at existing rates for all site outlets.

Catchment 204 has a slight decrease in drainage area from the existing condition due to the minor grading alterations directing flow into the conveyance swales and ultimately Burl's Creek. Catchments 202 and 205 experienced no site alteration and are therefore identical to the existing Catchments 102 and 105. The proposed drainage patterns are shown on Drawing ODP-2.

6 Proposed SWM Plan

An understanding of specific issues, constraints and opportunities pertaining to the site was gained through an analysis of relevant background information. A number of quality and quantity control measures are available and are identified here for consideration. Opportunities for maximizing the effective use of the control measures are discussed in this section.

6.1 Source/Conveyance Controls

Potential source control measures include directing pervious or gravel surfaces to vegetated buffer strips or soakaway pits. These measures provide both quality and quantity benefits, including infiltration enhancement and peak flow reduction, as well as pollutant removal.

Conveyance controls include low-sloped grass swales and pervious pipe systems. These systems can be very effective for reducing runoff volumes, increasing groundwater recharge and improving water quality.

The native soils on the subject site are sandy loam and gravelly sandy loam, which are conducive to the use of infiltration practices.

6.2 End of Pipe Controls

Potential end-of-pipe facilities include extended detention wet ponds, dry ponds, constructed wetlands, oil/grit separators, filter strips and infiltration basins. An end of pipe facility is effective for meeting water quantity and water quality requirements for large catchment areas.

6.3 Preferred SWM Strategy

As indicated above, SWM controls could be provided by a number of feasible alternatives. These include: grassed swales, infiltration trenches, dry ponds and extended detention ponds. The SWM strategy can rely primarily on one type of practice, or utilize a combination of practices.

For the purpose of confirming the feasibility of this approach, we have assumed that conveyance controls will be implemented and undertaken a conceptual design of this system. This system would consist of a series of enhanced swales located along the gravel driveways and pedestrian pathways. The swales would be low profile (typically 0.5 m depth, with 3:1 side slopes) to ensure they do not represent a hazard. The swales would provide both water quantity and water quality control. Water quality would be provided through infiltration and filtration, while water quantity control would be provided by attenuating runoff behind rock check dams and culvert controls.

The OTTHYMO hydrologic model was used to determine peak flow rates from the subject site under existing and proposed conditions for both the 4-hour Chicago (CHI) and 24-hour SCS storm distributions. The model was then used to determine the required water quantity storage volume to attenuate the post-development peak flow during the 100-year storm to pre-development levels. Model results for the pre and post-development scenarios, along with hydrologic input parameters, have been included in Appendix A and Appendix B respectively.

Table 2: Summary of 100-year Peak Flow Rates

	Outlet Location (Catchment Number)								
	Outlet A+B (102+106/ 202+206)	Outlet C (103/203)	Outlet D (105/205)	Outlet E (101/201)	Outlet F (104/204)	Outlet E+F Total Flow to Burl's Creek (Node 301)	Outlet A+B+C+D Total Flow to Allingham Creek (Node 306)	Burl's Creek Flow at Lake Simcoe	Allingham Creek Flow at Lake Simcoe
Existing 100-yr SCS (m^3/s)	1.46	0.61	0.21	2.33	0.93	4.74	2.18	10.71	10.77
Proposed100-yr SCS (m^3/s)	1.46	0.61	0.21	1.73	0.93	4.27	1.87	10.14	11.36
Existing 100-yr CHI (m^3/s)	1.34	0.450	0.17	2.04	0.82	3.91	1.89	8.72	8.68
Proposed 100-yr CHI (m^3/s)	1.27	0.49	0.17	1.51	0.82	3.52	1.87	8.33	9.25
Quantity Control Storage Volume Required (m^3)	3850	1822	0	0	460	-	-	-	-
Quality Control Volume Required (m^3)	520	750	0	1116	575				

The results shown in the Table above confirm that the post-development peak flow rates at the site outlet can be maintained at pre-development levels when SWM controls are provided. The hydrologic impact of the subject site and the proposed SWM controls was also assessed in the subwatershed context, with pre and post-development flow rates from Burl's Creek and Allingham Creek to Lake Simcoe being calculated. The results show that development will not adversely impact flow rates from Burl's Creek to Lake Simcoe. Small increases in flow rates to Lake Simcoe from Allingham Creek are shown to result from the site development. This increase is due to a change in the timing of flow releasing from the site and how it combines with upstream and downstream flows. The changes are deemed very minor and do not account for the potential attenuation effect of the on-site ponds. At the detailed design stage, additional modelling will be completed to account for the attenuation effect from the on-site ponds. It is expected that the results of the analysis with the on-site ponds and wetlands included will show that the timing of the peak flow from the site under pre-development conditions is similar to that under post-development conditions and the small difference in peak flow rates at Lake Simcoe will no longer appear in the model. Additional commentary with regard to peak flows and potential downstream impacts are included in Section 6.4.

The required water quantity storage volume of the conceptual SWM system, which is the volume required to control post-development 100-year storm to pre-development levels, is 460 m^3 for flow to Burl's Creek and 5,672 m^3 for flow to Allingham Creek. Water quality storage requirements for the system were determined based on the MOE SWM Manual criteria for Enhanced Level water quality control. Each catchment was considered individually when determining the required water quality storage volume. The proposed "impervious" surface for each catchment, which in this case is gravel, and the contributing drainage areas were used in determining the water quality volume requirement. This level of impervious cover corresponds to an infiltration storage volume requirement of between 15.5 and 17.7 m^3/ha depending on the catchment. The required water quality storage volumes are provided in Table 2 and supporting calculations can be found in Appendix C.

The drawdown time for runoff stored in the swales behind the check dams was calculated to be approximately 15 hours based on the conceptual design. This calculation confirms that the proposed infiltration storage volume would not result in ponding for a significant period of time, and that storage volume will quickly become available for successive runoff events.

A conceptual swale system, with a total length of 7,130 m and resulting storage volume of 8,021 m^3, based on a typical swale cross-section, was sized and is as shown on Drawing SG-1. For each catchment area, the greater of the calculated water quantity or quality volume was used to determine the required swale length. The total storage volume provided exceeds the required storage volume of 7,363 m^3, thus confirming the feasibility of providing the required SWM controls on-site. Preliminary design calculations are provided in Appendix C.

6.4 Impact on Hydrologic Function of Burl's Creek and Allingham Creek

Much of the additional property acquired by Burl's Creek was previously active agricultural land that was used for a combination of row crop and pasture. Review of aerial imagery over the last 10 years indicates that approximately 72 ha of this agricultural land was row crop.

The modeling completed has confirmed that under the proposed land use, this 72 ha will actually see a decrease in runoff, even with the addition of some gravel laneways, as the entire area will be grassed. The recently installed tile drains were also considered in the hydrologic model as providing a more efficient drainage pattern for certain areas. Based on these results it is our opinion that the impact of recently installed tile drainage in the selected areas shown on the attached drawing prepared by Burl's Creek, titled "Burl's Creek - Drainage", will be compensated for by this change in land cover.

The proposed SWM plan relies on infiltration controls and will serve to maintain the natural water balance as much as possible. It is therefore our assessment that, with the recommended SWM controls, the hydrologic function of Burl's Creek and Allingham Creek will not be adversely impacted by the site alteration.

7 Siltation & Erosion Plan

Siltation and erosion controls will be implemented for all future construction activities, including topsoil stripping, material stockpiling, swale construction and grading operations. A detailed erosion and sediment control plan for the site will be prepared with the final design and will include the following:

- all erosion control measures will be specified in accordance with Township of Oro-Medonte standards;
- silt fences will be erected before commencement of any grading operations to control sediment movement;
- outlet locations for storm drainage will be protected with appropriate permanent erosion control measures, including level spreaders where discharge will drain overland and rip-rap or other protective surfaces for watercourse outlets; and
- regular inspection of control measures will be instituted and repairs will be made as necessary.

Long term siltation and erosion control will be enhanced with a revegetation strategy for disturbed areas.

8 Conclusion & Recommendations

The work completed for this report has confirmed that the SWM requirements for this site can be met through the implementation of the SWM measures proposed. The plan in place supports the pending Official Plan Amendment and Zoning Bylaw Amendment applications.

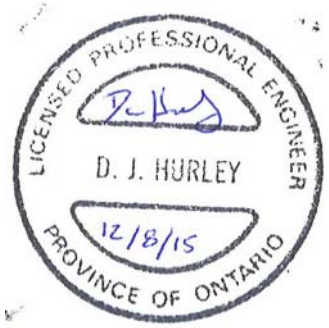
Site alteration has recently occurred and consists of minor grading of grassed parking/camping spaces, gravel driveways and pedestrian paths. Existing drainage patterns have been generally maintained, with stormwater continuing to be directed overland towards Burl's Creek and Allingham Creek.

Stormwater management quantity and quality controls can be provided through application of a number of SWM alternatives. For the purpose of confirming the feasibility of providing the required on-site SWM controls, conceptual design of a system of grassed swales was carried out. The grassed swales would manage runoff and allow a portion of runoff to infiltrate and provide controlled release for the remainder.

Permanent services are not currently proposed for the development. Servicing needs will be met through temporary servicing options. Potable water will be trucked onto the site and portable washrooms facilities will be brought in and out as needed.

Siltation and erosion control will be provided with the proper construction mitigation efforts. Long-term erosion control will be enhanced with an effective revegetation strategy.

Detailed design of the specific SWM facilities, as required, will be provided at the final design stage, which will occur in conjunction with a Site Plan Application, following approval of the OPA and ZBA. The detailed design should include field confirmation of the extent of gravel surfaces added to refine the water quantity and water quality storage volumes. The work completed to date confirms the feasibility of providing appropriate site servicing and stormwater management for the subject site.



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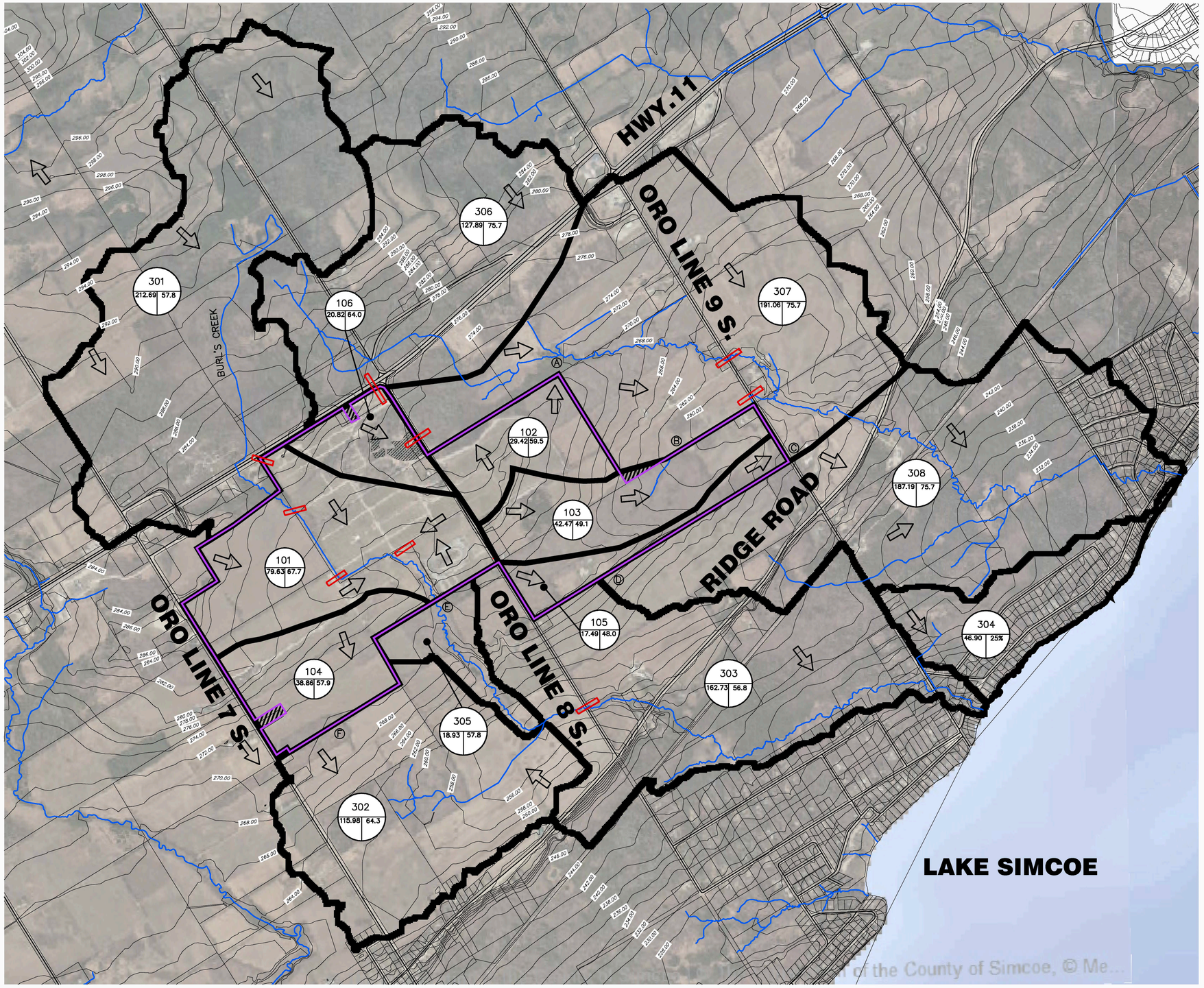
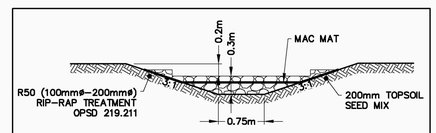




TYPICAL SWALE WITH ROCK CHECK DAM
N.T.S.

LEGEND
- OUTLET LOCATION
- EXISTING CULVERT
- PROPERTY LINE
- DRAINAGE BOUNDARY
- PROPERTY NOT OWNED BY BURL'S CREEK OVERLAND FLOW ROUTE
- 105 — DRAINAGE AREA LABEL
- 17.49 | 48.1 — CURVE NUMBER/% IMPERVIOUS
- AREA (ha)

LEGEND

CONTRACT DRAWINGS

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

NO.	REVISIONS	DATE	INITIAL

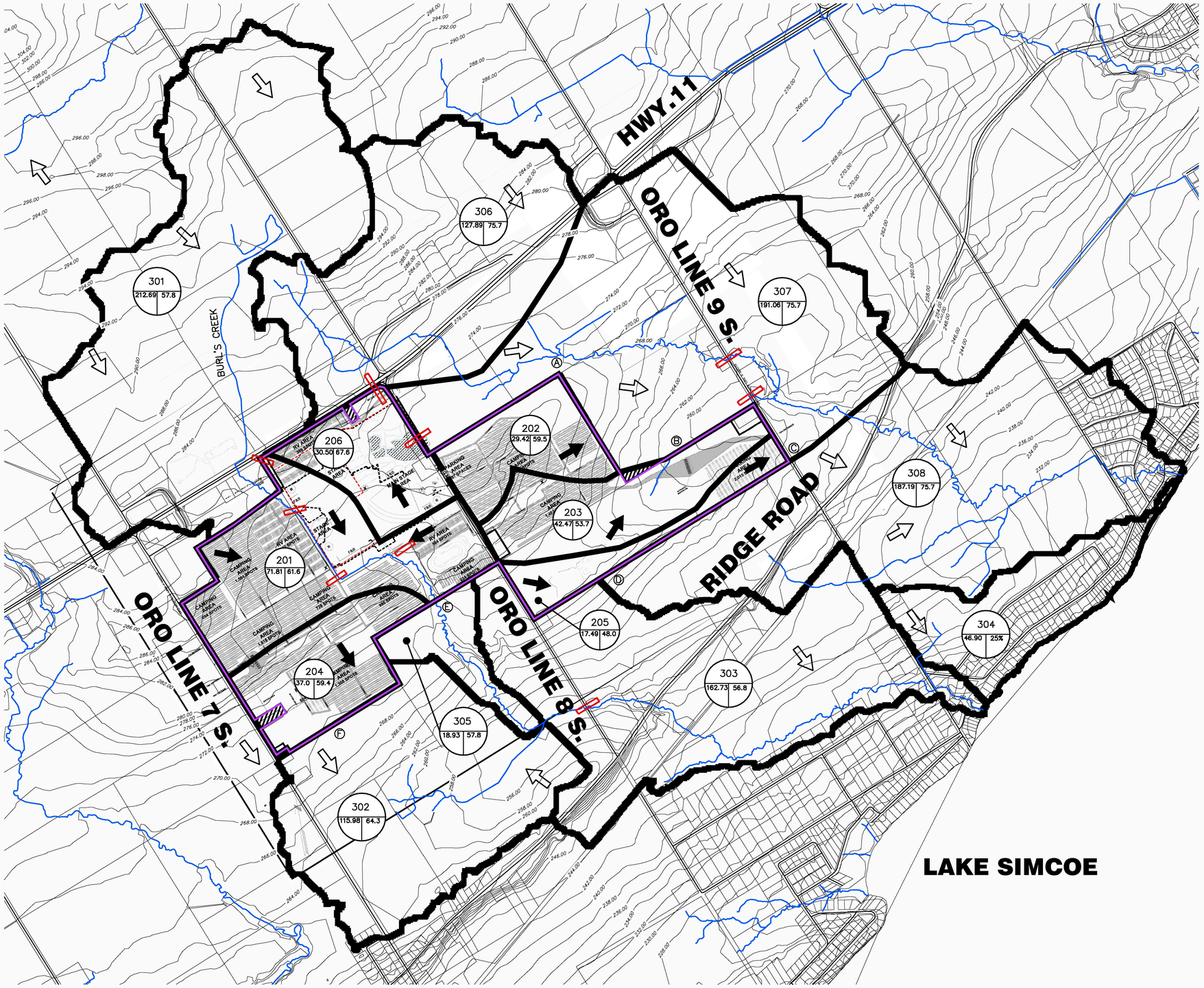
APPROVED

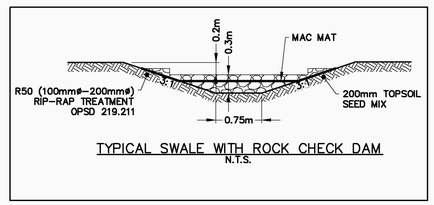
BURL'S CREEK EVENT GROUNDS
180 8TH LINE SOUTH, ORO MEDONTE, ON
L0L2X0

OVERALL DRAINAGE PLAN

C.C.Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie

SCALE: 1:500		JOB NO.	115032
DESIGN: AR	CHECKED: AK	DWG.	ODP-1
DRAWN: SD	DATE: MAY/2015		





TYPICAL SWALE WITH ROCK CHECK DAM
N.T.S.

LEGEND
- Ⓐ OUTLET LOCATION
- EXISTING CULVERT
- PROPERTY LINE
- DRAINAGE BOUNDARY
- PROPERTY NOT OWNED BY BURL'S CREEK
- POST–CONSTRUCTION OVERLAND FLOW ROUTE
- EXISTING OVERLAND FLOW ROUTE
- 205 / 17.49 | 48.1 — DRAINAGE AREA LABEL / CURVE NUMBER / AREA (ha)

LEGEND

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NO.	REVISIONS	DATE	INITIAL

APPROVED

BURL'S CREEK EVENT GROUNDS
180 8TH LINE SOUTH, ORO MEDONTE, ON
L0L2X0

OVERALL POST–DEVELOPMENT DRAINAGE PLAN

C.C.Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie

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DESIGN: AR	CHECKED: AK	DWG.	ODP-2
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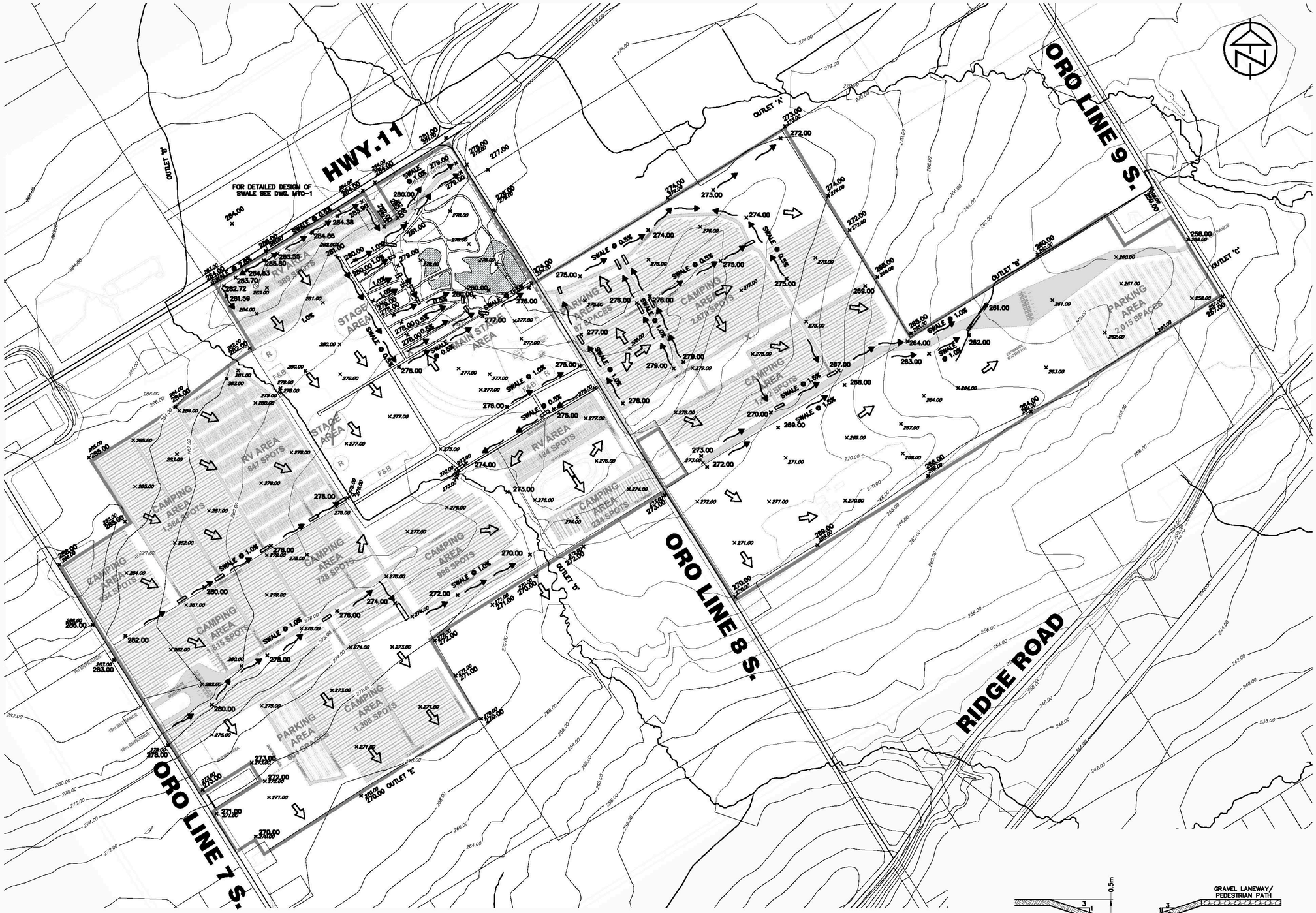

TYPICAL SWALE SECTION
N.T.S.

LEGEND

- PROPERTY LINE
- PROPOSED ENHANCED SWALE
- PROPERTY NOT OWED BY BURL'S CREEK
- 285.00 × EXISTING ELEVATION
- 274.00 × PROPOSED ELEVATION
- PROPOSED GRADING DIRECTION
- PROPOSED CULVERT
- POND/WETLAND AREA
- GRASSED CAMPING AREA
- GRASSED RV AREA

LEGEND

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BURL'S CREEK EVENT GROUNDS
180 8TH LINE SOUTH, ORO MEDONTE, ON
L0L2X0

OVERALL GRADING PLAN

C.C.Tatham & Associates Ltd.
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Collingwood Bracebridge Orillia Barrie

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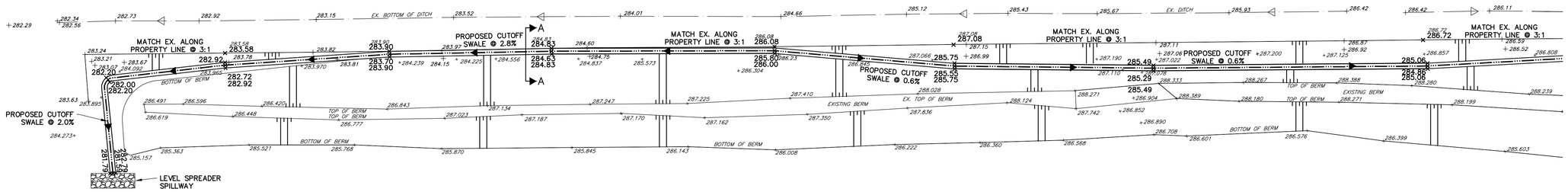
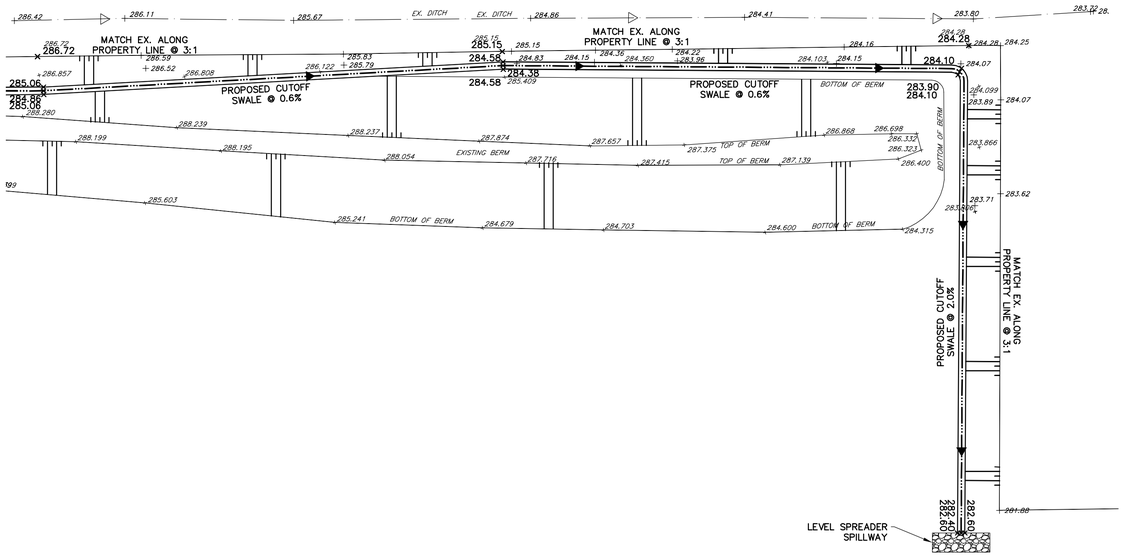
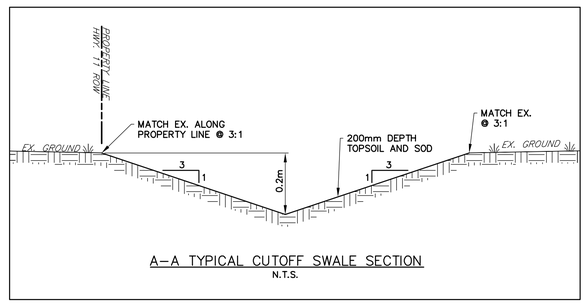
DESIGN: AR	CHECKED: AK	DWG.	SG-1
DRAWN: SD	DATE: MAY/2015		

HWY. 11



HWY. 11





A–A TYPICAL CUTOFF SWALE SECTION
N.T.S.

LEGEND

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APPROVED

BURL'S CREEK EVENT GROUNDS
180 8TH LINE SOUTH, ORO MEDONTE, ON
L0L2X0

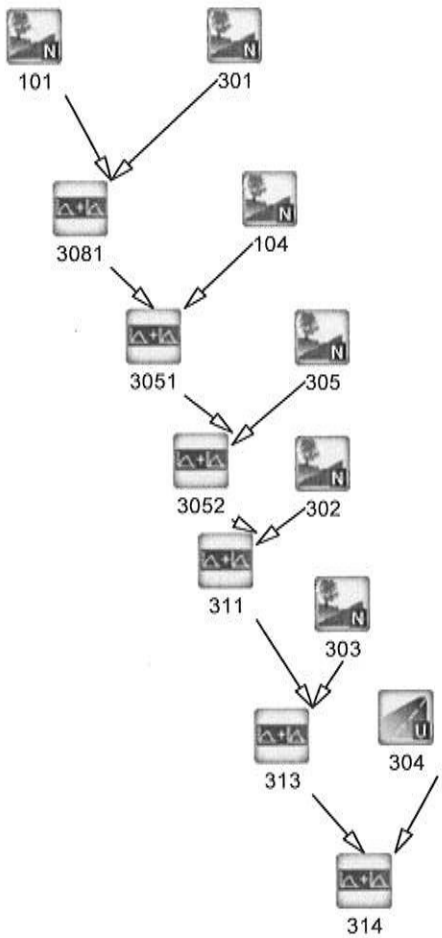
CUTOFF SWALE ADJACENT TO MTO ROW

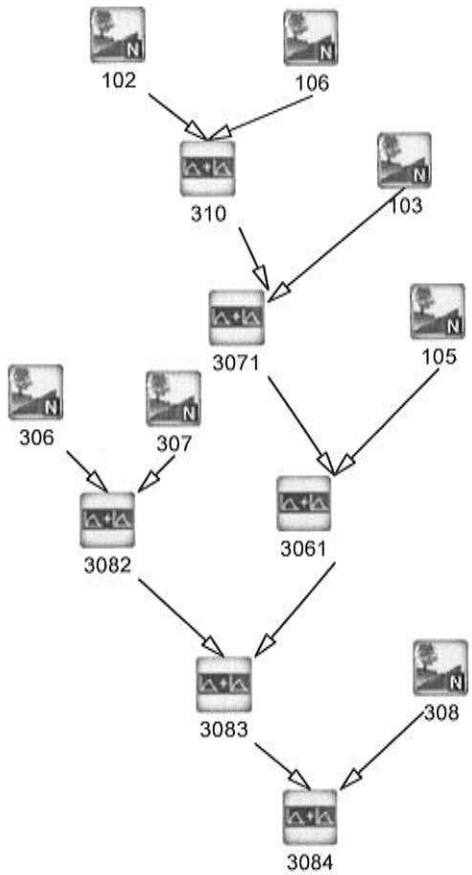
C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie

SCALE: 1:500		JOB NO.	115032
DESIGN: AR	CHECKED: AK	DWG.	MTO-1
DRAWN: SD	DATE: MAY/2015		

APPENDIX A:
PRE-DEVELOPMENT HYDROLOGY CALCULATIONS

Existing Conditions OTTHYMO Model Schematic





C.C. Tatham & Associates Ltd.
Consulting Engineers

Collingwood Bracebridge Orillia Barrie

Project:	Burls Creek Event Grounds
File No.:	115032
Date:	9-Apr-15
Designed By:	AR
Checked By:	ALK
Subject:	CN Calculator

Burls Creek Event Grounds
CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

CONDITIONS

Catchment 101 **Area** 79.63 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Cultivated			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
gus	GUERIN	AB	Sand Loam	1	79.63	1	4.778	0.06	46	0		59	71.67	0.9	68	1.593	0.02	89	1.593	0.02	100	0		50	67.74
stsl	SARGENT	AB	Sand Loam	1	0		0		46	0		59	0		68	0		89	0		100	0		50	0
vasl	VASEY	AB	Sand Loam	1	0		0		46	0		59	0		68	0		89	0		100	0		50	0
ans	ALLISTON	AB	Sand Loam	1	0		0		46	0		59	0		68	0		89	0		100	0		50	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	79.63	1	4.7778	0.06		0	0		71.667	0.9		1.5926	0.02		1.5926	0.02		0	0		67.7

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	288	m
Minimum Catchment Elevation	270	m
Catchment length	1250	m
Catchment Slope	1%	
Catchment Area	79.63	ha
Time of Concentration (Minutes)	42.76	
Time of Concentration (Hours)	0.71	
Time to Peak (2/3 x Time of Concentration)	0.48	

Time to Peak	0.98 hrs

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	288	m
Minimum Catchment Elevation	270	m
Catchment length	1250	m
Catchment Slope	1%	
Catchment Area	79.63	ha
Time of Concentration (Minutes)	88.52	
Time of Concentration (Hours)	1.48	
Time to Peak (2/3 x Time of Concentration)	0.98	

Initial Abstraction	7 mm

Wetlands	12
Woods	10
Cultivated	7
Gravel	3
Lawns	5
Impervious	2

Runoff Coefficient	0.23

Landuse Type	Soil Series				
	gus	0	0	0	0
	1	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.06	#N/A	#N/A	#N/A	#N/A
Gravel	0.6	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.1	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Cultivated	0.22	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.234	#N/A	#N/A	#N/A	#N/A

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Burls Creek Event Grounds
CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

CONDITIONS

Catchment 102 **Area** 29.42 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
gus	GUERIN	AB	Sand Loam	1	29.42	1	3.825	0.13	46	23.54	0.8	59	0		51	1.765	0.06	89	0.294	0.01	100	0	0	50	59.52
stsl	SARGENT	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
vasl	VASEY	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
ans	ALLISTON	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	29.42	1	3.8246	0.13		23.536	0.8		0	0		1.7652	0.06		0.2942	0.01		0	0		59.5

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	280	m
Minimum Catchment Elevation	266	m
Catchment length	700	m
Catchment Slope	2%	
Catchment Area	29.42	ha
Time of Concentration (Minutes)	**24.77**	
Time of Concentration (Hours)	**0.41**	
Time to Peak (2/3 x Time of Concentration)	**0.28**	

Time to Peak	0.74 hrs

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	280	m
Minimum Catchment Elevation	266	m
Catchment length	700	m
Catchment Slope	2%	
Catchment Area	29.42	ha
Time of Concentration (Minutes)	**66.15**	
Time of Concentration (Hours)	**1.10**	
Time to Peak (2/3 x Time of Concentration)	**0.74**	

Initial Abstraction	5.5 mm

Wetlands	12
Woods	10
Meadows	8
Gravel	3
Lawns	5
Impervious	2

Runoff Coefficient	0.14

Landuse Type	Soil Series				
	gus	0	0	0	0
	1	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.08	#N/A	#N/A	#N/A	#N/A
Gravel	0.6	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.1	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.09	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.136	#N/A	#N/A	#N/A	#N/A

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Burls Creek Event Grounds
CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

CONDITIONS

Catchment 103 **Area** 42.47 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
gus	GUERIN	AB	Sand Loam	1	42.47	1	33.55	0.79	46	8.494	0.2	59	0		51	0		89	0.425	0.01	100	0		50	49.14
stsl	SARGENT	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
vasl	VASEY	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
ans	ALLISTON	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	42.47	1	33.5513	0.79		8.494	0.2		0	0		0	0		0.4247	0.01		0	0		49.1

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	280	m
Minimum Catchment Elevation	259	m
Catchment length	1400	m
Catchment Slope	2%	
Catchment Area	42.47	ha
Time of Concentration (Minutes)	50.58	
Time of Concentration (Hours)	0.84	
Time to Peak (2/3 x Time of Concentration)	0.56	

Time to Peak	1.19 hrs

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	280	m
Minimum Catchment Elevation	259	m
Catchment length	1400	m
Catchment Slope	2%	
Catchment Area	42.47	ha
Time of Concentration (Minutes)	107.48	
Time of Concentration (Hours)	1.79	
Time to Peak (2/3 x Time of Concentration)	1.19	

Initial Abstraction	8.92 mm

Wetlands	12
Woods	10
Meadows	8
Gravel	3
Lawns	5
Impervious	2

Runoff Coefficient	0.09

Landuse Type	Soil Series				
	gus	0	0	0	0
	1	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.08	#N/A	#N/A	#N/A	#N/A
Gravel	0.6	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.1	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.09	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.093	#N/A	#N/A	#N/A	#N/A

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Burls Creek Event Grounds
CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

CONDITIONS

Catchment 104 **Area** 38.86 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
				Type	Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
gus	GUERIN	AB	Sand Loam	1	38.86	1	7.772	0.2	46	29.15	0.75	59	0		51	1.943	0.05	89	0		100	0		50	57.9
stsl	SARGENT	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
vasl	VASEY	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
ans	ALLISTON	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	38.86	1	7.772	0.2		29.145	0.75		0	0		1.943	0.05		0	0		0	0		57.9

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	282	m
Minimum Catchment Elevation	272	m
Catchment length	750	m
Catchment Slope	1%	
Catchment Area	38.86	ha
Time of Concentration (Minutes)	27.99	
Time of Concentration (Hours)	0.47	
Time to Peak (2/3 x Time of Concentration)	0.31	

Time to Peak	0.88 hrs

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	282	m
Minimum Catchment Elevation	272	m
Catchment length	750	m
Catchment Slope	1%	
Catchment Area	38.86	ha
Time of Concentration (Minutes)	79.49	
Time of Concentration (Hours)	1.32	
Time to Peak (2/3 x Time of Concentration)	0.88	

Initial Abstraction	5.9 mm

Wetlands	12
Woods	10
Meadows	8
Gravel	3
Lawns	5
Impervious	2

Runoff Coefficient	0.12

Landuse Type	Soil Series				
	gus	0	0	0	0
	1	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.08	#N/A	#N/A	#N/A	#N/A
Gravel	0.6	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.1	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.09	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.121	#N/A	#N/A	#N/A	#N/A

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Burls Creek Event Grounds
CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

CONDITIONS

Catchment 105 **Area** 17.49 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
gus	GUERIN	AB	Sand Loam	1	17.49	1	15.74	0.9	46	1.399	0.08	59	0		51	0.175	0.01	89	0.175	0.01	100	0		50	48.01
stsl	SARGENT	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
vasl	VASEY	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
ans	ALLISTON	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	17.49	1	15.741	0.9		1.3992	0.08		0	0		0.1749	0.01		0.1749	0.01		0	0		48.0

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	272	m
Minimum Catchment Elevation	258	m
Catchment length	1500	m
Catchment Slope	1%	
Catchment Area	17.49	ha
Time of Concentration (Minutes)	**65.11**	
Time of Concentration (Hours)	**1.09**	
Time to Peak (2/3 x Time of Concentration)	**0.72**	

Time to Peak	1.44 hrs

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	272	m
Minimum Catchment Elevation	258	m
Catchment length	1500	m
Catchment Slope	1%	
Catchment Area	17.49	ha
Time of Concentration (Minutes)	**129.75**	
Time of Concentration (Hours)	**2.16**	
Time to Peak (2/3 x Time of Concentration)	**1.44**	

Initial Abstraction	9.45 mm

Wetlands	12
Woods	10
Meadows	8
Gravel	3
Lawns	5
Impervious	2

Runoff Coefficient	0.10

Landuse Type	Soil Series				
	gus	0	0	0	0
	1	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.08	#N/A	#N/A	#N/A	#N/A
Gravel	0.6	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.1	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.09	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.096	#N/A	#N/A	#N/A	#N/A

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Burls Creek Event Grounds
CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

CONDITIONS

Catchment 106 **Area** 20.82 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
gus	GUERIN	AB	Sand Loam	1	20.82	1	4.164	0.2	46	11.45	0.55	59	0		51	4.997	0.24	89	0.208	0.01	100	0		50	64.01
stsl	SARGENT	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
vasl	VASEY	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
ans	ALLISTON	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	20.82	1	4.164	0.2		11.451	0.55		0	0		4.9968	0.24		0.2082	0.01		0	0		64.0

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	286	m
Minimum Catchment Elevation	276	m
Catchment length	750	m
Catchment Slope	1%	
Catchment Area	20.82	ha
Time of Concentration (Minutes)	**29.79**	
Time of Concentration (Hours)	**0.50**	
Time to Peak (2/3 x Time of Concentration)	**0.33**	

Time to Peak	**0.79 hrs**

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	286	m
Minimum Catchment Elevation	276	m
Catchment length	750	m
Catchment Slope	1%	
Catchment Area	20.82	ha
Time of Concentration (Minutes)	**71.08**	
Time of Concentration (Hours)	**1.18**	
Time to Peak (2/3 x Time of Concentration)	**0.79**	

Initial Abstraction	**5.49 mm**

Wetlands	12
Woods	10
Meadows	8
Gravel	3
Lawns	5
Impervious	2

Runoff Coefficient	**0.22**

Landuse Type	Soil Series				
	gus	0	0	0	0
	1	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.08	#N/A	#N/A	#N/A	#N/A
Gravel	0.6	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.1	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.09	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.225	#N/A	#N/A	#N/A	#N/A

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

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

       OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
      O   O    T      T    H   H   Y Y   MM MM  O   O
      O   O    T      T    H   H    Y    M   M  O   O
       OOO     T      T    H   H    Y    M   M   OOO

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                  *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files\Visual OTTHYMO 2.2.4\voin.dat
  Output  filename: I:\2015PR~1\115032~1\Design\SWM\OTTHYM~1\Existing CHI.out
  Summary filename: I:\2015PR~1\115032~1\Design\SWM\OTTHYM~1\Existing CHI.sum


DATE: 6/4/2015                            TIME: 9:12:55 AM

USER:

COMMENTS: Existing Condition Chicago Design Storm
          ________________________________________________


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

  W/E COMMAND             HYD ID   DT    AREA   Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha     cms   hrs     mm          cms

      START @   .00 hrs
      --------------------
      READ STORM                10.0
      [ Ptot= 33.84 mm ]
      fname : I:\2015 Projects\115032 - Burls Creek\Design\SWM\OTTHYMO Model\storms\Orillia\CHI 2-yr Orillia.stm
      remark: 2-Year Orillia 4-hour Chicago Storm
*
  **  CALIB NASHYD       0302  1  5.0  115.98     .41  3.17   4.17  .12    .000
      [CN=64.3         ]
      [ N = 3.0:Tp 1.32]
*
  **  CALIB NASHYD       0301  1  5.0  212.69     .38  4.67   3.37  .10    .000
      [CN=57.8         ]
      [ N = 3.0:Tp 2.55]
*
  **  CALIB NASHYD       0101  1  5.0   79.63     .40  2.67   4.87  .14    .000
      [CN=67.7         ]
      [ N = 3.0:Tp  .98]
*
  **  CALIB NASHYD       0104  1  5.0   38.86     .16  2.50   3.67  .11    .000
      [CN=57.9         ]
      [ N = 3.0:Tp  .88]
*
  **  CALIB NASHYD       0305  1  5.0   18.93     .03  4.67   3.37  .10    .000
      [CN=57.8         ]
      [ N = 3.0:Tp 2.55]
*
  **  CALIB NASHYD       0303  1  5.0  162.73     .38  3.50   3.12  .09    .000
      [CN=56.8         ]
      [ N = 3.0:Tp 1.56]
*
  *   CALIB STANDHYD     0304  1  5.0   46.90    1.63  1.42  13.59  .40    .000
      [I%=20.0:S%= 2.00]
*
  *   CALIB NASHYD       0306  1  5.0  127.89     .44  4.58   6.39  .19    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0307  1  5.0  191.06     .66  4.58   6.39  .19    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0105  1  5.0   17.49     .03  3.42   1.99  .06    .000
      [CN=48.0         ]
      [ N = 3.0:Tp 1.44]
*
  *   CALIB NASHYD       0103  1  5.0   42.47     .08  3.08   2.15  .06    .000
```

```
     [CN=49.1         ]
     [ N = 3.0:Tp 1.19]
*
  *  CALIB NASHYD       0102  1  5.0   29.42     .15  2.33   3.99  .12    .000
     [CN=59.5         ]
     [ N = 3.0:Tp  .74]
*
  *  CALIB NASHYD       0106  1  5.0   20.82     .12  2.42   4.69  .14    .000
     [CN=64.0         ]
     [ N = 3.0:Tp  .79]
*
  *  CALIB NASHYD       0308  1  5.0  187.19     .65  4.58   6.39  .19    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
     ADD [0301 + 0101]  3081  3  5.0  292.32     .64  3.33   3.78  n/a    .000
*
     ADD [3081 + 0104]  3051  3  5.0  331.18     .77  3.00   3.77  n/a    .000
*
     ADD [3051 + 0305]  3052  3  5.0  350.11     .80  3.08   3.74  n/a    .000
*
     ADD [0306 + 0307]  3082  3  5.0  318.95    1.10  4.58   6.39  n/a    .000
*
     ADD [0102 + 0106]  0310  3  5.0   50.24     .27  2.33   4.28  n/a    .000
*
     ADD [0302 + 3052]  0311  3  5.0  466.09    1.21  3.08   3.85  n/a    .000
*
     ADD [0103 + 0310]  3071  3  5.0   92.71     .34  2.42   3.31  n/a    .000
*
     ADD [0311 + 0303]  0313  3  5.0  628.82    1.58  3.25   3.66  n/a    .000
*
     ADD [0105 + 3071]  3061  3  5.0  110.20     .36  2.50   3.10  n/a    .000
*
     ADD [0313 + 0304]  0314  3  5.0  675.72    1.85  2.92   4.35  n/a    .000
*
     ADD [3082 + 3061]  3083  3  5.0  429.15    1.27  4.25   5.54  n/a    .000
*
     ADD [3083 + 0308]  3084  3  5.0  616.34    1.91  4.33   5.80  n/a    .000
*
  ****************************
  ** SIMULATION NUMBER:   2 **
  ****************************

  W/E COMMAND             HYD ID   DT    AREA   Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha     cms   hrs     mm          cms

     START @   .00 hrs
     --------------------
     READ STORM                10.0
     [ Ptot= 44.10 mm ]
     fname : I:\2015 Projects\115032 - Burls Creek\Design\SWM\OTTHYMO Model\storms\Orillia\CHI 5-yr Orillia.stm
     remark: 5-Year Orillia 4-hour Chicago Storm
*
  **  CALIB NASHYD       0302  1  5.0  115.98     .77  3.08   7.58  .17    .000
     [CN=64.3         ]
     [ N = 3.0:Tp 1.32]
*
  **  CALIB NASHYD       0301  1  5.0  212.69     .70  4.58   6.15  .14    .000
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  **  CALIB NASHYD       0101  1  5.0   79.63     .75  2.58   8.69  .20    .000
     [CN=67.7         ]
     [ N = 3.0:Tp  .98]
*
  **  CALIB NASHYD       0104  1  5.0   38.86     .30  2.50   6.54  .15    .000
     [CN=57.9         ]
     [ N = 3.0:Tp  .88]
*
  **  CALIB NASHYD       0305  1  5.0   18.93     .06  4.58   6.15  .14    .000
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  **  CALIB NASHYD       0303  1  5.0  162.73     .72  3.42   5.77  .13    .000
     [CN=56.8         ]
     [ N = 3.0:Tp 1.56]
*
  *  CALIB STANDHYD     0304  1  5.0   46.90    2.53  1.33  20.30  .46    .000
     [I%=20.0:S%= 2.00]
*
  *  CALIB NASHYD       0306  1  5.0  127.89     .79  4.50  11.28  .26    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
  *  CALIB NASHYD       0307  1  5.0  191.06    1.17  4.50  11.28  .26    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
  *  CALIB NASHYD       0105  1  5.0   17.49     .05  3.33   3.87  .09    .000
```

```
     [CN=48.0         ]
     [ N = 3.0:Tp 1.44]
*
  *   CALIB NASHYD       0103  1  5.0   42.47     .16  2.92   4.15  .09    .000
     [CN=49.1         ]
     [ N = 3.0:Tp 1.19]
*
  *   CALIB NASHYD       0102  1  5.0   29.42     .27  2.25   7.04  .16    .000
     [CN=59.5         ]
     [ N = 3.0:Tp  .74]
*
  *   CALIB NASHYD       0106  1  5.0   20.82     .22  2.33   8.21  .19    .000
     [CN=64.0         ]
     [ N = 3.0:Tp  .79]
*
  *   CALIB NASHYD       0308  1  5.0  187.19    1.15  4.50  11.28  .26    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
     ADD [0301 + 0101]  3081  3  5.0  292.32    1.18  3.17   6.84  n/a    .000
*
     ADD [3081 + 0104]  3051  3  5.0  331.18    1.43  2.92   6.81  n/a    .000
*
     ADD [3051 + 0305]  3052  3  5.0  350.11    1.47  3.00   6.77  n/a    .000
*
     ADD [0306 + 0307]  3082  3  5.0  318.95    1.96  4.50  11.28  n/a    .000
*
     ADD [0102 + 0106]  0310  3  5.0   50.24     .49  2.33   7.52  n/a    .000
*
     ADD [0302 + 3052]  0311  3  5.0  466.09    2.23  3.00   6.97  n/a    .000
*
     ADD [0103 + 0310]  3071  3  5.0   92.71     .63  2.42   5.98  n/a    .000
*
     ADD [0311 + 0303]  0313  3  5.0  628.82    2.93  3.17   6.66  n/a    .000
*
     ADD [0105 + 3071]  3061  3  5.0  110.20     .67  2.42   5.64  n/a    .000
*
     ADD [0313 + 0304]  0314  3  5.0  675.72    3.29  2.92   7.61  n/a    .000
*
     ADD [3082 + 3061]  3083  3  5.0  429.15    2.27  4.17   9.84  n/a    .000
*
     ADD [3083 + 0308]  3084  3  5.0  616.34    3.41  4.25  10.28  n/a    .000
*
  ****************************
  ** SIMULATION NUMBER:   3 **
  ****************************

  W/E COMMAND             HYD ID   DT    AREA   Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha     cms   hrs     mm          cms

     START @   .00 hrs
     --------------------
     READ STORM                10.0
     [ Ptot= 50.61 mm ]
     fname : I:\2015 Projects\115032 - Burls Creek\Design\SWM\OTTHYMO Model\storms\Orillia\CHI 10-yr Orillia.stm
     remark: 10-Year Orillia 4-hour Chicago Storm
*
  **  CALIB NASHYD       0302  1  5.0  115.98    1.03  3.00  10.13  .20    .000
     [CN=64.3         ]
     [ N = 3.0:Tp 1.32]
*
  **  CALIB NASHYD       0301  1  5.0  212.69     .94  4.50   8.27  .16    .000
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  **  CALIB NASHYD       0101  1  5.0   79.63    1.01  2.58  11.54  .23    .000
     [CN=67.7         ]
     [ N = 3.0:Tp  .98]
*
  **  CALIB NASHYD       0104  1  5.0   38.86     .40  2.42   8.71  .17    .000
     [CN=57.9         ]
     [ N = 3.0:Tp  .88]
*
  **  CALIB NASHYD       0305  1  5.0   18.93     .08  4.50   8.27  .16    .000
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  **  CALIB NASHYD       0303  1  5.0  162.73     .98  3.42   7.80  .15    .000
     [CN=56.8         ]
     [ N = 3.0:Tp 1.56]
*
  *   CALIB STANDHYD     0304  1  5.0   46.90    3.10  1.33  24.92  .49    .000
     [I%=20.0:S%= 2.00]
*
  *   CALIB NASHYD       0306  1  5.0  127.89    1.04  4.42  14.85  .29    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0307  1  5.0  191.06    1.55  4.42  14.85  .29    .000
```

```
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
  *  CALIB NASHYD       0105  1  5.0   17.49     .08  3.25   5.36  .11    .000
     [CN=48.0         ]
     [ N = 3.0:Tp 1.44]
*
  *  CALIB NASHYD       0103  1  5.0   42.47     .23  2.92   5.70  .11    .000
     [CN=49.1         ]
     [ N = 3.0:Tp 1.19]
*
  *  CALIB NASHYD       0102  1  5.0   29.42     .37  2.25   9.33  .18    .000
     [CN=59.5         ]
     [ N = 3.0:Tp  .74]
*
  *  CALIB NASHYD       0106  1  5.0   20.82     .29  2.33  10.83  .21    .000
     [CN=64.0         ]
     [ N = 3.0:Tp  .79]
*
  *  CALIB NASHYD       0308  1  5.0  187.19    1.52  4.42  14.85  .29    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
     ADD [0301 + 0101]  3081  3  5.0  292.32    1.58  3.08   9.16  n/a    .000
*
     ADD [3081 + 0104]  3051  3  5.0  331.18    1.93  2.92   9.11  n/a    .000
*
     ADD [3051 + 0305]  3052  3  5.0  350.11    1.98  2.92   9.06  n/a    .000
*
     ADD [0306 + 0307]  3082  3  5.0  318.95    2.59  4.42  14.85  n/a    .000
*
     ADD [0102 + 0106]  0310  3  5.0   50.24     .66  2.25   9.95  n/a    .000
*
     ADD [0302 + 3052]  0311  3  5.0  466.09    3.01  3.00   9.33  n/a    .000
*
     ADD [0103 + 0310]  3071  3  5.0   92.71     .85  2.42   8.00  n/a    .000
*
     ADD [0311 + 0303]  0313  3  5.0  628.82    3.97  3.08   8.93  n/a    .000
*
     ADD [0105 + 3071]  3061  3  5.0  110.20     .91  2.42   7.58  n/a    .000
*
     ADD [0313 + 0304]  0314  3  5.0  675.72    4.39  2.92  10.04  n/a    .000
*
     ADD [3082 + 3061]  3083  3  5.0  429.15    3.00  4.08  12.99  n/a    .000
*
     ADD [3083 + 0308]  3084  3  5.0  616.34    4.50  4.17  13.55  n/a    .000
*
  ****************************
  ** SIMULATION NUMBER:   4 **
  ****************************

  W/E COMMAND             HYD ID   DT    AREA   Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha     cms   hrs     mm          cms

     START @   .00 hrs
     --------------------
     READ STORM                10.0
     [ Ptot= 58.97 mm ]
     fname : I:\2015 Projects\115032 - Burls Creek\Design\SWM\OTTHYMO Model\storms\Orillia\CHI 25-yr Orillia.stm
     remark: 25-Year Orillia 4-hour Chicago Storm
*
  **  CALIB NASHYD       0302  1  5.0  115.98    1.43  3.00  13.81  .23    .000
     [CN=64.3         ]
     [ N = 3.0:Tp 1.32]
*
  **  CALIB NASHYD       0301  1  5.0  212.69    1.30  4.50  11.34  .19    .000
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  **  CALIB NASHYD       0101  1  5.0   79.63    1.39  2.58  15.60  .26    .000
     [CN=67.7         ]
     [ N = 3.0:Tp  .98]
*
  **  CALIB NASHYD       0104  1  5.0   38.86     .55  2.42  11.84  .20    .000
     [CN=57.9         ]
     [ N = 3.0:Tp  .88]
*
  **  CALIB NASHYD       0305  1  5.0   18.93     .12  4.50  11.34  .19    .000
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  **  CALIB NASHYD       0303  1  5.0  162.73    1.37  3.33  10.75  .18    .000
     [CN=56.8         ]
     [ N = 3.0:Tp 1.56]
*
  *  CALIB STANDHYD     0304  1  5.0   46.90    3.88  1.33  31.14  .53    .000
     [I%=20.0:S%= 2.00]
*
  *  CALIB NASHYD       0306  1  5.0  127.89    1.39  4.42  19.86  .34    .000
```

```
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
  *  CALIB NASHYD       0307  1  5.0  191.06    2.08  4.42  19.86  .34    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
  *  CALIB NASHYD       0105  1  5.0   17.49     .11  3.25   7.55  .13    .000
     [CN=48.0         ]
     [ N = 3.0:Tp 1.44]
*
  *  CALIB NASHYD       0103  1  5.0   42.47     .32  2.92   7.99  .14    .000
     [CN=49.1         ]
     [ N = 3.0:Tp 1.19]
*
  *  CALIB NASHYD       0102  1  5.0   29.42     .51  2.25  12.62  .21    .000
     [CN=59.5         ]
     [ N = 3.0:Tp  .74]
*
  *  CALIB NASHYD       0106  1  5.0   20.82     .40  2.33  14.57  .25    .000
     [CN=64.0         ]
     [ N = 3.0:Tp  .79]
*
  *  CALIB NASHYD       0308  1  5.0  187.19    2.04  4.42  19.86  .34    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
     ADD [0301 + 0101]  3081  3  5.0  292.32    2.18  3.08  12.50  n/a    .000
*
     ADD [3081 + 0104]  3051  3  5.0  331.18    2.65  2.83  12.42  n/a    .000
*
     ADD [3051 + 0305]  3052  3  5.0  350.11    2.73  2.92  12.36  n/a    .000
*
     ADD [0306 + 0307]  3082  3  5.0  318.95    3.47  4.42  19.86  n/a    .000
*
     ADD [0102 + 0106]  0310  3  5.0   50.24     .91  2.25  13.43  n/a    .000
*
     ADD [0302 + 3052]  0311  3  5.0  466.09    4.15  2.92  12.72  n/a    .000
*
     ADD [0103 + 0310]  3071  3  5.0   92.71    1.18  2.42  10.94  n/a    .000
*
     ADD [0311 + 0303]  0313  3  5.0  628.82    5.48  3.08  12.21  n/a    .000
*
     ADD [0105 + 3071]  3061  3  5.0  110.20    1.26  2.42  10.40  n/a    .000
*
     ADD [0313 + 0304]  0314  3  5.0  675.72    5.98  2.92  13.53  n/a    .000
*
     ADD [3082 + 3061]  3083  3  5.0  429.15    4.04  4.00  17.43  n/a    .000
*
     ADD [3083 + 0308]  3084  3  5.0  616.34    6.06  4.17  18.16  n/a    .000
*
  ****************************
  ** SIMULATION NUMBER:   5 **
  ****************************

  W/E COMMAND             HYD ID   DT    AREA   Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha     cms   hrs     mm          cms

     START @   .00 hrs
     --------------------
     READ STORM                10.0
     [ Ptot= 65.52 mm ]
     fname : I:\2015 Projects\115032 - Burls Creek\Design\SWM\OTTHYMO Model\storms\Orillia\CHI 50-yr Orillia.stm
     remark: 50-Year Orillia 4-hour Chicago Storm
*
  **  CALIB NASHYD       0302  1  5.0  115.98    1.77  3.00  16.96  .26    .000
     [CN=64.3         ]
     [ N = 3.0:Tp 1.32]
*
  **  CALIB NASHYD       0301  1  5.0  212.69    1.61  4.50  13.99  .21    .000
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  **  CALIB NASHYD       0101  1  5.0   79.63    1.72  2.58  19.06  .29    .000
     [CN=67.7         ]
     [ N = 3.0:Tp  .98]
*
  **  CALIB NASHYD       0104  1  5.0   38.86     .69  2.42  14.54  .22    .000
     [CN=57.9         ]
     [ N = 3.0:Tp  .88]
*
  **  CALIB NASHYD       0305  1  5.0   18.93     .14  4.50  13.99  .21    .000
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  **  CALIB NASHYD       0303  1  5.0  162.73    1.71  3.33  13.32  .20    .000
     [CN=56.8         ]
     [ N = 3.0:Tp 1.56]
*
```

```
  *   CALIB STANDHYD     0304  1  5.0   46.90    5.22  1.50  36.22  .55    .000
      [I%=20.0:S%= 2.00]
*
  *   CALIB NASHYD       0306  1  5.0  127.89    1.69  4.33  24.05  .37    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0307  1  5.0  191.06    2.53  4.33  24.05  .37    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0105  1  5.0   17.49     .14  3.17   9.49  .14    .000
      [CN=48.0         ]
      [ N = 3.0:Tp 1.44]
*
  *   CALIB NASHYD       0103  1  5.0   42.47     .41  2.83  10.01  .15    .000
      [CN=49.1         ]
      [ N = 3.0:Tp 1.19]
*
  *   CALIB NASHYD       0102  1  5.0   29.42     .63  2.25  15.46  .24    .000
      [CN=59.5         ]
      [ N = 3.0:Tp  .74]
*
  *   CALIB NASHYD       0106  1  5.0   20.82     .49  2.33  17.76  .27    .000
      [CN=64.0         ]
      [ N = 3.0:Tp  .79]
*
  *   CALIB NASHYD       0308  1  5.0  187.19    2.48  4.33  24.05  .37    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
      ADD [0301 + 0101]  3081  3  5.0  292.32    2.69  3.08  15.37  n/a    .000
*
      ADD [3081 + 0104]  3051  3  5.0  331.18    3.28  2.83  15.28  n/a    .000
*
      ADD [3051 + 0305]  3052  3  5.0  350.11    3.37  2.83  15.21  n/a    .000
*
      ADD [0306 + 0307]  3082  3  5.0  318.95    4.22  4.33  24.05  n/a    .000
*
      ADD [0102 + 0106]  0310  3  5.0   50.24    1.12  2.25  16.41  n/a    .000
*
      ADD [0302 + 3052]  0311  3  5.0  466.09    5.14  2.92  15.64  n/a    .000
*
      ADD [0103 + 0310]  3071  3  5.0   92.71    1.47  2.33  13.48  n/a    .000
*
      ADD [0311 + 0303]  0313  3  5.0  628.82    6.80  3.00  15.04  n/a    .000
*
      ADD [0105 + 3071]  3061  3  5.0  110.20    1.57  2.42  12.85  n/a    .000
*
      ADD [0313 + 0304]  0314  3  5.0  675.72    7.34  2.92  16.51  n/a    .000
*
      ADD [3082 + 3061]  3083  3  5.0  429.15    4.93  4.00  21.18  n/a    .000
*
      ADD [3083 + 0308]  3084  3  5.0  616.34    7.37  4.08  22.05  n/a    .000
*
  ****************************
  ** SIMULATION NUMBER:   6 **
  ****************************

  W/E COMMAND             HYD ID   DT    AREA   Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha     cms   hrs     mm          cms

      START @   .00 hrs
      --------------------
      READ STORM                10.0
      [ Ptot= 71.71 mm ]
      fname : I:\2015 Projects\115032 - Burls Creek\Design\SWM\OTTHYMO Model\storms\Orillia\CHI 100-yr Orillia.stm
      remark: 100-Year Orillia 4-hour Chicago Storm
*
  **  CALIB NASHYD       0302  1  5.0  115.98    2.11  3.00  20.14  .28    .000
      [CN=64.3         ]
      [ N = 3.0:Tp 1.32]
*
  **  CALIB NASHYD       0301  1  5.0  212.69    1.92  4.42  16.69  .23    .000
      [CN=57.8         ]
      [ N = 3.0:Tp 2.55]
*
  **  CALIB NASHYD       0101  1  5.0   79.63    2.04  2.50  22.52  .31    .000
      [CN=67.7         ]
      [ N = 3.0:Tp  .98]
*
  **  CALIB NASHYD       0104  1  5.0   38.86     .82  2.42  17.28  .24    .000
      [CN=57.9         ]
      [ N = 3.0:Tp  .88]
*
  **  CALIB NASHYD       0305  1  5.0   18.93     .17  4.42  16.69  .23    .000
      [CN=57.8         ]
      [ N = 3.0:Tp 2.55]
*
```

```
 **  CALIB NASHYD       0303  1  5.0  162.73    2.05  3.33  15.93  .22    .000
     [CN=56.8         ]
     [ N = 3.0:Tp 1.56]
*
  *  CALIB STANDHYD     0304  1  5.0   46.90    6.10  1.50  41.16  .57    .000
     [I%=20.0:S%= 2.00]
*
  *  CALIB NASHYD       0306  1  5.0  127.89    1.99  4.33  28.22  .39    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
  *  CALIB NASHYD       0307  1  5.0  191.06    2.97  4.33  28.22  .39    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
  *  CALIB NASHYD       0105  1  5.0   17.49     .17  3.17  11.49  .16    .000
     [CN=48.0         ]
     [ N = 3.0:Tp 1.44]
*
  *  CALIB NASHYD       0103  1  5.0   42.47     .50  2.83  12.09  .17    .000
     [CN=49.1         ]
     [ N = 3.0:Tp 1.19]
*
  *  CALIB NASHYD       0102  1  5.0   29.42     .75  2.25  18.32  .26    .000
     [CN=59.5         ]
     [ N = 3.0:Tp  .74]
*
  *  CALIB NASHYD       0106  1  5.0   20.82     .58  2.25  20.97  .29    .000
     [CN=64.0         ]
     [ N = 3.0:Tp  .79]
*
  *  CALIB NASHYD       0308  1  5.0  187.19    2.91  4.33  28.22  .39    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
     ADD [0301 + 0101]  3081  3  5.0  292.32    3.20  3.00  18.28  n/a    .000
*
     ADD [3081 + 0104]  3051  3  5.0  331.18    3.91  2.83  18.16  n/a    .000
*
     ADD [3051 + 0305]  3052  3  5.0  350.11    4.02  2.83  18.09  n/a    .000
*
     ADD [0306 + 0307]  3082  3  5.0  318.95    4.95  4.33  28.22  n/a    .000
*
     ADD [0102 + 0106]  0310  3  5.0   50.24    1.33  2.25  19.42  n/a    .000
*
     ADD [0302 + 3052]  0311  3  5.0  466.09    6.13  2.92  18.60  n/a    .000
*
     ADD [0103 + 0310]  3071  3  5.0   92.71    1.76  2.33  16.06  n/a    .000
*
     ADD [0311 + 0303]  0313  3  5.0  628.82    8.12  3.00  17.91  n/a    .000
*
     ADD [0105 + 3071]  3061  3  5.0  110.20    1.89  2.42  15.34  n/a    .000
*
     ADD [0313 + 0304]  0314  3  5.0  675.72    8.72  2.92  19.52  n/a    .000
*
     ADD [3082 + 3061]  3083  3  5.0  429.15    5.81  3.92  24.91  n/a    .000
*
     ADD [3083 + 0308]  3084  3  5.0  616.34    8.68  4.08  25.92  n/a    .000
*
  ****************************
  ** SIMULATION NUMBER:   7 **
  ****************************

  W/E COMMAND             HYD ID   DT    AREA   Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha     cms   hrs     mm          cms

     START @   .00 hrs
     --------------------
     READ STORM                15.0
     [ Ptot=193.00 mm ]
     fname : I:\2015 Projects\115032 - Burls Creek\Design\SWM\OTTHYMO Model\storms\Orillia\TIMMINS.STM
     remark: * Timmins Storm
*
  **  CALIB NASHYD       0302  1  5.0  115.98    5.37  9.17 105.46  .55    .000
     [CN=64.3         ]
     [ N = 3.0:Tp 1.32]
*
  **  CALIB NASHYD       0301  1  5.0  212.69    7.06 10.83  93.06  .48    .000
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  **  CALIB NASHYD       0101  1  5.0   79.63    4.34  7.75 112.62  .58    .000
     [CN=67.7         ]
     [ N = 3.0:Tp  .98]
*
  **  CALIB NASHYD       0104  1  5.0   38.86    1.82  7.67  94.15  .49    .000
     [CN=57.9         ]
     [ N = 3.0:Tp  .88]
*
```

```
  **  CALIB NASHYD       0305  1  5.0   18.93     .63 10.83  93.06  .48    .000
      [CN=57.8         ]
      [ N = 3.0:Tp 2.55]
*
  **  CALIB NASHYD       0303  1  5.0  162.73    6.29  9.50  90.72  .47    .000
      [CN=56.8         ]
      [ N = 3.0:Tp 1.56]
*
  *   CALIB STANDHYD     0304  1  5.0   46.90    4.61  7.00 150.32  .78    .000
      [I%=20.0:S%= 2.00]
*
  *   CALIB NASHYD       0306  1  5.0  127.89    5.83 10.42 128.77  .67    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0307  1  5.0  191.06    8.70 10.42 128.77  .67    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0105  1  5.0   17.49     .56  9.42  73.45  .38    .000
      [CN=48.0         ]
      [ N = 3.0:Tp 1.44]
*
  *   CALIB NASHYD       0103  1  5.0   42.47    1.45  9.25  75.74  .39    .000
      [CN=49.1         ]
      [ N = 3.0:Tp 1.19]
*
  *   CALIB NASHYD       0102  1  5.0   29.42    1.54  7.42  97.53  .51    .000
      [CN=59.5         ]
      [ N = 3.0:Tp  .74]
*
  *   CALIB NASHYD       0106  1  5.0   20.82    1.16  7.50 106.42  .55    .000
      [CN=64.0         ]
      [ N = 3.0:Tp  .79]
*
  *   CALIB NASHYD       0308  1  5.0  187.19    8.53 10.42 128.77  .67    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
      ADD [0301 + 0101]  3081  3  5.0  292.32   10.26  9.67  98.39  n/a    .000
*
      ADD [3081 + 0104]  3051  3  5.0  331.18   11.80  9.50  97.89  n/a    .000
*
      ADD [3051 + 0305]  3052  3  5.0  350.11   12.37  9.58  97.63  n/a    .000
*
      ADD [0306 + 0307]  3082  3  5.0  318.95   14.53 10.42 128.77  n/a    .000
*
      ADD [0102 + 0106]  0310  3  5.0   50.24    2.70  7.50 101.22  n/a    .000
*
      ADD [0302 + 3052]  0311  3  5.0  466.09   17.67  9.42  99.58  n/a    .000
*
      ADD [0103 + 0310]  3071  3  5.0   92.71    3.96  7.67  89.55  n/a    .000
*
      ADD [0311 + 0303]  0313  3  5.0  628.82   23.96  9.42  97.29  n/a    .000
*
      ADD [0105 + 3071]  3061  3  5.0  110.20    4.40  7.75  86.99  n/a    .000
*
      ADD [0313 + 0304]  0314  3  5.0  675.72   26.31  9.17 100.97  n/a    .000
*
      ADD [3082 + 3061]  3083  3  5.0  429.15   18.09  9.92 118.04  n/a    .000
*
      ADD [3083 + 0308]  3084  3  5.0  616.34   26.53 10.08 121.30  n/a    .000
*
 FINISH

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

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

  OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
 O   O    T      T    H   H   Y Y   MM MM  O   O
 O   O    T      T    H   H    Y    M   M  O   O
  OOO     T      T    H   H    Y    M   M   OOO
```


***** S U M M A R Y O U T P U T *****

Input filename: C:\Program Files\Visual OTTHYMO 2.2.4\voin.dat
Output filename: I:\2015PR~1\115032~1\Design\SWM\OTTHYM~1\Existing SCS.out
Summary filename: I:\2015PR~1\115032~1\Design\SWM\OTTHYM~1\Existing SCS.sum

DATE: 6/4/2015 TIME: 8:47:33 AM

USER:

COMMENTS: Existing Condition SCS Design Storm

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

W/E	COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R.V. mm	R.C.	Qbase cms
	START @ .00 hrs								
	MASS STORM		20.0						
	[Ptot= 47.40 mm]								
*									
*	CALIB STANDHYD	0304 1	5.0	46.90	1.12	12.08	22.61	.48	.000
	[I%=20.0:S%= 2.00]								
*									
*	CALIB NASHYD	0303 1	5.0	162.73	.52	13.92	6.77	.14	.000
	[CN=56.8]								
	[N = 3.0:Tp 1.56]								
*									
*	CALIB NASHYD	0305 1	5.0	18.93	.05	15.33	7.19	.15	.000
	[CN=57.8]								
	[N = 3.0:Tp 2.55]								
*									
*	CALIB NASHYD	0104 1	5.0	38.86	.21	13.00	7.61	.16	.000
	[CN=57.9]								
	[N = 3.0:Tp .88]								
*									
*	CALIB NASHYD	0101 1	5.0	79.63	.54	13.08	10.10	.21	.000
	[CN=67.7]								
	[N = 3.0:Tp .98]								
*									
*	CALIB NASHYD	0301 1	5.0	212.69	.54	15.33	7.19	.15	.000
	[CN=57.8]								
	[N = 3.0:Tp 2.55]								
*									
*	CALIB NASHYD	0302 1	5.0	115.98	.56	13.50	8.84	.19	.000
	[CN=64.3]								
	[N = 3.0:Tp 1.32]								
*									
*	CALIB NASHYD	0308 1	5.0	187.19	.89	15.17	13.06	.28	.000
	[CN=75.7]								
	[N = 3.0:Tp 2.51]								
*									
*	CALIB NASHYD	0106 1	5.0	20.82	.15	12.83	9.51	.20	.000
	[CN=64.0]								
	[N = 3.0:Tp .79]								
*									
*	CALIB NASHYD	0102 1	5.0	29.42	.19	12.83	8.17	.17	.000
	[CN=59.5]								
	[N = 3.0:Tp .74]								
*									
*	CALIB NASHYD	0103 1	5.0	42.47	.12	13.42	4.91	.10	.000
	[CN=49.1]								
	[N = 3.0:Tp 1.19]								

```
*
  *   CALIB NASHYD       0105  1  5.0   17.49     .04 13.75   4.60  .10    .000
      [CN=48.0         ]
      [ N = 3.0:Tp 1.44]
*
  *   CALIB NASHYD       0307  1  5.0  191.06     .91 15.17  13.06  .28    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0306  1  5.0  127.89     .61 15.17  13.06  .28    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
      ADD [0101 + 0301]  3081  3  5.0  292.32     .86 13.58   7.99  n/a    .000
*
      ADD [0106 + 0102]  0310  3  5.0   50.24     .34 12.83   8.72  n/a    .000
*
      ADD [0310 + 0103]  3071  3  5.0   92.71     .44 13.00   6.97  n/a    .000
*
      ADD [3071 + 0105]  3061  3  5.0  110.20     .47 13.00   6.60  n/a    .000
*
      ADD [0307 + 0306]  3082  3  5.0  318.95    1.52 15.17  13.06  n/a    .000
*
      ADD [0104 + 3081]  3051  3  5.0  331.18    1.05 13.33   7.94  n/a    .000
*
      ADD [3061 + 3082]  3083  3  5.0  429.15    1.75 14.83  11.40  n/a    .000
*
      ADD [0305 + 3051]  3052  3  5.0  350.11    1.08 13.42   7.90  n/a    .000
*
      ADD [0308 + 3083]  3084  3  5.0  616.34    2.63 15.00  11.90  n/a    .000
*
      ADD [3052 + 0302]  0311  3  5.0  466.09    1.63 13.42   8.13  n/a    .000
*
      ADD [0303 + 0311]  0313  3  5.0  628.82    2.14 13.58   7.78  n/a    .000
*
      ADD [0304 + 0313]  0314  3  5.0  675.72    2.53 13.08   8.81  n/a    .000
*
  ****************************
  ** SIMULATION NUMBER:   2 **
  ****************************

  W/E COMMAND             HYD ID   DT    AREA   Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha     cms   hrs     mm          cms

      START @   .00 hrs
      --------------------
      MASS STORM                20.0
      [ Ptot= 61.80 mm ]
*
  *   CALIB STANDHYD     0304  1  5.0   46.90    1.84 12.08  33.32  .54    .000
      [I%=20.0:S%= 2.00]
*
  *   CALIB NASHYD       0303  1  5.0  162.73     .94 13.83  11.84  .19    .000
      [CN=56.8         ]
      [ N = 3.0:Tp 1.56]
*
  *   CALIB NASHYD       0305  1  5.0   18.93     .08 15.25  12.46  .20    .000
      [CN=57.8         ]
      [ N = 3.0:Tp 2.55]
*
  *   CALIB NASHYD       0104  1  5.0   38.86     .36 13.00  12.98  .21    .000
      [CN=57.9         ]
      [ N = 3.0:Tp  .88]
*
  *   CALIB NASHYD       0101  1  5.0   79.63     .94 13.08  17.06  .28    .000
      [CN=67.7         ]
      [ N = 3.0:Tp  .98]
*
  *   CALIB NASHYD       0301  1  5.0  212.69     .94 15.25  12.46  .20    .000
      [CN=57.8         ]
      [ N = 3.0:Tp 2.55]
*
  *   CALIB NASHYD       0302  1  5.0  115.98     .98 13.50  15.14  .25    .000
      [CN=64.3         ]
      [ N = 3.0:Tp 1.32]
*
  *   CALIB NASHYD       0308  1  5.0  187.19    1.51 15.08  21.64  .35    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0106  1  5.0   20.82     .26 12.83  15.92  .26    .000
      [CN=64.0         ]
      [ N = 3.0:Tp  .79]
*
  *   CALIB NASHYD       0102  1  5.0   29.42     .32 12.75  13.82  .22    .000
      [CN=59.5         ]
      [ N = 3.0:Tp  .74]
*
  *   CALIB NASHYD       0103  1  5.0   42.47     .22 13.33   8.84  .14    .000
```

```
     [CN=49.1         ]
     [ N = 3.0:Tp 1.19]
*
  *  CALIB NASHYD       0105  1  5.0   17.49     .07 13.67   8.37  .14    .000
     [CN=48.0         ]
     [ N = 3.0:Tp 1.44]
*
  *  CALIB NASHYD       0307  1  5.0  191.06    1.54 15.08  21.64  .35    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
  *  CALIB NASHYD       0306  1  5.0  127.89    1.03 15.08  21.64  .35    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
     ADD [0101 + 0301]  3081  3  5.0  292.32    1.52 13.50  13.71  n/a    .000
*
     ADD [0106 + 0102]  0310  3  5.0   50.24     .58 12.83  14.69  n/a    .000
*
     ADD [0310 + 0103]  3071  3  5.0   92.71     .77 12.92  12.01  n/a    .000
*
     ADD [3071 + 0105]  3061  3  5.0  110.20     .83 13.00  11.43  n/a    .000
*
     ADD [0307 + 0306]  3082  3  5.0  318.95    2.57 15.08  21.64  n/a    .000
*
     ADD [0104 + 3081]  3051  3  5.0  331.18    1.85 13.33  13.63  n/a    .000
*
     ADD [3061 + 3082]  3083  3  5.0  429.15    2.99 14.67  19.02  n/a    .000
*
     ADD [0305 + 3051]  3052  3  5.0  350.11    1.90 13.33  13.57  n/a    .000
*
     ADD [0308 + 3083]  3084  3  5.0  616.34    4.49 14.83  19.82  n/a    .000
*
     ADD [3052 + 0302]  0311  3  5.0  466.09    2.88 13.42  13.96  n/a    .000
*
     ADD [0303 + 0311]  0313  3  5.0  628.82    3.79 13.50  13.41  n/a    .000
*
     ADD [0304 + 0313]  0314  3  5.0  675.72    4.32 13.08  14.79  n/a    .000
*
  ****************************
  ** SIMULATION NUMBER:   3 **
  ****************************

  W/E COMMAND             HYD ID   DT    AREA   Qpeak Tpeak   R.V. R.C.   Qbase
                                   min     ha     cms   hrs     mm          cms

     START @   .00 hrs
     --------------------
     MASS STORM               20.0
     [ Ptot= 71.30 mm ]
*
  *  CALIB STANDHYD     0304  1  5.0   46.90    2.31 12.08  40.83  .57    .000
     [I%=20.0:S%= 2.00]
*
  *  CALIB NASHYD       0303  1  5.0  162.73    1.26 13.75  15.75  .22    .000
     [CN=56.8         ]
     [ N = 3.0:Tp 1.56]
*
  *  CALIB NASHYD       0305  1  5.0   18.93     .11 15.17  16.51  .23    .000
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  *  CALIB NASHYD       0104  1  5.0   38.86     .48 13.00  17.10  .24    .000
     [CN=57.9         ]
     [ N = 3.0:Tp  .88]
*
  *  CALIB NASHYD       0101  1  5.0   79.63    1.24 13.08  22.29  .31    .000
     [CN=67.7         ]
     [ N = 3.0:Tp  .98]
*
  *  CALIB NASHYD       0301  1  5.0  212.69    1.26 15.17  16.51  .23    .000
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  *  CALIB NASHYD       0302  1  5.0  115.98    1.31 13.42  19.93  .28    .000
     [CN=64.3         ]
     [ N = 3.0:Tp 1.32]
*
  *  CALIB NASHYD       0308  1  5.0  187.19    1.97 15.00  27.94  .39    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
  *  CALIB NASHYD       0106  1  5.0   20.82     .34 12.83  20.75  .29    .000
     [CN=64.0         ]
     [ N = 3.0:Tp  .79]
*
  *  CALIB NASHYD       0102  1  5.0   29.42     .43 12.75  18.13  .25    .000
     [CN=59.5         ]
     [ N = 3.0:Tp  .74]
```

```
*
  *   CALIB NASHYD       0103  1  5.0   42.47     .30 13.33  11.95  .17    .000
      [CN=49.1         ]
      [ N = 3.0:Tp 1.19]
*
  *   CALIB NASHYD       0105  1  5.0   17.49     .10 13.67  11.35  .16    .000
      [CN=48.0         ]
      [ N = 3.0:Tp 1.44]
*
  *   CALIB NASHYD       0307  1  5.0  191.06    2.01 15.00  27.94  .39    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0306  1  5.0  127.89    1.34 15.00  27.94  .39    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
      ADD [0101 + 0301]  3081  3  5.0  292.32    2.02 13.50  18.08  n/a    .000
*
      ADD [0106 + 0102]  0310  3  5.0   50.24     .77 12.83  19.22  n/a    .000
*
      ADD [0310 + 0103]  3071  3  5.0   92.71    1.03 12.92  15.89  n/a    .000
*
      ADD [3071 + 0105]  3061  3  5.0  110.20    1.12 13.00  15.17  n/a    .000
*
      ADD [0307 + 0306]  3082  3  5.0  318.95    3.35 15.00  27.94  n/a    .000
*
      ADD [0104 + 3081]  3051  3  5.0  331.18    2.46 13.33  17.97  n/a    .000
*
      ADD [3061 + 3082]  3083  3  5.0  429.15    3.92 14.67  24.66  n/a    .000
*
      ADD [0305 + 3051]  3052  3  5.0  350.11    2.53 13.33  17.89  n/a    .000
*
      ADD [0308 + 3083]  3084  3  5.0  616.34    5.87 14.75  25.66  n/a    .000
*
      ADD [3052 + 0302]  0311  3  5.0  466.09    3.83 13.42  18.40  n/a    .000
*
      ADD [0303 + 0311]  0313  3  5.0  628.82    5.06 13.50  17.71  n/a    .000
*
      ADD [0304 + 0313]  0314  3  5.0  675.72    5.70 13.08  19.32  n/a    .000
*
  ****************************
  ** SIMULATION NUMBER:   4 **
  ****************************

  W/E COMMAND             HYD ID   DT    AREA   Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha     cms   hrs     mm          cms

      START @   .00 hrs
      --------------------
      MASS STORM                20.0
      [ Ptot= 83.30 mm ]
*
  *   CALIB STANDHYD     0304  1  5.0   46.90    2.95 12.08  50.69  .61    .000
      [I%=20.0:S%= 2.00]
*
  *   CALIB NASHYD       0303  1  5.0  162.73    1.73 13.75  21.26  .26    .000
      [CN=56.8         ]
      [ N = 3.0:Tp 1.56]
*
  *   CALIB NASHYD       0305  1  5.0   18.93     .15 15.17  22.19  .27    .000
      [CN=57.8         ]
      [ N = 3.0:Tp 2.55]
*
  *   CALIB NASHYD       0104  1  5.0   38.86     .65 12.92  22.85  .27    .000
      [CN=57.9         ]
      [ N = 3.0:Tp  .88]
*
  *   CALIB NASHYD       0101  1  5.0   79.63    1.65 13.08  29.48  .35    .000
      [CN=67.7         ]
      [ N = 3.0:Tp  .98]
*
  *   CALIB NASHYD       0301  1  5.0  212.69    1.71 15.17  22.19  .27    .000
      [CN=57.8         ]
      [ N = 3.0:Tp 2.55]
*
  *   CALIB NASHYD       0302  1  5.0  115.98    1.76 13.42  26.56  .32    .000
      [CN=64.3         ]
      [ N = 3.0:Tp 1.32]
*
  *   CALIB NASHYD       0308  1  5.0  187.19    2.59 15.00  36.45  .44    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0106  1  5.0   20.82     .45 12.83  27.43  .33    .000
      [CN=64.0         ]
      [ N = 3.0:Tp  .79]
*
  *   CALIB NASHYD       0102  1  5.0   29.42     .58 12.75  24.13  .29    .000
```

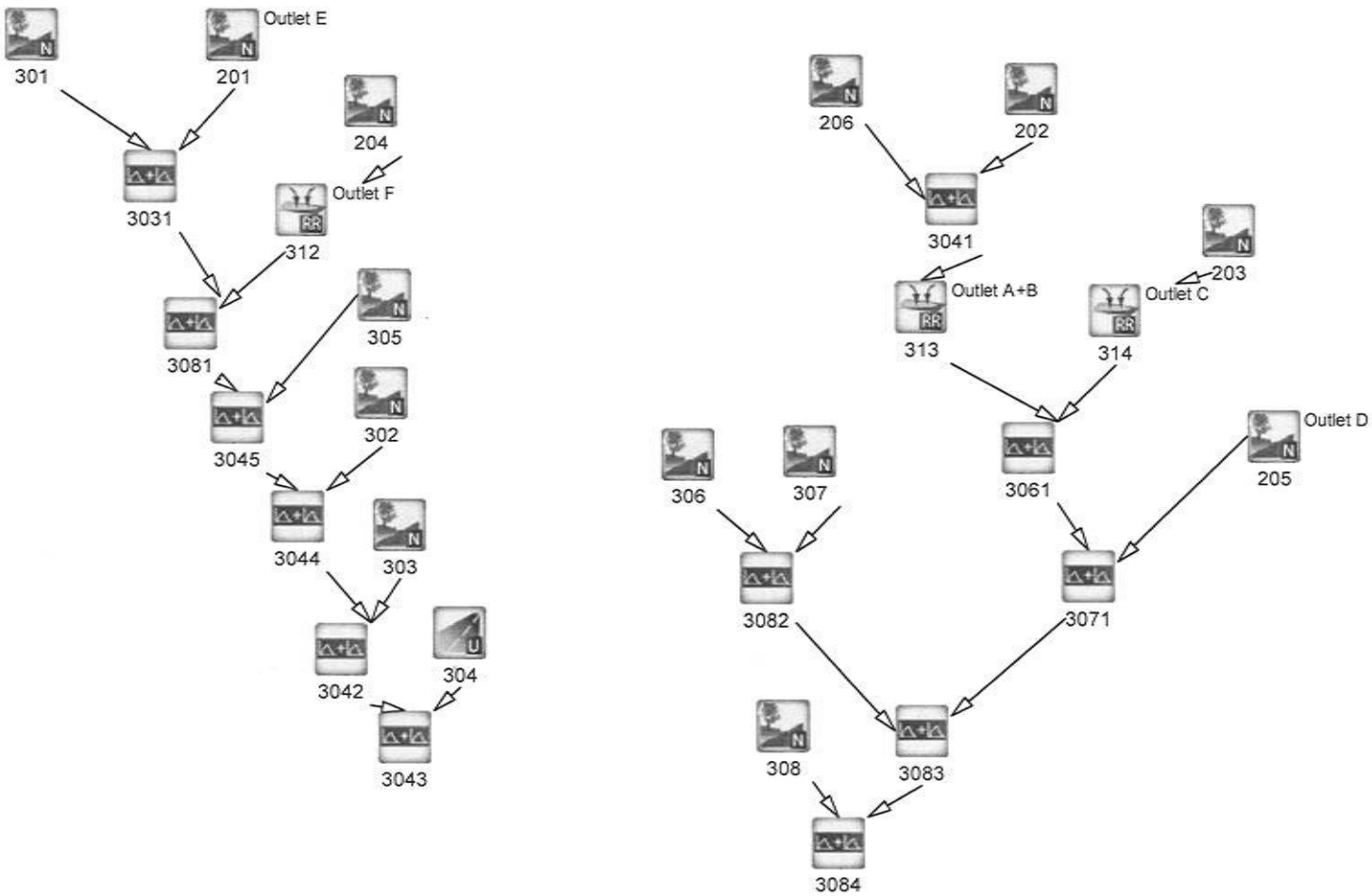
```
     [CN=59.5         ]
     [ N = 3.0:Tp  .74]
*
  *  CALIB NASHYD       0103  1  5.0   42.47     .41 13.33  16.38  .20    .000
     [CN=49.1         ]
     [ N = 3.0:Tp 1.19]
*
  *  CALIB NASHYD       0105  1  5.0   17.49     .14 13.58  15.63  .19    .000
     [CN=48.0         ]
     [ N = 3.0:Tp 1.44]
*
  *  CALIB NASHYD       0307  1  5.0  191.06    2.64 15.00  36.45  .44    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
  *  CALIB NASHYD       0306  1  5.0  127.89    1.77 15.00  36.45  .44    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
     ADD [0101 + 0301]  3081  3  5.0  292.32    2.73 13.50  24.18  n/a    .000
*
     ADD [0106 + 0102]  0310  3  5.0   50.24    1.03 12.75  25.50  n/a    .000
*
     ADD [0310 + 0103]  3071  3  5.0   92.71    1.40 12.92  21.32  n/a    .000
*
     ADD [3071 + 0105]  3061  3  5.0  110.20    1.51 13.00  20.42  n/a    .000
*
     ADD [0307 + 0306]  3082  3  5.0  318.95    4.41 15.00  36.45  n/a    .000
*
     ADD [0104 + 3081]  3051  3  5.0  331.18    3.32 13.33  24.02  n/a    .000
*
     ADD [3061 + 3082]  3083  3  5.0  429.15    5.19 14.58  32.33  n/a    .000
*
     ADD [0305 + 3051]  3052  3  5.0  350.11    3.42 13.33  23.92  n/a    .000
*
     ADD [0308 + 3083]  3084  3  5.0  616.34    7.75 14.75  33.58  n/a    .000
*
     ADD [3052 + 0302]  0311  3  5.0  466.09    5.17 13.33  24.58  n/a    .000
*
     ADD [0303 + 0311]  0313  3  5.0  628.82    6.85 13.50  23.72  n/a    .000
*
     ADD [0304 + 0313]  0314  3  5.0  675.72    7.62 13.08  25.59  n/a    .000
*
  ***************************
  ** SIMULATION NUMBER:   5 **
  ***************************

  W/E COMMAND             HYD ID   DT    AREA   Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha     cms   hrs     mm          cms

     START @   .00 hrs
     --------------------
     MASS STORM                20.0
     [ Ptot= 92.20 mm ]
*
  *  CALIB STANDHYD     0304  1  5.0   46.90    3.64 12.08  58.23  .63    .000
     [I%=20.0:S%= 2.00]
*
  *  CALIB NASHYD       0303  1  5.0  162.73    2.10 13.75  25.71  .28    .000
     [CN=56.8         ]
     [ N = 3.0:Tp 1.56]
*
  *  CALIB NASHYD       0305  1  5.0   18.93     .18 15.08  26.77  .29    .000
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  *  CALIB NASHYD       0104  1  5.0   38.86     .79 12.92  27.48  .30    .000
     [CN=57.9         ]
     [ N = 3.0:Tp  .88]
*
  *  CALIB NASHYD       0101  1  5.0   79.63    1.98 13.08  35.17  .38    .000
     [CN=67.7         ]
     [ N = 3.0:Tp  .98]
*
  *  CALIB NASHYD       0301  1  5.0  212.69    2.07 15.08  26.77  .29    .000
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  *  CALIB NASHYD       0302  1  5.0  115.98    2.13 13.42  31.84  .35    .000
     [CN=64.3         ]
     [ N = 3.0:Tp 1.32]
*
  *  CALIB NASHYD       0308  1  5.0  187.19    3.07 14.92  43.08  .47    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
  *  CALIB NASHYD       0106  1  5.0   20.82     .54 12.83  32.75  .36    .000
     [CN=64.0         ]
     [ N = 3.0:Tp  .79]
```

```
*
  *   CALIB NASHYD       0102  1  5.0   29.42     .70 12.75  28.95  .31    .000
      [CN=59.5         ]
      [ N = 3.0:Tp  .74]
*
  *   CALIB NASHYD       0103  1  5.0   42.47     .51 13.33  20.01  .22    .000
      [CN=49.1         ]
      [ N = 3.0:Tp 1.19]
*
  *   CALIB NASHYD       0105  1  5.0   17.49     .17 13.58  19.13  .21    .000
      [CN=48.0         ]
      [ N = 3.0:Tp 1.44]
*
  *   CALIB NASHYD       0307  1  5.0  191.06    3.14 14.92  43.08  .47    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0306  1  5.0  127.89    2.10 14.92  43.08  .47    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
      ADD [0101 + 0301]  3081  3  5.0  292.32    3.30 13.50  29.06  n/a    .000
*
      ADD [0106 + 0102]  0310  3  5.0   50.24    1.24 12.75  30.52  n/a    .000
*
      ADD [0310 + 0103]  3071  3  5.0   92.71    1.69 12.92  25.71  n/a    .000
*
      ADD [3071 + 0105]  3061  3  5.0  110.20    1.83 12.92  24.66  n/a    .000
*
      ADD [0307 + 0306]  3082  3  5.0  318.95    5.24 14.92  43.08  n/a    .000
*
      ADD [0104 + 3081]  3051  3  5.0  331.18    4.01 13.33  28.87  n/a    .000
*
      ADD [3061 + 3082]  3083  3  5.0  429.15    6.19 14.58  38.35  n/a    .000
*
      ADD [0305 + 3051]  3052  3  5.0  350.11    4.13 13.33  28.76  n/a    .000
*
      ADD [0308 + 3083]  3084  3  5.0  616.34    9.23 14.67  39.79  n/a    .000
*
      ADD [3052 + 0302]  0311  3  5.0  466.09    6.25 13.33  29.53  n/a    .000
*
      ADD [0303 + 0311]  0313  3  5.0  628.82    8.30 13.42  28.54  n/a    .000
*
      ADD [0304 + 0313]  0314  3  5.0  675.72    9.10 13.08  30.60  n/a    .000
*
  ****************************
  ** SIMULATION NUMBER:   6 **
  ****************************

  W/E COMMAND             HYD ID   DT    AREA   Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha     cms   hrs     mm          cms

      START @   .00 hrs
      --------------------
      MASS STORM                20.0
      [ Ptot=101.10 mm ]
*
  *   CALIB STANDHYD     0304  1  5.0   46.90    4.19 12.08  65.92  .65    .000
      [I%=20.0:S%= 2.00]
*
  *   CALIB NASHYD       0303  1  5.0  162.73    2.50 13.75  30.44  .30    .000
      [CN=56.8         ]
      [ N = 3.0:Tp 1.56]
*
  *   CALIB NASHYD       0305  1  5.0   18.93     .22 15.08  31.62  .31    .000
      [CN=57.8         ]
      [ N = 3.0:Tp 2.55]
*
  *   CALIB NASHYD       0104  1  5.0   38.86     .93 12.92  32.38  .32    .000
      [CN=57.9         ]
      [ N = 3.0:Tp  .88]
*
  *   CALIB NASHYD       0101  1  5.0   79.63    2.33 13.00  41.13  .41    .000
      [CN=67.7         ]
      [ N = 3.0:Tp  .98]
*
  *   CALIB NASHYD       0301  1  5.0  212.69    2.46 15.08  31.62  .31    .000
      [CN=57.8         ]
      [ N = 3.0:Tp 2.55]
*
  *   CALIB NASHYD       0302  1  5.0  115.98    2.51 13.42  37.40  .37    .000
      [CN=64.3         ]
      [ N = 3.0:Tp 1.32]
*
  *   CALIB NASHYD       0308  1  5.0  187.19    3.58 14.92  49.95  .49    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0106  1  5.0   20.82     .64 12.83  38.33  .38    .000
```

```
     [CN=64.0         ]
     [ N = 3.0:Tp  .79]
*
  *  CALIB NASHYD       0102  1  5.0   29.42     .82 12.75  34.03  .34    .000
     [CN=59.5         ]
     [ N = 3.0:Tp  .74]
*
  *  CALIB NASHYD       0103  1  5.0   42.47     .61 13.33  23.90  .24    .000
     [CN=49.1         ]
     [ N = 3.0:Tp 1.19]
*
  *  CALIB NASHYD       0105  1  5.0   17.49     .21 13.58  22.90  .23    .000
     [CN=48.0         ]
     [ N = 3.0:Tp 1.44]
*
  *  CALIB NASHYD       0307  1  5.0  191.06    3.65 14.92  49.95  .49    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
  *  CALIB NASHYD       0306  1  5.0  127.89    2.45 14.92  49.95  .49    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
     ADD [0101 + 0301]  3081  3  5.0  292.32    3.90 13.50  34.21  n/a    .000
*
     ADD [0106 + 0102]  0310  3  5.0   50.24    1.46 12.75  35.81  n/a    .000
*
     ADD [0310 + 0103]  3071  3  5.0   92.71    2.00 12.92  30.36  n/a    .000
*
     ADD [3071 + 0105]  3061  3  5.0  110.20    2.18 12.92  29.17  n/a    .000
*
     ADD [0307 + 0306]  3082  3  5.0  318.95    6.10 14.92  49.95  n/a    .000
*
     ADD [0104 + 3081]  3051  3  5.0  331.18    4.74 13.33  34.00  n/a    .000
*
     ADD [3061 + 3082]  3083  3  5.0  429.15    7.23 14.50  44.61  n/a    .000
*
     ADD [0305 + 3051]  3052  3  5.0  350.11    4.89 13.33  33.87  n/a    .000
*
     ADD [0308 + 3083]  3084  3  5.0  616.34   10.77 14.67  46.23  n/a    .000
*
     ADD [3052 + 0302]  0311  3  5.0  466.09    7.39 13.33  34.75  n/a    .000
*
     ADD [0303 + 0311]  0313  3  5.0  628.82    9.83 13.42  33.63  n/a    .000
*
     ADD [0304 + 0313]  0314  3  5.0  675.72   10.71 13.08  35.87  n/a    .000
*
 FINISH

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

APPENDIX B:
POST-DEVELOPMENT HYDROLOGY CALCULATIONS

Proposed Conditions OTTHYMO Model Schematic



C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie

Project:	Burls Creek Event Grounds
File No.:	115032
Date:	9-Apr-15
Designed By:	AR
Checked By:	ALK
Subject:	CN Calculator

Burls Creek Event Grounds
CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

CONDITIONS

Catchment 201 **Area** 71.81 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
gus	GUERIN	AB	Sand Loam	1	71.81	1	4.309	0.06	46	60.32	0.84	59	0		51	5.027	0.07	89	2.154	0.03	100	0		50	61.55
stsl	SARGENT	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
vasl	VASEY	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
ans	ALLISTON	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	71.81	1	4.3086	0.06		60.3204	0.84		0	0		5.0267	0.07		2.1543	0.03		0	0		61.6

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	288	m
Minimum Catchment Elevation	270	m
Catchment length	1250	m
Catchment Slope	1%	
Catchment Area	71.81	ha
Time of Concentration (Minutes)	43.20	
Time of Concentration (Hours)	0.72	
Time to Peak (2/3 x Time of Concentration)	0.48	

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	288	m
Minimum Catchment Elevation	270	m
Catchment length	1250	m
Catchment Slope	1%	
Catchment Area	71.81	ha
Time of Concentration (Minutes)	96.13	
Time of Concentration (Hours)	1.60	
Time to Peak (2/3 x Time of Concentration)	1.07	

Time to Peak	1.07 hrs

Initial Abstraction	5.07 mm

Wetlands	12
Woods	10
Meadows	8
Gravel	3
Lawns	5
Impervious	2

Runoff Coefficient	0.16

Landuse Type	Soil Series				
	gus	0	0	0	0
	1	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.08	#N/A	#N/A	#N/A	#N/A
Gravel	0.6	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.1	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.09	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.159	#N/A	#N/A	#N/A	#N/A

C.C.Tatham & Associates Ltd.
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Checked By:	ALK
Subject:	CN Calculator

Burls Creek Event Grounds
CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

CONDITIONS

Catchment 202 **Area** 29.42 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
gus	GUERIN	AB	Sand Loam	1	29.42	1	3.825	0.13	46	23.54	0.8	59	0		51	1.765	0.06	89	0.294	0.01	100	0		50	59.52
stsl	SARGENT	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
vasl	VASEY	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
ans	ALLISTON	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	29.42	1	3.8246	0.13		23.536	0.8		0	0		1.7652	0.06		0.2942	0.01		0	0		59.5

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	280	m
Minimum Catchment Elevation	266	m
Catchment length	700	m
Catchment Slope	2%	
Catchment Area	29.42	ha
Time of Concentration (Minutes)	**24.77**	
Time of Concentration (Hours)	**0.41**	
Time to Peak (2/3 x Time of Concentration)	**0.28**	

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	280	m
Minimum Catchment Elevation	266	m
Catchment length	700	m
Catchment Slope	2%	
Catchment Area	29.42	ha
Time of Concentration (Minutes)	**66.15**	
Time of Concentration (Hours)	**1.10**	
Time to Peak (2/3 x Time of Concentration)	**0.74**	

Time to Peak	0.74 hrs

Initial Abstraction	5.5 mm

Wetlands	12
Woods	10
Meadows	8
Gravel	3
Lawns	5
Impervious	2

Runoff Coefficient	0.14

Landuse Type	Soil Series				
	gus	0	0	0	0
	1	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.08	#N/A	#N/A	#N/A	#N/A
Gravel	0.6	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.1	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.09	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.136	#N/A	#N/A	#N/A	#N/A

C.C. Tatham & Associates Ltd.
Consulting Engineers

Collingwood Bracebridge Orillia Barrie

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Date:	9-Apr-15
Designed By:	AR
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Subject:	CN Calculator

Burls Creek Event Grounds
CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

CONDITIONS

Catchment 203 **Area** 42.47 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
gus	GUERIN	AB	Sand Loam	1	42.47	1	30.58	0.72	46	6.371	0.15	59	0		51	5.096	0.12	89	0.425	0.01	100	0		50	53.65
stsl	SARGENT	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
vasl	VASEY	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
ans	ALLISTON	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	42.47	1	30.5784	0.72		6.3705	0.15		0	0		5.0964	0.12		0.4247	0.01		0	0		53.7

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	280	m
Minimum Catchment Elevation	259	m
Catchment length	1400	m
Catchment Slope	2%	
Catchment Area	42.47	ha
Time of Concentration (Minutes)	**50.58**	
Time of Concentration (Hours)	**0.84**	
Time to Peak (2/3 x Time of Concentration)	**0.56**	

Time to Peak	**1.12 hrs**

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	280	m
Minimum Catchment Elevation	259	m
Catchment length	1400	m
Catchment Slope	2%	
Catchment Area	42.47	ha
Time of Concentration (Minutes)	**100.93**	
Time of Concentration (Hours)	**1.68**	
Time to Peak (2/3 x Time of Concentration)	**1.12**	

Initial Abstraction	**8.33 mm**

Runoff Coefficient	**0.15**

Wetlands	12
Woods	10
Meadows	8
Gravel	3
Lawns	5
Impervious	2

Landuse Type	Soil Series				
	gus	0	0	0	0
	1	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.08	#N/A	#N/A	#N/A	#N/A
Gravel	0.6	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.1	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.09	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.154	#N/A	#N/A	#N/A	#N/A

C.C. Tatham & Associates Ltd.
Consulting Engineers

Collingwood Bracebridge Orillia Barrie

Project:	Burls Creek Event Grounds
File No.:	115032
Date:	9-Apr-15
Designed By:	AR
Checked By:	ALK
Subject:	CN Calculator

Burls Creek Event Grounds
CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

CONDITIONS

Catchment 204 **Area** 37.00 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
gus	GUERIN	AB	Sand Loam	1	37	1	7.4	0.2	46	25.9	0.7	59	0		51	3.7	0.1	89	0		100	0		50	59.4
stsl	SARGENT	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
vasl	VASEY	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
ans	ALLISTON	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	37	1	7.4	0.2		25.9	0.7		0	0		3.7	0.1		0	0		0	0		59.4

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	282	m
Minimum Catchment Elevation	272	m
Catchment length	750	m
Catchment Slope	1%	
Catchment Area	37	ha
Time of Concentration (Minutes)	28.13	
Time of Concentration (Hours)	0.47	
Time to Peak (2/3 x Time of Concentration)	0.31	

Time to Peak	0.86 hrs

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	282	m
Minimum Catchment Elevation	272	m
Catchment length	750	m
Catchment Slope	1%	
Catchment Area	37	ha
Time of Concentration (Minutes)	77.46	
Time of Concentration (Hours)	1.29	
Time to Peak (2/3 x Time of Concentration)	0.86	

Initial Abstraction	5.8 mm

Wetlands	12
Woods	10
Meadows	8
Gravel	3
Lawns	5
Impervious	2

Runoff Coefficient	0.15

Landuse Type	Soil Series				
	gus	0	0	0	0
	1	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.08	#N/A	#N/A	#N/A	#N/A
Gravel	0.6	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.1	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.09	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.146	#N/A	#N/A	#N/A	#N/A

C.C. Tatham & Associates Ltd.
Consulting Engineers

Collingwood Bracebridge Orillia Barrie

Project:	Burls Creek Event Grounds
File No.:	115032
Date:	9-Apr-15
Designed By:	AR
Checked By:	ALK
Subject:	CN Calculator

Burls Creek Event Grounds
CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

CONDITIONS

Catchment 205 **Area** 17.49 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
gus	GUERIN	AB	Sand Loam	1	17.49	1	15.74	0.9	46	1.399	0.08	59	0		51	0.175	0.01	89	0.175	0.01	100	0		50	48.01
stsl	SARGENT	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
vasl	VASEY	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
ans	ALLISTON	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	17.49	1	15.741	0.9		1.3992	0.08		0	0		0.1749	0.01		0.1749	0.01		0	0		48.0

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	272	m
Minimum Catchment Elevation	258	m
Catchment length	1500	m
Catchment Slope	1%	
Catchment Area	17.49	ha
Time of Concentration (Minutes)	**65.11**	
Time of Concentration (Hours)	**1.09**	
Time to Peak (2/3 x Time of Concentration)	**0.72**	

Time to Peak	**1.44 hrs**

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	272	m
Minimum Catchment Elevation	258	m
Catchment length	1500	m
Catchment Slope	1%	
Catchment Area	17.49	ha
Time of Concentration (Minutes)	**129.75**	
Time of Concentration (Hours)	**2.16**	
Time to Peak (2/3 x Time of Concentration)	**1.44**	

Initial Abstraction	**9.45 mm**

Wetlands	12
Woods	10
Meadows	8
Gravel	3
Lawns	5
Impervious	2

Runoff Coefficient	**0.10**

Landuse Type	Soil Series				
	gus	0	0	0	0
	1	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.08	#N/A	#N/A	#N/A	#N/A
Gravel	0.6	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.1	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.09	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.096	#N/A	#N/A	#N/A	#N/A

C.C. Tatham & Associates Ltd.
Consulting Engineers

Collingwood Bracebridge Orillia Barrie

Project:	Burls Creek Event Grounds
File No.:	115032
Date:	9-Apr-15
Designed By:	AR
Checked By:	ALK
Subject:	CN Calculator

Burls Creek Event Grounds
CURVE NUMBER, INITIAL ABSTRACTION & TIME TO PEAK CALCULATIONS

CONDITIONS

Catchment 206 **Area** 30.50 ha

WEIGHTED CN VALUE

Soil Series	Soil Series	Hydrologic Soil Group	Soil Texture	Runoff Coefficient Type	Catchment Soil Characteristics		Forest/Woodland			Pasture/Lawns			Meadows			Gravel			Impervious			Wetland/Lakes/SWMF			Average CN for Soil Type
					Area	Percent	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	Area	Percent	CN	
gus	GUERIN	AB	Sand Loam	1	30.5	1	6.1	0.2	46	16.17	0.53	59	0		51	7.93	0.26	89	0.305	0.01	100	1.83	0.06	50	67.61
stsl	SARGENT	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
vasl	VASEY	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
ans	ALLISTON	AB	Sand Loam	1	0		0		46	0		59	0		51	0		89	0		100	0		50	0
	#N/A	#N/A	#N/A	#N/A	0		0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0		#N/A	0
				Totals	30.5	1	6.1	0.2		16.165	0.53		0	0		7.93	0.26		0.305	0.01		1.83	0.06		67.6

Time of Concentration Calculations

For Runoff Coefficients greater than 0.4

Bransby-Williams Formula

Maximum Catchment Elevation	286	m
Minimum Catchment Elevation	276	m
Catchment length	750	m
Catchment Slope	1%	
Catchment Area	30.5	ha
Time of Concentration (Minutes)	**28.68**	
Time of Concentration (Hours)	**0.48**	
Time to Peak (2/3 x Time of Concentration)	**0.32**	

Time to Peak	**0.78 hrs**

For Runoff Coefficients less than 0.4

Airport Method

Maximum Catchment Elevation	286	m
Minimum Catchment Elevation	276	m
Catchment length	750	m
Catchment Slope	1%	
Catchment Area	30.5	ha
Time of Concentration (Minutes)	**70.03**	
Time of Concentration (Hours)	**1.17**	
Time to Peak (2/3 x Time of Concentration)	**0.78**	

Initial Abstraction	**6.17 mm**

Wetlands	12
Woods	10
Meadows	8
Gravel	3
Lawns	5
Impervious	2

Runoff Coefficient	**0.24**

Landuse Type	Soil Series				
	gus	0	0	0	0
	1	#N/A	#N/A	#N/A	#N/A
Forest/Woodland	0.06	#N/A	#N/A	#N/A	#N/A
Gravel	0.6	#N/A	#N/A	#N/A	#N/A
Pasture/Lawn	0.1	#N/A	#N/A	#N/A	#N/A
Impervious	0.95	#N/A	#N/A	#N/A	#N/A
Wetland/Lake/SWMF	0.05	#N/A	#N/A	#N/A	#N/A
Meadows	0.09	#N/A	#N/A	#N/A	#N/A
Soil Series Total	0.238	#N/A	#N/A	#N/A	#N/A

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

  OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
 O   O    T      T    H   H   Y Y   MM MM  O   O
 O   O    T      T    H   H    Y    M   M  O   O
  OOO     T      T    H   H    Y    M   M   OOO
```


***** S U M M A R Y O U T P U T *****

Input filename: C:\Program Files\Visual OTTHYMO 2.2.4\voin.dat
Output filename: I:\2015PR~1\115032~1\Design\SWM\OTTHYM~1\Proposed CHI.out
Summary filename: I:\2015PR~1\115032~1\Design\SWM\OTTHYM~1\Proposed CHI.sum

DATE: 6/4/2015 TIME: 9:15:31 AM

USER:

COMMENTS: Proposed Condition Chicago Design Storm

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

  W/E COMMAND             HYD ID   DT    AREA   Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha     cms   hrs     mm          cms

      START @   .00 hrs
      --------------------
      READ STORM                10.0
      [ Ptot= 33.84 mm ]
      fname : I:\2015 Projects\115032 - Burls Creek\Design\SWM\OTTHYMO Model\storms\Orillia\CHI 2-yr Orillia.stm
      remark: 2-Year Orillia 4-hour Chicago Storm
*
  *   CALIB STANDHYD     0304  1  5.0   46.90    1.63  1.42  13.59  .40    .000
      [I%=20.0:S%= 2.00]
*
  *   CALIB NASHYD       0303  1  5.0  162.73     .38  3.50   3.12  .09    .000
      [CN=56.8         ]
      [ N = 3.0:Tp 1.56]
*
  *   CALIB NASHYD       0305  1  5.0   18.93     .03  4.67   3.37  .10    .000
      [CN=57.8         ]
      [ N = 3.0:Tp 2.55]
*
  *   CALIB NASHYD       0201  1  5.0   71.81     .32  2.75   4.41  .13    .000
      [CN=61.6         ]
      [ N = 3.0:Tp 1.07]
*
  *   CALIB NASHYD       0301  1  5.0  212.69     .38  4.67   3.37  .10    .000
      [CN=57.8         ]
      [ N = 3.0:Tp 2.55]
*
  *   CALIB NASHYD       0204  1  5.0   37.00     .17  2.50   3.90  .12    .000
      [CN=59.4         ]
      [ N = 3.0:Tp  .86]
*
  *   CALIB NASHYD       0302  1  5.0  115.98     .41  3.17   4.17  .12    .000
      [CN=64.3         ]
      [ N = 3.0:Tp 1.32]
*
  *   CALIB NASHYD       0308  1  5.0  187.19     .65  4.58   6.39  .19    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0206  1  5.0   30.50     .19  2.33   5.12  .15    .000
      [CN=67.6         ]
      [ N = 3.0:Tp  .78]
*
  *   CALIB NASHYD       0202  1  5.0   29.42     .15  2.33   3.99  .12    .000
      [CN=59.5         ]
      [ N = 3.0:Tp  .74]
*
  *   CALIB NASHYD       0203  1  5.0   42.47     .11  2.92   2.67  .08    .000
```

```
     [CN=53.7         ]
     [ N = 3.0:Tp 1.12]
*
  *  CALIB NASHYD       0205  1  5.0   17.49     .03  3.42   1.99  .06    .000
     [CN=48.0         ]
     [ N = 3.0:Tp 1.44]
*
  *  CALIB NASHYD       0307  1  5.0  191.06     .66  4.58   6.39  .19    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
  *  CALIB NASHYD       0306  1  5.0  127.89     .44  4.58   6.39  .19    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
     ADD [0201 + 0301]  3031  3  5.0  284.50     .58  3.58   3.63  n/a    .000
*
     RESRVR [ 2 : 0204] 0312  1  5.0   37.00     .16  2.67   3.90  n/a    .000
     {ST=   .01 ha.m }
*
     ADD [0206 + 0202]  3041  3  5.0   59.92     .34  2.33   4.57  n/a    .000
*
     RESRVR [ 2 : 0203] 0314  1  5.0   42.47     .09  3.83   2.67  n/a    .000
     {ST=   .03 ha.m }
*
     ADD [0307 + 0306]  3082  3  5.0  318.95    1.10  4.58   6.39  n/a    .000
*
     ADD [3031 + 0312]  3081  3  5.0  321.50     .71  3.17   3.66  n/a    .000
*
     RESRVR [ 2 : 3041] 0313  1  5.0   59.92     .26  3.08   4.56  n/a    .000
     {ST=   .07 ha.m }
*
     ADD [0313 + 0314]  3061  3  5.0  102.39     .34  3.25   3.78  n/a    .000
*
     ADD [0305 + 3081]  3045  3  5.0  340.43     .73  3.25   3.65  n/a    .000
*
     ADD [3061 + 0205]  3071  3  5.0  119.88     .37  3.25   3.52  n/a    .000
*
     ADD [3045 + 0302]  3044  3  5.0  456.41    1.14  3.25   3.78  n/a    .000
*
     ADD [3071 + 3082]  3083  3  5.0  438.83    1.38  4.25   5.60  n/a    .000
*
     ADD [0303 + 3044]  3042  3  5.0  619.14    1.52  3.33   3.61  n/a    .000
*
     ADD [0308 + 3083]  3084  3  5.0  626.02    2.02  4.33   5.84  n/a    .000
*
     ADD [0304 + 3042]  3043  3  5.0  666.04    1.77  3.00   4.31  n/a    .000
*
  ****************************
  ** SIMULATION NUMBER:   2 **
  ****************************

  W/E COMMAND             HYD ID   DT    AREA   Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha     cms   hrs     mm          cms

     START @   .00 hrs
     --------------------
     READ STORM                10.0
     [ Ptot= 44.10 mm ]
     fname : I:\2015 Projects\115032 - Burls Creek\Design\SWM\OTTHYMO Model\storms\Orillia\CHI 5-yr Orillia.stm
     remark: 5-Year Orillia 4-hour Chicago Storm
*
  *  CALIB STANDHYD     0304  1  5.0   46.90    2.53  1.33  20.30  .46    .000
     [I%=20.0:S%= 2.00]
*
  *  CALIB NASHYD       0303  1  5.0  162.73     .72  3.42   5.77  .13    .000
     [CN=56.8         ]
     [ N = 3.0:Tp 1.56]
*
  *  CALIB NASHYD       0305  1  5.0   18.93     .06  4.58   6.15  .14    .000
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  *  CALIB NASHYD       0201  1  5.0   71.81     .57  2.67   7.70  .17    .000
     [CN=61.6         ]
     [ N = 3.0:Tp 1.07]
*
  *  CALIB NASHYD       0301  1  5.0  212.69     .70  4.58   6.15  .14    .000
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  *  CALIB NASHYD       0204  1  5.0   37.00     .30  2.42   6.92  .16    .000
     [CN=59.4         ]
     [ N = 3.0:Tp  .86]
*
  *  CALIB NASHYD       0302  1  5.0  115.98     .77  3.08   7.58  .17    .000
     [CN=64.3         ]
     [ N = 3.0:Tp 1.32]
*
```

```
  *   CALIB NASHYD       0308  1  5.0  187.19    1.15  4.50  11.28  .26    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0206  1  5.0   30.50     .35  2.33   9.01  .20    .000
      [CN=67.6         ]
      [ N = 3.0:Tp  .78]
*
  *   CALIB NASHYD       0202  1  5.0   29.42     .27  2.25   7.04  .16    .000
      [CN=59.5         ]
      [ N = 3.0:Tp  .74]
*
  *   CALIB NASHYD       0203  1  5.0   42.47     .21  2.83   5.03  .11    .000
      [CN=53.7         ]
      [ N = 3.0:Tp 1.12]
*
  *   CALIB NASHYD       0205  1  5.0   17.49     .05  3.33   3.87  .09    .000
      [CN=48.0         ]
      [ N = 3.0:Tp 1.44]
*
  *   CALIB NASHYD       0307  1  5.0  191.06    1.17  4.50  11.28  .26    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0306  1  5.0  127.89     .79  4.50  11.28  .26    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
      ADD [0201 + 0301]  3031  3  5.0  284.50    1.05  3.50   6.54  n/a    .000
*
      RESRVR [ 2 : 0204] 0312  1  5.0   37.00     .30  2.58   6.92  n/a    .000
      {ST=   .01 ha.m }
*
      ADD [0206 + 0202]  3041  3  5.0   59.92     .62  2.33   8.04  n/a    .000
*
      RESRVR [ 2 : 0203] 0314  1  5.0   42.47     .17  3.67   5.03  n/a    .000
      {ST=   .05 ha.m }
*
      ADD [0307 + 0306]  3082  3  5.0  318.95    1.96  4.50  11.28  n/a    .000
*
      ADD [3031 + 0312]  3081  3  5.0  321.50    1.29  3.08   6.59  n/a    .000
*
      RESRVR [ 2 : 3041] 0313  1  5.0   59.92     .47  3.00   8.04  n/a    .000
      {ST=   .12 ha.m }
*
      ADD [0313 + 0314]  3061  3  5.0  102.39     .62  3.17   6.79  n/a    .000
*
      ADD [0305 + 3081]  3045  3  5.0  340.43    1.34  3.17   6.56  n/a    .000
*
      ADD [3061 + 0205]  3071  3  5.0  119.88     .68  3.17   6.36  n/a    .000
*
      ADD [3045 + 0302]  3044  3  5.0  456.41    2.10  3.08   6.82  n/a    .000
*
      ADD [3071 + 3082]  3083  3  5.0  438.83    2.47  4.08   9.94  n/a    .000
*
      ADD [0303 + 3044]  3042  3  5.0  619.14    2.81  3.25   6.54  n/a    .000
*
      ADD [0308 + 3083]  3084  3  5.0  626.02    3.61  4.25  10.34  n/a    .000
*
      ADD [0304 + 3042]  3043  3  5.0  666.04    3.15  3.00   7.51  n/a    .000
*
  ****************************
  ** SIMULATION NUMBER:   3 **
  ****************************

  W/E COMMAND             HYD ID   DT    AREA   Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha     cms   hrs     mm          cms

      START @   .00 hrs
      --------------------
      READ STORM                10.0
      [ Ptot= 50.61 mm ]
      fname : I:\2015 Projects\115032 - Burls Creek\Design\SWM\OTTHYMO Model\storms\Orillia\CHI 10-yr Orillia.stm
      remark: 10-Year Orillia 4-hour Chicago Storm
*
  *   CALIB STANDHYD     0304  1  5.0   46.90    3.10  1.33  24.92  .49    .000
      [I%=20.0:S%= 2.00]
*
  *   CALIB NASHYD       0303  1  5.0  162.73     .98  3.42   7.80  .15    .000
      [CN=56.8         ]
      [ N = 3.0:Tp 1.56]
*
  *   CALIB NASHYD       0305  1  5.0   18.93     .08  4.50   8.27  .16    .000
      [CN=57.8         ]
      [ N = 3.0:Tp 2.55]
*
  *   CALIB NASHYD       0201  1  5.0   71.81     .75  2.67  10.16  .20    .000
      [CN=61.6         ]
      [ N = 3.0:Tp 1.07]
```

```
*
  *   CALIB NASHYD       0301  1  5.0  212.69     .94  4.50   8.27  .16    .000
      [CN=57.8         ]
      [ N = 3.0:Tp 2.55]
*
  *   CALIB NASHYD       0204  1  5.0   37.00     .41  2.42   9.19  .18    .000
      [CN=59.4         ]
      [ N = 3.0:Tp  .86]
*
  *   CALIB NASHYD       0302  1  5.0  115.98    1.03  3.00  10.13  .20    .000
      [CN=64.3         ]
      [ N = 3.0:Tp 1.32]
*
  *   CALIB NASHYD       0308  1  5.0  187.19    1.52  4.42  14.85  .29    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0206  1  5.0   30.50     .47  2.33  11.88  .23    .000
      [CN=67.6         ]
      [ N = 3.0:Tp  .78]
*
  *   CALIB NASHYD       0202  1  5.0   29.42     .37  2.25   9.33  .18    .000
      [CN=59.5         ]
      [ N = 3.0:Tp  .74]
*
  *   CALIB NASHYD       0203  1  5.0   42.47     .29  2.83   6.85  .14    .000
      [CN=53.7         ]
      [ N = 3.0:Tp 1.12]
*
  *   CALIB NASHYD       0205  1  5.0   17.49     .08  3.25   5.36  .11    .000
      [CN=48.0         ]
      [ N = 3.0:Tp 1.44]
*
  *   CALIB NASHYD       0307  1  5.0  191.06    1.55  4.42  14.85  .29    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0306  1  5.0  127.89    1.04  4.42  14.85  .29    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
      ADD [0201 + 0301]  3031  3  5.0  284.50    1.41  3.50   8.74  n/a    .000
*
      RESRVR [ 2 : 0204] 0312  1  5.0   37.00     .40  2.58   9.19  n/a    .000
      {ST=   .02 ha.m }
*
      ADD [0206 + 0202]  3041  3  5.0   59.92     .84  2.25  10.63  n/a    .000
*
      RESRVR [ 2 : 0203] 0314  1  5.0   42.47     .23  3.67   6.85  n/a    .000
      {ST=   .07 ha.m }
*
      ADD [0307 + 0306]  3082  3  5.0  318.95    2.59  4.42  14.85  n/a    .000
*
      ADD [3031 + 0312]  3081  3  5.0  321.50    1.74  3.08   8.80  n/a    .000
*
      RESRVR [ 2 : 3041] 0313  1  5.0   59.92     .63  3.00  10.63  n/a    .000
      {ST=   .17 ha.m }
*
      ADD [0313 + 0314]  3061  3  5.0  102.39     .84  3.08   9.06  n/a    .000
*
      ADD [0305 + 3081]  3045  3  5.0  340.43    1.80  3.17   8.77  n/a    .000
*
      ADD [3061 + 0205]  3071  3  5.0  119.88     .92  3.17   8.52  n/a    .000
*
      ADD [3045 + 0302]  3044  3  5.0  456.41    2.83  3.08   9.11  n/a    .000
*
      ADD [3071 + 3082]  3083  3  5.0  438.83    3.28  4.08  13.12  n/a    .000
*
      ADD [0303 + 3044]  3042  3  5.0  619.14    3.80  3.17   8.77  n/a    .000
*
      ADD [0308 + 3083]  3084  3  5.0  626.02    4.78  4.17  13.64  n/a    .000
*
      ADD [0304 + 3042]  3043  3  5.0  666.04    4.20  3.00   9.91  n/a    .000
*
  ****************************
  ** SIMULATION NUMBER:   4 **
  ****************************

  W/E COMMAND             HYD ID   DT    AREA   Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha     cms   hrs     mm          cms

      START @   .00 hrs
      --------------------
      READ STORM                10.0
      [ Ptot= 58.97 mm ]
      fname : I:\2015 Projects\115032 - Burls Creek\Design\SWM\OTTHYMO Model\storms\Orillia\CHI 25-yr Orillia.stm
      remark: 25-Year Orillia 4-hour Chicago Storm
*
  *   CALIB STANDHYD     0304  1  5.0   46.90    3.88  1.33  31.14  .53    .000
```

```
     [I%=20.0:S%= 2.00]
*
  *  CALIB NASHYD       0303  1  5.0  162.73    1.37  3.33  10.75  .18    .000
     [CN=56.8         ]
     [ N = 3.0:Tp 1.56]
*
  *  CALIB NASHYD       0305  1  5.0   18.93     .12  4.50  11.34  .19    .000
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  *  CALIB NASHYD       0201  1  5.0   71.81    1.03  2.67  13.67  .23    .000
     [CN=61.6         ]
     [ N = 3.0:Tp 1.07]
*
  *  CALIB NASHYD       0301  1  5.0  212.69    1.30  4.50  11.34  .19    .000
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  *  CALIB NASHYD       0204  1  5.0   37.00     .57  2.42  12.47  .21    .000
     [CN=59.4         ]
     [ N = 3.0:Tp  .86]
*
  *  CALIB NASHYD       0302  1  5.0  115.98    1.43  3.00  13.81  .23    .000
     [CN=64.3         ]
     [ N = 3.0:Tp 1.32]
*
  *  CALIB NASHYD       0308  1  5.0  187.19    2.04  4.42  19.86  .34    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
  *  CALIB NASHYD       0206  1  5.0   30.50     .65  2.25  15.97  .27    .000
     [CN=67.6         ]
     [ N = 3.0:Tp  .78]
*
  *  CALIB NASHYD       0202  1  5.0   29.42     .51  2.25  12.62  .21    .000
     [CN=59.5         ]
     [ N = 3.0:Tp  .74]
*
  *  CALIB NASHYD       0203  1  5.0   42.47     .40  2.75   9.52  .16    .000
     [CN=53.7         ]
     [ N = 3.0:Tp 1.12]
*
  *  CALIB NASHYD       0205  1  5.0   17.49     .11  3.25   7.55  .13    .000
     [CN=48.0         ]
     [ N = 3.0:Tp 1.44]
*
  *  CALIB NASHYD       0307  1  5.0  191.06    2.08  4.42  19.86  .34    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
  *  CALIB NASHYD       0306  1  5.0  127.89    1.39  4.42  19.86  .34    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
     ADD [0201 + 0301]  3031  3  5.0  284.50    1.94  3.42  11.93  n/a    .000
*
     RESRVR [ 2 : 0204] 0312  1  5.0   37.00     .56  2.58  12.47  n/a    .000
     {ST=   .03 ha.m }
*
     ADD [0206 + 0202]  3041  3  5.0   59.92    1.15  2.25  14.33  n/a    .000
*
     RESRVR [ 2 : 0203] 0314  1  5.0   42.47     .33  3.58   9.52  n/a    .000
     {ST=   .10 ha.m }
*
     ADD [0307 + 0306]  3082  3  5.0  318.95    3.47  4.42  19.86  n/a    .000
*
     ADD [3031 + 0312]  3081  3  5.0  321.50    2.39  3.08  11.99  n/a    .000
*
     RESRVR [ 2 : 3041] 0313  1  5.0   59.92     .86  2.92  14.33  n/a    .000
     {ST=   .23 ha.m }
*
     ADD [0313 + 0314]  3061  3  5.0  102.39    1.16  3.08  12.33  n/a    .000
*
     ADD [0305 + 3081]  3045  3  5.0  340.43    2.47  3.08  11.95  n/a    .000
*
     ADD [3061 + 0205]  3071  3  5.0  119.88    1.27  3.08  11.63  n/a    .000
*
     ADD [3045 + 0302]  3044  3  5.0  456.41    3.90  3.08  12.42  n/a    .000
*
     ADD [3071 + 3082]  3083  3  5.0  438.83    4.44  4.00  17.61  n/a    .000
*
     ADD [0303 + 3044]  3042  3  5.0  619.14    5.25  3.17  11.98  n/a    .000
*
     ADD [0308 + 3083]  3084  3  5.0  626.02    6.44  4.08  18.28  n/a    .000
*
     ADD [0304 + 3042]  3043  3  5.0  666.04    5.72  3.00  13.33  n/a    .000
*
  ***************************
  ** SIMULATION NUMBER:   5 **
```

```
 ***************************

  W/E COMMAND             HYD ID   DT    AREA   Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha     cms   hrs     mm          cms

      START @   .00 hrs
      --------------------
      READ STORM                10.0
      [ Ptot= 65.52 mm ]
      fname : I:\2015 Projects\115032 - Burls Creek\Design\SWM\OTTHYMO Model\storms\Orillia\CHI 50-yr Orillia.stm
      remark: 50-Year Orillia 4-hour Chicago Storm
*
  *   CALIB STANDHYD     0304  1  5.0   46.90    5.22  1.50  36.22  .55    .000
      [I%=20.0:S%= 2.00]
*
  *   CALIB NASHYD       0303  1  5.0  162.73    1.71  3.33  13.32  .20    .000
      [CN=56.8         ]
      [ N = 3.0:Tp 1.56]
*
  *   CALIB NASHYD       0305  1  5.0   18.93     .14  4.50  13.99  .21    .000
      [CN=57.8         ]
      [ N = 3.0:Tp 2.55]
*
  *   CALIB NASHYD       0201  1  5.0   71.81    1.27  2.67  16.68  .25    .000
      [CN=61.6         ]
      [ N = 3.0:Tp 1.07]
*
  *   CALIB NASHYD       0301  1  5.0  212.69    1.61  4.50  13.99  .21    .000
      [CN=57.8         ]
      [ N = 3.0:Tp 2.55]
*
  *   CALIB NASHYD       0204  1  5.0   37.00     .70  2.42  15.28  .23    .000
      [CN=59.4         ]
      [ N = 3.0:Tp  .86]
*
  *   CALIB NASHYD       0302  1  5.0  115.98    1.77  3.00  16.96  .26    .000
      [CN=64.3         ]
      [ N = 3.0:Tp 1.32]
*
  *   CALIB NASHYD       0308  1  5.0  187.19    2.48  4.33  24.05  .37    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0206  1  5.0   30.50     .80  2.25  19.45  .30    .000
      [CN=67.6         ]
      [ N = 3.0:Tp  .78]
*
  *   CALIB NASHYD       0202  1  5.0   29.42     .63  2.25  15.46  .24    .000
      [CN=59.5         ]
      [ N = 3.0:Tp  .74]
*
  *   CALIB NASHYD       0203  1  5.0   42.47     .51  2.75  11.85  .18    .000
      [CN=53.7         ]
      [ N = 3.0:Tp 1.12]
*
  *   CALIB NASHYD       0205  1  5.0   17.49     .14  3.17   9.49  .14    .000
      [CN=48.0         ]
      [ N = 3.0:Tp 1.44]
*
  *   CALIB NASHYD       0307  1  5.0  191.06    2.53  4.33  24.05  .37    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0306  1  5.0  127.89    1.69  4.33  24.05  .37    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
      ADD [0201 + 0301]  3031  3  5.0  284.50    2.39  3.42  14.67  n/a    .000
*
      RESRVR [ 2 : 0204] 0312  1  5.0   37.00     .69  2.58  15.28  n/a    .000
      {ST=   .03 ha.m }
*
      ADD [0206 + 0202]  3041  3  5.0   59.92    1.43  2.25  17.49  n/a    .000
*
      RESRVR [ 2 : 0203] 0314  1  5.0   42.47     .41  3.58  11.85  n/a    .000
      {ST=   .12 ha.m }
*
      ADD [0307 + 0306]  3082  3  5.0  318.95    4.22  4.33  24.05  n/a    .000
*
      ADD [3031 + 0312]  3081  3  5.0  321.50    2.95  3.00  14.74  n/a    .000
*
      RESRVR [ 2 : 3041] 0313  1  5.0   59.92    1.06  2.92  17.49  n/a    .000
      {ST=   .28 ha.m }
*
      ADD [0313 + 0314]  3061  3  5.0  102.39    1.43  3.08  15.15  n/a    .000
*
      ADD [0305 + 3081]  3045  3  5.0  340.43    3.05  3.08  14.70  n/a    .000
*
      ADD [3061 + 0205]  3071  3  5.0  119.88    1.57  3.08  14.32  n/a    .000
```

```
*
     ADD [3045 + 0302]  3044  3  5.0  456.41    4.82  3.00  15.28  n/a    .000
*
     ADD [3071 + 3082]  3083  3  5.0  438.83    5.41  3.92  21.40  n/a    .000
*
     ADD [0303 + 3044]  3042  3  5.0  619.14    6.50  3.08  14.76  n/a    .000
*
     ADD [0308 + 3083]  3084  3  5.0  626.02    7.85  4.08  22.19  n/a    .000
*
     ADD [0304 + 3042]  3043  3  5.0  666.04    7.01  3.00  16.27  n/a    .000
*
  ***************************
  ** SIMULATION NUMBER:   6 **
  ***************************

  W/E COMMAND             HYD ID   DT    AREA   Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha     cms   hrs     mm          cms

     START @   .00 hrs
     --------------------
     READ STORM                10.0
     [ Ptot= 71.71 mm ]
     fname : I:\2015 Projects\115032 - Burls Creek\Design\SWM\OTTHYMO Model\storms\Orillia\CHI 100-yr Orillia.stm
     remark: 100-Year Orillia 4-hour Chicago Storm
*
  *  CALIB STANDHYD     0304  1  5.0   46.90    6.10  1.50  41.16  .57    .000
     [I%=20.0:S%= 2.00]
*
  *  CALIB NASHYD       0303  1  5.0  162.73    2.05  3.33  15.93  .22    .000
     [CN=56.8         ]
     [ N = 3.0:Tp 1.56]
*
  *  CALIB NASHYD       0305  1  5.0   18.93     .17  4.42  16.69  .23    .000
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  *  CALIB NASHYD       0201  1  5.0   71.81    1.51  2.67  19.72  .27    .000
     [CN=61.6         ]
     [ N = 3.0:Tp 1.07]
*
  *  CALIB NASHYD       0301  1  5.0  212.69    1.92  4.42  16.69  .23    .000
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  *  CALIB NASHYD       0204  1  5.0   37.00     .84  2.42  18.14  .25    .000
     [CN=59.4         ]
     [ N = 3.0:Tp  .86]
*
  *  CALIB NASHYD       0302  1  5.0  115.98    2.11  3.00  20.14  .28    .000
     [CN=64.3         ]
     [ N = 3.0:Tp 1.32]
*
  *  CALIB NASHYD       0308  1  5.0  187.19    2.91  4.33  28.22  .39    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
  *  CALIB NASHYD       0206  1  5.0   30.50     .95  2.25  22.94  .32    .000
     [CN=67.6         ]
     [ N = 3.0:Tp  .78]
*
  *  CALIB NASHYD       0202  1  5.0   29.42     .75  2.25  18.32  .26    .000
     [CN=59.5         ]
     [ N = 3.0:Tp  .74]
*
  *  CALIB NASHYD       0203  1  5.0   42.47     .61  2.75  14.24  .20    .000
     [CN=53.7         ]
     [ N = 3.0:Tp 1.12]
*
  *  CALIB NASHYD       0205  1  5.0   17.49     .17  3.17  11.49  .16    .000
     [CN=48.0         ]
     [ N = 3.0:Tp 1.44]
*
  *  CALIB NASHYD       0307  1  5.0  191.06    2.97  4.33  28.22  .39    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
  *  CALIB NASHYD       0306  1  5.0  127.89    1.99  4.33  28.22  .39    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
     ADD [0201 + 0301]  3031  3  5.0  284.50    2.85  3.42  17.46  n/a    .000
*
     RESRVR [ 2 : 0204] 0312  1  5.0   37.00     .82  2.50  18.14  n/a    .000
     {ST=   .04 ha.m }
*
     ADD [0206 + 0202]  3041  3  5.0   59.92    1.70  2.25  20.67  n/a    .000
*
     RESRVR [ 2 : 0203] 0314  1  5.0   42.47     .49  3.58  14.24  n/a    .000
     {ST=   .15 ha.m }
```

```
*
     ADD [0307 + 0306]  3082  3  5.0  318.95    4.95  4.33  28.22  n/a    .000
*
     ADD [3031 + 0312]  3081  3  5.0  321.50    3.51  3.00  17.53  n/a    .000
*
     RESRVR [ 2 : 3041] 0313  1  5.0   59.92    1.26  2.92  20.67  n/a    .000
     {ST=   .33 ha.m }
*
     ADD [0313 + 0314]  3061  3  5.0  102.39    1.71  3.08  18.00  n/a    .000
*
     ADD [0305 + 3081]  3045  3  5.0  340.43    3.64  3.08  17.49  n/a    .000
*
     ADD [3061 + 0205]  3071  3  5.0  119.88    1.87  3.08  17.05  n/a    .000
*
     ADD [3045 + 0302]  3044  3  5.0  456.41    5.75  3.00  18.16  n/a    .000
*
     ADD [3071 + 3082]  3083  3  5.0  438.83    6.39  3.92  25.17  n/a    .000
*
     ADD [0303 + 3044]  3042  3  5.0  619.14    7.77  3.08  17.58  n/a    .000
*
     ADD [0308 + 3083]  3084  3  5.0  626.02    9.25  4.08  26.08  n/a    .000
*
     ADD [0304 + 3042]  3043  3  5.0  666.04    8.33  3.00  19.24  n/a    .000
*
  ***************************
  ** SIMULATION NUMBER:   7 **
  ***************************

  W/E COMMAND             HYD ID   DT    AREA   Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha     cms   hrs     mm          cms

     START @   .00 hrs
     --------------------
     READ STORM                 15.0
     [ Ptot=193.00 mm ]
     fname : I:\2015 Projects\115032 - Burls Creek\Design\SWM\OTTHYMO Model\storms\Orillia\TIMMINS.STM
     remark: * Timmins Storm
*
  *  CALIB STANDHYD     0304  1  5.0   46.90    4.61  7.00 150.32  .78    .000
     [I%=20.0:S%= 2.00]
*
  *  CALIB NASHYD       0303  1  5.0  162.73    6.29  9.50  90.72  .47    .000
     [CN=56.8         ]
     [ N = 3.0:Tp 1.56]
*
  *  CALIB NASHYD       0305  1  5.0   18.93     .63 10.83  93.06  .48    .000
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  *  CALIB NASHYD       0201  1  5.0   71.81    3.38  8.00 101.96  .53    .000
     [CN=61.6         ]
     [ N = 3.0:Tp 1.07]
*
  *  CALIB NASHYD       0301  1  5.0  212.69    7.06 10.83  93.06  .48    .000
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  *  CALIB NASHYD       0204  1  5.0   37.00    1.81  7.58  97.12  .50    .000
     [CN=59.4         ]
     [ N = 3.0:Tp  .86]
*
  *  CALIB NASHYD       0302  1  5.0  115.98    5.37  9.17 105.46  .55    .000
     [CN=64.3         ]
     [ N = 3.0:Tp 1.32]
*
  *  CALIB NASHYD       0308  1  5.0  187.19    8.53 10.42 128.77  .67    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
  *  CALIB NASHYD       0206  1  5.0   30.50    1.83  7.50 113.12  .59    .000
     [CN=67.6         ]
     [ N = 3.0:Tp  .78]
*
  *  CALIB NASHYD       0202  1  5.0   29.42    1.54  7.42  97.53  .51    .000
     [CN=59.5         ]
     [ N = 3.0:Tp  .74]
*
  *  CALIB NASHYD       0203  1  5.0   42.47    1.62  9.08  84.50  .44    .000
     [CN=53.7         ]
     [ N = 3.0:Tp 1.12]
*
  *  CALIB NASHYD       0205  1  5.0   17.49     .56  9.42  73.45  .38    .000
     [CN=48.0         ]
     [ N = 3.0:Tp 1.44]
*
  *  CALIB NASHYD       0307  1  5.0  191.06    8.70 10.42 128.77  .67    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
```

```
  *   CALIB NASHYD       0306  1  5.0  127.89    5.83 10.42 128.77  .67    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
      ADD [0201 + 0301]  3031  3  5.0  284.50    9.70  9.92  95.31  n/a    .000
*
      RESRVR [ 2 : 0204] 0312  1  5.0   37.00     .94 11.67  97.12  n/a    .000
      {ST=   .94 ha.m }
*
      ADD [0206 + 0202]  3041  3  5.0   59.92    3.37  7.50 105.47  n/a    .000
*
      RESRVR [ 2 : 0203] 0314  1  5.0   42.47     .96 12.08  84.50  n/a    .000
      {ST=  1.24 ha.m }
*
      ADD [0307 + 0306]  3082  3  5.0  318.95   14.53 10.42 128.77  n/a    .000
*
      ADD [3031 + 0312]  3081  3  5.0  321.50   10.63  9.92  95.52  n/a    .000
*
      RESRVR [ 2 : 3041] 0313  1  5.0   59.92    1.46 11.83 105.47  n/a    .000
      {ST=  2.22 ha.m }
*
      ADD [0313 + 0314]  3061  3  5.0  102.39    2.42 12.08  96.77  n/a    .000
*
      ADD [0305 + 3081]  3045  3  5.0  340.43   11.24 10.00  95.38  n/a    .000
*
      ADD [3061 + 0205]  3071  3  5.0  119.88    2.89 10.17  93.37  n/a    .000
*
      ADD [3045 + 0302]  3044  3  5.0  456.41   16.40  9.58  97.94  n/a    .000
*
      ADD [3071 + 3082]  3083  3  5.0  438.83   17.42 10.42 119.10  n/a    .000
*
      ADD [0303 + 3044]  3042  3  5.0  619.14   22.68  9.58  96.05  n/a    .000
*
      ADD [0308 + 3083]  3084  3  5.0  626.02   25.94 10.42 121.99  n/a    .000
*
      ADD [0304 + 3042]  3043  3  5.0  666.04   24.91  9.17  99.87  n/a    .000
*
 FINISH

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

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

  OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
 O   O    T      T    H   H   Y Y   MM MM  O   O
 O   O    T      T    H   H    Y    M   M  O   O
  OOO     T      T    H   H    Y    M   M   OOO
```


***** S U M M A R Y O U T P U T *****

Input filename: C:\Program Files\Visual OTTHYMO 2.2.4\voin.dat
Output filename: I:\2015PR~1\115032~1\Design\SWM\OTTHYM~1\Proposed SCS.out
Summary filename: I:\2015PR~1\115032~1\Design\SWM\OTTHYM~1\Proposed SCS.sum

DATE: 6/4/2015 TIME: 9:14:24 AM

USER:

COMMENTS: Proposed Condition SCS Design Storm

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

W/E	COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R.V. mm	R.C.	Qbase cms
	START @ .00 hrs								
	MASS STORM		20.0						
	[Ptot= 47.40 mm]								
*									
**	CALIB NASHYD	0302 1	5.0	115.98	.56	13.50	8.84	.19	.000
	[CN=64.3]								
	[N = 3.0:Tp 1.32]								
*									
**	CALIB NASHYD	0204 1	5.0	37.00	.21	13.00	8.04	.17	.000
	[CN=59.4]								
	[N = 3.0:Tp .86]								
*									
**	CALIB NASHYD	0301 1	5.0	212.69	.54	15.33	7.19	.15	.000
	[CN=57.8]								
	[N = 3.0:Tp 2.55]								
*									
**	CALIB NASHYD	0201 1	5.0	71.81	.41	13.17	8.91	.19	.000
	[CN=61.6]								
	[N = 3.0:Tp 1.07]								
*									
**	CALIB NASHYD	0305 1	5.0	18.93	.05	15.33	7.19	.15	.000
	[CN=57.8]								
	[N = 3.0:Tp 2.55]								
*									
**	CALIB NASHYD	0303 1	5.0	162.73	.52	13.92	6.77	.14	.000
	[CN=56.8]								
	[N = 3.0:Tp 1.56]								
*									
*	CALIB STANDHYD	0304 1	5.0	46.90	1.12	12.08	22.61	.48	.000
	[I%=20.0:S%= 2.00]								
*									
*	CALIB NASHYD	0306 1	5.0	127.89	.61	15.17	13.06	.28	.000
	[CN=75.7]								
	[N = 3.0:Tp 2.51]								
*									
*	CALIB NASHYD	0307 1	5.0	191.06	.91	15.17	13.06	.28	.000
	[CN=75.7]								
	[N = 3.0:Tp 2.51]								
*									
*	CALIB NASHYD	0205 1	5.0	17.49	.04	13.75	4.60	.10	.000
	[CN=48.0]								
	[N = 3.0:Tp 1.44]								
*									
*	CALIB NASHYD	0203 1	5.0	42.47	.15	13.33	5.92	.12	.000
	[CN=53.7]								
	[N = 3.0:Tp 1.12]								

```
*
  *   CALIB NASHYD       0202  1  5.0   29.42     .19 12.83   8.17  .17    .000
      [CN=59.5         ]
      [ N = 3.0:Tp  .74]
*
  *   CALIB NASHYD       0206  1  5.0   30.50     .25 12.83  10.43  .22    .000
      [CN=67.6         ]
      [ N = 3.0:Tp  .78]
*
  *   CALIB NASHYD       0308  1  5.0  187.19     .89 15.17  13.06  .28    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
      RESRVR [ 2 : 0204] 0312  1  5.0   37.00     .21 13.08   8.04  n/a    .000
      {ST=   .01 ha.m }
*
      ADD [0301 + 0201]  3031  3  5.0  284.50     .78 14.33   7.63  n/a    .000
*
      ADD [0306 + 0307]  3082  3  5.0  318.95    1.52 15.17  13.06  n/a    .000
*
      RESRVR [ 2 : 0203] 0314  1  5.0   42.47     .12 14.25   5.92  n/a    .000
      {ST=   .04 ha.m }
*
      ADD [0202 + 0206]  3041  3  5.0   59.92     .43 12.83   9.32  n/a    .000
*
      ADD [0312 + 3031]  3081  3  5.0  321.50     .95 13.50   7.68  n/a    .000
*
      RESRVR [ 2 : 3041] 0313  1  5.0   59.92     .34 13.50   9.32  n/a    .000
      {ST=   .09 ha.m }
*
      ADD [3081 + 0305]  3045  3  5.0  340.43     .98 13.58   7.65  n/a    .000
*
      ADD [0314 + 0313]  3061  3  5.0  102.39     .45 13.58   7.91  n/a    .000
*
      ADD [0302 + 3045]  3044  3  5.0  456.41    1.53 13.58   7.95  n/a    .000
*
      ADD [0205 + 3061]  3071  3  5.0  119.88     .49 13.58   7.43  n/a    .000
*
      ADD [3044 + 0303]  3042  3  5.0  619.14    2.05 13.67   7.64  n/a    .000
*
      ADD [3082 + 3071]  3083  3  5.0  438.83    1.88 14.75  11.52  n/a    .000
*
      ADD [3042 + 0304]  3043  3  5.0  666.04    2.40 13.08   8.69  n/a    .000
*
      ADD [3083 + 0308]  3084  3  5.0  626.02    2.76 14.92  11.98  n/a    .000
*
  ****************************
  ** SIMULATION NUMBER:   2 **
  ****************************

  W/E COMMAND             HYD ID   DT    AREA   Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha     cms   hrs     mm          cms

      START @   .00 hrs
      --------------------
      MASS STORM                20.0
      [ Ptot= 61.80 mm ]
*
  **  CALIB NASHYD       0302  1  5.0  115.98     .98 13.50  15.14  .25    .000
      [CN=64.3         ]
      [ N = 3.0:Tp 1.32]
*
  **  CALIB NASHYD       0204  1  5.0   37.00     .37 12.92  13.66  .22    .000
      [CN=59.4         ]
      [ N = 3.0:Tp  .86]
*
  **  CALIB NASHYD       0301  1  5.0  212.69     .94 15.25  12.46  .20    .000
      [CN=57.8         ]
      [ N = 3.0:Tp 2.55]
*
  **  CALIB NASHYD       0201  1  5.0   71.81     .69 13.17  14.95  .24    .000
      [CN=61.6         ]
      [ N = 3.0:Tp 1.07]
*
  **  CALIB NASHYD       0305  1  5.0   18.93     .08 15.25  12.46  .20    .000
      [CN=57.8         ]
      [ N = 3.0:Tp 2.55]
*
  **  CALIB NASHYD       0303  1  5.0  162.73     .94 13.83  11.84  .19    .000
      [CN=56.8         ]
      [ N = 3.0:Tp 1.56]
*
  *   CALIB STANDHYD     0304  1  5.0   46.90    1.84 12.08  33.32  .54    .000
      [I%=20.0:S%= 2.00]
*
  *   CALIB NASHYD       0306  1  5.0  127.89    1.03 15.08  21.64  .35    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
```

```
  *   CALIB NASHYD       0307  1  5.0  191.06    1.54 15.08  21.64  .35    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0205  1  5.0   17.49     .07 13.67   8.37  .14    .000
      [CN=48.0         ]
      [ N = 3.0:Tp 1.44]
*
  *   CALIB NASHYD       0203  1  5.0   42.47     .27 13.25  10.50  .17    .000
      [CN=53.7         ]
      [ N = 3.0:Tp 1.12]
*
  *   CALIB NASHYD       0202  1  5.0   29.42     .32 12.75  13.82  .22    .000
      [CN=59.5         ]
      [ N = 3.0:Tp  .74]
*
  *   CALIB NASHYD       0206  1  5.0   30.50     .42 12.83  17.45  .28    .000
      [CN=67.6         ]
      [ N = 3.0:Tp  .78]
*
  *   CALIB NASHYD       0308  1  5.0  187.19    1.51 15.08  21.64  .35    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
      RESRVR [ 2 : 0204] 0312  1  5.0   37.00     .37 13.08  13.66  n/a    .000
      {ST=   .02 ha.m }
*
      ADD [0301 + 0201]  3031  3  5.0  284.50    1.36 14.25  13.09  n/a    .000
*
      ADD [0306 + 0307]  3082  3  5.0  318.95    2.57 15.08  21.64  n/a    .000
*
      RESRVR [ 2 : 0203] 0314  1  5.0   42.47     .22 14.17  10.50  n/a    .000
      {ST=   .07 ha.m }
*
      ADD [0202 + 0206]  3041  3  5.0   59.92     .74 12.83  15.67  n/a    .000
*
      ADD [0312 + 3031]  3081  3  5.0  321.50    1.65 13.50  13.15  n/a    .000
*
      RESRVR [ 2 : 3041] 0313  1  5.0   59.92     .59 13.42  15.67  n/a    .000
      {ST=   .15 ha.m }
*
      ADD [3081 + 0305]  3045  3  5.0  340.43    1.71 13.58  13.11  n/a    .000
*
      ADD [0314 + 0313]  3061  3  5.0  102.39     .79 13.58  13.52  n/a    .000
*
      ADD [0302 + 3045]  3044  3  5.0  456.41    2.69 13.50  13.63  n/a    .000
*
      ADD [0205 + 3061]  3071  3  5.0  119.88     .86 13.58  12.77  n/a    .000
*
      ADD [3044 + 0303]  3042  3  5.0  619.14    3.62 13.58  13.16  n/a    .000
*
      ADD [3082 + 3071]  3083  3  5.0  438.83    3.22 14.67  19.22  n/a    .000
*
      ADD [3042 + 0304]  3043  3  5.0  666.04    4.08 13.17  14.58  n/a    .000
*
      ADD [3083 + 0308]  3084  3  5.0  626.02    4.72 14.83  19.94  n/a    .000
*
  ****************************
  ** SIMULATION NUMBER:   3 **
  ****************************

  W/E COMMAND             HYD ID   DT    AREA   Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha     cms   hrs     mm          cms

      START @   .00 hrs
      --------------------
      MASS STORM                20.0
      [ Ptot= 71.30 mm ]
*
  **  CALIB NASHYD       0302  1  5.0  115.98    1.31 13.42  19.93  .28    .000
      [CN=64.3         ]
      [ N = 3.0:Tp 1.32]
*
  **  CALIB NASHYD       0204  1  5.0   37.00     .49 12.92  17.94  .25    .000
      [CN=59.4         ]
      [ N = 3.0:Tp  .86]
*
  **  CALIB NASHYD       0301  1  5.0  212.69    1.26 15.17  16.51  .23    .000
      [CN=57.8         ]
      [ N = 3.0:Tp 2.55]
*
  **  CALIB NASHYD       0201  1  5.0   71.81     .91 13.17  19.51  .27    .000
      [CN=61.6         ]
      [ N = 3.0:Tp 1.07]
*
  **  CALIB NASHYD       0305  1  5.0   18.93     .11 15.17  16.51  .23    .000
      [CN=57.8         ]
      [ N = 3.0:Tp 2.55]
*
```

```
  **  CALIB NASHYD       0303  1  5.0  162.73    1.26 13.75  15.75  .22    .000
      [CN=56.8         ]
      [ N = 3.0:Tp 1.56]
*
  *   CALIB STANDHYD     0304  1  5.0   46.90    2.31 12.08  40.83  .57    .000
      [I%=20.0:S%= 2.00]
*
  *   CALIB NASHYD       0306  1  5.0  127.89    1.34 15.00  27.94  .39    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0307  1  5.0  191.06    2.01 15.00  27.94  .39    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0205  1  5.0   17.49     .10 13.67  11.35  .16    .000
      [CN=48.0         ]
      [ N = 3.0:Tp 1.44]
*
  *   CALIB NASHYD       0203  1  5.0   42.47     .37 13.25  14.07  .20    .000
      [CN=53.7         ]
      [ N = 3.0:Tp 1.12]
*
  *   CALIB NASHYD       0202  1  5.0   29.42     .43 12.75  18.13  .25    .000
      [CN=59.5         ]
      [ N = 3.0:Tp  .74]
*
  *   CALIB NASHYD       0206  1  5.0   30.50     .55 12.83  22.70  .32    .000
      [CN=67.6         ]
      [ N = 3.0:Tp  .78]
*
  *   CALIB NASHYD       0308  1  5.0  187.19    1.97 15.00  27.94  .39    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
      RESRVR [ 2 : 0204] 0312  1  5.0   37.00     .49 13.08  17.94  n/a    .000
      {ST=   .02 ha.m }
*
      ADD [0301 + 0201]  3031  3  5.0  284.50    1.81 14.25  17.27  n/a    .000
*
      ADD [0306 + 0307]  3082  3  5.0  318.95    3.35 15.00  27.94  n/a    .000
*
      RESRVR [ 2 : 0203] 0314  1  5.0   42.47     .30 14.08  14.07  n/a    .000
      {ST=   .09 ha.m }
*
      ADD [0202 + 0206]  3041  3  5.0   59.92     .98 12.83  20.46  n/a    .000
*
      ADD [0312 + 3031]  3081  3  5.0  321.50    2.20 13.50  17.35  n/a    .000
*
      RESRVR [ 2 : 3041] 0313  1  5.0   59.92     .77 13.42  20.45  n/a    .000
      {ST=   .20 ha.m }
*
      ADD [3081 + 0305]  3045  3  5.0  340.43    2.28 13.58  17.30  n/a    .000
*
      ADD [0314 + 0313]  3061  3  5.0  102.39    1.05 13.58  17.81  n/a    .000
*
      ADD [0302 + 3045]  3044  3  5.0  456.41    3.59 13.50  17.97  n/a    .000
*
      ADD [0205 + 3061]  3071  3  5.0  119.88    1.15 13.58  16.87  n/a    .000
*
      ADD [3044 + 0303]  3042  3  5.0  619.14    4.84 13.58  17.38  n/a    .000
*
      ADD [3082 + 3071]  3083  3  5.0  438.83    4.23 14.58  24.91  n/a    .000
*
      ADD [3042 + 0304]  3043  3  5.0  666.04    5.39 13.17  19.04  n/a    .000
*
      ADD [3083 + 0308]  3084  3  5.0  626.02    6.17 14.75  25.82  n/a    .000
*
  ****************************
  ** SIMULATION NUMBER:   4 **
  ****************************

  W/E COMMAND             HYD ID   DT    AREA   Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha     cms   hrs     mm          cms

      START @   .00 hrs
      --------------------
      MASS STORM               20.0
      [ Ptot= 83.30 mm ]
*
  **  CALIB NASHYD       0302  1  5.0  115.98    1.76 13.42  26.56  .32    .000
      [CN=64.3         ]
      [ N = 3.0:Tp 1.32]
*
  **  CALIB NASHYD       0204  1  5.0   37.00     .66 12.92  23.92  .29    .000
      [CN=59.4         ]
      [ N = 3.0:Tp  .86]
*
  **  CALIB NASHYD       0301  1  5.0  212.69    1.71 15.17  22.19  .27    .000
```

```
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  **  CALIB NASHYD       0201  1  5.0   71.81    1.22 13.17  25.85  .31    .000
     [CN=61.6         ]
     [ N = 3.0:Tp 1.07]
*
  **  CALIB NASHYD       0305  1  5.0   18.93     .15 15.17  22.19  .27    .000
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  **  CALIB NASHYD       0303  1  5.0  162.73    1.73 13.75  21.26  .26    .000
     [CN=56.8         ]
     [ N = 3.0:Tp 1.56]
*
  *   CALIB STANDHYD     0304  1  5.0   46.90    2.95 12.08  50.69  .61    .000
     [I%=20.0:S%= 2.00]
*
  *   CALIB NASHYD       0306  1  5.0  127.89    1.77 15.00  36.45  .44    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0307  1  5.0  191.06    2.64 15.00  36.45  .44    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0205  1  5.0   17.49     .14 13.58  15.63  .19    .000
     [CN=48.0         ]
     [ N = 3.0:Tp 1.44]
*
  *   CALIB NASHYD       0203  1  5.0   42.47     .51 13.25  19.13  .23    .000
     [CN=53.7         ]
     [ N = 3.0:Tp 1.12]
*
  *   CALIB NASHYD       0202  1  5.0   29.42     .58 12.75  24.13  .29    .000
     [CN=59.5         ]
     [ N = 3.0:Tp  .74]
*
  *   CALIB NASHYD       0206  1  5.0   30.50     .73 12.83  29.91  .36    .000
     [CN=67.6         ]
     [ N = 3.0:Tp  .78]
*
  *   CALIB NASHYD       0308  1  5.0  187.19    2.59 15.00  36.45  .44    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
     RESRVR [ 2 : 0204] 0312  1  5.0   37.00     .65 13.08  23.92  n/a    .000
     {ST=   .03 ha.m }
*
     ADD [0301 + 0201]  3031  3  5.0  284.50    2.45 14.17  23.11  n/a    .000
*
     ADD [0306 + 0307]  3082  3  5.0  318.95    4.41 15.00  36.45  n/a    .000
*
     RESRVR [ 2 : 0203] 0314  1  5.0   42.47     .41 14.08  19.13  n/a    .000
     {ST=   .12 ha.m }
*
     ADD [0202 + 0206]  3041  3  5.0   59.92    1.31 12.75  27.08  n/a    .000
*
     ADD [0312 + 3031]  3081  3  5.0  321.50    2.98 13.50  23.21  n/a    .000
*
     RESRVR [ 2 : 3041] 0313  1  5.0   59.92    1.03 13.42  27.08  n/a    .000
     {ST=   .27 ha.m }
*
     ADD [3081 + 0305]  3045  3  5.0  340.43    3.09 13.50  23.15  n/a    .000
*
     ADD [0314 + 0313]  3061  3  5.0  102.39    1.41 13.58  23.78  n/a    .000
*
     ADD [0302 + 3045]  3044  3  5.0  456.41    4.85 13.50  24.02  n/a    .000
*
     ADD [0205 + 3061]  3071  3  5.0  119.88    1.55 13.58  22.59  n/a    .000
*
     ADD [3044 + 0303]  3042  3  5.0  619.14    6.55 13.58  23.29  n/a    .000
*
     ADD [3082 + 3071]  3083  3  5.0  438.83    5.60 14.58  32.66  n/a    .000
*
     ADD [3042 + 0304]  3043  3  5.0  666.04    7.20 13.17  25.22  n/a    .000
*
     ADD [3083 + 0308]  3084  3  5.0  626.02    8.16 14.67  33.79  n/a    .000
*
  ****************************
  ** SIMULATION NUMBER:   5 **
  ****************************

  W/E COMMAND             HYD ID   DT    AREA   Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha     cms   hrs     mm          cms

     START @   .00 hrs
     --------------------
     MASS STORM                20.0
```

```
     [ Ptot= 92.20 mm ]
*
  **  CALIB NASHYD       0302  1  5.0  115.98    2.13 13.42  31.84  .35    .000
     [CN=64.3         ]
     [ N = 3.0:Tp 1.32]
*
  **  CALIB NASHYD       0204  1  5.0   37.00     .80 12.92  28.71  .31    .000
     [CN=59.4         ]
     [ N = 3.0:Tp  .86]
*
  **  CALIB NASHYD       0301  1  5.0  212.69    2.07 15.08  26.77  .29    .000
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  **  CALIB NASHYD       0201  1  5.0   71.81    1.47 13.17  30.90  .34    .000
     [CN=61.6         ]
     [ N = 3.0:Tp 1.07]
*
  **  CALIB NASHYD       0305  1  5.0   18.93     .18 15.08  26.77  .29    .000
     [CN=57.8         ]
     [ N = 3.0:Tp 2.55]
*
  **  CALIB NASHYD       0303  1  5.0  162.73    2.10 13.75  25.71  .28    .000
     [CN=56.8         ]
     [ N = 3.0:Tp 1.56]
*
  *   CALIB STANDHYD     0304  1  5.0   46.90    3.64 12.08  58.23  .63    .000
     [I%=20.0:S%= 2.00]
*
  *   CALIB NASHYD       0306  1  5.0  127.89    2.10 14.92  43.08  .47    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0307  1  5.0  191.06    3.14 14.92  43.08  .47    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0205  1  5.0   17.49     .17 13.58  19.13  .21    .000
     [CN=48.0         ]
     [ N = 3.0:Tp 1.44]
*
  *   CALIB NASHYD       0203  1  5.0   42.47     .62 13.25  23.24  .25    .000
     [CN=53.7         ]
     [ N = 3.0:Tp 1.12]
*
  *   CALIB NASHYD       0202  1  5.0   29.42     .70 12.75  28.95  .31    .000
     [CN=59.5         ]
     [ N = 3.0:Tp  .74]
*
  *   CALIB NASHYD       0206  1  5.0   30.50     .88 12.83  35.62  .39    .000
     [CN=67.6         ]
     [ N = 3.0:Tp  .78]
*
  *   CALIB NASHYD       0308  1  5.0  187.19    3.07 14.92  43.08  .47    .000
     [CN=75.7         ]
     [ N = 3.0:Tp 2.51]
*
     RESRVR [ 2 : 0204] 0312  1  5.0   37.00     .79 13.08  28.71  n/a    .000
     {ST=   .04 ha.m }
*
     ADD [0301 + 0201]  3031  3  5.0  284.50    2.96 14.17  27.81  n/a    .000
*
     ADD [0306 + 0307]  3082  3  5.0  318.95    5.24 14.92  43.08  n/a    .000
*
     RESRVR [ 2 : 0203] 0314  1  5.0   42.47     .51 14.08  23.24  n/a    .000
     {ST=   .15 ha.m }
*
     ADD [0202 + 0206]  3041  3  5.0   59.92    1.57 12.75  32.34  n/a    .000
*
     ADD [0312 + 3031]  3081  3  5.0  321.50    3.60 13.50  27.92  n/a    .000
*
     RESRVR [ 2 : 3041] 0313  1  5.0   59.92    1.24 13.42  32.34  n/a    .000
     {ST=   .33 ha.m }
*
     ADD [3081 + 0305]  3045  3  5.0  340.43    3.74 13.50  27.85  n/a    .000
*
     ADD [0314 + 0313]  3061  3  5.0  102.39    1.70 13.50  28.57  n/a    .000
*
     ADD [0302 + 3045]  3044  3  5.0  456.41    5.86 13.50  28.87  n/a    .000
*
     ADD [0205 + 3061]  3071  3  5.0  119.88    1.87 13.58  27.19  n/a    .000
*
     ADD [3044 + 0303]  3042  3  5.0  619.14    7.93 13.58  28.04  n/a    .000
*
     ADD [3082 + 3071]  3083  3  5.0  438.83    6.69 14.50  38.74  n/a    .000
*
     ADD [3042 + 0304]  3043  3  5.0  666.04    8.60 13.17  30.16  n/a    .000
*
     ADD [3083 + 0308]  3084  3  5.0  626.02    9.73 14.67  40.04  n/a    .000
```

```
*
  ***************************
  ** SIMULATION NUMBER:   6 **
  ***************************

  W/E COMMAND             HYD ID   DT    AREA   Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha     cms   hrs     mm          cms

      START @   .00 hrs
      --------------------
      MASS STORM                 20.0
      [ Ptot=101.10 mm ]
*
  **  CALIB NASHYD       0302  1  5.0  115.98    2.51 13.42  37.40  .37    .000
      [CN=64.3         ]
      [ N = 3.0:Tp 1.32]
*
  **  CALIB NASHYD       0204  1  5.0   37.00     .94 12.92  33.77  .33    .000
      [CN=59.4         ]
      [ N = 3.0:Tp  .86]
*
  **  CALIB NASHYD       0301  1  5.0  212.69    2.46 15.08  31.62  .31    .000
      [CN=57.8         ]
      [ N = 3.0:Tp 2.55]
*
  **  CALIB NASHYD       0201  1  5.0   71.81    1.73 13.17  36.23  .36    .000
      [CN=61.6         ]
      [ N = 3.0:Tp 1.07]
*
  **  CALIB NASHYD       0305  1  5.0   18.93     .22 15.08  31.62  .31    .000
      [CN=57.8         ]
      [ N = 3.0:Tp 2.55]
*
  **  CALIB NASHYD       0303  1  5.0  162.73    2.50 13.75  30.44  .30    .000
      [CN=56.8         ]
      [ N = 3.0:Tp 1.56]
*
  *   CALIB STANDHYD     0304  1  5.0   46.90    4.19 12.08  65.92  .65    .000
      [I%=20.0:S%= 2.00]
*
  *   CALIB NASHYD       0306  1  5.0  127.89    2.45 14.92  49.95  .49    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0307  1  5.0  191.06    3.65 14.92  49.95  .49    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
  *   CALIB NASHYD       0205  1  5.0   17.49     .21 13.58  22.90  .23    .000
      [CN=48.0         ]
      [ N = 3.0:Tp 1.44]
*
  *   CALIB NASHYD       0203  1  5.0   42.47     .74 13.25  27.62  .27    .000
      [CN=53.7         ]
      [ N = 3.0:Tp 1.12]
*
  *   CALIB NASHYD       0202  1  5.0   29.42     .82 12.75  34.03  .34    .000
      [CN=59.5         ]
      [ N = 3.0:Tp  .74]
*
  *   CALIB NASHYD       0206  1  5.0   30.50    1.03 12.75  41.59  .41    .000
      [CN=67.6         ]
      [ N = 3.0:Tp  .78]
*
  *   CALIB NASHYD       0308  1  5.0  187.19    3.58 14.92  49.95  .49    .000
      [CN=75.7         ]
      [ N = 3.0:Tp 2.51]
*
      RESRVR [ 2 : 0204] 0312  1  5.0   37.00     .93 13.08  33.77  n/a    .000
      {ST=   .05 ha.m }
*
      ADD [0301 + 0201]  3031  3  5.0  284.50    3.51 14.08  32.78  n/a    .000
*
      ADD [0306 + 0307]  3082  3  5.0  318.95    6.10 14.92  49.95  n/a    .000
*
      RESRVR [ 2 : 0203] 0314  1  5.0   42.47     .60 14.00  27.62  n/a    .000
      {ST=   .18 ha.m }
*
      ADD [0202 + 0206]  3041  3  5.0   59.92    1.85 12.75  37.88  n/a    .000
*
      ADD [0312 + 3031]  3081  3  5.0  321.50    4.27 13.50  32.90  n/a    .000
*
      RESRVR [ 2 : 3041] 0313  1  5.0   59.92    1.46 13.42  37.88  n/a    .000
      {ST=   .39 ha.m }
*
      ADD [3081 + 0305]  3045  3  5.0  340.43    4.43 13.50  32.83  n/a    .000
*
      ADD [0314 + 0313]  3061  3  5.0  102.39    2.01 13.50  33.62  n/a    .000
*
```

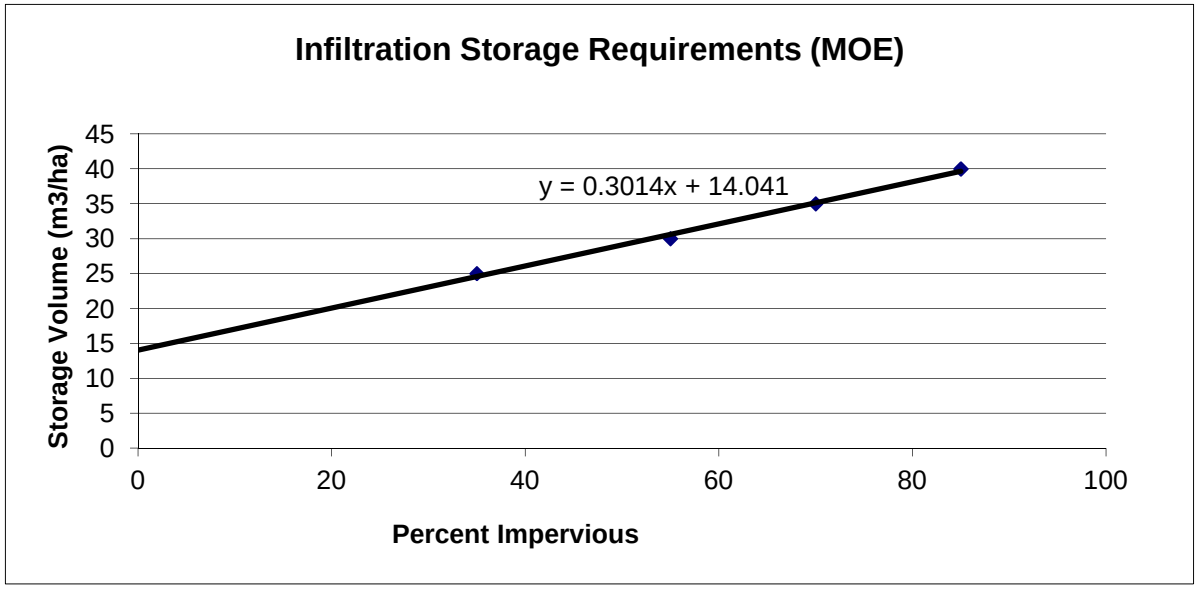
```
      ADD [0302 + 3045]  3044  3  5.0  456.41    6.93 13.50  33.99  n/a    .000
*
      ADD [0205 + 3061]  3071  3  5.0  119.88    2.22 13.50  32.06  n/a    .000
*
      ADD [3044 + 0303]  3042  3  5.0  619.14    9.40 13.50  33.06  n/a    .000
*
      ADD [3082 + 3071]  3083  3  5.0  438.83    7.82 14.50  45.06  n/a    .000
*
      ADD [3042 + 0304]  3043  3  5.0  666.04   10.14 13.17  35.37  n/a    .000
*
      ADD [3083 + 0308]  3084  3  5.0  626.02   11.36 14.58  46.52  n/a    .000
*
 FINISH

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

APPENDIX C:
PRELIMINARY DESIGN CALCULATIONS

MOE Water Quality Storage Volumes

Table 3.1 Values

% imp	storage (m^3/ha)
35	25
55	30
70	35
85	40



Contributing Areas

		Area (ha)	Proposed Gravel (%)	Proposed Impervious (%)	Proposed Combined (%)	Storage Volume (m^3/ha)	Storage Volume ($m^{3)}$
Catchment	201	71.81	4	1	5	15.5	1116.5
Catchment	203	42.47	12	0	12	17.7	749.9
Catchment	204	37	5	0	5	15.5	575.3
Catchment	206	30.5	10	0	10	17.1	520.2
TOTAL AREA		**181.78**	**7.1**	**0.4**	**7.5**	**65.8**	**2961.9**

Catchment		Swale Length Required	Swale Length Provided	Storage Volume Required	Controlling Factor	Storage Volume Provided	Area	Bottom Width	Top Width	Depth
	201	992	1065	1116	Quality	1198	1.125	0.75	3.75	0.5
	203	1620	1725	1822	Quantity	1941				
	204	511	700	575	Quality	788				
	206	3422	3640	3850	Quantity	4095				
Total		**6545**	**7130**	**7363**		**8021**				

Catchment	**201**	**202**	**203**	**204**	**206**	
Swale Sections	640	530	790	700	750	
	350	180	740		230	
	75	200	120		390	
		280	75		210	
		310			140	
		310			80	
					180	
					100	
					250	
					-500	MTO Swale
Total Swale Length	1065	1810	1725	700	1830	
					3640	202+206

Culvert Calculator Report
A-A

Solve For: Discharge

Culvert Summary					
Allowable HW Elevation	100.80	m	Headwater Depth/Height	2.62	
Computed Headwater Elev	100.80	m	Discharge	0.2172	m³/s
Inlet Control HW Elev.	100.57	m	Tailwater Elevation	99.91	m
Outlet Control HW Elev.	100.80	m	Control Type	Outlet Control	

Grades					
Upstream Invert	100.00	m	Downstream Invert	99.91	m
Length	10.00	m	Constructed Slope	0.009000	m/m

Hydraulic Profile					
Profile	CompositeM2PressureProfile		Depth, Downstream	0.25	m
Slope Type	Mild		Normal Depth	N/A	m
Flow Regime	Subcritical		Critical Depth	0.25	m
Velocity Downstream	1.67	m/s	Critical Slope	0.038432	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.024	
Section Material	CMP		Span	0.30	m
Section Size	300 mm		Rise	0.30	m
Number Sections	2				

Outlet Control Properties					
Outlet Control HW Elev.	100.80	m	Upstream Velocity Head	0.11	m
Ke	0.90		Entrance Loss	0.10	m

Inlet Control Properties					
Inlet Control HW Elev.	100.57	m	Flow Control	N/A	
Inlet Type	Projecting		Area Full	0.1	m²
K	0.03400		HDS 5 Chart	2	
M	1.50000		HDS 5 Scale	3	
C	0.05530		Equation Form	1	
Y	0.54000				

Worksheet for Swale at 1%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.01000	m/m
Normal Depth	0.50	m
Left Side Slope	3.00	m/m (H:V)
Right Side Slope	3.00	m/m (H:V)
Bottom Width	0.75	m

Results

Discharge	1.63	m^3/s
Flow Area	1.13	m^2
Wetted Perimeter	3.91	m
Hydraulic Radius	0.29	m
Top Width	3.75	m
Critical Depth	0.46	m
Critical Slope	0.01426	m/m
Velocity	1.45	m/s
Velocity Head	0.11	m
Specific Energy	0.61	m
Froude Number	0.85	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	m
Length	0.00	m
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	m
Profile Description		
Profile Headloss	0.00	m
Downstream Velocity	Infinity	m/s
Upstream Velocity	Infinity	m/s
Normal Depth	0.50	m
Critical Depth	0.46	m
Channel Slope	0.01000	m/m

Worksheet for Swale at 1%

GVF Output Data

Critical Slope	0.01426	m/m

Worksheet for Swale at 0.5%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.00500	m/m
Normal Depth	0.50	m
Left Side Slope	3.00	m/m (H:V)
Right Side Slope	3.00	m/m (H:V)
Bottom Width	0.75	m

Results

Discharge	1.16	m^3/s
Flow Area	1.13	m^2
Wetted Perimeter	3.91	m
Hydraulic Radius	0.29	m
Top Width	3.75	m
Critical Depth	0.39	m
Critical Slope	0.01493	m/m
Velocity	1.03	m/s
Velocity Head	0.05	m
Specific Energy	0.55	m
Froude Number	0.60	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	m
Length	0.00	m
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	m
Profile Description		
Profile Headloss	0.00	m
Downstream Velocity	Infinity	m/s
Upstream Velocity	Infinity	m/s
Normal Depth	0.50	m
Critical Depth	0.39	m
Channel Slope	0.00500	m/m

Worksheet for Swale at 0.5%

GVF Output Data

Critical Slope	0.01493	m/m