City of Hamilton
Watercourse 5.0 & 6.0
Hydraulic Assessment

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Submitted by

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1. Introduction

Dillon Consulting (Dillon) was retained by the City of Hamilton (City) in 2006 to undertake a Municipal Class Environmental Assessment Study (Class EA Study) for watercourse system improvements of Watercourse 5.0 and 6.0. Upon completion of the draft EA document, the City identified the need for a detailed hydraulic assessment to address comments from the Hamilton Region Conservation Authority (HCA). Dillon was subsequently retained to conduct a hydraulic assessment of Watercourse 5.0, 6.0, and secondary Watercourses 6.1 and 6.3. These watercourses are situated in the Community of Stoney Creek. The study area is generally bounded by Lake Ontario to the north, Highway 8 to the south, Fruitland Road to the west, and Glover Road to the east.

This report has been prepared in support of the draft EA document and has the following objectives: (1) describe the hydraulic assessment for the study watercourses, (2) present updated floodplain mapping for existing conditions, (3) evaluate watercourse upgrades to improve existing flooding problems, and (4) present future conditions floodplain mapping to illustrate the impacts of the watercourse improvements. The results from this report are intended to confirm and/or update the EA's recommended alternative and lead to the finalization of the EA process for the watercourse improvements.

1.1 Background

In anticipation for future development surrounding Watercourses 5.0, 6.0, 6.1, and 6.3, the City retained Dillon in 2006 to undertake a Municipal Class Environmental Assessment Study (Class EA Study) for Watercourse System Improvements of Watercourse 5.0 and 6.0.

The draft version of the Class EA Study was completed by Dillon Consulting in November 2007, which included a comprehensive review of previous studies:

- *The Corporation of Stoney Creek's Master Drainage Plan (MDP)* (Philips Engineering Limited, 1990);
- The QEW Drainage Report (UMA Engineering Limited);
- The QEW Expansion Objectives (Ministry of Transportation Ontario);

- Preliminary Servicing Report in support of the Trillium Neighbourhood Secondary Plan (Planning Initiatives Limited, 1996/2006);
- Hydrologic and Hydraulic Analysis for Bridgeport Watercourses (within the Trillium Neighbourhood Secondary Planning Area) (A.J. Clarke and Associates Limited, May 2005);
- Stormwater Quality Management Strategy, Community of Stoney Creek Master Plan (Philips Engineering, April 2006);
- City of Hamilton Growth Related Integrated Development Strategy (GRIDS) (May 2006); and
- City of Hamilton Stormwater Master Plan – Class Environmental Assessment.

As part of the draft EA document, Dillon also completed an assessment of the existing hydraulic conditions and proposed works along primary Watercourses 5.0 and 6.0, and secondary Watercourses 6.1 to 6.3. This assessment evaluated individual improvements at crossings and along specific reaches of each watercourse. The results of this analysis were used to confirm and assess the performance of watercourse system improvements recommended in previous studies. Based on the preliminary findings of the draft EA document, "Alternative 3" was identified as the recommended solution for primary watercourses (i.e. to replace all culverts with hydraulic and/or structural deficiencies and undertake channel diversions) and "Alternative 4" for secondary watercourses (i.e. to replace all culverts with hydraulic and/or structural deficiencies and complete channel lining).

A draft EA document was circulated to various stakeholders for review and comment. The Hamilton Conservation Authority (HCA) identified the need to holistically evaluate the hydraulic functions of the study watercourses to verify existing flood conditions and proposed improvements. As a result of this request, the EA has not been finalized and a notice of study completion has not yet been issued.

1.2 Current Studies

The hydraulic assessment study area is also coincident with the Fruitland-Winona (formerly SCUBE) Secondary Plan lands, which is under study by the City. Concurrently, Aquafor Beech

is completing the SCUBE West and East Subwatershed Studies in support of the secondary planning process. The results of this hydraulic study will be compiled as part of the SCUBE WEST Subwatershed Study findings and recommendations. The results of these technical studies ultimately will be used to inform the secondary plan process and assist in developing appropriate land use designations, development standards, and a planning policy framework.

1.3 Study Scope

This report builds on the findings presented in the draft EA and has adopted the following scope:

- Review previously completed floodplain mapping for the study area (Flood Damage Reduction Program (FDRP) mapping completed by Philips Engineering 1989) (refer to ***Appendix C*** for copies of the FDRP mapping);
- Compile and review previously completed hydraulic models;
- Compile and process topographic and watercourse crossing information provided by the City and the HCA;
- Develop an updated hydraulic model for Watercourses 5.0, 6.0, 6.1, and 6.3 and analyze existing hydraulic performance;
- Update and present the existing conditions regulatory (100 year return period) floodplain mapping;
- Evaluate watercourse improvements based on the draft EA recommendations and identify changes as a result of more recent technical and planning considerations;
- Confirm the hydraulic impacts of the proposed improvements on the regulatory floodplain; and
- Develop a list of improvements for further study and detailed design.

The draft EA findings did not recommend any improvements to Watercourse 6.2; therefore this reach has not been included in this hydraulic analysis. Furthermore, this study has not included any hydraulic considerations for future land use since the secondary planning process is ongoing. For clarification:

- "Existing conditions" refer to the floodplain mapping completed as part of the FDRP mapping completed in 1994.
- "Updated existing conditions" refer to the updated hydraulic assessment of existing conditions completed in support of this study.

- "Future conditions" only refer to potential watercourse improvements considered under existing conditions in support of this study.

2. Description of Existing Conditions

Within the study area boundary, there are eight watercourse crossings on Watercourse 5.0 and seven watercourse crossings on Watercourse 6.0, including crossings on the diversion channel along the north side of the QEW. The diversion channel stems from Watercourse 6.0 where flows are diverted Westerly across the QEW at Jones Street. The channel continues along the north side of the highway before a confluence with Watercourse 5.0 (refer to ***Figure 1***). Note that crossing improvements are limited to only the crossings between Hwy 8 and QEW.

The FDRP mapping considered two hydraulic modelling conditions:

- no spill conditions, which assumed no loss of flow from the system; and
- spill condition, which modeled spills with lateral weirs to simulate the effects of spills and reduced downstream flow values.

The approved floodplain mapping was based on the modelling results from the spill conditions.

The MDP and the QEWDR determined that crossings along Watercourse 5.0 and Watercourse 6.0, especially at the QEW and the CN rail, were under capacity. These reports also confirmed the presence of overbank flooding due to flat overbank topography and limited channel capacities as shown in the FDRP mapping. Where MDP and QEWDR drainage improvements were not implemented, flooding and conveyance issues as described above still exist within Watercourse 5.0 and Watercourse 6.0. Based on field inspections completed in support of the draft EA document, the structural conditions of the culverts on Watercourse 5.0 and Watercourse 6.0 appeared to be in good condition and/or required some minor repairs. The only exceptions are the culverts on Barton Street on Watercourse 5.0 and Watercourse 6.0 which were deteriorated and required replacement. Furthermore, the crossings at QEW have been improved since the QEWDR. The FDRP has not been updated to reflect these improvements.

Based on the FDRP mapping, the floodplain along several reaches of Watercourse 5.0 and Watercourse 6.0 north of Barton Street to Lake Ontario can be described as wide and undefined with potential spills between watersheds.

With respect to the secondary watercourses, south of the QEW, there are six watercourse crossings on Watercourse 6.1 and five watercourse crossings on Watercourse 6.3. Not all crossings will be evaluated as part of this study: only the crossings between Hwy 8 and QEW will be considered. The MDP and the QEWDR determined that these secondary crossings, especially at the QEW and the CN rail, were under capacity. The draft EA document determined that some of the recommendations outlined in the MDP and QEWDR were implemented and improved conveyance issues. However, the proposed diversions to reduce the number of secondary crossings or upgrades to these structures have not been implemented or confirmed, therefore culvert capacity issues are still a concern on Watercourse 6.1 and Watercourse 6.3. Based on field inspections completed in support of the draft EA document, the structural conditions of the culverts on Watercourses 6.1 to 6.3 appeared to be in good condition, and/or require some minor repairs. The culverts and their openings are significantly silted in, which limits the conveyance capacity.

The small size channels (shallow and narrow) and the flat overbank topography results in limited channel capacities and overbank flooding. Refer to the draft EA document for additional details.

3. Description of Proposed Improvements

The draft EA document recommendations for channel diversions and improvements (in the form of natural channel lining) were reviewed in conjunction with updated topographic information, aerial and street photography. The section of watercourse between Barton Street and the CN rail are heavily constrained by existing development on either side of the banks. It appears that a significant amount of vegetated cover has developed along the watercourse banks as well. Given these constraints and the relatively flat terrain beyond the watercourse overbanks, it was determined that channel lining works would result in minimal improvements to the regulatory floodplain.

The City's draft land use plan for the Fruitland-Wynona Secondary Plan was also reviewed as it relates to the proposed channel diversions. The draft land use plan assumes a series of stormwater management (SWM) facilities along Barton Street to service future development south of Barton Street. Although the location of these SWM facilities have not been finalized, nor has a future drainage plan been developed, it is assumed that the upstream drainage pattern will change significantly compared to existing conditions. Therefore, the draft EA recommendations for channel diversions might not be possible given consideration for the future land use planning and potential upstream drainage diversions to future SWM facilities.

In view of these considerations, this study will focus on improvements at crossings only. The draft EA recommended improvements that were used as a starting basis for the hydraulic analysis. Additional considerations were given to allow for a minimum 0.5m cover between a structure's obvert and top of road elevation (obtained from the City's 2007 DEM). The Watercourse 5.0 crossing at Fruitland Road is a new recommendation since this crossing was originally beyond the study limits of the draft EA. ***Table 1*** summarizes the existing crossing dimensions, the previous draft EA recommendations, and the revised recommendations for all relevant crossings within the Study Area. Although the potential cost implications of these changes may be minor, an updated cost estimate will be provided in the final EA document.

Table 1 – summary of existing and recommended crossing improvements

Watercourse ID	Crossing Location	Existing Culvert Sizes	EA Recommended Improvements	Updated Recommended Improvements	Comments
5.0	xing Hwy 8, west of Fruitland	1830x1440 CONC BOX	N/A	N/A	
	xing Fruitland, north of Hwy 8	1200x950 CONC BOX	N/A	1500x1000 CONC BOX	Crossing beyond original EA study limits, therefore was not considered
	xing Barton, east of Fruitland	1860X1035 CONC BOX	2400x1500 CONC BOX	SAME AS EA	
	xing Arvin, east of Fruitland	4300x1400 CONC BOX	4300X3000 CONC BOX	KEEP ORIGINAL STRUCTURE	There is no cover over the existing structure, therefore higher structure rise is not feasible
	xing CNR, east of Fruitland	1800x1540 CONC BOX	3000x1500 CONC BOX	SAME AS EA	
	xing SouthService RD, east of Fruitland	3665x1400 CONC BOX	3600x2860 CONC BOX	3600x1800 CONC BOX	Different structure proposed to include considerations for cover and depth of road overtopping
	xing QEW, plus ramps	5000x1600 CONC BOX	N/A	N/A	No changes are proposed for the QEW, improvements implemented by MTO
	xing North Service RD	5000x1760 CONC BOX	ADD 2100x1800 CONC BOX	N/A	Updated floodplain contained within channel, EA recommendation not included in analysis
6.0	xing Hwy 8, west of Jones	2440x840 CONC BOX	N/A	N/A	
	xing Barton, east of Jones, twin culverts	1250x1400 CONC ARCH 1880x1310 ELLIPTICAL CSP	1800x1200 CONC BOX	2000x1000 CONC BOX	Different structure proposed to include considerations for cover and depth of road overtopping
	xing CNR, east of Jones	1150dia CSP	3000x1800 CONC BOX	SAME AS EA	
	xing SouthService RD, east of Jones	3860x1130 CONC BOX	3600x1500 CONC BOX	KEEP ORIGINAL STRUCTURE	
	xing QEW	3860x1200 CONC BOX	N/A	N/A	
	xing North Service RD	2960x1100 CONC BOX	N/A	N/A	
	Diversion culvert	3970x1200 CONC BOX	N/A	N/A	
6.1	xing Barton, west of Glover	600dia CSP	2100x1200 CONC BOX	1750x750 CONC BOX	Different structure proposed to include considerations for cover and depth of road overtopping
	xing Arvin, west of Glover	900dia CSP	2100x1200 CONC BOX	SAME AS EA	
	xing CNR, west of Glover	1000x650 STONE STRUCTURE	1350dia CONC PIPE	SAME AS EA	
6.3	xing Arvin, east of Glover	730dia PVC	2100x1200 CONC BOX	1750x750 CONC BOX	Different structure proposed to include considerations for cover and depth of road overtopping
	xing CNR, east of Glover	750dia CAST IRON PIPE	2100x1200 CONC BOX	SAME AS EA	

4. Hydraulic Modelling

The FDRP mapping was developed using results from a HEC2 model. In view of the availability of updated finer-resolution topographic and crossing data, and advances in the HEC software, it was determined that the development of a new HEC-RAS model would be more efficient than updating the HEC2 model. Therefore, this hydraulic study utilizes updated flows and topographic information to build a new HEC-RAS hydraulic model to simulate the 100 year return period floodplain under existing conditions. A future conditions model will also be developed to evaluate the hydraulic impacts of the recommended crossing improvements under updated existing conditions. The following sections describe the modelling approach, parameter selection, and model results for updated existing and future conditions.

4.1 Summary of Modelling Approach

4.1.1 Channel Geometry

The model geometry used to characterize Watercourses 5.0, 6.0, 6.1 and 6.3 used a combination of data sources. HEC-GeoRAS software (integrated with ArcGIS) was used to cut cross-sections from DTM data provided by the City of Hamilton (2007). This data was supplemented by field surveys of the watercourses conducted by staff from the Hamilton Conservation Authority (refer to ***Appendix D***). HEC-RAS, a hydraulic modeling program developed by the US Army Corps of Engineers, was used to assemble the geometry files for each watercourse.

The HCA survey data gave a better representation of the low flow channel geometry, and picked up lower inverts than the City's DTM data (refer to ***Appendix D*** for section comparison details). As such, cross-sections from the DTM data were modified to include a representative low flow channel based on HCA survey data. These improvements produced a more representative geometry using actual survey points of the watercourse and removed artificial pools and barriers.

There are several areas of the watercourse that are not well defined and the HCA survey data in these areas illustrate channel inverts well below the resolution of the City's DTM information. For the purposes of this study, an inferred stream centerline was generated based on contour interpretation, nearby HCA survey data, and air photo review. Floodplain mapping of these areas will be determined based on contour interpretation, the inferred stream centerline, and top widths evaluated from HECRAS. These areas are:

- Along Watercourse 5.0, immediately downstream of Fruitland Road (between sections 2221 and 2150);
- Along Watercourse 5.0, halfway between Hwy 8 and Barton Street (between sections 1693.967 and 1537.457);
- Along Watercourse 6.0, downstream of Hwy 8 (between sections 2232.182 and 1785.033)

In addition to the main watercourse branches, an additional reach was modelled in between Watercourse 5.0 and 6.0 to represent the diversion upstream of the QEW. The reach is named "Watercourse 5/6_combined" and extra cross-sections were created downstream of the confluence to represent the diversion in the HEC-RAS model.

4.1.2 Input Parameter Estimation

Model input parameters for the existing conditions scenario are described below. The future conditions model utilizes the same input parameters as the updated existing conditions model with respect to flows, Manning's n value, and starting boundary conditions. However, the future model incorporates the recommended culvert improvements at each crossing. **Table 2** summarizes Manning's "n" values assumed for different channel and overbank conditions encountered within the study area.

Table 2 – Channel and Overbank roughness values

	Manning's Coefficient
Channel - Natural	0.035
Overbank - Woods	0.07-0.08
Overbank - Meadows	0.055
Overbank - Lawns	0.045

Channel roughness coefficients were determined based on a review of aerial photography, street view photos from Google Earth, and previous field work conducted in support of the draft EA document. The majority of the reaches appeared to be similar with respect to channel properties, therefore a channel roughness of 0.035 was conservatively chosen. This value is also consistent with the assumed values from the HEC2 model, which range from 0.025 to 0.035. A similar approach was adopted for the overbank roughness. The roughness values assumed in the HEC2 model ranged between 0.06 and 0.09. The

updated overbank roughness coefficients were selected based on a review of aerial photography and varies based on land use coverage classified in ***Table 2***.

Details of the existing infrastructure along Watercourses 5.0, 6.0, 6.1 and 6.3 were provided by the City of Hamilton based on survey data received January 18, 2010. A summary of the data collected is presented in ***Appendix A***. Other inputs, such as entrance and exit loss coefficients, Manning's roughness values, were selected based on the culvert photo inventory provided by the City and using typical values from the HEC-RAS Reference Manual. However, a "bottom n" value of 0.035 was selected for all culverts up to a depth of 0.3m. Expansion and contraction coefficients of 0.3 and 0.5, respectively, were used at crossings.

A hydrologic assessment was completed by Aquafor Beech (May 2010), and the flows generated for each watercourse represent peak flow conditions for both existing and future land use conditions. Summary flow data provided by Aquafor Beech is presented in ***Appendix B*** (SCUBE West Flow Data). ***Table 3*** compares the updated flows from Aquafor Beech and the flow data used in the HEC2 model (without spills). Sections 4.1.3 and 4.2.3 provides additional discussions in relation to the modelling of potential spills. With respect to flow change locations in the model, the flow at each crossing was applied at the upstream end of the reach to conservatively simulate flows through the reach and crossing.

Table 3 – Comparison of Flow Data (no spills)

		1994 FDRP Mapping		2010 Aquafor Beech update		
Reach	Location	Cross Section ID	Flows (m3/s)	Cross Section ID	Flows (m3/s)	%-Difference
5.0	Hwy 8	2863	10.5	2388	6.9	-34.3%
5.0	Barton St	1706.3	15.8	1320	8.82	-44.2%
5.0	Arvin Ave	1339	15.8	951	10.3	-34.8%
5.0	CNR	1080	19.47	680	11	-43.5%
5.0	South Service Road	915.2	19.47	518	11.9	-38.9%
5.0	QEW	597	20.4	230	11.9	-41.7%
6.0	Hwy 8	2767	5.15	2457	7.98	55.0%
6.0	Barton St	1769	12.23	1611	9.2	-24.8%
6.0	CNR	1107.3	12.63	940	8.79	-30.4%
6.0	QEW	610.5	13.42	350	8.79	-34.5%

With the exception of the upstream flow for Watercourse 6.0, the revised flows from the updated hydrology modelling are significantly lower than the FDRP flows. The draft EA document assumed similar flow values as the FDRP for its hydraulic analysis since the Aquafor Beech flows were not available at the time of the initial EA process. ***Table 4*** summarizes the interpolated flow values to ensure that flow change locations result in less than 10% change (interpolated values are denoted with an asterisks). These flow values were linearly interpolated for each cross section between know flow values. Additional flow change locations were added where the flow difference was 10% between the upstream known flow and the current interpolated flow (refer to ***Appendix B*** for detail calculations).

Table 4 – Interpolated flow change locations

Reach	RS	100yr Flow (m^3/s)
wc5	2388.964	6.90
	1986.134 *	7.62
	1602.883 *	8.31
	1320.692	8.82
	1131.031 *	9.58
	951.897	10.30
	680.8133	11.00
	518.7136	11.90
wc6	2457.382	7.98
	2096.869 *	8.50
	1611.292	9.20
	947.3374	8.79
5&6combined	50	23.90
wc6.1	1815.549	1.64
	1618.352 *	1.92
	1420.606 *	2.19
	1346.971 *	2.30
	1166.891	2.55
wc6.3	1400.84	0.70
	1350.769 *	0.79
	1290.277 *	0.90
	1100 *	1.24
	991.783	1.43

Normal depth has been assumed as the starting downstream boundary condition for each watercourse. In order to evaluate the model sensitivity to downstream boundary conditions, an assumed starting water surface elevation was also used in the HEC-RAS for the "known water surface elevation" input parameter: Culvert Master was used to evaluate the maximum potential headwater elevation at the QEW crossing for each of the secondary watercourses to use as a

conservative estimate for a boundary condition. Refer to ***Appendix F*** for the Culvert Master modelling results and assumptions. Since the hydraulic model for the primary watercourses extended downstream of the QEW, a spill elevation was identified based on the City's DTM. ***Table 5*** summarizes the downstream boundary conditions for each boundary condition assumption.

Table 5 – Summary of downstream boundary conditions

Reach	Normal Depth (m/m)	* Known Water Level
5&6 combined	0.005	78.80
6.1	0.005	81.00
6.3	0.007	80.10

* Known water level for 5&6 combined reach based on downstream spill point and for 6.1/6.3 based on Culvert Master analysis.

4.1.3 Potential Spills

As noted in previous sections, the HEC2 model simulated two existing conditions scenarios: no spills out of the model and with spills using lateral weirs and split flow analysis. The FDRP mapping is based on the "with spills" scenario. Split flow analysis was used to estimate the flow sinks from the spill locations, which reduced the downstream flow values depending on the weir geometry assumed at each potential spill location. The model incorporated lateral weirs at the following locations to simulate the effects of potential spills out of the watercourse:

- Watercourse 5.0: spilling west between Arvin Ave and QEW;
- Watercourse 6.0: spilling east and west between QEW and Lake Ontario;
- Watercourse 6.0: spilling east and west, immediately upstream of QEW; and
- Watercourse 6.0: spilling east immediately upstream of South Service Rd.

The FDRP flows downstream of Arvin Avenue were reduced by approximately 40% on Watercourse 5.0 and by more than 50% on Watercourse 6.0 as a result of the split flow analysis.

Depending on the results of the revised existing conditions floodplain mapping, lateral weirs will also be incorporated into the HEC-RAS model where necessary to evaluate the effects of spills in

relation to the objectives of this study. The City's DTM data will be used to determine the weir geometry affecting spills out of the watercourse system.

4.2 Summary of Modelling Results (Updated Existing Conditions)

4.2.1 Downstream Boundary Conditions

With respect to the primary watercourses, the more conservative boundary condition (i.e. known water level) results in higher head (approximately 0.4m of additional head) acting on the QEW crossing. However, this crossing does not overtop under either boundary assumptions and does not appear to adversely impact the hydraulic performance of this crossing. The water surface profile from both boundary assumptions (i.e. normal depth and known water surface elevation) converged at approximately 94m upstream of the QEW crossing and approximately 198m downstream of the South Service Road crossing.

With respect to Watercourse 6.1, the water surface profile from both boundary assumptions (i.e. normal depth and known water surface elevation) converged approximately 164m upstream of the last cross section in the model. The most downstream crossing is located approximately 285m upstream of the point of convergence. Similarly for Watercourse 6.3, the water surface profile from both boundary assumptions (i.e. normal depth and known water surface elevation) converged approximately 167m upstream of the last cross section in the model. The most downstream crossing is located approximately 365m upstream of the point of convergence.

Based on these results, it was determined that downstream boundary conditions would not have a significant effect on the analysis of crossings within the study area (refer to ***Appendix E*** for the HEC-RAS output).

4.2.2 Evaluation of Potential Spill Locations

The updated existing conditions floodplain mapping identified similar potential spill locations as the FDRP mapping:

- on Watercourse 5.0 between Arvin Avenue and South Service Road, potentially spills west of and north along Fruitland Road;
- on Watercourse 6.0 upstream of the CN rail crossing, potentially spills west onto Jones Road;
- on Watercourse 6.0 upstream of the CN rail crossing, potentially spills east along the rail embankment;
- on Watercourse 6.0 upstream of the South Service Road crossing, potentially spills west into a low lying area;
- on Watercourse 6.1 at Arvin Avenue, potentially spills northwest beyond the current terminus of Arvin Avenue cul-de-sac; and
- on Watercourse 6.1 upstream of the CN rail crossing, potentially spills west along the rail embankment.

It is difficult to properly characterize the lateral extent of the spill areas given that HEC-RAS is a one-dimensional model. However, later weirs were coded into the hydraulic model to evaluate the effects of significant spill locations at the following locations:

- Watercourse 5, west bank between Arvin Avenue and South Service Road;
- Watercourse 6, west bank upstream of South Service Road; and
- Watercourse 6, west bank upstream of CNR.

Figure 2 compares the updated floodplain without spills and with spills. The flood extents have been significantly reduced upstream and downstream of the CN Rail due to the flow reduction from the split flow analysis. The changes in flow values further downstream resulted in minor differences between the two floodplain scenarios.

Since the lateral weirs have a similar flow reducing effect under both the existing and future scenarios, the inclusion of the weirs do not effect the primary objective of the hydraulic study, which is to evaluate potential improvements from crossing upgrades. The inclusion of lateral weirs in the hydraulic model does not appear to conservatively identify areas of flood risks in the context of the secondary planning process. As such, lateral weirs have been excluded from further modelling considerations. ***Appendix E*** provides a detailed summary table comparing existing spill and no spill scenarios.

4.2.3 Mapping Results

Figure 3 illustrates the FDRP floodplain and the updated existing floodplain (no spills). The updated floodplain extents are generally less than the floodplain generated from the FDRP mapping. These differences could be attributed to generally lower upstream flows, improved crossing hydraulics at QEW, and updated resolution topographic information. Further updates to existing crossing geometry and varying roughness coefficient contributed to differences as well. Notwithstanding these differences, the updated existing flood line is intended to serve as the baseline conditions for comparison to proposed crossing improvements.

With respect to the secondary watercourses, ineffective flow areas were also identified based on topography, which did not appear to be used for flow conveyance in the HE-RAS model. These areas include:

- Watercourse 6.1: west bank, downstream of Barton Street (refer to HEC-RAS section 1618); and
- Watercourse 6.1: west bank, at Arvin Avenue (refer to HEC-RAS section 1420).

The floodplain for Watercourse 6.3 appeared to be fairly confined to within the channel banks.

The detailed HEC-RAS summary table for the updated existing conditions hydraulics is in ***Appendix E***. Map sheets (1:2000) have been prepared to illustrate the updated existing conditions floodplain. Refer to Sheets 1 to 7 in ***Appendix G***.

4.3 Summary of Modelling Results (Future Conditions)

Figure 4 compares the future conditions regulatory floodplain and the updated existing conditions floodplain. The recommended crossing improvements resulted in a significant reduction in the regulatory floodplain between Barton Street and the CN rail for all watercourses. Specifically at the rail crossings for Watercourse 6.0 and 6.3, the improved conveyance through the rail corridor significantly reduced the backwater affect of the large rail berm and lowered the 100 year levels by more than 1m. More modest reductions were observed for the CN Rail crossings on Watercourses 5.0 and 6.1.

Channel improvements along Watercourses 5.0 and 6.0 were also evaluated upstream and downstream of the CN Rail crossings assuming larger channel geometry. ***Appendix E*** contains a detailed comparison between the culvert improvement only scenario and the culverts/channel improvement scenario. Channel improvements resulted in a minor reduction in water surface elevation (reductions less than 0.3m in most locations) but had a negligible reduction in the lateral extent of the floodplain.

Table 6 compares the 100 year water levels for each recommended crossing improvement under existing and future conditions. The table also summarizes the results from the draft EA document. As noted in Section 4.1.2, the draft EA document assumed similar flows from the MDP, which are similar to the flow values used for the FDRP mapping. The draft EA results should be updated to reflect the updated flows and results of this study. However, these values have been included to illustrate that the hydraulic analysis developed through the EA process generally remains valid since both methods demonstrated improved water surface elevations at the same culvert location.

Table 6- Comparison of the 100yr water levels under existing and future conditions.

Reach	Crossing Location	HECRAS River Sta	WSEL (m) Existing	WSEL (m) Future	DIFF to Existing (m)	WSEL (m) EA results	Diff to Future (m)
wc5	xing Fruitland, north of Hwy 8	2240.61	93.23	93.16	-0.07	n/a	n/a
wc5	xing Barton, east of Fruitland	1307.9	87.36	87.17	-0.19	86.61	0.56
wc5	xing Arvin, east of Fruitland	937.1887	83.65	83.65	0.00	83.20	0.45
wc5	xing CNR, east of Fruitland	655	83.02	82.71	-0.31	82.00	0.71
wc5	xing SouthService RD, east of Fruitland	503.04	81.83	81.60	-0.23	81.50	0.10
wc5	xing QEW, plus ramps	215	78.75	78.75	0.00	78.69	0.06
wc6	xing Barton, east of Jones, twin culverts	1598.12	86.67	86.55	-0.12	85.61	0.94
wc6	xing CNR, east of Jones	939.548	84.59	83.51	-1.08	83.96	-0.45
wc6	xing SouthService RD, east of Jones	549.12	80.92	80.93	0.01	80.83	0.10
wc6	xing QEW	315	79.93	79.93	0.00	n/a	n/a
wc6.1	xing Barton, west of Glover	1778.1	88.57	88.29	-0.28	87.65	0.64
wc6.1	xing Arvin, west of Glover	1393.68	86.86	85.31	-1.55	85.88	-0.57
wc6.1	xing CNR, west of Glover	1154.78	84.24	83.35	-0.89	83.95	-0.60
wc6.3	xing Arvin, east of Glover	1364.866	87.58	87.23	-0.35	86.39	0.84
wc6.3	xing CNR, east of Glover	982.657	85.03	83.77	-1.26	84.61	-0.84

* Elevations provided refer to water levels upstream of the structure.

The detailed HEC-RAS summary table for the future conditions hydraulics is provided in ***Appendix E***. The updated detailed (with section locations, ID, and water levels) future floodplain mapping (1:2000 scale) is illustrated on Sheets 8 to 13 in ***Appendix G***.

5. Additional Design Considerations and Studies

Table 7 summarizes the proposed crossings improvements for implementation pending the finalization and approval of the Class EA Study. This revised set of recommendations will be appended to the EA study and to complete Phase 2 of the EA process and issuance of the Notice of Study Completion. Although it differs slightly from the original EA recommended alternative, the revised recommendations were necessary to account for changes in flow inputs and to factor recent planning processes undertaken by the City.

Table 7 - Summary of recommended crossing improvements

Watercourse ID	Crossing Location	Recommendation
5.0	xing Hwy 8, west of Fruitland	Maintain existing structure
	xing Fruitland, north of Hwy 8	Replace with 1500x1000 CONC BOX
	xing Barton, east of Fruitland	Replace with 2400x1500 CONC BOX
	xing Arvin, east of Fruitland	Maintain existing structure
	xing CNR, east of Fruitland	Replace with 2400x1500 CONC BOX
	xing SouthService RD, east of Fruitland	Replace with 3600x1800 CONC BOX
	xing QEW, plus ramps	N/A
	xing North Service RD	Maintain existing structure
6.0	xing Hwy 8, west of Jones	Maintain existing structure
	xing Barton, east of Jones, twin culverts	Replace with 2000x1000 CONC BOX
	xing CNR, east of Jones	2400x1500 CONC BOX
	xing SouthService RD, east of Jones	Maintain existing structure
	xing QEW	N/A
	xing North Service RD	Maintain existing structure
	Diversion culvert (QEW)	N/A
6.1	xing Barton, west of Glover	Replace with 1750x750 CONC BOX
	xing Arvin, west of Glover	Replace with 2100x1200 CONC BOX
	xing CNR, west of Glover	Replace with 1350dia CONC PIPE
6.3	xing Arvin, east of Glover	Replace with 1750x750 CONC BOX
	xing CNR, east of Glover	Replace with 2100x1200 CONC BOX

As each crossing improvement proceeds to implementation, additional considerations should be given during detailed design:

- minimum acceptable level of service for each crossing;
- fluvial geomorphology impacts and fish passage;
- erosion and sediment control
- structural design;
- employment lands north of Barton Street;
- consultation with CN Rail for any improvements within the rail corridor; and
- consultation with Agencies (e.g. HCA) to obtain relevant permits for the proposed works.

6. Conclusions and Recommendations

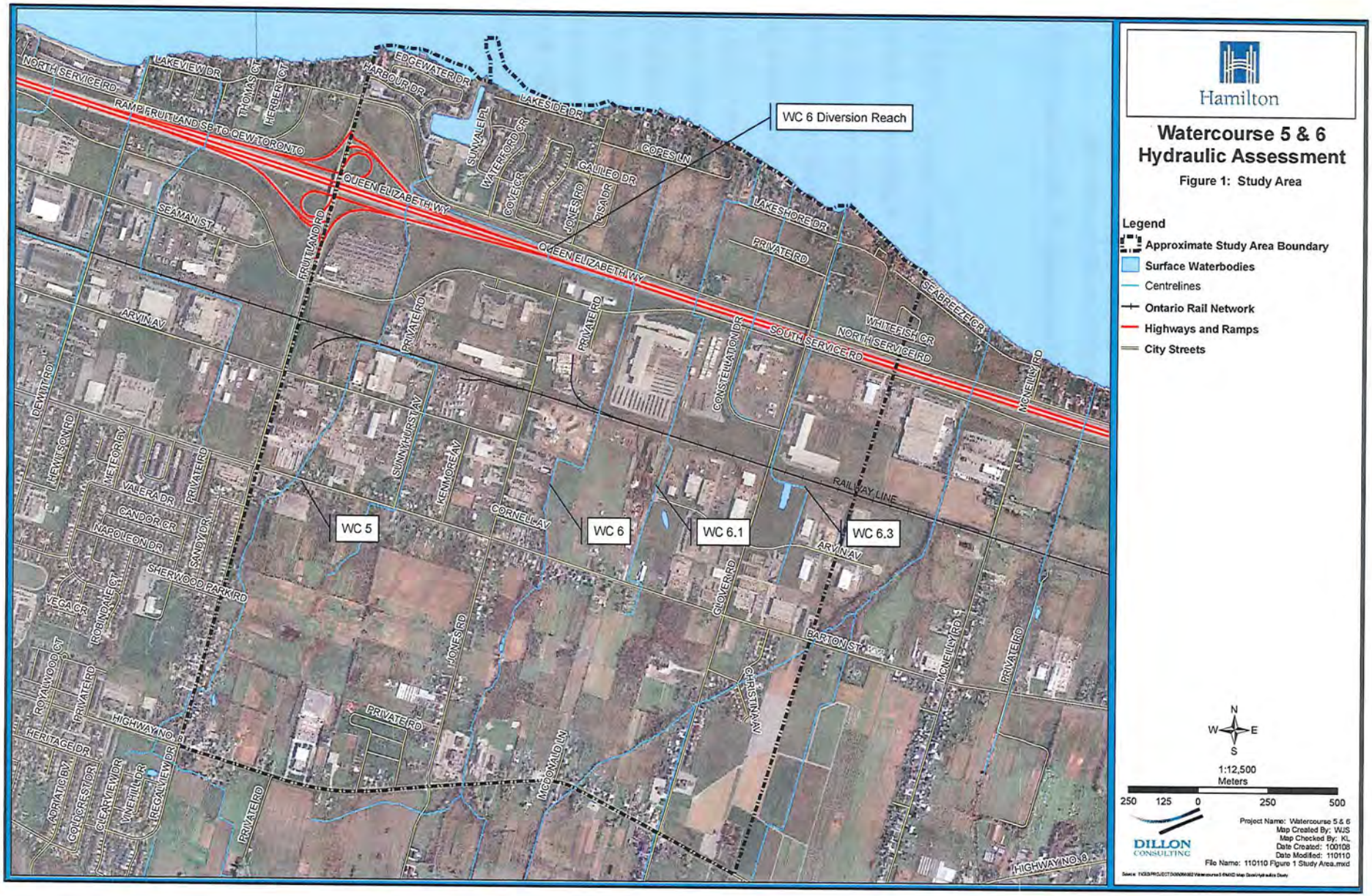
The updated existing conditions hydraulic assessment was generally in good agreement with the previous FDRP mapping in the upstream reaches of the primary watercourses. Greater differences were recorded downstream as result of the flow reduction and culvert improvements at the QEW crossing. Additional discrepancies between the two floodplain assessments could be reasonably explained by the updated hydrology, hydraulic improvements completed since the FDRP study, and availability of recent, improved topographic information. The future conditions hydraulic assessment demonstrated that the recommended crossing improvements could potentially improve existing flooding issues, although channel improvements had a negligible impact to the lateral extent of the floodplain. Although this conclusion deviates from the recommended draft EA alternative, the general findings from this study support the previous technical analysis completed for the EA, despite the use of an alternative model (i.e. HEC-RAS versus Culvert Master). Pending the finalization and approval of the EA study, additional detailed design would be required for each recommended crossing improvement.

We recommend that that the results of this hydraulic assessment be incorporated into the EA document for finalization and issuance of the notice of completion.

Respectfully submitted:

Whitney Szabo, MSc (Eng.), LEED AP
Water Resources EIT

Ken Luong, P. Eng.
Water Resources Engineer



Hamilton

Watercourse 5 & 6 Hydraulic Assessment

Figure 1: Study Area

Legend

- Approximate Study Area Boundary
- Surface Waterbodies
- Centrelines
- Ontario Rail Network
- Highways and Ramps
- City Streets

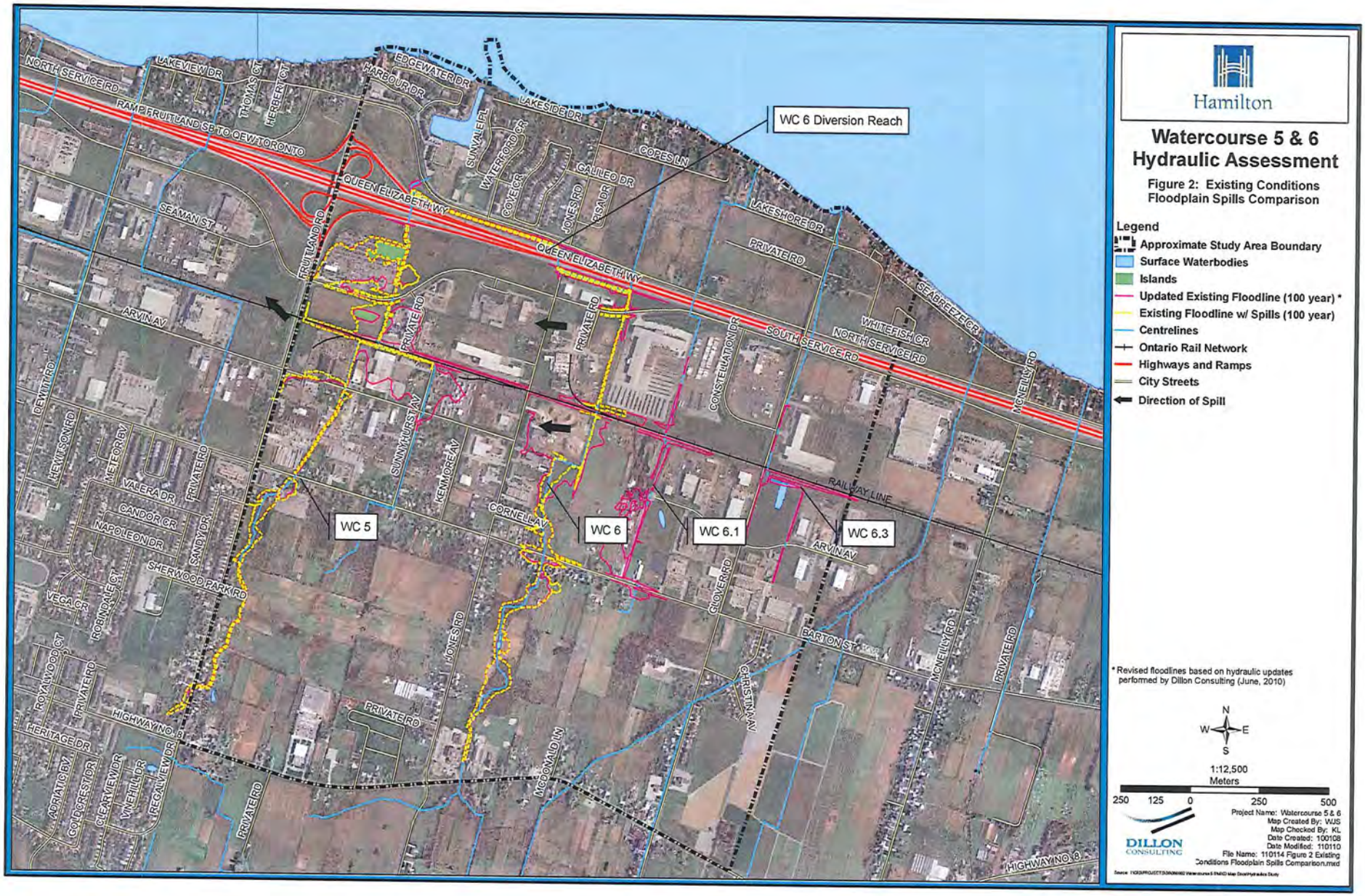
N
W E
S

1:12,500
Meters

250 125 0 250 500

DILLON CONSULTING

Project Name: Watercourse 5 & 6
Map Created By: WJS
Map Checked By: KL
Date Created: 100108
Date Modified: 110110
File Name: 110110 Figure 1 Study Area.mxd



Hamilton

Watercourse 5 & 6 Hydraulic Assessment

Figure 2: Existing Conditions Floodplain Spills Comparison

Legend

- Approximate Study Area Boundary
- Surface Waterbodies
- Islands
- Updated Existing Floodline (100 year) *
- Existing Floodline w/ Spills (100 year)
- Centrelines
- Ontario Rail Network
- Highways and Ramps
- City Streets
- Direction of Spill

* Revised floodlines based on hydraulic updates performed by Dillon Consulting (June, 2010)

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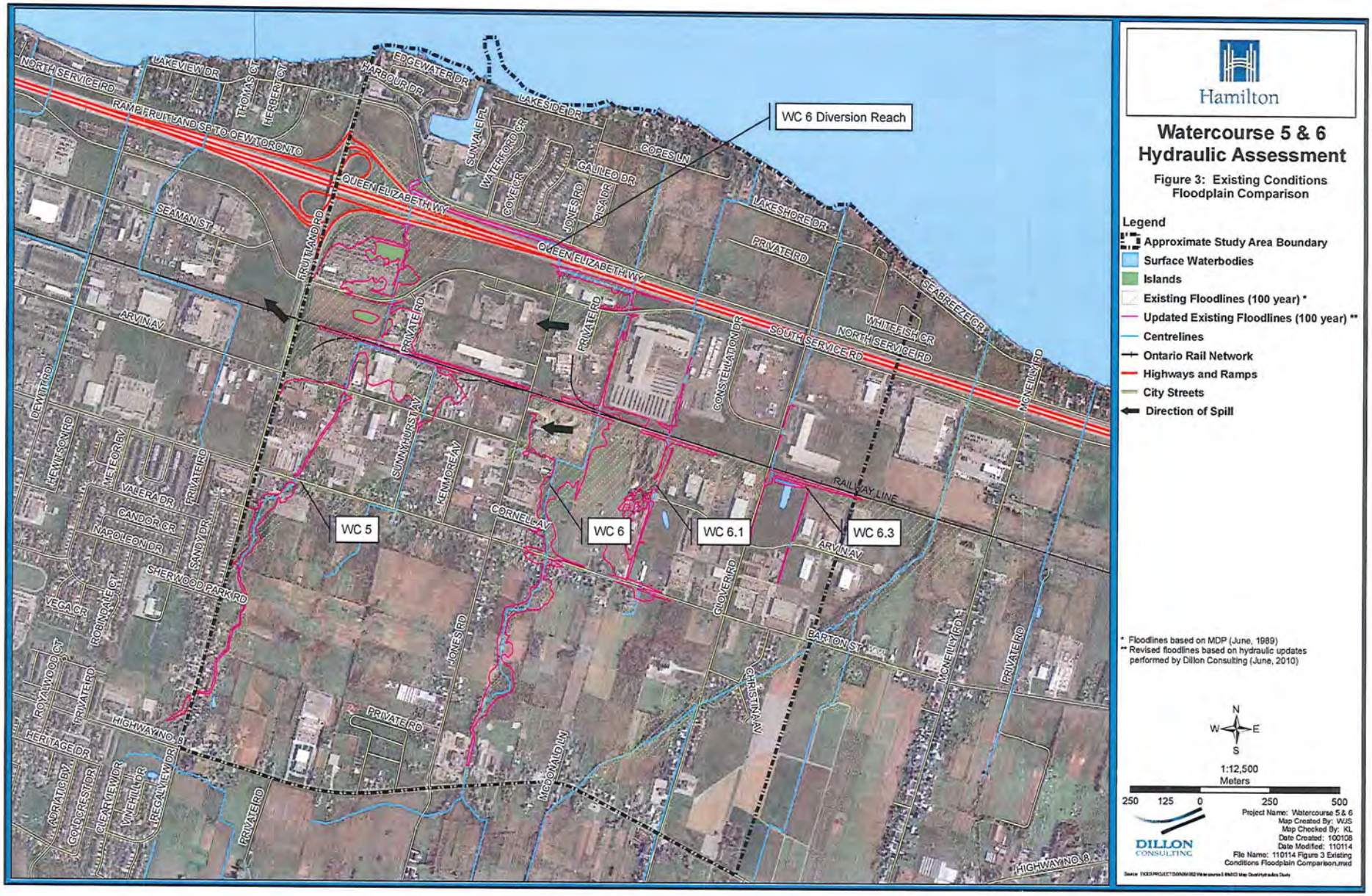
1:12,500
Meters

250 125 0 250 500

DILLON CONSULTING

Project Name: Watercourse 5 & 6
Map Created By: VJS
Map Checked By: KL
Date Created: 100108
Date Modified: 110110
File Name: 110114 Figure 2 Existing Conditions Floodplain Spills Comparison.mxd



Hamilton

Watercourse 5 & 6 Hydraulic Assessment

Figure 3: Existing Conditions Floodplain Comparison

Legend

- Approximate Study Area Boundary
- Surface Waterbodies
- Islands
- Existing Floodlines (100 year) *
- Updated Existing Floodlines (100 year) **
- Centrelines
- Ontario Rail Network
- Highways and Ramps
- City Streets
- Direction of Spill

* Floodlines based on MDP (June, 1989)
** Revised floodlines based on hydraulic updates performed by Dillon Consulting (June, 2010)

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W E
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1:12,500
Meters

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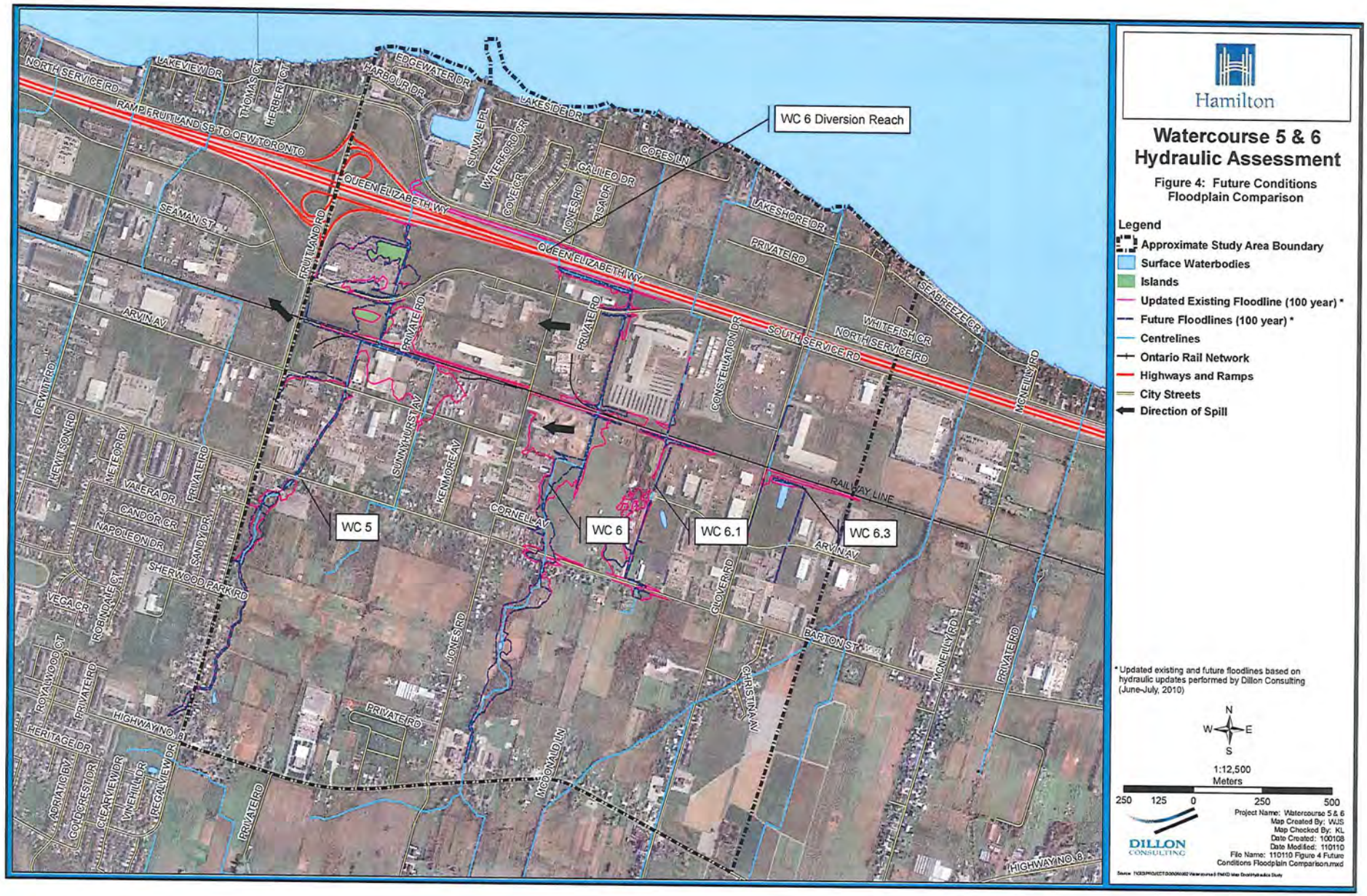
DILLON CONSULTING

Project Name: Watercourse 5 & 6
Map Created By: WJS
Map Checked By: KL
Date Created: 100108
Date Modified: 110114
File Name: 110114 Figure 3 Existing Conditions Floodplain Comparison.mxd


WC 6 Diversion Reach
WC 5
WC 6
WC 6.1
WC 6.3
NORTH SERVICE RD
LAKEVIEW DR
THOMAS CT
HERBERT CT
EDGEWATER DR
HARBOUR DR
LAKESIDE DR
RAMP FRUITLAND SB TO QEW TORONTO
QUEEN ELIZABETH WY
SUNNYLEIGH CR
WATERFORD CR
COVE CR
JONES RD
GALILEO DR
RISA DR
COPES LN
LAKESHORE DR
PRIVATE RD
SEABREEZE CR
WHITEFISH CR
SEAMAN ST
FRUITLAND RD
ARVIN AV
DEWITT RD
HEWITSON RD
METEOR RD
VALERA DR
CANDOR CR
NAPOLEON DR
SANDY DR
SHERWOOD PARK RD
VEGA CR
ROBINDALE CT
ROYALWOOD CT
HERITAGE DR
ADRIATIC CT
CONCORDE DR
CLEARVIEW DR
VINEHILL DR
REGAL VIEW DR
HIGHWAY NO. 8
SUNNYHURST AV
KENMORE AV
CORNELL AV
CONSTELLATION CR
SOUTH SERVICE RD
NORTH SERVICE RD
MCNEILLY RD
RAILWAY LINE
CLOVER RD
BARTON ST
CHRISTINA N
MCDONALD LN
Hamilton
Watercourse 5 & 6
Hydraulic Assessment
Figure 4: Future Conditions
Floodplain Comparison
Legend
Approximate Study Area Boundary
Surface Waterbodies
Islands
Updated Existing Floodline (100 year) *
Future Floodlines (100 year) *
Centrelines
Ontario Rail Network
Highways and Ramps
City Streets
Direction of Spill
* Updated existing and future floodlines based on hydraulic updates performed by Dillon Consulting (June-July, 2010)
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Meters
250 125 0 250 500
DILLON CONSULTING
Project Name: Watercourse 5 & 6
Map Created By: WJS
Map Checked By: KL
Date Created: 100108
Date Modified: 110110
File Name: 110110 Figure 4 Future Conditions Floodplain Comparison.mxd

Appendix A
Culvert Inventory Spreadsheet
and Photo Inventory

Waterway Opening Dimensions

XING ID	Point#D/S	Point # U/S	Location	Type	Length (m)	Width (mm)	Height/Diameter (mm)	U/S Inv	D/S Inv	Comments
WC5-8	145	144	xing Hwy 8, west of Fruitland	Conc Box	37.7	1830.00	1440.00	94.29	94.44	XING not modelling
WC5-7	47	46	xing Fruitland, north of Hwy 8	Conc Box	32.7	1200.00	950.00	91.98	92.00	
WC5-6	32	7	xing Barton, east of Fruitland	Conc Box	20.3	1860	1035	85.29	85.23	u/s (south) entrance is limited by CSP opening (2060x1400)
WC5-5	5	6	xing Arvin, east of Fruitland	Conc Box	15.2	4300	1400	82.50	82.60	
WC5-4	40		xing CNR, east of Fruitland	Conc Box	11.1 (U/s,south)	1800	1540	81.14	n/a	Armour stone wing walls, steel/wood bridge deck
				extended section	6.7 (d/s, north)	2230	1450	n/a	81.10	cast-in-place conc structure
WC5-3	103	104	xing SouthService RD, east of Fruitland	CIP conc struc	27.2	3665	1400	80.16	80.14	
WC5-2	30	28	xing QEW, plus ramps	CIP conc struc	111.9	5000	1600	76.71	76.44	
WC5-1	26	27	xing North Service RD	CIP conc struc	38.1	5000	1760	75.88	75.58	XING not modelling
WC6-7	143	43	xing Hwy 8, west of Jones	Conc Box	35.50	2440.00	840.00	91.81	91.90	XING not modelling
WC6-6	34	35	xing Barton, east of Jones, twin culverts	East: CIP arch conc struc	18.5	1250	1400	84.78	84.70	u/s extended with box CIP conc struct, d/s end extended with CSP (1300x1000)
	33	36		West: elliptical CSP	20.2	1880	1310	84.90	84.82	
WC6-5	138	137	xing CNR, east of Jones	CSP	24.70	n/a	1150	82.08	81.97	
WC6-4	2	1	xing SouthService RD, east of Jones	CIP conc struc	23.8	3050	1500	79.63	79.48	
WC6-3			xing QEW	CIP conc struc		3860	1200			XING not modelling - flows diverted to WC5
WC6-2	21		xing North Service RD			2960	1100			XING not modelling - flows diverted to WC5
WC6-1	25	24	Diversion culvert	Conc Box	71.00	3860	1130	78.53	77.84	
WC6.1-6	10	9	xing Barton, west of Glover	CSP	18.8	n/a	600	87.63	87.47	
WC6.1-5	11	12	xing Arvin, west of Glover	CSP	46.7	n/a	900	84.57	84.22	twin barrels? Need picture
WC6.1-4	39	38	xing CNR, west of Glover	Stone opening	13.7	1000	650	81.98	81.99	open area for U/S. D/S open area is 880x900
WC6.1-3	23	19	xing SouthService RD, west of Glover	CIP conc struc	93.70	2440	1400	79.58	79.26	
WC6.1-2			xing QEW	Conc Box	?	2400	1800	?	?	XING not modelling
WC6.1-1			xing North Service RD	CIP conc struc	?	2440	1300	?	?	XING not modelling
WC6.2-3	17	20	xing SouthService RD, east of Constellation	elliptical CSP	95	1300	1500	79.05	79.05	XING not modelling
WC6.2-2	?	?	xing QEW	Conc Circular	?	n/a	1200	?	?	XING not modelling
WC6.2-1	?	?	xing North Service RD	CIP conc struc	?	1200	1200	?	?	XING not modelling
WC6.3-5	14	13	xing Arvin, east of Glover	PVC	25.2	n/a	730	86.8	86	inlet has 1220x630 DICB
WC6.3-4	16	15	xing CNR, east of Glover	cast iron pipe	12.6	n/a	750	83.62	83.54	
WC6.3-3	18	29	xing SouthService RD, east of Glover	CIP conc struc	94	1830	1200	79.22	78.59	
WC6.3-2	?	?	xing QEW	Conc culvert (open bottom)	?	1800	1200	?	?	XING not modelling
WC6.3-1	?	?	xing North Service RD	CIP conc struc	?	1830	900	?	?	XING not modelling

Notes:

1. Height measured from soffit to streambed
2. Inverts based on survey data provided by City of Hamilton (drawing file: WaterCourse5-6.dgn)
3. Lengths measured from survey drawing where possible

WATER COURSE No. 5 and 6 CLASS EA

(Stoney Creek)

HUE No:	CONTRACT No. PW-06-05 (S) DRAWING No. 05 S-10	SHEET No 1 OF 6
DIMENSIONS SHOWN ON THIS PLAN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED		

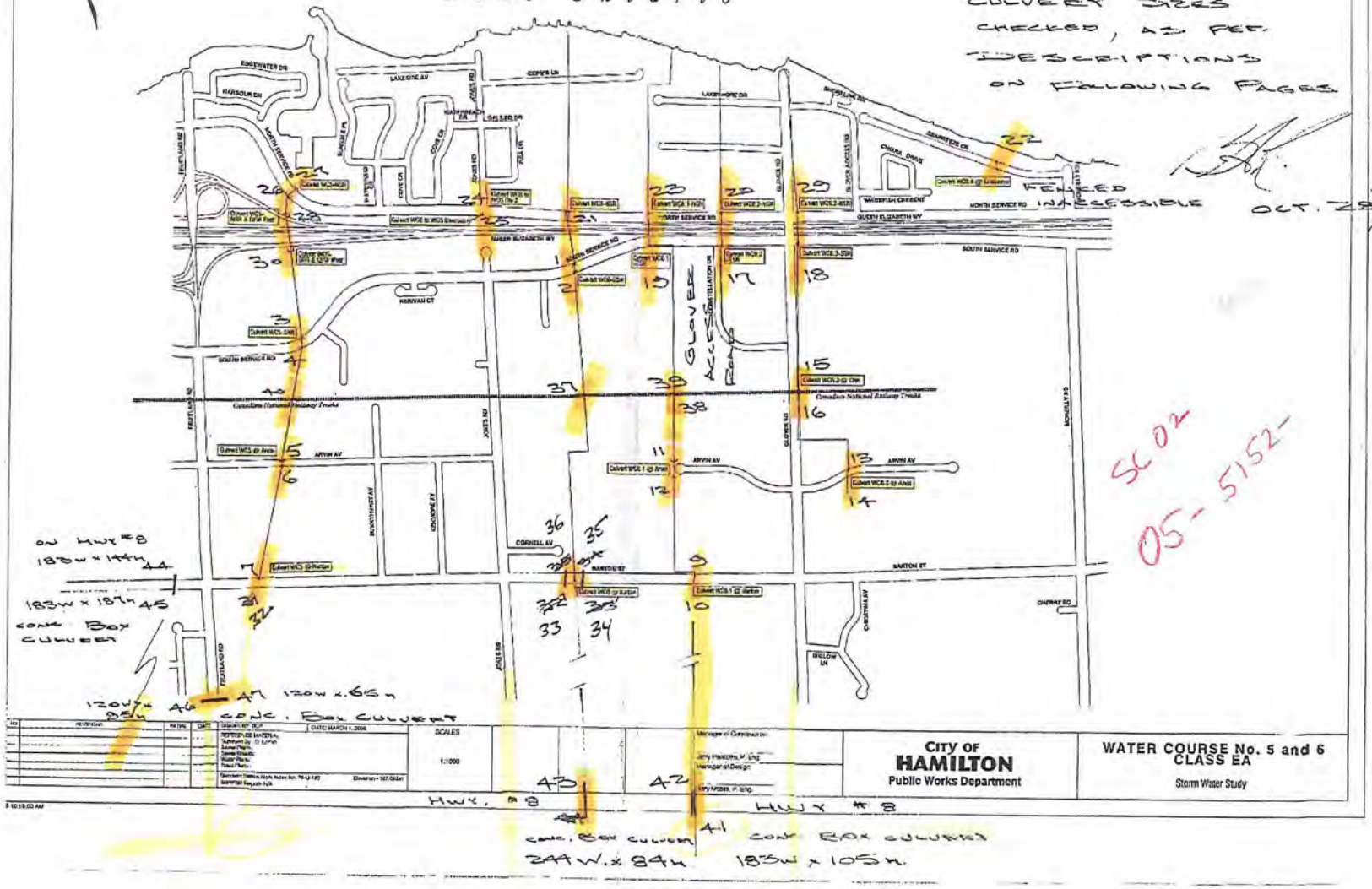


Table 2.1 – Status Primary Watercourse Crossings (December 2006)

Crossing ID	Location	Crossing Type and Opening Size	MDP Recommendation	MDP Recommendation Status	QEWDR Recommendation	QEWDR Recommendation Status	Hydraulic Assessment*	Structural Inspection and Visual Observations	Structural Recommendations
WCS-6	Barton St	Non-rigid frame concrete culvert at north end with opening 1860 mm wide by 1035mm high from soffit to streambed · CSP at south end 2060 mm x 1400 mm · Culvert built in 1934	Replace/upsize culverts	Not implemented	Beyond study	n/a	Q_{100} not conveyed Flooding Problems	· Soffit deteriorated with rust from reinforcing steel · west wall is honeycombed and there is a void approx. 1m wide x 300mm high to a maximum depth of 270mm	· Replacement
WCS-5	Arvin St	Pre-cast concrete culvert · opening 4300mm wide by 1290mm high · Length 15.06m	Lower/underpin culvert	Not implemented	Beyond study	n/a	· Q_{100} not conveyed · Flooding Problems	· Barrel generally in good condition. · Two areas of delamination on soffit near the south end (~1.5m^2) no cover over culvert, asphalt roadway an handrail at each end of culvert Silted in	Repair of delaminated soffit possible
WCS-4	CNR	· South 11.1m length of culvert directly under railway tracks consists of armour stone walls with steel and concrete top slab. Opening dimensions, 1800mm wide by 1540mm high from soffit to streambed · North 6.7 m of culvert is a cast-in-place concrete box, with opening dimensions, 2230 mm wide and 1450 mm high from soffit to streambed.	Replace/upsize culverts	Not implemented	Beyond study	n/a	· Q_{100} not conveyed Flooding Problems	Good condition	· n/a
WCS-3	SSR	· Non-rigid frame, cast-in-place concrete. · Opening dimensions, 3665 mm wide by 1400 mm high from soffit to streambed. · Approximately 27° skew. · Total length of culvert 27.4m	Lower/underpin culvert	Not implemented	Beyond study	n/a	Q_{100} not conveyed Flooding Problems	· Three areas of delamination on the soffit (~7.4m^2) Wide crack on soffit and walls with exposed rebar on soffit at 15.2m from south end. Leaching crack at 24.6m from south end . · North end of culvert has chipped corner 470mm x 200mm.	· Repair of deteriorated concrete possible with replacement of 1.5m wide section at 15.2m from south end and waterproofing.
WCS-2	QEW (including ramps)	· Cast-in-place concrete culvert constructed 1994. Opening dimensions, 5000 mm wide by 1600 mm high from soffit to streambed.	Replace/upsize culverts	Not implemented	Replace/upsize culvert	Implemented	Q_{100} conveyed	· Good Condition	n/a
WCS-1	NSR	· Cast-in-place concrete box culvert · Opening dimensions, 5000 mm wide by 1760 mm high.	Provide additional culvert	Not implemented	Provide additional culvert	Not implemented	Q_{100} not conveyed***	Good Condition	n/a
	Marina Outlet	· Two concrete box culverts · Opening dimensions, 3970mm by 1200 mm · Opening dimensions, 1520mm x 850mm	No recommendation	n/a	No recommendation	n/a	Q_{100} not conveyed***	· Good Condition	n/a

Table 2.1 – Status Primary Watercourse Crossings (December 2006)

Crossing ID	Location	Crossing Type and Opening Size	MDP Recommendation	MDP Recommendation Status	QEWDR Recommendation	QEWDR Recommendation Status	Hydraulic Assessment	Structural Inspection and Visual Observations	Structural Recommendations
WC6-6	Barton St	Two existing culverts side by side with west culvert a CSP and the east culvert a cast-in-place concrete culvert with CSP at the north end. West CSP culvert opening is 1880mm wide and 1310mm high · East concrete culvert opening is 1250mm wide and 1400mm high. The original concrete culvert was extended with a non-rigid-frame at the south end and also extended at the north end with a CSP (1300mm by 1000mm) placed under the sidewalk. · Total length of culvert 18.5m	Replace/upsize culverts	Not implemented	Beyond study	n/a	Q_{100} not conveyed · Flooding Problems	Original concrete culvert deteriorated. CSP culvert has a bulge at the north end under the sidewalk (one CSP section wide by approximately 1.5m long).	Replacement
WC6-5		· CSP culvert · Opening dimensions 1150mm diameter	Replace/upsize culverts	Could not confirm	Beyond study	n/a	Q_{100} not conveyed · Flooding Problems	Good Condition	· n/a
WC6-4	SSR	· Concrete cast-in-place non-rigid frame culvert · Opening dimensions, 3050mm wide by 1500mm high · Total length of culvert 23.8m	Lower/underpin culvert	Not implemented	Beyond study	n/a	Q_{100} not conveyed · Flooding Problems	Two locations with narrow leaching cracks on soffit and walls. · At 9.1m from north end rebar is exposed the full width of the soffit with a leaching crack on both walls and delamination 300mm wide.	Repair of deteriorated concrete possible with 1m wide replacement at 9.1m from north end and waterproofing
WC6-3	QEW	Concrete cast-in-place culvert. Opening dimensions, 3860mm wide by 1130mm height from soffit to streambed.	No recommendation**	n/a	No recommendation**	n/a	· n/a	Good Condition	n/a
WC6-2	NSR	· Concrete box culvert · Opening dimensions 2960 mm by 1100mm	No recommendation**	n/a	No recommendation**	n/a	· n/a	No Inspection since flow diverted to WC 5.0	· n/a
WC6-1	Diversion Culvert 1	· Concrete box culvert Opening dimensions 3970mm by 1200mm	Not existing at time of study	Implemented after the study	Not existing at time of study	Implemented after the study	Q_{100} conveyed	Good Condition	n/a
	Cope's Ln	Concrete Pipe 1000mm in diameter	No recommendations**	n/a	No recommendations**	n/a	Conveys minor system flows	· Good Condition	n/a

Notes:
n/a not applicable
* Hydraulic assessment based on FDRP mapping (future 100 year flow) with the exception as noted ***
**Improvements not required since diversion recommended
***Includes diversion of WC5.1 and WC6.0 to WC5.0

Table 2.3 – Status Secondary Watercourse Crossings (June 2007)

Crossing ID	Location	Crossing Type and Opening Size	MDP Recommendation	MDP Recommendation Status	QEWDR Recommendation	QEWDR Recommendation Status	Hydraulic Assessment	Structural Analysis/ Visual Inspection	Structural Recommendations
WC6.1-6	Barton St	· 600mm diameter CSP under sidewalk and Barton Street Overall length of CSP under Barton St 15.0m	Beyond Study Area	n/a	Beyond Study Area	n/a	Q_{100} not conveyed	· Generally good condition · Slight deformation in CSP under Barton Street at approximately ⅓ length from each end	n/a
WC6.1-5	Arvin St	· At outlet, two 900mm diameter CSP with 300mm thick endwall and wingwalls at 45°. Northeast CSP outlet skewed goes to manhole in centre of Arvin Ave. Northwest CSP outlet goes to inlet. At inlet, single 900mm diameter CSP with 220mm thick endwall and wingwalls at 30°. · Overall culvert length 46.50m	No Recommendations**	n/a	Beyond Study Area	n/a	Q_{100} not conveyed	Concrete in good condition Outlets almost fully submerged Watercourse recently cleaned at outlet	· n/a
WC6.1-4	CNR	· At outlet, 880mm x 900mm stone opening with armour stone end walls · At inlet, 650mm x 1000mm stone opening with armour stone end walls. · Overall culvert length 13.59m	No Recommendations**	n/a	Beyond Study Area	n/a	· Q_{100} not conveyed	Stone in good condition	· n/a
WC6.1-3	SSR	· Opening dimensions 2440m m x 1400mm · Non-rigid frame, cast-in-place concrete culvert.	No Recommendations**	n/a	Replace and connect culverts	Implemented	· Q_{100} conveyed	· No access to culvert outlet Generally in good condition · Concrete spalled at southeast corner 150mm x 150mm Concrete scaling at southwest face Silted through full length	Should be cleaned
WC6.1-2	QEW	· Concrete box culvert Opening dimensions 2400mm x 1800mm	No Recommendations**		Replace and connect culverts	Implemented	Q_{100} conveyed	· NSR, QEW and SSR culverts connected together · Condition could not be determined · Unknown obstruction transverse through culvert at approximate mid-length of connected culverts	Should be cleaned
WC6.1-1	NSR	Opening dimensions 2440m m x 1400mm · Non-rigid frame, cast-in-place concrete culvert	No Recommendations**		Replace and connect culverts	Implemented	Q_{100} conveyed	· No access to culvert inlet · Generally in good condition. · Culvert silted through for full length.	Should be cleaned
WC6.2-3	SSR	Oval Pipe · Opening 1500mm x 1300mm · 370mm thick wingwalls and endwall at 45° skew to CSP	Replace/upsize culvert	Not Implemented	Replace and connect culverts	Not Implemented	Q100 conveyed Bridgeport Assessment · Sedimentation may limit conveyance d/s invert > u/s invert	· No access to culvert outlet · Distress in side of CSP at inlet · Unable to see through culvert Concrete in good condition	· Should be cleaned

Table 2.3 – Status Secondary Watercourse Crossings (June 2007)

Crossing ID	Location	Crossing Type and Opening Size	MDP Recommendation	MDP Recommendation Status	QEWDR Recommendation	QEWDR Recommendation Status	Hydraulic Assessment	Structural Analysis/ Visual Inspection	Structural Recommendations
WC6.2-2	QEW	Concrete culvert · 1200 mm dia	Replace/upsize culvert	Not Implemented	Replace and connect culverts	Not Implemented	· Q_{100} conveyed · Bridgeport Assessment Sedimentation may limit conveyance d/s invert > u/s invert	· No Access - condition could not be determined · Unknown obstruction transverse through culvert at approximate mid-length of connected culverts	· Should be cleaned
WC6.2-1	NSR	· Opening dimensions 1200mm x 1200mm Non-rigid frame, cast-in-place concrete culvert	Replace/upsize culvert	Not Implemented	Replace and connect culverts	Not Implemented	· Q_{100} conveyed Bridgeport Assessment Sedimentation may limit conveyance · d/s invert > u/s invert	· No access to culvert inlet · Generally in good condition Concrete spalled at northeast and northwest corners 450mm x 200mm Culvert heavily silted	· Should be cleaned
WC6.3-5	Arvin St	· 730mm dia PVC pipe · At inlet, 1220mm x 630mm DICB At outlet, 225mm thick endwall and wingwalls at 45° Overall culvert length 24.30m	No Recommendations**	n/a	Beyond Study Area	n/a	· Q_{100} not conveyed (existing)	· Concrete in good condition	· n/a
WC6.3-4	CNR	· 750mm dia cast iron pipe with armour stone end walls · Overall culvert length 12.7m	No Recommendations**	n/a	Beyond Study Area	n/a	· Q_{100} not conveyed (existing)	Stone in good condition	· n/a
WC6.3-3	SSR	· Non-rigid frame, cast-in-place concrete culvert · Opening dimensions 1830m m x 900mm	No Recommendations**	n/a	Connect to QEW culvert	Implemented	Q_{100} conveyed	· No access to outlet Generally in good condition. Minor spalled concrete at end of culvert	n/a
WC6.3-2	QEW	· Open concrete culvert · Opening dimensions 1800mm x 1700mm	No Recommendations**	n/a	Replace QEW culvert and connect to SR culverts	Implemented	· Q_{100} conveyed	· No access to culvert outlet Unknown obstruction transverse through culvert at approximate mid-length of connected culverts	Should be cleaned
WC6.3-1	NSR	Opening dimensions 1830mm x 900mm Non-rigid frame, cast-in-place concrete culvert	No Recommendations**	n/a	Connect to QEW culvert	Implemented	· Q_{100} conveyed	· No access to culvert outlet Generally in good condition Minor spalled concrete at end of culvert · Kink in alignment at ROW of QEW · Culvert heavily silted	· Should be cleaned

Notes:
n/a – not applicable since no recommendations made
* Hydraulic assessments based on previous studies where available and CuovertMaster analysis using MDP flows
** No analysis undertaken for proposed/new Bridgeport crossings
** No recommendations for crossings on WC 6.1 and WC 6.3 since diversion proposed

City of Hamilton Class EA for Watercourse 5 and Watercourse 6

Table G.1 Watercourse Crossings Upgrades

Watercourse 5.0 (Main Branch) and Watercourse 6.0

Crossing ID	Location	Crossing Description	Crossing Dimensions (m)	Existing Culvert Hydraulic Assessment	Previous Recommendation	Proposed Culvert Hydraulic Assessment***		New Recommendation	Proposed Culvert Hydraulic Assessment***	
						Flow (cms)	HW Elevn (m) 100 yr		Flow (cms)	HW Elevn (m) 100 yr
WC5-6	Barton Street N	Box	1.85 m x 1.0 m	Q_{100} not conveyed Flooding Problems	Replace with 2.4 x 1.5 m box Invert u/s 82.79	16.00	86.61	Replace with 2.4 x 1.5 m box Lower Invert u/s 82.79	16.00	86.61
	Barton Street S	CSP	2.06 m x 1.4 m							
WC5-5	Arvin Street	Box	4.3 m x 1.29 m	Q_{100} not conveyed Flooding Problems	Lower culvert - 4.3 m x 3.0 m Invert u/s 80.69	2.86	81	Replace with 3.6 x 2.1 m box Lower Invert u/s 80.69 m	17.29	83.2
WC5-4	CNR	Box	2.1 m x 1.45 m and 1.8 m x 1.54 m	Q_{100} not conveyed Flooding Problems	replace with 3.0 m x 1.5 m box Invert u/s 79.82	15.14	82.00	Replace with 3.0 m x 1.5 m box Lower Invert u/s 79.82	15.14	82.00
WC5-3	SSR	Box	3.60 m x 1.35 m	Q_{100} not conveyed Flooding Problems	Lower culvert - 3.6 m x 2.86 m Invert u/s 78.36	21.42	81.5	Replace with 3.6 m x 2.85 m Lower Invert u/s 78.36	21.42	81.5
WC5-1	NSR	Box	5.0 m x 1.8 m	Q_{100} not conveyed*	Add 2.1 m x 1.8 m cell	37.86	78.95	Add 3.6 m x 1.8 m cell Invert u/s 75.96 m	37.86	78.69
	Marina Outlet	2 Box	2.4 m x 1.5 m	Q_{100} not conveyed*	none			none		
WC6-6	Barton Street S	Box	1.25 m x 1.4 m	Q_{100} not conveyed Flooding Problems	Replace with 1.8 x 1.2 m box Invert u/s 83.20			Replace with 1.8 x 1.2 m box Lower Invert u/s 83.20		
	Barton Street S	CSP	1.88 m x 1.3 m							
	Barton Street N	CSP	1.88 m x 1.3 m							
	Barton Street N	CSP	1.3 m x 1.0 m			14.22	85.61		14.22	85.61
WC6-5	CNR	CSP	1.15 m dia	Q_{100} not conveyed Flooding Problems	Replace with 3.0 m x 1.8 m box Invert u/s 80.10	27.59	83.96	Replace with 3.0 m x 1.8 m box Lower Invert u/s 80.10	27.59	83.96
WC6-4	SSR	Box	3.05 m x 1.5 m	Q_{100} not conveyed Flooding Problems	Lower culvert - 3.06 m x 1.81 m Invert u/s 79.14	5.41	80.03	Replace with 3.6 m x 1.5 m Lower Invert u/s 78.80	13.82	80.83

Notes:

* Includes diversion of WC5.1 and WC6.0 to WC5.0

**Channel works also required to ensure proper drainage - need to plot existing/proposed profile

*** CulvertMaster modelling

ok size – flows conveyed

new size req'd to convey flows/eliminate flooding

City of Hamilton Class EA for Watercourse 5 and Watercourse 6
Table G.2 Watercourse Crossings Upgrades
Watercourse 6.1

Crossing ID	Location	Crossing Description	Crossing Opening Dimensions	Crossing Length (m)	U/S Invert Elevation (m)	D/S Invert Elevation (m)	Road Crest Elevation (m)	Tailwater Elevation (m)	Hydraulic Assessment	Proposed Culvert	Proposed Culvert Hydraulic Assessment***	
											Flow (cms)	HW Elevn (m) 100 yr
WC6.1-6	Barton Street	CSP	600mm dia	18.1	87.59	87.51	88.75	88.11	Q_{100} not conveyed	Replace with 2.1 x 0.91 box Lower Invert u/s 86.80 m	1.17	87.65
WC6.1-5	Arvin Street S	Conc. Pipe	900 mm dia									
	Arvin Street N	Two Conc. Pipe	1.0 m dia	46.0	84.76	84.42	86.75	85.32	Q_{100} existing not conveyed	Replace with 2.1 x 1.2 box Lower Invert u/s 84.76 m	3.15	85.88
WC6.1-4	CNR	Block	0.9 m x 1.05 m	18.0	81.83	81.69	84.90	82.93	Q_{100} existing not conveyed	Replace with 1.35 m dia Lower Invert u/s 81.38 m d/s 81.80 m	4.17	83.95

Watercourse 6.3

Crossing ID	Location	Crossing Description	Crossing Opening Dimensions	Crossing Length (m)	U/S Invert Elevation (m)	D/S Invert Elevation (m)	Road Crest Elevation (m)	Tailwater Elevation (m)	Hydraulic Assessment	Proposed Culvert	Proposed Culvert Hydraulic Assessment***	
											Flow (cms)	HW Elevn (m) 100 yr
	Arvin Street S	DICB	1.53 m x 0.97m									
WC6.3-5	Arvin Street N	Circ pipe	750 mm dia	24.4	86.11	86.02	87.84	86.72	Q_{100} existing not conveyed	Replace with 2.1 x 0.9 m box Lower Invert u/s 85.50 m d/s 85.40	1.58	86.39
WC6.3-4	CNR	Circ pipe	750 mm dia	15.0	83.65	83.60	85.70	84.35	Q_{100} existing not conveyed	Replace with 2.1 x 0.9 m box Lower Invert u/s 83.60 m d/s 83.50	2.63	84.61

Watercourse 6.2

Crossing ID	Location	Crossing Description	Crossing Opening Dimensions	Recommendation Status	Hydraulic Assessment	Previous Recommendation (MTO)	Crossing Length (m)	U/S Invert Elevation (m)	D/S Invert Elevation (m)	SSR Road Crest Elevation (m)	Proposed Culvert Hydraulic Assessment***	
											Flow (cms)	HW Elevn (m) 100 yr
WC6.2-3	SSR	Oval Pipe	1.5 m x 1.3 m	Not Implemented	Q_{100} conveyed (no Freeboard)	1.8 m x 1.2 m box Regrade Inverts u/s 78.4 m, d/s 78.2	94	78.4	78.2	80.99	5.41	80.6
WC6.2-2	QEW	Culvert	1200 mm dia	Not Implemented	Q_{100} conveyed (no Freeboard)							
WC6.2-1	NSR	Box Culvert	1.2 m x 1.2 m	Not Implemented	Q_{100} conveyed but sedimentation may limit conveyance (no Freeboard)							

No analysis undertaken for proposed/new Bridgeport crossings
Hydraulic Analysis based on a combination of previous studies and CulvertMaster analysis
Proposed culvert analysis using CulvertMaster
Assumed lengths or estimated based on FPM
Road elevation not available therefore estimated by adding 0.5 m to Top Elevation provided by City

Photo 27: Watercourse 5, North Service Rd crossing (downstream looking south)

Photo 26: Watercourse 5, North Service Rd crossing (upstream looking north)

Photo 28: Watercourse 5, QEW crossing (downstream looking south)

Photo 30: Watercourse 5, QEW crossing (upstream looking north)

Photo 3: Watercourse 5, South Service Rd crossing (downstream looking south)

Photo 4: Watercourse 5, South Service Rd crossing (upstream looking north)

Photo 40: Watercourse 5, CN Rail crossing (downstream looking south)

Photo 5: Watercourse 5, Arvin Ave crossing (downstream looking south)

Photo 6: Watercourse 5, Arvin Ave crossing (upstream looking north)

Photo 7: Watercourse 5, Barton St crossing (downstream looking south)

Photo 6: Watercourse 5, Arvin Ave crossing (upstream looking north)

Photo 7: Watercourse 5, Barton St crossing (downstream looking south)

Photo 31: Watercourse 5, Barton St crossing (upstream looking north)

Photo 47: Watercourse 5, Fruitland Rd crossing (downstream looking west)

Photo 18: Watercourse 6.3, South Service Rd crossing (upstream looking north)

Photo 15: Watercourse 6.3, CN Rail crossing (downstream looking south)

Photo 46: Watercourse 5, Fruitland Rd crossing (upstream looking east)

Photo 39: Watercourse 6.1, CN Rail crossing (downstream looking south)

Photo 38: Watercourse 6.1, CN Rail crossing (upstream looking north)

Photo 9: Watercourse 6.1, Barton St crossing (downstream looking south)

Photo 10: Watercourse 6.1, Barton St crossing (upstream looking north)

Photo 29: Watercourse 6.3, North Service Rd crossing (downstream looking south)

Photo 16: Watercourse 6.3, CN Rail crossing (upstream looking north)

Photo 13: Watercourse 6.3, Arvin Ave crossing (downstream looking south)

Photo 14: Watercourse 6.3, Arvin Ave crossing (upstream looking north)

Appendix B

SCUBE West Flow Data

SCUBE West Study
Preliminary Flows

Location	Flows					
	2	5	10	20	50	100
Watercourse 5.0						
Highway 8	0.93	1.53	2.08	2.77	4.31	6.05
Barton Street	1.31	2.16	2.93	3.86	5.42	6.9
Arvin Ave	1.56	2.53	3.4	4.43	6.23	8.82
CNR (total)	2.17	3.5	4.66	6	8.14	10.3
South Service Road	2.52	4	5.25	6.67	8.89	11
QEW (total)	2.89	4.54	5.9	7.43	9.8	11.9
North Service Road	5.06	8.05	10.6	13.5	18	23.9
Lake Ontario	5.06	8.05	10.6	13.5	18	23.9
Watercourse 6.0						
Barton Street	1.12	1.86	2.54	3.39	5.21	7.98
CNR	1.58	2.6	3.52	4.62	6.45	9.2
South Servic Road	1.72	2.82	3.81	4.99	6.94	8.79
QEW/Diversion	1.72	2.82	3.81	4.99	6.94	8.79
North Service Rd/Lake Ontario	0.11	0.17	0.22	0.27	0.34	0.4
Watercourse 6.1						
Barton Street	0.16	0.25	0.31	0.38	0.48	0.4
Arvin Ave						
CNR	0.44	0.69	0.88	1.09	1.39	1.64
South Service Road	0.66	1.04	1.34	1.66	2.14	2.55
QEW	0.66	1.04	1.34	1.66	2.14	2.55
North Service Rd/Lake Ontario	0.9	1.41	1.81	2.24	2.88	3.42
Watercourse 6.2						
South Service Rd	0.16	0.24	0.31	0.38	46	0.56
QEW	0.16	0.24	0.31	0.38	46	0.56
North Service Rd/Lake Ontario	0.23	0.35	0.45	0.54	0.69	0.8
Watercourse 6.3						
Arvin Road	0.16	0.26	0.34	0.43	0.57	0.7
CNR	0.16	0.26	0.34	0.43	0.57	0.7
South Service Road	0.36	0.57	0.74	0.92	1.2	1.43
QEW	0.36	0.57	0.74	0.92	1.2	1.43
North Service Rd/Lake Ontario	0.6	0.93	1.19	1.47	1.87	2.2
Lake Ontario	0.6	0.93	1.19	1.47	1.87	2.2
Watercourse 7.0						
HWY 8	1.04	1.67	2.23	2.88	3.94	4.92
Conference (West) - South of Barton St	1.26	2.02	2.69	3.46	5.56	8.3
HWY 8	0.63	1.1	1.6	2.29	3.63	5.11
Conference (East) - South of Barton St	1.1	1.81	2.48	3.31	4.76	6.18
Conference (Total) - South of Barton St	2.36	3.83	5.15	6.75	10.9	16.9
CNR	2.64	4.27	5.73	7.48	11.2	16.7
QEW	3.52	5.65	7.49	9.63	13.1	18
Lake Ontario	3.66	5.84	7.7	9.86	13.3	18.5
Watercourse 7.2						
CNR	0.32	0.5	0.65	0.8	1.04	1.25
QEW/Diversion	0.48	0.76	0.99	1.24	1.62	1.95
Lake Ontario	0.094	0.14	0.18	0.21	0.26	0.3

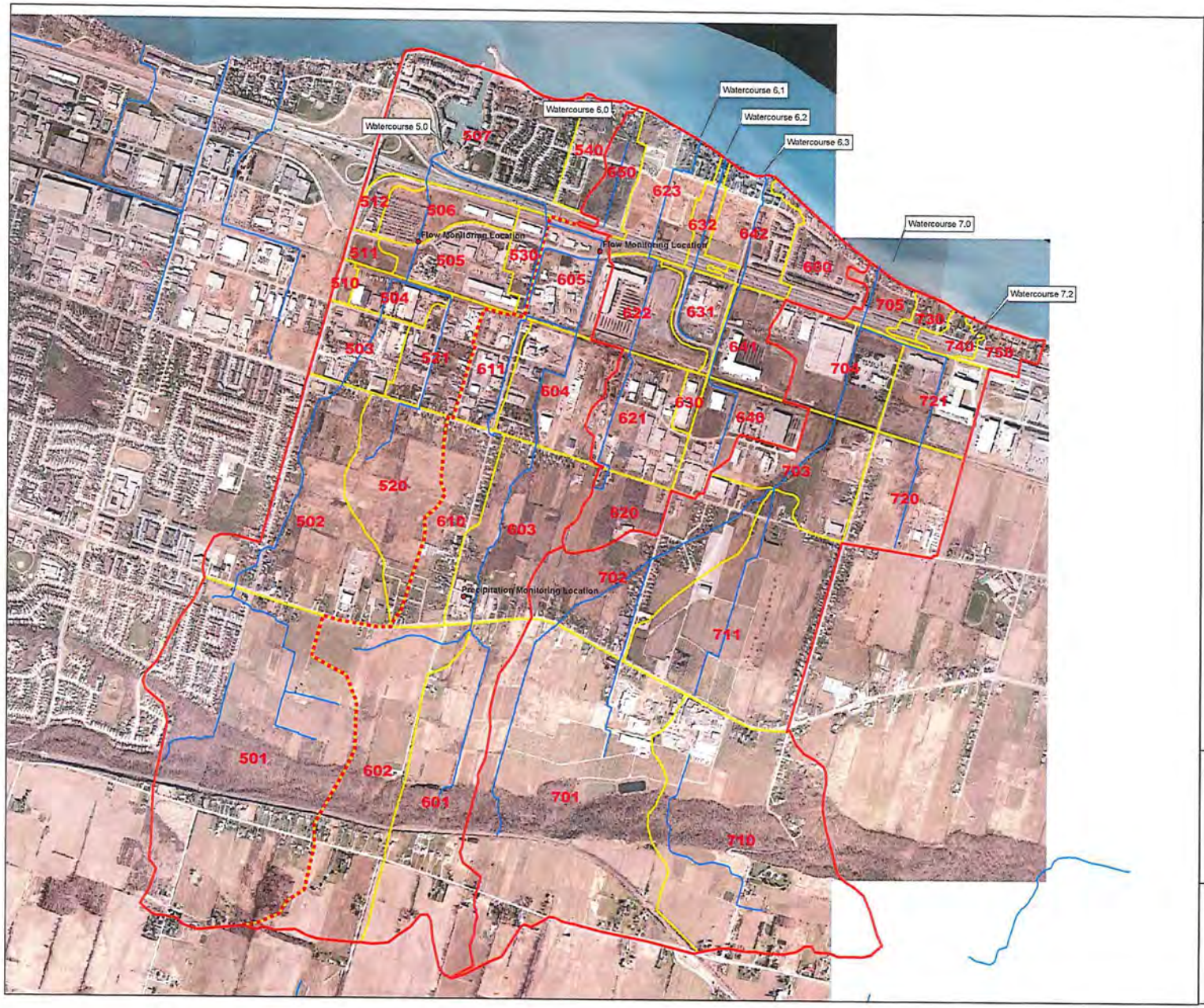
Interpolated Flow Values

Reach	River Sta	Q Total (m3/s)	
wc5	2388.964	6.9	
wc5	2290	7.08	103%
wc5	2256	7.14	103%
wc5	2221	7.20	104%
wc5	2198	7.24	105%
wc5	2150	7.33	106%
wc5	2068.437	7.48	108%
wc5	2044.707	7.52	109%
wc5	1986.134	7.62	110%
wc5	1901.03	7.78	113%
wc5	1874.583	7.82	113%
wc5	1845.237	7.88	114%
wc5	1801.453	7.96	115%
wc5	1693.967	8.15	118%
wc5	1602.883	8.31	120%
wc5	1537.467	8.43	122%
wc5	1471.795	8.55	124%
wc5	1439.675	8.61	125%
wc5	1320.692	8.82	128%
wc5	1316.508	8.84	100%
wc5	1291.617	8.94	101%
wc5	1288.054	8.95	101%
wc5	1225.493	9.20	104%
wc5	1157.883	9.47	107%
wc5	1131.031	9.58	109%
wc5	1112.568	9.66	109%
wc5	1071.48	9.82	111%
wc5	1034.499	9.97	113%
wc5	1013.774	10.05	114%
wc5	951.897	10.3	117%
wc5	942.8887		
wc5	931		
wc5	918.3739		
wc5	815.3577		
wc5	680.8133	11	107%
wc5	678.6898		
wc5	665		
wc5	660		
wc5	651.8919		
wc5	648.3854		
wc5	553.6066		
wc5	521.5115		
wc5	518.7136	11.9	108%
wc5	487.5449		
wc5	484.1846		
wc5	381.2556		
wc5	359.8282		
wc5	304.0528		
wc5	250		
wc5	230		
wc5	200		
wc5	170		

Reach	River Sta	Q Total (m3/s)	
wc6	2457.382	7.98	
wc6	2408.649	8.05	101%
wc6	2359.898	8.12	102%
wc6	2308.859	8.19	103%
wc6	2232.182	8.30	104%
wc6	2193.265	8.36	105%
wc6	2135.859	8.44	106%
wc6	2096.869	8.50	107%
wc6	2000	8.64	108%
wc6	1893.02	8.79	110%
wc6	1785.033	8.95	112%
wc6	1657.344	9.13	114%
wc6	1611.292	9.2	115%
wc6	1608.895		
wc6	1587.12		
wc6	1584.698		
wc6	1501.817		
wc6	1414.879		
wc6	1334.03		
wc6	1037.318		
wc6	947.3374		
wc6	940	6.79	96%
wc6	910.4732		
wc6	900		
wc6	801.4135		
wc6	730.3979		
wc6	634.0483		
wc6	586.5527		
wc6	564.4214		
wc6	535.9677		
wc6	533.8168		
wc6	502.0329		
wc6	480		
wc6	400		
wc6	350		
wc6	330		
wc6	300		
wc6	280		
wc6	250		
wc6	200		
wc6	150		
wc6	100		
5&6combin	50		
5&6combin	40		
5&6combin	30		
5&6combin	20		

Reach	River Sta	Q Total (m3/s)	
wc6.1	1815.549	1.64	
wc6.1	1791.246	1.67	102%
wc6.1	1788.426	1.68	102%
wc6.1	1767.8	1.71	104%
wc6.1	1765.227	1.71	104%
wc6.1	1618.352	1.92	117%
wc6.1	1549.359	2.01	123%
wc6.1	1423.36	2.19	134%
wc6.1	1420.606	2.19	134%
wc6.1	1368.765	2.27	138%
wc6.1	1366.013	2.27	138%
wc6.1	1346.971	2.30	140%
wc6.1	1273.903	2.40	146%
wc6.1	1166.891	2.55	155%
wc6.1	1163.643		
wc6.1	1145.92		
wc6.1	1141.721		
wc6.1	1024.484		
wc6.1	953.3818		
wc6.1	915.3637		
wc6.1	860.6113		

Reach	River Sta	Q Total (m3/s)	
wc6.3	1400.84	0.7	
wc6.3	1381.23	0.73	105%
wc6.3	1378.833	0.74	106%
wc6.3	1350.769	0.79	113%
wc6.3	1348.373	0.79	113%
wc6.3	1290.277	0.90	128%
wc6.3	1100	1.24	177%
wc6.3	991.783	1.43	204%
wc6.3	990.071		
wc6.3	975.2448		
wc6.3	973.5334		
wc6.3	910.8146		
wc6.3	867.1168		
wc6.3	814.7598		
wc6.3	777.7424		
wc6.3	610.3315		



SCUBE West

Subwatershed Study - Phase 1

Legend

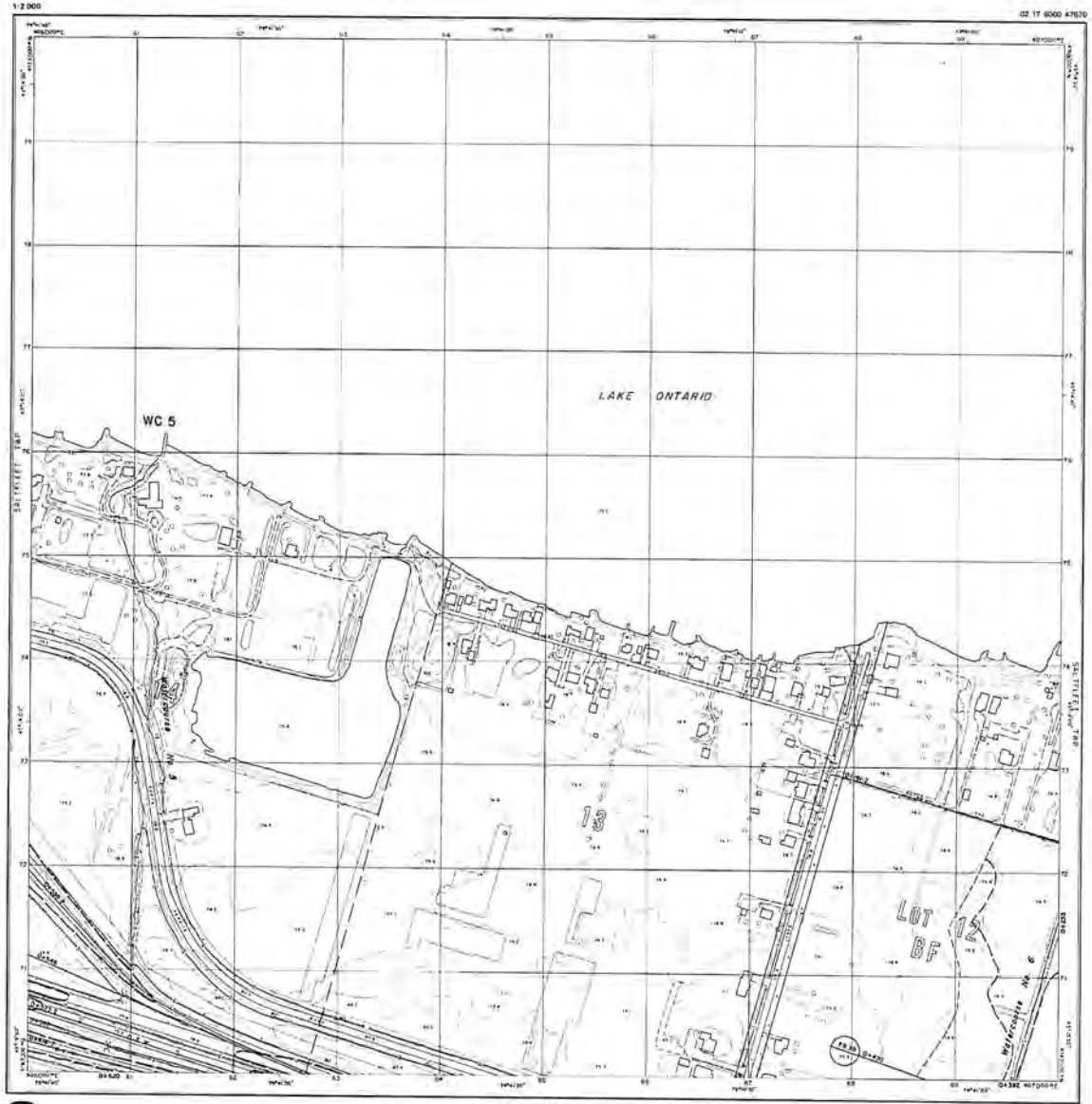
- SCUBE WEST SUBWATERSHED
- STORM SEWER
- WATERCOURSE
- MONITORING STATIONS

Scale: N.T.S.

Figure 3.3.1

Hydrologic Model Setup

Aquafor Beech Limited



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PROGRAMME DE RÉDUCTIONS DES DOMMAGES DUS AUX INONDATIONS

HAMILTON REGION CONSERVATION AUTHORITY

FLOOD RISK MAP

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LEGEND LÉGENDE

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D. M. LEVEY

Philips Planning + Engineering Limited
Date: June 20/84

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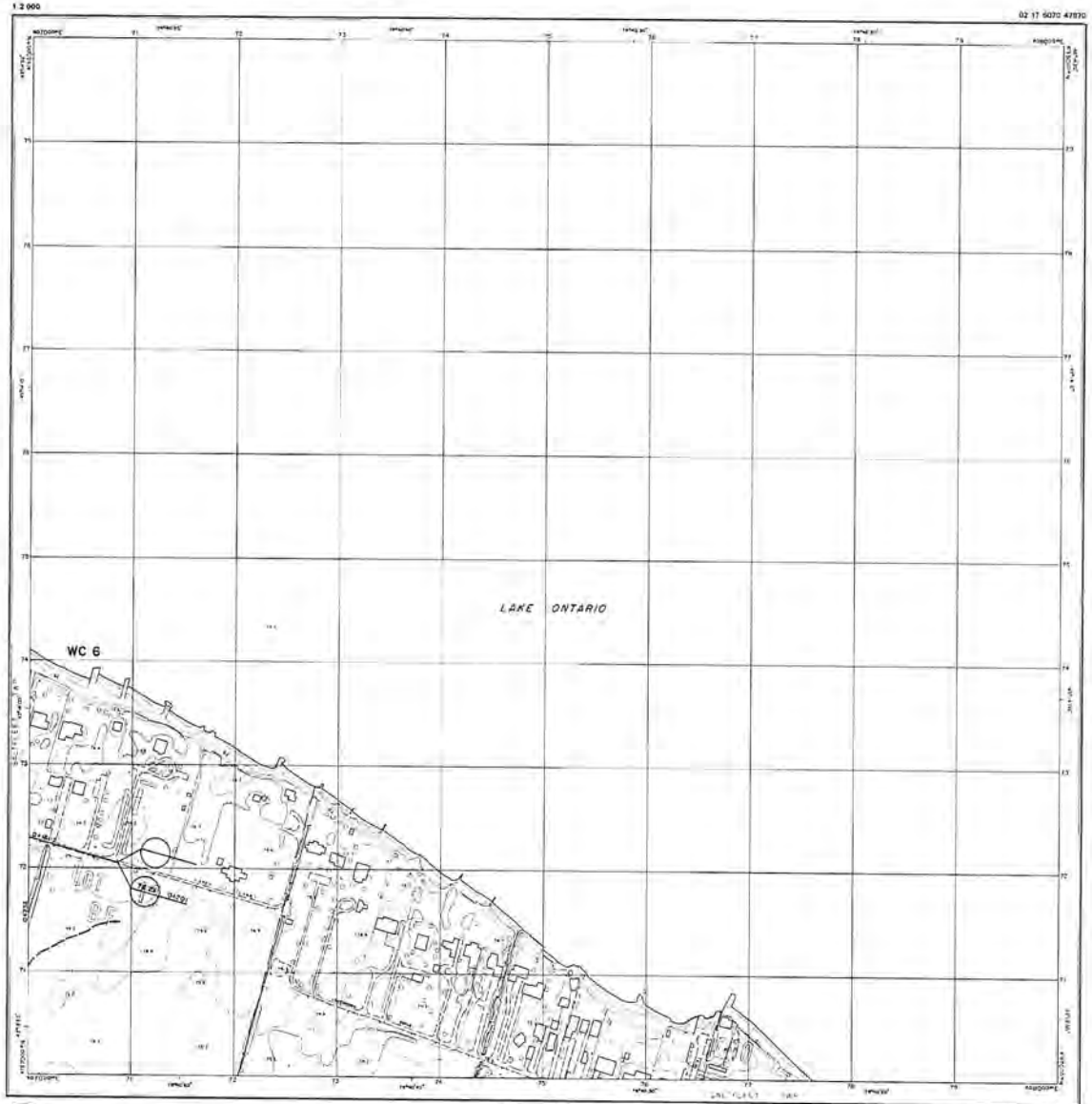

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FEET 100 0 100 200 300 400 500 600 700 800 PIEDS

CONTOUR INTERVAL 1.0 METRE EQUIDISTANCE DES COURBES DE NIVEAU 1.0 METRE
INTERPOLATED CONTOURS 0.5 METRE COURBES INTERPOLÉES 0.5 METRE
NORTH AMERICAN DATUM 1927 SYSTÈME DE RÉFÉRENCE GÉODÉSIQUE NORD-AMÉRICAIN 1927

NOTE:
REGULATORY FLOOD FOR STONEY AND BATTLEFIELD CREEKS IS THE REGIONAL EVENT (HURRICANE HAZEL). FOR ALL OTHER WATERCOURSES (i.e. NO. 1, 2, 3, 4, 5, 6, 7, 9 AND 12) THE REGULATORY FLOOD IS THE 100 YEAR EVENT.

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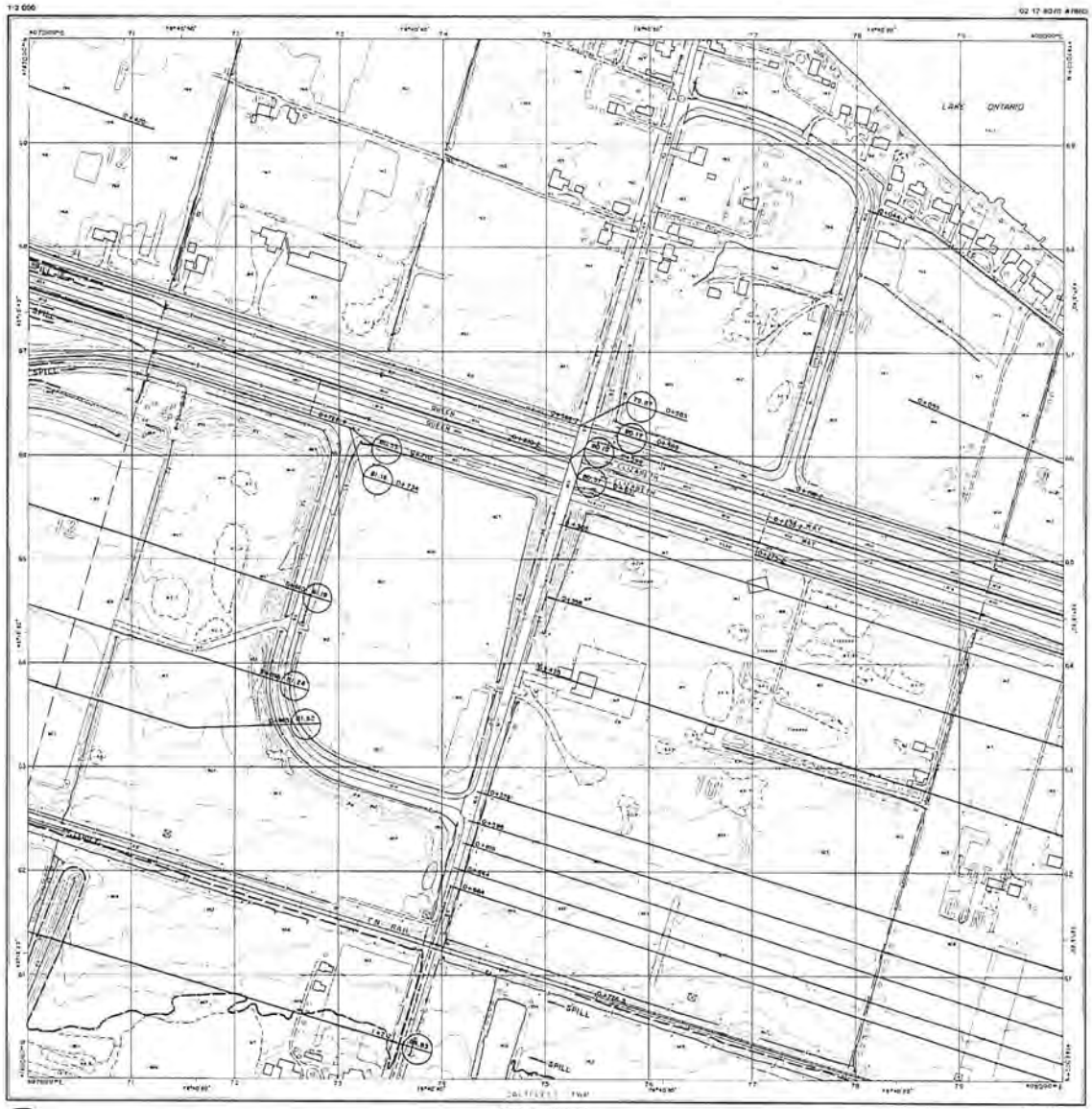

SCALE 1:2000 ECHELLE

METRES 40 0 100 200 METRES
FEET 100 0 100 200 300 400 500 600 700 800 FEUX

CONTOUR INTERVAL 1.0 METRE EQUIDISTANCE DES COURBES DE NIVEAU 1.0 METRE
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Date: June 26/89

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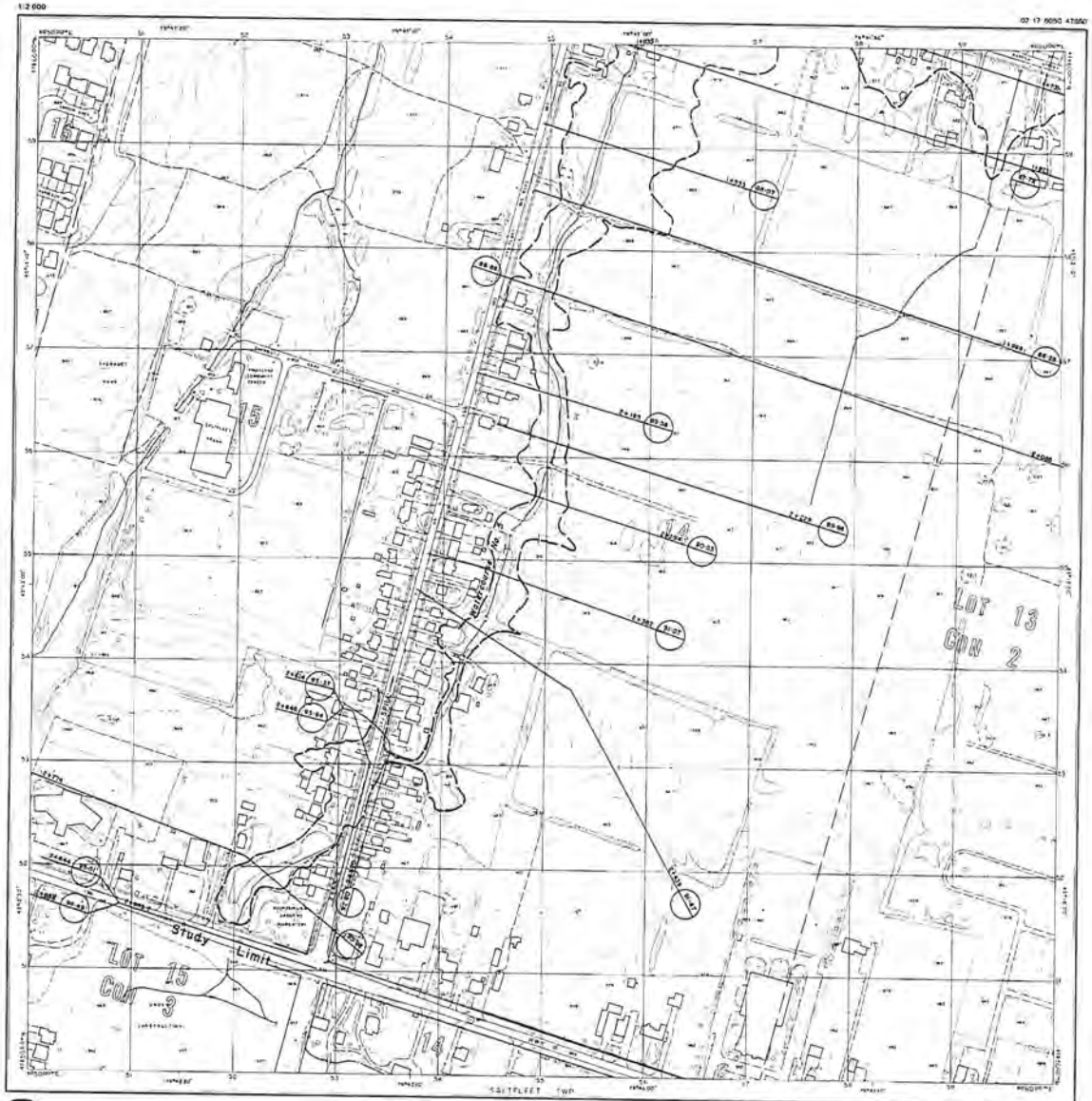

SCALE 1:2000 ECHELLE

METRES 40 0 100 200 METRES

FEET 100 0 100 200 300 400 500 600 700 800 FEETS

CONTOUR INTERVAL 1.0 METRE EQUIDISTANCE DES COURBES DE NIVEAU 1,0 METRE
INTERPOLATED CONTOURS 0.5 METRE COURBES INTERPOLÉES 0,5 METRE
NORTH AMERICAN DATUM 1927 SYSTEME DE REFERENCE GEODESIQUE NORD-AMERICAIN 1927

NOTE:
REGULATORY FLOOD FOR STONEY AND BATTLEFIELD CREEKS IS THE REGIONAL EVENT (HURRICANE HAZEL). FOR ALL OTHER WATERCOURSES (ie. NO. 1,2,3,4,5,6,7,8 AND 12) THE REGULATORY FLOOD IS THE 100 YEAR EVENT.

ADJOINING SHEETS

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Ministry of Natural Resources

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Environment Canada / Environnement Canada
Ministry of Natural Resources / Ministère des Richesses naturelles
Ontario

CANADA — ONTARIO FLOOD DAMAGE REDUCTION PROGRAM
PROGRAMME DE RÉDUCTIONS DES DOMMAGES DUS AUX INONDATIONS

HAMILTON REGION CONSERVATION AUTHORITY

FLOOD RISK MAP

CITY OF STONEY CREEK

CARTE DU RISQUE D'INONDATION

LEGEND LÉGENDE

SHEET INDEX TABLEAU D'ASSEMBLAGE

GENERAL INFORMATION

RENSEIGNEMENTS GÉNÉRAUX

J.D. BARNES LIMITED, Surveyors
Date:

D. M. LEVER

Philips Planning + Engineering Limited
Date:

COMPILATION NOTE

PHOTOGRAMMETRIC

Date	Amendment/Revision

ONTARIO REGULATION NO.
NO. DU RÈGLEMENT DE L'ONTARIO

SCHEDULE No.
CÉDULE No

MAP NO.
CARTE NO.

DATE

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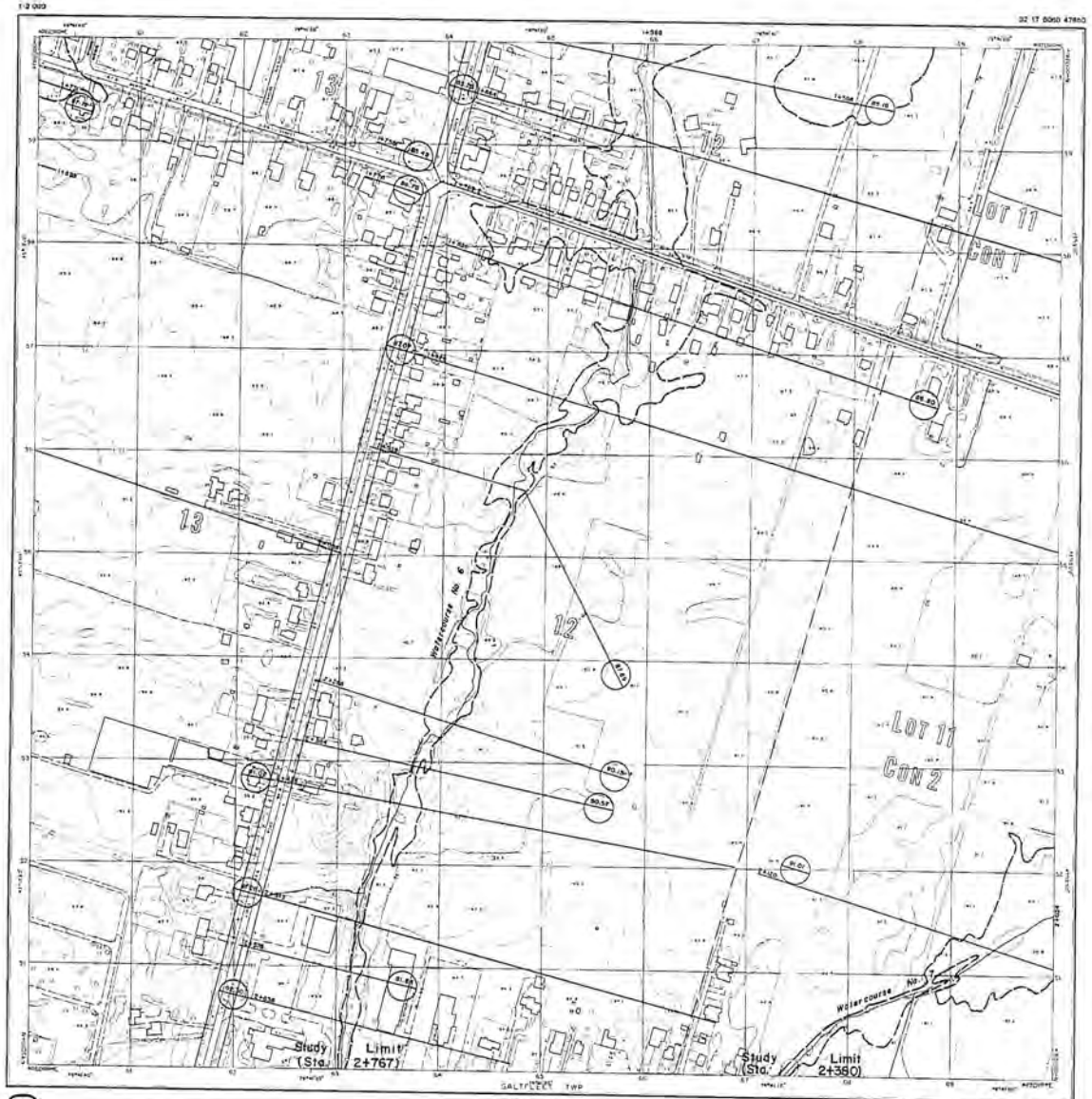

SCALE 1:2000 ECHELLE

METRES 40 0 100 200 METRES

FEET 100 0 100 200 300 400 500 600 700 800 FEET

CONTOUR INTERVAL 1.0 METRE. EQUIDISTANCE DES COURBES DE NIVEAU 1.0 METRE
INTERPOLATED CONTOURS 0.5 METRE. COURBES INTERPOLÉES 0.5 METRE
NORTH AMERICAN DATUM 1927. SYSTÈME DE RÉFÉRENCE GÉODÉSIQUE NORD-AMÉRICAIN 1927

Ontario
Ministry of Natural Resources

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Environment Canada / Environnement Canada

Ontario Ministry of Natural Resources / Ministère des Richesses naturelles

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NO. DU RÈGLEMENT DE L'ONTARIO

SCHEDULE No.
CÉDULE No.

MAP NO.
CARTE NO.

DATE

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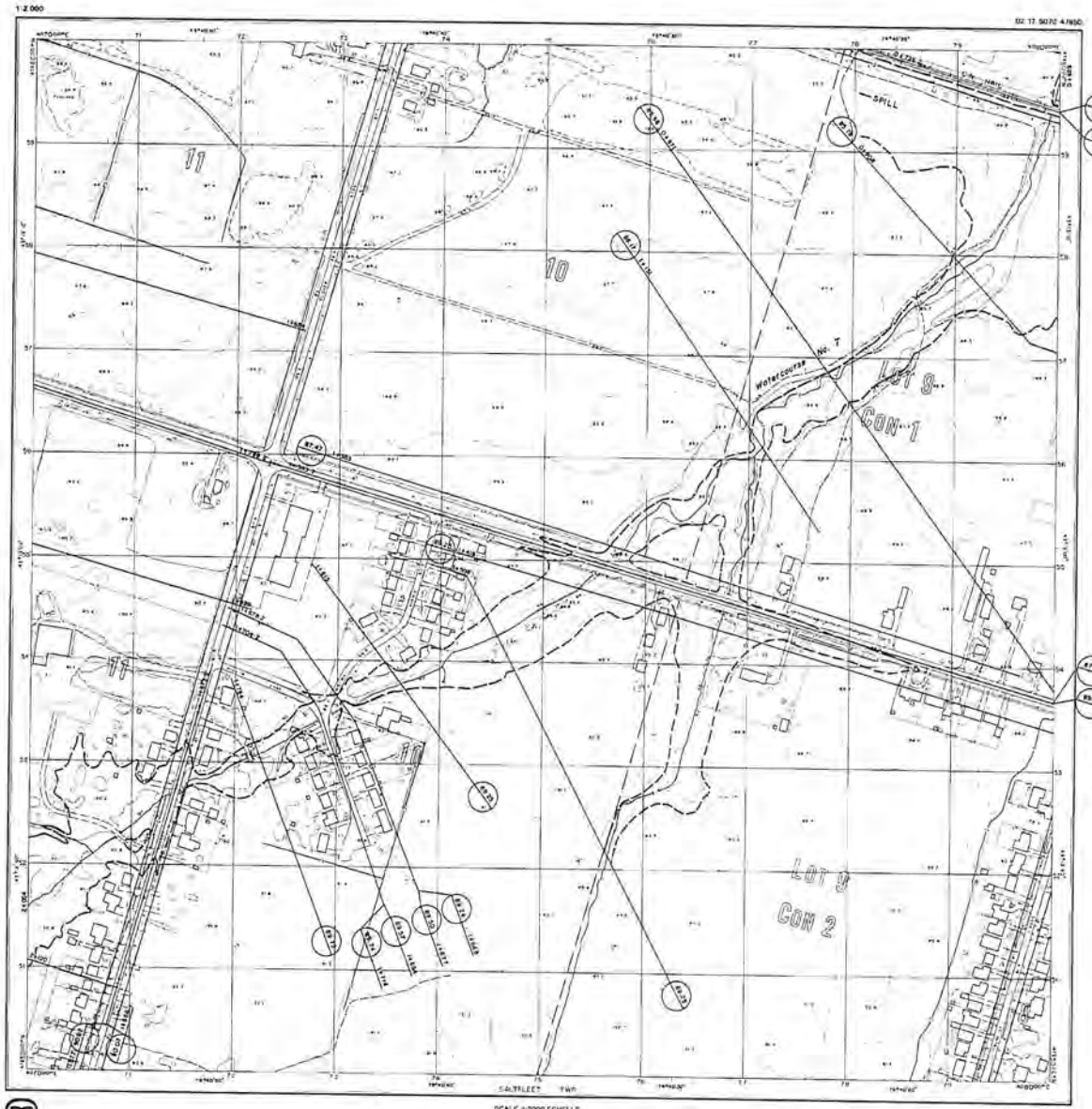

Environment Canada / Environnement Canada

Ministry of Natural Resources / Ministère des Richesses naturelles — Ontario

CANADA — ONTARIO FLOOD DAMAGE REDUCTION PROGRAM
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J.D. BARNES LIMITED, Surveyors

Date: _____

D. M. LEVER

Philips Planning + Engineering Limited

Date: June 30/87

COMPILATION NOTE

PHOTOGRAMMETRY

ONTARIO REGULATION NO. _____
NO. DU RÈGLEMENT DE L'ONTARIO

SCHEDULE No. _____
CÉDULE No

MAP NO. _____
CARTE NO.

DATE _____

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SCALE 1:2000 ECHELLE

METRES 40 0 100 200 METRES
FEET 100 0 100 200 300 400 500 600 700 800 FEETS

CONTOUR INTERVAL 1.0 METRE EQUIDISTANCE DES COURBES DE NIVEAU 1.0 METRE
INTERPOLATED CONTOURS 0.5 METRE COURBES INTERPOLÉES 0.5 METRE
NORTH AMERICAN DATUM 1927 SYSTÈME DE RÉFÉRENCE GÉODÉSIQUE NORD-AMÉRICAIN 1927

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ADJOINING SHEET

Date	Amendment/Revision

```
SF       SPLIT FLOW OPTION -  WC 5
TW       WEIR BETWEEN X-SECT 546.0 & 573.2
WS    9.   546.0   573.2    -1.0    1.56
WC     0    81.5      63    81.0      78    80.0      90    79.9      97    80.1
WC   106    80.1     111    79.8     115    80.2     119    80.2
TW       WEIR BETWEEN X-SECT 573.3 & 597.0
WS    5.   573.3   597.0    -1.0    1.56
WC     0    80.2       3    80.2       7    80.0      13    80.0      18    80.1
TW       WEIR BETWEEN X-SECT 597.0 & 616.2
WS    5.   597.0   616.2    -1.0    1.56
WC     0    80.1      10    80.2      12    80.2      18    81.0      35    86.0
TW       WEIR BETWEEN X-SECT 1080.3 & 1169.0
WS    2.  1080.3  1169.0    -1.0    1.56
WC     0    83.3      26    83.0
TW       WEIR BETWEEN X-SECT 1169.0 & 1229.0
WS    4.  1169.0  1229.0  1080.2    1.56
WC     0    83.0      29    82.9      52    83.0      90    83.1
TW       WEIR BETWEEN X-SECT 1229.0 & 1339.2
WS    5.  1229.0  1339.2  1080.2    1.56
WC     0    83.1      30    83.0      60    83.0      80    83.4     110    83.5
TW       WEIR BETWEEN X-SECT 1339.5 & 1424.0
WS    2.  1339.5  1424.0  1080.2    1.56
WC     0    83.5     110    84.5
EE
C
C     21
C      1  ALL SECTIONS HAVE UPSTREAM SECTIONING ASPECT
C     11  D/S SECTION NORTH SERVICE ROAD
C     12  U/S SECTION NORTH SERVICE ROAD
C  530.2  D/S SECTION Q.E.W. OFF-RAMP
C  530.5  U/S SECTION Q.E.W. OFF-RAMP
C  573.2  D/S SECTION Q.E.W.
C  573.3  U/S SECTION Q.E.W.
C  616.2  D/S SECTION Q.E.W. ON-RAMP
C  616.5  U/S SECTION Q.E.W. ON-RAMP
C  915.2  D/S SECTION SOUTH SERVICE ROAD
C  915.5  U/S SECTION SOUTH SERVICE ROAD
C 1080.2  D/S SECTION C.N.R.
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C 1080.3  U/S SECTION C.N.R.
C 1339.2  D/S SECTION ARVIN AVENUE
C 1339.5  U/S SECTION ARVIN AVENUE
C 1706.2  D/S SECTION BARTON STREET
C 1706.3  U/S SECTION BARTON STREET
C 2630.2  D/S SECTION FRUITLAND ROAD
C 2630.5  U/S SECTION FRUITLAND ROAD
C 2863.2  D/S SECTION HIGHWAY NO. 8
C 2863.5  U/S SECTION HIGHWAY NO. 8
T1 CITY OF STONEY CREEK FLOODPLAIN MAPPING STUDY
T2 BY PHILIPS PLANNING & ENGINEERING LIMITED -PROJECT NO. 86090
T3       Watercourse 5  100 yr STORM
J1     0     2.0       0       0     0.0     1.0       0       0   75.03
J2   1.0       0    -1.0
J6   1.0
QI     6.   21.90   19.28   16.13   13.87   11.70    8.35
NC 0.026   0.026   0.026     0.6     0.8
X1     1       4    0.05   21.95       0       0       0
GR    77       0      72    0.05      72   21.95      77      22
X1     2       4    0.05   33.45      32    33.5    31.5
GR    77       0      72    0.05      72   33.45      77    33.5
X1     3       4    0.05  145.95      29     106    27.5
GR    77       0      72    0.05      72  145.95      77     146
X1     4       4    0.05  170.95    66.5      62      64
GR    77       0      72    0.05      72  170.95      77     171
X1     5       4    0.05  170.95      15      67      16
GR    77       0      72    0.05      72  170.95      77     171
X1     6       4    0.05   37.45    79.5    39.5    39.5
GR    77       0      72    0.05      72   37.45      77    37.5
X1     7       4    0.05   53.95      18      24      18
GR    77       0      72    0.05      72   53.95      77      54
X1     8       4    0.05   53.95      32      32      32
X2  20.4
X3    10                                                  76.2    76.2
GR    77       0      72    0.05      72   53.95      77      54
NC 0.013   0.013   0.013     0.6     0.8
SB  1.05     1.6    1.72       0     4.8     0.3     7.2       0   75.44    72.5
X1     9       5       0      20    59.1    59.1    59.1
```

```
X2      0       0       1    76.94      79
X3     10                                          79.0    79.0
BT     -4       0      80       80       9   79.46   75.45      14    79.0   75.45
BT               20    79.6     78.2
GR   80.0       0   75.45        9   75.45      14    78.2      20    78.8      25
X1     10       8       0       44       28      20    32.5
GR  77.60       0   77.21       26    76.21      29   76.09      31   75.78    32.5
GR  76.09      34   76.21     35.5       79      44
X1     11       5       0       14       28     7.5     5.5
X3     10                                          78      78
GR     78       0   76.40        5    76.10     6.5   76.40     9.5   79.10      14
NC  0.013   0.013   0.013
SB   1.05     1.6    1.72        0      4.8     0.3     7.2       0   77.02   76.10
X1     12       8    4.08    13.08       22      22      22
X2      0       0       1    78.29    79.74
X3     10                                          79.25   79.25
BT      2       0   79.63    79.48    17.16   79.84   79.48
GR  79.48       0   78.12     4.08    78.12    6.08   77.02     6.10   77.02   11.08
GR  78.12   11.10   78.12    13.08    79.48   17.16
NC  0.035   0.035   0.035
X1     13       6    4.08    11.08        3       3       3
GR  79.48       0   78.41     4.08    77.35    7.08   77.35     8.08   77.41   11.08
GR  79.48   15.08
X1     14       0       0        0       23      23      23    0 .24
X1  530.2     13.    221.     227.     30.0    46.0    44.0
X3     10                                          79.65   79.65
GR   80.3       0    80.0      100     79.5     196    79.0      210    78.0     221
GR  77.45   222.1   77.45   225.75     78.0     227    79.0      238    79.5     274
GR   79.8     344    81.0      427     84.0     486
NC                  .022
X1  530.3     13.   222.1   225.75      0.5     0.5     0.5
BT   -14.     100    80.0     80.0      196    80.0    79.5      210    80.1    79.0
BT              222   80.35     78.0    222.1   80.35   77.56   222.1   80.36   79.17
BT           225.75   80.36    79.17   225.75   80.36   77.56   225.9   80.35    78.0
BT              238    80.3     79.0      274    81.0    79.5      344    82.0    79.8
BT              427    83.0     81.0      486    84.0    84.0
GR   80.3       0    80.0      100     79.5     196    79.0      210    78.0     222
GR  77.56   222.1   77.56   225.75     78.0   225.9    79.0      238    79.5     274
```



```
GR  79.8     344    81.0      427     84.0     486
X1 530.4       0       0        0     26.1    26.1    26.1
X2                                              1.0
NC                  .030
X1 530.5       0       0        0      0.5     0.5     0.5
X3     10                                          80.0    79.8
X1   546.      15.   222.0    225.9       4.      4.      4.
GR  80.3       0    79.9      100     79.5     181    79.0      210    78.0     222
GR 77.59   222.1   77.59   225.8     78.0   225.9    79.0      238    79.5     253
GR  79.8     323    79.8      376     79.7     401    81.0      405    81.5     412
NC                  .019
X1 573.2      12.   452.1   455.15      5.1     5.1     5.1
X3     10                                          79.35   79.35
GR  80.6       0    80.5       64     80.0     205    79.5      402    79.0     448
GR  78.0     452   77.62    452.1    77.62   455.15    78.0    455.3    79.0     515
GR  80.0     675    80.1      695
SB     0    1.99    1.45        0     3.05       0    3.81        0   77.59   77.62
X1 573.3      12.   452.1   455.15     42.56   42.56   42.56
X2     0       0     1.0    78.84    80.07
X3     10                                          80.07   80.07
BT   -14.       0    80.6     80.6       64    80.6    80.5      205    80.4     80.0
BT              402   80.15     79.5      448    80.1    79.0      452   80.07     78.0
BT           452.1   80.07    77.59    452.1   80.07   78.84   455.15   80.07    78.84
BT           455.15  80.07    77.59    455.3   80.07    78.0      515    80.3     79.0
BT              675    80.2     80.0      695    80.1    80.1
GR  80.6       0    80.5       64     80.0     205    79.5      402    79.0     448
GR  78.0     452   77.59    452.1    77.59   455.15    78.0    455.3    79.0     515
GR  80.0     675    80.1      695
NC                  .030
X1  597.       0       0        0      5.3     5.3     5.3
QT    6.   19.47   17.00    13.99    11.86    9.77    6.95
X1 616.2      14.   452.1    455.8      0.5     0.5     0.5
X3     10                                          79.95   79.95
GR  80.6       0    80.5       64     80.0     205    79.5      402    79.0     448
GR  78.0     452   77.72    452.1    77.72   455.8    78.0    455.9    79.0     515
GR  81.0     675    82.0      710     83.0     742    84.0      771
NC                  .021
X1 616.3      21.   360.1    363.8      0.5     0.5     0.5
```

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BT  -19.       0    80.7    80.7      56    80.8    80.5      97    80.8    80.3
BT           170    80.8    80.2     305    80.8    80.3     324    80.8    80.0
BT           341    80.8    79.5     344    80.8    79.0     360    80.6    78.0
BT         360.1    80.6   77.66   360.1    80.6   79.66   363.8    80.6   79.66
BT         363.8    80.6   77.66   363.9    80.6    78.0     366    80.7    79.0
BT           374    80.7    79.5     411    80.8    80.0     422    80.8    80.1
BT           500    80.8    80.8
GR  80.7       0    80.5      56    80.3      97    80.2     170    80.3     305
GR  80.0     324    79.5     341    79.0     344    78.0     360   77.66   360.1
GR 77.66   363.8    78.0   363.9    79.0     366    79.5     374    80.0     411
GR  80.1     422    80.8     500    81.0     675    82.0     710    83.0     742
GR  84.0     771
X1 616.4       0       0       0    31.7    31.7    31.7
X2                                          1.0
NC                  .030
X1 616.5       0       0       0     0.5     0.5     0.5
X3    10                                                  80.60   80.60
X1 616.6       0       0       0     20.     20.     20.             .20
NC  .060    .060    .030      .1      .3
X1 723.9    22.0   235.2   245.5    70.0    70.0    70.0
GR 82.09     0.0   80.84    21.4   80.80    30.0   80.71    60.0   80.59    90.0
GR 80.29   180.0   80.19   210.0   79.97   225.0   80.00   235.2   78.61   240.0
GR 79.34   244.0   79.43   245.5   79.39   270.0   79.62   300.0   79.69   330.0
GR 79.70   360.0   79.74   390.0   80.14   420.0    81.0   496.0    80.0   520.0
GR 81.00   530.0    82.0   540.0
NC  .060    .060    .030      .3      .5
X1  798.      31.  129.94  136.17   75.04   75.04   75.04
GR 80.94     .00   80.85    7.11   81.53   11.16   82.19   17.49   82.19   27.94
GR 80.52   36.71   80.68   38.05   80.50   69.04   80.24   88.07   80.16  109.07
GR 80.35  129.94   79.25  132.46   80.11  136.17   80.53  141.83   80.54  163.95
GR 80.38  182.62   80.37  204.72   80.39  224.35   80.48  246.54   80.46  267.41
GR 80.39  287.03   80.35  304.43   80.35  324.00   80.31  344.28   80.29  378.51
GR 80.29  392.00   80.42  402.69   79.99  406.16   80.29  410.76   84.00  418.00
GR 84.30  421.00
X1 915.2      15.     74.   77.85     103.    103.    103.
X3    10                                                  81.80   81.00
GR  82.4       0    82.0      12    81.5      21    81.0      51    80.3      74
GR 80.17    74.1   80.17   77.75    80.3   77.85    80.5     165    80.5     200
```



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GR  81.0     270    81.0     308    81.0     390    82.0     424    83.0     454
NC                  .022
X1 915.3      15    74.1   77.75     0.5     0.5     0.5
BT  -15.       0    82.4    82.4      12    82.3    82.0      21    82.3    81.5
BT            51    82.3    81.0      74   82.32    80.3    74.1   82.32   79.92
BT          74.1   82.32   81.42   77.75   82.32   81.42   77.75   82.32   79.92
BT         77.85   82.32    80.3     165    81.7    80.5     200    81.5    80.5
BT           270    81.1    81.0     308    81.0    81.0     390    81.0    81.0
GR  82.4       0    82.0      12    81.5      21    81.0      51    80.3      74
GR 79.92    74.1   79.92   77.75    80.3   77.85    80.5     165    80.5     200
GR  81.0     270    81.0     308    81.0     390    82.0     424    83.0     454
X1 915.4       0       0       0    27.3    27.3    27.3
X2                                          1.0
NC                  .030
X1 915.5       0       0       0     0.5     0.5     0.5
X3    10                                                  82.3    81.7
X1  990.      54  562.45  567.44   61.44   61.44   61.44
GR 82.95     .00   82.76    3.11   82.24    4.17   81.82    5.35   82.23    6.31
GR 82.25    8.04   82.21   22.87   82.19   48.43   82.24   77.38   82.23   96.43
GR 82.23  122.58   82.34  147.58   82.22  211.18   82.15  237.38   82.24  261.64
GR 82.24  286.64   82.21  312.02   82.26  328.28   81.98  352.48   82.18  376.49
GR 82.16  390.06   81.87  411.56   81.96  421.63   81.99  426.81   81.71  432.08
GR 81.81  436.39   81.67  444.27   81.53  449.53   81.67  452.32   81.67  462.74
GR 81.67  474.81   81.54  496.60   81.95  509.40   81.63  527.48   81.77  544.08
GR 81.94  547.01   83.20  550.05   83.78  553.53   82.46  558.07   81.33  562.45
GR 80.38  563.39   80.20  565.45   81.46  567.44   81.66  569.02   81.52  573.45
GR 81.43  582.08   81.76  587.07   82.29  595.09   83.21  605.64   83.42  616.58
GR 83.63  629.90   83.63  643.03   83.76  652.55   83.51  666.39
NC  .080    .080    .025      .3      .5
X11080.2      15.   84.1    86.0   146.3   146.3   146.3
X3    10                                                  83.15   83.15
GR  84.1       0    82.1      10    82.0      12    82.0      65    81.4      84
GR 80.99    84.1   80.99      86    81.4    86.1    82.0     112    82.0     123
GR  82.3     138    82.0     164    81.8     220    81.7     274    83.6     285
SB     0    1.47    1.55       0     1.9       0     2.9       0   81.12   80.99
X11080.3      14    70.1    72.0     9.6     9.6     9.6
X2     0       0     1.0   82.65   83.93
X3    10                                                  83.90   83.60
```

BT	-14.	37	83.9	83.9	52	83.9	83.0	55	83.9	82.0
BT		60	83.9	81.8	64	83.9	82.0	70	83.93	81.5
BT		70.1	83.93	81.12	70.1	83.93	82.65	72	83.93	82.65
BT		72	83.93	81.12	72.1	83.93	81.5	148	83.6	82.0
BT		218	83.6	82.2	219	83.6	83.6			
GR	84.2	0	84.0	35	83.9	37	83.0	52	82.0	55
GR	81.8	60	82.0	64	81.5	70	81.12	70.1	81.12	72
GR	81.5	72.1	82.0	148	82.2	218	83.6	219		
QT	6.	15.80	13.60	10.91	9.05	7.31	5.02			
NC	.090	.090	.030							
X1	1169.	50.	351.21	387.50	84.5	84.5	84.5			
GR	83.70	.00	83.50	43.00	83.00	137.00	83.00	145.00	82.90	150.00
GR	82.90	150.00	83.11	154.13	83.16	166.68	83.00	195.98	82.77	208.87
GR	82.49	222.03	82.52	234.57	82.29	248.19	82.67	259.46	82.24	263.53
GR	82.34	271.06	82.00	282.13	81.95	294.48	81.87	303.19	81.96	311.57
GR	82.16	324.08	81.72	338.58	81.89	351.21	81.28	359.44	81.54	365.84
GR	81.30	375.35	81.62	387.50	81.68	397.18	81.79	412.21	81.80	421.00
GR	82.09	424.06	82.03	425.81	81.81	427.65	82.31	434.38	82.33	439.56
GR	82.54	454.10	82.40	465.09	83.13	475.35	83.08	485.17	82.54	492.09
GR	82.10	504.39	81.74	526.08	81.84	540.31	81.80	554.22	81.93	567.49
GR	81.59	580.95	81.85	593.83	81.78	609.90	81.48	622.06	81.40	631.69
NC	.07	.07	.03							
X1	1229.	61	435.79	438.38	60.	60.	60.			
GR	84.10	.00	84.00	20.00	83.50	52.00	83.20	100.00	83.00	140.00
GR	83.23	150.00	83.23	155.19	82.52	156.56	82.49	157.95	83.08	159.54
GR	83.14	166.16	83.01	177.34	83.01	192.33	82.92	210.32	82.85	225.44
GR	82.80	240.43	82.96	256.06	82.96	277.01	82.96	287.91	82.72	289.51
GR	83.73	293.97	84.12	301.42	84.15	313.57	84.15	325.86	84.12	341.77
GR	83.75	353.73	83.48	385.05	83.85	386.92	84.03	392.41	84.04	407.12
GR	83.91	422.65	83.86	433.05	82.24	435.79	82.08	437.71	82.48	438.38
GR	82.78	450.11	82.76	462.40	82.67	475.10	82.85	489.55	83.18	489.89
GR	82.28	490.03	82.33	497.21	83.40	497.85	83.44	498.29	82.59	498.43
GR	82.59	505.75	82.24	509.49	82.57	513.10	82.68	539.71	82.33	555.83
GR	82.34	576.09	82.68	579.02	82.73	584.49	82.59	587.77	82.96	591.71
GR	82.83	595.43	82.31	596.87	82.60	606.33	82.43	623.44	82.44	638.15
GR	82.34	642.30								
X1	1339.2	11	107.1	111.35	102.0	102.0	102.0			
X3	10							83.7	83.5	

GR	84.4	0	84.0	62	83.0	106	82.7	107	82.34	107.1
GR	82.34	111.35	82.7	111.45	83.0	113	83.5	148	83.5	235
GR	83.4	254								
NC	.060	.060	.026							
X1	1339.3	12	139.6	143.85	0.5	0.5	0.5			
BT	-14.	0	84.4	84.4	4	84.3	84.3	10	84.3	84.0
BT		139	83.9	83.0	139.5	83.90	82.7	139.6	83.9	82.34
BT		139.6	83.9	83.69	143.85	83.9	83.69	143.85	83.9	82.34
BT		144.0	83.9	82.7	146.	83.9	83.0	184	83.8	83.8
BT		296	83.55	83.4	300	83.5	83.5			
GR	84.4	0	84.3	4	84.0	10	83.0	139	82.7	139.5
GR	82.34	139.6	82.34	143.85	82.7	144.0	83.0	146	83.8	184
GR	83.4	296	83.5	300						
X1	1339.4	0.	0.	0.	15.2	15.2	15.2			
X2							1.0			
NC			.030							
X1	1339.5	0	0	0	0.5	0.5	0.5			
X3	10							83.7	83.5	
X1	1424.	45	280.84	287.48	85.0	85.0	85.0			
X4	4.0	85.0	47.0	90.0	47.01	90.0	114.0	85.5	114.01	
GR	84.87	.00	84.31	2.76	84.66	14.39	84.97	36.74	90.00	58.09
GR	90.00	80.86	90.00	102.67	85.45	118.25	85.45	137.72	85.41	156.84
GR	85.51	174.88	85.57	192.20	85.47	201.21	85.32	211.77	85.14	216.93
GR	84.56	219.62	84.57	229.92	84.73	241.21	84.70	250.87	85.69	251.21
GR	86.07	256.46	84.92	257.63	84.85	262.54	85.98	263.72	86.15	267.49
GR	84.52	268.42	84.51	273.85	84.31	280.84	83.24	283.17	84.20	287.48
GR	84.36	307.61	84.82	311.69	85.05	319.83	85.00	335.72	85.07	350.15
GR	85.04	364.52	84.88	375.55	84.79	385.19	84.72	402.66	84.62	419.30
GR	84.52	439.68	84.46	457.90	84.36	476.09	84.32	494.01	84.50	527.00
NC	.060	.060	.030	.10	.30					
X1	1445.	29.	287.	297.	21.	21.	21.			
GR	85.5	0	85.0	14	87.3	16	87.3	35	85.5	40
GR	87.3	45	87.3	63	85.5	66	86.0	120	86.0	176
GR	85.5	221	85.2	224	85.5	255	85.0	287	84.0	290
GR	83.47	292	84.0	295	85.0	297	85.5	298	85.6	315
GR	88.1	318	88.1	341	85.6	343	85.5	355	86.7	370
GR	86.7	383	85.4	385	85.0	430	85.0	515		
X1	1481.	18.	297.	307.	36.	36.	36.			

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GR  86.0       0    86.5      95    86.5     205    86.0     240    86.0     275
GR  85.5     297    84.0     301   83.85     302    84.0     305    85.0     307
GR  86.0     315    86.0     328    85.8     380    85.5     422    85.0     450
GR  85.0     484    85.5     492    85.5     523
X1 1525.     17.   313.     325.    44.      44.     44.
GR  86.5       0    86.5      26    87.0      53    87.0     221    86.5     228
GR  86.5     263    86.0     313    85.0     316   84.32     319    85.0     322
GR  86.0     325    86.0     415    85.5     453    85.5     467    86.0     497
GR  86.0     515    86.4     520
X1 1549.     40.  312.25   322.40    24.      24.     24.
GR 86.00     .00   86.07     6.44   86.35    16.06   86.65    26.21   86.72    34.51
GR 86.82   42.78   86.98    45.48   87.54    51.04   87.54    55.47   87.73    64.42
GR 87.15   85.78   87.16    99.21   87.18   108.26   87.17   117.07   87.23   128.83
GR 87.36  144.20   87.36   158.16   87.32   175.37   87.32   188.77   87.26   205.52
GR 86.77  217.98   86.76   233.89   86.74   249.41   86.69   264.41   86.33   279.85
GR 86.05  297.07   86.24   312.25   85.06   314.92   84.58   317.03   84.64   318.75
GR 85.80  322.40   86.27   337.42   86.43   355.78   86.19   372.58   86.38   398.24
GR 86.41  419.92   86.20   446.38   86.21   469.71   86.21   489.72   86.50   515.00
X1 1567.     12   240.0    242.2     18.      18.     18.
GR  87.8       0    88.0       59    87.5     103    87.0     184    86.0     201
GR  84.9     240   84.65    240.1   84.65    242.1    84.9   242.2    86.0     271
GR  86.8     354    86.9      372
NC   .06     .06     .03      .30     .50
X1 1634.     59   322.16   351.48    67.      67.     67.
GR 87.33     .00   86.86     2.13   87.34     4.49   87.45     8.65   87.51    16.27
GR 87.53   22.96   86.88    32.09   86.68    43.97   86.72    54.75   86.89    64.36
GR 87.22   68.54   87.01    79.00   86.69    82.94   87.28    85.03   87.44    96.99
GR 87.59  114.20   87.85   119.01   87.97   130.72   87.70   144.50   87.68   155.16
GR 87.54  160.52   87.16   165.91   87.08   175.76   87.16   191.08   87.28   204.15
GR 87.39  216.68   87.71   226.47   87.56   240.91   87.14   250.70   86.90   263.30
GR 86.55  273.58   86.40   283.97   86.54   286.63   86.45   292.57   86.32   301.00
GR 86.48  307.53   87.08   313.65   87.07   322.16   86.35   335.94   86.19   340.15
GR 84.90  343.24   84.98   345.58   87.02   351.48   87.13   356.37   86.94   360.57
GR 86.92  374.70   87.01   385.27   87.69   386.97   86.89   390.41   87.02   396.03
GR 86.99  408.50   86.80   419.73   86.81   438.62   87.02   450.31   86.60   459.98
GR 86.89  475.93   87.09   479.77   87.53   490.55   87.57   495.42
NC                .020
X11706.2     13   172.1    174.0   129.9    129.9   129.9
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X3    10                                                  86.80    86.80
GR  87.7       0    87.5      32    87.5     142    87.0     164    86.0     170
GR  85.3     172   85.03   172.1   85.03   174.0    85.3   174.1    86.0     176
GR  87.0     180    87.0     232    88.9     240
SB     0    1.64    1.55       0     1.9       0    2.28       0   85.12    85.03
X11706.3      14   213.1   215.0    20.2    20.2    20.2
X2     0       0     1.0   86.32   87.61
X3    10                                                  87.60    87.60
BT   -16.      0    87.9    87.9      84    87.8    87.5     161    87.6     87.5
BT             206   87.61    87.0     211.   87.61    86.5     212   87.61     86.0
BT             213   87.61    85.5   213.1   87.61   85.12   213.1   87.61    86.32
BT             215   87.61   86.32     215   87.61   85.12   215.1   87.61     85.5
BT             216   87.61    86.0     224   87.65    87.0     260   87.55     87.5
BT            368.    87.9    87.9
GR  87.9       0    87.5      84    87.5     161    87.0     206    86.5     211
GR  86.0     212    85.5     213   85.12   213.1   85.12     215    85.5   215.1
GR  86.0     216    87.0     224    87.5     260    87.9     368
QT     6.  10.50    8.91    6.98    5.65    4.43    2.92
NC                .030
X1 1731.     49  354.97   369.66    15.0     15.0    15.0
GR 87.34     .00   87.42     9.02   87.24    12.56   87.46    19.13   87.47    27.61
GR 87.47   39.34   87.11    50.42   86.99    60.88   86.96    66.50   86.95    73.62
GR 86.34   75.76   86.92    77.75   86.95    87.51   87.24    96.87   87.11   104.62
GR 87.22  114.42   87.24   124.01   87.30   136.38   87.35   145.80   87.35   156.23
GR 87.81  160.75   87.93   170.66   87.68   182.22   87.92   192.80   87.83   203.74
GR 87.61  210.10   87.60   219.35   87.55   231.05   87.38   241.02   87.31   254.41
GR 87.36  268.50   87.41   279.33   87.58   296.54   87.76   306.55   87.43   320.72
GR 87.55  335.32   87.50   347.00   86.19   354.97   85.67   359.19   85.56   360.66
GR 85.50  363.22   86.06   365.42   86.96   369.66   87.26   382.93   87.60   403.74
GR 87.88  423.06   87.89   441.51   87.88   465.87   87.90   485.45     .00      .00
NC   .060    .060    .030      .10     .30
X1 1823.     50  400.12   470.23     92.      92.     92.
X3                                   471.00   90.00
GR 88.39     .00   88.19     4.62   88.32    15.60   88.47    26.67   88.07    56.77
GR 87.81   75.34   87.09    77.88   87.63    79.41   87.49    92.16   87.94   103.94
GR 88.27  115.96   88.64   129.89   87.97   146.90   87.76   161.40   87.82   177.37
GR 87.89  188.36   87.67   192.04   87.75   194.03   87.87   200.91   87.74   215.13
GR 87.76  222.60   88.13   235.06   87.87   267.46   88.68   272.16   89.39   274.54
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GR 89.62  276.07   89.57  277.45   88.83  281.24   88.01  284.19   88.13  299.63
GR 87.81  324.82   87.59  351.66   87.63  375.49   87.51  395.89   88.13  400.12
GR 87.11  403.10   87.29  404.16   86.87  407.41   86.81  421.04   86.98  434.73
GR 87.01  441.42   86.22  442.88   86.86  444.03   87.17  450.58   87.17  461.74
GR 87.84  470.23   88.16  471.17   88.48  480.94   88.48  489.84   88.19  503.12
X11933.9   14.0    148.0   151.0    110.    110.    110.
GR 88.68    0.0    88.73    30.0   88.60    60.0   88.38    90.0   87.98   120.0
GR 87.77  148.0    86.80   149.5   86.50   150.0   86.51   151.0   87.77   151.0
GR 88.11  181.0    88.69   201.6   88.17   204.0   89.29   211.0
X1 1998.     39  461.48   465.60    65.0    65.0    65.0
GR 89.64    .00   90.09     3.17   89.70    5.71   89.58    12.92  89.68    32.52
GR 89.73   48.59   89.59    67.24   89.37   85.42   89.23   102.76  89.20   116.46
GR 89.22  132.03   88.94   136.03   89.34  142.81   89.33   157.28  89.43   171.43
GR 89.77  186.72   89.79   208.33   90.01  224.12   90.15   235.86  89.90   252.57
GR 89.10  293.14   89.08   311.29   88.95  328.36   88.74   339.43  88.47   354.50
GR 88.48  368.11   88.41   383.72   88.42  398.54   88.33   411.80  87.95   441.22
GR 87.80  453.94   87.55   461.48   86.75  464.31   87.33   465.60  87.92   471.16
GR 88.44  480.67   88.86   493.86   88.89  504.97   89.05   512.99    .00     .00
X1 2088.     87  802.41   863.32    90.0    90.0    90.0
GR 90.96    .00   90.69     3.49   90.83    9.66   91.05    25.92  90.91    45.14
GR 91.19   65.38   91.37    78.36   91.49   95.13   91.66   110.07  91.82   123.76
GR 91.77  141.22   91.64   157.22   91.21  171.42   91.03   190.44  91.02   200.35
GR 90.98  215.51   91.15   227.85   90.72  238.24   91.03   248.53  91.36   269.98
GR 91.34  293.28   91.09   318.74   90.60  335.03   90.65   352.15  90.92   365.69
GR 90.87  373.49   91.12   381.37   90.99  384.72   90.97   391.99  90.75   397.49
GR 90.73  401.46   90.68   408.89   90.58  416.78   90.94   426.37  91.03   434.05
GR 91.14  442.93   90.84   451.43   90.57  458.37   90.92   469.40  91.07   480.50
GR 91.16  487.55   91.03   489.68   90.83  495.48   90.20   508.29  89.84   520.35
GR 89.79  533.30   89.65   540.58   90.06  551.92   90.36   561.27  90.34   568.67
GR 90.39  578.64   90.41   593.94   90.68  599.78   90.55   601.19  90.32   606.47
GR 90.34  614.25   90.42   621.22   90.29  622.87   90.45   625.02  90.28   626.43
GR 90.34  632.69   90.43   639.48   90.30  643.29   90.08   646.98  89.98   652.10
GR 90.10  666.04   90.27   671.90   89.94  676.63   89.79   688.01  89.76   700.17
GR 89.68  712.85   89.64   722.24   89.66  731.58   90.07   741.98  89.60   753.29
GR 89.70  769.13   89.57   780.68   89.72  794.17   89.47   802.41  89.48   814.28
GR 89.02  830.26   88.83   841.02   87.77  844.81   87.93   845.95  88.65   848.93
GR 89.12  863.32   89.32   877.64
X1 2185.     15.     81.      89.     97.     97.     97.
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GR  91.6      0    91.5       2    91.0      17    90.5      57   90.0      63
GR  89.5     78    89.0      81    88.5      83    88.4      84   88.4      86
GR  88.5     87    89.0      89    89.5     112    90.0     139   90.1     152
X1 2229.     25  266.29   271.43     44.     44.     44.
GR 91.48    .00   91.68    13.45   91.90   26.04   91.81   43.24  91.79   64.04
GR 91.64  82.28   91.61   103.13   91.60  123.18   91.49  144.60  91.42  159.75
GR 91.69 176.76   91.68   191.72   91.65  206.49   91.79  216.97  91.44  227.12
GR 90.69 242.27   90.08   257.76   89.75  266.29   88.61  269.86  89.57  271.43
GR 89.84 280.45   90.08   294.92   90.70  305.78   90.90  318.15  91.00  333.28
X12294.9   16.0    148.2    151.3    65.     65.     65.
GR 91.82    0.0   91.87     30.0   91.66    60.0   91.29    90.0  90.67   120.0
GR 90.16  148.2   89.22    149.0   89.00   150.0   89.29   151.0  89.90   151.3
GR 90.44  154.0   90.94    180.0   90.72   210.0   90.98   233.0  90.19   234.0
GR 91.32  241.5
X1 2382.     17.     159.     163.     88.     88.     88.
GR  92.3      0    92.0       34    91.5      60    91.5      85   92.0      94
GR  92.3    100    92.0      106    91.5     118    91.0     141   90.5     151
GR  90.5    159    90.3      161    90.5     163    91.0     168   91.5     176
GR  92.0    210    92.1      237
X1 2439.     44  320.79   324.78     57.     57.     57.
GR 96.68    .00   96.19    11.89   95.82   22.61   95.41   40.00  95.22   55.43
GR 94.85  69.71   94.71    80.21   94.32   84.33   94.30   90.49  94.26  111.75
GR 93.85 127.00   92.99   159.38   93.05  170.39   92.63  186.76  93.09  189.69
GR 92.97 198.46   92.97   203.67   92.84  209.61   92.73  218.06  92.46  225.71
GR 92.27 234.48   92.39   238.76   92.38  248.10   92.27  257.35  92.49  266.45
GR 92.84 274.42   92.97   278.98   92.85  284.53   92.66  292.92  92.51  304.49
GR 91.97 313.07   91.33   320.79   90.36  322.24   90.98  324.78  91.16  334.57
GR 91.62 340.16   92.13   356.83   92.57  364.21   92.60  372.75  92.78  381.84
GR 92.83 386.95   92.11   388.63   92.68  390.48   92.72  396.24    .00     .00
NC   .05    .05     .03      .30     .50
X1 2620.     25.  116.76   122.22    240.    160.    171.
GR 96.36    .00   96.37     6.16   96.08   15.12   95.82   21.28  95.80   28.01
GR 95.60  31.93   95.14    42.23   94.95   46.23   94.92   54.12  94.71   58.64
GR 94.14  66.07   93.74    69.88   93.44   76.93   93.56   81.54  93.63   88.62
GR 93.87  97.44   93.42    101.43  93.74  112.68   92.42  116.76  91.75  117.42
GR 91.67 119.18   93.58    122.22  94.00  159.00   94.60  180.00  94.80  190.00
X12630.2   15.    199.2    202.4    20.0    20.0    20.0
X3    10                                          93.25   93.25
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GR  96.5       0     96.5      57     94.5      76     94.0     104     93.5     120
GR  93.4     133     93.0     198     92.5   199.2    92.26   199.3    92.26   202.3
GR  92.5   202.4     93.0     219     93.0     223     93.5     252     94.8     261
NC                  .019
X12630.3     15.   199.3   202.3      0.5      0.5      0.5
BT  -16.     57     96.5     96.5      76     96.0     94.5     104     95.0     94.0
BT           120     94.5     93.5     133     94.0     93.4     198     93.44    93.0
BT         199.2    93.44    92.3   199.3    93.44    91.99   199.3    93.44    92.99
BT         202.3    93.44   92.99   202.3    93.44    91.99   202.4    93.44    92.3
BT           219     93.5     93.0     223     94.0     93.0     252     94.6     93.5
BT           261     94.8     94.8
GR  96.5       0     96.5      57     94.5      76     94.0     104     93.5     120
GR  93.4     133     93.0     198     92.3   199.2    91.99   199.3    91.99   202.3
GR  92.3   202.4     93.0     219     93.0     223     93.5     252     94.8     261
X12630.4       0        0        0     32.0     32.0     32.0
X2                                                      1.0
NC                  .030
X12630.5       0        0        0     15.0     15.0     15.0                .10
X3     10                                                       93.4     93.4
X1 2774.      45    78.77   130.55      85.      150.     145.
GR 97.00     .00    97.08     4.96    97.06    14.65    96.90    21.94    96.55    25.26
GR 96.62   34.88    96.66    40.48    96.61    44.94    96.68    55.82    96.56    64.72
GR 95.69   72.50    94.61    78.77    93.68    86.08    93.53    93.17    93.59    97.61
GR 92.98  101.95    92.72   103.72    93.58   105.07    93.46   113.58    93.67   118.48
GR 93.62  124.10    95.28   130.55    95.67   137.24    95.71   148.27    95.93   152.23
GR 95.61  157.48    95.67   164.42    95.85   181.63    96.03   195.85    96.08   209.57
GR 95.69  215.85    95.79   231.61    96.03   246.16    96.04   259.63    96.26   269.55
GR 96.44  272.71    96.69   284.33    96.65   304.29    96.74   323.93    96.75   338.43
GR 96.38  352.65    96.60   358.80    95.87   361.76    96.25   364.02    96.17   377.59
NC   .06     .06      .03      .3       .5
X12863.1      20     86.0     88.0    160.5    160.5    160.5
GR  97.3       0     97.2        4     97.0       22     96.5       62     95.0       80
GR  95.0      84     94.0       86    92.72     86.1    93.72     87.9     94.0       88
GR  95.0     100     96.0      118     96.1      144     96.5      159     96.5      168
GR  96.5     198     97.0      220     98.0      236     98.5      254     98.7      276
X12863.2      20     86.0     88.0     23.0     23.0     23.0
X3     10                                                       96.30    96.30
GR  97.3       0     97.2        4     97.0       22     96.5       62     95.0       80
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GR  95.0      84     94.0       86    93.90     86.1    93.90     87.9     94.0       88
GR  95.0     100     96.0      118     96.1      144     96.5      159     96.5      168
GR  96.5     198     97.0      220     98.0      236     98.5      254     98.7      276
NC   .07     .07     .019
X12863.3      11     84.1     85.9       .5       .5       .5
BT  -12.       0     97.5     97.5       20    97.45     96.9       71     97.4     96.0
BT            84    97.36     94.2     84.1    97.36    93.93     84.1    97.36    95.79
BT          85.9    97.36    95.79     85.9    97.36    93.93       86    97.36     94.2
BT           106     97.5     96.0      188     97.6     96.1      200     97.9     97.9
GR  97.5       0     96.9       20     96.0       71     94.2       84    93.93     84.1
GR 93.93    85.9     94.2       86     96.0      106     96.1      188     97.9      200
GR  99.2     210
X12863.4       0        0        0     37.5     37.5     37.5
X2                                                      1.0
NC                  .030
X12863.5       0        0        0      0.5      0.5      0.5
X3     10                                                       97.36    97.36
X12863.6       0        0        0     10.0     10.0     10.0
EJ


ER
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*************************************
*            S U M P O              *
*     Interactive SUmmary PrintOut  *
*        for the IBM PC/XT/AT       *
*         January 1987 version      *
*************************************
```

Input Filename: WC5S.HEC
Output Filename: WC5S.SUM

Watercourse 5

	SECNO	Q	QCH	VCH	CWSEL	DEPTH	DIFWSX	EG	TOPWID	K*CHSL	QLOB
	1.00	10.26	10.26	0.15	75.03	3.03	0.00	75.03	21.96	0.00	0.
	2.00	10.26	10.26	0.10	75.03	3.03	0.00	75.03	33.46	0.00	0.
	3.00	10.26	10.26	0.02	75.03	3.03	0.00	75.03	145.96	0.00	0.
	4.00	10.26	10.26	0.02	75.03	3.03	0.00	75.03	170.96	0.00	0.
	5.00	10.26	10.26	0.02	75.03	3.03	0.00	75.03	170.96	0.00	0.
	6.00	10.26	10.26	0.09	75.03	3.03	0.00	75.03	37.46	0.00	0.
	7.00	10.26	10.26	0.06	75.03	3.03	0.00	75.03	53.96	0.00	0.
	8.00	8.76	8.76	0.05	75.03	3.03	0.00	75.03	53.90	0.00	0.
	9.00	8.76	8.76	1.24	76.45	1.00	1.42	76.53	9.16	58.38	0.
*	10.00	8.76	8.76	2.15	76.60	0.82	0.15	76.84	8.88	10.15	0.
*	11.00	8.76	8.76	2.30	76.94	0.84	0.34	77.21	7.09	58.18	0.
*	12.00	8.76	8.76	1.89	77.95	0.93	1.01	78.13	5.01	41.82	0.
*	13.00	8.76	8.14	2.36	78.06	0.71	0.11	78.33	7.26	110.00	0.
*	14.00	8.76	7.77	3.49	78.91	1.56	0.86	79.48	2.84	0.00	0.
	530.20	8.76	2.38	0.18	79.82	2.37	0.91	79.82	211.11	2.27	2.
	530.30	8.76	8.76	1.49	79.80	2.24	-0.02	79.91	204.69	220.00	0.
	530.40	8.76	8.76	1.49	79.86	2.30	0.06	79.97	220.97	0.00	0.
	530.50	8.76	1.30	0.14	80.04	2.48	0.18	80.04	273.39	0.00	3.
	546.00	8.76	1.19	0.13	80.04	2.45	0.00	80.04	336.89	7.50	3.
	573.20	9.91	0.90	0.12	80.04	2.42	0.00	80.04	489.07	5.88	2.
	573.30	9.91	0.73	0.09	80.22	2.63	0.18	80.22	552.24	-0.71	2.
	597.00	11.73	0.56	0.07	80.22	2.63	0.00	80.22	552.23	0.00	3.
	616.20	11.12	0.69	0.07	80.22	2.50	0.00	80.22	469.88	260.01	3.
	616.30	11.12	11.12	1.50	80.20	2.54	-0.02	80.31	121.41	-120.00	0.
	616.40	11.12	11.12	1.50	80.25	2.59	0.06	80.37	243.34	0.00	0.
	616.50	11.12	11.12	1.12	80.34	2.68	0.08	80.40	3.70	0.00	0.
	616.60	11.12	2.46	0.26	80.44	2.58	0.10	80.44	204.81	10.00	5.

	723.90	11.12	2.08	0.16	80.44	1.83	0.00	80.44	325.95	10.71	0.
	798.00	11.12	4.21	0.90	80.47	1.22	0.04	80.49	305.48	8.53	2.
*	915.20	11.12	1.00	0.31	81.00	0.83	0.53	81.00	316.13	8.93	0.
*	915.30	11.12	7.28	1.60	81.17	1.25	0.16	81.25	354.73	-500.00	0.
	915.40	11.12	5.20	1.06	81.27	1.35	0.11	81.30	364.14	0.00	0.
	915.50	11.12	11.12	2.52	81.13	1.21	-0.15	81.45	3.65	0.00	0.
	990.00	11.12	11.09	2.51	81.50	1.30	0.37	81.82	13.34	4.56	0.
*	1080.20	11.12	11.12	3.86	82.51	1.52	1.01	83.27	1.90	5.40	0.
	1080.30	0.19	0.19	0.07	83.49	2.37	0.99	83.49	1.90	13.54	0.
	1169.00	0.16	0.05	0.00	83.49	2.21	0.00	83.49	587.40	1.89	0.
	1229.00	0.16	0.01	0.00	83.49	1.41	0.00	83.49	450.05	13.33	0.
	1339.20	8.33	6.06	1.22	83.52	1.18	0.03	83.58	146.90	2.55	0.
	1339.30	8.33	8.33	1.73	83.47	1.13	-0.05	83.62	113.69	0.00	0.
	1339.40	8.33	8.33	1.64	83.54	1.20	0.06	83.67	143.91	0.00	0.
	1339.50	8.33	2.83	0.49	83.71	1.37	0.17	83.71	219.14	0.00	3.
*	1424.00	15.80	9.71	1.83	84.54	1.30	0.83	84.64	140.16	10.59	0.
*	1445.00	15.80	15.80	2.66	84.69	1.22	0.15	85.05	8.43	10.95	0.
	1481.00	15.80	14.69	1.92	85.12	1.27	0.43	85.29	52.25	10.56	0.
*	1525.00	15.80	14.69	2.04	85.65	1.33	0.53	85.85	44.18	10.68	0.
	1549.00	15.80	15.80	2.45	85.75	1.17	0.10	86.06	8.91	10.83	0.
	1567.00	15.80	2.89	0.92	86.09	1.44	0.34	86.11	81.20	3.89	7.
	1634.00	15.80	15.80	2.13	86.22	1.32	0.13	86.45	10.12	3.73	0.
*	1706.20	15.80	10.88	3.24	86.80	1.77	0.58	87.17	14.00	1.00	2.
	1706.30	15.80	5.62	1.15	87.69	2.57	0.89	87.71	267.30	4.46	5.
	1731.00	10.50	4.97	0.19	87.72	2.22	0.03	87.72	365.09	25.33	4.
	1823.00	10.50	10.07	0.21	87.72	1.50	0.00	87.73	154.24	7.83	0.
*	1933.90	10.50	6.86	1.99	88.07	1.57	0.35	88.20	64.31	2.55	2.
	1998.00	10.50	5.17	1.07	88.28	1.53	0.21	88.32	62.46	3.85	3.
*	2088.00	10.50	10.50	1.86	88.86	1.09	0.57	89.03	15.92	11.33	0.
	2185.00	10.50	9.41	1.48	89.38	0.98	0.52	89.48	27.83	6.49	0.
*	2229.00	10.50	9.03	2.18	89.96	1.35	0.58	90.17	26.66	4.77	0.
*	2294.90	10.50	8.31	2.20	90.53	1.53	0.58	90.73	34.11	6.00	1.
	2382.00	10.50	4.51	1.67	91.07	0.77	0.53	91.14	31.61	14.77	5.
*	2439.00	10.50	6.94	2.36	91.47	1.11	0.40	91.67	19.25	1.05	0.
	2620.00	10.50	10.25	2.68	92.90	1.23	1.43	93.25	5.85	7.66	0.
	2630.20	10.50	3.18	0.90	93.37	1.11	0.47	93.38	105.91	29.50	2.
	2630.30	10.50	10.50	3.50	93.06	1.07	-0.30	93.69	39.33	-540.01	0.
	2630.40	10.50	4.13	0.93	93.91	1.92	0.85	93.93	148.02	0.00	3.

	2630.50	10.50	1.68	0.30	93.94	1.85	0.03	93.94	145.20	6.67	4.
	2774.00	10.50	10.50	0.54	93.98	1.26	0.04	94.00	41.90	4.34	0.
*	2863.10	10.50	6.39	2.91	94.83	1.11	0.85	95.11	13.63	6.23	0.
*	2863.20	10.50	10.50	3.74	95.31	1.41	0.48	96.02	2.00	7.83	0.
*	2863.30	10.50	10.50	3.86	95.44	1.51	0.13	96.20	24.76	60.00	0.
	2863.40	10.50	10.50	3.14	96.18	2.25	0.74	96.68	127.70	0.00	0.
	2863.50	10.50	10.50	2.28	96.49	2.56	0.31	96.75	1.80	0.00	0.
	2863.60	10.50	1.50	0.29	96.83	2.90	0.34	96.83	168.99	0.00	2.

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C
C     21
C      1  ALL SECTIONS HAVE UPSTREAM SECTIONING ASPECT
C     11  D/S SECTION NORTH SERVICE ROAD
C     12  U/S SECTION NORTH SERVICE ROAD
C  530.2  D/S SECTION Q.E.W. OFF-RAMP
C  530.5  U/S SECTION Q.E.W. OFF-RAMP
C  573.2  D/S SECTION Q.E.W.
C  573.3  U/S SECTION Q.E.W.
C  616.2  D/S SECTION Q.E.W. ON-RAMP
C  616.5  U/S SECTION Q.E.W. ON-RAMP
C  915.2  D/S SECTION SOUTH SERVICE ROAD
C  915.5  U/S SECTION SOUTH SERVICE ROAD
C 1080.2  D/S SECTION C.N.R.
C 1080.3  U/S SECTION C.N.R.
C 1339.2  D/S SECTION ARVIN AVENUE
C 1339.5  U/S SECTION ARVIN AVENUE
C 1706.2  D/S SECTION BARTON STREET
C 1706.3  U/S SECTION BARTON STREET
C 2630.2  D/S SECTION FRUITLAND ROAD
C 2630.5  U/S SECTION FRUITLAND ROAD
C 2863.2  D/S SECTION HIGHWAY NO. 8
C 2863.5  U/S SECTION HIGHWAY NO. 8
T1 CITY OF STONEY CREEK FLOODPLAIN MAPPING STUDY
T2 BY PHILIPS PLANNING & ENGINEERING LIMITED -PROJECT NO. 86090
T3       Watercourse 5  100 yr STORM
J1     0      2.0        0        0      0.0      1.0        0        0   75.03
J2   1.0        0     -1.0
J6   1.0
QT     6.   21.90    19.28    16.13    13.87    11.70     8.35
NC 0.026   0.026    0.026      0.6      0.8
X1     1       4     0.05    21.95        0        0        0
GR    77       0       72     0.05       72    21.95       77       22
X1     2       4     0.05    33.45       32     33.5     31.5
GR    77       0       72     0.05       72    33.45       77     33.5
X1     3       4     0.05   145.95       29      106     27.5
GR    77       0       72     0.05       72   145.95       77      146
X1     4       4     0.05   170.95     66.5       62       64
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GR    77       0       72     0.05       72   170.95       77      171
X1     5       4     0.05   170.95       15       67       16
GR    77       0       72     0.05       72   170.95       77      171
X1     6       4     0.05    37.45     79.5     39.5     39.5
GR    77       0       72     0.05       72    37.45       77     37.5
X1     7       4     0.05    53.95       18       24       18
GR    77       0       72     0.05       72    53.95       77       54
X1     8       4     0.05    53.95       32       32       32
X2  20.4
X3    10                                                  76.2     76.2
GR    77       0       72     0.05       72    53.95       77       54
NC 0.013   0.013    0.013      0.6      0.8
SB  1.05     1.6     1.72        0      4.8      0.3      7.2        0   75.44     72.5
X1     9       5        0       20     59.1     59.1     59.1
X2     0       0        1    76.94       79
X3    10                                                  79.0     79.0
BT    -4       0       80       80        9    79.46    75.45       14     79.0    75.45
BT            20     79.6     78.2
GR  80.0       0    75.45        9    75.45       14     78.2       20     78.8       25
X1    10       8        0       44       28       20     32.5
GR 77.60       0    77.21       26    76.21       29    76.09       31    75.78     32.5
GR 76.09      34    76.21     35.5       79       44
X1    11       5        0       14       28      7.5      5.5
X3    10                                                  78       78
GR    78       0    76.40        5    76.10      6.5    76.40      9.5    79.10       14
NC 0.013   0.013    0.013
SB  1.05     1.6     1.72        0      4.8      0.3      7.2        0    77.02    76.10
X1    12       8     4.08    13.08       22       22       22
X2     0       0        1    78.29    79.74
X3    10                                                  79.25    79.25
BT     2       0    79.63    79.48    17.16    79.84    79.48
GR 79.48       0    78.12     4.08    78.12     6.08    77.02     6.10    77.02    11.08
GR 78.12   11.10    78.12    13.08    79.48    17.16
NC 0.035   0.035    0.035
X1    13       6     4.08    11.08        3        3        3
GR 79.48       0    78.41     4.08    77.35     7.08    77.35     8.08    77.41    11.08
GR 79.48   15.08
X1    14       0        0        0       23       23       23  0 .24
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X1 530.2      13.     221.     227.     30.0     46.0     44.0
X3    10                                                 79.65    79.65
GR  80.3       0    80.0      100     79.5      196     79.0      210     78.0      221
GR 77.45   222.1   77.45   225.75     78.0      227     79.0      238     79.5      274
GR  79.8     344    81.0      427     84.0      486
NC                  .022
X1 530.3      13.   222.1   225.75      0.5      0.5      0.5
BT  -14.     100    80.0     80.0      196     80.0     79.5      210     80.1     79.0
BT           222   80.35     78.0    222.1    80.35    77.56    222.1    80.36    79.17
BT        225.75   80.36    79.17   225.75    80.36    77.56    225.9    80.35     78.0
BT           238    80.3     79.0      274     81.0     79.5      344     82.0     79.8
BT           427    83.0     81.0      486     84.0     84.0
GR  80.3       0    80.0      100     79.5      196     79.0      210     78.0      222
GR 77.56   222.1   77.56   225.75     78.0    225.9     79.0      238     79.5      274
GR  79.8     344    81.0      427     84.0      486
X1 530.4       0       0        0     26.1     26.1     26.1
X2                                               1.0
NC                  .030
X1 530.5       0       0        0      0.5      0.5      0.5
X3    10                                                 80.0     79.8
X1  546.      15.   222.0    225.9       4.       4.       4.
GR  80.3       0    79.9      100     79.5      181     79.0      210     78.0      222
GR 77.59   222.1   77.59    225.8     78.0    225.9     79.0      238     79.5      253
GR  79.8     323    79.8      376     79.7      401     81.0      405     81.5      412
NC                  .019
X1 573.2      12.   452.1   455.15      5.1      5.1      5.1
X3    10                                                 79.35    79.35
GR  80.6       0    80.5       64     80.0      205     79.5      402     79.0      448
GR  78.0     452    77.62    452.1    77.62   455.15     78.0    455.3     79.0      515
GR  80.0     675    80.1       695
SB     0    1.99     1.45        0     3.05        0     3.81        0    77.59     77.62
X1 573.3      12.   452.1   455.15     42.56    42.56    42.56
X2    0       0     1.0     78.84     80.07
X3    10                                                 80.07    80.07
BT  -14.       0    80.6     80.6       64     80.6     80.5      205     80.4     80.0
BT           402   80.15     79.5      448     80.1     79.0      452    80.07     78.0
BT         452.1   80.07    77.59    452.1    80.07    78.84    455.15   80.07    78.84
BT        455.15   80.07    77.59    455.3    80.07     78.0      515     80.3     79.0
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BT           675    80.2     80.0      695     80.1     80.1
GR  80.6       0    80.5       64     80.0      205     79.5      402     79.0      448
GR  78.0     452    77.59    452.1    77.59   455.15     78.0    455.3     79.0      515
GR  80.0     675    80.1       695
NC                  .030
X1  597.       0       0        0      5.3      5.3      5.3
QT    6.   19.47   17.00    13.99    11.86     9.77     6.95
X1 616.2      14.   452.1    455.8      0.5      0.5      0.5
X3    10                                                 79.95    79.95
GR  80.6       0    80.5       64     80.0      205     79.5      402     79.0      448
GR  78.0     452    77.72    452.1    77.72    455.8     78.0    455.9     79.0      515
GR  81.0     675    82.0       710     83.0      742     84.0      771
NC                  .021
X1 616.3      21.   360.1    363.8      0.5      0.5      0.5
BT  -19.       0    80.7     80.7       56     80.8     80.5       97     80.8     80.3
BT           170    80.8     80.2      305     80.8     80.3      324     80.8     80.0
BT           341    80.8     79.5      344     80.8     79.0      360     80.6     78.0
BT         360.1    80.6    77.66    360.1     80.6    79.66    363.8     80.6    79.66
BT         363.8    80.6    77.66    363.9     80.6     78.0      366     80.7     79.0
BT           374    80.7     79.5      411     80.8     80.0      422     80.8     80.1
BT           500    80.8     80.8
GR  80.7       0    80.5       56     80.3       97     80.2      170     80.3      305
GR  80.0     324    79.5      341     79.0      344     78.0      360    77.66    360.1
GR 77.66   363.8    78.0    363.9     79.0      366     79.5      374     80.0      411
GR  80.1     422    80.8      500     81.0      675     82.0      710     83.0      742
GR  84.0     771
X1 616.4       0       0        0     31.7     31.7     31.7
X2                                               1.0
NC                  .030
X1 616.5       0       0        0      0.5      0.5      0.5
X3    10                                                 80.60    80.60
X1 616.6       0       0        0      20.      20.      20.                        .20
NC  .060    .060    .030       .1       .3
X1 723.9      22.0   235.2    245.5     70.0     70.0     70.0
GR 82.09       0    80.84     21.4    80.80     30.0    80.71     60.0    80.59     90.0
GR 80.29   180.0    80.19    210.0    79.97    225.0    80.00    235.2    78.61    240.0
GR 79.34   244.0    79.43    245.5    79.39    270.0    79.62    300.0    79.69    330.0
GR 79.70   360.0    79.74    390.0    80.14    420.0     81.0    496.0     80.0    520.0
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GR 81.00   530.0    82.0   540.0
NC  .060    .060    .030      .3      .5
X1  798.     31.  129.94  136.17   75.04   75.04   75.04
GR 80.94     .00   80.85    7.11   81.53   11.16   82.19   17.49   82.19   27.94
GR 80.52   36.71   80.68   38.05   80.50   69.04   80.24   88.07   80.16  109.07
GR 80.35  129.94   79.25  132.46   80.11  136.17   80.53  141.83   80.54  163.95
GR 80.38  182.62   80.37  204.72   80.39  224.35   80.48  246.54   80.46  267.41
GR 80.39  287.03   80.35  304.43   80.35  324.00   80.31  344.28   80.29  378.51
GR 80.29  392.00   80.42  402.69   79.99  406.16   80.29  410.76   84.00  418.00
GR 84.30  421.00
X1 915.2     15.     74.   77.85   103.    103.    103.
X3    10                                          81.80   81.00
GR  82.4       0   82.0      12   81.5      21   81.0      51   80.3      74
GR 80.17    74.1  80.17   77.75   80.3   77.85   80.5     165   80.5     200
GR  81.0     270   81.0     308   81.0     390   82.0     424   83.0     454
NC                .022
X1 915.3      15   74.1   77.75     0.5     0.5     0.5
BT  -15.       0   82.4    82.4      12    82.3    82.0      21   82.3    81.5
BT             51   82.3    81.0      74   82.32    80.3    74.1  82.32   79.92
BT           74.1  82.32   81.42   77.75   82.32   81.42   77.75  82.32   79.92
BT          77.85  82.32    80.3     165    81.7    80.5     200   81.5    80.5
BT            270   81.1    81.0     308    81.0    81.0     390   81.0    81.0
GR  82.4       0   82.0      12   81.5      21   81.0      51   80.3      74
GR 79.92    74.1  79.92   77.75   80.3   77.85   80.5     165   80.5     200
GR  81.0     270   81.0     308   81.0     390   82.0     424   83.0     454
X1 915.4       0      0       0   27.3    27.3    27.3
X2                                         1.0
NC                .030
X1 915.5       0      0       0     0.5     0.5     0.5
X3    10                                          82.3    81.7
X1  990.      54  562.45  567.44   61.44   61.44   61.44
GR 82.95     .00   82.76    3.11   82.24    4.17   81.82    5.35   82.23    6.31
GR 82.25    8.04   82.21   22.87   82.19   48.43   82.24   77.38   82.23   96.43
GR 82.23  122.58   82.34  147.58   82.22  211.18   82.15  237.38   82.24  261.64
GR 82.24  286.64   82.21  312.02   82.26  328.28   81.98  352.48   82.18  376.49
GR 82.16  390.06   81.87  411.56   81.96  421.63   81.99  426.81   81.71  432.08
GR 81.81  436.39   81.67  444.27   81.53  449.53   81.67  452.32   81.67  462.74
GR 81.67  474.81   81.54  496.60   81.95  509.40   81.63  527.48   81.77  544.08
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GR 81.94  547.01   83.20  550.05   83.78  553.53   82.46  558.07   81.33  562.45
GR 80.38  563.39   80.20  565.45   81.46  567.44   81.66  569.02   81.52  573.45
GR 81.43  582.08   81.76  587.07   82.29  595.09   83.21  605.64   83.42  616.58
GR 83.63  629.90   83.63  643.03   83.76  652.55   83.51  666.39
NC  .080    .080    .025      .3      .5
X11080.2     15.     84.1    86.0   146.3   146.3   146.3
X3    10                                          83.15   83.15
GR  84.1       0   82.1      10   82.0      12   82.0      65   81.4      84
GR 80.99    84.1  80.99      86   81.4    86.1   82.0     112   82.0     123
GR  82.3     138   82.0     164   81.8     220   81.7     274   83.6     285
SB     0    1.47    1.55       0    1.9       0    2.9       0  81.12   80.99
X11080.3      14    70.1    72.0    9.6     9.6     9.6
X2     0       0     1.0   82.65   83.93
X3    10                                          83.90   83.60
BT  -14.      37   83.9     83.9      52   83.9     83.0      55   83.9     82.0
BT             60   83.9    81.8      64   83.9     82.0      70  83.93     81.5
BT           70.1  83.93   81.12    70.1  83.93    82.65      72  83.93    82.65
BT             72  83.93   81.12    72.1  83.93     81.5     148   83.6     82.0
BT            218   83.6    82.2     219   83.6     83.6
GR  84.2       0   84.0      35   83.9      37   83.0      52   82.0      55
GR  81.8      60   82.0      64   81.5      70  81.12    70.1  81.12      72
GR  81.5    72.1   82.0     148   82.2     218   83.6     219
QT     6.  15.80   13.60   10.91    9.05    7.31    5.02
NC  .090    .090    .030
X1 1169.      50.  351.21  387.50   84.5    84.5    84.5
GR 83.70     .00   83.50   43.00   83.00  137.00   83.00  145.00   82.90  150.00
GR 82.90  150.00   83.11  154.13   83.16  166.68   83.00  195.98   82.77  208.87
GR 82.49  222.03   82.52  234.57   82.29  248.19   82.67  259.46   82.24  263.53
GR 82.34  271.06   82.00  282.13   81.95  294.48   81.87  303.19   81.96  311.57
GR 82.16  324.08   81.72  338.58   81.89  351.21   81.28  359.44   81.54  365.84
GR 81.30  375.35   81.62  387.50   81.68  397.18   81.79  412.21   81.80  421.00
GR 82.09  424.06   82.03  425.81   81.81  427.65   82.31  434.38   82.33  439.56
GR 82.54  454.10   82.40  465.09   83.13  475.35   83.08  485.17   82.54  492.09
GR 82.10  504.39   81.74  526.08   81.84  540.31   81.80  554.22   81.93  567.49
GR 81.59  580.95   81.85  593.83   81.78  609.90   81.48  622.06   81.40  631.69
NC  .07     .07     .03
X1 1229.      61  435.79  438.38     60.     60.     60.
GR 84.10     .00   84.00   20.00   83.50   52.00   83.20  100.00   83.00  140.00
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GR 83.23  150.00   83.23  155.19   82.52  156.56   82.49  157.95   83.08  159.54
GR 83.14  166.16   83.01  177.34   83.01  192.33   82.92  210.32   82.85  225.44
GR 82.80  240.43   82.96  256.06   82.96  277.01   82.96  287.91   82.72  289.51
GR 83.73  293.97   84.12  301.42   84.15  313.57   84.15  325.86   84.12  341.77
GR 83.75  353.73   83.48  385.05   83.85  386.92   84.03  392.41   84.04  407.12
GR 83.91  422.65   83.86  433.05   82.24  435.79   82.08  437.71   82.48  438.38
GR 82.78  450.11   82.76  462.40   82.67  475.10   82.85  489.55   83.18  489.89
GR 82.28  490.03   82.33  497.21   83.40  497.85   83.44  498.29   82.59  498.43
GR 82.59  505.75   82.24  509.49   82.57  513.10   82.68  539.71   82.33  555.83
GR 82.34  576.09   82.68  579.02   82.73  584.49   82.59  587.77   82.96  591.71
GR 82.83  595.43   82.31  596.87   82.60  606.33   82.43  623.44   82.44  638.15
GR 82.34  642.30
X11339.2      11   107.1  111.35   102.0  102.0    102.0
X3    10                                          83.7   83.5
GR  84.4       0    84.0      62    83.0    106    82.7    107   82.34   107.1
GR 82.34  111.35    82.7  111.45    83.0    113    83.5    148    83.5     235
GR  83.4     254
NC  .060    .060    .026
X11339.3      12   139.6  143.85     0.5     0.5     0.5
BT  -14.       0    84.4    84.4       4    84.3    84.3      10    84.3    84.0
BT           139    83.9    83.0   139.5   83.90    82.7   139.6    83.9   82.34
BT         139.6    83.9   83.69  143.85    83.9   83.69  143.85    83.9   82.34
BT         144.0    83.9    82.7    146.    83.9    83.0     184    83.8    83.8
BT           296   83.55    83.4     300    83.5    83.5
GR  84.4       0    84.3       4    84.0      10    83.0     139    82.7   139.5
GR 82.34   139.6   82.34  143.85    82.7   144.0    83.0     146    83.8     184
GR  83.4     296    83.5     300
X11339.4      0.      0.      0.    15.2    15.2    15.2
X2                                                 1.0
NC                  .030
X11339.5      0       0       0     0.5     0.5     0.5
X3    10                                          83.7   83.5
X1 1424.     45  280.84  287.48    85.0    85.0    85.0
X4   4.0   85.0    47.0    90.0   47.01    90.0   114.0    85.5  114.01
GR 84.87    .00   84.31    2.76   84.66   14.39   84.97   36.74   90.00   58.09
GR 90.00  80.86   90.00  102.67   85.45  118.25   85.45  137.72   85.41  156.84
GR 85.51 174.88   85.57  192.20   85.47  201.21   85.32  211.77   85.14  216.93
GR 84.56 219.62   84.57  229.92   84.73  241.21   84.70  250.87   85.69  251.21
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GR 86.07  256.46   84.92  257.63   84.85  262.54   85.98  263.72   86.15  267.49
GR 84.52  268.42   84.51  273.85   84.31  280.84   83.24  283.17   84.20  287.48
GR 84.36  307.61   84.82  311.69   85.05  319.83   85.00  335.72   85.07  350.15
GR 85.04  364.52   84.88  375.55   84.79  385.19   84.72  402.66   84.62  419.30
GR 84.52  439.68   84.46  457.90   84.36  476.09   84.32  494.01   84.50  527.00
NC  .060    .060    .030     .10     .30
X1 1445.     29.     287.    297.    21.     21.     21.
GR  85.5       0    85.0      14    87.3      16    87.3      35    85.5      40
GR  87.3      45    87.3      63    85.5      66    86.0     120    86.0     176
GR  85.5     221    85.2     224    85.5     255    85.0     287    84.0     290
GR 83.47     292    84.0     295    85.0     297    85.5     298    85.6     315
GR  88.1     318    88.1     341    85.6     343    85.5     355    86.7     370
GR  86.7     383    85.4     385    85.0     430    85.0     515
X1 1481.     18.     297.    307.    36.     36.     36.
GR  86.0       0    86.5      95    86.5     205    86.0     240    86.0     275
GR  85.5     297    84.0     301   83.85     302    84.0     305    85.0     307
GR  86.0     315    86.0     328    85.8     380    85.5     422    85.0     450
GR  85.0     484    85.5     492    85.5     523
X1 1525.     17.     313.    325.    44.     44.     44.
GR  86.5       0    86.5      26    87.0      53    87.0     221    86.5     228
GR  86.5     263    86.0     313    85.0     316   84.32     319    85.0     322
GR  86.0     325    86.0     415    85.5     453    85.5     467    86.0     497
GR  86.0     515    86.4     520
X1 1549.     40.  312.25  322.40    24.     24.     24.
GR 86.00    .00   86.07    6.44   86.35   16.08   86.65   26.21   86.72   34.51
GR 86.82  42.78   86.98   45.48   87.54   51.04   87.54   55.47   87.73   64.42
GR 87.15  85.78   87.16   99.21   87.18  108.26   87.17  117.07   87.23  128.83
GR 87.36 144.20   87.36  158.16   87.32  175.37   87.32  188.77   87.26  205.52
GR 86.77 217.98   86.76  233.89   86.74  249.41   86.69  264.41   86.33  279.85
GR 86.05 297.07   86.24  312.25   85.06  314.92   84.58  317.03   84.64  318.75
GR 85.80 322.40   86.27  337.42   86.43  355.78   86.19  372.58   86.38  398.24
GR 86.41 419.92   86.20  446.38   86.21  469.71   86.21  489.72   86.50  515.00
X1 1567.     12   240.0   242.2     18.     18.     18.
GR  87.8       0    88.0      59    87.5     103    87.0     184    86.0     201
GR  84.9     240   84.65   240.1   84.65   242.1    84.9   242.2    86.0     271
GR  86.8     354    86.9     372
NC   .06     .06     .03     .30     .50
X1 1634.      59  322.16  351.48     67.     67.     67.
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GR 87.33     .00   86.86    2.13   87.34    4.49   87.45    8.65   87.51   16.27
GR 87.53   22.96   86.88   32.09   86.68   43.97   86.72   54.75   86.89   64.36
GR 87.22   68.54   87.01   79.00   86.69   82.94   87.28   85.03   87.44   96.99
GR 87.59  114.20   87.85  119.01   87.97  130.72   87.70  144.50   87.68  155.16
GR 87.54  160.52   87.16  165.91   87.08  175.76   87.16  191.08   87.28  204.15
GR 87.39  216.68   87.71  226.47   87.56  240.91   87.14  250.70   86.90  263.30
GR 86.55  273.58   86.40  283.97   86.54  286.63   86.45  292.57   86.32  301.00
GR 86.48  307.53   87.08  313.65   87.07  322.16   86.35  335.94   86.19  340.15
GR 84.90  343.24   84.98  345.58   87.02  351.48   87.13  356.37   86.94  360.57
GR 86.92  374.70   87.01  385.27   87.69  386.97   86.89  390.41   87.02  396.03
GR 86.99  408.50   86.80  419.73   86.81  438.62   87.02  450.31   86.60  459.98
GR 86.89  475.93   87.09  479.77   87.53  490.55   87.57  495.42
NC                 .020
X11706.2      13   172.1   174.0   129.9   129.9   129.9
X3    10                                    86.80   86.80
GR  87.7       0    87.5      32    87.5     142    87.0     164    86.0     170
GR  85.3     172   85.03   172.1   85.03   174.0    85.3   174.1    86.0     176
GR  87.0     180    87.0     232    88.9     240
SB     0    1.64    1.55       0     1.9       0    2.28       0   85.12   85.03
X11706.3      14   213.1   215.0    20.2    20.2    20.2
X2     0       0     1.0   86.32   87.61
X3    10                                    87.60   87.60
BT  -16.       0    87.9    87.9      84    87.8    87.5     161    87.6    87.5
BT            206   87.61    87.0     211.  87.61    86.5     212   87.61    86.0
BT            213   87.61    85.5   213.1   87.61   85.12   213.1   87.61   86.32
BT            215   87.61   86.32     215   87.61   85.12   215.1   87.61    85.5
BT            216   87.61    86.0     224   87.65    87.0     260   87.55    87.5
BT            368.  87.9     87.9
GR  87.9       0    87.5      84    87.5     161    87.0     206    86.5     211
GR  86.0     212    85.5     213   85.12   213.1   85.12     215    85.5   215.1
GR  86.0     216    87.0     224    87.5     260    87.9     368
QT     6.  10.50    8.91    6.98    5.65    4.43    2.92
NC                 .030
X1 1731.      49  354.97  369.66    15.0    15.0    15.0
GR 87.34     .00   87.42    9.02   87.24   12.56   87.46   19.13   87.47   27.61
GR 87.47   39.34   87.11   50.42   86.99   60.88   86.96   66.50   86.95   73.62
GR 86.34   75.76   86.92   77.75   86.95   87.51   87.24   96.87   87.11  104.62
GR 87.22  114.42   87.24  124.01   87.30  136.38   87.35  145.80   87.35  156.23
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GR 87.81  160.75   87.93  170.66   87.68  182.22   87.92  192.80   87.83  203.74
GR 87.61  210.10   87.60  219.35   87.55  231.05   87.38  241.02   87.31  254.41
GR 87.36  268.50   87.41  279.33   87.58  296.54   87.76  306.55   87.43  320.72
GR 87.55  335.32   87.50  347.00   86.19  354.97   85.67  359.19   85.56  360.66
GR 85.50  363.22   86.06  365.42   86.96  369.66   87.26  382.93   87.60  403.74
GR 87.88  423.06   87.89  441.51   87.88  465.87   87.90  485.45     .00     .00
NC  .060    .060    .030     .10     .30
X1 1823.      50  400.12  470.23     92.     92.     92.
X3                                  471.00   90.00
GR 88.39     .00   88.19    4.62   88.32   15.60   88.47   26.67   88.07   56.77
GR 87.81   75.34   87.09   77.88   87.63   79.41   87.49   92.16   87.94  103.94
GR 88.27  115.96   88.64  129.89   87.97  146.90   87.76  161.40   87.82  177.37
GR 87.89  188.36   87.67  192.04   87.75  194.03   87.87  200.91   87.74  215.13
GR 87.76  222.60   88.13  235.06   87.87  267.46   88.68  272.16   89.39  274.54
GR 89.62  276.07   89.57  277.45   88.83  281.24   88.01  284.19   88.13  299.63
GR 87.81  324.82   87.59  351.66   87.63  375.49   87.51  395.89   88.13  400.12
GR 87.11  403.10   87.29  404.16   86.87  407.41   86.81  421.04   86.98  434.73
GR 87.01  441.42   86.22  442.88   86.86  444.03   87.17  450.58   87.17  461.74
GR 87.84  470.23   88.16  471.17   88.48  480.94   88.48  489.84   88.19  503.12
X11933.9      14.0  148.0   151.0    110.    110.    110.
GR 88.68      0.0   88.73    30.0   88.60    60.0   88.38    90.0   87.98   120.0
GR 87.77    148.0   86.80   149.5   86.50   150.0   86.51   151.0   87.77   151.0
GR 88.11    181.0   88.69   201.6   88.17   204.0   89.29   211.0
X1 1998.       39  461.48  465.60    65.0    65.0    65.0
GR 89.64     .00   90.09    3.17   89.70    5.71   89.58   12.92   89.68   32.52
GR 89.73   48.59   89.59   67.24   89.37   85.42   89.23  102.76   89.20  116.46
GR 89.22  132.03   88.94  136.03   89.34  142.81   89.33  157.28   89.43  171.43
GR 89.77  186.72   89.79  208.33   90.01  224.12   90.15  235.86   89.90  252.57
GR 89.10  293.14   89.08  311.29   88.95  328.36   88.74  339.43   88.47  354.50
GR 88.48  368.11   88.41  383.72   88.42  398.54   88.33  411.80   87.95  441.22
GR 87.80  453.94   87.55  461.48   86.75  464.31   87.33  465.60   87.92  471.16
GR 88.44  480.67   88.86  493.86   88.89  504.97   89.05  512.99     .00     .00
X1 2088.       87  802.41  863.32    90.0    90.0    90.0
GR 90.96     .00   90.69    3.49   90.83    9.66   91.05   25.92   90.91   45.14
GR 91.19   65.38   91.37   78.36   91.49   95.13   91.66  110.07   91.82  123.76
GR 91.77  141.22   91.64  157.22   91.21  171.42   91.03  190.44   91.02  200.35
GR 90.98  215.51   91.15  227.85   90.72  238.24   91.03  248.53   91.36  269.98
GR 91.34  293.28   91.09  318.74   90.60  335.03   90.65  352.15   90.92  365.69
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*            S U M P O               *
*     Interactive SUmmary PrintOut   *
*        for the IBM PC/XT/AT        *
*          January 1987 version      *
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Input Filename: WC5N.HEC
Output Filename: WC5N.SUM

Watercourse 5

SECNO	Q	QCH	VCH	CWSEL	DEPTH	DIFWSX	EG	TOPWID	K*CHSL	QLOB
1.00	21.90	21.90	0.33	75.03	3.03	0.00	75.04	21.96	0.00	0.
1.00	19.28	19.28	0.29	75.03	3.03	0.00	75.03	21.96	0.00	0.
1.00	16.13	16.13	0.24	75.03	3.03	0.00	75.03	21.96	0.00	0.
1.00	13.87	13.87	0.21	75.03	3.03	0.00	75.03	21.96	0.00	0.
1.00	11.70	11.70	0.18	75.03	3.03	0.00	75.03	21.96	0.00	0.
1.00	8.35	8.35	0.13	75.03	3.03	0.00	75.03	21.96	0.00	0.
2.00	21.90	21.90	0.22	75.04	3.04	0.01	75.04	33.46	0.00	0.
2.00	19.28	19.28	0.19	75.03	3.03	0.00	75.04	33.46	0.00	0.
2.00	16.13	16.13	0.16	75.03	3.03	0.00	75.03	33.46	0.00	0.
2.00	13.87	13.87	0.14	75.03	3.03	0.00	75.03	33.46	0.00	0.
2.00	11.70	11.70	0.12	75.03	3.03	0.00	75.03	33.46	0.00	0.
2.00	8.35	8.35	0.08	75.03	3.03	0.00	75.03	33.46	0.00	0.
3.00	21.90	21.90	0.05	75.04	3.04	0.00	75.04	145.96	0.00	0.
3.00	19.28	19.28	0.04	75.04	3.04	0.00	75.04	145.96	0.00	0.
3.00	16.13	16.13	0.04	75.03	3.03	0.00	75.03	145.96	0.00	0.
3.00	13.87	13.87	0.03	75.03	3.03	0.00	75.03	145.96	0.00	0.
3.00	11.70	11.70	0.03	75.03	3.03	0.00	75.03	145.96	0.00	0.
3.00	8.35	8.35	0.02	75.03	3.03	0.00	75.03	145.96	0.00	0.
4.00	21.90	21.90	0.04	75.04	3.04	0.00	75.04	170.96	0.00	0.
4.00	19.28	19.28	0.04	75.04	3.04	0.00	75.04	170.96	0.00	0.
4.00	16.13	16.13	0.03	75.03	3.03	0.00	75.03	170.96	0.00	0.
4.00	13.87	13.87	0.03	75.03	3.03	0.00	75.03	170.96	0.00	0.
4.00	11.70	11.70	0.02	75.03	3.03	0.00	75.03	170.96	0.00	0.
4.00	8.35	8.35	0.02	75.03	3.03	0.00	75.03	170.96	0.00	0.

5.00	21.90	21.90	0.04	75.04	3.04	0.00	75.04	170.96	0.00	0.
5.00	19.28	19.28	0.04	75.04	3.04	0.00	75.04	170.96	0.00	0.
5.00	16.13	16.13	0.03	75.03	3.03	0.00	75.03	170.96	0.00	0.
5.00	13.87	13.87	0.03	75.03	3.03	0.00	75.03	170.96	0.00	0.
5.00	11.70	11.70	0.02	75.03	3.03	0.00	75.03	170.96	0.00	0.
5.00	8.35	8.35	0.02	75.03	3.03	0.00	75.03	170.96	0.00	0.
6.00	21.90	21.90	0.19	75.04	3.04	0.00	75.04	37.46	0.00	0.
6.00	19.28	19.28	0.17	75.04	3.04	0.00	75.04	37.46	0.00	0.
6.00	16.13	16.13	0.14	75.03	3.03	0.00	75.04	37.46	0.00	0.
6.00	13.87	13.87	0.12	75.03	3.03	0.00	75.03	37.46	0.00	0.
6.00	11.70	11.70	0.10	75.03	3.03	0.00	75.03	37.46	0.00	0.
6.00	8.35	8.35	0.07	75.03	3.03	0.00	75.03	37.46	0.00	0.
7.00	21.90	21.90	0.13	75.04	3.04	0.00	75.04	53.96	0.00	0.
7.00	19.28	19.28	0.12	75.04	3.04	0.00	75.04	53.96	0.00	0.
7.00	16.13	16.13	0.10	75.04	3.04	0.00	75.04	53.96	0.00	0.
7.00	13.87	13.87	0.08	75.03	3.03	0.00	75.03	53.96	0.00	0.
7.00	11.70	11.70	0.07	75.03	3.03	0.00	75.03	53.96	0.00	0.
7.00	8.35	8.35	0.05	75.03	3.03	0.00	75.03	53.96	0.00	0.
8.00	20.40	20.40	0.12	75.04	3.04	0.00	75.04	53.90	0.00	0.
8.00	20.40	20.40	0.12	75.04	3.04	0.00	75.04	53.90	0.00	0.
8.00	20.40	20.40	0.12	75.04	3.04	0.00	75.04	53.90	0.00	0.
8.00	20.40	20.40	0.12	75.03	3.03	0.00	75.03	53.90	0.00	0.
8.00	20.40	20.40	0.12	75.03	3.03	0.00	75.03	53.90	0.00	0.
8.00	20.40	20.40	0.12	75.03	3.03	0.00	75.03	53.90	0.00	0.
9.00	20.40	20.40	2.88	76.45	1.00	1.41	76.87	9.16	58.38	0.
9.00	20.40	20.40	2.88	76.45	1.00	1.41	76.87	9.16	58.38	0.
9.00	20.40	20.40	2.88	76.45	1.00	1.41	76.87	9.16	58.38	0.
9.00	20.40	20.40	2.88	76.45	1.00	1.42	76.87	9.16	58.38	0.
9.00	20.40	20.40	2.88	76.45	1.00	1.42	76.87	9.16	58.38	0.
9.00	20.40	20.40	2.88	76.45	1.00	1.42	76.87	9.16	58.38	0.
* 10.00	20.40	20.40	2.64	76.97	1.19	0.52	77.33	11.09	10.15	0.
* 10.00	20.40	20.40	2.64	76.97	1.19	0.52	77.33	11.09	10.15	0.

*	10.00	20.40	20.40	2.64	76.97	1.19	0.52	77.33	11.09	10.15	0.
*	10.00	20.40	20.40	2.64	76.97	1.19	0.52	77.33	11.09	10.15	0.
*	10.00	20.40	20.40	2.64	76.97	1.19	0.52	77.33	11.09	10.15	0.
*	10.00	20.40	20.40	2.64	76.97	1.19	0.52	77.33	11.09	10.15	0.
*	11.00	20.40	20.40	2.82	77.36	1.26	0.39	77.77	9.12	58.18	0.
*	11.00	20.40	20.40	2.82	77.36	1.26	0.39	77.77	9.12	58.18	0.
*	11.00	20.40	20.40	2.82	77.36	1.26	0.39	77.77	9.12	58.18	0.
*	11.00	20.40	20.40	2.82	77.36	1.26	0.39	77.77	9.12	58.18	0.
*	11.00	20.40	20.40	2.82	77.36	1.26	0.39	77.77	9.12	58.18	0.
*	11.00	20.40	20.40	2.82	77.36	1.26	0.39	77.77	9.12	58.18	0.
*	12.00	20.40	20.40	1.99	78.65	1.63	1.28	78.85	9.00	41.82	0.
*	12.00	20.40	20.40	1.99	78.65	1.63	1.28	78.85	9.00	41.82	0.
*	12.00	20.40	20.40	1.99	78.65	1.63	1.28	78.85	9.00	41.82	0.
*	12.00	20.40	20.40	1.99	78.65	1.63	1.28	78.85	9.00	41.82	0.
*	12.00	20.40	20.40	1.99	78.65	1.63	1.28	78.85	9.00	41.82	0.
*	12.00	20.40	20.40	1.99	78.65	1.63	1.28	78.85	9.00	41.82	0.
	13.00	20.40	17.97	2.42	78.64	1.29	0.00	78.92	10.32	110.00	0.
	13.00	20.40	17.97	2.42	78.64	1.29	0.00	78.92	10.32	110.00	0.
	13.00	20.40	17.97	2.42	78.64	1.29	0.00	78.92	10.32	110.00	0.
	13.00	20.40	17.97	2.42	78.64	1.29	0.00	78.92	10.32	110.00	0.
	13.00	20.40	17.97	2.42	78.64	1.29	0.00	78.92	10.32	110.00	0.
	13.00	20.40	17.97	2.42	78.64	1.29	0.00	78.92	10.32	110.00	0.
*	14.00	20.40	16.30	4.45	79.77	2.42	1.12	80.61	3.62	0.00	1.
*	14.00	20.40	16.30	4.45	79.77	2.42	1.12	80.61	3.62	0.00	1.
*	14.00	20.40	16.30	4.45	79.77	2.42	1.12	80.61	3.62	0.00	1.
*	14.00	20.40	16.30	4.45	79.77	2.42	1.12	80.61	3.62	0.00	1.
*	14.00	20.40	16.30	4.45	79.77	2.42	1.12	80.61	3.62	0.00	1.
*	14.00	20.40	16.30	4.45	79.77	2.42	1.12	80.61	3.62	0.00	1.
	530.20	20.40	1.34	0.06	81.12	3.67	1.36	81.12	429.42	2.27	9.
	530.20	20.40	1.34	0.06	81.12	3.67	1.36	81.12	429.42	2.27	9.
	530.20	20.40	1.34	0.06	81.12	3.67	1.36	81.12	429.42	2.27	9.
	530.20	20.40	1.34	0.06	81.12	3.67	1.36	81.12	429.42	2.27	9.
	530.20	20.40	1.34	0.06	81.12	3.67	1.36	81.12	429.42	2.27	9.

530.20	20.40	1.34	0.06	81.12	3.67	1.36	81.12	429.42	2.27	9.
530.30	20.40	0.76	0.09	81.12	3.56	0.00	81.12	429.48	220.00	18.
530.30	20.40	0.76	0.09	81.12	3.56	0.00	81.12	429.48	220.00	18.
530.30	20.40	0.76	0.09	81.12	3.56	0.00	81.12	429.48	220.00	18.
530.30	20.40	0.76	0.09	81.12	3.56	0.00	81.12	429.48	220.00	18.
530.30	20.40	0.76	0.09	81.12	3.56	0.00	81.12	429.48	220.00	18.
530.30	20.40	0.76	0.09	81.12	3.56	0.00	81.12	429.48	220.00	18.
530.40	20.40	0.76	0.09	81.12	3.56	0.00	81.12	429.42	0.00	18.
530.40	20.40	0.76	0.09	81.12	3.56	0.00	81.12	429.42	0.00	18.
530.40	20.40	0.76	0.09	81.12	3.56	0.00	81.12	429.42	0.00	18.
530.40	20.40	0.76	0.09	81.12	3.56	0.00	81.12	429.42	0.00	18.
530.40	20.40	0.76	0.09	81.12	3.56	0.00	81.12	429.42	0.00	18.
530.40	20.40	0.76	0.09	81.12	3.56	0.00	81.12	429.42	0.00	18.
530.50	20.40	0.98	0.08	81.12	3.56	0.00	81.12	429.42	0.00	9.
530.50	20.40	0.98	0.08	81.12	3.56	0.00	81.12	429.42	0.00	9.
530.50	20.40	0.98	0.08	81.12	3.56	0.00	81.12	429.42	0.00	9.
530.50	20.40	0.98	0.08	81.12	3.56	0.00	81.12	429.42	0.00	9.
530.50	20.40	0.98	0.08	81.12	3.56	0.00	81.12	429.42	0.00	9.
530.50	20.40	0.98	0.08	81.12	3.56	0.00	81.12	429.42	0.00	9.
546.00	20.40	0.86	0.06	81.12	3.53	0.00	81.12	406.73	7.50	10.
546.00	20.40	0.86	0.06	81.12	3.53	0.00	81.12	406.73	7.50	10.
546.00	20.40	0.86	0.06	81.12	3.53	0.00	81.12	406.73	7.50	10.
546.00	20.40	0.86	0.06	81.12	3.53	0.00	81.12	406.73	7.50	10.
546.00	20.40	0.86	0.06	81.12	3.53	0.00	81.12	406.73	7.50	10.
546.00	20.40	0.86	0.06	81.12	3.53	0.00	81.12	406.73	7.50	10.
573.20	20.40	0.69	0.06	81.12	3.50	0.00	81.12	695.00	5.88	9.
573.20	20.40	0.69	0.06	81.12	3.50	0.00	81.12	695.00	5.88	9.
573.20	20.40	0.69	0.06	81.12	3.50	0.00	81.12	695.00	5.88	9.
573.20	20.40	0.69	0.06	81.12	3.50	0.00	81.12	695.00	5.88	9.
573.20	20.40	0.69	0.06	81.12	3.50	0.00	81.12	695.00	5.88	9.
573.20	20.40	0.69	0.06	81.12	3.50	0.00	81.12	695.00	5.88	9.
573.30	20.40	0.70	0.06	81.13	3.54	0.00	81.13	695.00	-0.71	9.

573.30	20.40	0.70	0.06	81.13	3.54	0.00	81.13	695.00	-0.71	9.
573.30	20.40	0.70	0.06	81.13	3.54	0.00	81.13	695.00	-0.71	9.
573.30	20.40	0.70	0.06	81.13	3.54	0.00	81.13	695.00	-0.71	9.
573.30	20.40	0.70	0.06	81.13	3.54	0.00	81.13	695.00	-0.71	9.
573.30	20.40	0.70	0.06	81.13	3.54	0.00	81.13	695.00	-0.71	9.
597.00	20.40	0.45	0.04	81.13	3.54	0.00	81.13	695.00	0.00	9.
597.00	20.40	0.45	0.04	81.13	3.54	0.00	81.13	695.00	0.00	9.
597.00	20.40	0.45	0.04	81.13	3.54	0.00	81.13	695.00	0.00	9.
597.00	20.40	0.45	0.04	81.13	3.54	0.00	81.13	695.00	0.00	9.
597.00	20.40	0.45	0.04	81.13	3.54	0.00	81.13	695.00	0.00	9.
597.00	20.40	0.45	0.04	81.13	3.54	0.00	81.13	695.00	0.00	9.
616.20	19.47	0.56	0.04	81.13	3.41	0.00	81.13	679.43	260.01	10.
616.20	17.00	0.49	0.04	81.13	3.41	0.00	81.13	679.43	260.01	9.
616.20	13.99	0.41	0.03	81.13	3.41	0.00	81.13	679.43	260.01	7.
616.20	11.86	0.34	0.03	81.13	3.41	0.00	81.13	679.43	260.01	6.
616.20	9.77	0.28	0.02	81.13	3.41	0.00	81.13	679.43	260.01	5.
616.20	6.95	0.20	0.02	81.13	3.41	0.00	81.13	679.43	260.01	3.
616.30	19.47	2.02	0.22	81.13	3.47	0.00	81.13	679.43	-120.00	10.
616.30	17.00	1.76	0.19	81.13	3.47	0.00	81.13	679.43	-120.00	9.
616.30	13.99	1.45	0.16	81.13	3.47	0.00	81.13	679.43	-120.00	7.
616.30	11.86	1.23	0.13	81.13	3.47	0.00	81.13	679.43	-120.00	6.
616.30	9.77	1.01	0.11	81.13	3.47	0.00	81.13	679.43	-120.00	5.
616.30	6.95	0.72	0.08	81.13	3.47	0.00	81.13	679.43	-120.00	3.
616.40	19.47	2.02	0.22	81.13	3.47	0.00	81.13	679.44	0.00	10.
616.40	17.00	1.76	0.19	81.13	3.47	0.00	81.13	679.44	0.00	9.
616.40	13.99	1.45	0.16	81.13	3.47	0.00	81.13	679.44	0.00	7.
616.40	11.86	1.23	0.13	81.13	3.47	0.00	81.13	679.43	0.00	6.
616.40	9.77	1.01	0.11	81.13	3.47	0.00	81.13	679.43	0.00	5.
616.40	6.95	0.72	0.08	81.13	3.47	0.00	81.13	679.43	0.00	3.
616.50	19.47	1.22	0.10	81.13	3.47	0.00	81.13	679.47	0.00	12.
616.50	17.00	1.07	0.08	81.13	3.47	0.00	81.13	679.46	0.00	10.
616.50	13.99	0.88	0.07	81.13	3.47	0.00	81.13	679.45	0.00	8.
616.50	11.86	0.75	0.06	81.13	3.47	0.00	81.13	679.44	0.00	7.

	616.50	9.77	0.62	0.05	81.13	3.47	0.00	81.13	679.44	0.00	6.
	616.50	6.95	0.44	0.03	81.13	3.47	0.00	81.13	679.43	0.00	4.
	616.60	19.47	1.57	0.13	81.13	3.27	0.00	81.13	612.66	10.00	12.
	616.60	17.00	1.37	0.11	81.13	3.27	0.00	81.13	612.19	10.00	10.
	616.60	13.99	1.13	0.09	81.13	3.27	0.00	81.13	611.71	10.00	8.
	616.60	11.86	0.96	0.08	81.13	3.27	0.00	81.13	611.43	10.00	7.
	616.60	9.77	0.79	0.07	81.13	3.27	0.00	81.13	611.18	10.00	6.
	616.60	6.95	0.56	0.05	81.13	3.27	0.00	81.13	610.95	10.00	4.
	723.90	19.47	2.14	0.11	81.13	2.52	0.00	81.13	514.83	10.71	4.
	723.90	17.00	1.87	0.09	81.13	2.52	0.00	81.13	514.81	10.71	3.
	723.90	13.99	1.54	0.08	81.13	2.52	0.00	81.13	514.80	10.71	2.
	723.90	11.86	1.30	0.07	81.13	2.52	0.00	81.13	514.79	10.71	2.
	723.90	9.77	1.07	0.05	81.13	2.52	0.00	81.13	514.78	10.71	2.
	723.90	6.95	0.76	0.04	81.13	2.52	0.00	81.13	514.78	10.71	1.
	798.00	19.47	1.64	0.19	81.13	1.88	0.00	81.13	387.66	8.53	4.
	798.00	17.00	1.43	0.16	81.13	1.88	0.00	81.13	387.65	8.53	4.
	798.00	13.99	1.18	0.14	81.13	1.88	0.00	81.13	387.64	8.53	3.
	798.00	11.86	1.00	0.11	81.13	1.88	0.00	81.13	387.64	8.53	2.
	798.00	9.77	0.82	0.09	81.13	1.88	0.00	81.13	387.63	8.53	2.
	798.00	6.95	0.59	0.07	81.13	1.88	0.00	81.13	387.63	8.53	1.
	915.20	19.47	1.47	0.40	81.14	0.97	0.01	81.14	320.45	8.93	0.
	915.20	17.00	1.28	0.35	81.14	0.97	0.01	81.14	320.42	8.93	0.
	915.20	13.99	1.06	0.29	81.13	0.96	0.00	81.13	320.38	8.93	0.
	915.20	11.86	0.90	0.24	81.13	0.96	0.00	81.13	320.36	8.93	0.
	915.20	9.77	0.74	0.20	81.13	0.96	0.00	81.13	320.34	8.93	0.
	915.20	6.95	0.53	0.14	81.13	0.96	0.00	81.13	320.32	8.93	0.
*	915.30	19.47	9.51	1.95	81.25	1.33	0.12	81.35	362.86	-500.00	0.
*	915.30	17.00	9.29	1.96	81.22	1.30	0.08	81.33	359.69	-500.00	0.
*	915.30	13.99	8.13	1.74	81.20	1.28	0.07	81.29	357.99	-500.00	0.
*	915.30	11.86	7.50	1.63	81.18	1.26	0.05	81.26	355.67	-500.00	0.
*	915.30	9.77	6.89	1.54	81.15	1.23	0.02	81.23	352.68	-500.00	0.
	915.30	6.95	5.91	1.39	81.09	1.17	-0.04	81.17	347.30	-500.00	0.

	915.40	19.47	6.38	1.19	81.38	1.46	0.13	81.41	375.57	0.00	0.
	915.40	17.00	5.82	1.10	81.36	1.44	0.14	81.39	374.04	0.00	0.
	915.40	13.99	5.47	1.07	81.32	1.40	0.12	81.34	369.64	0.00	0.
	915.40	11.86	5.08	1.01	81.29	1.37	0.11	81.31	366.78	0.00	0.
	915.40	9.77	4.85	1.00	81.25	1.33	0.10	81.28	362.42	0.00	0.
	915.40	6.95	4.51	0.99	81.18	1.26	0.09	81.21	354.96	0.00	0.
*	915.50	19.47	19.47	3.75	81.34	1.42	-0.04	82.06	3.65	0.00	0.
*	915.50	17.00	17.00	3.59	81.22	1.30	-0.15	81.87	3.65	0.00	0.
*	915.50	13.99	13.99	3.36	81.06	1.14	-0.26	81.64	3.65	0.00	0.
	915.50	11.86	11.86	2.71	81.11	1.19	-0.17	81.49	3.65	0.00	0.
	915.50	9.77	9.77	2.19	81.14	1.22	-0.11	81.39	3.65	0.00	0.
	915.50	6.95	6.95	1.57	81.13	1.21	-0.05	81.26	3.65	0.00	0.
	990.00	19.47	4.34	0.52	82.29	2.09	0.94	82.29	538.29	4.56	12.
	990.00	17.00	5.55	0.75	82.10	1.90	0.88	82.11	212.31	4.56	8.
	990.00	13.99	7.64	1.21	81.88	1.68	0.82	81.92	141.80	4.56	4.
	990.00	11.86	11.39	2.32	81.60	1.40	0.49	81.86	35.93	4.56	0.
	990.00	9.77	9.77	2.38	81.43	1.23	0.29	81.72	5.81	4.56	0.
	990.00	6.95	6.95	1.92	81.33	1.13	0.20	81.52	4.81	4.56	0.
*	1080.20	19.47	1.01	0.24	83.19	2.20	0.91	83.19	278.11	5.40	5.
*	1080.20	17.00	17.00	4.50	82.98	1.99	0.88	84.01	1.90	5.40	0.
*	1080.20	13.99	13.99	4.18	82.75	1.76	0.87	83.64	1.90	5.40	0.
*	1080.20	11.86	11.86	3.95	82.57	1.58	0.97	83.36	1.90	5.40	0.
*	1080.20	9.77	9.77	3.70	82.38	1.39	0.94	83.08	1.90	5.40	0.
*	1080.20	6.95	6.95	3.31	82.10	1.11	0.76	82.65	1.90	5.40	0.
	1080.30	19.47	1.35	0.27	83.79	2.67	0.60	83.79	148.90	13.54	0.
	1080.30	17.00	1.00	0.18	84.01	2.89	1.03	84.01	185.57	13.54	1.
	1080.30	13.99	1.00	0.20	83.70	2.58	0.95	83.70	148.90	13.54	0.
	1080.30	11.86	0.82	0.16	83.82	2.70	1.25	83.82	148.90	13.54	0.
	1080.30	9.77	9.77	3.32	82.67	1.55	0.29	83.23	1.90	13.54	0.
*	1080.30	6.95	6.95	3.31	82.22	1.10	0.13	82.78	1.90	13.54	0.
	1169.00	15.80	4.69	0.06	83.79	2.51	0.00	83.79	631.69	1.89	4.
	1169.00	13.60	3.83	0.04	84.01	2.73	0.00	84.01	631.69	1.89	3.
	1169.00	10.91	3.32	0.04	83.70	2.42	0.00	83.70	631.09	1.89	2.

1169.00	9.05	2.67	0.03	83.82	2.54	0.00	83.82	631.69	1.89	2.
1169.00	7.31	2.42	0.03	83.40	2.12	0.73	83.40	569.14	1.89	1.
1169.00	5.02	1.92	0.04	82.95	1.67	0.73	82.95	422.41	1.89	0.
1229.00	15.80	0.45	0.11	83.79	1.71	0.00	83.79	505.37	13.33	5.
1229.00	13.60	0.34	0.07	84.01	1.93	0.00	84.01	559.19	13.33	5.
1229.00	10.91	0.33	0.09	83.70	1.62	0.00	83.70	489.76	13.33	3.
1229.00	9.05	0.25	0.06	83.82	1.74	0.00	83.82	508.92	13.33	3.
1229.00	7.31	0.29	0.09	83.40	1.32	0.00	83.40	431.90	13.33	1.
1229.00	5.02	0.37	0.19	82.95	0.87	0.00	82.95	263.25	13.33	0.
1339.20	15.80	5.20	0.84	83.81	1.47	0.01	83.82	183.21	2.55	2.
1339.20	13.60	3.22	0.45	84.01	1.67	0.00	84.02	193.48	2.55	2.
1339.20	10.91	4.36	0.75	83.71	1.37	0.01	83.72	179.02	2.55	1.
1339.20	9.05	2.86	0.45	83.83	1.49	0.00	83.83	184.18	2.55	1.
1339.20	7.31	7.31	1.57	83.43	1.09	0.04	83.56	4.25	2.55	0.
1339.20	5.02	5.02	2.08	82.91	0.57	-0.05	83.13	4.25	2.55	0.
1339.30	15.80	15.57	2.88	83.61	1.27	-0.20	84.02	178.93	0.00	0.
1339.30	13.60	3.61	0.58	84.01	1.67	0.00	84.02	290.26	0.00	0.
1339.30	10.91	10.72	1.97	83.62	1.28	-0.09	83.81	181.95	0.00	0.
1339.30	9.05	5.71	1.00	83.81	1.47	-0.01	83.84	266.72	0.00	0.
1339.30	7.31	7.31	1.57	83.44	1.10	0.00	83.56	94.87	0.00	0.
1339.30	5.02	5.02	2.08	82.91	0.57	0.01	83.13	6.24	0.00	0.
1339.40	15.80	2.80	0.41	84.15	1.81	0.55	84.16	293.04	0.00	0.
1339.40	13.60	3.55	0.57	84.02	1.68	0.01	84.03	290.36	0.00	0.
1339.40	10.91	5.33	0.93	83.87	1.53	0.25	83.89	274.65	0.00	0.
1339.40	9.05	5.43	0.95	83.84	1.50	0.03	83.87	268.31	0.00	0.
1339.40	7.31	7.31	1.51	83.48	1.14	0.05	83.60	115.64	0.00	0.
1339.40	5.02	5.02	1.51	83.12	0.78	0.21	83.23	28.25	0.00	0.
1339.50	15.80	2.29	0.30	84.15	1.81	0.00	84.16	293.08	0.00	6.
1339.50	13.60	2.44	0.34	84.03	1.69	0.01	84.03	290.47	0.00	5.
1339.50	10.91	2.46	0.37	83.90	1.56	0.03	83.90	277.00	0.00	4.
1339.50	9.05	2.13	0.33	83.88	1.54	0.03	83.88	273.98	0.00	3.
1339.50	7.31	7.31	1.50	83.49	1.15	0.00	83.60	4.25	0.00	0.
1339.50	5.02	5.02	1.51	83.12	0.78	0.00	83.24	4.25	0.00	0.

	2630.30	4.43	4.43	1.48	93.08	1.09	0.24	93.19	42.15	-540.01	0.
	2630.30	2.92	2.92	1.05	92.92	0.93	0.22	92.98	18.98	-540.01	0.
	2630.40	10.50	4.19	0.95	93.91	1.92	0.85	93.93	147.75	0.00	3.
	2630.40	8.91	8.91	2.97	93.42	1.43	0.38	93.87	117.29	0.00	0.
	2630.40	6.98	6.98	2.33	93.36	1.37	0.23	93.63	104.26	0.00	0.
	2630.40	5.65	5.65	1.88	93.34	1.35	0.15	93.52	99.09	0.00	0.
	2630.40	4.43	4.43	1.48	93.18	1.19	0.09	93.29	63.84	0.00	0.
	2630.40	2.92	2.92	1.01	92.95	0.96	0.03	93.00	19.74	0.00	0.
	2630.50	10.50	1.69	0.31	93.98	1.85	0.03	93.94	145.06	6.67	4.
	2630.50	8.91	1.32	0.23	94.01	1.92	0.58	94.01	147.81	6.67	3.
	2630.50	6.98	1.53	0.31	93.72	1.63	0.36	93.72	136.62	6.67	2.
	2630.50	5.65	1.62	0.37	93.57	1.48	0.23	93.57	126.44	6.67	1.
	2630.50	4.43	4.43	1.30	93.24	1.15	0.06	93.32	3.00	6.67	0.
	2630.50	2.92	2.92	1.12	92.96	0.87	0.01	93.02	3.00	6.67	0.
	2774.00	10.50	10.50	0.55	93.98	1.26	0.05	94.00	41.80	4.34	0.
	2774.00	8.91	8.91	0.42	94.03	1.31	0.02	94.04	42.38	4.34	0.
	2774.00	6.98	6.98	0.57	93.81	1.09	0.09	93.82	39.83	4.34	0.
	2774.00	5.65	5.65	0.62	93.73	1.01	0.16	93.75	38.88	4.34	0.
	2774.00	4.43	4.43	0.64	93.68	0.96	0.44	93.70	38.02	4.34	0.
	2774.00	2.92	2.92	1.43	93.42	0.70	0.46	93.52	5.94	4.34	0.
*	2863.10	10.50	6.39	2.91	94.83	1.11	0.85	95.11	13.63	6.23	0.
*	2863.10	8.91	5.70	2.78	94.76	1.04	0.73	95.02	12.62	6.23	0.
*	2863.10	6.98	4.79	2.60	94.66	0.94	0.85	94.90	11.18	6.23	0.
*	2863.10	5.65	4.11	2.45	94.57	0.85	0.84	94.80	10.02	6.23	0.
	2863.10	4.43	3.44	2.29	94.49	0.77	0.81	94.70	8.78	6.23	0.
	2863.10	2.92	2.36	1.69	94.43	0.71	1.02	94.55	8.05	6.23	0.
*	2863.20	10.50	10.50	3.74	95.31	1.41	0.48	96.02	2.00	7.83	0.
*	2863.20	8.91	8.91	3.54	95.16	1.26	0.41	95.80	2.00	7.83	0.
*	2863.20	6.98	6.98	3.25	94.98	1.08	0.32	95.52	2.00	7.83	0.
*	2863.20	5.65	5.65	3.04	94.84	0.94	0.26	95.30	2.00	7.83	0.
*	2863.20	4.43	4.43	2.80	94.70	0.80	0.21	95.09	2.00	7.83	0.
	2863.20	2.92	2.92	2.35	94.53	0.63	0.09	94.81	2.00	7.83	0.

*	2863.30	10.50	10.50	3.86	95.44	1.51	0.13	96.20	24.76	60.00	0.
*	2863.30	8.91	5.56	1.49	97.58	3.65	2.41	97.65	197.84	60.00	2.
*	2863.30	6.98	6.13	1.72	97.49	3.56	2.51	97.62	196.74	60.00	0.
*	2863.30	5.65	5.65	3.15	94.93	1.00	0.09	95.43	15.33	60.00	0.
*	2863.30	4.43	4.43	2.90	94.78	0.85	0.08	95.21	12.62	60.00	0.
*	2863.30	2.92	2.92	2.52	94.57	0.64	0.05	94.90	8.83	60.00	0.
	2863.40	10.50	10.50	3.14	96.18	2.25	0.74	96.68	127.70	0.00	0.
	2863.40	8.91	3.22	0.81	97.69	3.76	0.12	97.71	198.63	0.00	3.
	2863.40	6.98	2.70	0.69	97.68	3.75	0.19	97.69	198.53	0.00	2.
	2863.40	5.65	5.65	2.00	95.49	1.56	0.56	95.70	25.79	0.00	0.
	2863.40	4.43	4.43	1.83	95.27	1.34	0.49	95.44	21.71	0.00	0.
	2863.40	2.92	2.92	1.56	94.97	1.04	0.40	95.09	16.12	0.00	0.
	2863.50	10.50	10.50	2.28	96.49	2.56	0.31	96.75	1.80	0.00	0.
	2863.50	8.91	0.71	0.11	97.71	3.78	0.02	97.71	198.69	0.00	2.
	2863.50	6.98	0.56	0.08	97.69	3.76	0.01	97.69	198.57	0.00	2.
	2863.50	5.65	5.65	2.01	95.49	1.56	0.00	95.70	1.80	0.00	0.
	2863.50	4.43	4.43	1.83	95.27	1.34	0.00	95.44	1.80	0.00	0.
	2863.50	2.92	2.92	1.56	94.97	1.04	0.00	95.09	1.80	0.00	0.
	2863.60	10.50	1.50	0.29	96.83	2.90	0.34	96.83	168.97	0.00	2.
	2863.60	8.91	0.71	0.10	97.71	3.78	0.00	97.71	198.77	0.00	2.
	2863.60	6.98	0.56	0.08	97.69	3.76	0.00	97.69	198.63	0.00	2.
	2863.60	5.65	2.13	0.65	95.75	1.82	0.26	95.76	30.44	0.00	1.
	2863.60	4.43	1.92	0.69	95.48	1.55	0.21	95.50	25.57	0.00	0.
	2863.60	2.92	1.59	0.74	95.12	1.19	0.15	95.13	18.85	0.00	0.

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SF          SPLIT FLOW SPILL ANALYSIS -- WC 6
TW       WEIR BETWEEN X-SECT 181.3 & 181.4 (WEST)
WS    2.   181.3    181.4     -1.0     1.56
WC     0    78.9       25     79.0
TW       WEIR BETWEEN X-SECT 181.4 & 420.9 (WEST)
WS   10.   181.4    420.9     -1.0     1.56
WC     0    79.0       17     79.5       30    79.9      108    79.8      130    79.5
WC   148    79.4      161     79.5      196    79.8      227    79.5      241    79.4
TW       WEIR BETWEEN X-SECT 420.9 & 566.2 (WEST)
WS    7.   420.9    566.2     -1.0     1.56
WC     0    79.4       30     79.3       76    79.5       95    79.5      140    80.0
WC   142    80.5      149     80.7
TW       WEIR BETWEEN X-SECT 566.5 & 610.2 (WEST)
WS    7.   566.5    610.2     -1.0     1.56
WC     0    80.7        6     80.5        7    80.0       22    80.2       33    80.0
WC    37    80.5       43     80.6
TW       WEIR BETWEEN X-SECT 610.3 & 610.4 (WEST)
WS    5.   610.3    610.4     -1.0     1.56
WC     0    80.6        7     80.6       13    80.5       28    80.5       43    80.7
TW       WEIR BETWEEN X-SECT 610.5 & 610.6 (EAST)
WS    3.   610.5    610.6     -1.0     1.56
WC     0    80.6        5     80.6        7    80.4
TW       WEIR BETWEEN X-SECT 610.6 & 722.2 (EAST)
WS    7.   610.6    722.2     -1.0     1.56
WC     0    80.6        4     80.6        8    79.9        9    80.0       12    80.5
WC    16    80.9       20     80.9
TW       WEIR BETWEEN X-SECT 722.5 & 810.0 (EAST)
WS   13.   722.5    810.0     -1.0     1.56
WC     0    81.7        2     81.7        4    81.5       12    80.5       14    80.5
WC    15    81.0       19     82.0       26    83.0       49    83.8       70    83.0
WC   125    83.0      134     82.0      171    81.9
TW       WEIR BETWEEN X-SECT 1107.5 & 1212.0 (WEST)
WS   11.  1107.5   1212.0   1107.2     1.56
WC     0    84.6        5     84.5       10    84.0       12    84.0       18    85.0
WC    28    85.0       56     85.5       57    95.0       89    95.0      106    84.4
WC   115    84.5
EE
C
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C     12
C  181.2  ALL SECTIONS HAVE UPSTREAM SECTIONING ASPECT
C  181.3  U/S SECTION COPES LANE
C  566.2  D/S SECTION NORTH SERVICE ROAD
C  566.5  U/S SECTION NORTH SERVICE ROAD
C  610.2  D/S SECTION Q.E.W.
C  610.5  U/S SECTION Q.E.W.
C  722.2  D/S SECTION SOUTH SERVICE ROAD
C  722.5  U/S SECTION SOUTH SERVICE ROAD
C 1107.2  D/S SECTION C.N.R.
C 1107.5  U/S SECTION C.N.R.
C 1769.2  D/S SECTION BARTON STREET
C 1769.5  U/S SECTION BARTON STREET
T1 CITY OF STONEY CREEK FLOODPLAIN MAPPING STUDY
T2 BY PHILIPS PLANNING & ENGINEERING LIMITED - PROJECT NO. 86090
T3       Watercourse 6  100 YR STORM
J1   0.0      2.0      0.0      0.0     -1.0      1.0      0.0      0.0     79.0
J2  -1.0      0.0     -1.0
J6   1.0
QT     6.    13.42    11.71     9.50     7.90     6.28     4.12
NC  0.07     0.07     .013     0.30     0.50
X1 181.2      6.0     70.0     70.9       0.       0.       0.
X3  10.0                                                    79.0     78.9
GR  79.0      0.0     78.5     69.0    78.01     70.0    78.01     70.9     78.5     72.0
GR  78.9    150.0
SB   0.0     4.45      1.4      0.0      .90      0.0     0.95      0.0    78.01    74.80
X1 181.3      6.0     70.0     70.9      0.5      0.5      0.5
X2                     1.0    79.11    79.30
X3  10.0                                                    79.0     78.9
BT  -8.0      0.0     79.0     79.0     69.0     79.3     78.5     70.0     79.3    78.01
BT             70.0    79.3    79.11     70.9     79.3    79.11     70.9     79.3    78.01
BT             72.0    79.3     78.5    150.0     78.9     78.9
GR  79.0      0.0     78.5     69.0    78.01     70.0    78.01     70.9     78.5     72.0
GR  78.9    150.0
NC   .07      .07     .030
X1 181.4        0        0        0      25.      25.      25.              .10
NC   .08      .08      .03       .1       .3
X1 420.9     17.0    177.3    182.8    194.     194.     194.
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GR 79.74     0.0    79.84    30.0    79.69    60.0    79.47    90.0    79.60   120.0
GR 79.62   150.0    80.06   177.3    79.06   179.1    78.94   180.0    78.94   180.9
GR 80.10   182.8    79.51   210.0    79.56   240.0    79.52   270.0    79.25   300.0
GR 79.26   330.0    79.53   360.0
NC   .06     .06      .03     .30      .50
X1 566.1    25.0   624.0  627.25     118.     118.     118.
GR  87.3     0.0    87.3     4.0     81.0     18.0     80.5     30.0     80.0     66.0
GR  80.0   202.0    79.5   203.0    79.5    206.0     80.0    207.0     81.0    236.0
GR  81.0   296.0    81.0   384.0    80.0    418.0     79.5    420.0     80.0    422.0
GR  81.0   524.0    80.0   620.0    79.5    624.0    79.28    624.1    79.28   627.16
GR  79.5  627.25    80.0   628.0    80.0    884.0     80.0    890.0     80.3    894.0
X1 566.2       0       0       0      25.      25.      25.
X3    10                                                      80.8     80.3
NC                   .023
X1 566.3    25.0   624.1  627.16      0.5      0.5      0.5
BT -24.0    18.0    81.0    81.0     30.0     80.9     80.5     66.0     80.8     80.0
BT          202.0    80.8    80.0    203.0     80.8     79.5    206.0     80.8     79.5
BT          207.0    80.8    80.0    236.0     81.0     81.0    296.0     81.0     81.0
BT          384.0    81.4    81.0    418.0     81.4     80.0    420.0     81.4     79.5
BT          422.0    81.4    80.0    524.0     81.2     81.0    620.0    81.25     80.0
BT          624.0   81.25    79.5    624.1    81.25    79.28    624.1    81.25    80.33
BT         627.16   81.25   80.33   627.16   81.25    79.28   627.25   81.25     79.5
BT          628.0   81.25    80.0    884.0     80.4     80.0    890.0     80.3     80.3
GR  87.3     0.0    87.3     4.0     81.0     18.0     80.5     30.0     80.0     66.0
GR  80.0   202.0    79.5   203.0    79.5    206.0     80.0    207.0     81.0    236.0
GR  81.0   296.0    81.0   384.0    80.0    418.0     79.5    420.0     80.0    422.0
GR  81.0   524.0    80.0   620.0    79.5    624.0    79.21    624.1    79.21   627.16
GR  79.5  627.25    80.0   628.0    80.0    884.0     80.3    890.0     80.3    894.0
X1 566.4       0       0       0     25.6     25.6     25.6
X2                                                      1.0
NC                   .030
X1 566.5       0       0       0      4.0      4.0      4.0
X3   10.0                                                       80.8     80.3
X1 610.2      15   620.0  623.9      5.0      5.0      5.0
X3   10.0                                                     80.20    80.20
GR 80.55     0.0    80.0     1.0    79.97    110.0    79.94    204.0     79.9    417.0
GR  79.7   419.0    79.7   421.0     80.0    450.0     79.5    620.0    79.02   620.1
GR 79.02   623.8    79.5   623.9     80.0    760.0     80.1    913.0     80.3    914.0
```



```
NC                   .025
X1 610.3     15.0   620.0  623.9     0.50      0.5      0.5
BT -17.0      0.0   80.55   80.55      1.0    80.55     80.0    110.0     80.4    79.97
BT          204.0    80.4   79.94    417.0     80.6     79.9    419.0     80.6     79.7
BT          421.0    80.6    79.7    450.0     80.6     80.0    620.0    80.96     79.5
BT          620.1   80.96   79.31    620.1    80.96    80.14    623.8    80.96    80.14
BT          623.8   80.96   79.31    623.9    80.96     79.5    760.0     80.6     80.0
BT          913.0    80.3    80.1    914.0     80.3     80.3
GR 80.55     0.0    80.0     1.0    79.97    110.0    79.94    204.0     79.9    417.0
GR  79.7   419.0    79.7   421.0     80.0    450.0     79.5    620.0    79.31   620.1
GR 79.31   623.8    79.5   623.9     80.0    760.0     80.1    913.0     80.3    914.0
X1 610.4       0       0       0     42.6     42.6     42.6
X2                                                      1.0
NC   .06     .06     .030
X1 610.5       0       0       0      0.5      0.5      0.5
X3   10.0                                                    80.40    80.30
QT      6.  12.63   11.08    9.07    7.63     6.26     4.38
X1 610.6      0.      0.      0.      7.       7.       7.
X1 722.2     13.0   156.0   161.0     40.      40.      40.
X3   10.0                                                     80.40    81.60
GR  80.7     0.0    80.7   131.0     80.5    154.0     80.0    156.0    79.40    157.0
GR 79.40   160.06    80.0   161.0     80.5    178.0     80.5    218.0     80.5    371.0
GR  81.0   423.0    81.6   426.0     81.6    429.0
NC  0.06     0.06    .022
X1 722.3     15.0   428.0  431.06      0.5      0.5      0.5
BT -17.0      0.0    80.8    80.8     86.0     81.0     81.0    105.0     81.1     81.1
BT          200.0    81.4    81.4    216.0     81.5     81.5    270.0     81.6     81.6
BT          345.0    81.7    81.7    425.0     81.8     81.8    427.0     81.8     80.0
BT          428.0   81.83   79.59   428.00    81.83    80.95   431.06    81.83    80.95
BT         431.06   81.83   79.59    432.0    81.83     80.0    432.1    81.83    81.70
BT          520.0    81.7    81.7   615.00     81.6     81.6
GR  80.8     0.0    81.0    86.0     81.1    105.0     81.4    200.0     81.5    216.0
GR  81.6   270.0    81.7   345.0     81.8    425.0     80.0    427.0    79.59    428.0
GR 79.59   431.06    80.0   432.0     81.7    432.1     81.7    520.0     81.6    615.0
X1 722.4       0       0       0     23.7     23.7     23.7
X2                                                      1.0
NC                   .030
X1 722.5       0       0       0      0.5      0.5      0.5
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X3  10.0                                                    80.40   81.60
X1  810.      69  427.28  432.27   76.0   76.0   76.0
GR 81.02    8.50  81.02   10.50  80.03  14.31  80.28  15.74  80.73  18.83
GR 81.35   27.40  80.86   29.77  80.65  39.51  80.34  52.84  80.37  66.26
GR 82.64   72.13  82.54   75.65  82.18  84.41  81.52  90.93  80.98 100.04
GR 81.05  107.88  80.78  121.25  80.62 139.83  80.27 157.97  80.31 161.53
GR 80.10  162.63  80.10  165.72  81.12 169.06  81.28 175.39  81.27 189.93
GR 81.23  206.34  81.23  224.11  81.25 237.16  81.30 255.65  81.22 268.14
GR 81.31  288.57  81.31  303.32  81.22 320.56  81.17 339.35  81.20 358.98
GR 81.20  383.92  81.22  399.06  80.94 400.73  81.03 403.27  81.77 409.92
GR 80.85  418.28  80.83  427.28  79.97 429.28  79.99 430.50  81.04 432.27
GR 81.04  434.49  80.95  442.15  80.71 443.44  80.90 444.86  80.82 463.94
GR 80.74  486.84  80.66  506.71  80.63 514.68  81.07 523.43  81.11 530.80
GR 80.89  537.62  79.97  541.21  80.77 542.84  80.83 545.81  79.51 548.01
GR 79.52  594.26  80.78  598.72  80.99 620.92  80.98 655.71  80.99 684.10
GR 80.53  686.64  81.15  687.43  81.57 689.65  81.58 695.59
NC   .06    .06    .03    .1     .3
X1  895.      69  422.57  426.94  85.00  85.00  85.00
GR 81.64    .00  81.44    2.80  81.44   6.52  80.58   8.76  80.99  11.85
GR 81.88  16.19  82.21   20.60  81.34  28.61  81.29  33.67  81.54  38.49
GR 81.28  46.08  81.28   52.72  80.96  55.63  80.83  79.11  81.14  80.05
GR 81.36  83.72  81.64   90.05  80.99  93.54  81.06  99.35  81.52 100.40
GR 81.02 100.86  82.39  106.36  82.76 110.92  83.35 128.81  80.79 140.48
GR 81.19 147.76  81.07  158.47  81.62 164.09  81.82 184.59  81.70 205.75
GR 81.70 220.97  81.70  239.91  81.62 259.71  81.75 280.62  81.75 296.08
GR 81.77 311.06  81.62  329.50  81.62 344.33  81.59 363.77  81.55 401.88
GR 81.52 406.82  81.36  416.40  81.35 422.57  80.47 425.44  81.21 426.94
GR 81.21 436.27  81.07  438.91  81.10 461.06  81.15 486.47  81.14 505.26
GR 81.14 512.34  81.06  533.56  80.53 535.77  80.89 537.73  80.89 556.01
GR 81.05 569.42  80.96  582.98  80.91 589.34  81.14 604.12  81.20 619.21
GR 81.72 621.70  82.00  627.57  83.88 659.07  83.02 662.73  81.98 667.13
GR 81.81 677.38  81.01  679.76  82.02 682.86  82.07 685.88
X1  965.      63  448.02  458.71   70.0   70.0   70.0
X3                                595.79   90.0
GR 81.80    .00  81.20    7.21  81.82  13.58  82.20  19.97  82.07  25.01
GR 81.54  30.58  82.66   34.96  83.12  38.41  83.06  40.86  81.85  45.00
GR 81.67  70.73  81.83   78.33  81.72 104.64  81.43 133.16  81.37 151.98
GR 81.49 173.59  82.55  180.20  81.73 186.01  81.91 188.78  81.19 194.24
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GR 82.01  196.14  82.31  220.80  82.40  236.34  82.40  265.17  82.50  275.75
GR 82.27  291.71  82.34  301.52  82.39  316.05  82.26  334.70  82.29  345.82
GR 82.17  359.84  82.18  376.22  82.35  387.21  82.24  402.52  82.41  417.31
GR 82.42  434.18  81.88  441.48  81.98  448.02  81.28  456.31  81.67  458.71
GR 81.78  465.69  81.88  477.41  81.65  489.50  82.57  521.73  82.45  546.58
GR 82.26  549.72  82.45  558.01  82.19  566.50  81.30  571.75  81.38  582.78
GR 81.38  595.79  81.42  602.13  82.10  668.50  82.10  676.11  82.10  688.04
GR 82.01  701.62  82.23  703.11  82.06  706.88  81.85  709.67  81.51  711.11
GR 82.59  713.06  82.55  714.32  82.73  718.45
NC   .09    .09    .03    .30    .50
X11084.9    22.0  206.1  214.0  110.0  110.0  110.0
GR 82.75     0.0  82.55   30.0  82.50   60.0  82.42   90.0  82.32  120.0
GR 82.72   150.0  82.66  180.0  82.73  206.1  81.98  207.8  81.56  210.0
GR 82.02   212.0  82.87  214.0  83.15  240.0  82.86  270.0  83.19  300.0
GR 83.25   330.0  82.42  360.0  82.26  390.0  81.75  420.0  82.02  450.0
GR 83.60   464.2  83.65  467.8
X11107.2    20.0  640.0  645.0   10.0   10.0   10.0
X3  10.0                                        83.85  83.85
GR  85.1     0.0  85.1    3.0   84.0    7.0   84.0   94.0   83.5   96.0
GR  83.5   172.0  83.0  230.0   82.5  372.0   81.9  375.0   82.5  402.0
GR  82.5   640.0  81.79  642.0  81.79  642.9   82.5  645.0   83.0  712.0
GR  83.7   724.0  83.0  732.0   83.0  814.0   84.3  815.0   84.3  905.0
NC                .021
X11107.3    22.0  271.1  272.0    .5     .5     .5
BT -23.0     5.0  84.8   84.8   10.0   84.8   83.0   13.0   84.8   82.9
BT          15.0  84.8   83.0   17.0   84.8   82.9   20.0   84.8   83.0
BT          24.0  84.8   84.0  118.0   84.8   84.2  166.0  84.85   84.0
BT         177.0  84.85  83.0  218.0  84.96   82.8  255.0  84.96   83.0
BT         270.0  84.96  82.5  271.1  84.96  82.05  271.1  84.96  83.35
BT         272.0  84.96  83.35 272.0  84.96  82.05  273.0  84.96   82.5
BT         292.0  84.95  83.0  303.0  84.95   83.5  346.0   84.0   84.0
BT         348.0  84.9   84.9  354.0   84.9   84.9
GR  86.0     0.0  84.8   5.0   83.0   10.0   82.9   13.0   83.0   15.0
GR  82.9    17.0  83.0   20.0   84.0   24.0   84.2  118.0   84.0  166.0
GR  83.0   177.0  82.8  218.0   83.0  255.0   82.5  270.0  82.05  271.1
GR 82.05   272.0  82.5  273.0   83.0  292.0   83.5  303.0   84.0  346.0
GR  84.9   348.0  84.9  354.0
X11107.4       0      0      0   24.5   24.5   24.5
```

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X2
QT     6.   12.23   10.61    8.57    7.08    5.63    1.0
                                                     3.74
NC                  .030
X11107.5        0       0       0     0.5     0.5     0.5
X3  10.0                                                    84.8    84.9
X1 1212.       85  632.98  637.91     92.     92.     92.
GR 85.29      .00   85.22    1.94   84.40    4.88   85.03    6.50   85.10   13.84
GR 85.26    23.95   85.42   32.84   85.27   39.45   85.43   46.85   85.47   61.05
GR 85.44    73.77   85.13  101.36   84.85  123.62   84.91  140.97   85.04  147.35
GR 84.65   160.80   84.53  172.92   84.40  187.82   84.36  199.00   84.07  230.93
GR 84.06   242.40   83.86  261.37   83.77  276.13   83.77  288.70   83.62  299.95
GR 83.48   315.37   83.62  325.64   83.49  335.27   83.53  337.95   86.08  344.23
GR 86.13   345.39   83.36  353.05   83.91  355.68   86.01  360.00   86.45  362.06
GR 85.90   364.31   83.59  369.42   83.16  372.06   83.41  373.29   83.57  376.70
GR 83.25   378.27   83.38  379.11   83.88  381.81   83.99  386.55   84.30  396.39
GR 84.19   406.88   84.26  425.52   84.38  438.47   84.17  454.91   84.40  483.27
GR 84.09   511.82   84.22  527.08   84.64  529.53   83.01  535.21   83.25  625.00
GR 83.46   632.98   82.30  635.93   83.26  637.91   83.38  642.90   83.39  649.14
GR 83.51   667.23   83.91  669.96   83.74  673.81   83.68  684.35   83.83  692.97
GR 84.06   701.99   84.22  708.31   84.01  713.86   83.96  724.58   83.91  733.33
GR 83.91   745.03   83.93  749.09   84.01  760.07   84.13  767.42   84.23  772.27
GR 84.15   793.25   84.14  816.09   84.15  833.07   84.20  848.08   83.64  854.11
GR 84.01   855.29   86.52  865.61   87.19  869.36   87.18  872.13   86.54  875.03
NC   .08      .08     .03      .1      .3
X11506.9     22.0   141.2   145.2   305.0   195.0   294.0
GR 85.15      0.0   84.98    30.0   85.08    60.0   85.42    90.0   85.08   120.0
GR 84.71    129.0   84.68   141.2   83.72   143.2   83.44   144.0   83.58   144.8
GR 84.41    145.2   84.52   160.0   85.31   187.5   86.61   191.7   86.63   214.0
GR 86.46    244.0   86.25   274.0   85.93   287.6   86.55   290.8   86.00   294.0
GR 85.25    297.9   86.25   301.2
X1 1588.       40  215.60  231.93    72.0    72.0    72.0
GR 85.05      .00   85.03    4.86   85.16   14.10   85.34   15.62   85.26   18.14
GR 84.99    21.58   84.99   27.96   85.02   31.76   84.90   42.83   85.00   57.77
GR 85.10    73.24   85.18   84.13   84.56   87.73   84.99   91.37   85.23   99.97
GR 85.44   110.07   85.35  122.12   85.26  129.40   85.45  131.35   85.31  136.91
GR 85.43   142.70   85.43  153.16   85.64  164.43   85.15  199.69   85.04  215.60
GR 84.23   228.14   83.78  230.61   84.63  231.93   84.87  235.36   84.68  240.91
GR 85.03   258.67   85.45  260.65   85.59  262.88   85.93  266.95   86.00  273.23
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GR 86.26   288.42   86.41  305.70   86.70  320.67   87.24  370.98   87.09  378.24
X1 1664.       75  689.49  706.20   76.00   76.00   76.00
GR 88.78      .00   88.77    3.97   88.05    6.60   88.38   10.44   88.58   19.62
GR 88.83    29.07   88.90   47.26   88.94   64.66   88.73   78.85   88.29   96.97
GR 87.93   148.65   88.02  166.47   88.15  184.95   87.89  203.64   87.67  221.21
GR 87.74   242.24   87.19  288.22   87.46  302.99   87.50  319.10   87.32  334.53
GR 86.69   369.09   86.92  369.94   87.18  376.21   87.20  390.32   87.31  398.44
GR 87.33   407.00   87.22  416.30   86.96  423.08   86.80  429.34   86.99  444.96
GR 86.92   462.84   87.06  477.32   86.81  490.48   86.49  504.51   86.38  513.25
GR 86.60   516.90   85.84  523.40   85.99  532.46   85.76  539.50   86.07  545.60
GR 86.05   558.50   86.06  575.75   86.33  588.95   86.30  606.04   86.51  624.35
GR 86.60   635.90   86.33  640.93   86.44  648.92   85.75  662.55   85.20  674.35
GR 85.08   689.49   84.50  701.50   84.11  704.06   85.00  706.20   85.19  710.84
GR 84.93   712.57   85.18  713.49   85.04  723.14   85.20  730.51   85.52  734.04
GR 85.65   747.88   86.06  758.70   86.48  766.21   86.21  782.70   87.12  789.08
GR 87.43   797.14   87.07  803.74   86.97  810.71   87.28  815.28   87.34  823.85
GR 87.25   827.26   87.36  835.88   87.47  845.29   87.25  855.00   87.37  867.77
NC  .070     .070    .030     .30     .50
X11769.1      26.0    670.    677.    80.0    80.0    80.0
GR  90.1       0.0    90.0     3.0    89.5    10.0    89.5    38.0    89.0   138.0
GR  88.5     216.0    88.0   278.0    88.0   370.0    87.5   439.0    87.5   464.0
GR  87.0     498.0    86.5   540.0    86.5   613.0    86.0   634.0    85.5   647.0
GR  85.0     670.0    84.4   671.0    84.4   676.0    85.0   677.0    86.0   697.0
GR  86.0     736.0    86.5   794.0    87.0   861.0    87.5   876.0    87.8   880.0
GR  87.8     882.0
X11769.2      28.0   671.0  675.30    15.5    15.5    15.5
GR  90.1       0.0    90.0     3.0    89.5    10.0    89.5    38.0    89.0   138.0
GR  88.5     216.0    88.0   278.0    88.0   370.0    87.5   439.0    87.5   464.0
GR  87.0     498.0    86.5   540.0    86.5   613.0    86.0   634.0    85.5   647.0
GR  85.0     669.0   84.61   671.0   84.61  672.05   84.44  674.05   84.44  675.3
GR  85.0     677.0    86.0   697.0    86.0   736.0    86.5   794.0    87.0   861.0
GR  87.5     876.0    87.8   880.0    87.8   882.0
NC                    .024
X11769.3      28.0   671.0  675.3     0.5     0.5     0.5
BT -31.0       0.0    90.1   90.1     3.0    90.1    90.0    10.0   90.05    89.5
BT            38.0    90.0   89.5   138.0    89.5    89.0   216.0    89.1    88.5
BT           278.0    89.0   88.0   370.0    88.5    88.0   439.0    88.0    87.5
BT           464.0    87.8   87.5   498.0    87.5    87.0   540.0    87.3    86.5
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BT          613.0    86.9    86.5    634.0    86.8    86.0    647.0    86.7    85.5
BT          669.0   86.61    85.0    671.0   86.61   84.86    671.0   86.61   85.91
BT         672.05   86.61   85.91   672.05   86.61   84.86   674.05   86.61   84.94
BT         674.05   86.61   86.19   675.30   86.61   86.19   675.30   86.61   84.94
BT          677.0    86.6    85.0    697.0    86.5    86.0    736.0    86.4    86.0
BT          794.0    86.6    86.5    861.0    87.4    87.0    876.0    87.8    87.5
BT          880.0    87.8    87.8
GR  90.1      0.0    90.0     3.0    89.5    10.0    89.5     38.0    89.0   138.0
GR  88.5    216.0    88.0   278.0    88.0   370.0    87.5   439.0    87.5   464.0
GR  87.0    498.0    86.5   540.0    86.5   613.0    86.0   634.0    85.5   647.0
GR  85.0    669.0   84.86   671.0   84.86  672.05   84.94  674.05   84.94  675.30
GR  85.0    677.0    86.0   697.0    86.0   736.0    86.5   794.0    87.0   861.0
GR  87.5    876.0    87.8   880.0    87.8   882.0
X11769.4        0       0       0    18.9    18.9    18.9
X2                                           1.0
NC                   .030
X11769.5        0       0       0     0.5     0.5     0.5
X3  10.0                                                    86.61   86.60
QT     6.    5.15    4.11    2.90    2.15    1.52    0.79
X1 1826.      50  279.83  285.07     58.     58.     58.
GR 89.06     .00   89.33    9.84   88.73   19.95   88.21   41.39   88.05   57.41
GR 87.89   69.31   87.49   74.70   87.67   84.89   87.55   85.83   86.76   86.75
GR 87.30   87.36   87.58   91.31   87.40  103.73   87.56  119.59   87.61  132.64
GR 87.36  142.54   87.49  152.38   87.33  167.18   87.20  175.59   87.08  184.00
GR 86.86  196.79   86.47  198.51   86.92  200.39   87.04  207.62   86.92  220.63
GR 86.67  221.00   86.53  228.63   86.71  242.49   86.51  264.29   86.55  275.97
GR 86.54  279.83   85.71  281.08   85.70  282.23   87.16  285.07   87.47  286.07
GR 87.94  305.77   87.29  312.57   87.05  316.69   87.27  331.80   87.32  357.69
GR 87.25  367.37   87.06  379.35   87.14  391.70   86.87  401.41   86.80  414.77
GR 86.89  428.11   86.98  438.56   87.27  452.72   87.25  467.06   87.28  475.86
NC    .07     .07     .03      .1      .3
X1 1929.      65  670.58  719.53  103.00  103.00  103.00
GR 90.47     .00   90.37    3.68   89.72    5.98   90.22    8.20   90.11   12.34
GR 90.16   27.94   90.01   48.17   90.05   65.07   90.02   81.47   89.80   95.13
GR 89.78  111.23   90.17  120.62   90.33  127.48   90.22  136.37   89.97  154.74
GR 89.65  177.77   89.47  204.92   89.48  234.55   89.28  251.70   89.20  271.77
GR 89.52  285.81   89.47  301.24   89.39  321.21   89.44  332.77   89.61  384.46
GR 89.44  421.28   89.30  434.50   89.14  436.09   89.39  437.18   89.26  443.75
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GR 88.90  466.46   88.65  483.21   88.51  508.88   88.51  519.66   88.03  540.43
GR 87.64  594.18   87.35  618.12   87.24  633.70   87.22  640.54   86.97  652.40
GR 87.54  662.40   87.54  670.58   86.21  672.88   86.18  675.56   86.97  678.21
GR 86.98  681.79   87.01  695.92   86.92  709.52   88.23  719.53   88.51  729.06
GR 88.54  738.94   88.48  750.28   88.35  768.91   88.06  784.87   88.04  793.96
GR 88.14  804.48   88.41  813.61   88.78  826.84   88.92  838.13   88.94  847.16
GR 89.09  857.91   88.85  863.33   88.05  870.86   88.40  871.74   88.50  874.22
X1 2039.      43  174.34  216.21  110.00  110.00  110.00
GR 90.83     .00   91.01    8.93   90.57   25.36   90.31   36.77   90.06   46.09
GR 90.21   49.47   89.87   52.53   89.55   53.79   89.69   55.17   89.69   63.95
GR 89.46   74.74   89.34   88.15   89.26   99.71   89.24  110.43   89.26  120.71
GR 89.35  126.05   89.18  133.49   88.69  143.01   88.62  150.56   88.68  154.60
GR 88.47  160.65   88.63  164.23   88.34  168.04   87.93  174.34   87.60  177.30
GR 87.47  180.49   87.65  181.51   87.75  183.51   87.81  187.32   87.73  189.32
GR 87.78  194.12   87.77  208.77   89.09  216.21   88.95  223.10   88.92  236.57
GR 89.53  263.33   89.63  279.61   89.70  299.26   89.73  316.59   89.56  321.28
GR 89.09  322.73   89.43  323.69   89.68  326.90
X12288.9    15.0   149.0   150.8  149.00  149.00  149.00
GR 91.57     0.0   91.67    30.0   91.45    60.0   91.47    90.0   91.35   120.0
GR 89.55   149.0   89.33   150.0   89.33   150.8   89.90   151.1   90.23   180.0
GR 91.43   210.0   92.10   240.0   92.39   270.0   92.44   286.8   93.01   293.7
X1 2384.      16.     166.    173.     61.     61.     61.
GR  92.0       0    91.5      53    91.5     131    91.0     150    90.5     156
GR  90.5     166    90.0     169    90.0     172    90.5     173    91.0     174
GR  91.5     176    92.0     196    92.5     228    93.0     242    93.5     255
GR  94.0     300
X1 2428.      50  329.78  366.47  105.00  105.00  105.00
GR 92.27     .00   92.40    9.66   92.37   19.45   92.69   23.44   92.40   26.57
GR 92.56   30.62   92.56   42.21   92.42   59.85   92.43   68.09   92.66   79.84
GR 92.67   89.48   92.62  103.94   92.55  116.76   92.58  145.88   92.78  158.73
GR 92.89  172.33   92.46  190.38   92.62  192.11   92.64  197.65   92.46  212.50
GR 92.22  224.46   92.55  231.53   92.61  240.03   92.09  254.45   92.37  264.47
GR 92.69  275.33   92.56  287.04   92.64  295.23   92.71  305.51   92.37  317.17
GR 91.65  329.78   90.87  338.43   90.54  343.29   90.77  347.61   90.55  355.62
GR 90.57  357.51   90.93  359.97   91.25  366.47   91.65  371.04   92.39  381.14
GR 93.46  393.32   94.40  410.75   94.84  421.46   95.13  435.38   95.27  446.50
GR 95.04  455.69   94.82  464.89   94.26  466.40   94.56  468.14   94.56  472.61
X1 2513.      46  351.16  368.17   85.00   85.00   85.00
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GR 93.43     .00   93.43    3.42   93.26   13.99   93.13   27.65   92.91   39.36
GR 93.34   52.35   93.35   69.79   93.45   84.58   93.70   97.03   93.94  111.20
GR 94.15  125.99   94.08  137.59   94.06  152.78   94.05  166.46   94.07  180.25
GR 93.87  191.25   93.80  204.18   93.75  218.68   93.45  235.96   93.40  252.67
GR 93.05  267.60   92.75  283.60   92.61  308.17   92.51  319.42   92.13  327.13
GR 91.16  330.87   91.04  339.65   91.36  347.41   91.13  351.16   90.61  352.09
GR 90.60  353.16   90.76  353.40   91.09  359.57   91.76  368.17   92.09  376.31
GR 92.82  379.33   92.40  382.48   92.72  386.67   92.96  398.05   93.43  409.66
GR 94.08  419.50   94.40  429.87   94.28  441.20   94.56  452.89   94.87  455.44
GR 94.88  458.91
X1 2578.    15.     25.     38.     52.     52.     52.
GR  93.5     0    93.0     18    92.5     21    92.0     25    91.5     34
GR  91.0    36    91.5     37    92.0     38    93.0     42    93.5     51
GR  94.0    81    94.1     84    94.1    120    94.5    126    94.5    150
X1 2638.    29  164.75  171.00  105.00  105.00  105.00
GR 94.94   .00   94.86    6.25   94.62   10.22   94.83   16.38   94.97   24.99
GR 94.69 30.50   94.24   47.59   94.43   59.80   94.54   67.42   94.63   74.34
GR 94.41 81.66   94.12   89.41   94.08  101.49   93.81  117.21   93.11  152.29
GR 92.18 157.72  91.85  164.75   91.32  166.56   91.32  167.37   91.55  168.63
GR 92.15 171.00  93.21  174.36   93.68  187.13   94.00  189.45   93.65  195.13
GR 93.76 202.23  94.07  220.79   94.26  240.38   94.52  262.00     .00     .00
X1 2767.    30  216.76  225.83  129.00  129.00  129.00
GR 95.53   .00   95.48   18.66   94.89   36.26   94.82   52.99   94.70   71.19
GR 94.31 93.77   94.48  113.00   94.38  131.17   94.27  146.22   94.04  158.89
GR 94.22 166.28  94.03  174.83   93.33  187.65   93.14  196.29   93.25  206.38
GR 93.50 216.76  93.23  222.25   92.88  225.83   93.08  227.15   93.21  229.60
GR 93.70 235.74  94.18  252.38   94.38  266.77   95.12  303.37   95.26  312.05
GR 95.30 320.76  95.39  322.71   94.94  323.95   95.26  325.08   95.26  326.85
EJ


ER
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**************************************
*            S U M P O               *
*     Interactive SUmmary PrintOut   *
*        for the IBM PC/XT/AT        *
*        January 1987 version        *
**************************************
```

Input Filename: WC6S.HEC
Output Filename: WC6S.SUM

Watercourse 6 SPILL

	SECNO	Q	QCH	VCH	CWSEL	DEPTH	DIFWSX	EG	TOPWID	K*CHSL	QLOB
*	181.20	2.83	1.02	1.22	78.94	0.93	0.00	78.96	80.00	0.00	0.
*	181.30	2.83	1.48	1.49	79.15	1.14	0.21	79.21	150.00	0.00	0.
	181.40	2.83	0.20	0.20	79.23	1.12	0.08	79.23	150.00	4.00	1.
*	420.90	2.83	1.36	1.35	79.39	0.45	0.16	79.43	62.04	4.28	0.
	566.10	2.83	2.05	1.11	79.85	0.57	0.47	79.90	13.88	2.88	0.
	566.20	4.45	4.45	2.33	79.87	0.59	0.02	80.15	3.25	0.00	0.
	566.30	4.45	4.45	1.80	80.02	0.81	0.15	80.19	414.70	-140.00	0.
	566.40	4.45	4.45	1.52	80.16	0.95	0.14	80.28	467.90	0.00	0.
	566.50	4.45	4.45	1.53	80.17	0.96	0.01	80.29	3.06	0.00	0.
	610.20	6.52	6.52	1.45	80.19	1.17	0.03	80.30	3.90	-38.00	0.
*	610.30	6.52	4.12	1.34	80.45	1.14	0.26	80.51	913.83	580.00	1.
	610.40	6.55	1.34	0.44	80.57	1.26	0.11	80.57	914.00	0.00	3.
	610.50	6.55	0.05	0.04	80.57	1.26	0.00	80.57	914.00	0.00	4.
	610.60	5.83	0.13	0.03	80.57	1.26	0.00	80.57	914.00	0.00	3.
	722.20	8.74	8.51	1.64	80.55	1.15	-0.02	80.69	12.90	2.25	0.
*	722.30	8.74	8.74	3.04	80.53	0.94	-0.02	81.00	5.62	379.99	0.
	722.40	8.74	3.59	0.86	81.16	1.57	0.63	81.18	131.52	0.00	5.
	722.50	8.74	4.60	0.96	81.16	1.57	0.00	81.18	129.71	0.00	4.
	810.00	12.63	0.43	0.10	81.19	1.68	0.03	81.19	432.32	-1.05	3.
	895.00	12.63	0.94	0.59	81.24	0.77	0.05	81.24	263.58	11.29	4.
	965.00	12.63	1.07	1.02	81.62	0.43	0.38	81.64	107.00	10.29	7.
	1084.90	12.63	3.30	1.31	82.33	0.77	0.71	82.36	80.60	3.36	0.
*	1107.20	12.63	12.63	2.94	82.94	1.15	0.61	83.38	5.00	23.00	0.
*	1107.30	4.88	4.88	4.25	83.32	1.27	0.38	84.25	137.89	520.00	0.
	1107.40	4.88	1.43	1.22	84.66	2.61	1.33	84.68	342.10	0.00	0.
	1107.50	4.48	4.48	1.97	84.57	2.52	-0.09	84.77	0.90	0.00	0.
	1212.00	12.23	0.77	0.08	84.83	2.53	0.26	84.83	689.32	2.72	8.

	1506.90	12.23	6.37	1.41	85.05	1.61	0.22	85.11	88.92	3.88	1.
	1588.00	12.23	8.39	0.76	85.18	1.40	0.13	85.20	154.94	4.72	2.
	1664.00	12.23	11.11	1.12	85.28	1.17	0.10	85.33	58.67	4.34	0.
	1769.10	12.23	10.53	1.57	85.44	1.04	0.17	85.55	36.32	3.63	1.
	1769.20	12.23	7.99	1.93	85.48	1.04	0.04	85.61	38.93	2.58	2.
*	1769.30	12.23	4.41	1.57	86.64	1.78	1.16	86.69	284.78	840.00	0.
	1769.40	12.23	2.56	0.77	86.77	1.91	0.13	86.78	311.52	0.00	0.
	1769.50	12.23	1.85	0.23	86.78	1.92	0.01	86.78	313.36	0.00	5.
	1826.00	5.15	2.83	0.86	86.80	1.10	0.02	86.82	68.64	14.48	2.
	1929.00	5.15	5.12	0.70	87.07	0.89	0.27	87.10	46.02	4.66	0.
	2039.00	5.15	5.15	0.99	87.89	0.42	0.81	87.93	34.73	11.73	0.
*	2288.90	5.15	2.89	2.11	90.15	0.82	2.27	90.28	33.75	12.48	1.
	2384.00	5.15	4.99	1.66	90.57	0.57	0.42	90.70	18.01	10.98	0.
	2428.00	5.15	5.15	0.67	91.02	0.48	0.45	91.04	25.02	5.14	0.
	2513.00	5.15	4.42	1.23	91.28	0.68	0.26	91.34	28.01	0.71	0.
*	2578.00	5.15	5.15	1.75	91.84	0.84	0.57	92.00	9.82	7.69	0.
	2638.00	5.15	4.62	1.10	92.30	0.98	0.46	92.36	14.42	3.05	0.
	2767.00	5.15	2.15	1.46	93.39	0.51	1.09	93.45	38.68	12.09	1.

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C
C     12
C  181.2  ALL SECTIONS HAVE UPSTREAM SECTIONING ASPECT
C  181.3  U/S SECTION COPES LANE
C  566.2  D/S SECTION NORTH SERVICE ROAD
C  566.5  U/S SECTION NORTH SERVICE ROAD
C  610.2  D/S SECTION Q.E.W.
C  610.5  U/S SECTION Q.E.W.
C  722.2  D/S SECTION SOUTH SERVICE ROAD
C  722.5  U/S SECTION SOUTH SERVICE ROAD
C 1107.2  D/S SECTION C.N.R.
C 1107.5  U/S SECTION C.N.R.
C 1769.2  D/S SECTION BARTON STREET
C 1769.5  U/S SECTION BARTON STREET
T1 CITY OF STONEY CREEK FLOODPLAIN MAPPING STUDY
T2 BY PHILIPS PLANNING & ENGINEERING LIMITED - PROJECT NO. 86090
T3       Watercourse 6  100 YR STORM
J1    0.0      2.0      0.0      0.0     -1.0      1.0      0.0      0.0     79.0
J2    1.0      0.0     -1.0
J6    1.0
QT     6.    13.42    11.71     9.50     7.90     6.28     4.12
NC   0.07     0.07     .013     0.30     0.50
X1 181.2      6.0     70.0     70.9       0.       0.       0.
X3   10.0                                                   79.0     78.9
GR  79.0      0.0     78.5     69.0    78.01     70.0    78.01     70.9     78.5     72.0
GR  78.9    150.0
SB   0.0     4.45      1.4      0.0      .90      0.0     0.95      0.0    78.01    74.80
X1 181.3      6.0     70.0     70.9      0.5      0.5
X2                     1.0    79.11    79.30
X3   10.0                                                   79.0     78.9
BT  -8.0      0.0     79.0     79.0     69.0     79.3     78.5     70.0     79.3    78.01
BT            70.0     79.3    79.11     70.9     79.3    79.11     70.9     79.3    78.01
BT            72.0     79.3     78.5    150.0     78.9     78.9
GR  79.0      0.0     78.5     69.0    78.01     70.0    78.01     70.9     78.5     72.0
GR  78.9    150.0
NC   .07      .07     .030
X1 181.4        0        0        0      25.      25.      25.              .10
NC   .08      .08      .03       .1       .3
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X1 420.9     17.0    177.3    182.8     194.     194.     194.
GR 79.74      0.0    79.84     30.0    79.69     60.0    79.47     90.0    79.60    120.0
GR 79.62    150.0    80.06    177.3    79.06    179.1    78.94    180.0    78.94    180.9
GR 80.10    182.8    79.51    210.0    79.56    240.0    79.52    270.0    79.25    300.0
GR 79.26    330.0    79.53    360.0
NC   .06      .06      .03      .30      .50
X1 566.1     25.0    624.0   627.25     118.     118.     118.
GR  87.3      0.0     87.3      4.0     81.0     18.0     80.5     30.0     80.0     66.0
GR  80.0    202.0     79.5    203.0     79.5    206.0     80.0    207.0     81.0    236.0
GR  81.0    296.0     81.0    384.0     80.0    418.0     79.5    420.0     80.0    422.0
GR  81.0    524.0     80.0    620.0     79.5    624.0    79.28    624.1    79.28   627.16
GR  79.5   627.25     80.0    628.0     80.0    884.0     80.0    890.0     80.3    894.0
X1 566.2        0        0        0      25.      25.      25.
X3    10                                                     80.8     80.3
NC                     .023
X1 566.3     25.0    624.1   627.16      0.5      0.5      0.5
BT -24.0     18.0     81.0     81.0     30.0     80.9     80.5     66.0     80.8     80.0
BT            202.0     80.8     80.0    203.0     80.8     79.5    206.0     80.8     79.5
BT            207.0     80.8     80.0    236.0     81.0     81.0    296.0     81.0     81.0
BT            384.0     81.4     81.0    418.0     81.4     80.0    420.0     81.4     79.5
BT            422.0     81.4     80.0    524.0     81.2     81.0    620.0    81.25     80.0
BT            624.0    81.25     79.5    624.1    81.25    79.28    624.1    81.25    80.33
BT           627.16    81.25    80.33   627.16    81.25    79.28   627.25    81.25     79.5
BT            628.0    81.25     80.0    884.0     80.4     80.0    890.0     80.3     80.3
GR  87.3      0.0     87.3      4.0     81.0     18.0     80.5     30.0     80.0     66.0
GR  80.0    202.0     79.5    203.0     79.5    206.0     80.0    207.0     81.0    236.0
GR  81.0    296.0     81.0    384.0     80.0    418.0     79.5    420.0     80.0    422.0
GR  81.0    524.0     80.0    620.0     79.5    624.0    79.21    624.1    79.21   627.16
GR  79.5   627.25     80.0    628.0     80.0    884.0     80.3    890.0     80.3    894.0
X1 566.4        0        0        0     25.6     25.6     25.6
X2                                                      1.0
NC                     .030
X1 566.5        0        0        0      4.0      4.0      4.0
X3   10.0                                                   80.8     80.3
X1 610.2       15    620.0    623.9      5.0      5.0      5.0
X3   10.0                                                   80.20    80.20
GR 80.55      0.0     80.0      1.0    79.97    110.0    79.94    204.0     79.9    417.0
GR  79.7    419.0     79.7    421.0     80.0    450.0     79.5    620.0    79.02    620.1
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*************************************
*            S U M P O              *
*     Interactive SUmmary PrintOut  *
*         for the IBM PC/XT/AT      *
*          January 1987 version     *
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Input Filename: WC6S.HEC
Output Filename: WC6S.SUM

Watercourse 6 SPILL

	SECNO	Q	QCH	VCH	CWSEL	DEPTH	DIFWSX	EG	TOPWID	K*CHSL	QLOB
*	181.20	2.83	1.02	1.22	78.94	0.93	0.00	78.96	80.00	0.00	0.
*	181.30	2.83	1.48	1.49	79.15	1.14	0.21	79.21	150.00	0.00	0.
	181.40	2.83	0.20	0.20	79.23	1.12	0.08	79.23	150.00	4.00	1.
*	420.90	2.83	1.36	1.35	79.39	0.45	0.16	79.43	62.04	4.28	0.
	566.10	2.83	2.05	1.11	79.85	0.57	0.47	79.90	13.88	2.88	0.
	566.20	4.45	4.45	2.33	79.87	0.59	0.02	80.15	3.25	0.00	0.
	566.30	4.45	4.45	1.80	80.02	0.81	0.15	80.19	414.70	-140.00	0.
	566.40	4.45	4.45	1.52	80.16	0.95	0.14	80.28	467.90	0.00	0.
	566.50	4.45	4.45	1.53	80.17	0.96	0.01	80.29	3.06	0.00	0.
	610.20	6.52	6.52	1.45	80.19	1.17	0.03	80.30	3.90	-38.00	0.
*	610.30	6.52	4.12	1.34	80.45	1.14	0.26	80.51	913.83	580.00	1.
	610.40	6.55	1.34	0.44	80.57	1.26	0.11	80.57	914.00	0.00	3.
	610.50	6.55	0.05	0.04	80.57	1.26	0.00	80.57	914.00	0.00	4.
	610.60	5.83	0.13	0.03	80.57	1.26	0.00	80.57	914.00	0.00	3.
	722.20	8.74	8.51	1.64	80.55	1.15	-0.02	80.69	12.90	2.25	0.
*	722.30	8.74	8.74	3.04	80.53	0.94	-0.02	81.00	5.62	379.99	0.
	722.40	8.74	3.59	0.86	81.16	1.57	0.63	81.18	131.52	0.00	5.
	722.50	8.74	4.60	0.96	81.16	1.57	0.00	81.18	129.71	0.00	4.
	810.00	12.63	0.43	0.10	81.19	1.68	0.03	81.19	432.32	-1.05	3.
	895.00	12.63	0.94	0.59	81.24	0.77	0.05	81.24	263.58	11.29	4.
	965.00	12.63	1.07	1.02	81.62	0.43	0.38	81.64	107.00	10.29	7.
	1084.90	12.63	3.30	1.31	82.33	0.77	0.71	82.36	80.60	3.36	0.
*	1107.20	12.63	12.63	2.94	82.94	1.15	0.61	83.38	5.00	23.00	0.
*	1107.30	4.88	4.88	4.25	83.32	1.27	0.38	84.25	137.89	520.00	0.
	1107.40	4.88	1.43	1.22	84.66	2.61	1.33	84.68	342.10	0.00	0.
	1107.50	4.48	4.48	1.97	84.57	2.52	-0.09	84.77	0.90	0.00	0.
	1212.00	12.23	0.77	0.08	84.83	2.53	0.26	84.83	689.32	2.72	8.

	1506.90	12.23	6.37	1.41	85.05	1.61	0.22	85.11	88.92	3.88	1.
	1588.00	12.23	8.39	0.76	85.18	1.40	0.13	85.20	154.94	4.72	2.
	1664.00	12.23	11.11	1.12	85.28	1.17	0.10	85.33	58.67	4.34	0.
	1769.10	12.23	10.53	1.57	85.44	1.04	0.17	85.55	36.32	3.63	1.
	1769.20	12.23	7.99	1.93	85.48	1.04	0.04	85.61	38.93	2.58	2.
*	1769.30	12.23	4.41	1.57	86.64	1.78	1.16	86.69	284.78	840.00	0.
	1769.40	12.23	2.56	0.77	86.77	1.91	0.13	86.78	311.52	0.00	0.
	1769.50	12.23	1.85	0.23	86.78	1.92	0.01	86.78	313.36	0.00	5.
	1826.00	5.15	2.83	0.86	86.80	1.10	0.02	86.82	68.64	14.48	2.
	1929.00	5.15	5.12	0.70	87.07	0.89	0.27	87.10	46.02	4.66	0.
	2039.00	5.15	5.15	0.99	87.89	0.42	0.81	87.93	34.73	11.73	0.
*	2288.90	5.15	2.89	2.11	90.15	0.82	2.27	90.28	33.75	12.48	1.
	2384.00	5.15	4.99	1.66	90.57	0.57	0.42	90.70	18.01	10.98	0.
	2428.00	5.15	5.15	0.67	91.02	0.48	0.45	91.04	25.02	5.14	0.
	2513.00	5.15	4.42	1.23	91.28	0.68	0.26	91.34	28.01	0.71	0.
*	2578.00	5.15	5.15	1.75	91.84	0.84	0.57	92.00	9.82	7.69	0.
	2638.00	5.15	4.62	1.10	92.30	0.98	0.46	92.36	14.42	3.05	0.
	2767.00	5.15	2.15	1.46	93.39	0.51	1.09	93.45	38.68	12.09	1.

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C
C     12
C  181.2  ALL SECTIONS HAVE UPSTREAM SECTIONING ASPECT
C  181.3  U/S SECTION COPES LANE
C  566.2  D/S SECTION NORTH SERVICE ROAD
C  566.5  U/S SECTION NORTH SERVICE ROAD
C  610.2  D/S SECTION Q.E.W.
C  610.5  U/S SECTION Q.E.W.
C  722.2  D/S SECTION SOUTH SERVICE ROAD
C  722.5  U/S SECTION SOUTH SERVICE ROAD
C 1107.2  D/S SECTION C.N.R.
C 1107.5  U/S SECTION C.N.R.
C 1769.2  D/S SECTION BARTON STREET
C 1769.5  U/S SECTION BARTON STREET
T1 CITY OF STONEY CREEK FLOODPLAIN MAPPING STUDY
T2 BY PHILIPS PLANNING & ENGINEERING LIMITED - PROJECT NO. 86090
T3        Watercourse 6  100 YR STORM
J1   0.0      2.0      0.0      0.0     -1.0      1.0      0.0      0.0     79.0
J2   1.0      0.0     -1.0
J6   1.0
QT     6.    13.42    11.71     9.50     7.90     6.28     4.12
NC  0.07     0.07     .013     0.30     0.50
X1 181.2      6.0     70.0     70.9       0.       0.       0.
X3  10.0                                                    79.0     78.9
GR  79.0      0.0     78.5     69.0    78.01     70.0    78.01     70.9     78.5     72.0
GR  78.9    150.0
SB   0.0     4.45      1.4      0.0      .90      0.0     0.95      0.0    78.01    74.80
X1 181.3      6.0     70.0     70.9      0.5      0.5
X2                     1.0    79.11    79.30
X3  10.0                                                    79.0     78.9
BT  -8.0      0.0     79.0     79.0     69.0     79.3     78.5     70.0     79.3    78.01
BT            70.0     79.3    79.11     70.9     79.3    79.11     70.9     79.3    78.01
BT            72.0     79.3     78.5    150.0     78.9     78.9
GR  79.0      0.0     78.5     69.0    78.01     70.0    78.01     70.9     78.5     72.0
GR  78.9    150.0
NC   .07      .07     .030
X1 181.4        0        0        0      25.      25.      25.              .10
NC   .08      .08      .03       .1       .3
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X1 420.9     17.0    177.3    182.8     194.     194.     194.
GR 79.74      0.0     79.84     30.0    79.69     60.0    79.47     90.0    79.60    120.0
GR 79.62    150.0     80.06    177.3    79.06    179.1    78.94    180.0    78.94    180.9
GR 80.10    182.8     79.51    210.0    79.56    240.0    79.52    270.0    79.25    300.0
GR 79.26    330.0     79.53    360.0
NC   .06      .06      .03       .30      .50
X1 566.1     25.0    624.0   627.25     118.     118.     118.
GR  87.3      0.0     87.3      4.0     81.0     18.0     80.5     30.0     80.0     66.0
GR  80.0    202.0     79.5    203.0     79.5    206.0     80.0    207.0     81.0    236.0
GR  81.0    296.0     81.0    384.0     80.0    418.0     79.5    420.0     80.0    422.0
GR  81.0    524.0     80.0    620.0     79.5    624.0    79.28    624.1    79.28   627.16
GR  79.5   627.25     80.0    628.0     80.0    884.0     80.0    890.0     80.3    894.0
X1 566.2        0        0        0      25.      25.      25.
X3    10                                                    80.8     80.3
NC                    .023
X1 566.3     25.0    624.1   627.16      0.5      0.5      0.5
BT -24.0     18.0     81.0     81.0     30.0     80.9     80.5     66.0     80.8     80.0
BT           202.0     80.8     80.0    203.0     80.8     79.5    206.0     80.8     79.5
BT           207.0     80.8     80.0    236.0     81.0     81.0    296.0     81.0     81.0
BT           384.0     81.4     81.0    418.0     81.4     80.0    420.0     81.4     79.5
BT           422.0     81.4     80.0    524.0     81.2     81.0    620.0    81.25     80.0
BT           624.0    81.25     79.5    624.1    81.25    79.28    624.1    81.25    80.33
BT          627.16    81.25    80.33   627.16    81.25    79.28   627.25    81.25     79.5
BT           628.0    81.25     80.0    884.0     80.4     80.0    890.0     80.3     80.3
GR  87.3      0.0     87.3      4.0     81.0     18.0     80.5     30.0     80.0     66.0
GR  80.0    202.0     79.5    203.0     79.5    206.0     80.0    207.0     81.0    236.0
GR  81.0    296.0     81.0    384.0     80.0    418.0     79.5    420.0     80.0    422.0
GR  81.0    524.0     80.0    620.0     79.5    624.0    79.21    624.1    79.21   627.16
GR  79.5   627.25     80.0    628.0     80.0    884.0     80.3    890.0     80.3    894.0
X1 566.4        0        0        0     25.6     25.6     25.6
X2                                                  1.0
NC                    .030
X1 566.5        0        0        0      4.0      4.0      4.0
X3  10.0                                                    80.8     80.3
X1 610.2       15    620.0    623.9      5.0      5.0      5.0
X3  10.0                                                    80.20    80.20
GR 80.55      0.0     80.0      1.0    79.97    110.0    79.94    204.0     79.9    417.0
GR  79.7    419.0     79.7    421.0     80.0    450.0     79.5    620.0    79.02    620.1
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GR 79.02   623.8    79.5   623.9    80.0   760.0    80.1   913.0    80.3   914.0
NC                 .025
X1 610.3     15.0  620.0  623.9     0.50    0.5     0.5
BT -17.0      0.0  80.55  80.55     1.0   80.55    80.0   110.0    80.4   79.97
BT           204.0  80.4   79.94   417.0   80.6    79.9   419.0    80.6   79.7
BT           421.0  80.6   79.7    450.0   80.6    80.0   620.0    80.96  79.5
BT           620.1  80.96  79.31   620.1   80.96   80.14  623.8    80.96  80.14
BT           623.8  80.96  79.31   623.9   80.96   79.5   760.0    80.6   80.0
BT           913.0  80.3   80.1    914.0   80.3    80.3
GR 80.55     0.0    80.0    1.0    79.97   110.0   79.94  204.0    79.9   417.0
GR  79.7     419.0  79.7   421.0    80.0   450.0    79.5   620.0   79.31  620.1
GR 79.31     623.8  79.5   623.9    80.0   760.0    80.1   913.0    80.3   914.0
X1 610.4        0     0       0     42.6    42.6    42.6
X2                                          1.0
NC   .06      .06   .030
X1 610.5        0     0       0      0.5     0.5     0.5
X3  10.0                                          80.40   80.30
QT     6.    12.63  11.08   9.07    7.63    6.26    4.38
X1 610.6        0.    0.      0.      7.      7.      7.
X1 722.2       13.0  156.0   161.0    40.     40.     40.
X3  10.0                                                  80.40   81.60
GR  80.7     0.0    80.7   131.0    80.5   154.0    80.0   156.0   79.40  157.0
GR 79.40   160.06   80.0   161.0    80.5   178.0    80.5   218.0    80.5   371.0
GR  81.0     423.0  81.6   426.0    81.6   429.0
NC  0.06     0.06   .022
X1 722.3       15.0  428.0  431.06    0.5     0.5     0.5
BT -17.0      0.0   80.8    80.8    86.0    81.0    81.0   105.0    81.1   81.1
BT           200.0  81.4    81.4   216.0    81.5    81.5   270.0    81.6   81.6
BT           345.0  81.7    81.7   425.0    81.8    81.8   427.0    81.8   80.0
BT           428.0  81.83  79.59   428.00   81.83   80.95  431.06   81.83  80.95
BT          431.06  81.83  79.59   432.0    81.83   80.0   432.1    81.83  81.70
BT           520.0  81.7    81.7   615.00   81.6    81.6
GR  80.8     0.0    81.0    86.0    81.1    105.0    81.4   200.0    81.5   216.0
GR  81.6     270.0  81.7   345.0    81.8    425.0    80.0   427.0   79.59  428.0
GR 79.59   431.06   80.0   432.0    81.7    432.1    81.7   520.0    81.6   615.0
X1 722.4        0     0       0     23.7    23.7    23.7
X2                                          1.0
NC                 .030
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X1 722.5        0       0       0      0.5     0.5     0.5
X3  10.0                                                  80.40   81.60
X1  810.       69  427.28  432.27    76.0    76.0    76.0
GR 81.02     8.50  81.02   10.50   80.03   14.31   80.28   15.74   80.73   18.83
GR 81.35    27.40  80.86   29.77   80.65   39.51   80.34   52.84   80.37   66.26
GR 82.64    72.13  82.54   75.65   82.18   84.41   81.52   90.93   80.98  100.04
GR 81.05   107.88  80.78  121.25   80.62  139.83   80.27  157.97   80.31  161.53
GR 80.10   162.63  80.10  165.72   81.12  169.06   81.28  175.39   81.27  189.93
GR 81.23   206.34  81.23  224.11   81.25  237.16   81.30  255.65   81.22  268.14
GR 81.31   288.57  81.31  303.32   81.22  320.56   81.17  339.35   81.20  358.98
GR 81.20   383.92  81.22  399.06   80.94  400.73   81.03  403.27   81.77  409.92
GR 80.85   418.28  80.83  427.28   79.97  429.28   79.99  430.50   81.04  432.27
GR 81.04   434.49  80.95  442.15   80.71  443.44   80.90  444.86   80.82  463.94
GR 80.74   486.84  80.66  506.71   80.63  514.68   81.07  523.43   81.11  530.80
GR 80.89   537.62  79.97  541.21   80.77  542.84   80.83  545.81   79.51  548.01
GR 79.52   594.26  80.78  598.72   80.99  620.92   80.98  655.71   80.99  684.10
GR 80.53   686.64  81.15  687.43   81.57  689.65   81.58  695.59
NC   .06      .06    .03      .1      .3
X1  895.       69  422.57  426.94    85.00   85.00   85.00
GR 81.64      .00  81.44    2.80   81.44    6.52   80.58    8.76   80.99   11.85
GR 81.88    16.19  82.21   20.60   81.34   28.61   81.29   33.67   81.54   38.49
GR 81.28    46.08  81.28   52.72   80.96   55.63   80.83   79.11   81.14   80.05
GR 81.36    83.72  81.64   90.05   80.99   93.54   81.06   99.35   81.52  100.40
GR 81.02   100.86  82.39  106.36   82.76  110.92   83.35  128.81   80.79  140.48
GR 81.19   147.76  81.07  158.47   81.62  164.09   81.82  184.59   81.70  205.75
GR 81.70   220.97  81.70  239.91   81.62  259.71   81.75  280.62   81.75  296.08
GR 81.77   311.06  81.62  329.50   81.62  344.33   81.59  363.77   81.55  401.88
GR 81.52   406.82  81.36  416.40   81.35  422.57   80.47  425.44   81.21  426.94
GR 81.21   436.27  81.07  438.91   81.10  461.06   81.15  486.47   81.14  505.26
GR 81.14   512.34  81.06  533.56   80.53  535.77   80.89  537.73   80.89  556.01
GR 81.05   569.42  80.96  582.98   80.91  589.34   81.14  604.12   81.20  619.21
GR 81.72   621.70  82.00  627.57   83.88  659.07   83.02  662.73   81.98  667.13
GR 81.81   677.38  81.01  679.76   82.02  682.86   82.07  685.88
X1  965.       63  448.02  458.71    70.0    70.0    70.0
X3                                          595.79   90.0
GR 81.80      .00  81.20    7.21   81.82   13.58   82.20   19.97   82.07   25.01
GR 81.54    30.58  82.66   34.96   83.12   38.41   83.06   40.86   81.85   45.00
GR 81.67    70.73  81.83   78.33   81.72  104.64   81.43  133.16   81.37  151.98
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GR 81.49  173.59   82.55  180.20   81.73  186.01   81.91  188.78   81.19  194.24
GR 82.01  196.14   82.31  220.80   82.40  236.34   82.40  265.17   82.50  275.75
GR 82.27  291.71   82.34  301.52   82.39  316.05   82.26  334.70   82.29  345.82
GR 82.17  359.84   82.18  376.22   82.35  387.21   82.24  402.52   82.41  417.31
GR 82.42  434.18   81.88  441.48   81.98  448.02   81.28  456.31   81.67  458.71
GR 81.78  465.69   81.88  477.41   81.65  489.50   82.57  521.73   82.45  546.58
GR 82.26  549.72   82.45  558.01   82.19  566.50   81.30  571.75   81.38  582.78
GR 81.38  595.79   81.42  602.13   82.10  668.50   82.10  676.11   82.10  688.04
GR 82.01  701.62   82.23  703.11   82.06  706.88   81.85  709.67   81.51  711.11
GR 82.59  713.06   82.55  714.32   82.73  718.45
NC    .09    .09     .03    .30     .50
X11084.9   22.0   206.1  214.0   110.0  110.0   110.0
GR 82.75    0.0   82.55   30.0   82.50   60.0   82.42   90.0   82.32  120.0
GR 82.72  150.0   82.66  180.0   82.73  206.1   81.98  207.8   81.56  210.0
GR 82.02  212.0   82.87  214.0   83.15  240.0   82.86  270.0   83.19  300.0
GR 83.25  330.0   82.42  360.0   82.26  390.0   81.75  420.0   82.02  450.0
GR 83.60  464.2   83.65  467.8
X11107.2   20.0   640.0  645.0    10.0   10.0    10.0
X3  10.0                                        83.85  83.85
GR  85.1    0.0   85.1    3.0    84.0    7.0    84.0   94.0   83.5   96.0
GR  83.5  172.0   83.0  230.0    82.5  372.0    81.9  375.0   82.5  402.0
GR  82.5  640.0   81.79  642.0   81.79  642.9   82.5  645.0   83.0  712.0
GR  83.7  724.0   83.0   732.0   83.0   814.0   84.3  815.0   84.3  905.0
NC               .021
X11107.3   22.0   271.1  272.0     .5     .5     .5
BT -23.0    5.0   84.8   84.8    10.0   84.8   83.0   13.0   84.8   82.9
BT         15.0   84.8   83.0    17.0   84.8   82.9   20.0   84.8   83.0
BT         24.0   84.8   84.0   118.0   84.8   84.2  166.0  84.85   84.0
BT        177.0  84.85   83.0   218.0  84.96   82.8  255.0  84.96   83.0
BT        270.0  84.96   82.5   271.1  84.96  82.05  271.1  84.96  83.35
BT        272.0  84.96  83.35   272.0  84.96  82.05  273.0  84.96   82.5
BT        292.0  84.95   83.0   303.0  84.95   83.5  346.0   84.0   84.0
BT        348.0   84.9   84.9   354.0   84.9   84.9
GR  86.0    0.0   84.8    5.0   83.0   10.0   82.9   13.0   83.0   15.0
GR  82.9   17.0   83.0   20.0   84.0   24.0   84.2  118.0   84.0  166.0
GR  83.0  177.0   82.8  218.0   83.0  255.0   82.5  270.0  82.05  271.1
GR 82.05  272.0   82.5  273.0   83.0  292.0   83.5  303.0   84.0  346.0
GR  84.9  348.0   84.9  354.0
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X11107.4      0      0      0   24.5   24.5   24.5
X2                                      1.0
QT    6.  12.23  10.61   8.57   7.08   5.63   3.74
NC               .030
X11107.5      0      0      0    0.5    0.5    0.5
X3  10.0                                        84.8   84.9
X1 1212.     85 632.98 637.91    92.    92.    92.
GR 85.29    .00  85.22   1.94  84.40   4.88  85.03   6.50  85.10  13.84
GR 85.26  23.95  85.42  32.84  85.27  39.45  85.43  46.85  85.47  61.05
GR 85.44  73.77  85.13 101.36  84.85 123.62  84.91 140.97  85.04 147.35
GR 84.65 160.80  84.53 172.92  84.40 187.82  84.36 199.00  84.07 230.93
GR 84.06 242.40  83.88 261.37  83.77 276.13  83.77 288.70  83.62 299.95
GR 83.48 315.37  83.62 325.64  83.49 335.27  83.53 337.95  86.08 344.23
GR 86.13 345.39  83.36 353.05  83.91 355.68  86.01 360.00  86.45 362.06
GR 85.90 364.31  83.59 369.42  83.16 372.06  83.41 373.29  83.57 376.70
GR 83.25 378.27  83.38 379.11  83.88 381.81  83.99 386.55  84.30 396.39
GR 84.19 406.88  84.26 425.52  84.38 438.47  84.17 454.91  84.40 483.27
GR 84.09 511.82  84.22 527.08  84.64 529.53  83.01 535.21  83.25 625.00
GR 83.46 632.98  82.30 635.93  83.26 637.91  83.38 642.90  83.39 649.14
GR 83.51 667.23  83.91 669.96  83.74 673.81  83.68 684.35  83.83 692.97
GR 84.06 701.99  84.22 708.31  84.01 713.86  83.96 724.58  83.91 733.33
GR 83.91 745.03  83.93 749.09  84.01 760.07  84.13 767.42  84.23 772.27
GR 84.15 793.25  84.14 816.09  84.15 833.07  84.20 848.08  83.64 854.11
GR 84.01 855.29  86.52 865.61  87.19 869.36  87.18 872.13  86.54 875.03
NC    .08    .08    .03    .1     .3
X11506.9   22.0  141.2  145.2  305.0  195.0  294.0
GR 85.15    0.0  84.98   30.0  85.08   60.0  85.42   90.0  85.08  120.0
GR 84.71  129.0  84.68  141.2  83.72  143.2  83.44  144.0  83.58  144.8
GR 84.41  145.2  84.52  160.0  85.31  187.5  86.61  191.7  86.63  214.0
GR 86.46  244.0  86.25  274.0  85.93  287.6  86.55  290.8  86.00  294.0
GR 85.25  297.9  86.25  301.2
X1 1588.     40 215.60 231.93   72.0   72.0   72.0
GR 85.05    .00  85.03   4.86  85.16  14.10  85.34  15.62  85.26  18.14
GR 84.99  21.58  84.99  27.96  85.02  31.76  84.90  42.83  85.00  57.77
GR 85.10  73.24  85.18  84.13  84.56  87.73  84.99  91.37  85.23  99.97
GR 85.44 110.07  85.35 122.12  85.26 129.40  85.45 131.35  85.31 136.91
GR 85.43 142.70  85.43 153.16  85.64 164.43  85.15 199.69  85.04 215.60
GR 84.23 228.14  83.78 230.61  84.63 231.93  84.87 235.36  84.68 240.91
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GR 85.03  258.67   85.45  260.65   85.59  262.88   85.93  266.95   86.00  273.23
GR 86.26  288.42   86.41  305.70   86.70  320.67   87.24  370.98   87.09  378.24
X1 1664.      75  689.49  706.20   76.00   76.00   76.00
GR 88.78     .00   88.77    3.97   88.05    6.60   88.38   10.44   88.58   19.62
GR 88.83   29.07   88.90   47.26   88.94   64.66   88.73   78.85   88.29   96.97
GR 87.93  148.65   88.02  166.47   88.15  184.95   87.89  203.64   87.67  221.21
GR 87.74  242.24   87.19  288.22   87.46  302.99   87.50  319.10   87.32  334.53
GR 86.69  369.09   86.92  369.94   87.18  376.21   87.20  390.32   87.31  398.44
GR 87.33  407.00   87.22  416.30   86.96  423.08   86.80  429.34   86.99  444.96
GR 86.92  462.84   87.06  477.32   86.81  490.48   86.49  504.51   86.38  513.25
GR 86.60  516.90   85.84  523.40   85.99  532.46   85.76  539.50   86.07  545.60
GR 86.05  558.50   86.06  575.75   86.33  588.95   86.30  606.04   86.51  624.35
GR 86.60  635.90   86.33  640.93   86.44  648.92   85.75  662.55   85.20  674.35
GR 85.08  689.49   84.50  701.50   84.11  704.06   85.00  706.20   85.19  710.84
GR 84.93  712.57   85.18  713.49   85.04  723.14   85.20  730.51   85.52  734.04
GR 85.65  747.88   86.06  758.70   86.48  766.21   86.21  782.70   87.12  789.08
GR 87.43  797.14   87.07  803.74   86.97  810.71   87.28  815.28   87.34  823.85
GR 87.25  827.26   87.36  835.88   87.47  845.29   87.25  855.00   87.37  867.77
NC   .070   .070    .030    .30    .50
X11769.1    26.0   670.    677.    80.0    80.0    80.0
GR  90.1     0.0    90.0     3.0    89.5    10.0    89.5    38.0    89.0   138.0
GR  88.5   216.0    88.0   278.0    88.0   370.0    87.5   439.0    87.5   464.0
GR  87.0   498.0    86.5   540.0    86.5   613.0    86.0   634.0    85.5   647.0
GR  85.0   670.0    84.4   671.0    84.4   676.0    85.0   677.0    86.0   697.0
GR  86.0   736.0    86.5   794.0    87.0   861.0    87.5   876.0    87.8   880.0
GR  87.8   882.0
X11769.2    28.0   671.0  675.30    15.5    15.5    15.5
GR  90.1     0.0    90.0     3.0    89.5    10.0    89.5    38.0    89.0   138.0
GR  88.5   216.0    88.0   278.0    88.0   370.0    87.5   439.0    87.5   464.0
GR  87.0   498.0    86.5   540.0    86.5   613.0    86.0   634.0    85.5   647.0
GR  85.0   669.0   84.61   671.0   84.61  672.05   84.44  674.05   84.44  675.3
GR  85.0   677.0    86.0   697.0    86.0   736.0    86.5   794.0    87.0   861.0
GR  87.5   876.0    87.8   880.0    87.8   882.0
NC              .024
X11769.3    28.0   671.0  675.3     0.5     0.5     0.5
BT -31.0     0.0    90.1    90.1     3.0    90.1    90.0    10.0   90.05    89.5
BT           38.0    90.0    89.5   138.0    89.5    89.0   216.0    89.1    88.5
BT          278.0    89.0    88.0   370.0    88.5    88.0   439.0    88.0    87.5
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BT           464.0    87.8    87.5   498.0    87.5    87.0   540.0    87.3    86.5
BT           613.0    86.9    86.5   634.0    86.8    86.0   647.0    86.7    85.5
BT           669.0   86.61    85.0   671.0   86.61   84.86   671.0   86.61   85.91
BT          672.05   86.61   85.91  672.05   86.61   84.86  674.05   86.61   84.94
BT          674.05   86.61   86.19  675.30   86.61   86.19  675.30   86.61   84.94
BT           677.0    86.6    85.0   697.0    86.5    86.0   736.0    86.4    86.0
BT           794.0    86.6    86.5   861.0    87.4    87.0   876.0    87.8    87.5
BT           880.0    87.8    87.8
GR  90.1     0.0    90.0     3.0    89.5    10.0    89.5    38.0    89.0   138.0
GR  88.5   216.0    88.0   278.0    88.0   370.0    87.5   439.0    87.5   464.0
GR  87.0   498.0    86.5   540.0    86.5   613.0    86.0   634.0    85.5   647.0
GR  85.0   669.0   84.86   671.0   84.86  672.05   84.94  674.05   84.94  675.30
GR  85.0   677.0    86.0   697.0    86.0   736.0    86.5   794.0    87.0   861.0
GR  87.5   876.0    87.8   880.0    87.8   882.0
X11769.4       0       0       0    18.9    18.9    18.9
X2                                              1.0
NC              .030
X11769.5       0       0       0     0.5     0.5     0.5
X3  10.0                                                 86.61   86.60
QT     6.    5.15    4.11    2.90    2.15    1.52    0.79
X1 1826.      50  279.83  285.07     58.     58.     58.
GR 89.06     .00   89.33    9.84   88.73   19.95   88.21   41.39   88.05   57.41
GR 87.89   69.31   87.49   74.70   87.67   84.89   87.55   85.83   86.76   86.75
GR 87.30   87.36   87.58   91.31   87.40  103.73   87.56  119.59   87.61  132.64
GR 87.36  142.54   87.49  152.38   87.33  167.18   87.20  175.59   87.08  184.00
GR 86.86  196.79   86.47  198.51   86.92  200.39   87.04  207.62   86.92  220.63
GR 86.67  221.00   86.53  228.63   86.71  242.49   86.51  264.29   86.55  275.97
GR 86.54  279.83   85.71  281.08   85.70  282.23   87.16  285.07   87.47  286.07
GR 87.94  305.77   87.29  312.57   87.05  316.69   87.27  331.80   87.32  357.69
GR 87.25  367.37   87.06  379.35   87.14  391.70   86.87  401.41   86.80  414.77
GR 86.89  428.11   86.98  438.56   87.27  452.72   87.25  467.06   87.28  475.86
NC   .07    .07     .03      .1      .3
X1 1929.      65  670.58  719.53  103.00  103.00  103.00
GR 90.47     .00   90.37    3.68   89.72    5.98   90.22    8.20   90.11   12.34
GR 90.16   27.94   90.01   48.17   90.05   65.07   90.02   81.47   89.80   95.13
GR 89.78  111.23   90.17  120.62   90.33  127.48   90.22  136.37   89.97  154.74
GR 89.65  177.77   89.47  204.92   89.48  234.55   89.28  251.70   89.20  271.77
GR 89.52  285.81   89.47  301.24   89.39  321.21   89.44  332.77   89.61  384.46
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GR 89.44  421.28   89.30  434.50   89.14  436.09   89.39  437.18   89.26  443.75
GR 88.90  466.46   88.65  483.21   88.51  508.88   88.51  519.66   88.03  540.43
GR 87.64  594.18   87.35  618.12   87.24  633.70   87.22  640.54   86.97  652.40
GR 87.54  662.40   87.54  670.58   86.21  672.88   86.18  675.56   86.97  678.21
GR 86.98  681.79   87.01  695.92   86.92  709.52   88.23  719.53   88.51  729.06
GR 88.54  738.94   88.48  750.28   88.35  768.91   88.06  784.87   88.04  793.96
GR 88.14  804.48   88.41  813.61   88.78  826.84   88.92  838.13   88.94  847.16
GR 89.09  857.91   88.85  863.33   88.05  870.86   88.40  871.74   88.50  874.22
X1 2039.      43  174.34  216.21  110.00  110.00  110.00
GR 90.83     .00   91.01    8.93   90.57   25.36   90.31   36.77   90.06   46.09
GR 90.21   49.47   89.87   52.53   89.55   53.79   89.69   55.17   89.69   63.95
GR 89.46   74.74   89.34   88.15   89.26   99.71   89.24  110.43   89.26  120.71
GR 89.35  126.05   89.18  133.49   88.69  143.01   88.62  150.56   88.68  154.60
GR 88.47  160.65   88.63  164.23   88.34  168.04   87.93  174.34   87.60  177.30
GR 87.47  180.49   87.65  181.51   87.75  183.51   87.81  187.32   87.73  189.32
GR 87.78  194.12   87.77  208.77   89.09  216.21   88.95  223.10   88.92  236.57
GR 89.53  263.33   89.63  279.61   89.70  299.26   89.73  316.59   89.56  321.28
GR 89.09  322.73   89.43  323.69   89.68  326.90
X12288.9    15.0  149.0   150.8  149.00  149.00  149.00
GR 91.57     0.0   91.67    30.0   91.45    60.0   91.47    90.0   91.35   120.0
GR 89.55   149.0   89.33   150.0   89.33   150.8   89.90   151.1   90.23   180.0
GR 91.43   210.0   92.10   240.0   92.39   270.0   92.44   286.8   93.01   293.7
X1 2384.      16.   166.    173.     61.     61.     61.
GR  92.0       0   91.5      53    91.5     131    91.0     150    90.5     156
GR  90.5     166   90.0     169    90.0     172    90.5     173    91.0     174
GR  91.5     176   92.0     196    92.5     228    93.0     242    93.5     255
GR  94.0     300
X1 2428.      50  329.78  366.47  105.00  105.00  105.00
GR 92.27     .00   92.40    9.66   92.37   19.45   92.69   23.44   92.40   26.57
GR 92.56   30.62   92.56   42.21   92.42   59.85   92.43   68.09   92.66   79.84
GR 92.67   89.48   92.62  103.94   92.55  116.76   92.58  145.88   92.78  158.73
GR 92.89  172.33   92.46  190.38   92.62  192.11   92.64  197.65   92.46  212.50
GR 92.22  224.46   92.55  231.53   92.61  240.03   92.09  254.45   92.37  264.47
GR 92.69  275.33   92.56  287.04   92.64  295.23   92.71  305.51   92.37  317.17
GR 91.65  329.78   90.87  338.43   90.54  343.29   90.77  347.61   90.55  355.62
GR 90.57  357.51   90.93  359.97   91.25  366.47   91.65  371.04   92.39  381.14
GR 93.46  393.32   94.40  410.75   94.84  421.46   95.13  435.38   95.27  446.50
GR 95.04  455.69   94.82  464.89   94.26  466.40   94.56  468.14   94.56  472.61
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X1 2513.      46  351.16  368.17   85.00   85.00   85.00
GR 93.43     .00   93.43    3.42   93.26   13.99   93.13   27.65   92.91   39.36
GR 93.34   52.35   93.35   69.79   93.45   84.58   93.70   97.03   93.94  111.20
GR 94.15  125.99   94.08  137.59   94.06  152.78   94.05  166.46   94.07  180.25
GR 93.87  191.25   93.80  204.18   93.75  218.68   93.45  235.96   93.40  252.67
GR 93.05  267.60   92.75  283.60   92.61  308.17   92.51  319.42   92.13  327.13
GR 91.16  330.87   91.04  339.65   91.36  347.41   91.13  351.16   90.61  352.09
GR 90.60  353.16   90.76  353.40   91.09  359.57   91.76  368.17   92.09  376.31
GR 92.82  379.33   92.40  382.48   92.72  386.67   92.96  398.05   93.43  409.66
GR 94.08  419.50   94.40  429.87   94.28  441.20   94.56  452.89   94.87  455.44
GR 94.88  458.91
X1 2578.      15.     25.     38.     52.     52.     52.
GR  93.5       0   93.0      18    92.5      21    92.0      25    91.5      34
GR  91.0      36   91.5      37    92.0      38    93.0      42    93.5      51
GR  94.0      81   94.1      84    94.1     120    94.5     126    94.5     150
X1 2638.      29  164.75  171.00  105.00  105.00  105.00
GR 94.94     .00   94.86    6.25   94.62   10.22   94.83   16.38   94.97   24.99
GR 94.69   30.50   94.24   47.59   94.43   59.80   94.54   67.42   94.63   74.34
GR 94.41   81.66   94.12   89.41   94.08  101.49   93.81  117.21   93.11  152.29
GR 92.18  157.72   91.85  164.75   91.32  166.56   91.32  167.37   91.55  168.63
GR 92.15  171.00   93.21  174.36   93.68  187.13   94.00  189.45   93.65  195.13
GR 93.76  202.23   94.07  220.79   94.26  240.38   94.52  262.00     .00     .00
X1 2767.      30  216.76  225.83  129.00  129.00  129.00
GR 95.53     .00   95.48   18.66   94.89   36.26   94.82   52.99   94.70   71.19
GR 94.31   93.77   94.48  113.00   94.38  131.17   94.27  146.22   94.04  158.89
GR 94.22  166.28   94.03  174.83   93.33  187.65   93.14  196.29   93.25  206.38
GR 93.50  216.76   93.23  222.25   92.88  225.83   93.08  227.15   93.21  229.60
GR 93.70  235.74   94.18  252.38   94.38  266.77   95.12  303.37   95.26  312.05
GR 95.30  320.76   95.39  322.71   94.94  323.95   95.26  325.08   95.26  326.85
EJ
T1 CITY OF STONEY CREEK FLOODPLAIN MAPPING STUDY
T2 BY PHILIPS PLANNING & ENGINEERING LIMITED - PROJECT NO. 86090
T3       Watercourse 6  50 YR STORM
J1   0.0     3.0     0.0     0.0    -1.0     1.0     0.0     0.0    79.0
J2   2.0     0.0    -1.0
T1 CITY OF STONEY CREEK FLOODPLAIN MAPPING STUDY
T2 BY PHILIPS PLANNING & ENGINEERING LIMITED - PROJECT NO. 86090
T3       Watercourse 6  20 YR STORM
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J1   0.0     4.0     0.0     0.0    -1.0     1.0     0.0     0.0    79.0
J2   3.0     0.0    -1.0
T1 CITY OF STONEY CREEK FLOODPLAIN MAPPING STUDY
T2 BY PHILIPS PLANNING & ENGINEERING LIMITED - PROJECT NO. 86090
T3       Watercourse 6  10 YR STORM
J1   0.0     5.0     0.0     0.0    -1.0     1.0     0.0     0.0    79.0
J2   4.0     0.0    -1.0
T1 CITY OF STONEY CREEK FLOODPLAIN MAPPING STUDY
T2 BY PHILIPS PLANNING & ENGINEERING LIMITED - PROJECT NO. 86090
T3       Watercourse 6  5 YR STORM
J1   0.0     6.0     0.0     0.0    -1.0     1.0     0.0     0.0    79.0
J2   5.0     0.0    -1.0
T1 CITY OF STONEY CREEK FLOODPLAIN MAPPING STUDY
T2 BY PHILIPS PLANNING & ENGINEERING LIMITED - PROJECT NO. 86090
T3       Watercourse 6  2 YR STORM
J1   0.0     7.0     0.0     0.0    -1.0     1.0     0.0     0.0    79.0
J2  15.0     0.0    -1.0


ER
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**************************************
*            S U M P O               *
*     Interactive SUmmary PrintOut   *
*         for the IBM PC/XT/AT       *
*          January 1987 version      *
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Input Filename: WC6N.HEC
Output Filename: WC6N.SUM

Watercourse 6

	SECNO	Q	QCH	VCH	CWSEL	DEPTH	DIFWSX	EG	TOPWID	K*CHSL	QLOB
*	181.20	13.42	2.70	3.02	79.01	1.00	0.00	79.10	150.00	0.00	4.
*	181.20	11.71	2.22	2.43	79.02	1.01	0.00	79.08	150.00	0.00	3.
*	181.20	9.50	1.87	2.08	79.01	1.00	0.00	79.06	150.00	0.00	3.
*	181.20	7.90	1.62	1.81	79.00	0.99	0.00	79.04	150.00	0.00	2.
*	181.20	6.28	1.22	1.34	79.02	1.01	0.00	79.04	150.00	0.00	2.
*	181.20	4.12	1.34	1.56	78.97	0.96	0.00	79.01	80.00	0.00	0.
*	181.30	13.42	2.12	2.10	79.32	1.31	0.32	79.37	150.00	0.00	4.
*	181.30	11.71	2.07	2.08	79.30	1.29	0.28	79.35	150.00	0.00	3.
*	181.30	9.50	2.12	2.14	79.28	1.27	0.27	79.34	150.00	0.00	2.
*	181.30	7.90	1.96	1.98	79.27	1.26	0.27	79.32	150.00	0.00	1.
*	181.30	6.28	1.99	2.01	79.23	1.22	0.21	79.30	150.00	0.00	1.
*	181.30	4.12	1.77	1.78	79.18	1.17	0.21	79.25	150.00	0.00	0.
	181.40	13.42	0.69	0.60	79.39	1.28	0.06	79.39	150.00	4.00	5.
	181.40	11.71	0.62	0.54	79.37	1.26	0.07	79.37	150.00	4.00	4.
	181.40	9.50	0.51	0.45	79.36	1.25	0.08	79.36	150.00	4.00	3.
	181.40	7.90	0.44	0.39	79.34	1.23	0.07	79.34	150.00	4.00	3.
	181.40	6.28	0.35	0.32	79.32	1.21	0.09	79.32	150.00	4.00	2.
	181.40	4.12	0.26	0.25	79.27	1.16	0.09	79.27	150.00	4.00	1.
	420.90	13.42	2.05	1.02	79.67	0.73	0.28	79.68	250.38	4.28	1.
	420.90	11.71	1.94	1.01	79.65	0.71	0.28	79.66	245.18	4.28	0.
	420.90	9.50	1.74	0.95	79.62	0.68	0.25	79.63	235.83	4.28	0.
	420.90	7.90	1.62	0.94	79.59	0.65	0.25	79.60	202.00	4.28	0.
	420.90	6.28	1.45	0.90	79.56	0.62	0.24	79.57	190.24	4.28	0.
	420.90	4.12	1.19	0.85	79.51	0.57	0.23	79.52	102.12	4.28	0.

*	566.10	13.42	3.93	1.51	80.09	0.81	0.42	80.13	446.04	2.88	5.
*	566.10	11.71	4.03	1.58	80.07	0.79	0.43	80.12	440.07	2.88	4.
*	566.10	9.50	3.42	1.35	80.07	0.79	0.45	80.10	438.43	2.88	3.
	566.10	7.90	4.81	2.04	80.01	0.73	0.42	80.15	418.77	2.88	2.
	566.10	6.28	4.14	1.89	79.96	0.68	0.40	80.09	16.12	2.88	2.
	566.10	4.12	2.90	1.52	79.87	0.59	0.37	79.96	14.29	2.88	1.
*	566.20	13.42	2.01	0.61	80.30	1.02	0.21	80.30	270.00	0.00	0.
*	566.20	11.71	1.61	0.48	80.33	1.05	0.25	80.33	270.00	0.00	0.
*	566.20	9.50	1.40	0.42	80.31	1.03	0.24	80.31	270.00	0.00	0.
*	566.20	7.90	7.90	2.88	80.13	0.85	0.12	80.55	3.25	0.00	0.
	566.20	6.28	6.28	2.50	80.05	0.77	0.09	80.37	3.25	0.00	0.
	566.20	4.12	4.12	1.87	79.96	0.68	0.09	80.14	3.25	0.00	0.
*	566.30	13.42	6.60	1.93	80.69	1.48	0.39	80.78	638.83	-140.00	0.
*	566.30	11.71	6.79	1.98	80.64	1.43	0.32	80.76	626.44	-140.00	0.
*	566.30	9.50	9.50	3.14	80.20	0.99	-0.11	80.70	479.50	-140.00	0.
	566.30	7.90	7.90	2.32	80.33	1.12	0.20	80.60	527.09	-140.00	0.
	566.30	6.28	6.28	2.20	80.15	0.94	0.10	80.39	459.79	-140.00	0.
	566.30	4.12	4.12	1.69	80.01	0.80	0.05	80.15	411.44	-140.00	0.
	566.40	13.42	3.19	0.93	80.86	1.65	0.17	80.87	686.41	0.00	0.
	566.40	11.71	3.01	0.88	80.84	1.63	0.20	80.85	682.24	0.00	0.
	566.40	9.50	2.07	0.60	80.87	1.66	0.67	80.88	691.00	0.00	0.
	566.40	7.90	3.52	1.03	80.72	1.51	0.39	80.74	645.93	0.00	0.
	566.40	6.28	6.13	1.79	80.39	1.18	0.25	80.55	551.47	0.00	0.
	566.40	4.12	4.12	1.47	80.12	0.91	0.12	80.23	453.36	0.00	0.
	566.50	13.42	0.45	0.09	80.88	1.67	0.02	80.88	692.01	0.00	6.
	566.50	11.71	0.40	0.08	80.86	1.65	0.02	80.86	686.73	0.00	5.
	566.50	9.50	0.32	0.06	80.88	1.67	0.01	80.88	696.01	0.00	4.
	566.50	7.90	0.57	0.12	80.75	1.54	0.03	80.75	269.90	0.00	0.
	566.50	6.28	0.54	0.13	80.60	1.39	0.21	80.60	269.90	0.00	0.
	566.50	4.12	4.12	1.46	80.13	0.92	0.01	80.24	3.06	0.00	0.
	610.20	13.42	0.28	0.04	80.88	1.86	0.00	80.88	914.00	-38.00	9.
	610.20	11.71	0.25	0.04	80.86	1.84	0.00	80.86	914.00	-38.00	7.

	610.20	9.50	0.20	0.03	80.88	1.86	0.00	80.88	914.00	-38.00	6.
	610.20	7.90	0.18	0.03	80.75	1.73	0.00	80.75	914.00	-38.00	5.
	610.20	6.28	0.17	0.03	80.60	1.58	0.00	80.60	914.00	-38.00	4.
	610.20	4.12	0.20	0.04	80.27	1.25	0.14	80.27	913.37	-38.00	2.
	610.30	13.42	0.33	0.11	80.88	1.57	0.00	80.88	914.00	580.00	9.
	610.30	11.71	0.31	0.10	80.86	1.55	0.00	80.86	914.00	580.00	8.
	610.30	9.50	0.23	0.07	80.88	1.57	0.00	80.88	914.00	580.00	6.
	610.30	7.90	0.36	0.12	80.75	1.44	0.00	80.75	914.00	580.00	5.
	610.30	6.28	0.90	0.29	80.60	1.29	0.00	80.60	914.00	580.00	3.
*	610.30	4.12	3.52	1.15	80.41	1.10	0.14	80.47	913.75	580.00	0.
	610.40	13.42	0.33	0.11	80.88	1.57	0.00	80.88	914.00	0.00	9.
	610.40	11.71	0.31	0.10	80.86	1.55	0.00	80.86	914.00	0.00	8.
	610.40	9.50	0.23	0.07	80.88	1.57	0.00	80.88	914.00	0.00	6.
	610.40	7.90	0.36	0.12	80.75	1.44	0.00	80.75	914.00	0.00	5.
	610.40	6.28	0.86	0.28	80.61	1.30	0.01	80.61	914.00	0.00	3.
	610.40	4.12	1.32	0.43	80.52	1.21	0.11	80.52	913.94	0.00	1.
	610.50	13.42	0.10	0.05	80.88	1.57	0.00	80.88	914.00	0.00	9.
	610.50	11.71	0.09	0.04	80.86	1.55	0.00	80.86	914.00	0.00	8.
	610.50	9.50	0.07	0.03	80.88	1.57	0.00	80.88	914.00	0.00	6.
	610.50	7.90	0.06	0.03	80.75	1.44	0.00	80.75	914.00	0.00	5.
	610.50	6.28	0.04	0.04	80.61	1.30	0.00	80.61	914.00	0.00	4.
	610.50	4.12	0.03	0.03	80.53	1.22	0.00	80.53	913.95	0.00	3.
	610.60	12.63	0.22	0.04	80.88	1.57	0.00	80.88	914.00	0.00	8.
	610.60	11.08	0.20	0.03	80.86	1.55	0.00	80.86	914.00	0.00	7.
	610.60	9.07	0.16	0.03	80.88	1.57	0.00	80.88	914.00	0.00	6.
	610.60	7.63	0.14	0.03	80.75	1.44	0.00	80.75	914.00	0.00	5.
	610.60	6.26	0.13	0.03	80.61	1.30	0.00	80.61	914.00	0.00	4.
	610.60	4.38	0.10	0.02	80.53	1.22	0.00	80.53	913.96	0.00	2.
	722.20	12.63	7.52	1.10	80.87	1.47	0.00	80.91	161.00	2.25	5.
	722.20	11.08	6.97	1.04	80.85	1.45	0.00	80.89	161.00	2.25	4.
	722.20	9.07	5.33	0.78	80.88	1.48	0.00	80.90	161.00	2.25	3.
	722.20	7.63	6.42	1.04	80.74	1.34	-0.01	80.79	161.00	2.25	1.
	722.20	6.26	6.01	1.10	80.60	1.20	-0.01	80.66	19.81	2.25	0.

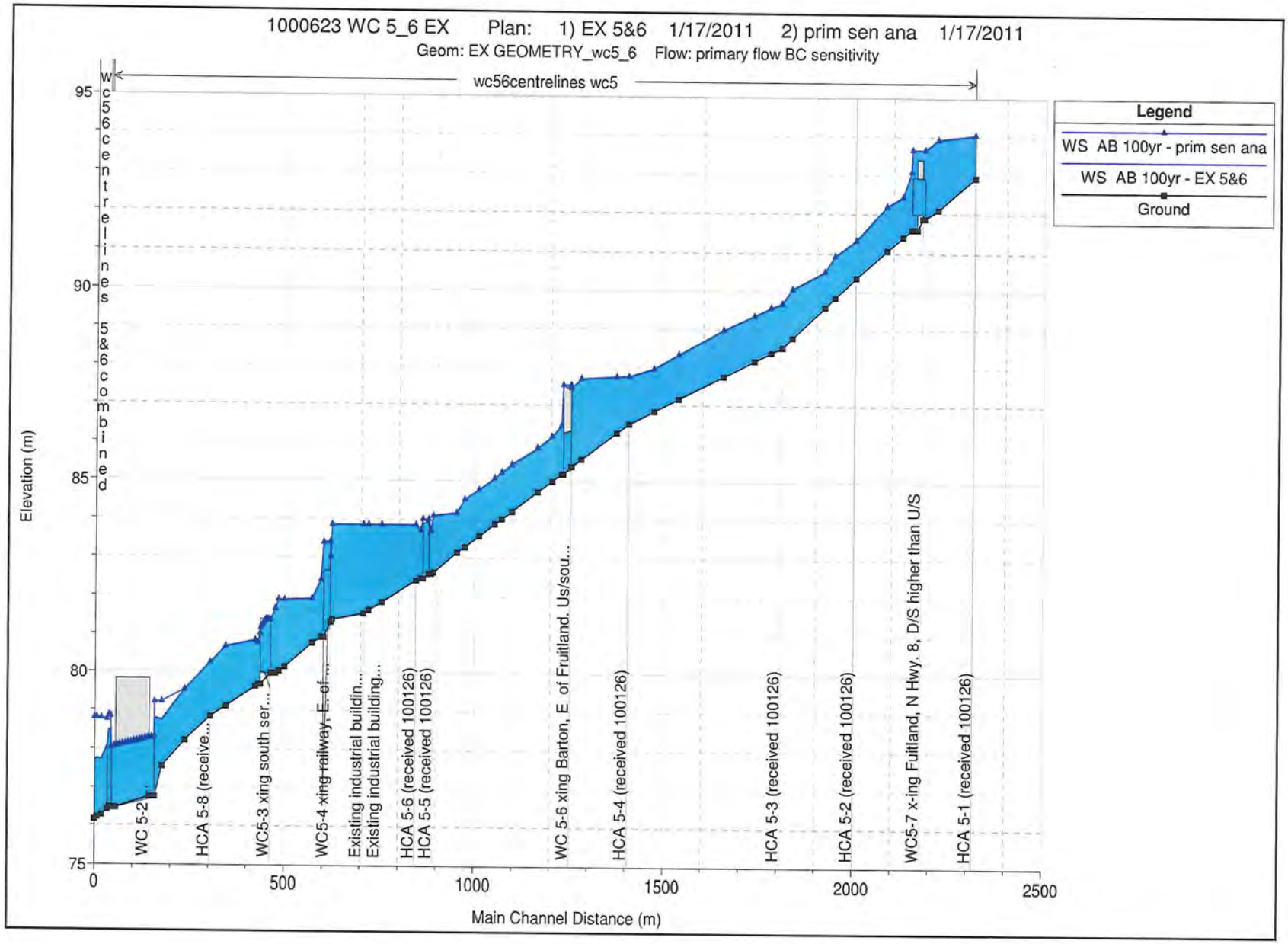
	722.20	4.38	4.28	0.85	80.52	1.12	0.00	80.56	9.98	2.25	0.
*	722.30	12.63	7.44	1.79	81.08	1.49	0.20	81.17	106.67	379.99	5.
*	722.30	11.08	11.08	3.30	80.69	1.10	-0.17	81.24	5.81	379.99	0.
	722.30	9.07	9.07	2.66	80.71	1.12	-0.17	81.07	5.82	379.99	0.
	722.30	7.63	7.63	2.41	80.62	1.03	-0.12	80.92	5.73	379.99	0.
	722.30	6.26	6.26	2.22	80.51	0.92	-0.09	80.76	5.60	379.99	0.
	722.30	4.38	4.38	1.62	80.47	0.88	-0.05	80.61	5.55	379.99	0.
	722.40	12.63	4.00	0.96	81.23	1.64	0.15	81.24	151.90	0.00	8.
	722.40	11.08	1.75	0.42	81.42	1.83	0.73	81.42	209.07	0.00	9.
	722.40	9.07	3.24	0.78	81.20	1.61	0.49	81.21	142.22	0.00	5.
	722.40	7.63	7.59	1.97	80.84	1.25	0.22	81.04	27.26	0.00	0.
	722.40	6.26	6.26	1.83	80.70	1.11	0.19	80.87	5.83	0.00	0.
	722.40	4.38	4.38	1.47	80.56	0.97	0.09	80.67	5.66	0.00	0.
	722.50	12.63	5.68	1.13	81.22	1.63	-0.01	81.25	150.71	0.00	6.
	722.50	11.08	3.27	0.59	81.41	1.82	0.00	81.42	208.51	0.00	7.
	722.50	9.07	4.36	0.88	81.19	1.60	0.00	81.21	141.82	0.00	4.
	722.50	7.63	5.56	1.27	81.02	1.43	0.18	81.08	94.92	0.00	2.
	722.50	6.26	5.53	1.50	80.79	1.20	0.09	80.89	4.94	0.00	0.
	722.50	4.38	3.91	1.25	80.61	1.02	0.05	80.68	4.74	0.00	0.
	810.00	12.63	0.42	0.09	81.26	1.75	0.04	81.26	566.40	-1.05	3.
	810.00	11.08	0.35	0.06	81.42	1.91	0.01	81.42	650.73	-1.05	3.
	810.00	9.07	0.31	0.07	81.22	1.71	0.03	81.22	498.33	-1.05	2.
	810.00	7.63	0.26	0.07	81.10	1.59	0.08	81.10	399.34	-1.05	1.
	810.00	6.26	0.21	0.07	80.92	1.41	0.14	80.92	276.14	-1.05	1.
	810.00	4.38	0.13	0.07	80.71	1.20	0.10	80.71	158.18	-1.05	0.
	895.00	12.63	0.84	0.48	81.29	0.82	0.03	81.29	273.19	11.29	4.
	895.00	11.08	0.58	0.24	81.43	0.96	0.01	81.43	305.47	11.29	3.
	895.00	9.07	0.68	0.43	81.25	0.78	0.03	81.25	263.16	11.29	3.
	895.00	7.63	0.77	0.60	81.16	0.69	0.06	81.16	235.88	11.29	2.
*	895.00	6.26	1.34	1.75	81.01	0.54	0.08	81.05	89.73	11.29	2.
	895.00	4.38	0.91	1.17	81.02	0.55	0.31	81.04	91.96	11.29	1.
	965.00	12.63	1.07	1.46	81.57	0.38	0.28	81.61	97.08	10.29	6.

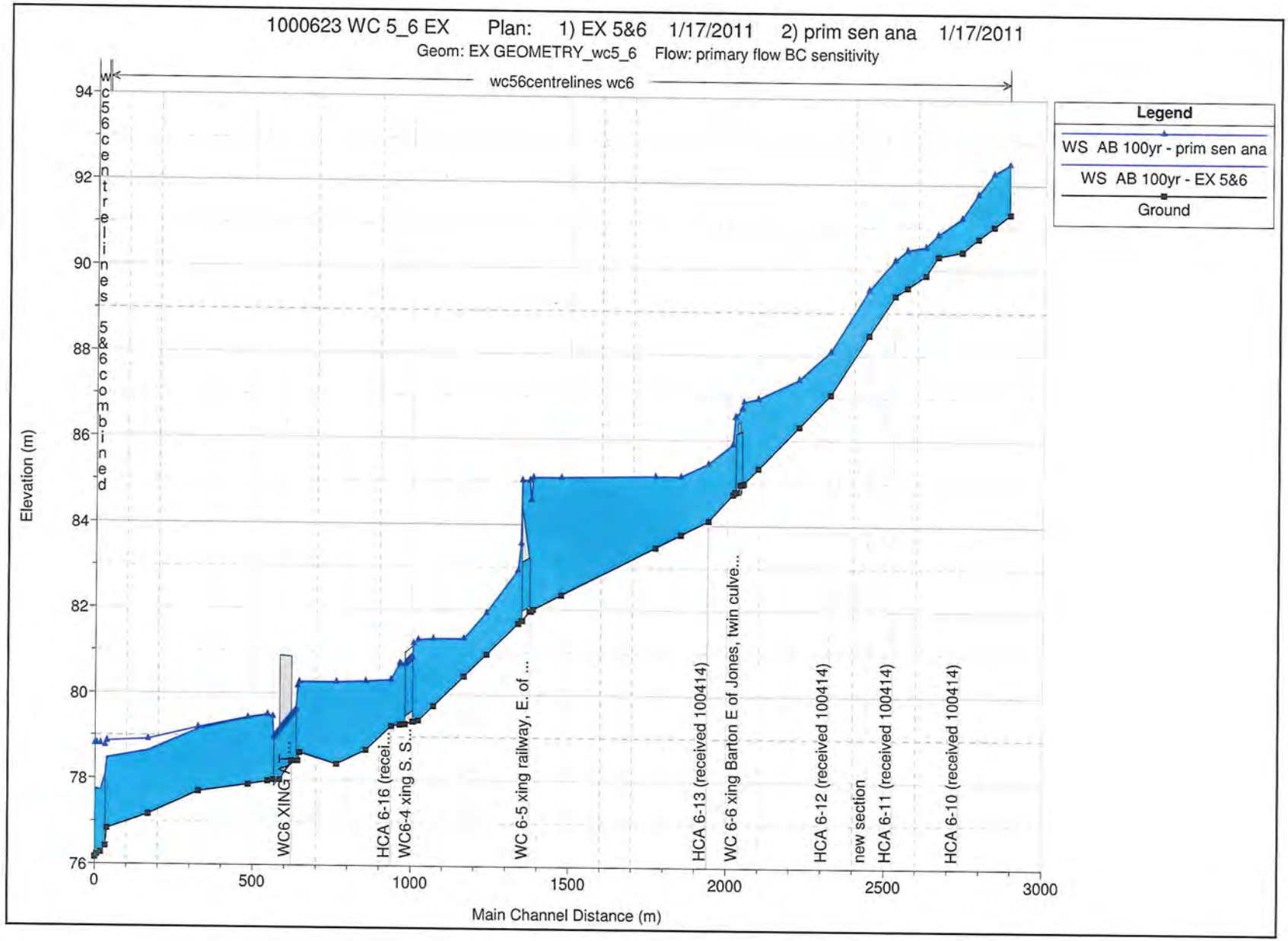
	965.00	11.08	0.95	1.53	81.54	0.35	0.11	81.59	93.03	10.29	5.
	965.00	9.07	0.78	1.43	81.53	0.34	0.29	81.57	90.56	10.29	4.
*	965.00	7.63	0.70	1.75	81.49	0.30	0.33	81.54	84.70	10.29	3.
	965.00	6.26	0.53	0.65	81.57	0.38	0.56	81.58	99.95	10.29	3.
	965.00	4.38	0.38	0.67	81.53	0.34	0.51	81.54	91.02	10.29	2.
	1084.90	12.63	3.22	1.21	82.34	0.78	0.78	82.37	94.57	3.36	0.
	1084.90	11.08	2.90	1.16	82.32	0.76	0.78	82.34	79.31	3.36	0.
	1084.90	9.07	2.48	1.10	82.28	0.72	0.74	82.30	70.84	3.36	0.
	1084.90	7.63	2.15	1.02	82.24	0.68	0.76	82.26	66.58	3.36	0.
	1084.90	6.26	1.97	1.21	82.15	0.59	0.58	82.18	59.83	3.36	0.
	1084.90	4.38	1.45	1.00	82.11	0.55	0.58	82.13	57.26	3.36	0.
*	1107.20	12.63	12.63	2.94	82.94	1.15	0.60	83.38	5.00	23.00	0.
*	1107.20	11.08	11.08	2.81	82.87	1.08	0.55	83.27	5.00	23.00	0.
*	1107.20	9.07	9.07	2.62	82.77	0.98	0.50	83.12	5.00	23.00	0.
*	1107.20	7.63	7.63	2.48	82.70	0.91	0.45	83.01	5.00	23.00	0.
*	1107.20	6.26	6.26	2.31	82.62	0.83	0.47	82.89	5.00	23.00	0.
*	1107.20	4.38	4.38	2.07	82.50	0.71	0.39	82.72	5.00	23.00	0.
*	1107.30	12.63	3.40	2.90	84.69	2.64	1.75	84.83	342.25	520.00	0.
*	1107.30	11.08	3.21	2.75	84.67	2.62	1.80	84.80	342.11	520.00	0.
*	1107.30	9.07	3.23	2.76	84.60	2.55	1.82	84.75	341.75	520.00	0.
*	1107.30	7.63	3.02	2.58	84.56	2.51	1.86	84.71	341.57	520.00	0.
*	1107.30	6.26	2.67	2.28	84.53	2.48	1.91	84.65	341.45	520.00	0.
*	1107.30	4.38	4.38	3.87	83.31	1.26	0.80	84.07	137.18	520.00	0.
	1107.40	12.63	0.95	0.80	84.96	2.91	0.27	84.97	349.72	0.00	4.
	1107.40	11.08	1.13	0.96	84.93	2.88	0.26	84.94	349.57	0.00	3.
	1107.40	9.07	1.16	1.00	84.89	2.84	0.30	84.90	343.39	0.00	1.
	1107.40	7.63	1.27	1.09	84.86	2.81	0.30	84.87	343.08	0.00	0.
	1107.40	6.26	1.28	1.09	84.79	2.74	0.26	84.81	342.75	0.00	0.
	1107.40	4.38	2.04	1.75	84.50	2.45	1.20	84.58	341.29	0.00	0.
	1107.50	12.23	0.29	0.11	84.97	2.92	0.01	84.97	349.70	0.00	9.
	1107.50	10.61	0.25	0.10	84.94	2.89	0.01	84.94	349.57	0.00	7.
	1107.50	8.57	0.28	0.11	84.91	2.86	0.01	84.91	267.41	0.00	8.
	1107.50	7.08	0.23	0.09	84.88	2.83	0.02	84.88	267.29	0.00	6.

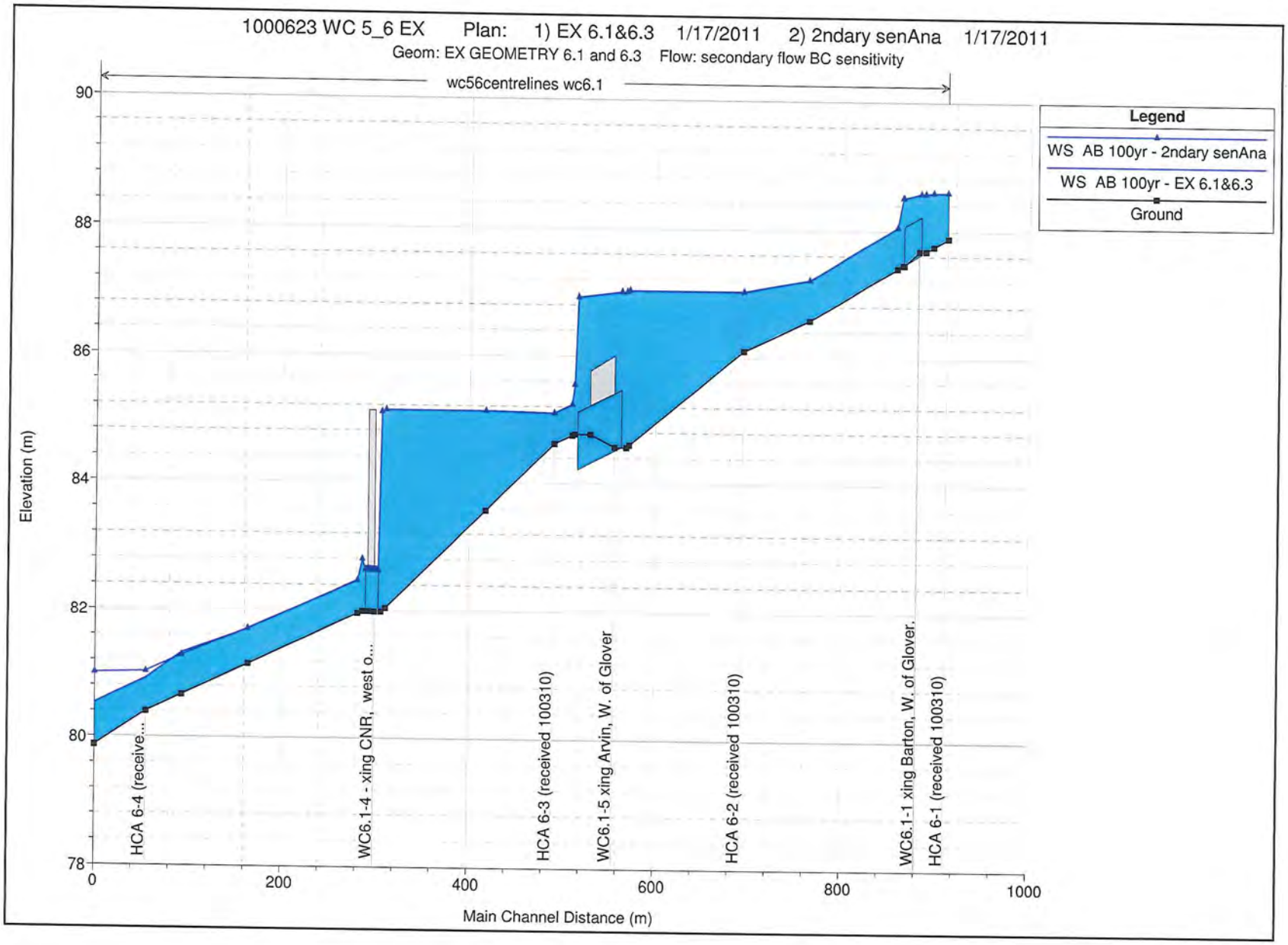
	1107.50	5.63	5.63	2.40	84.65	2.60	-0.14	84.95	0.90	0.00	0.
	1107.50	3.74	3.74	1.72	84.47	2.42	-0.04	84.62	0.90	0.00	0.
	1212.00	12.23	0.70	0.07	84.97	2.67	0.00	84.97	727.17	2.72	8.
	1212.00	10.61	0.61	0.06	84.94	2.64	0.00	84.94	722.29	2.72	7.
	1212.00	8.57	0.51	0.05	84.91	2.61	0.00	84.91	715.02	2.72	5.
	1212.00	7.08	0.43	0.04	84.88	2.58	0.00	84.88	701.77	2.72	4.
	1212.00	5.63	0.31	0.03	85.04	2.74	0.38	85.04	739.93	2.72	3.
	1212.00	3.74	0.27	0.03	84.66	2.36	0.20	84.66	680.64	2.72	2.
	1506.90	12.23	5.71	1.18	85.11	1.67	0.14	85.15	123.14	3.88	2.
	1506.90	10.61	5.26	1.13	85.08	1.64	0.14	85.11	108.09	3.88	1.
	1506.90	8.57	4.57	1.03	85.03	1.59	0.12	85.06	79.17	3.88	0.
	1506.90	7.08	4.00	0.94	84.98	1.54	0.11	85.01	54.21	3.88	0.
	1506.90	5.63	2.83	0.61	85.08	1.64	0.04	85.09	102.82	3.88	0.
	1506.90	3.74	2.78	0.82	84.77	1.33	0.11	84.80	41.18	3.88	0.
	1588.00	12.23	8.14	0.72	85.20	1.42	0.09	85.22	157.97	4.72	2.
	1588.00	10.61	7.44	0.69	85.16	1.38	0.09	85.18	150.79	4.72	1.
	1588.00	8.57	6.49	0.66	85.11	1.33	0.08	85.12	128.72	4.72	0.
	1588.00	7.08	5.72	0.63	85.06	1.28	0.07	85.07	107.13	4.72	0.
	1588.00	5.63	4.32	0.45	85.11	1.33	0.03	85.11	124.66	4.72	0.
	1588.00	3.74	3.55	0.60	84.85	1.07	0.08	84.87	34.40	4.72	0.
	1664.00	12.23	11.06	1.11	85.29	1.18	0.09	85.34	58.89	4.34	0.
	1664.00	10.61	9.84	1.05	85.25	1.14	0.09	85.30	57.68	4.34	0.
	1664.00	8.57	8.25	0.98	85.20	1.09	0.09	85.25	54.68	4.34	0.
	1664.00	7.08	6.97	0.91	85.15	1.04	0.10	85.19	42.20	4.34	0.
	1664.00	5.63	5.54	0.72	85.16	1.05	0.05	85.18	43.37	4.34	0.
	1664.00	3.74	3.74	0.77	84.97	0.86	0.12	85.00	14.69	4.34	0.
	1769.10	12.23	10.50	1.56	85.45	1.05	0.16	85.56	36.61	3.63	1.
	1769.10	10.61	9.33	1.45	85.41	1.01	0.16	85.50	33.86	3.63	0.
	1769.10	8.57	7.79	1.29	85.35	0.95	0.15	85.42	29.94	3.63	0.
	1769.10	7.08	6.61	1.17	85.29	0.89	0.14	85.36	26.43	3.63	0.
	1769.10	5.63	5.35	1.00	85.25	0.85	0.10	85.30	23.68	3.63	0.
	1769.10	3.74	3.72	0.86	85.10	0.70	0.13	85.14	13.64	3.63	0.

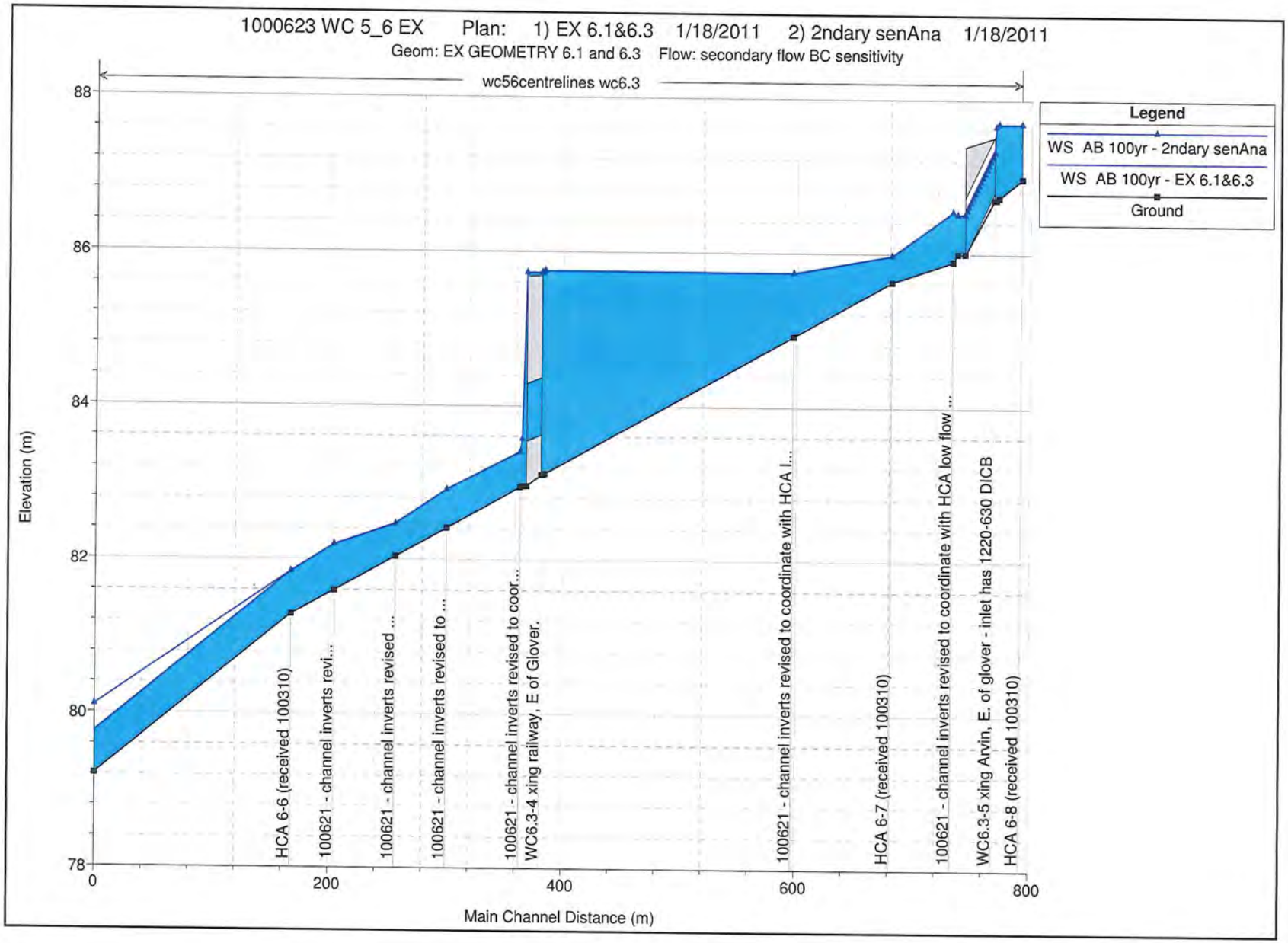
	1769.20	12.23	7.98	1.92	85.48	1.04	0.04	85.61	39.06	2.58	2.
	1769.20	10.61	7.18	1.81	85.44	1.00	0.03	85.55	36.26	2.58	2.
	1769.20	8.57	6.11	1.66	85.37	0.93	0.03	85.48	32.28	2.58	1.
	1769.20	7.08	5.28	1.53	85.32	0.88	0.02	85.41	28.77	2.58	1.
	1769.20	5.63	4.37	1.35	85.27	0.83	0.02	85.34	25.51	2.58	0.
	1769.20	3.74	3.19	1.23	85.12	0.68	0.02	85.19	15.99	2.58	0.
*	1769.30	12.23	4.41	1.57	86.64	1.78	1.16	86.69	284.78	840.00	0.
*	1769.30	10.61	10.61	4.37	86.00	1.14	0.56	86.97	62.97	840.00	0.
*	1769.30	8.57	8.57	3.77	85.89	1.03	0.52	86.62	57.97	840.00	0.
*	1769.30	7.08	7.08	3.13	85.89	1.03	0.57	86.39	57.79	840.00	0.
*	1769.30	5.63	5.63	2.89	85.75	0.89	0.48	86.18	51.51	840.00	0.
*	1769.30	3.74	3.74	2.52	85.55	0.69	0.43	85.87	42.24	840.00	0.
	1769.40	12.23	2.58	0.78	86.77	1.91	0.13	86.78	311.02	0.00	0.
	1769.40	10.61	0.79	0.14	87.27	2.41	1.27	87.27	388.57	0.00	2.
	1769.40	8.57	1.39	0.38	86.85	1.99	0.96	86.85	329.15	0.00	0.
	1769.40	7.08	2.52	0.90	86.63	1.77	0.75	86.65	285.30	0.00	0.
	1769.40	5.63	5.63	2.11	86.31	1.45	0.56	86.54	151.88	0.00	0.
	1769.40	3.74	3.74	1.55	85.99	1.13	0.44	86.11	62.65	0.00	0.
	1769.50	12.23	1.85	0.23	86.78	1.92	0.01	86.78	313.15	0.00	5.
	1769.50	10.61	1.04	0.10	87.27	2.41	0.00	87.27	389.60	0.00	4.
	1769.50	8.57	1.19	0.14	86.85	1.99	0.00	86.85	331.55	0.00	3.
	1769.50	7.08	1.21	0.16	86.66	1.80	0.02	86.66	286.37	0.00	2.
	1769.50	5.63	5.63	0.79	86.57	1.71	0.25	86.60	4.30	0.00	0.
	1769.50	3.74	3.74	0.72	86.11	1.25	0.12	86.14	4.30	0.00	0.
	1826.00	5.15	2.85	0.86	86.80	1.10	0.02	86.83	67.74	14.48	2.
	1826.00	4.11	0.86	0.15	87.27	1.57	0.00	87.27	238.12	14.48	2.
	1826.00	2.90	1.38	0.39	86.85	1.15	0.00	86.86	89.25	14.48	1.
	1826.00	2.15	1.74	0.64	86.67	0.97	0.01	86.69	57.16	14.48	0.
	1826.00	1.52	1.37	0.55	86.62	0.92	0.05	86.63	44.55	14.48	0.
	1826.00	0.79	0.79	0.80	86.20	0.50	0.09	86.23	2.85	14.48	0.
	1929.00	5.15	5.11	0.69	87.07	0.89	0.26	87.09	46.21	4.66	0.
	1929.00	4.11	3.92	0.26	87.28	1.10	0.01	87.28	68.90	4.66	0.
*	1929.00	2.90	2.90	0.89	86.91	0.73	0.06	86.95	6.35	4.66	0.

	1929.00	2.15	2.15	0.84	86.80	0.62	0.13	86.84	5.77	4.66	0.
	1929.00	1.52	1.52	0.71	86.72	0.54	0.11	86.75	5.39	4.66	0.
	1929.00	0.79	0.79	0.73	86.50	0.32	0.31	86.53	4.28	4.66	0.
	2039.00	5.15	5.15	0.99	87.89	0.42	0.82	87.94	34.71	11.73	0.
	2039.00	4.11	4.11	0.90	87.86	0.39	0.59	87.90	34.45	11.73	0.
	2039.00	2.90	2.90	0.86	87.83	0.36	0.91	87.86	33.94	11.73	0.
*	2039.00	2.15	2.15	0.89	87.81	0.34	1.01	87.85	33.21	11.73	0.
*	2039.00	1.52	1.52	0.80	87.79	0.32	1.07	87.82	31.56	11.73	0.
*	2039.00	0.79	0.79	1.09	87.70	0.23	1.20	87.76	6.04	11.73	0.
*	2288.90	5.15	2.89	2.11	90.15	0.82	2.26	90.28	33.76	12.48	1.
*	2288.90	4.11	2.52	1.97	90.10	0.77	2.24	90.23	28.73	12.48	1.
*	2288.90	2.90	2.10	1.92	90.00	0.67	2.17	90.14	17.95	12.48	0.
*	2288.90	2.15	1.77	1.98	89.89	0.56	2.08	90.05	7.52	12.48	0.
*	2288.90	1.52	1.33	1.78	89.81	0.48	2.02	89.95	6.18	12.48	0.
*	2288.90	0.79	0.76	1.52	89.67	0.34	1.97	89.78	3.89	12.48	0.
	2384.00	5.15	4.99	1.66	90.57	0.57	0.42	90.71	18.00	10.98	0.
	2384.00	4.11	4.09	1.54	90.52	0.52	0.42	90.64	17.29	10.98	0.
	2384.00	2.90	2.90	1.28	90.46	0.46	0.46	90.54	6.72	10.98	0.
	2384.00	2.15	2.15	1.10	90.42	0.42	0.53	90.48	6.34	10.98	0.
	2384.00	1.52	1.52	1.01	90.34	0.34	0.53	90.39	5.74	10.98	0.
*	2384.00	0.79	0.79	1.21	90.18	0.18	0.51	90.25	4.40	10.98	0.
	2428.00	5.15	5.15	0.67	91.02	0.48	0.45	91.04	25.04	5.14	0.
	2428.00	4.11	4.11	0.63	90.97	0.43	0.44	90.99	23.48	5.14	0.
	2428.00	2.90	2.90	0.60	90.90	0.36	0.44	90.91	21.57	5.14	0.
	2428.00	2.15	2.15	0.56	90.84	0.30	0.43	90.86	20.65	5.14	0.
	2428.00	1.52	1.52	0.52	90.80	0.26	0.46	90.82	19.66	5.14	0.
*	2428.00	0.79	0.79	0.87	90.68	0.14	0.50	90.72	12.07	5.14	0.
	2513.00	5.15	4.43	1.24	91.28	0.68	0.26	91.35	27.80	0.71	0.
	2513.00	4.11	3.69	1.19	91.24	0.64	0.27	91.30	25.27	0.71	0.
	2513.00	2.90	2.72	1.02	91.18	0.58	0.28	91.23	22.67	0.71	0.
	2513.00	2.15	2.09	0.92	91.13	0.53	0.29	91.18	18.72	0.71	0.
	2513.00	1.52	1.51	0.78	91.09	0.49	0.29	91.13	14.36	0.71	0.
*	2513.00	0.79	0.79	1.21	90.91	0.31	0.23	90.98	4.57	0.71	0.


1000623 WC 5_6 EX Plan: 1) EX 5&6 1/17/2011 2) prim sen ana 1/17/2011
Geom: EX GEOMETRY_wc5_6 Flow: primary flow BC sensitivity
wc56centrelines wc5
wc56centrelines 5&6combined
Legend
WS AB 100yr - prim sen ana
WS AB 100yr - EX 5&6
Ground
Elevation (m)
Main Channel Distance (m)
95
90
85
80
75
0
500
1000
1500
2000
2500
WC 5-2
HCA 5-8 (receive...
WC5-3 xing south ser...
WC5-4 xing railway, E. of...
Existing industrial buildin...
Existing industrial building...
HCA 5-6 (received 100126)
HCA 5-5 (received 100126)
WC 5-6 xing Barton, E. of Fruitland. Us/sou...
HCA 5-4 (received 100126)
HCA 5-3 (received 100126)
HCA 5-2 (received 100126)
WC5-7 x-ing Fuitland, N Hwy. 8, D/S higher than U/S
HCA 5-1 (received 100126)


1000623 WC 5_6 EX Plan: 1) EX 5&6 1/17/2011 2) prim sen ana 1/17/2011
Geom: EX GEOMETRY_wc5_6 Flow: primary flow BC sensitivity
wc56centrelines wc6
wc56centrelines 5&6combined
Legend
WS AB 100yr - prim sen ana
WS AB 100yr - EX 5&6
Ground
Elevation (m)
Main Channel Distance (m)
94
92
90
88
86
84
82
80
78
76
0
500
1000
1500
2000
2500
3000
WC6 XING AT ...
HCA 6-16 (recei...
WC6-4 xing S. S...
WC 6-5 xing railway, E. of ...
HCA 6-13 (received 100414)
WC 6-6 xing Barton E of Jones, twin culve...
HCA 6-12 (received 100414)
new section
HCA 6-11 (received 100414)
HCA 6-10 (received 100414)


1000623 WC 5_6 EX Plan: 1) EX 6.1&6.3 1/17/2011 2) 2ndary senAna 1/17/2011
Geom: EX GEOMETRY 6.1 and 6.3 Flow: secondary flow BC sensitivity
wc56centrelines wc6.1
Legend
WS AB 100yr - 2ndary senAna
WS AB 100yr - EX 6.1&6.3
Ground
Elevation (m)
90
88
86
84
82
80
78
0
200
400
600
800
1000
Main Channel Distance (m)
HCA 6-4 (receive...
WC6.1-4 - xing CNR, west o...
HCA 6-3 (received 100310)
WC6.1-5 xing Arvin, W. of Glover
HCA 6-2 (received 100310)
WC6.1-1 xing Barton, W. of Glover.
HCA 6-1 (received 100310)


1000623 WC 5_6 EX Plan: 1) EX 6.1&6.3 1/18/2011 2) 2ndary senAna 1/18/2011
Geom: EX GEOMETRY 6.1 and 6.3 Flow: secondary flow BC sensitivity
wc56centrelines wc6.3
Legend
WS AB 100yr - 2ndary senAna
WS AB 100yr - EX 6.1&6.3
Ground
Elevation (m)
88
86
84
82
80
78
0
200
400
600
800
Main Channel Distance (m)
HCA 6-6 (received 100310)
100621 - channel inverts revi...
100621 - channel inverts revised ...
100621 - channel inverts revised to ...
100621 - channel inverts revised to coor...
WC6.3-4 xing railway, E of Glover.
100621 - channel inverts revised to coordinate with HCA I...
HCA 6-7 (received 100310)
100621 - channel inverts revised to coordinate with HCA low flow ...
WC6.3-5 xing Arvin, E. of glover - inlet has 1220-630 DICB
HCA 6-8 (received 100310)

HEC-RAS Profile: AB 100yr

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Max Ch Dpth	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Vel Left	Vel Right	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m/s)	(m/s)	(m)	
wc5	2388.964	AB 100yr	EX 5&6	6.90	92.94	94.05	1.11	93.73	94.07	0.000937	0.75	0.22	0.18	40.89	0.27
wc5	2388.964	AB 100yr	EX 5&6(spills)	6.90	92.94	94.05	1.11	93.73	94.07	0.000937	0.75	0.22	0.18	40.89	0.27
wc5	2290	AB 100yr	EX 5&6	6.90	92.11	93.93	1.82		93.96	0.000648	0.72	0.07	0.02	14.42	0.22
wc5	2290	AB 100yr	EX 5&6(spills)	6.90	92.11	93.93	1.82		93.96	0.000648	0.72	0.07	0.02	14.42	0.22
wc5	2256	AB 100yr	EX 5&6	6.90	91.88	93.67	1.79	93.67	93.88	0.010325	2.14	0.32	0.38	17.47	0.60
wc5	2256	AB 100yr	EX 5&6(spills)	6.90	91.88	93.67	1.79	93.67	93.88	0.010325	2.14	0.32	0.38	17.47	0.60
wc5	2240.61			Culvert											
wc5	2221	AB 100yr	EX 5&6	6.90	91.59	93.10	1.50	93.10	93.84	0.010886	3.83			7.13	1.00
wc5	2221	AB 100yr	EX 5&6(spills)	6.90	91.59	93.10	1.50	93.10	93.84	0.010886	3.83			7.13	1.00
wc5	2198	AB 100yr	EX 5&6	6.90	91.41	92.44	1.03		92.62	0.008243	1.88	0.07	0.07	6.05	0.73
wc5	2198	AB 100yr	EX 5&6(spills)	6.90	91.41	92.44	1.03		92.62	0.008243	1.88	0.07	0.07	6.05	0.73
wc5	2150	AB 100yr	EX 5&6	6.90	91.07	92.20	1.13		92.34	0.005114	1.62	0.15	0.15	7.68	0.59
wc5	2150	AB 100yr	EX 5&6(spills)	6.90	91.07	92.20	1.13		92.34	0.005114	1.62	0.15	0.15	7.68	0.59
wc5	2068.437	AB 100yr	EX 5&6	6.90	90.36	91.32	0.96	91.30	91.64	0.016028	2.52	0.05		4.43	0.96
wc5	2068.437	AB 100yr	EX 5&6(spills)	6.90	90.36	91.32	0.96	91.30	91.64	0.016028	2.52	0.05		4.43	0.96
wc5	2044.707	AB 100yr	EX 5&6	6.90	89.83	90.93	1.10		91.08	0.005883	1.70	0.13	0.13	7.34	0.63
wc5	2044.707	AB 100yr	EX 5&6(spills)	6.90	89.83	90.93	1.10		91.08	0.005883	1.70	0.13	0.13	7.34	0.63
wc5	1986.134	AB 100yr	EX 5&6	7.62	89.59	90.52	0.93	90.52	90.82	0.016119	2.44			5.22	1.01
wc5	1986.134	AB 100yr	EX 5&6(spills)	7.62	89.59	90.52	0.93	90.52	90.82	0.016119	2.44			5.22	1.01
wc5	1901.030	AB 100yr	EX 5&6	7.62	88.78	90.07	1.29		90.18	0.003285	1.47	0.25	0.29	8.19	0.49
wc5	1901.030	AB 100yr	EX 5&6(spills)	7.62	88.78	90.07	1.29		90.18	0.003285	1.47	0.25	0.29	8.19	0.49
wc5	1874.583	AB 100yr	EX 5&6	7.62	88.53	89.68	1.15	89.63	90.00	0.014431	2.51			4.07	0.93
wc5	1874.583	AB 100yr	EX 5&6(spills)	7.62	88.53	89.68	1.15	89.63	90.00	0.014431	2.51			4.07	0.93
wc5	1845.237	AB 100yr	EX 5&6	7.62	88.39	89.57	1.18		89.71	0.004980	1.67	0.16	0.31	8.55	0.59
wc5	1845.237	AB 100yr	EX 5&6(spills)	7.62	88.39	89.57	1.18		89.71	0.004980	1.67	0.16	0.31	8.55	0.59
wc5	1801.453	AB 100yr	EX 5&6	7.62	88.17	89.35	1.18		89.49	0.005017	1.67	0.10	0.23	10.49	0.59
wc5	1801.453	AB 100yr	EX 5&6(spills)	7.62	88.17	89.35	1.18		89.49	0.005017	1.67	0.10	0.23	10.49	0.59
wc5	1693.967	AB 100yr	EX 5&6	7.62	87.76	88.98	1.22		89.11	0.004322	1.60	0.26	0.27	7.20	0.55
wc5	1693.967	AB 100yr	EX 5&6(spills)	7.62	87.76	88.98	1.22		89.11	0.004322	1.60	0.26	0.27	7.20	0.55
wc5	1602.883	AB 100yr	EX 5&6	8.31	87.17	88.33	1.16	88.14	88.50	0.006220	1.84	0.18	0.26	21.34	0.66
wc5	1602.883	AB 100yr	EX 5&6(spills)	8.31	87.17	88.33	1.16	88.14	88.50	0.006220	1.84	0.18	0.26	21.34	0.66
wc5	1537.467	AB 100yr	EX 5&6	8.31	86.84	87.96	1.12	87.96	88.09	0.005963	1.73	0.32	0.27	43.43	0.64
wc5	1537.467	AB 100yr	EX 5&6(spills)	8.31	86.84	87.96	1.12	87.96	88.09	0.005963	1.73	0.32	0.27	43.43	0.64
wc5	1471.795	AB 100yr	EX 5&6	8.31	86.50	87.76	1.26		87.78	0.001178	0.93	0.22	0.34	49.24	0.29
wc5	1471.795	AB 100yr	EX 5&6(spills)	8.31	86.50	87.75	1.26		87.78	0.001209	0.94	0.23	0.35	49.94	0.30
wc5	1439.675	AB 100yr	EX 5&6	8.31	86.27	87.75	1.48	87.32	87.76	0.000391	0.57	0.09	0.23	62.98	0.17
wc5	1439.675	AB 100yr	EX 5&6(spills)	8.31	86.27	87.74	1.47	87.32	87.75	0.000402	0.58	0.09	0.23	62.78	0.18
wc5	1320.692	AB 100yr	EX 5&6	8.82	85.57	87.69	2.12		87.71	0.000367	0.75	0.20	0.13	50.46	0.18
wc5	1320.692	AB 100yr	EX 5&6(spills)	8.82	85.57	87.69	2.12		87.71	0.000373	0.76	0.20	0.13	49.18	0.18
wc5	1316.508	AB 100yr	EX 5&6	8.82	85.38	87.44	2.06	86.65	87.68	0.002289	2.16			22.76	0.48
wc5	1316.508	AB 100yr	EX 5&6(spills)	8.82	85.38	87.43	2.05	86.65	87.67	0.002317	2.17			22.48	0.48
wc5	1307.90			Culvert											
wc5	1291.617	AB 100yr	EX 5&6	8.82	85.19	86.46	1.27	86.46	87.09	0.011725	3.52			6.23	1.01
wc5	1291.617	AB 100yr	EX 5&6(spills)	8.82	85.19	86.48	1.27	86.46	87.09	0.011586	3.51			6.24	1.00
wc5	1288.054	AB 100yr	EX 5&6	8.82	85.00	86.17	1.17		86.37	0.007273	1.99	0.24	0.10	5.63	0.71
wc5	1288.054	AB 100yr	EX 5&6(spills)	8.82	85.00	86.17	1.17		86.37	0.007273	1.99	0.24	0.10	5.63	0.71
wc5	1225.493	AB 100yr	EX 5&6	8.82	84.72	85.86	1.14		86.08	0.008091	2.06	0.32	0.32	6.07	0.74
wc5	1225.493	AB 100yr	EX 5&6(spills)	8.82	84.72	85.86	1.14		86.08	0.008091	2.06	0.32	0.32	6.07	0.74
wc5	1157.883	AB 100yr	EX 5&6	8.82	84.21	85.43	1.22		85.61	0.005768	1.86	0.39	0.30	6.64	0.64
wc5	1157.883	AB 100yr	EX 5&6(spills)	8.82	84.21	85.43	1.22		85.61	0.005768	1.86	0.39	0.30	6.64	0.64
wc5	1131.031	AB 100yr	EX 5&6	9.58	84.01	85.22	1.21		85.43	0.007054	2.04	0.40	0.41	7.38	0.71
wc5	1131.031	AB 100yr	EX 5&6(spills)	9.58	84.01	85.22	1.21		85.43	0.007045	2.03	0.40	0.41	7.39	0.71
wc5	1112.568	AB 100yr	EX 5&6	9.58	83.68	85.08	1.20	84.92	85.30	0.007499	2.08	0.40	0.39	6.72	0.73
wc5	1112.568	AB 100yr	EX 5&6(spills)	9.58	83.88	85.08	1.20	84.92	85.30	0.007480	2.07	0.40	0.39	6.72	0.72
wc5	1071.480	AB 100yr	EX 5&6	9.58	83.57	84.77	1.20		84.99	0.007379	2.07	0.26	0.39	6.07	0.72
wc5	1071.480	AB 100yr	EX 5&6(spills)	9.58	83.57	84.77	1.20		84.99	0.007478	2.08	0.25	0.39	6.06	0.72
wc5	1034.499	AB 100yr	EX 5&6	9.58	83.29	84.53	1.24	84.33	84.73	0.006499	1.99	0.27	0.37	5.93	0.68
wc5	1034.499	AB 100yr	EX 5&6(spills)	9.58	83.29	84.50	1.21	84.33	84.71	0.007303	2.06	0.26	0.35	5.68	0.72
wc5	1013.774	AB 100yr	EX 5&6	9.58	83.14	84.18	1.04	84.18	84.52	0.015063	2.56	0.21	0.20	5.82	0.99
wc5	1013.774	AB 100yr	EX 5&6(spills)	9.58	83.14	84.35	1.21	84.18	84.56	0.007125	2.04	0.41	0.40	7.08	0.71
wc5	951.8970	AB 100yr	EX 5&6	10.30	82.62	84.10	1.48	83.73	84.11	0.000627	0.69	0.29	0.14	112.73	0.22
wc5	951.8970	AB 100yr	EX 5&6(spills)	10.30	82.62	83.95	1.33	83.74	84.14	0.006290	1.98	0.27	0.40	13.66	0.66
wc5	942.8887	AB 100yr	EX 5&6	10.30	82.59	83.71	1.12	83.65	84.07	0.011460	2.67			6.06	0.91
wc5	942.8887	AB 100yr	EX 5&6(spills)	10.30	82.59	83.65	1.06	83.65	84.06	0.014148	2.84			6.69	1.00

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J1   0.0     4.0     0.0     0.0    -1.0     1.0     0.0     0.0    79.0
J2   3.0     0.0    -1.0
T1 CITY OF STONEY CREEK FLOODPLAIN MAPPING STUDY
T2 BY PHILIPS PLANNING & ENGINEERING LIMITED - PROJECT NO. 86090
T3        Watercourse 6  10 YR STORM
J1   0.0     5.0     0.0     0.0    -1.0     1.0     0.0     0.0    79.0
J2   4.0     0.0    -1.0
T1 CITY OF STONEY CREEK FLOODPLAIN MAPPING STUDY
T2 BY PHILIPS PLANNING & ENGINEERING LIMITED - PROJECT NO. 86090
T3        Watercourse 6  5 YR STORM
J1   0.0     6.0     0.0     0.0    -1.0     1.0     0.0     0.0    79.0
J2   5.0     0.0    -1.0
T1 CITY OF STONEY CREEK FLOODPLAIN MAPPING STUDY
T2 BY PHILIPS PLANNING & ENGINEERING LIMITED - PROJECT NO. 86090
T3        Watercourse 6  2 YR STORM
J1   0.0     7.0     0.0     0.0    -1.0     1.0     0.0     0.0    79.0
J2  15.0     0.0    -1.0


ER
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**************************************
*            S U M P O               *
*     Interactive SUmmary PrintOut   *
*         for the IBM PC/XT/AT       *
*         January 1987 version       *
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Input Filename: WC6N.HEC
Output Filename: WC6N.SUM

Watercourse 6

	SECNO	Q	QCH	VCH	CWSEL	DEPTH	DIFWSX	EG	TOPWID	K*CHSL	QLOB
*	181.20	13.42	2.70	3.02	79.01	1.00	0.00	79.10	150.00	0.00	4.
*	181.20	11.71	2.22	2.43	79.02	1.01	0.00	79.08	150.00	0.00	3.
*	181.20	9.50	1.87	2.08	79.01	1.00	0.00	79.06	150.00	0.00	3.
*	181.20	7.90	1.62	1.81	79.00	0.99	0.00	79.04	150.00	0.00	2.
*	181.20	6.28	1.22	1.34	79.02	1.01	0.00	79.04	150.00	0.00	2.
*	181.20	4.12	1.34	1.56	78.97	0.96	0.00	79.01	80.00	0.00	0.
*	181.30	13.42	2.12	2.10	79.32	1.31	0.32	79.37	150.00	0.00	4.
*	181.30	11.71	2.07	2.08	79.30	1.29	0.28	79.35	150.00	0.00	3.
*	181.30	9.50	2.12	2.14	79.28	1.27	0.27	79.34	150.00	0.00	2.
*	181.30	7.90	1.96	1.98	79.27	1.26	0.27	79.32	150.00	0.00	1.
*	181.30	6.28	1.99	2.01	79.23	1.22	0.21	79.30	150.00	0.00	1.
*	181.30	4.12	1.77	1.78	79.18	1.17	0.21	79.25	150.00	0.00	0.
	181.40	13.42	0.69	0.60	79.39	1.28	0.06	79.39	150.00	4.00	5.
	181.40	11.71	0.62	0.54	79.37	1.26	0.07	79.37	150.00	4.00	4.
	181.40	9.50	0.51	0.45	79.36	1.25	0.08	79.36	150.00	4.00	3.
	181.40	7.90	0.44	0.39	79.34	1.23	0.07	79.34	150.00	4.00	3.
	181.40	6.28	0.35	0.32	79.32	1.21	0.09	79.32	150.00	4.00	2.
	181.40	4.12	0.26	0.25	79.27	1.16	0.09	79.27	150.00	4.00	1.
	420.90	13.42	2.05	1.02	79.67	0.73	0.28	79.68	250.38	4.28	1.
	420.90	11.71	1.94	1.01	79.65	0.71	0.28	79.66	245.18	4.28	0.
	420.90	9.50	1.74	0.95	79.62	0.68	0.25	79.63	235.83	4.28	0.
	420.90	7.90	1.62	0.94	79.59	0.65	0.25	79.60	202.00	4.28	0.
	420.90	6.28	1.45	0.90	79.56	0.62	0.24	79.57	190.24	4.28	0.
	420.90	4.12	1.19	0.85	79.51	0.57	0.23	79.52	102.12	4.28	0.

*	566.10	13.42	3.93	1.51	80.09	0.81	0.42	80.13	446.04	2.88	5.
*	566.10	11.71	4.03	1.58	80.07	0.79	0.43	80.12	440.07	2.88	4.
*	566.10	9.50	3.42	1.35	80.07	0.79	0.45	80.10	438.43	2.88	3.
	566.10	7.90	4.81	2.04	80.01	0.73	0.42	80.15	418.77	2.88	2.
	566.10	6.28	4.14	1.89	79.96	0.68	0.40	80.09	16.12	2.88	2.
	566.10	4.12	2.90	1.52	79.87	0.59	0.37	79.96	14.29	2.88	1.
*	566.20	13.42	2.01	0.61	80.30	1.02	0.21	80.30	270.00	0.00	0.
*	566.20	11.71	1.61	0.48	80.33	1.05	0.25	80.33	270.00	0.00	0.
*	566.20	9.50	1.40	0.42	80.31	1.03	0.24	80.31	270.00	0.00	0.
*	566.20	7.90	7.90	2.88	80.13	0.85	0.12	80.55	3.25	0.00	0.
	566.20	6.28	6.28	2.50	80.05	0.77	0.09	80.37	3.25	0.00	0.
	566.20	4.12	4.12	1.87	79.96	0.68	0.09	80.14	3.25	0.00	0.
*	566.30	13.42	6.60	1.93	80.69	1.48	0.39	80.78	638.83	-140.00	0.
*	566.30	11.71	6.79	1.98	80.64	1.43	0.32	80.76	626.44	-140.00	0.
*	566.30	9.50	9.50	3.14	80.20	0.99	-0.11	80.70	479.50	-140.00	0.
	566.30	7.90	7.90	2.32	80.33	1.12	0.20	80.60	527.09	-140.00	0.
	566.30	6.28	6.28	2.20	80.15	0.94	0.10	80.39	459.79	-140.00	0.
	566.30	4.12	4.12	1.69	80.01	0.80	0.05	80.15	411.44	-140.00	0.
	566.40	13.42	3.19	0.93	80.86	1.65	0.17	80.87	686.41	0.00	0.
	566.40	11.71	3.01	0.88	80.84	1.63	0.20	80.85	682.24	0.00	0.
	566.40	9.50	2.07	0.60	80.87	1.66	0.67	80.88	691.00	0.00	0.
	566.40	7.90	3.52	1.03	80.72	1.51	0.39	80.74	645.93	0.00	0.
	566.40	6.28	6.13	1.79	80.39	1.18	0.25	80.55	551.47	0.00	0.
	566.40	4.12	4.12	1.47	80.12	0.91	0.12	80.23	453.36	0.00	0.
	566.50	13.42	0.45	0.09	80.88	1.67	0.02	80.88	692.01	0.00	6.
	566.50	11.71	0.40	0.08	80.86	1.65	0.02	80.86	686.73	0.00	5.
	566.50	9.50	0.32	0.06	80.88	1.67	0.01	80.88	696.01	0.00	4.
	566.50	7.90	0.57	0.12	80.75	1.54	0.03	80.75	269.90	0.00	0.
	566.50	6.28	0.54	0.13	80.60	1.39	0.21	80.60	269.90	0.00	0.
	566.50	4.12	4.12	1.46	80.13	0.92	0.01	80.24	3.06	0.00	0.
	610.20	13.42	0.28	0.04	80.88	1.86	0.00	80.88	914.00	-38.00	9.
	610.20	11.71	0.25	0.04	80.86	1.84	0.00	80.86	914.00	-38.00	7.

HEC-RAS Profile: AB 100yr (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Max Ch Dpth	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Vel Left	Vel Right	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m/s)	(m/s)	(m)	
wc5	937.1887			Culvert											
wc5	931	AB 100yr	EX 5&6	10.30	82.47	83.72	1.25	83.54	84.00	0.007406	2.34			57.55	0.75
wc5	931	AB 100yr	EX 5&6(spills)	10.30	82.47	83.54	1.07	83.54	83.95	0.014152	2.84			8.55	1.00
wc5	918.3739	AB 100yr	EX 5&6	10.30	82.41	83.66	2.22	83.57	83.66	0.000009	0.07	0.06		174.95	0.02
wc5	918.3739	AB 100yr	EX 5&6(spills)	10.30	82.41	83.57	1.16	83.57	83.58	0.000998	0.66	0.32		91.55	0.26
wc5	815.3577	AB 100yr	EX 5&6	10.30	81.85	83.86	2.01	82.95	83.85	0.000002	0.04	0.04		224.05	0.01
wc5	815.3577	AB 100yr	EX 5&6(spills)	7.74	81.85	83.15	1.30	82.79	83.25	0.004317	1.40			7.98	0.54
wc5	660.8133	AB 100yr	EX 5&6	11.00	81.64	83.86	5.48	82.75	83.86	0.000000	0.02	0.02	0.00	297.96	0.01
wc5	660.8133	AB 100yr	EX 5&6(spills)	7.91	81.64	83.05	1.41	82.59	83.14	0.002426	1.37	0.33	0.27	6.39	0.43
wc5	678.6898	AB 100yr	EX 5&6	11.00	81.55	83.86	6.28	82.66	83.86	0.000000	0.02	0.02	0.00	342.06	0.00
wc5	678.6898	AB 100yr	EX 5&6(spills)	7.91	81.55	83.02	1.46	82.50	83.11	0.001961	1.28	0.33	0.14	6.30	0.39
wc5	665	AB 100yr	EX 5&6	11.00	81.40	83.86	2.46	82.68	83.86	0.000002	0.06	0.02	0.04	388.44	0.01
wc5	665	AB 100yr	EX 5&6(spills)	5.82	81.40	83.05	1.65	82.33	83.05	0.000051	0.19	0.05	0.07	177.83	0.06
wc5	660	AB 100yr	EX 5&6	11.00	81.32	83.02	1.70	83.02	83.78	0.011988	3.86			7.81	1.01
wc5	660	AB 100yr	EX 5&6(spills)	5.82	81.32	82.51	1.18	82.51	83.00	0.013640	3.11			5.47	1.00
wc5	655			Culvert											
wc5	651.8919	AB 100yr	EX 5&6	11.00	80.93	82.43	5.68	82.43	83.16	0.010873	3.81			418.06	1.00
wc5	651.8919	AB 100yr	EX 5&6(spills)	5.82	80.93	81.91	0.98	81.91	82.40	0.012612	3.08			5.42	1.00
wc5	648.3854	AB 100yr	EX 5&6	11.00	80.78	81.93	4.51	81.93	81.93	0.000003	0.04	0.03	0.01	355.19	0.01
wc5	648.3854	AB 100yr	EX 5&6(spills)	5.82	80.78	81.59	0.81	81.59	81.86	0.016386	2.29			4.75	1.00
wc5	553.6066	AB 100yr	EX 5&6	11.00	80.14	81.91	3.13	81.18	81.92	0.000160	0.36	0.10	0.13	157.19	0.11
wc5	553.6066	AB 100yr	EX 5&6(spills)	5.82	80.14	81.42	1.28	80.95	81.45	0.001406	0.76			12.54	0.31
wc5	521.5115	AB 100yr	EX 5&6	11.00	80.04	81.91	2.72	81.18	81.91	0.000004	0.07	0.03	0.02	340.81	0.02
wc5	521.5115	AB 100yr	EX 5&6(spills)	5.50	80.04	81.38	1.34	80.83	81.43	0.001372	0.99	0.14	0.24	17.65	0.32
wc5	518.7136	AB 100yr	EX 5&6	11.90	79.98	81.67	2.11	81.17	81.69	0.003383	2.08			341.65	0.54
wc5	518.7136	AB 100yr	EX 5&6(spills)	6.40	79.98	81.29	1.31	80.83	81.41	0.002576	1.50			10.19	0.45
wc5	503.04			Culvert											
wc5	487.5449	AB 100yr	EX 5&6	11.90	79.68	80.79	1.11	80.79	81.29	0.012768	3.14			13.47	1.00
wc5	487.5449	AB 100yr	EX 5&6(spills)	11.90	79.68	80.79	1.11	80.79	81.29	0.012768	3.14			13.47	1.00
wc5	484.1846	AB 100yr	EX 5&6	11.90	79.63	80.85	1.22	80.71	80.90	0.002198	1.20	0.39	0.17	54.05	0.41
wc5	484.1846	AB 100yr	EX 5&6(spills)	11.90	79.63	80.96	1.33	80.71	80.98	0.001085	0.91	0.32	0.11	64.32	0.29
wc5	381.2556	AB 100yr	EX 5&6	11.90	79.11	80.69	1.58	80.25	80.75	0.001689	1.27	0.23	0.26	72.79	0.37
wc5	381.2556	AB 100yr	EX 5&6(spills)	11.90	79.11	80.66	1.55	80.25	80.83	0.003557	1.81	0.31	0.23	71.55	0.53
wc5	359.8282	AB 100yr	EX 5&6	11.90	78.85	80.25	1.41	80.15	80.58	0.010931	2.53	0.28	0.07	7.44	0.85
wc5	359.8282	AB 100yr	EX 5&6(spills)	11.90	78.85	80.25	1.41	80.15	80.58	0.010943	2.53	0.28	0.07	7.41	0.85
wc5	304.0528	AB 100yr	EX 5&6	11.90	78.22	79.55	1.33	79.55	79.83	0.011095	2.46	0.94	0.39	11.29	0.88
wc5	304.0528	AB 100yr	EX 5&6(spills)	11.90	78.22	79.55	1.33	79.55	79.83	0.011095	2.46	0.94	0.39	11.29	0.88
wc5	250	AB 100yr	EX 5&6	11.90	77.55	78.75	1.20		78.97	0.008832	2.10			7.76	0.79
wc5	250	AB 100yr	EX 5&6(spills)	11.90	77.55	78.62	1.07	78.62	78.95	0.014849	2.53			7.21	1.00
wc5	230	AB 100yr	EX 5&6	11.90	76.75	78.60	2.05	77.88	78.69	0.001068	1.32			26.00	0.32
wc5	230	AB 100yr	EX 5&6(spills)	11.90	76.75	78.49	1.74	77.88	78.63	0.002040	1.61			13.03	0.43
wc5	215			Culvert											
wc5	200	AB 100yr	EX 5&6	11.90	76.48	78.45	1.97		78.55	0.001248	1.38			13.05	0.34
wc5	200	AB 100yr	EX 5&6(spills)	11.90	76.48	78.15	1.66		78.30	0.002424	1.69			11.14	0.46
wc5	170	AB 100yr	EX 5&6	11.90	76.48	78.49	2.00	77.43	78.51	0.000299	0.67	0.26	0.28	18.00	0.17
wc5	170	AB 100yr	EX 5&6(spills)	11.90	76.48	78.20	1.72	77.43	78.24	0.000629	0.85	0.31	0.31	17.12	0.24
wc6	2457.382	AB 100yr	EX 5&6	7.98	91.31	92.50	1.19	92.43	92.88	0.010594	2.81	0.60	0.61	4.13	0.86
wc6	2457.382	AB 100yr	EX 5&6(spills)	7.98	91.31	92.50	1.19	92.43	92.88	0.010594	2.81	0.60	0.61	4.13	0.86
wc6	2408.649	AB 100yr	EX 5&6	7.98	91.02	92.27	1.25	92.12	92.45	0.005491	2.10	0.77	0.63	9.30	0.62
wc6	2408.649	AB 100yr	EX 5&6(spills)	7.98	91.02	92.27	1.25	92.12	92.45	0.005491	2.10	0.77	0.83	9.30	0.62
wc6	2359.898	AB 100yr	EX 5&6	7.98	90.74	91.79	1.05	91.79	92.07	0.011026	2.52	0.96	0.96	7.77	0.86
wc6	2359.898	AB 100yr	EX 5&6(spills)	7.98	90.74	91.79	1.05	91.79	92.07	0.011026	2.52	0.96	0.96	7.77	0.86
wc6	2308.859	AB 100yr	EX 5&6	7.98	90.44	91.22	0.79		91.29	0.002659	1.10	0.13		11.91	0.43
wc6	2308.859	AB 100yr	EX 5&6(spills)	7.98	90.44	91.22	0.79		91.29	0.002659	1.10	0.13		11.91	0.43
wc6	2232.182	AB 100yr	EX 5&6	7.98	90.33	90.83	0.50		90.93	0.010009	1.44	0.33	0.29	28.55	0.77
wc6	2232.182	AB 100yr	EX 5&6(spills)	7.98	90.33	90.83	0.50		90.93	0.010009	1.44	0.33	0.29	28.55	0.77
wc6	2193.265	AB 100yr	EX 5&6	7.98	89.88	90.55	0.67	90.49	90.60	0.006848	1.39		0.43	48.93	0.65
wc6	2193.265	AB 100yr	EX 5&6(spills)	7.98	89.88	90.55	0.67	90.49	90.60	0.006848	1.39		0.43	48.93	0.65
wc6	2135.859	AB 100yr	EX 5&6	7.98	89.59	90.47	0.88	90.24	90.48	0.000856	0.64	0.15	0.22	90.97	0.23
wc6	2135.859	AB 100yr	EX 5&6(spills)	7.98	89.59	90.47	0.88	90.24	90.48	0.000856	0.64	0.15	0.22	90.97	0.23
wc6	2096.869	AB 100yr	EX 5&6	8.50	89.40	90.24	0.84	90.24	90.38	0.012657	2.30	0.74	0.56	25.04	0.89
wc6	2096.869	AB 100yr	EX 5&6(spills)	8.50	89.40	90.24	0.84	90.24	90.38	0.012657	2.30	0.74	0.56	25.04	0.89
wc6	2000	AB 100yr	EX 5&6	8.50	88.47	89.54	1.07	89.54	89.66	0.005777	1.85	0.37	0.31	52.06	0.62
wc6	2000	AB 100yr	EX 5&6(spills)	8.50	88.47	89.54	1.07	89.54	89.66	0.005777	1.85	0.37	0.31	52.06	0.62

HEC-RAS Profile: AB 100yr (Continued)

Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Max Ch Dpth (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Vel Left (m/s)	Vel Right (m/s)	Top Width (m)	Froude # Chl
wc6	1893.020	AB 100yr	EX 5&6	8.50	87.07	88.08	1.01	88.07	88.18	0.007690	1.74	0.50	0.22	35.42	0.68
wc6	1893.020	AB 100yr	EX 5&6(spills)	8.50	87.07	88.08	1.01	88.07	88.18	0.007690	1.74	0.50	0.22	35.42	0.68
wc6	1785.033	AB 100yr	EX 5&6	8.50	86.31	87.42	1.11	87.37	87.52	0.005773	1.50	0.26	0.27	58.67	0.61
wc6	1785.033	AB 100yr	EX 5&6(spills)	8.50	86.31	87.42	1.11	87.37	87.52	0.005773	1.50	0.26	0.27	58.67	0.61
wc6	1657.344	AB 100yr	EX 5&6	8.50	85.34	86.97	1.63	86.36	87.09	0.002181	1.56	0.27	0.18	24.77	0.41
wc6	1657.344	AB 100yr	EX 5&6(spills)	8.50	85.34	86.97	1.63	86.36	87.09	0.002181	1.56	0.27	0.18	24.77	0.41
wc6	1611.292	AB 100yr	EX 5&6	9.20	84.99	86.89	1.90		87.00	0.001565	1.48	0.23	0.15	17.73	0.36
wc6	1611.292	AB 100yr	EX 5&6(spills)	9.20	84.99	86.89	1.90		87.00	0.001565	1.48	0.23	0.15	17.73	0.36
wc6	1608.895	AB 100yr	EX 5&6	9.20	84.96	86.73	1.77	86.73	86.97	0.013755	2.50	0.47	1.04	14.96	0.92
wc6	1608.895	AB 100yr	EX 5&6(spills)	9.20	84.96	86.73	1.77	86.73	86.97	0.013755	2.50	0.47	1.04	14.96	0.92
wc6	1598.12			Culvert											
wc6	1587.120	AB 100yr	EX 5&6	9.20	84.79	86.54	1.75	86.54	86.58	0.006408	1.45	0.39	0.32	184.08	0.60
wc6	1587.120	AB 100yr	EX 5&6(spills)	9.20	84.79	86.54	1.75	86.54	86.58	0.006408	1.45	0.39	0.32	184.08	0.60
wc6	1584.698	AB 100yr	EX 5&6	9.20	84.73	85.90	1.17	85.90	86.04	0.005384	1.92	0.62	0.39	39.37	0.61
wc6	1584.698	AB 100yr	EX 5&6(spills)	9.20	84.73	85.90	1.17	85.90	86.04	0.005384	1.92	0.62	0.39	39.37	0.61
wc6	1501.817	AB 100yr	EX 5&6	9.20	84.11	85.45	1.34	85.11	85.49	0.001638	1.02	0.36	0.12	48.17	0.35
wc6	1501.817	AB 100yr	EX 5&6(spills)	9.20	84.11	85.44	1.33	85.11	85.48	0.001692	1.04	0.36	0.12	47.67	0.35
wc6	1414.879	AB 100yr	EX 5&6	9.20	83.78	85.14	1.36		85.27	0.003604	1.65	0.29	0.34	20.43	0.51
wc6	1414.879	AB 100yr	EX 5&6(spills)	9.20	83.78	85.06	1.28	84.78	85.23	0.004937	1.84	0.16	0.35	15.91	0.59
wc6	1334.030	AB 100yr	EX 5&6	9.20	83.47	85.14	1.67	84.47	85.16	0.000439	0.69	0.27	0.14	62.45	0.19
wc6	1334.030	AB 100yr	EX 5&6(spills)	9.20	83.47	84.77	1.30	84.47	84.88	0.003464	1.56	0.36	0.24	33.77	0.50
wc6	1037.318	AB 100yr	EX 5&6	9.20	82.35	85.10	2.75	83.35	85.11	0.000083	0.44	0.11	0.11	85.37	0.09
wc6	1037.318	AB 100yr	EX 5&6(spills)	9.20	82.35	83.77	1.42	83.35	83.90	0.003159	1.60	0.42	0.43	7.39	0.48
wc6	947.3374	AB 100yr	EX 5&6	8.79	82.01	85.10	3.10	83.14	85.10	0.000010	0.15	0.06	0.04	163.00	0.03
wc6	947.3374	AB 100yr	EX 5&6(spills)	2.53	82.01	83.79	1.78	82.63	83.79	0.000090	0.28	0.05	0.09	39.92	0.08
wc6	940	AB 100yr	EX 5&6	8.79	81.96	84.58	2.62	83.83	85.06	0.003141	3.05			160.08	0.60
wc6	940	AB 100yr	EX 5&6(spills)	2.42	81.96	83.70	1.74	82.75	83.79	0.000927	1.26			60.67	0.30
wc6	939.548			Culvert											
wc6	910.4732	AB 100yr	EX 5&6	8.79	81.74	83.55	1.81	83.55	84.46	0.009825	4.21			345.91	1.00
wc6	910.4732	AB 100yr	EX 5&6(spills)	2.42	81.74	82.50	0.76	82.50	82.89	0.013311	2.75			4.29	1.01
wc6	900	AB 100yr	EX 5&6	8.79	81.67	82.92	1.25	82.64	83.07	0.004625	1.74	0.24	0.32	18.42	0.57
wc6	900	AB 100yr	EX 5&6(spills)	2.42	81.87	82.30	0.63	82.14	82.39	0.006356	1.31			3.69	0.60
wc6	801.4135	AB 100yr	EX 5&6	8.79	80.95	81.93	0.98	81.93	82.27	0.015962	2.60			4.93	1.00
wc6	801.4135	AB 100yr	EX 5&6(spills)	2.42	80.95	81.52	0.57	81.42	81.63	0.009108	1.48			3.71	0.72
wc6	730.3979	AB 100yr	EX 5&6	8.79	80.43	81.31	0.88	81.01	81.31	0.000021	0.10	0.06		203.88	0.04
wc6	730.3979	AB 100yr	EX 5&6(spills)	2.42	80.43	80.96	0.53	80.85	81.04	0.007533	1.23			5.41	0.65
wc6	634.0483	AB 100yr	EX 5&6	8.79	79.73	81.31	1.58	80.71	81.31	0.000043	0.20	0.07	0.07	276.29	0.06
wc6	634.0483	AB 100yr	EX 5&6(spills)	2.42	79.73	80.43	0.70	80.20	80.49	0.004353	1.14			4.09	0.51
wc6	586.5527	AB 100yr	EX 5&6	8.79	79.39	81.29	1.90	80.49	81.31	0.000477	0.70	0.22	0.22	54.31	0.19
wc6	586.5527	AB 100yr	EX 5&6(spills)	2.42	79.39	80.26	0.87	79.95	80.31	0.003155	1.04			3.93	0.43
wc6	564.4214	AB 100yr	EX 5&6	8.79	79.36	81.20	1.84	80.31	81.29	0.001210	1.31			27.59	0.32
wc6	564.4214	AB 100yr	EX 5&6(spills)	2.00	79.26	80.25	0.90	79.78	80.28	0.001005	0.89			4.69	0.26
wc6	549.12			Culvert											
wc6	535.9677	AB 100yr	EX 5&6	8.79	79.30	80.70	1.40	80.27	80.87	0.003455	1.80			68.97	0.52
wc6	535.9677	AB 100yr	EX 5&6(spills)	2.00	79.30	80.05	0.75	79.72	80.09	0.002109	0.88			4.25	0.36
wc6	533.8168	AB 100yr	EX 5&6	8.79	79.29	80.73	1.44	80.27	80.81	0.002187	1.33	0.25	0.28	28.96	0.40
wc6	533.8168	AB 100yr	EX 5&6(spills)	2.00	79.29	80.04	0.75	79.71	80.08	0.002253	0.85			4.25	0.37
wc6	502.0329	AB 100yr	EX 5&6	8.79	79.25	80.35	1.09	80.35	80.67	0.013565	2.58	0.85		6.62	0.94
wc6	502.0329	AB 100yr	EX 5&6(spills)	2.00	79.25	79.75	0.50	79.75	79.93	0.019427	1.87			3.03	1.01
wc6	480	AB 100yr	EX 5&6	8.79	78.69	80.30	1.61	79.51	80.31	0.000313	0.58	0.14	0.21	39.31	0.17
wc6	480	AB 100yr	EX 5&6(spills)	2.00	78.69	79.37	0.68	79.15	79.39	0.002446	0.68			6.65	0.37
wc6	400	AB 100yr	EX 5&6	8.79	78.36	80.28	1.92	79.29	80.29	0.000218	0.53	0.17	0.20	24.79	0.14
wc6	400	AB 100yr	EX 5&6(spills)	2.00	78.36	79.21	0.85	78.87	79.23	0.001326	0.57			8.42	0.28
wc6	350	AB 100yr	EX 5&6	8.79	78.63	80.27	1.64	79.10	80.27	0.000051	0.27	0.10	0.11	52.29	0.07
wc6	350	AB 100yr	EX 5&6(spills)	2.00	78.63	79.05	0.42	78.80	79.06	0.001447	0.48	0.11	0.13	16.64	0.28
wc6	330	AB 100yr	EX 5&6	8.79	78.44	80.18	1.74	79.29	80.27	0.001069	1.31			37.73	0.32
wc6	330	AB 100yr	EX 5&6(spills)	2.00	78.44	79.00	0.56	78.80	79.05	0.003278	1.02			12.56	0.46
wc6	315			Culvert											
wc6	300	AB 100yr	EX 5&6	8.79	77.99	79.45	1.46	78.96	79.60	0.002599	1.69			18.03	0.46
wc6	300	AB 100yr	EX 5&6(spills)	2.00	77.99	78.85	0.85	78.47	78.87	0.001175	0.74			10.16	0.29
wc6	280	AB 100yr	EX 5&6	8.79	77.96	79.50	1.55	78.76	79.52	0.000411	0.62	0.18	0.15	27.03	0.19
wc6	280	AB 100yr	EX 5&6(spills)	2.00	77.96	78.84	0.89	78.40	78.85	0.000481	0.37	0.04	0.04	12.35	0.17
wc6	250	AB 100yr	EX 5&6	8.79	77.87	79.42	1.55	78.87	79.47	0.001387	1.02	0.40	0.13	12.38	0.33

HEC-RAS Profile: AB 100yr (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Max Chl Dpth	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Vel Left	Vel Right	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m/s)	(m/s)	(m)	
wc6	250	AB 100yr	EX 5&6(spills)	2.00	77.87	78.76	0.91	78.42	78.80	0.001206	0.62	0.17		7.31	0.28
wc6	200	AB 100yr	EX 5&6	8.79	77.71	79.15	1.44		79.20	0.002164	1.06		0.07	11.54	0.39
wc6	200	AB 100yr	EX 5&6(spills)	2.00	77.71	78.47	0.77		78.51	0.003307	0.85			6.15	0.44
wc6	150	AB 100yr	EX 5&6	8.79	77.17	78.65	1.48	78.31	78.78	0.003179	1.71	0.56	0.54	8.92	0.51
wc6	150	AB 100yr	EX 5&6(spills)	2.00	77.17	78.26	1.09	77.79	78.28	0.000779	0.64	0.19	0.17	6.55	0.23
wc6	100	AB 100yr	EX 5&6	8.79	76.83	78.47	1.64	77.85	78.51	0.001251	0.87			12.37	0.31
wc6	100	AB 100yr	EX 5&6(spills)	2.00	76.83	78.23	1.41	77.39	78.24	0.000149	0.27			10.59	0.10
5&6combined	50	AB 100yr	EX 5&6	23.90	76.42	78.07	1.65	78.07	78.51	0.013545	2.93	0.25		9.52	1.00
5&6combined	50	AB 100yr	EX 5&6(spills)	17.11	76.42	77.86	1.44	77.86	78.24	0.014297	2.72			8.31	1.00
5&6combined	40	AB 100yr	EX 5&6	23.90	76.27	77.72	1.44	77.61	78.02	0.007614	2.47	0.90	0.57	13.58	0.78
5&6combined	40	AB 100yr	EX 5&6(spills)	17.11	76.27	77.56	1.28	77.42	77.79	0.007156	2.14	0.72	0.36	12.26	0.74
5&6combined	30	AB 100yr	EX 5&6	23.90	76.22	77.74	1.52	77.44	77.91	0.004213	1.82	0.22	0.74	16.06	0.58
5&6combined	30	AB 100yr	EX 5&6(spills)	17.11	76.22	77.56	1.34	77.27	77.69	0.004200	1.61		0.61	14.51	0.57
5&6combined	20	AB 100yr	EX 5&6	23.90	76.16	77.68	1.52	77.45	77.88	0.005004	2.00	0.78	0.42	15.93	0.64
5&6combined	20	AB 100yr	EX 5&6(spills)	17.11	76.16	77.51	1.35	77.28	77.66	0.005001	1.76	0.65	0.23	14.49	0.62

HEC-RAS Profile: AB 100yr

Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Max Chl Dpth (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Vel Left (m/s)	Vel Right (m/s)	Top Width (m)	Froude # Chl
wc5	2388.964	AB 100yr	EX 586	6.90	92.94	94.05	1.11	93.73	94.07	0.000937	0.75	0.22	0.18	40.89	0.27
wc5	2388.964	AB 100yr	FUT 586	6.90	92.94	94.05	1.11	93.73	94.07	0.000937	0.75	0.22	0.18	40.89	0.27
wc5	2290	AB 100yr	EX 586	6.90	92.11	93.93	1.82		93.96	0.000648	0.72	0.07	0.02	14.42	0.22
wc5	2290	AB 100yr	FUT 586	6.90	92.11	93.93	1.82		93.96	0.000648	0.72	0.07	0.02	14.42	0.22
wc5	2256	AB 100yr	EX 586	6.90	91.88	93.67	1.79	93.67	93.88	0.010325	2.14	0.32	0.38	17.47	0.80
wc5	2256	AB 100yr	FUT 586	6.90	91.88	93.67	1.79	93.67	93.88	0.010325	2.14	0.32	0.38	17.47	0.80
wc5	2240.61			Culvert											
wc5	2221	AB 100yr	EX 586	6.90	91.59	93.10	1.50	93.10	93.84	0.010886	3.83			7.13	1.00
wc5	2221	AB 100yr	FUT 586	6.90	91.59	93.10	1.50	93.10	93.84	0.010886	3.83			7.13	1.00
wc5	2198	AB 100yr	EX 586	6.90	91.41	92.44	1.03		92.62	0.008243	1.88	0.07	0.07	6.05	0.73
wc5	2198	AB 100yr	FUT 586	6.90	91.41	92.44	1.03		92.62	0.008243	1.88	0.07	0.07	6.05	0.73
wc5	2150	AB 100yr	EX 586	6.90	91.07	92.20	1.13		92.34	0.005114	1.62	0.15	0.15	7.68	0.59
wc5	2150	AB 100yr	FUT 586	6.90	91.07	92.20	1.13		92.34	0.005114	1.62	0.15	0.15	7.68	0.59
wc5	2068.437	AB 100yr	EX 586	6.90	90.36	91.32	0.96	91.30	91.64	0.016028	2.52	0.05		4.43	0.96
wc5	2068.437	AB 100yr	FUT 586	6.90	90.36	91.32	0.96	91.30	91.64	0.016028	2.52	0.05		4.43	0.96
wc5	2044.707	AB 100yr	EX 586	6.90	89.83	90.93	1.10		91.08	0.005883	1.70	0.13	0.13	7.34	0.63
wc5	2044.707	AB 100yr	FUT 586	6.90	89.83	90.93	1.10		91.08	0.005883	1.70	0.13	0.13	7.34	0.63
wc5	1886.134	AB 100yr	EX 586	7.62	89.59	90.52	0.93	90.52	90.82	0.016119	2.44			5.22	1.01
wc5	1886.134	AB 100yr	FUT 586	7.62	89.59	90.52	0.93	90.52	90.82	0.016119	2.44			5.22	1.01
wc5	1901.030	AB 100yr	EX 586	7.62	88.78	90.07	1.29		90.18	0.003285	1.47	0.25	0.29	8.19	0.49
wc5	1901.030	AB 100yr	FUT 586	7.62	88.78	90.07	1.29		90.18	0.003285	1.47	0.25	0.29	8.19	0.49
wc5	1874.583	AB 100yr	EX 586	7.62	88.53	89.68	1.15	89.63	90.00	0.014431	2.51			4.07	0.93
wc5	1874.583	AB 100yr	FUT 586	7.62	88.53	89.68	1.15	89.63	90.00	0.014431	2.51			4.07	0.93
wc5	1845.237	AB 100yr	EX 586	7.62	88.39	89.57	1.18		89.71	0.004980	1.67	0.16	0.31	8.55	0.59
wc5	1845.237	AB 100yr	FUT 586	7.62	88.39	89.57	1.18		89.71	0.004980	1.67	0.16	0.31	8.55	0.59
wc5	1801.453	AB 100yr	EX 586	7.62	88.17	89.35	1.18		89.49	0.005017	1.67	0.10	0.23	10.49	0.59
wc5	1801.453	AB 100yr	FUT 586	7.62	88.17	89.35	1.18		89.49	0.005017	1.67	0.10	0.23	10.49	0.59
wc5	1693.967	AB 100yr	EX 586	7.62	87.76	88.98	1.22		89.11	0.004322	1.60	0.26	0.27	7.20	0.55
wc5	1693.967	AB 100yr	FUT 586	7.62	87.76	88.98	1.22		89.11	0.004319	1.60	0.26	0.27	7.20	0.55
wc5	1602.883	AB 100yr	EX 586	8.31	87.17	88.33	1.16	88.14	88.50	0.006220	1.84	0.18	0.26	21.34	0.66
wc5	1602.883	AB 100yr	FUT 586	8.31	87.17	88.33	1.16	88.14	88.50	0.006231	1.84	0.18	0.26	21.29	0.66
wc5	1537.467	AB 100yr	EX 586	8.31	86.84	87.96	1.12	87.95	88.09	0.005963	1.73	0.32	0.27	43.43	0.64
wc5	1537.467	AB 100yr	FUT 586	8.31	86.84	87.96	1.12	87.96	88.09	0.005965	1.73	0.32	0.27	43.42	0.64
wc5	1471.795	AB 100yr	EX 586	8.31	86.50	87.76	1.26		87.78	0.001178	0.93	0.22	0.34	49.24	0.29
wc5	1471.795	AB 100yr	FUT 586	8.31	86.50	87.53	1.04		87.62	0.005370	1.68	0.35	0.53	34.28	0.60
wc5	1439.675	AB 100yr	EX 586	8.31	86.27	87.75	1.48	87.32	87.76	0.000391	0.57	0.09	0.23	62.98	0.17
wc5	1439.675	AB 100yr	FUT 586	8.31	86.27	87.43	1.16	87.32	87.49	0.003141	1.50	0.18	0.35	43.20	0.47
wc5	1320.692	AB 100yr	EX 586	8.82	85.57	87.69	2.12		87.71	0.000367	0.75	0.20	0.13	50.46	0.18
wc5	1320.692	AB 100yr	FUT 586	8.82	85.57	87.23	1.66		87.30	0.001301	1.16	0.30	0.31	10.53	0.33
wc5	1316.508	AB 100yr	EX 586	8.82	85.38	87.44	2.06	86.65	87.68	0.002289	2.16			22.76	0.48
wc5	1316.508	AB 100yr	FUT 586	8.82	85.38	87.07	1.69	86.43	87.25	0.002404	1.84			14.78	0.47
wc5	1307.90			Culvert											
wc5	1291.617	AB 100yr	EX 586	8.82	85.19	86.46	1.27	86.46	87.09	0.011725	3.52			6.23	1.01
wc5	1291.617	AB 100yr	FUT 586	8.82	85.19	86.27	1.08	86.27	86.77	0.013055	3.15			5.71	1.01
wc5	1288.054	AB 100yr	EX 586	8.82	85.00	86.17	1.17		86.37	0.007273	1.99	0.24	0.10	5.63	0.71
wc5	1288.054	AB 100yr	FUT 586	8.82	85.00	86.17	1.17		86.37	0.007273	1.99	0.24	0.10	5.63	0.71
wc5	1225.493	AB 100yr	EX 586	8.82	84.72	85.86	1.14		86.08	0.008091	2.06	0.32	0.32	6.07	0.74
wc5	1225.493	AB 100yr	FUT 586	8.82	84.72	85.86	1.14		86.08	0.008091	2.06	0.32	0.32	6.07	0.74
wc5	1157.883	AB 100yr	EX 586	8.82	84.21	85.43	1.22		85.61	0.005768	1.86	0.39	0.30	6.84	0.64
wc5	1157.883	AB 100yr	FUT 586	8.82	84.21	85.43	1.22		85.61	0.005768	1.86	0.39	0.30	6.84	0.64
wc5	1131.031	AB 100yr	EX 586	9.58	84.01	85.22	1.21		85.43	0.007054	2.04	0.40	0.41	7.38	0.71
wc5	1131.031	AB 100yr	FUT 586	9.58	84.01	85.22	1.21		85.43	0.007048	2.04	0.40	0.41	7.39	0.71
wc5	1112.568	AB 100yr	EX 586	9.58	83.88	85.08	1.20	84.92	85.30	0.007499	2.08	0.40	0.39	6.72	0.73
wc5	1112.568	AB 100yr	FUT 586	9.58	83.88	85.08	1.20	84.92	85.30	0.007488	2.08	0.40	0.39	6.72	0.72
wc5	1071.480	AB 100yr	EX 586	9.58	83.57	84.77	1.20		84.99	0.007379	2.07	0.26	0.39	6.07	0.72
wc5	1071.480	AB 100yr	FUT 586	9.58	83.57	84.77	1.20		84.99	0.007443	2.07	0.25	0.39	6.07	0.72
wc5	1034.499	AB 100yr	EX 586	9.58	83.29	84.53	1.24	84.33	84.73	0.005499	1.99	0.27	0.37	5.93	0.66
wc5	1034.499	AB 100yr	FUT 586	9.58	83.29	84.51	1.22	84.33	84.72	0.006990	2.04	0.27	0.36	5.90	0.70
wc5	1013.774	AB 100yr	EX 586	9.58	83.14	84.18	1.04	84.18	84.52	0.015063	2.56	0.21	0.20	5.82	0.99
wc5	1013.774	AB 100yr	FUT 586	9.58	83.14	84.38	1.24	84.18	84.55	0.006316	1.97	0.42	0.41	7.30	0.67
wc5	951.8970	AB 100yr	EX 586	10.30	82.62	84.10	1.48	83.73	84.11	0.000627	0.69	0.29	0.14	112.73	0.22
wc5	951.8970	AB 100yr	FUT 586	10.30	82.62	83.88	1.26	83.74	84.12	0.008394	2.17	0.18	0.36	10.69	0.76
wc5	942.8887	AB 100yr	EX 586	10.30	82.59	83.71	1.12	83.65	84.07	0.011460	2.67			8.06	0.91
wc5	942.8887	AB 100yr	FUT 586	10.30	82.59	83.66	1.07	83.65	84.04	0.014219	2.74			6.84	0.99
wc5	937.1887			Culvert											
wc5	931	AB 100yr	EX 586	10.30	82.47	83.72	1.25	83.54	84.00	0.007406	2.34			57.55	0.75
wc5	931	AB 100yr	FUT 586	10.30	82.47	83.54	1.07	83.54	83.93	0.014649	2.77			8.40	1.00

HEC-RAS Profile: AB 100yr (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Max Chl Dpth	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Vel Left	Vel Right	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m/s)	(m/s)	(m)	
wc5	918.3739	AB 100yr	EX 586	10.30	82.41	83.86	2.22	83.57	83.86	0.000009	0.07	0.06		174.95	0.02
wc5	918.3739	AB 100yr	FUT 586	10.30	82.41	83.57	1.16	83.57	83.58	0.000998	0.66	0.32		91.55	0.26
wc5	815.3577	AB 100yr	EX 586	10.30	81.85	83.86	2.01	82.95	83.86	0.000002	0.04	0.04		224.05	0.01
wc5	815.3577	AB 100yr	FUT 586	10.30	81.85	83.14	4.55	82.95	83.32	0.007927	1.89			7.89	0.73
wc5	680.8133	AB 100yr	EX 586	11.00	81.64	83.86	5.48	82.75	83.86	0.000000	0.02	0.02	0.00	297.96	0.01
wc5	680.8133	AB 100yr	FUT 586	11.00	81.64	83.27	1.63	82.75	83.27	0.000011	0.10	0.07	0.02	155.48	0.03
wc5	678.6898	AB 100yr	EX 586	11.00	81.55	83.86	6.28	82.66	83.86	0.000000	0.02	0.02	0.00	342.06	0.00
wc5	678.6898	AB 100yr	FUT 586	11.00	81.55	83.27	1.72	82.66	83.27	0.000013	0.12	0.07	0.01	154.40	0.03
wc5	665	AB 100yr	EX 586	11.00	81.40	83.86	2.46	82.68	83.86	0.000002	0.06	0.02	0.04	388.44	0.01
wc5	665	AB 100yr	FUT 586	11.00	81.40	83.26	1.87	82.68	83.26	0.000044	0.21	0.06	0.10	178.40	0.06
wc5	660	AB 100yr	EX 586	11.00	81.32	83.02	1.70	83.02	83.78	0.011988	3.86			7.81	1.01
wc5	660	AB 100yr	FUT 586	11.00	81.32	82.71	1.39	82.71	83.21	0.015294	3.13			6.32	1.00
wc5	655			Culvert											
wc5	651.8919	AB 100yr	EX 586	11.00	80.93	82.43	5.88	82.43	83.16	0.010873	3.81			418.08	1.00
wc5	651.8919	AB 100yr	FUT 586	11.00	80.93	82.07	1.14	82.07	82.56	0.013221	3.11			13.58	1.00
wc5	648.3854	AB 100yr	EX 586	11.00	80.78	81.93	4.51	81.93	81.93	0.000003	0.04	0.03	0.01	355.19	0.01
wc5	648.3854	AB 100yr	FUT 586	11.00	80.78	81.93	1.15	81.93	81.93	0.000165	0.30	0.12	0.05	231.21	0.11
wc5	553.6066	AB 100yr	EX 586	11.00	80.14	81.91	3.13	81.18	81.92	0.000160	0.36	0.10	0.13	157.19	0.11
wc5	553.6066	AB 100yr	FUT 586	11.00	80.14	81.80	1.66	81.18	81.81	0.000063	0.50	0.10	0.16	151.81	0.17
wc5	521.5115	AB 100yr	EX 586	11.00	80.04	81.91	2.72	81.16	81.91	0.000004	0.07	0.03	0.02	340.81	0.02
wc5	521.5115	AB 100yr	FUT 586	11.00	80.04	81.81	1.77	81.16	81.81	0.000027	0.18	0.07	0.06	239.06	0.05
wc5	518.7136	AB 100yr	EX 586	11.90	79.98	81.67	2.11	81.17	81.89	0.003383	2.08			341.65	0.54
wc5	518.7136	AB 100yr	FUT 586	11.90	79.98	81.49	1.51	81.17	81.78	0.005135	2.36			24.49	0.65
wc5	503.04			Culvert											
wc5	487.5449	AB 100yr	EX 586	11.90	79.68	80.79	1.11	80.79	81.29	0.012768	3.14			13.47	1.00
wc5	487.5449	AB 100yr	FUT 586	11.90	79.68	80.79	1.11	80.79	81.29	0.012768	3.14			13.47	1.00
wc5	484.1846	AB 100yr	EX 586	11.90	79.63	80.85	1.22	80.71	80.90	0.002198	1.20	0.39	0.17	54.05	0.41
wc5	484.1846	AB 100yr	FUT 586	11.90	79.63	80.85	1.22	80.71	80.90	0.002198	1.20	0.39	0.17	54.05	0.41
wc5	381.2556	AB 100yr	EX 586	11.90	79.11	80.69	1.58	80.25	80.75	0.001689	1.27	0.23	0.26	72.79	0.37
wc5	381.2556	AB 100yr	FUT 586	11.90	79.11	80.69	1.58	80.25	80.75	0.001689	1.27	0.23	0.26	72.79	0.37
wc5	359.8282	AB 100yr	EX 586	11.90	78.85	80.25	1.41	80.15	80.58	0.010931	2.53	0.28	0.07	7.44	0.85
wc5	359.8282	AB 100yr	FUT 586	11.90	78.85	80.25	1.41	80.15	80.58	0.010931	2.53	0.28	0.07	7.44	0.85
wc5	304.0528	AB 100yr	EX 586	11.90	78.22	79.55	1.33	79.55	79.83	0.011095	2.46	0.94	0.39	11.29	0.88
wc5	304.0528	AB 100yr	FUT 586	11.90	78.22	79.55	1.33	79.55	79.83	0.011095	2.46	0.94	0.39	11.29	0.88
wc5	250	AB 100yr	EX 586	11.90	77.55	78.75	1.20		78.97	0.008832	2.10			7.78	0.79
wc5	250	AB 100yr	FUT 586	11.90	77.55	78.75	1.20		78.97	0.008832	2.10			7.78	0.79
wc5	230	AB 100yr	EX 586	11.90	76.75	78.80	2.05	77.88	78.89	0.001068	1.32			26.00	0.32
wc5	230	AB 100yr	FUT 586	11.90	76.75	78.80	2.05	77.88	78.89	0.001068	1.32			26.00	0.32
wc5	215			Culvert											
wc5	200	AB 100yr	EX 586	11.90	76.48	78.45	1.97		78.55	0.001248	1.38			13.05	0.34
wc5	200	AB 100yr	FUT 586	11.90	76.48	78.45	1.97		78.55	0.001248	1.38			13.05	0.34
wc5	170	AB 100yr	EX 586	11.90	76.48	78.49	2.00	77.43	78.51	0.000299	0.67	0.26	0.28	18.00	0.17
wc5	170	AB 100yr	FUT 586	11.90	76.48	78.49	2.00	77.43	78.51	0.000299	0.67	0.26	0.28	18.00	0.17
wc6	2457.382	AB 100yr	EX 586	7.98	91.31	92.50	1.19	92.43	92.88	0.010594	2.81	0.60	0.61	4.13	0.86
wc6	2457.382	AB 100yr	FUT 586	7.98	91.31	92.50	1.19	92.43	92.88	0.010594	2.81	0.60	0.61	4.13	0.86
wc6	2408.649	AB 100yr	EX 586	7.98	91.02	92.27	1.25	92.12	92.45	0.005491	2.10	0.77	0.83	9.30	0.62
wc6	2408.649	AB 100yr	FUT 586	7.98	91.02	92.27	1.25	92.12	92.45	0.005491	2.10	0.77	0.83	9.30	0.62
wc6	2359.898	AB 100yr	EX 586	7.98	90.74	91.79	1.05	91.79	92.07	0.011026	2.52	0.96	0.96	7.77	0.86
wc6	2359.898	AB 100yr	FUT 586	7.98	90.74	91.79	1.05	91.79	92.07	0.011026	2.52	0.96	0.96	7.77	0.86
wc6	2308.859	AB 100yr	EX 586	7.98	90.44	91.22	0.79		91.29	0.002659	1.10	0.13		11.91	0.43
wc6	2308.859	AB 100yr	FUT 586	7.98	90.44	91.22	0.79		91.29	0.002659	1.10	0.13		11.91	0.43
wc6	2232.182	AB 100yr	EX 586	7.98	90.33	90.83	0.50		90.93	0.010009	1.44	0.33	0.29	28.55	0.77
wc6	2232.182	AB 100yr	FUT 586	7.98	90.33	90.83	0.50		90.93	0.010009	1.44	0.33	0.29	28.55	0.77
wc6	2193.265	AB 100yr	EX 586	7.98	89.88	90.55	0.67	90.49	90.60	0.006848	1.39		0.43	48.93	0.65
wc6	2193.265	AB 100yr	FUT 586	7.98	89.88	90.55	0.67	90.49	90.60	0.006848	1.39		0.43	48.93	0.65
wc6	2135.859	AB 100yr	EX 586	7.98	89.59	90.47	0.88	90.24	90.48	0.000856	0.64	0.15	0.22	90.97	0.23
wc6	2135.859	AB 100yr	FUT 586	7.98	89.59	90.47	0.88	90.24	90.48	0.000856	0.64	0.15	0.22	90.97	0.23
wc6	2096.869	AB 100yr	EX 586	8.50	89.40	90.24	0.84	90.24	90.38	0.012657	2.30	0.74	0.56	25.04	0.89
wc6	2096.869	AB 100yr	FUT 586	8.50	89.40	90.24	0.84	90.24	90.38	0.012657	2.30	0.74	0.56	25.04	0.89
wc6	2000	AB 100yr	EX 586	8.50	88.47	89.54	1.07	89.54	89.65	0.005777	1.85	0.37	0.31	52.06	0.62
wc6	2000	AB 100yr	FUT 586	8.50	88.47	89.54	1.07	89.54	89.66	0.005777	1.85	0.37	0.31	52.06	0.62
wc6	1893.020	AB 100yr	EX 586	8.50	87.07	88.08	1.01	88.07	88.18	0.007690	1.74	0.50	0.22	35.42	0.68
wc6	1893.020	AB 100yr	FUT 586	8.50	87.07	88.07	1.00	88.07	88.18	0.008299	1.79	0.51	0.21	35.21	0.70
wc6	1785.033	AB 100yr	EX 586	8.50	86.31	87.42	1.11	87.37	87.52	0.005773	1.50	0.26	0.27	59.67	0.61
wc6	1785.033	AB 100yr	FUT 586	8.50	86.31	87.43	1.12		87.52	0.005276	1.45	0.25	0.26	61.53	0.58
wc6	1657.344	AB 100yr	EX 586	8.50	85.34	86.97	1.63	86.36	87.09	0.002181	1.56	0.27	0.18	24.77	0.41

HEC-RAS Profile: AB 100yr (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Max Chl Dpth	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Vel Left	Vel Right	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m/s)	(m/s)	(m)	
wc6	1657.344	AB 100yr	FUT 5&6	8.50	85.34	86.86	1.52	86.36	87.01	0.003006	1.75	0.29	0.19	14.05	0.47
wc6	1611.292	AB 100yr	EX 5&6	9.20	84.99	86.89	1.90		87.00	0.001565	1.48	0.23	0.15	17.73	0.36
wc6	1611.292	AB 100yr	FUT 5&6	9.20	84.99	86.77	1.78		86.90	0.002018	1.60	0.25	0.26	6.78	0.40
wc6	1608.995	AB 100yr	EX 5&6	9.20	84.96	86.73	1.77	86.73	86.97	0.013755	2.50	0.47	1.04	14.96	0.92
wc6	1608.895	AB 100yr	FUT 5&6	9.20	84.96	86.67	1.71	86.12	86.88	0.004557	2.03	0.22	0.34	12.87	0.58
wc6	1598.12			Culvert											
wc6	1587.120	AB 100yr	EX 5&6	9.20	84.79	86.54	1.75	86.54	86.58	0.006408	1.45	0.39	0.32	184.08	0.60
wc6	1587.120	AB 100yr	FUT 5&6	9.20	84.79	85.95	1.16	85.95	86.52	0.012571	3.35			44.13	1.00
wc6	1584.698	AB 100yr	EX 5&6	9.20	84.73	85.90	1.17	85.90	86.04	0.005384	1.92	0.62	0.39	39.37	0.61
wc6	1584.698	AB 100yr	FUT 5&6	9.20	84.73	85.90	1.17	85.90	86.04	0.005384	1.92	0.62	0.39	39.37	0.61
wc6	1501.817	AB 100yr	EX 5&6	9.20	84.11	85.45	1.34	85.11	85.49	0.001638	1.02	0.36	0.12	48.17	0.35
wc6	1501.817	AB 100yr	FUT 5&6	9.20	84.11	85.44	1.33	85.11	85.48	0.001689	1.04	0.36	0.12	47.69	0.35
wc6	1414.879	AB 100yr	EX 5&6	9.20	83.78	85.14	1.36		85.27	0.003604	1.65	0.26	0.34	29.43	0.51
wc6	1414.879	AB 100yr	FUT 5&6	9.20	83.78	85.07	1.29	84.78	85.24	0.004878	1.83	0.17	0.35	16.23	0.59
wc6	1334.030	AB 100yr	EX 5&6	9.20	83.47	85.14	1.67	84.47	85.16	0.000439	0.69	0.27	0.14	62.45	0.19
wc6	1334.030	AB 100yr	FUT 5&6	9.20	83.47	84.77	1.30	84.47	84.88	0.003644	1.59	0.36	0.25	32.91	0.51
wc6	1037.318	AB 100yr	EX 5&6	9.20	82.35	85.10	2.75	83.35	85.11	0.000083	0.44	0.11	0.11	85.37	0.09
wc6	1037.318	AB 100yr	FUT 5&6	9.20	82.35	83.80	1.45	83.35	83.92	0.002874	1.56	0.42	0.43	7.56	0.46
wc6	947.3374	AB 100yr	EX 5&6	8.79	82.01	85.10	3.10	83.14	85.10	0.000010	0.15	0.06	0.04	163.00	0.03
wc6	947.3374	AB 100yr	FUT 5&6	8.79	82.01	83.53	1.53	83.14	83.64	0.003367	1.47		0.33	14.56	0.49
wc6	940	AB 100yr	EX 5&6	8.79	81.96	84.58	2.62	83.83	85.06	0.003141	3.05			160.08	0.60
wc6	940	AB 100yr	FUT 5&6	8.79	81.96	83.43	1.47	82.94	83.61	0.003171	1.88			40.76	0.51
wc6	939.548			Culvert											
wc6	910.4732	AB 100yr	EX 5&6	8.79	81.74	83.55	1.81	83.55	84.48	0.009825	4.21			345.91	1.00
wc6	910.4732	AB 100yr	FUT 5&6	8.79	81.74	82.90	1.16	82.72	83.21	0.007676	2.49			48.98	0.77
wc6	900	AB 100yr	EX 5&6	8.79	81.67	82.92	1.25	82.64	83.07	0.004625	1.74	0.24	0.32	18.42	0.57
wc6	900	AB 100yr	FUT 5&6	8.79	81.67	82.92	1.25	82.64	83.07	0.004625	1.74	0.24	0.32	18.42	0.57
wc6	801.4135	AB 100yr	EX 5&6	8.79	80.95	81.93	0.98	81.93	82.27	0.015962	2.60			4.93	1.00
wc6	801.4135	AB 100yr	FUT 5&6	8.79	80.95	81.93	0.98	81.93	82.27	0.015962	2.60			4.93	1.00
wc6	730.3979	AB 100yr	EX 5&6	8.79	80.43	81.31	0.88	81.01	81.31	0.000021	0.10	0.06		203.88	0.04
wc6	730.3979	AB 100yr	FUT 5&6	8.79	80.43	81.21	0.78	81.01	81.21	0.000037	0.12	0.08		201.39	0.05
wc6	634.0483	AB 100yr	EX 5&6	8.79	79.73	81.31	1.58	80.71	81.31	0.000043	0.20	0.07	0.07	276.29	0.06
wc6	634.0483	AB 100yr	FUT 5&6	8.79	79.73	81.20	1.47	80.71	81.21	0.000111	0.31	0.09	0.07	244.59	0.09
wc6	586.5527	AB 100yr	EX 5&6	8.79	79.39	81.29	1.90	80.49	81.31	0.000477	0.70	0.22	0.22	54.31	0.19
wc6	586.5527	AB 100yr	FUT 5&6	8.79	79.39	81.16	1.78	80.49	81.19	0.000861	0.88	0.24	0.29	43.46	0.25
wc6	564.4214	AB 100yr	EX 5&6	8.79	79.36	81.20	1.84	80.31	81.29	0.001210	1.31			27.59	0.32
wc6	564.4214	AB 100yr	FUT 5&6	8.79	79.36	81.07	1.71	80.32	81.17	0.001524	1.38			26.75	0.36
wc6	549.12			Culvert											
wc6	535.9677	AB 100yr	EX 5&6	8.79	79.30	80.70	1.40	80.27	80.87	0.003455	1.80			58.97	0.52
wc6	535.9677	AB 100yr	FUT 5&6	8.79	79.30	80.71	1.41	80.27	80.86	0.003328	1.74			69.21	0.51
wc6	533.8168	AB 100yr	EX 5&6	8.79	79.29	80.73	1.44	80.27	80.81	0.002107	1.33	0.25	0.28	28.96	0.40
wc6	533.8168	AB 100yr	FUT 5&6	8.79	79.29	80.73	1.44	80.27	80.81	0.002107	1.33	0.25	0.28	28.96	0.40
wc6	502.0329	AB 100yr	EX 5&6	8.79	79.25	80.35	1.09	80.35	80.67	0.013565	2.56	0.65		6.62	0.94
wc6	502.0329	AB 100yr	FUT 5&6	8.79	79.25	80.35	1.09	80.35	80.67	0.013565	2.56	0.65		6.62	0.94
wc6	480	AB 100yr	EX 5&6	8.79	78.69	80.30	1.61	79.51	80.31	0.000313	0.58	0.14	0.21	39.31	0.17
wc6	480	AB 100yr	FUT 5&6	8.79	78.69	80.19	1.50	79.51	80.21	0.000475	0.67	0.14	0.24	36.17	0.20
wc6	400	AB 100yr	EX 5&6	8.79	78.36	80.28	1.92	79.29	80.29	0.000218	0.53	0.17	0.20	24.79	0.14
wc6	400	AB 100yr	FUT 5&6	8.79	78.36	80.16	1.80	79.29	80.17	0.000306	0.60	0.19	0.21	23.54	0.17
wc6	350	AB 100yr	EX 5&6	8.79	78.63	80.27	1.64	79.10	80.27	0.000051	0.27	0.10	0.11	52.29	0.07
wc6	350	AB 100yr	FUT 5&6	8.79	78.63	80.15	1.52	79.10	80.15	0.000073	0.30	0.11	0.12	51.03	0.08
wc6	330	AB 100yr	EX 5&6	8.79	78.44	80.18	1.74	79.29	80.27	0.001069	1.31			37.73	0.32
wc6	330	AB 100yr	FUT 5&6	8.79	78.44	80.04	1.60	79.29	80.14	0.001423	1.43			35.93	0.37
wc6	315			Culvert											
wc6	300	AB 100yr	EX 5&6	8.79	77.99	79.45	1.46	78.96	79.60	0.002599	1.69			16.03	0.48
wc6	300	AB 100yr	FUT 5&6	8.79	77.99	79.45	1.46	78.96	79.60	0.002599	1.69			16.03	0.48
wc6	280	AB 100yr	EX 5&6	8.79	77.96	79.50	1.55	78.76	79.52	0.000411	0.62	0.18	0.15	27.03	0.19
wc6	280	AB 100yr	FUT 5&6	8.79	77.96	79.50	1.55	78.76	79.52	0.000411	0.62	0.18	0.15	27.03	0.19
wc6	250	AB 100yr	EX 5&6	8.79	77.87	79.42	1.55	78.87	79.47	0.001387	1.02	0.40	0.13	12.38	0.33
wc6	250	AB 100yr	FUT 5&6	8.79	77.87	79.42	1.55	78.87	79.47	0.001387	1.02	0.40	0.13	12.38	0.33
wc6	200	AB 100yr	EX 5&6	8.79	77.71	79.15	1.44		79.20	0.002164	1.06		0.07	11.54	0.39
wc6	200	AB 100yr	FUT 5&6	8.79	77.71	79.15	1.44		79.20	0.002164	1.06		0.07	11.54	0.39
wc6	150	AB 100yr	EX 5&6	8.79	77.17	78.65	1.48	78.31	78.78	0.003179	1.71	0.56	0.54	8.92	0.51
wc6	150	AB 100yr	FUT 5&6	8.79	77.17	78.65	1.48	78.31	78.78	0.003179	1.71	0.56	0.54	8.92	0.51
wc6	100	AB 100yr	EX 5&6	8.79	76.83	78.47	1.64	77.85	78.51	0.001251	0.87			12.37	0.31
wc6	100	AB 100yr	FUT 5&6	8.79	76.83	78.47	1.64	77.85	78.51	0.001251	0.87			12.37	0.31
5&6combined	50	AB 100yr	EX 5&6	23.90	76.42	78.07	1.65	76.07	78.51	0.013545	2.90	0.25		9.52	1.00

HEC-RAS Profile: AB 100yr (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Max Chl Dpth	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Vel Left	Vel Right	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m/s)	(m/s)	(m)	
5&6combined	50	AB 100yr	FUT 5&6	23.90	76.42	78.07	1.65	78.07	78.51	0.013545	2.93	0.25		9.52	1.00
5&6combined	40	AB 100yr	EX 5&6	23.90	76.27	77.72	1.44	77.61	78.02	0.007614	2.47	0.90	0.57	13.58	0.78
5&6combined	40	AB 100yr	FUT 5&6	23.90	76.27	77.72	1.44	77.61	78.02	0.007614	2.47	0.90	0.57	13.58	0.78
5&6combined	30	AB 100yr	EX 5&6	23.90	76.22	77.74	1.52	77.44	77.91	0.004213	1.82	0.22	0.74	16.06	0.58
5&6combined	30	AB 100yr	FUT 5&6	23.90	76.22	77.74	1.52	77.44	77.91	0.004213	1.82	0.22	0.74	16.06	0.58
5&6combined	20	AB 100yr	EX 5&6	23.90	76.16	77.68	1.52	77.45	77.88	0.005004	2.00	0.78	0.42	15.93	0.64
5&6combined	20	AB 100yr	FUT 5&6	23.90	76.16	77.68	1.52	77.45	77.88	0.005004	2.00	0.78	0.42	15.93	0.64

HEC-RAS Profile: AB 100yr

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Max Chl Dpth	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Vel Left	Vel Right	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m/s)	(m/s)	(m)	
wc6.3	1400.840	AB 100yr	EX 6.1&6.3	0.70	86.97	87.69	0.71		87.70	0.001018	0.46			3.90	0.24
wc6.3	1400.840	AB 100yr	FUT2ndary	0.70	86.97	87.35	0.38	87.35	87.46	0.022324	1.48			2.25	1.01
wc6.3	1381.230	AB 100yr	EX 6.1&6.3	0.70	86.73	87.69	0.98	86.98	87.69	0.000120	0.21			5.30	0.09
wc6.3	1381.230	AB 100yr	FUT2ndary	0.70	86.73	87.22	0.51	86.98	87.23	0.001825	0.58			3.45	0.31
wc6.3	1378.833	AB 100yr	EX 6.1&6.3	0.70	86.70	87.65	0.97	87.09	87.69	0.000821	0.79			6.08	0.26
wc6.3	1378.833	AB 100yr	FUT2ndary	0.70	86.70	87.21	0.52	86.95	87.23	0.001288	0.60			3.95	0.28
wc6.3	1364.865			Culvert											
wc6.3	1350.769	AB 100yr	EX 6.1&6.3	0.79	86.00	86.51	0.51	86.51	86.72	0.017907	2.03			2.33	1.00
wc6.3	1350.769	AB 100yr	FUT2ndary	0.79	86.00	86.49	0.49	86.45	86.59	0.015964	1.37			2.24	0.87
wc6.3	1348.373	AB 100yr	EX 6.1&6.3	0.79	85.90	86.55	0.65	86.39	86.59	0.005130	0.91			2.66	0.51
wc6.3	1348.373	AB 100yr	FUT2ndary	0.79	85.90	86.43	0.53	86.39	86.52	0.014326	1.33			2.20	0.82
wc6.3	1290.277	AB 100yr	EX 6.1&6.3	0.90	85.63	85.97	0.35	85.97	86.08	0.021313	1.44			2.95	1.00
wc6.3	1290.277	AB 100yr	FUT2ndary	0.90	85.63	86.12	0.49	85.97	86.16	0.004132	0.81			3.56	0.47
wc6.3	1100	AB 100yr	EX 6.1&6.3	1.24	84.92	85.74	0.83	85.27	85.76	0.000701	0.48			4.80	0.21
wc6.3	1100	AB 100yr	FUT2ndary	1.24	84.92	85.27	0.35	85.27	85.40	0.020040	1.81			2.90	1.00
wc6.3	991.7830	AB 100yr	EX 6.1&6.3	1.43	83.12	85.75	2.63		85.75	0.000000	0.02	0.01	0.01	257.11	0.01
wc6.3	991.7830	AB 100yr	FUT2ndary	1.43	83.12	83.75	0.64		83.79	0.002693	0.81			4.04	0.39
wc6.3	990.0710	AB 100yr	EX 6.1&6.3	1.43	83.10	85.73	2.63	83.72	85.75	0.000111	0.57			181.13	0.11
wc6.3	990.0710	AB 100yr	FUT2ndary	1.43	83.10	83.73	0.62	83.47	83.78	0.002728	1.00			3.99	0.42
wc6.3	982.657			Culvert											
wc6.3	975.2448	AB 100yr	EX 6.1&6.3	1.43	82.96	83.57	0.61	83.57	83.88	0.014071	2.45			3.96	1.00
wc6.3	975.2448	AB 100yr	FUT2ndary	1.43	82.96	83.41	0.45		83.51	0.009822	1.42			3.31	0.71
wc6.3	973.5334	AB 100yr	EX 6.1&6.3	1.43	82.94	83.40	0.46		83.49	0.009466	1.28			3.34	0.71
wc6.3	973.5334	AB 100yr	FUT2ndary	1.43	82.94	83.40	0.46		83.49	0.009466	1.28			3.34	0.71
wc6.3	910.8146	AB 100yr	EX 6.1&6.3	1.43	82.41	82.91	0.50	82.79	82.98	0.006890	1.14			3.50	0.61
wc6.3	910.8146	AB 100yr	FUT2ndary	1.43	82.41	82.91	0.50	82.79	82.98	0.006890	1.14			3.59	0.61
wc6.3	867.1168	AB 100yr	EX 6.1&6.3	1.43	82.04	82.46	0.42	82.42	82.57	0.013021	1.44			3.19	0.82
wc6.3	867.1168	AB 100yr	FUT2ndary	1.43	82.04	82.46	0.42	82.42	82.57	0.013021	1.44			3.19	0.82
wc6.3	814.7598	AB 100yr	EX 6.1&6.3	1.43	81.60	82.19	0.70	81.98	82.23	0.003459	0.89			3.89	0.44
wc6.3	814.7598	AB 100yr	FUT2ndary	1.43	81.60	82.19	0.70	81.98	82.23	0.003459	0.89			3.89	0.44
wc6.3	777.7424	AB 100yr	EX 6.1&6.3	1.43	81.29	81.84	0.56	81.84	81.97	0.020796	1.58			3.56	1.00
wc6.3	777.7424	AB 100yr	FUT2ndary	1.43	81.29	81.84	0.56	81.84	81.97	0.020796	1.58			3.56	1.00
wc6.3	610.3315	AB 100yr	EX 6.1&6.3	1.43	79.21	79.71	0.50	79.59	79.78	0.007003	1.15			3.49	0.62
wc6.3	610.3315	AB 100yr	FUT2ndary	1.43	79.21	79.71	0.50	79.59	79.78	0.007003	1.15			3.49	0.62
wc6.1	1815.549	AB 100yr	EX 6.1&6.3	1.64	87.89	88.60	0.71	88.43	88.61	0.001429	0.49	0.18	0.12	15.56	0.26
wc6.1	1815.549	AB 100yr	FUT2ndary	1.64	87.89	88.49	0.61	88.43	88.52	0.006144	0.78	0.21	0.12	12.47	0.54
wc6.1	1791.246	AB 100yr	EX 6.1&6.3	1.64	87.75	88.59	0.84	88.32	88.60	0.000364	0.42	0.16	0.09	76.36	0.16
wc6.1	1791.246	AB 100yr	FUT2ndary	1.64	87.75	88.45	0.70	88.32	88.47	0.002162	0.88	0.31	0.19	26.14	0.37
wc6.1	1788.428	AB 100yr	EX 6.1&6.3	1.64	87.68	88.58	0.91	88.55	88.59	0.001959	0.73	0.21	0.18	70.42	0.34
wc6.1	1788.428	AB 100yr	FUT2ndary	1.64	87.68	88.23	0.56	88.23	88.41	0.015780	1.98	1.08	1.08	13.59	0.95
wc6.1	1778.1			Culvert											
wc6.1	1767.800	AB 100yr	EX 6.1&6.3	1.64	87.46	88.51	1.05	88.51	88.52	0.002305	0.79	0.12	0.12	213.66	0.37
wc6.1	1767.800	AB 100yr	FUT2ndary	1.64	87.46	88.03	0.57	88.03	88.21	0.014767	1.95	0.88	1.10	22.47	0.92
wc6.1	1765.227	AB 100yr	EX 6.1&6.3	1.64	87.41	88.06	0.65	88.00	88.11	0.004895	1.25	0.38	0.43	16.64	0.54
wc6.1	1765.227	AB 100yr	FUT2ndary	1.64	87.41	88.00	0.59	88.00	88.10	0.009349	1.59	0.47	0.55	9.37	0.74
wc6.1	1618.352	AB 100yr	EX 6.1&6.3	1.92	86.58	87.21	0.63	87.21	87.38	0.012445	1.95	0.65	0.73	4.46	0.66
wc6.1	1618.352	AB 100yr	FUT2ndary	1.92	86.58	87.32	0.74	87.21	87.42	0.006049	1.54	0.45	0.42	8.30	0.52
wc6.1	1549.359	AB 100yr	EX 6.1&6.3	1.92	86.10	87.03	0.93		87.03	0.000533	0.52	0.24	0.16	26.93	0.19
wc6.1	1549.359	AB 100yr	FUT2ndary	1.92	86.10	86.70	0.60	86.70	86.82	0.012688	1.75	0.73	0.22	7.90	0.65
wc6.1	1423.360	AB 100yr	EX 6.1&6.3	1.92	84.60	87.03	2.42	85.00	87.03	0.000009	0.13	0.05	0.05	14.44	0.03
wc6.1	1423.360	AB 100yr	FUT2ndary	1.92	84.60	85.52	0.92	85.00	85.54	0.000753	0.54			5.68	0.22
wc6.1	1420.606	AB 100yr	EX 6.1&6.3	2.19	84.57	87.00	2.43	85.33	87.02	0.001388	0.65	0.13	0.18	17.03	0.29
wc6.1	1420.606	AB 100yr	FUT2ndary	2.19	84.57	85.48	0.91	85.01	85.53	0.001374	0.97			5.65	0.33
wc6.1	1393.68			Culvert											
wc6.1	1368.765	AB 100yr	EX 6.1&6.3	2.19	84.77	85.55	0.78	85.55	85.95	0.013165	2.79			11.16	1.01
wc6.1	1368.765	AB 100yr	FUT2ndary	2.19	84.77	85.24	0.47	85.20	85.42	0.012569	1.90			5.45	0.89
wc6.1	1366.013	AB 100yr	EX 6.1&6.3	2.19	84.75	85.23	0.48		85.35	0.011745	1.52			3.94	0.80
wc6.1	1366.013	AB 100yr	FUT2ndary	2.19	84.75	85.24	0.49		85.36	0.011031	1.49			3.97	0.78
wc6.1	1346.971	AB 100yr	EX 6.1&6.3	2.30	84.61	85.10	0.49		85.17	0.007143	1.13	0.09		7.25	0.63
wc6.1	1346.971	AB 100yr	FUT2ndary	2.30	84.61	85.07	0.45		85.15	0.009819	1.26			6.04	0.73
wc6.1	1273.903	AB 100yr	EX 6.1&6.3	2.30	83.57	85.12	1.55		85.13	0.000077	0.27	0.09	0.06	14.12	0.08
wc6.1	1273.903	AB 100yr	FUT2ndary	2.30	83.57	84.01	0.44	84.01	84.18	0.018395	1.81	0.30		4.05	1.00
wc6.1	1166.891	AB 100yr	EX 6.1&6.3	2.55	82.04	85.13	3.09		85.13	0.000001	0.04	0.01	0.01	140.43	0.01
wc6.1	1166.891	AB 100yr	FUT2ndary	2.55	82.04	83.45	1.41		83.45	0.000125	0.32	0.05	0.07	39.42	0.10

HEC-RAS Profile: AB 100yr (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Max Chl Dpth	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Vel Left	Vel Right	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m/s)	(m/s)	(m)	
wc6.1	1163.643	AB 100yr	EX 6.1&6.3	2.55	81.98	85.10	3.12	82.80	85.12	0.000149	0.74			238.55	0.13
wc6.1	1163.643	AB 100yr	FUT2ndary	2.55	81.98	83.40	1.42	82.57	83.45	0.000776	1.00			11.37	0.27
wc6.1	1154.78			Culvert											
wc6.1	1145.920	AB 100yr	EX 6.1&6.3	2.55	81.99	82.81	0.82	82.81	83.22	0.012989	2.84			10.32	1.00
wc6.1	1145.920	AB 100yr	FUT2ndary	2.55	81.99	82.60	0.61	82.60	82.91	0.014320	2.46			8.23	1.01
wc6.1	1141.721	AB 100yr	EX 6.1&6.3	2.55	81.96	82.48	0.53		82.61	0.011601	1.58			4.11	0.81
wc6.1	1141.721	AB 100yr	FUT2ndary	2.55	81.96	82.48	0.53		82.61	0.011601	1.58			4.11	0.81
wc6.1	1024.484	AB 100yr	EX 6.1&6.3	2.55	81.15	81.69	0.55		81.74	0.004910	0.97			7.65	0.53
wc6.1	1024.484	AB 100yr	FUT2ndary	2.55	81.15	81.69	0.55		81.74	0.004910	0.97			7.65	0.53
wc6.1	953.3818	AB 100yr	EX 6.1&6.3	2.55	80.66	81.32	0.66	81.12	81.39	0.005042	1.17			4.62	0.55
wc6.1	953.3818	AB 100yr	FUT2ndary	2.55	80.66	81.32	0.66	81.12	81.39	0.005042	1.17			4.62	0.55
wc6.1	915.3637	AB 100yr	EX 6.1&6.3	2.55	80.40	80.92	0.52	80.89	81.07	0.015461	1.71			4.26	0.93
wc6.1	915.3637	AB 100yr	FUT2ndary	2.55	80.40	80.92	0.52	80.89	81.07	0.015461	1.71			4.26	0.93
wc6.1	860.6113	AB 100yr	EX 6.1&6.3	2.55	79.87	80.53	0.66	80.33	80.59	0.005004	1.17			4.63	0.54
wc6.1	860.6113	AB 100yr	FUT2ndary	2.55	79.87	80.53	0.66	80.33	80.59	0.005004	1.17			4.63	0.54

HEC-RAS Profile: AB 100yr

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Max Chl Dpth	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Vel Left	Vel Right	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m/s)	(m/s)	(m)	
wc5	2388.964	AB 100yr	FUT 5&6	6.90	92.94	94.05	1.11	93.73	94.07	0.000937	0.75	0.22	0.18	40.89	0.27
wc5	2388.964	AB 100yr	FUT 5&6cha impro	6.90	92.94	94.05	1.11	93.73	94.07	0.000937	0.75	0.22	0.18	40.89	0.27
wc5	2290	AB 100yr	FUT 5&6	6.90	92.11	93.93	1.82		93.96	0.000648	0.72	0.07	0.02	14.42	0.22
wc5	2290	AB 100yr	FUT 5&6cha impro	6.90	92.11	93.93	1.82		93.96	0.000648	0.72	0.07	0.02	14.42	0.22
wc5	2256	AB 100yr	FUT 5&6	6.90	91.88	93.67	1.79	93.67	93.88	0.010325	2.14	0.32	0.38	17.47	0.80
wc5	2256	AB 100yr	FUT 5&6cha impro	6.90	91.88	93.67	1.79	93.67	93.88	0.010325	2.14	0.32	0.38	17.47	0.80
wc5	2240.61			Culvert											
wc5	2221	AB 100yr	FUT 5&6	6.90	91.59	93.10	1.50	93.10	93.84	0.010886	3.83			7.13	1.00
wc5	2221	AB 100yr	FUT 5&6cha impro	6.90	91.59	93.10	1.50	93.10	93.84	0.010886	3.83			7.13	1.00
wc5	2198	AB 100yr	FUT 5&6	6.90	91.41	92.44	1.03		92.62	0.008243	1.88	0.07	0.07	6.05	0.73
wc5	2198	AB 100yr	FUT 5&6cha impro	6.90	91.41	92.44	1.03		92.62	0.008243	1.88	0.07	0.07	6.05	0.73
wc5	2150	AB 100yr	FUT 5&6	6.90	91.07	92.20	1.13		92.34	0.005114	1.62	0.15	0.15	7.68	0.59
wc5	2150	AB 100yr	FUT 5&6cha impro	6.90	91.07	92.20	1.13		92.34	0.005114	1.62	0.15	0.15	7.68	0.59
wc5	2068.437	AB 100yr	FUT 5&6	6.90	90.36	91.32	0.96	91.30	91.64	0.016028	2.52	0.05		4.43	0.96
wc5	2068.437	AB 100yr	FUT 5&6cha impro	6.90	90.36	91.32	0.96	91.30	91.64	0.016028	2.52	0.05		4.43	0.96
wc5	2044.707	AB 100yr	FUT 5&6	6.90	89.83	90.93	1.10		91.08	0.005883	1.70	0.13	0.13	7.34	0.63
wc5	2044.707	AB 100yr	FUT 5&6cha impro	6.90	89.83	90.93	1.10		91.08	0.005883	1.70	0.13	0.13	7.34	0.63
wc5	1986.134	AB 100yr	FUT 5&6	7.62	89.59	90.52	0.93	90.52	90.82	0.016119	2.44			5.22	1.01
wc5	1986.134	AB 100yr	FUT 5&6cha impro	7.62	89.59	90.52	0.93	90.52	90.82	0.016119	2.44			5.22	1.01
wc5	1901.030	AB 100yr	FUT 5&6	7.62	88.78	90.07	1.29		90.18	0.003285	1.47	0.25	0.29	8.19	0.49
wc5	1901.030	AB 100yr	FUT 5&6cha impro	7.62	88.78	90.07	1.29		90.18	0.003285	1.47	0.25	0.29	8.19	0.49
wc5	1874.583	AB 100yr	FUT 5&6	7.62	88.53	89.68	1.15	89.63	90.00	0.014431	2.51			4.07	0.93
wc5	1874.583	AB 100yr	FUT 5&6cha impro	7.62	88.53	89.68	1.15	89.63	90.00	0.014431	2.51			4.07	0.93
wc5	1845.237	AB 100yr	FUT 5&6	7.62	88.39	89.57	1.18		89.71	0.004980	1.67	0.16	0.31	8.55	0.59
wc5	1845.237	AB 100yr	FUT 5&6cha impro	7.62	88.39	89.57	1.18		89.71	0.004980	1.67	0.16	0.31	8.55	0.59
wc5	1801.453	AB 100yr	FUT 5&6	7.62	88.17	89.35	1.18		89.49	0.005017	1.67	0.10	0.23	10.49	0.59
wc5	1801.453	AB 100yr	FUT 5&6cha impro	7.62	88.17	89.35	1.18		89.49	0.005017	1.67	0.10	0.23	10.49	0.59
wc5	1693.967	AB 100yr	FUT 5&6	7.62	87.76	88.98	1.22		89.11	0.004319	1.60	0.26	0.27	7.20	0.55
wc5	1693.967	AB 100yr	FUT 5&6cha impro	7.62	87.76	88.98	1.22		89.11	0.004319	1.60	0.26	0.27	7.20	0.55
wc5	1602.883	AB 100yr	FUT 5&6	8.31	87.17	88.33	1.16	88.14	88.50	0.006231	1.84	0.18	0.26	21.29	0.66
wc5	1602.883	AB 100yr	FUT 5&6cha impro	8.31	87.17	88.33	1.16	88.14	88.50	0.006231	1.84	0.18	0.26	21.29	0.66
wc5	1537.467	AB 100yr	FUT 5&6	8.31	86.84	87.96	1.12	87.96	88.09	0.005965	1.73	0.32	0.27	43.42	0.64
wc5	1537.467	AB 100yr	FUT 5&6cha impro	8.31	86.84	87.96	1.12	87.96	88.09	0.005965	1.73	0.32	0.27	43.42	0.64
wc5	1471.795	AB 100yr	FUT 5&6	8.31	86.50	87.53	1.04		87.62	0.005270	1.68	0.35	0.53	34.28	0.60
wc5	1471.795	AB 100yr	FUT 5&6cha impro	8.31	86.50	87.53	1.04		87.62	0.005270	1.68	0.35	0.53	34.28	0.60
wc5	1439.675	AB 100yr	FUT 5&6	8.31	86.27	87.43	1.16	87.32	87.49	0.003141	1.30	0.18	0.35	43.20	0.47
wc5	1439.675	AB 100yr	FUT 5&6cha impro	8.31	86.27	87.43	1.16	87.32	87.49	0.003141	1.30	0.18	0.35	43.20	0.47
wc5	1320.692	AB 100yr	FUT 5&6	8.82	85.57	87.23	1.66		87.30	0.001301	1.16	0.50	0.31	10.53	0.33
wc5	1320.692	AB 100yr	FUT 5&6cha impro	8.82	85.57	87.23	1.66		87.30	0.001301	1.16	0.50	0.31	10.53	0.33
wc5	1316.508	AB 100yr	FUT 5&6	8.82	85.38	87.07	1.69	86.43	87.25	0.002404	1.84			14.78	0.47
wc5	1316.508	AB 100yr	FUT 5&6cha impro	8.82	85.38	87.07	1.69	86.43	87.25	0.002404	1.84			14.78	0.47
wc5	1307.50			Culvert											
wc5	1291.617	AB 100yr	FUT 5&6	8.82	85.19	86.27	1.08	86.27	86.77	0.013068	3.15			5.71	1.01
wc5	1291.617	AB 100yr	FUT 5&6cha impro	8.82	85.19	86.27	1.08	86.27	86.77	0.013068	3.15			5.71	1.01
wc5	1288.054	AB 100yr	FUT 5&6	8.82	85.00	86.17	1.17		86.37	0.007273	1.99	0.24	0.10	5.63	0.71
wc5	1288.054	AB 100yr	FUT 5&6cha impro	8.82	85.00	86.17	1.17		86.37	0.007273	1.99	0.24	0.10	5.63	0.71
wc5	1225.493	AB 100yr	FUT 5&6	8.82	84.72	85.86	1.14		86.08	0.006091	2.06	0.32	0.32	6.07	0.74
wc5	1225.493	AB 100yr	FUT 5&6cha impro	8.82	84.72	85.86	1.14		86.08	0.006091	2.06	0.32	0.32	6.07	0.74
wc5	1157.883	AB 100yr	FUT 5&6	8.82	84.21	85.43	1.22		85.61	0.005768	1.86	0.39	0.30	6.84	0.64
wc5	1157.883	AB 100yr	FUT 5&6cha impro	8.82	84.21	85.43	1.22		85.61	0.005768	1.86	0.39	0.30	6.84	0.64
wc5	1131.031	AB 100yr	FUT 5&6	9.58	84.01	85.22	1.21		85.43	0.007048	2.04	0.40	0.41	7.39	0.71
wc5	1131.031	AB 100yr	FUT 5&6cha impro	9.58	84.01	85.22	1.21		85.43	0.007048	2.04	0.40	0.41	7.39	0.71
wc5	1112.568	AB 100yr	FUT 5&6	9.58	83.68	85.08	1.20	84.92	85.30	0.007488	2.08	0.40	0.39	5.72	0.72
wc5	1112.568	AB 100yr	FUT 5&6cha impro	9.58	83.68	85.08	1.20	84.92	85.30	0.007487	2.08	0.40	0.39	6.72	0.72
wc5	1071.480	AB 100yr	FUT 5&6	9.58	83.57	84.77	1.20		84.99	0.007443	2.07	0.25	0.39	6.07	0.72
wc5	1071.480	AB 100yr	FUT 5&6cha impro	9.58	83.57	84.77	1.20		84.99	0.007441	2.07	0.25	0.39	6.07	0.72
wc5	1034.499	AB 100yr	FUT 5&6	9.58	83.29	84.51	1.22	84.33	84.72	0.006990	2.04	0.27	0.36	5.90	0.70
wc5	1034.499	AB 100yr	FUT 5&6cha impro	9.58	83.29	84.51	1.22	84.33	84.72	0.006971	2.03	0.27	0.36	5.90	0.70
wc5	1013.774	AB 100yr	FUT 5&6	9.58	83.14	84.38	1.24	84.18	84.58	0.006310	1.97	0.42	0.41	7.30	0.67
wc5	1013.774	AB 100yr	FUT 5&6cha impro	9.58	83.14	84.38	1.24	84.18	84.58	0.006268	1.96	0.42	0.41	7.32	0.67
wc5	951.8970	AB 100yr	FUT 5&6	10.30	82.62	83.88	1.26	83.74	84.12	0.006394	2.17	0.18	0.36	10.69	0.76
wc5	951.8970	AB 100yr	FUT 5&6cha impro	10.30	82.62	83.88	1.26	83.74	84.12	0.006512	2.18	0.18	0.35	10.54	0.76
wc5	942.6887	AB 100yr	FUT 5&6	10.30	82.59	83.66	1.07	83.65	84.04	0.014219	2.74			6.94	0.99
wc5	942.6887	AB 100yr	FUT 5&6cha impro	10.30	82.59	83.66	1.07	83.65	84.04	0.014219	2.74			6.94	0.99
wc5	907.1887			Culvert											
wc5	931	AB 100yr	FUT 5&6	10.30	82.47	83.54	1.07	83.54	83.93	0.014649	2.77			8.40	1.00
wc5	931	AB 100yr	FUT 5&6cha impro	10.30	82.47	83.54	1.07	83.54	83.93	0.014649	2.77			8.40	1.00

HEC-RAS Profile: AB 100yr (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Max Chl Dpth	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Vel Left	Vel Right	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m/s)	(m/s)	(m)	
wc5	918.3739	AB 100yr	FUT 5&6	10.30	82.41	83.57	1.16	83.57	83.58	0.000998	0.66	0.32		91.55	0.26
wc5	918.3739	AB 100yr	FUT 5&6cha impro	10.30	82.41	83.39	0.98	83.18	83.55	0.006165	1.76			7.92	0.66
wc5	815.3577	AB 100yr	FUT 5&6	10.30	81.85	83.14	4.55	82.95	83.32	0.007927	1.89			7.89	0.73
wc5	815.3577	AB 100yr	FUT 5&6cha impro	10.30	81.85	83.15	4.57	82.62	83.23	0.002094	1.20			9.21	0.40
wc5	680.8133	AB 100yr	FUT 5&6	11.00	81.64	83.27	1.63	82.75	83.27	0.000011	0.10	0.07	0.02	155.48	0.03
wc5	680.8133	AB 100yr	FUT 5&6cha impro	11.00	81.64	83.20	1.56	82.44	83.20	0.000010	0.09	0.07	0.01	159.33	0.03
wc5	678.6898	AB 100yr	FUT 5&6	11.00	81.55	83.27	1.72	82.66	83.27	0.000013	0.12	0.07	0.01	154.40	0.03
wc5	678.6898	AB 100yr	FUT 5&6cha impro	11.00	81.55	83.20	1.65	82.35	83.20	0.000011	0.11	0.08	0.02	157.24	0.03
wc5	665	AB 100yr	FUT 5&6	11.00	81.40	83.26	1.87	82.68	83.26	0.000044	0.21	0.06	0.10	178.40	0.06
wc5	665	AB 100yr	FUT 5&6cha impro	11.00	81.40	83.20	1.80	82.19	83.20	0.000044	0.23	0.06	0.10	184.00	0.06
wc5	660	AB 100yr	FUT 5&6	11.00	81.32	82.71	1.39	82.71	83.21	0.015284	3.13			5.32	1.00
wc5	660	AB 100yr	FUT 5&6cha impro	11.00	81.32	83.06	1.74	82.24	83.19	0.001475	1.58			12.23	0.38
wc5	655			Culvert											
wc5	651.8919	AB 100yr	FUT 5&6	11.00	80.93	82.07	1.14	82.07	82.56	0.013221	3.11			13.58	1.00
wc5	651.8919	AB 100yr	FUT 5&6cha impro	11.00	80.93	82.07	1.14	82.07	82.56	0.013221	3.11			13.58	1.00
wc5	648.3854	AB 100yr	FUT 5&6	11.00	80.78	81.93	1.15	81.93	81.93	0.000165	0.30	0.12	0.05	231.21	0.11
wc5	648.3854	AB 100yr	FUT 5&6cha impro	11.00	80.78	81.93	1.15	81.93	81.93	0.000165	0.30	0.12	0.05	231.21	0.11
wc5	553.6066	AB 100yr	FUT 5&6	11.00	80.14	81.80	1.66	81.18	81.81	0.000363	0.50	0.10	0.16	151.81	0.17
wc5	553.6066	AB 100yr	FUT 5&6cha impro	11.00	80.14	81.79	1.64	81.18	81.82	0.001011	0.82	0.16	0.07	150.56	0.28
wc5	521.5115	AB 100yr	FUT 5&6	11.00	80.04	81.81	1.77	81.16	81.81	0.000027	0.18	0.07	0.06	239.06	0.05
wc5	521.5115	AB 100yr	FUT 5&6cha impro	11.00	80.04	81.81	1.77	81.16	81.81	0.000027	0.18	0.07	0.06	239.06	0.05
wc5	518.7136	AB 100yr	FUT 5&6	11.90	79.98	81.49	1.51	81.17	81.78	0.005135	2.36			24.49	0.65
wc5	518.7136	AB 100yr	FUT 5&6cha impro	11.90	79.98	81.49	1.51	81.17	81.78	0.005135	2.36			24.49	0.65
wc5	503.04			Culvert											
wc5	487.5449	AB 100yr	FUT 5&6	11.90	79.68	80.79	1.11	80.79	81.29	0.012768	3.14			13.47	1.00
wc5	487.5449	AB 100yr	FUT 5&6cha impro	11.90	79.68	80.79	1.11	80.79	81.29	0.012768	3.14			13.47	1.00
wc5	484.1846	AB 100yr	FUT 5&6	11.90	79.63	80.85	1.22	80.71	80.90	0.002198	1.20	0.39	0.17	54.05	0.41
wc5	484.1846	AB 100yr	FUT 5&6cha impro	11.90	79.63	80.98	1.33	80.71	80.98	0.001085	0.91	0.32	0.11	64.32	0.29
wc5	381.2556	AB 100yr	FUT 5&6	11.90	79.11	80.69	1.58	80.25	80.75	0.001689	1.27	0.23	0.26	72.79	0.37
wc5	381.2556	AB 100yr	FUT 5&6cha impro	11.90	79.11	80.66	1.55	80.25	80.83	0.003557	1.81	0.31	0.23	71.55	0.53
wc5	359.8282	AB 100yr	FUT 5&6	11.90	78.85	80.25	1.41	80.15	80.58	0.010931	2.53	0.28	0.07	7.44	0.85
wc5	359.8282	AB 100yr	FUT 5&6cha impro	11.90	78.85	80.25	1.41	80.15	80.58	0.010943	2.53	0.28	0.07	7.41	0.85
wc5	304.0528	AB 100yr	FUT 5&6	11.90	78.22	79.55	1.33	79.55	79.83	0.011095	2.46	0.94	0.39	11.29	0.88
wc5	304.0528	AB 100yr	FUT 5&6cha impro	11.90	78.22	79.55	1.33	79.55	79.83	0.011095	2.46	0.94	0.39	11.29	0.88
wc5	250	AB 100yr	FUT 5&6	11.90	77.55	78.75	1.20		78.97	0.008832	2.10			7.78	0.79
wc5	250	AB 100yr	FUT 5&6cha impro	11.90	77.55	78.62	1.07	78.62	78.95	0.014849	2.53			7.21	1.00
wc5	230	AB 100yr	FUT 5&6	11.90	76.75	78.80	2.05	77.88	78.89	0.001068	1.32			26.00	0.32
wc5	230	AB 100yr	FUT 5&6cha impro	11.90	76.75	78.66	1.91	77.88	78.77	0.001402	1.43			18.23	0.36
wc5	215			Culvert											
wc5	200	AB 100yr	FUT 5&6	11.90	76.48	78.45	1.97		78.55	0.001248	1.38			13.05	0.34
wc5	200	AB 100yr	FUT 5&6cha impro	11.90	76.48	78.33	1.85		78.44	0.001618	1.50			12.26	0.39
wc5	170	AB 100yr	FUT 5&6	11.90	76.48	78.49	2.00	77.43	78.51	0.000299	0.67	0.26	0.28	18.00	0.17
wc5	170	AB 100yr	FUT 5&6cha impro	11.90	76.48	78.37	1.88	77.43	78.39	0.000401	0.73	0.28	0.30	17.64	0.19
wc6	2457.382	AB 100yr	FUT 5&6	7.98	91.31	92.50	1.19	92.43	92.88	0.010594	2.81	0.60	0.61	4.13	0.86
wc6	2457.382	AB 100yr	FUT 5&6cha impro	7.98	91.31	92.50	1.19	92.43	92.88	0.010594	2.81	0.60	0.61	4.13	0.86
wc6	2408.649	AB 100yr	FUT 5&6	7.98	91.02	92.27	1.25	92.12	92.45	0.005491	2.10	0.77	0.83	9.30	0.62
wc6	2408.649	AB 100yr	FUT 5&6cha impro	7.98	91.02	92.27	1.25	92.12	92.45	0.005491	2.10	0.77	0.83	9.30	0.62
wc6	2359.898	AB 100yr	FUT 5&6	7.98	90.74	91.79	1.05	91.79	92.07	0.011026	2.52	0.96	0.96	7.77	0.86
wc6	2359.898	AB 100yr	FUT 5&6cha impro	7.98	90.74	91.79	1.05	91.79	92.07	0.011026	2.52	0.96	0.96	7.77	0.86
wc6	2308.859	AB 100yr	FUT 5&6	7.98	90.44	91.22	0.79		91.29	0.002659	1.10	0.13		11.91	0.43
wc6	2308.859	AB 100yr	FUT 5&6cha impro	7.98	90.44	91.22	0.79		91.29	0.002659	1.10	0.13		11.91	0.43
wc6	2232.182	AB 100yr	FUT 5&6	7.98	90.33	90.83	0.50		90.93	0.010009	1.44	0.33	0.29	28.55	0.77
wc6	2232.182	AB 100yr	FUT 5&6cha impro	7.98	90.33	90.83	0.50		90.93	0.010009	1.44	0.33	0.29	28.55	0.77
wc6	2193.265	AB 100yr	FUT 5&6	7.98	89.88	90.55	0.67	90.49	90.60	0.006848	1.39		0.43	48.93	0.65
wc6	2193.265	AB 100yr	FUT 5&6cha impro	7.98	89.88	90.55	0.67	90.49	90.60	0.006848	1.39		0.43	48.93	0.65
wc6	2135.859	AB 100yr	FUT 5&6	7.98	89.59	90.47	0.88	90.24	90.48	0.000856	0.64	0.15	0.22	90.97	0.23
wc6	2135.859	AB 100yr	FUT 5&6cha impro	7.98	89.59	90.47	0.88	90.24	90.48	0.000856	0.64	0.15	0.22	90.97	0.23
wc6	2096.869	AB 100yr	FUT 5&6	8.50	89.40	90.24	0.84	90.24	90.38	0.012657	2.30	0.74	0.56	25.04	0.89
wc6	2096.869	AB 100yr	FUT 5&6cha impro	8.50	89.40	90.24	0.84	90.24	90.38	0.012657	2.30	0.74	0.56	25.04	0.89
wc6	2000	AB 100yr	FUT 5&6	8.50	88.47	89.54	1.07	89.54	89.66	0.005777	1.85	0.37	0.31	52.06	0.62
wc6	2000	AB 100yr	FUT 5&6cha impro	8.50	88.47	89.54	1.07	89.54	89.66	0.005777	1.85	0.37	0.31	52.06	0.62
wc6	1893.020	AB 100yr	FUT 5&6	8.50	87.07	88.07	1.00	88.07	88.18	0.008299	1.79	0.51	0.21	35.21	0.70
wc6	1893.020	AB 100yr	FUT 5&6cha impro	8.50	87.07	88.07	1.00	88.07	88.18	0.008299	1.79	0.51	0.21	35.21	0.70
wc6	1785.033	AB 100yr	FUT 5&6	8.50	86.31	87.43	1.12		87.52	0.005276	1.45	0.25	0.26	61.53	0.58
wc6	1785.033	AB 100yr	FUT 5&6cha impro	8.50	86.31	87.43	1.12		87.52	0.005276	1.45	0.25	0.26	61.53	0.58
wc6	1657.344	AB 100yr	FUT 5&6	8.50	85.34	86.66	1.52	86.36	87.01	0.003006	1.75	0.29	0.19	14.05	0.47

HEC-RAS Profile: AB 100yr (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Max Chl Dpth	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Vel Left	Vel Right	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m/s)	(m/s)	(m)	
wc6	1657.344	AB 100yr	FUT 5&6cha impro	8.50	85.34	86.86	1.52	86.36	87.01	0.003006	1.75	0.29	0.19	14.05	0.47
wc6	1611.292	AB 100yr	FUT 5&6	9.20	84.99	86.77	1.78		86.90	0.002018	1.60	0.25	0.26	6.78	0.40
wc6	1611.292	AB 100yr	FUT 5&6cha impro	9.20	84.99	86.77	1.78		86.90	0.002018	1.60	0.25	0.26	6.78	0.40
wc6	1608.895	AB 100yr	FUT 5&6	9.20	84.96	86.67	1.71	86.12	86.88	0.004557	2.03	0.22	0.34	12.87	0.58
wc6	1608.895	AB 100yr	FUT 5&6cha impro	9.20	84.96	86.67	1.71	86.12	86.88	0.004557	2.03	0.22	0.34	12.87	0.58
wc6	1598.12			Culvert											
wc6	1587.120	AB 100yr	FUT 5&6	9.20	84.79	85.95	1.16	85.95	86.52	0.012571	3.35			44.13	1.00
wc6	1587.120	AB 100yr	FUT 5&6cha impro	9.20	84.79	85.95	1.16	85.95	86.52	0.012571	3.35			44.13	1.00
wc6	1584.698	AB 100yr	FUT 5&6	9.20	84.73	85.90	1.17	85.90	86.04	0.005384	1.92	0.62	0.39	39.37	0.61
wc6	1584.698	AB 100yr	FUT 5&6cha impro	9.20	84.73	85.90	1.17	85.90	86.04	0.005384	1.92	0.62	0.39	39.37	0.61
wc6	1501.817	AB 100yr	FUT 5&6	9.20	84.11	85.44	1.33	85.11	85.48	0.001689	1.04	0.36	0.12	47.69	0.35
wc6	1501.817	AB 100yr	FUT 5&6cha impro	9.20	84.11	85.44	1.33	85.11	85.48	0.001692	1.04	0.36	0.12	47.66	0.35
wc6	1414.879	AB 100yr	FUT 5&6	9.20	83.78	85.07	1.29	84.78	85.24	0.004878	1.83	0.17	0.35	16.23	0.59
wc6	1414.879	AB 100yr	FUT 5&6cha impro	9.20	83.78	85.06	1.28	84.78	85.23	0.004944	1.84	0.16	0.35	15.86	0.59
wc6	1334.030	AB 100yr	FUT 5&6	9.20	83.47	84.77	1.30	84.47	84.88	0.003644	1.59	0.36	0.25	32.91	0.51
wc6	1334.030	AB 100yr	FUT 5&6cha impro	9.20	83.47	84.78	1.31	84.47	84.88	0.003446	1.56	0.36	0.24	33.86	0.50
wc6	1037.318	AB 100yr	FUT 5&6	9.20	82.35	83.80	1.45	83.35	83.92	0.002874	1.56	0.42	0.43	7.56	0.46
wc6	1037.318	AB 100yr	FUT 5&6cha impro	9.20	82.35	83.77	1.42	83.35	83.90	0.003190	1.61	0.42	0.43	7.37	0.49
wc6	947.3374	AB 100yr	FUT 5&6	8.79	82.01	83.53	1.53	83.14	83.64	0.003367	1.47		0.33	14.56	0.45
wc6	947.3374	AB 100yr	FUT 5&6cha impro	8.24	82.01	83.45	1.44	83.10	83.57	0.004199	1.55		0.24	14.10	0.54
wc6	940	AB 100yr	FUT 5&6	8.79	81.96	83.43	1.47	82.94	83.61	0.003171	1.88			40.76	0.51
wc6	940	AB 100yr	FUT 5&6cha impro	8.24	81.96	83.37	1.41	82.90	83.54	0.003230	1.85			25.11	0.51
wc6	939.548			Culvert											
wc6	910.4732	AB 100yr	FUT 5&6	8.79	81.74	82.90	1.16	82.72	83.21	0.007676	2.49			48.98	0.77
wc6	910.4732	AB 100yr	FUT 5&6cha impro	8.24	81.74	82.87	1.13	82.68	83.16	0.007230	2.38			40.71	0.74
wc6	900	AB 100yr	FUT 5&6	8.79	81.67	82.92	1.25	82.64	83.07	0.004625	1.74	0.24	0.32	18.42	0.57
wc6	900	AB 100yr	FUT 5&6cha impro	8.24	81.67	82.89	1.22	82.61	83.03	0.004708	1.72	0.21	0.31	15.16	0.57
wc6	801.4135	AB 100yr	FUT 5&6	8.79	80.95	81.93	0.98	81.93	82.27	0.015962	2.60			4.93	1.00
wc6	801.4135	AB 100yr	FUT 5&6cha impro	8.24	80.95	81.89	0.94	81.89	82.23	0.015981	2.56			4.83	1.00
wc6	730.3979	AB 100yr	FUT 5&6	8.79	80.43	81.21	0.78	81.01	81.21	0.000037	0.12	0.08		201.39	0.05
wc6	730.3979	AB 100yr	FUT 5&6cha impro	8.24	80.43	81.11	0.68	81.01	81.11	0.000063	0.13	0.09		198.90	0.06
wc6	634.0483	AB 100yr	FUT 5&6	8.79	79.73	81.20	1.47	80.71	81.21	0.000111	0.31	0.09	0.07	244.59	0.09
wc6	634.0483	AB 100yr	FUT 5&6cha impro	7.76	79.73	80.93	1.20	80.64	81.07	0.004594	1.68	0.22	0.26	14.97	0.56
wc6	586.5527	AB 100yr	FUT 5&6	8.79	79.39	81.16	1.78	80.49	81.19	0.000861	0.88	0.24	0.29	43.46	0.25
wc6	586.5527	AB 100yr	FUT 5&6cha impro	7.43	79.39	80.61	1.22	80.39	80.80	0.007529	1.93			4.82	0.69
wc6	564.4214	AB 100yr	FUT 5&6	8.79	79.36	81.07	1.71	80.32	81.17	0.001524	1.38			26.75	0.36
wc6	564.4214	AB 100yr	FUT 5&6cha impro	5.76	79.36	80.62	1.26	80.13	80.71	0.002103	1.28			23.83	0.40
wc6	549.12			Culvert											
wc6	535.9677	AB 100yr	FUT 5&6	8.79	79.30	80.71	1.41	80.27	80.86	0.003328	1.74			69.21	0.51
wc6	535.9677	AB 100yr	FUT 5&6cha impro	5.76	79.30	80.50	1.20	80.07	80.60	0.002692	1.38			13.01	0.44
wc6	533.8168	AB 100yr	FUT 5&6	8.79	79.29	80.73	1.44	80.27	80.81	0.002107	1.33	0.25	0.28	28.96	0.40
wc6	533.8168	AB 100yr	FUT 5&6cha impro	5.76	79.29	80.50	1.21	80.06	80.57	0.002535	1.25	0.13	0.17	14.01	0.42
wc6	502.0329	AB 100yr	FUT 5&6	8.79	79.25	80.35	1.09	80.35	80.67	0.013565	2.56	0.65		6.62	0.94
wc6	502.0329	AB 100yr	FUT 5&6cha impro	5.76	79.25	80.12	0.87	80.12	80.41	0.015973	2.38	0.36		4.81	0.98
wc6	480	AB 100yr	FUT 5&6	8.79	78.69	80.19	1.50	79.51	80.21	0.000475	0.67	0.14	0.24	36.17	0.20
wc6	480	AB 100yr	FUT 5&6cha impro	5.76	78.69	79.75	1.06	79.39	79.79	0.001420	0.84	0.21	0.22	18.44	0.32
wc6	400	AB 100yr	FUT 5&6	8.79	78.36	80.18	1.80	79.29	80.17	0.000306	0.60	0.19	0.21	23.54	0.17
wc6	400	AB 100yr	FUT 5&6cha impro	5.76	78.36	79.66	1.30	79.15	79.68	0.000890	0.74	0.18	0.18	14.35	0.26
wc6	350	AB 100yr	FUT 5&6	8.79	78.63	80.15	1.52	79.10	80.15	0.000073	0.30	0.11	0.12	51.03	0.08
wc6	350	AB 100yr	FUT 5&6cha impro	5.76	78.63	79.62	0.99	79.02	79.63	0.000237	0.40	0.14	0.12	39.40	0.14
wc6	330	AB 100yr	FUT 5&6	8.79	78.44	80.04	1.60	79.29	80.14	0.001423	1.43			35.93	0.37
wc6	330	AB 100yr	FUT 5&6cha impro	5.76	78.44	79.51	1.07	79.10	79.62	0.002480	1.43			28.82	0.45
wc6	315			Culvert											
wc6	300	AB 100yr	FUT 5&6	8.79	77.99	79.45	1.46	78.96	79.60	0.003599	1.69			16.03	0.48
wc6	300	AB 100yr	FUT 5&6cha impro	5.76	77.99	79.25	1.26	78.77	79.34	0.001964	1.31			14.44	0.40
wc6	280	AB 100yr	FUT 5&6	8.79	77.96	79.50	1.55	78.76	79.52	0.000411	0.62	0.18	0.15	27.03	0.19
wc6	280	AB 100yr	FUT 5&6cha impro	5.76	77.96	79.28	1.32	78.64	79.29	0.000408	0.53	0.14	0.15	17.78	0.18
wc6	250	AB 100yr	FUT 5&6	8.79	77.87	79.42	1.55	78.87	79.47	0.001387	1.02	0.40	0.13	12.39	0.33
wc6	250	AB 100yr	FUT 5&6cha impro	5.76	77.87	79.21	1.34	78.71	79.25	0.001380	0.87	0.33		10.70	0.32
wc6	200	AB 100yr	FUT 5&6	8.79	77.71	79.15	1.44		79.20	0.002164	1.06		0.07	11.54	0.39
wc6	200	AB 100yr	FUT 5&6cha impro	5.76	77.71	78.91	1.21		78.96	0.002427	0.99			9.68	0.40
wc6	150	AB 100yr	FUT 5&6	8.79	77.17	78.65	1.48	78.31	78.78	0.003178	1.71	0.56	0.54	8.92	0.51
wc6	150	AB 100yr	FUT 5&6cha impro	5.76	77.17	78.49	1.32	78.12	78.57	0.002436	1.35	0.43	0.41	7.94	0.43
wc6	100	AB 100yr	FUT 5&6	8.79	76.83	78.47	1.64	77.85	78.51	0.001251	0.87			12.37	0.31
wc6	100	AB 100yr	FUT 5&6cha impro	5.76	76.83	78.37	1.55	77.69	78.39	0.000744	0.64			11.54	0.23
5&6combined	50	AB 100yr	FUT 5&6	23.90	76.42	78.07	1.65	78.07	78.51	0.013545	2.93	0.25		9.52	1.00

HEC-RAS Profile: AB 100yr (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Max Chl Dpth	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Vel Left	Vel Right	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m/s)	(m/s)	(m)	
5&6combined	50	AB 100yr	FUT 5&6cha impro	20.87	76.42	77.99	1.56	77.99	78.39	0.015876	2.83			8.99	1.00
5&6combined	40	AB 100yr	FUT 5&6	23.90	76.27	77.72	1.44	77.61	78.02	0.007614	2.47	0.90	0.57	13.58	0.78
5&6combined	40	AB 100yr	FUT 5&6cha impro	20.87	76.27	77.65	1.38	77.53	77.92	0.007395	2.33	0.82	0.48	13.03	0.76
5&6combined	30	AB 100yr	FUT 5&6	23.90	76.22	77.74	1.52	77.44	77.91	0.004213	1.82	0.22	0.74	16.06	0.58
5&6combined	30	AB 100yr	FUT 5&6cha impro	20.87	76.22	77.67	1.44	77.37	77.82	0.004250	1.73	0.11	0.69	15.39	0.58
5&6combined	20	AB 100yr	FUT 5&6	23.90	76.16	77.68	1.52	77.45	77.88	0.005004	2.00	0.79	0.42	15.93	0.64
5&6combined	20	AB 100yr	FUT 5&6cha impro	20.87	76.16	77.61	1.45	77.38	77.78	0.005006	1.90	0.72	0.35	15.31	0.63

Appendix F
CulvertMaster Output

Culvert Calculator Report
Watercourse 5 @ NSR

Comments: WATERCOURSE 5.0 - XING AT NORTH SERVICE ROAD

TW TAKEN AT SPILL POINT OF CHANNEL AT DOWNSTREAM END OF STRUCTURE

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	100.00	m	Headwater Depth/Height	1.93	
Computed Headwater Elev	79.29	m	Discharge	23.9000	m³/s
Inlet Control HW Elev.	78.75	m	Tailwater Elevation	78.75	m
Outlet Control HW Elev.	79.29	m	Control Type	Outlet Control	

Grades					
Upstream Invert	75.88	m	Downstream Invert	75.58	m
Length	38.10	m	Constructed Slope	0.007874	m/m

Hydraulic Profile					
Profile	PressureProfile		Depth, Downstream	3.17	m
Slope Type	N/A		Normal Depth	0.91	m
Flow Regime	N/A		Critical Depth	1.33	m
Velocity Downstream	2.72	m/s	Critical Slope	0.002660	m/m

Section					
Section Shape	Box		Mannings Coefficient	0.013	
Section Material	Concrete		Span	5.00	m
Section Size	5000x1760mm		Rise	1.76	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	79.29	m	Upstream Velocity Head	0.38	m
Ke	0.20		Entrance Loss	0.08	m

Inlet Control Properties					
Inlet Control HW Elev.	78.75	m	Flow Control	N/A	
Inlet Type	90° headwall w 45° bevels		Area Full	8.8	m²
K	0.49500		HDS 5 Chart	10	
M	0.66700		HDS 5 Scale	2	
C	0.03140		Equation Form	2	
Y	0.82000				

Culvert Calculator Report
Watercourse 6.1 @ QEW

Comments: WATERCOURSE 6.1- XING AT SSR, QEW, AND NSR
XING STRUCTURES DATA FROM CITY APPEAR TO INDICATE THAT A SINGLE CROSS CULVERT COVERS ALL THREE ROADWAYS

TW TAKEN AT DOWNSTREAM OBVERT OF STRUCTURE

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	100.00 m	Headwater Depth/Height	1.17
Computed Headwater Elev:	81.00 m	Discharge	2.5500 m³/s
Inlet Control HW Elev.	80.66 m	Tailwater Elevation	80.66 m
Outlet Control HW Elev.	81.00 m	Control Type	Outlet Control

Grades			
Upstream Invert	79.58 m	Downstream Invert	79.26 m
Length	93.70 m	Constructed Slope	0.003415 m/m

Hydraulic Profile			
Profile	PressureProfile	Depth, Downstream	1.40 m
Slope Type	N/A	Normal Depth	0.95 m
Flow Regime	N/A	Critical Depth	0.48 m
Velocity Downstream	0.86 m/s	Critical Slope	0.023888 m/m

Section			
Section Shape	Box	Mannings Coefficient	0.035
Section Material	Concrete	Span	2.44 m
Section Size	2440 x 1220 mm	Rise	1.22 m
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	81.00 m	Upstream Velocity Head	0.04 m
Ke	0.70	Entrance Loss	0.03 m

Inlet Control Properties			
Inlet Control HW Elev.	80.66 m	Flow Control	Unsubmerged
Inlet Type	0° wingwall flares	Area Full	3.0 m²
K	0.06100	HDS 5 Chart	8
M	0.75000	HDS 5 Scale	3
C	0.04230	Equation Form	1
Y	0.82000		

Culvert Calculator Report
Watercourse 6.3 @ QEW

Comments: WATERCOURSE 6.3 - XING AT QEW

TW TAKEN AT DOWNSTREAM OBV OF STRUCTURE

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	100.00 m	Headwater Depth/Height	0.70
Computed Headwater Elev:	80.08 m	Discharge	1.4300 m³/s
Inlet Control HW Elev.	79.89 m	Tailwater Elevation	79.79 m
Outlet Control HW Elev.	80.08 m	Control Type	Outlet Control

Grades			
Upstream Invert	79.22 m	Downstream Invert	78.59 m
Length	94.00 m	Constructed Slope	0.006702 m/m

Hydraulic Profile			
Profile	M1	Depth, Downstream	1.20 m
Slope Type	Mild	Normal Depth	0.64 m
Flow Regime	Subcritical	Critical Depth	0.40 m
Velocity Downstream	0.65 m/s	Critical Slope	0.026434 m/m

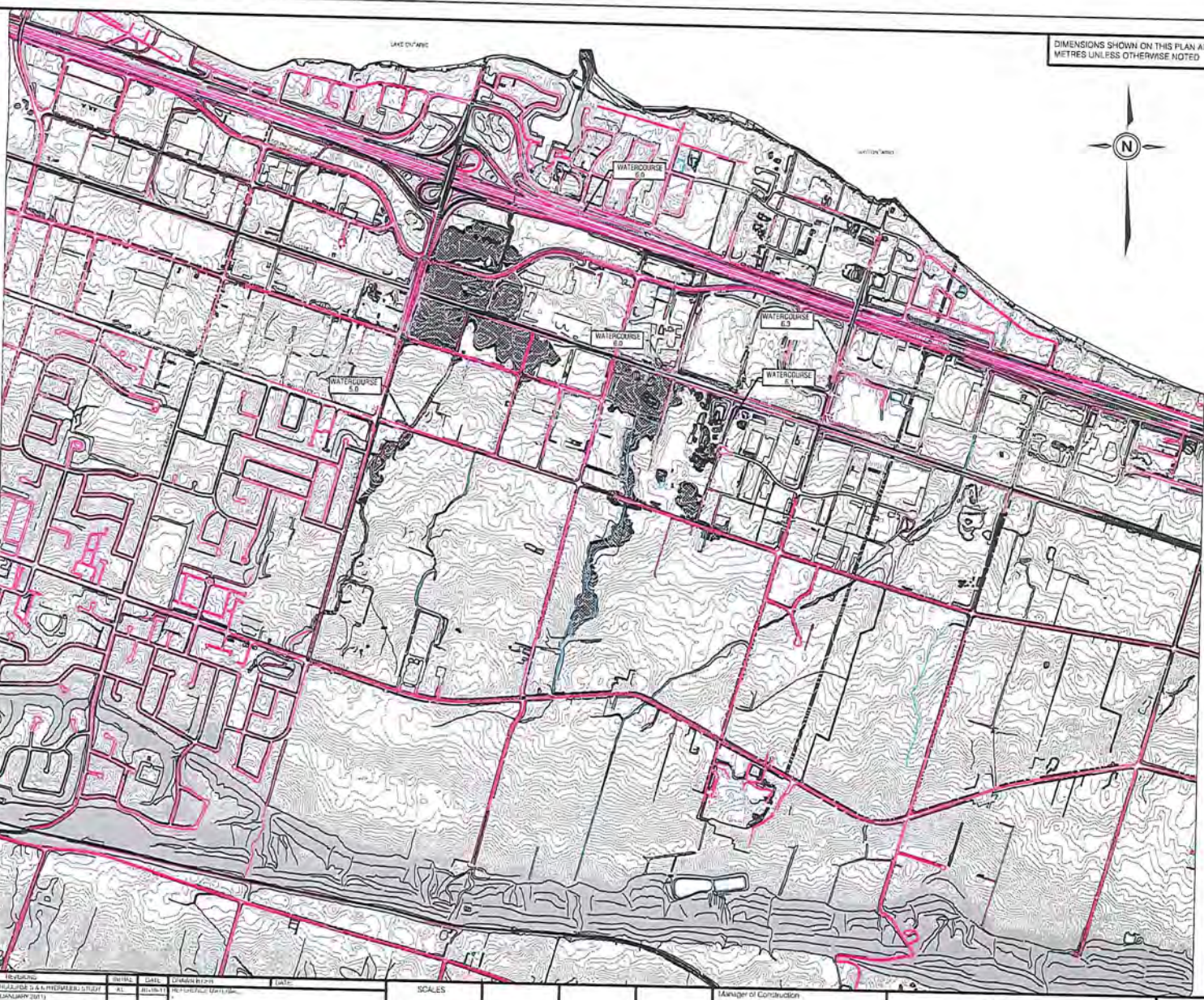
Section			
Section Shape	Box	Mannings Coefficient	0.035
Section Material	Concrete	Span	1.83 m
Section Size	1830 x 1220 mm	Rise	1.22 m
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	80.08 m	Upstream Velocity Head	0.05 m
Ke	0.70	Entrance Loss	0.04 m

Inlet Control Properties			
Inlet Control HW Elev.	79.89 m	Flow Control	Unsubmerged
Inlet Type	0° wingwall flares	Area Full	2.2 m²
K	0.06100	HDS 5 Chart	8
M	0.75000	HDS 5 Scale	3
C	0.04230	Equation Form	1
Y	0.82000		

Appendix G

Updated Floodplain Mapping, Dillon Consulting



DIMENSIONS SHOWN ON THIS PLAN ARE IN METRES UNLESS OTHERWISE NOTED

CONTRACT No.
DRAWING No. 00-P-00
FILE No.

SHEET No.
1 OF 13

No.	REVISIONS	INITIAL	DATE	DRAWN BY:	DATE:
1	ISSUED FOR WATERCOURSE 5 & 6 HYDRAULIC STUDY JANUARY 2011	AL	2011/01/11	REFERENCE DRAWINGS:	

SCALES
1:12000

Manager of Construction

Manager of Design

CITY OF **HAMILTON**
Public Works Department

Watercourse 5.0 & 6.0 Hydraulic Study
Overall Detail Mapping

00-P-00 (1)

Sheet No. 1 DTM 2007 (SITE PLAN).dgn 1/20/2011 3:00:14 PM

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FILE No.

SHEET No.
2 OF 15

SHEET INDEX

LEGEND:

- CROSS SECTION NUMBER
- 100 YEAR FLOOD ELEVATION
- CROSS SECTION LINE
- CONTOURS
- CULVERT
- 100 YEAR FLOODLINE
- POTENTIAL SPILL POINT
- INEFFECTIVE FLOW AREA
- WATERCOURSE / DITCH CENTRE LINE
- ISLAND (HIGH POINT)

No.	REVISIONS	INITIAL	DATE	DRAWN BY/CH	DATE
1	ISSUED FOR WATERCOURSE 5.0 & 6.0 HYDRAULIC STUDY JANUARY 2011	AC	01/19/11		

SCALES: 1 : 2000

Manager of Construction

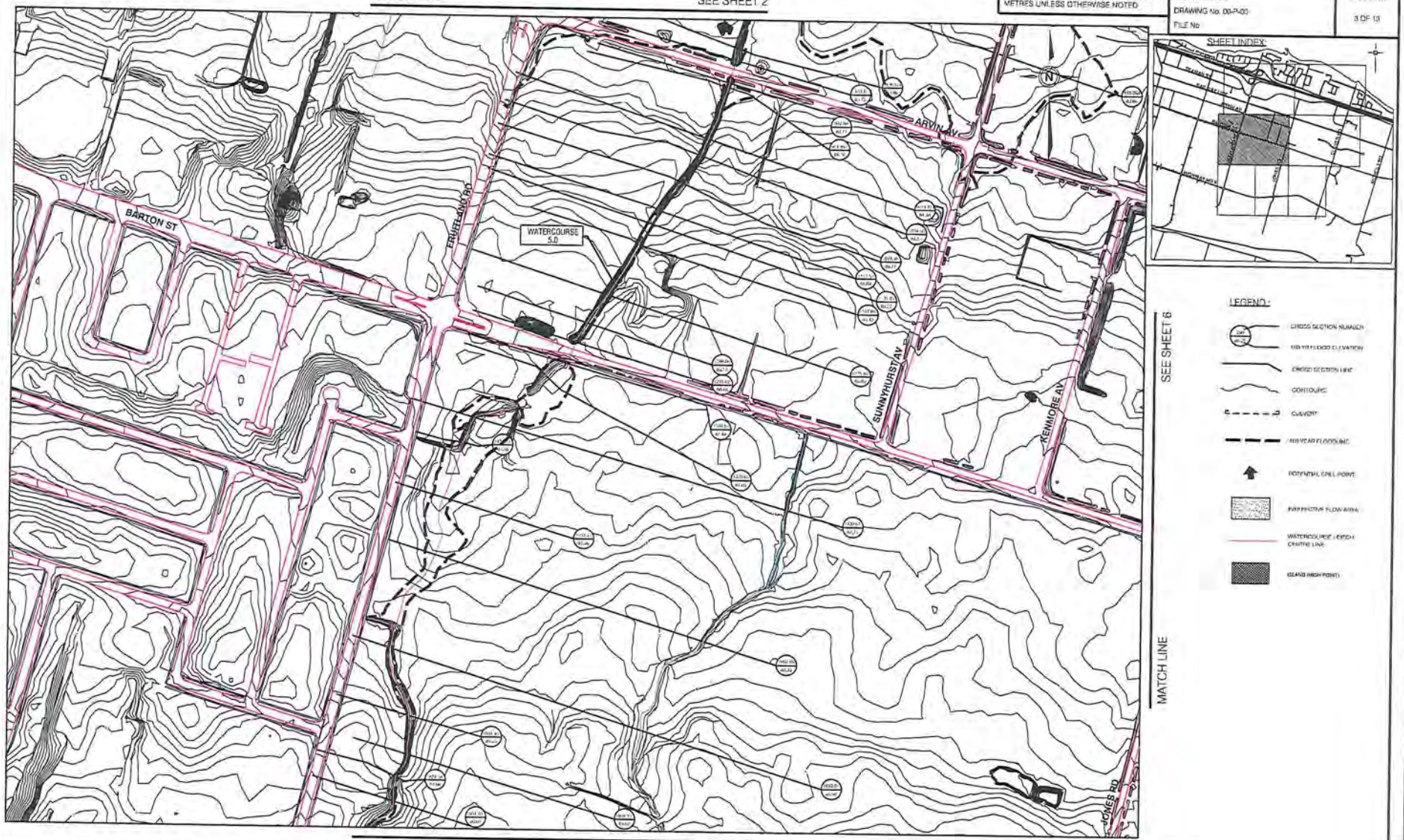
Manager of Design

CITY OF HAMILTON
Public Works Department

Watercourse 5.0 & 6.0 Hydraulic Study
Existing Floodplain Mapping (1)

00-P-00 (2)

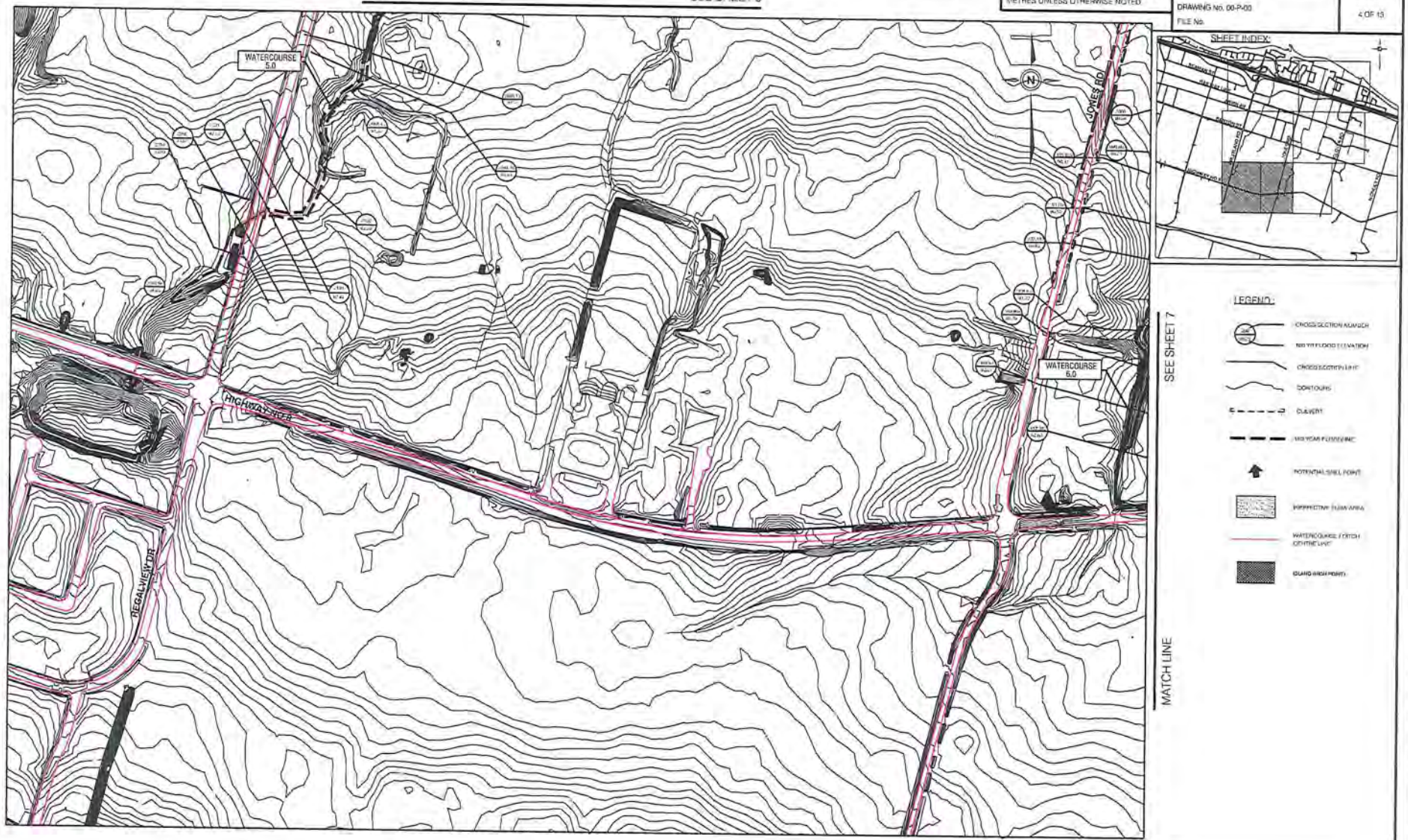
Sheet No. 2 DTM 2007.dgn 1/20/2011 2:59:14 PM



No.	REVISIONS	INITIAL	DATE	DRAWN BY:	DATE:	SCALES	Manager of Construction	CITY OF HAMILTON Public Works Department	Watercourse 5.0 & 6.0 Hydraulic Study Existing Floodplain Mapping (2)
A	ISSUED FOR WATERCOURSE 5.0 & 6.0 HYDRAULIC STUDY JANUARY 2011	KC	01/19/11	PETTYPIECE MECHANICAL		1 : 2000	Manager of Design		

00-P-00 (3)

Sheet No. 3 DTM 2007.dgn 1/20/2011 2:57:22 PM



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CONTRACT No.
DRAWING No. 00-P-00
FILE No.

SHEET No. 4 OF 13

No.	REVISIONS	INITIAL	DATE	Surveyed by (print)	DATE
1	EQUIPTON WATERCOURSE 5.0 HYDRAULIC STUDY JANUARY 2011	KL	09-11-11		

SCALES
1 : 2000

Manager of Construction

Manager of Design

CITY OF **HAMILTON**
Public Works Department

Watercourse 5.0 & 6.0 Hydraulic Study
Existing Floodplain Mapping (3)

00-P-00 (4)

Sheet No. 4 DTM 2007.dgn 1/20/2011 2:55:19 PM

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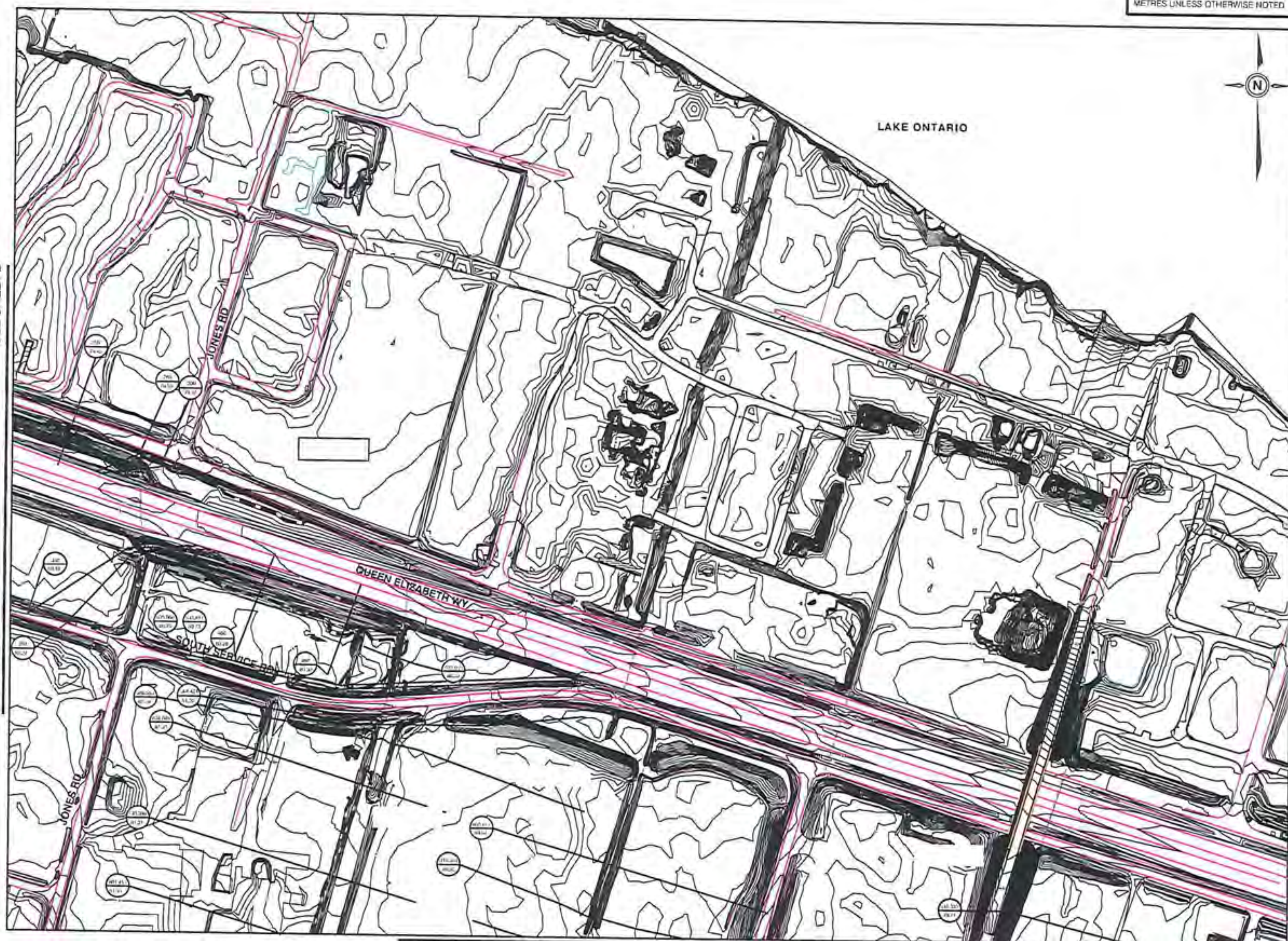
DRAWING No. 00-P-00
FILE No.

SHEET No.
5 OF 13



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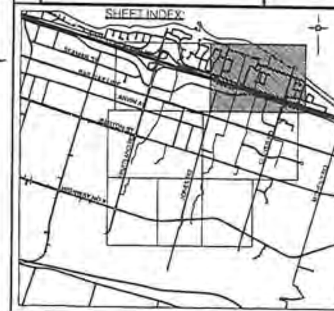


LEGEND:

- CROSS SECTION NUMBER / 100 YR FLOOD ELEVATION
- CROSS SECTION LINE
- CONTOURS
- CULVERT
- 100 YEAR FLOODLINE
- POTENTIAL SPILL POINT
- INEFFECTIVE FLOW AREA
- WATERCOURSE / DITCH CENTRE LINE
- (LAND HIGH POINT)

No.	REVISIONS	INITIAL	DATE
A	ISSUED FOR WATERCOURSE 5.0 & 6.0 HYDRAULIC STUDY (JANUARY 2011)		

DRAWN BY / DATE
SCALES
1:2000

Manager of Construction
Manager of Design

CITY OF HAMILTON
Public Works Department

Watercourse 5.0 & 6.0 Hydraulic Study
Existing Floodplain Mapping (4)

00-P-00 (5)

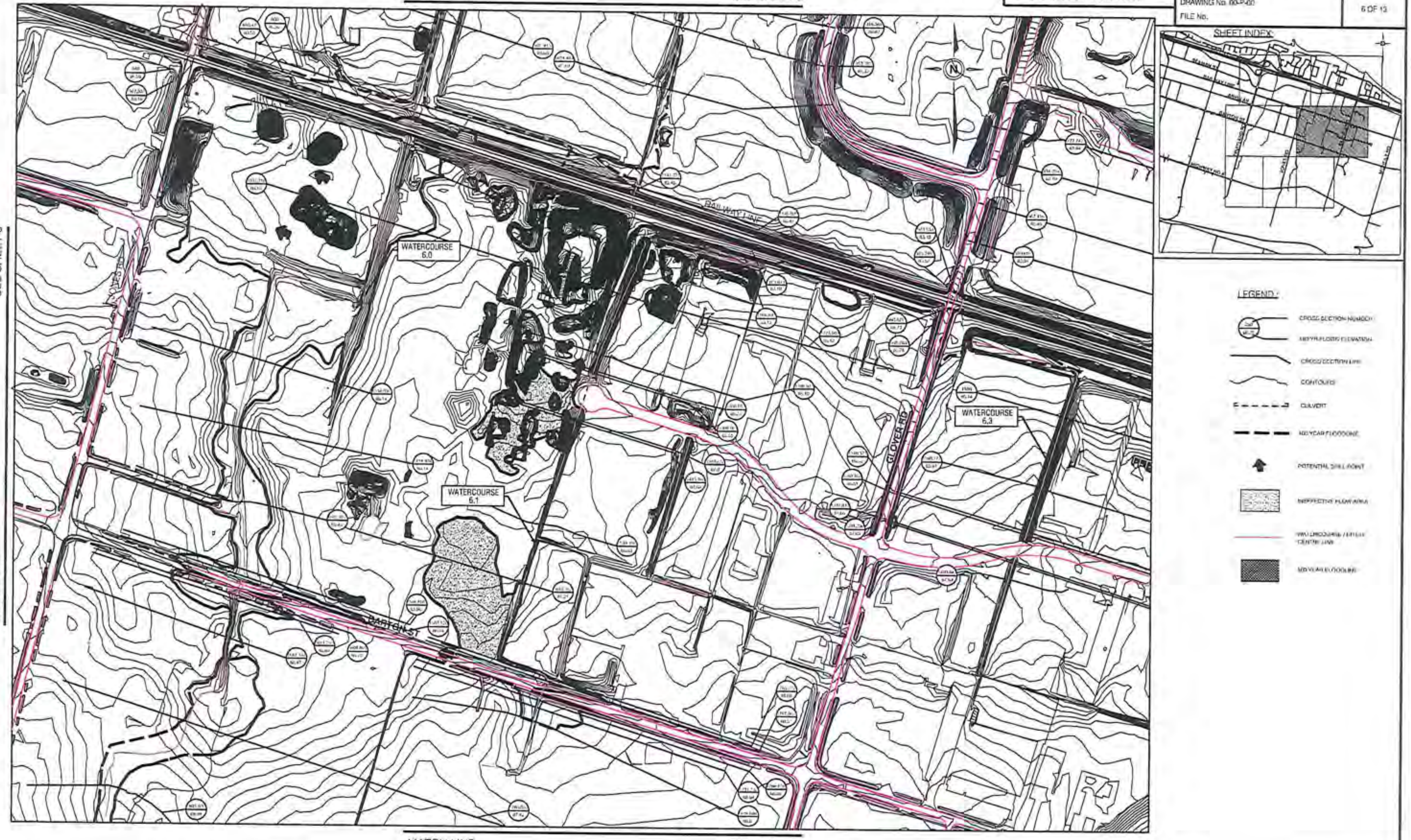
Sheet No. 5 DTM 2007.dgn 1/20/2011 2:52:58 PM

MATCH LINE SEE SHEET 5

DIMENSIONS SHOWN ON THIS PLAN ARE IN METRES UNLESS OTHERWISE NOTED

CONTRACT No.
DRAWING No. 00-P-00
FILE No.

SHEET No. 6 OF 13



MATCH LINE SEE SHEET 7

SCALES: 1:2000

Manager of Construction

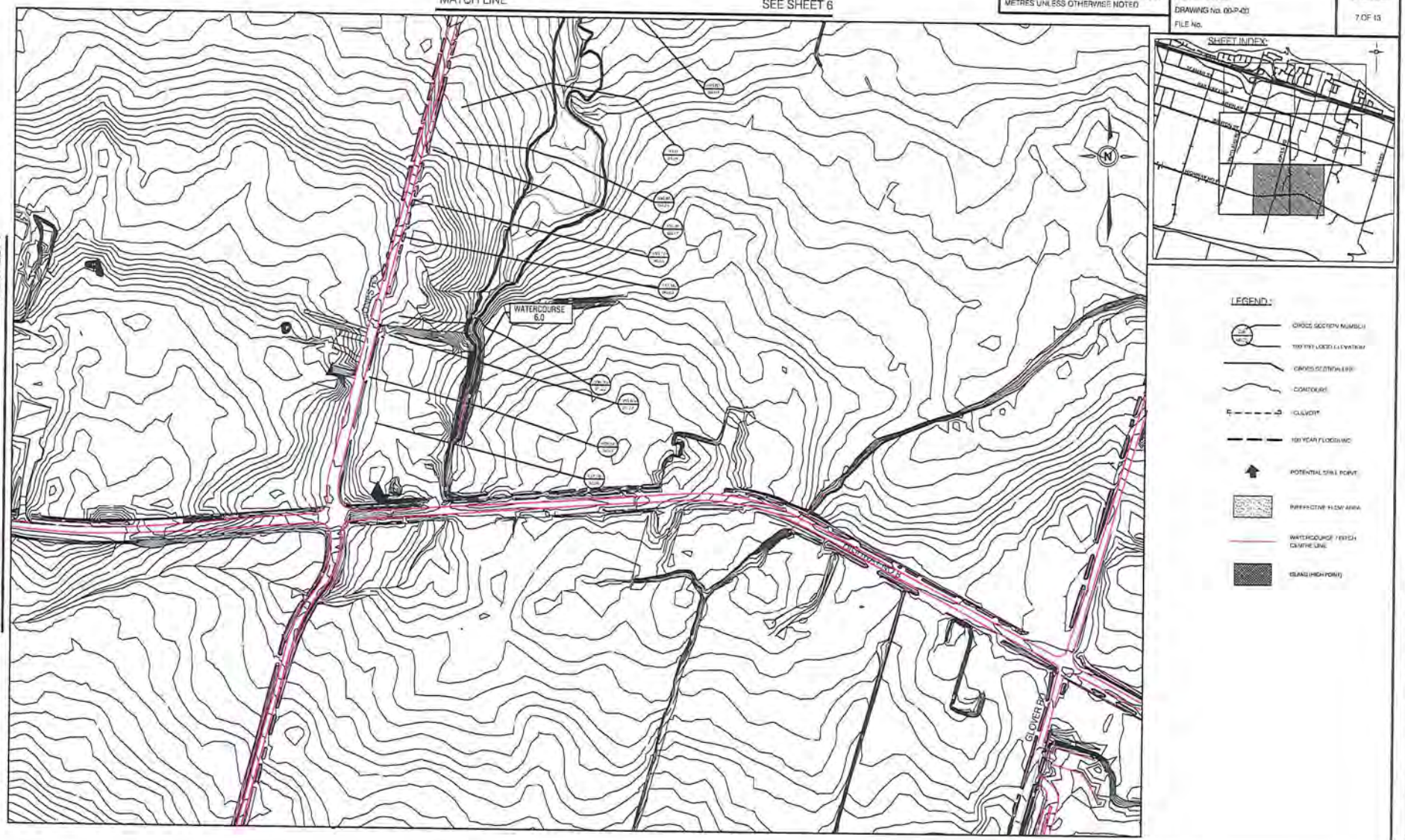
Manager of Design

CITY OF HAMILTON
Public Works Department

Watercourse 5.0 & 6.0 Hydraulic Study
Existing Floodplain Mapping (5)

00-P-00 (6)

Sheet No. 6 DTM 2007.dgn 1/20/2011 2:50:19 PM



00-P-00 (7)

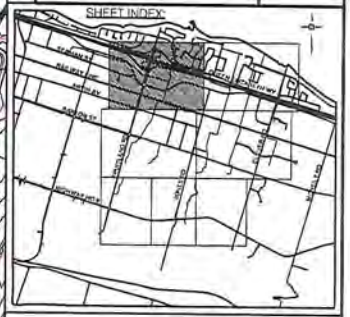
Sheet No. 7 DTM 2007.dgn 1/20/2011 2:47:02 PM

DIMENSIONS SHOWN ON THIS PLAN ARE IN METRES UNLESS OTHERWISE NOTED

CONTRACT No.
DRAWING No.00-P-00
FILE No.

SHEET No.
8 OF 10

SHEET INDEX:



LEGEND:

- CROSS SECTION NUMBER
- 100 YR FLOOD ELEVATION
- CROSS SECTION LINE
- CONTOURS
- CULVERT
- 100 YEAR FLOODLINE
- POTENTIAL SPILL POINT
- INEFFECTIVE FLOW AREA
- WATERCOURSE / CREEK CENTRE LINE
- ISLAND HIGH POINT

NO.	REVISIONS	BY/RE.	DATE	DRAWN BY/CH.	CHK.
A	CHANGES FOR WATERCOURSE 5.0 & 6.0 HYDRAULIC STUDY - JANUARY 2011	KL	01/19/11		

SCALES
1 : 2000

Manager of Construction

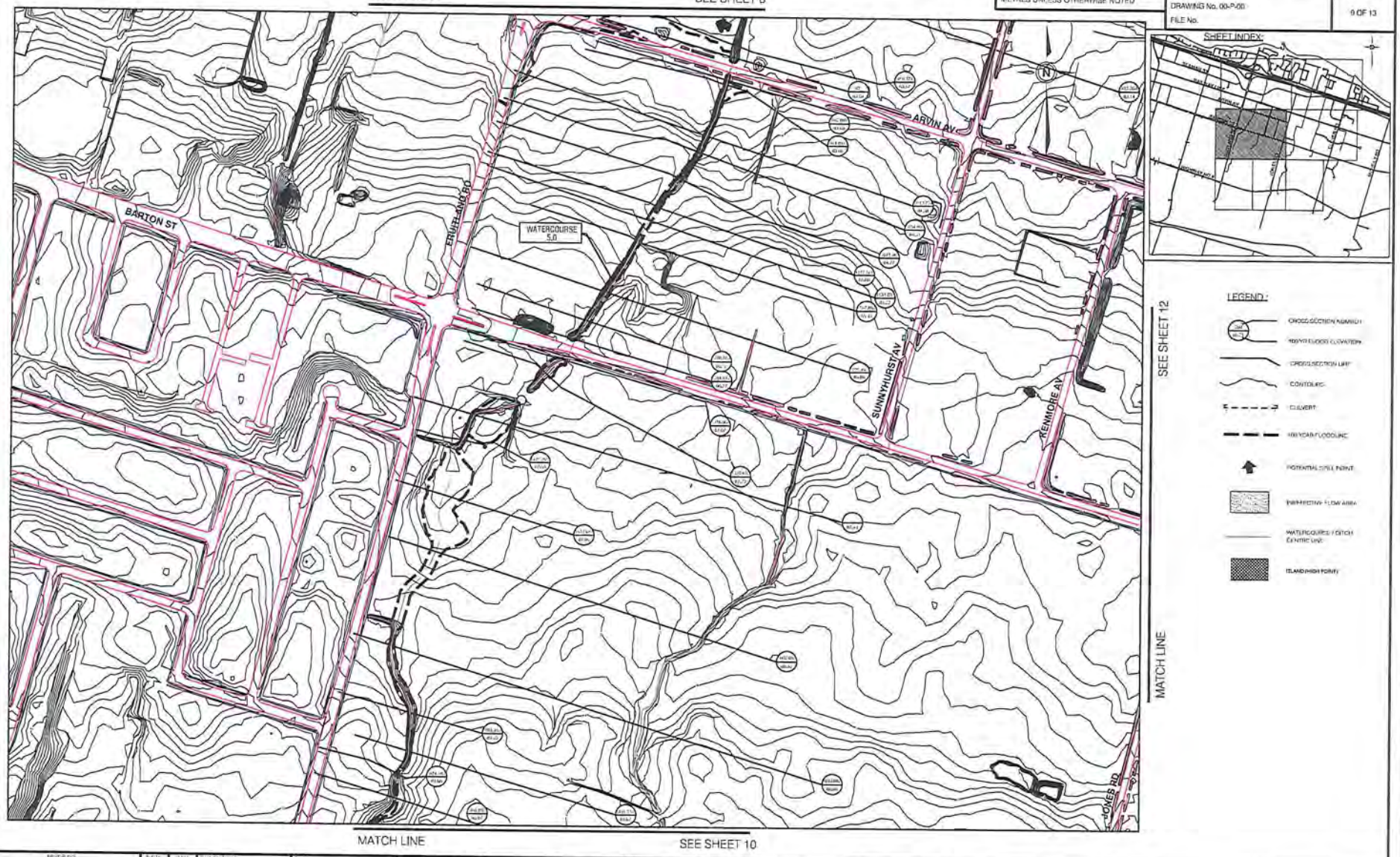
Manager of Design

CITY OF HAMILTON
Public Works Department

Watercourse 5,0 & 6.0 Hydraulic Study
Future Floodplain Mapping (1)

00-P-00 (8)

Sheet No. 8 DTM 2007 (Future floodplain mapping).dgn 1/20/2011 2:44:48 PM



No.	REVISIONS	INITIAL	DATE	DRAWN/DESIGN	DATE
1	ISSUED FOR WATERCOURSE 5.0 & 6.0 HYDRAULIC STUDY (JANUARY 2011)	KG	01-19-11	KG / REVIEW: MATTHEW...	

SCALES: 1:2000

Manager of Construction

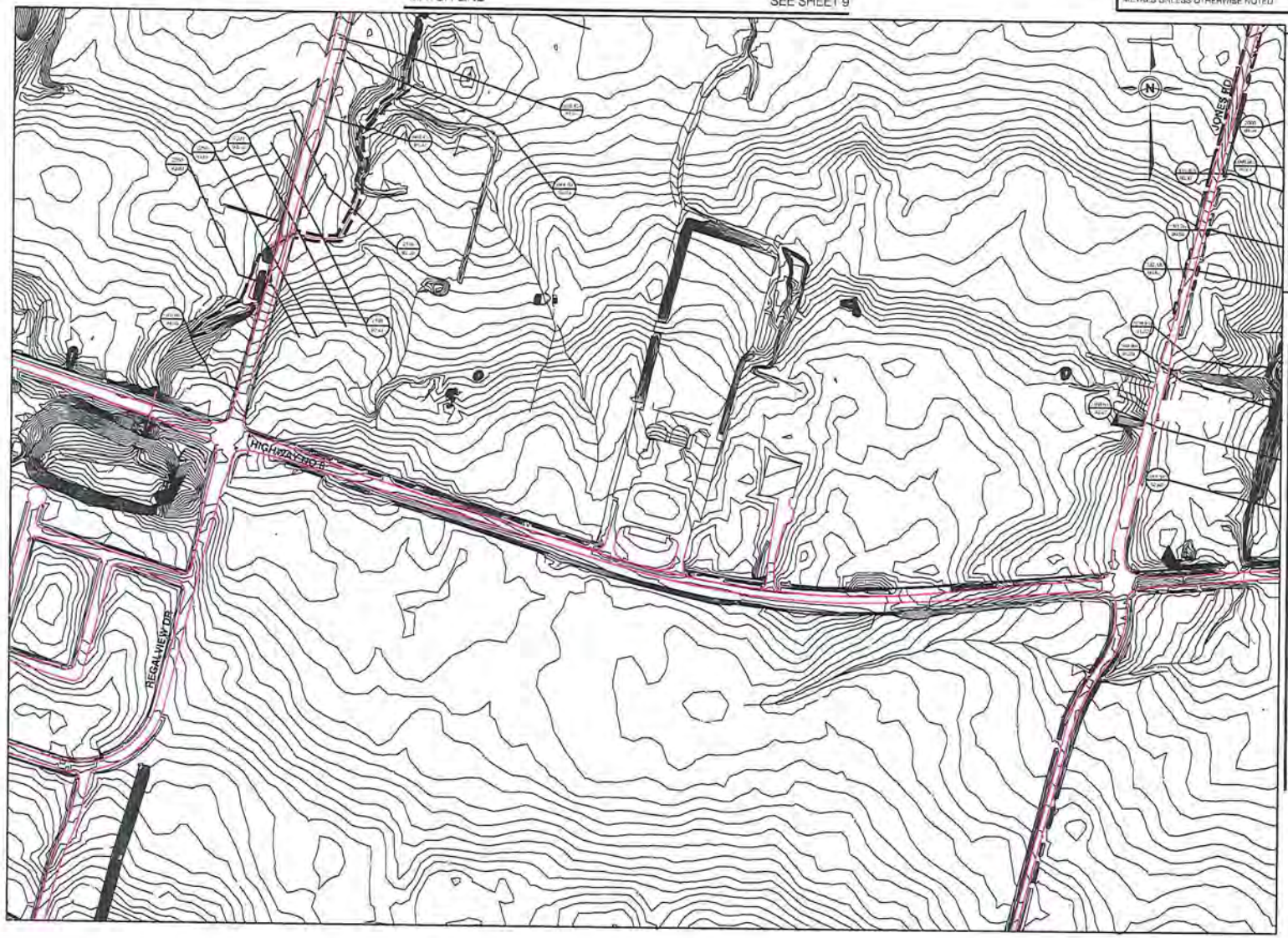
Manager of Design

CITY OF HAMILTON
Public Works Department

Watercourse 5.0 & 6.0 Hydraulic Study
Future Floodplain Mapping (2)

00-P-00 (9)

Sheet No. 9 DTM 2007 (Future floodplain mapping).dgn 1/20/2011 2:42:29 PM



DIMENSIONS SHOWN ON THIS PLAN ARE IN METRES UNLESS OTHERWISE NOTED

CONTRACT No.
DRAWING No. 00-P-00
FILE No.

SHEET No.
10 OF 13

SCALES
1 : 2000

Division Manager of Construction

Manager of Design

CITY OF **HAMILTON**
Public Works Department

Watercourse 5.0 & 6.0 Hydraulic Study
Future Floodplain Mapping (3)

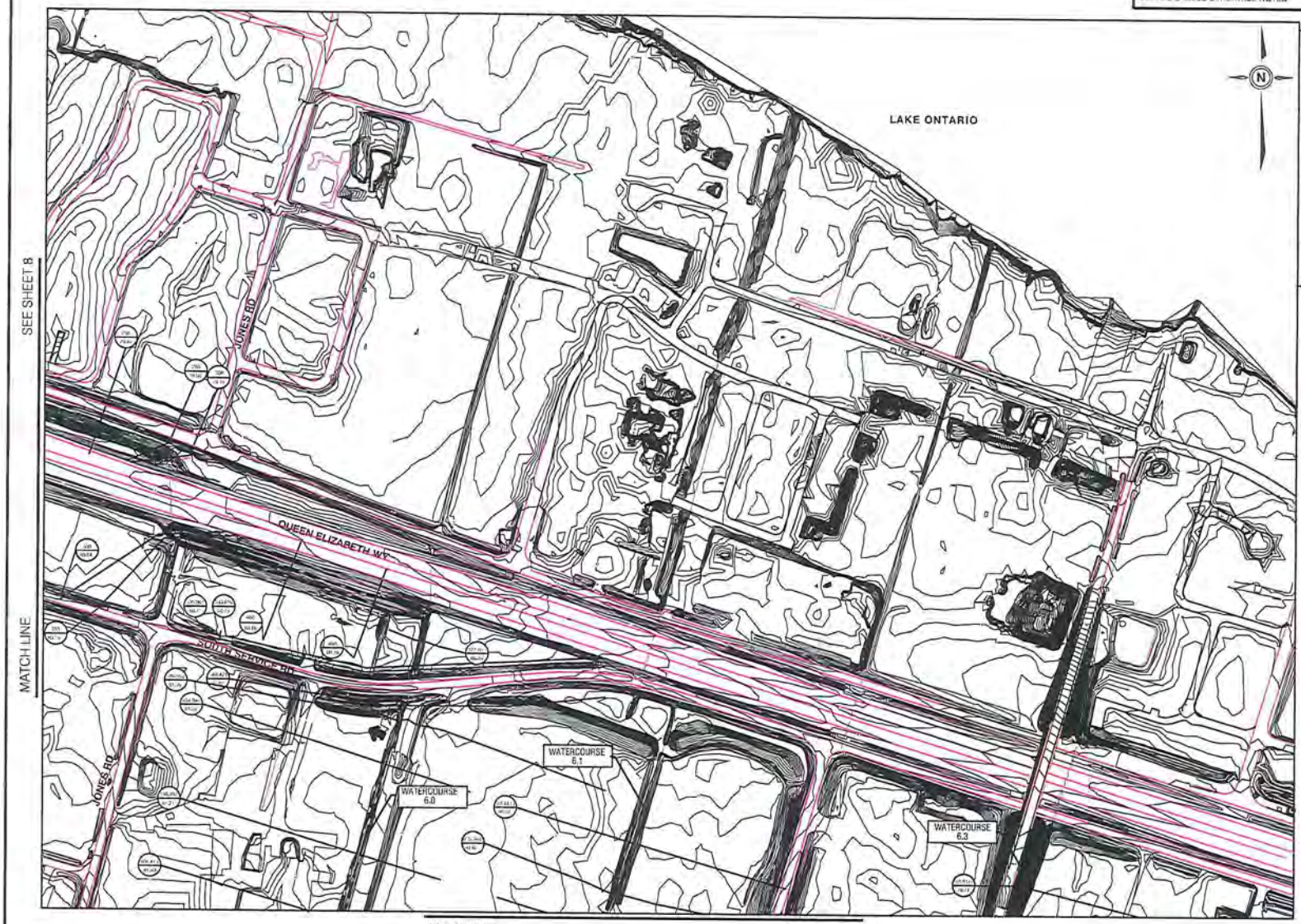
00-P-00 (10)

Sheet No. 10 DTM 2007 (Future floodplain mapping).dgn 1/20/2011 2:40:19 PM

DIMENSIONS SHOWN ON THIS PLAN ARE IN METRES UNLESS OTHERWISE NOTED

CONTRACT No.
DRAWING No. 00-P-00
FILE No.

SHEET No. 11 OF 13



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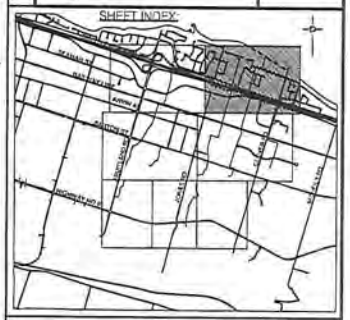


LEGEND:

- CROSS SECTION NUMBER
- 100YR FLOOD ELEVATION
- CROSS SECTION LINE
- CONTOURS
- CULVERT
- 100 YEAR FLOODLINE
- POTENTIAL SPILL POINT
- INEFFECTIVE FLOW AREA
- WATERCOURSE / DITCH CENTRE LINE
- ISLAND (HIGH POINT)

NO.	REASON	INITIAL	DATE
1	ISSUED FOR WATERCOURSE 5 & 6 HYDRAULIC STUDY (JANUARY 2011)	KL	01-18-11

DRAWN BY: [illegible] DATE:
REVIEWED BY:
-
-
Regional Surveyor:
Geodetic Bench Mark Plate No.
Division:

SCALES
1 : 2000

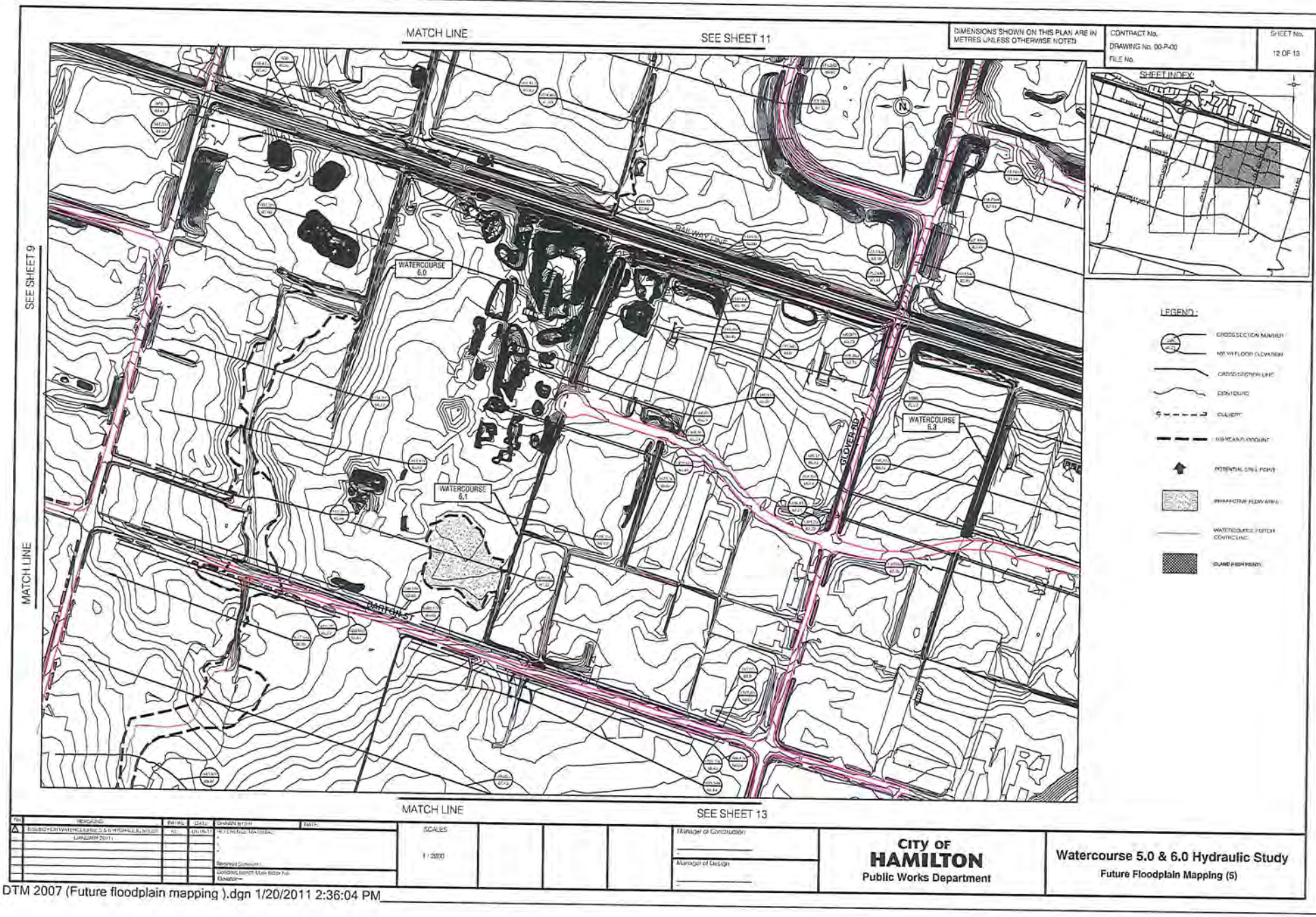
Manager of Construction
Manager of Design

CITY OF HAMILTON
Public Works Department

Watercourse 5.0 & 6.0 Hydraulic Study
Future Floodplain Mapping (4)

00-P-00 (11)

Sheet No. 11 DTM 2007 (Future floodplain mapping).dgn 1/20/2011 2:38:06 PM



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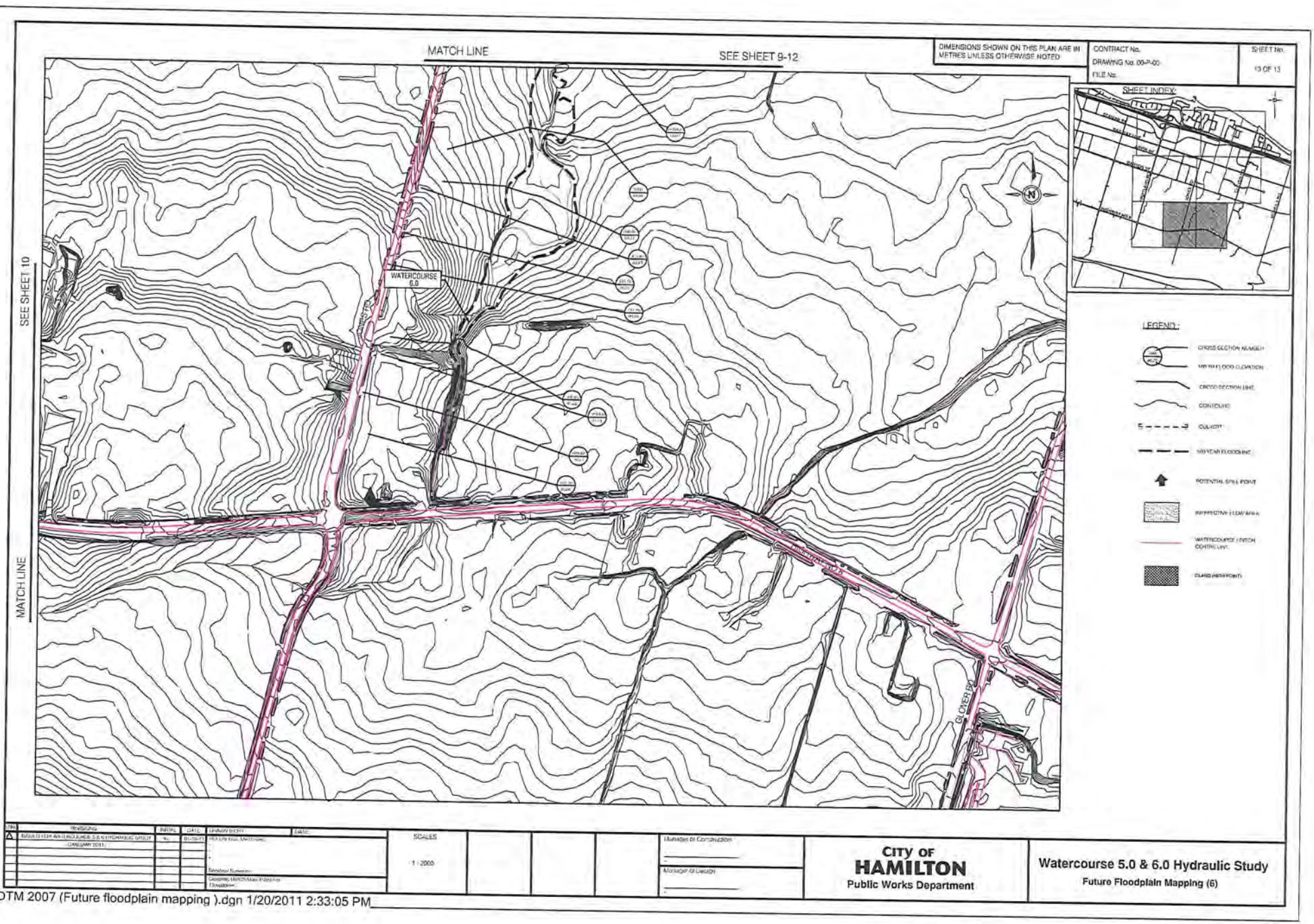
Sheet No. 12 DTM 2007 (Future floodplain mapping).dgn 1/20/2011 2:36:04 PM



00-P-00 (13)

Sheet No. 13 DTM 2007 (Future floodplain mapping).dgn 1/20/2011 2:33:05 PM