Westwood Village (Phase 2) Community
Brian Domm Subdivision
Hallman Subdivision

Preliminary Stormwater Management Report

Project Location:

North of Blenheim Road, West of Newman Drive
Township of North Dumfries

Prepared for:

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and
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April 19, 2021

MTE File No.: 02534-800

Engineers, Scientists, Surveyors.

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MTE Drawing No. 02534-800-QU1.1 – Finished Grade Contour Plan.....Encl.
MTE Drawing No. 44720-114-SW2.1 – SWM Facility No.2 Plan .....Encl.
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MTE Drawing No. 44720-114-SW2.3 – SWM Facility No.2 Details and Notes Plan .....Encl.

1.0 Introduction

1.1 Overview

MTE Consultants Inc. (MTE) was retained by Hallman Construction Limited (Hallman) and Brian Domm (Domm) to complete a Preliminary Stormwater Management (SWM) Report in support of an Official Plan Amendment, Plans of Subdivision, and Zoning By-law Amendment applications. Although separate subdivisions are proposed for each property, the lands have been comprehensively evaluated together to ensure a coordinated approach to the design and development of the Hallman and Domm lands.

The Hallman and Domm lands are located in the Township of North Dumfries and are immediately adjacent to a comprehensively planned community located in the City of Cambridge; commonly referred to as "Westwood Village – Phase 1". The lands owned by Hallman and Domm are generally in the northwestern portion of the Westwood Village Community. Refer to **Figure 1.1** for more details. These lands represent the logical extension and second phase of the Westwood Village Community. For the purpose of this report, the two Draft Plans will be reviewed as one cohesive development herein referred to as the 'subject lands'.

The subject lands comprise a total area of approximately 25.43ha, of which 8.48ha represents the Domm property and 16.95ha represents the Hallman property. Development plans for the subject lands include the construction of street-oriented residential units, multiple residential blocks, park lands, with the required roads, municipal services (storm, sanitary, and water), and open spaces. Draft Plans of Subdivision (dated February 4, 2021) for the proposed developments have been prepared by MHBC Planning and form the basis of this report. The consolidated Draft Plan has been included in **Appendix A**.

This report presents the proposed plan detailing the stormwater quality, quantity, and water balance measures that will be provided for the proposed developments. This report should be read in conjunction with the following other reports;

- Westwood Village (Phase 2) Community - Functional Servicing Report - MTE (April 19, 2021).
- Westwood Village (Phase 2) Community - Hydrogeological Assessment Report - MTE (April 19, 2021).
- Cambridge West Community Westwood Village - Final Stormwater Management Report - MTE (April 15, 2020).

1.2 Background Information

Master Environmental Servicing Plan

A Master Environmental Servicing Plan (MESP) was undertaken for the Cambridge West Community by the City of Cambridge and area landowners. The MESP was completed in November 2013 and approved by City Council on March 17, 2014. The purpose of the MESP was to guide the development of the remaining designated greenfield lands on the west side of the City. The MESP integrated environmental, servicing, transportation, and land use planning components to provide the basis for the preparation of a Community Plan for the Cambridge West Area, and for the preparation and processing of the future development applications.

The MESP outlined a preliminary municipal servicing strategy for the area, which included: sanitary, storm, and watermain servicing, along with a stormwater management strategy. The recommended stormwater management solution was designed to maximize the use of existing storm drainage infrastructure, maintain current levels of infiltration into the ground, maintain surface water inputs into local wetland features, and mitigate the potential for stream erosion. The recommended solution consisted of multiple types of stormwater management infrastructure, including lot-level and conveyance infiltration facilities, along with several extended detention end-of-pipe stormwater management facilities.

LPAT (Cambridge West Community)

In June 2018, the applications of the adjacent Hallman Subdivision (30T-16104), Cachet Subdivision (30T-16103) and Huron Creek (30T-16105) proceeded through the Local Planning Appeal Tribunal (LPAT) as Case No. 170301. The resulting LPAT order provided approval of the three Draft Plans of Subdivision on February 19, 2019.

Final Stormwater Management Report (Cambridge West Community)

A Final Stormwater Management Report (FSWMR) was submitted by MTE in August 2019 (and revised April 15, 2020), as part of the final design for the Hallman Subdivision and Cachet Subdivision within the City of Cambridge. The stormwater management approach for the Westwood Village (Phase 1) Community has been developed as our implementation of the conceptual solution recommended by the MESP. The Township lands (i.e. the subject lands) were considered as part of the overall stormwater management strategy, to ensure that adequate stormwater management infrastructure would be planned to accommodate their eventual development.

Stormwater Management Facility 2 (SWMF 2) within the Cachet Subdivision has been designed to service the majority of the subject lands. The MESP contemplated that a small drainage area consisting of approximately 3.6ha, would drain to a future SWM facility (SWMF 4) within the Domm lands. However, as part of the pre-consultation process for the Township lands, MTE was requested to revisit the stormwater management strategy for this drainage area and determine if this area could be serviced by SWMF 2.

An Environmental Compliance Approval has been issued for SWMF 2 by the Ministry of the Environment, Conservation and Parks (MECP – formerly referred to as the MOE) in November 2020. To facilitate the servicing of the subject lands by SWMF 2, the storm sewer system within the Cachet Subdivision has been designed to accommodate the ultimate build-out. A roof water collection system was also recommended to collect clean roof water from a portion of the subject lands to provide surface water inputs into Wetland 2, which is located within the Cachet Subdivision and adjacent to SWMF 2.

1.3 Purpose of Study

The purpose of this study is to document a recommended stormwater management strategy for the development proposals contemplated for the subject lands and to verify that SWMF 2 (located within the Cachet Subdivision in the City of Cambridge) will have sufficient capacity to service the subject lands such that SWMF 4 can be eliminated. The proposed stormwater management strategy has been developed in consideration of design requirements of the Township of North Dumfries, City of Cambridge, Region of Waterloo, Grand River Conservation Authority (GRCA), and the MECP. The proposed strategy also takes the findings and recommendations of previously completed and related studies into consideration.

1.4 Objectives

The overall objective of this stormwater management report is to recommend a stormwater management strategy for the proposed development that protects the hydrology and water quality of the receiving water systems. The primary objectives of this study are as follows:

- Document criteria for the management of stormwater runoff from the study area;
- Recommend a comprehensive plan for controlling the quality and quantity of stormwater runoff from the subject lands;
- Determine if SWMF 2 has sufficient quality and quantity controls for the subject lands;
- Recommend a comprehensive plan for balancing infiltration to groundwater and surface water inputs to existing environmental features as part of a strategy that ensures the long term protection of those features; and
- Ensure that the final engineering of the downstream stormwater infrastructure incorporates the recommendations of this report.

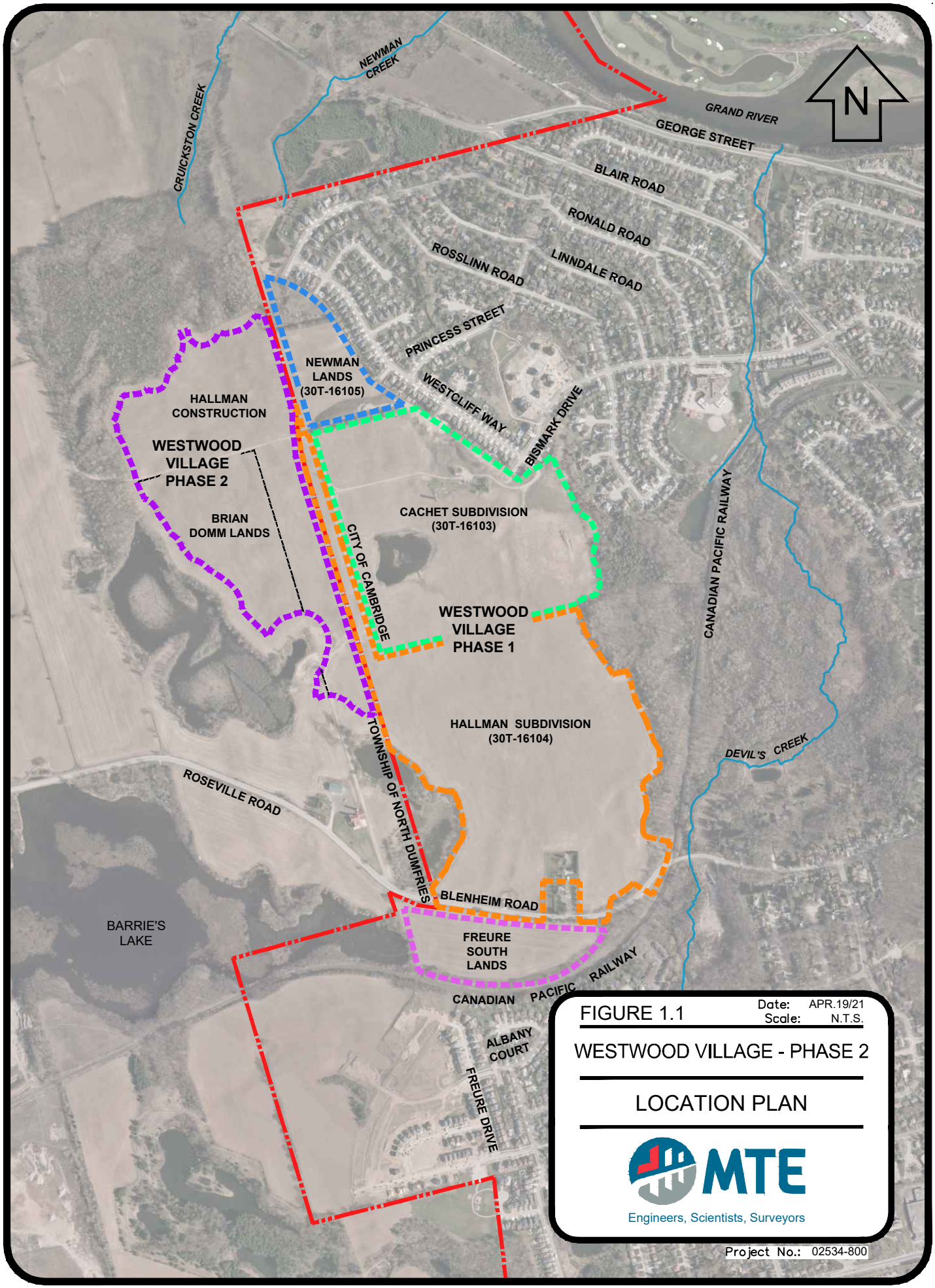

FIGURE 1.1

Date: APR.19/21
Scale: N.T.S.

WESTWOOD VILLAGE - PHASE 2

LOCATION PLAN

MTE
Engineers, Scientists, Surveyors

Project No.: 02534-800

CAD: P:\P\02534\800\02534-800-P-F1 Project: 02534-800
April 26, 2021 — 1:02 p.m. — Plotted By: CCarre

2.0 Existing Conditions and Background Information

2.1 Topographical Information

As previously discussed, the subject lands consist of approximately 25.43ha of land, which form part of the overall Westwood Village Community. The subject lands are generally bounded by the future extension of Newman Drive and the Cachet Subdivision to the east, and by existing agricultural and woodlot/wetlands to the south, west and north. The subject lands are currently under an interim agricultural use.

MTE conducted a detailed topographical survey of the Westwood Village lands in 2010. There was some initial survey work completed in 2005 as well as supplementary surveys completed in 2013, 2014, and 2017 through to 2020. Existing topographic conditions for the Westwood Village Community are illustrated in **Figure 2.1** and **MTE Drawing 02534-800-EC1.1**. Under existing conditions, the subject lands are moderately sloped throughout the majority of the site (generally between 2.0% and 10.0%). Existing elevations range between 307.0m near the wetland features in the north and 316.0m on the centralized hills in the central portion of the lands.

It should be noted that as part of the Hallman Subdivision (30T-16104) and Cachet Subdivision (30T-16103) final design, an area grading contract for the entire Westwood Village Community was completed this past summer/fall. As part of this contract, the subject lands were filled and graded to a sub-grade depth as illustrated on **MTE Drawings 44719-114-AG3.1** to **AG3.3**. Topsoil will be placed on the sub-grade surface, and the lands will be returned to an interim agricultural use. The “existing conditions” described in this report refer to the original site conditions prior to the 2020 area grading contract.

2.2 Pre-Development Conditions

The eastern portion of the subject lands primarily drain to an existing wetland feature (Wetland 2) as illustrated in **Figure 2.1**. This feature does not have a surface outlet and as a result recharges and drains internally. Based on monitoring data and a hydrogeological study completed as part of the MESP, it is understood that after rainfall events, the surface water inputs in this feature create a localized groundwater mound that dissipates laterally through shallow groundwater movements to the east. During drier periods, shallow groundwater flow from the west sustains the wetland level.

Wetland 2 water elevations experience natural fluctuations that are driven by surface water inputs and seasonal rise and fall of the local water table. Based on information documented in the MESP, historic air photo analysis, and multi-year monitoring, water levels in this wetland generally fluctuate within an elevation range of approximately 307.60m to 308.65m.

The northern and western portion of the subject lands drain externally towards the adjacent woodland and wetland features (Wetland 6 and Wetland 4/5) respectively. Both the northern and western portions of the subject lands are currently within the Cruickston Creek subwatershed, however were recommended in the MESP as being redirected to the Grand River via SWMF 2.

As part of the MESP, and confirmed through subsequent field surveys by WSP, Ambystoma salamanders were confirmed in suitable breeding ponds on adjacent lands, particularly in several vernal ponds illustrated in **Figure 2.1**. Those vernal ponds receive drainage from the northern and western portions of the subject lands as well as some external lands.

A current conditions hydrologic model was created for the Westwood Village subwatersheds as part of the MESP, using the GAWSER (version 6.9.12) hydrologic modelling platform. As part of the MESP, the current conditions model was run in continuous mode to estimate streamflow conditions and water balance information for the various water features within and surrounding the study area. The continuous model utilized a 39-year meteorological data set from the Preston (Cambridge) weather station. Design storm event simulations were also completed using the existing conditions hydrologic model with the intent of obtaining peak flow rates for a range of low-frequency storm events. Design storm event modelling was completed for the 4-hour 25mm and Regional (48 hour) storm events, along with the 2 through 100 year return period 3 hour Chicago design storms. The Chicago design storms were modeled using the Region's (DGSSMS) IDF values, which exceed the City of Cambridge IDF values. A summary of the IDF and pre-development catchment parameters has been included in **Appendix B**, whereas the pre and post-development modelling is included in **Appendices C** and **D**, respectively.

2.3 Geotechnical and Hydrogeological Information

From 2010 to 2013, LVM Inc. carried out a hydrogeological investigation for the Westwood Village Community lands for Hallman Construction Limited and Brian Domm Farms Ltd. The fieldwork for the investigation on the subject lands included: 13 boreholes to depths ranging from 4.88m to 11.89m, and 9 mini piezometers to depths ranging from 0.91m to 2.44m, collection of soil samples, and measurement of groundwater levels.

In the spring and summer of 2014, LVM also carried out a geotechnical investigation. The field work for this investigation included boreholes and handholes to accurately determine topsoil depths. Monitoring wells were installed to allow measurement of the stabilized groundwater levels and to support the existing hydrogeological data of the area.

In 2015, MTE carried out a *Supplemental Hydrogeology Study* (October 11, 2017) for the Cambridge West Community (now Westwood Village Community) lands. This study conducted additional fieldwork and summarizes the hydrogeological investigations performed for the development study area.

To support the proposed development of the subject lands, MTE has completed an additional hydrogeological assessment in April 2021. The study reviewed and integrated findings from seven previous studies relevant to the subject lands.

Based on the results of LVM's detailed hydrogeological and geotechnical investigations, the subsurface stratigraphy is generally described as topsoil underlain by deposits of sand, or sand and gravel underlain at depth by deposits of silt/silt till. Silt was contacted in localized layers and pockets across the site. The granular deposits are extensive in areas and are typically saturated at their base, forming a shallow overburden aquifer. Groundwater in the overburden aquifer generally flows towards the Grand River, driven by topography and surface drainage features. The overburden aquifer (ranging in elevations from 305m to 308m) is separated from the bedrock aquifer (ranging in elevations from 270m to 300m) by a thick overburden aquitard.

Composite high groundwater contours, as shown in **Figure 4.2** of the Westwood Village – Phase 2 FSR, have been generated for the subject lands based on collected groundwater level monitoring to date.

Refer to the LVM's Geotechnical Investigation Report attached in the *Westwood Village (Phase 2) Community - Functional Servicing Report* (MTE, April 19, 2021) for more details. The original LVM borehole logs are also provided in **Appendix E**.

LEGEND

- PROPERTY BOUNDARY
- EXISTING CONTOURS (326)
- MUNICIPAL BOUNDARY
- SUBJECT LANDS (DRAFT PLAN LIMITS)
- LIMIT OF WETLAND
- LIMIT OF WETLAND BUFFER
- GRCA REGULATION LIMIT
- FLOODLINE LIMIT
- EXISTING SWM FACILITY
- 101 / 0.39 — SUB-CATCHMENT NUMBER / AREA (ha.)

GRANDVIEW HILLS SUBDIVISION
BLOSSOMFIELD CRESCENT
DOMM PARK
ROSSLINN ROAD
BISMARK DRIVE
WESTCLIFF WAY
PRINCESS STREET
GRAND RIVER
HALE CRESCENT
NEWMAN CREEK
NEWMAN DRIVE
EX. NEWMAN DRIVE SWM FACILITY
NEWMAN LANDS (30T-16105)
CACHET SUBDIVISION (30T-16103)
WETLAND 2
DEVIL'S CREEK
CANADIAN PACIFIC RAILWAY
200 BLENHEIM RD.
HALLMAN SUBDIVISION (30T-16104)
BLENHEIM ROAD
WETLAND 3
CITY OF CAMBRIDGE
TOWNSHIP OF NORTH DUMFRIES
CRUICKSTON CREEK
East Wetland (Vernal Pond 7)
HALLMAN SUBDIVISION
BRIAN DOMM SUBDIVISION
WETLAND 4
WETLAND 5
West Wetland (Vernal Pond 1)
BARRIE'S LAKE
GILHOLM MARSH

101	0.39	
102	2.14	
103	2.59	*
104	2.82	*
105	16.40	
108	12.40	
109	12.52	
201	8.07	
202	10.84	
301	16.62	
304	11.93	
305	0.65	
306	4.39	
307	16.53	
308	6.30	
309	1.64	*
311	47.93	
312	31.80	*
313	9.85	
314	11.42	
315	4.92	
316	21.20	
401	2.34	
402	13.37	
403	10.73	
404	11.41	
407	25.55	*
408	5.90	
409	89.14	*
410	1.71	*
501	2.07	
601	4.68	*
602	3.31	*

FIGURE 2.1
Date: APR.19/21
Scale: 1:4000

WESTWOOD VILLAGE - PHASE 2

EXISTING DRAINAGE AREA PLAN

MTE
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Project No.: 02534-800

April 26, 2021 — 1:20 p.m. — Plotted By: CCarre

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3.0 Stormwater Management Criteria

The subject lands have been considered in the approved stormwater management strategy for the Westwood Village (Phase 1) Community. The details have been well documented in the *Cambridge West Community Westwood Village - Final Stormwater Management Report* (MTE, April 15, 2020), including the established stormwater management criteria.

The following stormwater management criteria has been established for the Phase 2 Community:

- **Water Quality** – Provide an *Enhanced* (MOE, 2003) level of stormwater quality treatment prior to discharge to surface or groundwater systems.
- **Water Quantity** – Control peak flow rates to creek systems to existing levels, to minimize flooding and preserve hydraulic and hydrologic functions.
- **Water Balance**
  - *Infiltration* – Maintain or enhance existing recharge rates across the development area.
  - *Surface Water* – Maintain existing surface water volume and hydro-period inputs into significant environmental features.

Water Quality and Quantity Control - SWM Facility 2

As described in the *Cambridge West Community Westwood Village - Final Stormwater Management Report* (MTE, April 15, 2020), SWMF 2 will provide water quality and quantity controls for the subject lands. The quality control provided by SWMF 2 for the subject lands will need to meet requirements of an Enhanced level. All flows up to and including the Regional storm event will need to be controlled to the capacity of the proposed storm connection to the Princess Street storm sewer.

Water Balance

The existing conditions hydrologic model was run for a 39-year simulation period to determine the average annual evapotranspiration, runoff, and infiltration values. The average water balance results for the catchments within the MESP development study area are listed in **Table 3.1** below.

Table 3.1 – Existing Conditions Annual Water Balance

Condition	Hydrologic Component Values (mm/yr) (MESP – 83ha)
Precipitation	882.3
Evapotranspiration	582.2
Infiltration	249.3
Runoff	50.8

The proposed development will need to match or exceed the pre-development infiltration rate through a combination of lot-level and conveyance infiltration galleries. As good engineering practice, infiltration facilities should be constructed with an actual volume 15% larger than their modeled volume.

The volume and hydro-period of surface water inputs into the water features surrounding the subject lands need to be maintained under post-development conditions.

4.0 Proposed Development and SWM Strategy

4.1 Proposed Area Grading

A finished grade contour plan illustrating road grades is enclosed (**MTE Drawing 02534-800-QU1.1**). The grading design of the subject lands was controlled by many factors, including: servicing constraints (sanitary and storm), matching existing and proposed boundary grades around the perimeter of the property while respecting existing natural features, ensuring major storm event overland flows are directed towards the existing road right-of-ways and/or proposed SWM facilities, as well as maintaining a cut/fill balance for the overall development.

4.2 Post-Development Conditions

The stormwater management strategy for the Westwood Village Community is outlined in the approved MESP and detailed for implementation as part of the Final Stormwater Management Report. The subject lands were considered as part of the overall strategy. Although the Final Stormwater Management Report proposed four (4) new stormwater management facilities to service the Westwood Village Community, this report has re-evaluated the need for the fourth facility that was intended to serve a small drainage area of the Domm lands, to determine if this drainage area could be directed to SWMF 2. As such, the solution for the subject lands includes the implementation of at-source roof infiltration facilities throughout the property, and the use of SWMF 2 for water quality and quantity control. A conveyance infiltration facility is also proposed as part of the SWM strategy for the subject lands. The strategy has been designed to meet the criteria presented in Section 3.0 of this report.

The proposed development consists primarily of residential land use with some park blocks and related roads. Minor storm runoff from all contributing areas will be conveyed by the proposed storm sewer system to SWMF 2. Excess runoff from major storms will flow overland to the SWMF via the proposed right-of-ways and overland flow routes. The post-development catchment areas are detailed in **Figure 4.1**. Stormwater Management Facility 2 is located adjacent to Wetland 2. It will primarily discharge to the existing Princess Street storm sewer, which outlets directly to the Grand River. It should be noted that, the proposed Plan of Subdivision for the Hallman and Domm lands contain a number of Blocks that will be developed through a Site Plan Approval process. As part of that process, a Stormwater Management Brief will be prepared identifying the stormwater management criteria for the Block and how the stormwater control measures will adhere to the Subdivision SWM criteria as established in this report.

Lot-level infiltration facilities are proposed to be connected to the majority of roof areas within the development. All lot-level infiltration systems for single detached lots will be located in the backyards and have been designed to accept 25mm of runoff.

A conveyance infiltration facility (infiltration facility located along the conveyance route) will also be provided to infiltrate treated ‘non-roof’ (road, front/rear yard) runoff. The conveyance facility within the subject lands has been designed to infiltrate 25mm of contributing runoff. The area contributing to the conveyance infiltration facility is illustrated in **Figure 4.2**.

Water balance into wetland features from the subject property will be met by a combination of inputs from the rear yards/roof areas of lots adjacent to the wetlands and contributions from a roof drainage collection system (‘third-pipe’ system). The areas that will contribute to the wetland surface water balance under post-development conditions are detailed in **Figure 4.2**.

The post-development modelling parameters and imperviousness calculations are included in **Appendix B**.

701
Catchment 701 consists of the northern portion of Cachet Subdivision and is adjacent to the portion of the subject lands that are proposed to drain to SWMF 2. The drainage area contains residential blocks and a portion of SWMF 2, for a total area of 8.81ha.

702
Catchment 702 consists of the major portion of Hallman Subdivision and the western portion of Cachet Subdivision. The catchment is proposed to drain to SWMF 2. The drainage area contains residential, park, and mixed-use blocks as well as a school and the majority of SWMF 2, for a total area of 27.88ha.

708
Catchment 708 consists of the majority of the subject lands and is proposed to drain to SWMF 2. The drainage area contains primarily residential and park blocks, and has a total area of 17.49ha.

710
Catchments 710 consists of the southern portion of Newman Lands which is proposed to drain to the existing Newman Drive SWM Pond. It should be noted that the drainage area from the subject lands to be accommodated by the Newman SWMF has been coordinated with the engineering consultant (Meritech) for the Newman Lands. A portion of the subject lands at the northeast would be graded toward this catchment. This catchment area has a total drainage area of 6.32ha.

712
Catchment 712 consists of the southern portion of the subject lands and is proposed to drain to SWMF 2 through the storm sewer system and overland flow route within catchment 702. The drainage area contains two multiple residential blocks and have a combined area of approximately 1.04ha.

LEGEND

- PROPERTY BOUNDARY
- EXISTING CONTOURS (326.0)
- PROPOSED CONTOURS (326.0)
- MUNICIPAL BOUNDARY
- SUBJECT LANDS (DRAFT PLAN LIMITS)
- LIMIT OF WETLAND
- LIMIT OF WETLAND BUFFER
- FLOODLINE LIMIT
- MAJOR OVERLAND FLOW ROUTE
- CONVEYANCE INFILTRATION FACILITY
- EXTERNAL DRAINAGE AREA
- INTERNAL DRAINAGE AREA
- EXISTING SWM FACILITY
- 206 / 4.28 — SUB-CATCHMENT NUMBER / AREA (ha.)
- DRAINAGE TO BARRIE'S LAKE
- DRAINAGE TO WETLAND 2/ GRANDRIVER
- DRAINAGE TO WETLAND 3
- DRAINAGE TO WETLAND 4/5
- DRAINAGE TO DEVIL'S CREEK
- DRAINAGE TO NEWMAN SWM FACILITY
- DRAINAGE TO CRUICKSTON CREEK

GRANDVIEW HILLS SUBDIVISION
316 / 21.01
315 / 1.58
314 / 11.42
311 / 47.93
303 / 32.16
309b / 1.19
OGS
OGS
307 / 16.53
DEVIL'S CREEK
CANADIAN PACIFIC RAILWAY
313 / 4.92
308b / 0.28
707 / 0.77
SWM FACILITY #3
306 / 4.90
703 / 3.06
WESTCLIFF WAY
STREET A
STREET B
STREET C
BISMARK DRIVE
HALLMAN SUBDIVISION (30T-16104)
STREET F
STREET E
STREET G
706 / 4.68
704 / 3.38
SWM FACILITY #1
709 / 4.46
EX. BLENHEIM ROAD
CANADIAN PACIFIC RAILWAY
202 / 10.43
NEWMAN CREEK
ROSECLIFF CRESCENT
201a / 6.10
PRINCESS STREET
NEWMAN DRIVE
SWM FACILITY #2
702 / 27.88
312 / 5.52
WETLAND 2
CACHET SUBDIVISION (30T-16103)
701 / 8.81
710 / 6.32
NEWMAN LANDS (30T-16105)
711 / 2.60
EX. NEWMAN DRIVE SWM FACILITY
201b / 0.29
CRUICKSTON CREEK
105 / 4.04
STREET D
402 / 5.07
705 / 0.43
WETLAND 3
CITY OF CAMBRIDGE
TOWNSHIP OF NORTH DUMFRIES
712 / 1.04
404 / 5.98
403 / 10.73
ROSEHILL DRIVE
HALLMAN SUBDIVISION
BRIAN DOMM SUBDIVISION
708 / 17.49
WETLAND 4
407 / 25.55
WETLAND 5
BARRIE'S LAKE

FIGURE 4.1 — Date: APR.19/21 — Scale: N.T.S.

WESTWOOD VILLAGE - PHASE 2

PROPOSED DRAINAGE AREA PLAN

MTE — Engineers, Scientists, Surveyors

Project No.: 02534-800

April 26, 2021 — 1:30 p.m. — Plotted By: CCarre

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LEGEND

- PROPERTY BOUNDARY
- EXISTING CONTOURS
- PROPOSED CONTOURS
- LIMIT OF SUBDIVISION
- LIMIT OF WETLAND
- LIMIT OF WETLAND BUFFER
- LIMIT OF DEVELOPMENT
- FLOODLINE LIMIT
- MUNICIPAL BOUNDARY
- INTERNAL DRAINAGE AREA
- DEDICATED 3rd PIPE ROOF LEADER STORM SEWER SYSTEM
- MAJOR OVERLAND FLOW ROUTE
- EXISTING SWM FACILITY
- CONVEYANCE INFILTRATION FACILITY
- ROOF AREA TO WETLAND 2 VIA 3RD PIPE & OVERLAND
- ROOF AREA TO EAST WETLAND VIA 3RD PIPE
- ROOF AREA TO ADJACENT WETLAND (AS NOTED)
- AREA TO CONVEYANCE INFILTRATION FACILITY

NEWMAN LANDS (30T-16105)

CACHET SUBDIVISION (30T-16103)

HALLMAN SUBDIVISION (30T-16104)

BRIAN DOMM SUBDIVISION

STREET A

STREET B

STREET C

STREET D

STREET E

STREET F

STREET G

NEWMAN DRIVE

WETLAND 2

WETLAND 4

ROOF AREA TO WETLAND 4

1.00ha ROOF AREA TO EAST WETLAND (VP7)

0.08ha ROOF AREA TO CRUICKSTON CREEK

0.02ha ROOF AREA TO WEST WETLAND (VP1)

3.71ha AREA TO CIF

0.12ha ROOF AREA TO WETLAND 3

0.81ha ROOF AREA TO WETLAND 4

CITY OF CAMBRIDGE

TOWNSHIP OF NORTH DUMFRIES

FIGURE 4.2

Date: APR.19/21
Scale: 1:2500

WESTWOOD VILLAGE - PHASE 2

CONVEYANCE INFILTRATION AND ROOFWATER COLLECTION STRATEGY

MTE
Engineers, Scientists, Surveyors

Project No.: 02534-800

April 20, 2021 — 5:04 p.m. — Plotted By: CCarre

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5.0 Stormwater Management Design

5.1 Hydrologic Modelling

As previously noted, an existing conditions hydrologic model for the Westwood Village Community subwatersheds was developed for the MESP using the GAWSER (version 6.9.12) modelling platform. This model was then updated in the Final Stormwater Management Report (FSWMR) to reflect the proposed conditions and stormwater management strategies approved for the Westwood Village Community lands to create a proposed hydrologic model. This proposed hydrologic model was further refined in this report to simulate the proposed development conditions and stormwater management strategy proposed for the subject lands. Both continuous and single event simulations were run using GAWSER (version 6.9.18). The proposed development conditions were modelled for the:

- Quality event (25mm depth, 4hr Chicago distribution);
- 2, 5, 10, 25, 50, and 100 year return period rainfall events (3hr Chicago distribution derived from the Region's Intensity-Duration-Frequency parameters);
- Regional storm event (48hr, 285mm depth - Hurricane Hazel); and
- 39-year continuous simulation period (meteorological data from Preston weather station 1960-1999).

The IDF parameters and the hydrologic parameters for the pre and post-development conditions are included in **Appendix B**. The pre-development modelling is included in **Appendix C**; whereas the post-development modelling is included in **Appendix D**.

5.2 Stormwater Management Facility 2 (Cachet Subdivision)

As described in Section 4.2, the majority of the subject lands are proposed to drain to SWMF 2. The facility will provide quality and quantity controls for the subject lands. The detailed design of SWMF 2 has been completed as part of the final SWM designs (MTE, April 15, 2020) for the Westwood Village Phase 1 Community. An Environmental Compliance Approval has been issued for SWMF 2 by MECP in November 2020. The facility is located within the Cachet Subdivision (30T-16103), adjacent to Wetland 2. The facility was originally designed to provide Enhanced level of quality control for a total drainage area of 51.22 ha with a 57.7% imperviousness.

In addition to the original designed drainage area, an additional 4.0ha area of the subject lands is proposed to be directed to SWMF 2. This report confirms that SWMF 2 has enough capacity to service the additional area without requiring any changes or causing significant impacts, while meeting all the criteria as described in Section 3.0 of this report.

Please refer to the FSWMR for more details regarding the design of SWMF 2. The approved design drawings **44720-114-SW2.1** to **SW2.3** for SWMF 2 are enclosed, updated with the new ponding elevations under various storm events.

5.3 Stormwater Quality Control

SWMF 2 has been designed as a wetland with a permanent pool depth of 0.3m. The facility incorporates two sediment forebays with a depth of 1.5m, which offers benefits of dilution and settling of sediment. A planting scheme has been prepared that carefully selects plant species and their location in and around the basins to stabilize banks, mitigate temperature increases, and provide aesthetics and safety benefits.

The total drainage area for SWMF 2, which includes the subject lands and the majority of the Hallman Subdivision and Cachet Subdivision, is 55.22ha at 58.5% imperviousness. The MECP requires 108.5m^3/ha of storage, 40m^3/ha of which is extended detention, and the remainder of which is the permanent pool. The required permanent pool and extended detention volumes for SWMF 2 are therefore 3,780m^3 and 2,209m^3, respectively.

SWMF 2 has a forebay at both its northern and southern ends. The northern forebay will accept minor storm event flows from the northern portion of the facility's drainage area (catchments 701 and 708) via a splitter structure designed to split off flows in excess of the 25mm quality event. The large flows will be directed into the main pond, avoiding potential 'washout' of the forebay. The southern forebay will accept minor storm event flows from the southern portion of the facility's drainage area (catchment 702 and 712). A similar splitter structure would surcharge the incoming sewers and therefore was not proposed for this forebay.

The northern and southern forebays have permanent pool volumes of 944m^3 and 2,617m^3, respectively, which combined with 3,752m^3 of permanent pool within the designed wetland makes for a total provided permanent pool volume of 7,313m^3 within SWMF 2. A 235mm orifice at the outlet structure will be able to provide over 24-hour extended detention for 2,209 m^3.

The SWMF 2 design characteristics are summarized in **Table 5.1** below. Refer to **Appendix B** for the relevant updated design sheets and calculations (catchment parameters, imperviousness calculations, stage-storage discharge relationships, drawdown calculations, forebay sizing calculations, control manhole sizing, etc.). Refer to the appended **MTE Drawings 44720-114-SW2.1** to **SW2.3** for more details of SWMF 2.

All the calculations demonstrate that the original design of SWMF 2 will be able to provide the intended functions for quality control, given the additional drainage area from the proposed development.

5.4 Stormwater Quantity Control

As previously discussed, flows for all storm events will be conveyed to SWMF 2 by a combination of storm sewers and overland flow routes (road right-of-ways). The post-development design storm event modelling output is included in **Appendix D**.

A typical single-stage outlet pipe was designed for use in this stormwater management facility. A single 235mm orifice plate at elevation 308.30m will control peak design flows for all storm durations to a maximum of 0.191m^3/s to suit the capacity of the outlet sewer (95% full-flow capacity of a 450mm diameter pipe at 0.5% slope). The designed wetland portion of the facility has storage sufficient to hold the 5-year storm to elevation 309.20m, above which the designed wetland provides storage in combination with Wetland 2. SWMF 2 together with Wetland 2, has a total active storage capacity (with an assumed spring water level of 308.40m in the wetland) of 137,900m^3 to elevation 311.30m. The peak ponding elevation, storage, and outflow for SWMF 2 for the various design storms are updated and listed in **Table 5.2** below.

Table 5.1 – SWM Facility 2 Design Characteristics

General	Facility Characteristics
Stormwater Management Facility Type	Wetland
Required MECP Water Quality Protection	Level 1 (Enhanced)
Total Contributing Area	55.22ha
Imperviousness	58.5%
Bottom Elevation (of main facility)	308.00m
Storage	
Unit Area Storage Volume Requirements as per SWMPDM (MOE, 2003)	108.5m^3/ha
Required Total Volume	5,989m^3
Permanent Pool	
Required Permanent Pool Volume	3,780m^3
Permanent Pool Volume Provided	7,313m^3
Permanent Pool Elevation	308.30m
Extended Detention	
Minimum Required Volume (40m^3/ha)	2,209m^3
Approximate Drawdown Time (40m^3/ha)	28.4hr
Extended Detention Elevation (40m^3/ha)	308.43m
Peak Release Rate for Extended Detention (40m^3/ha) – no diversion to Wetland 2	0.018m^3/s
North Forebay	
Required Forebay Length	29.6m
Actual Forebay Length	39.0m
Permanent Pool Elevation	308.30m
Bottom Elevation	306.80m
South Forebay	
Required Forebay Length	44.1m
Actual Forebay Length	79.0m
Permanent Pool Elevation	308.30m
Bottom Elevation	306.80m
Outlet Controls	
CSP Riser	
Orifice 1 Diameter (Extended Detention)	235mm
Orifice 1 Elevation (Extended Detention)	308.30m
Shared Storage Elevation (SWMF 2 & Wetland 2)	309.20m

Table 5.2 – Proposed Event Modelling Output

Storm Event	Maximum Ponding Elevation (m)	Peak Storage Requirement (m^3)	Peak Outflow (m^3/s) to Wetland[1] (to sewer)
25mm Storm	308.54	4,122	0.000 (0.041)
2-Year Storm	308.70	6,931	0.000 (0.063)
5-Year Storm	309.05	14,039	0.000 (0.096)
10-Year Storm	309.24 *	18,565 *	0.227 (0.111)
25-Year Storm	309.32 *	21,055 *	0.913 (0.119)
50-Year Storm	309.37	23,500	1.925 (0.125)
100-Year Storm	309.45	25,117	2.762 (0.128)
Regional Storm	310.86	30,509	6.219 (0.140)

** Storage provided in Wetland 2 depressions below weir elevation 309.20m*
[1]. Unbracketed flows are those leaving SWMF 2 to the wetland (via the equalization channel).

The 10 to 100-year event elevations refer to the maximum ponding required to pass flows to the wetland during infrequent events. During these events, the ponding elevation within the SWMF are higher than the ponding elevations within the wetland, as shown in the table in **MTE Drawing 44720-114-SW2.1**. During infrequent events (10 to 100 year), the SWMF fills to 309.20m before beginning to fill the wetland. Once the wetland level reaches 309.20m, available storage is shared with the upper portion (above 309.20m) of the SWMF.

Emergency overflow from Wetland 2 is provided with two spill points: one to the southeast (312.0m), over an earthen berm to the wildlife crossing beneath Bismark Drive; the other to the southwest (313.0m), towards Wetland 4 via the wildlife crossing beneath Newman Drive.

The model results demonstrate that the original design of SWMF 2 will be able to provide the intended functions for quantity control without any negative impacts, given additional drainage area from the proposed development.

5.5 Water Balance Analysis

During urban development, the conversion of pervious vegetated areas to impervious surfaces leads to a decrease in evapotranspiration and infiltration volumes, and an increase in runoff volumes. The MESP established that both existing infiltration rates and existing surface water inputs to key natural features were to be maintained in the post-development conditions.

5.5.1 Infiltration

The infiltration strategy identified for the subject lands is an enhancement over the current average annual volumes. As such, lot-level and conveyance controls will be implemented within the development lands to achieve the infiltration targets.

Lot-Level Controls

Lot-level infiltration facilities have been designed to accept 25mm of runoff from the contributing roof area, which is assumed to be approximately 43% and 30% of residential and multi-residential blocks, respectively, within the catchment area. This equates to approximately 25% of the development. The volume to area relationship modelled in GAWSER assumes a 0.4 void ratio. The facilities are to be oversized by 15% to provide some volumetric infiltration capacity redundancy to allow for a potential loss in performance over time. Runoff is to be directed to the infiltration facilities through direct connection of the roof leaders, wherein each facility will contain an overflow to the local storm sewer system. Specific details of this configuration will be shown on the lot grading details plans during the final design stage.

Lot-level infiltration galleries located within condominium blocks will likely consist of a series of independent infiltration galleries located within appropriate areas of the site (e.g. pervious areas, under parking lots, etc.). Given the relatively small size of the rear yard areas, the galleries will likely be constructed using a commercial subsurface storage system in order to provide the necessary volumetric efficiency. Runoff will enter the galleries through direct connection of roof leaders. The infiltration galleries are also to be oversized by 15%.

Conveyance Controls

A conveyance control will include an infiltration gallery and an upstream oil and grit separator to treat stormwater prior to entering the facility. The proposed SWM strategy includes a conveyance infiltration facility (CIF), located within the central park block (Block 16-Stage 1, Domm) of the proposed development. **Figure 4.2** illustrates the drainage area of the conveyance facility which serves to infiltrate 'non-roof' runoff in order to provide a distributed infiltration balance to pre-development levels. The over flows from the CIF will discharge to the proposed storm sewer system in the subject lands.

The CIF is proposed to infiltrate 25mm of runoff from a 3.71ha drainage area. The facility is to be oversized by 15% to provide some volumetric infiltration capacity redundancy to allow for a potential loss in performance over time. The post-development hydrologic modelling that accompanies this report reflects this design philosophy. The design of CIF will need to meet criteria described in the MOE's 2003 *Stormwater Management Planning and Design Manual*. Specific details of the design will be provided during the final design stage.

As can be seen from the continuous GAWSER modelling and summary water balance tables contained in **Appendix F**, implementation of the proposed infiltration measures results in an average annual infiltration depth of 262.8mm, which exceeds the pre-development value of 256.4mm.

5.5.2 Surface Water

As described in Section 3.0, an objective of the proposed stormwater management plan is to ensure that the surface water volume inputs into the wetland features surrounding the development are maintained.

Wetland 2

Wetland 2 (hydrograph 5312) is located within the Cachet Subdivision, adjacent to SWMF 2, and receives a pre-development runoff volume of 23,800m^3 (MESP, 2013). In the post-development condition, Wetland 2 receives a direct runoff volume of 6,442m^3, which is supplemented by directing clean roof water year round via a 'third-pipe' system, to achieve an annual post-development runoff volume of 24,349m^3. Refer to **Appendix F** for the detailed water balance assessment. The roof areas that drain to Wetland 2 are illustrated in **Figure 4.2**.

Wetland 2 primarily receives surface balance inputs from the contributing roof areas, rather than runoff from SWMF 2. All SWMF 2 discharge up to and including the 5-year storm event, which would include all winter month melts and events, outlets to the Princess Street storm sewer. In this manner, SWMF 2 has an inherent wetland winter bypass, which functions passively, avoiding ecological impacts associated with chloride loading.

Wetland 3

Wetland 3 (hydrograph 1402) is located south of the subject lands and receives a pre-development runoff volume of 37,300m^3. In the post-development condition, it receives post-development non-winter runoff from Facility 1 outlet totaling 6,860m^3, runoff from the undeveloped buffer (catchment 402), proposed Blenheim Road, and the rear yard/roof areas of the subject land (catchment 712) for a total post-development runoff volume of 38,842m^3 - a small (4%) surface water runoff surplus. Refer to **Appendix F** for the detailed water balance assessment.

Wetland 4 and 5

Wetlands 4 and 5 (hydrograph 1405), which are hydraulically connected, are located west of the subject lands and receive a pre-development runoff volume of 55,000m^3. In the post-development condition, they receive surface water input from the undeveloped buffer and the rear yard/roof areas of the subject lands (catchments 708 and 712) for a total post-development runoff volume of 54,681m^3. Refer to **Appendix F** for the detailed water balance assessment.

West Wetland (VP1)

This wetland was identified as Vernal Pond 1 (WSP, 2016) and is located northwest of the subject lands. It receives a pre-development runoff volume of 3,802m^3. In the post-development condition, it receives surface water input from the undeveloped lands and buffer to the west of the subject lands, and the rear yard/roof areas of the development, for a total post-development runoff volume of 3,850m^3 (a slight increase of approximately 1%). Refer to **Appendix F** for the detailed water balance assessment and **Figure F1** for the catchment delineation of VP1.

East Wetland (VP7)

This wetland was identified as Vernal Pond 7 (WSP, 2016) and is located north of the subject lands. It receives a pre-development runoff volume of 9,135m^3. In the post-development condition, it receives surface water input from the undeveloped lands and buffer to the north of the subject lands, the rear yard/roof areas of the adjacent lots, and additional roof drainage collected through a third-pipe system within the development. A total of 9,301m^3 of post-development runoff will be contributed to this wetland (a slight increase of less than 2%), as illustrated in **Figure 4.2**. Refer to **Appendix F** for the detailed water balance assessment and **Figure F1** for the catchment delineation of VP7.

Cruickston Creek

Cruickston Creek downstream of the proposed development area (hydrograph 1110) receives a pre-development runoff volume of 46,300m^3 via diffuse drainage through the surrounding 'hogsback' swamp into a channel toward the north end of that feature. It receives a total post-development runoff volume of 46,368m^3, matching pre-development. Refer to **Appendix F** for the detailed water balance assessment.

All residential blocks will have infiltration galleries, except for those reserved for the surface water balance to the wetlands. In the lots with roof draining to Wetland 2, the proposed 'third-pipe' system will replace the roof infiltration galleries. For the residential lots (in the Cachet Subdivision) adjacent to Wetland 2, runoff from the roofs will be directed to Wetland 2 through downspouts and overland routing. It is estimated that drainage from a total roof area of 1.51ha within the subject lands will be directed to Wetland 2 via a 'third-pipe' system, and 2.70ha will be directed to lot-level infiltration galleries. Downspouts will be directly connected to the 'third-pipe' storm sewer system via a separate storm sewer connection. The drainage from a total roof area of 0.14ha within catchment 712 will be directed to lot-level infiltration galleries. The total

roof areas of 0.12ha, 0.81ha, 1.00ha, 0.02ha and 0.08ha will drain from the subject lands to Wetland 3, Wetland 4 and 5, East Wetland (VP7), West Wetland (VP1) and Wetland 6, respectively, to maintain surface water inputs, as illustrated in **Figure 4.2**.

5.6 Block Level Stormwater Management Approach

The proposed Plans of Subdivision for the subject lands contain a number of blocks that will be developed through a Site Plan Approval process. As part of that process, a SWM Brief will be prepared identifying the stormwater management criteria for the block and how the stormwater control measures will adhere to the Subdivision SWM criteria as established in this report. To facilitate this process, the following summarizes the overall approach for stormwater management for the blocks within the plan.

Water Quality Control

- Criteria - Provide an Enhanced level of stormwater quality control.
- *Stormwater Management Strategy - This has been provided by stormwater management facility 2 within the Cachet Subdivision.*

Water Quantity

- Criteria - Control peak flow rates to creek systems to existing levels, to minimize flooding and preserve hydraulic and hydrologic functions.
- *Stormwater Management Strategy - This has been provided by stormwater management facility 2 within the Cachet Subdivision.*

Water Balance

- Criteria - Infiltration – maintain or enhance existing recharge rates across the development area.
- *Stormwater Management Strategy - The infiltration galleries should be designed to accept 25mm of runoff from the contributing roof area (assumed to be 30% of multi-residential blocks). These facilities are to be oversized by 15% to provide some volumetric and infiltration capacity redundancy to allow for potential loss in performance over time. Runoff is to be directed to the infiltration facilities through direct connection of the roof leaders, and each facility should contain overflows to the storm sewer system. The infiltration facilities are to be situated to have a minimum 1.0m separation to high groundwater.*
- Criteria - Surface Water – Maintain existing surface water volume and hydro-period inputs into significant environmental features.
- *Stormwater Management Strategy - Reserved sufficient rear yard/roof areas to provide drainage to maintain surface water inputs to surrounding wetlands.*

6.0 Chloride Impact Assessment

A Chloride Impact Assessment was prepared for the subject lands and includes the calculation of the loading of salt from de-icing operations to groundwater so as to ensure that groundwater chloride concentrations will remain within Reasonable Use Guidelines established by the Ministry of Environments, Conservation and Parks (MECP), previously referred to as the MOE.

6.1 Reasonable Use Concept

The assessment of road salt and its implications on groundwater can be made by estimating total chloride levels and comparing the estimated value with specific target criteria for chloride concentrations. Although the Region has yet to establish groundwater quality criterion for chlorides, the Ontario Drinking Water Standard (ODWS) for chloride of 250mg/L generally defines the upper limit of acceptability. In recent years, the MECP's Reasonable Use Concept (RUC) has been adopted for various studies conducted in the Region to assess the impact of road salt on groundwater quality, per the Region's document entitled *Draft Protocol for Evaluating Road Salt Impacts to Groundwater Using the Reasonable Use Concept*, dated January, 2008.

The RUC establishes limits for the allowable concentrations of contaminants based on background groundwater quality and the reasonable use of groundwater on adjacent property. The limits are set such that there would not be any significant effect on the use of the groundwater on the adjacent property. Since the reasonable use of groundwater is commonly drinking water, the Reasonable Use limits are typically set on this basis. As a result, the quality of groundwater may not be degraded by an amount in excess of:

- 50 of the difference between background[1] and the Ontario Drinking Water Objectives for non-health related parameters (e.g. chloride); or
- 25% of the difference between background and the Ontario Drinking Water Objectives for health related parameters (e.g. lead).

The Reasonable Use Concept has been incorporated in Regulation 232/98. The Reasonable Use requirements have been included directly as performance specifications for the site specific design approach. In cases where the reasonable use of groundwater is other than drinking water, for example where background groundwater quality is poor, the RUC guideline allows alternative concentration limits to be set. These alternative limits would be determined on a case-by-case basis.

Given the ODWS for chloride is 250mg/L and the background chloride concentration in the groundwater is approximately 2.5mg/L, the RUC maximum concentration of chloride in groundwater for the site should not exceed 126mg/L.

[1] For the development-scale assessment, the background level would be the concentration in the groundwater prior to anthropogenic impacts (2.5mg/L). (*Draft Protocol for Evaluating Road Salt Impacts to Groundwater Using the Reasonable Use Concept*. Region of Waterloo, DOCs:409317, Version 1.0 January 2008)

6.2 Chloride Impact – Mass Balance Analysis

In an effort to quantify potential winter salt application impacts (chloride) to the existing groundwater quality, a conservative mass balance analysis was completed. Both municipal roads and private parking areas within multi-residential blocks have been included in this analysis. The road lengths used in the analysis are based on the Draft Plans. The area of the private parking (for all hard surfaces; such as asphalt surfaces and concrete sidewalks) for the purposes of calculating total annual salt weight (in tonnes) has been based on overall conceptual site plans.

This mass balance approach, although basic, is considered a conservative evaluation since it does not include any dilution from groundwater already present in the system, any flow through dilution effects, or any off-site effects. All of these effects would result in additional dilution of the chloride concentrations. The salt application rates used in the analysis do not include the expected 25% reduction in average salt application rates for municipal roads and the Best Management Practices recommended in previous studies for the Region. The annual salt application rate for private parking areas was suggested by Regional staff based on recent studies/analysis completed. The results of the salt application analysis are summarized in **Table 6.1** and detailed in **Appendix G**.

Table 6.1 – Impact of Road Salt on Groundwater Chloride Levels

Chloride Calculations	Local Road	Local Road to CIF	Private Parking Areas to CIF	Private Parking Areas
Lengths of Roads in subdivisions (km)	2.19	0.54	0.15ha	0.34ha
Annual Salt Application Rate (tonnes/2 lane-km)	1	1	15 tones/ha	15 tones/ha
Total Salt Applied (tonnes/year)	**2.19**	**0.54**	**2.30**	**5.07**
Total Estimated Infiltration Volume	66,816m^3			
Infiltration Rate into Subsurface	28% for Roads and 10% for Private Parking Areas 100% for CIF (Conveyance Infiltration Facility) Contributions			
Weight of Salt Infiltrating (Annual)	3.95tonnes			
Additional Chloride Input to Groundwater	**36mg/L**			

6.3 Mitigation Measures

The estimated post-development groundwater chloride concentration of 36mg/L is below the corresponding RUC limits of 126mg/L. As a best management practice, Salt Management Plans for multiple residential blocks should be completed to address potential groundwater quality impacts relate to winter de-icing operations.

6.3.1 Salt Management Plans

For the multiple residential blocks within the subject lands, it is likely that snow removal and ice control will be undertaken by a private winter maintenance service provider. As such, it is recommended that a site specific Salt Management Plan be implemented as part of the future development of these sites. The purpose of the Salt Management Plan will be to reduce the impact of all winter maintenance activities involving salting practices on the surface water and groundwater resources. The Salt Management Plan should outline operational practices and strategies for three main areas of concern: general salt use, salt storage, and snow storage/disposal. With respect to snow storage, it is recommended that the snow be stored on impervious surfaces that are connected to a storm sewer system, to prevent chloride impacted water from infiltrating directly into the groundwater system.

7.0 Monitoring Program

7.1 Historical Monitoring (MESP)

A comprehensive monitoring program was developed as part of the MESP study, including hydrological, groundwater, and biological components. The monitoring completed by MTE for the MESP included the following: climate monitoring (weather station), stream temperature monitoring, water quality (wetland and stream) sampling, wetland water level monitoring, baseflow rate sampling, continuous streamflow rate monitoring, and ambient air temperature monitoring. For additional details of the biological monitoring, refer to MMM Group's *Natural Environment Study* (NES) (Section 9) within the MESP.

The During-Development Monitoring Program specified herein was generated by recommended monitoring components within *Section 9.3.1.9* of the MESP (NES), which specified that final monitoring programs be verified at the Draft Plan of Subdivision application stage and undertaken by the developer.

7.2 During-Development Monitoring Program

In accordance with the recommendations of the MESP, a During-Development Monitoring Program associated with the developments within Westwood Village have been designed for implementation by the developer and is divided into three components:

- Pre-Construction
- During-Construction
- Post-Construction

The During-Development Monitoring Program includes monitoring programs for surface water, wetland features, groundwater, and biological features.

- The surface water monitoring program includes continuous temperature monitoring and seasonal base and storm quality samples (total 8 samples per year) including total suspended solids (TSS) and dissolved chloride (DC).
- The wetland monitoring program includes water level and seasonal base quality samples (total 3-4 samples per year) including total phosphorus (TP), total Kjeldahl nitrogen (TkN), and dissolved chloride (DC).
- The groundwater monitoring program includes water level (continuous monitoring and manual measurements) and annual chemistry testing for general water quality including metals and anions.
- Biological monitoring has been completed by WSP (previously MMM Group), and includes wildlife monitoring (brook trout, birds, amphibians), and vegetation units. For additional details of the biological monitoring, refer to MMM Group's *Scoped Environmental Impact Study* (EIS).

Table E.1 of the FSWMR summarizes the various components of the monitoring program along with specific locations, parameters, frequency, and status. This table has been included is this report as **Table 7.1**, however has been updated to only include monitoring associated with the subject lands. **Figure 7.1** illustrates the pre-construction surface and groundwater monitoring locations, and **Figure 7.2** illustrates the proposed during and post-construction surface and groundwater monitoring locations.

The following section documents the During-Development Monitoring program as it relates to the Township lands.

7.2.1 Pre-Construction Monitoring Program

The pre-construction monitoring program was developed with reference to the MESP and subsequent input from relevant agencies (GRCA, City, and Region). This portion of the monitoring is intended to establish the detailed site background conditions and baseline data, and shall include two years of monitoring prior to area grading. This information will facilitate comparison with conditions during and following construction and allow for an evaluation of mitigative measures, if necessary. Note that pre-development monitoring was generally satisfied through the MESP study. Many of the monitoring locations from the MESP program have been continued past 2013 (completion of the MESP), and the current pre-construction monitoring program includes the following:

- Surface Water Quality
- Groundwater Quality
- Groundwater Level
- Wetland Level

7.2.2 During-Construction Monitoring Program

This stage will begin at the commencement of subdivision area grading and continue until substantial completion of the subdivision (which is marked by 90% of building permits having been issued). The purpose of the during-construction monitoring is to ensure that the stormwater management measures are functioning as intended, and to monitor the effectiveness of erosion and sediment control measures. The SWMF inspections detailed herein are to occur seasonally. The during-construction monitoring will include:

- Surface Water Quality
- Groundwater Quality
- Groundwater Level
- Wetland Level
- Erosion and Sediment Control
- SWM Facility

SWM Facility 2 Monitoring

- Standard inspection of vegetation, structures, and general operation of hydraulic controls (observations of drawdown) within the stormwater management facility and within Wetland 2.
- Water level recording equipment may be required to supplement the visual monitoring of Wetland 2 to ensure that post-construction water levels are reasonable.
- Regular inspection and maintenance of erosion and sediment control measures around and within the facility.
- Installation of at least three water level monitoring locations within the inlet and outlet areas of the facility to ensure proper control structure functionality, where applicable.

7.2.3 Post-Construction Monitoring Program

This period of monitoring will extend 24 months from substantial completion of the development (90% of building permits having been issued). The purpose of this stage of the monitoring is to evaluate performance of the facility under 'ultimate' operating conditions. The post-construction monitoring period will include all monitoring components from the pre-construction and during-construction monitoring program.

The post-construction monitoring will include:

- Surface Water Quality
- Groundwater Quality
- Groundwater Level
- Wetland Level
- Erosion and Sediment Control
- SWM Facility

The post-construction monitoring will also include:

- Standard inspection of vegetation, structures, and general operation of hydraulic controls (observations of drawdown) within the stormwater management facilities. These inspections are to occur seasonally.

It is recommended that following completion of the developer's portion of the post-construction monitoring program and assumption of the stormwater management facility by the City, the City continues with a post-development inspection and maintenance program to ensure the long-term effectiveness of the proposed stormwater management facility.

TABLE 7.1. SURFACE AND GROUNDWATER MONITORING PROGRAM-TOWNSHIP LANDS

Monitoring Component	Type of Monitoring	Development Phase	Sampling Frequency	Location(s)	Methodology / Timing
SWM Facilities	Water Temperature and Levels	During/Post-Construction	Continuous (30 minute interval)	SW3, SW4, SW5 - Forebays and Outlet of SWMF2	Water temperatures will be continuously measured with recordings taken every 30 minutes. Water levels will be measured continuously at facility outlet(s) to monitoring drawdown and general facility performance.
Wetland Features	Water Quality	All	3-4x per year (one base sample per season)	Wetland 2 (91Q), Wetland 3 (92Q), and Wetland 4 (90Q)	Grab samples will be taken 3-4 times per year (once per season) under base flow conditions. Samples will be analyzed for dissolved chlorides, TKN, and total phosphorous in a laboratory.
	Water Temperature	All	Continuous (6 hour interval)	Wetland 2 (76P), Wetland 3 (77P), Wetland 4 (78P), Wetland 5 (79P)	Water temperatures will be continuously measured with recordings taken every 6 hours.
	Water Levels	All	Continuous (6 hour interval)	Wetland 2 (76P), Wetland 3 (77P), Wetland 4 (78P), Wetland 5 (79P)	Water levels will be continuously measured with recordings taken every 6 hours.
Groundwater	Water Levels	Pre-Construction	4x per year	On site monitoring wells BH11-10, BH101-21, BH14-10, BH102-21, BH112-10, BH09-10, BH101-10, BH113-10, BH07-10, BH104-10, BH105-10, BH12-10, BH106-10, BH13-10, BH111-10, BH15-10, BH19-10, BH110-10, BH103-10, BH114-10, BH17-10	Monitored on a quarterly basis (either with manual water level measurements or with electronic data loggers) for two continuous years within seven years of commencement of grading activities in a phase.
		During/Post-Construction	4x per year	On site monitoring wells BH11-10, BH101-21, BH14-10, BH102-21, BH112-10, BH09-10, BH113-10, BH12-10, BH15-10, BH19-10, BH110-10,	Monitored on a quarterly basis (either with manual water level measurements or with electronic data loggers). It is recognized that as development of a Phase progresses, some monitoring wells and mini piezometers will be decommissioned (per O. Reg. 903) due to their locations.
	Chemistry	Pre-Construction	1x per year	On site monitoring wells BH11-10, BH101-21, BH14-10, BH102-21, BH112-10	Sampled on an annual basis and analyzed for general chemistry parameters (Metals, Anions, etc.). Sampling of residential wells will be dependent on homeowner participation.
		During/Post-Construction	1x per year	On site monitoring wells BH11-10, BH101-21, BH14-10, BH102-21, BH112-10	Sampled on an annual basis and analyzed for general chemistry parameters (Metals, Anions, etc.). Sampling of residential wells will be dependent on homeowner participation. Additionally, it is recognized that as development progresses, some monitoring wells will be decommissioned (as per O. Reg. 903) due to their locations.
Biological	Brook Trout	All		Refer to *Environmental Impact Study* (MMM, February 2016) for details.	
	Vegetation	All		Refer to *Environmental Impact Study* (MMM, February 2016) for details.	
	Avifauna	All		Refer to *Environmental Impact Study* (MMM, February 2016) for details.	
	Herpetofauna	All		Refer to *Environmental Impact Study* (MMM, February 2016) for details.	
	Wildlife Passage	During/Post-Construction		Refer to *Environmental Impact Study* (MMM, February 2016) for details.	
	Buffer Integrity and Functioning	Post-Construction		Refer to *Environmental Impact Study* (MMM, February 2016) for details.	

M:\02534\800\02 - Reports\MTE Reports\SWM\Table 7.1 Monitoring Program.xlsx

CRUICKSTON CREEK

NEWMAN CREEK

CITY OF CAMBRIDGE
TOWNSHIP OF NORTH DUMFRIES

GRAND RIVER

CPR

BH09-10
BH102-21
BH113-10
BH11-10
BH07-10
BH104-10
BH105-10
BH106-10
BH12-10
BH101-21
BH112-10
BH13-10
79P
90Q
BH111-10
BH14-10
WETLAND 5
BH15-10
78P
BH114-10
BRIAN DOMM SUBDIVISION
BH19-10
WETLAND 4
BH17-10
BH101-10
BH110-10
BH103-10
92Q
77P
BLENHEIM ROAD
BARRIE'S LAKE

HALLMAN SUBDIVISION

NEWMAN LANDS (30T-16105)

SWM FACILITY 2

R1

76P
91Q
WETLAND 2

CACHET SUBDIVISION (30T-16103)

HALLMAN SUBDIVISION (30T-16104)

WETLAND 3

SWM FACILITY 1

SWM FACILITY 3

DEVIL'S CREEK

LEGEND

- PROPERTY BOUNDARY
- MUNICIPAL BOUNDARY
- LIMIT OF DEVELOPMENT
- WATERCOURSE
- Q — WATER QUALITY MONITORING STATION (NUTRIENTS) AND CHLORIDE SAMPLING STATION
- BH — GROUNDWATER LEVEL, QUALITY AND TEMPERATURE MONITORING
- P — WETLAND WATER LEVEL MONITORING (INCLUDES TEMPERATURE)
- R — RAIN GAUGE

FIGURE 7.1

Date: APR.19/21
Scale: 1:7500

WESTWOOD VILLAGE - PHASE 2

PRE-CONSTRUCTION SURFACE WATER AND GROUNDWATER MONITORING PLAN

MTE
Engineers, Scientists, Surveyors

Project No.: 02534-800

April 26, 2021 — 1:37 p.m. — Plotted By: CCarre

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CRUICKSTON CREEK

NEWMAN CREEK

CITY OF CAMBRIDGE
TOWNSHIP OF NORTH DUMFRIES

GRAND RIVER

CPR

BH102-21

BH113-10

BH11-10

HALLMAN SUBDIVISION

NEWMAN LANDS (30T-16105)

BH12-10

BH101-21

BH112-10

79P

90Q

BH14-10

WETLAND 5

BH15-10

78P

BRIAN DOMM SUBDIVISION

BH19-10

WETLAND 4

BH110-10

92Q

77P

BLENHEIM ROAD

WETLAND 3

SWM FACILITY 2

SW3

SW5

76P

WETLAND 2

91Q

SW4

CACHET SUBDIVISION (30T-16103)

HALLMAN SUBDIVISION (30T-16104)

SWM FACILITY 3

SWM FACILITY 1

DEVIL'S CREEK

BARRIE'S LAKE

N

LEGEND

- PROPERTY BOUNDARY
- MUNICIPAL BOUNDARY
- LIMIT OF DEVELOPMENT
- WATERCOURSE
- Q — WATER QUALITY MONITORING STATION (NUTRIENTS) AND CHLORIDE SAMPLING STATION
- BH — GROUNDWATER LEVEL, QUALITY AND TEMPERATURE MONITORING
- P — WETLAND WATER LEVEL MONITORING (INCLUDES TEMPERATURE)
- SW — STORMWATER MANAGEMENT MONITORING

FIGURE 7.2

Date: APR.19/21
Scale: 1:7500

WESTWOOD VILLAGE - PHASE 2

DURING AND POST CONSTRUCTION SURFACE WATER AND GROUNDWATER MONITORING PLAN

MTE
Engineers, Scientists, Surveyors

Project No.: 02534-800

April 26, 2021 — 1:39 p.m. — Plotted By: CCarre

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8.0 Erosion and Sediment Control Measures

Precautions will be taken during all stages of construction to limit erosion and sedimentation. The erosion and sediment control plans will follow the *Erosion & Sediment Control Guideline for Urban Construction* document. The plans will illustrate the erosion and sediment control measures to be implemented during construction, which will limit impacts associated with site development.

Typically, the recommended construction sequence for erosion and sediment control measures will be as follows:

- Placement of all sediment control fencing where required.
- Stripping and strategic placement of topsoil stockpiles. Placement of sediment control fencing around all stockpile areas.
- Construction of temporary sediment control ponds which will serve as sedimentation basins for the site during construction.
- Construction of temporary swales to direct runoff to sedimentation basins, with rock check dams as required to control velocities; and
- Re-vegetation of completed areas as soon as possible after construction, including those areas not slated for construction within 60 days.

Where rock check dams are proposed to promote sedimentation and reduce velocities, clean aggregate is to be placed perpendicular to the direction of flow in the swale, with a small volume of excavation on the upstream side to provide storage for accumulated sediment.

Sediment control fencing shall consist of filter fabric attached to page wire fencing and sealed at ground level. It will be installed at the perimeter of the work areas and intermittently on sloped areas where required. Sediment control fencing will be placed around all topsoil stockpiles.

Storage consistent with the GRCA's requirement of 125m^3/ha of live and dead storage respectively (total 250m^3/ha), will be provided. This storage will be provided to ensure that suspended material will have ample time to settle out. In addition, the sediment basin will be sized with sufficient capacity to allow flows to pass without breaching. Once the active construction and grading activities have been completed, the sedimentation basins can be cleaned out.

Access to topsoil or fill storage areas will be located on the upstream side of storage piles. This practice will ensure continuity of the sediment control fencing in the downslope direction which is most vulnerable to erosion and sediment deposition.

It is recommended that during construction, monitoring and inspection of the erosion and sediment controls be conducted to ensure the satisfactory performance of these measures. Reporting of the inspection and monitoring results should be distributed to the Township of North Dumfries, City of Cambridge and the GRCA. If it is found that the erosion and sediment control measures are not working adequately, they shall be augmented to the satisfaction of the Township, City and the GRCA, based on field decisions.

9.0 Conclusions and Recommendations

Based on the foregoing analysis, it is concluded that:

1. The stormwater management strategy outlined herein will provide appropriate levels of quality, quantity, and water balance controls to meet the criteria set out for the subject lands, as documented in the *Cambridge West Community, Master Environmental Servicing Plan*, MTE Consultants Inc., November, 2013 and the *Cambridge West Community Westwood Village - Final Stormwater Management Report* (MTE, April 15, 2020).
2. 'Enhanced' quality control of stormwater runoff can be provided by stormwater management facility 2 (SWMF 2) within the Cachet Subdivision (30T-16103).
3. Quantity control of stormwater runoff can also be achieved by SWMF 2.
4. No revisions/modifications are required to the original design of SWMF 2 as a result of the additional drainage area being directed to this facility.
5. Infiltration targets can be satisfactorily met through the use of the prescribed lot-level and conveyance infiltration controls, as recommended within this report.
6. Surface water inputs to existing wetlands and other environmental features will be maintained in the post-development condition.
7. Implementing erosion and sediment controls during construction will minimize any negative impacts of construction activities on the adjacent properties and the receiving watercourse.
8. Based on a simple conservative mass balance analysis, the expected average post-development groundwater chloride concentration of 36mg/L is below the Ontario Drinking Water Standard of 250mg/L and the Reasonable Use Concept limit of 126mg/L.

The findings of this report, and the above conclusions, lead to the following recommendations:

1. That SWMF 2 be constructed according to the detailed designs completed in the *Cambridge West Community Westwood Village - Final Stormwater Management Report* (MTE, April 15, 2020) to provide controls of stormwater as described in Sections 4.0 and 5.0 of this report.
2. That the preliminary design and modelling of the proposed stormwater management measures for the development be reviewed and re-confirmed at the time of final design.
3. That the infiltration and surface water balance, as calculated in this report, be reviewed and re-confirmed during final design.
4. That sediment and erosion controls be implemented during construction as described in Section 8.0 of this report.
5. That Salt Management plans be prepared for multiple residential blocks within the subject lands.

All of which is respectfully submitted,

MTE Consultants Inc.

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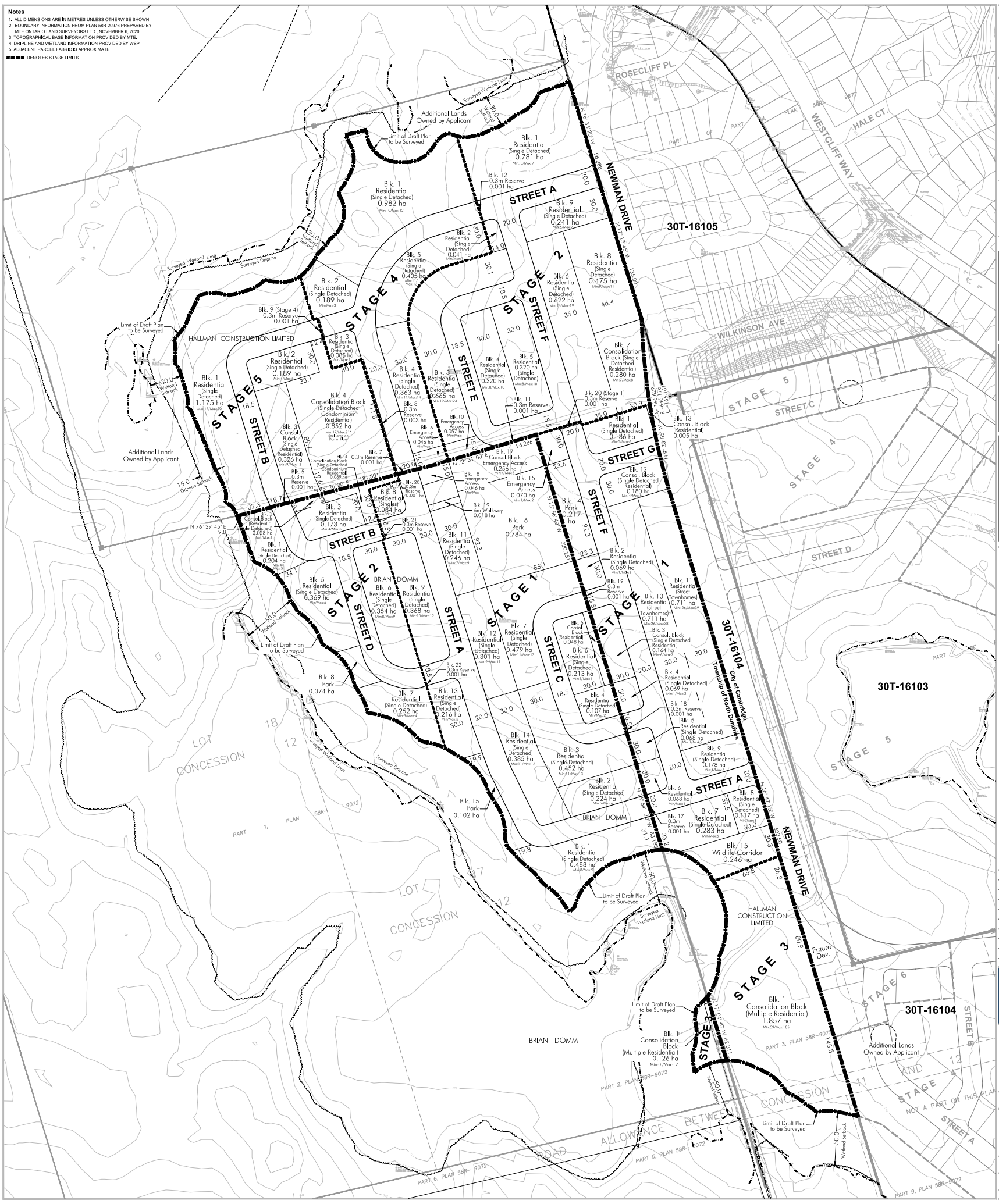
Appendix A

Draft Plans of Subdivision (Reduced)

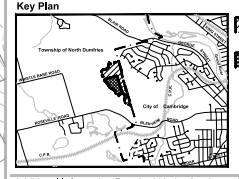


CONSOLIDATED DRAFT PLAN OF SUBDIVISION

Legal Description

PART OF LOTS 13 AND 14, CONCESSION 11
AND PART OF ROAD ALLOWANCE BETWEEN CONCESSIONS 11 & 12
TOWNSHIP OF NORTH DUMFRIES
REGIONAL MUNICIPALITY OF WATERLOO

Key Plan



Additional Information Required Under Section 51(17) of the Planning Act
R.S.O. 1990, c.P.13 as Amended

A. AS SHOWN	B. AS SHOWN	C. AS SHOWN
D. RESIDENTIAL, MULTIPLE RESIDENTIAL, PARK, WILDLIFE CORRIDOR		
E. AS SHOWN	F. AS SHOWN	G. AS SHOWN
H. MUNICIPAL WATER SUPPLY	I. LOAM	J. AS SHOWN
K. ALL SERVICES AS REQUIRED	L. AS SHOWN	

Area Schedule - Hallman Construction Limited **30T-_____**

	STAGE 1			STAGE 2		
Description	Lots/Blks	Units	Area (ha)	Lots/Blks	Units	Area (ha)
Residential/ Consolidation Block	1-13	83-115	2.809	1-9	82-98	3.745
Park	14		0.217			
Emergency Access	15	1-2	0.070	10	1	0.057
Wildlife Corridor	16		0.246			
0.3m Reserve	17-20		0.004	11,12		0.002
Roads			1.121			1.108
Total	**20**	**84-117**	**4.467**	**12**	**83-99**	**4.912**

	STAGE 3			STAGE 4		
Description	Lots/Blks	Units	Area (ha)	Lots/Blks	Units	Area (ha)
Residential/ Consolidation Block				1-5	37-44	2.024
Multiple Residential/ Consolidation Block	1	59-185	1.857			
Emergency Access				6	1	0.046
0.3m Reserve				7-9		0.005
Roads						0.676
Total	**1**	**59-185**	**1.857**	**9**	**38-45**	**2.751**

	STAGE 5			TOTAL		
Description	Lots/Blks	Units	Area (ha)	Lots/Blks	Units	Area (ha)
Residential/ Consolidation Block	1-4	47-58	2.542	30	249-315	11.120
Multiple Residential/ Consolidation Block				1	59-185	1.857
Park				1		0.217
Wildlife Corridor				1		0.246
Emergency Access				3	3-4	0.173
0.3m Reserve	5		0.001	10		0.012
Roads			0.417			3.322
Total	**5**	**47-58**	**2.960**	**46**	**311-504**	**16.947**

Area Schedule - Brian Domm **30T-_____**

	STAGE 1			STAGE 2		
Description	Lots/Blks	Units	Area (ha)	Lots/Blks	Units	Area (ha)
Residential/ Consolidation Block	1-14	88-104	3.669	1-7	26-30	1.469
Park	15,16		0.886	8		0.074
Emergency Access	17,18	5-6	0.302			
Walkway	19		0.018			
0.3m Reserve	20-22		0.003			
Roads			1.415			0.518
Total	**22**	**93-110**	**6.293**	**8**	**26-30**	**2.061**

	STAGE 3			TOTAL		
Description	Lots/Blks	Units	Area (ha)	Lots/Blks	Units	Area (ha)
Residential/ Consolidation Block				21	114-134	5.138
Multiple Residential/ Consolidation Block	1	0-12	0.126	1	0-12	0.126
Park				3		0.960
Emergency Access				2	5-6	0.302
Walkway				1		0.018
0.3m Reserve				3		0.003
Roads						1.933
Total	**1**	**0-12**	**0.126**	**31**	**119-152**	**8.480**

Total Number of Units Proposed for Entire Plan (Hallman/Domm):430-656

Unit Calculations:
Minimum Unit Yield: 13.716m (45 ft) lots backing onto Open Space
12.192m (40 ft) lots across from those lots backing onto Open Space
10.9728m (36 ft) lots for the remainder
5.5m (18 ft) units from used for street townhouse blocks
Concept Plan used for minimum number of units in multiple blocks

Maximum Unit Yield: 12.192m (40 ft) lots backing onto Open Space
10.9728m (36 ft) lots across from those lots backing onto Open Space
9.0m (30 ft) lots for the remainder
5.5m (18 ft) units from used for street townhouse blocks
100 units/ha used for maximum number of units in multiple blocks

Rev. No.	Date	Issued / Revision	By
1.	Feb.4, 2021	For Submission to Region of Waterloo;	DGS

PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE
MHBC
200-540 BINGEMANS CENTRE DR. KITCHENER, ON, N2B 3X9 | P: 519.576.3650 F: 519.576.0121 | WWW.MHBCPLAN.COM

Approval Stamp	Date: February 4, 2021
	File No.: 0800C
	Plan Scale: 1:1,250 (36x36)
	Drawn By: D.G.S.
Project: **Westwood Phase 2**	Checked By: P.B.
Applicant: Hallman Construction Limited/ Brian Domm	north
File Name: **DRAFT PLAN**	Dwg No.: 1 of 1
Scale Bar: 0 5 10 25 50 100m	

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Appendix B

Hydrologic Parameters & SWM Design Sheets

WESTWOOD VILLAGE PHASE 2
PREMINARY STORMWATER MANAGEMENT DESIGN
North Dumfries, Ontario

Project Number: 02534-800
Date: January 20, 2021
Design By: JNJ/XSP
File: Q:\02534\800\SWM\02534-800 SWM Design.xlsx

HYDROLOGIC PARAMETERS
Pre-Development Conditions

Sub-Catchment Number	Area (ha)	Overland Slope (%)	Overland Length (m)	SCS Curve Number Pervious (AMC II)	SCS Curve Number Impervious	Percent Impervious (%)	Land Use	Comment
101	0.07						Crop Field, Residential	Exisitng lands northwest of development
104	2.82						Crop Field, Residential	Exisitng lands northwest of development
105	16.40						Crop Field, Residential	Existing lands northwest of development
201	8.07					35	Crop Field, Residential	Existing lands north of development
202	10.84						Crop Field, Residential	Existing lands north of development
303	32.16						Crop Field, Residential	Existing lands southeast of development
305	0.65	4.0	80	70	98	6	Crop Field, Residential	Southeast Corner below Blenheim Road
306	4.39	2.0	800	70	98	3	Crop Field, Residential	Southeast Corner below Blenheim Road
308	6.30	8.2	180	70	98	2	Crop Field, Residential	Southeast Corner above Blenheim Road
309	1.64	24.2	120	70	98	0	Crop Field, Residential	Southeast Corner above Blenheim Road
311	47.93					0	Crop Field, Residential	Existing lands east of development
312	31.80					0	Crop Field, Residential	Central Area to Wetland #2
313	9.85					0	Crop Field	Eastern side of property & limit of grading
315	4.92					0	Crop Field	Northeast corner to Bismark
316	21.20					20	Crop Field, Residential	Existing lands northeast of development
401	2.34						Crop Field	Southern area to Small Wetland north of Blenheim
402	13.37						Crop Field	Western area to Wetland #3
404	11.41						Crop Field	Western area to Wetland #4
408	5.90						Crop Field	Western area to Barrie's Lake
501	2.07						Crop Field	Northernwestern area, Domm Lane
Total	**234.13**							

Parameters defined in Cambridge West Community MESP Report, completed by MTE Consultants, November 2013.

Discharge to Cruickston Creek
Discharge to Newman Creek
Discharge to Devil's Creek
Discharge to Barrie's Lake
Discharge to Grand River

Post-Development Conditions

Sub-Catchment Number	Area (ha)	Overland Slope (%)	Overland Length (m)	SCS Curve Number Pervious (AMC II)	SCS Curve Number Impervious	Percent Impervious (%)	Land Use	Comment
701	8.81	0.5	60	70	98	58	Residential, Wetland, Park, SWM Facility	Northern portion of property to Central SWM Facility
702	25.18	0.5	60	70	98	60	Residential, Wetland, Park, School, Commercial, SWM Facility	Central portion of property to Central SWM Facility
7021	2.70	2.0	60	70	98	38	School	Northern portion of property to Central SWM Facility (Minor Storms)
703	3.06	2.0	60	70	98	63	Residential	Drainage to Grandview SWM Facility
704	3.38	2.0	60	70	98	58	Residential, SWM Facility	Southwestern corner to Southwest SWM Facility
705	0.43	4.0	60	70	98	80	Roadway	Blenheim Road to Southwest SWM Facility
706	4.68	2.0	60	70	98	57	Residential, SWM Facility	Southeastern corner to Devil's Creek SWM Facility
707	0.77	3.0	60	70	98	38	Roadway	Blenheim Road uncontrolled to Devil's Creek (via depression)
708	17.49	1.0	60	70	98	60	Residential, Park	Northwestern external drainage to Central SWM Facility
709	4.46	1.0	60	70	98	60	Residential, SWM Facility	Southern external area to Southwest SWM Facility
710	6.32	1.0	60	70	98	58	Residential, Park	Northeastern external drainage to future Newman Creek Pond
711	2.60	1.0	60	70	98	50	Residential	Northeastern external drainage to future Newman Creek Pond
712	1.04	1.0	60	70	98	60	Residential, SWM Facility	Western external area to future SWM Facility
104	0.18							Exisitng lands northwest of development
105	3.31							Existing lands northwest of development
1050	0.74							Roof to Cruickston Creek, 0.36ha in 708
201a	6.10	1.0	60	70	98	46		Existing lands north of development
201b	0.29	12.0	35	70	98	0		Existing lands north of development
202	10.43							Existing lands north of development
303	32.16							Existing lands southeast of development
305i	0.56	3.1	90	70	98	0	Crop Field, Residential	Intermediate drainage area.
305	0.15	4.0	80	70	98	0	Crop Field, Residential	Southeast Corner below Blenheim Road
306	4.90	2.0	800	70	98	0	Crop Field, Residential	Southeast Corner below Blenheim Road
308b	0.28	11.8	30	70	98	0	Crop Field	Southeast Corner above Blenheim Road
309b	1.19	26.9	60	70	98	0	Crop Field	Southeast Corner above Blenheim Road
311	47.93							Existing lands east of development
312	5.52							Wetland #2
313	4.92							Eastern side of property & limit of grading
315	1.58							Northeast corner to Bismark
316	21.01							Existing lands northeast of development
402	5.07							Western area to Wetland #3
404	5.17							Western area to Wetland #4
7120	0.81					100		Roof area to Wetland #4
408i	5.53							Intermediate drainage area.
408	1.48							Western area to Barrie's Lake
Total	**234.68**	**Note: the 0.15 ha. additional was previously draining directly to the Grand River (no pre-development catchment assigned)**						

IDF PARAMETERS
Region of Waterloo (DGSSMS)

Frequency (Years)	a	b	c	Comment
25mm (4hr)	386	4.0	0.750	
2	582	4.6	0.756	
5	1,395	12.7	0.839	
10	2,146	16.9	0.878	
25	3,509	22.6	0.925	
50	4,620	25.8	0.948	
100	5,886	28.6	0.969	

City of Cambridge

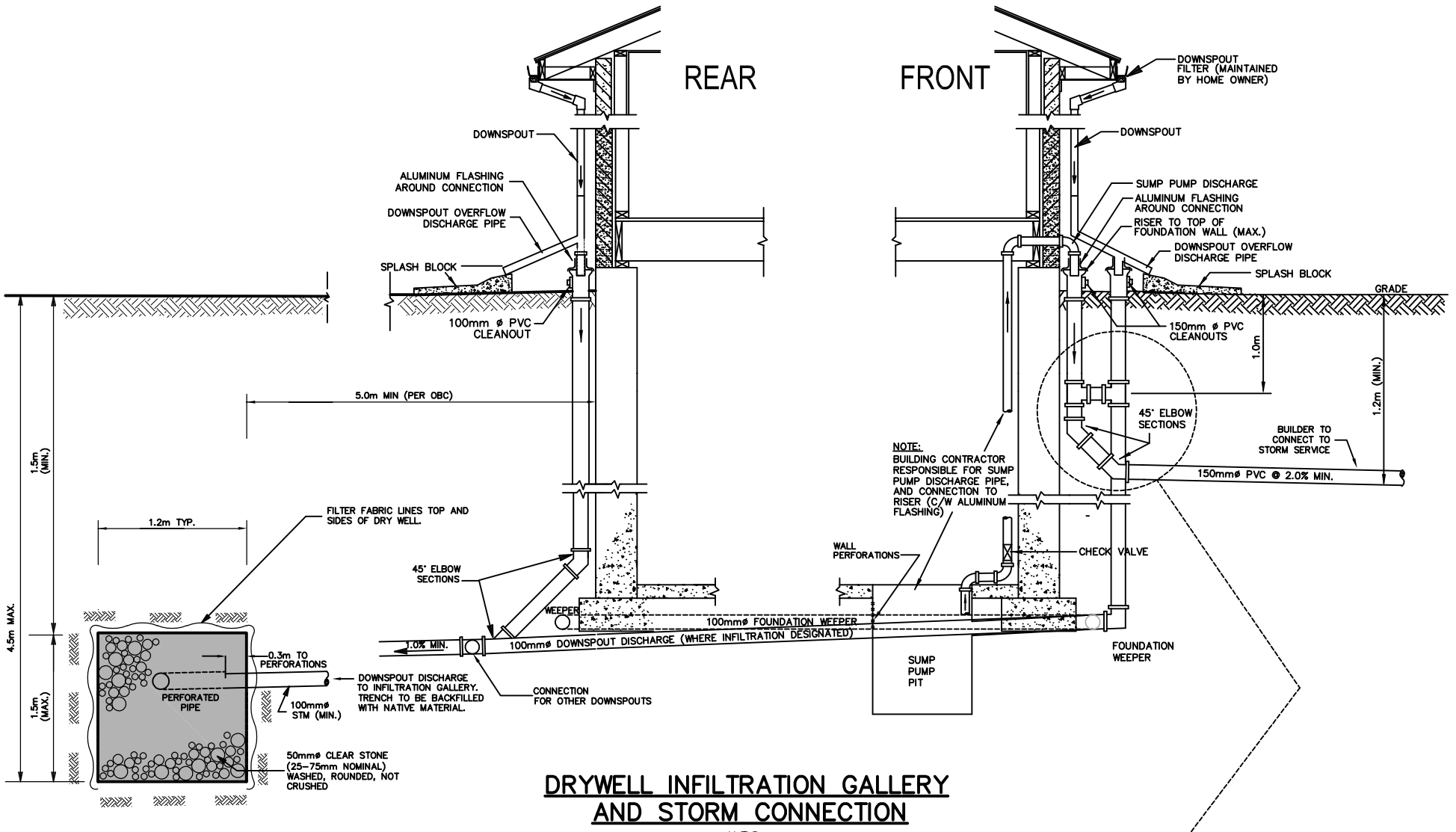
Frequency (Years)	a	b	c	Comment
2	573	5.0	0.761	
5	1,220	10.5	0.823	
10	1,729	14.0	0.849	
25	2,227	17.0	0.865	
50	2,640	19.0	0.866	
100	3,015	21.0	0.870	

WESTWOOD VILLAGE PHASE 2
PREMINARY STORMWATER MANAGEMENT DESIGN
North Dumfries, Ontario

Project Number: 02534-800
Date: January 20, 2021
Design By: XSP
File: Q:\02534\800\SWM\02534-800 SWM Design.xlsx

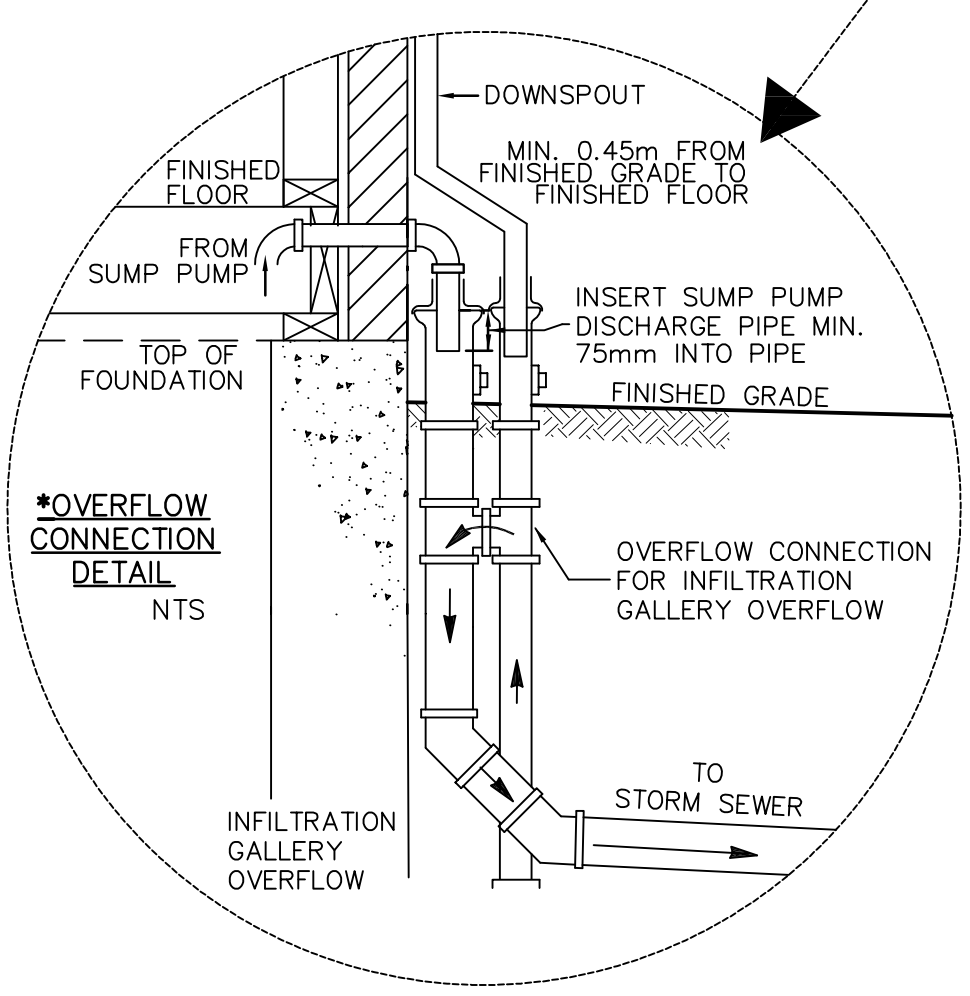
IMPERVIOUS CALCULATION

Catchment	Use	Area	% Impervious (Assumed)	Impervious Area	Cumulative Impervious Area	% Roof (Assumed)	Roof Area (ha)
701	Right-of-Way	2.14	80%	1.71	1.71	0%	0.00
SWM2	Residential	3.78	55%	2.08	3.79	48%	1.80
	Multiple-Residential	1.36	60%	0.82	4.61	30%	0.41
	Service Corridor	0.05	80%	0.04	4.65	0%	0.00
	SWM	1.48	30%	0.44	5.09	0%	0.00
	Open Space/Wetland	0.00	0%	0.00	5.09	0%	0.00
	Totals	**8.81**			**58%**	25%	**2.21**
702	Right-of-Way	5.56	80%	4.45	4.45	0%	0.00
SWM2	Residential	6.93	55%	3.81	8.26	43%	2.95
	Multiple-Residential	5.68	60%	3.41	11.67	30%	1.70
	Mixed Use	3.43	80%	2.74	14.41	25%	0.86
	Service Corridor	0.12	80%	0.10	14.51	0%	0.00
	Open Space/Park	1.80	0%	0.00	14.51	0%	0.00
	SWM	1.66	30%	0.50	15.01	0%	0.00
	Totals	**25.18**			**60%**	22%	**5.51**
7021	School	2.70	38%	1.01	1.01	14%	0.39
	Totals	**2.70**			**38%**	14%	**0.39**
703	Right-of-Way	1.03	80%	0.83	0.83	0%	0.00
Grandview	Residential	1.86	55%	1.02	1.85	43%	0.79
	Multiple-Residential	0.12	60%	0.07	1.92	30%	0.03
	Open Space/Wetland	0.06	0%	0.00	1.92	0%	0.00
	Totals	**3.06**			**63%**	27%	**0.82**
704	Right-of-Way	0.97	80%	0.77	0.77	0%	0.00
SWM1	Residential	0.37	55%	0.21	0.98	43%	0.16
	Multiple-Residential	1.24	60%	0.74	1.72	30%	0.37
	SWM	0.80	30%	0.24	1.96	0%	0.00
	Totals	**3.38**			**58%**	16%	**0.53**
705	Right-of-Way	0.43	80%	0.34	0.34	0%	0.00
Blenheim Rd	**Totals**	**0.43**			**80%**	0%	**0.00**
706	Right-of-Way	1.43	80%	1.14	1.14	0%	0.00
SWM3	Residential	1.56	55%	0.86	2.00	43%	0.66
	Multiple-Residential	0.77	60%	0.46	2.46	30%	0.23
	Pervious Area	0.30	0%	0.00	2.46	0%	0.00
	Service Corridor	0.02	80%	0.01	2.48	0%	0.00
	SWM	0.60	30%	0.18	2.66	0%	0.00
	Totals	**4.68**			**57%**	19%	**0.90**
707	Right-of-Way	0.37	80%	0.30	0.30	0%	0.00
Blenheim Rd	Other Pervious Area	0.40	0%	0.00	0.30	0%	0.00
	Totals	**0.77**			**38%**	0%	**0.00**
		0.68					
708	Right-of-Way	4.07	80%	3.25	3.25	0%	0.00
Township	Residential	7.10	58%	4.09	7.34	41%	2.88
to SWM2	Multiple-Residential	1.42	60%	0.85	8.20	42%	0.60
	Service Corridor	0.00	80%	0.00	8.20	0%	0.00
	Open Space/Wetland	1.18	0%	0.00	8.20	0%	0.00
	Subtotal	13.77			**60%**	25%	3.48
Area to	Right-of-Way	1.05	80%	0.84	0.84	0%	0.00
Conveyance	Residential	1.73	55%	0.95	1.78	39%	0.67
	Multiple-Residential	0.94	60%	0.56	2.35	30%	0.28
	Subtotal	3.71			**63%**	26%	0.95
	Totals	**17.49**			**60%**	25%	**4.43**
709	Residential	4.46	60%	2.68	2.68	30%	1.34
Freure	**Totals**	**4.46**			**60%**	30%	**1.34**
710	Right-of-Way	1.64	80%	1.31	1.31	0%	0.00
Newman	Residential	4.31	55%	2.37	3.69	42%	1.81
	Multiple-Residential	0.00	60%	0.00	3.69	30%	0.00
	Open Space/Wetland	0.36	0%	0.00	3.69	0%	0.00
	Totals	**6.32**			**58%**	29%	**1.81**
711	Right-of-Way	0.46	80%	0.37	0.37	0%	0.00
Newman	Residential	1.19	55%	0.65	1.02	43%	0.51
	SWM	0.95	30%	0.29	1.31	0%	0.00
	Totals	**2.60**			**50%**	19%	**0.51**
712	Right-of-Way	0.00	80%	0.00	0.00	0%	0.00
Township Lands	Residential	0.00	55%	0.00	0.00	43%	0.00
	Multiple-Residential	1.04	60%	0.63	0.63	14%	0.14
	SWM	0.00	30%	0.00	0.63	0%	0.00
	Totals	**1.04**			**60%**	14%	**0.14**



DRYWELL INFILTRATION GALLERY AND STORM CONNECTION

N.T.S.



*OVERFLOW CONNECTION DETAIL

NTS

WESTWOOD VILLAGE PHASE 2
PREMINARY STORMWATER MANAGEMENT DESIGN
North Dumfries, Ontario

Project Number:	02534-800
Date:	January 20, 2021
Design By:	XSP
File:	Q:\02534\800\SWM\02534-800 SWM Design.xlsx

MECP Volume Calculation - SWM Facility #2 (Central SWM Facility)

Step 1: Choose Level of Water Quality Control

Enhanced 80% long-term S.S. removal

Step 2: Choose Type of Facility

Wetlands

Step 3: Define Catchment area and Imperviousness

Catchment Area (ha)	Imperviousness (%)
55.22	58.5

Interpolated Storage Volume Requirement (m^3/ha)

108.5

Permanent Pool Required (m^3)

3780

Extended Detention Volume Required (m^3)

2209

Table 3.2 Water Quality Storage Requirements based on Receiving Waters (from MOE Stormwater Management Planning and Design Manual, March 2003)

Protection Level	SWMP Type	Storage Volume (m^3/ha) for Impervious Level			
		35	55	70	85
Enhanced 80% long-term S.S. removal	*Wetlands*	80	105	120	140
	Hybrid Wet Pond/Wetland	110	150	175	195
	Wet Pond	140	190	225	250
Normal 70% long-term S.S. Removal	*Wetlands*	60	70	80	90
	Hybrid Wet Pond/Wetland	75	90	105	120
	Wet Pond	90	110	130	150
Basic 60% long-term S.S. Removal	*Wetlands*	60	60	60	60
	Hybrid Wet Pond/Wetland	60	70	75	80
	Wet Pond	60	75	85	95
	Dry Pond (Continuous Flow)	90	150	200	240

WESTWOOD VILLAGE PHASE 2
PREMINARY STORMWATER MANAGEMENT DESIGN - FACILITY 2 (CENTRAL)
North Dumfries, Ontario

Project Number: 02534-800
Date: January 20, 2021
Design By: JNJ/XSP
File: Q:\02534\800\SWM\02534-800 SWM Design.xlsx

STAGE-STORAGE RELATIONSHIP

Stage	Active Depth	North Forebay (Permanent Pool)			South Forebay (Permanent Pool)			Constructed Wetland			Central Wetland 2			Total Pond Volume	Active Constr WI Storage Volume	Active Storage Volume	Volume Summary		Comments	Stage
		Area	Volume	Cumulative Volume	Area	Volume	Cumulative Volume	Area	Volume	Cumulative Volume	Area	Volume	Cumulative Volume							
m	*m*	m^2	m^3	m^3	m^2	m^3	m^3	m^2	m^3	m^3	m^2	m^3	m^3	m^3	m^3	m^3	m^3			*m*
306.80		345	0	0	1174	0	0		0	0				0					Bottom of Forebays	306.80
306.90		379	36	36	1239	121	121		0	0				157						306.90
307.00		412	40	76	1305	127	248		0	0				324						307.00
307.10		447	43	119	1372	134	382		0	0				500						307.10
307.20		482	46	165	1440	141	522		0	0				687						307.20
307.30		519	50	215	1510	148	670		0	0				885						307.30
307.40		555	54	269	1581	155	824		0	0				1093						307.40
307.50		593	57	326	1653	162	986		0	0				1312						307.50
307.60		631	61	388	1727	169	1155		0	0				1543						307.60
307.70		670	65	453	1801	176	1332		0	0				1784						307.70
307.80		718	69	522	1912	186	1517		0	0				2039						307.80
307.90		767	74	596	2025	197	1714		0	0				2310						307.90
308.00		818	79	676	2139	208	1922	11934	0	0				2598					Bottom of Constr. Wetland	308.00
308.10		869	84	760	2256	220	2142	12314	1212	1212				4114						308.10
308.20		922	90	849	2373	231	2374	12696	1251	2463				5686						308.20
308.30		975	95	944	2494	243	2617	13080	1289	3752				7313			7313		Permanent Pool Elevation	308.30
308.30	0.00							16687	0	0				7313	0	0				308.30
308.40	0.10							17233	1696	1696				9009	1696	1696				308.40
308.50	0.20							17784	1751	3447				10760	3447	3447	2209	308.43	MECP Quality Volume	308.50
308.60	0.30							18339	1806	5253				12566	5253	5253	4122	308.54	25mm Event	308.60
308.70	0.40							18898	1862	7115				14428	7115	7115	6931	308.70	1:2 Year Event	308.70
308.80	0.50							19462	1918	9033				16346	9033	9033				308.80
308.90	0.60							20268	1987	11019				18332	11019	11019				308.90
309.00	0.70							20585	2043	13062				20375	13062	13062				309.00
309.10	0.80							20901	2074	15136				22449	15136	15136	14039	309.05	1:5 Year Event	309.10
309.20	0.90							21218	2106	17242				24555	17242	17242			**Spill into Wetland 2 (5312)**	309.20
309.30	1.00							21328	2127	19370	24178	1209	1209	27891	19370	20578				309.30
309.40	1.10							21679	2150	21520	25321	2475	3684	32517	21520	25204	18565	309.24	1:10 Year Event	309.40
309.50	1.20							22030	2185	23705	26286	2580	6264	37282	23705	29970	21055	309.32	1:25 Year Event	309.50
309.60	1.30							22381	2221	25926	27255	2677	8941	42180	25926	34867	23500	309.37	1:50 Year Event	309.60
309.70	1.40							22732	2256	28182	28232	2774	11716	47210	28182	39897	25117	309.40	1:100 Year Event	309.70
309.80	1.50							23083	2291	30472	29214	2872	14588	52373	30472	45060	30509	309.52	Regional Event	309.80
309.90	1.60							23434	2326	32798	30204	2971	17559	57670	32798	50357				309.90
310.00	1.70							23785	2361	35159	31200	3070	20629	63101	35159	55788				310.00
310.10	1.80							24135	2396	37555	32202	3170	23799	68667	37555	61354				310.10
310.20	1.90							24486	2431	39986	33211	3271	27070	74369	39986	67056				310.20
310.30	2.00							24837	2466	42452	34227	3372	30442	80207	42452	72894				310.30
310.40	2.10							25188	2501	44954	35249	3474	33915	86182	44954	78869				310.40
310.50	2.20							25539	2536	47490	36278	3576	37492	92295		84982				310.50
310.60	2.30							25890	2571	50061	37314	3680	41171	98546		91233				310.60
310.70	2.40							26241	2607	52668	38356	3784	44955	104936		97623				310.70
310.80	2.50							26592	2642	55310	39404	3888	48843	111465		104152		310.86	Regional Event	310.80
310.90	2.60							26943	2677	57986	40459	3993	52836	118135		110822				310.90
311.00	2.70							27294	2712	60698	41521	4099	56935	124946		117633				311.00
311.10	2.80							27645	2747	63445	42589	4206	61141	131898		124586		0.30	Freeboard	311.10
311.20	2.90							27996	2782	66227	43664	4313	65453	138993		131680				311.20
311.30	3.00							28346	2817	69044	44747	4421	69874	146231		138918				311.30

WESTWOOD VILLAGE PHASE 2
PREMINARY STORMWATER MANAGEMENT DESIGN
North Dumfries, Ontario **- FACILITY 2 (CENTRAL)**

Project Number: 02534-800
Date: January 20, 2021
Design By: JNJ/XSP
File: Q:\02534\800\SWM\02534-800 SWM Design.xlsx

STAGE-STORAGE RELATIONSHIP

GAWSER 5312: WL 2 + SWMF2 Storage > 309.2m
use in major events model, assuming starting water level in WL is 308.4 (spring conditions)

Stage	Effective Infiltration Area	Area	Volume	Cumulative Volume	Volume Summary		Comments
m		m^2	m^3	m^3	m^3		
308.30							
308.40	0.0000	10600		0	594	308.45	25mm Event
308.50	0.3400	14000	1230	1230	985	308.49	1:2 Year Event
308.60					1976	308.55	1:5 Year Event
308.70					2732	**308.59**	1:10 Year Event
308.80							
308.90					9053	308.97	1:25 Year Event
309.00	0.9319	19919	8480	9710			
309.10	Area in SSD table						
309.20	1.3000	22500	4242	9800			
309.30	1.3578	45506	3400	13110			
309.40	1.4721	47000	4625	17735	15124	309.35	1:50 Year Event
309.50	1.5686	48316	4766	22501	20015	309.45	1:100 Year Event
309.60	1.6655	49636	4898	27399			
309.70	1.7632	50964	5030	32429			
309.80	1.8614	52297	5163	37592			
309.90	1.9604	53638	5297	42889			
310.00	2.0600	54985	5431	48320			
310.10	2.1602	56337	5566	53886			
310.20	2.2611	57697	5702	59588			
310.30	2.3627	59064	5838	65426			
310.40	2.4649	60437	5975	71401			
310.50	2.5678	61817	6113	77513			
310.60	2.6714	63204	6251	83764			
310.70	2.7756	64597	6390	90154			
310.80	2.8804	65996	6530	96684	100640	310.86	Regional Event
310.90	2.9859	67402	6670	103354			
311.00	3.0921	68815	6811	110165			
311.10	3.1989	70234	6952	117117		311.16	Freeboard
311.20	3.3064	71660	7095	124212			
311.30	3.4147	73093	7238	131450			

^ subtract 1.06 ha for water coverage @ 308.4 to remove area from infiltration calculations

WESTWOOD VILLAGE PHASE 2
PREMINARY STORMWATER MANAGEMENT DESIGN **- FACILITY 2 (CENTRAL)**
North Dumfries, Ontario

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Orifice Calculations			
$Q_o=C_d*A_o*(2*g*H_o)^{0.5}$	Sewer Orifice 1	Wetland Orifice 2	Orifice 3
C_d	0.63	0.63	0.63
Invert (m)	308.3	500	500
Width (m)	0.00	0.00	0.00
Diameter/Height (m)	0.235	0.175	0.175
Type (H/V)	V	V	V

Cd	Description
0.63	Orifice Plate
0.82	Eccentric Reducer

Weir Calculations	
$Q_w=C_w*(H_w)^{1.5}*((L-0.2*H_w)+(0.8*TAN(THETA)*H_w))$	
Cw	1.60
Invert (m)	309.2
Length (m)	7
Side Slope (H:V)	3
Side Slope (rad)	1.249

STAGE-DISCHARGE RELATIONSHIP

Stage	Active Volume	Orifice 1			Orifice 2			Weir Flow	Total Flow	Average Discharge	Increment Volume	Increment Dewatering Time	Extended Detention: Cumulative Dewatering Time
		Area	H_o	Flow	Area	H_o	Flow						
m	m^3	m^2	*m*	m^3/s	m^2	*m*	m^3/s	m^3/s	m^3/s	m^3/s	m^3	*hours*	*hours*
308.30	0	0.00	0.00	**0.000**				0.00	0.00	0.01	1696	85.85	48.25
308.40	1696	0.02	0.05	**0.011**				0.00	0.01	0.02	1751	21.29	10.65
308.50	3447	0.04	0.10	**0.035**				0.00	0.03	0.04	1806	11.61	
308.60	5253	0.04	0.18	**0.052**				0.00	0.05	0.06	1862	8.91	
308.70	7115	0.04	0.28	**0.064**	0.00	0.00	0.000	0.00	0.06	0.07	1918	7.66	
308.80	9033	0.04	0.38	**0.075**	0.00	0.00	0.000	0.00	0.07	0.08	1987	6.94	
308.90	11019	0.04	0.48	**0.084**	0.00	0.00	0.000	0.00	0.08	0.09	2043	6.43	
309.00	13062	0.04	0.58	**0.092**	0.00	0.00	0.000	0.00	0.09	0.10	2074	5.99	
309.10	15136	0.04	0.68	**0.100**	0.00	0.00	0.000	0.00	0.10	0.10	2106	5.65	
309.20	17242	0.04	0.78	**0.107**	0.00	0.00	0.000	0.00	**0.11**	0.29	3336	3.16	
309.30	20578	0.04	0.88	0.114	0.00	0.00		0.37	0.48	0.83	4625		
309.40	25204	0.04	0.98	0.120	0.00	0.00		1.06	1.18	1.66	4766		
309.50	**29970**	**0.04**	**1.08**	**0.126**	**0.00**	**0.00**		**2.01**	**2.14**	**2.73**	**4898**		
309.60	34867	0.04	1.18	0.132	0.00	0.00		3.19	3.32	4.02	5030		
309.70	39897	0.04	1.28	0.137	0.00	0.00		4.58	4.72	5.52	5163		
309.80	45060	0.04	1.38	0.142	0.00	0.00		6.19	6.33	7.24	5297		
309.90	50357	0.04	1.48	0.147	0.00	0.00		8.00	8.15	9.17	5431		
310.00	**55788**	**0.04**	**1.58**	**0.152**	**0.00**	**0.00**		**10.03**	**10.18**	**11.30**	**5566**		
310.10	61354	0.04	1.68	0.157	0.00	0.00		12.27	12.42	13.65	5702		
310.20	67056	0.04	1.78	0.162	0.00	0.00		14.72	14.88	16.22	5838		
310.30	72894	0.04	1.88	0.166	0.00	0.00		17.39	17.55	19.00	5975		
310.40	78869	0.04	1.98	0.170	0.00	0.00		20.28	20.45	22.00	6113		
310.50	**84982**	**0.04**	**2.08**	**0.175**	**0.00**	**0.00**		**23.38**	**23.56**	**25.23**	**6251**		
310.60	91233	0.04	2.18	0.179	0.00	0.00		26.72	26.89	28.68	6390		
310.70	**97623**	**0.04**	**2.28**	**0.183**	**0.00**	**0.00**		**30.28**	**30.46**	**32.36**	**6530**		
310.80	104152	0.04	2.38	0.187	0.00	0.00		34.07	34.25	36.27	6670		
310.90	110822	0.04	2.48	0.191	0.00	0.00		38.09	38.28	40.41	6811		
311.00	**117633**	**0.04**	**2.58**	**0.195**	**0.00**	**0.00**		**42.35**	**42.54**	**44.79**	**6952**		
311.10	124586	0.04	2.68	0.198	0.00	0.00		46.85	47.05	49.42	7095		
311.20	131680	0.04	2.78	0.202	0.00	0.00		51.59	51.79	54.29	7238		
311.30	138918	0.04	2.88	0.205	0.00	0.00		56.58	56.78	28.39	0		

WESTWOOD VILLAGE PHASE 2
PREMINARY STORMWATER MANAGEMENT DESIGN - FACILITY 2 (CENTRAL)
North Dumfries, Ontario

Project Number: 02534-800
Date: April 8, 2021
Design By: JNJ/XSP
File: Q:\02534\800\SWM\02534-800 SWM Design.xlsx

NORTH FOREBAY DESIGN CALCULATIONS
MECP SWM Planning and Design Manual, 2003

Forebay Design Flows

Flow into forebay during the 1:5-year return period event	2.416	m^3/s
Flow into forebay during the 25 mm - 4 hour design storm event	0.652	m^3/s
Peak flow from main pond outlet for the 25mm design storm (from GAWSER)	0.041	m^3/s

Forebay Characteristics

b =	9.0	*m*	bottom width
y =	1.5	*m*	depth
z =	3	:1	side slope
w =	13.5	*m*	average width
R =	1.10	*m*	hydraulic radius
A =	20.3	m^2	cross-sectional area

1. Length Calculation Based on Settling Velocity

L = forebay flow length *(m)*
r = length-to-width ratio
Q_p = peak flow rate through forebay *(m^3/s)*
v_s = settling velocity *(m/s)*

$$L = \sqrt{\frac{rQ_p}{v_s}}$$ Equation 4.5: Forebay Settling Length

a) Required Settling Length (assuming Q_p = forebay through-flow & v_s = 0.0055 m/s)

Q_p =	0.65	m^3/s	peak flow rate through forebay
v_s =	0.0055	*m/s*	settling velocity
r =	0.65		length-to-width ratio
L =	8.8	*m*	required settling length
L =	*8.8*	*m*	*trial length*

b) Required Settling Length (assuming Q_p = pond discharge & v_s = 0.0003 m/s)

Q_p =	0.041	m^3/s	peak flow rate through forebay
v_s =	0.0003	*m/s*	settling velocity
r =	0.76		length-to-width ratio
L =	10.2	*m*	required settling length
L =	*10.2*	*m*	*trial length*

Table 1: Average settling velocities

	Mass Removed	Particle Size Range	Average Settling Velocity
	%	*μm*	*m/s*
	80 - 100	x ≤ 20	0.00000254
Enhanced:	70 - 80	20 < x ≤ 40	0.00001300
Normal:	60 - 70	40 < x ≤ 60	0.00002540
Basic:	40 - 60	60 < x ≤ 130	0.00012700
Medium Sand:	20 - 40	130 < x ≤ 400	0.00059267
Gross Grit:	0 - 20	400 < x ≤ 4000	0.00550333

2. Length Calculation Based on Flow Dispersion Length

Q =	2.42	m^3/s	inlet flow rate
d =	1.5	*m*	depth of permanent pool in forebay
V_f =	0.50	*m/s*	desired velocity in forebay (typical value ≤ 0.50 *m/s*)
L =	25.8	m	required length of dispersion

$$L_D = \frac{8Q}{dV_f}$$ Equation 4.6: Dispersion Length

3. Required Forebay Length

L =	**25.8**	***m***	**design length** **(proposed length 39m)**
r =	2.96		design length-to-width ratio (typical minimum of 2.0)

4. Scour Velocity

v_s =	0.15	*m/s*	scour velocity (typical value = 0.15 *m/s*)
v =	**0.12**	***m/s***	**actual velocity**

OK The actual velocity through the forebay is less than the scour velocity.

5. Weir Flow From Forebay

L =	9	*m*	length of crest of weir
α =	1.65		coefficient
H =	0.5	*m*	head
Q =	**5.25**	***m^3/s***	**discharge**

$$Q = \alpha L H^{1.5}$$ Equation 4.4: Weir Flow

OK The weir flow from the forebay exceeds the flow entering the forebay

6. Estimated Cleanout Frequencies

a) Forebay

Forebay volume	944	m^3
Estimated TSS removal efficiency	50%	
Impervious level	59%	
Estimated annual sediment loading	2.2	m^3/ha
Contributing area	26.30	*ha*
Annual sediment volume	29	m^3/yr
Cleanout frequency for 33% volume reduction	**10.8**	***years***

b) Stormwater Management Pond

Wetpond volume (excluding forebay)	3752	m^3
Estimated TSS removal efficiency	30%	
Impervious level	58%	
Estimated annual sediment loading	2.1	m^3/ha
Contributing area	55.22	*ha*
Annual sediment volume	35	m^3/yr
Cleanout frequency for 33% volume reduction	**35.2**	***years***

Table 2: Annual sediment loading

Impervious Level	Annual Loading
%	m^3/ha
35%	0.6
55%	1.9
70%	2.8
85%	3.8

WESTWOOD VILLAGE PHASE 2
PREMINARY STORMWATER MANAGEMENT DESIGN
North Dumfries, Ontario - FACILITY 2 (CENTRAL)

Project Number: 02534-800
Date: April 8, 2021
Design By: JNJ/XSP
File: Q:\02534\800\SWM\02534-800 SWM Design.xlsx

NORTH SPLITTER MANHOLE DESIGN CALCULATION

	Forebay Inlet Pipe	Pond Inlet Pipe		Manhole Weir		
Number of pipes =	1	1				
Diameter =	750	1050	*mm*	Weir Elevation =	309.471	*m*
Area =	0.442	0.866	m^2	Weir Length =	3.000	*m*
Orifice Coefficient =	0.820	0.820		Weir Coefficient =	1.65	
Invert Elevation =	308.720	308.695	*m*	**Weir Opening**		
Slope =	0.40%	1.14%				
Hydraulic Radius =	0.188	0.263	*m*	Area =	3.040	m^2
Manning's 'n' =	0.013	0.013		Coefficient =	0.63	
Velocity =	1.594	3.367	*m/s*			
Pipe Capacity =	0.704	2.916	m^3/s			

Q_{25mm} =	0.652	m^3/s	forebay design flow (lower limit)
Q =	2.416	m^3/s	maximum design flow in sewer pipes

Water Elevation *m*	Head Above Invert *m*	Forebay Inflow m^3/s	Weir Head *m*	Weir Flow m^3/s	Weir Opening Flow m^3/s	Pipe Orifice Head *m*	Pipe Orifice Flow m^3/s	Total Pond Flow m^3/s
308.700								
308.800	0.080	0.002						0.002
308.900	0.180	0.041						0.041
309.000	0.280	0.101						0.101
309.100	0.380	0.177						0.177
309.200	0.480	0.267						0.267
309.300	0.580	0.369						0.369
309.400	0.680	0.482						0.482
309.471	**0.751**	**0.804**						**0.804**
309.500	0.780	0.849	0.029	0.024	1.444	0.805	0.843	0.874
309.600	0.880	0.989	0.129	0.229	3.045	0.905	1.027	1.219
309.700	0.980	1.112	0.229	0.542	4.058	1.005	1.225	1.654
309.800	1.080	1.222	0.329	0.934	4.863	1.105	2.002	2.156
309.848	**1.128**	**1.272**	**0.377**	**1.146**	**5.206**	**1.153**	**2.117**	**2.417**
309.900	1.180	1.323	0.429	1.391	5.554	1.205	2.235	2.714
310.000	1.280	1.417	0.529	1.905	6.167	1.305	2.446	3.322
310.100	1.380	1.505	0.629	2.469	6.725	1.405	2.641	3.975
310.200	1.480	1.589	0.729	3.081	7.239	1.505	2.822	4.410
310.300	1.580	1.668	0.829	3.736	7.720	1.605	2.992	4.660
310.400	1.680	1.743	0.929	4.432	8.172	1.705	3.153	4.896
310.500	1.780	1.815	1.029	5.167	8.601	1.805	3.306	5.122
310.600	1.880	1.885	1.129	5.938	9.009	1.905	3.452	5.337
310.700	1.980	1.952	1.229	6.744	9.400	2.005	3.593	5.545
310.800	2.080	2.017	1.329	7.584	9.775	2.105	3.728	5.745
310.900	2.180	2.080	1.429	8.456	10.136	2.205	3.858	5.938
311.000	2.280	2.141	1.529	9.359	10.484	2.305	3.984	6.125
311.100	2.380	2.200	1.629	10.292	10.822	2.405	4.107	6.307
311.200	2.480	2.258	1.729	11.254	11.149	2.505	4.225	6.483
311.300	2.580	2.314	1.829	12.244	11.467	2.605	4.341	6.655
311.400	2.680	2.369	1.929	13.262	11.776	2.705	4.453	6.823
311.500	2.780	2.423	2.029	14.306	12.078	2.805	4.563	6.986
311.600	2.880	2.476	2.129	15.377	12.372	2.905	4.670	7.146
311.700	2.980	2.527	2.229	16.473	12.659	3.005	4.775	7.302
311.800	3.080	2.577	2.329	17.594	12.940	3.105	4.877	7.455
311.900	3.180	2.627	2.429	18.739	13.215	3.205	4.978	7.605
312.000	3.280	2.675	2.529	19.908	13.484	3.305	5.076	7.752
312.100	3.380	2.723	2.629	21.100	13.748	3.405	5.173	7.896
312.200	3.480	2.770	2.729	22.316	14.007	3.505	5.267	8.037
312.300	3.580	2.816	2.829	23.553	14.261	3.605	5.360	8.177
312.400	3.680	2.861	2.929	24.813	14.511	3.705	5.452	8.313
312.500	3.780	2.906	3.029	26.095	14.757	3.805	5.542	8.448
312.600	3.880	2.950	3.129	27.398	14.998	3.905	5.630	8.581
312.700	3.980	2.993	3.229	28.722	15.236	4.005	5.718	8.711
312.800	4.080	3.036	3.329	30.066	15.470	4.105	5.804	8.840

Notes:

1. Forebay inflow calcuated as: $Q = C \cdot A_o \cdot \sqrt{2g \cdot \left(H - \frac{2}{3}d\right)}$ for H > d

$$Q = f \cdot \frac{H}{d} \cdot C \cdot \sqrt{g} \cdot d^{2.5}$$ for H < d, where

$$f \cdot \frac{H}{d} = 0.494\left(\frac{H}{d}\right)^{1.57} - 0.04\left(\frac{H}{d}\right)^{0.5}$$

2. Bypassing inflow calculated as the smallest of

$Q = C_d \cdot L \cdot H^{1.5}$ weir flow

$Q = C \cdot A \cdot \sqrt{2g \cdot H}$ weir opening (orifice) flow

$Q = C \cdot A \cdot \sqrt{2g \cdot \left(H - \frac{2}{3}d\right)}$ pipe opening (orifice) flow

WESTWOOD VILLAGE PHASE 2
PREMINARY STORMWATER MANAGEMENT DESIC - FACILITY 2 (CENTRAL)
North Dumfries, Ontario

Project Number: 02534-800
Date: April 8, 2021
Design By: JNJ/XSP
File: Q:\02534\800\SWM\02534-800 SWM Design.xlsx

NORTH SPLITTER MANHOLE DESIGN CALCULATION

	US SPMH	DS SPMH			
	Main Pond Inlet Pipe	**Forebay Inlet Pipe**	**Bypass Pipe**		**Manhole Weir**
Number of pipes =	1	1	1		
Diameter =	1350	750	1050	*mm*	Weir Elevation = 309.345 *m*
Area =	1.431	0.442	0.866	m^2	Weir Length = 3.000 *m*
Orifice Coefficient =	NA	0.820	0.820		Weir Coefficient = 1.65
Pipe Length =	32.9	27.6	11.9	*m*	
Invert Elevation at SPMH =	309.233	308.720	308.695	*m*	
Slope =	0.40%	0.40%	1.14%		
Hydraulic Radius =	0.338	0.188	0.263	*m*	
Manning's 'n' =	0.013	0.013	0.013		
Full Flow Velocity =	NA	1.594	3.367	*m/s*	
Pipe Capacity =	3.376	0.704	2.916	m^3/s	
Design Flow =	2.42	m^3/s	Minor system design flow - input elsewhere		
Design Velocity =	2.57	*m/s*	Under design flow conditions		
Upstream Obvert =	310.71	*m*			
Exit head loss =	0.337	*m*	Head loss into SPMH based on design velocity		
Friction head Loss =	0.067	*m*	Head loss through main pond inlet pipe		
SPMH 5yr WSEL =	309.75	*m*	SPMH water surface required to pass minor system design flow		
Upstream HGL =	310.15	*m*	Hydraulic grade line elevation upstream of main pond inlet pipe		

Q_{25mm} =	0.652	m^3/s	Peak flow from hydrologic modeling - 25 mm stm
Q_{5yr} =	2.416	m^3/s	Peak flow through main pond inlet (from storm design sheet) - 5 yr stm
$WSEL_{25mm}$ =	308.54	m	Maximum water surface elevation in pond - 25 mm stm
$WSEL_{5yr}$ =	309.05	m	Maximum water surface elevation in pond - 5 yr stm

Water Elevation *m*	Depth Above Invert *m*	Forebay Inflow m^3/s	Weir Head *m*	Weir Flow m^3/s	Depth Above Pipe Invert *m*	Pipe Orifice Flow m^3/s	Total Pond Flow m^3/s
308.700							
308.800	0.080	0.015					0.015
308.900	0.180	0.073					0.073
309.000	0.280	0.167					0.167
309.100	0.380	0.290					0.290
309.200	0.480	0.434					0.434
309.300	0.580	0.585					0.585
309.345	**0.625**	**0.652**					**0.652**
309.400	0.680	0.728	0.055	0.064	0.705	1.088	0.792
309.500	0.780	0.849	0.155	0.302	0.805	1.340	1.151
309.600	0.880	0.989	0.255	0.637	0.905	1.583	1.627
309.700	0.980	1.112	0.355	1.047	1.005	1.793	2.159
309.746	**1.026**	**1.164**	**0.401**	**1.257**	**1.051**	**1.863**	**2.421**
309.800	1.080	1.222	0.455	1.519	1.105	2.002	2.741
309.900	1.180	1.323	0.555	2.047	1.205	2.235	3.370
310.000	1.280	1.417	0.655	2.624	1.305	2.446	3.863
310.100	1.380	1.505	0.755	3.247	1.405	2.641	4.146
310.200	1.480	1.589	0.855	3.913	1.505	2.822	4.410
310.300	1.580	1.668	0.955	4.620	1.605	2.992	4.660
310.400	1.680	1.743	1.055	5.364	1.705	3.153	4.896
310.500	1.780	1.815	1.155	6.144	1.805	3.306	5.122
310.600	1.880	1.885	1.255	6.959	1.905	3.452	5.337
310.700	1.980	1.952	1.355	7.808	2.005	3.593	5.545
310.800	2.080	2.017	1.455	8.688	2.105	3.728	5.745
310.900	2.180	2.080	1.555	9.598	2.205	3.858	5.938

Notes:

1. Forebay inflow calculated as:

$$Q = C \cdot A_o \cdot \sqrt{2g \cdot \left(H - \frac{2}{3}d\right)}$$ for H > d

$$Q = f \cdot \frac{H}{d} \cdot C \cdot \sqrt{g} \cdot d^{2.5}$$ for H < d, where:

$$f \cdot \frac{H}{d} = 0.494\left(\frac{H}{d}\right)^{1.57} - 0.04\left(\frac{H}{d}\right)^{0.5}$$

2. Bypassing inflow calculated as the smallest of:

$$Q = C_d \cdot L \cdot H^{1.5}$$ weir flow

$$Q = C \cdot A \cdot \sqrt{2g \cdot \left(H - \frac{2}{3}d\right)}$$ pipe opening (orifice) flow

3. Exit head loss calculation:

$$h_L = k\frac{v^2}{2g}$$ where:

k = 1 at exit into SPMH
v = average velocity in pipe in minor system design event

4. Friction head loss calculation:

$$h_f = s_f L$$ where:

$$s_f = \left(\frac{Qn}{0.312D^{2.67}}\right)^2$$

WESTWOOD VILLAGE PHASE 2

PREMINARY STORMWATER MANAGEMENT DESIGN - FACILITY 2 (CENTRAL)

North Dumfries, Ontario

Project Number: 02534-800
Date: April 8, 2021
Design By: JNJ/XSP
File: Q:\02534\800\SWM\02534-800 SWM Design.xlsx

SOUTH FOREBAY DESIGN CALCULATIONS

MOE SWM Planning and Design Manual, 2003

Forebay Design Flows

Flow into forebay during the 1:5-year return period event	3.507	m^3/s
Flow into forebay during the 25 mm - 4 hour design storm event	0.742	m^3/s
Peak flow from main pond outlet for the 25mm design storm (from GAWSER)	0.041	m^3/s

Forebay Characteristics

b =	14.0	*m*	bottom width
y =	1.5	*m*	depth
z =	3	:1	side slope
w =	18.5	*m*	average width
R =	1.18	*m*	hydraulic radius
A =	27.8	m^2	cross-sectional area

1. Length Calculation Based on Settling Velocity

L = forebay flow length *(m)*
r = length-to-width ratio
Q_p = peak flow rate through forebay (m^3/s)
v_s = settling velocity *(m/s)*

$$L = \sqrt{\frac{rQ_p}{v_s}}$$ Equation 4.5: Forebay Settling Length

a) Required Settling Length (assuming Q_p = forebay through-flow & v_s = 0.0055 m/s)

Q_p =	0.74	m^3/s	peak flow rate through forebay
v_s =	0.0055	*m/s*	settling velocity
r =	0.39		length-to-width ratio $Q = \alpha L H^{1.5}$
L =	7.3	*m*	required settling length
L =	*7.3*	*m*	*trial length*

b) Required Settling Length (assuming Q_p = pond discharge & v_s = 0.0003 m/s)

Q_p =	0.041	m^3/s	peak flow rate through forebay
v_s =	0.0003	*m/s*	settling velocity
r =	0.40		length-to-width ratio
L =	7.4	*m*	required settling length
L =	*7.4*	*m*	*trial length*

Table 1: Average settling velocities

	Mass Removed	Particle Size Range	Average Settling Velocity
	%	*μm*	*m/s*
	80 - 100	x ≤ 20	0.00000254
Enhanced:	70 - 80	20 < x ≤ 40	0.00001300
Normal:	60 - 70	40 < x ≤ 60	0.00002540
Basic:	40 - 60	60 < x ≤ 130	0.00012700
Medium Sand:	20 - 40	130 < x ≤ 400	0.00059267
Gross Grit:	0 - 20	400 < x ≤ 4000	0.00550333

2. Length Calculation Based on Flow Dispersion Length

Q =	3.51	m^3/s	inlet flow rate
d =	1.5	*m*	depth of permanent pool in forebay
V_f =	0.50	*m/s*	desired velocity in forebay (typical value ≤ 0.50 *m/s*)
L =	37.4	m	required length of dispersion

$$L_D = \frac{8Q}{dV_f}$$ Equation 4.6: Dispersion Length

3. Required Forebay Length

L =	**37.4**	***m***	**design length**
r =	2.02		design length-to-width ratio (typical minimum of 2.0)

Proposed Length 87m

4. Scour Velocity

v_s =	0.15	*m/s*	scour velocity (typical value = 0.15 *m/s*)
v =	**0.13**	***m/s***	**actual velocity**

OK The actual velocity through the forebay is less than the scour velocity.

5. Weir Flow From Forebay

L =	18	*m*	length of crest of weir
α =	1.65		coefficient
H =	0.5	*m*	head
Q =	**10.50**	***m³/s***	**discharge**

Equation 4.4: Weir Flow

OK The weir flow from the forebay exceeds the flow entering the forebay

6. Estimated Cleanout Frequencies

a) Forebay

Forebay volume	2617	m^3
Estimated TSS removal efficiency	50%	
Impervious level	58%	
Estimated annual sediment loading	2.1	m^3/ha
Contributing area	28.92	*ha*
Annual sediment volume	30	m^3/yr
Cleanout frequency for 33% volume reduction	**28.9**	***years***

b) Stormwater Management Pond

Wetpond volume (excluding forebay)	3752	m^3
Estimated TSS removal efficiency	30%	
Impervious level	58%	
Estimated annual sediment loading	2.1	m^3/ha
Contributing area	55.22	*ha*
Annual sediment volume	35	m^3/yr
Cleanout frequency for 33% volume reduction	**35.2**	***years***

Table 2: Annual sediment loading

Impervious Level	Annual Loading
%	m^3/ha
35%	0.6
55%	1.9
70%	2.8
85%	3.8

WESTWOOD VILLAGE PHASE 2
PREMINARY STORMWATER MANAGEMENT DESIGN
North Dumfries, Ontario **- FACILITY 2 (CENTRAL)**

Project Number: 02534-800
Date: January 20, 2021
Design By: JNJ/XSP
File: Q:\02534\800\SWM\02534-800 SWM Design.xlsx

FALLING HEAD DRAWDOWN CALCULATION
MECP SWM Planning and Design Manual, 2003

$$t = \frac{0.66C_2h^{1.5} + 2C_3h^{0.5}}{2.75A_O}$$ Equation 4.11

where

t =	102298	*s*	
	28.4	*hr*	drawdown time
A_p =	17400.7	m^2	surface area of the pond
C =	0.63		discharge coefficient
d =	235	*mm*	diameter of the orifice
A_O =	0.04337	m^2	cross-sectional area of the orifice
g =	9.81	m/s^2	gravitational acceleration constant
h_1 =	308.430	*m*	starting water elevation above the orifice
h_2 =	308.300	*m*	ending water elevation above the orifice
h =	0.13	*m*	maximum water elevation above the orifice
C_2 =	5508.08		slope coefficient from the area-depth linear regression
C_3 =	16684.7		intercept from the area-depth linear regression

	ELEVATION *m*	STAGE *m*	AREA m^2	COMMENTS
1	308.300	0	16687	Permanent pool
2	308.400	0.1	17233	
3	308.500	0.2	17784	
4	308.600	0.3	18339	Extended detention - 40cu.m/ha = 2209cu.m

DRAWDOWN TIME: 102298 *s*
28.4 *hr*

Regression Output:

m_1 =	5508.08	slope coefficient from the area-depth linear regression
b =	16684.67	intercept from the area-depth linear regression
se_1 =	14.55	standard error for coefficient m_1
se_b =	2.72	standard error for constant b
R^2 =	1.0000	coefficient of determination
se_y =	3.25	standard error of the *y* estimate
F =	143255.16	F statistic
df =	2	degrees of freedom
ss_{reg} =	1516946	regression sum of squares
ss_{resid} =	21	residual sum of squares

Major SWM 2 North

Project Description		
Friction Method	Manning Formula	
Solve For	Normal Depth	

Input Data		
Roughness Coefficient	0.013	
Channel Slope	2.000 %	Minimum slope along overland flow route
Bottom Width	4.00 m	
Discharge	3.03 m³/s	Q100yr - 5 yr STM capacity

Results		
Normal Depth	210.4 mm	Depth of overland flow (250mm provided)
Flow Area	0.8 m²	
Wetted Perimeter	4.4 m	
Hydraulic Radius	190.3 mm	
Top Width	4.00 m	
Critical Depth	388.3 mm	
Critical Slope	0.288 %	
Velocity	3.60 m/s	
Velocity Head	0.66 m	
Specific Energy	0.87 m	
Froude Number	2.507	
Flow Type	Supercritical	

GVF Input Data		
Downstream Depth	0.0 mm	
Length	0.0 m	
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.0 mm	
Profile Description		
Profile Headloss	0.00 m	
Downstream Velocity	Infinity m/s	
Upstream Velocity	Infinity m/s	
Normal Depth	210.4 mm	
Critical Depth	388.3 mm	
Channel Slope	2.000 %	
Critical Slope	0.288 %	

Major Overland SWM2 South

Project Description		
Friction Method	Manning Formula	
Solve For	Normal Depth	

Input Data			
Roughness Coefficient	0.013		
Channel Slope	0.009	m/m	Minimum slope along overland flow route
Bottom Width	4.00	m	
Discharge	2.18	m^3/s	Q100yr - 5 yr STM capacity

Results			
Normal Depth	219.7	mm	Depth of overland flow (250mm provided)
Flow Area	0.9	m^2	
Wetted Perimeter	4.4	m	
Hydraulic Radius	198.0	mm	
Top Width	4.00	m	
Critical Depth	311.7	mm	
Critical Slope	0.003	m/m	
Velocity	2.48	m/s	
Velocity Head	0.31	m	
Specific Energy	0.53	m	
Froude Number	1.690		
Flow Type	Supercritical		

GVF Input Data		
Downstream Depth	0.0	mm
Length	0.0	m
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.0	mm
Profile Description		
Profile Headloss	0.00	m
Downstream Velocity	Infinity	m/s
Upstream Velocity	Infinity	m/s
Normal Depth	219.7	mm
Critical Depth	311.7	mm
Channel Slope	0.009	m/m
Critical Slope	0.003	m/m

Appendix C

Existing Conditions Hydrologic Modelling

Cambridge West
Existing Conditions Hydrologic Modeling Parameter Database
Kitchener, Ontario

Project Nu 2534-100
Date: October 18, 2017
File: Q:\02534\100\SWM\2534-200 GAWSER existing conditions parameter database July 2013.xlsx

HYD	Area (sq.km)	1	2	3	4	5	6	7	8	9	Sum	HYD	FTB	GWFACT	LENGTH	WIDTH	OFFCSLP	MCSLP	HYD	Ploughed	Grass	Forest	Roadway	Fence	For Edges	Sum
401	0.0235	2.0	0.0	0.0	39.2	0.0	0.0	0.0	58.8	0.0	100.0	401	3	1	160	140	10	10	401	90			5	5		100
402	0.1336	1.0	0.0	0.0	32.7	0.0	0.0	0.0	66.3	0.0	100.0	402	2	1	160	270	3.5	2	402	95			2.5	2.5		100
403	0.1073	1.0	41.0	18.7	8.8	0.0	0.0	0.0	30.5	0.0	100.0	403	5	1	140	180	5	5	403	20	60		10		10	100
404	0.1141	0.0	0.0	0.0	30.0	0.0	0.0	0.0	70.0	0.0	100.0	404	3	1	230	170	2	2	404	100						100
405	0.0966	1.0	0.0	0.0	19.8	0.0	0.0	0.0	79.2	0.0	100.0	405	3	1	230	210	2	2	405	93	2			5		100
406	0.093	0.0	0.0	0.0	15.0	0.0	0.0	0.0	85.0	0.0	100.0	406	3	1	180	275	3.5	2	406	100						100
407	0.2555	0.5	30.0	14.9	14.9	0.0	0.0	0.0	9.2	30.5	100.0	407	3	1	100	100	3.5	3.5	407		60	30			10	100
408	0.0581	3.0	0.0	0.0	9.7	0.0	0.0	0.0	87.3	0.0	100.0	408	3	1	350	150	10	2	408	100						100
409	0.8914	3.0	28.0	0.0	0.0	5.8	0.0	24.9	0.0	38.3	100.0	409	4	1	300	200	5	3.5	409	35	35	10	5	5	10	100
410	0.0171	0.0	0.0	0.0	0.0	0.0	60.0	0.0	40.0	0.0	100.0	410	3	1	200	80	1	2	410	100						100
101	0.0039	0.0	0.0	0.0	10.0	0.0	80.0	0.0	10.0	0.0	100.0	101	2	1	40	100	3.5	3.5	101	100						100
102	0.0214	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	100.0	102	2	1	180	120	3.5	3.5	102	100						100
103	0.0259	0.0	10.0	10.0	0.0	0.0	0.0	0.0	0.0	80.0	100.0	103	5	1	280	90	3.5	2	103			80			20	100
104	0.0282	0.0	0.0	0.0	40.0	0.0	0.0	0.0	60.0	0.0	100.0	104	3	1	100	90	5	2	104	95			5			100
105	0.1656	0.0	0.0	0.0	5.0	0.0	0.0	0.0	95.0	0.0	100.0	105	3	1	280	550	3.5	2	105	97.5			2.5			100
106	0.0215	0.0	0.0	0.0	20.0	0.0	0.0	0.0	80.0	0.0	100.0	106	3	1	220	100	2	0.5	106	95				5		100
107	0.151	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	100.0	107	2	1	10	400	5	3.5	107	96			2	2		100
108	0.124	0.0	20.0	45.0	0.0	10.0	0.0	0.0	0.0	25.0	100.0	108	5	0	300	250	0.5	0.5	108			85			15	100
109	0.1252	5.0	0.0	0.0	0.0	15.0	0.0	80.0	0.0	0.0	100.0	109	3	0	600	100	5	5	109			85			15	100
110	0.0201	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0	110	2	1	60	60	5	5	110	100						100
111	0.0498	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	100.0	111	2	1	10	250	10	5	111	96			2	2		100
201	0.0806	35.0	3.0	0.0	0.0	0.0	0.0	0.0	62.0	0.0	100.0	201	1.2	0	260	310	2	1	201		50		40		10	100
202	0.146	0.0	0.0	0.0	0.0	30.0	0.0	50.0	0.0	20.0	100.0	202	3	0	400	200	10	0.5	202			85			15	100
203	0.0368	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0	203	2	0	380	100	10	5	203	96			2	2		100
204	0.0453	0.0	0.0	0.0	10.0	0.0	50.0	0.0	40.0	0.0	100.0	204	2	0	200	115	1	1	204	96			2	2		100
205	0.07	0.0	0.0	35.0	0.0	0.0	0.0	65.0	0.0	0.0	100.0	205	5	0	500	140	2	2	205		20	60		20		100
301	0.1662	30.0	0.0	0.0	3.5	0.0	66.5	0.0	0.0	0.0	100.0	301	1.2	0	350	520	2	1	301		60		40			100
302	0.1347	20.0	5.0	11.8	0.0	0.0	63.2	0.0	0.0	0.0	100.0	302	1.2	0	180	240	2	1	302		40		50		10	100
303	0.321	25.0	0.0	0.0	15.0	0.0	60.0	0.0	0.0	0.0	100.0	303	1.2	0	300	300	2	2	303		40		50		10	100
304	0.1193	30.0	0.0	0.0	3.5	0.0	31.5	0.0	35.0	0.0	100.0	304	1.2	0	300	420	2	3.5	304		40		50		10	100
305	0.0064	6.0	0.0	0.0	9.4	0.0	0.0	0.0	84.6	0.0	100.0	305	2	0	80	80	2	2	305	100						100
306	0.0447	3.0	0.0	0.0	9.7	0.0	0.0	0.0	87.3	0.0	100.0	306	2	0	500	50	10	2	306				100			100
307	0.1653	0.0	0.0	85.0	0.0	0.0	0.0	5.0	0.0	10.0	100.0	307	3	0	850	200	10	1	307		15	70			15	100
308	0.063	2.0	0.0	0.0	12.3	0.0	0.0	0.0	85.8	0.0	100.0	308	3	0	200	320	3.5	2	308	85	5		5		5	100
309	0.0164	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0	309	3	0	60	200	10	1	309			80			20	100
310	0.0682	25.0	0.0	0.0	0.0	0.0	26.3	0.0	48.8	0.0	100.0	310	1.2	0	450	140	3.5	1	310		40		50		10	100
311	0.4726	0.0	2.0	64.0	0.0	0.0	0.0	34.0	0.0	0.0	100.0	311	5	0	1200	390	2	0.5	311		80	10			10	100
312	0.318	0.0	4.0	1.0	5.0	0.0	0.0	0.0	90.0	0.0	100.0	312	3	1	450	180	3.5	2	312	85	6.5		2	6.5		100
313	0.0985	0.0	0.0	0.0	10.0	0.0	0.0	0.0	90.0	0.0	100.0	313	2	0	170	580	5	3.5	313	98				2		100
314	0.1142	0.0	0.0	20.0	0.0	0.0	0.0	10.0	0.0	70.0	100.0	314	3	0	500	240	10	1	314			85			15	100
315	0.045	0.0	0.0	0.0	30.0	0.0	0.0	0.0	70.0	0.0	100.0	315	3	0	110	410	10	2	315	98				2		100
316	0.2117	20.0	0.0	8.0	16.0	0.0	8.0	0.0	48.0	0.0	100.0	316	1.2	0	650	330	3.5	2	316		40		50		10	100
317	0.118	20.0	0.0	0.0	0.0	0.0	40.0	0.0	40.0	0.0	100.0	317	1.2	0	150	200	2	1.5	317		40		50		10	100
318	0.1539	30.0	0.0	0.0	0.0	0.0	10.5	0.0	59.5	0.0	100.0	318	1.2	0	450	340	2	1.5	318		40		50		10	100
601	0.0468	0.0	0.0	0.0	0.0	0.0	60.0	0.0	40.0	0.0	100.0	601	3	1	230	200	5	10	601	100						100
602	0.0331	0.0	0.0	0.0	0.0	0.0	60.0	0.0	40.0	0.0	100.0	602	3	1	200	170	3.5	10	602	70	30					100
603	0.0912	0.0	0.0	0.0	5.0	0.0	70.0	0.0	25.0	0.0	100.0	603	2	1	150	550	2	2	603	50	50					100
604	0.2409	0.0	18.0	4.0	0.0	0.0	8.0	0.0	40.0	30.0	100.0	604	4	1	300	300	10	10	604	40		50			10	100

gawsparm.dat

GAWSER Parameter Adjustment Table

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
FDS	0.75	1.00	0.00	1.00	1.20	1.15	1.15	1.50	1.50	1.00	0.75	0.75
FKEFF	0.03	0.03	0.03	0.10	0.40	0.65	0.75	0.90	0.65	0.25	0.10	0.03
FCS	0.03	0.03	0.03	0.09	0.40	0.50	0.60	0.75	0.35	0.30	0.13	0.06
FD	0.06	0.04	0.05	0.05	0.06	0.08	0.10	0.11	0.10	0.10	0.08	0.07
FKO	5.00	5.00	3.50	3.50	4.00	4.50	5.50	6.00	5.00	4.00	3.50	4.00
FKSS	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
FHI	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FKMF	0.25	0.33	1.10	1.30	1.50	1.00	1.00	1.00	1.00	1.00	0.25	0.15
FNEW	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95
FEVAP	0.00	0.00	0.00	2.67	3.94	4.60	4.74	3.81	2.60	1.55	1.00	0.00
FMCR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FOCF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FOCR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FKE	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00
FKD	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FDD	1.00	1.00	1.00	1.00	1.00	2.50	2.50	2.50	2.50	2.50	1.00	1.00
FRCC	1.00	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.00	1.00
FSSC	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FTE	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FTEM	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FDINS	0.20	0.20	0.20	0.50	0.70	1.20	1.50	1.50	1.20	0.70	0.20	0.20

→

LEGEND

- 5201 — CATCHMENT
- 1201 — ADD HYDROGRAPH
- 201 — ROUTE RESERVOIR
- 2202 — ROUTE CHANNEL

NEWMAN CREEK

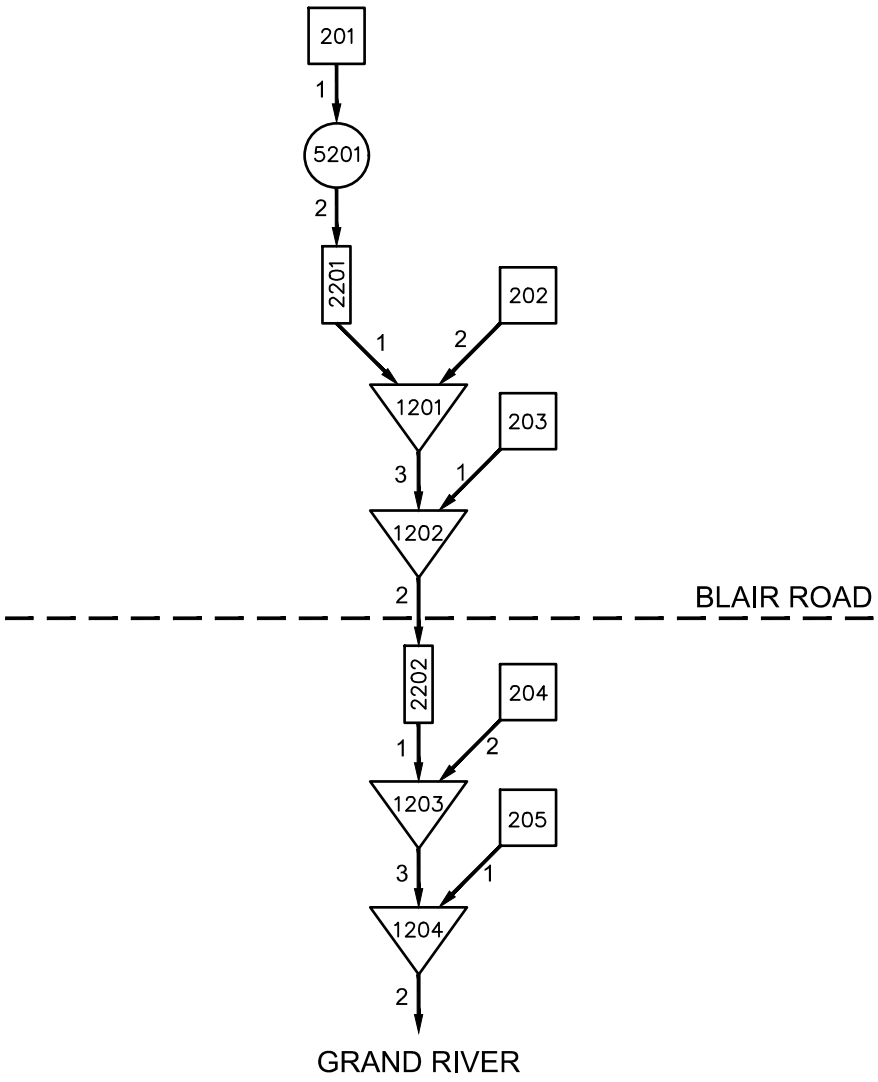

FIGURE C1 Scale N.T.S.

NEWMAN CREEK
EXISTING CONDITIONS
GAWSER MODEL SCHEMATIC

MTE
Engineers | Scientists | Surveyors

DWG PATH: P:\P\44719\114\44719-114-F7.dwg
April 23, 2019 – 11:50 a.m. – Plotted By: jjoye

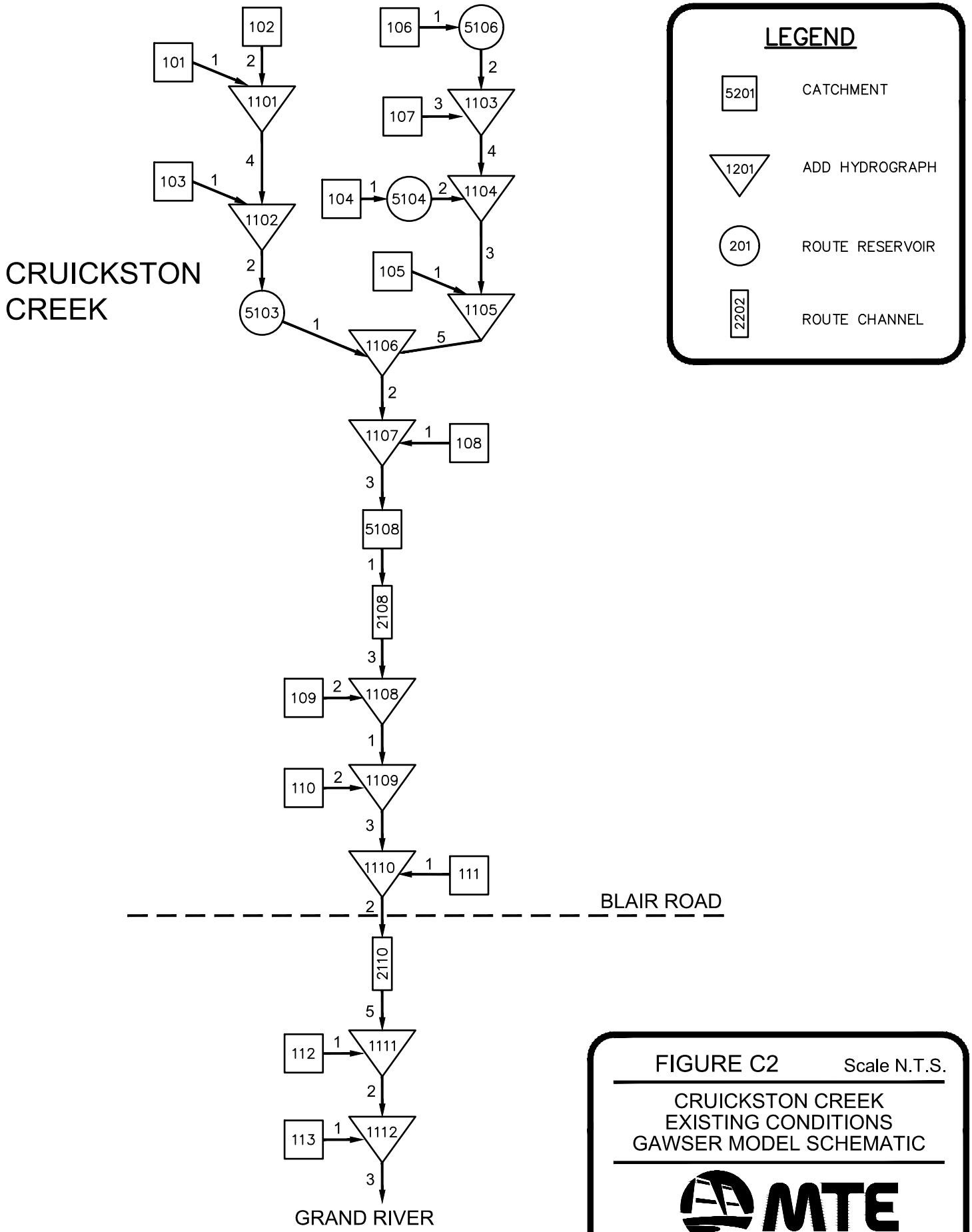

FIGURE C2 Scale N.T.S.

CRUICKSTON CREEK
EXISTING CONDITIONS
GAWSER MODEL SCHEMATIC

MTE
Engineers | Scientists | Surveyors

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October 17, 2017 – 2:55 p.m. – Plotted By: jjoye

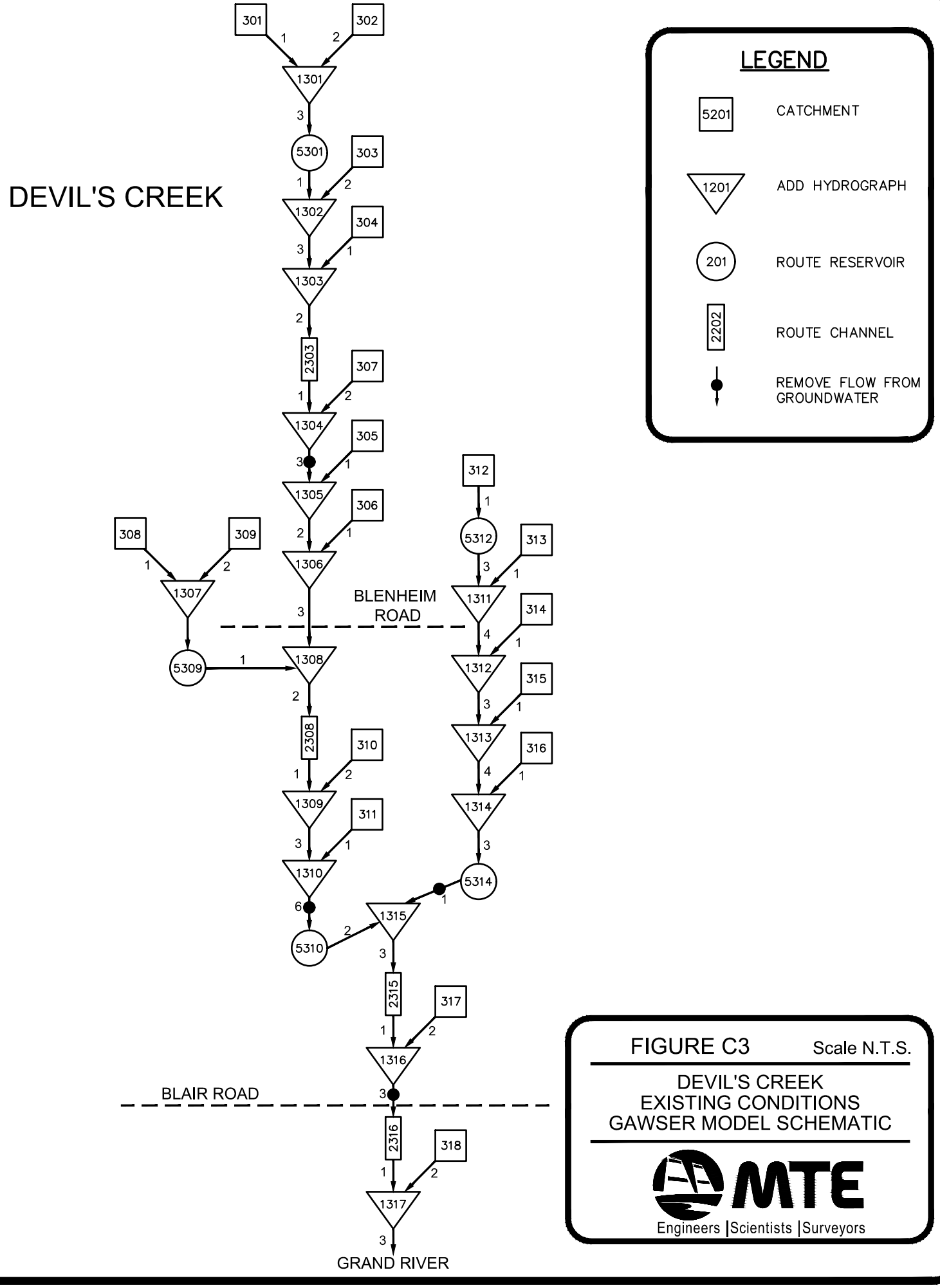


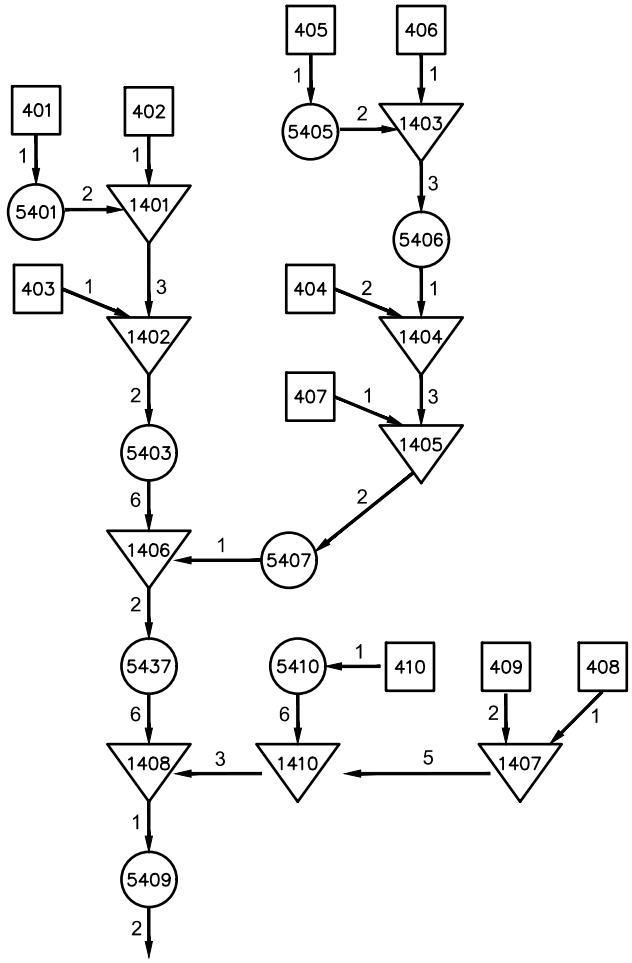
FIGURE C3 Scale N.T.S.

DEVIL'S CREEK
EXISTING CONDITIONS
GAWSER MODEL SCHEMATIC

MTE
Engineers | Scientists | Surveyors

DWG PATH:P:\P\44719\114\44719-114-F7.dwg
October 17, 2017 – 2:55 p.m. – Plotted By: jjoye

BARRIE'S LAKE



LEGEND

- 5201 — CATCHMENT
- 1201 — ADD HYDROGRAPH
- 201 — ROUTE RESERVOIR
- 2202 — ROUTE CHANNEL

FIGURE C4 Scale N.T.S.

BARRIE'S LAKE
EXISTING CONDITIONS
GAWSER MODEL SCHEMATIC

MTE
Engineers | Scientists | Surveyors

DWG PATH:P:\P\44719\114\44719-114-F7.dwg
April 23, 2019 — 11:42 a.m. — Plotted By: jjoye

```
* Cruickston, Newman, and Devil's Creeks Subwatersheds Model - Existing Cond.
* ============================================================================
* MTE Consultants Inc., 2011
* ============================================================================
* Hydrologic Response Units - Cruickston, Newman, and Devil's Creeks
* ============================================================================
*
* Unit  Response Unit Descriptions
*   1 = Impervious
*   2 = Wetland (Open water)
*   3 = Organic Soils
*   4 = Silt tills-poor and imperfectly draining
*   5 = Silt tills high vegetation cover
*   6 = Sand tills-sandy clay to fine sand loams
*   7 = Sand tills with high vegetation cover
*   8 = Silt/sand over sand/gravel tills (gravelly sandy clay to gravelly sandy silt loams
*   9 = Silt/sand over sand/gravel tills with high vegetation cover
*
* Soil drainage parameters taken from "Hydrology of Floods in Canada", 1989.
* Edited by Watt, W.E., National Research Council of Canada
*
READ SOIL PARAMETERS  NZONE=9
                                      SILT TILL   SAND TILL   SAND/GRAV
                        IMP  WET   ORG   LOW  HIGH   LOW  HIGH   LOW  HIGH
                DS=    2.0 40.0  40.0   5.0  15.0   5.0  15.0   5.0  15.0
                KEFF=    0   0.2   2.0   5.0  15.0  10.0  40.0  10.0  40.0
                CS=      0   0.2   1.5   3.8  11.2   7.5  30.0   7.5  30.0
                D=       0   0.2   0.2   0.5   1.5   1.0   4.0   1.0   4.0
                SAV=     0   200   200   200   200   200   200   200   200
                HI=      0  0.01   100   100   200   100   200   100   200
                SMCI=    0  0.56  0.56  0.54  0.54  0.46  0.46  0.46  0.46
                IMCI=    0  0.46  0.46  0.40  0.40  0.23  0.23  0.23  0.23
                FCAPI=   0  0.46  0.46  0.40  0.40  0.23  0.23  0.23  0.23
                WILTI=   0  0.27  0.27  0.19  0.19  0.07  0.07  0.07  0.07
                HII=     0  0.01   150   150   400   300   600   400   600
                SMCII=   0  0.56  0.56  0.54  0.54  0.46  0.46  0.40  0.40
                IMCII=   0  0.46  0.46  0.40  0.40  0.23  0.23  0.10  0.10
                FCAPII=  0  0.46  0.46  0.40  0.40  0.23  0.23  0.10  0.10
                WILTII=  0  0.27  0.27  0.19  0.19  0.07  0.07  0.04  0.04
                X=       0     1     1     0     1     0     0     0     0
                FATR=    1     1     1     1     1     1     1     1     1
                INCS=    0     1     3     1     5     1     5     1     5
*
* Go to event file
*
CHANGE INPUT FILE
*
*   3.5% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=1  VS=     2.035   NSEGS=3
                     MIN EL=  100.00   MAX EL=  100.80
                     CHNSLP= 0.03500   FLNSLP= 0.03500
                     N= 0.350  DIST=   24.45
                     N=-0.150  DIST=   25.55
                     N= 0.350  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                    RFN=0.0000 PCODE=1
*
*   5% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=2  VS=     2.050   NSEGS=3
                     MIN EL=  100.00   MAX EL=  100.80
```



```
                     CHNSLP= 0.05000   FLNSLP= 0.05000
                     N= 0.350  DIST=   24.45
                     N=-0.150  DIST=   25.55
                     N= 0.350  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                    RFN=0.0000 PCODE=1
*
*   3.5% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=3  VS=   100.035   NSEGS=3
                     MIN EL=  100.70   MAX EL=  103.00
                     CHNSLP= 0.03500   FLNSLP= 0.03500
                     N= 0.080  DIST=   20.00
                     N=-0.050  DIST=   30.00
                     N= 0.080  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  103.00    20.00  101.00    23.00  100.80
                       25.00  100.70    27.00  100.80    30.00  101.00
                       50.00  103.00
                    RFN=0.0000 PCODE=1
*
*   2% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=4  VS=   100.020   NSEGS=3
                     MIN EL=  100.70   MAX EL=  103.00
                     CHNSLP= 0.02000   FLNSLP= 0.02000
                     N= 0.080  DIST=   20.00
                     N=-0.050  DIST=   30.00
                     N= 0.080  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  103.00    20.00  101.00    23.00  100.80
                       25.00  100.70    27.00  100.80    30.00  101.00
                       50.00  103.00
                    RFN=0.0000 PCODE=1
*
* Catchment 2% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=5  VS=     2.020   NSEGS=3
                     MIN EL=  100.00   MAX EL=  100.80
                     CHNSLP= 0.02000   FLNSLP= 0.02000
                     N= 0.350  DIST=   24.45
                     N=-0.150  DIST=   25.55
                     N= 0.350  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                    RFN=0.0000 PCODE=1
*
*   Catchment 0.5% Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=6  VS=   100.005   NSEGS=3
                     MIN EL=  100.70   MAX EL=  103.00
                     CHNSLP= 0.00500   FLNSLP= 0.005000
                     N= 0.080  DIST=   20.00
                     N=-0.050  DIST=   30.00
                     N= 0.080  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  103.00    20.00  101.00    23.00  100.80
                       25.00  100.70    27.00  100.80    30.00  101.00
                       50.00  103.00
                    RFN=0.0000 PCODE=1
*
```

```
**********************************************************************************
* CRUICKSTON CREEK
*
*
*
* Catchment 106
* VS=  100.005 is main channel & VS= 2.02 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 106 AREA=    0.0215 Sq km  L=  220 m  W=   100 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     0.0   0.0  0.0  20.0  0.0   0.0  0.0  80.0  0.0
                   RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.05 QROC=  0.01
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=1.00 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Route flows from 106 through a depression
*
ROUTE SPECIAL POND  ID=2 HYD NO=5106 INFLOW=1 PCODE=0 OPTION=15
                   Inflow controls:
                       USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                       GWPCT=  0% GWDIV=0
                   Maximum level for Routing Tables:  ZMAX= 317.000
                   Recharge characteristics for Compartment A
                     LEVELA= 315.000                EVAPA= 0.0 mm/d ACODE=0
                     CDA=   0.000 mm/h  DZA= 23.00 m
                   Recharge characteristics for Compartment B
                     LEVELB= 315.000 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                     CDB=  25.000 mm/h  DZB= 10.00 m
                   Irrigation Pond Controls: IPOND=0
                   Number of points=  5
                                  Compartment  A          Compartment B
                   Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                      (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                    315.000     0.000   0.000   0.000   0.000   0.000   0.018
                    315.500     0.000   0.000   0.000   0.000   0.043   0.155
                    316.000     0.000   0.000   0.000   0.000   0.155   0.291
                    316.500     0.000   0.000   0.000   0.000   0.355   0.511
                    317.000     0.000   0.000   0.000   5.000   0.693   0.839
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Catchment 107
* VS= 100.035 is main channel & VS=   2.050 is off-channel
*
COMPUTE FLOWRATE    ID=3 NHD= 107 AREA=    0.1510 Sq km  L=  10 m  W=   400 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     0.0   0.0  0.0   0.0  0.0   0.0  0.0 100.0  0.0
                   RATING CURVES: IDMC=3 IDOC=2 QRMC=  0.05 QROC=  0.01
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 2.0 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=1.00 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*
* Sum hydr.  107 & 5106, call result  1103
*
ADD HYD             ID=4 HYD NO= 1103 IDA=3 IDB=2 ICODE=0
*
* Catchment 104
```



```
* VS= 100.020 is main channel & VS= 2.050 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 104 AREA=    0.0282 Sq km  L=  100 m  W=    90 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     0.0   0.0  0.0  40.0  0.0   0.0  0.0  60.0  0.0
                   RATING CURVES: IDMC=4 IDOC=2 QRMC=  0.05 QROC=  0.01
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=1.00 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Route flows from 104 through a depression
*
ROUTE SPECIAL POND  ID=2 HYD NO=5104 INFLOW=1 PCODE=0 OPTION=15
                   Inflow controls:
                       USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                       GWPCT=  0% GWDIV=0
                   Maximum level for Routing Tables:  ZMAX= 311.400
                   Recharge characteristics for Compartment A
                     LEVELA= 309.500                EVAPA= 0.0 mm/d ACODE=0
                     CDA=   0.000 mm/h  DZA= 23.00 m
                   Recharge characteristics for Compartment B
                     LEVELB= 309.500 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                     CDB=  25.000 mm/h  DZB= 10.00 m
                   Irrigation Pond Controls: IPOND=0
                   Number of points=  5
                                  Compartment  A          Compartment B
                   Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                      (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                    309.500     0.000   0.000   0.000   0.000   0.000   0.007
                    310.000     0.000   0.000   0.000   0.000   0.031   0.118
                    310.500     0.000   0.000   0.000   0.000   0.123   0.248
                    311.000     0.000   0.000   0.000   0.000   0.283   0.394
                    311.400     0.000   0.000   0.000   5.000   0.476   0.569
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  1103, 5104, call result  1104
*
ADD HYD             ID=3 HYD NO= 1104 IDA=2 IDB=4 ICODE=0
*
* Catchment 105
* VS= 100.020 is main channel & VS=   2.035 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 105 AREA=    0.1640 Sq km  L=  280 m  W=   550 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     0.0   0.0  0.0   5.0  0.0   0.0  0.0  95.0  0.0
                   RATING CURVES: IDMC=4 IDOC=1 QRMC=  0.05 QROC=  0.01
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=1.00 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  105, 1104, call result  1105
*
ADD HYD             ID=5 HYD NO= 1105 IDA=1 IDB=3 ICODE=0
*
* Catchment 101
```

```
* VS= 100.035 is main channel & VS= 2.035 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 101 AREA=    0.0039 Sq km  L=  40 m  W=   100 m
               SOIL ZONE I    II  III    IV    V    VI  VII  VIII    IX
                       0.0   0.0  0.0  10.0  0.0  80.0  0.0  10.0   0.0
                    RATING CURVES: IDMC=3 IDOC=1 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 2.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Catchment 102
* VS= 100.035 is main channel & VS= 2.035 is off-channel
*
COMPUTE FLOWRATE    ID=2 NHD= 102 AREA=    0.0214 Sq km  L=  180 m  W=   120 m
               SOIL ZONE I    II  III    IV    V    VI  VII  VIII    IX
                       0.0   0.0  0.0   0.0  0.0   0.0  0.0 100.0   0.0
                    RATING CURVES: IDMC=3 IDOC=1 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 2.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  101, 102, call result  1101
*
ADD HYD             ID=4 HYD NO= 1101 IDA=1 IDB=2 ICODE=0
*
* Catchment 103
* VS= 100.020 is main channel & VS= 2.035 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 103 AREA=    0.0259 Sq km  L=  280 m  W=   90 m
               SOIL ZONE I    II  III    IV    V    VI  VII  VIII    IX
                       0.0  10.0 10.0   0.0  0.0   0.0  0.0   0.0  80.0
                    RATING CURVES: IDMC=4 IDOC=1 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 5.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  103, 1101, call result  1102
*
ADD HYD             ID=2 HYD NO= 1102 IDA=1 IDB=4 ICODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Route flows from 1102 through a depression
*
ROUTE SPECIAL POND  ID=1 HYD NO=5103 INFLOW=2 PCODE=0 OPTION=15
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 308.000
                    Recharge characteristics for Compartment A
                      LEVELA= 307.300               EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
```



```
                    Recharge characteristics for Compartment B
                      LEVELB= 307.300 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB=  4.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  4
                                      Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     307.300     0.000   0.000   0.000   0.000   0.000   0.200
                     307.500     0.000   0.000   0.000   0.000   0.055   0.347
                     307.600     0.000   0.000   0.000   0.000   0.093   0.415
                     308.000     0.000   0.000   0.000   5.000   0.312   0.680
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  5102, 1105, call result  1106
*
ADD HYD             ID=2 HYD NO= 1106 IDA=1 IDB=5 ICODE=0
*
*   0.5% Off-channel (Flat areas)
*
COMPUTE RATING CURVE ID=5  VS=     1.005   NSEGS=3
                      MIN EL=  100.00   MAX EL=  100.60
                      CHNSLP= 0.00500   FLNSLP= 0.00500
                      N= 0.350  DIST=   39.15
                      N=-0.150  DIST=   40.85
                      N= 0.350  DIST=   80.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.60    39.15  100.20    39.75  100.00
                       40.25  100.00    40.85  100.20    80.00  100.60
                     RFN=0.0000 PCODE=1
*
* Catchment 108
* VS= 100.005 is main channel & VS= 2.005 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 108 AREA=    0.124 Sq km  L=  300 m  W=  250 m
               SOIL ZONE I    II  III    IV    V    VI  VII  VIII    IX
                       0.0  10.0 45.0   0.0 15.0   0.0  0.0   0.0  30.0
                    RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 5.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  108, 1106, call result  1107
*
ADD HYD             ID=3 HYD NO= 1107 IDA=1 IDB=2 ICODE=0
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*
* Route flows from 1107 through small wetland storage area
*
ROUTE RESERVOIR     ID=1 HYD NO=5108 INFLOW=3 PCODE=0 OPTION=5
                         OUTFLOW   STORAGE    OUTFLOW   STORAGE
                           CMS      HA-M        CMS       HA-M
                           0.0       0.0       0.003      0.010
                         0.005     0.030       5.000      0.200
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
COMPUTE RATING CURVE ID=6  VS=   9.000   NSEGS=3
```

```
                      MIN EL=  294.25   MAX EL=  297.00
                      CHNSLP= 0.03500   FLNSLP= 0.03500
                      N= 0.080  DIST=   95.70
                      N=-0.035  DIST=   99.50
                      N= 0.080  DIST=  130.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                       70.00  297.00    78.00  296.00    94.00  295.00
                       95.70  294.40    97.60  294.25    99.50  294.40
                      100.00  295.00   115.00  296.00   130.00  297.00
                     RFN=0.0000 PCODE=1
*
* Route through reach 2108
* Using Valley Section 9.000  As channel Rating Curve
*
ROUTE CHANNEL       ID=3 HYD NO= 2108 INFLOW=1 LENGTH=   600 m  SLOPE=0.03500
                    RCID=6 NS=1 PCODE=1 INDEX=1 PIPE=0 CANOPY= 75.0%
*
*   5% Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=6  VS=   100.050   NSEGS=3
                      MIN EL=  100.70   MAX EL=  103.00
                      CHNSLP= 0.05000   FLNSLP= 0.050000
                      N= 0.080  DIST=   20.00
                      N=-0.050  DIST=   30.00
                      N= 0.080  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  103.00    20.00  101.00    23.00  100.80
                       25.00  100.70    27.00  100.80    30.00  101.00
                       50.00  103.00
                     RFN=0.0000 PCODE=1
* Catchment 109
* VS= 100.050 is main channel & VS= 2.050 is off-channel
*
COMPUTE FLOWRATE    ID=2 NHD= 109 AREA=    0.1252 Sq km  L=  600 m  W=  100 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII    IX
                     5.0   0.0  0.0   0.0 15.0   0.0 80.0   0.0   0.0
                    RATING CURVES: IDMC=6 IDOC=2 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  109, 2108, call result  1108
*
ADD HYD             ID=1 HYD NO= 1108 IDA=3 IDB=2 ICODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Catchment 110
* VS= 100.050 is main channel & VS= 2.050 is off-channel
*
COMPUTE FLOWRATE    ID=2 NHD= 110 AREA=    0.0201 Sq km  L=  60 m  W=   60 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII    IX
                    0.0   0.0  0.0   0.0  0.0 100.0  0.0   0.0   0.0
                    RATING CURVES: IDMC=6 IDOC=2 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 2.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
```



```
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  110, 1108, call result  1109
*
ADD HYD             ID=3 HYD NO= 1109 IDA=2 IDB=1 ICODE=0
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*
* Catchment 10% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=5  VS=     2.100   NSEGS=3
                      MIN EL=  100.00   MAX EL=  100.80
                      CHNSLP= 0.10000   FLNSLP= 0.10000
                      N= 0.350  DIST=   24.45
                      N=-0.150  DIST=   25.55
                      N= 0.350  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1
*
* Catchment 111
* VS= 100.050 is main channel & VS= 1.10 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 111 AREA=    0.0498 Sq km  L=   10 m  W=   250 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII    IX
                     0.0   0.0  0.0   0.0  0.0   0.0  0.0 100.0   0.0
                    RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 2.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  111, 1109, call result  1110
*
ADD HYD             ID=2 HYD NO= 1110 IDA=1 IDB=3 ICODE=0
*
* Cruickston Creek at Blair Road
*
PRINT HYD           ID=2 PCODE=1 MODE=10
KEEP HYD            ID=2 CUTOFF=24 ICODE=3 ISTEP=1 IFORM=0 IDB=2 IMET=1
KEEP HYD            ID=2 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=2 IMET=1
*
COMPUTE RATING CURVE ID=5  VS=   7.000   NSEGS=3
                      MIN EL=  279.10   MAX EL=  281.00
                      CHNSLP= 0.01500   FLNSLP= 0.01700
                      N= 0.080  DIST=   98.95
                      N=-0.035  DIST=  100.95
                      N= 0.080  DIST=  165.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                       40.00  281.00    60.00  280.00    98.95  279.50
                      100.00  279.10   100.95  279.50   125.00  280.00
                      165.00  281.00
                     RFN=0.0000 PCODE=1
*
* Route through reach 2110
* Using Valley Section  7.000  As channel Rating Curve
*
ROUTE CHANNEL       ID=5 HYD NO= 2110 INFLOW=2 LENGTH=   800 m  SLOPE=0.01600
                    RCID=5 NS=1 PCODE=1 INDEX=1 PIPE=0 CANOPY= 50.0%
*
```

```
PRINT HYD           ID=5 PCODE=1 MODE=10
KEEP HYD            ID=5 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=5 IMET=1
*
*
*******************************************************************************
* BARRIE'S LAKE
*
*
*
*   2% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=1  VS=   100.020   NSEGS=3
                      MIN EL=  100.70   MAX EL=  103.00
                      CHNSLP= 0.02000   FLNSLP= 0.02000
                      N= 0.080  DIST=   20.00
                      N=-0.050  DIST=   30.00
                      N= 0.080  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                         0.00  103.00    20.00  101.00    23.00  100.80
                        25.00  100.70    27.00  100.80    30.00  101.00
                        50.00  103.00
                     RFN=0.0000 PCODE=1
*
*   3.5% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=2  VS=   100.035   NSEGS=3
                      MIN EL=  100.70   MAX EL=  103.00
                      CHNSLP= 0.03500   FLNSLP= 0.03500
                      N= 0.080  DIST=   20.00
                      N=-0.050  DIST=   30.00
                      N= 0.080  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                         0.00  103.00    20.00  101.00    23.00  100.80
                        25.00  100.70    27.00  100.80    30.00  101.00
                        50.00  103.00
                     RFN=0.0000 PCODE=1
*
* Catchment 2% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=3  VS=     2.020   NSEGS=3
                      MIN EL=  100.00   MAX EL=  100.80
                      CHNSLP= 0.02000   FLNSLP= 0.02000
                      N= 0.350  DIST=   24.45
                      N=-0.150  DIST=   25.55
                      N= 0.350  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                         0.00  100.80    24.45  100.30    24.75  100.00
                        25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1
*
*   3.5% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=4  VS=     2.035   NSEGS=3
                      MIN EL=  100.00   MAX EL=  100.80
                      CHNSLP= 0.03500   FLNSLP= 0.03500
                      N= 0.350  DIST=   24.45
                      N=-0.150  DIST=   25.55
                      N= 0.350  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                         0.00  100.80    24.45  100.30    24.75  100.00
                        25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1
*
*   10% Typical Main channel Parabolic Swale
```



```
*
COMPUTE RATING CURVE ID=5  VS=   100.100   NSEGS=3
                      MIN EL=  100.70   MAX EL=  103.00
                      CHNSLP= 0.10000   FLNSLP= 0.10000
                      N= 0.080  DIST=   20.00
                      N=-0.050  DIST=   30.00
                      N= 0.080  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                         0.00  103.00    20.00  101.00    23.00  100.80
                        25.00  100.70    27.00  100.80    30.00  101.00
                        50.00  103.00
                     RFN=0.0000 PCODE=1
*
* Catchment 10% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=6  VS=     2.100   NSEGS=3
                      MIN EL=  100.00   MAX EL=  100.80
                      CHNSLP= 0.10000   FLNSLP= 0.10000
                      N= 0.350  DIST=   24.45
                      N=-0.150  DIST=   25.55
                      N= 0.350  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                         0.00  100.80    24.45  100.30    24.75  100.00
                        25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1
*
* Catchment 401
* VS=  100.100 is main channel & VS= 2.10 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 401 AREA=   0.0234 Sq km  L=  160 m  W=   140 m
                SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                       2.0   0.0  0.0  39.2  0.0   0.0  0.0  58.8  0.0
                     RATING CURVES: IDMC=5 IDOC=6 QRMC=  0.05 QROC=  0.01
                     ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                     SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                     RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                     GWFACT=1.00 GWON=1
                     SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Route flows from 401 through a depression
*
ROUTE SPECIAL POND  ID=2 HYD NO=5401 INFLOW=1 PCODE=0 OPTION=15
                     Inflow controls:
                         USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                         GWPCT=  0% GWDIV=0
                     Maximum level for Routing Tables:  ZMAX= 310.000
                     Recharge characteristics for Compartment A
                       LEVELA= 308.400                EVAPA= 0.0 mm/d ACODE=0
                       CDA=   0.000 mm/h  DZA= 23.00 m
                     Recharge characteristics for Compartment B
                       LEVELB= 308.400 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                       CDB=  25.000 mm/h  DZB= 10.00 m
                     Irrigation Pond Controls: IPOND=0
                     Number of points=  8
                                        Compartment  A          Compartment B
                     Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                        (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                      308.400     0.000   0.000   0.000   0.000   0.000   0.001
                      308.500     0.000   0.000   0.000   0.000   0.001   0.026
                      308.600     0.000   0.000   0.000   0.000   0.006   0.075
                      308.700     0.000   0.000   0.000   0.000   0.016   0.119
                      309.000     0.000   0.000   0.000   0.000   0.076   0.278
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                    309.300     0.000   0.000   0.000   0.000   0.183   0.439
                    309.600     0.000   0.000   0.000   0.000   0.339   0.596
                    310.000     0.000   0.000   0.000   5.000   0.602   0.720
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Catchment 402
* VS=  100.020 is main channel & VS= 2.035 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 402 AREA=    0.1337 Sq km  L=  160 m  W=   270 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     1.0   0.0  0.0  32.7  0.0   0.0  0.0  66.3  0.0
                    RATING CURVES: IDMC=1 IDOC=4 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 2.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  5401, 402, call result  1401
*
ADD HYD             ID=3 HYD NO= 1401 IDA=1 IDB=2 ICODE=0
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*
*   5% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=5  VS=   100.050   NSEGS=3
                     MIN EL=  100.70   MAX EL=  103.00
                     CHNSLP= 0.05000   FLNSLP= 0.05000
                     N= 0.080  DIST=   20.00
                     N=-0.050  DIST=   30.00
                     N= 0.080  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  103.00    20.00  101.00    23.00  100.80
                       25.00  100.70    27.00  100.80    30.00  101.00
                       50.00  103.00
                     RFN=0.0000 PCODE=1
*
* Catchment 5% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=6  VS=     2.050   NSEGS=3
                     MIN EL=  100.00   MAX EL=  100.80
                     CHNSLP= 0.05000   FLNSLP= 0.05000
                     N= 0.350  DIST=   24.45
                     N=-0.150  DIST=   25.55
                     N= 0.350  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1
*
* Catchment 403
* HRU was             1.0  41.0 18.7   8.8  0.0   0.0  0.0  30.5  0.0
* VS=  100.050 is main channel & VS= 2.050 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 403 AREA=    0.1073 Sq km  L=  140 m  W=   180 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     1.0  26.0 33.7   8.8  0.0   0.0  0.0  30.5  0.0
                    RATING CURVES: IDMC=5 IDOC=6 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 5.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
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                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  1401, 403, call result  1402
*
ADD HYD             ID=2 HYD NO= 1402 IDA=1 IDB=3 ICODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Route flows from 1402 through a depression
* Revised Sept 28/17 to include storage down to 307.9 to match monitored data
*
ROUTE SPECIAL POND  ID=6 HYD NO=5403 INFLOW=2 PCODE=0 OPTION=15
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 309.500
                    Recharge characteristics for Compartment A
                      LEVELA= 307.900               EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 307.900 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB=  4.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  7
                                    Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     307.900     0.000   0.000   0.000   0.000   0.000   0.745
                     308.200     0.000   0.000   0.000   0.000   0.235   0.824
                     308.500     0.000   0.000   0.000   0.000   0.986   4.184
                     309.000     0.000   0.000   0.000   0.000   3.497   5.859
                     309.200     0.000   0.000   0.000   0.000   4.673   5.902
                     309.400     0.000   0.000   0.000   0.000   6.726   7.784
                     309.500     0.000   0.000   0.000   5.000   6.726   7.784
*
PRINT HYD           ID=6 PCODE=1 MODE=10
*
* Catchment 405
* VS=  100.020 is main channel & VS= 2.020 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 405 AREA=    0.0966 Sq km  L=  230 m  W=   210 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     1.0   0.0  0.0  19.8  0.0   0.0  0.0  79.2  0.0
                    RATING CURVES: IDMC=1 IDOC=3 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Route flows from 405 through a depression
*
ROUTE SPECIAL POND  ID=2 HYD NO=5405 INFLOW=1 PCODE=0 OPTION=15
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 315.000
                    Recharge characteristics for Compartment A
                      LEVELA= 313.600               EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
```

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                    Recharge characteristics for Compartment B
                      LEVELB= 313.600 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB= 25.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  9
                                  Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     313.600     0.000   0.000   0.000   0.000   0.000   0.001
                     313.700     0.000   0.000   0.000   0.000   0.002   0.042
                     313.800     0.000   0.000   0.000   0.000   0.012   0.159
                     313.900     0.000   0.000   0.000   0.000   0.034   0.275
                     314.000     0.000   0.000   0.000   0.000   0.068   0.400
                     314.200     0.000   0.000   0.000   0.000   0.173   0.657
                     314.400     0.000   0.000   0.000   0.000   0.347   1.079
                     314.700     0.000   0.000   0.000   0.000   0.778   1.793
                     315.000     0.000   0.000   0.000   5.000   1.430   2.554
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Catchment 406
* VS=  100.020 is main channel & VS= 2.035 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 406 AREA=   0.093 Sq km  L=  180 m  W=  275 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                    0.0   0.0  0.0  15.0  0.0   0.0  0.0  85.0  0.0
                    RATING CURVES: IDMC=1 IDOC=4 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Sum hydr.  5405, 406, call result  1403
*
ADD HYD             ID=3 HYD NO= 1403 IDA=1 IDB=2 ICODE=0
*
* Route flows from 1403 through a depression
*
ROUTE SPECIAL POND  ID=1 HYD NO=5406 INFLOW=3 PCODE=0 OPTION=15
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 101.000
                    Recharge characteristics for Compartment A
                      LEVELA= 98.800              EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 98.800 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB= 25.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  4
                                  Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                      98.800     0.000   0.000   0.000   0.000   0.000   0.001
                     100.000     0.000   0.000   0.000   0.000   0.036   0.358
                     100.500     0.000   0.000   0.000   0.000   0.353   0.912
                     101.000     0.000   0.000   0.000   5.000   0.992   1.642
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Catchment 404
* VS=  100.020 is main channel & VS= 2.020 is off-channel
```



```
*
COMPUTE FLOWRATE    ID=2 NHD= 404 AREA=   0.1141 Sq km  L=  230 m  W=  170 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                    0.0   0.0  0.0  30.0  0.0   0.0  0.0  70.0  0.0
                    RATING CURVES: IDMC=1 IDOC=3 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  5406, 404, call result  1404
*
ADD HYD             ID=3 HYD NO= 1404 IDA=1 IDB=2 ICODE=0
*
* Catchment 407
* VS=  100.035 is main channel & VS= 2.035 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 407 AREA=   0.2555 Sq km  L=  100 m  W=  100 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                    0.5  30.0 14.9  14.9  0.0   0.0  0.0   9.2 30.5
                    RATING CURVES: IDMC=2 IDOC=4 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  1404, 407, call result  1405
*
ADD HYD             ID=2 HYD NO= 1405 IDA=1 IDB=3 ICODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Route flows from 1405 through a depression
*
ROUTE SPECIAL POND  ID=1 HYD NO=5407 INFLOW=2 PCODE=0 OPTION=15
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 309.300
                    Recharge characteristics for Compartment A
                      LEVELA= 308.800              EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 308.800 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB=  4.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  4
                                  Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     308.800     0.000   0.000   0.000   0.000   0.000   3.600
                     309.000     0.000   0.000   0.000   0.000   0.953   5.932
                     309.200     0.000   0.000   0.000   0.000   2.292   7.459
                     309.300     0.000   0.000   0.000   5.000   2.750   8.225
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  5403, 5407, call result  1406
```

```
*
ADD HYD             ID=2 HYD NO= 1406 IDA=1 IDB=6 ICODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Route flows from 1406 through a depression
*
ROUTE SPECIAL POND  ID=6 HYD NO=5437 INFLOW=2 PCODE=0 OPTION=15
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 310.900
                    Recharge characteristics for Compartment A
                      LEVELA= 309.200               EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 309.200 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB=  4.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  6
                                  Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     309.200     0.000   0.000   0.000   0.000   0.000   13.36
                     309.500     0.000   0.000   0.000   0.000   4.501   16.65
                     310.000     0.000   0.000   0.000   0.000   14.54   23.50
                     310.500     0.000   0.000   0.000   0.000   27.30   27.54
                     310.800     0.000   0.000   0.000   0.000   35.96   30.21
                     310.900     0.000   0.000   0.000   5.000   36.50   31.99
*
PRINT HYD           ID=6 PCODE=1 MODE=10
*
* Catchment 10% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=5  VS=     2.100   NSEGS=3
                      MIN EL=  100.00   MAX EL=  100.80
                      CHNSLP= 0.10000   FLNSLP= 0.10000
                      N= 0.350  DIST=   24.45
                      N=-0.150  DIST=   25.55
                      N= 0.350  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1
*
* Catchment 408
* VS=  100.020 is main channel & VS= 2.100 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 408 AREA=    0.0590 Sq km  L=  350 m  W=  150 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                      3.0   0.0  0.0   9.7  0.0   0.0  0.0  87.3  0.0
                    RATING CURVES: IDMC=1 IDOC=5 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Catchment 409
* VS=  100.035 is main channel & VS= 2.050 is off-channel
*
COMPUTE FLOWRATE    ID=2 NHD= 409 AREA=    0.8914 Sq km  L=  300 m  W=  200 m
```



```
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                      3.0  28.0  0.0   0.0  5.8   0.0 24.9   0.0 38.3
                    RATING CURVES: IDMC=2 IDOC=6 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 4.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  408, 409, call result  1407
*
ADD HYD             ID=5 HYD NO= 1407 IDA=1 IDB=2 ICODE=0
*
PRINT HYD           ID=5 PCODE=1 MODE=10
*
* Catchment 410
* VS=  100.020 is main channel & VS= 2.020 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 410 AREA=    0.0171 Sq km  L=  200 m  W=   80 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                      0.0   0.0  0.0   0.0  0.0  60.0  0.0  40.0  0.0
                    RATING CURVES: IDMC=1 IDOC=3 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Route flows from 410 through a depression
*
ROUTE SPECIAL POND  ID=2 HYD NO=5410 INFLOW=1 PCODE=0 OPTION=15
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 318.500
                    Recharge characteristics for Compartment A
                      LEVELA= 317.600               EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 317.600 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB= 25.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  5
                                  Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     317.600     0.000   0.000   0.000   0.000   0.000   0.002
                     317.800     0.000   0.000   0.000   0.000   0.003   0.028
                     318.000     0.000   0.000   0.000   0.000   0.014   0.078
                     318.200     0.000   0.000   0.000   0.000   0.036   0.150
                     318.500     0.000   0.000   0.000   5.000   0.043   0.300
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  1407, 5410, call result  1410
*
ADD HYD             ID=3 HYD NO= 1410 IDA=5 IDB=2 ICODE=0
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*
* Sum hydr. 1410, 5437, call result  1408
*
```

```
ADD HYD             ID=1 HYD NO= 1408 IDA=3 IDB=6 ICODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Route flows from 1408 through Barrie's Lake
*
ROUTE SPECIAL POND  ID=2 HYD NO=5409 INFLOW=1 PCODE=0 OPTION=15
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 310.500
                    Recharge characteristics for Compartment A
                      LEVELA= 308.500              EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 308.500 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB=  4.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  3
                                 Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     308.500     0.000   0.000   0.000   0.000   0.000   27.00
                     309.500     0.000   0.000   0.000   0.000   28.50   30.00
                     310.500     0.000   0.000   0.000   0.000   61.50   36.00
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
********************************************************************************
* GILHOLM MARSH
*
*
*
*   2% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=1  VS=   100.020   NSEGS=3
                      MIN EL=  100.70   MAX EL=  103.00
                      CHNSLP= 0.02000   FLNSLP= 0.02000
                      N= 0.080  DIST=   20.00
                      N=-0.050  DIST=   30.00
                      N= 0.080  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  103.00    20.00  101.00    23.00  100.80
                       25.00  100.70    27.00  100.80    30.00  101.00
                       50.00  103.00
                     RFN=0.0000 PCODE=1
*
* Catchment 5% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=2  VS=     2.050   NSEGS=3
                      MIN EL=  100.00   MAX EL=  100.80
                      CHNSLP= 0.05000   FLNSLP= 0.05000
                      N= 0.350  DIST=   24.45
                      N=-0.150  DIST=   25.55
                      N= 0.350  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1
*
* Catchment 2% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=3  VS=     2.020   NSEGS=3
                      MIN EL=  100.00   MAX EL=  100.80
```



```
                      CHNSLP= 0.02000   FLNSLP= 0.02000
                      N= 0.350  DIST=   24.45
                      N=-0.150  DIST=   25.55
                      N= 0.350  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1
*
*   3.5% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=4  VS=     2.035   NSEGS=3
                      MIN EL=  100.00   MAX EL=  100.80
                      CHNSLP= 0.03500   FLNSLP= 0.03500
                      N= 0.350  DIST=   24.45
                      N=-0.150  DIST=   25.55
                      N= 0.350  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1
*
*   10% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=5  VS=   100.100   NSEGS=3
                      MIN EL=  100.70   MAX EL=  103.00
                      CHNSLP= 0.10000   FLNSLP= 0.10000
                      N= 0.080  DIST=   20.00
                      N=-0.050  DIST=   30.00
                      N= 0.080  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  103.00    20.00  101.00    23.00  100.80
                       25.00  100.70    27.00  100.80    30.00  101.00
                       50.00  103.00
                     RFN=0.0000 PCODE=1
*
* Catchment 10% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=6  VS=     2.100   NSEGS=3
                      MIN EL=  100.00   MAX EL=  100.80
                      CHNSLP= 0.10000   FLNSLP= 0.10000
                      N= 0.350  DIST=   24.45
                      N=-0.150  DIST=   25.55
                      N= 0.350  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1
*
* Catchment 601
* VS=  100.100 is main channel & VS= 2.050 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 601 AREA=   0.0468 Sq km  L=  230 m  W=   200 m
                SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                          0.0   0.0  0.0   0.0  0.0  60.0  0.0  40.0  0.0
                    RATING CURVES: IDMC=5 IDOC=2 QRMC=  0.5 QROC=  0.05
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
```

```
* Route flows from 601 through 5601
*
ROUTE SPECIAL POND  ID=2 HYD NO=5601 INFLOW=1 PCODE=0 OPTION=15
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 318.500
                    Recharge characteristics for Compartment A
                      LEVELA= 313.000                EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 313.000 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB= 25.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  7
                                 Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     313.000     0.000   0.000   0.000   0.000   0.000   0.030
                     314.000     0.000   0.000   0.000   0.000   0.080   0.129
                     315.000     0.000   0.000   0.000   0.000   0.264   0.240
                     316.000     0.000   0.000   0.000   0.000   0.578   0.388
                     316.500     0.000   0.000   0.000   0.000   0.868   0.770
                     317.500     0.000   0.000   0.000   0.000   1.955   1.404
                     318.500     0.000   0.000   0.000   5.000   2.100   1.500
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Catchment 602
* VS=  100.100 is main channel & VS= 2.035 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 602 AREA=   0.0331 Sq km  L=  200 m  W=   170 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     0.0   0.0  0.0   0.0  0.0  60.0  0.0  40.0  0.0
                    RATING CURVES: IDMC=5 IDOC=4 QRMC=  0.5 QROC=  0.05
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr. 5601, 602, call result  1601
*
ADD HYD             ID=3 HYD NO= 1601 IDA=1 IDB=2 ICODE=0
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*
* Route flows from 1601 through 5602
*
ROUTE SPECIAL POND  ID=1 HYD NO=5602 INFLOW=3 PCODE=0 OPTION=15
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 318.00
                    Recharge characteristics for Compartment A
                      LEVELA= 311.000                EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 311.000 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB= 25.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  9
```



```
                                 Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     311.000     0.000   0.000   0.000   0.000   0.000   0.005
                     312.000     0.000   0.000   0.000   0.000   0.046   0.087
                     313.000     0.000   0.000   0.000   0.000   0.170   0.160
                     314.000     0.000   0.000   0.000   0.000   0.370   0.241
                     315.000     0.000   0.000   0.000   0.000   0.662   0.343
                     316.000     0.000   0.000   0.000   0.000   1.075   0.483
                     316.500     0.000   0.000   0.000   0.000   1.339   0.572
                     317.000     0.000   0.000   0.000   0.000   1.673   0.765
                     318.000     0.000   0.000   0.000   5.000   1.800   0.800
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Catchment 603
* VS=  100.020 is main channel & VS= 2.020 is off-channel
*
COMPUTE FLOWRATE    ID=2 NHD= 603 AREA=   0.0912 Sq km  L=  150 m  W=   550 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     0.0   0.0  0.0   5.0  0.0  70.0  0.0  25.0  0.0
                    RATING CURVES: IDMC=1 IDOC=3 QRMC=  0.5 QROC=  0.05
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 2.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr. 5602, 603, call result  1602
*
ADD HYD             ID=3 HYD NO= 1602 IDA=1 IDB=2 ICODE=0
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*
* Catchment 604
* VS=  100.100 is main channel & VS= 2.100 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 604 AREA=   0.2409 Sq km  L=  300 m  W=   300 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     0.0  18.0  4.0   0.0  0.0   8.0  0.0  40.0 30.0
                    RATING CURVES: IDMC=5 IDOC=6 QRMC=  0.5 QROC=  0.05
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 4.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr. 1602, 604, call result  1603
*
ADD HYD             ID=2 HYD NO= 1603 IDA=1 IDB=3 ICODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Route flows from 1603 through 5604
*
ROUTE SPECIAL POND  ID=1 HYD NO=5604 INFLOW=2 PCODE=0 OPTION=15
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 316.00
```

```
                    Recharge characteristics for Compartment A
                      LEVELA= 311.500              EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 311.500 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB= 4.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  9
                              Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     311.500     0.000   0.000   0.000   0.000   0.000   4.758
                     312.000     0.000   0.000   0.000   0.000   2.511   5.345
                     312.500     0.000   0.000   0.000   0.000   5.330   5.930
                     313.000     0.000   0.000   0.000   0.000   8.487   6.697
                     313.500     0.000   0.000   0.000   0.000   12.08   7.691
                     314.000     0.000   0.000   0.000   0.000   16.18   8.686
                     314.500     0.000   0.000   0.000   0.000   21.12   11.07
                     315.000     0.000   0.000   0.000   0.000   27.01   12.92
                     316.000     0.000   0.000   0.000   5.000   30.00   13.00
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
*
*
********************************************************************************
* NEWMAN CREEK
*
*
*
*   2.0% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=1  VS=     2.020   NSEGS=3
                      MIN EL=  100.00   MAX EL=  100.80
                      CHNSLP= 0.02000   FLNSLP= 0.02000
                      N= 0.350  DIST=   24.45
                      N=-0.150  DIST=   25.55
                      N= 0.350  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1

*
*   10.0% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=2  VS=     2.100   NSEGS=3
                      MIN EL=  100.00   MAX EL=  100.80
                      CHNSLP= 0.10000   FLNSLP= 0.10000
                      N= 0.350  DIST=   24.45
                      N=-0.150  DIST=   25.55
                      N= 0.350  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1
*
*   1.0% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=3  VS=   100.010   NSEGS=3
                      MIN EL=  100.70   MAX EL=  103.00
                      CHNSLP= 0.01000   FLNSLP= 0.01000
                      N= 0.080  DIST=   20.00
                      N=-0.050  DIST=   30.00
```



```
                      N= 0.080  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  103.00    20.00  101.00    23.00  100.80
                       25.00  100.70    27.00  100.80    30.00  101.00
                       50.00  103.00
                     RFN=0.0000 PCODE=1
*
* Typical Urban section
*
COMPUTE RATING CURVE ID=5  VS=     3.200   NSEGS=3
                      MIN EL=  295.00   MAX EL=  295.70
                      CHNSLP= 0.01000   FLNSLP= 0.01000
                      N= 0.015  DIST=  200.00
                      N=-0.015  DIST=  300.00
                      N= 0.015  DIST=  500.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  295.70   200.00  295.50   200.10  295.00
                      299.90  295.00   300.00  295.50   500.00  295.70
*
* Typical Urban section
*
COMPUTE RATING CURVE ID=6  VS=     3.200   NSEGS=3
                      MIN EL=  295.00   MAX EL=  295.70
                      CHNSLP= 0.02000   FLNSLP= 0.02000
                      N= 0.015  DIST=  200.00
                      N=-0.015  DIST=  300.00
                      N= 0.015  DIST=  500.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  295.70   200.00  295.50   200.10  295.00
                      299.90  295.00   300.00  295.50   500.00  295.70
*
* Catchment 201
* VS=  100.010 is main channel & VS= 2.020 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 201 AREA=   0.0807 Sq km  L=  260 m  W=   310 m
                SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                      35.0   3.0  0.0   0.0  0.0   0.0  0.0  62.0  0.0
                    RATING CURVES: IDMC=5 IDOC=6 QRMC=  0.5 QROC=  0.05
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Route flows from 201 through existing Grandview Hills SWM Facility (Newman)
*
ROUTE SPECIAL POND  ID=2 HYD NO=5201 INFLOW=1 PCODE=0 OPTION=15
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 306.300
                    Recharge characteristics for Compartment A
                      LEVELA= 304.580              EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 304.580 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB=   0.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  7
                              Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
```

```
                    304.580     0.000   0.000   0.000   0.000   0.000   0.290
                    305.100     0.000   0.000   0.000   0.006   0.174   0.290
                    305.400     0.000   0.000   0.000   0.046   0.301   0.290
                    305.500     0.000   0.000   0.000   0.285   0.349   0.290
                    305.700     0.000   0.000   0.000   0.316   0.451   0.290
                    306.000     0.000   0.000   0.000   2.330   0.624   0.290
                    306.300     0.000   0.000   0.000   6.643   0.821   0.290
*
PRINT HYD           ID=2 PCODE=1 MODE=10
KEEP HYD            ID=2 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=2 IMET=1
*
COMPUTE RATING CURVE ID=4  VS=   6.000   NSEGS=3
                     MIN EL=  298.40   MAX EL=  300.00
                     CHNSLP= 0.06600   FLNSLP= 0.07400
                     N= 0.080  DIST=   98.90
                     N=-0.035  DIST=  101.10
                     N= 0.080  DIST=  125.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                      75.00  300.00    85.00  299.50    95.00  299.00
                      98.90  298.90    99.30  298.40   100.70  298.40
                     101.10  298.90   105.00  299.00   115.00  299.50
                     125.00  300.00
                    RFN=0.0000 PCODE=1
*
* Route through reach 2201
* Using Valley Section 6.0  As channel Rating Curve
*
ROUTE CHANNEL       ID=1 HYD NO= 2201 INFLOW=2 LENGTH=   350 m  SLOPE=0.07
                    RCID=4 NS=1 PCODE=1 INDEX=1 PIPE=0 CANOPY= 75.0%
*
*   0.5% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=4  VS=   100.005   NSEGS=3
                     MIN EL=  100.70   MAX EL=  103.00
                     CHNSLP= 0.00500   FLNSLP= 0.00500
                     N= 0.080  DIST=   20.00
                     N=-0.050  DIST=   30.00
                     N= 0.080  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  103.00    20.00  101.00    23.00  100.80
                      25.00  100.70    27.00  100.80    30.00  101.00
                      50.00  103.00
                    RFN=0.0000 PCODE=1
*
* Catchment 202
* VS=  100.005 is main channel & VS= 2.100 is off-channel
*
COMPUTE FLOWRATE    ID=2 NHD= 202 AREA=    0.1084 Sq km  L=  400 m  W=   200 m
               SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                      0.0   0.0  0.0   0.0 30.0   0.0 50.0   0.0 20.0
                    RATING CURVES: IDMC=4 IDOC=2 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  2201, 202, call result  1201
*
ADD HYD             ID=3 HYD NO= 1201 IDA=1 IDB=2 ICODE=0
*
*   5.0% Main channel Parabolic Swale
```



```
*
COMPUTE RATING CURVE ID=4  VS=   100.050   NSEGS=3
                     MIN EL=  100.70   MAX EL=  103.00
                     CHNSLP= 0.05000   FLNSLP= 0.05000
                     N= 0.080  DIST=   20.00
                     N=-0.050  DIST=   30.00
                     N= 0.080  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  103.00    20.00  101.00    23.00  100.80
                      25.00  100.70    27.00  100.80    30.00  101.00
                      50.00  103.00
                    RFN=0.0000 PCODE=1
*
* Catchment 203
* VS=  100.050 is main channel & VS= 2.100 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 203 AREA=    0.0368 Sq km  L=  380 m  W=   100 m
               SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                      0.0   0.0  0.0   0.0  0.0 100.0  0.0   0.0  0.0
                    RATING CURVES: IDMC=4 IDOC=2 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 2.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  1201, 203, call result  1202
*
ADD HYD             ID=2 HYD NO= 1202 IDA=3 IDB=1 ICODE=0
*
* Newman Creek at Blair Road
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
COMPUTE RATING CURVE ID=4  VS=   5.000   NSEGS=3
                     MIN EL=  277.20   MAX EL=  280.00
                     CHNSLP= 0.02500   FLNSLP= 0.02700
                     N= 0.080  DIST=   98.95
                     N=-0.035  DIST=  100.95
                     N= 0.080  DIST=  165.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                      85.00  280.00    95.00  278.00    98.00  277.50
                     100.00  277.20   102.00  277.50   105.00  278.00
                     115.00  280.00
                    RFN=0.0000 PCODE=1
*
* Route through reach 2202
* Using Valley Section 5.0 as channel Rating Curve
*
ROUTE CHANNEL       ID=1 HYD NO= 2202 INFLOW=2 LENGTH=   520 m  SLOPE=0.025
                    RCID=4 NS=1 PCODE=1 INDEX=1 PIPE=0 CANOPY= 75.0%
*
*   1% Off-channel (Flat areas)
*
COMPUTE RATING CURVE ID=4  VS=     1.010   NSEGS=3
                     MIN EL=  100.00   MAX EL=  100.60
                     CHNSLP= 0.01000   FLNSLP= 0.01000
                     N= 0.350  DIST=   39.15
                     N=-0.150  DIST=   40.85
                     N= 0.350  DIST=   80.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  100.60    39.15  100.20    39.75  100.00
```

```
                    40.25  100.00    40.85  100.20    80.00  100.60
                  RFN=0.0000 PCODE=1
*
* Catchment 204
* VS=  100.010 is main channel & VS= 2.010 is off-channel
*
COMPUTE FLOWRATE    ID=2 NHD= 204 AREA=    0.0453 Sq km  L=  200 m  W=   115 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     0.0   0.0  0.0  10.0  0.0  50.0  0.0  40.0  0.0
                  RATING CURVES: IDMC=3 IDOC=4 QRMC=  0.05 QROC=  0.01
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 2.0 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=0.00 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum 204, 2202, call result 1203
*
ADD HYD             ID=3 HYD NO= 1203 IDA=1 IDB=2 ICODE=0
*
*   2% off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=4  VS=     2.020   NSEGS=3
                     MIN EL=  100.00   MAX EL=  100.80
                     CHNSLP= 0.02000   FLNSLP= 0.02000
                     N= 0.350  DIST=   24.45
                     N=-0.150  DIST=   25.55
                     N= 0.350  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  100.80    24.45  100.30    24.75  100.00
                      25.50  100.00    25.55  100.30    50.00  100.80
                    RFN=0.0000 PCODE=1
*
*   2.0% Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=5  VS=   100.020   NSEGS=3
                     MIN EL=  100.70   MAX EL=  103.00
                     CHNSLP= 0.02000   FLNSLP= 0.02000
                     N= 0.080  DIST=   20.00
                     N=-0.050  DIST=   30.00
                     N= 0.080  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  103.00    20.00  101.00    23.00  100.80
                      25.00  100.70    27.00  100.80    30.00  101.00
                      50.00  103.00
                    RFN=0.0000 PCODE=1
*
* Catchment 205
* VS=  100.020 is main channel & VS= 2.020 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 205 AREA=    0.07 Sq km  L=  500 m  W=   140 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     0.0   0.0  35.0  0.0  0.0   0.0 65.0   0.0  0.0
                  RATING CURVES: IDMC=5 IDOC=4 QRMC=  0.05 QROC=  0.01
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 5.0 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=0.00 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
```



```
* Sum 205, 1203, call result 1204
*
ADD HYD             ID=2 HYD NO= 1204 IDA=3 IDB=1 ICODE=0
*
* NEWMAN CREEK AT GRAND RIVER
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
*************************************************************************
* DEVIL'S CREEK
*
*
*
*   2% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=1  VS=     2.020   NSEGS=3
                     MIN EL=  100.00   MAX EL=  100.80
                     CHNSLP= 0.02000   FLNSLP= 0.02000
                     N= 0.350  DIST=   24.45
                     N=-0.150  DIST=   25.55
                     N= 0.350  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  100.80    24.45  100.30    24.75  100.00
                      25.50  100.00    25.55  100.30    50.00  100.80
                    RFN=0.0000 PCODE=1
*
*   3.5% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=2  VS=     2.035   NSEGS=3
                     MIN EL=  100.00   MAX EL=  100.80
                     CHNSLP= 0.03500   FLNSLP= 0.03500
                     N= 0.350  DIST=   24.45
                     N=-0.150  DIST=   25.55
                     N= 0.350  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  100.80    24.45  100.30    24.75  100.00
                      25.50  100.00    25.55  100.30    50.00  100.80
                    RFN=0.0000 PCODE=1
*
*   10.0% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=3  VS=     2.100   NSEGS=3
                     MIN EL=  100.00   MAX EL=  100.80
                     CHNSLP= 0.10000   FLNSLP= 0.10000
                     N= 0.350  DIST=   24.45
                     N=-0.150  DIST=   25.55
                     N= 0.350  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  100.80    24.45  100.30    24.75  100.00
                      25.50  100.00    25.55  100.30    50.00  100.80
                    RFN=0.0000 PCODE=1
*
*   1.0% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=4  VS=   100.010   NSEGS=3
                     MIN EL=  100.70   MAX EL=  103.00
                     CHNSLP= 0.01000   FLNSLP= 0.01000
                     N= 0.080  DIST=   20.00
                     N=-0.050  DIST=   30.00
                     N= 0.080  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  103.00    20.00  101.00    23.00  100.80
                      25.00  100.70    27.00  100.80    30.00  101.00
                      50.00  103.00
```

```
                    RFN=0.0000 PCODE=1
*
*   2.0% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=5  VS=   100.020   NSEGS=3
                      MIN EL=  100.70   MAX EL=  103.00
                      CHNSLP= 0.02000   FLNSLP= 0.02000
                      N= 0.080  DIST=   20.00
                      N=-0.050  DIST=   30.00
                      N= 0.080  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                         0.00  103.00    20.00  101.00    23.00  100.80
                        25.00  100.70    27.00  100.80    30.00  101.00
                        50.00  103.00
                     RFN=0.0000 PCODE=1
*
* Typical Urban section
*
COMPUTE RATING CURVE ID=6  VS=     3.200   NSEGS=3
                      MIN EL=  295.00   MAX EL=  295.70
                      CHNSLP= 0.02000   FLNSLP= 0.02000
                      N= 0.015  DIST=  200.00
                      N=-0.015  DIST=  300.00
                      N= 0.015  DIST=  500.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                         0.00  295.70   200.00  295.50   200.10  295.00
                       299.90  295.00   300.00  295.50   500.00  295.70
*
* Catchment 301
* VS=  100.010 is main channel & VS= 2.020 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 301 AREA=    0.1662 Sq km  L=  350 m  W=   520 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                    30.0   0.0  0.0   3.5  0.0  66.5  0.0   0.0  0.0
                   RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.05
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=0.00 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Catchment 302
* VS=  100.010 is main channel & VS= 2.020 is off-channel
*
COMPUTE FLOWRATE    ID=2 NHD= 302 AREA=    0.1347 Sq km  L=  180 m  W=   240 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                    20.0   5.0 11.8   0.0  0.0  63.2  0.0   0.0  0.0
                   RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.05
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=0.00 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  301, 302, call result  1301
*
ADD HYD             ID=3 HYD NO= 1301 IDA=1 IDB=2 ICODE=0
*
* Route flows from 1301 through the Grand Ridge Estates SWM Facility
*
```



```
ROUTE SPECIAL POND  ID=1 HYD NO=5301 INFLOW=3 PCODE=0 OPTION=15
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 311.600
                    Recharge characteristics for Compartment A
                      LEVELA= 309.390               EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 309.390 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB=   0.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  17
                                    Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     309.390     0.000   0.000   0.000   0.000   0.000   0.790
                     309.590     0.000   0.000   0.000   0.037   0.240   0.790
                     309.690     0.000   0.000   0.000   0.046   0.370   0.790
                     309.730     0.000   0.000   0.000   0.049   0.410   0.790
                     309.820     0.000   0.000   0.000   0.055   0.530   0.790
                     309.940     0.000   0.000   0.000   0.062   0.690   0.790
                     309.950     0.000   0.000   0.000   0.391   0.710   0.790
                     310.030     0.000   0.000   0.000   0.417   0.820   0.790
                     310.400     0.000   0.000   0.000   0.524   1.320   0.790
                     310.820     0.000   0.000   0.000   0.624   1.920   0.790
                     310.850     0.000   0.000   0.000   0.631   1.970   0.790
                     311.000     0.000   0.000   0.000   0.662   2.210   0.790
                     311.200     0.000   0.000   0.000   1.494   2.530   0.790
                     311.300     0.000   0.000   0.000   2.177   2.690   0.790
                     311.400     0.000   0.000   0.000   2.981   2.850   0.790
                     311.500     0.000   0.000   0.000   3.890   3.000   0.790
                     311.600     0.000   0.000   0.000   4.893   3.160   0.790
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Catchment 303
* VS=  100.020 is main channel & VS= 2.020 is off-channel
*
COMPUTE FLOWRATE    ID=2 NHD= 303 AREA=    0.3216 Sq km  L=  300 m  W=   300 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                    25.0   0.0  0.0  15.0  0.0  60.0  0.0   0.0  0.0
                   RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.05
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=0.00 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  303, 5301, call result  1302
*
ADD HYD             ID=3 HYD NO= 1302 IDA=1 IDB=2 ICODE=0
*
* Catchment 304
* VS=  100.035 is main channel & VS= 2.020 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 304 AREA=    0.1193 Sq km  L=  300 m  W=   420 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                    30.0   0.0  0.0   3.5  0.0  31.5  0.0  35.0  0.0
                   RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.05
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
```

```
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  304, 1302, call result  1303
*
ADD HYD             ID=2 HYD NO= 1303 IDA=1 IDB=3 ICODE=0
*
COMPUTE RATING CURVE ID=6  VS=   1.000   NSEGS=3
                      MIN EL=  301.00   MAX EL=  303.00
                      CHNSLP= 0.01300   FLNSLP= 0.01400
                      N= 0.080  DIST=   97.00
                      N=-0.035  DIST=  103.00
                      N= 0.080  DIST=  140.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                       60.00  303.00    85.00  302.50    97.00  301.50
                      100.00  301.00   103.00  301.50   115.00  302.50
                      140.00  303.00
                     RFN=0.0000 PCODE=1
*
* Route through reach 2303
* Using Valley Section 1.0  As channel Rating Curve
*
ROUTE CHANNEL       ID=1 HYD NO= 2303 INFLOW=2 LENGTH=   900 m  SLOPE=0.013
                    RCID=6 NS=1 PCODE=1 INDEX=1 PIPE=0 CANOPY= 90.0%
*
* Catchment 307
* VS=  100.010 is main channel & VS= 2.100 is off-channel
*
COMPUTE FLOWRATE    ID=2 NHD= 307 AREA=   0.1653 Sq km  L=  850 m  W=   200 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     0.0   0.0 85.0   0.0  0.0   0.0  5.0   0.0 10.0
                    RATING CURVES: IDMC=4 IDOC=3 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  307, 2303, call result  1304
*
ADD HYD             ID=3 HYD NO= 1304 IDA=1 IDB=2 ICODE=0
*
REMOVE FLOW FROM GW ID=3 OPTION=2 PCODE=0 QPCT=00% KGW=384 h QSOUT=  0.004
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*
* Catchment 305
* VS=  100.020 is main channel & VS= 2.020 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 305 AREA=   0.0065 Sq km  L=  80 m  W=   80 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     6.0   0.0  0.0   9.4  0.0   0.0  0.0  84.6  0.0
                    RATING CURVES: IDMC=5 IDOC=1 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 2.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
```



```
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  305, 1304, call result  1305
*
ADD HYD             ID=2 HYD NO= 1305 IDA=1 IDB=3 ICODE=0
*
* Catchment 306
* VS=  100.020 is main channel & VS= 2.100 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 306 AREA=   0.0439 Sq km  L=  500 m  W=   50 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     3.0   0.0  0.0   9.7  0.0   0.0  0.0  87.3  0.0
                    RATING CURVES: IDMC=5 IDOC=3 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 2.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  306, 1305, call result  1306
*
ADD HYD             ID=3 HYD NO= 1306 IDA=1 IDB=2 ICODE=0
*
* Devil's Creek at Blenheim Road
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*
* Catchment 308
* VS=  100.020 is main channel & VS= 2.035 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 308 AREA=   0.063 Sq km  L=  200 m  W=   320 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     2.0   0.0  0.0  12.3  0.0   0.0  0.0  85.8  0.0
                    RATING CURVES: IDMC=5 IDOC=2 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Catchment 309
* VS=  100.010 is main channel & VS= 2.100 is off-channel
*
COMPUTE FLOWRATE    ID=2 NHD= 309 AREA=   0.0164 Sq km  L=  60 m  W=   200 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII    IX
                     0.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0 100.0
                    RATING CURVES: IDMC=4 IDOC=3 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  308, 309, call result  1307
*
ADD HYD             ID=4 HYD NO= 1307 IDA=1 IDB=2 ICODE=0
*
* Route flows from 1307 through a depression
```

```
*
ROUTE SPECIAL POND  ID=1 HYD NO=5309 INFLOW=4 PCODE=0 OPTION=15
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 300.500
                    Recharge characteristics for Compartment A
                      LEVELA= 298.500               EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 298.500 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB=  25.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  5
                                  Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     298.500     0.000   0.000   0.000   0.000   0.000   0.001
                     299.000     0.000   0.000   0.000   0.000   0.005   0.017
                     299.500     0.000   0.000   0.000   0.000   0.028   0.077
                     300.000     0.000   0.000   0.000   0.000   0.083   0.143
                     300.500     0.000   0.000   0.000   5.000   0.171   0.209
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  5309,1306 call result  1308
*
ADD HYD             ID=2 HYD NO= 1308 IDA=1 IDB=3 ICODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
KEEP HYD            ID=2 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=2 IMET=1
*
COMPUTE RATING CURVE ID=6  VS=   2.000   NSEGS=3
                     MIN EL=  290.00   MAX EL=  291.50
                     CHNSLP= 0.0030   FLNSLP= 0.0035
                     N= 0.080  DIST=   99.50
                     N=-0.035  DIST=  100.50
                     N= 0.080  DIST=  165.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                      35.00  291.50    75.00  291.00    98.50  290.50
                      99.50  290.40    99.60  290.00   100.40  290.00
                     100.50  290.40   101.50  290.50   125.00  291.00
                     165.00  291.50
                    RFN=0.0000 PCODE=1
*
* Route through reach 2308
* Using Valley Section 2.0  As channel Rating Curve
*
ROUTE CHANNEL       ID=1 HYD NO= 2308 INFLOW=2 LENGTH=  1400 m  SLOPE=0.003
                    RCID=6 NS=1 PCODE=1 INDEX=1 PIPE=0 CANOPY= 75.0%
*
* Typical Urban section
*
COMPUTE RATING CURVE ID=6  VS=     3.200   NSEGS=3
                     MIN EL=  295.00   MAX EL=  295.70
                     CHNSLP= 0.02000   FLNSLP= 0.02000
                     N= 0.015  DIST=  200.00
                     N=-0.015  DIST=  300.00
                     N= 0.015  DIST=  500.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  295.70   200.00  295.50   200.10  295.00
                     299.90  295.00   300.00  295.50   500.00  295.70
*
* Catchment 310
```



```
* VS=  100.010 is main channel & VS= 2.035 is off-channel
*
COMPUTE FLOWRATE    ID=2 NHD= 310 AREA=   0.0682 Sq km  L=  450 m  W=   140 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                    25.0   0.0  0.0   0.0  0.0  26.3  0.0  48.8  0.0
                   RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.05
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=0.00 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  310, 2308, call result  1309
*
ADD HYD             ID=3 HYD NO= 1309 IDA=1 IDB=2 ICODE=0
*
*   Catchment 0.5% Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=6  VS=   100.005   NSEGS=3
                      MIN EL=  100.70   MAX EL=  103.00
                      CHNSLP= 0.00500   FLNSLP= 0.005000
                      N= 0.080  DIST=   20.00
                      N=-0.050  DIST=   30.00
                      N= 0.080  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  103.00    20.00  101.00    23.00  100.80
                       25.00  100.70    27.00  100.80    30.00  101.00
                       50.00  103.00
                     RFN=0.0000 PCODE=1
*
* Catchment 311
* VS=  100.005 is main channel & VS= 2.020 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 311 AREA=   0.4793 Sq km  L=  1200 m  W=   390 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                    0.0   2.0 64.0   0.0  0.0   0.0 34.0   0.0  0.0
                   RATING CURVES: IDMC=6 IDOC=1 QRMC=  0.05 QROC=  0.01
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 5.0 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=0.00 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  311, 1309, call result  1310
*
ADD HYD             ID=6 HYD NO= 1310 IDA=1 IDB=3 ICODE=0
*
REMOVE FLOW FROM GW ID=6 OPTION=2 PCODE=0 QPCT=00% KGW=384 h QSOUT=  0.001
*
PRINT HYD           ID=6 PCODE=1 MODE=10
*
* Route flows from 1310 through the Devil's Creek wetland area
*
ROUTE SPECIAL POND  ID=2 HYD NO=5310 INFLOW=6 PCODE=0 OPTION=5
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 292.500
                    Recharge characteristics for Compartment A
                      LEVELA= 289.300               EVAPA= 0.0 mm/d ACODE=0
```

```
                    CDA=   0.000 mm/h  DZA= 23.00 m
                  Recharge characteristics for Compartment B
                    LEVELB= 289.300 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                    CDB=   4.000 mm/h  DZB= 10.00 m
                  Irrigation Pond Controls: IPOND=0
                  Number of points=  11
                                Compartment  A          Compartment B
                  Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                     (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                   289.300     0.000   0.000   0.000   0.000   0.000    0.00
                   289.600     0.000   0.000   0.000   0.090   0.500   10.00
                   289.700     0.000   0.000   0.000   0.110   1.495   10.00
                   289.800     0.000   0.000   0.000   0.130   2.492   10.00
                   289.900     0.000   0.000   0.000   0.230   3.489   10.00
                   290.000     0.000   0.000   0.000   1.200   3.515   10.00
                   290.500     0.000   0.000   0.000   4.200   3.815   10.00
                   291.000     0.000   0.000   0.000   8.200   4.648   10.00
                   291.500     0.000   0.000   0.000   13.00   7.048   10.00
                   292.000     0.000   0.000   0.000   18.40  12.448   10.00
                   292.500     0.000   0.000   0.000   24.40  20.998   10.00
*
PRINT HYD          ID=2 PCODE=1 MODE=10
KEEP HYD           ID=2 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=2 IMET=1
*
* Catchment 312
* VS=  100.020 is main channel & VS= 2.035 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 312 AREA=    0.318 Sq km  L=  450 m  W=   180 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                    0.0   4.0  1.0   5.0  0.0   0.0  0.0  90.0  0.0
                  RATING CURVES: IDMC=5 IDOC=2 QRMC=  0.05 QROC=  0.01
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=1.00 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD          ID=1 PCODE=1 MODE=10
*
* Central Wetland
* Route 6312 through Wetland 2 Depression - Revised per MTE Survey April 2017
* Min Ponding set to 307.9 to be more in line with monitoring data
*
ROUTE SPECIAL POND  ID=3 HYD NO=5312 INFLOW=1 PCODE=0 OPTION=15
                  Inflow controls:
                      USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                      GWPCT=  0% GWDIV=0
                  Maximum level for Routing Tables:  ZMAX= 311.000
                  Recharge characteristics for Compartment A
                    LEVELA= 307.900                EVAPA= 0.0 mm/d ACODE=0
                    CDA=   0.000 mm/h  DZA= 10.00 m
                  Recharge characteristics for Compartment B
                    LEVELB= 307.900 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                    CDB=  4.000 mm/h  DZB= 10.00 m
                  Irrigation Pond Controls: IPOND=0
                  Number of points= 10
                                Compartment  A          Compartment B
                  Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                     (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                   307.900     0.000  0.0000  0.0000  0.0000  0.2000  0.7500
                   308.000     0.000  0.0000  0.0000  0.0000  0.2730  1.1500
                   308.400     0.000  0.0000  0.0000  0.0000  0.7730  1.3460
                   308.500     0.000  0.0000  0.0000  0.0000  0.9140  1.4849
                   309.000     0.000  0.0000  0.0000  0.0000  1.8210  2.1441
```



```
                   309.500     0.000  0.0000  0.0000  0.1259  3.1740  3.2667
                   310.000     0.000  0.0000  0.0000  0.1523  5.2080  4.8696
                   310.500     0.000  0.0000  0.0000  0.1747  8.0750  6.5959
                   310.700     0.000  0.0000  0.0000  0.1829  9.4630  7.2920
                   311.000     0.000  0.0000  0.0000  0.1945  11.783  8.1691
*
PRINT HYD          ID=3 PCODE=1 MODE=10
KEEP HYD           ID=3 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=3 IMET=1
*
*   3.5% Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=4  VS=   100.035   NSEGS=3
                    MIN EL=  100.70   MAX EL=  103.00
                    CHNSLP= 0.03500   FLNSLP= 0.03500
                    N= 0.080  DIST=   20.00
                    N=-0.050  DIST=   30.00
                    N= 0.080  DIST=   50.00
                      DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  103.00    20.00  101.00    23.00  100.80
                      25.00  100.70    27.00  100.80    30.00  101.00
                      50.00  103.00
                    RFN=0.0000 PCODE=1
*
*   5%  off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=6  VS=     2.050   NSEGS=3
                    MIN EL=  100.00   MAX EL=  100.80
                    CHNSLP= 0.05000   FLNSLP= 0.05000
                    N= 0.350  DIST=   24.45
                    N=-0.150  DIST=   25.55
                    N= 0.350  DIST=   50.00
                      DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  100.80    24.45  100.30    24.75  100.00
                      25.50  100.00    25.55  100.30    50.00  100.80
                    RFN=0.0000 PCODE=1
*
* Catchment 313
* VS=  100.035 is main channel & VS= 2.050 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 313 AREA=   0.0985 Sq km  L=  170 m  W=   580 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                    0.0   0.0  0.0  10.0  0.0   0.0  0.0  90.0  0.0
                  RATING CURVES: IDMC=4 IDOC=6 QRMC=  0.05 QROC=  0.01
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 2.0 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=0.00 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD          ID=1 PCODE=1 MODE=10
*
* Sum hydr.  5312,313 call result 1311
*
ADD HYD            ID=4 HYD NO= 1311 IDA=1 IDB=3 ICODE=0
*
* 1.0% Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=4  VS=   100.010   NSEGS=3
                    MIN EL=  100.70   MAX EL=  103.00
                    CHNSLP= 0.01000   FLNSLP= 0.01000
                    N= 0.080  DIST=   20.00
                    N=-0.050  DIST=   30.00
                    N= 0.080  DIST=   50.00
                      DIST    ELEV     DIST    ELEV     DIST    ELEV
```

```
                      0.00  103.00    20.00  101.00    23.00  100.80
                     25.00  100.70    27.00  100.80    30.00  101.00
                     50.00  103.00
                   RFN=0.0000 PCODE=1
* Catchment 314
* VS=  100.010 is main channel & VS= 2.100 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 314 AREA=    0.1142 Sq km  L=  500 m  W=   240 m
               SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                      0.0   0.0 20.0   0.0  0.0   0.0 10.0   0.0 70.0
                    RATING CURVES: IDMC=4 IDOC=3 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  1311,314 call result 1312
*
ADD HYD             ID=3 HYD NO= 1312 IDA=1 IDB=4 ICODE=0
*
* Catchment 315
* VS=  100.020 is main channel & VS= 2.100 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 315 AREA=    0.0492 Sq km  L=  110 m  W=   410 m
               SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                      0.0   0.0  0.0  30.0  0.0   0.0  0.0  70.0  0.0
                    RATING CURVES: IDMC=5 IDOC=3 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  1312,315 call result 1313
*
ADD HYD             ID=4 HYD NO= 1313 IDA=1 IDB=3 ICODE=0
*
* Typical Urban section
*
COMPUTE RATING CURVE ID=6  VS=     3.200   NSEGS=3
                     MIN EL=  295.00   MAX EL=  295.70
                     CHNSLP= 0.02000   FLNSLP= 0.02000
                     N= 0.015  DIST=  200.00
                     N=-0.015  DIST=  300.00
                     N= 0.015  DIST=  500.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  295.70   200.00  295.50   200.10  295.00
                     299.90  295.00   300.00  295.50   500.00  295.70
*
* Catchment 316
*
COMPUTE FLOWRATE    ID=1 NHD= 316 AREA=    0.212 Sq km  L=  650 m  W=   330 m
               SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     20.0   0.0  8.0  16.0  0.0   8.0  0.0  48.0  0.0
                    RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.05
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.00 GWON=1
```



```
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  1313,316 call result 1314
*
ADD HYD             ID=3 HYD NO= 1314 IDA=1 IDB=4 ICODE=0
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*
* Route flows from 1314 through Grandview Hills SWM Facility (Devil's)
*
ROUTE SPECIAL POND  ID=1 HYD NO=5314 INFLOW=3 PCODE=0 OPTION=15
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 291.000
                    Recharge characteristics for Compartment A
                      LEVELA= 289.800               EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 289.800 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB=  4.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  9
                                  Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     289.800     0.000   0.000   0.000   0.000   0.000   0.600
                     289.900     0.000   0.000   0.000   0.059   0.087   0.600
                     290.000     0.000   0.000   0.000   0.084   0.185   0.600
                     290.100     0.000   0.000   0.000   0.103   0.295   0.600
                     290.200     0.000   0.000   0.000   0.119   0.417   0.600
                     290.300     0.000   0.000   0.000   0.502   0.549   0.600
                     290.400     0.000   0.000   0.000   1.191   0.691   0.600
                     290.500     0.000   0.000   0.000   2.078   0.860   0.600
                     291.000     0.000   0.000   0.000   5.000   1.200   0.600
*
REMOVE FLOW FROM GW ID=1 OPTION=2 PCODE=0 QPCT=00% KGW=384 h QSOUT=  0.004
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  5314,1310 call result 1315
*
ADD HYD             ID=3 HYD NO= 1315 IDA=1 IDB=2 ICODE=0
*
COMPUTE RATING CURVE ID=6  VS=   3.000   NSEGS=3
                     MIN EL=  285.20   MAX EL=  287.00
                     CHNSLP= 0.01100   FLNSLP= 0.01200
                     N= 0.080  DIST=   99.30
                     N=-0.035  DIST=  100.70
                     N= 0.080  DIST=  120.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                      80.00  287.00    85.00  286.00    90.00  285.70
                      99.30  285.50    99.40  285.20   100.60  285.20
                     100.70  285.50   110.00  285.70   115.00  286.00
                     120.00  287.00
                    RFN=0.0000 PCODE=1
*
* Route through reach 2315
* Using Valley Section 3.0  As channel Rating Curve
*
ROUTE CHANNEL       ID=1 HYD NO= 2315 INFLOW=3 LENGTH=   420 m  SLOPE=0.011
                    RCID=6 NS=1 PCODE=1 INDEX=1 PIPE=0 CANOPY= 25.0%
```

```
*
* Typical Urban section
*
COMPUTE RATING CURVE ID=6  VS=     3.200   NSEGS=3
                      MIN EL=  295.00   MAX EL=  295.70
                      CHNSLP= 0.02000   FLNSLP= 0.02000
                      N= 0.015  DIST=  200.00
                      N=-0.015  DIST=  300.00
                      N= 0.015  DIST=  500.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  295.70   200.00  295.50   200.10  295.00
                      299.90  295.00   300.00  295.50   500.00  295.70
*
* Catchment 317
*
COMPUTE FLOWRATE    ID=2 NHD= 317 AREA=   0.118 Sq km  L=  150 m  W=   200 m
               SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     20.0   0.0  0.0   0.0  0.0  40.0  0.0  40.0  0.0
                    RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.05
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  2315,317 call result 1316
*
ADD HYD             ID=3 HYD NO= 1316 IDA=1 IDB=2 ICODE=0
*
REMOVE FLOW FROM GW ID=3 OPTION=2 PCODE=0 QPCT=00% KGW=384 h QSOUT=  0.003
*
* Devil's Creek at Blair Road
*
PRINT HYD           ID=3 PCODE=1 MODE=10
KEEP HYD            ID=3 CUTOFF=24 ICODE=3 ISTEP=1 IFORM=0 IDB=3 IMET=1
KEEP HYD            ID=3 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=3 IMET=1
*
COMPUTE RATING CURVE ID=6  VS=   4.000   NSEGS=3
                      MIN EL=  282.00   MAX EL=  285.00
                      CHNSLP= 0.01900   FLNSLP= 0.02100
                      N= 0.080  DIST=   99.30
                      N=-0.035  DIST=  100.70
                      N= 0.080  DIST=  120.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                       80.00  285.00    90.00  284.00    96.00  283.00
                       99.30  282.30    99.40  282.00   100.60  282.00
                      100.70  282.30   104.00  283.00   110.00  284.00
                      120.00  285.00
                     RFN=0.0000 PCODE=1
*
* Route through reach 2316
* Using Valley Section 4.0  As channel Rating Curve
*
ROUTE CHANNEL       ID=1 HYD NO= 2316 INFLOW=3 LENGTH=   270 m  SLOPE=0.019
                    RCID=6 NS=1 PCODE=1 INDEX=1 PIPE=0 CANOPY= 50.0%
*
* Typical Urban section
*
COMPUTE RATING CURVE ID=6  VS=     3.200   NSEGS=3
                      MIN EL=  295.00   MAX EL=  295.70
                      CHNSLP= 0.02000   FLNSLP= 0.02000
                      N= 0.015  DIST=  200.00
```



```
                      N=-0.015  DIST=  300.00
                      N= 0.015  DIST=  500.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  295.70   200.00  295.50   200.10  295.00
                      299.90  295.00   300.00  295.50   500.00  295.70
*
* Catchment 318
*
COMPUTE FLOWRATE    ID=2 NHD= 318 AREA=   0.1539 Sq km  L=  450 m  W=   340 m
               SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     30.0   0.0  0.0   0.0  0.0  10.5  0.0  59.5  0.0
                    RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.05
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  2316,318 call result 1317
*
ADD HYD             ID=3 HYD NO= 1317 IDA=1 IDB=2 ICODE=0
*
* Devil's Creek at Grand River
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*


*********************************************************************************
* SMALL CATCHMENT TO GRAND RIVER STORM SEWER OUTLET
*
*
*
*   3.5% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=2  VS=     2.035   NSEGS=3
                      MIN EL=  100.00   MAX EL=  100.80
                      CHNSLP= 0.03500   FLNSLP= 0.03500
                      N= 0.350  DIST=   24.45
                      N=-0.150  DIST=   25.55
                      N= 0.350  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1
*
*   3.5% Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=4  VS=   100.035   NSEGS=3
                      MIN EL=  100.70   MAX EL=  103.00
                      CHNSLP= 0.03500   FLNSLP= 0.03500
                      N= 0.080  DIST=   20.00
                      N=-0.050  DIST=   30.00
                      N= 0.080  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  103.00    20.00  101.00    23.00  100.80
                       25.00  100.70    27.00  100.80    30.00  101.00
                       50.00  103.00
                     RFN=0.0000 PCODE=1
*
* Catchment 501
*
```

```
COMPUTE FLOWRATE    ID=2 NHD= 501 AREA=    0.0207 Sq km  L=  100 m  W=   200 m
               SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                      0.0   0.0  0.0  20.0  0.0   0.0  0.0  80.0  0.0
                    RATING CURVES: IDMC=4 IDOC=2 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
CHANGE INPUT FILE
*
* Go to event file
*
CHANGE INPUT FILE
*
FINISH
```

1	106	0.0215	7.46	0.0195	0.	RCFLAGS	0	0 cndchi.dat
1	5106	0.0215	0.00	0.0000	110.	RCFLAGS	0	0
1	107	0.1510	6.28	0.1524	0.	RCFLAGS	0	0
1	1103	0.1725	5.50	0.1524	0.	RCFLAGS	0	0
1	104	0.0282	8.69	0.0597	0.	RCFLAGS	0	0
1	5104	0.0282	0.00	0.0000	197.	RCFLAGS	0	0
1	1104	0.2007	4.72	0.1524	0.	RCFLAGS	0	0
1	105	0.1640	6.58	0.0651	0.	RCFLAGS	0	0
1	1105	0.3647	5.56	0.2128	0.	RCFLAGS	0	0
1	101	0.0039	6.84	0.0105	0.	RCFLAGS	0	0
1	102	0.0214	6.27	0.0362	0.	RCFLAGS	0	0
1	1101	0.0253	6.36	0.0467	0.	RCFLAGS	0	0
1	103	0.0259	0.09	0.0000	0.	RCFLAGS	0	0
1	1102	0.0512	3.19	0.0467	0.	RCFLAGS	0	0
1	5103	0.0512	0.00	0.0000	149.	RCFLAGS	0	0
1	1106	0.4159	4.87	0.2128	0.	RCFLAGS	0	0
1	108	0.1240	0.71	0.0007	0.	RCFLAGS	0	0
1	1107	0.5399	3.92	0.2130	0.	RCFLAGS	0	0
1	5108	0.5399	3.86	0.1747	358.	RCFLAGS	0	0
1	2108	0.5399	3.88	0.1704	0.	RCFLAGS	0	0
1	109	0.1252	2.08	0.0178	0.	RCFLAGS	0	0
1	1108	0.6651	3.54	0.1869	0.	RCFLAGS	0	0
1	110	0.0201	6.28	0.0691	0.	RCFLAGS	0	0
1	1109	0.6852	3.62	0.1942	0.	RCFLAGS	0	0
1	111	0.0498	6.28	0.0889	0.	RCFLAGS	0	0
1	1110	0.7350	3.80	0.2325	0.	RCFLAGS	0	0
1	2110	0.7350	3.80	0.2281	0.	RCFLAGS	0	0
1	401	0.0234	9.08	0.0468	0.	RCFLAGS	0	0
1	5401	0.0234	0.00	0.0000	141.	RCFLAGS	0	0
1	402	0.1337	8.49	0.1723	0.	RCFLAGS	0	0
1	1401	0.1571	7.23	0.1723	0.	RCFLAGS	0	0
1	403	0.1073	3.56	0.0375	0.	RCFLAGS	0	0
1	1402	0.2644	5.74	0.2097	0.	RCFLAGS	0	0
1	5403	0.2644	0.00	0.0000	1357.	RCFLAGS	0	0
1	405	0.0966	7.69	0.0774	0.	RCFLAGS	0	0
1	5405	0.0966	0.00	0.0000	374.	RCFLAGS	0	0
1	406	0.0930	7.18	0.0713	0.	RCFLAGS	0	0
1	1403	0.1896	3.52	0.0713	0.	RCFLAGS	0	0
1	5406	0.1896	0.00	0.0000	306.	RCFLAGS	0	0
1	404	0.1141	8.09	0.1080	0.	RCFLAGS	0	0
1	1404	0.3037	3.04	0.1080	0.	RCFLAGS	0	0
1	407	0.2555	2.80	0.1436	0.	RCFLAGS	0	0
1	1405	0.5592	2.93	0.2514	0.	RCFLAGS	0	0
1	5407	0.5592	0.00	0.0000	1370.	RCFLAGS	0	0
1	1406	0.8236	0.00	0.0000	0.	RCFLAGS	0	0
1	5437	0.8236	0.00	0.0000	0.	RCFLAGS	0	0
1	408	0.0590	7.57	0.0589	0.	RCFLAGS	0	0 cndchi.dat
1	409	0.8914	1.18	0.0608	0.	RCFLAGS	0	0
1	1407	0.9504	1.58	0.1181	0.	RCFLAGS	0	0
1	410	0.0171	6.26	0.0206	0.	RCFLAGS	0	0
1	5410	0.0171	0.00	0.0000	70.	RCFLAGS	0	0
1	1410	0.9675	1.55	0.1181	0.	RCFLAGS	0	0
1	1408	1.7911	0.84	0.1181	0.	RCFLAGS	0	0
1	5409	1.7911	0.00	0.0000	1235.	RCFLAGS	0	0
1	601	0.0468	6.28	0.0741	0.	RCFLAGS	0	0
1	5601	0.0468	0.00	0.0000	258.	RCFLAGS	0	0
1	602	0.0331	6.28	0.0551	0.	RCFLAGS	0	0
1	1601	0.0799	2.60	0.0551	0.	RCFLAGS	0	0
1	5602	0.0799	0.00	0.0000	181.	RCFLAGS	0	0
1	603	0.0912	6.58	0.0800	0.	RCFLAGS	0	0
1	1602	0.1711	3.51	0.0800	0.	RCFLAGS	0	0
1	604	0.2409	3.14	0.1230	0.	RCFLAGS	0	0
1	1603	0.4120	3.29	0.2025	0.	RCFLAGS	0	0
1	5604	0.4120	0.00	0.0000	1249.	RCFLAGS	0	0

1	201	0.0807	14.80	0.3379	0.	RCFLAGS	0	0
1	5201	0.0807	6.57	0.0039	1134.	RCFLAGS	0	0
1	2201	0.0807	6.56	0.0039	0.	RCFLAGS	0	0
1	202	0.1084	0.78	0.0007	0.	RCFLAGS	0	0
1	1201	0.1891	3.24	0.0041	0.	RCFLAGS	0	0
1	203	0.0368	6.56	0.0588	0.	RCFLAGS	0	0
1	1202	0.2259	3.78	0.0597	0.	RCFLAGS	0	0
1	2202	0.2259	3.78	0.0597	0.	RCFLAGS	0	0
1	204	0.0453	7.15	0.0548	0.	RCFLAGS	0	0
1	1203	0.2712	4.35	0.1144	0.	RCFLAGS	0	0
1	205	0.0700	0.40	0.0002	0.	RCFLAGS	0	0
1	1204	0.3412	3.54	0.1146	0.	RCFLAGS	0	0
1	301	0.1662	13.99	0.5657	0.	RCFLAGS	0	0
1	302	0.1347	10.38	0.5591	0.	RCFLAGS	0	0
1	1301	0.3009	12.38	1.1248	0.	RCFLAGS	0	0
1	5301	0.3009	11.36	0.0428	3242.	RCFLAGS	0	0
1	303	0.3216	13.48	1.3922	0.	RCFLAGS	0	0
1	1302	0.6225	12.46	1.4048	0.	RCFLAGS	0	0
1	304	0.1193	13.99	0.4652	0.	RCFLAGS	0	0
1	1303	0.7418	12.70	1.8700	0.	RCFLAGS	0	0
1	2303	0.7418	12.70	1.7830	0.	RCFLAGS	0	0
1	307	0.1653	0.53	0.0008	0.	RCFLAGS	0	0
1	1304	0.9071	10.48	1.7833	0.	RCFLAGS	0	0
1	305	0.0065	8.46	0.0172	0.	RCFLAGS	0	0
1	1305	0.9136	11.26	1.8024	0.	RCFLAGS	0	0
1	306	0.0439	7.84	0.0614	0.	RCFLAGS	0	0
1	1306	0.9575	11.10	1.8619	0.	RCFLAGS	0	0
1	308	0.0630	7.73	0.0437	0.	RCFLAGS	0	0
1	309	0.0164	0.30	0.0000	0.	RCFLAGS	0	0 cndchi.dat
1	1307	0.0794	6.19	0.0437	0.	RCFLAGS	0	0
1	5309	0.0794	0.00	0.0000	321.	RCFLAGS	0	0
1	1308	1.0369	10.25	1.8619	0.	RCFLAGS	0	0
1	2308	1.0369	12.65	1.4408	0.	RCFLAGS	0	0
1	310	0.0682	12.56	0.2812	0.	RCFLAGS	0	0
1	1309	1.1051	12.65	1.5181	0.	RCFLAGS	0	0
1	311	0.4793	0.49	0.0021	0.	RCFLAGS	0	0
1	1310	1.5844	8.97	1.5188	0.	RCFLAGS	0	0
1	5310	1.5844	3.89	0.0955	7727.	RCFLAGS	0	0
1	312	0.3180	6.30	0.1981	0.	RCFLAGS	0	0
1	5312	0.3180	0.00	0.0000	3565.	RCFLAGS	0	0
1	313	0.0985	7.15	0.0680	0.	RCFLAGS	0	0
1	1311	0.4165	1.69	0.0680	0.	RCFLAGS	0	0
1	314	0.1142	0.35	0.0003	0.	RCFLAGS	0	0
1	1312	0.5307	1.40	0.0682	0.	RCFLAGS	0	0
1	315	0.0492	8.35	0.0435	0.	RCFLAGS	0	0
1	1313	0.5799	1.99	0.1117	0.	RCFLAGS	0	0
1	316	0.2120	11.86	0.5734	0.	RCFLAGS	0	0
1	1314	0.7919	4.63	0.6777	0.	RCFLAGS	0	0
1	5314	0.7919	4.22	0.0919	2306.	RCFLAGS	0	0
1	1315	2.3763	4.30	0.1907	0.	RCFLAGS	0	0
1	2315	2.3763	4.30	0.1907	0.	RCFLAGS	0	0
1	317	0.1180	11.37	0.6139	0.	RCFLAGS	0	0
1	1316	2.4943	4.64	0.6350	0.	RCFLAGS	0	0
1	2316	2.4943	4.85	0.6277	0.	RCFLAGS	0	0
1	318	0.1539	13.77	0.5547	0.	RCFLAGS	0	0
1	1317	2.6482	5.37	1.1824	0.	RCFLAGS	0	0
1	501	0.0207	7.47	0.0237	0.	RCFLAGS	0	0
2	106	0.0215	20.59	0.0501	0.	RCFLAGS	0	0 cndchi.dat
2	5106	0.0215	0.00	0.0000	303.	RCFLAGS	0	0
2	107	0.1510	18.85	0.4147	0.	RCFLAGS	0	0
2	1103	0.1725	16.50	0.4147	0.	RCFLAGS	0	0
2	104	0.0282	22.38	0.1402	0.	RCFLAGS	0	0
2	5104	0.0282	0.00	0.0000	519.	RCFLAGS	0	0
2	1104	0.2007	14.18	0.4147	0.	RCFLAGS	0	0

2	105	0.1640	19.28	0.1831	0.	RCFLAGS	0	0
2	1105	0.3647	16.48	0.5894	0.	RCFLAGS	0	0
2	101	0.0039	19.69	0.0262	0.	RCFLAGS	0	0
2	102	0.0214	18.84	0.0968	0.	RCFLAGS	0	0
2	1101	0.0253	18.97	0.1226	0.	RCFLAGS	0	0
2	103	0.0259	0.78	0.0016	0.	RCFLAGS	0	0
2	1102	0.0512	9.77	0.1226	0.	RCFLAGS	0	0
2	5103	0.0512	0.00	0.0000	454.	RCFLAGS	0	0
2	1106	0.4159	14.45	0.5894	0.	RCFLAGS	0	0
2	108	0.1240	2.47	0.0063	0.	RCFLAGS	0	0
2	1107	0.5399	11.70	0.5923	0.	RCFLAGS	0	0
2	5108	0.5399	11.60	0.5725	493.	RCFLAGS	0	0
2	2108	0.5399	11.60	0.5695	0.	RCFLAGS	0	0
2	109	0.1252	3.93	0.0417	0.	RCFLAGS	0	0
2	1108	0.6651	10.16	0.6098	0.	RCFLAGS	0	0
2	110	0.0201	18.84	0.1769	0.	RCFLAGS	0	0
2	1109	0.6852	10.41	0.6757	0.	RCFLAGS	0	0
2	111	0.0498	18.84	0.2366	0.	RCFLAGS	0	0
2	1110	0.7350	10.98	0.8590	0.	RCFLAGS	0	0
2	2110	0.7350	11.14	0.8118	0.	RCFLAGS	0	0
2	401	0.0234	22.83	0.1082	0.	RCFLAGS	0	0
2	5401	0.0234	0.00	0.0000	398.	RCFLAGS	0	0
2	402	0.1337	22.02	0.4171	0.	RCFLAGS	0	0
2	1401	0.1571	18.74	0.4171	0.	RCFLAGS	0	0
2	403	0.1073	10.86	0.0940	0.	RCFLAGS	0	0
2	1402	0.2644	15.54	0.5104	0.	RCFLAGS	0	0
2	5403	0.2644	0.00	0.0000	3687.	RCFLAGS	0	0
2	405	0.0966	20.85	0.1989	0.	RCFLAGS	0	0
2	5405	0.0966	0.00	0.0000	1216.	RCFLAGS	0	0
2	406	0.0930	20.17	0.1883	0.	RCFLAGS	0	0
2	1403	0.1896	9.89	0.1883	0.	RCFLAGS	0	0
2	5406	0.1896	0.00	0.0000	1087.	RCFLAGS	0	0
2	404	0.1141	21.50	0.2700	0.	RCFLAGS	0	0
2	1404	0.3037	8.08	0.2700	0.	RCFLAGS	0	0
2	407	0.2555	8.59	0.3147	0.	RCFLAGS	0	0
2	1405	0.5592	8.31	0.5807	0.	RCFLAGS	0	0
2	5407	0.5592	0.00	0.0000	3994.	RCFLAGS	0	0
2	1406	0.8236	0.00	0.0000	0.	RCFLAGS	0	0
2	5437	0.8236	0.00	0.0000	0.	RCFLAGS	0	0
2	408	0.0590	20.53	0.1503	0.	RCFLAGS	0	0 cndchi.dat
2	409	0.8914	4.17	0.2523	0.	RCFLAGS	0	0
2	1407	0.9504	5.18	0.3347	0.	RCFLAGS	0	0
2	410	0.0171	18.82	0.0555	0.	RCFLAGS	0	0
2	5410	0.0171	0.00	0.0000	228.	RCFLAGS	0	0
2	1410	0.9675	5.09	0.3347	0.	RCFLAGS	0	0
2	1408	1.7911	2.75	0.3347	0.	RCFLAGS	0	0
2	5409	1.7911	0.00	0.0000	4444.	RCFLAGS	0	0
2	601	0.0468	18.84	0.1984	0.	RCFLAGS	0	0
2	5601	0.0468	0.00	0.0000	775.	RCFLAGS	0	0
2	602	0.0331	18.84	0.1476	0.	RCFLAGS	0	0
2	1601	0.0799	7.81	0.1476	0.	RCFLAGS	0	0
2	5602	0.0799	0.00	0.0000	546.	RCFLAGS	0	0
2	603	0.0912	19.29	0.2172	0.	RCFLAGS	0	0
2	1602	0.1711	10.28	0.2172	0.	RCFLAGS	0	0
2	604	0.2409	10.53	0.3336	0.	RCFLAGS	0	0
2	1603	0.4120	10.42	0.5495	0.	RCFLAGS	0	0
2	5604	0.4120	0.00	0.0000	4011.	RCFLAGS	0	0
2	201	0.0807	28.52	0.6420	0.	RCFLAGS	0	0
2	5201	0.0807	14.43	0.0190	2152.	RCFLAGS	0	0
2	2201	0.0807	14.41	0.0190	0.	RCFLAGS	0	0
2	202	0.1084	2.84	0.0163	0.	RCFLAGS	0	0
2	1201	0.1891	7.78	0.0284	0.	RCFLAGS	0	0
2	203	0.0368	19.13	0.1575	0.	RCFLAGS	0	0
2	1202	0.2259	9.63	0.1700	0.	RCFLAGS	0	0

2	2202	0.2259	9.63	0.1699	0.	RCFLAGS	0	0
2	204	0.0453	20.00	0.1427	0.	RCFLAGS	0	0
2	1203	0.2712	11.36	0.3127	0.	RCFLAGS	0	0
2	205	0.0700	0.43	0.0003	0.	RCFLAGS	0	0
2	1204	0.3412	9.12	0.3128	0.	RCFLAGS	0	0
2	301	0.1662	27.77	1.1126	0.	RCFLAGS	0	0
2	302	0.1347	21.96	1.1526	0.	RCFLAGS	0	0
2	1301	0.3009	25.17	2.2591	0.	RCFLAGS	0	0
2	5301	0.3009	22.46	0.0619	6869.	RCFLAGS	0	0
2	303	0.3216	27.40	2.7645	0.	RCFLAGS	0	0
2	1302	0.6225	25.02	2.7891	0.	RCFLAGS	0	0
2	304	0.1193	27.77	0.9111	0.	RCFLAGS	0	0
2	1303	0.7418	25.46	3.7002	0.	RCFLAGS	0	0
2	2303	0.7418	25.45	3.5882	0.	RCFLAGS	0	0
2	307	0.1653	0.53	0.0008	0.	RCFLAGS	0	0
2	1304	0.9071	20.91	3.5884	0.	RCFLAGS	0	0
2	305	0.0065	21.56	0.0405	0.	RCFLAGS	0	0
2	1305	0.9136	21.70	3.6307	0.	RCFLAGS	0	0
2	306	0.0439	20.80	0.1538	0.	RCFLAGS	0	0
2	1306	0.9575	21.66	3.7845	0.	RCFLAGS	0	0
2	308	0.0630	20.72	0.1138	0.	RCFLAGS	0	0
2	309	0.0164	0.33	0.0000	0.	RCFLAGS	0	0 cndchi.dat
2	1307	0.0794	16.51	0.1139	0.	RCFLAGS	0	0
2	5309	0.0794	1.64	0.0259	835.	RCFLAGS	0	0
2	1308	1.0369	20.13	3.7845	0.	RCFLAGS	0	0
2	2308	1.0369	23.65	3.0323	0.	RCFLAGS	0	0
2	310	0.0682	26.06	0.5739	0.	RCFLAGS	0	0
2	1309	1.1051	23.80	3.2119	0.	RCFLAGS	0	0
2	311	0.4793	0.64	0.0022	0.	RCFLAGS	0	0
2	1310	1.5844	16.79	3.2126	0.	RCFLAGS	0	0
2	5310	1.5844	7.52	0.1128	16326.	RCFLAGS	0	0
2	312	0.3180	18.68	0.5431	0.	RCFLAGS	0	0
2	5312	0.3180	0.00	0.0000	7295.	RCFLAGS	0	0
2	313	0.0985	20.00	0.1840	0.	RCFLAGS	0	0
2	1311	0.4165	4.73	0.1840	0.	RCFLAGS	0	0
2	314	0.1142	0.38	0.0004	0.	RCFLAGS	0	0
2	1312	0.5307	3.79	0.1842	0.	RCFLAGS	0	0
2	315	0.0492	21.77	0.1089	0.	RCFLAGS	0	0
2	1313	0.5799	5.32	0.2923	0.	RCFLAGS	0	0
2	316	0.2120	24.61	1.1784	0.	RCFLAGS	0	0
2	1314	0.7919	10.48	1.4473	0.	RCFLAGS	0	0
2	5314	0.7919	9.87	0.3568	4990.	RCFLAGS	0	0
2	1315	2.3763	8.61	0.4683	0.	RCFLAGS	0	0
2	2315	2.3763	8.60	0.4676	0.	RCFLAGS	0	0
2	317	0.1180	24.68	1.3058	0.	RCFLAGS	0	0
2	1316	2.4943	9.36	1.3415	0.	RCFLAGS	0	0
2	2316	2.4943	9.58	1.3175	0.	RCFLAGS	0	0
2	318	0.1539	27.46	1.0918	0.	RCFLAGS	0	0
2	1317	2.6482	10.62	2.4093	0.	RCFLAGS	0	0
2	501	0.0207	20.60	0.0603	0.	RCFLAGS	0	0
3	106	0.0215	29.82	0.0699	0.	RCFLAGS	0	0 cndchi.dat
3	5106	0.0215	0.00	0.0000	439.	RCFLAGS	0	0
3	107	0.1510	27.82	0.5812	0.	RCFLAGS	0	0
3	1103	0.1725	24.35	0.5812	0.	RCFLAGS	0	0
3	104	0.0282	31.88	0.1894	0.	RCFLAGS	0	0
3	5104	0.0282	0.00	0.0000	754.	RCFLAGS	0	0
3	1104	0.2007	20.93	0.5812	0.	RCFLAGS	0	0
3	105	0.1640	28.32	0.2617	0.	RCFLAGS	0	0
3	1105	0.3647	24.25	0.8324	0.	RCFLAGS	0	0
3	101	0.0039	28.80	0.0354	0.	RCFLAGS	0	0
3	102	0.0214	27.81	0.1339	0.	RCFLAGS	0	0
3	1101	0.0253	27.96	0.1691	0.	RCFLAGS	0	0
3	103	0.0259	2.83	0.0056	0.	RCFLAGS	0	0
3	1102	0.0512	15.25	0.1698	0.	RCFLAGS	0	0

3	5103	0.0512	0.00	0.0000	705.	RCFLAGS	0	0
3	1106	0.4159	21.27	0.8324	0.	RCFLAGS	0	0
3	108	0.1240	8.74	0.0296	0.	RCFLAGS	0	0
3	1107	0.5399	18.39	0.8408	0.	RCFLAGS	0	0
3	5108	0.5399	18.24	0.8262	580.	RCFLAGS	0	0
3	2108	0.5399	18.24	0.8252	0.	RCFLAGS	0	0
3	109	0.1252	5.93	0.0682	0.	RCFLAGS	0	0
3	1108	0.6651	15.92	0.8916	0.	RCFLAGS	0	0
3	110	0.0201	27.82	0.2388	0.	RCFLAGS	0	0
3	1109	0.6852	16.27	1.0007	0.	RCFLAGS	0	0
3	111	0.0498	27.82	0.3270	0.	RCFLAGS	0	0
3	1110	0.7350	17.05	1.2817	0.	RCFLAGS	0	0
3	2110	0.7350	17.27	1.2081	0.	RCFLAGS	0	0
3	401	0.0234	32.35	0.1457	0.	RCFLAGS	0	0
3	5401	0.0234	0.00	0.0000	579.	RCFLAGS	0	0
3	402	0.1337	31.43	0.5706	0.	RCFLAGS	0	0
3	1401	0.1571	26.75	0.5706	0.	RCFLAGS	0	0
3	403	0.1073	20.23	0.1749	0.	RCFLAGS	0	0
3	1402	0.2644	24.11	0.7223	0.	RCFLAGS	0	0
3	5403	0.2644	0.00	0.0000	5686.	RCFLAGS	0	0
3	405	0.0966	30.10	0.2769	0.	RCFLAGS	0	0
3	5405	0.0966	0.00	0.0000	1843.	RCFLAGS	0	0
3	406	0.0930	29.34	0.2637	0.	RCFLAGS	0	0
3	1403	0.1896	14.39	0.2637	0.	RCFLAGS	0	0
3	5406	0.1896	0.00	0.0000	1707.	RCFLAGS	0	0
3	404	0.1141	30.87	0.3740	0.	RCFLAGS	0	0
3	1404	0.3037	11.60	0.3740	0.	RCFLAGS	0	0
3	407	0.2555	15.50	0.5686	0.	RCFLAGS	0	0
3	1405	0.5592	13.38	0.9360	0.	RCFLAGS	0	0
3	5407	0.5592	0.00	0.0000	6485.	RCFLAGS	0	0
3	1406	0.8236	0.00	0.0000	0.	RCFLAGS	0	0
3	5437	0.8236	0.00	0.0000	0.	RCFLAGS	0	0
3	408	0.0590	29.67	0.2090	0.	RCFLAGS	0	0 cndchi.dat
3	409	0.8914	8.07	0.4979	0.	RCFLAGS	0	0
3	1407	0.9504	9.41	0.6642	0.	RCFLAGS	0	0
3	410	0.0171	27.80	0.0777	0.	RCFLAGS	0	0
3	5410	0.0171	0.00	0.0000	344.	RCFLAGS	0	0
3	1410	0.9675	9.25	0.6642	0.	RCFLAGS	0	0
3	1408	1.7911	4.99	0.6642	0.	RCFLAGS	0	0
3	5409	1.7911	0.00	0.0000	8263.	RCFLAGS	0	0
3	601	0.0468	27.82	0.2745	0.	RCFLAGS	0	0
3	5601	0.0468	0.00	0.0000	1156.	RCFLAGS	0	0
3	602	0.0331	27.81	0.2040	0.	RCFLAGS	0	0
3	1601	0.0799	11.52	0.2040	0.	RCFLAGS	0	0
3	5602	0.0799	0.00	0.0000	819.	RCFLAGS	0	0
3	603	0.0912	28.32	0.3054	0.	RCFLAGS	0	0
3	1602	0.1711	15.10	0.3054	0.	RCFLAGS	0	0
3	604	0.2409	17.13	0.5192	0.	RCFLAGS	0	0
3	1603	0.4120	16.29	0.8232	0.	RCFLAGS	0	0
3	5604	0.4120	0.00	0.0000	6284.	RCFLAGS	0	0
3	201	0.0807	38.10	0.8212	0.	RCFLAGS	0	0
3	5201	0.0807	22.91	0.0393	2797.	RCFLAGS	0	0
3	2201	0.0807	22.89	0.0393	0.	RCFLAGS	0	0
3	202	0.1084	5.62	0.0385	0.	RCFLAGS	0	0
3	1201	0.1891	12.99	0.0647	0.	RCFLAGS	0	0
3	203	0.0368	28.10	0.2178	0.	RCFLAGS	0	0
3	1202	0.2259	15.45	0.2518	0.	RCFLAGS	0	0
3	2202	0.2259	15.45	0.2515	0.	RCFLAGS	0	0
3	204	0.0453	29.11	0.1985	0.	RCFLAGS	0	0
3	1203	0.2712	17.73	0.4500	0.	RCFLAGS	0	0
3	205	0.0700	3.50	0.0113	0.	RCFLAGS	0	0
3	1204	0.3412	14.81	0.4504	0.	RCFLAGS	0	0
3	301	0.1662	37.27	1.4503	0.	RCFLAGS	0	0
3	302	0.1347	31.28	1.4944	0.	RCFLAGS	0	0

3	1301	0.3009	34.59	2.9229	0.	RCFLAGS	0	0
3	5301	0.3009	31.81	0.4148	8109.	RCFLAGS	0	0
3	303	0.3216	36.97	3.5689	0.	RCFLAGS	0	0
3	1302	0.6225	34.48	3.6019	0.	RCFLAGS	0	0
3	304	0.1193	37.27	1.1745	0.	RCFLAGS	0	0
3	1303	0.7418	34.93	4.7764	0.	RCFLAGS	0	0
3	2303	0.7418	34.92	4.6594	0.	RCFLAGS	0	0
3	307	0.1653	7.78	0.0627	0.	RCFLAGS	0	0
3	1304	0.9071	29.97	4.6596	0.	RCFLAGS	0	0
3	305	0.0065	30.76	0.0548	0.	RCFLAGS	0	0
3	1305	0.9136	30.77	4.7161	0.	RCFLAGS	0	0
3	306	0.0439	29.95	0.2124	0.	RCFLAGS	0	0
3	1306	0.9575	30.73	4.9285	0.	RCFLAGS	0	0
3	308	0.0630	29.89	0.1598	0.	RCFLAGS	0	0
3	309	0.0164	0.49	0.0006	0.	RCFLAGS	0	0 cndchi.dat
3	1307	0.0794	23.82	0.1604	0.	RCFLAGS	0	0
3	5309	0.0794	8.23	0.0893	846.	RCFLAGS	0	0
3	1308	1.0369	29.01	4.9285	0.	RCFLAGS	0	0
3	2308	1.0369	33.49	3.8266	0.	RCFLAGS	0	0
3	310	0.0682	35.43	0.7453	0.	RCFLAGS	0	0
3	1309	1.1051	33.61	4.1296	0.	RCFLAGS	0	0
3	311	0.4793	6.09	0.0472	0.	RCFLAGS	0	0
3	1310	1.5844	25.28	4.1367	0.	RCFLAGS	0	0
3	5310	1.5844	11.69	0.1423	26143.	RCFLAGS	0	0
3	312	0.3180	27.78	0.7779	0.	RCFLAGS	0	0
3	5312	0.3180	0.00	0.0000	10055.	RCFLAGS	0	0
3	313	0.0985	29.10	0.2594	0.	RCFLAGS	0	0
3	1311	0.4165	6.88	0.2594	0.	RCFLAGS	0	0
3	314	0.1142	2.23	0.0142	0.	RCFLAGS	0	0
3	1312	0.5307	5.88	0.2628	0.	RCFLAGS	0	0
3	315	0.0492	31.13	0.1509	0.	RCFLAGS	0	0
3	1313	0.5799	8.02	0.4122	0.	RCFLAGS	0	0
3	316	0.2120	34.08	1.5474	0.	RCFLAGS	0	0
3	1314	0.7919	15.00	1.9169	0.	RCFLAGS	0	0
3	5314	0.7919	14.35	0.7491	5999.	RCFLAGS	0	0
3	1315	2.3763	12.88	0.8634	0.	RCFLAGS	0	0
3	2315	2.3763	12.86	0.8588	0.	RCFLAGS	0	0
3	317	0.1180	33.97	1.6983	0.	RCFLAGS	0	0
3	1316	2.4943	13.86	1.7200	0.	RCFLAGS	0	0
3	2316	2.4943	14.08	1.6883	0.	RCFLAGS	0	0
3	318	0.1539	36.91	1.4191	0.	RCFLAGS	0	0
3	1317	2.6482	15.40	3.0986	0.	RCFLAGS	0	0
3	501	0.0207	29.83	0.0834	0.	RCFLAGS	0	0
4	106	0.0215	38.82	0.0880	0.	RCFLAGS	0	0 cndchi.dat
4	5106	0.0215	0.00	0.0000	585.	RCFLAGS	0	0
4	107	0.1510	36.63	0.7362	0.	RCFLAGS	0	0
4	1103	0.1725	32.07	0.7362	0.	RCFLAGS	0	0
4	104	0.0282	41.06	0.2334	0.	RCFLAGS	0	0
4	5104	0.0282	0.00	0.0000	982.	RCFLAGS	0	0
4	1104	0.2007	27.56	0.7362	0.	RCFLAGS	0	0
4	105	0.1640	37.18	0.3357	0.	RCFLAGS	0	0
4	1105	0.3647	31.89	1.0558	0.	RCFLAGS	0	0
4	101	0.0039	37.70	0.0437	0.	RCFLAGS	0	0
4	102	0.0214	36.62	0.1673	0.	RCFLAGS	0	0
4	1101	0.0253	36.79	0.2110	0.	RCFLAGS	0	0
4	103	0.0259	9.77	0.0205	0.	RCFLAGS	0	0
4	1102	0.0512	23.12	0.2266	0.	RCFLAGS	0	0
4	5103	0.0512	2.68	0.0332	945.	RCFLAGS	0	0
4	1106	0.4159	28.29	1.0558	0.	RCFLAGS	0	0
4	108	0.1240	17.31	0.0605	0.	RCFLAGS	0	0
4	1107	0.5399	25.77	1.0908	0.	RCFLAGS	0	0
4	5108	0.5399	25.56	1.0766	665.	RCFLAGS	0	0
4	2108	0.5399	25.56	1.0753	0.	RCFLAGS	0	0
4	109	0.1252	12.67	0.1695	0.	RCFLAGS	0	0

4	1108	0.6651	23.13	1.2339	0.	RCFLAGS	0	0
4	110	0.0201	36.63	0.2933	0.	RCFLAGS	0	0
4	1109	0.6852	23.53	1.3726	0.	RCFLAGS	0	0
4	111	0.0498	36.63	0.4084	0.	RCFLAGS	0	0
4	1110	0.7350	24.41	1.7294	0.	RCFLAGS	0	0
4	2110	0.7350	24.64	1.6505	0.	RCFLAGS	0	0
4	401	0.0234	41.57	0.1803	0.	RCFLAGS	0	0
4	5401	0.0234	0.00	0.0000	755.	RCFLAGS	0	0
4	402	0.1337	40.56	0.7132	0.	RCFLAGS	0	0
4	1401	0.1571	34.52	0.7132	0.	RCFLAGS	0	0
4	403	0.1073	29.79	0.2657	0.	RCFLAGS	0	0
4	1402	0.2644	32.60	0.9571	0.	RCFLAGS	0	0
4	5403	0.2644	0.00	0.0000	7670.	RCFLAGS	0	0
4	405	0.0966	39.11	0.3501	0.	RCFLAGS	0	0
4	5405	0.0966	0.00	0.0000	2457.	RCFLAGS	0	0
4	406	0.0930	38.29	0.3342	0.	RCFLAGS	0	0
4	1403	0.1896	18.78	0.3342	0.	RCFLAGS	0	0
4	5406	0.1896	0.00	0.0000	2319.	RCFLAGS	0	0
4	404	0.1141	39.96	0.4696	0.	RCFLAGS	0	0
4	1404	0.3037	15.01	0.4696	0.	RCFLAGS	0	0
4	407	0.2555	24.14	0.9736	0.	RCFLAGS	0	0
4	1405	0.5592	19.18	1.4432	0.	RCFLAGS	0	0
4	5407	0.5592	0.00	0.0000	9344.	RCFLAGS	0	0
4	1406	0.8236	0.00	0.0000	0.	RCFLAGS	0	0
4	5437	0.8236	0.00	0.0000	0.	RCFLAGS	0	0
4	408	0.0590	38.61	0.2632	0.	RCFLAGS	0	0 cndchi.dat
4	409	0.8914	15.55	1.0319	0.	RCFLAGS	0	0
4	1407	0.9504	16.98	1.2798	0.	RCFLAGS	0	0
4	410	0.0171	36.61	0.0979	0.	RCFLAGS	0	0
4	5410	0.0171	6.39	0.0632	361.	RCFLAGS	0	0
4	1410	0.9675	16.79	1.2798	0.	RCFLAGS	0	0
4	1408	1.7911	9.07	1.2798	0.	RCFLAGS	0	0
4	5409	1.7911	0.00	0.0000	15195.	RCFLAGS	0	0
4	601	0.0468	36.63	0.3437	0.	RCFLAGS	0	0
4	5601	0.0468	0.00	0.0000	1536.	RCFLAGS	0	0
4	602	0.0331	36.63	0.2550	0.	RCFLAGS	0	0
4	1601	0.0799	15.17	0.2550	0.	RCFLAGS	0	0
4	5602	0.0799	0.00	0.0000	1089.	RCFLAGS	0	0
4	603	0.0912	37.18	0.3866	0.	RCFLAGS	0	0
4	1602	0.1711	19.82	0.3866	0.	RCFLAGS	0	0
4	604	0.2409	25.39	0.7836	0.	RCFLAGS	0	0
4	1603	0.4120	23.08	1.1696	0.	RCFLAGS	0	0
4	5604	0.4120	0.00	0.0000	8918.	RCFLAGS	0	0
4	201	0.0807	47.36	0.9857	0.	RCFLAGS	0	0
4	5201	0.0807	31.85	0.1480	3215.	RCFLAGS	0	0
4	2201	0.0807	31.84	0.1475	0.	RCFLAGS	0	0
4	202	0.1084	12.53	0.0957	0.	RCFLAGS	0	0
4	1201	0.1891	20.77	0.2187	0.	RCFLAGS	0	0
4	203	0.0368	36.91	0.2725	0.	RCFLAGS	0	0
4	1202	0.2259	23.40	0.3634	0.	RCFLAGS	0	0
4	2202	0.2259	23.40	0.3633	0.	RCFLAGS	0	0
4	204	0.0453	38.02	0.2493	0.	RCFLAGS	0	0
4	1203	0.2712	25.84	0.6123	0.	RCFLAGS	0	0
4	205	0.0700	10.98	0.0364	0.	RCFLAGS	0	0
4	1204	0.3412	22.79	0.6384	0.	RCFLAGS	0	0
4	301	0.1662	46.47	1.7526	0.	RCFLAGS	0	0
4	302	0.1347	40.51	1.8160	0.	RCFLAGS	0	0
4	1301	0.3009	43.80	3.5316	0.	RCFLAGS	0	0
4	5301	0.3009	40.84	0.4599	10207.	RCFLAGS	0	0
4	303	0.3216	46.22	4.2773	0.	RCFLAGS	0	0
4	1302	0.6225	43.62	4.3162	0.	RCFLAGS	0	0
4	304	0.1193	46.46	1.4134	0.	RCFLAGS	0	0
4	1303	0.7418	44.08	5.7246	0.	RCFLAGS	0	0
4	2303	0.7418	44.07	5.6098	0.	RCFLAGS	0	0

4	307	0.1653	17.10	0.1359	0.	RCFLAGS	0	0
4	1304	0.9071	39.15	5.6307	0.	RCFLAGS	0	0
4	305	0.0065	39.74	0.0676	0.	RCFLAGS	0	0
4	1305	0.9136	39.95	5.6999	0.	RCFLAGS	0	0
4	306	0.0439	38.88	0.2656	0.	RCFLAGS	0	0
4	1306	0.9575	39.90	5.9656	0.	RCFLAGS	0	0
4	308	0.0630	38.84	0.2024	0.	RCFLAGS	0	0
4	309	0.0164	6.67	0.0214	0.	RCFLAGS	0	0 cndchi.dat
4	1307	0.0794	32.20	0.2212	0.	RCFLAGS	0	0
4	5309	0.0794	16.14	0.1615	858.	RCFLAGS	0	0
4	1308	1.0369	38.08	5.9656	0.	RCFLAGS	0	0
4	2308	1.0369	43.51	4.7870	0.	RCFLAGS	0	0
4	310	0.0682	44.54	0.8970	0.	RCFLAGS	0	0
4	1309	1.1051	43.57	5.0522	0.	RCFLAGS	0	0
4	311	0.4793	14.31	0.1138	0.	RCFLAGS	0	0
4	1310	1.5844	34.72	5.1279	0.	RCFLAGS	0	0
4	5310	1.5844	16.63	0.7133	35020.	RCFLAGS	0	0
4	312	0.3180	36.69	1.0006	0.	RCFLAGS	0	0
4	5312	0.3180	0.00	0.0000	12762.	RCFLAGS	0	0
4	313	0.0985	38.01	0.3297	0.	RCFLAGS	0	0
4	1311	0.4165	8.99	0.3297	0.	RCFLAGS	0	0
4	314	0.1142	9.14	0.0661	0.	RCFLAGS	0	0
4	1312	0.5307	9.02	0.3941	0.	RCFLAGS	0	0
4	315	0.0492	40.22	0.1899	0.	RCFLAGS	0	0
4	1313	0.5799	11.67	0.5828	0.	RCFLAGS	0	0
4	316	0.2120	43.36	1.8898	0.	RCFLAGS	0	0
4	1314	0.7919	20.15	2.4235	0.	RCFLAGS	0	0
4	5314	0.7919	19.47	1.1865	6901.	RCFLAGS	0	0
4	1315	2.3763	17.88	1.3023	0.	RCFLAGS	0	0
4	2315	2.3763	17.85	1.2972	0.	RCFLAGS	0	0
4	317	0.1180	43.02	2.0402	0.	RCFLAGS	0	0
4	1316	2.4943	19.04	2.0761	0.	RCFLAGS	0	0
4	2316	2.4943	19.25	2.0325	0.	RCFLAGS	0	0
4	318	0.1539	46.07	1.7158	0.	RCFLAGS	0	0
4	1317	2.6482	20.81	3.7266	0.	RCFLAGS	0	0
4	501	0.0207	38.83	0.1049	0.	RCFLAGS	0	0
5	106	0.0215	50.19	0.1089	0.	RCFLAGS	0	0 cndchi.dat
5	5106	0.0215	0.00	0.0000	778.	RCFLAGS	0	0
5	107	0.1510	47.98	0.9128	0.	RCFLAGS	0	0
5	1103	0.1725	42.00	0.9128	0.	RCFLAGS	0	0
5	104	0.0282	52.45	0.2832	0.	RCFLAGS	0	0
5	5104	0.0282	0.00	0.0000	1263.	RCFLAGS	0	0
5	1104	0.2007	36.10	0.9128	0.	RCFLAGS	0	0
5	105	0.1640	48.54	0.4214	0.	RCFLAGS	0	0
5	1105	0.3647	41.69	1.3139	0.	RCFLAGS	0	0
5	101	0.0039	49.02	0.0531	0.	RCFLAGS	0	0
5	102	0.0214	47.97	0.2050	0.	RCFLAGS	0	0
5	1101	0.0253	48.13	0.2582	0.	RCFLAGS	0	0
5	103	0.0259	18.07	0.0407	0.	RCFLAGS	0	0
5	1102	0.0512	32.93	0.2937	0.	RCFLAGS	0	0
5	5103	0.0512	12.00	0.1269	986.	RCFLAGS	0	0
5	1106	0.4159	38.04	1.3139	0.	RCFLAGS	0	0
5	108	0.1240	27.47	0.0972	0.	RCFLAGS	0	0
5	1107	0.5399	35.61	1.3810	0.	RCFLAGS	0	0
5	5108	0.5399	35.35	1.3687	764.	RCFLAGS	0	0
5	2108	0.5399	35.35	1.3670	0.	RCFLAGS	0	0
5	109	0.1252	20.80	0.2860	0.	RCFLAGS	0	0
5	1108	0.6651	32.61	1.6313	0.	RCFLAGS	0	0
5	110	0.0201	47.98	0.3542	0.	RCFLAGS	0	0
5	1109	0.6852	33.06	1.8052	0.	RCFLAGS	0	0
5	111	0.0498	47.98	0.5003	0.	RCFLAGS	0	0
5	1110	0.7350	34.07	2.2476	0.	RCFLAGS	0	0
5	2110	0.7350	34.29	2.1645	0.	RCFLAGS	0	0
5	401	0.0234	52.96	0.2193	0.	RCFLAGS	0	0

5	5401	0.0234	0.00	0.0000	977.	RCFLAGS	0	0
5	402	0.1337	51.94	0.8748	0.	RCFLAGS	0	0
5	1401	0.1571	44.21	0.8748	0.	RCFLAGS	0	0
5	403	0.1073	41.34	0.3685	0.	RCFLAGS	0	0
5	1402	0.2644	43.04	1.2223	0.	RCFLAGS	0	0
5	5403	0.2644	0.00	0.0000	10114.	RCFLAGS	0	0
5	405	0.0966	50.49	0.4332	0.	RCFLAGS	0	0
5	5405	0.0966	0.00	0.0000	3231.	RCFLAGS	0	0
5	406	0.0930	49.65	0.4145	0.	RCFLAGS	0	0
5	1403	0.1896	24.36	0.4145	0.	RCFLAGS	0	0
5	5406	0.1896	0.00	0.0000	3099.	RCFLAGS	0	0
5	404	0.1141	51.33	0.5795	0.	RCFLAGS	0	0
5	1404	0.3037	19.29	0.5795	0.	RCFLAGS	0	0
5	407	0.2555	34.48	1.4430	0.	RCFLAGS	0	0
5	1405	0.5592	26.23	2.0200	0.	RCFLAGS	0	0
5	5407	0.5592	0.00	0.0000	12983.	RCFLAGS	0	0
5	1406	0.8236	0.00	0.0000	0.	RCFLAGS	0	0
5	5437	0.8236	0.00	0.0000	0.	RCFLAGS	0	0
5	408	0.0590	49.98	0.3245	0.	RCFLAGS	0	0 cndchi.dat
5	409	0.8914	24.52	1.7046	0.	RCFLAGS	0	0
5	1407	0.9504	26.10	2.0253	0.	RCFLAGS	0	0
5	410	0.0171	47.96	0.1208	0.	RCFLAGS	0	0
5	5410	0.0171	16.49	0.0804	361.	RCFLAGS	0	0
5	1410	0.9675	25.93	2.0253	0.	RCFLAGS	0	0
5	1408	1.7911	14.01	2.0253	0.	RCFLAGS	0	0
5	5409	1.7911	0.00	0.0000	23588.	RCFLAGS	0	0
5	601	0.0468	47.98	0.4233	0.	RCFLAGS	0	0
5	5601	0.0468	0.00	0.0000	2025.	RCFLAGS	0	0
5	602	0.0331	47.98	0.3129	0.	RCFLAGS	0	0
5	1601	0.0799	19.88	0.3129	0.	RCFLAGS	0	0
5	5602	0.0799	0.00	0.0000	1436.	RCFLAGS	0	0
5	603	0.0912	48.54	0.4801	0.	RCFLAGS	0	0
5	1602	0.1711	25.87	0.4801	0.	RCFLAGS	0	0
5	604	0.2409	35.67	1.0851	0.	RCFLAGS	0	0
5	1603	0.4120	31.60	1.5643	0.	RCFLAGS	0	0
5	5604	0.4120	0.00	0.0000	12219.	RCFLAGS	0	0
5	201	0.0807	58.84	1.1764	0.	RCFLAGS	0	0
5	5201	0.0807	43.28	0.2865	3540.	RCFLAGS	0	0
5	2201	0.0807	43.27	0.2865	0.	RCFLAGS	0	0
5	202	0.1084	20.90	0.1633	0.	RCFLAGS	0	0
5	1201	0.1891	30.44	0.4267	0.	RCFLAGS	0	0
5	203	0.0368	48.27	0.3355	0.	RCFLAGS	0	0
5	1202	0.2259	33.35	0.6018	0.	RCFLAGS	0	0
5	2202	0.2259	33.35	0.6015	0.	RCFLAGS	0	0
5	204	0.0453	49.38	0.3076	0.	RCFLAGS	0	0
5	1203	0.2712	36.02	0.8253	0.	RCFLAGS	0	0
5	205	0.0700	19.89	0.0680	0.	RCFLAGS	0	0
5	1204	0.3412	32.72	0.8933	0.	RCFLAGS	0	0
5	301	0.1662	57.93	2.0916	0.	RCFLAGS	0	0
5	302	0.1347	51.98	2.2382	0.	RCFLAGS	0	0
5	1301	0.3009	55.26	4.2798	0.	RCFLAGS	0	0
5	5301	0.3009	52.03	0.5184	12941.	RCFLAGS	0	0
5	303	0.3216	57.67	5.0749	0.	RCFLAGS	0	0
5	1302	0.6225	54.94	5.1185	0.	RCFLAGS	0	0
5	304	0.1193	57.92	1.6845	0.	RCFLAGS	0	0
5	1303	0.7418	55.42	6.7914	0.	RCFLAGS	0	0
5	2303	0.7418	55.41	6.6744	0.	RCFLAGS	0	0
5	307	0.1653	28.05	0.2221	0.	RCFLAGS	0	0
5	1304	0.9071	50.43	6.7574	0.	RCFLAGS	0	0
5	305	0.0065	51.09	0.0820	0.	RCFLAGS	0	0
5	1305	0.9136	51.22	6.8409	0.	RCFLAGS	0	0
5	306	0.0439	50.26	0.3258	0.	RCFLAGS	0	0
5	1306	0.9575	51.18	7.1667	0.	RCFLAGS	0	0
5	308	0.0630	50.21	0.2514	0.	RCFLAGS	0	0

5	309	0.0164	14.14	0.0439	0.	RCFLAGS	0	0 cndchi.dat
5	1307	0.0794	42.76	0.2915	0.	RCFLAGS	0	0
5	5309	0.0794	26.27	0.2470	873.	RCFLAGS	0	0
5	1308	1.0369	49.27	7.1667	0.	RCFLAGS	0	0
5	2308	1.0369	55.10	5.7453	0.	RCFLAGS	0	0
5	310	0.0682	55.98	1.0679	0.	RCFLAGS	0	0
5	1309	1.1051	55.15	6.0892	0.	RCFLAGS	0	0
5	311	0.4793	24.02	0.1923	0.	RCFLAGS	0	0
5	1310	1.5844	45.73	6.2265	0.	RCFLAGS	0	0
5	5310	1.5844	25.88	2.0445	35994.	RCFLAGS	0	0
5	312	0.3180	48.07	1.2559	0.	RCFLAGS	0	0
5	5312	0.3180	0.00	0.0000	16219.	RCFLAGS	0	0
5	313	0.0985	49.37	0.4101	0.	RCFLAGS	0	0
5	1311	0.4165	11.68	0.4101	0.	RCFLAGS	0	0
5	314	0.1142	17.43	0.1357	0.	RCFLAGS	0	0
5	1312	0.5307	12.91	0.5457	0.	RCFLAGS	0	0
5	315	0.0492	51.60	0.2344	0.	RCFLAGS	0	0
5	1313	0.5799	16.20	0.7794	0.	RCFLAGS	0	0
5	316	0.2120	54.81	2.3044	0.	RCFLAGS	0	0
5	1314	0.7919	26.53	3.0172	0.	RCFLAGS	0	0
5	5314	0.7919	25.82	1.6973	7875.	RCFLAGS	0	0
5	1315	2.3763	26.16	2.8821	0.	RCFLAGS	0	0
5	2315	2.3763	26.14	2.8604	0.	RCFLAGS	0	0
5	317	0.1180	54.44	2.4199	0.	RCFLAGS	0	0
5	1316	2.4943	27.47	2.8619	0.	RCFLAGS	0	0
5	2316	2.4943	27.68	2.8586	0.	RCFLAGS	0	0
5	318	0.1539	57.53	2.0480	0.	RCFLAGS	0	0
5	1317	2.6482	29.42	4.4468	0.	RCFLAGS	0	0
5	501	0.0207	50.20	0.1293	0.	RCFLAGS	0	0
6	106	0.0215	58.80	0.1244	0.	RCFLAGS	0	0 cndchi.dat
6	5106	0.0215	0.00	0.0000	926.	RCFLAGS	0	0
6	107	0.1510	56.60	1.0429	0.	RCFLAGS	0	0
6	1103	0.1725	49.54	1.0429	0.	RCFLAGS	0	0
6	104	0.0282	61.06	0.3198	0.	RCFLAGS	0	0
6	5104	0.0282	0.00	0.0000	1479.	RCFLAGS	0	0
6	1104	0.2007	42.58	1.0429	0.	RCFLAGS	0	0
6	105	0.1640	57.15	0.4860	0.	RCFLAGS	0	0
6	1105	0.3647	49.13	1.5050	0.	RCFLAGS	0	0
6	101	0.0039	57.68	0.0599	0.	RCFLAGS	0	0
6	102	0.0214	56.59	0.2329	0.	RCFLAGS	0	0
6	1101	0.0253	56.76	0.2921	0.	RCFLAGS	0	0
6	103	0.0259	24.69	0.0564	0.	RCFLAGS	0	0
6	1102	0.0512	40.53	0.3427	0.	RCFLAGS	0	0
6	5103	0.0512	19.35	0.1920	1014.	RCFLAGS	0	0
6	1106	0.4159	45.47	1.5263	0.	RCFLAGS	0	0
6	108	0.1240	35.29	0.1256	0.	RCFLAGS	0	0
6	1107	0.5399	43.13	1.6458	0.	RCFLAGS	0	0
6	5108	0.5399	42.84	1.6275	852.	RCFLAGS	0	0
6	2108	0.5399	42.84	1.6225	0.	RCFLAGS	0	0
6	109	0.1252	27.34	0.3735	0.	RCFLAGS	0	0
6	1108	0.6651	39.92	1.9338	0.	RCFLAGS	0	0
6	110	0.0201	56.60	0.3961	0.	RCFLAGS	0	0
6	1109	0.6852	40.41	2.1358	0.	RCFLAGS	0	0
6	111	0.0498	56.60	0.5663	0.	RCFLAGS	0	0
6	1110	0.7350	41.51	2.6420	0.	RCFLAGS	0	0
6	2110	0.7350	41.76	2.5478	0.	RCFLAGS	0	0
6	401	0.0234	61.57	0.2476	0.	RCFLAGS	0	0
6	5401	0.0234	0.00	0.0000	1148.	RCFLAGS	0	0
6	402	0.1337	60.56	0.9937	0.	RCFLAGS	0	0
6	1401	0.1571	51.54	0.9937	0.	RCFLAGS	0	0
6	403	0.1073	50.01	0.4444	0.	RCFLAGS	0	0
6	1402	0.2644	50.92	1.4174	0.	RCFLAGS	0	0
6	5403	0.2644	0.00	0.0000	12047.	RCFLAGS	0	0
6	405	0.0966	59.11	0.4951	0.	RCFLAGS	0	0

6	5405	0.0966	0.00	0.0000	3828.	RCFLAGS	0	0
6	406	0.0930	58.27	0.4741	0.	RCFLAGS	0	0
6	1403	0.1896	28.58	0.4741	0.	RCFLAGS	0	0
6	5406	0.1896	0.85	0.0397	3581.	RCFLAGS	0	0
6	404	0.1141	59.95	0.6609	0.	RCFLAGS	0	0
6	1404	0.3037	23.05	0.6609	0.	RCFLAGS	0	0
6	407	0.2555	42.38	1.7823	0.	RCFLAGS	0	0
6	1405	0.5592	31.88	2.4388	0.	RCFLAGS	0	0
6	5407	0.5592	0.00	0.0000	15972.	RCFLAGS	0	0
6	1406	0.8236	0.00	0.0000	0.	RCFLAGS	0	0
6	5437	0.8236	0.00	0.0000	0.	RCFLAGS	0	0
6	408	0.0590	58.60	0.3704	0.	RCFLAGS	0	0 cndchi.dat
6	409	0.8914	31.55	2.2372	0.	RCFLAGS	0	0
6	1407	0.9504	33.23	2.6045	0.	RCFLAGS	0	0
6	410	0.0171	56.58	0.1377	0.	RCFLAGS	0	0
6	5410	0.0171	24.41	0.1287	362.	RCFLAGS	0	0
6	1410	0.9675	33.08	2.6184	0.	RCFLAGS	0	0
6	1408	1.7911	17.87	2.6184	0.	RCFLAGS	0	0
6	5409	1.7911	0.00	0.0000	30146.	RCFLAGS	0	0
6	601	0.0468	56.59	0.4811	0.	RCFLAGS	0	0
6	5601	0.0468	0.00	0.0000	2397.	RCFLAGS	0	0
6	602	0.0331	56.59	0.3555	0.	RCFLAGS	0	0
6	1601	0.0799	23.44	0.3555	0.	RCFLAGS	0	0
6	5602	0.0799	0.00	0.0000	1700.	RCFLAGS	0	0
6	603	0.0912	57.15	0.5493	0.	RCFLAGS	0	0
6	1602	0.1711	30.46	0.5493	0.	RCFLAGS	0	0
6	604	0.2409	43.55	1.3080	0.	RCFLAGS	0	0
6	1603	0.4120	38.11	1.8574	0.	RCFLAGS	0	0
6	5604	0.4120	0.00	0.0000	14745.	RCFLAGS	0	0
6	201	0.0807	67.52	1.3118	0.	RCFLAGS	0	0
6	5201	0.0807	51.89	0.2982	3924.	RCFLAGS	0	0
6	2201	0.0807	51.89	0.2982	0.	RCFLAGS	0	0
6	202	0.1084	27.61	0.2158	0.	RCFLAGS	0	0
6	1201	0.1891	37.97	0.4923	0.	RCFLAGS	0	0
6	203	0.0368	56.88	0.3813	0.	RCFLAGS	0	0
6	1202	0.2259	41.05	0.7590	0.	RCFLAGS	0	0
6	2202	0.2259	41.05	0.7580	0.	RCFLAGS	0	0
6	204	0.0453	57.99	0.3507	0.	RCFLAGS	0	0
6	1203	0.2712	43.88	1.0515	0.	RCFLAGS	0	0
6	205	0.0700	26.90	0.0935	0.	RCFLAGS	0	0
6	1204	0.3412	40.40	1.1450	0.	RCFLAGS	0	0
6	301	0.1662	66.59	2.3342	0.	RCFLAGS	0	0
6	302	0.1347	60.64	2.5430	0.	RCFLAGS	0	0
6	1301	0.3009	63.92	4.8151	0.	RCFLAGS	0	0
6	5301	0.3009	60.49	0.5555	15092.	RCFLAGS	0	0
6	303	0.3216	66.32	5.6321	0.	RCFLAGS	0	0
6	1302	0.6225	63.50	5.6795	0.	RCFLAGS	0	0
6	304	0.1193	66.58	1.8777	0.	RCFLAGS	0	0
6	1303	0.7418	64.00	7.5384	0.	RCFLAGS	0	0
6	2303	0.7418	63.99	7.4269	0.	RCFLAGS	0	0
6	307	0.1653	36.36	0.2880	0.	RCFLAGS	0	0
6	1304	0.9071	58.95	7.5624	0.	RCFLAGS	0	0
6	305	0.0065	59.74	0.0922	0.	RCFLAGS	0	0
6	1305	0.9136	59.75	7.6561	0.	RCFLAGS	0	0
6	306	0.0439	58.87	0.3699	0.	RCFLAGS	0	0
6	1306	0.9575	59.71	8.0259	0.	RCFLAGS	0	0
6	308	0.0630	58.84	0.2879	0.	RCFLAGS	0	0
6	309	0.0164	20.24	0.0605	0.	RCFLAGS	0	0 cndchi.dat
6	1307	0.0794	50.87	0.3443	0.	RCFLAGS	0	0
6	5309	0.0794	34.10	0.3079	884.	RCFLAGS	0	0
6	1308	1.0369	57.74	8.0259	0.	RCFLAGS	0	0
6	2308	1.0369	63.67	6.6225	0.	RCFLAGS	0	0
6	310	0.0682	64.63	1.1872	0.	RCFLAGS	0	0
6	1309	1.1051	63.73	7.0043	0.	RCFLAGS	0	0

6	311	0.4793	31.47	0.2525	0.	RCFLAGS	0	0
6	1310	1.5844	53.97	7.2153	0.	RCFLAGS	0	0
6	5310	1.5844	32.99	3.1464	37096.	RCFLAGS	0	0
6	312	0.3180	56.69	1.4470	0.	RCFLAGS	0	0
6	5312	0.3180	0.44	0.0054	18785.	RCFLAGS	0	0
6	313	0.0985	57.98	0.4698	0.	RCFLAGS	0	0
6	1311	0.4165	14.05	0.4698	0.	RCFLAGS	0	0
6	314	0.1142	24.05	0.1912	0.	RCFLAGS	0	0
6	1312	0.5307	16.20	0.6611	0.	RCFLAGS	0	0
6	315	0.0492	60.21	0.2674	0.	RCFLAGS	0	0
6	1313	0.5799	19.93	0.9279	0.	RCFLAGS	0	0
6	316	0.2120	63.46	2.6001	0.	RCFLAGS	0	0
6	1314	0.7919	31.59	3.4482	0.	RCFLAGS	0	0
6	5314	0.7919	30.84	2.0705	8586.	RCFLAGS	0	0
6	1315	2.3763	32.57	4.4020	0.	RCFLAGS	0	0
6	2315	2.3763	32.55	4.3829	0.	RCFLAGS	0	0
6	317	0.1180	63.09	2.6790	0.	RCFLAGS	0	0
6	1316	2.4943	34.00	4.3928	0.	RCFLAGS	0	0
6	2316	2.4943	34.21	4.3841	0.	RCFLAGS	0	0
6	318	0.1539	66.19	2.2852	0.	RCFLAGS	0	0
6	1317	2.6482	36.07	4.9448	0.	RCFLAGS	0	0
6	501	0.0207	58.81	0.1472	0.	RCFLAGS	0	0
7	106	0.0215	189.52	0.1862	0.	RCFLAGS	0	0 regional.dat
7	5106	0.0215	0.00	0.0000	2954.	RCFLAGS	0	0
7	107	0.1510	177.83	1.3935	0.	RCFLAGS	0	0
7	1103	0.1725	155.66	1.3935	0.	RCFLAGS	0	0
7	104	0.0282	203.69	0.3133	0.	RCFLAGS	0	0
7	5104	0.0282	62.68	0.2713	2935.	RCFLAGS	0	0
7	1104	0.2007	142.60	1.6588	0.	RCFLAGS	0	0
7	105	0.1640	180.75	1.0040	0.	RCFLAGS	0	0
7	1105	0.3647	159.75	2.6606	0.	RCFLAGS	0	0
7	101	0.0039	186.97	0.0507	0.	RCFLAGS	0	0
7	102	0.0214	177.82	0.2334	0.	RCFLAGS	0	0
7	1101	0.0253	179.23	0.2834	0.	RCFLAGS	0	0
7	103	0.0259	109.05	0.1618	0.	RCFLAGS	0	0
7	1102	0.0512	143.73	0.4240	0.	RCFLAGS	0	0
7	5103	0.0512	119.39	0.4176	1113.	RCFLAGS	0	0
7	1106	0.4159	154.79	3.0782	0.	RCFLAGS	0	0
7	108	0.1240	175.27	0.4888	0.	RCFLAGS	0	0
7	1107	0.5399	159.49	3.5607	0.	RCFLAGS	0	0
7	5108	0.5399	159.09	3.5327	1501.	RCFLAGS	0	0
7	2108	0.5399	159.08	3.5321	0.	RCFLAGS	0	0
7	109	0.1252	108.47	0.8715	0.	RCFLAGS	0	0
7	1108	0.6651	149.56	4.3868	0.	RCFLAGS	0	0
7	110	0.0201	185.06	0.2838	0.	RCFLAGS	0	0
7	1109	0.6852	150.60	4.6024	0.	RCFLAGS	0	0
7	111	0.0498	177.82	0.5538	0.	RCFLAGS	0	0
7	1110	0.7350	152.44	5.1161	0.	RCFLAGS	0	0
7	2110	0.7350	152.44	5.0985	0.	RCFLAGS	0	0
7	401	0.0234	204.65	0.2513	0.	RCFLAGS	0	0
7	5401	0.0234	0.00	0.0000	3382.	RCFLAGS	0	0
7	402	0.1337	199.72	1.2721	0.	RCFLAGS	0	0
7	1401	0.1571	169.97	1.2721	0.	RCFLAGS	0	0
7	403	0.1073	215.01	0.9278	0.	RCFLAGS	0	0
7	1402	0.2644	188.25	2.1999	0.	RCFLAGS	0	0
7	5403	0.2644	0.00	0.0000	45797.	RCFLAGS	0	0
7	405	0.0966	191.37	0.7934	0.	RCFLAGS	0	0
7	5405	0.0966	49.66	0.5344	8477.	RCFLAGS	0	0
7	406	0.0930	187.52	0.7623	0.	RCFLAGS	0	0
7	1403	0.1896	117.28	1.2082	0.	RCFLAGS	0	0
7	5406	0.1896	76.34	1.0583	4883.	RCFLAGS	0	0
7	404	0.1141	197.23	0.9900	0.	RCFLAGS	0	0
7	1404	0.3037	121.76	1.8723	0.	RCFLAGS	0	0
7	407	0.2555	184.58	2.6493	0.	RCFLAGS	0	0

7	1405	0.5592	150.46	4.2359	0.	RCFLAGS	0	0
7	5407	0.5592	99.22	4.0805	26658.	RCFLAGS	0	0
7	1406	0.8236	67.37	4.0805	0.	RCFLAGS	0	0
7	5437	0.8236	0.00	0.0000	51695.	RCFLAGS	0	0
7	408	0.0590	186.31	0.5260	0.	RCFLAGS	0	0 regional.dat
7	409	0.8914	139.30	5.8698	0.	RCFLAGS	0	0
7	1407	0.9504	142.22	6.3957	0.	RCFLAGS	0	0
7	410	0.0171	182.14	0.1708	0.	RCFLAGS	0	0
7	5410	0.0171	134.15	0.1606	362.	RCFLAGS	0	0
7	1410	0.9675	142.08	6.5532	0.	RCFLAGS	0	0
7	1408	1.7911	76.74	6.5532	0.	RCFLAGS	0	0
7	5409	1.7911	0.00	0.0000	129010.	RCFLAGS	0	0
7	601	0.0468	182.16	0.5107	0.	RCFLAGS	0	0
7	5601	0.0468	0.00	0.0000	7462.	RCFLAGS	0	0
7	602	0.0331	182.16	0.3688	0.	RCFLAGS	0	0
7	1601	0.0799	75.46	0.3688	0.	RCFLAGS	0	0
7	5602	0.0799	0.00	0.0000	5375.	RCFLAGS	0	0
7	603	0.0912	185.82	0.8290	0.	RCFLAGS	0	0
7	1602	0.1711	99.04	0.8290	0.	RCFLAGS	0	0
7	604	0.2409	163.13	2.1489	0.	RCFLAGS	0	0
7	1603	0.4120	136.52	2.9780	0.	RCFLAGS	0	0
7	5604	0.4120	0.00	0.0000	53207.	RCFLAGS	0	0
7	201	0.0807	217.24	1.0217	0.	RCFLAGS	0	0
7	5201	0.0807	202.32	0.9572	5061.	RCFLAGS	0	0
7	2201	0.0807	202.31	0.9528	0.	RCFLAGS	0	0
7	202	0.1084	113.93	0.6130	0.	RCFLAGS	0	0
7	1201	0.1891	151.65	1.4998	0.	RCFLAGS	0	0
7	203	0.0368	185.82	0.4103	0.	RCFLAGS	0	0
7	1202	0.2259	157.22	1.9022	0.	RCFLAGS	0	0
7	2202	0.2259	157.21	1.9017	0.	RCFLAGS	0	0
7	204	0.0453	188.62	0.4458	0.	RCFLAGS	0	0
7	1203	0.2712	162.46	2.3399	0.	RCFLAGS	0	0
7	205	0.0700	130.21	0.3375	0.	RCFLAGS	0	0
7	1204	0.3412	155.84	2.6739	0.	RCFLAGS	0	0
7	301	0.1662	217.13	2.0311	0.	RCFLAGS	0	0
7	302	0.1347	212.11	1.9091	0.	RCFLAGS	0	0
7	1301	0.3009	214.88	3.9243	0.	RCFLAGS	0	0
7	5301	0.3009	211.52	3.1523	28782.	RCFLAGS	0	0
7	303	0.3216	218.83	4.3010	0.	RCFLAGS	0	0
7	1302	0.6225	215.30	6.6600	0.	RCFLAGS	0	0
7	304	0.1193	214.56	1.5044	0.	RCFLAGS	0	0
7	1303	0.7418	215.18	7.9619	0.	RCFLAGS	0	0
7	2303	0.7418	215.17	7.9609	0.	RCFLAGS	0	0
7	307	0.1653	197.80	1.0321	0.	RCFLAGS	0	0
7	1304	0.9071	212.01	8.9846	0.	RCFLAGS	0	0
7	305	0.0065	187.55	0.0784	0.	RCFLAGS	0	0
7	1305	0.9136	213.41	9.0567	0.	RCFLAGS	0	0
7	306	0.0439	186.98	0.4310	0.	RCFLAGS	0	0
7	1306	0.9575	212.19	9.4877	0.	RCFLAGS	0	0
7	308	0.0630	187.90	0.4894	0.	RCFLAGS	0	0
7	309	0.0164	82.82	0.1284	0.	RCFLAGS	0	0 regional.dat
7	1307	0.0794	166.20	0.6179	0.	RCFLAGS	0	0
7	5309	0.0794	142.95	0.6028	936.	RCFLAGS	0	0
7	1308	1.0369	206.89	10.0905	0.	RCFLAGS	0	0
7	2308	1.0369	206.85	10.3626	0.	RCFLAGS	0	0
7	310	0.0682	206.64	0.8959	0.	RCFLAGS	0	0
7	1309	1.1051	206.84	10.7727	0.	RCFLAGS	0	0
7	311	0.4793	167.25	1.1368	0.	RCFLAGS	0	0
7	1310	1.5844	194.86	11.8948	0.	RCFLAGS	0	0
7	5310	1.5844	160.34	9.8086	54523.	RCFLAGS	0	0
7	312	0.3180	184.13	2.4966	0.	RCFLAGS	0	0
7	5312	0.3180	77.74	0.1524	52271.	RCFLAGS	0	0
7	313	0.0985	184.96	0.7834	0.	RCFLAGS	0	0
7	1311	0.4165	103.10	0.9101	0.	RCFLAGS	0	0

7	314	0.1142	109.89	0.6157	0.	RCFLAGS	0	0
7	1312	0.5307	104.56	1.5258	0.	RCFLAGS	0	0
7	315	0.0492	197.89	0.4156	0.	RCFLAGS	0	0
7	1313	0.5799	112.48	1.9414	0.	RCFLAGS	0	0
7	316	0.2120	213.60	2.4614	0.	RCFLAGS	0	0
7	1314	0.7919	139.55	4.2027	0.	RCFLAGS	0	0
7	5314	0.7919	133.38	4.1121	10967.	RCFLAGS	0	0
7	1315	2.3763	151.96	13.0180	0.	RCFLAGS	0	0
7	2315	2.3763	151.93	13.0055	0.	RCFLAGS	0	0
7	317	0.1180	202.41	1.6725	0.	RCFLAGS	0	0
7	1316	2.4943	154.32	13.5334	0.	RCFLAGS	0	0
7	2316	2.4943	154.74	13.4917	0.	RCFLAGS	0	0
7	318	0.1539	210.76	1.8713	0.	RCFLAGS	0	0
7	1317	2.6482	158.00	14.9584	0.	RCFLAGS	0	0
7	501	0.0207	190.70	0.1937	0.	RCFLAGS	0	0
8	106	0.0215	1.56	0.0042	0.	RCFLAGS	0	0 25mm.dat
8	5106	0.0215	0.00	0.0000	23.	RCFLAGS	0	0
8	107	0.1510	0.72	0.0186	0.	RCFLAGS	0	0
8	1103	0.1725	0.63	0.0186	0.	RCFLAGS	0	0
8	104	0.0282	2.44	0.0175	0.	RCFLAGS	0	0
8	5104	0.0282	0.00	0.0000	56.	RCFLAGS	0	0
8	1104	0.2007	0.54	0.0186	0.	RCFLAGS	0	0
8	105	0.1640	0.93	0.0094	0.	RCFLAGS	0	0
8	1105	0.3647	0.72	0.0271	0.	RCFLAGS	0	0
8	101	0.0039	1.11	0.0019	0.	RCFLAGS	0	0
8	102	0.0214	0.71	0.0046	0.	RCFLAGS	0	0
8	1101	0.0253	0.78	0.0065	0.	RCFLAGS	0	0
8	103	0.0259	0.09	0.0000	0.	RCFLAGS	0	0
8	1102	0.0512	0.43	0.0065	0.	RCFLAGS	0	0
8	5103	0.0512	0.00	0.0000	18.	RCFLAGS	0	0
8	1106	0.4159	0.63	0.0271	0.	RCFLAGS	0	0
8	108	0.1240	0.64	0.0007	0.	RCFLAGS	0	0
8	1107	0.5399	0.63	0.0272	0.	RCFLAGS	0	0
8	5108	0.5399	0.61	0.0037	168.	RCFLAGS	0	0
8	2108	0.5399	0.61	0.0037	0.	RCFLAGS	0	0
8	109	0.1252	1.62	0.0127	0.	RCFLAGS	0	0
8	1108	0.6651	0.80	0.0134	0.	RCFLAGS	0	0
8	110	0.0201	0.72	0.0096	0.	RCFLAGS	0	0
8	1109	0.6852	0.79	0.0217	0.	RCFLAGS	0	0
8	111	0.0498	0.72	0.0114	0.	RCFLAGS	0	0
8	1110	0.7350	0.79	0.0332	0.	RCFLAGS	0	0
8	2110	0.7350	0.79	0.0287	0.	RCFLAGS	0	0
8	401	0.0234	2.81	0.0146	0.	RCFLAGS	0	0
8	5401	0.0234	0.00	0.0000	37.	RCFLAGS	0	0
8	402	0.1337	2.35	0.0479	0.	RCFLAGS	0	0
8	1401	0.1571	2.00	0.0479	0.	RCFLAGS	0	0
8	403	0.1073	1.14	0.0096	0.	RCFLAGS	0	0
8	1402	0.2644	1.65	0.0575	0.	RCFLAGS	0	0
8	5403	0.2644	0.00	0.0000	373.	RCFLAGS	0	0
8	405	0.0966	1.77	0.0177	0.	RCFLAGS	0	0
8	5405	0.0966	0.00	0.0000	67.	RCFLAGS	0	0
8	406	0.0930	1.37	0.0138	0.	RCFLAGS	0	0
8	1403	0.1896	0.67	0.0138	0.	RCFLAGS	0	0
8	5406	0.1896	0.00	0.0000	58.	RCFLAGS	0	0
8	404	0.1141	2.02	0.0277	0.	RCFLAGS	0	0
8	1404	0.3037	0.76	0.0277	0.	RCFLAGS	0	0
8	407	0.2555	1.17	0.0538	0.	RCFLAGS	0	0
8	1405	0.5592	0.95	0.0812	0.	RCFLAGS	0	0
8	5407	0.5592	0.00	0.0000	410.	RCFLAGS	0	0
8	1406	0.8236	0.00	0.0000	0.	RCFLAGS	0	0
8	5437	0.8236	0.00	0.0000	0.	RCFLAGS	0	0
8	408	0.0590	1.79	0.0128	0.	RCFLAGS	0	0 25mm.dat
8	409	0.8914	0.94	0.0433	0.	RCFLAGS	0	0
8	1407	0.9504	0.99	0.0556	0.	RCFLAGS	0	0

8	410	0.0171	0.70	0.0025	0.	RCFLAGS	0	0
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8	1408	1.7911	0.52	0.0556	0.	RCFLAGS	0	0
8	5409	1.7911	0.00	0.0000	783.	RCFLAGS	0	0
8	601	0.0468	0.72	0.0094	0.	RCFLAGS	0	0
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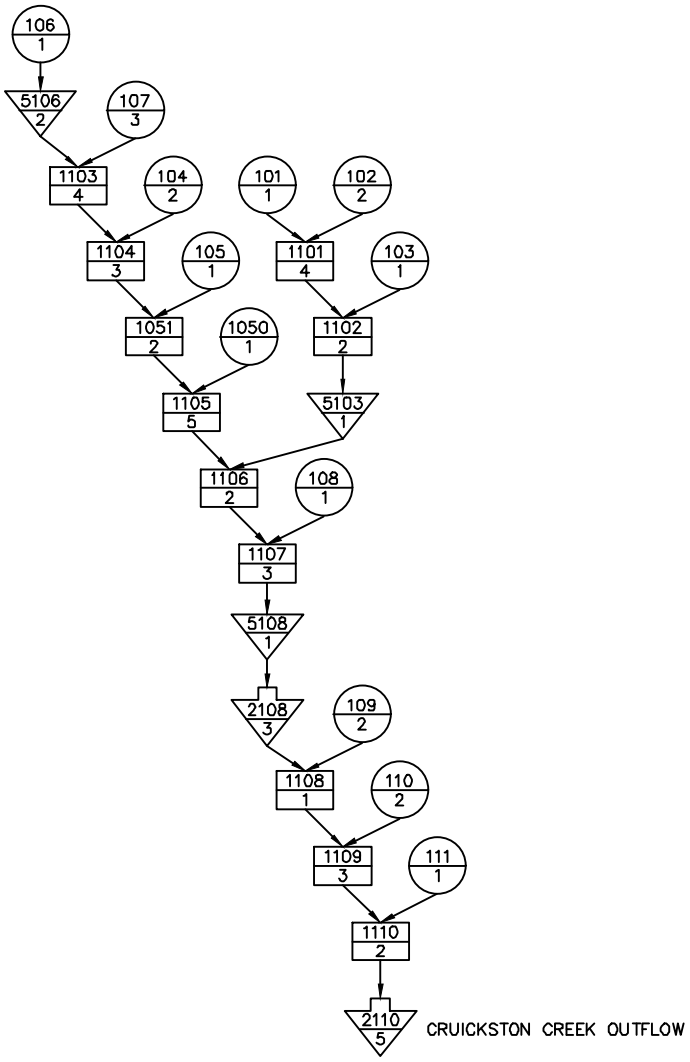
8	602	0.0331	0.72	0.0070	0.	RCFLAGS	0	0
8	1601	0.0799	0.30	0.0070	0.	RCFLAGS	0	0
8	5602	0.0799	0.00	0.0000	21.	RCFLAGS	0	0
8	603	0.0912	0.94	0.0117	0.	RCFLAGS	0	0
8	1602	0.1711	0.50	0.0117	0.	RCFLAGS	0	0
8	604	0.2409	0.47	0.0150	0.	RCFLAGS	0	0
8	1603	0.4120	0.48	0.0268	0.	RCFLAGS	0	0
8	5604	0.4120	0.00	0.0000	161.	RCFLAGS	0	0
8	201	0.0807	8.78	0.1684	0.	RCFLAGS	0	0
8	5201	0.0807	3.85	0.0023	662.	RCFLAGS	0	0
8	2201	0.0807	3.84	0.0023	0.	RCFLAGS	0	0
8	202	0.1084	0.63	0.0005	0.	RCFLAGS	0	0
8	1201	0.1891	2.00	0.0025	0.	RCFLAGS	0	0
8	203	0.0368	1.00	0.0075	0.	RCFLAGS	0	0
8	1202	0.2259	1.84	0.0080	0.	RCFLAGS	0	0
8	2202	0.2259	1.84	0.0079	0.	RCFLAGS	0	0
8	204	0.0453	1.42	0.0095	0.	RCFLAGS	0	0
8	1203	0.2712	1.77	0.0174	0.	RCFLAGS	0	0
8	205	0.0700	0.39	0.0002	0.	RCFLAGS	0	0
8	1204	0.3412	1.48	0.0175	0.	RCFLAGS	0	0
8	301	0.1662	7.83	0.2656	0.	RCFLAGS	0	0
8	302	0.1347	5.40	0.2288	0.	RCFLAGS	0	0
8	1301	0.3009	6.74	0.4944	0.	RCFLAGS	0	0
8	5301	0.3009	6.16	0.0260	1687.	RCFLAGS	0	0
8	303	0.3216	7.21	0.6298	0.	RCFLAGS	0	0
8	1302	0.6225	6.70	0.6361	0.	RCFLAGS	0	0
8	304	0.1193	7.82	0.2173	0.	RCFLAGS	0	0
8	1303	0.7418	6.88	0.8534	0.	RCFLAGS	0	0
8	2303	0.7418	6.88	0.8032	0.	RCFLAGS	0	0
8	307	0.1653	0.52	0.0008	0.	RCFLAGS	0	0
8	1304	0.9071	5.72	0.8034	0.	RCFLAGS	0	0
8	305	0.0065	2.63	0.0044	0.	RCFLAGS	0	0
8	1305	0.9136	6.49	0.8114	0.	RCFLAGS	0	0
8	306	0.0439	2.06	0.0135	0.	RCFLAGS	0	0
8	1306	0.9575	6.28	0.8245	0.	RCFLAGS	0	0
8	308	0.0630	1.91	0.0092	0.	RCFLAGS	0	0
8	309	0.0164	0.28	0.0000	0.	RCFLAGS	0	0 25mm.dat
8	1307	0.0794	1.57	0.0092	0.	RCFLAGS	0	0
8	5309	0.0794	0.00	0.0000	70.	RCFLAGS	0	0
8	1308	1.0369	5.80	0.8245	0.	RCFLAGS	0	0
8	2308	1.0369	7.13	0.6333	0.	RCFLAGS	0	0
8	310	0.0682	6.55	0.1185	0.	RCFLAGS	0	0
8	1309	1.1051	7.09	0.6669	0.	RCFLAGS	0	0
8	311	0.4793	0.48	0.0020	0.	RCFLAGS	0	0
8	1310	1.5844	5.09	0.6676	0.	RCFLAGS	0	0
8	5310	1.5844	2.19	0.0672	3732.	RCFLAGS	0	0
8	312	0.3180	0.93	0.0293	0.	RCFLAGS	0	0
8	5312	0.3180	0.00	0.0000	2204.	RCFLAGS	0	0
8	313	0.0985	1.42	0.0117	0.	RCFLAGS	0	0
8	1311	0.4165	0.34	0.0117	0.	RCFLAGS	0	0
8	314	0.1142	0.34	0.0003	0.	RCFLAGS	0	0
8	1312	0.5307	0.34	0.0119	0.	RCFLAGS	0	0
8	315	0.0492	2.28	0.0112	0.	RCFLAGS	0	0
8	1313	0.5799	0.50	0.0231	0.	RCFLAGS	0	0
8	316	0.2120	6.11	0.2513	0.	RCFLAGS	0	0
8	1314	0.7919	2.00	0.2716	0.	RCFLAGS	0	0
8	5314	0.7919	1.78	0.0578	852.	RCFLAGS	0	0

8	1315	2.3763	2.36	0.1234	0.	RCFLAGS	0	0
8	2315	2.3763	2.36	0.1234	0.	RCFLAGS	0	0
8	317	0.1180	5.45	0.2292	0.	RCFLAGS	0	0
8	1316	2.4943	2.50	0.2419	0.	RCFLAGS	0	0
8	2316	2.4943	2.72	0.2384	0.	RCFLAGS	0	0
8	318	0.1539	7.67	0.2563	0.	RCFLAGS	0	0
8	1317	2.6482	3.01	0.4947	0.	RCFLAGS	0	0
8	501	0.0207	1.57	0.0051	0.	RCFLAGS	0	0

Appendix D

Proposed Conditions Hydrologic Modelling



LEGEND

- 3000 / 1 — HYDROGRAPH GENERATION NUMBER / GAWSER STORAGE LOCATION NUMBER
- 3000 / 1 — HYDROGRAPH ROUTING NUMBER / GAWSER STORAGE LOCATION NUMBER
- 3000 / 1 — HYDROGRAPH ADDITION NUMBER / GAWSER STORAGE LOCATION NUMBER

FIGURE D1

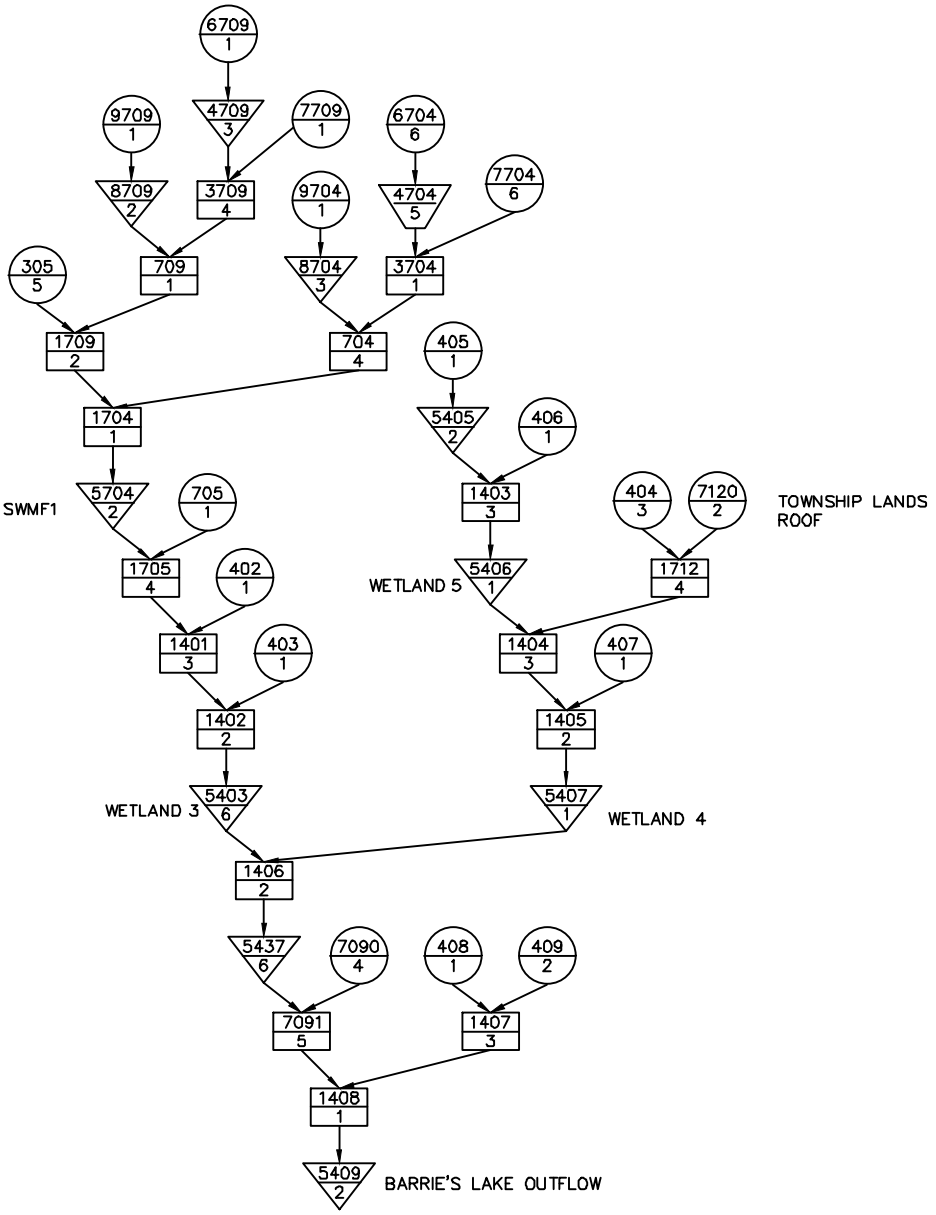
Date: 12/3/20
Scale: N/A

CRUICKSTON CREEK GAWSER MODEL

MTE
Engineers, Scientists, Surveyors

Project No.: 02534-800

P:\P\02534\800\TEMP DWGS\XSP\02534-800-Schematics Highlighted.dwg



LEGEND

- 3000 / 1 — HYDROGRAPH GENERATION NUMBER / GAWSER STORAGE LOCATION NUMBER
- 3000 / 1 — HYDROGRAPH ROUTING NUMBER / GAWSER STORAGE LOCATION NUMBER
- 3000 / 1 — HYDROGRAPH ADDITION NUMBER / GAWSER STORAGE LOCATION NUMBER

FIGURE D2

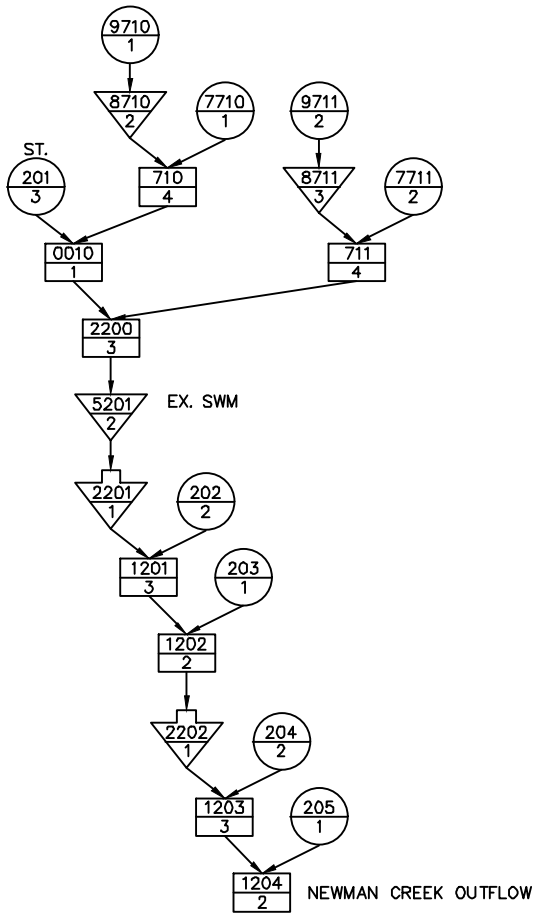
Date: 12/3/20
Scale: N/A

BARRIE'S LAKE GAWSER MODEL

MTE
Engineers, Scientists, Surveyors

Project No.: 44719-114

P:\P\02534\800\TEMP DWGS\XSP\02534-800-Schematics Highlighted.dwg



LEGEND

3000 / 1 — HYDROGRAPH GENERATION NUMBER
GAWSER STORAGE LOCATION NUMBER

3000 / 1 — HYDROGRAPH ROUTING NUMBER
GAWSER STORAGE LOCATION NUMBER

3000 / 1 — HYDROGRAPH ADDITION NUMBER
GAWSER STORAGE LOCATION NUMBER

FIGURE D3

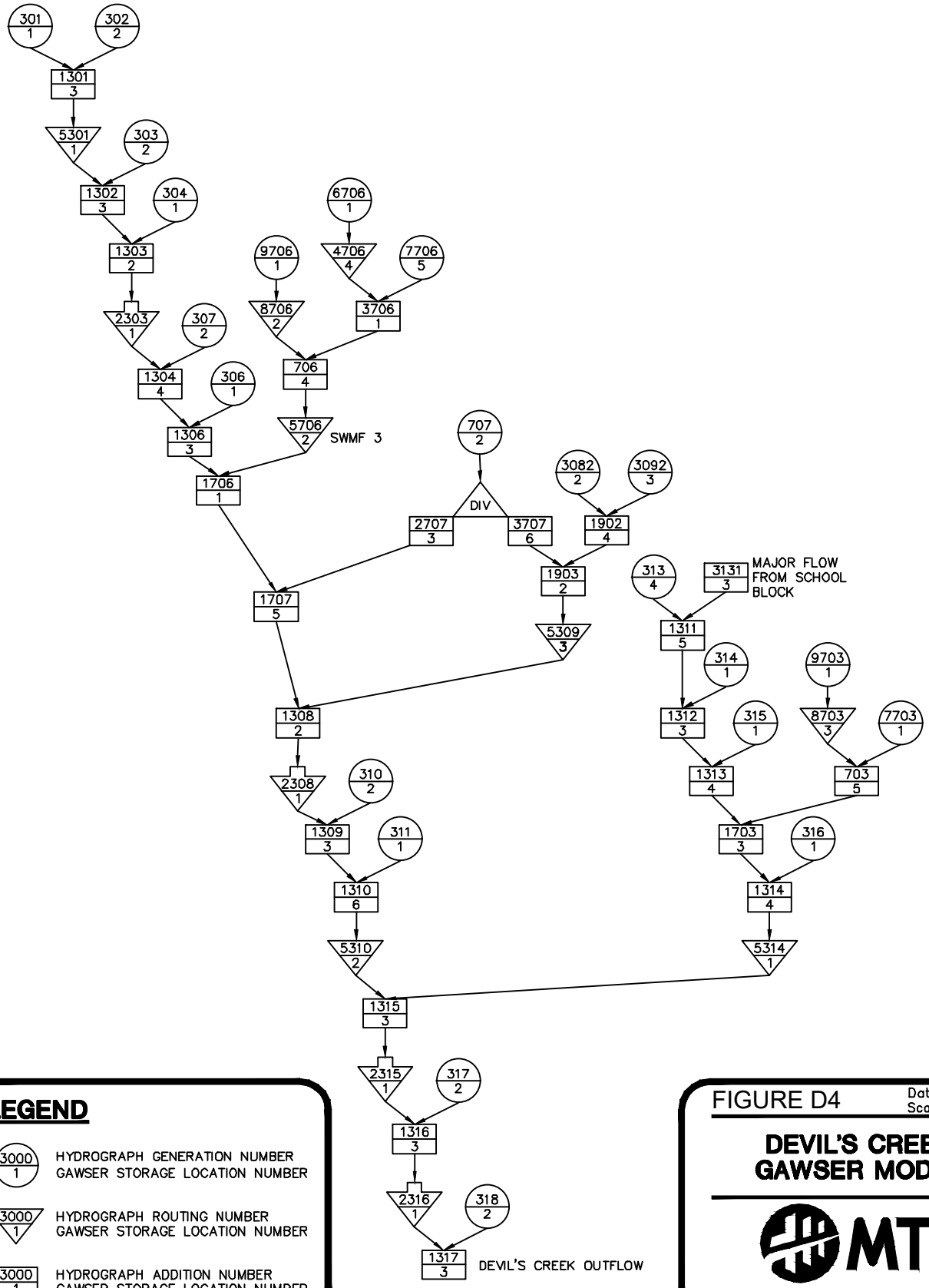
Date: 12/3/20
Scale: N/A

NEWMAN CREEK GAWSER MODEL

MTE
Engineers, Scientists, Surveyors

Project No.: 02534-800

P:\P\02534\800\TEMP DWGS\XSP\02534-800-Schematics Highlighted.dwg



LEGEND

- 3000 / 1 — HYDROGRAPH GENERATION NUMBER / GAWSER STORAGE LOCATION NUMBER
- 3000 / 1 — HYDROGRAPH ROUTING NUMBER / GAWSER STORAGE LOCATION NUMBER
- 3000 / 1 — HYDROGRAPH ADDITION NUMBER / GAWSER STORAGE LOCATION NUMBER

FIGURE D4

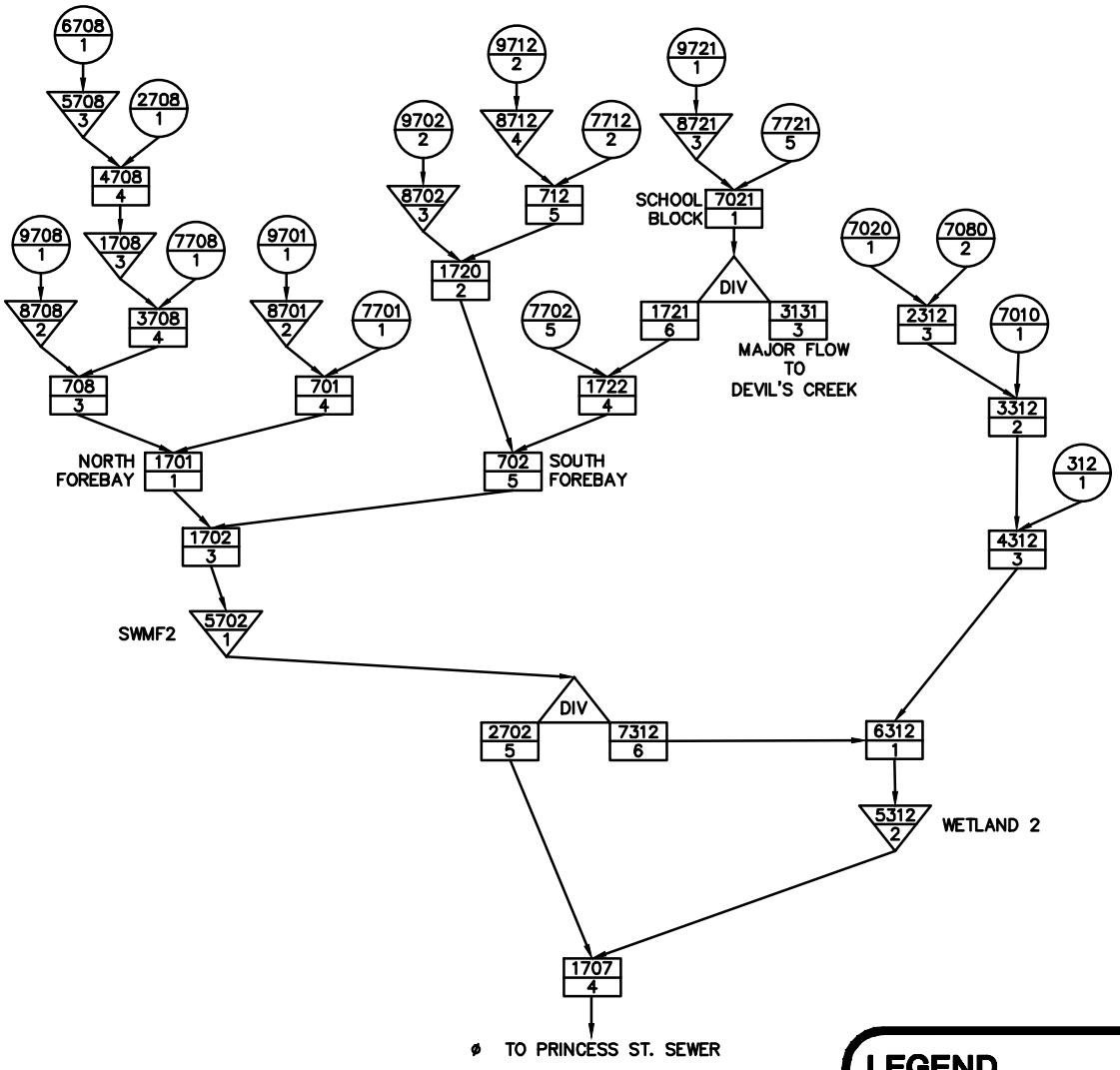
Date: 12/3/20
Scale: N/A

DEVIL'S CREEK GAWSER MODEL

MTE
Engineers, Scientists, Surveyors

Project No.: 02534-800

P:\P\02534\800\TEMP DWGS\XSP\02534-800-Schematics Highlighted.dwg



LEGEND

3000 / 1 — HYDROGRAPH GENERATION NUMBER
GAWSER STORAGE LOCATION NUMBER

3000 / 1 — HYDROGRAPH ROUTING NUMBER
GAWSER STORAGE LOCATION NUMBER

3000 / 1 — HYDROGRAPH ADDITION NUMBER
GAWSER STORAGE LOCATION NUMBER

FIGURE D5

Date: 12/3/20
Scale: N/A

GRAND RIVER GAWSER MODEL

MTE
Engineers, Scientists, Surveyors

Project No.: 02534-800

P:\P\02534\800\TEMP DWGS\XSP\02534-800-Schematics Highlighted.dwg

GAWSER Proposed Conditions Model
(*.WAT)

```
* Cruickston, Newman, and Devil's Creeks Subwatersheds Model - Proposed Cond.
* ==========================================================================
* MTE Consultants Inc., 2021
* ==========================================================================
* Hydrologic Response Units - Cruickston, Newman, and Devil's Creeks
* ==========================================================================
*
* Unit  Response Unit Descriptions
*   1 = Impervious
*   2 = Wetland (Open water)
*   3 = Organic Soils
*   4 = Silt tills-poor and imperfectly draining
*   5 = Silt tills high vegetation cover
*   6 = Sand tills-sandy clay to fine sand loams
*   7 = Sand tills high vegetation cover
*   8 = Sand/gravel tills-gravelly sandy clay to gravelly sandy silt loams
*   9 = Sand/gravel tills high vegetation cover
*
* Soil drainage parameters taken from "Hydrology of Floods in Canada", 1989.
* Edited by Watt, W.E., National Research Council of Canada
*
READ SOIL PARAMETERS  NZONE=9
                                          SILT TILL   SAND TILL   SAND/GRAV
                        IMP  WET   ORG    LOW  HIGH   LOW  HIGH   LOW  HIGH
                DS=    2.0 40.0  40.0    5.0  15.0   5.0  15.0   5.0  15.0
                KEFF=    0   0.2   2.0    5.0  15.0  10.0  40.0  10.0  40.0
                CS=      0   0.2   1.5    3.8  11.2   7.5  30.0   7.5  30.0
                D=       0   0.2   0.2    0.5   1.5   1.0   4.0   1.0   4.0
                SAV=     0   200   200    200   200   200   200   200   200
                HI=      0  0.01   100    100   200   100   200   100   200
                SMCI=    0  0.56  0.56   0.54  0.54  0.46  0.46  0.46  0.46
                IMCI=    0  0.46  0.46   0.40  0.40  0.23  0.23  0.23  0.23
                FCAPI=   0  0.46  0.46   0.40  0.40  0.23  0.23  0.23  0.23
                WILTI=   0  0.27  0.27   0.19  0.19  0.07  0.07  0.07  0.07
                HII=     0  0.01   150    150   400   300   600   400   600
                SMCII=   0  0.56  0.56   0.54  0.54  0.46  0.46  0.40  0.40
                IMCII=   0  0.46  0.46   0.40  0.40  0.23  0.23  0.10  0.10
                FCAPII=  0  0.46  0.46   0.40  0.40  0.23  0.23  0.10  0.10
                WILTII=  0  0.27  0.27   0.19  0.19  0.07  0.07  0.04  0.04
                X=       0     1     1      0     1     0     0     0     0
                FATR=    1     1     1      1     1     1     1     1     1
                INCS=    0     1     3      1     5     1     5     1     5
*
* Go to event file
*
CHANGE INPUT FILE
*
*   3.5% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=1  VS=     2.035   NSEGS=3
                      MIN EL=  100.00   MAX EL=  100.80
                      CHNSLP= 0.03500   FLNSLP= 0.03500
                      N= 0.350  DIST=   24.45
                      N=-0.150  DIST=   25.55
                      N= 0.350  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1
*
*   5% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=2  VS=     2.050   NSEGS=3
                      MIN EL=  100.00   MAX EL=  100.80
                      CHNSLP= 0.05000   FLNSLP= 0.05000
                      N= 0.350  DIST=   24.45
                      N=-0.150  DIST=   25.55
                      N= 0.350  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1
*
*   3.5% Typical Main channel Parabolic Swale
```



```
*
COMPUTE RATING CURVE ID=3  VS=   100.035   NSEGS=3
                      MIN EL=  100.70   MAX EL=  103.00
                      CHNSLP= 0.03500   FLNSLP= 0.03500
                      N= 0.080  DIST=   20.00
                      N=-0.050  DIST=   30.00
                      N= 0.080  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  103.00    20.00  101.00    23.00  100.80
                       25.00  100.70    27.00  100.80    30.00  101.00
                       50.00  103.00
                     RFN=0.0000 PCODE=1
*
*   2% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=4  VS=   100.020   NSEGS=3
                      MIN EL=  100.70   MAX EL=  103.00
                      CHNSLP= 0.02000   FLNSLP= 0.02000
                      N= 0.080  DIST=   20.00
                      N=-0.050  DIST=   30.00
                      N= 0.080  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  103.00    20.00  101.00    23.00  100.80
                       25.00  100.70    27.00  100.80    30.00  101.00
                       50.00  103.00
                     RFN=0.0000 PCODE=1
*
* Catchment 2% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=5  VS=     2.020   NSEGS=3
                      MIN EL=  100.00   MAX EL=  100.80
                      CHNSLP= 0.02000   FLNSLP= 0.02000
                      N= 0.350  DIST=   24.45
                      N=-0.150  DIST=   25.55
                      N= 0.350  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1
*
*   Catchment 0.5% Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=6  VS=   100.005   NSEGS=3
                      MIN EL=  100.70   MAX EL=  103.00
                      CHNSLP= 0.00500   FLNSLP= 0.005000
                      N= 0.080  DIST=   20.00
                      N=-0.050  DIST=   30.00
                      N= 0.080  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  103.00    20.00  101.00    23.00  100.80
                       25.00  100.70    27.00  100.80    30.00  101.00
                       50.00  103.00
                     RFN=0.0000 PCODE=1
*
**************************************************************************
* CRUICKSTON CREEK
*
*
*
* Catchment 106
* VS=  100.005 is main channel & VS= 2.02 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 106 AREA=   0.0215 Sq km  L=  220 m  W=   100 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                    0.0   0.0  0.0  20.0  0.0   0.0  0.0  80.0  0.0
                  RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.05 QROC=  0.01
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=1.00 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Route flows from 106 through a depression
*
```

```
ROUTE SPECIAL POND  ID=2 HYD NO=5106 INFLOW=1 PCODE=0 OPTION=15
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 317.000
                    Recharge characteristics for Compartment A
                      LEVELA= 315.000                EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 315.000 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB=  25.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  5
                                 Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)   (ha*m)    (ha)    (cms)   (ha*m)    (ha)
                     315.000     0.000   0.000   0.000   0.000   0.000   0.018
                     315.500     0.000   0.000   0.000   0.000   0.043   0.155
                     316.000     0.000   0.000   0.000   0.000   0.155   0.291
                     316.500     0.000   0.000   0.000   0.000   0.355   0.511
                     317.000     0.000   0.000   0.000   5.000   0.693   0.839
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Catchment 107
* VS= 100.035 is main channel & VS=   2.050 is off-channel
*
COMPUTE FLOWRATE    ID=3 NHD= 107 AREA=   0.1510 Sq km  L=  150 m  W=   325 m
              SOIL ZONE I    II  III   IV    V    VI  VII  VIII   IX
                     0.0   0.0  0.0   0.0  0.0   0.0  0.0 100.0  0.0
                    RATING CURVES: IDMC=3 IDOC=2 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*
* Sum hydr.  107 & 5106, call result  1103
*
ADD HYD             ID=4 HYD NO= 1103 IDA=3 IDB=2 ICODE=0
*
* Catchment 104 - reduced to 0ha (mar 3/20)
* VS= 100.020 is main channel & VS= 2.050 is off-channel
*
COMPUTE FLOWRATE    ID=2 NHD= 104 AREA=  0.00001 Sq km  L=   40 m  W=    40 m
              SOIL ZONE I    II  III   IV    V    VI  VII  VIII   IX
                     0.0   0.0  0.0  40.0  0.0   0.0  0.0  60.0  0.0
                    RATING CURVES: IDMC=4 IDOC=2 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  1103, 104, call result  1104
*
ADD HYD             ID=3 HYD NO= 1104 IDA=2 IDB=4 ICODE=0
*
* Typical Roof section
*
COMPUTE RATING CURVE ID=5  VS=   101.000   NSEGS=3
                      MIN EL=  295.00   MAX EL=  295.70
                      CHNSLP= 0.2500   FLNSLP= 0.2500
                      N= 0.018  DIST=  100.00
                      N=-0.018  DIST=  400.00
                      N= 0.018  DIST=  500.00
                        DIST    ELEV    DIST    ELEV    DIST    ELEV
                        0.00  295.70  100.00  295.50  100.10  295.00
                      399.90  295.00  400.00  295.50  500.00  295.70
                     RFN=0.0000 PCODE=1
```



```
*
* Typical Urban section
*
COMPUTE RATING CURVE ID=6  VS=     3.200   NSEGS=3
                      MIN EL=  295.00   MAX EL=  295.70
                      CHNSLP= 0.02000   FLNSLP= 0.02000
                      N= 0.015  DIST=  200.00
                      N=-0.015  DIST=  300.00
                      N= 0.015  DIST=  500.00
                        DIST    ELEV    DIST    ELEV    DIST    ELEV
                        0.00  295.70  200.00  295.50  200.10  295.00
                      299.90  295.00  300.00  295.50  500.00  295.70
*
* buffer areas from 708 to Cruickston Creek (pre 105), hydrograph 1050
* Mar 5/20 add rear yards of multires blocks
*
*
COMPUTE FLOWRATE    ID=1 NHD= 105 AREA=   0.0331 Sq km  L=   30 m  W=    50 m
              SOIL ZONE I    II  III   IV    V    VI  VII  VIII   IX
                     0.0   0.0  0.0  15.5  0.0   0.4  0.0  84.2  0.0
                    RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.0 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr. 1104 and 1051, call result 1051
*
ADD HYD             ID=2 HYD NO= 1051 IDA=3 IDB=1 ICODE=0
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Catchment 1050 - Roofs from adjacent 708 MR to Cruickston for surface WB
* VS= 100.020 is main channel & VS=   2.035 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 1050 AREA=   0.0110 Sq km  L=    20 m  W=    10 m
              SOIL ZONE I    II  III   IV    V    VI  VII  VIII   IX
                   100.0   0.0  0.0  0.0  0.0   0.0  0.0  0.0  0.0
                    RATING CURVES: IDMC=4 IDOC=1 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  1050, 1051, call result  1105
*
ADD HYD             ID=5 HYD NO= 1105 IDA=2 IDB=1 ICODE=0
*
* Catchment 101
* VS= 100.035 is main channel & VS= 2.035 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 101 AREA=   0.0032 Sq km  L=  40 m  W=   100 m
              SOIL ZONE I    II  III   IV    V    VI  VII  VIII   IX
                     0.0   0.0  0.0  10.0  0.0  80.0  0.0  10.0  0.0
                    RATING CURVES: IDMC=3 IDOC=1 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 2.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Catchment 102
* VS= 100.035 is main channel & VS= 2.035 is off-channel
*
COMPUTE FLOWRATE    ID=2 NHD= 102 AREA=   0.0214 Sq km  L=  180 m  W=   120 m
              SOIL ZONE I    II  III   IV    V    VI  VII  VIII   IX
                     0.0   0.0  0.0   0.0  0.0   0.0  0.0 100.0  0.0
```

```
                    RATING CURVES: IDMC=3 IDOC=1 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 2.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  101, 102, call result  1101
*
ADD HYD             ID=4 HYD NO= 1101 IDA=1 IDB=2 ICODE=0
*
* Catchment 103
* VS= 100.020 is main channel & VS= 2.035 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 103 AREA=   0.0259 Sq km  L=  280 m  W=   90 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII    IX
                  0.0  10.0 10.0   0.0  0.0   0.0  0.0   0.0  80.0
                    RATING CURVES: IDMC=4 IDOC=1 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 5.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  103, 1101, call result  1102
*
ADD HYD             ID=2 HYD NO= 1102 IDA=1 IDB=4 ICODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Route flows from 1102 through a depression
*
ROUTE SPECIAL POND  ID=1 HYD NO=5103 INFLOW=2 PCODE=0 OPTION=15
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 308.000
                    Recharge characteristics for Compartment A
                      LEVELA= 307.300              EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 307.300 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB=  4.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  4
                                 Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                      (m)       (cms)   (ha*m)    (ha)   (cms)   (ha*m)    (ha)
                     307.300    0.000   0.000   0.000   0.000   0.000   0.200
                     307.500    0.000   0.000   0.000   0.000   0.055   0.347
                     307.600    0.000   0.000   0.000   0.000   0.093   0.415
                     308.000    0.000   0.000   0.000   5.000   0.312   0.680
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  5103, 1105, call result  1106
*
ADD HYD             ID=2 HYD NO= 1106 IDA=1 IDB=5 ICODE=0
*
*   0.5% Off-channel (Flat areas)
*
COMPUTE RATING CURVE ID=5  VS=    2.005   NSEGS=3
                     MIN EL=  100.00   MAX EL=  100.60
                     CHNSLP= 0.00500   FLNSLP= 0.00500
                     N= 0.350  DIST=   39.15
                     N=-0.150  DIST=   40.85
                     N= 0.350  DIST=   80.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  100.60    39.15  100.20    39.75  100.00
                      40.25  100.00    40.85  100.20    80.00  100.60
```



```
                    RFN=0.0000 PCODE=1
*
*   Catchment 0.5% Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=6  VS=   100.005   NSEGS=3
                     MIN EL=  100.70   MAX EL=  103.00
                     CHNSLP= 0.00500   FLNSLP= 0.005000
                     N= 0.080  DIST=   20.00
                     N=-0.050  DIST=   30.00
                     N= 0.080  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  103.00    20.00  101.00    23.00  100.80
                      25.00  100.70    27.00  100.80    30.00  101.00
                      50.00  103.00
                    RFN=0.0000 PCODE=1
*
* Catchment 108
* VS= 100.005 is main channel & VS= 2.005 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 108 AREA=   0.124 Sq km  L=  300 m  W=  250 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII    IX
                  0.0  10.0 45.0   0.0 15.0   0.0  0.0   0.0  30.0
                    RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 5.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  108, 1106, call result  1107
*
ADD HYD             ID=3 HYD NO= 1107 IDA=1 IDB=2 ICODE=0
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*
* Route flows from 1107 through small wetland storage area
*
ROUTE RESERVOIR     ID=1 HYD NO=5108 INFLOW=3 PCODE=0 OPTION=5
                       OUTFLOW   STORAGE    OUTFLOW   STORAGE
                         CMS       HA-M       CMS       HA-M
                         0.0       0.0      0.003      0.010
                       0.005       0.030      5.000      0.200
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
COMPUTE RATING CURVE ID=6  VS=    9.000   NSEGS=3
                     MIN EL=  294.25   MAX EL=  297.00
                     CHNSLP= 0.03500   FLNSLP= 0.03500
                     N= 0.080  DIST=   95.70
                     N=-0.035  DIST=   99.50
                     N= 0.080  DIST=  130.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                      70.00  297.00    78.00  296.00    94.00  295.00
                      95.70  294.40    97.60  294.25    99.50  294.40
                     100.00  295.00   115.00  296.00   130.00  297.00
                    RFN=0.0000 PCODE=1
*
* Route through reach 2108
* Using Valley Section 9.000  As channel Rating Curve
*
ROUTE CHANNEL       ID=3 HYD NO= 2108 INFLOW=1 LENGTH=   600 m  SLOPE=0.03500
                    RCID=6 NS=1 PCODE=1 INDEX=1 PIPE=0 CANOPY= 75.0%
*
*   5% Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=6  VS=   100.050   NSEGS=3
                     MIN EL=  100.70   MAX EL=  103.00
                     CHNSLP= 0.05000   FLNSLP= 0.050000
                     N= 0.080  DIST=   20.00
                     N=-0.050  DIST=   30.00
                     N= 0.080  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
```

```
                      0.00  103.00    20.00  101.00    23.00  100.80
                     25.00  100.70    27.00  100.80    30.00  101.00
                     50.00  103.00
                   RFN=0.0000 PCODE=1
* Catchment 109
* VS= 100.050 is main channel & VS= 2.050 is off-channel
*
COMPUTE FLOWRATE    ID=2 NHD= 109 AREA=   0.1252 Sq km  L=  600 m  W=  100 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII    IX
                     5.0   0.0  0.0   0.0 15.0   0.0 80.0   0.0   0.0
                   RATING CURVES: IDMC=6 IDOC=2 QRMC=  0.05 QROC=  0.01
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=0.00 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  109, 2108, call result  1108
*
ADD HYD             ID=1 HYD NO= 1108 IDA=3 IDB=2 ICODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Catchment 110
* VS= 100.050 is main channel & VS= 2.050 is off-channel
*
COMPUTE FLOWRATE    ID=2 NHD= 110 AREA=   0.0201 Sq km  L=  60 m  W=   60 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII    IX
                     0.0   0.0  0.0   0.0  0.0 100.0  0.0   0.0   0.0
                   RATING CURVES: IDMC=6 IDOC=2 QRMC=  0.05 QROC=  0.01
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 2.0 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=1.00 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  110, 1108, call result  1109
*
ADD HYD             ID=3 HYD NO= 1109 IDA=2 IDB=1 ICODE=0
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*
* Catchment 10% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=5  VS=     2.100   NSEGS=3
                     MIN EL=  100.00   MAX EL=  100.80
                     CHNSLP= 0.10000   FLNSLP= 0.10000
                     N= 0.350  DIST=   24.45
                     N=-0.150  DIST=   25.55
                     N= 0.350  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  100.80    24.45  100.30    24.75  100.00
                      25.50  100.00    25.55  100.30    50.00  100.80
                    RFN=0.0000 PCODE=1
*
* Catchment 111
* VS= 100.050 is main channel & VS= 1.10 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 111 AREA=   0.0498 Sq km  L=   10 m  W=   250 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII    IX
                     0.0   0.0  0.0   0.0  0.0   0.0  0.0 100.0   0.0
                   RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.05 QROC=  0.01
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 2.0 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=1.00 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
```



```
* Sum hydr.  111, 1109, call result  1110
*
ADD HYD             ID=2 HYD NO= 1110 IDA=1 IDB=3 ICODE=0
*
* Cruickston Creek at Blair Road
*
PRINT HYD           ID=2 PCODE=1 MODE=10
KEEP HYD            ID=2 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=2 IMET=1
*
COMPUTE RATING CURVE ID=5  VS=   7.000   NSEGS=3
                     MIN EL=  279.10   MAX EL=  281.00
                     CHNSLP= 0.01500   FLNSLP= 0.01700
                     N= 0.080  DIST=   98.95
                     N=-0.035  DIST=  100.95
                     N= 0.080  DIST=  165.00
                       DIST    ELEV    c  DIST    ELEV     DIST    ELEV
                       40.00  281.00    60.00  280.00    98.95  279.50
                      100.00  279.10   100.95  279.50   125.00  280.00
                      165.00  281.00
                     RFN=0.0000 PCODE=1
*
* Route through reach 2110
* Using Valley Section  7.000  As channel Rating Curve
*
ROUTE CHANNEL       ID=5 HYD NO= 2110 INFLOW=2 LENGTH=   800 m  SLOPE=0.01600
                    RCID=5 NS=1 PCODE=1 INDEX=1 PIPE=0 CANOPY= 50.0%
*
PRINT HYD           ID=5 PCODE=1 MODE=10
KEEP HYD            ID=5 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=5 IMET=1
NEW DUMP OUTPUT     MODE=10 ID=5 IOPT=4 FTYPE=0
*
*
*******************************************************************************
* BARRIE'S LAKE
*
*
*
*   2% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=1  VS=   100.020   NSEGS=3
                     MIN EL=  100.70   MAX EL=  103.00
                     CHNSLP= 0.02000   FLNSLP= 0.02000
                     N= 0.080  DIST=   20.00
                     N=-0.050  DIST=   30.00
                     N= 0.080  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  103.00    20.00  101.00    23.00  100.80
                      25.00  100.70    27.00  100.80    30.00  101.00
                      50.00  103.00
                     RFN=0.0000 PCODE=1
*
*   3.5% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=2  VS=   100.035   NSEGS=3
                     MIN EL=  100.70   MAX EL=  103.00
                     CHNSLP= 0.03500   FLNSLP= 0.03500
                     N= 0.080  DIST=   20.00
                     N=-0.050  DIST=   30.00
                     N= 0.080  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  103.00    20.00  101.00    23.00  100.80
                      25.00  100.70    27.00  100.80    30.00  101.00
                      50.00  103.00
                     RFN=0.0000 PCODE=1
*
* Catchment 2% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=3  VS=     2.020   NSEGS=3
                     MIN EL=  100.00   MAX EL=  100.80
                     CHNSLP= 0.02000   FLNSLP= 0.02000
                     N= 0.350  DIST=   24.45
                     N=-0.150  DIST=   25.55
                     N= 0.350  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
```

```
                      0.00  100.80    24.45  100.30    24.75  100.00
                     25.50  100.00    25.55  100.30    50.00  100.80
                   RFN=0.0000 PCODE=1
*
*   3.5% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=4  VS=     2.035   NSEGS=3
                     MIN EL=  100.00   MAX EL=  100.80
                     CHNSLP= 0.03500   FLNSLP= 0.03500
                     N= 0.350  DIST=   24.45
                     N=-0.150  DIST=   25.55
                     N= 0.350  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  100.80    24.45  100.30    24.75  100.00
                      25.50  100.00    25.55  100.30    50.00  100.80
                   RFN=0.0000 PCODE=1
*
*   10% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=5  VS=   100.100   NSEGS=3
                     MIN EL=  100.70   MAX EL=  103.00
                     CHNSLP= 0.10000   FLNSLP= 0.10000
                     N= 0.080  DIST=   20.00
                     N=-0.050  DIST=   30.00
                     N= 0.080  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  103.00    20.00  101.00    23.00  100.80
                      25.00  100.70    27.00  100.80    30.00  101.00
                      50.00  103.00
                   RFN=0.0000 PCODE=1
*
* Catchment 10% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=6  VS=     2.100   NSEGS=3
                     MIN EL=  100.00   MAX EL=  100.80
                     CHNSLP= 0.10000   FLNSLP= 0.10000
                     N= 0.350  DIST=   24.45
                     N=-0.150  DIST=   25.55
                     N= 0.350  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  100.80    24.45  100.30    24.75  100.00
                      25.50  100.00    25.55  100.30    50.00  100.80
                   RFN=0.0000 PCODE=1
*
* Catchment 305
* VS=  100.020 is main channel & VS= 2.020 is off-channel
*
COMPUTE FLOWRATE    ID=5 NHD= 305 AREA=   0.0015 Sq km  L=  80 m  W=   80 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                    0.0   0.0  0.0   9.4  0.0   0.0  0.0  90.6  0.0
                  RATING CURVES: IDMC=1 IDOC=3 QRMC=  0.05 QROC=  0.01
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 2.0 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=1.00 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=5 PCODE=1 MODE=10
*
* Typical Roof section
*
COMPUTE RATING CURVE ID=5  VS=   101.000   NSEGS=3
                     MIN EL=  295.00   MAX EL=  295.70
                     CHNSLP= 0.2500   FLNSLP= 0.2500
                     N= 0.018  DIST=  100.00
                     N=-0.018  DIST=  400.00
                     N= 0.018  DIST=  500.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  295.70   100.00  295.50   100.10  295.00
                     399.90  295.00   400.00  295.50   500.00  295.70
                   RFN=0.0000 PCODE=1
*
* Typical Urban section
*
```



```
COMPUTE RATING CURVE ID=6  VS=     3.200   NSEGS=3
                     MIN EL=  295.00   MAX EL=  295.70
                     CHNSLP= 0.02000   FLNSLP= 0.02000
                     N= 0.015  DIST=  200.00
                     N=-0.015  DIST=  300.00
                     N= 0.015  DIST=  500.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  295.70   200.00  295.50   200.10  295.00
                     299.90  295.00   300.00  295.50   500.00  295.70
*
*~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
*~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
*
*
* Roof areas within 709, hydrograph 9709
* VS=101.000 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=1 NHD= 9709 AREA=   0.0064 Sq km  L=   20 m  W=   10 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                  100.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0  0.0
                  RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=1.0 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Roof infiltration gallery within 709; hydrograph 8709
*
ROUTE SPECIAL POND  ID=2 HYD NO=8709 INFLOW=1 PCODE=0 OPTION= 5
                    Inflow controls:
                       USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                       GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 101.100
                    Recharge characteristics for Compartment A
                      LEVELA= 100.000                EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 10.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
                      CDB=  15.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  3
                                  Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)   (ha*m)    (ha)   (cms)   (ha*m)    (ha)
                     100.000     0.000  0.0000  0.0000   0.000  0.0000  0.0399
                     101.000     0.000  0.0000  0.0000   0.000  0.0160  0.0399
                     101.100     0.000  0.0000  0.0000   1.000  0.0175  0.0399
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Area of 709 to conveyance infiltration system, hydrograph 6709
*
COMPUTE FLOWRATE    ID=1 NHD= 6709 AREA=   0.0230 Sq km  L=  120 m  W=  120 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   42.9   0.0  0.0   8.8  0.0   0.2  0.0  48.1  0.0
                  RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=1.0 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Route 6709 through reservoir 4709 - conveyance infiltration system
*
ROUTE SPECIAL POND  ID=3 HYD NO=4709 INFLOW=1 PCODE=0 OPTION= 5
                    Inflow controls:
                       USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                       GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 101.100
                    Recharge characteristics for Compartment A
                      LEVELA= 100.000                EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
```

```
                    Recharge characteristics for Compartment B
                      LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
                      CDB=  15.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  3
                                    Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     100.000     0.000  0.0000  0.0000   0.000  0.0000  0.0385
                     101.000     0.000  0.0000  0.0000   0.000  0.0275  0.0385
                     101.100     0.000  0.0000  0.0000   1.000  0.0315  0.0385
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*
*
* Remainder of catchment 709, hydr. 7709
*
COMPUTE FLOWRATE    ID=1 NHD= 7709 AREA=   0.0082 Sq km  L=   120 m  W=   120 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                    42.9   0.0  0.0   8.8  0.0   0.2  0.0  48.1  0.0
                    RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.0 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Sum hydr. 4709, 7709, call result 3709, total non-roof area of 709
*
ADD HYD             ID=4 HYD NO= 3709 IDA=3 IDB=1 ICODE=0
PRINT HYD           ID=4 PCODE=1 MODE=10
*
*
* Sum components of 709 (3709, 8709), call result 709
*
ADD HYD             ID=1 HYD NO=  709 IDA=2 IDB=4 ICODE=0
PRINT HYD           ID=1 PCODE=1 MODE=10
*~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
*
*COMPUTE FLOWRATE    ID=1 NHD= 709 AREA=   0.0371 Sq km  L=   120 m  W=   120 m
*             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
*                   57.9   0.0  0.0   6.5  0.0   0.2  0.0  35.4  0.0
*                   RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
*                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
*                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
*                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
*                   GWFACT=1.0 GWON=1
*                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
*PRINT HYD           ID=1 PCODE=1 MODE=10
*~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
*
* Sum hydr. 305 and 709, call result 1709
*
ADD HYD             ID=2 HYD NO= 1709 IDA=5 IDB=1 ICODE=0
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Roof areas within 704, hydrograph 9704
* VS=101.000 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=1 NHD= 9704 AREA=   0.0053 Sq km  L=    20 m  W=    10 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                    100.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0  0.0
                    RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.0 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Roof infiltration gallery within 704; hydrograph 8704
*
```



```
ROUTE SPECIAL POND  ID=3 HYD NO=8704 INFLOW=1 PCODE=0 OPTION= 5
                    Inflow controls:
                      USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                      GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 101.100
                    Recharge characteristics for Compartment A
                      LEVELA= 100.000               EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 10.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
                      CDB=  15.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  3
                                    Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Str orage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     100.000     0.000  0.0000  0.0000   0.000  0.0000  0.0332
                     101.000     0.000  0.0000  0.0000   0.000  0.0133  0.0332
                     101.100     0.000  0.0000  0.0000   1.000  0.0146  0.0332
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*
*
* Area of 704 to conveyance infiltration system, hydrograph 6704
*
COMPUTE FLOWRATE    ID=6 NHD= 6704 AREA=   0.0170 Sq km  L=   100 m  W=   100 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   50.3   0.0  0.0   7.7  0.0   0.2  0.0  41.9  0.0
                   RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=1.0 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=6 PCODE=1 MODE=10
*
* Route 6704 through reservoir 4704 - conveyance infiltration system
*
ROUTE SPECIAL POND  ID=5 HYD NO=4704 INFLOW=6 PCODE=0 OPTION= 5
                    Inflow controls:
                      USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                      GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 101.100
                    Recharge characteristics for Compartment A
                      LEVELA= 100.000               EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
                      CDB=  15.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  3
                                    Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     100.000     0.000  0.0000  0.0000   0.000  0.0000  0.0260
                     101.000     0.000  0.0000  0.0000   0.000  0.0185  0.0260
                     101.100     0.000  0.0000  0.0000   1.000  0.0210  0.0260
*
PRINT HYD           ID=5 PCODE=1 MODE=10
*
*
* Remainder of catchment 704, hydr. 7704
*
* VS=3.200 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=6 NHD= 7704 AREA=   0.0115 Sq km  L=   165 m  W=   165 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   50.3   0.0  0.0   7.7  0.0   0.2  0.0  41.9  0.0
                   RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=1.0 GWON=1
```

```
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Sum catchment 704 component hydrographs
*
ADD HYD             ID=1 HYD NO= 3704 IDA=6 IDB=5 ICODE=0
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum components of 704 (3704, 8704), call result 704
*
ADD HYD             ID=4 HYD NO=  704 IDA=1 IDB=3 ICODE=0
PRINT HYD           ID=4 PCODE=1 MODE=10
*
* Add catchment 704 to catchments 709 and 305, call result 1704
*
ADD HYD             ID=1 HYD NO= 1704 IDA=2 IDB=4 ICODE=0
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* SWM Facility 1 (Southwest SWM Facility)
* Route 1704 through resevoir 5704
* Revised May '18 to allow Regional Water Station to remain adjacent to SWM Block
* Revised Mar 1'19
*
ROUTE SPECIAL POND  ID=2 HYD NO=5704 INFLOW=1 PCODE=0 OPTION=15
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 310.700
                    Recharge characteristics for Compartment A
                      LEVELA= 309.600              EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 10.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 309.600 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB=   0.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  12
                                Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                      (m)        (cms)   (ha*m)    (ha)    (cms)   (ha*m)    (ha)
                     309.600    0.000   0.000   0.000   0.000   0.000   0.222
                     309.700    0.000   0.000   0.000   0.003   0.023   0.236
                     309.800    0.000   0.000   0.000   0.005   0.047   0.250
                     309.900    0.000   0.000   0.000   0.006   0.073   0.264
                     310.000    0.000   0.000   0.000   0.101   0.100   0.278
                     310.100    0.000   0.000   0.000   0.273   0.129   0.293
                     310.200    0.000   0.000   0.000   0.494   0.159   0.311
                     310.300    0.000   0.000   0.000   0.757   0.190   0.322
                     310.400    0.000   0.000   0.000   1.055   0.223   0.332
                     310.500    0.000   0.000   0.000   1.384   0.257   0.344
                     310.600    0.000   0.000   0.000   1.742   0.292   0.356
                     310.700    0.000   0.000   0.000   2.126   0.328   0.370
*
PRINT HYD           ID=2 PCODE=1 MODE=10
KEEP HYD            ID=2 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=2 IMET=1
*
* Catchment 705, uncontrolled area of Blenheim road draining to Wetland 3
*
COMPUTE FLOWRATE    ID=1 NHD= 705 AREA=   0.0043 Sq km  L=   60 m  W=   20 m
              SOIL ZONE I    II  III   IV    V    VI  VII  VIII   IX
                    80.0   0.0  0.0   3.1  0.0   0.1  0.0  16.8  0.0
                    RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.0 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
KEEP HYD            ID=1 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=1 IMET=1
*
* Sum hydr. 5704 and 705, call result 1705
*
ADD HYD             ID=4 HYD NO= 1705 IDA=2 IDB=1 ICODE=0
PRINT HYD           ID=4 PCODE=1 MODE=10
*
```



```
* Catchment 402
* VS=  100.020 is main channel & VS= 2.035 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 402 AREA=   0.0507 Sq km  L=   55 m  W=   270 m
              SOIL ZONE I    II  III   IV    V    VI  VII  VIII   IX
                    7.4   0.0  0.0  30.6  0.0   0.0  0.0  62.0  0.0
                    RATING CURVES: IDMC=1 IDOC=4 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 2.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  1705, 402, call result  1401
*
ADD HYD             ID=3 HYD NO= 1401 IDA=4 IDB=1 ICODE=0
PRINT HYD           ID=3 PCODE=1 MODE=10
*
*   5% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=5  VS=   100.050   NSEGS=3
                     MIN EL=  100.70   MAX EL=  103.00
                     CHNSLP= 0.05000   FLNSLP= 0.05000
                     N= 0.080  DIST=   20.00
                     N=-0.050  DIST=   30.00
                     N= 0.080  DIST=   50.00
                       DIST     ELEV     DIST     ELEV     DIST     ELEV
                      0.00   103.00    20.00   101.00    23.00   100.80
                     25.00   100.70    27.00   100.80    30.00   101.00
                     50.00   103.00
                    RFN=0.0000 PCODE=1
*
* Catchment 5% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=6  VS=     2.050   NSEGS=3
                     MIN EL=  100.00   MAX EL=  100.80
                     CHNSLP= 0.05000   FLNSLP= 0.05000
                     N= 0.350  DIST=   24.45
                     N=-0.150  DIST=   25.55
                     N= 0.350  DIST=   50.00
                       DIST     ELEV     DIST     ELEV     DIST     ELEV
                      0.00   100.80    24.45   100.30    24.75   100.00
                     25.50   100.00    25.55   100.30    50.00   100.80
                    RFN=0.0000 PCODE=1
*
* Catchment 403
* HRU was              1.0  41.0 18.7   8.8  0.0   0.0  0.0  30.5  0.0
* VS=  100.050 is main channel & VS= 2.050 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 403 AREA=   0.1073 Sq km  L=  140 m  W=   180 m
              SOIL ZONE I    II  III   IV    V    VI  VII  VIII   IX
                    1.0  26.0 33.7   8.8  0.0   0.0  0.0  30.5  0.0
                    RATING CURVES: IDMC=5 IDOC=6 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 5.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=1.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  1401, 403, call result  1402
*
ADD HYD             ID=2 HYD NO= 1402 IDA=1 IDB=3 ICODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Route flows from 1402 through a depression
* Revised Sept 27/17 to include storage down to 307.9 to match monitored data
*
ROUTE SPECIAL POND  ID=6 HYD NO=5403 INFLOW=2 PCODE=0 OPTION=15
                    Inflow controls:
```

```
                    USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                    GWPCT=  0% GWDIV=0
                  Maximum level for Routing Tables:  ZMAX= 309.500
                  Recharge characteristics for Compartment A
                    LEVELA= 307.900                EVAPA= 0.0 mm/d ACODE=0
                    CDA=   0.000 mm/h  DZA= 23.00 m
                  Recharge characteristics for Compartment B
                    LEVELB= 307.900 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                    CDB=  4.000 mm/h  DZB= 10.00 m
                  Irrigation Pond Controls: IPOND=0
                  Number of points=  7
                                Compartment  A          Compartment B
                  Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                     (m)       (cms)   (ha*m)    (ha)   (cms)   (ha*m)    (ha)
                   307.900     0.000   0.000   0.000   0.000   0.000   0.745
                   308.200     0.000   0.000   0.000   0.000   0.235   0.824
                   308.500     0.000   0.000   0.000   0.000   0.986   4.184
                   309.000     0.000   0.000   0.000   0.000   3.497   5.859
                   309.200     0.000   0.000   0.000   0.000   4.673   5.902
                   309.400     0.000   0.000   0.000   0.000   6.726   7.784
                   309.500     0.000   0.000   0.000   5.000   6.726   7.784
*
PRINT HYD          ID=6 PCODE=1 MODE=10
*
* Catchment 405
* VS=  100.020 is main channel & VS= 2.020 is off-channel
*
COMPUTE FLOWRATE   ID=1 NHD= 405 AREA=   0.0966 Sq km  L=  230 m  W=   210 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   1.0   0.0  0.0  19.8  0.0   0.0  0.0  79.2  0.0
                  RATING CURVES: IDMC=1 IDOC=3 QRMC=  0.05 QROC=  0.01
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=1.00 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Route flows from 405 through a depression
*
ROUTE SPECIAL POND ID=2 HYD NO=5405 INFLOW=1 PCODE=0 OPTION=15
                  Inflow controls:
                    USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                    GWPCT=  0% GWDIV=0
                  Maximum level for Routing Tables:  ZMAX= 315.000
                  Recharge characteristics for Compartment A
                    LEVELA= 313.600                EVAPA= 0.0 mm/d ACODE=0
                    CDA=   0.000 mm/h  DZA= 23.00 m
                  Recharge characteristics for Compartment B
                    LEVELB= 313.600 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                    CDB= 25.000 mm/h  DZB= 10.00 m
                  Irrigation Pond Controls: IPOND=0
                  Number of points=  9
                                Compartment  A          Compartment B
                  Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                     (m)       (cms)   (ha*m)    (ha)   (cms)   (ha*m)    (ha)
                   313.600     0.000   0.000   0.000   0.000   0.000   0.001
                   313.700     0.000   0.000   0.000   0.000   0.002   0.042
                   313.800     0.000   0.000   0.000   0.000   0.012   0.159
                   313.900     0.000   0.000   0.000   0.000   0.034   0.275
                   314.000     0.000   0.000   0.000   0.000   0.068   0.400
                   314.200     0.000   0.000   0.000   0.000   0.173   0.657
                   314.400     0.000   0.000   0.000   0.000   0.347   1.079
                   314.700     0.000   0.000   0.000   0.000   0.778   1.793
                   315.000     0.000   0.000   0.000   5.000   1.430   2.554
*
PRINT HYD          ID=2 PCODE=1 MODE=10
*
* Catchment 406
* VS=  100.020 is main channel & VS= 2.035 is off-channel
*
COMPUTE FLOWRATE   ID=1 NHD= 406 AREA=   0.093 Sq km  L=  180 m  W=  275 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   0.0   0.0  0.0  15.0  0.0   0.0  0.0  85.0  0.0
                  RATING CURVES: IDMC=1 IDOC=4 QRMC=  0.05 QROC=  0.01
```



```
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=1.00 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Sum hydr.  5405, 406, call result  1403
*
ADD HYD            ID=3 HYD NO= 1403 IDA=1 IDB=2 ICODE=0
*
* Route flows from 1403 through a depression
*
ROUTE SPECIAL POND ID=1 HYD NO=5406 INFLOW=3 PCODE=0 OPTION=15
                  Inflow controls:
                    USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                    GWPCT=  0% GWDIV=0
                  Maximum level for Routing Tables:  ZMAX= 101.000
                  Recharge characteristics for Compartment A
                    LEVELA= 98.800                 EVAPA= 0.0 mm/d ACODE=0
                    CDA=   0.000 mm/h  DZA= 23.00 m
                  Recharge characteristics for Compartment B
                    LEVELB= 98.800 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                    CDB= 25.000 mm/h  DZB= 10.00 m
                  Irrigation Pond Controls: IPOND=0
                  Number of points=  4
                                Compartment  A          Compartment B
                  Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                     (m)       (cms)   (ha*m)    (ha)   (cms)   (ha*m)    (ha)
                    98.800     0.000   0.000   0.000   0.000   0.000   0.001
                   100.000     0.000   0.000   0.000   0.000   0.036   0.358
                   100.500     0.000   0.000   0.000   0.000   0.353   0.912
                   101.000     0.000   0.000   0.000   5.000   0.992   1.642
*
PRINT HYD          ID=1 PCODE=1 MODE=10
*
* Typical Roof section
*
COMPUTE RATING CURVE ID=5  VS=   101.000   NSEGS=3
                    MIN EL=  295.00   MAX EL=  295.70
                    CHNSLP= 0.2500   FLNSLP= 0.2500
                    N= 0.018  DIST=  100.00
                    N=-0.018  DIST=  400.00
                    N= 0.018  DIST=  500.00
                      DIST    ELEV    DIST    ELEV    DIST    ELEV
                      0.00  295.70  100.00  295.50  100.10  295.00
                    399.90  295.00  400.00  295.50  500.00  295.70
                   RFN=0.0000 PCODE=1
*
* Typical Urban section
*
COMPUTE RATING CURVE ID=6  VS=     3.200   NSEGS=3
                    MIN EL=  295.00   MAX EL=  295.70
                    CHNSLP= 0.02000   FLNSLP= 0.02000
                    N= 0.015  DIST=  200.00
                    N=-0.015  DIST=  300.00
                    N= 0.015  DIST=  500.00
                      DIST    ELEV    DIST    ELEV    DIST    ELEV
                      0.00  295.70  200.00  295.50  200.10  295.00
                    299.90  295.00  300.00  295.50  500.00  295.70
*
* Roof areas within 712, hydrograph 7120
* VS=101.000 MC, VS=3.200 OC
*
COMPUTE FLOWRATE   ID=2 NHD= 7120 AREA=   0.0081 Sq km  L=   20 m  W=    10 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                  100.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0  0.0
                  RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=1.0 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD          ID=2 PCODE=1 MODE=10
```

```
*
* Catchment 404
* VS=  100.020 is main channel & VS= 2.020 is off-channel
*
COMPUTE FLOWRATE    ID=3 NHD= 404 AREA=   0.0517 Sq km  L=  50 m  W=  70 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                    0.0   0.0  0.0  30.0  0.0   0.0  0.0  70.0  0.0
                   RATING CURVES: IDMC=1 IDOC=3 QRMC=  0.05 QROC=  0.01
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=1.00 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*
* Sum hydr.  7120, 404, call result  1712
*
ADD HYD             ID=4 HYD NO= 1712 IDA=2 IDB=3 ICODE=0
PRINT HYD           ID=4 PCODE=1 MODE=10
*
* Sum hydr.  5406, 1712, call result  1404
*
ADD HYD             ID=3 HYD NO= 1404 IDA=1 IDB=4 ICODE=0
PRINT HYD           ID=3 PCODE=1 MODE=10
*
* Catchment 407
* VS=  100.035 is main channel & VS= 2.035 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 407 AREA=   0.2555 Sq km  L=  100 m  W=  100 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                    0.5  30.0 14.9  14.9  0.0   0.0  0.0   9.2 30.5
                   RATING CURVES: IDMC=2 IDOC=4 QRMC=  0.05 QROC=  0.01
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 5.0 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=1.00 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  1404, 407, call result  1405
*
ADD HYD             ID=2 HYD NO= 1405 IDA=1 IDB=3 ICODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* WETLAND 4 SURFACE RUNOFF WATER BALANCE POINT OF ASSESSMENT (1405)
*
* Route flows from 1405 through a depression (Wetland 4/5)
*
*
ROUTE SPECIAL POND  ID=1 HYD NO=5407 INFLOW=2 PCODE=0 OPTION=15
                   Inflow controls:
                       USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                       GWPCT=  0% GWDIV=0
                   Maximum level for Routing Tables:  ZMAX= 309.300
                   Recharge characteristics for Compartment A
                     LEVELA= 308.800                EVAPA= 0.0 mm/d ACODE=0
                     CDA=   0.000 mm/h  DZA= 23.00 m
                   Recharge characteristics for Compartment B
                     LEVELB= 308.800 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                     CDB=  4.000 mm/h  DZB= 10.00 m
                   Irrigation Pond Controls: IPOND=0
                   Number of points=  4
                                  Compartment  A          Compartment B
                   Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                      (m)       (cms)   (ha*m)    (ha)   (cms)   (ha*m)    (ha)
                    308.800     0.000   0.000   0.000   0.000   0.000   3.600
                    309.000     0.000   0.000   0.000   0.000   0.953   5.932
                    309.200     0.000   0.000   0.000   0.000   2.292   7.459
                    309.300     0.000   0.000   0.000   5.000   2.750   8.225
*
PRINT HYD           ID=1 PCODE=1 MODE=10
```



```
*
* Sum hydr.  5403, 5407, call result  1406
*
ADD HYD             ID=2 HYD NO= 1406 IDA=1 IDB=6 ICODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Route flows from 1406 through a depression
*
ROUTE SPECIAL POND  ID=6 HYD NO=5437 INFLOW=2 PCODE=0 OPTION=15
                   Inflow controls:
                       USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                       GWPCT=  0% GWDIV=0
                   Maximum level for Routing Tables:  ZMAX= 310.900
                   Recharge characteristics for Compartment A
                     LEVELA= 309.200                EVAPA= 0.0 mm/d ACODE=0
                     CDA=   0.000 mm/h  DZA= 23.00 m
                   Recharge characteristics for Compartment B
                     LEVELB= 309.200 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                     CDB=  4.000 mm/h  DZB= 10.00 m
                   Irrigation Pond Controls: IPOND=0
                   Number of points=  6
                                  Compartment  A          Compartment B
                   Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                      (m)       (cms)   (ha*m)    (ha)   (cms)   (ha*m)    (ha)
                    309.200     0.000   0.000   0.000   0.000   0.000  13.36
                    309.500     0.000   0.000   0.000   0.000   4.501  16.65
                    310.000     0.000   0.000   0.000   0.000  14.54   23.50
                    310.500     0.000   0.000   0.000   0.000  27.30   27.54
                    310.800     0.000   0.000   0.000   0.000  35.96   30.21
                    310.900     0.000   0.000   0.000   5.000  36.50   31.99
*
PRINT HYD           ID=6 PCODE=1 MODE=10
*
* Typical Roof section
*
COMPUTE RATING CURVE ID=5  VS=   101.000   NSEGS=3
                     MIN EL=  295.00   MAX EL=  295.70
                     CHNSLP= 0.2500   FLNSLP= 0.2500
                     N= 0.018  DIST=  100.00
                     N=-0.018  DIST=  400.00
                     N= 0.018  DIST=  500.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  295.70   100.00  295.50   100.10  295.00
                     399.90  295.00   400.00  295.50   500.00  295.70
                    RFN=0.0000 PCODE=1
*
* Typical Urban section
*
COMPUTE RATING CURVE ID=6  VS=     3.200   NSEGS=3
                     MIN EL=  295.00   MAX EL=  295.70
                     CHNSLP= 0.02000   FLNSLP= 0.02000
                     N= 0.015  DIST=  200.00
                     N=-0.015  DIST=  300.00
                     N= 0.015  DIST=  500.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  295.70   200.00  295.50   200.10  295.00
                     299.90  295.00   300.00  295.50   500.00  295.70
*
* Roof (NOT rear yard areas and buffer areas) from 709 to Barrie's Lake
*
COMPUTE FLOWRATE    ID=4 NHD= 7090 AREA=   0.0070 Sq km  L=   20 m  W=   10 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   100.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0  0.0
                   RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=1.0 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=4 PCODE=1 MODE=10
*
* Sum hydr. 5437 and 7090, call result 7091
```

```
*
ADD HYD             ID=5 HYD NO= 7091 IDA=6 IDB=4 ICODE=0
PRINT HYD           ID=5 PCODE=1 MODE=10
*
* Catchment 10% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=5  VS=     2.100   NSEGS=3
                      MIN EL=  100.00   MAX EL=  100.80
                      CHNSLP= 0.10000   FLNSLP= 0.10000
                      N= 0.350  DIST=   24.45
                      N=-0.150  DIST=   25.55
                      N= 0.350  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1
*
* Catchment 408
* VS=  100.020 is main channel & VS= 2.100 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 408 AREA=   0.0148 Sq km  L=   50 m  W=  120 m
            SOIL ZONE I    II  III   IV    V    VI  VII  VIII   IX
                   3.0   0.0  0.0   9.7  0.0   0.0  0.0  87.3  0.0
                  RATING CURVES: IDMC=1 IDOC=5 QRMC=  0.05 QROC=  0.01
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=1.00 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Catchment 5% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=6  VS=     2.050   NSEGS=3
                      MIN EL=  100.00   MAX EL=  100.80
                      CHNSLP= 0.05000   FLNSLP= 0.05000
                      N= 0.350  DIST=   24.45
                      N=-0.150  DIST=   25.55
                      N= 0.350  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1
*
* Catchment 409
* VS=  100.035 is main channel & VS= 2.050 is off-channel
*
COMPUTE FLOWRATE    ID=2 NHD= 409 AREA=   0.884 Sq km  L=  300 m  W=  200 m
            SOIL ZONE I    II  III   IV    V    VI  VII  VIII   IX
                   3.0  28.0  0.0   0.0  5.8   0.0 24.9   0.0 38.3
                  RATING CURVES: IDMC=2 IDOC=6 QRMC=  0.05 QROC=  0.01
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 4.0 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=1.00 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  408, 409, call result  1407
*
ADD HYD             ID=3 HYD NO= 1407 IDA=1 IDB=2 ICODE=0
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*
* Sum hydr. 1407, 7091, call result  1408
*
ADD HYD             ID=1 HYD NO= 1408 IDA=3 IDB=5 ICODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Route flows from 1408 through Barrie's Lake
*
```



```
ROUTE SPECIAL POND  ID=2 HYD NO=5409 INFLOW=1 PCODE=0 OPTION=15
                    Inflow controls:
                       USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                       GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 310.500
                    Recharge characteristics for Compartment A
                      LEVELA= 308.500                EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 308.500 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB=  4.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  3
                                  Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)   (ha*m)    (ha)   (cms)   (ha*m)    (ha)
                     308.500     0.000   0.000   0.000   0.000   0.000   27.00
                     309.500     0.000   0.000   0.000   0.000   28.50   30.00
                     310.500     0.000   0.000   0.000   0.000   61.50   36.00
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
*******************************************************************************
* NEWMAN CREEK
*
*
*
*   2.0% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=1  VS=     2.020   NSEGS=3
                      MIN EL=  100.00   MAX EL=  100.80
                      CHNSLP= 0.02000   FLNSLP= 0.02000
                      N= 0.350  DIST=   24.45
                      N=-0.150  DIST=   25.55
                      N= 0.350  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1

*
*   10.0% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=2  VS=     2.100   NSEGS=3
                      MIN EL=  100.00   MAX EL=  100.80
                      CHNSLP= 0.10000   FLNSLP= 0.10000
                      N= 0.350  DIST=   24.45
                      N=-0.150  DIST=   25.55
                      N= 0.350  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1
*
*   1.0% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=3  VS=   100.010   NSEGS=3
                      MIN EL=  100.70   MAX EL=  103.00
                      CHNSLP= 0.01000   FLNSLP= 0.01000
                      N= 0.080  DIST=   20.00
                      N=-0.050  DIST=   30.00
                      N= 0.080  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  103.00    20.00  101.00    23.00  100.80
                       25.00  100.70    27.00  100.80    30.00  101.00
                       50.00  103.00
                     RFN=0.0000 PCODE=1
*
* Typical Urban section
*
COMPUTE RATING CURVE ID=5  VS=     3.200   NSEGS=3
                      MIN EL=  295.00   MAX EL=  295.70
                      CHNSLP= 0.01000   FLNSLP= 0.01000
                      N= 0.015  DIST=  200.00
```

```
                    N=-0.015  DIST=  300.00
                    N= 0.015  DIST=  500.00
                      DIST    ELEV     DIST    ELEV     DIST    ELEV
                      0.00  295.70   200.00  295.50   200.10  295.00
                    299.90  295.00   300.00  295.50   500.00  295.70
*
* Typical Urban section
*
COMPUTE RATING CURVE ID=6  VS=     3.200   NSEGS=3
                    MIN EL=  295.00   MAX EL=  295.70
                    CHNSLP= 0.02000   FLNSLP= 0.02000
                    N= 0.015  DIST=  200.00
                    N=-0.015  DIST=  300.00
                    N= 0.015  DIST=  500.00
                      DIST    ELEV     DIST    ELEV     DIST    ELEV
                      0.00  295.70   200.00  295.50   200.10  295.00
                    299.90  295.00   300.00  295.50   500.00  295.70
*
* Catchment 201
* VS=  100.010 is main channel & VS= 2.020 is off-channel
*
COMPUTE FLOWRATE    ID=3 NHD= 201 AREA=   0.0639 Sq km  L=  260 m  W=   245 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   44.0   2.6  0.0   0.0  0.0   0.0  0.0  53.2  0.0
                  RATING CURVES: IDMC=5 IDOC=6 QRMC=  0.5 QROC=  0.05
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=1.00 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*
* Typical Roof section
*
COMPUTE RATING CURVE ID=5  VS=   101.000   NSEGS=3
                    MIN EL=  295.00   MAX EL=  295.70
                    CHNSLP= 0.2500   FLNSLP= 0.2500
                    N= 0.018  DIST=  100.00
                    N=-0.018  DIST=  400.00
                    N= 0.018  DIST=  500.00
                      DIST    ELEV     DIST    ELEV     DIST    ELEV
                      0.00  295.70   100.00  295.50   100.10  295.00
                    399.90  295.00   400.00  295.50   500.00  295.70
                   RFN=0.0000 PCODE=1
*
********** Cambridge West Area to Newman Pond **************
*
* Roof areas within 710
*
COMPUTE FLOWRATE    ID=1 NHD= 9710 AREA=   0.0181 Sq km  L=   20 m  W=    10 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                  100.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0  0.0
                  RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=1.0 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Route 9710 through reservoir 8710
*
ROUTE SPECIAL POND  ID=2 HYD NO=8710 INFLOW=1 PCODE=0 OPTION= 5
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 101.100
                    Recharge characteristics for Compartment A
                      LEVELA= 100.000                EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 10.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
                      CDB=  15.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
```



```
                    Number of points=  3
                                 Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     100.000     0.000  0.0000  0.0000   0.000  0.0000  0.1132
                     101.000     0.000  0.0000  0.0000   0.000  0.0453  0.1132
                     101.100     0.000  0.0000  0.0000   1.000  0.0498  0.1132
*
* Remaining area within 710
*
COMPUTE FLOWRATE    ID=1 NHD= 7710 AREA=   0.0450 Sq km  L=  60 m  W=  230 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   41.6   0.0  0.0   9.0  0.0   0.2  0.0  49.2  0.0
                  RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=1.0 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
ADD HYD             ID=4 HYD NO=  710 IDA=2 IDB=1 ICODE=0
*
PRINT HYD           ID=4 PCODE=1 MODE=10
*
* Add 710 to 201
*
ADD HYD             ID=1 HYD NO= 0010 IDA=3 IDB=4 ICODE=0
*
* Roof areas within 711
*
COMPUTE FLOWRATE    ID=2 NHD= 9711 AREA=   0.0051 Sq km  L=   20 m  W=    10 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                  100.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0  0.0
                  RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=0.0 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Route 9711 through reservoir 8711
*
ROUTE SPECIAL POND  ID=3 HYD NO=8711 INFLOW=2 PCODE=0 OPTION= 5
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 101.100
                    Recharge characteristics for Compartment A
                      LEVELA= 100.000                EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
                      CDB=  15.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  3
                                 Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     100.000     0.000  0.0000  0.0000   0.000  0.0000  0.0316
                     101.000     0.000  0.0000  0.0000   0.000  0.0126  0.0316
                     101.100     0.000  0.0000  0.0000   1.000  0.0139  0.0316
*
* Remaining area within 711
*
COMPUTE FLOWRATE    ID=2 NHD= 7711 AREA=   0.0209 Sq km  L=  60 m  W=  100 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   38.2   0.0  0.0   9.6  0.0   0.2  0.0  52.0  0.0
                  RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=0.0 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
```

```
ADD HYD            ID=4 HYD NO=  711 IDA=3 IDB=2 ICODE=0
*
PRINT HYD          ID=4 PCODE=1 MODE=10
*
* Add 711 to 710 & 210
*
ADD HYD            ID=3 HYD NO=  2200 IDA=1 IDB=4 ICODE=0
*
PRINT HYD          ID=3 PCODE=1 MODE=10
*
********** End Cambridge West Area to Newman Pond **************
*
* Route flows from 201 through existing Grandview Hills SWM Facility (Newman)
*
ROUTE SPECIAL POND  ID=2 HYD NO=5201 INFLOW=3 PCODE=0 OPTION=15
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 306.200
                    Recharge characteristics for Compartment A
                      LEVELA= 304.000                EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 304.000 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB=   0.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  12
                                  Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)   (ha*m)    (ha)   (cms)   (ha*m)    (ha)
                     304.000    0.000   0.000   0.000   0.000   0.000   0.290
                     304.200    0.000   0.000   0.000   0.005   0.043   0.290
                     304.400    0.000   0.000   0.000   0.007   0.090   0.290
                     304.600    0.000   0.000   0.000   0.009   0.150   0.290
                     304.800    0.000   0.000   0.000   0.011   0.227   0.290
                     305.000    0.000   0.000   0.000   0.012   0.316   0.290
                     305.200    0.000   0.000   0.000   0.013   0.411   0.290
                     305.400    0.000   0.000   0.000   0.014   0.515   0.290
                     305.600    0.000   0.000   0.000   0.015   0.626   0.290
                     305.800    0.000   0.000   0.000   0.205   0.746   0.290
                     306.000    0.000   0.000   0.000   0.581   0.874   0.290
                     306.200    0.000   0.000   0.000   0.639   1.012   0.290
*
*
PRINT HYD          ID=2 PCODE=1 MODE=10
KEEP HYD           ID=2 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=2 IMET=1
NEW DUMP OUTPUT    MODE=10 ID=2 IOPT=4 FTYPE=0
*
COMPUTE RATING CURVE ID=4  VS=   6.000   NSEGS=3
                     MIN EL=  298.40   MAX EL=  300.00
                     CHNSLP= 0.06600   FLNSLP= 0.07400
                     N= 0.080  DIST=   98.90
                     N=-0.035  DIST=  101.10
                     N= 0.080  DIST=  125.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                      75.00  300.00    85.00  299.50    95.00  299.00
                      98.90  298.90    99.30  298.40   100.70  298.40
                     101.10  298.90   105.00  299.00   115.00  299.50
                     125.00  300.00
                    RFN=0.0000 PCODE=1
*
* Route through reach 2201
* Using Valley Section 6.0  As channel Rating Curve
*
ROUTE CHANNEL      ID=1 HYD NO= 2201 INFLOW=2 LENGTH=   350 m  SLOPE=0.07
                   RCID=4 NS=1 PCODE=1 INDEX=1 PIPE=0 CANOPY= 75.0%
*
*   0.5% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=4  VS=   100.005   NSEGS=3
                     MIN EL=  100.70   MAX EL=  103.00
                     CHNSLP= 0.00500   FLNSLP= 0.00500
                     N= 0.080  DIST=   20.00
                     N=-0.050  DIST=   30.00
```



```
                     N= 0.080  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  103.00    20.00  101.00    23.00  100.80
                       25.00  100.70    27.00  100.80    30.00  101.00
                       50.00  103.00
                    RFN=0.0000 PCODE=1
*
* Catchment 202
* VS=  100.005 is main channel & VS= 2.100 is off-channel
*
COMPUTE FLOWRATE    ID=2 NHD= 202 AREA=  0.1043 Sq km  L=  400 m  W=   200 m
            SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   0.0   0.0  0.0   0.0 30.0   0.0 50.0   0.0 20.0
                 RATING CURVES: IDMC=4 IDOC=2 QRMC=  0.05 QROC=  0.01
                 ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                 SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                 RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                 GWFACT=0.00 GWON=1
                 SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD          ID=2 PCODE=1 MODE=10
*
* Sum hydr.  2201, 202, call result  1201
*
ADD HYD            ID=3 HYD NO= 1201 IDA=1 IDB=2 ICODE=0
*
*   5.0% Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=4  VS=   100.050   NSEGS=3
                     MIN EL=  100.70   MAX EL=  103.00
                     CHNSLP= 0.05000   FLNSLP= 0.05000
                     N= 0.080  DIST=   20.00
                     N=-0.050  DIST=   30.00
                     N= 0.080  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  103.00    20.00  101.00    23.00  100.80
                       25.00  100.70    27.00  100.80    30.00  101.00
                       50.00  103.00
                    RFN=0.0000 PCODE=1
*
* Catchment 203
* VS=  100.050 is main channel & VS= 2.100 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 203 AREA=  0.0368 Sq km  L=  380 m  W=   100 m
            SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   0.0   0.0  0.0   0.0  0.0 100.0  0.0   0.0  0.0
                 RATING CURVES: IDMC=4 IDOC=2 QRMC=  0.05 QROC=  0.01
                 ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 2.0 TLO= 0.0
                 SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                 RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                 GWFACT=0.00 GWON=1
                 SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD          ID=1 PCODE=1 MODE=10
*
* Sum hydr.  1201, 203, call result  1202
*
ADD HYD            ID=2 HYD NO= 1202 IDA=3 IDB=1 ICODE=0
*
* Newman Creek at Blair Road
*
PRINT HYD          ID=2 PCODE=1 MODE=10
*
COMPUTE RATING CURVE ID=4  VS=   5.000   NSEGS=3
                     MIN EL=  277.20   MAX EL=  280.00
                     CHNSLP= 0.02500   FLNSLP= 0.02700
                     N= 0.080  DIST=   98.95
                     N=-0.035  DIST=  100.95
                     N= 0.080  DIST=  165.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                      85.00  280.00    95.00  278.00    98.00  277.50
                     100.00  277.20   102.00  277.50   105.00  278.00
                     115.00  280.00
                    RFN=0.0000 PCODE=1
```

```
*
* Route through reach 2202
* Using Valley Section 5.0 as channel Rating Curve
*
ROUTE CHANNEL       ID=1 HYD NO= 2202 INFLOW=2 LENGTH=   520 m  SLOPE=0.025
                    RCID=4 NS=1 PCODE=1 INDEX=1 PIPE=0 CANOPY= 75.0%
*
*   1% Off-channel (Flat areas)
*
COMPUTE RATING CURVE ID=4  VS=     1.010   NSEGS=3
                     MIN EL=  100.00   MAX EL=  100.60
                     CHNSLP= 0.01000   FLNSLP= 0.01000
                     N= 0.350  DIST=   39.15
                     N=-0.150  DIST=   40.85
                     N= 0.350  DIST=   80.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.60    39.15  100.20    39.75  100.00
                       40.25  100.00    40.85  100.20    80.00  100.60
                    RFN=0.0000 PCODE=1
*
* Catchment 204
* VS=  100.010 is main channel & VS= 2.010 is off-channel
*
COMPUTE FLOWRATE    ID=2 NHD= 204 AREA=   0.0453 Sq km  L=  200 m  W=   115 m
              SOIL ZONE I    II  III   IV    V    VI  VII  VIII   IX
                    0.0   0.0  0.0  10.0  0.0  50.0  0.0  40.0  0.0
                   RATING CURVES: IDMC=3 IDOC=4 QRMC=  0.05 QROC=  0.01
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 2.0 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=0.00 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum 204, 2202, call result 1203
*
ADD HYD             ID=3 HYD NO= 1203 IDA=1 IDB=2 ICODE=0
*
*   2% off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=4  VS=     2.020   NSEGS=3
                     MIN EL=  100.00   MAX EL=  100.80
                     CHNSLP= 0.02000   FLNSLP= 0.02000
                     N= 0.350  DIST=   24.45
                     N=-0.150  DIST=   25.55
                     N= 0.350  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                    RFN=0.0000 PCODE=1
*
*   2.0% Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=5  VS=   100.020   NSEGS=3
                     MIN EL=  100.70   MAX EL=  103.00
                     CHNSLP= 0.02000   FLNSLP= 0.02000
                     N= 0.080  DIST=   20.00
                     N=-0.050  DIST=   30.00
                     N= 0.080  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  103.00    20.00  101.00    23.00  100.80
                       25.00  100.70    27.00  100.80    30.00  101.00
                       50.00  103.00
                    RFN=0.0000 PCODE=1
*
* Catchment 205
* VS=  100.020 is main channel & VS= 2.020 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 205 AREA=   0.07 Sq km  L=  500 m  W=   140 m
              SOIL ZONE I    II  III   IV    V    VI  VII  VIII   IX
                    0.0   0.0 35.0  0.0  0.0   0.0 65.0   0.0  0.0
                   RATING CURVES: IDMC=5 IDOC=4 QRMC=  0.05 QROC=  0.01
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 5.0 TLO= 0.0
```



```
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=0.00 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum 205, 1203, call result 1204
*
ADD HYD             ID=2 HYD NO= 1204 IDA=3 IDB=1 ICODE=0
*
* NEWMAN CREEK AT GRAND RIVER
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
*******************************************************************************
* DEVIL'S CREEK
*
*
*
*   2% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=1  VS=     2.020   NSEGS=3
                     MIN EL=  100.00   MAX EL=  100.80
                     CHNSLP= 0.02000   FLNSLP= 0.02000
                     N= 0.350  DIST=   24.45
                     N=-0.150  DIST=   25.55
                     N= 0.350  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                    RFN=0.0000 PCODE=1
*
*   3.5% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=2  VS=     2.035   NSEGS=3
                     MIN EL=  100.00   MAX EL=  100.80
                     CHNSLP= 0.03500   FLNSLP= 0.03500
                     N= 0.350  DIST=   24.45
                     N=-0.150  DIST=   25.55
                     N= 0.350  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                    RFN=0.0000 PCODE=1
*
*   10.0% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=3  VS=     2.100   NSEGS=3
                     MIN EL=  100.00   MAX EL=  100.80
                     CHNSLP= 0.10000   FLNSLP= 0.10000
                     N= 0.350  DIST=   24.45
                     N=-0.150  DIST=   25.55
                     N= 0.350  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                    RFN=0.0000 PCODE=1
*
*   1.0% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=4  VS=   100.010   NSEGS=3
                     MIN EL=  100.70   MAX EL=  103.00
                     CHNSLP= 0.01000   FLNSLP= 0.01000
                     N= 0.080  DIST=   20.00
                     N=-0.050  DIST=   30.00
                     N= 0.080  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  103.00    20.00  101.00    23.00  100.80
                       25.00  100.70    27.00  100.80    30.00  101.00
                       50.00  103.00
                    RFN=0.0000 PCODE=1
*
*   2.0% Typical Main channel Parabolic Swale
```

```
*
COMPUTE RATING CURVE ID=5  VS=   100.020   NSEGS=3
                     MIN EL=  100.70   MAX EL=  103.00
                     CHNSLP= 0.02000   FLNSLP= 0.02000
                     N= 0.080  DIST=   20.00
                     N=-0.050  DIST=   30.00
                     N= 0.080  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  103.00    20.00  101.00    23.00  100.80
                       25.00  100.70    27.00  100.80    30.00  101.00
                       50.00  103.00
                     RFN=0.0000 PCODE=1
*
* Typical Urban section
*
COMPUTE RATING CURVE ID=6  VS=     3.200   NSEGS=3
                     MIN EL=  295.00   MAX EL=  295.70
                     CHNSLP= 0.02000   FLNSLP= 0.02000
                     N= 0.015  DIST=  200.00
                     N=-0.015  DIST=  300.00
                     N= 0.015  DIST=  500.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  295.70   200.00  295.50   200.10  295.00
                      299.90  295.00   300.00  295.50   500.00  295.70
*
*
* Catchment 301
* VS=  100.010 is main channel & VS= 2.020 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 301 AREA=   0.1662 Sq km  L=  350 m  W=   520 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   30.0   0.0  0.0   3.5  0.0  66.5  0.0   0.0  0.0
                  RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.05
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=0.00 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Catchment 302
* VS=  100.010 is main channel & VS= 2.020 is off-channel
*
COMPUTE FLOWRATE    ID=2 NHD= 302 AREA=   0.1347 Sq km  L=  180 m  W=   240 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   20.0   5.0 11.8   0.0  0.0  63.2  0.0   0.0  0.0
                  RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.05
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=0.00 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  301, 302, call result  1301
*
ADD HYD             ID=3 HYD NO= 1301 IDA=1 IDB=2 ICODE=0
*
* Route flows from 1301 through the Grand Ridge Estates SWM Facility
*
ROUTE SPECIAL POND  ID=1 HYD NO=5301 INFLOW=3 PCODE=0 OPTION=15
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 311.600
                    Recharge characteristics for Compartment A
                      LEVELA= 309.390              EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 309.390 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB=   0.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
```



```
                    Number of points=  17
                                 Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)   (ha*m)    (ha)   (cms)   (ha*m)    (ha)
                     309.390     0.000   0.000   0.000   0.000   0.000   0.790
                     309.590     0.000   0.000   0.000   0.037   0.240   0.790
                     309.690     0.000   0.000   0.000   0.046   0.370   0.790
                     309.730     0.000   0.000   0.000   0.049   0.410   0.790
                     309.820     0.000   0.000   0.000   0.055   0.530   0.790
                     309.940     0.000   0.000   0.000   0.062   0.690   0.790
                     309.950     0.000   0.000   0.000   0.391   0.710   0.790
                     310.030     0.000   0.000   0.000   0.417   0.820   0.790
                     310.400     0.000   0.000   0.000   0.524   1.320   0.790
                     310.820     0.000   0.000   0.000   0.624   1.920   0.790
                     310.850     0.000   0.000   0.000   0.631   1.970   0.790
                     311.000     0.000   0.000   0.000   0.662   2.210   0.790
                     311.200     0.000   0.000   0.000   1.494   2.530   0.790
                     311.300     0.000   0.000   0.000   2.177   2.690   0.790
                     311.400     0.000   0.000   0.000   2.981   2.850   0.790
                     311.500     0.000   0.000   0.000   3.890   3.000   0.790
                     311.600     0.000   0.000   0.000   4.893   3.160   0.790
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Catchment 303
* VS=  100.020 is main channel & VS= 2.020 is off-channel
*
COMPUTE FLOWRATE    ID=2 NHD= 303 AREA=   0.3216 Sq km  L=  300 m  W=   300 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   25.0   0.0  0.0  15.0  0.0  60.0  0.0   0.0  0.0
                  RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.05
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=0.00 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  303, 5301, call result  1302
*
ADD HYD             ID=3 HYD NO= 1302 IDA=1 IDB=2 ICODE=0
*
* Catchment 304
* VS=  100.035 is main channel & VS= 2.020 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 304 AREA=   0.1193 Sq km  L=  300 m  W=   420 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   30.0   0.0  0.0   3.5  0.0  31.5  0.0  35.0  0.0
                  RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.05
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=0.00 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  304, 1302, call result  1303
*
ADD HYD             ID=2 HYD NO= 1303 IDA=1 IDB=3 ICODE=0
*
COMPUTE RATING CURVE ID=6  VS=   1.000   NSEGS=3
                     MIN EL=  301.00   MAX EL=  303.00
                     CHNSLP= 0.01300   FLNSLP= 0.01400
                     N= 0.080  DIST=   97.00
                     N=-0.035  DIST=  103.00
                     N= 0.080  DIST=  140.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       60.00  303.00    85.00  302.50    97.00  301.50
                      100.00  301.00   103.00  301.50   115.00  302.50
                      140.00  303.00
                     RFN=0.0000 PCODE=1
*
```

```
* Route through reach 2303
* Using Valley Section 1.0  As channel Rating Curve
*
ROUTE CHANNEL       ID=1 HYD NO= 2303 INFLOW=2 LENGTH=   900 m  SLOPE=0.013
                    RCID=6 NS=1 PCODE=1 INDEX=1 PIPE=0 CANOPY= 90.0%
*
* Catchment 307
* VS=  100.010 is main channel & VS= 2.100 is off-channel
*
COMPUTE FLOWRATE    ID=2 NHD= 307 AREA=   0.1653 Sq km  L=  850 m  W=   200 m
               SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     0.0   0.0 85.0   0.0  0.0   0.0  5.0   0.0 10.0
                    RATING CURVES: IDMC=4 IDOC=3 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  307, 2303, call result  1304
*
ADD HYD             ID=4 HYD NO= 1304 IDA=1 IDB=2 ICODE=0
*
REMOVE FLOW FROM GW ID=4 OPTION=2 PCODE=0 QPCT=00% KGW=384 h QSOUT=  0.004
*
PRINT HYD           ID=4 PCODE=1 MODE=10
*
* Catchment 306
* VS=  100.020 is main channel & VS= 2.100 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 306 AREA=   0.0490 Sq km  L=  500 m  W=   50 m
               SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     0.0   0.0  0.0   9.7  0.0   0.0  0.0  80.3  10.0
                    RATING CURVES: IDMC=5 IDOC=3 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 2.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  306, 1304, call result  1306
*
ADD HYD             ID=3 HYD NO= 1306 IDA=1 IDB=4 ICODE=0
KEEP HYD            ID=3 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=3 IMET=1
NEW DUMP OUTPUT     MODE=10 ID=3 IOPT=4 FTYPE=0
*
* Devil's Creek at Blenheim Road
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*
* Typical Roof section
*
COMPUTE RATING CURVE ID=5  VS=   101.000   NSEGS=3
                     MIN EL=  295.00   MAX EL=  295.70
                     CHNSLP= 0.2500   FLNSLP= 0.2500
                     N= 0.018  DIST=  100.00
                     N=-0.018  DIST=  400.00
                     N= 0.018  DIST=  500.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  295.70   100.00  295.50   100.10  295.00
                     399.90  295.00   400.00  295.50   500.00  295.70
                    RFN=0.0000 PCODE=1
*
* Typical Urban section
*
COMPUTE RATING CURVE ID=6  VS=     3.200   NSEGS=3
                     MIN EL=  295.00   MAX EL=  295.70
                     CHNSLP= 0.02000   FLNSLP= 0.02000
                     N= 0.015  DIST=  200.00
                     N=-0.015  DIST=  300.00
```



```
                     N= 0.015  DIST=  500.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  295.70   200.00  295.50   200.10  295.00
                     299.90  295.00   300.00  295.50   500.00  295.70
*
* Roof areas within 706, hydrograph 9706
* VS=101.000 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=1 NHD= 9706 AREA=   0.0090 Sq km  L=   20 m  W=    10 m
               SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                    100.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0  0.0
                    RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.0 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Roof infiltration gallery within 706; hydrograph 8706
*
ROUTE SPECIAL POND  ID=2 HYD NO=8706 INFLOW=1 PCODE=0 OPTION= 5
                    Inflow controls:
                       USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                       GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 101.100
                    Recharge characteristics for Compartment A
                      LEVELA= 100.000                EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 10.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
                      CDB=  15.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  3
                                  Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)   (ha*m)    (ha)   (cms)   (ha*m)    (ha)
                     100.000     0.000  0.0000  0.0000   0.000  0.0000  0.0560
                     101.000     0.000  0.0000  0.0000   0.000  0.0224  0.0560
                     101.100     0.000  0.0000  0.0000   1.000  0.0246  0.0560
*
* Area of 706 to conveyance infiltration system, hydrograph 6706
*
COMPUTE FLOWRATE    ID=1 NHD= 6706 AREA=   0.0055 Sq km  L=   60 m  W=   140 m
               SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     46.6   0.0  0.0   8.3  0.0   0.2  0.0  45.0  0.0
                    RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.0 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0

PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Route 6706 through reservoir 4706 - conveyance infiltration system
*
ROUTE SPECIAL POND  ID=4 HYD NO=4706 INFLOW=1 PCODE=0 OPTION= 5
                    Inflow controls:
                       USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                       GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 101.100
                    Recharge characteristics for Compartment A
                      LEVELA= 100.000                EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
                      CDB=  15.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  3
                                  Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)   (ha*m)    (ha)   (cms)   (ha*m)    (ha)
                     100.000     0.000  0.0000  0.0000   0.000  0.0000  0.0137
                     101.000     0.000  0.0000  0.0000   0.000  0.0137  0.0137
```

```
                    101.100     0.000  0.0000  0.0000   1.000  0.0150  0.0137

PRINT HYD           ID=4 PCODE=1 MODE=10
*
* Remainder of catchment 706, hydr. 7706
* VS=3.200 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=5 NHD= 7706 AREA=   0.0323 Sq km  L=   60 m  W=   210 m
              SOIL ZONE I    II  III    IV     V    VI  VII  VIII   IX
                    46.6   0.0  0.0   8.3   0.0   0.2  0.0  45.0  0.0
                   RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=0.0 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Sum hydr. 4706, 7706, call result 3706, total non-roof area of 702
*
ADD HYD             ID=1 HYD NO= 3706 IDA=4 IDB=5 ICODE=0
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum components of 706 (8706, 3706), call result 706
*
ADD HYD             ID=4 HYD NO=  706 IDA=2 IDB=1 ICODE=0
PRINT HYD           ID=4 PCODE=1 MODE=10
*
* SWM Facility 3 (Devil's Creek SWM Facility)
* Route 706 through resevoir 5706
*
ROUTE SPECIAL POND  ID=2 HYD NO=5706 INFLOW=4 PCODE=0 OPTION=15
                   Inflow controls:
                       USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                       GWPCT=  0% GWDIV=0
                   Maximum level for Routing Tables:  ZMAX= 307.200
                   Recharge characteristics for Compartment A
                     LEVELA= 304.800                EVAPA= 0.0 mm/d ACODE=0
                     CDA=   0.000 mm/h  DZA= 10.00 m
                   Recharge characteristics for Compartment B
                     LEVELB= 304.800 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                     CDB=   0.000 mm/h  DZB= 10.00 m
                   Irrigation Pond Controls: IPOND=0
                   Number of points=  25
                                Compartment  A          Compartment B
                   Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                      (m)      (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                    304.800    0.000   0.000   0.000   0.000   0.000   0.132
                    304.900    0.000   0.000   0.000   0.002   0.014   0.138
                    305.000    0.000   0.000   0.000   0.003   0.028   0.145
                    305.100    0.000   0.000   0.000   0.004   0.043   0.152
                    305.200    0.000   0.000   0.000   0.005   0.058   0.159
                    305.300    0.000   0.000   0.000   0.012   0.074   0.166
                    305.400    0.000   0.000   0.000   0.013   0.093   0.201
                    305.500    0.000   0.000   0.000   0.013   0.113   0.207
                    305.600    0.000   0.000   0.000   0.013   0.134   0.213
                    305.700    0.000   0.000   0.000   0.014   0.156   0.220
                    305.800    0.000   0.000   0.000   0.014   0.178   0.226
                    305.900    0.000   0.000   0.000   0.015   0.201   0.232
                    306.000    0.000   0.000   0.000   0.015   0.224   0.238
                    306.100    0.000   0.000   0.000   0.015   0.249   0.245
                    306.200    0.000   0.000   0.000   0.016   0.273   0.251
                    306.300    0.000   0.000   0.000   0.016   0.299   0.258
                    306.400    0.000   0.000   0.000   0.054   0.325   0.264
                    306.500    0.000   0.000   0.000   0.123   0.352   0.271
                    306.600    0.000   0.000   0.000   0.211   0.379   0.278
                    306.700    0.000   0.000   0.000   0.316   0.407   0.285
                    306.800    0.000   0.000   0.000   0.435   0.436   0.292
                    306.900    0.000   0.000   0.000   0.567   0.466   0.300
                    307.000    0.000   0.000   0.000   0.710   0.496   0.308
                    307.100    0.000   0.000   0.000   0.864   0.527   0.316
                    307.200    0.000   0.000   0.000   1.028   0.561   0.362
*
PRINT HYD           ID=2 PCODE=1 MODE=10
KEEP HYD            ID=2 CUTOFF=96 ICODE=3 ISTEPS=1 IFORM=0 IDB=2 IMET=1
```



```
*
* Add outflow from SWM3 to flows at Blenheim Road
*
ADD HYD             ID=1 HYD NO=  1706 IDA=3 IDB=2 ICODE=0
PRINT HYD           ID=1 PCODE=1 MODE=10
KEEP HYD            ID=1 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=1 IMET=1
NEW DUMP OUTPUT     MODE=10 ID=1 IOPT=4 FTYPE=0
*
*   2.0% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=5  VS=   100.020   NSEGS=3
                     MIN EL=  100.70   MAX EL=  103.00
                     CHNSLP= 0.02000   FLNSLP= 0.02000
                     N= 0.080  DIST=   20.00
                     N=-0.050  DIST=   30.00
                     N= 0.080  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  103.00    20.00  101.00    23.00  100.80
                      25.00  100.70    27.00  100.80    30.00  101.00
                      50.00  103.00
                     RFN=0.0000 PCODE=1
*
* Area of 308 south (upstream) of Blenheim Road; 308a or 3081 for GAWSER
* VS=100.020 MC, VS=2.035 OC
*
*COMPUTE FLOWRATE    ID=1 NHD= 3081 AREA=   0.0001 Sq km  L=  43 m  W=  100 m
*             SOIL ZONE I    II  III    IV     V    VI  VII  VIII   IX
*                   2.0   0.0  0.0  12.3  0.0   0.0  0.0  85.8  0.0
*                   RATING CURVES: IDMC=5 IDOC=2 QRMC=  0.05 QROC=  0.01
*                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
*                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
*                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
*                   GWFACT=0.00 GWON=1
*                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
*PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Area of 309 south (upstream) of Blenheim Road; 309a or 3091 for GAWSER
* Area blended with 306
* VS=100.010 MC, VS=2.100 OC
*
*COMPUTE FLOWRATE    ID=3 NHD= 3091 AREA=   0.0000 Sq km  L=  20 m  W=  100 m
*             SOIL ZONE I    II  III    IV     V    VI  VII  VIII   IX
*                   0.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0 100.0
*                   RATING CURVES: IDMC=4 IDOC=3 QRMC=  0.05 QROC=  0.01
*                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
*                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
*                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
*                   GWFACT=0.00 GWON=1
*                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
*PRINT HYD           ID=3 PCODE=1 MODE=10
*
* Sum 308a & 309a and call result 1900
*
*ADD HYD             ID=4 HYD NO= 1900 IDA=1 IDB=3 ICODE=0
*PRINT HYD           ID=4 PCODE=1 MODE=10
*KEEP HYD            ID=4 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=4 IMET=1
*
* Sum total flows at Blenheim Road crossing
*
*ADD HYD             ID=1 HYD NO= 1901 IDA=2 IDB=4 ICODE=0
*PRINT HYD           ID=1 PCODE=1 MODE=10
*NEW DUMP OUTPUT     MODE=10 ID=1 IOPT=4 FTYPE=0
*
*
* Catchment 707, uncontrolled area of Blenheim Road draining to Devil's Creek
*
COMPUTE FLOWRATE    ID=2 NHD= 707 AREA=   0.0077 Sq km  L=   60 m  W=   15 m
              SOIL ZONE I    II  III    IV     V    VI  VII  VIII   IX
                    38.3   0.0  0.0   9.5  0.0   0.2  0.0  51.9  0.0
                   RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
```

```
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.0 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
KEEP HYD            ID=2 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=2 IMET=1
*
*
* 707 ->  2707 / 3707 Split Flow from realigned Blenheim  to Minor (2707)
* and Major(3707) components. minor to creek via storm, major to 5309 depression
*
*----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
DIVERT FLOWS        INFLOW=2  DIVERT=6 HYD NO=3707 PCODE=1 OPTION=2
                    INLET CAP=0.148 CMS THRUFLO ID=3 HYD NOB=2707
                    IDFLAG=0  IDSTOR=0  IGWT=0
*
PRINT HYD           ID=3 PCODE=1 MODE=10
KEEP HYD            ID=3 CUTOFF=0 ICODE=5 ISTEP=1 IFORM=0 IDB=3 IMET=0
PRINT HYD           ID=6 PCODE=1 MODE=10
KEEP HYD            ID=6 CUTOFF=0 ICODE=5 ISTEP=1 IFORM=0 IDB=6 IMET=0
*
*
* Sum 1901 & 2707 and call result 1707
*
ADD HYD             ID=5 HYD NO= 1707 IDA=1 IDB=3 ICODE=0
PRINT HYD           ID=5 PCODE=1 MODE=10
KEEP HYD            ID=5 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=5 IMET=1
*
* Area of 308 north (downstream) of Blenheim Road; 308b or 3082 for GAWSER
* VS=100.020 MC, VS=2.035 OC
*
COMPUTE FLOWRATE    ID=2 NHD= 3082 AREA=   0.0028 Sq km  L=  34 m  W=  100 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                    2.0   0.0  0.0  12.3  0.0   0.0  0.0  85.8  0.0
                    RATING CURVES: IDMC=5 IDOC=2 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Area of 309 north (downstream) of Blenheim Road; 309b or 3092 for GAWSER
* VS=100.010 MC, VS=2.100 OC
*
COMPUTE FLOWRATE    ID=3 NHD= 3092 AREA=   0.0119 Sq km  L=  60 m  W=  200 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                    0.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0 100.0
                    RATING CURVES: IDMC=4 IDOC=3 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*
* Sum 308b & 309b and call result 1902
*
ADD HYD             ID=4 HYD NO= 1902 IDA=2 IDB=3 ICODE=0
*
* Sum 1902 & Diverted Majors from Blenheim (3707) and call result 1903
*
ADD HYD             ID=2 HYD NO= 1903 IDA=4 IDB=6 ICODE=0
*
* Route flows from 1903 through a depression
*
ROUTE SPECIAL POND  ID=3 HYD NO=5309 INFLOW=2 PCODE=0 OPTION=15
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 300.500
                    Recharge characteristics for Compartment A
```



```
                      LEVELA= 298.500              EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 298.500 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB=  25.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  5
                                Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)   (ha*m)    (ha)   (cms)   (ha*m)    (ha)
                     298.500     0.000   0.000   0.000   0.000   0.000   0.001
                     299.000     0.000   0.000   0.000   0.000   0.005   0.017
                     299.500     0.000   0.000   0.000   0.000   0.028   0.077
                     300.000     0.000   0.000   0.000   0.000   0.083   0.143
                     300.500     0.000   0.000   0.000   5.000   0.171   0.209
*
PRINT HYD           ID=3 PCODE=1 MODE=10
KEEP HYD            ID=3 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=3 IMET=1
*
* Sum hydr.  706, 707, 308, 309, and 1306 and call result 1308
*
ADD HYD             ID=2 HYD NO= 1308 IDA=5 IDB=3 ICODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
KEEP HYD            ID=2 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=2 IMET=1
NEW DUMP OUTPUT     MODE=10 ID=2 IOPT=4 FTYPE=0
*
COMPUTE RATING CURVE ID=6  VS=   2.000   NSEGS=3
                     MIN EL=  290.00   MAX EL=  291.50
                     CHNSLP= 0.0030   FLNSLP= 0.0035
                     N= 0.080  DIST=   99.50
                     N=-0.035  DIST=  100.50
                     N= 0.080  DIST=  165.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                      35.00  291.50    75.00  291.00    98.50  290.50
                      99.50  290.40    99.60  290.00   100.40  290.00
                     100.50  290.40   101.50  290.50   125.00  291.00
                     165.00  291.50
                    RFN=0.0000 PCODE=1
*
* Route through reach 2308
* Using Valley Section 2.0  As channel Rating Curve
*
ROUTE CHANNEL       ID=1 HYD NO= 2308 INFLOW=2 LENGTH=  1400 m  SLOPE=0.003
                    RCID=6 NS=1 PCODE=1 INDEX=1 PIPE=0 CANOPY= 75.0%
*
* Catchment 310
* VS=  100.010 is main channel & VS= 2.035 is off-channel
*
COMPUTE FLOWRATE    ID=2 NHD= 310 AREA=   0.0682 Sq km  L=  450 m  W=  140 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                    25.0   0.0  0.0   0.0  0.0  26.3  0.0  48.8  0.0
                    RATING CURVES: IDMC=4 IDOC=2 QRMC=  0.50 QROC=  0.05
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  310, 2308, call result  1309
*
ADD HYD             ID=3 HYD NO= 1309 IDA=1 IDB=2 ICODE=0
*
*   Catchment 0.5% Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=6  VS=   100.005   NSEGS=3
                     MIN EL=  100.70   MAX EL=  103.00
                     CHNSLP= 0.00500   FLNSLP= 0.005000
                     N= 0.080  DIST=   20.00
                     N=-0.050  DIST=   30.00
                     N= 0.080  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
```

```
                      0.00  103.00    20.00  101.00    23.00  100.80
                     25.00  100.70    27.00  100.80    30.00  101.00
                     50.00  103.00
                    RFN=0.0000 PCODE=1
*
* Catchment 311
* VS=  100.005 is main channel & VS= 2.020 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 311 AREA=   0.4793 Sq km  L=  1200 m  W=   390 m
              SOIL ZONE I    II   III    IV     V    VI  VII  VIII    IX
                     0.0   2.0 64.0   0.0  0.0   0.0 34.0   0.0  0.0
                    RATING CURVES: IDMC=6 IDOC=1 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 5.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  311, 1309, call result  1310
*
ADD HYD             ID=6 HYD NO= 1310 IDA=1 IDB=3 ICODE=0
*
REMOVE FLOW FROM GW ID=6 OPTION=2 PCODE=0 QPCT=00% KGW=384 h QSOUT=  0.001
*
PRINT HYD           ID=6 PCODE=1 MODE=10
*
* Route flows from 1310 through the Devil's Creek wetland area
*
ROUTE SPECIAL POND  ID=2 HYD NO=5310 INFLOW=6 PCODE=0 OPTION=5
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 292.500
                    Recharge characteristics for Compartment A
                      LEVELA= 289.300              EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 23.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 289.300 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB=   4.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  11
                                  Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     289.300     0.000  0.000   0.000   0.000   0.000    0.00
                     289.600     0.000  0.000   0.000   0.090   0.500   10.00
                     289.700     0.000  0.000   0.000   0.110   1.495   10.00
                     289.800     0.000  0.000   0.000   0.130   2.492   10.00
                     289.900     0.000  0.000   0.000   0.230   3.489   10.00
                     290.000     0.000  0.000   0.000   1.200   3.515   10.00
                     290.500     0.000  0.000   0.000   4.200   3.815   10.00
                     291.000     0.000  0.000   0.000   8.200   4.648   10.00
                     291.500     0.000  0.000   0.000  13.00    7.048   10.00
                     292.000     0.000  0.000   0.000  18.40   12.448   10.00
                     292.500     0.000  0.000   0.000  24.40   20.998   10.00
*
PRINT HYD           ID=2 PCODE=1 MODE=10
KEEP HYD            ID=2 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=2 IMET=1
NEW DUMP OUTPUT     MODE=10 ID=2 IOPT=4 FTYPE=0
*
*   3.5% Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=6  VS=   100.035   NSEGS=3
                     MIN EL=  100.70   MAX EL=  103.00
                     CHNSLP= 0.03500   FLNSLP= 0.03500
                     N= 0.080  DIST=   20.00
                     N=-0.050  DIST=   30.00
                     N= 0.080  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  103.00    20.00  101.00    23.00  100.80
                      25.00  100.70    27.00  100.80    30.00  101.00
                      50.00  103.00
```



```
                     RFN=0.0000 PCODE=1
*
*   5%  off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=1  VS=     2.050   NSEGS=3
                     MIN EL=  100.00   MAX EL=  100.80
                     CHNSLP= 0.05000   FLNSLP= 0.05000
                     N= 0.350  DIST=   24.45
                     N=-0.150  DIST=   25.55
                     N= 0.350  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  100.80    24.45  100.30    24.75  100.00
                      25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1
*
* Catchment 313
* VS=  100.035 is main channel & VS= 2.050 is off-channel
*
COMPUTE FLOWRATE    ID=4 NHD= 313 AREA=   0.0492 Sq km  L=   55 m  W=   580 m
              SOIL ZONE I    II   III    IV     V    VI  VII  VIII    IX
                     0.0   0.0  0.0  10.0  0.0   0.0  0.0  90.0  0.0
                    RATING CURVES: IDMC=6 IDOC=1 QRMC=  0.05 QROC=  0.01
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 2.0 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.00 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=4 PCODE=1 MODE=10
*
*************************************************************************
* This portion is part of the development area (school block) in SWM 2 Cmt
* Major flow would continue to Devils creek and minor flow will be diverted
* to SWMF2 (and ultimately the Grand)
*
* Roof area of school blck
*
COMPUTE FLOWRATE    ID=1 NHD= 9721 AREA=   0.0039 Sq km  L=    20 m  W=    10 m
              SOIL ZONE I    II   III    IV     V    VI  VII  VIII    IX
                   100.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0  0.0
                    RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.0 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Roof infiltration gallery within 7021; hydrograph 8721
*
ROUTE SPECIAL POND  ID=3 HYD NO=8721 INFLOW=1 PCODE=0 OPTION= 5
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 101.100
                    Recharge characteristics for Compartment A
                      LEVELA= 100.000              EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 10.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
                      CDB=  15.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  3
                                  Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     100.000     0.000  0.0000  0.0000   0.000  0.0000  0.0096
                     101.000     0.000  0.0000  0.0000   0.000  0.0096  0.0096
                     101.100     0.000  0.0000  0.0000   1.000  0.0106  0.0096
*
* Non-roof areas within 7021; hydrograph 7721
* VS=3.200 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=5 NHD= 7721 AREA=   0.0231 Sq km  L=   60 m  W=   150 m
              SOIL ZONE I    II   III    IV     V    VI  VII  VIII    IX
```

```
                    27.1   0.0   0.0   11.3   0.0    0.3   0.0   61.4   0.0
                   RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=0.75 GWON=1
*
* Sum hydr.  8721,7721 call result 7021
*
ADD HYD            ID=1 HYD NO= 7021 IDA=3 IDB=5 ICODE=0
*
* Divert minor flow to SWMF2 and major flow to Devils creek (313)
*
DIVERT FLOWS       INFLOW=1  DIVERT=3 HYD NO=3131 PCODE=1 OPTION=2
                   INLET CAP=0.7872 CMS THRUFLO ID=6 HYD NOB=1721
                   IDFLAG=0  IDSTOR=0  IGWT=0
*
* Sum hydr.  3131,313 call result 1311
*
ADD HYD            ID=5 HYD NO= 1311 IDA=3 IDB=4 ICODE=0
*
*
*******************************************************************************
*
* Catchment 314
* VS=  100.010 is main channel & VS= 2.100 is off-channel
*
COMPUTE FLOWRATE   ID=1 NHD= 314 AREA=   0.1142 Sq km  L=  500 m  W=   240 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   0.0   0.0 20.0   0.0   0.0   0.0 10.0   0.0 70.0
                   RATING CURVES: IDMC=4 IDOC=3 QRMC=  0.05 QROC=  0.01
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=0.00 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD          ID=1 PCODE=1 MODE=10
*
* Sum hydr.  1311,314 call result 1312
*
ADD HYD            ID=3 HYD NO= 1312 IDA=1 IDB=5 ICODE=0
*
* Catchment 315
* VS=  100.020 is main channel & VS= 2.100 is off-channel
*
COMPUTE FLOWRATE   ID=1 NHD= 315 AREA=   0.0158 Sq km  L=  60 m  W=   150 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   0.0   0.0  0.0  30.0  0.0   0.0  0.0  70.0  0.0
                   RATING CURVES: IDMC=5 IDOC=3 QRMC=  0.05 QROC=  0.01
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=0.00 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD          ID=1 PCODE=1 MODE=10
*
* Sum hydr.  1312,315 call result 1313
*
ADD HYD            ID=4 HYD NO= 1313 IDA=1 IDB=3 ICODE=0
*
* Typical Roof section
*
COMPUTE RATING CURVE ID=5  VS=   101.000   NSEGS=3
                     MIN EL=  295.00   MAX EL=  295.70
                     CHNSLP= 0.2500   FLNSLP= 0.2500
                     N= 0.018  DIST=  100.00
                     N=-0.018  DIST=  400.00
                     N= 0.018  DIST=  500.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  295.70   100.00  295.50   100.10  295.00
                     399.90  295.00   400.00  295.50   500.00  295.70
                    RFN=0.0000 PCODE=1
```



```
*
* Typical Urban section
*
COMPUTE RATING CURVE ID=6  VS=     3.200   NSEGS=3
                     MIN EL=  295.00   MAX EL=  295.70
                     CHNSLP= 0.02000   FLNSLP= 0.02000
                     N= 0.015  DIST=  200.00
                     N=-0.015  DIST=  300.00
                     N= 0.015  DIST=  500.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  295.70   200.00  295.50   200.10  295.00
                     299.90  295.00   300.00  295.50   500.00  295.70
*
* Roof areas within 703, hydrograph 9703
* VS=101.000 MC, VS=3.200 OC
*
COMPUTE FLOWRATE   ID=1 NHD= 9703 AREA=   0.0082 Sq km  L=   20 m  W=    10 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   100.0   0.0  0.0   0.0   0.0   0.0  0.0   0.0  0.0
                   RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=0.0 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Roof infiltration gallery within 703; hydrograph 8703
*
ROUTE SPECIAL POND ID=3 HYD NO=8703 INFLOW=1 PCODE=0 OPTION= 5
                   Inflow controls:
                      USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                      GWPCT=  0% GWDIV=0
                   Maximum level for Routing Tables:  ZMAX= 101.100
                   Recharge characteristics for Compartment A
                     LEVELA= 100.000                EVAPA= 0.0 mm/d ACODE=0
                     CDA=   0.000 mm/h  DZA= 10.00 m
                   Recharge characteristics for Compartment B
                     LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
                     CDB=  15.000 mm/h  DZB= 10.00 m
                   Irrigation Pond Controls: IPOND=0
                   Number of points=  3
                                  Compartment  A          Compartment B
                   Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                      (m)       (cms)   (ha*m)    (ha)   (cms)   (ha*m)    (ha)
                    100.000     0.000  0.0000  0.0000   0.000  0.0000  0.0515
                    101.000     0.000  0.0000  0.0000   0.000  0.0206  0.0515
                    101.100     0.000  0.0000  0.0000   1.000  0.0226  0.0515
*
* Non-roof areas within 703; hydrograph 7703
* VS=3.200 MC, VS=3.200 OC
*
COMPUTE FLOWRATE   ID=1 NHD= 7703 AREA=   0.0224 Sq km  L=  60 m  W=   170 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   48.9   0.0  0.0   7.9   0.0   0.2  0.0  43.0  0.0
                   RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=0.0 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Sum catchment 703 component hydrographs
*
ADD HYD            ID=5 HYD NO=  703 IDA=3 IDB=1 ICODE=0
PRINT HYD          ID=5 PCODE=1 MODE=10
KEEP HYD           ID=5 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=5 IMET=1
*
* Sum hydr. 1313 and 703, call result 1703
*
ADD HYD            ID=3 HYD NO= 1703 IDA=4 IDB=5 ICODE=0
PRINT HYD          ID=3 PCODE=1 MODE=10
*
* Catchment 316
*
```

```
COMPUTE FLOWRATE    ID=1 NHD= 316 AREA=   0.2101 Sq km  L=  650 m  W=   330 m
             SOIL ZONE I    II  III   IV    V    VI  VII  VIII   IX
                   20.0   0.0  8.0  16.0  0.0   8.0  0.0  48.0  0.0
                  RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.05
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=0.00 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr. 1703 and 316, call result 1314
*
ADD HYD             ID=4 HYD NO= 1314 IDA=3 IDB=1 ICODE=0
*
PRINT HYD           ID=4 PCODE=1 MODE=10
*
* Route flows from 1314 through Grandview Hills SWM Facility (Devil's)
*
ROUTE SPECIAL POND  ID=1 HYD NO=5314 INFLOW=4 PCODE=0 OPTION=15
                  Inflow controls:
                     USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                     GWPCT=  0% GWDIV=0
                  Maximum level for Routing Tables:  ZMAX= 291.000
                  Recharge characteristics for Compartment A
                    LEVELA= 289.800                EVAPA= 0.0 mm/d ACODE=0
                    CDA=   0.000 mm/h  DZA= 23.00 m
                  Recharge characteristics for Compartment B
                    LEVELB= 289.800 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                    CDB=  4.000 mm/h  DZB= 10.00 m
                  Irrigation Pond Controls: IPOND=0
                  Number of points=  9
                                Compartment  A          Compartment B
                  Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                     (m)       (cms)   (ha*m)    (ha)    (cms)   (ha*m)    (ha)
                   289.800     0.000   0.000   0.000   0.000   0.000   0.600
                   289.900     0.000   0.000   0.000   0.059   0.087   0.600
                   290.000     0.000   0.000   0.000   0.084   0.185   0.600
                   290.100     0.000   0.000   0.000   0.103   0.295   0.600
                   290.200     0.000   0.000   0.000   0.119   0.417   0.600
                   290.300     0.000   0.000   0.000   0.502   0.549   0.600
                   290.400     0.000   0.000   0.000   1.191   0.691   0.600
                   290.500     0.000   0.000   0.000   2.078   0.860   0.600
                   291.000     0.000   0.000   0.000   5.000   1.200   0.600
*
REMOVE FLOW FROM GW ID=1 OPTION=2 PCODE=0 QPCT=00% KGW=384 h QSOUT=  0.004
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr.  5314,5310 call result 1315
*
ADD HYD             ID=3 HYD NO= 1315 IDA=1 IDB=2 ICODE=0
*
COMPUTE RATING CURVE ID=6  VS=   3.000   NSEGS=3
                    MIN EL=  285.20   MAX EL=  287.00
                    CHNSLP= 0.01100   FLNSLP= 0.01200
                    N= 0.080  DIST=   99.30
                    N=-0.035  DIST=  100.70
                    N= 0.080  DIST=  120.00
                      DIST    ELEV     DIST    ELEV     DIST    ELEV
                     80.00  287.00    85.00  286.00    90.00  285.70
                     99.30  285.50    99.40  285.20   100.60  285.20
                    100.70  285.50   110.00  285.70   115.00  286.00
                    120.00  287.00
                   RFN=0.0000 PCODE=1
*
* Route through reach 2315
* Using Valley Section 3.0  As channel Rating Curve
*
ROUTE CHANNEL       ID=1 HYD NO= 2315 INFLOW=3 LENGTH=   420 m  SLOPE=0.011
                  RCID=6 NS=1 PCODE=1 INDEX=1 PIPE=0 CANOPY= 25.0%
*
* Typical Urban section
```



```
*
COMPUTE RATING CURVE ID=6  VS=     3.200   NSEGS=3
                    MIN EL=  295.00   MAX EL=  295.70
                    CHNSLP= 0.02000   FLNSLP= 0.02000
                    N= 0.015  DIST=  200.00
                    N=-0.015  DIST=  300.00
                    N= 0.015  DIST=  500.00
                      DIST    ELEV     DIST    ELEV     DIST    ELEV
                      0.00  295.70   200.00  295.50   200.10  295.00
                    299.90  295.00   300.00  295.50   500.00  295.70
*
* Catchment 317
*
COMPUTE FLOWRATE    ID=2 NHD= 317 AREA=   0.118 Sq km  L=  150 m  W=   200 m
             SOIL ZONE I    II  III   IV    V    VI  VII  VIII   IX
                   20.0   0.0  0.0   0.0  0.0  40.0  0.0  40.0  0.0
                  RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.05
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=0.00 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum hydr.  2315,317 call result 1316
*
ADD HYD             ID=3 HYD NO= 1316 IDA=1 IDB=2 ICODE=0
*
REMOVE FLOW FROM GW ID=3 OPTION=2 PCODE=0 QPCT=00% KGW=384 h QSOUT=  0.003
*
* Devil's Creek at Blair Road
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*
COMPUTE RATING CURVE ID=6  VS=   4.000   NSEGS=3
                    MIN EL=  282.00   MAX EL=  285.00
                    CHNSLP= 0.01900   FLNSLP= 0.02100
                    N= 0.080  DIST=   99.30
                    N=-0.035  DIST=  100.70
                    N= 0.080  DIST=  120.00
                      DIST    ELEV     DIST    ELEV     DIST    ELEV
                     80.00  285.00    90.00  284.00    96.00  283.00
                     99.30  282.30    99.40  282.00   100.60  282.00
                    100.70  282.30   104.00  283.00   110.00  284.00
                    120.00  285.00
                   RFN=0.0000 PCODE=1
*
* Route through reach 2316
* Using Valley Section 4.0  As channel Rating Curve
*
ROUTE CHANNEL       ID=1 HYD NO= 2316 INFLOW=3 LENGTH=   270 m  SLOPE=0.019
                  RCID=6 NS=1 PCODE=1 INDEX=1 PIPE=0 CANOPY= 50.0%
*
* Typical Urban section
*
COMPUTE RATING CURVE ID=6  VS=     3.200   NSEGS=3
                    MIN EL=  295.00   MAX EL=  295.70
                    CHNSLP= 0.02000   FLNSLP= 0.02000
                    N= 0.015  DIST=  200.00
                    N=-0.015  DIST=  300.00
                    N= 0.015  DIST=  500.00
                      DIST    ELEV     DIST    ELEV     DIST    ELEV
                      0.00  295.70   200.00  295.50   200.10  295.00
                    299.90  295.00   300.00  295.50   500.00  295.70
*
* Catchment 318
*
COMPUTE FLOWRATE    ID=2 NHD= 318 AREA=   0.1539 Sq km  L=  450 m  W=   340 m
             SOIL ZONE I    II  III   IV    V    VI  VII  VIII   IX
                   30.0   0.0  0.0   0.0  0.0  10.5  0.0  59.5  0.0
                  RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.05
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
```

```
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=0.00 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD         ID=2 PCODE=1 MODE=10
*
* Sum hydr,  2316,318 call result 1317
*
ADD HYD           ID=3 HYD NO= 1317 IDA=1 IDB=2 ICODE=0
*
* Devil's Creek at Grand River
*
PRINT HYD         ID=3 PCODE=1 MODE=10
*
********************************************************************************
* GRAND RIVER
*
*
* Roof areas within 708, hydrograph 9708
* VS=101.000 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=1 NHD= 9708 AREA=   0.0176 Sq km  L=    20 m  W=    10 m
            SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                 100.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0  0.0
                 RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                 ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                 SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                 RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                 GWFACT=1.0 GWON=1
                 SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Roof infiltration gallery within 708; hydrograph 8708
*
ROUTE SPECIAL POND  ID=2 HYD NO=8708 INFLOW=1 PCODE=0 OPTION= 5
                 Inflow controls:
                     USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                     GWPCT=  0% GWDIV=0
                 Maximum level for Routing Tables:  ZMAX= 101.100
                 Recharge characteristics for Compartment A
                   LEVELA= 100.000               EVAPA= 0.0 mm/d ACODE=0
                   CDA=   0.000 mm/h  DZA= 10.00 m
                 Recharge characteristics for Compartment B
                   LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
                   CDB=  15.000 mm/h  DZB= 10.00 m
                 Irrigation Pond Controls: IPOND=0
                 Number of points=  3
                                Compartment  A          Compartment B
                 Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                    (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                  100.000     0.000  0.0000  0.0000   0.000  0.0000  0.1102
                  101.000     0.000  0.0000  0.0000   0.000  0.0441  0.1102
                  101.100     0.000  0.0000  0.0000   1.000  0.0485  0.1102
*
*-------------------------------------------------------------------------------------------------
*
* Areas within 708 to CIF, hydrograph 6708
* VS=101.000 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=1 NHD= 6708 AREA=   0.0080 Sq km  L=    20 m  W=    10 m
            SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                 100.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0  0.0
                 RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                 ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                 SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                 RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                 GWFACT=1.0 GWON=1
                 SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Roof infiltration gallery in areas within 708 to CIF; hydrograph 5708
*
ROUTE SPECIAL POND  ID=3 HYD NO=5708 INFLOW=1 PCODE=0 OPTION= 5
                 Inflow controls:
                     USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                     GWPCT=  0% GWDIV=0
```



```
                 Maximum level for Routing Tables:  ZMAX= 101.100
                 Recharge characteristics for Compartment A
                   LEVELA= 100.000               EVAPA= 0.0 mm/d ACODE=0
                   CDA=   0.000 mm/h  DZA= 10.00 m
                 Recharge characteristics for Compartment B
                   LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
                   CDB=  15.000 mm/h  DZB= 10.00 m
                 Irrigation Pond Controls: IPOND=0
                 Number of points=  3
                                Compartment  A          Compartment B
                 Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                    (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                  100.000     0.000  0.0000  0.0000   0.000  0.0000  0.0498
                  101.000     0.000  0.0000  0.0000   0.000  0.0199  0.0498
                  101.100     0.000  0.0000  0.0000   1.000  0.0219  0.0498
*
* Non-roof areas in areas within 708 to CIF; hydrograph 2708
* VS=3.200 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=1 NHD= 2708 AREA=   0.0276 Sq km  L=    60 m  W=    60 m
            SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                  50.4   0.0  0.0   7.7   0.0  0.2  0.0  41.7  0.0
                 RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
                 ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                 SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                 RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                 GWFACT=1.0 GWON=1
                 SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
ADD HYD           ID=4 HYD NO=  4708 IDA=3 IDB=1 ICODE=0
PRINT HYD         ID=4 PCODE=1 MODE=10
*
* Conveyance infiltration gallery within 708, sized by 25mm,15% safety faactor; hydrograph 4708
*
ROUTE SPECIAL POND  ID=3 HYD NO=1708 INFLOW=4 PCODE=0 OPTION= 5
                 Inflow controls:
                     USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                     GWPCT=  0% GWDIV=0
                 Maximum level for Routing Tables:  ZMAX= 101.100
                 Recharge characteristics for Compartment A
                   LEVELA= 100.000               EVAPA= 0.0 mm/d ACODE=0
                   CDA=   0.000 mm/h  DZA= 10.00 m
                 Recharge characteristics for Compartment B
                   LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
                   CDB=  15.000 mm/h  DZB= 10.00 m
                 Irrigation Pond Controls: IPOND=0
                 Number of points=  3
                                Compartment  A          Compartment B
                 Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                    (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                  100.000     0.000  0.0000  0.0000   0.000  0.0000  0.0889
                  101.000     0.000  0.0000  0.0000   0.000  0.0889  0.0889
                  101.100     0.000  0.0000  0.0000   1.000  0.1023  0.0889
*
PRINT HYD         ID=3 PCODE=1 MODE=10
*-------------------------------------------------------------------------------
*
* Non-roof areas within 708; hydrograph 7708
* VS=3.200 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=1 NHD= 7708 AREA=   0.1030 Sq km  L=    60 m  W=   340 m
            SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                  45.9   0.0  0.0   8.4   0.0  0.2  0.0  45.5  0.0
                 RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
                 ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                 SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                 RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                 GWFACT=1.0 GWON=1
                 SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Sum catchment 7708 and 4708 component hydrographs
*
ADD HYD           ID=4 HYD NO=  3708 IDA=3 IDB=1 ICODE=0
PRINT HYD         ID=4 PCODE=1 MODE=10
```

```
*
* Sum catchment 708 component hydrographs
*
ADD HYD             ID=3 HYD NO=  708 IDA=2 IDB=4 ICODE=0
PRINT HYD           ID=3 PCODE=1 MODE=10
KEEP HYD            ID=3 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=3 IMET=1
*
* Roof areas within 701, hydrograph 9701
* VS=101.000 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=1 NHD= 9701 AREA=   0.0187 Sq km  L=    20 m  W=    10 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                  100.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0  0.0
                  RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=0.75 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Roof infiltration gallery within 701; hydrograph 8701
*
ROUTE SPECIAL POND  ID=2 HYD NO=8701 INFLOW=1 PCODE=0 OPTION= 5
                  Inflow controls:
                      USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                      GWPCT=  0% GWDIV=0
                  Maximum level for Routing Tables:  ZMAX= 101.100
                  Recharge characteristics for Compartment A
                    LEVELA= 100.000              EVAPA= 0.0 mm/d ACODE=0
                    CDA=   0.000 mm/h  DZA= 10.00 m
                  Recharge characteristics for Compartment B
                    LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
                    CDB=  15.000 mm/h  DZB= 10.00 m
                  Irrigation Pond Controls: IPOND=0
                  Number of points=  3
                                Compartment  A          Compartment B
                  Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                     (m)        (cms)   (ha*m)    (ha)    (cms)   (ha*m)    (ha)
                   100.000     0.000  0.0000  0.0000   0.000  0.0000  0.1166
                   101.000     0.000  0.0000  0.0000   0.000  0.0467  0.1166
                   101.100     0.000  0.0000  0.0000   1.000  0.0513  0.1166
*
* Non-roof areas within 701; hydrograph 7701
* VS=3.200 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=1 NHD= 7701 AREA=   0.0661 Sq km  L=   60 m  W=   265 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   43.7   0.0  0.0   8.7  0.0   0.2  0.0  47.4  0.0
                  RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=0.75 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Sum catchment 701 component hydrographs
*
ADD HYD             ID=4 HYD NO=  701 IDA=2 IDB=1 ICODE=0
PRINT HYD           ID=4 PCODE=1 MODE=10
KEEP HYD            ID=4 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=4 IMET=1
*
* Sum catchments 708 and 701, call result 1701
*
ADD HYD             ID=1 HYD NO= 1701 IDA=3 IDB=4 ICODE=0
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Parameters for Catchment 702 got updated, school blck major flows to the creek
*
*
* Roof areas within 702, hydrograph 9702
* VS=101.000 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=2 NHD= 9702 AREA=   0.0486 Sq km  L=    20 m  W=    10 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
```



```
                  100.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0  0.0
                  RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=0.7 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Roof infiltration gallery within 702; hydrograph 8702
*
ROUTE SPECIAL POND  ID=3 HYD NO=8702 INFLOW=2 PCODE=0 OPTION= 5
                  Inflow controls:
                      USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                      GWPCT=  0% GWDIV=0
                  Maximum level for Routing Tables:  ZMAX= 101.100
                  Recharge characteristics for Compartment A
                    LEVELA= 100.000              EVAPA= 0.0 mm/d ACODE=0
                    CDA=   0.000 mm/h  DZA= 10.00 m
                  Recharge characteristics for Compartment B
                    LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
                    CDB=  15.000 mm/h  DZB= 10.00 m
                  Irrigation Pond Controls: IPOND=0
                  Number of points=  3
                                Compartment  A          Compartment B
                  Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                     (m)        (cms)   (ha*m)    (ha)    (cms)   (ha*m)    (ha)
                   100.000     0.000  0.0000  0.0000   0.000  0.0000  0.3035
                   101.000     0.000  0.0000  0.0000   0.000  0.1214  0.3035
                   101.100     0.000  0.0000  0.0000   1.000  0.1336  0.3035
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*
*-------------------------------------------------------------------------------------------------------------------
*
* Area of 702 to conveyance infiltration system, hydrograph 6702
*
*COMPUTE FLOWRATE    ID=2 NHD= 6702 AREA=   0.02 Sq km  L=   140 m  W=   140 m
*            SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
*                 33.6   0.0  0.0  10.3  0.0   0.2  0.0  55.9  0.0
*                 RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
*                 ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
*                 SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
*                 RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
*                 GWFACT=0.7 GWON=1
*                 SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
*PRINT HYD          ID=2 PCODE=1 MODE=10
*
* Route 6702 through reservoir 4702 - conveyance infiltration system
*
*ROUTE SPECIAL POND  ID=4 HYD NO=4702 INFLOW=2 PCODE=0 OPTION= 5
*                 Inflow controls:
*                     USPCT=100% USDIV=0     PCTA=  0% ADIV=0
*                     GWPCT=  0% GWDIV=0
*                 Maximum level for Routing Tables:  ZMAX= 101.100
*                 Recharge characteristics for Compartment A
*                   LEVELA= 100.000              EVAPA= 0.0 mm/d ACODE=0
*                   CDA=   0.000 mm/h  DZA= 23.00 m
*                 Recharge characteristics for Compartment B
*                   LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
*                   CDB=  15.000 mm/h  DZB= 10.00 m
*                 Irrigation Pond Controls: IPOND=0
*                 Number of points=  3
*                               Compartment  A          Compartment B
*                 Elevation  Outflow Storage  SFArea Outflow Storage SFArea
*                    (m)        (cms)   (ha*m)    (ha)    (cms)   (ha*m)    (ha)
*                  100.000     0.000  0.0000  0.0000   0.000  0.0000  0.1250
*                  101.000     0.000  0.0000  0.0000   0.000  0.0500  0.1250
*                  101.100     0.000  0.0000  0.0000   1.000  0.0550  0.1250
*
*PRINT HYD          ID=4 PCODE=1 MODE=10
*
* Remainder of catchment 702, hydr. 7702
*
```

```
*COMPUTE FLOWRATE    ID=2 NHD= 7702 AREA=   0.2096 Sq km  L=   495 m  W=   500 m
*              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
*                    48.4   0.0  0.0   8.0  0.0   0.2  0.0  43.5  0.0
*                   RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
*                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
*                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
*                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
*                   GWFACT=0.7 GWON=1
*                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Sum hydr. 4702, 7702, call result 3702, total non-roof area of 702
*
*ADD HYD             ID=5 HYD NO= 3702 IDA=4 IDB=2 ICODE=0
*
*
*******************************************************************************************
*       ADD 1721 runoff to catchment 702 then to SWMF2 South FB
*******************************************************************************************
*
* Roof areas within 712, hydrograph 9702
* VS=101.000 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=2 NHD= 9712 AREA=   0.0014 Sq km  L=    20 m  W=    10 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                  100.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0  0.0
                  RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=0.7 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Roof infiltration gallery within 702; hydrograph 8702
*
ROUTE SPECIAL POND  ID=4 HYD NO=8712 INFLOW=2 PCODE=0 OPTION= 5
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 101.100
                    Recharge characteristics for Compartment A
                      LEVELA= 100.000               EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 10.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
                      CDB=  15.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  3
                                    Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)   (ha*m)    (ha)    (cms)   (ha*m)    (ha)
                     100.000     0.000  0.0000  0.0000   0.000  0.0000  0.0090
                     101.000     0.000  0.0000  0.0000   0.000  0.0036  0.0090
                     101.100     0.000  0.0000  0.0000   1.000  0.0039  0.0090
*
PRINT HYD           ID=3 PCODE=1 MODE=10
* Non-roof areas within 712 (Hallman MR Blk); hydrograph 7712
* VS=3.200 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=2 NHD= 7712 AREA=   0.0090 Sq km  L=  60 m  W= 50 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   54.0   0.0  0.0   7.1  0.0   0.2  0.0  38.7  0.0
                  RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=1.0 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
*
ADD HYD             ID=5 HYD NO=  712 IDA=4 IDB=2 ICODE=0
PRINT HYD           ID=5 PCODE=1 MODE=10
*
* Sum catchment 7712 and surplus from roof inf. galleries (8702) hydrographs
*
```



```
ADD HYD             ID=2 HYD NO=  1720 IDA=3 IDB=5 ICODE=0
*
*-------------------------------------------------------------------------------------------
*
COMPUTE FLOWRATE    ID=5 NHD= 7702 AREA=   0.1967 Sq km  L=   65 m  W=   500 m
             SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   48.3   0.0  0.0   8.0  0.0   0.2  0.0  43.5  0.0
                  RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=0.7 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
*-------------------------------------------------------------------------------------------
*
PRINT HYD           ID=5 PCODE=1 MODE=10
*******************************************************************************************
* Add minor flow from school block 7021
*
* Sum hydr. 1721, 7702, call result 1722
*
ADD HYD             ID=4 HYD NO= 1722 IDA=5 IDB=6 ICODE=0
*******************************************************************************************
* Sum components of 702 (1722, 1720), call result 702
*
ADD HYD             ID=5 HYD NO=  702 IDA=2 IDB=4 ICODE=0
PRINT HYD           ID=5 PCODE=1 MODE=10
*
* Sum hydr. 1701, 702, call result 1702
*
ADD HYD             ID=3 HYD NO= 1702 IDA=1 IDB=5 ICODE=0
PRINT HYD           ID=3 PCODE=1 MODE=10
*
* SWM Facility 2 (Central SWM Facility)
* Route 1702 through resevoir 5702
*
ROUTE SPECIAL POND  ID=1 HYD NO=5702 INFLOW=3 PCODE=0 OPTION=15
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 310.400
                    Recharge characteristics for Compartment A
                      LEVELA= 308.300               EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 10.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 308.300 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB=   0.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  22
                                    Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)   (ha*m)    (ha)    (cms)   (ha*m)    (ha)
                     308.300     0.000  0.0000  0.0000   0.0000  0.0000  1.6687
                     308.400     0.000  0.0000  0.0000   0.0110  0.1696  1.7233
                     308.500     0.000  0.0000  0.0000   0.0347  0.3447  1.7784
                     308.600     0.000  0.0000  0.0000   0.0517  0.5253  1.8339
                     308.700     0.000  0.0000  0.0000   0.0643  0.7115  1.8898
                     308.800     0.000  0.0000  0.0000   0.0749  0.9033  1.9462
                     308.900     0.000  0.0000  0.0000   0.0841  1.1019  2.0268
                     309.000     0.000  0.0000  0.0000   0.0924  1.3062  2.0585
                     309.100     0.000  0.0000  0.0000   0.1000  1.5136  2.0901
                     309.200     0.000  0.0000  0.0000   0.1071  1.7242  2.1218
                     309.300     0.000  0.0000  0.0000   0.4790  1.9370  2.1328
                     309.400     0.000  0.0000  0.0000   1.1847  2.1520  2.1679
                     309.500     0.000  0.0000  0.0000   2.1398  2.3705  2.2030
                     309.600     0.000  0.0000  0.0000   3.3212  2.5926  2.2381
                     309.700     0.000  0.0000  0.0000   4.7191  2.8182  2.2732
                     309.800     0.000  0.0000  0.0000   6.3292  3.0472  2.3083
                     309.900     0.000  0.0000  0.0000   8.1499  3.2798  2.3434
                     310.000     0.000  0.0000  0.0000  10.029   3.5159  2.3785
                     310.100     0.000  0.0000  0.0000  12.268   3.7555  2.4135
                     310.200     0.000  0.0000  0.0000  14.720   3.9986  2.4486
                     310.300     0.000  0.0000  0.0000  17.388   4.2452  2.4837
```

```
                  310.400     0.000  0.0000  0.0000  20.275  4.4954  2.5188
*
PRINT HYD         ID=1 PCODE=1 MODE=10
KEEP HYD          ID=1 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=1 IMET=1
*
*
* 5702 -> 7312 / 2702 Split Pond 2 Outflow (5702) into Wetland DIVERT (7312)
*         and Sewer (2702) components
*
*----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
DIVERT FLOWS      INFLOW=1  DIVERT=6 HYD NO=7312 PCODE=1 OPTION=4
                  THRUFLO=5 HYD NOB=2702 THROUGHFLOW  DIVERSION
                                          0.000       0.000
                                          0.011       0.000
                                          0.035       0.000
                                          0.052       0.000
                                          0.064       0.000
                                          0.075       0.000
                                          0.084       0.000
                                          0.092       0.000
                                          0.100       0.000
                                          0.107       0.000
                                          0.114       0.365
                                          0.120       1.065
                                          0.126       2.014
                                          0.152      10.03
                                          0.170      10.50
                  IDFLAG=0  IDSTOR=0  IGWT=0
*
*KEEP HYD           ID=5 CUTOFF=0 ICODE=5 ISTEP=1 IFORM=0 IDB=5 IMET=0
*PRINT HYD          ID=5 PCODE=1 MODE=10
*KEEP HYD           ID=6 CUTOFF=0 ICODE=5 ISTEP=1 IFORM=0 IDB=6 IMET=0
*PRINT HYD          ID=6 PCODE=1 MODE=10
*~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
*~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
*
*
* Typical Roof section
*
COMPUTE RATING CURVE ID=5  VS=   101.000   NSEGS=3
                     MIN EL=  295.00   MAX EL=  295.70
                     CHNSLP= 0.2500   FLNSLP= 0.2500
                     N= 0.018  DIST=  100.00
                     N=-0.018  DIST=  400.00
                     N= 0.018  DIST=  500.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  295.70   100.00  295.50   100.10  295.00
                     399.90  295.00   400.00  295.50   500.00  295.70
                    RFN=0.0000 PCODE=1
*
* Typical Urban section
*
COMPUTE RATING CURVE ID=6  VS=     3.200   NSEGS=3
                     MIN EL=  295.00   MAX EL=  295.70
                     CHNSLP= 0.02000   FLNSLP= 0.02000
                     N= 0.015  DIST=  200.00
                     N=-0.015  DIST=  300.00
                     N= 0.015  DIST=  500.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  295.70   200.00  295.50   200.10  295.00
                     299.90  295.00   300.00  295.50   500.00  295.70
*
* Roof & Park areas within 702 directed to Wetland, hydrograph 7020
* VS=101.000 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=1 NHD= 7020 AREA=   0.0065 Sq km  L=    20 m  W=    10 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   100.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0  0.0
                   RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=1.0 GWON=1
```



```
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
PRINT HYD          ID=1 PCODE=1 MODE=10
*
* Roof areas within 708 directed to Wetland, hydrograph 7080
* VS=101.000 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=2 NHD= 7080 AREA=   0.0151 Sq km  L=    20 m  W=    10 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   100.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0  0.0
                   RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=1.0 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
PRINT HYD          ID=2 PCODE=1 MODE=10
*
* Sum catchments 7020 and 7080, call result 2312
*
ADD HYD            ID=3 HYD NO= 2312 IDA=1 IDB=2 ICODE=0
PRINT HYD          ID=3 PCODE=1 MODE=10
*
* Roof areas within 701 directed to Wetland, hydrograph 7010
* VS=101.000 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=1 NHD= 7010 AREA=   0.0034 Sq km  L=    20 m  W=    10 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   100.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0  0.0
                   RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=1.0 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
PRINT HYD          ID=1 PCODE=1 MODE=10
*
* Sum 2312 and 7010, call result 3312
*
ADD HYD            ID=2 HYD NO= 3312 IDA=3 IDB=1 ICODE=0
PRINT HYD          ID=2 PCODE=1 MODE=10
*
*~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
*~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
*
*
*   2.0% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=4  VS=   100.020   NSEGS=3
                     MIN EL=  100.70   MAX EL=  103.00
                     CHNSLP= 0.02000   FLNSLP= 0.02000
                     N= 0.080  DIST=   20.00
                     N=-0.050  DIST=   30.00
                     N= 0.080  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                       0.00  103.00    20.00  101.00    23.00  100.80
                      25.00  100.70    27.00  100.80    30.00  101.00
                      50.00  103.00
                    RFN=0.0000 PCODE=1
*
* Catchment 312, existing wetland area for water balancing
* Percentage wetland increased from 4 to 20%
* This area has been spliced from drainage area 702 above
* VS=  100.020 is main channel & VS= 2.035 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 312 AREA=   0.0552 Sq km  L=   280 m  W=   180 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     0.0  20.0  1.0   5.0  0.0   0.0  0.0  74.0  0.0
                   RATING CURVES: IDMC=4 IDOC=2 QRMC=  0.05 QROC=  0.01
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=1.00 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
```

```
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr. 3312 and 312, call result 4312
*
ADD HYD             ID=3 HYD NO= 4312 IDA=2 IDB=1 ICODE=0
PRINT HYD           ID=3 PCODE=1 MODE=10
*
*
* Sum hydr. 4312 and Diversion from SWM 2 (7312) call result 6312
*
ADD HYD             ID=1 HYD NO= 6312 IDA=3 IDB=6 ICODE=0
PRINT HYD           ID=1 PCODE=1 MODE=10
KEEP HYD            ID=1 CUTOFF=0 ICODE=5 ISTEP=1 IFORM=0 IDB=1 IMET=0
*
*
* Central Wetland
* Route 6312 through Wetland 2 Depression - Revised per MTE Survey April 2017
* Min Ponding set to 307.9 to be more in line with monitoring data
* Modfy infil area for wetland 5312, same as Model Oct20.2017
*
ROUTE SPECIAL POND  ID=2 HYD NO=5312 INFLOW=1 PCODE=0 OPTION=15
                    Inflow controls:
                        USPCT=100% USDIV=0      PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 311.000
                    Recharge characteristics for Compartment A
                      LEVELA= 307.900                EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 10.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 307.900 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB= 50.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points= 11
                                  Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     307.900     0.000  0.0000  0.0000  0.0000   0.000  0.0000
                     308.100     0.000  0.0000  0.0000  0.0000   0.229  0.0090
                     308.400     0.000  0.0000  0.0000  0.0000   0.609  0.0050
                     308.500     0.000  0.0000  0.0000  0.0000   0.751  0.0090
                     308.510     0.000  0.0000  0.0000  0.0000   0.766  0.3950
                     309.000     0.000  0.0000  0.0000  0.0000   1.656  1.0491
                     309.500     0.000  0.0000  0.0000  0.1259   3.009  2.1717
                     310.000     0.000  0.0000  0.0000  0.1523   5.043  3.7746
                     310.500     0.000  0.0000  0.0000  0.1747   7.912  5.5009
                     310.700     0.000  0.0000  0.0000  0.1829   9.300  6.1970
                     311.000     0.000  0.0000  0.0000  0.1945   11.62  7.0741
*
PRINT HYD           ID=2 PCODE=1 MODE=10
KEEP HYD            ID=2 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=2 IMET=1
*~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
*~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
*~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
*~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
CHANGE INPUT FILE
*
* Go to event file
*
CHANGE INPUT FILE
*
FINISH
```

1	106	0.0215	7.46	0.0195	0.	RCFLAGS	0	0	cndchi.dat	cnde
1	5106	0.0215	0.00	0.0000	110.	RCFLAGS	0	0		
1	107	0.1510	6.28	0.1089	0.	RCFLAGS	0	0		
1	1103	0.1725	5.50	0.1089	0.	RCFLAGS	0	0		
1	104	0.0000	0.00	0.0000	0.	RCFLAGS	0	0		
1	1104	0.1725	5.50	0.1089	0.	RCFLAGS	0	0		
1	105	0.0331	7.22	0.3821	0.	RCFLAGS	0	0		
1	1051	0.2056	5.77	0.4116	0.	RCFLAGS	0	0		
1	1050	0.0110	30.36	0.1696	0.	RCFLAGS	0	0		
1	1105	0.2166	7.02	0.5474	0.	RCFLAGS	0	0		
1	101	0.0032	6.83	0.0086	0.	RCFLAGS	0	0		
1	102	0.0214	6.27	0.0362	0.	RCFLAGS	0	0		
1	1101	0.0246	6.34	0.0448	0.	RCFLAGS	0	0		
1	103	0.0259	0.09	0.0000	0.	RCFLAGS	0	0		
1	1102	0.0505	3.14	0.0448	0.	RCFLAGS	0	0		
1	5103	0.0505	0.00	0.0000	144.	RCFLAGS	0	0		
1	1106	0.2671	5.69	0.5474	0.	RCFLAGS	0	0		
1	108	0.1240	0.70	0.0007	0.	RCFLAGS	0	0		
1	1107	0.3911	4.11	0.5476	0.	RCFLAGS	0	0		
1	5108	0.3911	4.05	0.2677	389.	RCFLAGS	0	0		
1	2108	0.3911	4.05	0.2654	0.	RCFLAGS	0	0		
1	109	0.1252	2.05	0.0178	0.	RCFLAGS	0	0		
1	1108	0.5163	3.56	0.2831	0.	RCFLAGS	0	0		
1	110	0.0201	6.28	0.0691	0.	RCFLAGS	0	0		
1	1109	0.5364	3.66	0.3316	0.	RCFLAGS	0	0		
1	111	0.0498	6.28	0.0889	0.	RCFLAGS	0	0		
1	1110	0.5862	3.89	0.4130	0.	RCFLAGS	0	0		
1	2110	0.5862	3.89	0.3823	0.	RCFLAGS	0	0		
1	305	0.0015	6.72	0.0036	0.	RCFLAGS	0	0		
1	9709	0.0064	30.37	0.1766	0.	RCFLAGS	0	0		
1	8709	0.0064	3.55	0.0147	160.	RCFLAGS	0	0		
1	6709	0.0230	17.14	0.2004	0.	RCFLAGS	0	0		
1	4709	0.0230	4.60	0.0990	279.	RCFLAGS	0	0		
1	7709	0.0082	17.14	0.0715	0.	RCFLAGS	0	0		
1	3709	0.0312	7.90	0.1197	0.	RCFLAGS	0	0		
1	709	0.0376	7.16	0.1197	0.	RCFLAGS	0	0		
1	1709	0.0391	7.14	0.1220	0.	RCFLAGS	0	0		
1	9704	0.0053	30.37	0.1463	0.	RCFLAGS	0	0		
1	8704	0.0053	3.46	0.0129	133.	RCFLAGS	0	0		
1	6704	0.0170	18.85	0.1729	0.	RCFLAGS	0	0		
1	4704	0.0170	7.42	0.1542	189.	RCFLAGS	0	0		
1	7704	0.0115	18.84	0.0902	0.	RCFLAGS	0	0		
1	3704	0.0285	12.03	0.2135	0.	RCFLAGS	0	0		
1	704	0.0338	10.69	0.2135	0.	RCFLAGS	0	0		
1	1704	0.0729	8.78	0.2540	0.	RCFLAGS	0	0		
1	5704	0.0729	7.53	0.0055	605.	RCFLAGS	0	0		
1	705	0.0043	25.74	0.1049	0.	RCFLAGS	0	0	cndchi.dat	cnde
1	1705	0.0772	8.55	0.1055	0.	RCFLAGS	0	0		
1	402	0.0507	9.90	0.0831	0.	RCFLAGS	0	0		
1	1401	0.1279	9.08	0.1348	0.	RCFLAGS	0	0		
1	403	0.1073	3.54	0.0375	0.	RCFLAGS	0	0		
1	1402	0.2352	6.56	0.1459	0.	RCFLAGS	0	0		
1	5403	0.2352	0.00	0.0000	1033.	RCFLAGS	0	0		
1	405	0.0966	7.69	0.0774	0.	RCFLAGS	0	0		
1	5405	0.0966	0.00	0.0000	374.	RCFLAGS	0	0		
1	406	0.0930	7.18	0.0713	0.	RCFLAGS	0	0		
1	1403	0.1896	3.52	0.0713	0.	RCFLAGS	0	0		
1	5406	0.1896	0.00	0.0000	306.	RCFLAGS	0	0		
1	7120	0.0081	30.37	0.2236	0.	RCFLAGS	0	0		
1	404	0.0517	8.09	0.1188	0.	RCFLAGS	0	0		
1	1712	0.0598	11.11	0.2630	0.	RCFLAGS	0	0		
1	1404	0.2494	2.66	0.2630	0.	RCFLAGS	0	0		
1	407	0.2555	2.79	0.0947	0.	RCFLAGS	0	0		
1	1405	0.5049	2.73	0.2927	0.	RCFLAGS	0	0		
1	5407	0.5049	0.00	0.0000	1178.	RCFLAGS	0	0		
1	1406	0.7401	0.00	0.0000	0.	RCFLAGS	0	0		
1	5437	0.7401	0.00	0.0000	0.	RCFLAGS	0	0		
1	7090	0.0070	30.37	0.1932	0.	RCFLAGS	0	0		
1	7091	0.7471	0.28	0.1932	0.	RCFLAGS	0	0		
1	408	0.0148	7.54	0.0319	0.	RCFLAGS	0	0		
1	409	0.8840	1.17	0.0603	0.	RCFLAGS	0	0		
1	1407	0.8988	1.28	0.0894	0.	RCFLAGS	0	0		
1	1408	1.6459	0.83	0.2369	0.	RCFLAGS	0	0		
1	5409	1.6459	0.00	0.0000	1131.	RCFLAGS	0	0		

1	201	0.0639	16.75	0.3172	0.	RCFLAGS	0	0		
1	9710	0.0181	30.37	0.4996	0.	RCFLAGS	0	0		
1	8710	0.0181	3.49	0.0383	455.	RCFLAGS	0	0		
1	7710	0.0450	16.84	0.3494	0.	RCFLAGS	0	0		
1	710	0.0631	13.01	0.3494	0.	RCFLAGS	0	0		
1	10	0.1270	14.89	0.6482	0.	RCFLAGS	0	0		
1	9711	0.0051	30.61	0.1408	0.	RCFLAGS	0	0		
1	8711	0.0051	3.84	0.0114	126.	RCFLAGS	0	0		
1	7711	0.0209	16.31	0.2089	0.	RCFLAGS	0	0		
1	711	0.0260	13.87	0.2089	0.	RCFLAGS	0	0		
1	2200	0.1530	14.72	0.8563	0.	RCFLAGS	0	0		
1	5201	0.1530	9.55	0.0107	2148.	RCFLAGS	0	0		
1	2201	0.1530	9.53	0.0107	0.	RCFLAGS	0	0		
1	202	0.1043	0.77	0.0007	0.	RCFLAGS	0	0		
1	1201	0.2573	5.98	0.0108	0.	RCFLAGS	0	0		
1	203	0.0368	6.54	0.0588	0.	RCFLAGS	0	0		
1	1202	0.2941	6.05	0.0648	0.	RCFLAGS	0	0		
1	2202	0.2941	6.05	0.0646	0.	RCFLAGS	0	0		
1	204	0.0453	7.14	0.0548	0.	RCFLAGS	0	0	cndchi.dat	cnde
1	1203	0.3394	6.19	0.1194	0.	RCFLAGS	0	0		
1	205	0.0700	0.40	0.0002	0.	RCFLAGS	0	0		
1	1204	0.4094	5.20	0.1195	0.	RCFLAGS	0	0		
1	301	0.1662	13.98	0.5657	0.	RCFLAGS	0	0		
1	302	0.1347	10.37	0.5591	0.	RCFLAGS	0	0		
1	1301	0.3009	12.36	1.1248	0.	RCFLAGS	0	0		
1	5301	0.3009	11.26	0.0428	3242.	RCFLAGS	0	0		
1	303	0.3216	13.47	1.3922	0.	RCFLAGS	0	0		
1	1302	0.6225	12.40	1.4048	0.	RCFLAGS	0	0		
1	304	0.1193	13.98	0.4652	0.	RCFLAGS	0	0		
1	1303	0.7418	12.66	1.8700	0.	RCFLAGS	0	0		
1	2303	0.7418	12.65	1.7830	0.	RCFLAGS	0	0		
1	307	0.1653	0.52	0.0008	0.	RCFLAGS	0	0		
1	1304	0.9071	10.44	1.7833	0.	RCFLAGS	0	0		
1	306	0.0490	6.50	0.0584	0.	RCFLAGS	0	0		
1	1306	0.9561	10.96	1.8437	0.	RCFLAGS	0	0		
1	9706	0.0090	30.61	0.2484	0.	RCFLAGS	0	0		
1	8706	0.0090	3.66	0.0155	224.	RCFLAGS	0	0		
1	6706	0.0055	18.24	0.0541	0.	RCFLAGS	0	0		
1	4706	0.0055	0.00	0.0000	96.	RCFLAGS	0	0		
1	7706	0.0323	18.25	0.2741	0.	RCFLAGS	0	0		
1	3706	0.0378	15.59	0.2741	0.	RCFLAGS	0	0		
1	706	0.0468	13.30	0.2741	0.	RCFLAGS	0	0		
1	5706	0.0468	11.14	0.0050	580.	RCFLAGS	0	0		
1	1706	1.0029	10.97	1.8472	0.	RCFLAGS	0	0		
1	707	0.0077	16.34	0.1363	0.	RCFLAGS	0	0		
1	2707	0.0077	16.34	0.1363	0.	RCFLAGS	0	0		
1	3707	0.0077	0.00	0.0000	0.	RCFLAGS	0	0		
1	1707	1.0106	11.01	1.8588	0.	RCFLAGS	0	0		
1	3082	0.0028	7.56	0.0057	0.	RCFLAGS	0	0		
1	3092	0.0119	0.30	0.0000	0.	RCFLAGS	0	0		
1	1902	0.0147	1.68	0.0057	0.	RCFLAGS	0	0		
1	1903	0.0147	1.68	0.0057	0.	RCFLAGS	0	0		
1	5309	0.0147	0.00	0.0000	17.	RCFLAGS	0	0		
1	1308	1.0253	10.86	1.8588	0.	RCFLAGS	0	0		
1	2308	1.0253	13.21	1.4387	0.	RCFLAGS	0	0		
1	310	0.0682	12.55	0.2157	0.	RCFLAGS	0	0		
1	1309	1.0935	13.17	1.5301	0.	RCFLAGS	0	0		
1	311	0.4793	0.48	0.0021	0.	RCFLAGS	0	0		
1	1310	1.5728	9.30	1.5308	0.	RCFLAGS	0	0		
1	5310	1.5728	4.01	0.0955	7748.	RCFLAGS	0	0		
1	313	0.0492	7.13	0.0369	0.	RCFLAGS	0	0		
1	9721	0.0039	30.61	0.1077	0.	RCFLAGS	0	0		
1	8721	0.0039	5.03	0.0076	96.	RCFLAGS	0	0		
1	7721	0.0231	13.55	0.1906	0.	RCFLAGS	0	0		
1	7021	0.0270	12.32	0.1906	0.	RCFLAGS	0	0	cndchi.dat	cnde
1	1721	0.0270	12.32	0.1906	0.	RCFLAGS	0	0		
1	3131	0.0270	0.00	0.0000	96.	RCFLAGS	0	0		
1	1311	0.0492	7.13	0.0369	0.	RCFLAGS	0	0		
1	314	0.1142	0.35	0.0003	0.	RCFLAGS	0	0		
1	1312	0.1634	2.39	0.0371	0.	RCFLAGS	0	0		
1	315	0.0158	8.34	0.0306	0.	RCFLAGS	0	0		
1	1313	0.1792	2.92	0.0671	0.	RCFLAGS	0	0		
1	9703	0.0082	30.61	0.2263	0.	RCFLAGS	0	0		
1	8703	0.0082	3.42	0.0183	206.	RCFLAGS	0	0		

1	7703	0.0224	18.79	0.2110	0.	RCFLAGS	0	0	
1	703	0.0306	14.67	0.2110	0.	RCFLAGS	0	0	
1	1703	0.2098	4.63	0.2566	0.	RCFLAGS	0	0	
1	316	0.2101	11.84	0.5683	0.	RCFLAGS	0	0	
1	1314	0.4199	8.24	0.8180	0.	RCFLAGS	0	0	
1	5314	0.4199	7.50	0.0930	2370.	RCFLAGS	0	0	
1	1315	1.9927	5.10	0.1912	0.	RCFLAGS	0	0	
1	2315	1.9927	5.09	0.1912	0.	RCFLAGS	0	0	
1	317	0.1180	11.36	0.6139	0.	RCFLAGS	0	0	
1	1316	2.1107	5.44	0.6414	0.	RCFLAGS	0	0	
1	2316	2.1107	5.69	0.6329	0.	RCFLAGS	0	0	
1	318	0.1539	13.76	0.5547	0.	RCFLAGS	0	0	
1	1317	2.2646	6.24	1.1876	0.	RCFLAGS	0	0	
1	9708	0.0176	30.37	0.4858	0.	RCFLAGS	0	0	
1	8708	0.0176	3.46	0.0389	443.	RCFLAGS	0	0	
1	6708	0.0080	30.37	0.2208	0.	RCFLAGS	0	0	
1	5708	0.0080	3.66	0.0136	199.	RCFLAGS	0	0	
1	2708	0.0276	18.89	0.3350	0.	RCFLAGS	0	0	
1	4708	0.0356	15.46	0.3350	0.	RCFLAGS	0	0	
1	1708	0.0356	0.00	0.0000	535.	RCFLAGS	0	0	
1	7708	0.1030	17.84	0.6884	0.	RCFLAGS	0	0	
1	3708	0.1386	13.26	0.6884	0.	RCFLAGS	0	0	
1	708	0.1562	12.16	0.6884	0.	RCFLAGS	0	0	
1	9701	0.0187	30.43	0.5162	0.	RCFLAGS	0	0	
1	8701	0.0187	3.55	0.0365	469.	RCFLAGS	0	0	
1	7701	0.0661	17.40	0.4905	0.	RCFLAGS	0	0	
1	701	0.0848	14.34	0.4905	0.	RCFLAGS	0	0	
1	1701	0.2410	12.93	1.1773	0.	RCFLAGS	0	0	
1	9702	0.0486	30.44	1.3414	0.	RCFLAGS	0	0	
1	8702	0.0486	3.52	0.0755	1223.	RCFLAGS	0	0	
1	9712	0.0014	30.44	0.0386	0.	RCFLAGS	0	0	
1	8712	0.0014	2.81	0.0017	36.	RCFLAGS	0	0	
1	7712	0.0090	19.72	0.1819	0.	RCFLAGS	0	0	
1	712	0.0104	17.44	0.1819	0.	RCFLAGS	0	0	
1	1720	0.0590	5.98	0.1819	0.	RCFLAGS	0	0	
1	7702	0.1967	18.47	1.1139	0.	RCFLAGS	0	0	
1	1722	0.2237	17.73	1.2801	0.	RCFLAGS	0	0	cndchi.dat cnde
1	702	0.2827	15.28	1.3375	0.	RCFLAGS	0	0	
1	1702	0.5237	14.20	2.5147	0.	RCFLAGS	0	0	
1	5702	0.5237	10.94	0.0631	6931.	RCFLAGS	0	0	
1	2702	0.5237	10.94	0.0631	0.	RCFLAGS	0	0	
1	7312	0.5237	0.00	0.0000	0.	RCFLAGS	0	0	
1	7020	0.0065	30.37	0.1794	0.	RCFLAGS	0	0	
1	7080	0.0151	30.37	0.4168	0.	RCFLAGS	0	0	
1	2312	0.0216	30.37	0.5962	0.	RCFLAGS	0	0	
1	7010	0.0034	30.37	0.0938	0.	RCFLAGS	0	0	
1	3312	0.0250	30.37	0.6900	0.	RCFLAGS	0	0	
1	312	0.0552	5.38	0.0357	0.	RCFLAGS	0	0	
1	4312	0.0802	13.17	0.6999	0.	RCFLAGS	0	0	
1	6312	0.0802	13.17	0.6999	0.	RCFLAGS	0	0	
1	5312	0.0802	0.00	0.0000	1030.	RCFLAGS	0	0	
2	106	0.0215	20.59	0.0501	0.	RCFLAGS	0	0	cndchi.dat cnde
2	5106	0.0215	0.00	0.0000	303.	RCFLAGS	0	0	
2	107	0.1510	18.85	0.3014	0.	RCFLAGS	0	0	
2	1103	0.1725	16.50	0.3014	0.	RCFLAGS	0	0	
2	104	0.0000	0.00	0.0000	0.	RCFLAGS	0	0	
2	1104	0.1725	16.50	0.3014	0.	RCFLAGS	0	0	
2	105	0.0331	20.22	1.0056	0.	RCFLAGS	0	0	
2	1051	0.2056	17.10	1.0914	0.	RCFLAGS	0	0	
2	1050	0.0110	46.65	0.2408	0.	RCFLAGS	0	0	
2	1105	0.2166	18.60	1.2866	0.	RCFLAGS	0	0	
2	101	0.0032	19.68	0.0215	0.	RCFLAGS	0	0	
2	102	0.0214	18.84	0.0968	0.	RCFLAGS	0	0	
2	1101	0.0246	18.95	0.1180	0.	RCFLAGS	0	0	
2	103	0.0259	0.78	0.0016	0.	RCFLAGS	0	0	
2	1102	0.0505	9.63	0.1180	0.	RCFLAGS	0	0	
2	5103	0.0505	0.00	0.0000	441.	RCFLAGS	0	0	
2	1106	0.2671	15.08	1.2866	0.	RCFLAGS	0	0	
2	108	0.1240	2.43	0.0063	0.	RCFLAGS	0	0	
2	1107	0.3911	11.07	1.2868	0.	RCFLAGS	0	0	
2	5108	0.3911	10.97	0.7813	564.	RCFLAGS	0	0	
2	2108	0.3911	10.97	0.7656	0.	RCFLAGS	0	0	
2	109	0.1252	3.90	0.0417	0.	RCFLAGS	0	0	
2	1108	0.5163	9.26	0.8036	0.	RCFLAGS	0	0	

2	110	0.0201	18.84	0.1769	0.	RCFLAGS	0	0	
2	1109	0.5364	9.62	0.9666	0.	RCFLAGS	0	0	
2	111	0.0498	18.84	0.2366	0.	RCFLAGS	0	0	
2	1110	0.5862	10.40	1.2033	0.	RCFLAGS	0	0	
2	2110	0.5862	11.00	1.0210	0.	RCFLAGS	0	0	
2	305	0.0015	19.43	0.0089	0.	RCFLAGS	0	0	
2	9709	0.0064	46.65	0.2273	0.	RCFLAGS	0	0	
2	8709	0.0064	19.65	0.1326	162.	RCFLAGS	0	0	
2	6709	0.0230	31.55	0.3573	0.	RCFLAGS	0	0	
2	4709	0.0230	18.13	0.2597	291.	RCFLAGS	0	0	
2	7709	0.0082	31.55	0.1274	0.	RCFLAGS	0	0	
2	3709	0.0312	21.66	0.3557	0.	RCFLAGS	0	0	
2	709	0.0376	21.31	0.3557	0.	RCFLAGS	0	0	
2	1709	0.0391	21.24	0.3646	0.	RCFLAGS	0	0	
2	9704	0.0053	46.65	0.1882	0.	RCFLAGS	0	0	
2	8704	0.0053	19.54	0.1129	134.	RCFLAGS	0	0	
2	6704	0.0170	33.50	0.2969	0.	RCFLAGS	0	0	
2	4704	0.0170	22.04	0.2551	195.	RCFLAGS	0	0	
2	7704	0.0115	33.49	0.1547	0.	RCFLAGS	0	0	
2	3704	0.0285	26.66	0.3887	0.	RCFLAGS	0	0	
2	704	0.0338	25.54	0.4649	0.	RCFLAGS	0	0	
2	1704	0.0729	23.24	0.7814	0.	RCFLAGS	0	0	
2	5704	0.0729	21.45	0.1919	1153.	RCFLAGS	0	0	
2	705	0.0043	41.36	0.1483	0.	RCFLAGS	0	0	cndchi.dat cnde
2	1705	0.0772	22.55	0.2004	0.	RCFLAGS	0	0	
2	402	0.0507	23.61	0.1884	0.	RCFLAGS	0	0	
2	1401	0.1279	22.97	0.3599	0.	RCFLAGS	0	0	
2	403	0.1073	10.85	0.0940	0.	RCFLAGS	0	0	
2	1402	0.2352	17.44	0.4528	0.	RCFLAGS	0	0	
2	5403	0.2352	0.00	0.0000	3205.	RCFLAGS	0	0	
2	405	0.0966	20.85	0.1989	0.	RCFLAGS	0	0	
2	5405	0.0966	0.00	0.0000	1216.	RCFLAGS	0	0	
2	406	0.0930	20.17	0.1883	0.	RCFLAGS	0	0	
2	1403	0.1896	9.89	0.1883	0.	RCFLAGS	0	0	
2	5406	0.1896	0.00	0.0000	1087.	RCFLAGS	0	0	
2	7120	0.0081	46.65	0.2876	0.	RCFLAGS	0	0	
2	404	0.0517	21.50	0.2862	0.	RCFLAGS	0	0	
2	1712	0.0598	24.91	0.3963	0.	RCFLAGS	0	0	
2	1404	0.2494	5.97	0.3963	0.	RCFLAGS	0	0	
2	407	0.2555	8.57	0.2116	0.	RCFLAGS	0	0	
2	1405	0.5049	7.29	0.5613	0.	RCFLAGS	0	0	
2	5407	0.5049	0.00	0.0000	3208.	RCFLAGS	0	0	
2	1406	0.7401	0.00	0.0000	0.	RCFLAGS	0	0	
2	5437	0.7401	0.00	0.0000	0.	RCFLAGS	0	0	
2	7090	0.0070	46.65	0.2486	0.	RCFLAGS	0	0	
2	7091	0.7471	0.44	0.2486	0.	RCFLAGS	0	0	
2	408	0.0148	20.49	0.0789	0.	RCFLAGS	0	0	
2	409	0.8840	4.15	0.2502	0.	RCFLAGS	0	0	
2	1407	0.8988	4.42	0.2620	0.	RCFLAGS	0	0	
2	1408	1.6459	2.61	0.3289	0.	RCFLAGS	0	0	
2	5409	1.6459	0.00	0.0000	3862.	RCFLAGS	0	0	
2	201	0.0639	30.83	0.5745	0.	RCFLAGS	0	0	
2	9710	0.0181	46.65	0.6427	0.	RCFLAGS	0	0	
2	8710	0.0181	19.61	0.3481	469.	RCFLAGS	0	0	
2	7710	0.0450	31.21	0.6269	0.	RCFLAGS	0	0	
2	710	0.0631	27.88	0.9562	0.	RCFLAGS	0	0	
2	10	0.1270	29.36	1.5307	0.	RCFLAGS	0	0	
2	9711	0.0051	46.89	0.1811	0.	RCFLAGS	0	0	
2	8711	0.0051	19.96	0.0983	127.	RCFLAGS	0	0	
2	7711	0.0209	30.57	0.3830	0.	RCFLAGS	0	0	
2	711	0.0260	28.49	0.4279	0.	RCFLAGS	0	0	
2	2200	0.1530	29.22	1.9475	0.	RCFLAGS	0	0	
2	5201	0.1530	13.44	0.0132	4332.	RCFLAGS	0	0	
2	2201	0.1530	13.41	0.0132	0.	RCFLAGS	0	0	
2	202	0.1043	2.79	0.0157	0.	RCFLAGS	0	0	
2	1201	0.2573	9.10	0.0274	0.	RCFLAGS	0	0	
2	203	0.0368	19.11	0.1575	0.	RCFLAGS	0	0	
2	1202	0.2941	10.36	0.1770	0.	RCFLAGS	0	0	
2	2202	0.2941	10.36	0.1768	0.	RCFLAGS	0	0	
2	204	0.0453	19.99	0.1427	0.	RCFLAGS	0	0	cndchi.dat cnde
2	1203	0.3394	11.64	0.3195	0.	RCFLAGS	0	0	
2	205	0.0700	0.42	0.0003	0.	RCFLAGS	0	0	
2	1204	0.4094	9.72	0.3196	0.	RCFLAGS	0	0	
2	301	0.1662	27.76	1.1126	0.	RCFLAGS	0	0	

2	302	0.1347	21.95	1.1526	0.	RCFLAGS	0	0	
2	1301	0.3009	25.16	2.2591	0.	RCFLAGS	0	0	
2	5301	0.3009	22.18	0.0619	6869.	RCFLAGS	0	0	
2	303	0.3216	27.39	2.7645	0.	RCFLAGS	0	0	
2	1302	0.6225	24.87	2.7891	0.	RCFLAGS	0	0	
2	304	0.1193	27.76	0.9111	0.	RCFLAGS	0	0	
2	1303	0.7418	25.34	3.7002	0.	RCFLAGS	0	0	
2	2303	0.7418	25.33	3.5882	0.	RCFLAGS	0	0	
2	307	0.1653	0.53	0.0008	0.	RCFLAGS	0	0	
2	1304	0.9071	20.81	3.5884	0.	RCFLAGS	0	0	
2	306	0.0490	18.08	0.1511	0.	RCFLAGS	0	0	
2	1306	0.9561	21.39	3.7435	0.	RCFLAGS	0	0	
2	9706	0.0090	46.89	0.3196	0.	RCFLAGS	0	0	
2	8706	0.0090	19.79	0.1787	228.	RCFLAGS	0	0	
2	6706	0.0055	32.77	0.0947	0.	RCFLAGS	0	0	
2	4706	0.0055	6.80	0.0239	137.	RCFLAGS	0	0	
2	7706	0.0323	32.78	0.4791	0.	RCFLAGS	0	0	
2	3706	0.0378	29.00	0.4791	0.	RCFLAGS	0	0	
2	706	0.0468	27.23	0.6349	0.	RCFLAGS	0	0	
2	5706	0.0468	22.84	0.0130	1179.	RCFLAGS	0	0	
2	1706	1.0029	21.46	3.7545	0.	RCFLAGS	0	0	
2	707	0.0077	30.61	0.2491	0.	RCFLAGS	0	0	
2	2707	0.0077	26.67	0.1480	0.	RCFLAGS	0	0	
2	3707	0.0077	3.94	0.1011	0.	RCFLAGS	0	0	
2	1707	1.0106	21.50	3.7849	0.	RCFLAGS	0	0	
2	3082	0.0028	20.53	0.0142	0.	RCFLAGS	0	0	
2	3092	0.0119	0.33	0.0000	0.	RCFLAGS	0	0	
2	1902	0.0147	4.18	0.0143	0.	RCFLAGS	0	0	
2	1903	0.0147	6.24	0.1062	0.	RCFLAGS	0	0	
2	5309	0.0147	0.00	0.0000	73.	RCFLAGS	0	0	
2	1308	1.0253	21.19	3.7849	0.	RCFLAGS	0	0	
2	2308	1.0253	24.63	3.0301	0.	RCFLAGS	0	0	
2	310	0.0682	26.05	0.4413	0.	RCFLAGS	0	0	
2	1309	1.0935	24.72	3.2404	0.	RCFLAGS	0	0	
2	311	0.4793	0.61	0.0022	0.	RCFLAGS	0	0	
2	1310	1.5728	17.37	3.2411	0.	RCFLAGS	0	0	
2	5310	1.5728	7.75	0.1129	16396.	RCFLAGS	0	0	
2	313	0.0492	19.98	0.0990	0.	RCFLAGS	0	0	
2	9721	0.0039	46.89	0.1385	0.	RCFLAGS	0	0	
2	8721	0.0039	21.30	0.0719	97.	RCFLAGS	0	0	
2	7721	0.0231	27.44	0.3745	0.	RCFLAGS	0	0	
2	7021	0.0270	26.55	0.4148	0.	RCFLAGS	0	0	cndchi.dat cnde
2	1721	0.0270	26.55	0.4148	0.	RCFLAGS	0	0	
2	3131	0.0270	0.00	0.0000	97.	RCFLAGS	0	0	
2	1311	0.0492	19.98	0.0990	0.	RCFLAGS	0	0	
2	314	0.1142	0.38	0.0004	0.	RCFLAGS	0	0	
2	1312	0.1634	6.28	0.0992	0.	RCFLAGS	0	0	
2	315	0.0158	21.75	0.0740	0.	RCFLAGS	0	0	
2	1313	0.1792	7.64	0.1708	0.	RCFLAGS	0	0	
2	9703	0.0082	46.89	0.2912	0.	RCFLAGS	0	0	
2	8703	0.0082	19.54	0.1721	209.	RCFLAGS	0	0	
2	7703	0.0224	33.39	0.3646	0.	RCFLAGS	0	0	
2	703	0.0306	29.68	0.5061	0.	RCFLAGS	0	0	
2	1703	0.2098	10.86	0.6589	0.	RCFLAGS	0	0	
2	316	0.2101	24.60	1.1678	0.	RCFLAGS	0	0	
2	1314	0.4199	17.73	1.8054	0.	RCFLAGS	0	0	
2	5314	0.4199	16.65	0.3477	4958.	RCFLAGS	0	0	
2	1315	1.9927	9.97	0.4567	0.	RCFLAGS	0	0	
2	2315	1.9927	9.97	0.4563	0.	RCFLAGS	0	0	
2	317	0.1180	24.67	1.3058	0.	RCFLAGS	0	0	
2	1316	2.1107	10.79	1.3551	0.	RCFLAGS	0	0	
2	2316	2.1107	11.04	1.3284	0.	RCFLAGS	0	0	
2	318	0.1539	27.45	1.0918	0.	RCFLAGS	0	0	
2	1317	2.2646	12.15	2.4202	0.	RCFLAGS	0	0	
2	9708	0.0176	46.65	0.6250	0.	RCFLAGS	0	0	
2	8708	0.0176	19.58	0.3409	456.	RCFLAGS	0	0	
2	6708	0.0080	46.65	0.2841	0.	RCFLAGS	0	0	
2	5708	0.0080	19.78	0.1592	202.	RCFLAGS	0	0	
2	2708	0.0276	33.54	0.5761	0.	RCFLAGS	0	0	
2	4708	0.0356	30.45	0.6353	0.	RCFLAGS	0	0	
2	1708	0.0356	4.71	0.0854	900.	RCFLAGS	0	0	
2	7708	0.1030	32.35	1.2345	0.	RCFLAGS	0	0	
2	3708	0.1386	25.25	1.2345	0.	RCFLAGS	0	0	
2	708	0.1562	24.61	1.5753	0.	RCFLAGS	0	0	

2	9701	0.0187	46.71	0.6640	0.	RCFLAGS	0	0	
2	8701	0.0187	19.68	0.3558	483.	RCFLAGS	0	0	
2	7701	0.0661	31.83	0.8698	0.	RCFLAGS	0	0	
2	701	0.0848	29.15	1.2178	0.	RCFLAGS	0	0	
2	1701	0.2410	26.21	2.7932	0.	RCFLAGS	0	0	
2	9702	0.0486	46.72	1.7258	0.	RCFLAGS	0	0	
2	8702	0.0486	19.66	0.7552	1306.	RCFLAGS	0	0	
2	9712	0.0014	46.72	0.0497	0.	RCFLAGS	0	0	
2	8712	0.0014	18.94	0.0361	36.	RCFLAGS	0	0	
2	7712	0.0090	34.49	0.2983	0.	RCFLAGS	0	0	
2	712	0.0104	32.40	0.2983	0.	RCFLAGS	0	0	
2	1720	0.0590	21.91	0.8766	0.	RCFLAGS	0	0	
2	7702	0.1967	33.06	1.9708	0.	RCFLAGS	0	0	
2	1722	0.2237	32.28	2.3739	0.	RCFLAGS	0	0	cndchi.dat cnde
2	702	0.2827	30.11	3.2505	0.	RCFLAGS	0	0	
2	1702	0.5237	28.32	6.0437	0.	RCFLAGS	0	0	
2	5702	0.5237	21.57	0.0960	14039.	RCFLAGS	0	0	
2	2702	0.5237	21.57	0.0960	0.	RCFLAGS	0	0	
2	7312	0.5237	0.00	0.0000	0.	RCFLAGS	0	0	
2	7020	0.0065	46.65	0.2308	0.	RCFLAGS	0	0	
2	7080	0.0151	46.65	0.5362	0.	RCFLAGS	0	0	
2	2312	0.0216	46.65	0.7670	0.	RCFLAGS	0	0	
2	7010	0.0034	46.65	0.1207	0.	RCFLAGS	0	0	
2	3312	0.0250	46.65	0.8877	0.	RCFLAGS	0	0	
2	312	0.0552	16.95	0.0961	0.	RCFLAGS	0	0	
2	4312	0.0802	26.21	0.9160	0.	RCFLAGS	0	0	
2	6312	0.0802	26.21	0.9160	0.	RCFLAGS	0	0	
2	5312	0.0802	0.00	0.0000	2053.	RCFLAGS	0	0	
3	106	0.0215	29.82	0.0699	0.	RCFLAGS	0	0	cndchi.dat cnde
3	5106	0.0215	0.00	0.0000	439.	RCFLAGS	0	0	
3	107	0.1510	27.82	0.4269	0.	RCFLAGS	0	0	
3	1103	0.1725	24.35	0.4269	0.	RCFLAGS	0	0	
3	104	0.0000	0.00	0.0000	0.	RCFLAGS	0	0	
3	1104	0.1725	24.35	0.4269	0.	RCFLAGS	0	0	
3	105	0.0331	29.40	1.1961	0.	RCFLAGS	0	0	
3	1051	0.2056	25.16	1.3376	0.	RCFLAGS	0	0	
3	1050	0.0110	57.22	0.2796	0.	RCFLAGS	0	0	
3	1105	0.2166	26.79	1.5665	0.	RCFLAGS	0	0	
3	101	0.0032	28.79	0.0291	0.	RCFLAGS	0	0	
3	102	0.0214	27.81	0.1339	0.	RCFLAGS	0	0	
3	1101	0.0246	27.94	0.1628	0.	RCFLAGS	0	0	
3	103	0.0259	2.83	0.0056	0.	RCFLAGS	0	0	
3	1102	0.0505	15.06	0.1635	0.	RCFLAGS	0	0	
3	5103	0.0505	0.00	0.0000	685.	RCFLAGS	0	0	
3	1106	0.2671	21.72	1.5665	0.	RCFLAGS	0	0	
3	108	0.1240	8.69	0.0296	0.	RCFLAGS	0	0	
3	1107	0.3911	17.59	1.5666	0.	RCFLAGS	0	0	
3	5108	0.3911	17.40	1.0497	656.	RCFLAGS	0	0	
3	2108	0.3911	17.40	1.0298	0.	RCFLAGS	0	0	
3	109	0.1252	5.90	0.0682	0.	RCFLAGS	0	0	
3	1108	0.5163	14.61	1.0911	0.	RCFLAGS	0	0	
3	110	0.0201	27.82	0.2388	0.	RCFLAGS	0	0	
3	1109	0.5364	15.10	1.3144	0.	RCFLAGS	0	0	
3	111	0.0498	27.82	0.3270	0.	RCFLAGS	0	0	
3	1110	0.5862	16.18	1.6414	0.	RCFLAGS	0	0	
3	2110	0.5862	16.76	1.4091	0.	RCFLAGS	0	0	
3	305	0.0015	28.63	0.0123	0.	RCFLAGS	0	0	
3	9709	0.0064	57.22	0.2523	0.	RCFLAGS	0	0	
3	8709	0.0064	30.21	0.1281	164.	RCFLAGS	0	0	
3	6709	0.0230	41.33	0.4420	0.	RCFLAGS	0	0	
3	4709	0.0230	28.71	0.4189	298.	RCFLAGS	0	0	
3	7709	0.0082	41.32	0.1576	0.	RCFLAGS	0	0	
3	3709	0.0312	32.03	0.5417	0.	RCFLAGS	0	0	
3	709	0.0376	31.72	0.6087	0.	RCFLAGS	0	0	
3	1709	0.0391	31.60	0.6210	0.	RCFLAGS	0	0	
3	9704	0.0053	57.22	0.2089	0.	RCFLAGS	0	0	
3	8704	0.0053	30.11	0.1049	136.	RCFLAGS	0	0	
3	6704	0.0170	43.38	0.3627	0.	RCFLAGS	0	0	
3	4704	0.0170	31.90	0.3248	196.	RCFLAGS	0	0	
3	7704	0.0115	43.37	0.1908	0.	RCFLAGS	0	0	
3	3704	0.0285	36.53	0.5155	0.	RCFLAGS	0	0	
3	704	0.0338	35.52	0.6204	0.	RCFLAGS	0	0	
3	1704	0.0729	33.42	1.1944	0.	RCFLAGS	0	0	
3	5704	0.0729	31.61	0.3860	1443.	RCFLAGS	0	0	

3	705	0.0043	51.66	0.1667	0.	RCFLAGS	0	0	cndchi.dat cnde
3	1705	0.0772	32.73	0.4009	0.	RCFLAGS	0	0	
3	402	0.0507	33.10	0.2546	0.	RCFLAGS	0	0	
3	1401	0.1279	32.87	0.6390	0.	RCFLAGS	0	0	
3	403	0.1073	20.22	0.1749	0.	RCFLAGS	0	0	
3	1402	0.2352	27.10	0.8061	0.	RCFLAGS	0	0	
3	5403	0.2352	0.00	0.0000	5211.	RCFLAGS	0	0	
3	405	0.0966	30.10	0.2769	0.	RCFLAGS	0	0	
3	5405	0.0966	0.00	0.0000	1843.	RCFLAGS	0	0	
3	406	0.0930	29.34	0.2637	0.	RCFLAGS	0	0	
3	1403	0.1896	14.39	0.2637	0.	RCFLAGS	0	0	
3	5406	0.1896	0.00	0.0000	1707.	RCFLAGS	0	0	
3	7120	0.0081	57.22	0.3193	0.	RCFLAGS	0	0	
3	404	0.0517	30.87	0.3880	0.	RCFLAGS	0	0	
3	1712	0.0598	34.44	0.5048	0.	RCFLAGS	0	0	
3	1404	0.2494	8.26	0.5048	0.	RCFLAGS	0	0	
3	407	0.2555	15.49	0.4152	0.	RCFLAGS	0	0	
3	1405	0.5049	11.92	0.7848	0.	RCFLAGS	0	0	
3	5407	0.5049	0.00	0.0000	5267.	RCFLAGS	0	0	
3	1406	0.7401	0.00	0.0000	0.	RCFLAGS	0	0	
3	5437	0.7401	0.00	0.0000	0.	RCFLAGS	0	0	
3	7090	0.0070	57.22	0.2759	0.	RCFLAGS	0	0	
3	7091	0.7471	0.54	0.2759	0.	RCFLAGS	0	0	
3	408	0.0148	29.66	0.1077	0.	RCFLAGS	0	0	
3	409	0.8840	8.06	0.4937	0.	RCFLAGS	0	0	
3	1407	0.8988	8.41	0.5410	0.	RCFLAGS	0	0	
3	1408	1.6459	4.84	0.5589	0.	RCFLAGS	0	0	
3	5409	1.6459	0.00	0.0000	7332.	RCFLAGS	0	0	
3	201	0.0639	40.55	0.7254	0.	RCFLAGS	0	0	
3	9710	0.0181	57.22	0.7135	0.	RCFLAGS	0	0	
3	8710	0.0181	30.12	0.6049	480.	RCFLAGS	0	0	
3	7710	0.0450	40.97	0.7797	0.	RCFLAGS	0	0	
3	710	0.0631	37.86	1.3846	0.	RCFLAGS	0	0	
3	10	0.1270	39.21	2.0477	0.	RCFLAGS	0	0	
3	9711	0.0051	57.47	0.2011	0.	RCFLAGS	0	0	
3	8711	0.0051	30.55	0.1071	129.	RCFLAGS	0	0	
3	7711	0.0209	40.28	0.4720	0.	RCFLAGS	0	0	
3	711	0.0260	38.37	0.5791	0.	RCFLAGS	0	0	
3	2200	0.1530	39.07	2.6268	0.	RCFLAGS	0	0	
3	5201	0.1530	14.98	0.0146	5821.	RCFLAGS	0	0	
3	2201	0.1530	14.95	0.0146	0.	RCFLAGS	0	0	
3	202	0.1043	5.57	0.0371	0.	RCFLAGS	0	0	
3	1201	0.2573	11.14	0.0500	0.	RCFLAGS	0	0	
3	203	0.0368	28.09	0.2178	0.	RCFLAGS	0	0	
3	1202	0.2941	13.27	0.2587	0.	RCFLAGS	0	0	
3	2202	0.2941	13.26	0.2583	0.	RCFLAGS	0	0	
3	204	0.0453	29.10	0.1985	0.	RCFLAGS	0	0	cndchi.dat cnde
3	1203	0.3394	15.38	0.4569	0.	RCFLAGS	0	0	
3	205	0.0700	3.47	0.0113	0.	RCFLAGS	0	0	
3	1204	0.4094	13.34	0.4572	0.	RCFLAGS	0	0	
3	301	0.1662	37.26	1.4503	0.	RCFLAGS	0	0	
3	302	0.1347	31.27	1.4944	0.	RCFLAGS	0	0	
3	1301	0.3009	34.58	2.9229	0.	RCFLAGS	0	0	
3	5301	0.3009	31.52	0.4148	8109.	RCFLAGS	0	0	
3	303	0.3216	36.96	3.5689	0.	RCFLAGS	0	0	
3	1302	0.6225	34.33	3.6019	0.	RCFLAGS	0	0	
3	304	0.1193	37.26	1.1745	0.	RCFLAGS	0	0	
3	1303	0.7418	34.80	4.7764	0.	RCFLAGS	0	0	
3	2303	0.7418	34.79	4.6594	0.	RCFLAGS	0	0	
3	307	0.1653	7.75	0.0627	0.	RCFLAGS	0	0	
3	1304	0.9071	29.87	4.6596	0.	RCFLAGS	0	0	
3	306	0.0490	26.30	0.2101	0.	RCFLAGS	0	0	
3	1306	0.9561	30.41	4.8738	0.	RCFLAGS	0	0	
3	9706	0.0090	57.47	0.3548	0.	RCFLAGS	0	0	
3	8706	0.0090	30.31	0.3486	232.	RCFLAGS	0	0	
3	6706	0.0055	42.60	0.1162	0.	RCFLAGS	0	0	
3	4706	0.0055	16.60	0.0934	138.	RCFLAGS	0	0	
3	7706	0.0323	42.60	0.5913	0.	RCFLAGS	0	0	
3	3706	0.0378	38.82	0.5913	0.	RCFLAGS	0	0	
3	706	0.0468	37.18	0.9400	0.	RCFLAGS	0	0	
3	5706	0.0468	30.80	0.0140	1635.	RCFLAGS	0	0	
3	1706	1.0029	30.43	4.8868	0.	RCFLAGS	0	0	
3	707	0.0077	40.32	0.2880	0.	RCFLAGS	0	0	
3	2707	0.0077	34.36	0.1480	0.	RCFLAGS	0	0	

3	3707	0.0077	5.95	0.1400	0.	RCFLAGS	0	0	
3	1707	1.0106	30.46	4.9303	0.	RCFLAGS	0	0	
3	3082	0.0028	29.65	0.0194	0.	RCFLAGS	0	0	
3	3092	0.0119	0.47	0.0004	0.	RCFLAGS	0	0	
3	1902	0.0147	6.03	0.0197	0.	RCFLAGS	0	0	
3	1903	0.0147	9.14	0.1481	0.	RCFLAGS	0	0	
3	5309	0.0147	0.00	0.0000	109.	RCFLAGS	0	0	
3	1308	1.0253	30.02	4.9303	0.	RCFLAGS	0	0	
3	2308	1.0253	34.43	3.8279	0.	RCFLAGS	0	0	
3	310	0.0682	35.42	0.5806	0.	RCFLAGS	0	0	
3	1309	1.0935	34.49	4.1594	0.	RCFLAGS	0	0	
3	311	0.4793	6.03	0.0472	0.	RCFLAGS	0	0	
3	1310	1.5728	25.82	4.1665	0.	RCFLAGS	0	0	
3	5310	1.5728	11.69	0.1394	25860.	RCFLAGS	0	0	
3	313	0.0492	29.09	0.1392	0.	RCFLAGS	0	0	
3	9721	0.0039	57.47	0.1537	0.	RCFLAGS	0	0	
3	8721	0.0039	31.89	0.0865	98.	RCFLAGS	0	0	
3	7721	0.0231	36.99	0.4702	0.	RCFLAGS	0	0	
3	7021	0.0270	36.26	0.5567	0.	RCFLAGS	0	0	cndchi.dat cnde
3	1721	0.0270	36.26	0.5567	0.	RCFLAGS	0	0	
3	3131	0.0270	0.00	0.0000	98.	RCFLAGS	0	0	
3	1311	0.0492	29.09	0.1392	0.	RCFLAGS	0	0	
3	314	0.1142	2.20	0.0142	0.	RCFLAGS	0	0	
3	1312	0.1634	10.30	0.1419	0.	RCFLAGS	0	0	
3	315	0.0158	31.12	0.1006	0.	RCFLAGS	0	0	
3	1313	0.1792	12.13	0.2369	0.	RCFLAGS	0	0	
3	9703	0.0082	57.47	0.3233	0.	RCFLAGS	0	0	
3	8703	0.0082	30.07	0.3101	212.	RCFLAGS	0	0	
3	7703	0.0224	43.25	0.4474	0.	RCFLAGS	0	0	
3	703	0.0306	39.72	0.7575	0.	RCFLAGS	0	0	
3	1703	0.2098	16.16	0.9178	0.	RCFLAGS	0	0	
3	316	0.2101	34.07	1.5335	0.	RCFLAGS	0	0	
3	1314	0.4199	25.12	2.2514	0.	RCFLAGS	0	0	
3	5314	0.4199	23.98	0.7353	5971.	RCFLAGS	0	0	
3	1315	1.9927	14.63	0.8448	0.	RCFLAGS	0	0	
3	2315	1.9927	14.60	0.8395	0.	RCFLAGS	0	0	
3	317	0.1180	33.97	1.6983	0.	RCFLAGS	0	0	
3	1316	2.1107	15.68	1.7312	0.	RCFLAGS	0	0	
3	2316	2.1107	15.93	1.6953	0.	RCFLAGS	0	0	
3	318	0.1539	36.90	1.4191	0.	RCFLAGS	0	0	
3	1317	2.2646	17.35	3.1057	0.	RCFLAGS	0	0	
3	9708	0.0176	57.22	0.6938	0.	RCFLAGS	0	0	
3	8708	0.0176	30.09	0.5886	467.	RCFLAGS	0	0	
3	6708	0.0080	57.22	0.3154	0.	RCFLAGS	0	0	
3	5708	0.0080	30.32	0.3139	205.	RCFLAGS	0	0	
3	2708	0.0276	43.42	0.6964	0.	RCFLAGS	0	0	
3	4708	0.0356	40.48	1.0103	0.	RCFLAGS	0	0	
3	1708	0.0356	14.69	0.4126	944.	RCFLAGS	0	0	
3	7708	0.1030	42.17	1.5480	0.	RCFLAGS	0	0	
3	3708	0.1386	35.11	1.6553	0.	RCFLAGS	0	0	
3	708	0.1562	34.55	2.0850	0.	RCFLAGS	0	0	
3	9701	0.0187	57.28	0.7372	0.	RCFLAGS	0	0	
3	8701	0.0187	30.19	0.6271	496.	RCFLAGS	0	0	
3	7701	0.0661	41.62	1.0819	0.	RCFLAGS	0	0	
3	701	0.0848	39.10	1.7083	0.	RCFLAGS	0	0	
3	1701	0.2410	36.15	3.7933	0.	RCFLAGS	0	0	
3	9702	0.0486	57.30	1.9159	0.	RCFLAGS	0	0	
3	8702	0.0486	30.18	1.1733	1357.	RCFLAGS	0	0	
3	9712	0.0014	57.30	0.0552	0.	RCFLAGS	0	0	
3	8712	0.0014	29.56	0.0534	36.	RCFLAGS	0	0	
3	7712	0.0090	44.42	0.3412	0.	RCFLAGS	0	0	
3	712	0.0104	42.42	0.3412	0.	RCFLAGS	0	0	
3	1720	0.0590	32.34	1.4190	0.	RCFLAGS	0	0	
3	7702	0.1967	42.91	2.4709	0.	RCFLAGS	0	0	
3	1722	0.2237	42.11	2.9790	0.	RCFLAGS	0	0	cndchi.dat cnde
3	702	0.2827	40.07	4.2627	0.	RCFLAGS	0	0	
3	1702	0.5237	38.26	8.0560	0.	RCFLAGS	0	0	
3	5702	0.5237	28.55	0.3382	18565.	RCFLAGS	0	0	
3	2702	0.5237	26.12	0.1114	0.	RCFLAGS	0	0	
3	7312	0.5237	2.44	0.2268	0.	RCFLAGS	0	0	
3	7020	0.0065	57.22	0.2562	0.	RCFLAGS	0	0	
3	7080	0.0151	57.22	0.5953	0.	RCFLAGS	0	0	
3	2312	0.0216	57.22	0.8515	0.	RCFLAGS	0	0	
3	7010	0.0034	57.22	0.1340	0.	RCFLAGS	0	0	

3	3312	0.0250	57.22	0.9855	0.	RCFLAGS	0	0	
3	312	0.0552	26.31	0.1459	0.	RCFLAGS	0	0	
3	4312	0.0802	35.95	1.0317	0.	RCFLAGS	0	0	
3	6312	0.0802	51.86	1.0317	0.	RCFLAGS	0	0	
3	5312	0.0802	0.00	0.0000	4107.	RCFLAGS	0	0	
4	106	0.0215	38.82	0.0880	0.	RCFLAGS	0	0 cndchi.dat	cnde
4	5106	0.0215	0.00	0.0000	585.	RCFLAGS	0	0	
4	107	0.1510	36.63	0.5432	0.	RCFLAGS	0	0	
4	1103	0.1725	32.06	0.5432	0.	RCFLAGS	0	0	
4	104	0.0000	0.00	0.0000	0.	RCFLAGS	0	0	
4	1104	0.1725	32.06	0.5432	0.	RCFLAGS	0	0	
4	105	0.0331	38.35	1.3102	0.	RCFLAGS	0	0	
4	1051	0.2056	33.08	1.5106	0.	RCFLAGS	0	0	
4	1050	0.0110	67.20	0.3127	0.	RCFLAGS	0	0	
4	1105	0.2166	34.81	1.7687	0.	RCFLAGS	0	0	
4	101	0.0032	37.69	0.0359	0.	RCFLAGS	0	0	
4	102	0.0214	36.62	0.1673	0.	RCFLAGS	0	0	
4	1101	0.0246	36.76	0.2031	0.	RCFLAGS	0	0	
4	103	0.0259	9.76	0.0205	0.	RCFLAGS	0	0	
4	1102	0.0505	22.91	0.2192	0.	RCFLAGS	0	0	
4	5103	0.0505	2.20	0.0272	942.	RCFLAGS	0	0	
4	1106	0.2671	28.64	1.7687	0.	RCFLAGS	0	0	
4	108	0.1240	17.25	0.0605	0.	RCFLAGS	0	0	
4	1107	0.3911	25.03	1.7691	0.	RCFLAGS	0	0	
4	5108	0.3911	24.73	1.2866	736.	RCFLAGS	0	0	
4	2108	0.3911	24.73	1.2641	0.	RCFLAGS	0	0	
4	109	0.1252	12.63	0.1695	0.	RCFLAGS	0	0	
4	1108	0.5163	21.79	1.4196	0.	RCFLAGS	0	0	
4	110	0.0201	36.63	0.2933	0.	RCFLAGS	0	0	
4	1109	0.5364	22.35	1.6963	0.	RCFLAGS	0	0	
4	111	0.0498	36.63	0.4084	0.	RCFLAGS	0	0	
4	1110	0.5862	23.56	2.1046	0.	RCFLAGS	0	0	
4	2110	0.5862	24.29	1.8484	0.	RCFLAGS	0	0	
4	305	0.0015	37.45	0.0152	0.	RCFLAGS	0	0	
4	9709	0.0064	67.20	0.2731	0.	RCFLAGS	0	0	
4	8709	0.0064	40.14	0.2032	165.	RCFLAGS	0	0	
4	6709	0.0230	50.72	0.5139	0.	RCFLAGS	0	0	
4	4709	0.0230	38.09	0.4924	301.	RCFLAGS	0	0	
4	7709	0.0082	50.72	0.1832	0.	RCFLAGS	0	0	
4	3709	0.0312	41.41	0.6386	0.	RCFLAGS	0	0	
4	709	0.0376	41.19	0.7925	0.	RCFLAGS	0	0	
4	1709	0.0391	41.05	0.8074	0.	RCFLAGS	0	0	
4	9704	0.0053	67.20	0.2262	0.	RCFLAGS	0	0	
4	8704	0.0053	40.05	0.1697	137.	RCFLAGS	0	0	
4	6704	0.0170	52.84	0.4181	0.	RCFLAGS	0	0	
4	4704	0.0170	41.35	0.4128	198.	RCFLAGS	0	0	
4	7704	0.0115	52.84	0.2234	0.	RCFLAGS	0	0	
4	3704	0.0285	45.98	0.6362	0.	RCFLAGS	0	0	
4	704	0.0338	45.05	0.7869	0.	RCFLAGS	0	0	
4	1704	0.0729	42.90	1.5942	0.	RCFLAGS	0	0	
4	5704	0.0729	41.09	0.5751	1686.	RCFLAGS	0	0	
4	705	0.0043	61.43	0.1809	0.	RCFLAGS	0	0 cndchi.dat	cnde
4	1705	0.0772	42.22	0.5942	0.	RCFLAGS	0	0	
4	402	0.0507	42.28	0.3147	0.	RCFLAGS	0	0	
4	1401	0.1279	42.25	0.8961	0.	RCFLAGS	0	0	
4	403	0.1073	29.77	0.2657	0.	RCFLAGS	0	0	
4	1402	0.2352	36.56	1.1523	0.	RCFLAGS	0	0	
4	5403	0.2352	0.00	0.0000	7175.	RCFLAGS	0	0	
4	405	0.0966	39.11	0.3501	0.	RCFLAGS	0	0	
4	5405	0.0966	0.00	0.0000	2457.	RCFLAGS	0	0	
4	406	0.0930	38.29	0.3342	0.	RCFLAGS	0	0	
4	1403	0.1896	18.78	0.3342	0.	RCFLAGS	0	0	
4	5406	0.1896	0.00	0.0000	2319.	RCFLAGS	0	0	
4	7120	0.0081	67.20	0.3457	0.	RCFLAGS	0	0	
4	404	0.0517	39.96	0.4790	0.	RCFLAGS	0	0	
4	1712	0.0598	43.65	0.6085	0.	RCFLAGS	0	0	
4	1404	0.2494	10.47	0.6085	0.	RCFLAGS	0	0	
4	407	0.2555	24.13	0.6862	0.	RCFLAGS	0	0	
4	1405	0.5049	17.38	1.1660	0.	RCFLAGS	0	0	
4	5407	0.5049	0.00	0.0000	7702.	RCFLAGS	0	0	
4	1406	0.7401	0.00	0.0000	0.	RCFLAGS	0	0	
4	5437	0.7401	0.00	0.0000	0.	RCFLAGS	0	0	
4	7090	0.0070	67.20	0.2987	0.	RCFLAGS	0	0	
4	7091	0.7471	0.63	0.2987	0.	RCFLAGS	0	0	

4	408	0.0148	38.59	0.1334	0.	RCFLAGS	0	0	
4	409	0.8840	15.54	1.0233	0.	RCFLAGS	0	0	
4	1407	0.8988	15.91	1.1195	0.	RCFLAGS	0	0	
4	1408	1.6459	8.98	1.1516	0.	RCFLAGS	0	0	
4	5409	1.6459	0.00	0.0000	13794.	RCFLAGS	0	0	
4	201	0.0639	49.90	0.8624	0.	RCFLAGS	0	0	
4	9710	0.0181	67.20	0.7725	0.	RCFLAGS	0	0	
4	8710	0.0181	40.05	0.5021	493.	RCFLAGS	0	0	
4	7710	0.0450	50.35	0.9109	0.	RCFLAGS	0	0	
4	710	0.0631	47.40	1.4130	0.	RCFLAGS	0	0	
4	10	0.1270	48.66	2.2605	0.	RCFLAGS	0	0	
4	9711	0.0051	67.45	0.2177	0.	RCFLAGS	0	0	
4	8711	0.0051	40.48	0.1643	130.	RCFLAGS	0	0	
4	7711	0.0209	49.63	0.5455	0.	RCFLAGS	0	0	
4	711	0.0260	47.84	0.7097	0.	RCFLAGS	0	0	
4	2200	0.1530	48.52	2.9067	0.	RCFLAGS	0	0	
4	5201	0.1530	21.06	0.1211	6930.	RCFLAGS	0	0	
4	2201	0.1530	21.04	0.1210	0.	RCFLAGS	0	0	
4	202	0.1043	12.48	0.0921	0.	RCFLAGS	0	0	
4	1201	0.2573	17.57	0.1848	0.	RCFLAGS	0	0	
4	203	0.0368	36.90	0.2725	0.	RCFLAGS	0	0	
4	1202	0.2941	19.99	0.3676	0.	RCFLAGS	0	0	
4	2202	0.2941	19.99	0.3676	0.	RCFLAGS	0	0	
4	204	0.0453	38.00	0.2493	0.	RCFLAGS	0	0 cndchi.dat	cnde
4	1203	0.3394	22.39	0.6166	0.	RCFLAGS	0	0	
4	205	0.0700	10.96	0.0364	0.	RCFLAGS	0	0	
4	1204	0.4094	20.44	0.6427	0.	RCFLAGS	0	0	
4	301	0.1662	46.46	1.7526	0.	RCFLAGS	0	0	
4	302	0.1347	40.49	1.8160	0.	RCFLAGS	0	0	
4	1301	0.3009	43.79	3.5316	0.	RCFLAGS	0	0	
4	5301	0.3009	40.53	0.4599	10207.	RCFLAGS	0	0	
4	303	0.3216	46.21	4.2773	0.	RCFLAGS	0	0	
4	1302	0.6225	43.46	4.3162	0.	RCFLAGS	0	0	
4	304	0.1193	46.45	1.4134	0.	RCFLAGS	0	0	
4	1303	0.7418	43.94	5.7246	0.	RCFLAGS	0	0	
4	2303	0.7418	43.94	5.6098	0.	RCFLAGS	0	0	
4	307	0.1653	17.07	0.1359	0.	RCFLAGS	0	0	
4	1304	0.9071	39.04	5.6307	0.	RCFLAGS	0	0	
4	306	0.0490	34.94	0.2696	0.	RCFLAGS	0	0	
4	1306	0.9561	39.55	5.9043	0.	RCFLAGS	0	0	
4	9706	0.0090	67.45	0.3841	0.	RCFLAGS	0	0	
4	8706	0.0090	40.24	0.2774	235.	RCFLAGS	0	0	
4	6706	0.0055	52.03	0.1343	0.	RCFLAGS	0	0	
4	4706	0.0055	25.98	0.1221	139.	RCFLAGS	0	0	
4	7706	0.0323	52.04	0.6873	0.	RCFLAGS	0	0	
4	3706	0.0378	48.25	0.6976	0.	RCFLAGS	0	0	
4	706	0.0468	46.71	0.9647	0.	RCFLAGS	0	0	
4	5706	0.0468	38.10	0.0150	2072.	RCFLAGS	0	0	
4	1706	1.0029	39.49	5.9173	0.	RCFLAGS	0	0	
4	707	0.0077	49.66	0.3139	0.	RCFLAGS	0	0	
4	2707	0.0077	41.64	0.1480	0.	RCFLAGS	0	0	
4	3707	0.0077	8.03	0.1659	0.	RCFLAGS	0	0	
4	1707	1.0106	39.50	5.9736	0.	RCFLAGS	0	0	
4	3082	0.0028	38.62	0.0241	0.	RCFLAGS	0	0	
4	3092	0.0119	6.64	0.0155	0.	RCFLAGS	0	0	
4	1902	0.0147	12.73	0.0394	0.	RCFLAGS	0	0	
4	1903	0.0147	16.94	0.1772	0.	RCFLAGS	0	0	
4	5309	0.0147	0.00	0.0000	200.	RCFLAGS	0	0	
4	1308	1.0253	38.94	5.9736	0.	RCFLAGS	0	0	
4	2308	1.0253	44.30	4.7873	0.	RCFLAGS	0	0	
4	310	0.0682	44.53	0.7055	0.	RCFLAGS	0	0	
4	1309	1.0935	44.31	5.1057	0.	RCFLAGS	0	0	
4	311	0.4793	14.20	0.1138	0.	RCFLAGS	0	0	
4	1310	1.5728	35.13	5.1813	0.	RCFLAGS	0	0	
4	5310	1.5728	15.97	0.4362	34945.	RCFLAGS	0	0	
4	313	0.0492	37.99	0.1767	0.	RCFLAGS	0	0	
4	9721	0.0039	67.45	0.1664	0.	RCFLAGS	0	0	
4	8721	0.0039	41.86	0.1283	98.	RCFLAGS	0	0	
4	7721	0.0231	46.23	0.5500	0.	RCFLAGS	0	0	
4	7021	0.0270	45.59	0.6783	0.	RCFLAGS	0	0 cndchi.dat	cnde
4	1721	0.0270	45.59	0.6783	0.	RCFLAGS	0	0	
4	3131	0.0270	0.00	0.0000	98.	RCFLAGS	0	0	
4	1311	0.0492	37.99	0.1767	0.	RCFLAGS	0	0	
4	314	0.1142	9.12	0.0661	0.	RCFLAGS	0	0	

4	1312	0.1634	17.81	0.2405	0.	RCFLAGS	0	0	
4	315	0.0158	40.21	0.1244	0.	RCFLAGS	0	0	
4	1313	0.1792	19.79	0.3554	0.	RCFLAGS	0	0	
4	9703	0.0082	67.45	0.3500	0.	RCFLAGS	0	0	
4	8703	0.0082	40.00	0.2537	215.	RCFLAGS	0	0	
4	7703	0.0224	52.71	0.5175	0.	RCFLAGS	0	0	
4	703	0.0306	49.30	0.7713	0.	RCFLAGS	0	0	
4	1703	0.2098	24.09	0.9874	0.	RCFLAGS	0	0	
4	316	0.2101	43.34	1.8729	0.	RCFLAGS	0	0	
4	1314	0.4199	33.72	2.7894	0.	RCFLAGS	0	0	
4	5314	0.4199	32.52	1.1739	6874.	RCFLAGS	0	0	
4	1315	1.9927	19.80	1.2849	0.	RCFLAGS	0	0	
4	2315	1.9927	19.76	1.2781	0.	RCFLAGS	0	0	
4	317	0.1180	43.01	2.0402	0.	RCFLAGS	0	0	
4	1316	2.1107	21.06	2.0831	0.	RCFLAGS	0	0	
4	2316	2.1107	21.30	2.0406	0.	RCFLAGS	0	0	
4	318	0.1539	46.06	1.7158	0.	RCFLAGS	0	0	
4	1317	2.2646	22.98	3.7347	0.	RCFLAGS	0	0	
4	9708	0.0176	67.20	0.7511	0.	RCFLAGS	0	0	
4	8708	0.0176	40.02	0.4897	479.	RCFLAGS	0	0	
4	6708	0.0080	67.20	0.3414	0.	RCFLAGS	0	0	
4	5708	0.0080	40.25	0.2489	208.	RCFLAGS	0	0	
4	2708	0.0276	52.89	0.7944	0.	RCFLAGS	0	0	
4	4708	0.0356	50.05	1.0433	0.	RCFLAGS	0	0	
4	1708	0.0356	24.24	0.6746	979.	RCFLAGS	0	0	
4	7708	0.1030	51.60	1.8207	0.	RCFLAGS	0	0	
4	3708	0.1386	44.57	2.3622	0.	RCFLAGS	0	0	
4	708	0.1562	44.06	2.5734	0.	RCFLAGS	0	0	
4	9701	0.0187	67.26	0.7981	0.	RCFLAGS	0	0	
4	8701	0.0187	40.12	0.5179	509.	RCFLAGS	0	0	
4	7701	0.0661	51.02	1.2718	0.	RCFLAGS	0	0	
4	701	0.0848	48.62	1.7882	0.	RCFLAGS	0	0	
4	1701	0.2410	45.66	4.0936	0.	RCFLAGS	0	0	
4	9702	0.0486	67.28	2.0742	0.	RCFLAGS	0	0	
4	8702	0.0486	40.11	1.8077	1435.	RCFLAGS	0	0	
4	9712	0.0014	67.27	0.0597	0.	RCFLAGS	0	0	
4	8712	0.0014	39.44	0.0470	36.	RCFLAGS	0	0	
4	7712	0.0090	53.93	0.3713	0.	RCFLAGS	0	0	
4	712	0.0104	51.98	0.3738	0.	RCFLAGS	0	0	
4	1720	0.0590	42.20	2.0787	0.	RCFLAGS	0	0	
4	7702	0.1967	52.36	2.9105	0.	RCFLAGS	0	0	
4	1722	0.2237	51.55	3.5150	0.	RCFLAGS	0	0	cndchi.dat cnde
4	702	0.2827	49.60	5.4430	0.	RCFLAGS	0	0	
4	1702	0.5237	47.79	9.4665	0.	RCFLAGS	0	0	
4	5702	0.5237	37.75	1.0320	21055.	RCFLAGS	0	0	
4	2702	0.5237	26.66	0.1187	0.	RCFLAGS	0	0	
4	7312	0.5237	11.09	0.9133	0.	RCFLAGS	0	0	
4	7020	0.0065	67.20	0.2774	0.	RCFLAGS	0	0	
4	7080	0.0151	67.20	0.6444	0.	RCFLAGS	0	0	
4	2312	0.0216	67.20	0.9218	0.	RCFLAGS	0	0	
4	7010	0.0034	67.20	0.1451	0.	RCFLAGS	0	0	
4	3312	0.0250	67.20	1.0669	0.	RCFLAGS	0	0	
4	312	0.0552	35.41	0.1938	0.	RCFLAGS	0	0	
4	4312	0.0802	45.32	1.1319	0.	RCFLAGS	0	0	
4	6312	0.0802	117.74	1.1319	0.	RCFLAGS	0	0	
4	5312	0.0802	0.00	0.0000	8707.	RCFLAGS	0	0	
5	106	0.0215	50.19	0.1089	0.	RCFLAGS	0	0	cndchi.dat cnde
5	5106	0.0215	0.00	0.0000	778.	RCFLAGS	0	0	
5	107	0.1510	47.98	0.6770	0.	RCFLAGS	0	0	
5	1103	0.1725	42.00	0.6770	0.	RCFLAGS	0	0	
5	104	0.0000	0.00	0.0000	0.	RCFLAGS	0	0	
5	1104	0.1725	42.00	0.6770	0.	RCFLAGS	0	0	
5	105	0.0331	49.72	1.4516	0.	RCFLAGS	0	0	
5	1051	0.2056	43.24	1.7229	0.	RCFLAGS	0	0	
5	1050	0.0110	78.89	0.3503	0.	RCFLAGS	0	0	
5	1105	0.2166	45.05	2.0140	0.	RCFLAGS	0	0	
5	101	0.0032	49.01	0.0436	0.	RCFLAGS	0	0	
5	102	0.0214	47.97	0.2050	0.	RCFLAGS	0	0	
5	1101	0.0246	48.11	0.2486	0.	RCFLAGS	0	0	
5	103	0.0259	18.07	0.0407	0.	RCFLAGS	0	0	
5	1102	0.0505	32.70	0.2846	0.	RCFLAGS	0	0	
5	5103	0.0505	11.49	0.1186	982.	RCFLAGS	0	0	
5	1106	0.2671	38.71	2.0140	0.	RCFLAGS	0	0	
5	108	0.1240	27.41	0.0972	0.	RCFLAGS	0	0	

5	1107	0.3911	35.13	2.0147	0.	RCFLAGS	0	0	
5	5108	0.3911	34.74	1.5526	827.	RCFLAGS	0	0	
5	2108	0.3911	34.74	1.5261	0.	RCFLAGS	0	0	
5	109	0.1252	20.76	0.2860	0.	RCFLAGS	0	0	
5	1108	0.5163	31.35	1.7714	0.	RCFLAGS	0	0	
5	110	0.0201	47.98	0.3542	0.	RCFLAGS	0	0	
5	1109	0.5364	31.97	2.1070	0.	RCFLAGS	0	0	
5	111	0.0498	47.98	0.5003	0.	RCFLAGS	0	0	
5	1110	0.5862	33.33	2.6073	0.	RCFLAGS	0	0	
5	2110	0.5862	34.23	2.3345	0.	RCFLAGS	0	0	
5	305	0.0015	48.86	0.0185	0.	RCFLAGS	0	0	
5	9709	0.0064	78.90	0.2994	0.	RCFLAGS	0	0	
5	8709	0.0064	51.77	0.2546	164.	RCFLAGS	0	0	
5	6709	0.0230	62.23	0.5951	0.	RCFLAGS	0	0	
5	4709	0.0230	49.55	0.5854	299.	RCFLAGS	0	0	
5	7709	0.0082	62.22	0.2122	0.	RCFLAGS	0	0	
5	3709	0.0312	52.88	0.7875	0.	RCFLAGS	0	0	
5	709	0.0376	52.69	0.8626	0.	RCFLAGS	0	0	
5	1709	0.0391	52.55	0.8808	0.	RCFLAGS	0	0	
5	9704	0.0053	78.90	0.2479	0.	RCFLAGS	0	0	
5	8704	0.0053	51.69	0.2117	136.	RCFLAGS	0	0	
5	6704	0.0170	64.37	0.4804	0.	RCFLAGS	0	0	
5	4704	0.0170	52.84	0.4854	201.	RCFLAGS	0	0	
5	7704	0.0115	64.37	0.2595	0.	RCFLAGS	0	0	
5	3704	0.0285	57.50	0.7449	0.	RCFLAGS	0	0	
5	704	0.0338	56.58	0.8517	0.	RCFLAGS	0	0	
5	1704	0.0729	54.42	1.6853	0.	RCFLAGS	0	0	
5	5704	0.0729	52.59	0.7905	1937.	RCFLAGS	0	0	
5	705	0.0043	73.06	0.1986	0.	RCFLAGS	0	0	cndchi.dat cnde
5	1705	0.0772	53.73	0.8186	0.	RCFLAGS	0	0	
5	402	0.0507	53.68	0.3825	0.	RCFLAGS	0	0	
5	1401	0.1279	53.71	1.1951	0.	RCFLAGS	0	0	
5	403	0.1073	41.32	0.3685	0.	RCFLAGS	0	0	
5	1402	0.2352	48.06	1.5494	0.	RCFLAGS	0	0	
5	5403	0.2352	0.00	0.0000	9566.	RCFLAGS	0	0	
5	405	0.0966	50.49	0.4332	0.	RCFLAGS	0	0	
5	5405	0.0966	0.00	0.0000	3231.	RCFLAGS	0	0	
5	406	0.0930	49.65	0.4145	0.	RCFLAGS	0	0	
5	1403	0.1896	24.36	0.4145	0.	RCFLAGS	0	0	
5	5406	0.1896	0.00	0.0000	3099.	RCFLAGS	0	0	
5	7120	0.0081	78.90	0.3789	0.	RCFLAGS	0	0	
5	404	0.0517	51.33	0.5815	0.	RCFLAGS	0	0	
5	1712	0.0598	55.07	0.7263	0.	RCFLAGS	0	0	
5	1404	0.2494	13.20	0.7263	0.	RCFLAGS	0	0	
5	407	0.2555	34.47	1.0031	0.	RCFLAGS	0	0	
5	1405	0.5049	23.96	1.6030	0.	RCFLAGS	0	0	
5	5407	0.5049	0.00	0.0000	10678.	RCFLAGS	0	0	
5	1406	0.7401	0.00	0.0000	0.	RCFLAGS	0	0	
5	5437	0.7401	0.00	0.0000	0.	RCFLAGS	0	0	
5	7090	0.0070	78.90	0.3274	0.	RCFLAGS	0	0	
5	7091	0.7471	0.74	0.3274	0.	RCFLAGS	0	0	
5	408	0.0148	49.96	0.1625	0.	RCFLAGS	0	0	
5	409	0.8840	24.50	1.6905	0.	RCFLAGS	0	0	
5	1407	0.8988	24.92	1.8262	0.	RCFLAGS	0	0	
5	1408	1.6459	13.95	1.8732	0.	RCFLAGS	0	0	
5	5409	1.6459	0.00	0.0000	21552.	RCFLAGS	0	0	
5	201	0.0639	61.42	1.0184	0.	RCFLAGS	0	0	
5	9710	0.0181	78.90	0.8467	0.	RCFLAGS	0	0	
5	8710	0.0181	51.70	0.7645	487.	RCFLAGS	0	0	
5	7710	0.0450	61.85	1.0595	0.	RCFLAGS	0	0	
5	710	0.0631	58.94	1.8240	0.	RCFLAGS	0	0	
5	10	0.1270	60.18	2.7494	0.	RCFLAGS	0	0	
5	9711	0.0051	79.14	0.2386	0.	RCFLAGS	0	0	
5	8711	0.0051	52.10	0.1948	129.	RCFLAGS	0	0	
5	7711	0.0209	61.12	0.6277	0.	RCFLAGS	0	0	
5	711	0.0260	59.35	0.8211	0.	RCFLAGS	0	0	
5	2200	0.1530	60.04	3.5705	0.	RCFLAGS	0	0	
5	5201	0.1530	32.23	0.3228	7861.	RCFLAGS	0	0	
5	2201	0.1530	32.22	0.3224	0.	RCFLAGS	0	0	
5	202	0.1043	20.84	0.1571	0.	RCFLAGS	0	0	
5	1201	0.2573	27.60	0.4482	0.	RCFLAGS	0	0	
5	203	0.0368	48.26	0.3355	0.	RCFLAGS	0	0	
5	1202	0.2941	30.19	0.5995	0.	RCFLAGS	0	0	
5	2202	0.2941	30.19	0.5994	0.	RCFLAGS	0	0	

5	204	0.0453	49.36	0.3076	0.	RCFLAGS	0	0	cndchi.dat cnde
5	1203	0.3394	32.75	0.8165	0.	RCFLAGS	0	0	
5	205	0.0700	19.87	0.0680	0.	RCFLAGS	0	0	
5	1204	0.4094	30.54	0.8845	0.	RCFLAGS	0	0	
5	301	0.1662	57.92	2.0916	0.	RCFLAGS	0	0	
5	302	0.1347	51.96	2.2382	0.	RCFLAGS	0	0	
5	1301	0.3009	55.25	4.2798	0.	RCFLAGS	0	0	
5	5301	0.3009	51.69	0.5184	12941.	RCFLAGS	0	0	
5	303	0.3216	57.66	5.0749	0.	RCFLAGS	0	0	
5	1302	0.6225	54.77	5.1185	0.	RCFLAGS	0	0	
5	304	0.1193	57.91	1.6845	0.	RCFLAGS	0	0	
5	1303	0.7418	55.28	6.7914	0.	RCFLAGS	0	0	
5	2303	0.7418	55.27	6.6744	0.	RCFLAGS	0	0	
5	307	0.1653	28.02	0.2221	0.	RCFLAGS	0	0	
5	1304	0.9071	50.30	6.7574	0.	RCFLAGS	0	0	
5	306	0.0490	45.92	0.3365	0.	RCFLAGS	0	0	
5	1306	0.9561	50.80	7.0980	0.	RCFLAGS	0	0	
5	9706	0.0090	79.14	0.4210	0.	RCFLAGS	0	0	
5	8706	0.0090	51.87	0.3619	232.	RCFLAGS	0	0	
5	6706	0.0055	63.55	0.1546	0.	RCFLAGS	0	0	
5	4706	0.0055	37.47	0.1237	139.	RCFLAGS	0	0	
5	7706	0.0323	63.55	0.7959	0.	RCFLAGS	0	0	
5	3706	0.0378	59.76	0.8133	0.	RCFLAGS	0	0	
5	706	0.0468	58.24	1.1578	0.	RCFLAGS	0	0	
5	5706	0.0468	46.40	0.0155	2601.	RCFLAGS	0	0	
5	1706	1.0029	50.60	7.1118	0.	RCFLAGS	0	0	
5	707	0.0077	61.16	0.3463	0.	RCFLAGS	0	0	
5	2707	0.0077	49.10	0.1480	0.	RCFLAGS	0	0	
5	3707	0.0077	12.06	0.1983	0.	RCFLAGS	0	0	
5	1707	1.0106	50.59	7.1820	0.	RCFLAGS	0	0	
5	3082	0.0028	49.99	0.0294	0.	RCFLAGS	0	0	
5	3092	0.0119	14.12	0.0318	0.	RCFLAGS	0	0	
5	1902	0.0147	20.95	0.0610	0.	RCFLAGS	0	0	
5	1903	0.0147	27.27	0.2144	0.	RCFLAGS	0	0	
5	5309	0.0147	0.00	0.0000	324.	RCFLAGS	0	0	
5	1308	1.0253	49.86	7.1820	0.	RCFLAGS	0	0	
5	2308	1.0253	55.64	5.8591	0.	RCFLAGS	0	0	
5	310	0.0682	55.96	0.8457	0.	RCFLAGS	0	0	
5	1309	1.0935	55.66	6.2740	0.	RCFLAGS	0	0	
5	311	0.4793	23.85	0.1923	0.	RCFLAGS	0	0	
5	1310	1.5728	45.97	6.4214	0.	RCFLAGS	0	0	
5	5310	1.5728	24.85	1.8959	35846.	RCFLAGS	0	0	
5	313	0.0492	49.35	0.2193	0.	RCFLAGS	0	0	
5	9721	0.0039	79.14	0.1824	0.	RCFLAGS	0	0	
5	8721	0.0039	53.50	0.1581	98.	RCFLAGS	0	0	
5	7721	0.0231	57.68	0.6394	0.	RCFLAGS	0	0	
5	7021	0.0270	57.07	0.7805	0.	RCFLAGS	0	0	cndchi.dat cnde
5	1721	0.0270	57.07	0.7805	0.	RCFLAGS	0	0	
5	3131	0.0270	0.00	0.0000	98.	RCFLAGS	0	0	
5	1311	0.0492	49.35	0.2193	0.	RCFLAGS	0	0	
5	314	0.1142	17.41	0.1357	0.	RCFLAGS	0	0	
5	1312	0.1634	27.03	0.3550	0.	RCFLAGS	0	0	
5	315	0.0158	51.58	0.1518	0.	RCFLAGS	0	0	
5	1313	0.1792	29.19	0.4955	0.	RCFLAGS	0	0	
5	9703	0.0082	79.14	0.3836	0.	RCFLAGS	0	0	
5	8703	0.0082	51.63	0.3362	213.	RCFLAGS	0	0	
5	7703	0.0224	64.24	0.5967	0.	RCFLAGS	0	0	
5	703	0.0306	60.86	0.9329	0.	RCFLAGS	0	0	
5	1703	0.2098	33.81	1.1985	0.	RCFLAGS	0	0	
5	316	0.2101	54.79	2.2837	0.	RCFLAGS	0	0	
5	1314	0.4199	44.31	3.3591	0.	RCFLAGS	0	0	
5	5314	0.4199	43.05	1.6804	7842.	RCFLAGS	0	0	
5	1315	1.9927	29.03	2.5300	0.	RCFLAGS	0	0	
5	2315	1.9927	29.00	2.5059	0.	RCFLAGS	0	0	
5	317	0.1180	54.43	2.4199	0.	RCFLAGS	0	0	
5	1316	2.1107	30.42	2.5075	0.	RCFLAGS	0	0	
5	2316	2.1107	30.66	2.4981	0.	RCFLAGS	0	0	
5	318	0.1539	57.52	2.0480	0.	RCFLAGS	0	0	
5	1317	2.2646	32.49	4.4588	0.	RCFLAGS	0	0	
5	9708	0.0176	78.90	0.8233	0.	RCFLAGS	0	0	
5	8708	0.0176	51.67	0.7444	474.	RCFLAGS	0	0	
5	6708	0.0080	78.90	0.3742	0.	RCFLAGS	0	0	
5	5708	0.0080	51.87	0.3193	205.	RCFLAGS	0	0	
5	2708	0.0276	64.42	0.9042	0.	RCFLAGS	0	0	

5	4708	0.0356	61.60	1.2235	0.	RCFLAGS	0	0	
5	1708	0.0356	35.75	0.7531	990.	RCFLAGS	0	0	
5	7708	0.1030	63.11	2.1242	0.	RCFLAGS	0	0	
5	3708	0.1386	56.08	2.8730	0.	RCFLAGS	0	0	
5	708	0.1562	55.59	3.1291	0.	RCFLAGS	0	0	
5	9701	0.0187	78.96	0.8748	0.	RCFLAGS	0	0	
5	8701	0.0187	51.77	0.7874	503.	RCFLAGS	0	0	
5	7701	0.0661	62.53	1.4820	0.	RCFLAGS	0	0	
5	701	0.0848	60.16	2.2584	0.	RCFLAGS	0	0	
5	1701	0.2410	57.19	5.0468	0.	RCFLAGS	0	0	
5	9702	0.0486	78.97	2.2734	0.	RCFLAGS	0	0	
5	8702	0.0486	51.76	1.9295	1449.	RCFLAGS	0	0	
5	9712	0.0014	78.97	0.0655	0.	RCFLAGS	0	0	
5	8712	0.0014	51.20	0.0586	36.	RCFLAGS	0	0	
5	7712	0.0090	65.47	0.4089	0.	RCFLAGS	0	0	
5	712	0.0104	63.55	0.4566	0.	RCFLAGS	0	0	
5	1720	0.0590	53.83	2.2455	0.	RCFLAGS	0	0	
5	7702	0.1967	63.88	3.4036	0.	RCFLAGS	0	0	
5	1722	0.2237	63.06	4.0409	0.	RCFLAGS	0	0	cndchi.dat cnde
5	702	0.2827	61.14	6.1699	0.	RCFLAGS	0	0	
5	1702	0.5237	59.32	11.2167	0.	RCFLAGS	0	0	
5	5702	0.5237	49.17	2.0504	23500.	RCFLAGS	0	0	
5	2702	0.5237	26.94	0.1254	0.	RCFLAGS	0	0	
5	7312	0.5237	22.23	1.9249	0.	RCFLAGS	0	0	
5	7020	0.0065	78.90	0.3041	0.	RCFLAGS	0	0	
5	7080	0.0151	78.90	0.7063	0.	RCFLAGS	0	0	
5	2312	0.0216	78.90	1.0104	0.	RCFLAGS	0	0	
5	7010	0.0034	78.90	0.1590	0.	RCFLAGS	0	0	
5	3312	0.0250	78.90	1.1694	0.	RCFLAGS	0	0	
5	312	0.0552	46.85	0.2482	0.	RCFLAGS	0	0	
5	4312	0.0802	56.84	1.2570	0.	RCFLAGS	0	0	
5	6312	0.0802	201.99	2.2198	0.	RCFLAGS	0	0	
5	5312	0.0802	0.00	0.0000	14439.	RCFLAGS	0	0	
6	106	0.0215	58.80	0.1244	0.	RCFLAGS	0	0	cndchi.dat cnde
6	5106	0.0215	0.00	0.0000	926.	RCFLAGS	0	0	
6	107	0.1510	56.60	0.7762	0.	RCFLAGS	0	0	
6	1103	0.1725	49.54	0.7762	0.	RCFLAGS	0	0	
6	104	0.0000	0.00	0.0000	0.	RCFLAGS	0	0	
6	1104	0.1725	49.54	0.7762	0.	RCFLAGS	0	0	
6	105	0.0331	58.33	1.5350	0.	RCFLAGS	0	0	
6	1051	0.2056	50.95	1.8603	0.	RCFLAGS	0	0	
6	1050	0.0110	87.67	0.3753	0.	RCFLAGS	0	0	
6	1105	0.2166	52.82	2.1739	0.	RCFLAGS	0	0	
6	101	0.0032	57.67	0.0491	0.	RCFLAGS	0	0	
6	102	0.0214	56.59	0.2329	0.	RCFLAGS	0	0	
6	1101	0.0246	56.73	0.2813	0.	RCFLAGS	0	0	
6	103	0.0259	24.68	0.0564	0.	RCFLAGS	0	0	
6	1102	0.0505	40.29	0.3324	0.	RCFLAGS	0	0	
6	5103	0.0505	18.82	0.1832	1010.	RCFLAGS	0	0	
6	1106	0.2671	46.39	2.1739	0.	RCFLAGS	0	0	
6	108	0.1240	35.23	0.1256	0.	RCFLAGS	0	0	
6	1107	0.3911	42.85	2.1750	0.	RCFLAGS	0	0	
6	5108	0.3911	42.42	1.7312	887.	RCFLAGS	0	0	
6	2108	0.3911	42.41	1.7013	0.	RCFLAGS	0	0	
6	109	0.1252	27.30	0.3735	0.	RCFLAGS	0	0	
6	1108	0.5163	38.75	2.0284	0.	RCFLAGS	0	0	
6	110	0.0201	56.60	0.3961	0.	RCFLAGS	0	0	
6	1109	0.5364	39.42	2.4054	0.	RCFLAGS	0	0	
6	111	0.0498	56.60	0.5663	0.	RCFLAGS	0	0	
6	1110	0.5862	40.88	2.9717	0.	RCFLAGS	0	0	
6	2110	0.5862	41.70	2.6904	0.	RCFLAGS	0	0	
6	305	0.0015	57.41	0.0209	0.	RCFLAGS	0	0	
6	9709	0.0064	87.67	0.3149	0.	RCFLAGS	0	0	
6	8709	0.0064	60.46	0.2689	165.	RCFLAGS	0	0	
6	6709	0.0230	70.91	0.6482	0.	RCFLAGS	0	0	
6	4709	0.0230	58.21	0.6877	311.	RCFLAGS	0	0	
6	7709	0.0082	70.90	0.2311	0.	RCFLAGS	0	0	
6	3709	0.0312	61.55	0.9089	0.	RCFLAGS	0	0	
6	709	0.0376	61.36	1.0799	0.	RCFLAGS	0	0	
6	1709	0.0391	61.21	1.1003	0.	RCFLAGS	0	0	
6	9704	0.0053	87.67	0.2608	0.	RCFLAGS	0	0	
6	8704	0.0053	60.36	0.2218	137.	RCFLAGS	0	0	
6	6704	0.0170	73.07	0.5208	0.	RCFLAGS	0	0	
6	4704	0.0170	61.52	0.5089	199.	RCFLAGS	0	0	

6	7704	0.0115	73.06	0.2842	0.	RCFLAGS	0	0		
6	3704	0.0285	66.18	0.7931	0.	RCFLAGS	0	0		
6	704	0.0338	65.27	0.9482	0.	RCFLAGS	0	0		
6	1704	0.0729	63.09	2.0348	0.	RCFLAGS	0	0		
6	5704	0.0729	61.26	0.9527	2117.	RCFLAGS	0	0		
6	705	0.0043	81.80	0.2091	0.	RCFLAGS	0	0	cndchi.dat	cnde
6	1705	0.0772	62.40	0.9850	0.	RCFLAGS	0	0		
6	402	0.0507	62.31	0.4331	0.	RCFLAGS	0	0		
6	1401	0.1279	62.37	1.4125	0.	RCFLAGS	0	0		
6	403	0.1073	50.00	0.4444	0.	RCFLAGS	0	0		
6	1402	0.2352	56.72	1.8414	0.	RCFLAGS	0	0		
6	5403	0.2352	0.00	0.0000	11432.	RCFLAGS	0	0		
6	405	0.0966	59.11	0.4951	0.	RCFLAGS	0	0		
6	5405	0.0966	0.00	0.0000	3828.	RCFLAGS	0	0		
6	406	0.0930	58.27	0.4741	0.	RCFLAGS	0	0		
6	1403	0.1896	28.58	0.4741	0.	RCFLAGS	0	0		
6	5406	0.1896	0.85	0.0397	3581.	RCFLAGS	0	0		
6	7120	0.0081	87.67	0.3985	0.	RCFLAGS	0	0		
6	404	0.0517	59.95	0.6549	0.	RCFLAGS	0	0		
6	1712	0.0598	63.70	0.8092	0.	RCFLAGS	0	0		
6	1404	0.2494	15.92	0.8092	0.	RCFLAGS	0	0		
6	407	0.2555	42.36	1.2404	0.	RCFLAGS	0	0		
6	1405	0.5049	29.30	1.9220	0.	RCFLAGS	0	0		
6	5407	0.5049	0.00	0.0000	13207.	RCFLAGS	0	0		
6	1406	0.7401	0.00	0.0000	0.	RCFLAGS	0	0		
6	5437	0.7401	0.00	0.0000	0.	RCFLAGS	0	0		
6	7090	0.0070	87.67	0.3444	0.	RCFLAGS	0	0		
6	7091	0.7471	0.82	0.3444	0.	RCFLAGS	0	0		
6	408	0.0148	58.59	0.1833	0.	RCFLAGS	0	0		
6	409	0.8840	31.54	2.2187	0.	RCFLAGS	0	0		
6	1407	0.8988	31.98	2.3741	0.	RCFLAGS	0	0		
6	1408	1.6459	17.84	2.4233	0.	RCFLAGS	0	0		
6	5409	1.6459	0.00	0.0000	27632.	RCFLAGS	0	0		
6	201	0.0639	70.10	1.1272	0.	RCFLAGS	0	0		
6	9710	0.0181	87.67	0.8905	0.	RCFLAGS	0	0		
6	8710	0.0181	60.44	0.8700	492.	RCFLAGS	0	0		
6	7710	0.0450	70.53	1.1580	0.	RCFLAGS	0	0		
6	710	0.0631	67.63	1.8178	0.	RCFLAGS	0	0		
6	10	0.1270	68.88	2.8427	0.	RCFLAGS	0	0		
6	9711	0.0051	87.91	0.2509	0.	RCFLAGS	0	0		
6	8711	0.0051	60.79	0.2144	130.	RCFLAGS	0	0		
6	7711	0.0209	69.80	0.6799	0.	RCFLAGS	0	0		
6	711	0.0260	68.03	0.8943	0.	RCFLAGS	0	0		
6	2200	0.1530	68.73	3.7370	0.	RCFLAGS	0	0		
6	5201	0.1530	40.82	0.4989	8461.	RCFLAGS	0	0		
6	2201	0.1530	40.81	0.4986	0.	RCFLAGS	0	0		
6	202	0.1043	27.55	0.2076	0.	RCFLAGS	0	0		
6	1201	0.2573	35.44	0.6764	0.	RCFLAGS	0	0		
6	203	0.0368	56.87	0.3813	0.	RCFLAGS	0	0		
6	1202	0.2941	38.12	0.8861	0.	RCFLAGS	0	0		
6	2202	0.2941	38.12	0.8857	0.	RCFLAGS	0	0		
6	204	0.0453	57.98	0.3507	0.	RCFLAGS	0	0	cndchi.dat	cnde
6	1203	0.3394	40.77	1.1587	0.	RCFLAGS	0	0		
6	205	0.0700	26.87	0.0935	0.	RCFLAGS	0	0		
6	1204	0.4094	38.39	1.2520	0.	RCFLAGS	0	0		
6	301	0.1662	66.58	2.3342	0.	RCFLAGS	0	0		
6	302	0.1347	60.62	2.5430	0.	RCFLAGS	0	0		
6	1301	0.3009	63.91	4.8151	0.	RCFLAGS	0	0		
6	5301	0.3009	60.13	0.5555	15092.	RCFLAGS	0	0		
6	303	0.3216	66.31	5.6321	0.	RCFLAGS	0	0		
6	1302	0.6225	63.32	5.6795	0.	RCFLAGS	0	0		
6	304	0.1193	66.57	1.8777	0.	RCFLAGS	0	0		
6	1303	0.7418	63.84	7.5384	0.	RCFLAGS	0	0		
6	2303	0.7418	63.83	7.4269	0.	RCFLAGS	0	0		
6	307	0.1653	36.33	0.2880	0.	RCFLAGS	0	0		
6	1304	0.9071	58.82	7.5624	0.	RCFLAGS	0	0		
6	306	0.0490	54.28	0.3857	0.	RCFLAGS	0	0		
6	1306	0.9561	59.31	7.9519	0.	RCFLAGS	0	0		
6	9706	0.0090	87.91	0.4428	0.	RCFLAGS	0	0		
6	8706	0.0090	60.59	0.3818	235.	RCFLAGS	0	0		
6	6706	0.0055	72.24	0.1677	0.	RCFLAGS	0	0		
6	4706	0.0055	46.12	0.1445	140.	RCFLAGS	0	0		
6	7706	0.0323	72.24	0.8677	0.	RCFLAGS	0	0		
6	3706	0.0378	68.44	0.9451	0.	RCFLAGS	0	0		

6	706	0.0468	66.93	1.2495	0.	RCFLAGS	0	0		
6	5706	0.0468	51.34	0.0174	2999.	RCFLAGS	0	0		
6	1706	1.0029	58.94	7.9659	0.	RCFLAGS	0	0		
6	707	0.0077	69.83	0.3654	0.	RCFLAGS	0	0		
6	2707	0.0077	55.29	0.1480	0.	RCFLAGS	0	0		
6	3707	0.0077	14.55	0.2174	0.	RCFLAGS	0	0		
6	1707	1.0106	58.91	8.0471	0.	RCFLAGS	0	0		
6	3082	0.0028	58.58	0.0332	0.	RCFLAGS	0	0		
6	3092	0.0119	20.21	0.0439	0.	RCFLAGS	0	0		
6	1902	0.0147	27.52	0.0769	0.	RCFLAGS	0	0		
6	1903	0.0147	35.14	0.2401	0.	RCFLAGS	0	0		
6	5309	0.0147	0.00	0.0000	423.	RCFLAGS	0	0		
6	1308	1.0253	58.07	8.0471	0.	RCFLAGS	0	0		
6	2308	1.0253	63.98	6.6494	0.	RCFLAGS	0	0		
6	310	0.0682	64.62	0.9460	0.	RCFLAGS	0	0		
6	1309	1.0935	64.02	7.1416	0.	RCFLAGS	0	0		
6	311	0.4793	31.26	0.2525	0.	RCFLAGS	0	0		
6	1310	1.5728	54.03	7.3434	0.	RCFLAGS	0	0		
6	5310	1.5728	31.71	2.9697	36920.	RCFLAGS	0	0		
6	313	0.0492	57.97	0.2514	0.	RCFLAGS	0	0		
6	9721	0.0039	87.91	0.1919	0.	RCFLAGS	0	0		
6	8721	0.0039	62.29	0.1640	98.	RCFLAGS	0	0		
6	7721	0.0231	66.34	0.6966	0.	RCFLAGS	0	0		
6	7021	0.0270	65.75	0.8606	0.	RCFLAGS	0	0	cndchi.dat	cnde
6	1721	0.0270	64.94	0.7872	0.	RCFLAGS	0	0		
6	3131	0.0270	0.82	0.0734	98.	RCFLAGS	0	0		
6	1311	0.0492	58.41	0.2514	0.	RCFLAGS	0	0		
6	314	0.1142	24.03	0.1912	0.	RCFLAGS	0	0		
6	1312	0.1634	34.38	0.4424	0.	RCFLAGS	0	0		
6	315	0.0158	60.20	0.1718	0.	RCFLAGS	0	0		
6	1313	0.1792	36.66	0.6004	0.	RCFLAGS	0	0		
6	9703	0.0082	87.91	0.4035	0.	RCFLAGS	0	0		
6	8703	0.0082	60.35	0.3459	215.	RCFLAGS	0	0		
6	7703	0.0224	72.93	0.6485	0.	RCFLAGS	0	0		
6	703	0.0306	69.56	0.9943	0.	RCFLAGS	0	0		
6	1703	0.2098	41.46	1.3867	0.	RCFLAGS	0	0		
6	316	0.2101	63.45	2.5768	0.	RCFLAGS	0	0		
6	1314	0.4199	52.46	3.7813	0.	RCFLAGS	0	0		
6	5314	0.4199	51.16	2.0572	8560.	RCFLAGS	0	0		
6	1315	1.9927	36.16	3.9914	0.	RCFLAGS	0	0		
6	2315	1.9927	36.13	3.9677	0.	RCFLAGS	0	0		
6	317	0.1180	63.08	2.6790	0.	RCFLAGS	0	0		
6	1316	2.1107	37.64	3.9777	0.	RCFLAGS	0	0		
6	2316	2.1107	37.88	3.9727	0.	RCFLAGS	0	0		
6	318	0.1539	66.18	2.2852	0.	RCFLAGS	0	0		
6	1317	2.2646	39.80	4.9536	0.	RCFLAGS	0	0		
6	9708	0.0176	87.67	0.8659	0.	RCFLAGS	0	0		
6	8708	0.0176	60.41	0.8477	478.	RCFLAGS	0	0		
6	6708	0.0080	87.67	0.3936	0.	RCFLAGS	0	0		
6	5708	0.0080	60.59	0.3388	208.	RCFLAGS	0	0		
6	2708	0.0276	73.12	0.9736	0.	RCFLAGS	0	0		
6	4708	0.0356	70.30	1.3124	0.	RCFLAGS	0	0		
6	1708	0.0356	44.43	1.1515	1043.	RCFLAGS	0	0		
6	7708	0.1030	71.80	2.3335	0.	RCFLAGS	0	0		
6	3708	0.1386	64.77	3.4850	0.	RCFLAGS	0	0		
6	708	0.1562	64.28	3.8618	0.	RCFLAGS	0	0		
6	9701	0.0187	87.73	0.9201	0.	RCFLAGS	0	0		
6	8701	0.0187	60.50	0.8996	508.	RCFLAGS	0	0		
6	7701	0.0661	71.21	1.6259	0.	RCFLAGS	0	0		
6	701	0.0848	68.85	2.2921	0.	RCFLAGS	0	0		
6	1701	0.2410	65.89	5.8895	0.	RCFLAGS	0	0		
6	9702	0.0486	87.74	2.3912	0.	RCFLAGS	0	0		
6	8702	0.0486	60.49	1.9985	1458.	RCFLAGS	0	0		
6	9712	0.0014	87.74	0.0689	0.	RCFLAGS	0	0		
6	8712	0.0014	59.87	0.0572	36.	RCFLAGS	0	0		
6	7712	0.0090	74.17	0.4311	0.	RCFLAGS	0	0		
6	712	0.0104	72.25	0.4708	0.	RCFLAGS	0	0		
6	1720	0.0590	62.56	2.3363	0.	RCFLAGS	0	0		
6	7702	0.1967	72.58	3.7479	0.	RCFLAGS	0	0		
6	1722	0.2237	71.65	4.4888	0.	RCFLAGS	0	0	cndchi.dat	cnde
6	702	0.2827	69.76	6.5840	0.	RCFLAGS	0	0		
6	1702	0.5237	67.98	11.8235	0.	RCFLAGS	0	0		
6	5702	0.5237	57.77	2.8909	25117.	RCFLAGS	0	0		
6	2702	0.5237	27.08	0.1284	0.	RCFLAGS	0	0		

6	7312	0.5237	30.70	2.7624	0.	RCFLAGS	0	0	
6	7020	0.0065	87.67	0.3198	0.	RCFLAGS	0	0	
6	7080	0.0151	87.67	0.7429	0.	RCFLAGS	0	0	
6	2312	0.0216	87.67	1.0627	0.	RCFLAGS	0	0	
6	7010	0.0034	87.67	0.1673	0.	RCFLAGS	0	0	
6	3312	0.0250	87.67	1.2300	0.	RCFLAGS	0	0	
6	312	0.0552	55.49	0.2886	0.	RCFLAGS	0	0	
6	4312	0.0802	65.52	1.3371	0.	RCFLAGS	0	0	
6	6312	0.0802	265.97	3.1211	0.	RCFLAGS	0	0	
6	5312	0.0802	3.35	0.0202	18736.	RCFLAGS	0	0	
7	106	0.0215	189.52	0.1862	0.	RCFLAGS	0	0	regional.dat cnde
7	5106	0.0215	0.00	0.0000	2954.	RCFLAGS	0	0	
7	107	0.1510	177.82	1.2401	0.	RCFLAGS	0	0	
7	1103	0.1725	155.66	1.2401	0.	RCFLAGS	0	0	
7	104	0.0000	0.00	0.0000	0.	RCFLAGS	0	0	
7	1104	0.1725	155.65	1.2401	0.	RCFLAGS	0	0	
7	105	0.0331	187.87	0.4698	0.	RCFLAGS	0	0	
7	1051	0.2056	160.84	1.5720	0.	RCFLAGS	0	0	
7	1050	0.0110	283.00	0.1619	0.	RCFLAGS	0	0	
7	1105	0.2166	167.04	1.6937	0.	RCFLAGS	0	0	
7	101	0.0032	186.95	0.0416	0.	RCFLAGS	0	0	
7	102	0.0214	177.82	0.2334	0.	RCFLAGS	0	0	
7	1101	0.0246	179.00	0.2745	0.	RCFLAGS	0	0	
7	103	0.0259	109.04	0.1618	0.	RCFLAGS	0	0	
7	1102	0.0505	143.12	0.4164	0.	RCFLAGS	0	0	
7	5103	0.0505	118.47	0.4098	1109.	RCFLAGS	0	0	
7	1106	0.2671	157.86	2.0980	0.	RCFLAGS	0	0	
7	108	0.1240	175.03	0.4888	0.	RCFLAGS	0	0	
7	1107	0.3911	163.30	2.5805	0.	RCFLAGS	0	0	
7	5108	0.3911	162.66	2.5587	1169.	RCFLAGS	0	0	
7	2108	0.3911	162.66	2.5474	0.	RCFLAGS	0	0	
7	109	0.1252	108.32	0.8715	0.	RCFLAGS	0	0	
7	1108	0.5163	149.49	3.4189	0.	RCFLAGS	0	0	
7	110	0.0201	185.06	0.2838	0.	RCFLAGS	0	0	
7	1109	0.5364	150.82	3.6345	0.	RCFLAGS	0	0	
7	111	0.0498	177.82	0.5538	0.	RCFLAGS	0	0	
7	1110	0.5862	153.11	4.1482	0.	RCFLAGS	0	0	
7	2110	0.5862	153.10	4.1538	0.	RCFLAGS	0	0	
7	305	0.0015	179.79	0.0180	0.	RCFLAGS	0	0	
7	9709	0.0064	283.00	0.0942	0.	RCFLAGS	0	0	
7	8709	0.0064	217.52	0.0925	161.	RCFLAGS	0	0	
7	6709	0.0230	228.65	0.3304	0.	RCFLAGS	0	0	
7	4709	0.0230	205.70	0.3287	288.	RCFLAGS	0	0	
7	7709	0.0082	228.65	0.1178	0.	RCFLAGS	0	0	
7	3709	0.0312	211.73	0.4464	0.	RCFLAGS	0	0	
7	709	0.0376	212.72	0.5387	0.	RCFLAGS	0	0	
7	1709	0.0391	211.46	0.5568	0.	RCFLAGS	0	0	
7	9704	0.0053	283.00	0.0780	0.	RCFLAGS	0	0	
7	8704	0.0053	217.27	0.0766	134.	RCFLAGS	0	0	
7	6704	0.0170	235.67	0.2458	0.	RCFLAGS	0	0	
7	4704	0.0170	214.50	0.2455	191.	RCFLAGS	0	0	
7	7704	0.0115	235.66	0.1636	0.	RCFLAGS	0	0	
7	3704	0.0285	223.04	0.4077	0.	RCFLAGS	0	0	
7	704	0.0338	222.13	0.4841	0.	RCFLAGS	0	0	
7	1704	0.0729	216.41	1.0409	0.	RCFLAGS	0	0	
7	5704	0.0729	214.78	0.9679	2134.	RCFLAGS	0	0	
7	705	0.0043	263.98	0.0629	0.	RCFLAGS	0	0	regional.dat cnde
7	1705	0.0772	217.52	1.0170	0.	RCFLAGS	0	0	
7	402	0.0507	205.40	0.5016	0.	RCFLAGS	0	0	
7	1401	0.1279	212.71	1.5009	0.	RCFLAGS	0	0	
7	403	0.1073	214.98	0.9278	0.	RCFLAGS	0	0	
7	1402	0.2352	213.75	2.3420	0.	RCFLAGS	0	0	
7	5403	0.2352	0.00	0.0000	45612.	RCFLAGS	0	0	
7	405	0.0966	191.37	0.7934	0.	RCFLAGS	0	0	
7	5405	0.0966	49.66	0.5344	8477.	RCFLAGS	0	0	
7	406	0.0930	187.52	0.7623	0.	RCFLAGS	0	0	
7	1403	0.1896	117.28	1.2082	0.	RCFLAGS	0	0	
7	5406	0.1896	76.34	1.0583	4883.	RCFLAGS	0	0	
7	7120	0.0081	283.00	0.1193	0.	RCFLAGS	0	0	
7	404	0.0517	197.23	0.6008	0.	RCFLAGS	0	0	
7	1712	0.0598	208.85	0.7128	0.	RCFLAGS	0	0	
7	1404	0.2494	108.11	1.3909	0.	RCFLAGS	0	0	
7	407	0.2555	184.40	2.3076	0.	RCFLAGS	0	0	
7	1405	0.5049	146.72	3.6357	0.	RCFLAGS	0	0	

7	5407	0.5049	90.45	3.4726	26101.	RCFLAGS	0	0	
7	1406	0.7401	61.71	3.4726	0.	RCFLAGS	0	0	
7	5437	0.7401	0.00	0.0000	42583.	RCFLAGS	0	0	
7	7090	0.0070	283.00	0.1031	0.	RCFLAGS	0	0	
7	7091	0.7471	2.65	0.1031	0.	RCFLAGS	0	0	
7	408	0.0148	186.29	0.1700	0.	RCFLAGS	0	0	
7	409	0.8840	139.26	5.8210	0.	RCFLAGS	0	0	
7	1407	0.8988	140.04	5.9755	0.	RCFLAGS	0	0	
7	1408	1.6459	77.68	6.0494	0.	RCFLAGS	0	0	
7	5409	1.6459	0.00	0.0000	119852.	RCFLAGS	0	0	
7	201	0.0639	225.93	0.8316	0.	RCFLAGS	0	0	
7	9710	0.0181	283.00	0.2665	0.	RCFLAGS	0	0	
7	8710	0.0181	217.45	0.2638	466.	RCFLAGS	0	0	
7	7710	0.0450	227.41	0.6425	0.	RCFLAGS	0	0	
7	710	0.0631	224.56	0.9027	0.	RCFLAGS	0	0	
7	10	0.1270	225.25	1.7343	0.	RCFLAGS	0	0	
7	9711	0.0051	283.47	0.0751	0.	RCFLAGS	0	0	
7	8711	0.0051	218.17	0.0737	127.	RCFLAGS	0	0	
7	7711	0.0209	224.80	0.3009	0.	RCFLAGS	0	0	
7	711	0.0260	223.50	0.3746	0.	RCFLAGS	0	0	
7	2200	0.1530	224.95	2.1088	0.	RCFLAGS	0	0	
7	5201	0.1530	197.02	0.8987	16299.	RCFLAGS	0	0	
7	2201	0.1530	197.02	0.8982	0.	RCFLAGS	0	0	
7	202	0.1043	113.73	0.5898	0.	RCFLAGS	0	0	
7	1201	0.2573	163.26	1.4811	0.	RCFLAGS	0	0	
7	203	0.0368	185.77	0.4103	0.	RCFLAGS	0	0	
7	1202	0.2941	166.07	1.8655	0.	RCFLAGS	0	0	
7	2202	0.2941	166.07	1.8643	0.	RCFLAGS	0	0	
7	204	0.0453	188.58	0.4458	0.	RCFLAGS	0	0	regional.dat cnde
7	1203	0.3394	169.08	2.3101	0.	RCFLAGS	0	0	
7	205	0.0700	130.11	0.3375	0.	RCFLAGS	0	0	
7	1204	0.4094	162.41	2.6459	0.	RCFLAGS	0	0	
7	301	0.1662	217.10	2.0311	0.	RCFLAGS	0	0	
7	302	0.1347	212.08	1.9091	0.	RCFLAGS	0	0	
7	1301	0.3009	214.85	3.9243	0.	RCFLAGS	0	0	
7	5301	0.3009	210.75	3.1523	28782.	RCFLAGS	0	0	
7	303	0.3216	218.81	4.3010	0.	RCFLAGS	0	0	
7	1302	0.6225	214.91	6.6600	0.	RCFLAGS	0	0	
7	304	0.1193	214.53	1.5044	0.	RCFLAGS	0	0	
7	1303	0.7418	214.85	7.9619	0.	RCFLAGS	0	0	
7	2303	0.7418	214.84	7.9609	0.	RCFLAGS	0	0	
7	307	0.1653	197.72	1.0321	0.	RCFLAGS	0	0	
7	1304	0.9071	211.72	8.9846	0.	RCFLAGS	0	0	
7	306	0.0490	175.16	0.4703	0.	RCFLAGS	0	0	
7	1306	0.9561	211.29	9.4588	0.	RCFLAGS	0	0	
7	9706	0.0090	283.47	0.1325	0.	RCFLAGS	0	0	
7	8706	0.0090	217.92	0.1303	227.	RCFLAGS	0	0	
7	6706	0.0055	232.73	0.0794	0.	RCFLAGS	0	0	
7	4706	0.0055	194.47	0.0789	138.	RCFLAGS	0	0	
7	7706	0.0323	232.73	0.4633	0.	RCFLAGS	0	0	
7	3706	0.0378	227.16	0.5420	0.	RCFLAGS	0	0	
7	706	0.0468	225.38	0.6717	0.	RCFLAGS	0	0	
7	5706	0.0468	209.28	0.5339	4585.	RCFLAGS	0	0	
7	1706	1.0029	211.20	9.9633	0.	RCFLAGS	0	0	
7	707	0.0077	224.89	0.1109	0.	RCFLAGS	0	0	
7	2707	0.0077	224.89	0.1109	0.	RCFLAGS	0	0	
7	3707	0.0077	0.00	0.0000	42583.	RCFLAGS	0	0	
7	1707	1.0106	211.30	10.0421	0.	RCFLAGS	0	0	
7	3082	0.0028	183.23	0.0317	0.	RCFLAGS	0	0	
7	3092	0.0119	82.71	0.0932	0.	RCFLAGS	0	0	
7	1902	0.0147	101.86	0.1224	0.	RCFLAGS	0	0	
7	1903	0.0147	101.86	0.1224	0.	RCFLAGS	0	0	
7	5309	0.0147	27.28	0.1063	852.	RCFLAGS	0	0	
7	1308	1.0253	208.66	10.0421	0.	RCFLAGS	0	0	
7	2308	1.0253	208.57	10.3548	0.	RCFLAGS	0	0	
7	310	0.0682	206.61	0.8167	0.	RCFLAGS	0	0	
7	1309	1.0935	208.45	10.8353	0.	RCFLAGS	0	0	
7	311	0.4793	165.79	1.1368	0.	RCFLAGS	0	0	
7	1310	1.5728	195.45	11.9574	0.	RCFLAGS	0	0	
7	5310	1.5728	159.51	9.8316	54638.	RCFLAGS	0	0	
7	313	0.0492	184.31	0.4036	0.	RCFLAGS	0	0	
7	9721	0.0039	283.47	0.0574	0.	RCFLAGS	0	0	
7	8721	0.0039	242.21	0.0570	97.	RCFLAGS	0	0	
7	7721	0.0231	213.77	0.3312	0.	RCFLAGS	0	0	

7	7021	0.0270	217.88	0.3882	0.	RCFLAGS	0	0	regional.dat cnde
7	1721	0.0270	217.88	0.3882	0.	RCFLAGS	0	0	
7	3131	0.0270	0.00	0.0000	97.	RCFLAGS	0	0	
7	1311	0.0492	184.31	0.4036	0.	RCFLAGS	0	0	
7	314	0.1142	109.79	0.6157	0.	RCFLAGS	0	0	
7	1312	0.1634	132.23	1.0193	0.	RCFLAGS	0	0	
7	315	0.0158	197.84	0.1722	0.	RCFLAGS	0	0	
7	1313	0.1792	138.01	1.1836	0.	RCFLAGS	0	0	
7	9703	0.0082	283.47	0.1207	0.	RCFLAGS	0	0	
7	8703	0.0082	217.40	0.1187	208.	RCFLAGS	0	0	
7	7703	0.0224	234.94	0.3238	0.	RCFLAGS	0	0	
7	703	0.0306	230.24	0.4424	0.	RCFLAGS	0	0	
7	1703	0.2098	151.47	1.4983	0.	RCFLAGS	0	0	
7	316	0.2101	213.57	2.4393	0.	RCFLAGS	0	0	
7	1314	0.4199	182.54	3.8207	0.	RCFLAGS	0	0	
7	5314	0.4199	179.37	3.7099	10499.	RCFLAGS	0	0	
7	1315	1.9927	164.39	12.4246	0.	RCFLAGS	0	0	
7	2315	1.9927	164.37	12.4124	0.	RCFLAGS	0	0	
7	317	0.1180	202.39	1.6725	0.	RCFLAGS	0	0	
7	1316	2.1107	166.49	13.0967	0.	RCFLAGS	0	0	
7	2316	2.1107	166.98	13.0535	0.	RCFLAGS	0	0	
7	318	0.1539	210.74	1.8713	0.	RCFLAGS	0	0	
7	1317	2.2646	169.95	14.5291	0.	RCFLAGS	0	0	
7	9708	0.0176	283.00	0.2591	0.	RCFLAGS	0	0	
7	8708	0.0176	217.39	0.2564	453.	RCFLAGS	0	0	
7	6708	0.0080	283.00	0.1178	0.	RCFLAGS	0	0	
7	5708	0.0080	217.69	0.1158	201.	RCFLAGS	0	0	
7	2708	0.0276	235.83	0.3991	0.	RCFLAGS	0	0	
7	4708	0.0356	231.75	0.5149	0.	RCFLAGS	0	0	
7	1708	0.0356	194.59	0.5186	961.	RCFLAGS	0	0	
7	7708	0.1030	231.55	1.4400	0.	RCFLAGS	0	0	
7	3708	0.1386	222.05	1.9501	0.	RCFLAGS	0	0	
7	708	0.1562	221.53	2.2032	0.	RCFLAGS	0	0	
7	9701	0.0187	283.12	0.2753	0.	RCFLAGS	0	0	
7	8701	0.0187	217.66	0.2726	480.	RCFLAGS	0	0	
7	7701	0.0661	229.57	0.9390	0.	RCFLAGS	0	0	
7	701	0.0848	226.94	1.2079	0.	RCFLAGS	0	0	
7	1701	0.2410	223.43	3.4111	0.	RCFLAGS	0	0	
7	9702	0.0486	283.14	0.7155	0.	RCFLAGS	0	0	
7	8702	0.0486	217.64	0.7206	1308.	RCFLAGS	0	0	
7	9712	0.0014	283.14	0.0206	0.	RCFLAGS	0	0	
7	8712	0.0014	215.98	0.0204	36.	RCFLAGS	0	0	
7	7712	0.0090	239.23	0.1303	0.	RCFLAGS	0	0	
7	712	0.0104	236.10	0.1507	0.	RCFLAGS	0	0	
7	1720	0.0590	220.89	0.8709	0.	RCFLAGS	0	0	
7	7702	0.1967	233.98	2.6153	0.	RCFLAGS	0	0	
7	1722	0.2237	232.04	3.0035	0.	RCFLAGS	0	0	regional.dat cnde
7	702	0.2827	229.71	3.8542	0.	RCFLAGS	0	0	
7	1702	0.5237	226.82	7.2653	0.	RCFLAGS	0	0	
7	5702	0.5237	217.49	6.3581	30509.	RCFLAGS	0	0	
7	2702	0.5237	46.94	0.1396	0.	RCFLAGS	0	0	
7	7312	0.5237	170.55	6.2185	0.	RCFLAGS	0	0	
7	7020	0.0065	283.00	0.0957	0.	RCFLAGS	0	0	
7	7080	0.0151	283.00	0.2223	0.	RCFLAGS	0	0	
7	2312	0.0216	283.00	0.3180	0.	RCFLAGS	0	0	
7	7010	0.0034	283.00	0.0501	0.	RCFLAGS	0	0	
7	3312	0.0250	283.00	0.3681	0.	RCFLAGS	0	0	
7	312	0.0552	194.62	0.4774	0.	RCFLAGS	0	0	
7	4312	0.0802	222.17	0.7824	0.	RCFLAGS	0	0	
7	6312	0.0802	1335.84	6.9275	0.	RCFLAGS	0	0	
7	5312	0.0802	205.97	0.1781	84946.	RCFLAGS	0	0	
8	106	0.0215	1.56	0.0042	0.	RCFLAGS	0	0	25mm.dat cnde
8	5106	0.0215	0.00	0.0000	23.	RCFLAGS	0	0	
8	107	0.1510	0.72	0.0132	0.	RCFLAGS	0	0	
8	1103	0.1725	0.63	0.0132	0.	RCFLAGS	0	0	
8	104	0.0000	0.00	0.0000	0.	RCFLAGS	0	0	
8	1104	0.1725	0.63	0.0132	0.	RCFLAGS	0	0	
8	105	0.0331	1.40	0.0889	0.	RCFLAGS	0	0	
8	1051	0.2056	0.75	0.0950	0.	RCFLAGS	0	0	
8	1050	0.0110	23.00	0.1230	0.	RCFLAGS	0	0	
8	1105	0.2166	1.88	0.2180	0.	RCFLAGS	0	0	
8	101	0.0032	1.10	0.0015	0.	RCFLAGS	0	0	
8	102	0.0214	0.71	0.0046	0.	RCFLAGS	0	0	
8	1101	0.0246	0.76	0.0062	0.	RCFLAGS	0	0	

8	103	0.0259	0.09	0.0000	0.	RCFLAGS	0	0	
8	1102	0.0505	0.42	0.0062	0.	RCFLAGS	0	0	
8	5103	0.0505	0.00	0.0000	18.	RCFLAGS	0	0	
8	1106	0.2671	1.53	0.2180	0.	RCFLAGS	0	0	
8	108	0.1240	0.63	0.0007	0.	RCFLAGS	0	0	
8	1107	0.3911	1.24	0.2182	0.	RCFLAGS	0	0	
8	5108	0.3911	1.19	0.0153	304.	RCFLAGS	0	0	
8	2108	0.3911	1.19	0.0153	0.	RCFLAGS	0	0	
8	109	0.1252	1.60	0.0127	0.	RCFLAGS	0	0	
8	1108	0.5163	1.29	0.0243	0.	RCFLAGS	0	0	
8	110	0.0201	0.72	0.0096	0.	RCFLAGS	0	0	
8	1109	0.5364	1.27	0.0243	0.	RCFLAGS	0	0	
8	111	0.0498	0.72	0.0114	0.	RCFLAGS	0	0	
8	1110	0.5862	1.22	0.0339	0.	RCFLAGS	0	0	
8	2110	0.5862	1.22	0.0303	0.	RCFLAGS	0	0	
8	305	0.0015	0.92	0.0006	0.	RCFLAGS	0	0	
8	9709	0.0064	23.00	0.1322	0.	RCFLAGS	0	0	
8	8709	0.0064	0.00	0.0000	135.	RCFLAGS	0	0	
8	6709	0.0230	10.66	0.1077	0.	RCFLAGS	0	0	
8	4709	0.0230	0.00	0.0000	232.	RCFLAGS	0	0	
8	7709	0.0082	10.65	0.0384	0.	RCFLAGS	0	0	
8	3709	0.0312	2.80	0.0384	0.	RCFLAGS	0	0	
8	709	0.0376	2.32	0.0384	0.	RCFLAGS	0	0	
8	1709	0.0391	2.27	0.0387	0.	RCFLAGS	0	0	
8	9704	0.0053	23.00	0.1095	0.	RCFLAGS	0	0	
8	8704	0.0053	0.00	0.0000	111.	RCFLAGS	0	0	
8	6704	0.0170	12.25	0.0985	0.	RCFLAGS	0	0	
8	4704	0.0170	0.74	0.0069	185.	RCFLAGS	0	0	
8	7704	0.0115	12.24	0.0520	0.	RCFLAGS	0	0	
8	3704	0.0285	5.38	0.0520	0.	RCFLAGS	0	0	
8	704	0.0338	4.54	0.0520	0.	RCFLAGS	0	0	
8	1704	0.0729	3.32	0.0907	0.	RCFLAGS	0	0	
8	5704	0.0729	2.91	0.0029	219.	RCFLAGS	0	0	
8	705	0.0043	18.68	0.0718	0.	RCFLAGS	0	0	25mm.dat cnde
8	1705	0.0772	3.79	0.0723	0.	RCFLAGS	0	0	
8	402	0.0507	3.69	0.0288	0.	RCFLAGS	0	0	
8	1401	0.1279	3.75	0.0816	0.	RCFLAGS	0	0	
8	403	0.1073	1.13	0.0096	0.	RCFLAGS	0	0	
8	1402	0.2352	2.55	0.0835	0.	RCFLAGS	0	0	
8	5403	0.2352	0.00	0.0000	405.	RCFLAGS	0	0	
8	405	0.0966	1.77	0.0177	0.	RCFLAGS	0	0	
8	5405	0.0966	0.00	0.0000	67.	RCFLAGS	0	0	
8	406	0.0930	1.37	0.0138	0.	RCFLAGS	0	0	
8	1403	0.1896	0.67	0.0138	0.	RCFLAGS	0	0	
8	5406	0.1896	0.00	0.0000	58.	RCFLAGS	0	0	
8	7120	0.0081	23.00	0.1673	0.	RCFLAGS	0	0	
8	404	0.0517	2.02	0.0308	0.	RCFLAGS	0	0	
8	1712	0.0598	4.86	0.1728	0.	RCFLAGS	0	0	
8	1404	0.2494	1.17	0.1728	0.	RCFLAGS	0	0	
8	407	0.2555	1.15	0.0354	0.	RCFLAGS	0	0	
8	1405	0.5049	1.16	0.1810	0.	RCFLAGS	0	0	
8	5407	0.5049	0.00	0.0000	473.	RCFLAGS	0	0	
8	1406	0.7401	0.00	0.0000	0.	RCFLAGS	0	0	
8	5437	0.7401	0.00	0.0000	0.	RCFLAGS	0	0	
8	7090	0.0070	23.00	0.1446	0.	RCFLAGS	0	0	
8	7091	0.7471	0.22	0.1446	0.	RCFLAGS	0	0	
8	408	0.0148	1.74	0.0069	0.	RCFLAGS	0	0	
8	409	0.8840	0.92	0.0429	0.	RCFLAGS	0	0	
8	1407	0.8988	0.94	0.0486	0.	RCFLAGS	0	0	
8	1408	1.6459	0.61	0.1694	0.	RCFLAGS	0	0	
8	5409	1.6459	0.00	0.0000	844.	RCFLAGS	0	0	
8	201	0.0639	10.54	0.1731	0.	RCFLAGS	0	0	
8	9710	0.0181	23.00	0.3739	0.	RCFLAGS	0	0	
8	8710	0.0181	0.00	0.0000	381.	RCFLAGS	0	0	
8	7710	0.0450	10.38	0.1864	0.	RCFLAGS	0	0	
8	710	0.0631	7.40	0.1864	0.	RCFLAGS	0	0	
8	10	0.1270	8.98	0.3517	0.	RCFLAGS	0	0	
8	9711	0.0051	23.24	0.1054	0.	RCFLAGS	0	0	
8	8711	0.0051	0.00	0.0000	107.	RCFLAGS	0	0	
8	7711	0.0209	9.90	0.1057	0.	RCFLAGS	0	0	
8	711	0.0260	7.96	0.1057	0.	RCFLAGS	0	0	
8	2200	0.1530	8.81	0.4575	0.	RCFLAGS	0	0	
8	5201	0.1530	6.77	0.0082	1254.	RCFLAGS	0	0	
8	2201	0.1530	6.77	0.0082	0.	RCFLAGS	0	0	

8	202	0.1043	0.62	0.0005	0.	RCFLAGS	0	0	
8	1201	0.2573	4.28	0.0083	0.	RCFLAGS	0	0	
8	203	0.0368	0.99	0.0075	0.	RCFLAGS	0	0	
8	1202	0.2941	3.86	0.0120	0.	RCFLAGS	0	0	
8	2202	0.2941	3.86	0.0120	0.	RCFLAGS	0	0	
8	204	0.0453	1.41	0.0095	0.	RCFLAGS	0	0	25mm.dat cnde
8	1203	0.3394	3.54	0.0212	0.	RCFLAGS	0	0	
8	205	0.0700	0.38	0.0002	0.	RCFLAGS	0	0	
8	1204	0.4094	3.00	0.0213	0.	RCFLAGS	0	0	
8	301	0.1662	7.82	0.2656	0.	RCFLAGS	0	0	
8	302	0.1347	5.38	0.2288	0.	RCFLAGS	0	0	
8	1301	0.3009	6.73	0.4944	0.	RCFLAGS	0	0	
8	5301	0.3009	6.10	0.0260	1687.	RCFLAGS	0	0	
8	303	0.3216	7.20	0.6298	0.	RCFLAGS	0	0	
8	1302	0.6225	6.67	0.6361	0.	RCFLAGS	0	0	
8	304	0.1193	7.81	0.2173	0.	RCFLAGS	0	0	
8	1303	0.7418	6.85	0.8534	0.	RCFLAGS	0	0	
8	2303	0.7418	6.85	0.8032	0.	RCFLAGS	0	0	
8	307	0.1653	0.51	0.0008	0.	RCFLAGS	0	0	
8	1304	0.9071	5.70	0.8034	0.	RCFLAGS	0	0	
8	306	0.0490	1.32	0.0104	0.	RCFLAGS	0	0	
8	1306	0.9561	6.20	0.8174	0.	RCFLAGS	0	0	
8	9706	0.0090	23.24	0.1859	0.	RCFLAGS	0	0	
8	8706	0.0090	0.00	0.0000	189.	RCFLAGS	0	0	
8	6706	0.0055	11.69	0.0299	0.	RCFLAGS	0	0	
8	4706	0.0055	0.00	0.0000	61.	RCFLAGS	0	0	
8	7706	0.0323	11.70	0.1527	0.	RCFLAGS	0	0	
8	3706	0.0378	10.00	0.1527	0.	RCFLAGS	0	0	
8	706	0.0468	8.08	0.1527	0.	RCFLAGS	0	0	
8	5706	0.0468	7.04	0.0034	340.	RCFLAGS	0	0	
8	1706	1.0029	6.24	0.8199	0.	RCFLAGS	0	0	
8	707	0.0077	9.93	0.0653	0.	RCFLAGS	0	0	
8	2707	0.0077	9.93	0.0653	0.	RCFLAGS	0	0	
8	3707	0.0077	0.00	0.0000	0.	RCFLAGS	0	0	
8	1707	1.0106	6.26	0.8274	0.	RCFLAGS	0	0	
8	3082	0.0028	1.78	0.0012	0.	RCFLAGS	0	0	
8	3092	0.0119	0.28	0.0000	0.	RCFLAGS	0	0	
8	1902	0.0147	0.57	0.0012	0.	RCFLAGS	0	0	
8	1903	0.0147	0.57	0.0012	0.	RCFLAGS	0	0	
8	5309	0.0147	0.00	0.0000	4.	RCFLAGS	0	0	
8	1308	1.0253	6.17	0.8274	0.	RCFLAGS	0	0	
8	2308	1.0253	7.47	0.6353	0.	RCFLAGS	0	0	
8	310	0.0682	6.54	0.0920	0.	RCFLAGS	0	0	
8	1309	1.0935	7.41	0.6751	0.	RCFLAGS	0	0	
8	311	0.4793	0.47	0.0020	0.	RCFLAGS	0	0	
8	1310	1.5728	5.30	0.6758	0.	RCFLAGS	0	0	
8	5310	1.5728	2.27	0.0676	3756.	RCFLAGS	0	0	
8	313	0.0492	1.40	0.0064	0.	RCFLAGS	0	0	
8	9721	0.0039	23.24	0.0806	0.	RCFLAGS	0	0	
8	8721	0.0039	0.00	0.0000	87.	RCFLAGS	0	0	
8	7721	0.0231	7.31	0.0837	0.	RCFLAGS	0	0	
8	7021	0.0270	6.25	0.0837	0.	RCFLAGS	0	0	25mm.dat cnde
8	1721	0.0270	6.25	0.0837	0.	RCFLAGS	0	0	
8	3131	0.0270	0.00	0.0000	87.	RCFLAGS	0	0	
8	1311	0.0492	1.40	0.0064	0.	RCFLAGS	0	0	
8	314	0.1142	0.34	0.0003	0.	RCFLAGS	0	0	
8	1312	0.1634	0.66	0.0065	0.	RCFLAGS	0	0	
8	315	0.0158	2.27	0.0079	0.	RCFLAGS	0	0	
8	1313	0.1792	0.80	0.0144	0.	RCFLAGS	0	0	
8	9703	0.0082	23.24	0.1694	0.	RCFLAGS	0	0	
8	8703	0.0082	0.00	0.0000	173.	RCFLAGS	0	0	
8	7703	0.0224	12.21	0.1193	0.	RCFLAGS	0	0	
8	703	0.0306	8.94	0.1193	0.	RCFLAGS	0	0	
8	1703	0.2098	1.99	0.1270	0.	RCFLAGS	0	0	
8	316	0.2101	6.09	0.2490	0.	RCFLAGS	0	0	
8	1314	0.4199	4.04	0.3669	0.	RCFLAGS	0	0	
8	5314	0.4199	3.60	0.0617	978.	RCFLAGS	0	0	
8	1315	1.9927	2.90	0.1295	0.	RCFLAGS	0	0	
8	2315	1.9927	2.89	0.1294	0.	RCFLAGS	0	0	
8	317	0.1180	5.44	0.2292	0.	RCFLAGS	0	0	
8	1316	2.1107	3.04	0.2463	0.	RCFLAGS	0	0	
8	2316	2.1107	3.28	0.2418	0.	RCFLAGS	0	0	
8	318	0.1539	7.66	0.2563	0.	RCFLAGS	0	0	
8	1317	2.2646	3.58	0.4982	0.	RCFLAGS	0	0	

8	9708	0.0176	23.00	0.3635	0.	RCFLAGS	0	0	
8	8708	0.0176	0.00	0.0000	370.	RCFLAGS	0	0	
8	6708	0.0080	23.00	0.1652	0.	RCFLAGS	0	0	
8	5708	0.0080	0.00	0.0000	168.	RCFLAGS	0	0	
8	2708	0.0276	12.28	0.1889	0.	RCFLAGS	0	0	
8	4708	0.0356	9.52	0.1889	0.	RCFLAGS	0	0	
8	1708	0.0356	0.00	0.0000	326.	RCFLAGS	0	0	
8	7708	0.1030	11.31	0.3842	0.	RCFLAGS	0	0	
8	3708	0.1386	8.41	0.3842	0.	RCFLAGS	0	0	
8	708	0.1562	7.46	0.3842	0.	RCFLAGS	0	0	
8	9701	0.0187	23.06	0.3863	0.	RCFLAGS	0	0	
8	8701	0.0187	0.00	0.0000	393.	RCFLAGS	0	0	
8	7701	0.0661	10.90	0.2678	0.	RCFLAGS	0	0	
8	701	0.0848	8.49	0.2678	0.	RCFLAGS	0	0	
8	1701	0.2410	7.82	0.6520	0.	RCFLAGS	0	0	
8	9702	0.0486	23.07	1.0039	0.	RCFLAGS	0	0	
8	8702	0.0486	0.00	0.0000	1022.	RCFLAGS	0	0	
8	9712	0.0014	23.07	0.0289	0.	RCFLAGS	0	0	
8	8712	0.0014	0.00	0.0000	29.	RCFLAGS	0	0	
8	7712	0.0090	13.06	0.1042	0.	RCFLAGS	0	0	
8	712	0.0104	11.30	0.1042	0.	RCFLAGS	0	0	
8	1720	0.0590	1.99	0.1042	0.	RCFLAGS	0	0	
8	7702	0.1967	11.90	0.6334	0.	RCFLAGS	0	0	
8	1722	0.2237	11.22	0.7078	0.	RCFLAGS	0	0	25mm.dat cnde
8	702	0.2827	9.30	0.7422	0.	RCFLAGS	0	0	
8	1702	0.5237	8.62	1.3942	0.	RCFLAGS	0	0	
8	5702	0.5237	6.27	0.0411	4122.	RCFLAGS	0	0	
8	2702	0.5237	6.27	0.0411	0.	RCFLAGS	0	0	
8	7312	0.5237	0.00	0.0000	0.	RCFLAGS	0	0	
8	7020	0.0065	23.00	0.1343	0.	RCFLAGS	0	0	
8	7080	0.0151	23.00	0.3119	0.	RCFLAGS	0	0	
8	2312	0.0216	23.00	0.4462	0.	RCFLAGS	0	0	
8	7010	0.0034	23.00	0.0702	0.	RCFLAGS	0	0	
8	3312	0.0250	23.00	0.5164	0.	RCFLAGS	0	0	
8	312	0.0552	0.90	0.0055	0.	RCFLAGS	0	0	
8	4312	0.0802	7.79	0.5167	0.	RCFLAGS	0	0	
8	6312	0.0802	7.79	0.5167	0.	RCFLAGS	0	0	
8	5312	0.0802	0.00	0.0000	610.	RCFLAGS	0	0	

GAWSER V6.9.18 - Released - Sep. 21, 2016

Upper River Watershed Model
Generalized Water Balance Summary
Demonstration

```
   Input file 1=wbsum1.dat
   Input file 2=
   Output file =wbsum1.lst
* ======================================================================
* File created by Dr. H.O. Schroeter, January 10, 2000
* ======================================================================
START              KUNITS=2 TOTAL WATERSHED AREA=167     SQ KM
                   INITIAL BASEFLOW AT OUTLET: QBSS= 0.0000 QBGW= 0.000
                   PRINT OPTIONS: ECHO=3 OUTPUT=1 PLOTS=0 RCS=1 SUBW=1
                     PLOT CUTOFF=576 SUM=6 FREE=0
                   PARAMETER ADJUSTMENT FACTORS: FDS=1.00 FKEFF=0.25
                     FCS=0.30 FD=0.30 FSAV=1.0 FKO=1.00 FKSS=1.0 FKMF=1.00
                   INITIAL SOIL/SNOW WATER FACTORS:
                     FIMCI=1.00 FIMCII=1.00 FIWE=0.0000
                   GLOBAL RAINFALL SCALING FACTOR: GFRF=1.0000
                   SIMULATION CONTROLS: TTI=1.00000 IDEL=2 HOURS=576
                   SUBWATERSHED INITIAL BASEFLOWS: -999
```

WATER BALANCE SUMMARY FOR HYDROGRAPH 1050

Location: Hydrograph 1050
Scenario File: wbsum1.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0110 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	29.1	0.0	13.4	29.1
FEB	45.5	6.9	40.6	0.0	-2.0	40.6
MAR	64.8	8.3	79.9	0.0	-23.4	79.9
APR	78.8	18.3	65.9	0.0	-5.4	65.9
MAY	76.0	19.5	56.8	0.0	-0.3	56.8
JUN	83.3	19.1	64.7	0.0	-0.5	64.7
JUL	87.2	17.9	69.1	0.0	0.1	69.1
AUG	86.5	18.4	68.5	0.0	-0.4	68.5
SEP	82.8	16.7	65.5	0.0	0.6	65.5
OCT	73.5	15.7	57.9	0.0	-0.1	57.9
NOV	86.7	11.9	71.6	0.0	3.2	71.6
DEC	67.0	7.1	46.1	0.0	13.7	46.1
Total	882.0	167.6	715.6	0.0	-1.1	715.6

WATER BALANCE SUMMARY FOR HYDROGRAPH 105

Location: Hydrograph 105
Scenario File: wbsum1.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0331 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	4.9	0.0	37.6	4.9
FEB	45.5	6.9	10.6	0.0	28.0	10.6
MAR	64.8	9.5	25.8	0.0	29.5	25.8
APR	78.8	55.5	13.5	0.0	9.8	13.5
MAY	76.0	99.1	1.7	0.0	-24.8	1.7
JUN	83.3	106.7	1.1	0.0	-24.5	1.1
JUL	87.2	93.5	1.2	0.0	-7.6	1.2
AUG	86.5	80.2	3.2	0.0	3.0	3.2
SEP	82.8	51.5	1.1	0.0	30.1	1.1
OCT	73.5	37.7	1.1	0.0	34.7	1.1
NOV	86.7	17.5	5.5	0.0	63.7	5.5

DEC	67.0	7.2	8.1	0.0	51.7	8.1
Total	882.0	573.1	77.7	0.0	231.2	77.7

WATER BALANCE SUMMARY FOR HYDROGRAPH 5706

Location: Hydrograph 5706
Scenario File: wbsum1.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0468 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	11.8	9.1	21.6	20.9
FEB	45.5	6.9	17.7	7.6	13.4	25.2
MAR	64.8	9.0	34.1	9.6	12.1	43.7
APR	78.8	35.1	26.5	9.9	7.3	36.4
MAY	76.0	54.9	18.4	10.6	-7.9	29.0
JUN	83.3	58.1	21.7	8.1	-4.5	29.7
JUL	87.2	51.6	23.1	4.9	7.6	28.0
AUG	86.5	45.9	25.9	3.0	11.7	28.9
SEP	82.8	32.2	21.5	2.5	26.6	24.0
OCT	73.5	25.5	19.4	3.3	25.3	22.8
NOV	86.7	14.5	24.5	6.0	41.6	30.6
DEC	67.0	7.2	17.5	9.2	33.1	26.7
Total	882.0	348.5	262.1	83.8	187.7	345.9

WATER BALANCE SUMMARY FOR HYDROGRAPH 707

Location: Hydrograph 707
Scenario File: wbsum1.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0077 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	14.2	15.7	12.5	29.9
FEB	45.5	6.9	22.1	13.2	3.2	35.4
MAR	64.8	9.0	46.6	14.7	-5.6	61.3
APR	78.8	41.2	33.6	17.1	-13.1	50.6
MAY	76.0	68.6	22.8	18.5	-34.0	41.3
JUN	83.3	73.1	25.5	14.1	-29.4	39.6
JUL	87.2	64.5	27.2	8.6	-13.3	35.9
AUG	86.5	56.5	28.3	4.8	-3.1	33.1
SEP	82.8	38.2	25.8	3.6	15.1	29.5
OCT	73.5	29.2	22.9	5.9	15.5	28.7
NOV	86.7	15.3	30.9	9.6	30.9	40.5
DEC	67.0	7.2	22.8	14.7	22.4	37.5
Total	882.0	417.7	322.6	140.6	1.2	463.2

File=DUMP1900.WTB Does not exist

WATER BALANCE SUMMARY FOR HYDROGRAPH 5309

Location: Hydrograph 5309
Scenario File: wbsum1.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0147 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	0.0	0.0	42.5	0.0
FEB	45.5	6.9	0.0	0.0	38.6	0.0
MAR	64.8	10.2	0.0	0.0	54.5	0.0
APR	78.8	57.7	0.0	0.0	21.0	0.0

MAY	76.0	100.1	0.0	0.0	-24.2	0.0
JUN	83.3	105.3	0.0	0.0	-22.0	0.0
JUL	87.2	90.2	0.0	0.0	-3.0	0.0
AUG	86.5	77.7	0.0	0.0	8.8	0.0
SEP	82.8	52.2	0.0	0.0	30.6	0.0
OCT	73.5	37.5	0.0	0.0	36.0	0.0
NOV	86.7	17.7	0.0	0.0	69.0	0.0
DEC	67.0	7.3	0.0	0.0	59.7	0.0
Total	882.0	570.6	0.0	0.0	311.5	0.0

WATER BALANCE SUMMARY FOR HYDROGRAPH 311

Location: Hydrograph 311
Scenario File: wbsum1.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.4793 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	12.3	15.2	15.0	27.5
FEB	45.5	6.9	26.3	12.2	0.0	38.5
MAR	64.8	9.5	52.1	16.9	-13.7	69.0
APR	78.8	55.4	11.9	22.0	-10.6	34.0
MAY	76.0	99.0	3.4	20.3	-46.7	23.7
JUN	83.3	103.9	1.7	10.6	-32.9	12.2
JUL	87.2	96.1	0.3	5.3	-14.7	5.7
AUG	86.5	81.2	0.5	3.9	0.9	4.4
SEP	82.8	52.7	1.4	4.4	24.2	5.8
OCT	73.5	37.6	6.6	7.6	21.7	14.2
NOV	86.7	17.5	23.2	10.5	35.5	33.7
DEC	67.0	7.2	21.0	15.3	23.5	36.3
Total	882.0	574.8	160.8	144.3	2.2	305.1

WATER BALANCE SUMMARY FOR HYDROGRAPH 313

Location: Hydrograph 313
Scenario File: wbsum1.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0492 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	4.3	26.0	12.2	30.3
FEB	45.5	6.9	9.7	21.7	7.2	31.4
MAR	64.8	9.5	23.4	24.1	7.8	47.5
APR	78.8	55.5	12.5	28.0	-17.2	40.5
MAY	76.0	99.3	1.4	30.5	-55.2	31.9
JUN	83.3	108.0	1.0	23.6	-49.3	24.6
JUL	87.2	94.3	1.0	14.6	-22.8	15.6
AUG	86.5	80.4	3.1	8.6	-5.6	11.7
SEP	82.8	51.6	0.9	6.7	23.6	7.6
OCT	73.5	37.7	0.7	10.0	25.1	10.7
NOV	86.7	17.5	4.2	15.6	49.3	19.8
DEC	67.0	7.2	7.0	24.1	28.8	31.0
Total	882.0	575.6	69.1	233.6	3.8	302.7

WATER BALANCE SUMMARY FOR HYDROGRAPH 315

Location: Hydrograph 315
Scenario File: wbsum1.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0158 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow

JAN	50.2	7.8	6.3	24.6	11.6	30.8
FEB	45.5	6.9	12.7	20.3	5.6	33.0
MAR	64.8	9.5	30.8	22.3	2.2	53.1
APR	78.8	55.5	15.9	25.5	-18.0	41.3
MAY	76.0	98.7	2.3	27.1	-52.1	29.3
JUN	83.3	103.2	1.5	20.2	-41.7	21.7
JUL	87.2	91.6	1.6	12.3	-18.4	13.9
AUG	86.5	79.6	3.6	7.3	-4.1	11.0
SEP	82.8	51.4	1.8	6.0	23.6	7.7
OCT	73.5	37.6	2.0	9.4	24.4	11.4
NOV	86.7	17.5	8.6	15.1	45.5	23.7
DEC	67.0	7.2	10.7	23.1	26.0	33.8
Total	882.0	566.6	97.7	213.1	4.6	310.8

WATER BALANCE SUMMARY FOR HYDROGRAPH 703

Location: Hydrograph 703
Scenario File: wbsum1.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0306 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	12.3	9.6	20.5	22.0
FEB	45.5	6.9	19.2	8.0	11.4	27.2
MAR	64.8	8.8	38.3	8.8	8.9	47.1
APR	78.8	32.2	29.2	10.2	7.2	39.4
MAY	76.0	49.3	21.4	11.0	-5.8	32.4
JUN	83.3	51.9	25.0	8.5	-2.1	33.5
JUL	87.2	46.2	27.4	5.2	8.3	32.6
AUG	86.5	41.5	28.8	3.0	13.2	31.8
SEP	82.8	29.7	25.3	2.3	25.4	27.7
OCT	73.5	23.9	21.3	3.6	24.7	24.9
NOV	86.7	14.0	28.1	5.8	38.8	33.9
DEC	67.0	7.1	19.8	8.9	31.1	28.7
Total	882.0	319.3	296.3	85.0	181.5	381.3

WATER BALANCE SUMMARY FOR HYDROGRAPH 316

Location: Hydrograph 316
Scenario File: wbsum1.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.2101 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	11.3	18.9	12.2	30.2
FEB	45.5	6.9	19.9	15.6	3.1	35.5
MAR	64.8	9.2	43.0	17.3	-4.8	60.3
APR	78.8	48.1	25.4	19.8	-14.5	45.2
MAY	76.0	83.1	13.2	21.0	-41.3	34.1
JUN	83.3	87.3	14.1	15.4	-33.6	29.5
JUL	87.2	77.1	14.8	9.3	-14.1	24.1
AUG	86.5	67.7	16.2	5.6	-3.0	21.8
SEP	82.8	44.6	14.3	4.8	19.1	19.1
OCT	73.5	33.3	13.4	7.5	19.2	21.0
NOV	86.7	16.4	22.3	11.8	36.2	34.1
DEC	67.0	7.2	18.7	17.9	23.2	36.6
Total	882.0	488.6	226.7	164.9	1.8	391.6

WATER BALANCE SUMMARY FOR HYDROGRAPH 5704

Location: Hydrograph 5704
Scenario File: wbsum1.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0729 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	5.7	0.0	36.7	5.7
FEB	45.5	6.9	10.6	0.0	28.0	10.6
MAR	64.8	8.9	18.9	0.0	36.9	18.9
APR	78.8	35.6	14.3	0.0	28.9	14.3
MAY	76.0	56.4	8.7	0.0	10.9	8.7
JUN	83.3	59.8	11.2	0.0	12.2	11.2
JUL	87.2	53.1	12.9	0.0	21.1	12.9
AUG	86.5	47.2	15.5	0.0	23.8	15.5
SEP	82.8	32.9	11.3	0.0	38.5	11.3
OCT	73.5	25.9	8.4	0.0	39.2	8.4
NOV	86.7	14.6	11.8	0.0	60.3	11.8
DEC	67.0	7.2	9.5	0.0	50.3	9.5
Total	882.0	356.4	138.8	0.0	386.9	138.9

WATER BALANCE SUMMARY FOR HYDROGRAPH 7090

Location: Hydrograph 7090
Scenario File: wbsum1.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0070 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	29.2	0.0	13.3	29.2
FEB	45.5	6.9	40.7	0.0	-2.1	40.7
MAR	64.8	8.3	80.1	0.0	-23.6	80.1
APR	78.8	18.3	65.9	0.0	-5.4	65.9
MAY	76.0	19.5	56.8	0.0	-0.4	56.8
JUN	83.3	19.1	64.7	0.0	-0.6	64.7
JUL	87.2	17.9	69.1	0.0	0.1	69.1
AUG	86.5	18.4	68.5	0.0	-0.4	68.5
SEP	82.8	16.7	65.5	0.0	0.5	65.5
OCT	73.5	15.7	58.0	0.0	-0.1	58.0
NOV	86.7	11.9	71.8	0.0	3.0	71.8
DEC	67.0	7.1	46.4	0.0	13.5	46.4
Total	882.0	167.6	716.5	0.0	-2.1	716.5

WATER BALANCE SUMMARY FOR HYDROGRAPH 705

Location: Hydrograph 705
Scenario File: wbsum1.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0043 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	24.3	0.0	18.1	24.3
FEB	45.5	6.9	34.7	0.0	3.9	34.7
MAR	64.8	8.6	69.2	0.0	-13.0	69.2
APR	78.8	25.7	55.4	0.0	-2.4	55.4
MAY	76.0	35.5	45.8	0.0	-5.3	45.8
JUN	83.3	36.6	52.0	0.0	-5.3	52.0
JUL	87.2	33.0	55.5	0.0	-1.4	55.5
AUG	86.5	30.8	55.4	0.0	0.3	55.4
SEP	82.8	23.7	52.6	0.0	6.5	52.6
OCT	73.5	20.1	46.6	0.0	6.8	46.6
NOV	86.7	13.0	58.5	0.0	15.2	58.5
DEC	67.0	7.1	38.7	0.0	21.1	38.7
Total	882.0	248.7	588.8	0.0	44.6	588.8

WATER BALANCE SUMMARY FOR HYDROGRAPH 709

Location: Hydrograph 709
Scenario File: wbsum1.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0376 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	4.5	0.0	38.0	4.5
FEB	45.5	6.9	9.3	0.0	29.3	9.3
MAR	64.8	8.9	15.5	0.0	40.4	15.5
APR	78.8	35.9	11.5	0.0	31.3	11.5
MAY	76.0	57.2	6.8	0.0	11.9	6.8
JUN	83.3	60.6	9.1	0.0	13.5	9.1
JUL	87.2	53.8	10.8	0.0	22.6	10.8
AUG	86.5	47.7	13.0	0.0	25.8	13.0
SEP	82.8	33.2	9.2	0.0	40.4	9.2
OCT	73.5	26.1	6.1	0.0	41.3	6.1
NOV	86.7	14.5	9.2	0.0	63.0	9.2
DEC	67.0	7.1	7.7	0.0	52.2	7.7
Total	882.0	359.7	112.6	0.0	409.7	112.6

WATER BALANCE SUMMARY FOR HYDROGRAPH 710

Location: Hydrograph 710
Scenario File: wbsum1.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0631 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	10.8	0.0	31.7	10.8
FEB	45.5	6.9	17.3	0.0	21.3	17.3
MAR	64.8	8.8	34.6	0.0	21.4	34.6
APR	78.8	33.8	25.8	0.0	19.3	25.8
MAY	76.0	52.7	18.0	0.0	5.3	18.0
JUN	83.3	55.6	21.2	0.0	6.4	21.2
JUL	87.2	49.4	23.4	0.0	14.3	23.4
AUG	86.5	44.2	25.0	0.0	17.4	25.0
SEP	82.8	31.2	21.5	0.0	30.1	21.5
OCT	73.5	24.8	17.9	0.0	30.8	17.9
NOV	86.7	14.2	24.0	0.0	48.5	24.0
DEC	67.0	7.1	17.4	0.0	42.4	17.4
Total	882.0	336.5	256.7	0.0	288.8	256.7

WATER BALANCE SUMMARY FOR HYDROGRAPH 402

Location: Hydrograph 402
Scenario File: wbsum1.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0507 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	8.2	0.0	34.3	8.2
FEB	45.5	6.9	15.2	0.0	23.4	15.2
MAR	64.8	9.4	35.3	0.0	20.0	35.3
APR	78.8	52.7	20.0	0.0	6.1	20.0
MAY	76.0	92.8	6.3	0.0	-23.1	6.3
JUN	83.3	96.4	6.1	0.0	-19.3	6.1
JUL	87.2	85.7	6.6	0.0	-5.2	6.6
AUG	86.5	75.0	8.4	0.0	3.1	8.4
SEP	82.8	48.8	6.5	0.0	27.4	6.5
OCT	73.5	36.0	6.2	0.0	31.2	6.2
NOV	86.7	17.1	13.7	0.0	55.9	13.7
DEC	67.0	7.2	13.8	0.0	46.0	13.8
Total	882.0	535.8	146.4	0.0	199.9	146.4

File=DUMP5712.WTB Does not exist

WATER BALANCE SUMMARY FOR HYDROGRAPH 404

Location: Hydrograph 404
Scenario File: wbsum1.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0517 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	6.3	0.0	36.1	6.3
FEB	45.5	6.9	12.9	0.0	25.7	12.9
MAR	64.8	9.5	31.0	0.0	24.3	31.0
APR	78.8	55.5	15.9	0.0	7.4	15.9
MAY	76.0	98.7	2.3	0.0	-25.0	2.3
JUN	83.3	103.2	1.5	0.0	-21.5	1.5
JUL	87.2	91.6	1.6	0.0	-6.1	1.6
AUG	86.5	79.6	3.6	0.0	3.2	3.6
SEP	82.8	51.4	1.8	0.0	29.6	1.8
OCT	73.5	37.6	2.0	0.0	33.8	2.0
NOV	86.7	17.5	8.6	0.0	60.5	8.6
DEC	67.0	7.2	10.8	0.0	49.0	10.8
Total	882.0	566.6	98.3	0.0	217.2	98.3

WATER BALANCE SUMMARY FOR HYDROGRAPH 408

Location: Hydrograph 408
Scenario File: wbsum1.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0148 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	4.7	0.0	37.7	4.7
FEB	45.5	6.9	10.3	0.0	28.3	10.3
MAR	64.8	9.4	24.8	0.0	30.6	24.8
APR	78.8	54.4	13.8	0.0	10.6	13.8
MAY	76.0	96.9	2.9	0.0	-23.8	2.9
JUN	83.3	105.3	2.8	0.0	-24.8	2.8
JUL	87.2	92.0	3.0	0.0	-7.8	3.0
AUG	86.5	78.6	4.9	0.0	3.0	4.9
SEP	82.8	50.5	2.6	0.0	29.6	2.6
OCT	73.5	37.0	2.2	0.0	34.3	2.2
NOV	86.7	17.3	5.8	0.0	63.5	5.8
DEC	67.0	7.2	7.8	0.0	52.0	7.8
Total	882.0	563.4	85.6	0.0	233.1	85.6

WATER BALANCE SUMMARY FOR HYDROGRAPH 5702

Location: Hydrograph 5702
Scenario File: wbsum1.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.5237 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	12.4	2.1	27.9	14.5
FEB	45.5	6.9	18.5	1.7	18.4	20.2
MAR	64.8	9.1	37.6	2.3	15.9	39.8
APR	78.8	35.6	28.4	2.3	12.4	30.7
MAY	76.0	55.8	19.4	2.3	-1.5	21.7
JUN	83.3	59.1	22.4	1.8	-0.1	24.2
JUL	87.2	52.7	23.8	1.1	9.6	24.9

AUG	86.5	46.9	26.9	0.7	12.0	27.7
SEP	82.8	32.8	22.9	0.6	26.5	23.4
OCT	73.5	25.9	20.7	0.7	26.2	21.5
NOV	86.7	14.7	26.4	1.5	44.1	27.8
DEC	67.0	7.2	19.5	2.5	37.9	21.9
Total	882.0	354.4	278.8	19.5	229.3	298.4

WATER BALANCE SUMMARY FOR HYDROGRAPH 4312

Location: Hydrograph 4312
Scenario File: wbsum1.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0802 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	14.4	0.6	27.5	15.0
FEB	45.5	6.9	24.1	0.5	14.0	24.6
MAR	64.8	9.1	48.5	0.6	6.5	49.2
APR	78.8	43.3	29.7	1.0	4.7	30.7
MAY	76.0	70.6	19.2	1.0	-14.8	20.2
JUN	83.3	74.9	21.6	1.0	-14.2	22.6
JUL	87.2	67.0	22.8	1.2	-3.8	24.0
AUG	86.5	59.4	24.0	1.5	1.5	25.5
SEP	82.8	40.0	22.5	1.5	18.7	24.1
OCT	73.5	30.6	21.9	1.9	19.1	23.8
NOV	86.7	15.7	31.4	1.6	37.9	33.0
DEC	67.0	7.2	23.4	1.0	35.4	24.4
Total	882.0	432.6	303.6	13.3	132.5	317.0

WATER BALANCE SUMMARY FOR HYDROGRAPH 5312

Location: Hydrograph 5312
Scenario File: wbsum1.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0802 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	0.0	0.0	42.5	0.0
FEB	45.5	6.9	0.0	0.0	38.6	0.0
MAR	64.8	9.5	0.0	0.0	55.3	0.0
APR	78.8	44.0	0.0	0.0	34.8	0.0
MAY	76.0	70.8	0.0	0.0	5.2	0.0
JUN	83.3	75.1	0.0	0.0	8.1	0.0
JUL	87.2	67.2	0.0	0.0	20.0	0.0
AUG	86.5	59.6	0.9	0.0	26.0	0.9
SEP	82.8	40.1	0.0	0.0	42.6	0.0
OCT	73.5	30.7	0.0	0.0	42.8	0.0
NOV	86.7	15.9	0.0	0.0	70.8	0.0
DEC	67.0	7.2	0.0	0.0	59.8	0.0
Total	882.0	434.7	0.9	0.0	446.5	0.9

WATER BALANCE SUMMARY FOR HYDROGRAPH 101

Location: Hydrograph 101
Scenario File: wbsum1.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0032 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	3.9	0.0	38.5	3.9
FEB	45.5	6.9	9.9	0.0	28.7	9.9
MAR	64.8	9.5	25.7	0.0	29.6	25.7

APR	78.8	55.5	15.4	0.0	7.9	15.4
MAY	76.0	99.3	1.4	0.0	-24.7	1.4
JUN	83.3	106.5	1.2	0.0	-24.5	1.2
JUL	87.2	92.2	1.0	0.0	-6.1	1.0
AUG	86.5	80.8	3.1	0.0	2.6	3.1
SEP	82.8	51.7	0.9	0.0	30.2	0.9
OCT	73.5	37.7	0.6	0.0	35.2	0.6
NOV	86.7	17.5	4.8	0.0	64.4	4.8
DEC	67.0	7.2	7.9	0.0	51.9	7.9
Total	882.0	572.5	75.8	0.0	233.7	75.8

GAWSER V6.9.18 - Released - Sep. 21, 2016

Upper River Watershed Model
Generalized Water Balance Summary
Demonstration

```
Input file 1=wbsum2.dat
Input file 2=
Output file =wbsum2.lst
* ====================================================================
* File created by Dr. H.O. Schroeter, January 10, 2000
* ====================================================================
START              KUNITS=2 TOTAL WATERSHED AREA=167     SQ KM
                   INITIAL BASEFLOW AT OUTLET: QBSS= 0.0000 QBGW= 0.000
                   PRINT OPTIONS: ECHO=3 OUTPUT=1 PLOTS=0 RCS=1 SUBW=1
                     PLOT CUTOFF=576 SUM=4 FREE=0
                   PARAMETER ADJUSTMENT FACTORS: FDS=1.00 FKEFF=0.25
                     FCS=0.30 FD=0.30 FSAV=1.0 FKO=1.00 FKSS=1.0 FKMF=1.00
                   INITIAL SOIL/SNOW WATER FACTORS:
                     FIMCI=1.00 FIMCII=1.00 FIWE=0.0000
                   GLOBAL RAINFALL SCALING FACTOR: GFRF=1.0000
                   SIMULATION CONTROLS: TTI=1.00000 IDEL=2 HOURS=576
                   SUBWATERSHED INITIAL BASEFLOWS: -999
```

WATER BALANCE SUMMARY FOR HYDROGRAPH 105

Location: Hydrograph 105
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0331 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	4.9	0.0	37.6	4.9
FEB	45.5	6.9	10.6	0.0	28.0	10.6
MAR	64.8	9.5	25.8	0.0	29.5	25.8
APR	78.8	55.5	13.5	0.0	9.8	13.5
MAY	76.0	99.1	1.7	0.0	-24.8	1.7
JUN	83.3	106.7	1.1	0.0	-24.5	1.1
JUL	87.2	93.5	1.2	0.0	-7.6	1.2
AUG	86.5	80.2	3.2	0.0	3.0	3.2
SEP	82.8	51.5	1.1	0.0	30.1	1.1
OCT	73.5	37.7	1.1	0.0	34.7	1.1
NOV	86.7	17.5	5.5	0.0	63.7	5.5
DEC	67.0	7.2	8.1	0.0	51.7	8.1
Total	882.0	573.1	77.7	0.0	231.2	77.7

WATER BALANCE SUMMARY FOR HYDROGRAPH 702

Location: Hydrograph 702
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.2827 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	13.2	3.1	26.1	16.3
FEB	45.5	6.9	20.4	2.6	15.6	23.0
MAR	64.8	8.8	41.3	2.9	11.7	44.3
APR	78.8	34.4	31.0	3.4	10.0	34.4
MAY	76.0	54.1	22.4	3.6	-4.1	26.0
JUN	83.3	57.1	25.9	2.8	-2.5	28.7
JUL	87.2	50.7	28.1	1.7	6.6	29.8
AUG	86.5	45.2	29.3	1.0	11.0	30.3
SEP	82.8	31.8	26.2	0.8	24.0	27.0
OCT	73.5	25.2	22.4	1.2	24.7	23.6
NOV	86.7	14.3	29.6	1.9	40.8	31.6

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
DEC	67.0	7.1	21.1	3.0	35.8	24.1
Total	882.0	343.6	311.0	28.0	199.5	339.0

WATER BALANCE SUMMARY FOR HYDROGRAPH 312

Location: Hydrograph 312
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0552 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	7.6	0.9	33.9	8.5
FEB	45.5	6.9	16.6	0.6	21.4	17.2
MAR	64.8	9.4	34.2	0.9	20.2	35.2
APR	78.8	54.7	13.4	1.4	9.3	14.8
MAY	76.0	93.7	2.2	1.4	-21.4	3.6
JUN	83.3	100.2	2.1	1.4	-20.4	3.5
JUL	87.2	89.2	1.9	1.7	-5.6	3.6
AUG	86.5	78.0	3.9	2.2	2.4	6.1
SEP	82.8	50.6	3.0	2.2	26.9	5.2
OCT	73.5	37.4	5.5	2.7	27.8	8.3
NOV	86.7	17.4	13.2	2.4	53.7	15.6
DEC	67.0	7.2	13.0	1.4	45.4	14.4
Total	882.0	552.6	116.7	19.3	193.5	136.0

WATER BALANCE SUMMARY FOR HYDROGRAPH 5702

Location: Hydrograph 5702
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.5237 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	12.4	2.1	27.9	14.5
FEB	45.5	6.9	18.5	1.7	18.4	20.2
MAR	64.8	9.1	37.6	2.3	15.9	39.8
APR	78.8	35.6	28.4	2.3	12.4	30.7
MAY	76.0	55.8	19.4	2.3	-1.5	21.7
JUN	83.3	59.1	22.4	1.8	-0.1	24.2
JUL	87.2	52.7	23.8	1.1	9.6	24.9
AUG	86.5	46.9	26.9	0.7	12.0	27.7
SEP	82.8	32.8	22.9	0.6	26.5	23.4
OCT	73.5	25.9	20.7	0.7	26.2	21.5
NOV	86.7	14.7	26.4	1.5	44.1	27.8
DEC	67.0	7.2	19.5	2.5	37.9	21.9
Total	882.0	354.4	278.8	19.5	229.3	298.4

WATER BALANCE SUMMARY FOR HYDROGRAPH 5704

Location: Hydrograph 5704
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0729 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	5.7	0.0	36.7	5.7
FEB	45.5	6.9	10.6	0.0	28.0	10.6
MAR	64.8	8.9	18.9	0.0	36.9	18.9
APR	78.8	35.6	14.3	0.0	28.9	14.3
MAY	76.0	56.4	8.7	0.0	10.9	8.7
JUN	83.3	59.8	11.2	0.0	12.2	11.2
JUL	87.2	53.1	12.9	0.0	21.1	12.9

AUG	86.5	47.2	15.5	0.0	23.8	15.5
SEP	82.8	32.9	11.3	0.0	38.5	11.3
OCT	73.5	25.9	8.4	0.0	39.2	8.4
NOV	86.7	14.6	11.8	0.0	60.3	11.8
DEC	67.0	7.2	9.5	0.0	50.3	9.5
Total	882.0	356.4	138.8	0.0	386.9	138.9

WATER BALANCE SUMMARY FOR HYDROGRAPH 1402

Location: Hydrograph 1402
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.2352 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	10.5	1.8	30.2	12.2
FEB	45.5	6.9	21.1	1.2	16.3	22.3
MAR	64.8	9.2	41.7	1.7	12.2	43.4
APR	78.8	47.6	17.6	2.0	11.6	19.6
MAY	76.0	79.7	6.9	1.9	-12.5	8.8
JUN	83.3	82.1	7.4	1.4	-7.7	8.8
JUL	87.2	73.8	7.7	1.3	4.4	8.9
AUG	86.5	66.1	9.5	1.7	9.2	11.3
SEP	82.8	44.0	8.2	2.0	28.7	10.1
OCT	73.5	33.1	9.8	2.8	27.8	12.6
NOV	86.7	16.4	20.7	2.8	46.8	23.5
DEC	67.0	7.2	18.0	2.4	39.5	20.3
Total	882.0	473.7	179.0	22.8	206.5	201.9

WATER BALANCE SUMMARY FOR HYDROGRAPH 1308

Location: Hydrograph 1308
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 1.0253 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	12.1	27.5	2.8	39.6
FEB	45.5	6.9	21.4	23.8	-6.6	45.2
MAR	64.8	9.3	43.8	28.1	-16.4	71.9
APR	78.8	47.6	25.7	29.3	-23.8	55.0
MAY	76.0	82.0	13.2	30.1	-49.4	43.3
JUN	83.3	86.4	14.5	22.8	-40.4	37.3
JUL	87.2	75.5	15.0	17.1	-20.5	32.1
AUG	86.5	67.0	16.3	14.6	-11.3	30.9
SEP	82.8	44.2	14.0	14.3	10.2	28.3
OCT	73.5	32.9	14.4	16.8	9.4	31.2
NOV	86.7	16.3	23.2	21.4	25.7	44.6
DEC	67.0	7.2	19.2	28.0	12.6	47.2
Total	882.0	483.0	232.8	274.0	-107.8	506.8

WATER BALANCE SUMMARY FOR HYDROGRAPH 7090

Location: Hydrograph 7090
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0070 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	29.2	0.0	13.3	29.2
FEB	45.5	6.9	40.7	0.0	-2.1	40.7
MAR	64.8	8.3	80.1	0.0	-23.6	80.1

APR	78.8	18.3	65.9	0.0	-5.4	65.9
MAY	76.0	19.5	56.8	0.0	-0.4	56.8
JUN	83.3	19.1	64.7	0.0	-0.6	64.7
JUL	87.2	17.9	69.1	0.0	0.1	69.1
AUG	86.5	18.4	68.5	0.0	-0.4	68.5
SEP	82.8	16.7	65.5	0.0	0.5	65.5
OCT	73.5	15.7	58.0	0.0	-0.1	58.0
NOV	86.7	11.9	71.8	0.0	3.0	71.8
DEC	67.0	7.1	46.4	0.0	13.5	46.4
Total	882.0	167.6	716.5	0.0	-2.1	716.5

WATER BALANCE SUMMARY FOR HYDROGRAPH 1408

Location: Hydrograph 1408
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 1.6459 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	4.0	1.5	37.0	5.4
FEB	45.5	6.9	8.0	1.1	29.5	9.1
MAR	64.8	10.5	14.6	2.0	37.7	16.6
APR	78.8	57.1	4.5	2.5	14.7	7.0
MAY	76.0	89.5	2.1	1.9	-17.6	4.0
JUN	83.3	93.0	2.4	1.2	-13.3	3.6
JUL	87.2	85.4	2.3	1.3	-1.8	3.6
AUG	86.5	74.1	2.6	1.8	8.0	4.4
SEP	82.8	49.4	3.2	1.7	28.5	4.9
OCT	73.5	36.3	5.1	2.3	29.8	7.4
NOV	86.7	17.6	9.2	2.4	57.5	11.6
DEC	67.0	7.3	7.0	2.1	50.6	9.1
Total	882.0	534.9	64.7	21.8	260.7	86.5

WATER BALANCE SUMMARY FOR HYDROGRAPH 1102

Location: Hydrograph 1102
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0505 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	3.6	0.6	38.3	4.2
FEB	45.5	6.9	8.4	0.5	29.7	8.9
MAR	64.8	9.5	18.1	0.6	36.6	18.7
APR	78.8	55.3	7.4	0.7	15.4	8.1
MAY	76.0	98.1	1.1	0.7	-23.9	1.8
JUN	83.3	105.0	0.8	0.5	-23.1	1.4
JUL	87.2	91.0	0.7	0.5	-5.1	1.2
AUG	86.5	78.7	1.8	0.7	5.3	2.5
SEP	82.8	51.7	1.0	0.8	29.3	1.7
OCT	73.5	37.5	1.8	1.1	33.2	2.8
NOV	86.7	17.5	5.4	1.1	62.7	6.5
DEC	67.0	7.2	6.2	0.9	52.7	7.1
Total	882.0	566.1	56.2	8.7	251.1	64.9

File=DUMP5712.WTB Does not exist

WATER BALANCE SUMMARY FOR HYDROGRAPH 1405

Location: Hydrograph 1405
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.5049 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	7.1	1.3	34.1	8.4
FEB	45.5	6.9	14.4	0.9	23.4	15.2
MAR	64.8	9.6	28.3	1.1	25.7	29.5
APR	78.8	54.4	9.6	1.6	13.2	11.2
MAY	76.0	93.1	3.0	1.5	-21.6	4.5
JUN	83.3	96.1	2.9	1.3	-17.0	4.1
JUL	87.2	85.9	2.6	1.4	-2.8	4.0
AUG	86.5	76.3	3.4	1.9	4.9	5.3
SEP	82.8	50.2	3.8	2.0	26.8	5.8
OCT	73.5	37.0	6.4	2.6	27.6	9.0
NOV	86.7	17.3	14.5	2.4	52.4	16.9
DEC	67.0	7.2	12.3	1.8	45.7	14.1
Total	882.0	541.7	108.3	19.7	212.3	128.0

WATER BALANCE SUMMARY FOR HYDROGRAPH 7080

Location: Hydrograph 7080
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0151 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	29.2	0.0	13.3	29.2
FEB	45.5	6.9	40.7	0.0	-2.1	40.7
MAR	64.8	8.3	80.1	0.0	-23.6	80.1
APR	78.8	18.3	65.9	0.0	-5.4	65.9
MAY	76.0	19.5	56.8	0.0	-0.4	56.8
JUN	83.3	19.1	64.7	0.0	-0.6	64.7
JUL	87.2	17.9	69.1	0.0	0.1	69.1
AUG	86.5	18.4	68.5	0.0	-0.4	68.5
SEP	82.8	16.7	65.5	0.0	0.5	65.5
OCT	73.5	15.7	58.0	0.0	-0.1	58.0
NOV	86.7	11.9	71.8	0.0	3.0	71.8
DEC	67.0	7.1	46.4	0.0	13.5	46.4
Total	882.0	167.6	716.5	0.0	-2.1	716.5

WATER BALANCE SUMMARY FOR HYDROGRAPH 1110

Location: Hydrograph 1110
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.5862 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	5.0	9.5	28.0	14.5
FEB	45.5	6.9	10.2	7.9	20.4	18.2
MAR	64.8	9.5	21.8	12.4	21.0	34.3
APR	78.8	54.6	9.6	15.5	-1.0	25.1
MAY	76.0	96.5	2.7	13.6	-36.9	16.3
JUN	83.3	105.2	2.6	6.6	-31.3	9.3
JUL	87.2	94.9	2.5	3.3	-13.6	5.9
AUG	86.5	79.0	3.5	2.0	2.0	5.5
SEP	82.8	51.2	2.5	2.1	27.0	4.6
OCT	73.5	36.9	3.4	3.5	29.7	6.9
NOV	86.7	17.3	7.5	6.0	55.8	13.5
DEC	67.0	7.2	7.7	10.1	42.1	17.7
Total	882.0	567.2	79.1	92.6	143.1	171.7

File=DUMP7312.WTB Does not exist

File=DUMP2702.WTB Does not exist

WATER BALANCE SUMMARY FOR HYDROGRAPH 4312

Location: Hydrograph 4312
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0802 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	14.4	0.6	27.5	15.0
FEB	45.5	6.9	24.1	0.5	14.0	24.6
MAR	64.8	9.1	48.5	0.6	6.5	49.2
APR	78.8	43.3	29.7	1.0	4.7	30.7
MAY	76.0	70.6	19.2	1.0	-14.8	20.2
JUN	83.3	74.9	21.6	1.0	-14.2	22.6
JUL	87.2	67.0	22.8	1.2	-3.8	24.0
AUG	86.5	59.4	24.0	1.5	1.5	25.5
SEP	82.8	40.0	22.5	1.5	18.7	24.1
OCT	73.5	30.6	21.9	1.9	19.1	23.8
NOV	86.7	15.7	31.4	1.6	37.9	33.0
DEC	67.0	7.2	23.4	1.0	35.4	24.4
Total	882.0	432.6	303.6	13.3	132.5	317.0

WATER BALANCE SUMMARY FOR HYDROGRAPH 6312

Location: Hydrograph 6312
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0802 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	14.4	0.6	27.5	15.0
FEB	45.5	6.9	25.4	0.5	12.6	26.0
MAR	64.8	9.1	48.5	0.6	6.5	49.2
APR	78.8	43.3	31.0	1.0	3.5	32.0
MAY	76.0	70.6	19.2	1.0	-14.8	20.2
JUN	83.3	74.9	23.0	1.0	-15.6	24.0
JUL	87.2	67.0	25.0	1.2	-6.1	26.3
AUG	86.5	59.4	32.2	1.5	-6.7	33.8
SEP	82.8	40.0	23.1	1.5	18.1	24.7
OCT	73.5	30.6	21.9	1.9	19.1	23.8
NOV	86.7	15.7	31.6	1.6	37.7	33.2
DEC	67.0	7.2	23.4	1.0	35.4	24.4
Total	882.0	432.6	318.8	13.5	117.2	332.3

WATER BALANCE SUMMARY FOR HYDROGRAPH 4709

Location: Hydrograph 4709
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0230 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	1.9	0.0	40.5	1.9
FEB	45.5	6.9	6.2	0.0	32.4	6.2
MAR	64.8	9.0	7.9	0.0	47.9	7.9
APR	78.8	39.5	5.5	0.0	33.7	5.5
MAY	76.0	65.0	1.6	0.0	9.3	1.6
JUN	83.3	69.1	3.3	0.0	10.9	3.3
JUL	87.2	61.1	4.5	0.0	21.5	4.5
AUG	86.5	53.7	6.9	0.0	25.9	6.9

SEP	82.8	36.6	3.3	0.0	42.9	3.3
OCT	73.5	28.2	0.7	0.0	44.5	0.7
NOV	86.7	15.1	2.6	0.0	68.9	2.6
DEC	67.0	7.2	3.7	0.0	56.1	3.7
Total	882.0	399.2	48.3	0.0	434.5	48.3

WATER BALANCE SUMMARY FOR HYDROGRAPH 4704

Location: Hydrograph 4704
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0170 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	2.4	0.0	40.0	2.4
FEB	45.5	6.9	7.2	0.0	31.4	7.2
MAR	64.8	8.9	10.3	0.0	45.5	10.3
APR	78.8	36.8	7.2	0.0	34.8	7.2
MAY	76.0	59.1	3.2	0.0	13.6	3.2
JUN	83.3	62.7	5.6	0.0	15.0	5.6
JUL	87.2	55.5	8.1	0.0	23.5	8.1
AUG	86.5	49.2	9.8	0.0	27.5	9.8
SEP	82.8	34.0	5.9	0.0	42.9	5.9
OCT	73.5	26.6	2.0	0.0	44.9	2.0
NOV	86.7	14.7	4.7	0.0	67.3	4.7
DEC	67.0	7.2	5.0	0.0	54.8	5.0
Total	882.0	369.4	71.6	0.0	441.1	71.6

WATER BALANCE SUMMARY FOR HYDROGRAPH 3312

Location: Hydrograph 3312
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0250 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	29.2	0.0	13.3	29.2
FEB	45.5	6.9	40.7	0.0	-2.1	40.7
MAR	64.8	8.3	80.1	0.0	-23.6	80.1
APR	78.8	18.3	65.9	0.0	-5.4	65.9
MAY	76.0	19.5	56.8	0.0	-0.4	56.8
JUN	83.3	19.1	64.7	0.0	-0.6	64.7
JUL	87.2	17.9	69.1	0.0	0.1	69.1
AUG	86.5	18.4	68.5	0.0	-0.4	68.5
SEP	82.8	16.7	65.5	0.0	0.5	65.5
OCT	73.5	15.7	58.0	0.0	-0.1	58.0
NOV	86.7	11.9	71.8	0.0	3.0	71.8
DEC	67.0	7.1	46.4	0.0	13.5	46.4
Total	882.0	167.6	716.5	0.0	-2.1	716.5

WATER BALANCE SUMMARY FOR HYDROGRAPH 5312

Location: Hydrograph 5312
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0802 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	0.0	0.0	42.5	0.0
FEB	45.5	6.9	0.0	0.0	38.6	0.0
MAR	64.8	9.5	0.0	0.0	55.3	0.0
APR	78.8	44.0	0.0	0.0	34.8	0.0

MAY	76.0	70.8	0.0	0.0	5.2	0.0
JUN	83.3	75.1	0.0	0.0	8.1	0.0
JUL	87.2	67.2	0.0	0.0	20.0	0.0
AUG	86.5	59.6	0.9	0.0	26.0	0.9
SEP	82.8	40.1	0.0	0.0	42.6	0.0
OCT	73.5	30.7	0.0	0.0	42.8	0.0
NOV	86.7	15.9	0.0	0.0	70.8	0.0
DEC	67.0	7.2	0.0	0.0	59.8	0.0
Total	882.0	434.7	0.9	0.0	446.5	0.9

WATER BALANCE SUMMARY FOR HYDROGRAPH 5706

Location: Hydrograph 5706
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0468 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	11.8	9.1	21.6	20.9
FEB	45.5	6.9	17.7	7.6	13.4	25.2
MAR	64.8	9.0	34.1	9.6	12.1	43.7
APR	78.8	35.1	26.5	9.9	7.3	36.4
MAY	76.0	54.9	18.4	10.6	-7.9	29.0
JUN	83.3	58.1	21.7	8.1	-4.5	29.7
JUL	87.2	51.6	23.1	4.9	7.6	28.0
AUG	86.5	45.9	25.9	3.0	11.7	28.9
SEP	82.8	32.2	21.5	2.5	26.6	24.0
OCT	73.5	25.5	19.4	3.3	25.3	22.8
NOV	86.7	14.5	24.5	6.0	41.6	30.6
DEC	67.0	7.2	17.5	9.2	33.1	26.7
Total	882.0	348.5	262.1	83.8	187.7	345.9

WATER BALANCE SUMMARY FOR HYDROGRAPH 101

Location: Hydrograph 101
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0032 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	3.9	0.0	38.5	3.9
FEB	45.5	6.9	9.9	0.0	28.7	9.9
MAR	64.8	9.5	25.7	0.0	29.6	25.7
APR	78.8	55.5	15.4	0.0	7.9	15.4
MAY	76.0	99.3	1.4	0.0	-24.7	1.4
JUN	83.3	106.5	1.2	0.0	-24.5	1.2
JUL	87.2	92.2	1.0	0.0	-6.1	1.0
AUG	86.5	80.8	3.1	0.0	2.6	3.1
SEP	82.8	51.7	0.9	0.0	30.2	0.9
OCT	73.5	37.7	0.6	0.0	35.2	0.6
NOV	86.7	17.5	4.8	0.0	64.4	4.8
DEC	67.0	7.2	7.9	0.0	51.9	7.9
Total	882.0	572.5	75.8	0.0	233.7	75.8

WATER BALANCE SUMMARY FOR HYDROGRAPH 103

Location: Hydrograph 103
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0259 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow

JAN	50.2	7.8	3.8	1.2	37.4	5.0
FEB	45.5	6.9	8.3	0.9	29.4	9.2
MAR	64.8	9.5	15.4	1.1	38.7	16.6
APR	78.8	55.1	3.5	1.4	18.7	5.0
MAY	76.0	96.7	1.1	1.4	-23.2	2.4
JUN	83.3	100.4	0.9	1.0	-19.1	1.9
JUL	87.2	87.1	0.6	1.0	-1.5	1.6
AUG	86.5	76.6	0.8	1.4	7.7	2.2
SEP	82.8	51.8	1.4	1.6	28.1	2.9
OCT	73.5	37.3	3.3	2.1	30.8	5.4
NOV	86.7	17.4	8.2	2.1	58.9	10.3
DEC	67.0	7.2	6.9	1.7	51.3	8.5
Total	882.0	553.7	54.1	16.9	257.2	71.1

WATER BALANCE SUMMARY FOR HYDROGRAPH 1050

Location: Hydrograph 1050
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0110 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	29.1	0.0	13.4	29.1
FEB	45.5	6.9	40.6	0.0	-2.0	40.6
MAR	64.8	8.3	79.9	0.0	-23.4	79.9
APR	78.8	18.3	65.9	0.0	-5.4	65.9
MAY	76.0	19.5	56.8	0.0	-0.3	56.8
JUN	83.3	19.1	64.7	0.0	-0.5	64.7
JUL	87.2	17.9	69.1	0.0	0.1	69.1
AUG	86.5	18.4	68.5	0.0	-0.4	68.5
SEP	82.8	16.7	65.5	0.0	0.6	65.5
OCT	73.5	15.7	57.9	0.0	-0.1	57.9
NOV	86.7	11.9	71.6	0.0	3.2	71.6
DEC	67.0	7.1	46.1	0.0	13.7	46.1
Total	882.0	167.6	715.6	0.0	-1.1	715.6

WATER BALANCE SUMMARY FOR HYDROGRAPH 108

Location: Hydrograph 108
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.1240 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	10.6	18.7	13.2	29.3
FEB	45.5	6.9	23.3	14.7	0.5	38.1
MAR	64.8	9.5	45.3	21.1	-11.1	66.4
APR	78.8	55.1	10.6	25.9	-12.8	36.5
MAY	76.0	96.7	2.9	22.5	-46.1	25.4
JUN	83.3	100.1	1.8	11.2	-29.8	12.9
JUL	87.2	90.1	0.7	5.9	-9.6	6.6
AUG	86.5	78.4	1.0	4.9	2.2	5.9
SEP	82.8	51.9	2.1	5.8	23.0	7.9
OCT	73.5	37.4	6.8	10.0	19.3	16.8
NOV	86.7	17.5	20.9	14.6	33.7	35.5
DEC	67.0	7.2	18.4	20.8	20.6	39.2
Total	882.0	558.4	144.3	176.2	3.2	320.5

WATER BALANCE SUMMARY FOR HYDROGRAPH 109

Location: Hydrograph 109
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.1252 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	1.6	27.1	13.8	28.7
FEB	45.5	6.9	2.8	23.0	12.8	25.8
MAR	64.8	9.4	6.2	35.1	14.0	41.3
APR	78.8	53.6	3.9	47.7	-26.4	51.5
MAY	76.0	95.6	2.8	41.2	-63.7	44.0
JUN	83.3	108.9	3.2	20.1	-49.0	23.3
JUL	87.2	107.8	3.4	9.8	-33.8	13.1
AUG	86.5	81.2	3.4	4.7	-2.8	8.1
SEP	82.8	52.5	3.2	3.7	23.4	6.9
OCT	73.5	36.4	2.8	7.1	27.2	9.9
NOV	86.7	17.2	3.6	13.1	52.8	16.7
DEC	67.0	7.2	2.6	25.6	31.5	28.3
Total	882.0	584.5	39.5	258.2	-0.1	297.7

WATER BALANCE SUMMARY FOR HYDROGRAPH 5103

Location: Hydrograph 5103
Scenario File: wbsum2.dat
Period: 1960/11/01 to 1999/10/30 Area: 0.0505 km^2

Water Balance Quantities (in mm)

Month	Precip	ET	Runoff	Infiltration (Baseflow)	Infiltration (Losses)	Total Flow
JAN	50.2	7.8	0.9	0.0	41.6	0.9
FEB	45.5	6.9	2.4	0.0	36.2	2.4
MAR	64.8	10.5	7.6	0.2	46.5	7.7
APR	78.8	58.8	1.4	0.0	18.6	1.5
MAY	76.0	98.5	0.0	0.0	-22.5	0.0
JUN	83.3	105.1	0.0	0.0	-21.9	0.0
JUL	87.2	91.1	0.0	0.0	-4.0	0.0
AUG	86.5	78.8	0.2	0.0	7.5	0.2
SEP	82.8	51.8	0.0	0.0	31.0	0.0
OCT	73.5	37.7	0.0	0.0	35.8	0.0
NOV	86.7	17.8	0.0	0.0	68.8	0.0
DEC	67.0	7.3	0.6	0.0	59.0	0.7
Total	882.0	572.0	13.0	0.3	296.7	13.3

SWMF2 (Major Event)
Sub-Model

```
* Sub Model Grand River - Proposed Event
* USE FOR 10yr to Regional Events in SWMF 2, WL2
* ============================================================================
* MTE Consultants Inc., 2021
* ============================================================================
* Hydrologic Response Units
* ============================================================================
*
* Unit  Response Unit Descriptions
*   1 = Impervious
*   2 = Wetland (Open water)
*   3 = Organic Soils
*   4 = Silt tills-poor and imperfectly draining
*   5 = Silt tills high vegetation cover
*   6 = Sand tills-sandy clay to fine sand loams
*   7 = Sand tills high vegetation cover
*   8 = Sand/gravel tills-gravelly sandy clay to gravelly sandy silt loams
*   9 = Sand/gravel tills high vegetation cover
*
* Soil drainage parameters taken from "Hydrology of Floods in Canada", 1989.
* Edited by Watt, W.E., National Research Council of Canada
*
READ SOIL PARAMETERS  NZONE=9
                                                SILT TILL   SAND TILL   SAND/GRAV
                        IMP  WET   ORG   SILT TILL  HIGH   SAND TILL  HIGH   SAND/GRAV  HIGH
                  DS=   2.0 40.0  40.0   5.0   15.0   5.0   15.0   5.0   15.0
                  KEFF=  0   0.2   2.0   5.0   15.0  10.0   40.0  10.0   40.0
                  CS=    0   0.2   1.5   3.8   11.2   7.5   30.0   7.5   30.0
                  D=     0   0.2   0.2   0.5    1.5   1.0    4.0   1.0    4.0
                  SAV=   0   200   200   200    200   200    200   200    200
                  HI=    0  0.01   100   100    200   100    200   100    200
                  SMCI=  0  0.56  0.56  0.54   0.54  0.46   0.46  0.46   0.46
                  IMCI=  0  0.46  0.46  0.40   0.40  0.23   0.23  0.23   0.23
                  FCAPI= 0  0.46  0.46  0.40   0.40  0.23   0.23  0.23   0.23
                  WILTI= 0  0.27  0.27  0.19   0.19  0.07   0.07  0.07   0.07
                  HII=   0  0.01   150   150    400   300    600   400    600
                  SMCII= 0  0.56  0.56  0.54   0.54  0.46   0.46  0.40   0.40
                  IMCII= 0  0.46  0.46  0.40   0.40  0.23   0.23  0.10   0.10
                  FCAPII=0  0.46  0.46  0.40   0.40  0.23   0.23  0.10   0.10
                  WILTII=0  0.27  0.27  0.19   0.19  0.07   0.07  0.04   0.04
                  X=     0     1     1     0     1     0      0     0      0
                  FATR=  1     1     1     1     1     1      1     1      1
                  INCS=  0     1     3     1     5     1      5     1      5
*
* Go to event file
*
CHANGE INPUT FILE
*
*   3.5% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=1  VS=     2.035   NSEGS=3
                      MIN EL=  100.00   MAX EL=  100.80
                      CHNSLP= 0.03500   FLNSLP= 0.03500
                      N= 0.350  DIST=   24.45
                      N=-0.150  DIST=   25.55
                      N= 0.350  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1
*
*   5% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=2  VS=     2.050   NSEGS=3
                      MIN EL=  100.00   MAX EL=  100.80
                      CHNSLP= 0.05000   FLNSLP= 0.05000
                      N= 0.350  DIST=   24.45
                      N=-0.150  DIST=   25.55
                      N= 0.350  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1
*
```



```
*   3.5% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=3  VS=   100.035   NSEGS=3
                      MIN EL=  100.70   MAX EL=  103.00
                      CHNSLP= 0.03500   FLNSLP= 0.03500
                      N= 0.080  DIST=   20.00
                      N=-0.050  DIST=   30.00
                      N= 0.080  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  103.00    20.00  101.00    23.00  100.80
                       25.00  100.70    27.00  100.80    30.00  101.00
                       50.00  103.00
                     RFN=0.0000 PCODE=1
*
*   2% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=4  VS=   100.020   NSEGS=3
                      MIN EL=  100.70   MAX EL=  103.00
                      CHNSLP= 0.02000   FLNSLP= 0.02000
                      N= 0.080  DIST=   20.00
                      N=-0.050  DIST=   30.00
                      N= 0.080  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  103.00    20.00  101.00    23.00  100.80
                       25.00  100.70    27.00  100.80    30.00  101.00
                       50.00  103.00
                     RFN=0.0000 PCODE=1
*
* Catchment 2% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=5  VS=     2.020   NSEGS=3
                      MIN EL=  100.00   MAX EL=  100.80
                      CHNSLP= 0.02000   FLNSLP= 0.02000
                      N= 0.350  DIST=   24.45
                      N=-0.150  DIST=   25.55
                      N= 0.350  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1
*
*   Catchment 0.5% Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=6  VS=   100.005   NSEGS=3
                      MIN EL=  100.70   MAX EL=  103.00
                      CHNSLP= 0.00500   FLNSLP= 0.005000
                      N= 0.080  DIST=   20.00
                      N=-0.050  DIST=   30.00
                      N= 0.080  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  103.00    20.00  101.00    23.00  100.80
                       25.00  100.70    27.00  100.80    30.00  101.00
                       50.00  103.00
                     RFN=0.0000 PCODE=1
*******************************************************************************
* NEWMAN CREEK
*
*
*
*   2.0% Typical off-channel (Steep areas)
*
COMPUTE RATING CURVE ID=1  VS=     2.020   NSEGS=3
                      MIN EL=  100.00   MAX EL=  100.80
                      CHNSLP= 0.02000   FLNSLP= 0.02000
                      N= 0.350  DIST=   24.45
                      N=-0.150  DIST=   25.55
                      N= 0.350  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1

*
*   10.0% Typical off-channel (Steep areas)
```

```
*
COMPUTE RATING CURVE ID=2  VS=     2.100   NSEGS=3
                     MIN EL=  100.00   MAX EL=  100.80
                     CHNSLP= 0.10000   FLNSLP= 0.10000
                     N= 0.350  DIST=   24.45
                     N=-0.150  DIST=   25.55
                     N= 0.350  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  100.80    24.45  100.30    24.75  100.00
                       25.50  100.00    25.55  100.30    50.00  100.80
                     RFN=0.0000 PCODE=1
*
*   1.0% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=3  VS=   100.010   NSEGS=3
                     MIN EL=  100.70   MAX EL=  103.00
                     CHNSLP= 0.01000   FLNSLP= 0.01000
                     N= 0.080  DIST=   20.00
                     N=-0.050  DIST=   30.00
                     N= 0.080  DIST=   50.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  103.00    20.00  101.00    23.00  100.80
                       25.00  100.70    27.00  100.80    30.00  101.00
                       50.00  103.00
                     RFN=0.0000 PCODE=1
*
* Typical Urban section
*
COMPUTE RATING CURVE ID=5  VS=     3.200   NSEGS=3
                     MIN EL=  295.00   MAX EL=  295.70
                     CHNSLP= 0.01000   FLNSLP= 0.01000
                     N= 0.015  DIST=  200.00
                     N=-0.015  DIST=  300.00
                     N= 0.015  DIST=  500.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  295.70   200.00  295.50   200.10  295.00
                      299.90  295.00   300.00  295.50   500.00  295.70
*
* Typical Urban section
*
COMPUTE RATING CURVE ID=6  VS=     3.200   NSEGS=3
                     MIN EL=  295.00   MAX EL=  295.70
                     CHNSLP= 0.02000   FLNSLP= 0.02000
                     N= 0.015  DIST=  200.00
                     N=-0.015  DIST=  300.00
                     N= 0.015  DIST=  500.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  295.70   200.00  295.50   200.10  295.00
                      299.90  295.00   300.00  295.50   500.00  295.70
*
* Catchment 201
* VS=  100.010 is main channel & VS= 2.020 is off-channel
*
COMPUTE FLOWRATE    ID=3 NHD= 201 AREA=   0.0639 Sq km  L=  260 m  W=   245 m
            SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   46.0   0.0  0.0   0.0  0.0   0.0  0.0  54.0  0.0
                 RATING CURVES: IDMC=5 IDOC=6 QRMC=  0.5 QROC=  0.05
                 ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                 SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                 RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                 GWFACT=1.00 GWON=1
                 SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*
* Typical Roof section
*
COMPUTE RATING CURVE ID=5  VS=   101.000   NSEGS=3
                     MIN EL=  295.00   MAX EL=  295.70
                     CHNSLP= 0.2500   FLNSLP= 0.2500
                     N= 0.018  DIST=  100.00
                     N=-0.018  DIST=  400.00
                     N= 0.018  DIST=  500.00
                       DIST    ELEV     DIST    ELEV     DIST    ELEV
```



```
                        0.00  295.70   100.00  295.50   100.10  295.00
                      399.90  295.00   400.00  295.50   500.00  295.70
                     RFN=0.0000 PCODE=1
*
*******************************************************************************
* GRAND RIVER
*******************************************************************************
* This portion is part of the development area (school block) in SWM 2 Cmt
* Major flow would continue to Devils creek and minor flow will be diverted
* to SWMF2 (and ultimately the Grand)
*
* Roof area of school blck
*
COMPUTE FLOWRATE    ID=1 NHD= 9721 AREA=   0.0039 Sq km  L=   20 m  W=    10 m
            SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   100.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0  0.0
                 RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                 ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                 SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                 RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                 GWFACT=0.0 GWON=1
                 SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Roof infiltration gallery within 7021; hydrograph 8721
*
ROUTE SPECIAL POND  ID=3 HYD NO=8721 INFLOW=1 PCODE=0 OPTION= 5
                    Inflow controls:
                       USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                       GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 101.100
                    Recharge characteristics for Compartment A
                      LEVELA= 100.000               EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 10.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
                      CDB=  15.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  3
                                  Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     100.000     0.000  0.0000  0.0000   0.000  0.0000  0.0096
                     101.000     0.000  0.0000  0.0000   0.000  0.0096  0.0096
                     101.100     0.000  0.0000  0.0000   1.000  0.0106  0.0096
*
* Non-roof areas within 7021; hydrograph 7721
* VS=3.200 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=5 NHD= 7721 AREA=   0.0231 Sq km  L=   60 m  W=   150 m
            SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                    27.1   0.0  0.0  11.3  0.0   0.3  0.0  61.4  0.0
                 RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
                 ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                 SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                 RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                 GWFACT=0.75 GWON=1
*
* Sum hydr,  8721,7721 call result 7021
*
ADD HYD             ID=1 HYD NO= 7021 IDA=3 IDB=5 ICODE=0
*
* Divert minor flow to SWMF2 and major flow to Devils creek (313)
*
DIVERT FLOWS        INFLOW=1  DIVERT=3 HYD NO=3131 PCODE=1 OPTION=2
                    INLET CAP=0.7872 CMS THRUFLO ID=6 HYD NOB=1721
                    IDFLAG=0  IDSTOR=0  IGWT=0
*
*
*******************************************************************************
* GRAND RIVER
*
*
*
*
```

```
* Roof areas within 708, hydrograph 9708
* VS=101.000 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=1 NHD= 9708 AREA=   0.0176 Sq km  L=    20 m  W=    10 m
             SOIL ZONE I    II  III   IV    V    VI  VII  VIII   IX
                  100.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0  0.0
                  RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=1.0 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Roof infiltration gallery within 708; hydrograph 8708
*
ROUTE SPECIAL POND  ID=2 HYD NO=8708 INFLOW=1 PCODE=0 OPTION= 5
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 101.100
                    Recharge characteristics for Compartment A
                      LEVELA= 100.000               EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 10.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
                      CDB=  15.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  3
                                  Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     100.000     0.000  0.0000  0.0000   0.000  0.0000  0.1102
                     101.000     0.000  0.0000  0.0000   0.000  0.0441  0.1102
                     101.100     0.000  0.0000  0.0000   1.000  0.0485  0.1102
*
*-------------------------------------------------------------------------------------------------
*
* Areas within 708 to CIF, hydrograph 6708
* VS=101.000 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=1 NHD= 6708 AREA=   0.0080 Sq km  L=    20 m  W=    10 m
             SOIL ZONE I    II  III   IV    V    VI  VII  VIII   IX
                  100.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0  0.0
                  RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=1.0 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Roof infiltration gallery in areas within 708 to CIF; hydrograph 5708
*
ROUTE SPECIAL POND  ID=3 HYD NO=5708 INFLOW=1 PCODE=0 OPTION= 5
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 101.100
                    Recharge characteristics for Compartment A
                      LEVELA= 100.000               EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 10.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
                      CDB=  15.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  3
                                  Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     100.000     0.000  0.0000  0.0000   0.000  0.0000  0.0498
                     101.000     0.000  0.0000  0.0000   0.000  0.0199  0.0498
                     101.100     0.000  0.0000  0.0000   1.000  0.0219  0.0498
*
* Non-roof areas in areas within 708 to CIF; hydrograph 2708
* VS=3.200 MC, VS=3.200 OC
```



```
*
COMPUTE FLOWRATE    ID=1 NHD= 2708 AREA=   0.0276 Sq km  L=    60 m  W=    60 m
             SOIL ZONE I    II  III   IV    V    VI  VII  VIII   IX
                   50.4   0.0  0.0   7.7   0.0  0.2  0.0  41.7  0.0
                  RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=1.0 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
ADD HYD             ID=4 HYD NO=  4708 IDA=3 IDB=1 ICODE=0
PRINT HYD           ID=4 PCODE=1 MODE=10
*
* Conveyance infiltration gallery within 708, sized by 25mm,15% safety faactor; hydrograph 4708
*
ROUTE SPECIAL POND  ID=3 HYD NO=1708 INFLOW=4 PCODE=0 OPTION= 5
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 101.100
                    Recharge characteristics for Compartment A
                      LEVELA= 100.000               EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 10.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
                      CDB=  15.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  3
                                  Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                     100.000     0.000  0.0000  0.0000   0.000  0.0000  0.0889
                     101.000     0.000  0.0000  0.0000   0.000  0.0889  0.0889
                     101.100     0.000  0.0000  0.0000   1.000  0.1023  0.0889
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*-------------------------------------------------------------------------------
*
* Non-roof areas within 708; hydrograph 7708
* VS=3.200 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=1 NHD= 7708 AREA=   0.1030 Sq km  L=    60 m  W=   340 m
             SOIL ZONE I    II  III   IV    V    VI  VII  VIII   IX
                   45.9   0.0  0.0   8.4   0.0  0.2  0.0  45.5  0.0
                  RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=1.0 GWON=1
                  SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Sum catchment 7708 and 4708 component hydrographs
*
ADD HYD             ID=4 HYD NO=  3708 IDA=3 IDB=1 ICODE=0
PRINT HYD           ID=4 PCODE=1 MODE=10
*
* Sum catchment 708 component hydrographs
*
ADD HYD             ID=3 HYD NO=  708 IDA=2 IDB=4 ICODE=0
PRINT HYD           ID=3 PCODE=1 MODE=10
KEEP HYD            ID=3 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=3 IMET=1
*
* Roof areas within 701, hydrograph 9701
* VS=101.000 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=1 NHD= 9701 AREA=   0.0187 Sq km  L=    20 m  W=    10 m
             SOIL ZONE I    II  III   IV    V    VI  VII  VIII   IX
                  100.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0  0.0
                  RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                  ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                  SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                  RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                  GWFACT=0.75 GWON=1
```

```
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Roof infiltration gallery within 701; hydrograph 8701
*
ROUTE SPECIAL POND  ID=2 HYD NO=8701 INFLOW=1 PCODE=0 OPTION= 5
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 101.100
                    Recharge characteristics for Compartment A
                      LEVELA= 100.000                EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 10.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
                      CDB=  15.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  3
                                  Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)   (ha*m)    (ha)    (cms)   (ha*m)    (ha)
                     100.000     0.000  0.0000  0.0000   0.000  0.0000  0.1166
                     101.000     0.000  0.0000  0.0000   0.000  0.0467  0.1166
                     101.100     0.000  0.0000  0.0000   1.000  0.0513  0.1166
*
* Non-roof areas within 701; hydrograph 7701
* VS=3.200 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=1 NHD= 7701 AREA=   0.0661 Sq km  L=   60 m  W=   265 m
               SOIL ZONE I    II   III    IV    V    VI  VII  VIII   IX
                     43.7   0.0   0.0   8.7   0.0   0.2  0.0  47.4  0.0
                    RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.75 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Sum catchment 701 component hydrographs
*
ADD HYD             ID=4 HYD NO=  701 IDA=2 IDB=1 ICODE=0
PRINT HYD           ID=4 PCODE=1 MODE=10
KEEP HYD            ID=4 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=4 IMET=1
*
* Sum catchments 708 and 701, call result 1701
*
ADD HYD             ID=1 HYD NO= 1701 IDA=3 IDB=4 ICODE=0
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Parameters for Catchment 702 got updated, school blck major flows to the creek
*
*
* Roof areas within 702, hydrograph 9702
* VS=101.000 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=2 NHD= 9702 AREA=   0.0486 Sq km  L=   20 m  W=    10 m
               SOIL ZONE I    II   III    IV    V    VI  VII  VIII   IX
                    100.0   0.0   0.0   0.0   0.0   0.0  0.0   0.0  0.0
                    RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                    GWFACT=0.7 GWON=1
                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Roof infiltration gallery within 702; hydrograph 8702
*
ROUTE SPECIAL POND  ID=3 HYD NO=8702 INFLOW=2 PCODE=0 OPTION= 5
                    Inflow controls:
                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                        GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 101.100
                    Recharge characteristics for Compartment A
                      LEVELA= 100.000                EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 10.00 m
```



```
                    Recharge characteristics for Compartment B
                      LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
                      CDB=  15.000 mm/h  DZB= 10.00 m
                    Irrigation Pond Controls: IPOND=0
                    Number of points=  3
                                  Compartment  A          Compartment B
                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                       (m)       (cms)   (ha*m)    (ha)    (cms)   (ha*m)    (ha)
                     100.000     0.000  0.0000  0.0000   0.000  0.0000  0.3035
                     101.000     0.000  0.0000  0.0000   0.000  0.1214  0.3035
                     101.100     0.000  0.0000  0.0000   1.000  0.1336  0.3035
*
PRINT HYD           ID=3 PCODE=1 MODE=10
*
*-------------------------------------------------------------------------------------------------
*
* Area of 702 to conveyance infiltration system, hydrograph 6702
*
*COMPUTE FLOWRATE    ID=2 NHD= 6702 AREA=   0.02 Sq km  L=   140 m  W=   140 m
*              SOIL ZONE I    II   III    IV    V    VI  VII  VIII   IX
*                    33.6   0.0   0.0  10.3   0.0   0.2  0.0  55.9  0.0
*                    RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
*                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
*                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
*                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
*                    GWFACT=0.7 GWON=1
*                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
*PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Route 6702 through reservoir 4702 - conveyance infiltration system
*
*ROUTE SPECIAL POND  ID=4 HYD NO=4702 INFLOW=2 PCODE=0 OPTION= 5
*                    Inflow controls:
*                        USPCT=100% USDIV=0     PCTA=  0% ADIV=0
*                        GWPCT=  0% GWDIV=0
*                    Maximum level for Routing Tables:  ZMAX= 101.100
*                    Recharge characteristics for Compartment A
*                      LEVELA= 100.000                EVAPA= 0.0 mm/d ACODE=0
*                      CDA=   0.000 mm/h  DZA= 23.00 m
*                    Recharge characteristics for Compartment B
*                      LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
*                      CDB=  15.000 mm/h  DZB= 10.00 m
*                    Irrigation Pond Controls: IPOND=0
*                    Number of points=  3
*                                  Compartment  A          Compartment B
*                    Elevation  Outflow Storage  SFArea Outflow Storage SFArea
*                       (m)       (cms)   (ha*m)    (ha)    (cms)   (ha*m)    (ha)
*                     100.000     0.000  0.0000  0.0000   0.000  0.0000  0.1250
*                     101.000     0.000  0.0000  0.0000   0.000  0.0500  0.1250
*                     101.100     0.000  0.0000  0.0000   1.000  0.0550  0.1250
*
*PRINT HYD           ID=4 PCODE=1 MODE=10
*
* Remainder of catchment 702, hydr. 7702
*
*COMPUTE FLOWRATE    ID=2 NHD= 7702 AREA=   0.2096 Sq km  L=   495 m  W=   500 m
*              SOIL ZONE I    II   III    IV    V    VI  VII  VIII   IX
*                    48.4   0.0   0.0   8.0   0.0   0.2  0.0  43.5  0.0
*                    RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
*                    ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
*                    SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
*                    RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
*                    GWFACT=0.7 GWON=1
*                    SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Sum hydr. 4702, 7702, call result 3702, total non-roof area of 702
*
*ADD HYD             ID=5 HYD NO= 3702 IDA=4 IDB=2 ICODE=0
*
*
*****************************************************************************************
*       ADD 1721 runoff to catchment 702 then to SWMF2 South FB
*****************************************************************************************
```

```
*
* Roof areas within 712, hydrograph 9702
* VS=101.000 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=2 NHD= 9712 AREA=   0.0014 Sq km  L=    20 m  W=    10 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                   100.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0  0.0
                   RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=0.7 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
* Roof infiltration gallery within 702; hydrograph 8702
*
ROUTE SPECIAL POND  ID=4 HYD NO=8712 INFLOW=2 PCODE=0 OPTION= 5
                   Inflow controls:
                       USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                       GWPCT=  0% GWDIV=0
                   Maximum level for Routing Tables:  ZMAX= 101.100
                   Recharge characteristics for Compartment A
                     LEVELA= 100.000              EVAPA= 0.0 mm/d ACODE=0
                     CDA=   0.000 mm/h  DZA= 10.00 m
                   Recharge characteristics for Compartment B
                     LEVELB= 100.000 CCBA= 0.00000  EVAPB= 0.0 mm/d BCODE=1
                     CDB=  15.000 mm/h  DZB= 10.00 m
                   Irrigation Pond Controls: IPOND=0
                   Number of points=  3
                                  Compartment  A          Compartment B
                   Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                      (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                    100.000     0.000  0.0000  0.0000   0.000  0.0000  0.0090
                    101.000     0.000  0.0000  0.0000   0.000  0.0036  0.0090
                    101.100     0.000  0.0000  0.0000   1.000  0.0039  0.0090
*
PRINT HYD           ID=3 PCODE=1 MODE=10
* Non-roof areas within 712 (Hallman MR Blk); hydrograph 7712
* VS=3.200 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=2 NHD= 7712 AREA=   0.0090 Sq km  L=  60 m  W= 50 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                    54.0   0.0  0.0   7.1  0.0   0.2  0.0  38.7  0.0
                   RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=1.0 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
*
ADD HYD             ID=5 HYD NO=  712 IDA=4 IDB=2 ICODE=0
PRINT HYD           ID=5 PCODE=1 MODE=10
*
* Sum catchment 7712 and surplus from roof inf. galleries (8702) hydrographs
*
ADD HYD             ID=2 HYD NO=  1720 IDA=3 IDB=5 ICODE=0
*
*-------------------------------------------------------------------------------------------------------------
*
COMPUTE FLOWRATE    ID=5 NHD= 7702 AREA=   0.1967 Sq km  L=   65 m  W=   500 m
              SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                    48.3   0.0  0.0   8.0  0.0   0.2  0.0  43.5  0.0
                   RATING CURVES: IDMC=6 IDOC=6 QRMC=  0.50 QROC=  0.25
                   ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                   SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                   RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                   GWFACT=0.7 GWON=1
                   SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
*-------------------------------------------------------------------------------------------------------------
*
PRINT HYD           ID=5 PCODE=1 MODE=10
*************************************************************************************************************
```



```
* Add minor flow from school block 7021
*
* Sum hydr. 1721, 7702, call result 1722
*
ADD HYD             ID=4 HYD NO= 1722 IDA=5 IDB=6 ICODE=0
*************************************************************************************************************
* Sum components of 702 (1722, 1720), call result 702
*
ADD HYD             ID=5 HYD NO=  702 IDA=2 IDB=4 ICODE=0
PRINT HYD           ID=5 PCODE=1 MODE=10
*
* Sum hydr. 1701, 702, call result 1702
*
ADD HYD             ID=3 HYD NO= 1702 IDA=1 IDB=5 ICODE=0
PRINT HYD           ID=3 PCODE=1 MODE=10
*
*
* SWM Facility 2 (Central SWM Facility)
* Major Storms
* Route 1702 through resevoir 5702
*
ROUTE SPECIAL POND  ID=1 HYD NO=5702 INFLOW=3 PCODE=0 OPTION=15
                   Inflow controls:
                       USPCT=100% USDIV=0     PCTA=  0% ADIV=0
                       GWPCT=  0% GWDIV=0
                   Maximum level for Routing Tables:  ZMAX= 309.300
                   Recharge characteristics for Compartment A
                     LEVELA= 308.300              EVAPA= 0.0 mm/d ACODE=0
                     CDA=   0.000 mm/h  DZA= 10.00 m
                   Recharge characteristics for Compartment B
                     LEVELB= 308.300 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                     CDB=   0.000 mm/h  DZB= 10.00 m
                   Irrigation Pond Controls: IPOND=0
                   Number of points=  11
                                  Compartment  A          Compartment B
                   Elevation  Outflow Storage  SFArea Outflow Storage SFArea
                      (m)       (cms)  (ha*m)    (ha)   (cms)  (ha*m)    (ha)
                    308.300     0.000  0.0000  0.0000  0.0000  0.0000  1.6687
                    308.400     0.000  0.0000  0.0000  0.0110  0.1696  1.7233
                    308.500     0.000  0.0000  0.0000  0.0347  0.3447  1.7784
                    308.600     0.000  0.0000  0.0000  0.0517  0.5253  1.8339
                    308.700     0.000  0.0000  0.0000  0.0643  0.7115  1.8898
                    308.800     0.000  0.0000  0.0000  0.0749  0.9033  1.9462
                    308.900     0.000  0.0000  0.0000  0.0841  1.1019  2.0268
                    309.000     0.000  0.0000  0.0000  0.0924  1.3062  2.0585
                    309.100     0.000  0.0000  0.0000  0.1000  1.5136  2.0901
                    309.200     0.000  0.0000  0.0000  0.1071  1.7242  2.1218
                    309.300     0.000  0.0000  0.0000 10.0000 2.0578  4.5506
*
PRINT HYD           ID=1 PCODE=1 MODE=10
KEEP HYD            ID=1 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=1 IMET=1
*
*
* 5702 -> 7312 / 2702 Split Pond 2 Outflow (5702) into Wetland DIVERT (7312)
*         and Sewer (2702) components
*
*----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
DIVERT FLOWS        INFLOW=1  DIVERT=6 HYD NO=7312 PCODE=1 OPTION=4
                   THRUFLO=5 HYD NOB=2702 THROUGHFLOW  DIVERSION
                                          0.000        0.000
                                          0.011        0.000
                                          0.035        0.000
                                          0.052        0.000
                                          0.064        0.000
                                          0.075        0.000
                                          0.084        0.000
                                          0.924        0.000
                                          0.107        0.000
                                          0.195       10.00
                   IDFLAG=0  IDSTOR=0  IGWT=0
*
KEEP HYD            ID=5 CUTOFF=0 ICODE=5 ISTEP=1 IFORM=0 IDB=5 IMET=0
PRINT HYD           ID=5 PCODE=1 MODE=10
KEEP HYD            ID=6 CUTOFF=0 ICODE=5 ISTEP=1 IFORM=0 IDB=6 IMET=0
```

```
PRINT HYD           ID=6 PCODE=1 MODE=10
*
*~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
*~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
*
*
* Typical Roof section
*
COMPUTE RATING CURVE ID=5  VS=   101.000   NSEGS=3
                      MIN EL=  295.00   MAX EL=  295.70
                      CHNSLP= 0.2500   FLNSLP= 0.2500
                      N= 0.018  DIST=  100.00
                      N=-0.018  DIST=  400.00
                      N= 0.018  DIST=  500.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  295.70   100.00  295.50   100.10  295.00
                      399.90  295.00   400.00  295.50   500.00  295.70
                     RFN=0.0000 PCODE=1
*
* Typical Urban section
*
COMPUTE RATING CURVE ID=6  VS=     3.200   NSEGS=3
                      MIN EL=  295.00   MAX EL=  295.70
                      CHNSLP= 0.02000   FLNSLP= 0.02000
                      N= 0.015  DIST=  200.00
                      N=-0.015  DIST=  300.00
                      N= 0.015  DIST=  500.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  295.70   200.00  295.50   200.10  295.00
                      299.90  295.00   300.00  295.50   500.00  295.70
*
* Roof & Park areas within 702 directed to Wetland, hydrograph 7020
* VS=101.000 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=1 NHD= 7020 AREA=   0.0065 Sq km  L=    20 m  W=    10 m
            SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     100.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0  0.0
                     RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                     ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                     SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                     RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                     GWFACT=1.0 GWON=1
                     SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Roof areas within 708 directed to Wetland, hydrograph 7080
* VS=101.000 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=2 NHD= 7080 AREA=   0.0151 Sq km  L=    20 m  W=    10 m
            SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     100.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0  0.0
                     RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                     ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                     SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                     RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                     GWFACT=1.0 GWON=1
                     SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
PRINT HYD           ID=2 PCODE=1 MODE=10
*
* Sum catchments 7020 and 7080, call result 2312
*
ADD HYD             ID=3 HYD NO= 2312 IDA=1 IDB=2 ICODE=0
PRINT HYD           ID=3 PCODE=1 MODE=10
*
* Roof areas within 701 directed to Wetland, hydrograph 7010
* VS=101.000 MC, VS=3.200 OC
*
COMPUTE FLOWRATE    ID=1 NHD= 7010 AREA=   0.0034 Sq km  L=    20 m  W=    10 m
            SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     100.0   0.0  0.0   0.0  0.0   0.0  0.0   0.0  0.0
                     RATING CURVES: IDMC=6 IDOC=5 QRMC=  0.50 QROC=  0.25
                     ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 1.2 TLO= 0.0
                     SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                     RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
```



```
                     GWFACT=1.0 GWON=1
                     SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum 2312 and 7010, call result 3312
*
ADD HYD             ID=2 HYD NO= 3312 IDA=3 IDB=1 ICODE=0
PRINT HYD           ID=2 PCODE=1 MODE=10
*
*~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
*~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
*
*
*   2.0% Typical Main channel Parabolic Swale
*
COMPUTE RATING CURVE ID=4  VS=   100.020   NSEGS=3
                      MIN EL=  100.70   MAX EL=  103.00
                      CHNSLP= 0.02000   FLNSLP= 0.02000
                      N= 0.080  DIST=   20.00
                      N=-0.050  DIST=   30.00
                      N= 0.080  DIST=   50.00
                        DIST    ELEV     DIST    ELEV     DIST    ELEV
                        0.00  103.00    20.00  101.00    23.00  100.80
                       25.00  100.70    27.00  100.80    30.00  101.00
                       50.00  103.00
                     RFN=0.0000 PCODE=1
*
* Catchment 312, existing wetland area for water balancing
* Percentage wetland increased from 4 to 20%
* This area has been spliced from drainage area 702 above
* VS=  100.020 is main channel & VS= 2.035 is off-channel
*
COMPUTE FLOWRATE    ID=1 NHD= 312 AREA=   0.0552 Sq km  L=  280 m  W=   180 m
            SOIL ZONE I    II  III    IV    V    VI  VII  VIII   IX
                     0.0  20.0  1.0   5.0  0.0   0.0  0.0  74.0  0.0
                     RATING CURVES: IDMC=4 IDOC=2 QRMC=  0.05 QROC=  0.01
                     ROUTING MODEL=2 CONSTANTS: OVERLAND FTB= 3.0 TLO= 0.0
                     SUBSURFACE: KSS= 5.0 KGW= 384 h PCODE=1 WQPCODE=1
                     RBASIN=0 IDA=0 IDB=0 IDC=0 IDD=0 RBDUMP=0
                     GWFACT=1.00 GWON=1
                     SWQTH=   0.0 L/s SWPUMP=   0.0 L/s SWCODE=0
*
PRINT HYD           ID=1 PCODE=1 MODE=10
*
* Sum hydr. 3312 and 312, call result 4312
*
ADD HYD             ID=3 HYD NO= 4312 IDA=2 IDB=1 ICODE=0
PRINT HYD           ID=3 PCODE=1 MODE=10
*
*
* Sum hydr. 4312 and Diversion from SWM 2 (7312) call result 6312
*
ADD HYD             ID=1 HYD NO= 6312 IDA=3 IDB=6 ICODE=0
PRINT HYD           ID=1 PCODE=1 MODE=10
KEEP HYD            ID=1 CUTOFF=0 ICODE=5 ISTEP=1 IFORM=0 IDB=1 IMET=0
*
*
* Central Wetland
* Route 6312 through Wetland 2 Depression - Revised per MTE Survey April 2017
* Min Ponding set to 308.4 to be more in line with spring high level monit data
* Added storage available in SWMF2 above 309.2 to establish ponding in WL2 with
* pond overflow and outflow to sewer
*
ROUTE SPECIAL POND  ID=2 HYD NO=5312 INFLOW=1 PCODE=0 OPTION=15
                    Inflow controls:
                       USPCT=100% USDIV=0      PCTA=  0% ADIV=0
                       GWPCT=  0% GWDIV=0
                    Maximum level for Routing Tables:  ZMAX= 311.300
                    Recharge characteristics for Compartment A
                      LEVELA= 308.400              EVAPA= 0.0 mm/d ACODE=0
                      CDA=   0.000 mm/h  DZA= 10.00 m
                    Recharge characteristics for Compartment B
                      LEVELB= 308.400 CCBA= 0.00000  EVAPB= 1.4 mm/d BCODE=1
                      CDB=  4.000 mm/h  DZB= 10.00 m
```

Irrigation Pond Controls: IPOND=0
Number of points= 13

	Compartment A			Compartment B		
Elevation (m)	Outflow (cms)	Storage (ha*m)	SFArea (ha)	Outflow (cms)	Storage (ha*m)	SFArea (ha)
308.400	0.000	0.0000	0.0000	0.0000	0.0000	0.0000
308.500	0.000	0.0000	0.0000	0.0000	0.1230	0.3400
309.000	0.000	0.0000	0.0000	0.0000	0.9710	0.9319
309.200	0.000	0.0000	0.0000	0.0000	0.9800	1.3000
309.300	0.000	0.0000	0.0000	0.1137	1.3110	1.3578
309.400	0.000	0.0000	0.0000	0.1200	1.7735	1.4721
309.500	0.000	0.0000	0.0000	0.1259	2.2501	1.5686
310.000	0.000	0.0000	0.0000	0.1523	4.8320	2.0600
310.500	0.000	0.0000	0.0000	0.1747	7.7513	2.5678
311.000	0.000	0.0000	0.0000	0.1945	11.017	3.0921
311.100	0.000	0.0000	0.0000	0.1982	11.712	3.1989
311.200	0.000	0.0000	0.0000	0.2019	12.421	3.3064
311.300	0.000	0.0000	0.0000	0.2055	13.145	3.4147

```
*
PRINT HYD           ID=2 PCODE=1 MODE=10
KEEP HYD            ID=2 CUTOFF=24 ICODE=5 ISTEP=1 IFORM=0 IDB=2 IMET=1
*~~~
```

1	201	0.0639	17.36	0.3281	0.	RCFLAGS	0	0	cndchi.dat	sw2m
1	9721	0.0039	30.61	0.1077	0.	RCFLAGS	0	0		
1	8721	0.0039	5.03	0.0076	96.	RCFLAGS	0	0		
1	7721	0.0231	13.55	0.1828	0.	RCFLAGS	0	0		
1	7021	0.0270	12.32	0.1828	0.	RCFLAGS	0	0		
1	1721	0.0270	12.32	0.1828	0.	RCFLAGS	0	0		
1	3131	0.0270	0.00	0.0000	96.	RCFLAGS	0	0		
1	9708	0.0176	30.37	0.4858	0.	RCFLAGS	0	0		
1	8708	0.0176	3.46	0.0389	443.	RCFLAGS	0	0		
1	6708	0.0080	30.37	0.2208	0.	RCFLAGS	0	0		
1	5708	0.0080	3.66	0.0136	199.	RCFLAGS	0	0		
1	2708	0.0276	18.89	0.3350	0.	RCFLAGS	0	0		
1	4708	0.0356	15.46	0.3350	0.	RCFLAGS	0	0		
1	1708	0.0356	0.00	0.0000	535.	RCFLAGS	0	0		
1	7708	0.1030	17.84	0.6884	0.	RCFLAGS	0	0		
1	3708	0.1386	13.26	0.6884	0.	RCFLAGS	0	0		
1	708	0.1562	12.16	0.6884	0.	RCFLAGS	0	0		
1	9701	0.0187	30.43	0.5162	0.	RCFLAGS	0	0		
1	8701	0.0187	3.55	0.0365	469.	RCFLAGS	0	0		
1	7701	0.0661	17.40	0.4905	0.	RCFLAGS	0	0		
1	701	0.0848	14.34	0.4905	0.	RCFLAGS	0	0		
1	1701	0.2410	12.93	1.1773	0.	RCFLAGS	0	0		
1	9702	0.0486	30.44	1.3414	0.	RCFLAGS	0	0		
1	8702	0.0486	3.52	0.0755	1223.	RCFLAGS	0	0		
1	9712	0.0014	30.44	0.0386	0.	RCFLAGS	0	0		
1	8712	0.0014	2.81	0.0017	36.	RCFLAGS	0	0		
1	7712	0.0090	19.72	0.1819	0.	RCFLAGS	0	0		
1	712	0.0104	17.44	0.1819	0.	RCFLAGS	0	0		
1	1720	0.0590	5.98	0.1819	0.	RCFLAGS	0	0		
1	7702	0.1967	18.47	1.1139	0.	RCFLAGS	0	0		
1	1722	0.2237	17.73	1.2773	0.	RCFLAGS	0	0		
1	702	0.2827	15.28	1.3296	0.	RCFLAGS	0	0		
1	1702	0.5237	14.20	2.5069	0.	RCFLAGS	0	0		
1	5702	0.5237	10.94	0.0631	6931.	RCFLAGS	0	0		
1	2702	0.5237	10.94	0.0631	0.	RCFLAGS	0	0		
1	7312	0.5237	0.00	0.0000	0.	RCFLAGS	0	0		
1	7020	0.0065	30.37	0.1794	0.	RCFLAGS	0	0		
1	7080	0.0151	30.37	0.4168	0.	RCFLAGS	0	0		
1	2312	0.0216	30.37	0.5962	0.	RCFLAGS	0	0		
1	7010	0.0034	30.37	0.0938	0.	RCFLAGS	0	0		
1	3312	0.0250	30.37	0.6900	0.	RCFLAGS	0	0		
1	312	0.0552	5.38	0.0418	0.	RCFLAGS	0	0		
1	4312	0.0802	13.17	0.7018	0.	RCFLAGS	0	0		
1	6312	0.0802	13.17	0.7018	0.	RCFLAGS	0	0		
1	5312	0.0802	0.00	0.0000	985.	RCFLAGS	0	0		
2	201	0.0639	31.64	0.5923	0.	RCFLAGS	0	0	cndchi.dat	sw2m
2	9721	0.0039	46.89	0.1385	0.	RCFLAGS	0	0		
2	8721	0.0039	21.30	0.0719	97.	RCFLAGS	0	0		
2	7721	0.0231	27.44	0.3590	0.	RCFLAGS	0	0		
2	7021	0.0270	26.55	0.3993	0.	RCFLAGS	0	0		
2	1721	0.0270	26.55	0.3993	0.	RCFLAGS	0	0		
2	3131	0.0270	0.00	0.0000	97.	RCFLAGS	0	0		
2	9708	0.0176	46.65	0.6250	0.	RCFLAGS	0	0		
2	8708	0.0176	19.58	0.3409	456.	RCFLAGS	0	0		
2	6708	0.0080	46.65	0.2841	0.	RCFLAGS	0	0		
2	5708	0.0080	19.78	0.1592	202.	RCFLAGS	0	0		
2	2708	0.0276	33.54	0.5761	0.	RCFLAGS	0	0		
2	4708	0.0356	30.45	0.6353	0.	RCFLAGS	0	0		
2	1708	0.0356	4.71	0.0854	900.	RCFLAGS	0	0		
2	7708	0.1030	32.35	1.2345	0.	RCFLAGS	0	0		
2	3708	0.1386	25.25	1.2345	0.	RCFLAGS	0	0		
2	708	0.1562	24.61	1.5753	0.	RCFLAGS	0	0		
2	9701	0.0187	46.71	0.6640	0.	RCFLAGS	0	0		
2	8701	0.0187	19.68	0.3558	483.	RCFLAGS	0	0		
2	7701	0.0661	31.83	0.8698	0.	RCFLAGS	0	0		
2	701	0.0848	29.15	1.2178	0.	RCFLAGS	0	0		
2	1701	0.2410	26.21	2.7932	0.	RCFLAGS	0	0		
2	9702	0.0486	46.72	1.7258	0.	RCFLAGS	0	0		
2	8702	0.0486	19.66	0.7552	1306.	RCFLAGS	0	0		
2	9712	0.0014	46.72	0.0497	0.	RCFLAGS	0	0		
2	8712	0.0014	18.94	0.0361	36.	RCFLAGS	0	0		
2	7712	0.0090	34.49	0.2983	0.	RCFLAGS	0	0		
2	712	0.0104	32.40	0.2983	0.	RCFLAGS	0	0		
2	1720	0.0590	21.91	0.8766	0.	RCFLAGS	0	0		

2	7702	0.1967	33.06	1.9708	0.	RCFLAGS	0	0		
2	1722	0.2237	32.28	2.3680	0.	RCFLAGS	0	0		
2	702	0.2827	30.11	3.2446	0.	RCFLAGS	0	0		
2	1702	0.5237	28.32	6.0378	0.	RCFLAGS	0	0		
2	5702	0.5237	21.57	0.0960	14039.	RCFLAGS	0	0		
2	2702	0.5237	21.57	0.0960	0.	RCFLAGS	0	0		
2	7312	0.5237	0.00	0.0000	0.	RCFLAGS	0	0		
2	7020	0.0065	46.65	0.2308	0.	RCFLAGS	0	0		
2	7080	0.0151	46.65	0.5362	0.	RCFLAGS	0	0		
2	2312	0.0216	46.65	0.7670	0.	RCFLAGS	0	0		
2	7010	0.0034	46.65	0.1207	0.	RCFLAGS	0	0		
2	3312	0.0250	46.65	0.8877	0.	RCFLAGS	0	0		
2	312	0.0552	16.95	0.1118	0.	RCFLAGS	0	0		
2	4312	0.0802	26.21	0.9214	0.	RCFLAGS	0	0		
2	6312	0.0802	26.21	0.9214	0.	RCFLAGS	0	0		
2	5312	0.0802	0.00	0.0000	1976.	RCFLAGS	0	0		
3	201	0.0639	41.34	0.7470	0.	RCFLAGS	0	0	cndchi.dat	sw2m
3	9721	0.0039	57.47	0.1537	0.	RCFLAGS	0	0		
3	8721	0.0039	32.07	0.0888	98.	RCFLAGS	0	0		
3	7721	0.0231	36.99	0.4519	0.	RCFLAGS	0	0		
3	7021	0.0270	36.28	0.5407	0.	RCFLAGS	0	0		
3	1721	0.0270	36.28	0.5407	0.	RCFLAGS	0	0		
3	3131	0.0270	0.00	0.0000	98.	RCFLAGS	0	0		
3	9708	0.0176	57.22	0.6938	0.	RCFLAGS	0	0		
3	8708	0.0176	30.09	0.5886	467.	RCFLAGS	0	0		
3	6708	0.0080	57.22	0.3154	0.	RCFLAGS	0	0		
3	5708	0.0080	30.32	0.3139	205.	RCFLAGS	0	0		
3	2708	0.0276	43.42	0.6964	0.	RCFLAGS	0	0		
3	4708	0.0356	40.48	1.0103	0.	RCFLAGS	0	0		
3	1708	0.0356	14.69	0.4126	944.	RCFLAGS	0	0		
3	7708	0.1030	42.17	1.5480	0.	RCFLAGS	0	0		
3	3708	0.1386	35.11	1.6553	0.	RCFLAGS	0	0		
3	708	0.1562	34.55	2.0850	0.	RCFLAGS	0	0		
3	9701	0.0187	57.28	0.7372	0.	RCFLAGS	0	0		
3	8701	0.0187	30.19	0.6271	496.	RCFLAGS	0	0		
3	7701	0.0661	41.62	1.0819	0.	RCFLAGS	0	0		
3	701	0.0848	39.10	1.7083	0.	RCFLAGS	0	0		
3	1701	0.2410	36.15	3.7933	0.	RCFLAGS	0	0		
3	9702	0.0486	57.30	1.9159	0.	RCFLAGS	0	0		
3	8702	0.0486	30.18	1.1733	1357.	RCFLAGS	0	0		
3	9712	0.0014	57.30	0.0552	0.	RCFLAGS	0	0		
3	8712	0.0014	29.56	0.0534	36.	RCFLAGS	0	0		
3	7712	0.0090	44.42	0.3412	0.	RCFLAGS	0	0		
3	712	0.0104	42.42	0.3412	0.	RCFLAGS	0	0		
3	1720	0.0590	32.34	1.4190	0.	RCFLAGS	0	0		
3	7702	0.1967	42.91	2.4709	0.	RCFLAGS	0	0		
3	1722	0.2237	42.11	2.9719	0.	RCFLAGS	0	0		
3	702	0.2827	40.07	4.2467	0.	RCFLAGS	0	0		
3	1702	0.5237	38.27	8.0400	0.	RCFLAGS	0	0		
3	5702	0.5237	29.04	0.9157	17515.	RCFLAGS	0	0		
3	2702	0.5237	29.04	0.9157	0.	RCFLAGS	0	0		
3	7312	0.5237	0.00	0.0000	0.	RCFLAGS	0	0		
3	7020	0.0065	57.22	0.2562	0.	RCFLAGS	0	0		
3	7080	0.0151	57.22	0.5953	0.	RCFLAGS	0	0		
3	2312	0.0216	57.22	0.8515	0.	RCFLAGS	0	0		
3	7010	0.0034	57.22	0.1340	0.	RCFLAGS	0	0		
3	3312	0.0250	57.22	0.9855	0.	RCFLAGS	0	0		
3	312	0.0552	26.32	0.1678	0.	RCFLAGS	0	0		
3	4312	0.0802	35.95	1.0405	0.	RCFLAGS	0	0		
3	6312	0.0802	35.95	1.0405	0.	RCFLAGS	0	0		
3	5312	0.0802	0.00	0.0000	2732.	RCFLAGS	0	0		
4	201	0.0639	50.69	0.8837	0.	RCFLAGS	0	0	cndchi.dat	sw2m
4	9721	0.0039	67.45	0.1664	0.	RCFLAGS	0	0		
4	8721	0.0039	41.86	0.1283	98.	RCFLAGS	0	0		
4	7721	0.0231	46.23	0.5298	0.	RCFLAGS	0	0		
4	7021	0.0270	45.59	0.6581	0.	RCFLAGS	0	0		
4	1721	0.0270	45.59	0.6581	0.	RCFLAGS	0	0		
4	3131	0.0270	0.00	0.0000	98.	RCFLAGS	0	0		
4	9708	0.0176	67.20	0.7511	0.	RCFLAGS	0	0		
4	8708	0.0176	40.02	0.4897	479.	RCFLAGS	0	0		
4	6708	0.0080	67.20	0.3414	0.	RCFLAGS	0	0		
4	5708	0.0080	40.25	0.2489	208.	RCFLAGS	0	0		
4	2708	0.0276	52.89	0.7944	0.	RCFLAGS	0	0		
4	4708	0.0356	50.05	1.0433	0.	RCFLAGS	0	0		

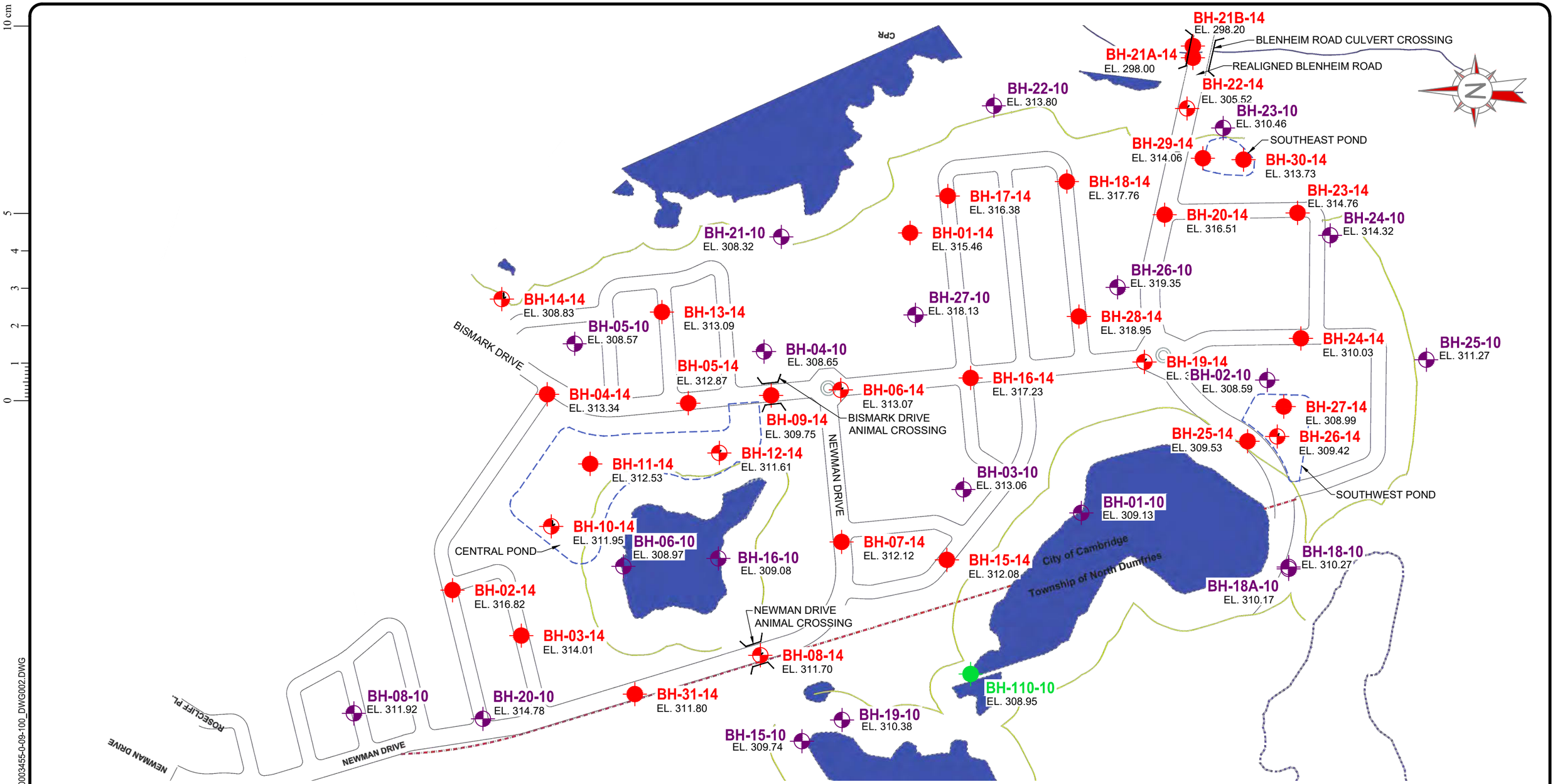
4	1708	0.0356	24.24	0.6746	979.	RCFLAGS	0	0		
4	7708	0.1030	51.60	1.8207	0.	RCFLAGS	0	0		
4	3708	0.1386	44.57	2.3622	0.	RCFLAGS	0	0		
4	708	0.1562	44.06	2.5734	0.	RCFLAGS	0	0		
4	9701	0.0187	67.26	0.7981	0.	RCFLAGS	0	0		
4	8701	0.0187	40.12	0.5179	509.	RCFLAGS	0	0		
4	7701	0.0661	51.02	1.2718	0.	RCFLAGS	0	0		
4	701	0.0848	48.62	1.7882	0.	RCFLAGS	0	0		
4	1701	0.2410	45.66	4.0936	0.	RCFLAGS	0	0		
4	9702	0.0486	67.28	2.0742	0.	RCFLAGS	0	0		
4	8702	0.0486	40.11	1.8077	1435.	RCFLAGS	0	0		
4	9712	0.0014	67.27	0.0597	0.	RCFLAGS	0	0		
4	8712	0.0014	39.44	0.0470	36.	RCFLAGS	0	0		
4	7712	0.0090	53.93	0.3713	0.	RCFLAGS	0	0		
4	712	0.0104	51.98	0.3738	0.	RCFLAGS	0	0		
4	1720	0.0590	42.20	2.0787	0.	RCFLAGS	0	0		
4	7702	0.1967	52.36	2.9105	0.	RCFLAGS	0	0		
4	1722	0.2237	51.55	3.5070	0.	RCFLAGS	0	0		
4	702	0.2827	49.60	5.4228	0.	RCFLAGS	0	0		
4	1702	0.5237	47.79	9.4464	0.	RCFLAGS	0	0		
4	5702	0.5237	38.53	2.7438	18131.	RCFLAGS	0	0		
4	2702	0.5237	27.68	0.8746	0.	RCFLAGS	0	0		
4	7312	0.5237	10.85	2.6138	0.	RCFLAGS	0	0		
4	7020	0.0065	67.20	0.2774	0.	RCFLAGS	0	0		
4	7080	0.0151	67.20	0.6444	0.	RCFLAGS	0	0		
4	2312	0.0216	67.20	0.9218	0.	RCFLAGS	0	0		
4	7010	0.0034	67.20	0.1451	0.	RCFLAGS	0	0		
4	3312	0.0250	67.20	1.0669	0.	RCFLAGS	0	0		
4	312	0.0552	35.41	0.2229	0.	RCFLAGS	0	0		
4	4312	0.0802	45.32	1.1442	0.	RCFLAGS	0	0		
4	6312	0.0802	116.20	2.9020	0.	RCFLAGS	0	0		
4	5312	0.0802	0.00	0.0000	9053.	RCFLAGS	0	0		
5	201	0.0639	62.20	1.0374	0.	RCFLAGS	0	0	cndchi.dat	sw2m
5	9721	0.0039	79.14	0.1824	0.	RCFLAGS	0	0		
5	8721	0.0039	53.50	0.1581	98.	RCFLAGS	0	0		
5	7721	0.0231	57.68	0.6173	0.	RCFLAGS	0	0		
5	7021	0.0270	57.07	0.7584	0.	RCFLAGS	0	0		
5	1721	0.0270	57.07	0.7584	0.	RCFLAGS	0	0		
5	3131	0.0270	0.00	0.0000	98.	RCFLAGS	0	0		
5	9708	0.0176	78.90	0.8233	0.	RCFLAGS	0	0		
5	8708	0.0176	51.67	0.7444	474.	RCFLAGS	0	0		
5	6708	0.0080	78.90	0.3742	0.	RCFLAGS	0	0		
5	5708	0.0080	51.87	0.3193	205.	RCFLAGS	0	0		
5	2708	0.0276	64.42	0.9042	0.	RCFLAGS	0	0		
5	4708	0.0356	61.60	1.2235	0.	RCFLAGS	0	0		
5	1708	0.0356	35.75	0.7531	990.	RCFLAGS	0	0		
5	7708	0.1030	63.11	2.1242	0.	RCFLAGS	0	0		
5	3708	0.1386	56.08	2.8730	0.	RCFLAGS	0	0		
5	708	0.1562	55.59	3.1291	0.	RCFLAGS	0	0		
5	9701	0.0187	78.96	0.8748	0.	RCFLAGS	0	0		
5	8701	0.0187	51.77	0.7874	503.	RCFLAGS	0	0		
5	7701	0.0661	62.53	1.4820	0.	RCFLAGS	0	0		
5	701	0.0848	60.16	2.2584	0.	RCFLAGS	0	0		
5	1701	0.2410	57.19	5.0468	0.	RCFLAGS	0	0		
5	9702	0.0486	78.97	2.2734	0.	RCFLAGS	0	0		
5	8702	0.0486	51.76	1.9295	1449.	RCFLAGS	0	0		
5	9712	0.0014	78.97	0.0655	0.	RCFLAGS	0	0		
5	8712	0.0014	51.20	0.0586	36.	RCFLAGS	0	0		
5	7712	0.0090	65.47	0.4089	0.	RCFLAGS	0	0		
5	712	0.0104	63.55	0.4566	0.	RCFLAGS	0	0		
5	1720	0.0590	53.83	2.2455	0.	RCFLAGS	0	0		
5	7702	0.1967	63.88	3.4036	0.	RCFLAGS	0	0		
5	1722	0.2237	63.06	4.0322	0.	RCFLAGS	0	0		
5	702	0.2827	61.14	6.1478	0.	RCFLAGS	0	0		
5	1702	0.5237	59.32	11.1946	0.	RCFLAGS	0	0		
5	5702	0.5237	50.03	4.8830	18853.	RCFLAGS	0	0		
5	2702	0.5237	27.26	0.8243	0.	RCFLAGS	0	0		
5	7312	0.5237	22.77	4.7343	0.	RCFLAGS	0	0		
5	7020	0.0065	78.90	0.3041	0.	RCFLAGS	0	0		
5	7080	0.0151	78.90	0.7063	0.	RCFLAGS	0	0		
5	2312	0.0216	78.90	1.0104	0.	RCFLAGS	0	0		
5	7010	0.0034	78.90	0.1590	0.	RCFLAGS	0	0		
5	3312	0.0250	78.90	1.1694	0.	RCFLAGS	0	0		
5	312	0.0552	46.85	0.2851	0.	RCFLAGS	0	0		

5	4312	0.0802	56.84	1.2734	0.	RCFLAGS	0	0		
5	6312	0.0802	205.53	5.1657	0.	RCFLAGS	0	0		
5	5312	0.0802	65.28	0.1164	15124.	RCFLAGS	0	0		
6	201	0.0639	70.89	1.1451	0.	RCFLAGS	0	0	cndchi.dat	sw2m
6	9721	0.0039	87.91	0.1919	0.	RCFLAGS	0	0		
6	8721	0.0039	62.29	0.1640	98.	RCFLAGS	0	0		
6	7721	0.0231	66.34	0.6736	0.	RCFLAGS	0	0		
6	7021	0.0270	65.75	0.8376	0.	RCFLAGS	0	0		
6	1721	0.0270	65.19	0.7872	0.	RCFLAGS	0	0		
6	3131	0.0270	0.56	0.0504	98.	RCFLAGS	0	0		
6	9708	0.0176	87.67	0.8659	0.	RCFLAGS	0	0		
6	8708	0.0176	60.41	0.8477	478.	RCFLAGS	0	0		
6	6708	0.0080	87.67	0.3936	0.	RCFLAGS	0	0		
6	5708	0.0080	60.59	0.3388	208.	RCFLAGS	0	0		
6	2708	0.0276	73.12	0.9736	0.	RCFLAGS	0	0		
6	4708	0.0356	70.30	1.3124	0.	RCFLAGS	0	0		
6	1708	0.0356	44.43	1.1515	1043.	RCFLAGS	0	0		
6	7708	0.1030	71.80	2.3335	0.	RCFLAGS	0	0		
6	3708	0.1386	64.77	3.4850	0.	RCFLAGS	0	0		
6	708	0.1562	64.28	3.8618	0.	RCFLAGS	0	0		
6	9701	0.0187	87.73	0.9201	0.	RCFLAGS	0	0		
6	8701	0.0187	60.50	0.8996	508.	RCFLAGS	0	0		
6	7701	0.0661	71.21	1.6259	0.	RCFLAGS	0	0		
6	701	0.0848	68.85	2.2921	0.	RCFLAGS	0	0		
6	1701	0.2410	65.89	5.8895	0.	RCFLAGS	0	0		
6	9702	0.0486	87.74	2.3912	0.	RCFLAGS	0	0		
6	8702	0.0486	60.49	1.9985	1458.	RCFLAGS	0	0		
6	9712	0.0014	87.74	0.0689	0.	RCFLAGS	0	0		
6	8712	0.0014	59.87	0.0572	36.	RCFLAGS	0	0		
6	7712	0.0090	74.17	0.4311	0.	RCFLAGS	0	0		
6	712	0.0104	72.25	0.4708	0.	RCFLAGS	0	0		
6	1720	0.0590	62.56	2.3363	0.	RCFLAGS	0	0		
6	7702	0.1967	72.58	3.7479	0.	RCFLAGS	0	0		
6	1722	0.2237	71.68	4.4797	0.	RCFLAGS	0	0		
6	702	0.2827	69.78	6.5840	0.	RCFLAGS	0	0		
6	1702	0.5237	67.99	11.8144	0.	RCFLAGS	0	0		
6	5702	0.5237	58.67	6.3470	19346.	RCFLAGS	0	0		
6	2702	0.5237	27.30	0.8042	0.	RCFLAGS	0	0		
6	7312	0.5237	31.38	6.1856	0.	RCFLAGS	0	0		
6	7020	0.0065	87.67	0.3198	0.	RCFLAGS	0	0		
6	7080	0.0151	87.67	0.7429	0.	RCFLAGS	0	0		
6	2312	0.0216	87.67	1.0627	0.	RCFLAGS	0	0		
6	7010	0.0034	87.67	0.1673	0.	RCFLAGS	0	0		
6	3312	0.0250	87.67	1.2300	0.	RCFLAGS	0	0		
6	312	0.0552	55.49	0.3309	0.	RCFLAGS	0	0		
6	4312	0.0802	65.52	1.3569	0.	RCFLAGS	0	0		
6	6312	0.0802	270.40	6.7157	0.	RCFLAGS	0	0		
6	5312	0.0802	121.68	0.1228	20015.	RCFLAGS	0	0		
7	201	0.0639	226.20	0.8314	0.	RCFLAGS	0	0	regional.dat	sw2m
7	9721	0.0039	283.47	0.0574	0.	RCFLAGS	0	0		
7	8721	0.0039	242.21	0.0570	97.	RCFLAGS	0	0		
7	7721	0.0231	213.77	0.3312	0.	RCFLAGS	0	0		
7	7021	0.0270	217.88	0.3882	0.	RCFLAGS	0	0		
7	1721	0.0270	217.88	0.3882	0.	RCFLAGS	0	0		
7	3131	0.0270	0.00	0.0000	97.	RCFLAGS	0	0		
7	9708	0.0176	283.00	0.2591	0.	RCFLAGS	0	0		
7	8708	0.0176	217.39	0.2564	453.	RCFLAGS	0	0		
7	6708	0.0080	283.00	0.1178	0.	RCFLAGS	0	0		
7	5708	0.0080	217.69	0.1158	201.	RCFLAGS	0	0		
7	2708	0.0276	235.83	0.3991	0.	RCFLAGS	0	0		
7	4708	0.0356	231.75	0.5149	0.	RCFLAGS	0	0		
7	1708	0.0356	194.59	0.5186	961.	RCFLAGS	0	0		
7	7708	0.1030	231.55	1.4400	0.	RCFLAGS	0	0		
7	3708	0.1386	222.05	1.9501	0.	RCFLAGS	0	0		
7	708	0.1562	221.53	2.2032	0.	RCFLAGS	0	0		
7	9701	0.0187	283.12	0.2753	0.	RCFLAGS	0	0		
7	8701	0.0187	217.66	0.2726	480.	RCFLAGS	0	0		
7	7701	0.0661	229.57	0.9390	0.	RCFLAGS	0	0		
7	701	0.0848	226.94	1.2079	0.	RCFLAGS	0	0		
7	1701	0.2410	223.43	3.4111	0.	RCFLAGS	0	0		
7	9702	0.0486	283.14	0.7155	0.	RCFLAGS	0	0		
7	8702	0.0486	217.64	0.7206	1308.	RCFLAGS	0	0		
7	9712	0.0014	283.14	0.0206	0.	RCFLAGS	0	0		
7	8712	0.0014	215.98	0.0204	36.	RCFLAGS	0	0		

7	7712	0.0090	239.23	0.1303	0.	RCFLAGS	0	0	
7	712	0.0104	236.10	0.1507	0.	RCFLAGS	0	0	
7	1720	0.0590	220.89	0.8709	0.	RCFLAGS	0	0	
7	7702	0.1967	233.98	2.6153	0.	RCFLAGS	0	0	
7	1722	0.2237	232.04	3.0035	0.	RCFLAGS	0	0	
7	702	0.2827	229.71	3.8542	0.	RCFLAGS	0	0	
7	1702	0.5237	226.82	7.2653	0.	RCFLAGS	0	0	
7	5702	0.5237	218.33	7.1721	19625.	RCFLAGS	0	0	
7	2702	0.5237	47.24	0.5797	0.	RCFLAGS	0	0	
7	7312	0.5237	171.09	7.0035	0.	RCFLAGS	0	0	
7	7020	0.0065	283.00	0.0957	0.	RCFLAGS	0	0	
7	7080	0.0151	283.00	0.2223	0.	RCFLAGS	0	0	
7	2312	0.0216	283.00	0.3180	0.	RCFLAGS	0	0	
7	7010	0.0034	283.00	0.0501	0.	RCFLAGS	0	0	
7	3312	0.0250	283.00	0.3681	0.	RCFLAGS	0	0	
7	312	0.0552	194.62	0.5039	0.	RCFLAGS	0	0	
7	4312	0.0802	222.17	0.8153	0.	RCFLAGS	0	0	
7	6312	0.0802	1339.35	7.8187	0.	RCFLAGS	0	0	
7	5312	0.0802	429.00	0.1887	100640.	RCFLAGS	0	0	
8	201	0.0639	10.97	0.1802	0.	RCFLAGS	0	0	25mm.dat sw2m
8	9721	0.0039	23.24	0.0806	0.	RCFLAGS	0	0	
8	8721	0.0039	0.00	0.0000	87.	RCFLAGS	0	0	
8	7721	0.0231	7.31	0.0805	0.	RCFLAGS	0	0	
8	7021	0.0270	6.25	0.0805	0.	RCFLAGS	0	0	
8	1721	0.0270	6.25	0.0805	0.	RCFLAGS	0	0	
8	3131	0.0270	0.00	0.0000	87.	RCFLAGS	0	0	
8	9708	0.0176	23.00	0.3635	0.	RCFLAGS	0	0	
8	8708	0.0176	0.00	0.0000	370.	RCFLAGS	0	0	
8	6708	0.0080	23.00	0.1652	0.	RCFLAGS	0	0	
8	5708	0.0080	0.00	0.0000	168.	RCFLAGS	0	0	
8	2708	0.0276	12.28	0.1889	0.	RCFLAGS	0	0	
8	4708	0.0356	9.52	0.1889	0.	RCFLAGS	0	0	
8	1708	0.0356	0.00	0.0000	326.	RCFLAGS	0	0	
8	7708	0.1030	11.31	0.3842	0.	RCFLAGS	0	0	
8	3708	0.1386	8.41	0.3842	0.	RCFLAGS	0	0	
8	708	0.1562	7.46	0.3842	0.	RCFLAGS	0	0	
8	9701	0.0187	23.06	0.3863	0.	RCFLAGS	0	0	
8	8701	0.0187	0.00	0.0000	393.	RCFLAGS	0	0	
8	7701	0.0661	10.90	0.2678	0.	RCFLAGS	0	0	
8	701	0.0848	8.49	0.2678	0.	RCFLAGS	0	0	
8	1701	0.2410	7.82	0.6520	0.	RCFLAGS	0	0	
8	9702	0.0486	23.07	1.0039	0.	RCFLAGS	0	0	
8	8702	0.0486	0.00	0.0000	1022.	RCFLAGS	0	0	
8	9712	0.0014	23.07	0.0289	0.	RCFLAGS	0	0	
8	8712	0.0014	0.00	0.0000	29.	RCFLAGS	0	0	
8	7712	0.0090	13.06	0.1042	0.	RCFLAGS	0	0	
8	712	0.0104	11.30	0.1042	0.	RCFLAGS	0	0	
8	1720	0.0590	1.99	0.1042	0.	RCFLAGS	0	0	
8	7702	0.1967	11.90	0.6334	0.	RCFLAGS	0	0	
8	1722	0.2237	11.22	0.7067	0.	RCFLAGS	0	0	
8	702	0.2827	9.30	0.7390	0.	RCFLAGS	0	0	
8	1702	0.5237	8.62	1.3910	0.	RCFLAGS	0	0	
8	5702	0.5237	6.27	0.0411	4122.	RCFLAGS	0	0	
8	2702	0.5237	6.27	0.0411	0.	RCFLAGS	0	0	
8	7312	0.5237	0.00	0.0000	0.	RCFLAGS	0	0	
8	7020	0.0065	23.00	0.1343	0.	RCFLAGS	0	0	
8	7080	0.0151	23.00	0.3119	0.	RCFLAGS	0	0	
8	2312	0.0216	23.00	0.4462	0.	RCFLAGS	0	0	
8	7010	0.0034	23.00	0.0702	0.	RCFLAGS	0	0	
8	3312	0.0250	23.00	0.5164	0.	RCFLAGS	0	0	
8	312	0.0552	0.90	0.0064	0.	RCFLAGS	0	0	
8	4312	0.0802	7.79	0.5168	0.	RCFLAGS	0	0	
8	6312	0.0802	7.79	0.5168	0.	RCFLAGS	0	0	
8	5312	0.0802	0.00	0.0000	594.	RCFLAGS	0	0	

Appendix E

LVM Borehole Logs



LEGEND :

- BOREHOLE LOCATION
- MONITORING WELL LOCATION
- BOREHOLE LOCATION INVESTIGATION P036589 (2010)
- BOREHOLE LOCATION INVESTIGATION P031655 (2010)
- EL. 298.00 — GROUND SURFACE ELEVATION (m)
- PROPOSED SWM FACILITIES
- PROPOSED CULVERT STRUCTURE

NOTES :

1-REFERENCES: MHBC Cambridge West, Concept Plan, 2014-03-18.

2-Drawing scale may be distorted due to file conversion and/or copying. Measurements taken from the drawing must be verified in the field.

0 50 100 150 200 m

SCALE 1:5000

Project

Cambridge West Development

Blenheim Road, Cambridge, Ontario

Title

SITE PLAN

LVM

353, Bridge Street East
Kitchener (Ontario) N2K 2Y5
Telephone : 519.741.1313
Fax : 519.741.5422

Prepared	E.Ciochon	Discipline	GEOTECHNICAL
Drawn	E.Ciochon	Scale	1 : 5000
Checked	D.Gonser	Date	2016-02-17

Project manager: D.Gonser
Sequence no.: 02 of 04

M. dept.	Project	Disc.	Dwg no.	Rev.
160	P-0003455-0-09-100	GE	002	00

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LIST OF ABBREVIATIONS

The abbreviations commonly employed on the borehole logs, on the figures, and in the text of the report, are as follows:

Sample Types		Soil Tests and Properties	
AS	Auger Sample	SPT	Standard Penetration Test
CS	Core Sample	UC	Unconfined Compression
RC	Rock Core	FV	Field Vane Test
SS	Split Spoon	ø	Angle of internal friction
TW	Thinwall, Open	γ	Unit weight
WS	Wash Sample	w_p	Plastic limit
BS	Bulk Sample	w	Water content
GS	Grab Sample	w_L	Liquid limit
WC	Water Content Sample	I_L	Liquidity index
TP	Thinwall, Piston	I_p	Plasticity index
		PP	Pocket penetrometer

Penetration Resistances	
Dynamic Penetration Resistance	The number of blows by a 63.5 kg (140 lb.) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) diameter 60º cone a distance 300 mm (12 in.). The cone is attached to 'A' size drill rods and casing is not used.
Standard Penetration Resistance, N (ASTM D1586)	The number of blows by a 63.5 kg (140 lb.) hammer dropped 760 mm (30 in.) required to drive a standard split spoon sampler 300 mm (12 in.)
WH	sampler advanced by static weight of hammer
PH	sampler advanced by hydraulic pressure
PM	sampler advanced by manual pressure

Soil Description		
Cohesionless Soils	**SPT N-Value**	**Relative Density (D_r)**
Compactness Condition	(blows per 0.3 m)	(%)
Very Loose	0 to 4	0 to 20
Loose	4 to 10	20 to 40
Compact	10 to 30	40 to 60
Dense	30 to 50	60 to 80
Very Dense	over 50	80 to 100
Cohesive Soils	**Undrained Shear Strength (C_u)**	
Consistency	**kPa**	**psf**
Very Soft	less than 12	less than 250
Soft	12 to 25	250 to 500
Firm	25 to 50	500 to 1000
Stiff	50 to 100	1000 to 2000
Very Stiff	100 to 200	2000 to 4000
Hard	over 200	over 4000
DTPL	Drier than plastic limit	Low Plasticity, W_L <30
APL	About plastic limit	Medium Plasticity, 30 < W_L < 50
WTPL	Wetter than plastic limit	High Plasticity, W_L > 50

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Ground Elevation: *315.46 m*

Borehole Number: **BH-01-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-23*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

SOIL PROFILE			SAMPLE								
Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value	Dynamic Cone / Std Penetration (20 40 60 80)	Shear Strength (PP) kPa / Initial / Remold / Shear Strength (FV) kPa (50 100 150 200)	Water Content (%) WP WL (10 20 30)	Groundwater Observations and Standpipe Details
	Ground Elevation		315.46							
	TOPSOIL: dark brown silt, trace sand gravel and corn roots, moist		0.00 315.13 0.33							
1	***SAND:*** compact brown sand, some gravel, trace silt, moist			SS-1	5-8 9	17				
			313.94							
	trace silt and gravel, very moist		1.52	SS-2	4-5 8	13				native backfill
2			313.17							
	SAND AND GRAVEL: dense brown sand and gravel, some silt and occasional cobbles, moist		2.29	SS-3	23-20 15	35				
3			312.41							
	SAND: compact brown fine to coarse sand, some gravel, trace silt, moist		3.05 311.95	SS-4	5-6 7	13				native cave
	Borehole terminated at 3.50 m		3.50							
4										
5										
6										
7										
8										
9										
10										
11										
12										

Vertical Scale = 1 : 70.0

Reviewed by: *D.Gonser*

Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes:

EQ-09-Ge-72 R.1 18.02.2011

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Ground Elevation: *316.82 m*

Borehole Number: **BH-02-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-20*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		316.82			
	TOPSOIL: dark brown silt, some sand, trace gravel and corn roots, moist		0.00 / 316.41			
			0.41			
1	***SAND AND GRAVEL:*** dense brown sand and gravel, some silt, moist			SS-1	10-22 16	38
2				SS-2	12-15 23	38
3				SS-3	14-18 18	36
				SS-4	12-20 24	44
4						
	very dense		312.25			
			4.57	SS-5	40-42 42	84
5						
6			310.72			
	SAND: compact brown fine sand, some silt, moist		6.10	SS-6	11-12 12	24
7						
				SS-7	10-22 15	37
8			308.74			
	very moist		8.08			
9			307.68			
	saturated		9.14	SS-8	8-11 12	23
			307.07			
10	Borehole terminated at 9.75 m		9.75			
11						
12						

Dynamic Cone: 20 40 60 80
Std Penetration: 20 40 60 80
Shear Strength (PP) kPa: 50 100 150 200
Initial
Remold
Shear Strength (FV) kPa: 50 100 150 200
WP WL
Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details

native backfill
bentonite seal
native cave
At drilling completion, dry cave at 5.79 m.

Vertical Scale = 1 : 70.0

Reviewed by: *D.Gonser*

Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes: *Bulk sample AS-4A taken from 3.05 to 4.57 m.*

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Ground Elevation: *314.01 m*

Borehole Number: **BH-03-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-20*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		314.01			
	TOPSOIL: dark brown silt, some sand, trace gravel and corn roots, moist		0.00 313.76 0.25			
1	***SAND:*** compact brown sand, some gravel and silt, moist		312.49	SS-1	10-11 12	23
2	***SAND AND GRAVEL:*** compact brown sand and gravel, some silt, moist		1.52 311.72	SS-2	9-11 12	23
3	***SAND:*** compact grey and brown coarse sand, some gravel, trace silt, moist		2.29 310.96	SS-3	9-10 10	20
	dense, gravel and coarse sand		3.05	SS-4	8-11 21	32
4			309.44			
	compact, trace gravel and silt		4.57	SS-5	8-8 10	18
5						
6			307.91			
	fine sand, some silt, saturated; some grey sandy silt layers, wet		6.10 307.46	SS-6	7-9 10	19
	Borehole terminated at 6.55 m		6.55			
7						
8						
9						
10						
11						
12						

Dynamic Cone: 20 40 60 80
Std Penetration: 20 40 60 80

Shear Strength (PP) kPa: 50 100 150 200
Initial
Remold
Shear Strength (FV) kPa: 50 100 150 200

WP WL
Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details

native backfill

bentonite seal

native cave

At drilling completion, dry cave at 3.35 m.

Vertical Scale = 1 : 70.0

Reviewed by: *D.Gonser*

Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes:

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Ground Elevation: *313.34 m*

Borehole Number: **BH-04-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-21*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation	313.34			
	FILL: dark brown silt (topsoil), some sand and gravel, moist	0.00 / 313.11 / 0.23			
1	***SAND AND GRAVEL:*** compact brown sand and gravel, some silt, moist		SS-1	7-8 9	17
		311.82 / 1.52			
2	***SAND:*** compact brown medium sand, some silt, trace gravel, moist		SS-2	5-7 7	14
	trace silt and gravel, very moist	311.05 / 2.29	SS-3	4-5 6	11
3		310.29			
	medium to coarse sand	3.05	SS-4	5-5 6	11
4					
		308.77			
	fine sand, trace silt	4.57	SS-5	6-7 10	17
5					
6		307.24			
	gravelly coarse sand, some silt, saturated	6.10	SS-6	6-9 12	21
7					
		305.72			
	silty fine sand, some dark grey stains	7.62	SS-7	3-4 6	10
8					
9		304.20			
	brown, wet to saturated	9.14	SS-8	6-10 12	22
		303.43			
10	saturated	9.91	SS-9	3-6 8	14
		302.98			
	Borehole terminated at 10.36 m	10.36			
11					
12					

Dynamic Cone: 20 40 60 80 — Std Penetration: 20 40 60 80

Shear Strength (PP) kPa: 50 100 150 200 — Initial / Remold — Shear Strength (FV) kPa: 50 100 150 200

WP WL — Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details

native backfill

bentonite seal

native cave

At drilling completion, wet cave at 5.49 m.

Vertical Scale = 1 : 70.0

Reviewed by: *D.Gonser*

Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes: *Bulk sample AS-4A taken from 3.05 to 4.57 m.*

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Ground Elevation: *312.87 m*

Borehole Number: **BH-05-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-21*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		312.87			
	TOPSOIL: dark brown silt, some sand and gravel, moist		0.00 / 312.67 / 0.20			
1	***SAND:*** compact brown gravelly sand, some silt, moist			SS-1	5-7 10	17
				SS-2	6-8 8	16
2			310.58			
	SAND AND GRAVEL: compact brown sand and gravel, some silt, moist		2.29	SS-3	6-10 16	26
3	very dense		309.82 / 3.05	SS-4	25-50 /150 mm	
4			308.30			
	saturated		4.57	SS-5	10-14 21	35
5						
6			306.77			
	SAND: dense brown coarse sand, some silt and gravel, saturated		6.10 / 306.32	SS-6	11-15 16	31
	Borehole terminated at 6.55 m		6.55			
7						
8						
9						
10						
11						
12						

Dynamic Cone: 20 40 60 80
Std Penetration: 20 40 60 80
Shear Strength (PP) kPa: 50 100 150 200
Initial
Remold
Shear Strength (FV) kPa: 50 100 150 200
WP WL
Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details:
- native backfill
- bentonite seal
- native cave
- At drilling completion, dry cave at 2.13 m.

Vertical Scale = 1 : 70.0

Reviewed by: *D.Gonser*

Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes: *Bulk sample AS-3A taken from 2.29 to 3.05 m.*

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Ground Elevation: *313.07 m*

Borehole Number: **BH-06-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-22*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		313.07			
	TOPSOIL: dark brown silt, some sand and gravel, trace corn roots, moist		0.00 312.79 0.28			
1	***SAND AND GRAVEL:*** compact brown sand and gravel, some silt, occasional cobbles, moist			SS-1	9-12 13	
				SS-2	7-9 10	
2			310.78			
	dense		2.29	SS-3	8-10 25	
3				SS-4	12-15 16	
4			308.50			
	compact, very moist		4.57	SS-5	8-10 18	
5	wet to saturated		308.19 4.88			
6			306.97			
	saturated		6.10	SS-6	9-11 10	
	Borehole terminated at 6.55 m		306.52 6.55			
7						
8						
9						
10						
11						
12						

Dynamic Cone — Std Penetration: 20 40 60 80

Shear Strength (PP) kPa — Initial / Remold — Shear Strength (FV) kPa: 50 100 150 200

WP WL — Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details

- protective cover and concrete
- bentonite seal
- el. 308.05 m 2014-06-15
- 50 mm pipe
- sand pack
- 1.52 m slotted screen
- July 9, 2014 groundwater at Elevation 307.86 m.

Vertical Scale = 1 : 70.0

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Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes:

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Ground Elevation: *312.12 m*

Borehole Number: **BH-07-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-21*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

SOIL PROFILE			SAMPLE								
Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value	Dynamic Cone / Std Penetration	Shear Strength (PP) kPa / Shear Strength (FV) kPa	Water Content (%)	Groundwater Observations and Standpipe Details
	Ground Elevation		312.12							
	TOPSOIL: dark brown silt, some sand, gravel and corn roots, moist		0.00 311.97							native backfill
			0.15 311.66							
	SILT: brown silt, some sand, trace gravel and topsoil, moist		0.46							
1				SS-1	8-10 16	26				
	SAND AND GRAVEL: compact brown sand and gravel, trace silt and cobbles, moist									bentonite seal
				SS-2	9-12 14	26				
2			309.83							
	dense		2.29	SS-3	15-18 26	44				
3										
			308.77	SS-4	32-21 13	34				
	SAND: compact brown coarse sand, some silt, trace gravel, moist		3.35							native cave
4										
	dark brown silty sand, some gravel, saturated		307.85 4.27							
			307.24	SS-5	8-12 15	27				
5	brown, trace cobbles		4.88							
	Borehole terminated at 5.03 m		307.09 5.03							At drilling completion, dry cave at 2.29 m.
6										
7										
8										
9										
10										
11										
12										

Dynamic Cone / Std Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200 — Initial — Remold

Water Content (%): WP — WL; 10 20 30

Vertical Scale = 1 : 70.0

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Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes:

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Ground Elevation: *311.70 m*

Borehole Number: **BH-08-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-22*

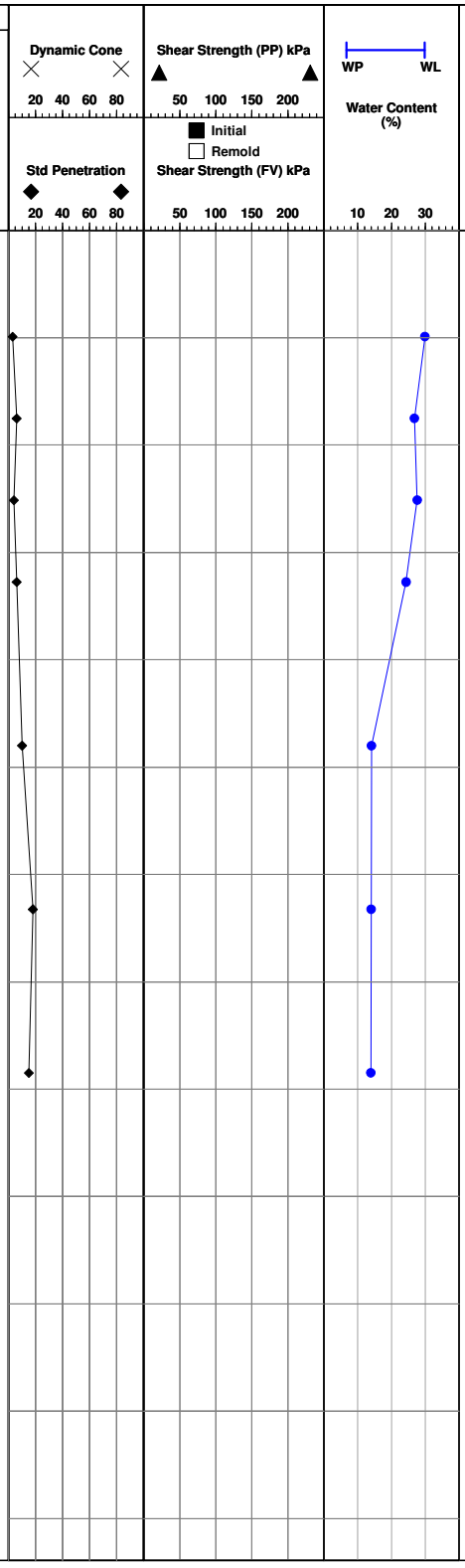
Project: *Cambridge West Development*

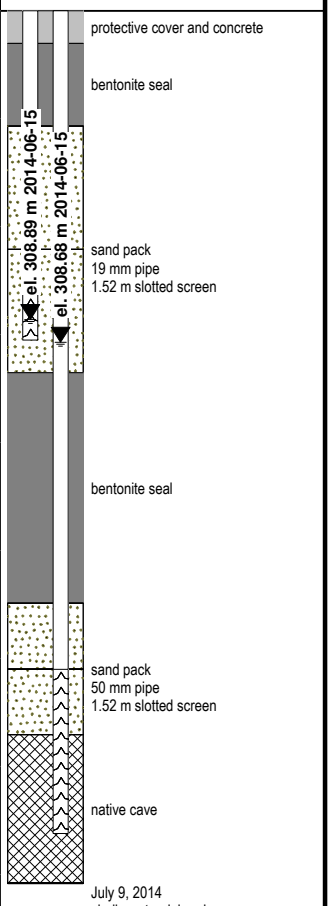
Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		311.70			
	TOPSOIL: dark brown silt, trace sand, gravel and corn roots, moist		0.00 311.29 0.41			
1	***SILT:*** dark brown silt, some topsoil and sand, wet to saturated			SS-1	2-1 2	
			310.18			
	loose brown sandy silt, saturated		1.52	SS-2	2-3 3	
2			309.41			
	wet		2.29	SS-3	3-2 2	
3			308.65			
	mottled grey and brown, wet		3.05	SS-4	2-3 3	
4						
			307.13			
	some saturated gravel and silty sand in spoon		4.57 306.82	SS-5	4-5 5	
5	***SAND:*** compact brown gravelly sand, some silt, saturated		4.88			
6				SS-6	5-8 10	
7						
				SS-7	4-6 9	
8			303.62			
	Borehole terminated at 8.08 m		8.08			
9						
10						
11						
12						





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Sheet: *1 of 1*

Notes: *Bulk sample AS-3A taken from 2.29 to 3.05 m.*

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Vertical Scale = 1 : 70.0

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Ground Elevation: *309.76 m*

Borehole Number: **BH-09-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-21*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		309.76			
	TOPSOIL: dark brown silt, some sand and gravel, moist		0.00 / 309.40			
			0.36			
1	***SAND AND GRAVEL:*** compact brown sand and gravel, some silt, trace topsoil, moist			SS-1	6-10 11	21
			308.24			
	silty sand and gravel, wet		1.52	SS-2	6-5 6	11
2			307.47			
	SAND: loose grey and brown coarse sand, some gravel, trace silt		2.29	SS-3	2-4 5	9
3			306.71			
	SAND AND GRAVEL: compact grey and brown sand and gravel, some silt, saturated		3.05	SS-4	3-5 6	11
4			305.19			
	SAND: compact brown silty sand, some gravel, saturated		4.57	SS-5	5-10 10	20
5						
6			303.66			
	greenish brown coarse sand, some silt and gravel		6.10	SS-6	6-9 11	20
			303.21			
	Borehole terminated at 6.55 m		6.55			
7						
8						
9						
10						
11						
12						

Dynamic Cone: 20 40 60 80

Std Penetration: 20 40 60 80

Shear Strength (PP) kPa: 50 100 150 200

Initial

Remold

Shear Strength (FV) kPa: 50 100 150 200

WP WL

Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details

native backfill

bentonite seal

native cave

At drilling completion, wet cave at 1.83 m.

Vertical Scale = 1 : 70.0

Reviewed by: *D.Gonser*

Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes:

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Ground Elevation: *311.95 m*

Borehole Number: **BH-10-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-22*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		311.95			
	TOPSOIL: dark brown silt, some sand and gravel, trace corn roots, moist		0.00			
1			310.88	SS-1	2-2 2	
	SAND: loose brown and dark brown silty sand, some gravel, trace topsoil, very moist		1.07 310.43			
			1.52	SS-2	1-2 4	
2	brown silty fine sand, trace clay and gravel, very moist to wet		309.66			
	coarse sand, trace silt and gravel, moist		2.29	SS-3	3-4 4	
3			308.90			
	compact, some gravel		3.05 308.60	SS-4	3-5 5	
	wet		3.35			
4			307.38			
	SAND AND GRAVEL: loose grey/brown coarse sand and fine gravel, trace silt, saturated		4.57	SS-5	2-2 2	
5						
6			305.85			
	SAND: compact grey/brown medium sand, trace silt and gravel, saturated		6.10	SS-6	3-5 6	
7						
				SS-7	6-4 6	
8						
9			302.81			
	Borehole terminated at 9.14 m		9.14			
10						
11						
12						

Dynamic Cone — Std Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200 — Initial / Remold

Water Content (%): WP WL — 10 20 30

Groundwater Observations and Standpipe Details

- protective cover and concrete
- el. 308.46 m 2014-06-15
- bentonite seal
- native cave (sand pack)
- 50 mm pipe
- 1.52 m slotted screen.
- July 9, 2014 groundwater at Elevation 308.25 m.

Vertical Scale = 1 : 70.0

Reviewed by: *D.Gonser* **Drafted by:** *E.Ciochon* **Sheet:** *1 of 1*

Notes: *Bulk sample AS-8 taken at 9.14 m (moisture content=14.2%).*

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Ground Elevation: *312.53 m*

Borehole Number: **BH-11-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-21*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		312.53			
	TOPSOIL: dark brown silt, some sand, trace gravel and corn roots, moist		0.00 / 312.33			
	some gravel		0.20 / 312.12			
1	***SAND AND GRAVEL:*** compact brown sand and gravel, some silt, moist to very moist		0.41	SS-1	5-7 17	24
				SS-2	7-9 18	27
2			310.24			
	SAND: compact brown coarse sand, trace silt and gravel, very moist		2.29	SS-3	6-7 8	15
			309.48			
3	some gravel		3.05	SS-4	6-7 8	15
4			307.96			
	SAND AND GRAVEL: compact brown sand and gravel, some silt, saturated		4.57	SS-5	9-11 12	23
5						
6			306.43			
	SAND: compact brown silty fine sand, saturated		6.10	SS-6	8-9 11	20
7						
				SS-7	6-7 8	15
8			304.45			
	Borehole terminated at 8.08 m		8.08			
9						
10						
11						
12						

Dynamic Cone: Std Penetration — 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa — 50 100 150 200 — Initial / Remold

Water Content (%) — WP WL — 10 20 30

Groundwater Observations and Standpipe Details

- native backfill
- bentonite seal
- native cave
- At drilling completion, dry cave at 2.59 m.

Vertical Scale = 1 : 70.0

Reviewed by: *D.Gonser*

Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes:

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Ground Elevation: *311.61 m*

Borehole Number: **BH-12-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-22*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		311.61			
	TOPSOIL: dark brown silt, some sand and gravel, trace corn roots, moist		0.00 / 311.23			
	SAND AND GRAVEL: compact brown sand and gravel, some silt, moist to very moist		0.38	SS-1	6-10 13	
	dense, trace silt, numerous cobbles, moist		310.09 / 1.52	SS-2	12-20 22	
	compact, grey and brown		309.32 / 2.29	SS-3	8-12 14	
	saturated		308.56 / 3.05	SS-4	8-8 8	
	SAND: compact brown coarse sand, some gravel, trace silt, saturated		308.26 / 3.35			
	SAND AND GRAVEL: dense brown and grey coarse sand and fine gravel, trace silt, saturated		307.04 / 4.57	SS-5	8-12 19	
	yellowish brown sand and coarse gravel, some silt		306.73 / 4.88			
	compact greyish brown sand and gravel, some silt		305.51 / 6.10	SS-6	8-10 10	
	Borehole terminated at 6.55 m		305.06 / 6.55			

Dynamic Cone / Std Penetration: 20 40 60 80

Shear Strength (PP) kPa / Initial / Remold / Shear Strength (FV) kPa: 50 100 150 200

WP WL — Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details

- protective cover and concrete
- el. 308.38 m 2014-06-15
- bentonite seal
- sand pack
- 50 mm pipe
- 1.52 m slotted screen
- native cave
- July 9, 2014 groundwater at Elevation 308.19 m.

Vertical Scale = 1 : 70.0

Reviewed by: *D.Gonser*

Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes:

EQ-09-Ge-72 R.1 18.02.2011

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Ground Elevation: *313.09 m*

Borehole Number: **BH-13-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-21*

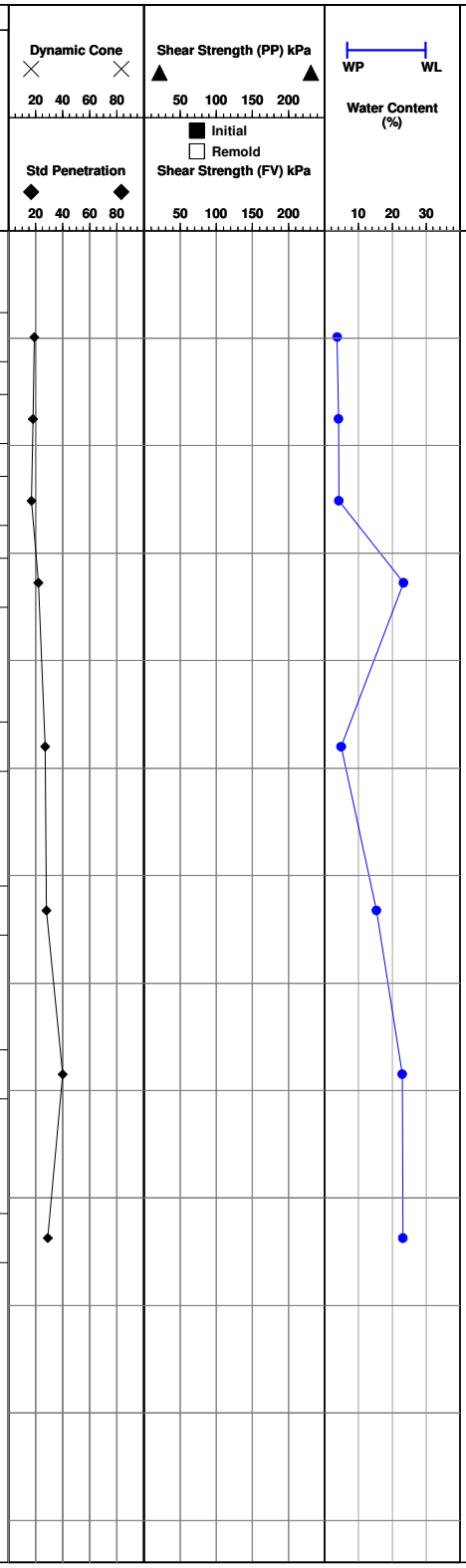
Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Elevation (m)	Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation	313.09				
	TOPSOIL: dark brown silt, some sand and gravel, trace corn roots, moist	312.63	0.46			
1	***SAND:*** compact grey and brown coarse sand, some gravel, trace silt, moist			SS-1	6-9 10	19
2				SS-2	7-9 9	18
3				SS-3	7-8 9	17
	fine sand, some silt	310.04	3.05			
	SILT: compact brown fine sandy silt, moist	309.89	3.20	SS-4	8-11 11	22
4	wet	309.66	3.43			
		308.52	4.57			
5	***SAND:*** compact brown fine sand, trace silt, moist			SS-5	10-12 15	27
		306.99	6.10			
6	layers of grey/brown silt, some sand, clay and gravel, moist			SS-6	11-12 16	28
	silty fine sand, wet	306.54	6.55			
7						
		305.47	7.62			
8	dense brown, saturated			SS-7	13-18 22	40
9		303.95	9.14			
	wet			SS-8	11-13 16	29
		303.49	9.60			
10	Borehole terminated at 9.60 m					
11						
12						



Groundwater Observations and Standpipe Details

native backfill

bentonite seal

native cave

At drilling completion, dry cave at 6.40 m.

Vertical Scale = 1 : 70.0

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Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes:

EQ-09-Ge-72 R.1 18.02.2011

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Ground Elevation: *308.83 m*

Borehole Number: **BH-14-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-22*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation	308.83			
	TOPSOIL: dark brown silt, trace sand, moist	0.00 / 308.52 / 0.30			
1	***SAND:*** loose brown coarse sand, some gravel, trace silt, moist		SS-1	4-4 4	
		307.31			
	medium sand, trace silt and gravel	1.52	SS-2	2-3 3	
2		306.54			
	fine sand, some silt	2.29	SS-3	3-3 5	
	silty fine sand, very moist	306.24 / 2.59			
3		305.63			
	compact fine sand, some silt, moist	3.20	SS-4	3-5 5	
4					
		303.90	SS-5	5-6 7	
5	silty fine sand, trace gravel, very moist to wet	4.93			
	loose to compact, wet	303.50 / 5.33	SS-6	4-6 4	
6		302.73			
	some silt, trace sand and clay layers, very moist to wet	6.10	SS-7	5-6 6	
	fine sand, trace silt, moist	302.43 / 6.40 / 302.28			
	Borehole terminated at 6.55 m	6.55			
7					
8					
9					
10					
11					
12					

Dynamic Cone / Std Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200 (Initial / Remold)

Water Content (%): WP WL; 10 20 30

Groundwater Observations and Standpipe Details:
- protective cover and concrete
- bentonite seal
- sand pack
- 50 mm pipe
- 1.52 m slotted screen
- native cave

June 15 and July 9, 2014. Monitoring well dry.

Vertical Scale = 1 : 70.0

Reviewed by: *D.Gonser*

Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes:

EQ-09-Ge-72 R.1 18.02.2011

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Ground Elevation: *312.08 m*

Borehole Number: **BH-15-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-21*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		312.08			
	TOPSOIL: dark brown silt, some gravel, trace sand, very moist		0.00 / 311.57			
	SAND AND GRAVEL: compact brown sand and gravel, some silt, moist		0.51	SS-1	7-8 9	
			310.56			
	SAND: compact brown sand, some silt, trace gravel, moist to very moist		1.52	SS-2	5-6 8	
			309.79			
	some gravel, trace silt, moist		2.29	SS-3	7-11 12	
			309.03			
	very dense coarse sand, very moist		3.05	SS-4	16-22 32	
			308.27			
	saturated		3.81	SS-5	12-10 8	
			307.96			
	compact brown and dark brown sand, some silt, trace gravel, saturated		4.12 / 307.81			
	Borehole terminated at 4.27 m		4.27			

Dynamic Cone / Std Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200 — Initial / Remold

Water Content (%): WP WL — 10 20 30

Groundwater Observations and Standpipe Details

- native backfill
- bentonite seal
- native cave
- At drilling completion, dry cave at 2.44 m.

Vertical Scale = 1 : 70.0

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Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes:

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Ground Elevation: *317.23 m*

Borehole Number: **BH-16-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-23*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		317.23			
	TOPSOIL: dark brown silt, trace sand, gravel and corn roots, moist		316.90 / 0.33			
1	***SAND AND GRAVEL:*** dense brown sand and gravel, some silt, occasional cobbles, moist			SS-1	5-11 20	31
2				SS-2	16-16 16	32
3				SS-3	5-16 20	36
	compact		314.18 / 3.05	SS-4	16-12 11	23
4						
	dense, coarse sand and gravel, trace silt		312.66 / 4.57	SS-5	20-26 16	42
5						
6				SS-6	9-15 19	34
7			309.61			
	SAND: dense brown sand, some silt, moist		7.62	SS-7	8-17 28	45
8						
9			308.09			
	dense light brown fine sand, trace silt, moist		9.14 / 307.63	AS-8		
	Borehole terminated at 9.60 m		9.60			
10						
11						
12						

Dynamic Cone / Std Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200 — Initial / Remold

Water Content (%): WP WL — 10 20 30

Groundwater Observations and Standpipe Details

native backfill

bentonite seal

native cave

At drilling completion, dry cave at 2.29 m.

Vertical Scale = 1 : 70.0

Reviewed by: *D.Gonser*

Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes:

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Ground Elevation: *316.38 m*

Borehole Number: **BH-17-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-23*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		316.38			
	TOPSOIL: dark brown silt, trace sand, gravel and roots, moist		0.00 / 316.07			
			0.30			
1	***SAND AND GRAVEL:*** compact brown sand and gravel, trace silt, occasional cobbles, moist			SS-1	3-6 12	18
			314.86			
	dense		1.52	SS-2	7-15 17	32
2				SS-3	13-17 23	40
3			313.33			
	SAND: compact brown coarse sand, some gravel, trace silt, moist		3.05	SS-4	8-8 10	18
4						
			311.81			
	dense medium sand, trace silt and gravel		4.57	SS-5	9-12 18	30
5						
6			310.28			
	compact, some gravel		6.10	SS-6	8-11 13	24
7						
			308.76			
	coarse sand		7.62	SS-7	12-10 12	22
8			308.30			
	Borehole terminated at 8.08 m		8.08			
9						
10						
11						
12						

Dynamic Cone: 20 40 60 80

Std Penetration: 20 40 60 80

Shear Strength (PP) kPa: 50 100 150 200

Initial / Remold

Shear Strength (FV) kPa: 50 100 150 200

WP WL

Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details

native backfill

bentonite seal

native cave

At drilling completion, dry cave at 4.57 m.

Vertical Scale = 1 : 70.0

Reviewed by: *D.Gonser*

Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes:

EQ-09-Ge-72 R.1 18.02.2011

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Ground Elevation: *317.76 m*

Borehole Number: **BH-18-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-23*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Elevation (m)	Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation	317.76				
	TOPSOIL: dark brown silt, trace sand, gravel and roots, moist	317.40	0.00			
			0.36			
1	***SAND AND GRAVEL:*** compact brown sand and gravel, trace silt, moist			SS-1	13-14 12	26
		316.54	1.22			
	occasional cobbles	316.24	1.52			
2	dense			SS-2	11-16 18	34
		315.47	2.29			
	compact sand, some silt, wet	315.17	2.59	SS-3	7-11 13	24
3	some gravel, trace silt, moist	314.71	3.05			
	SAND: compact brown coarse sand, some gravel, trace silt, moist			SS-4	10-11 16	27
4						
5				SS-5	10-12 12	24
6		311.66	6.10			
	grey/brown			SS-6	11-12 12	24
7		310.14	7.62			
	brown fine sand, some silt, very moist	309.68		SS-7	9-12 14	26
8	Borehole terminated at 8.08 m		8.08			
9						
10						
11						
12						

Dynamic Cone / Std Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200 — Initial / Remold

WP WL — Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details:
- native backfill
- bentonite seal
- native cave
- At drilling completion, dry cave at 5.49 m.

Vertical Scale = 1 : 70.0

Reviewed by: *D.Gonser*

Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes:

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Ground Elevation: *312.99 m*

Borehole Number: **BH-19-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-27*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		312.99			
	TOPSOIL: dark brown silt, some sand, trace gravel and corn roots, moist		0.00 / 312.63			
			0.36			
1	***SAND:*** loose brown medium sand, some silt, trace gravel, moist			SS-1	4-4 4	
				SS-2	4-4 5	
2			310.70			
	SAND AND GRAVEL: very dense brown sand and gravel, some silt, occasional cobbles, moist		2.29	SS-3	21-30 33	
3			309.94			
	dense		3.05	SS-4	22-14 20	
4						
			308.42			
	compact, saturated		4.57	SS-5	12-12 14	
5						
6			306.89			
	SAND: compact brown silty fine sand, saturated		6.10	SS-6	9-10 12	
			306.44			
	Borehole terminated at 6.55 m		6.55			
7						
8						
9						
10						
11						
12						

Dynamic Cone — Std Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200 — Initial / Remold

Water Content (%): WP WL — 10 20 30

Groundwater Observations and Standpipe Details

- protective cover and concrete
- bentonite seal
- el. 308.46 m 2014-06-15
- sand pack
- 50 mm pipe
- 1.52 m slotted screen
- native cave
- July 9, 2014 groundwater at Elevation 308.31 m.

Vertical Scale = 1 : 70.0

Reviewed by: *D.Gonser*

Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes:

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Ground Elevation: *316.51 m*

Borehole Number: **BH-20-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-26*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		316.51			
	TOPSOIL: dark brown silt, some sand, trace gravel and corn roots, moist		0.00 / 316.15			
			0.36			
1	***SAND:*** compact brown sand, some silt, trace gravel, moist			SS-1	5-8 8	16
				SS-2	4-5 6	11
2			314.22			
	SAND AND GRAVEL: dense brown sand and gravel, trace silt and cobbles, moist		2.29	SS-3	16-24 18	42
3			313.46			
	compact to dense		3.05	SS-4	11-14 14	28
4						
				SS-5	11-13 15	28
5						
6			310.41			
	SAND: compact brown coarse sand, some gravel, trace silt, moist		6.10	SS-6	6-9 9	18
7						
			308.89			
	gravelly sand, saturated		7.62	SS-7	5-6 10	16
8						
9			307.37			
	silty fine sand		9.14	SS-8	7-6 7	13
10						
			305.84			
	fine sand, some silt, moist to very moist		10.67	SS-9	7-10 12	22
11			305.38			
	Borehole terminated at 11.13 m		11.13			
12						

Dynamic Cone: 20 40 60 80
Std Penetration: 20 40 60 80
Shear Strength (PP) kPa: 50 100 150 200
Initial
Remold
Shear Strength (FV) kPa: 50 100 150 200
WP WL
Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details

native backfill

bentonite seal

native cave

At drilling completion, dry cave at 6.71 m.

Vertical Scale = 1 : 70.0

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Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes:

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Ground Elevation: *298.00 m*

Borehole Number: **BH-21A-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-06-04*

Project: *Cambridge West Development*

Field Tech: *D.Gonser*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hand Sampled Borehole*

SOIL PROFILE			SAMPLE							
Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value	Dynamic Cone / Std Penetration	Shear Strength (PP) kPa / Shear Strength (FV) kPa	Water Content (%)	Groundwater Observations and Standpipe Details
	Ground Elevation		298.00							
	FILL: dark brown organic silt (topsoil), moist		0.00 / 297.39							native backfill
	light brown silty fine sand to silty clay		0.61 / 297.24	SS-1	3-3 4-3					
1	some layered organics and roots		0.76 / 296.93	SS-2	6-21 22-50					
	SAND: brown silty fine sand, trace clay and gravel, very moist		1.07 / 296.78	SS-3	50 /125 mm					At drilling completion, wet cave at 1.07 m.
2	***SAND AND GRAVEL:*** dense brown to grey sand and gravel, trace silt, saturated		1.22 / 296.35							
	Borehole terminated at 1.65 m		1.65							
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										

Dynamic Cone: 20 40 60 80 — Std Penetration: 20 40 60 80

Shear Strength (PP) kPa: 50 100 150 200 — Initial / Remold — Shear Strength (FV) kPa: 50 100 150 200

WP WL — Water Content (%): 10 20 30

Reviewed by: *D.Gonser* **Drafted by:** *E.Ciochon* **Sheet:** *1 of 1*

Notes:

Vertical Scale = 1 : 70.0

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Ground Elevation: *298.20 m*

Borehole Number: **BH-21B-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-06-04*

Project: *Cambridge West Development*

Field Tech: *D.Gonser*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hand Sampled Borehole*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		298.20			
	FILL: dark brown organic silt (topsoil), very moist		0.00 / 298.05			
	light brown silty fine sand, very moist		0.15 / 297.59	SS-1	1-2 1-3	
1	saturated		0.61 / 296.98	SS-2	16-12 20-35	
	SAND AND GRAVEL: dense brown sand and gravel, some silt, saturated		1.22 / 296.68	SS-3	31-50 /75 mm	
2	Borehole terminated at 1.52 m		1.52			
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

Dynamic Cone: 20 40 60 80

Std Penetration: 20 40 60 80

Shear Strength (PP) kPa: 50 100 150 200

Initial

Remold

Shear Strength (FV) kPa: 50 100 150 200

WP WL

Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details

native backfill

At drilling completion, water level at 0.71 m.

Reviewed by: *D.Gonser*

Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes:

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Vertical Scale = 1 : 70.0

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Ground Elevation: *305.52 m*

Borehole Number: **BH-22-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-27*

Project: *Cambridge West Development*

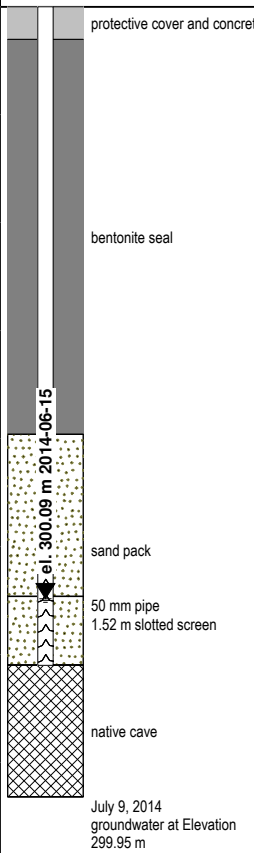
Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation	305.52			
	TOPSOIL: dark brown silt, some sand, gravel and cobbles, moist	0.00 / 305.11			
		0.41			
1	***SAND:*** compact brown medium sand, trace silt and gravel, moist		SS-1	3-6 8	
			SS-2	9-10 11	
2			SS-3	6-8 9	
3		302.47			
	some gravel and silt, wet	3.05 / 302.01	SS-4	12-12 13	
	fine sand, some silt	3.50			
4					
		300.80			
	SILT: compact brown silt, some fine sand, trace clay and gravel, very moist	4.72 / 300.49	SS-5	15-17 10	
5		5.03			
	SAND: compact brown fine sand, some silt, wet	299.42			
6	saturated	6.10	SS-6	6-6 7	
			SS-7	4-5 7	
7		298.20			
	Borehole terminated 7.32 m	7.32			
8					
9					
10					
11					
12					

Dynamic Cone: 20 40 60 80
Std Penetration: 20 40 60 80
Shear Strength (PP) kPa: 50 100 150 200
Initial
Remold
Shear Strength (FV) kPa: 50 100 150 200
WP WL
Water Content (%): 10 20 30



Groundwater Observations and Standpipe Details

Vertical Scale = 1 : 70.0

Reviewed by: *D.Gonser*

Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes:

EQ-09-Ge-72 R.1 18.02.2011

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Ground Elevation: *314.76 m*

Borehole Number: **BH-23-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-26*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		314.76			
	TOPSOIL: dark brown silt, trace sand and gravel, moist		0.00 / 314.45			
			0.30			
1	***SAND:*** loose brown sand, some silt, trace gravel, very moist			SS-1	2-2 2	4
			313.24			
	compact, very moist to wet		1.52	SS-2	2-5 6	11
2			312.47			
	SAND AND GRAVEL: compact brown sand and gravel, trace silt and cobbles, moist		2.29	SS-3	13-10 11	21
			311.71			
3	very dense, numerous cobbles		3.05	SS-4	30-37 30	67
4			310.49			
	SAND: dense brown coarse sand, some gravel, trace silt, moist		4.27	SS-5	19-20 22	42
5						
6			308.66			
	medium sand		6.10	SS-6	13-16 17	33
7						
			307.14			
	compact fine sand, some silt, wet		7.62	SS-7	12-13 15	28
8						
9			305.62			
	dense, saturated		9.14	SS-8	10-16 17	33
10				SS-9	9-13 21	34
			304.40			
	Borehole terminated at 10.40 m		10.36			
11						
12						

Dynamic Cone / Std Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200 — Initial / Remold

Water Content (%): WP WL — 10 20 30

Groundwater Observations and Standpipe Details: native backfill; bentonite seal; native cave; At drilling completion, dry cave at 4.57 m.

Reviewed by: *D.Gonser*

Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes: *Bulk sample AS-2A taken from 1.52 to 2.29 m.*

Vertical Scale = 1 : 70.0

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Ground Elevation: *310.03 m*

Borehole Number: **BH-24-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-26*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		310.03			
	TOPSOIL: dark brown silt, trace sand and gravel, moist		0.00 / 309.80 / 0.23			
1	***SAND AND GRAVEL:*** compact brown sand and gravel, trace silt and cobbles, moist			SS-1	6-10 15	
			308.51 / 1.52			
2	***SAND:*** compact brown fine to coarse sand, some silt, saturated			SS-2	5-6 10	
	coarse sand, trace gravel and silt		307.74 / 2.29	SS-3	5-7 12	
			307.29 / 2.74			
3	***SAND AND GRAVEL:*** compact brown sand and gravel, some silt, occasional cobbles, saturated			SS-4	6-9 10	
4				SS-5	10-12 14	
	Borehole terminated at 4.27 m		305.76 / 4.27			

Dynamic Cone: 20 40 60 80 — Std Penetration: 20 40 60 80

Shear Strength (PP) kPa: 50 100 150 200 — Initial / Remold — Shear Strength (FV) kPa: 50 100 150 200

WP WL — Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details: native backfill; native cave; At drilling completion, wet cave at 1.98 m.

Vertical Scale = 1 : 70.0

Reviewed by: *D.Gonser*

Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes:

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Ground Elevation: *309.53 m*

Borehole Number: **BH-25-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-26*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation	309.53			
	TOPSOIL: dark brown silty sand, trace sand, gravel, corn roots and cobbles, moist	0.00 / 309.17			
		0.36 / 308.77			
1	brown silty sand, some gravel, moist	0.76	SS-1	5-6 7	13
	SAND AND GRAVEL: compact brown sand and gravel, some silt, saturated	308.01			
2	occasional cobbles	1.52 / 307.24	SS-2	8-10 12	22
	SAND: compact grey and brown coarse sand, some gravel, trace silt, saturated	2.29	SS-3	6-8 9	17
3			SS-4	5-6 6	12
4					
	dense	304.96			
5		4.57 / 304.50	SS-5	8-12 25	37
	Borehole terminated at 5.03 m	5.03			
6					
7					
8					
9					
10					
11					
12					

Dynamic Cone / Std Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200 — Initial — Remold

Water Content (%): WP — WL; 10 20 30

Groundwater Observations and Standpipe Details

native backfill

native cave

At drilling completion, wet cave at 1.00 m.

Vertical Scale = 1 : 70.0

Reviewed by: *D.Gonser*

Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes:

Ground Elevation: *309.42 m*

Borehole Number: **BH-26-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-27*

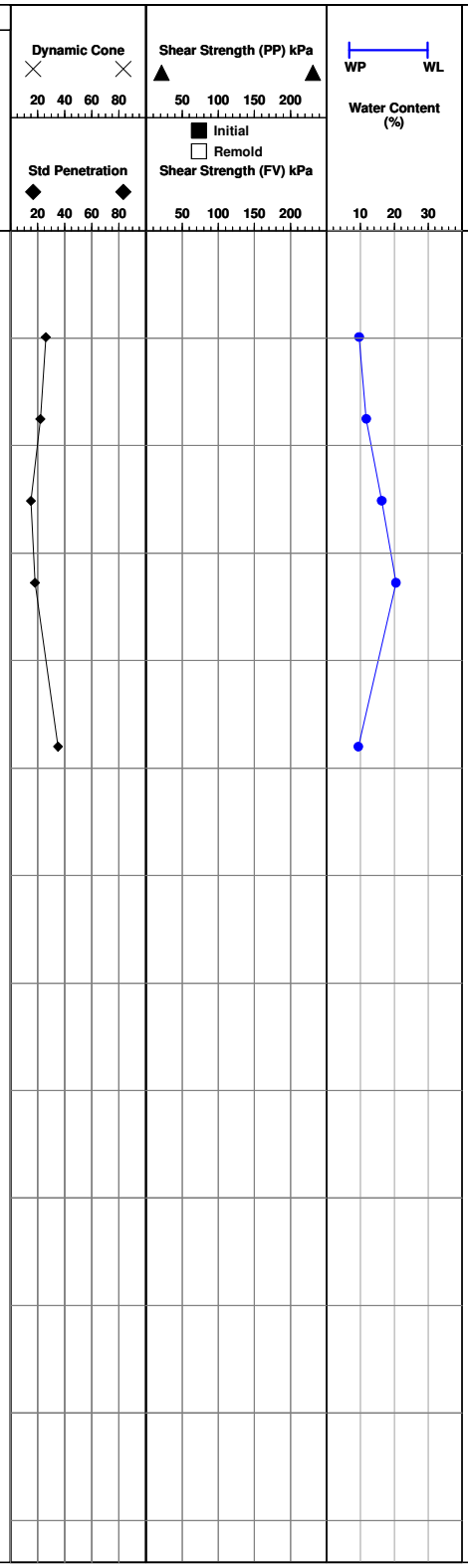
Project: *Cambridge West Development*

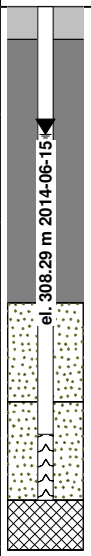
Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		309.42			
	TOPSOIL: dark brown silt, trace sand, gravel and corn roots, moist		0.00 309.19 0.23 308.81			
1	***SAND:*** brown silty sand, moist		0.61	SS-1	11-12 14	
	SAND AND GRAVEL: compact grey and brown sand and gravel, some silt, wet to saturated			SS-2	8-11 11	
2			307.13			
	SAND: compact brown fine to coarse sand, some silt and gravel, saturated		2.29 306.37	SS-3	6-6 9	
3	***SAND AND GRAVEL:*** compact grey/brown sand and gravel, some silt and occasional cobbles, saturated		3.05	SS-4	5-6 12	
4			304.85			
	dense		4.57 304.39	SS-5	10-11 24	
5	Borehole terminated at 5.03 m		5.03			
6						
7						
8						
9						
10						
11						
12						





Groundwater Observations and Standpipe Details

- protective cover and concrete
- bentonite seal
- sand pack
- 50 mm pipe
- 0.61 m slotted screen
- native cave

July 9, 2014 groundwater at Elevation 308.19 m.

Reviewed by: *D.Gonser*

Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes:

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Vertical Scale = 1 : 70.0

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Ground Elevation: *308.99 m*

Borehole Number: **BH-27-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-27*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		308.99			
	TOPSOIL: dark brown silt, trace sand, gravel and corn roots, moist		0.00 / 308.81			
			0.18 / 308.58			
	SAND: grey/brown silty sand, trace roots, moist		0.41	SS-1	4-5 5	10
1	compact brown coarse sand, some gravel and silt, saturated		307.47			
	loose to compact, trace silt		1.52	SS-2	3-4 5	9
2			306.70			
	compact		2.29	SS-3	11-7 10	17
3			305.94			
	SAND AND GRAVEL: compact brown sand and gravel, some silt, saturated		3.05	SS-4	8-7 8	15
4			304.42			
	grey		4.57	SS-5	4-6 8	14
5						
6			302.89			
	dense, trace silt		6.10	SS-6	9-21 20	41
7				SS-7	7-16 24	40
			301.67			
	Borehole terminated at 7.32 m		7.32			
8						
9						
10						
11						
12						

Dynamic Cone: 20 40 60 80

Std Penetration: 20 40 60 80

Shear Strength (PP) kPa: 50 100 150 200

Initial

Remold

Shear Strength (FV) kPa: 50 100 150 200

WP WL

Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details

bentonite seal

native cave

At drilling completion, wet cave at 0.76 m.

Vertical Scale = 1 : 70.0

Reviewed by: *D.Gonser*

Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes:

EQ-09-Ge-72 R.1 18.02.2011

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Ground Elevation: *318.95 m*

Borehole Number: **BH-28-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-23*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		318.95			
	TOPSOIL: dark brown silt, trace sand, gravel and corn roots, moist		0.00 / 318.67 / 0.28			
1	***SAND AND GRAVEL:*** compact brown sand and gravel, some silt, moist			SS-1	5-6 6	12
	trace silt		317.43 / 1.52	SS-2	6-8 9	17
2	dense, coarse sand and gravel		316.66 / 2.29	SS-3	9-17 13	30
3	compact		315.90 / 3.05	SS-4	7-10 14	24
4						
	very dense, occasional cobbles		314.38 / 4.57	SS-5	36-25 31	56
5						
6	dense		312.85 / 6.10	SS-6	11-21 20	41
7						
	very dense		311.33 / 7.62	SS-7	43-36 31	67
8						
9			309.81			
	SAND: compact brown fine sand, some silt, trace gravel, wet		9.14	SS-8	10-13 15	28
10						
	silty fine sand, saturated		308.28 / 10.67	SS-9	12-13 15	28
11	Borehole terminated at 11.13 m		307.82 / 11.13			
12						

Dynamic Cone: 20 40 60 80 — Std Penetration: 20 40 60 80

Shear Strength (PP) kPa: 50 100 150 200 — Initial / Remold — Shear Strength (FV) kPa: 50 100 150 200

WP WL — Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details

native backfill

bentonite seal

native cave

At drilling completion, dry cave at 3.35 m.

Vertical Scale = 1 : 70.0

Reviewed by: *D.Gonser*

Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes: *Bulk sample AS-4A taken from 3.05 to 4.57 m.*

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Ground Elevation: *314.06 m*

Borehole Number: **BH-29-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-26*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		314.06			
	TOPSOIL: dark brown silt, some sand, trace gravel and corn roots, moist		0.00 313.81 0.25			
1	***SAND:*** compact brown sand, some gravel and silt, moist to very moist		312.84 1.22	SS-1	6-7 7	14
2	***SAND AND GRAVEL:*** dense brown sand and gravel, trace silt and cobbles, moist			SS-2 SS-3	8-21 22 16-18 23	43 41
3			311.01			
4	***SAND:*** very dense brown coarse sand, some gravel, trace silt and cobbles, moist		3.05 309.49	SS-4	13-21 40	61
5	dense		4.57	SS-5	16-15 15	30
6	compact fine sand, trace silt, moist		307.96 6.10	SS-6	9-9 15	24
7	wet		307.51 6.55			
8	dense silty fine sand, saturated fine sand, some silt, wet		306.44 7.62 306.13 7.92	SS-7	10-14 17	31
9	saturated		304.92 9.14	SS-8	8-14 22	36
10	Borehole terminated at 9.60 m		304.46 9.60			
11						
12						

Dynamic Cone: 20 40 60 80
Std Penetration: 20 40 60 80
Shear Strength (PP) kPa: 50 100 150 200
Initial
Remold
Shear Strength (FV) kPa: 50 100 150 200
WP WL
Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details

native backfill

bentonite seal

native cave

At drilling completion, dry cave at 3.96 m.

Vertical Scale = 1 : 70.0

Reviewed by: *D.Gonser*

Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes:

EQ-09-Ge-72 R.1 18.02.2011

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Ground Elevation: *313.73 m*

Borehole Number: **BH-30-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-26*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Symbol	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation		313.73			
	TOPSOIL: dark brown silt, some sand and gravel, moist		0.00 / 313.48			
			0.25			
1	***SAND:*** compact brown sand, some gravel, trace silt, moist			SS-1	5-5 10	15
			312.21			
2	***SAND AND GRAVEL:*** compact brown sand and gravel, trace silt and cobbles, moist		1.52	SS-2	6-9 10	19
			311.44			
	dense, numerous cobbles		2.29	SS-3	9-15 15	30
3			310.68			
	very dense		3.05	SS-4	50 /125 mm	
4			309.16			
	SAND: dense brown coarse sand, some gravel, trace silt, moist		4.57	SS-5	9-18 15	33
5						
6			307.63			
	silty fine sand, very moist to wet		6.10	SS-6	6-10 23	33
7			306.11			
	moist to very moist		7.62	SS-7	12-20 21	41
			305.81			
8	moist		7.92			
9			304.59			
	silty fine sand		9.14	SS-8	7-15 16	31
			304.13			
	Borehole terminated at 9.60 m		9.60			
10						
11						
12						

Dynamic Cone / Std Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200 — Initial / Remold

Water Content (%): WP WL — 10 20 30

Groundwater Observations and Standpipe Details

native backfill

bentonite seal

native cave

At drilling completion, dry cave at 3.05 m.

Vertical Scale = 1 : 70.0

Reviewed by: *D.Gonser*

Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes: *Bulk sample AS-4A taken from 3.05 to 4.57 m, moisture content = 6.4%.*

EQ-09-Ge-72 R.1 18.02.2011

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Ground Elevation: *311.80 m*

Borehole Number: **BH-31-14**

Job N°: *P-0003455-0-09-100*

Drill Date: *2014-05-20*

Project: *Cambridge West Development*

Field Tech: *D.Souter*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Method: *Hollow Stem Auger*

Depth (m)	Description	Elevation (m) / Depth (m)	Type and Number	"Blows" /150 mm	SPT 'N' Value
	Ground Elevation	311.80			
	TOPSOIL: dark brown and black silt, some sand, trace gravel and corn roots, moist	311.44 / 0.36			
1	***SAND:*** very loose brown silty fine to coarse sand, trace gravel, very moist	310.58 / 1.22	SS-1	1-2 1	3
	some silt, moist	309.97 / 1.83	SS-2	1-6 9	15
2	***SAND AND GRAVEL:*** compact brown sand and gravel, trace silt, moist		SS-3	20-12 12	24
3	***SAND:*** loose grey and brown sand, some silt and gravel, saturated	308.75 / 3.05	SS-4	4-4 4	8
4					
	compact, brown, trace silt and gravel	307.23 / 4.57	SS-5	6-8 8-8	16
5					
6	gravelly coarse sand, some silt	305.70 / 6.10	SS-6	6-8 9	17
			SS-7	7-8 10	18
7	Borehole terminated at 7.32 m	304.48 / 7.32			
8					
9					
10					
11					
12					

Dynamic Cone / Std Penetration: 20 40 60 80

Shear Strength (PP) kPa / Initial / Remold / Shear Strength (FV) kPa: 50 100 150 200

WP WL — Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details

- native backfill
- bentonite seal
- native cave
- At drilling completion, wet cave at 3.20 m.

Vertical Scale = 1 : 70.0

Reviewed by: *D.Gonser*

Drafted by: *E.Ciochon*

Sheet: *1 of 1*

Notes:

EQ-09-Ge-72 R.1 18.02.2011

Borehole Number: 110-10

Ground Elevation: *308.95 m*

Project: *Supplementary Borehole Drilling - Cambridge West*

Job No.: *P036589-300*

Location: *Roseville Road / Blenheim Road, Cambridge, Ontario*

Drill Date: *2010-10-18*

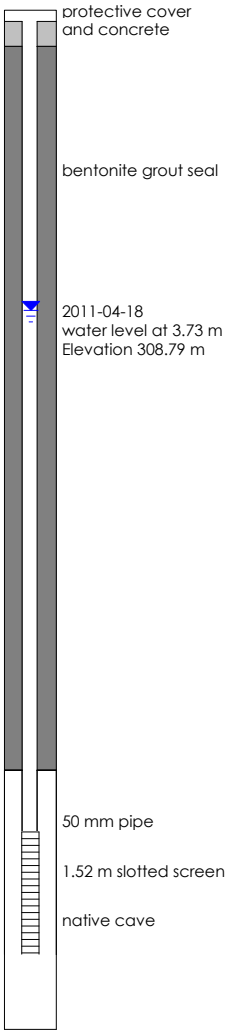
Depth (m)	Description	Symbol	Elevation (m)	Sample Number	Sample Type	N-Value
0.00	Ground Elevation		308.95			
0.00	***TOPSOIL:*** dark brown silt, moist					
1.00	***SILT:*** grey silt, trace sand adn clay, very moist		308.00	1	SS	2
				2	SS	12
2.00	***SAND:*** very loose to compact brown fine to coarse sand, some silt, saturated		307.00	3	SS	11
3.00	grey, saturated		306.00	4	SS	8
4.00			305.00			
5.00			304.00	5	SS	10
6.00			303.00	6	SS	12
7.00			302.00			
8.00			301.00	7	SS	12
9.00			300.00	8	SS	21
10.00			299.00			
11.00			298.00	9	SS	12
12.00	***SILT TILL:*** compact grey silt, trace sand and fine gravel, moist		297.00	10	SS	13
13.00	Borehole terminated at 12.65 m		296.00			
14.00			295.00			
15.00			294.00			

Dynamic Cone / Standard Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200

WP WL — Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details



Reviewed by: *CHelmer*

Drill Method: *Hollow Stem Auger*

Notes:

Field Tech.: *RMcMillan*

Sheet: *1 of 1*

Drafted by: *SMeteer*

Borehole Number: 01-10

Ground Elevation: *309.13 mASL*

Project: *Scoped Hydrogeology Study - Cambridge West Community*

Job No.: *P031655-300*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Date: *February 11, 2010*

Depth (m)	Description	Symbol	Elevation (m)	Sample Number	Sample Type	N-Value
0.00	Ground Elevation		309.13			
	TOPSOIL: dark brown silt, frozen					
1.00	***SILT:*** firm brown clayey silt, trace sand, APL		308.00	1	SS	8
	SAND: compact brown fine to coarse sand, some silt, trace fine gravel, saturated			2	SS	18
2.00			307.00	3	SS	22
3.00	***SAND AND GRAVEL:*** compact brown sand and gravel, some silt, saturated		306.00	4	SS	29
4.00			305.00			
5.00			304.00	5	SS	23
6.00			303.00			
7.00			302.00			
	Borehole terminated at 7.62 m					
8.00			301.00			
9.00			300.00			
10.00			299.00			
11.00			298.00			

Dynamic Cone / Standard Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200

Water Content (%): t m, t i; 10 20 30

Groundwater Observations and Standpipe Details

- protective cover and concrete
- bentonite seal
- 19 mm pipe
- 0.30 m slotted filter
- sand pack
- bentonite seal
- 2010-03-04
- upper standpipe water level at 0.91 m Elev. 308.22 m
- lower standpipe water level at 0.97 m Elev. 308.16 m
- 50 mm pipe
- 1.52 m slotted screen
- native cave
- At drilling completion, water level at 0.61 m

Reviewed by: *CH*

Drill Method: *Hollow Stem Auger*

Notes:

Field Tech.: *RM*

Sheet: *1 of 1*

Drafted by: *SM*

Borehole Number: 02-10

Ground Elevation: *308.59 mASL*

Project: *Scoped Hydrogeology Study - Cambridge West Community*

Job No.: *P031655-300*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Date: *February 11, 2010*

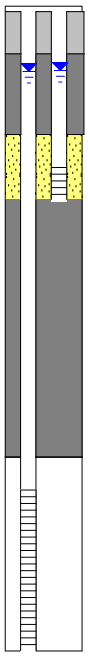
Depth (m)	Description	Symbol	Elevation (m)	Sample Number	Sample Type	N-Value
0.00	Ground Elevation		308.59			
0.00	***TOPSOIL:*** black peaty topsoil, WTPL		308.00			
1.00	***SILT:*** very loose brown silt, some sand and organics			1	SS	2
2.00	***SAND AND GRAVEL:*** compact brown sand and gravel, some silt, saturated		307.00	2	SS	12
	some cobbles		306.00			
3.00				3	SS	22
	frequent cobbles		305.00			
4.00			304.00			
5.00			303.00			
6.00	Borehole terminated at 6.10 m		302.00			
7.00			301.00			
8.00			300.00			
9.00			299.00			
10.00			298.00			
11.00			297.00			

Dynamic Cone / Standard Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200

Water Content (%): t m, t i; 10 20 30

Groundwater Observations and Standpipe Details



- protective cover and concrete
- bentonite seal
- 19 mm pipe
- 0.30 m slotted filter
- sand pack
- bentonite seal
- 2010-03-14 upper standpipe water level at 0.62 m Elev. 307.97 m
- lower standpipe water level at 0.62 m Elev. 307.97 m
- 50 mm pipe
- 1.52 m slotted screen
- native cave
- At drilling completion, water level at 0.61 m

Reviewed by: *CH*

Drill Method: *Hollow Stem Auger*

Notes:

Field Tech.: *RM*

Sheet: *1 of 1*

Drafted by: *SM*

Borehole Number: 03-10

Ground Elevation: *313.06 mASL*

Project: *Scoped Hydrogeology Study - Cambridge West Community*

Job No.: *P031655-300*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Date: *February 11-12, 2010*

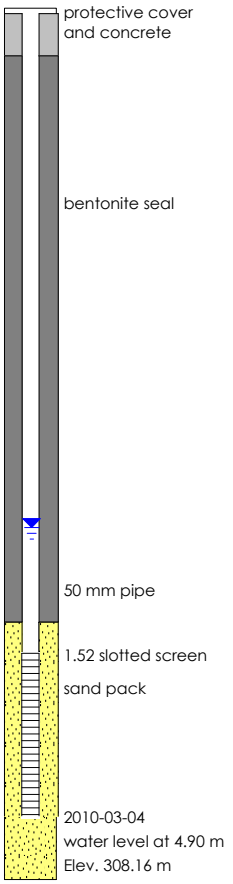
Depth (m)	Description	Symbol	Elevation (m)	Number	Type	N-Value
0.00	Ground Elevation		313.06			
0.00	***TOPSOIL:*** dark brown silt, frozen					
1.00	***SAND:*** compact rusty brown fine to coarse sand, trace silt and fine gravel, damp		312.00	1	SS	13
	some gravel			2	SS	20
2.00			311.00			
3.00	***SAND AND GRAVEL:*** very dense brown sand and gravel		310.00	3	SS	27\150mm
4.00			309.00			
5.00	moist		308.00	4	SS	33
	saturated					
6.00	some silt		307.00	5	SS	27
7.00			306.00			
8.00	***SILT:*** compact grey silt, trace clay; some sand layers, saturated		305.00	6	SS	23
	Borehole terminated at 8.23 m					
9.00			304.00			
10.00			303.00			
11.00			302.00			

Dynamic Cone / Standard Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200

Water Content (%): t m t i; 10 20 30

Groundwater Observations and Standpipe Details



Reviewed by: *CH*

Drill Method: *Hollow Stem Auger*

Notes:

Field Tech.: *RM*

Sheet: *1 of 1*

Drafted by: *SM*

Borehole Number: 04-10

Ground Elevation: *308.65 mASL*

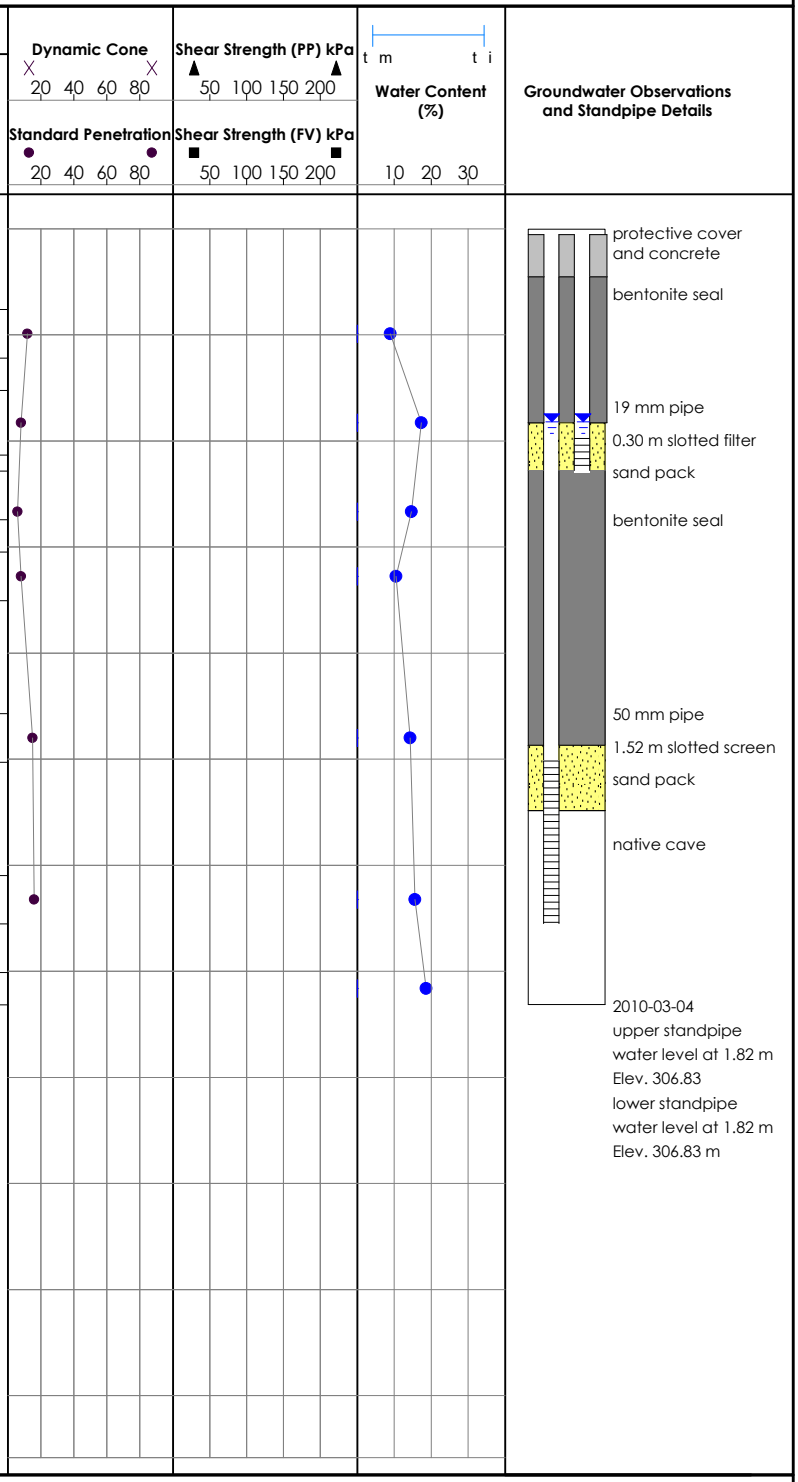
Project: *Scoped Hydrogeology Study - Cambridge West Community*

Job No.: *P031655-300*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Date: *February 12, 2010*

Depth (m)	Description	Symbol	Elevation (m)	Number	Type	N-Value
	Ground Elevation		308.65			
0.00	***TOPSOIL:*** dark brown silt, frozen					
	SAND: compact brown silty sand, some gravel, moist		308.00	1	SS	12
1.00						
			307.00	2	SS	8
2.00	trace organics					
	some gravel, saturated			3	SS	6
			306.00			
3.00				4	SS	8
			305.00			
4.00						
	trace silt		304.00	5	SS	15
5.00						
			303.00			
6.00				6	SS	16
			302.00			
7.00	***SILT:*** compact grey silt, trace fine sand, wet			7	SS	14\150mm
	Borehole terminated at 7.32 m		301.00			
8.00						
			300.00			
9.00						
			299.00			
10.00						
			298.00			
11.00						



2010-03-04
upper standpipe water level at 1.82 m Elev. 306.83
lower standpipe water level at 1.82 m Elev. 306.83 m

Reviewed by: *CH*

Drill Method: *Hollow Stem Auger*

Notes:

Field Tech.: *RM*

Sheet: *1 of 1*

Drafted by: *SM*

Borehole Number: 05-10

Ground Elevation: *308.57 mASL*

Project: *Scoped Hydrogeology Study - Cambridge West Community*

Job No.: *P031655-300*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Date: *February 12, 2010*

Depth (m)	Description	Symbol	Elevation (m)	Sample Number	Sample Type	N-Value
0.00	Ground Elevation		308.57			
	FILL: loose brown and rusty brown sand and silty sand, damp to moist		308.00	1	SS	4
1.00						
			307.00	2	SS	6
2.00	***SILT:*** compact grey silt, trace sand, saturated					
			306.00	3	SS	16
3.00	trace clay					
				4	SS	21
4.00			305.00			
			304.00	5	SS	14
5.00	***SAND:*** compact brown fine sand, trace silt, damp					
			303.00			
6.00	saturated			6	SS	16
			302.00			
7.00						
			301.00	7	SS	20
8.00	some gravel					
			300.00			
9.00						
			299.00	8	SS	22
	Borehole terminated at 9.60 m					
10.00			298.00			
11.00			297.00			

Dynamic Cone / Standard Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200

Water Content (%): t m, t i; 10 20 30

Groundwater Observations and Standpipe Details

- protective cover and concrete
- bentonite seal
- 19 mm pipe
- 0.61 m slotted filter
- sand pack
- bentonite seal
- 2010-03-04
- upper standpipe water level at 2.11 m Elev. 306.46 m
- lower standpipe water level at 6.04 m Elev. 302.53 m
- 50 mm pipe
- 1.52 m slotted screen
- sand pack

Reviewed by: *CH*

Drill Method: *Hollow Stem Auger*

Notes:

Field Tech.: *RM*

Sheet: *1 of 1*

Drafted by: *SM*

Borehole Number: 06-10

Ground Elevation: *308.97 mASL*

Project: *Scoped Hydrogeology Study - Cambridge West Community*

Job No.: *P031655-300*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Date: *February 12, 2010*

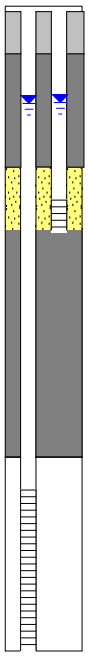
Depth (m)	Description	Symbol	Elevation (m)	Sample Number	Sample Type	N-Value
0.00	Ground Elevation		308.97			
	TOPSOIL: dark brown silt, frozen					
1.00	***SILT:*** loose brown silt, some sand and clay, very moist to wet		308.00	1	SS	4
2.00	***SAND:*** loose grey fine to coarse sand, some silt and gravel, saturated		307.00	2	SS	4
3.00			306.00	3	SS	16
4.00			305.00	4	SS	17
5.00			304.00	5	SS	36
6.00	Borehole terminated at 6.10 m		303.00			
7.00			302.00			
8.00			301.00			
9.00			300.00			
10.00			299.00			
11.00			298.00			

Dynamic Cone / Standard Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200

Water Content (%): t m, t i; 10 20 30

Groundwater Observations and Standpipe Details



- protective cover and concrete
- bentonite seal
- 19 mm pipe
- 0.30 m slotted filter
- sand pack
- bentonite seal
- 50 mm pipe
- 1.52 m slotted screen
- native cave

2010-03-04
upper standpipe
water level at 0.91 m
Elev. 308.06 m
lower standpipe
water level at 0.92
Elev. 308.05 m

Reviewed by: *CH*

Drill Method: *Hollow Stem Auger*

Notes:

Field Tech.: *RM*

Sheet: *1 of 1*

Drafted by: *SM*

Borehole Number: 08-10

Ground Elevation: *311.92 mASL*

Project: *Scoped Hydrogeology Study - Cambridge West Community*

Job No.: *P031655-300*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Date: *February 16, 2010*

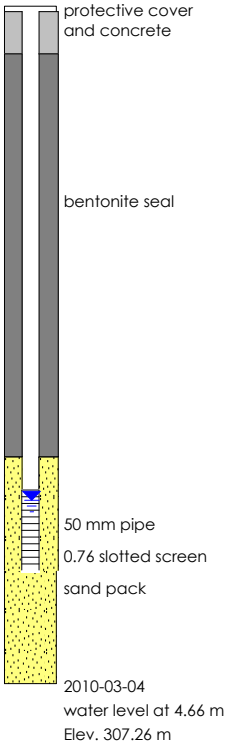
Depth (m)	Description	Symbol	Elevation (m)	Sample Number	Sample Type	N-Value
0.00	Ground Elevation		311.92			
0.00	***TOPSOIL:*** dark brown silt, frozen					
1.00	***SILT:*** loose brown silt, trace sand and clay, moist		311.00	1	SS	6
1.00	***SAND:*** compact brown fine to coarse sand, trace silt and fine gravel, damp			2	SS	13
2.00			310.00	3	SS	17
3.00			309.00	4	SS	15
4.00			308.00			
	saturated			5	SS	10
5.00			307.00			
5.00	***SILT TILL:*** compact brown sandy silt, some gravel, moist			6	SS	18
6.00			306.00	7	SS	27
6.00	Borehole terminated at 6.40 m					
7.00			305.00			
8.00			304.00			
9.00			303.00			
10.00			302.00			
11.00			301.00			

Dynamic Cone / Standard Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200

Water Content (%): t m, t i; 10 20 30

Groundwater Observations and Standpipe Details



Reviewed by: *CH*

Drill Method: *Hollow Stem Auger*

Notes:

Field Tech.: *RM*

Sheet: *1 of 1*

Drafted by: *SM*

Borehole Number: 15-10

Ground Elevation: *309.74 mASL*

Project: *Scoped Hydrogeology Study - Cambridge West Community*

Job No.: *P031655-300*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Date: *February 18, 2010*

Depth (m)	Description	Symbol	Elevation (m)	Number	Type	N-Value
0.00	Ground Elevation		309.74			
0.00	***TOPSOIL:*** dark brown silt, frozen					
1.00	***SILT:*** firm brown silt, some clay, trace sand and gravel, APL		309.00	1	SS	7
2.00	***SAND:*** loose brown fine to coarse sand, trace silt, moist		308.00	2	SS	8
2.00	saturated					
3.00	compact		307.00	3	SS	11
4.00	***SAND AND GRAVEL:*** compact brown sand and gravel, trace silt, saturated		306.00	4	SS	16
5.00			305.00	5	SS	26
5.00	Borehole terminated at 5.03 m					
6.00			304.00			
7.00			303.00			
8.00			302.00			
9.00			301.00			
10.00			300.00			
11.00			299.00			

Dynamic Cone: 20 40 60 80
Standard Penetration: 20 40 60 80
Shear Strength (PP) kPa: 50 100 150 200
Shear Strength (FV) kPa: 50 100 150 200
Water Content (%): t m, t i; 10 20 30

Groundwater Observations and Standpipe Details:
- protective cover and concrete
- bentonite seal
- 50 mm pipe
- 1.52 m slotted screen
- native cave
- 2010-03-04 water level at 1.40 m Elev. 308.34 m

Reviewed by: *CH*

Drill Method: *Hollow Stem Auger*

Notes:

Field Tech.: *RM*

Sheet: *1 of 1*

Drafted by: *SM*

Borehole Number: 16-10

Ground Elevation: *309.08 mASL*

Project: *Scoped Hydrogeology Study - Cambridge West Community*

Job No.: *P031655-300*

Location: *Blenheim Road, Cambridge, Ontario*

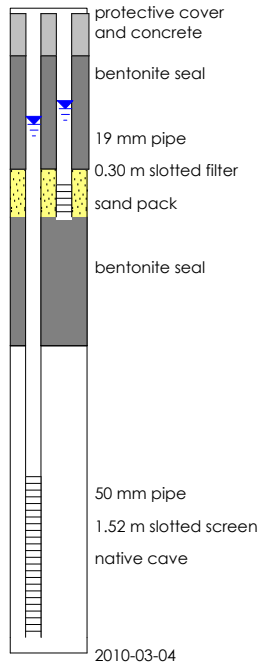
Drill Date: *February 18, 2010*

Depth (m)	Description	Symbol	Elevation (m)	Sample Number	Sample Type	N-Value
0.00	Ground Elevation		309.08			
	PEAT: firm black amorphous peat, WTPL					
1.00			308.00	1	SS	6
				2	SS	WH
2.00	***SAND:*** very loose brown silty sand, saturated		307.00			
	trace gravel			3	SS	3
3.00			306.00	4	SS	8
4.00	***SAND AND GRAVEL:*** compact brown sand and gravel, some cobbles and silt, saturated		305.00			
5.00			304.00	5	SS	28
	SAND: brown sand, trace silt and fine gravel, saturated					
6.00	Borehole terminated at 6.10 m		303.00			
7.00			302.00			
8.00			301.00			
9.00			300.00			
10.00			299.00			
11.00			298.00			

Dynamic Cone / Standard Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200

Water Content (%): t m, t i; 10 20 30



Groundwater Observations and Standpipe Details

2010-03-04
upper standpipe
water level at 0.95 m
Elev. 308.13 m
lower standpipe
water level at 1.10 m
Elev. 307.98 m

Reviewed by: *CH*

Drill Method: *Hollow Stem Auger*

Notes:

Field Tech.: *RM*

Sheet: *1 of 1*

Drafted by: *SM*

Borehole Number: 18-10

Ground Elevation: *310.17 mASL*

Project: *Scoped Hydrogeology Study - Cambridge West Community*

Job No.: *P031655-300*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Date: *February 24, 2010*

Depth (m)	Description	Symbol	Elevation (m)	Sample Number	Sample Type	N-Value
0.00	Ground Elevation		310.17			
0.00	***TOPSOIL:*** dark brown silt, frozen					
1.00	***SILT:*** brown silt, some sand and gravel, moist		309.00	1	SS	47
				2	SS	32\150mm
2.00			308.00	3	AS	
3.00	***SAND AND GRAVEL:*** dense to very dense brown sand and gravel, some cobbles, trace silt, damp		307.00	4	SS	23
4.00	saturated		306.00			
5.00	***SAND:*** compact brown fine to coarse sand, some gravel, trace silt, saturated		305.00	5	SS	27
6.00	trace fine gravel		304.00	6	SS	38
7.00	***SAND AND GRAVEL:*** dense brown sand and gravel, trace silt, saturated		303.00	7	SS	40
8.00	***SAND:*** compact brown fine to coarse sand, trace silt, saturated		302.00			
9.00			301.00	8	SS	22
10.00	***SILT:*** dense brown fine sandy silt, saturated		300.00			
11.00			299.00	9	SS	33
12.00	grey, saturated		298.00	10	SS	20
13.00			297.00			
14.00			296.00	11	SS	7
15.00			295.00			
16.00			294.00			
17.00			293.00			
18.00	***SILT TILL:*** very dense grey silt, some sand and gravel, moist		292.00	12	SS	10\25mm
19.00			291.00			
20.00	Borehole terminated at 19.51 m upon auger refusal on bedrock or boulder		290.00			

Dynamic Cone / Standard Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200

Water Content (%): t m, t i; 10 20 30

Groundwater Observations and Standpipe Details:
- protective cover and concrete
- bentonite seal
- 2010-03-04 water level at 2.08 m Elev. 307.98 m
- bentonite grout
- 50 mm pipe
- 1.52 slotted screen
- sand pack

Reviewed by: *CH*

Drill Method: *Hollow Stem Auger*

Notes:

Field Tech.: *RM*

Sheet: *1 of 1*

Drafted by: *SM*

Borehole Number: 18A-10

Ground Elevation: *310.27 mASL*

Project: *Scoped Hydrogeology Study - Cambridge West Community*

Job No.: *P031655-300*

Location: *Blenheim Road, Cambridge, Ontario*

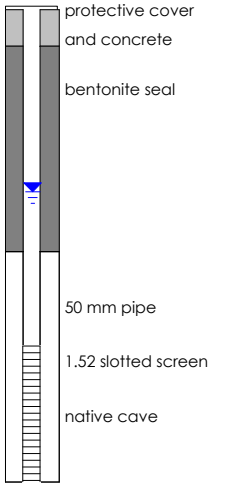
Drill Date: *March 2, 2010*

Depth (m)	Description	Symbol	Elevation (m)	Sample Number	Sample Type	N-Value
0.00	Ground Elevation		310.27			
0.00	***TOPSOIL:*** dark brown silt, frozen					
1.00	***SILT:*** brown silt, some sand and gravel, moist		309.00	1	SS	47
2.00	***SAND AND GRAVEL:*** dense to very dense brown sand and gravel, some cobbles, trace silt, damp		308.00	2	SS	32\150mm
				3	AS	
3.00	saturated		307.00	4	SS	23
4.00	***SAND:*** compact brown fine to coarse sand, some gravel, trace silt, saturated		306.00			
	trace fine gravel			5	SS	27
5.00	Borehole terminated at 5.33 m		305.00			
6.00			304.00			
7.00			303.00			
8.00			302.00			
9.00			301.00			
10.00			300.00			
11.00			299.00			
12.00			298.00			
13.00			297.00			

Dynamic Cone / Standard Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200

Water Content (%): t m, t i; 10 20 30



2010-03-04
water level at 2.08 m
Elev. 308.19 m

Reviewed by: *CH*

Drill Method: *Hollow Stem Auger*

Notes:

Field Tech.: *RM/KT*

Sheet: *1 of 1*

Drafted by: *SM*

Borehole Number: 19-10

Ground Elevation: *310.38 mASL*

Project: *Scoped Hydrogeology Study - Cambridge West Community*

Job No.: *P031655-300*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Date: *February 25, 2010*

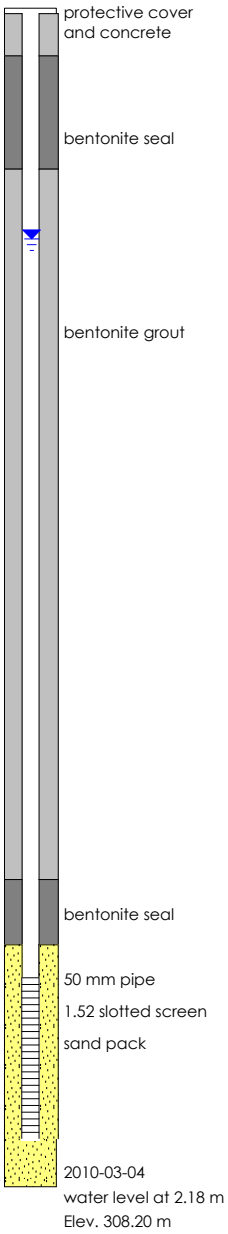
Depth (m)	Description	Symbol	Elevation (m)	Sample Number	Sample Type	N-Value
0.00	Ground Elevation		310.38			
	FILL: brown sandy silt, trace gravel and topsoil, frozen					
1.00	***TOPSOIL:*** dark brown silt, moist			1	SS	6
	SAND AND GRAVEL: compact brown silty sand and gravel, damp		309.00	2	SS	11
2.00						
	SAND: loose to compact brown fine to coarse sand, some silt, trace fine gravel, saturated		308.00	3	SS	14
3.00						
			307.00	4	SS	8
4.00						
			306.00			
	SAND AND GRAVEL: compact grey fine to coarse sand and gravel, trace silt, saturated			5	SS	24
5.00			305.00			
6.00	***SAND:*** compact grey fine to coarse sand, trace silt and fine gravel, saturated			6	SS	16
			304.00			
7.00						
			303.00	7	SS	28
8.00	***SILT TILL:*** compact grey silt, some sand, clay and gravel, moist					
			302.00			
9.00				8	SS	26
			301.00			
10.00	very dense					
			300.00			
11.00				9	SS	52
	Borehole terminated at 11.13 m		299.00			

Dynamic Cone / Standard Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200

Water Content (%): t m, t i; 10 20 30

Groundwater Observations and Standpipe Details



Reviewed by: *CH*

Drill Method: *Hollow Stem Auger*

Notes:

Field Tech.: *RM*

Sheet: *1 of 1*

Drafted by: *SM*

Borehole Number: 20-10

Ground Elevation: *314.78 mASL*

Project: *Scoped Hydrogeology Study - Cambridge West Community*

Job No.: *P031655-300*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Date: *February 25, 2010*

Depth (m)	Description	Symbol	Elevation (m)	Sample Number	Sample Type	N-Value
0.00	Ground Elevation		314.78			
0.00	***TOPSOIL:*** dark brown silt, frozen					
1.00	***SILT:*** brown silt, some sand and gravel, frozen		314.00	1	SS	19
2.00	***SAND AND GRAVEL:*** compact brown silty sand and gravel, damp		313.00	2	SS	10
3.00	***SAND:*** compact brown fine to coarse sand, trace silt and gravel, damp		312.00	3	SS	18
4.00	compact brown fine to coarse sand, trace silt, damp		311.00	4	SS	27
4.00	some gravel					
5.00	occasional brown silt layers, moist		310.00	5	SS	19
6.00	***SILT:*** compact brown silt, trace fine sand, moist		309.00	6	SS	14
7.00	brown fine sandy silt, saturated		308.00			
8.00	brown sand and gravel layers, saturated		307.00	7	SS	28
9.00	***SILT TILL:*** very dense grey silt, some sand, clay and gravel, moist		306.00	8	SS	56
10.00			305.00			
11.00			304.00	9	SS	69
12.00	***SILT:*** very dense grey silt, some fine sand, saturated		303.00			
12.00				10	SS	114
13.00	Borehole terminated at 12.65 m		302.00			

Dynamic Cone / Standard Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200

Water Content (%): t m, t i; 10 20 30

Groundwater Observations and Standpipe Details

- protective cover and concrete
- bentonite seal
- 19 mm pipe
- 1.52 m slotted filter
- sand pack
- bentonite seal
- 2010-03-04 upper standpipe dry lower standpipe water level at 6.92 m Elev. 307.86 m
- 50 mm pipe
- 1.52 m slotted screen
- native cave

Reviewed by: *CH*

Drill Method: *Hollow Stem Auger*

Notes:

Field Tech.: *RM*

Sheet: *1 of 1*

Drafted by: *SM*

Borehole Number: 21-10

Ground Elevation: *308.32 mASL*

Project: *Scoped Hydrogeology Study - Cambridge West Community*

Job No.: *P031655-300*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Date: *February 26, 2010*

Depth (m)	Description	Symbol	Elevation (m)	Sample Number	Sample Type	N-Value
0.00	Ground Elevation		308.32			
0.00	***TOPSOIL:*** dark brown silt, frozen					
1.00	***SILT:*** brown silt, trace sand and gravel, frozen		307.00	1	SS	9
2.00	***SAND AND GRAVEL:*** compact brown sand and gravel, trace silt, damp		306.00	2	SS	12
				3	SS	27
3.00	saturated		305.00	4	SS	26
4.00			304.00			
5.00	***SAND:*** compact brown fine to coarse sand, trace silt and fine gravel, saturated		303.00	5	SS	33
6.00			302.00	6	SS	24
7.00			301.00			
7.62	Borehole terminated at 7.62 m					
8.00			300.00			
9.00			299.00			
10.00			298.00			
11.00			297.00			

Dynamic Cone / Standard Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200

Water Content (%): t m, t i; 10 20 30

Groundwater Observations and Standpipe Details

- protective cover and concrete
- bentonite seal
- 2010-03-04 water level at 3.06 m Elev. 305.26 m
- 50 mm pipe
- 1.52 slotted screen
- sand pack

Reviewed by: *CH*

Drill Method: *Hollow Stem Auger*

Notes:

Field Tech.: *RM*

Sheet: *1 of 1*

Drafted by: *SM*

Borehole Number: 22-10

Ground Elevation: *313.80 mASL*

Project: *Scoped Hydrogeology Study - Cambridge West Community*

Job No.: *P031655-300*

Location: *Blenheim Road, Cambridge, Ontario*

Drill Date: *Feb 26 and Mar 1, 2010*

Depth (m)	Description	Elevation (m)	Number	Type	N-Value
0.00	Ground Elevation	313.80			
0.00	***TOPSOIL:*** dark brown silt, frozen				
1.00			1	SS	6
1.00	***SILT:*** loose reddish brown silt, some sand, moist	312.00	2	SS	21
2.00					
2.00	***SAND:*** compact brown fine to coarse sand, trace silt, damp		3	AS	27
3.00		311.00	4	SS	*
3.00					
4.00	***SAND AND GRAVEL:*** compact to dense brown fine to coarse sand and gravel, some cobbles, trace silt, damp	310.00			
5.00		309.00	5	SS	31
6.00	***SAND:*** compact brown fine to coarse sand, trace silt and fine gravel, damp	308.00	6	SS	22
7.00	some gravel, damp	307.00			
8.00	very dense brown fine to coarse sand, some gravel, trace silt, damp	306.00	7	SS	71
9.00		305.00			
10.00	compact brown fine to coarse sand, trace gravel and silt, damp	304.00	8	SS	27
11.00	***SAND AND SILT:*** dense to very dense light brown fine sand and silt, moist	303.00	9	SS	50
12.00		302.00			
13.00	dense, brown, moist	301.00	10	SS	45
14.00	***SAND:*** compact brown to reddish brown silty fine sand, saturated	300.00	11	SS	21
15.00		299.00			
16.00	***SILT:*** dense brown silt, trace fine sand, saturated, dilatant	298.00	12	SS	31
17.00	dense to very dense grey and brown silt, saturated	297.00	13	SS	50
18.00	***SAND:*** dense brown fine sand, some silt, saturated	296.00			
19.00	Borehole terminated at 17.22 m	295.00			
20.00		294.00			
		293.00			

Dynamic Cone / Standard Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200

Water Content (%): t m, t i; 10 20 30

Groundwater Observations and Standpipe Details:
- protective cover and concrete
- bentonite seal
- 2010-03-04 water level at 13.29 m Elev. 300.51 m
- 50 mm pipe
- 1.52 slotted screen
- sand pack

Reviewed by: *CH*

Drill Method: *Hollow Stem Auger*

Notes: **Sampler bouncing on cobble*

Field Tech.: *RM/KT*

Sheet: *1 of 1*

Drafted by: *SM*