

**City of Hamilton  
Watercourse 5.0 & 6.0  
Hydraulic Assessment**

*September 2010*

06-6992

*Submitted by*

**Dillon Consulting  
Limited**

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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 works and “Alternative 4” for secondary watercourses (i.e. to replace all culverts with hydraulic and/or structural deficiencies).

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, Aqaufor 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 1994) (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 six watercourse crossings on Watercourse 5.0 and six 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*).

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.

Based on the FDRP mapping, the flood plain 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. 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 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 evaluate improvements at crossings only. The EA recommended improvements 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 overtop and top of road elevation (obtained from the City's 2007 DEM). The Watercourse 5.0 crossing at Fruitland is a new recommendation since this crossing was originally beyond the study limits of the EA. **Table 1** summarizes the existing crossing dimensions, the previous 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.

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**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	King Hwy 8, west of Fruitland	1830x1440 CONC BOX	N/A	N/A	
	King Fruitland, north of Hwy 8	1200x950 CONC BOX	N/A	1500x1000 CONC BOX	Crossing beyond original EA study limits, therefore was not considered
	King Barton, east of Fruitland	1860x1035 CONC BOX	2400x1500 CONC BOX	SAME AS EA	
	King 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
	King CNR, east of Fruitland	1800x1540 CONC BOX	3000x1500 CONC BOX	SAME AS EA	
	King 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
	King OEW, plus ramps	5000x1600 CONC BOX	N/A	N/A	No changes are proposed for the OEW, improvements implemented by MTO
	King 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	King Hwy 8, west of Jones	2440x840 CONC BOX	N/A	N/A	
	King 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
	King CNR, east of Jones	1150dia CSP	3000x1800 CONC BOX	SAME AS EA	
	King SouthService RD, east of Jones	3860x1130 CONC BOX	3800x1500 CONC BOX	KEEP ORIGINAL STRUCTURE	
	King OEW	3860x1200 CONC BOX	N/A	N/A	
	King North Service RD	2960x1100 CONC BOX	N/A	N/A	
	Diversions culvert	3970x1200 CONC BOX	N/A	N/A	
6.1	King 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
	King Arvin, west of Glover	900dia CSP	2100x1200 CONC BOX	SAME AS EA	
	King CNR, west of Glover	1000x650 STONE STRUCTURE	1350dia CONC PIPE	SAME AS EA	
6.3	King 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
	King CNR, east of Glover	750dia CAST IRON PIPE	2100x1200 CONC BOX	SAME AS EA	

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## 4. Hydraulic Modelling

This hydraulic study utilizes updated flows and topographic information to build a new hydraulic model and 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 existing conditions. The following sections describe the modelling approach, parameter selection, and model results for existing and future conditions.

### 4.1 Summary of Modelling Approach

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#### 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. State-of-the-art 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. As such, cross-sections from the DTM data were modified to include a representative low flow channel from HCA data. These improvements produced a more representative geometry using actual survey points of the watercourse and

removed artificial pools and barriers. HCA sections were extended beyond the bank stations to include geometry of the floodplain. This was particularly important for areas where high flows (i.e. 100 year event) could exceed the bank full channel capacity or where potential spills could occur.

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 Rd (between sections 2221 and 2150);
- Along Watercourse 5.0, halfway between Hwy 8 and Barton (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 existing conditions with respect to flows, manning's n value, and starting boundary conditions. However, the future model incorporates the recommended culvert improvements at each crossing.

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* (Culvert Inventory Spreadsheet). It should be noted that professional judgment was applied to correct the stationing of the culverts in an effort to improve the alignment within the low flow channel. Other inputs include entrance and exit loss coefficients and Manning's roughness values which were selected based on the type, condition and layout of the infrastructure, material and suggested values summarized in the HEC-RAS Reference Manual. Bounding cross-sections were adapted with increases to the expansion and contraction coefficients; 0.3 and 0.5 were used respectively as per the HEC-RAS Reference Manual.

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). Estimated flows along Watercourse 5.0 and 6.0 from the updated hydrologic model are generally similar to the flows assumed in original FDRP mapping (1994) and Draft EA Study (refer to *Appendix C* for original HEC-2 printouts). *Table 2* compares the updated flows from Aquafor Beech and the flow data used in the HEC-2 model which supported the FDRP mapping. 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 2 – Comparison of Flow Data**

Reach	Location	1994 FDRP Mapping		2010 Aquafor Beech update	
		Cross Section ID	Flows (m3/s)	Cross Section ID	Flows (m3/s)
5.0	Hwy 8	2863	10.5	2256	6.9
5.0	Barton St	1706	15.8	1307	8.82
5.0	Arvin Ave	1339	8.33	951	10.3
5.0	CNR	1080	11.12	680	11
5.0	South Service Road	573	varies (9.91-10.26)	518	11.9
6.0	Hwy 8	2767	5.15	2457	7.98
6.0	Barton St	1769	12.23	1611	9.2
6.0	CNR	1107	varies due to spill point (4.88-12.63)	947	8.79

A sensitivity analysis was completed to determine the appropriate starting water surface elevations as input for the downstream boundary condition. Two scenarios were considered:

- Normal depth assuming an average slope of 0.005m/m; and
- Assumed starting water surface elevation assuming a headwater elevation for crossings along the QEW.

For the secondary crossings, CulvertMaster was used to calculate maximum headwater elevations for the applicable QEW crossing (refer to *Appendix F*) and assuming a tailwater elevation at the downstream channel spill point. It was determined that the assumed starting water surface elevation resulted in higher initial starting downstream boundary conditions than the normal depth assumption (less than 2% difference). However, the upstream water levels under both assumptions equalized less than 200 m upstream and did not affect any upstream crossings with respect to hydraulics.

For the primary watercourses, the spill point elevation downstream of the QEW crossing was assumed as the starting downstream boundary elevation. This elevation is higher than the normal depth assumption by approximately 1m but the upstream water levels equalized less than 300m upstream and did not affect any upstream crossings with respect to hydraulics. Therefore, normal depth was assumed as the model’s starting downstream boundary condition. *Table 3* summarizes the downstream boundary conditions for each assumption.

**Table 3 – Comparison of downstream boundary conditions**

Reach	Normal Depth (assumed s=0.005m/m)	* Known Water Level	Difference (m)
5&6 combined	77.68	78.80	1.12
6.1	80.53	81.00	0.47
6.3	79.76	80.00	0.24

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

Based on the normal depth starting elevations, the hydraulic model was run assuming subcritical conditions. Additionally, considering the consistent channel material and cover, standard roughness coefficients were selected for the main channel and overbanks; 0.035 and 0.045, respectively.

## 4.2 Summary of Modelling Results (Existing Conditions)

*Figure 2* illustrates the FDRP floodline and the updated floodline. The new floodplain extents are generally less than the floodplain generated from the FDRP mapping. This result is consistent with the lower flow inputs (refer to *Table 2*) compared to the flows originally used for the FDRP mapping. The updated detailed (with section locations, ID, and water levels) floodplain mapping is illustrated on Sheets 1 to 7 in *Appendix G*.

The floodplain is relatively confined within the channel banks or experiences marginal overbank flooding. Due to the coarse resolution of the DTM data, reasonable interpolations were made to map the floodline along the low flow channel top of bank. This was accomplished by reviewing the top width from HECRAS modelling results in conjunction with the inferred location of the watercourse centerlines.

In addition, several potential spill points have been identified:

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

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These results are consistent with the spill points identified in the FDRP mapping. However, it is difficult to quantify the lateral extent of the spill areas given that HEC-RAS is a one-dimensional model.

Ineffective flow areas were also identified where the floodplain was wide, but the topography did not appear to provide any flow conveyance. These areas are illustrated on the updated floodplain mapping.

**Table 4** compares the FDRP and updated water levels at the upstream end of each crossing. The updated mapping shows a significant increase in water level (0.7m) at the South Service Rd crossing on Watercourse 5.0. The FDRP mapping considered flow reductions in spill areas and thus utilized lower flows at this crossing. The updated model did not account for flow reductions and thus resulted in a higher flood elevation. However, from Figure 2, minimal changes in the lateral extents of the floodplain are observed. This is attributed to the significant spill point into Fruitland Rd on the westside of the floodplain and the steep channel slopes on the east side of the floodplain and along South Service Rd embankment.

**Table 4 - Comparison of upstream water levels at each crossing**

Crossing ID	Watercourse 5.0 WSEL (m)			Watercourse 6.0 WSEL (m)		
	FDRP (1994)	Dillon (2010)	Difference (m)	FDRP (1994)	Dillon (2010)	Difference (m)
Fruitland Rd	93.37	93.23	-0.14	n/a		
Barton St	87.72	87.36	-0.36	86.78	86.67	-0.11
Arvin Ave	83.71	83.65	-0.06	n/a		
Rail XING	83.49	83.02	-0.47	84.83	84.56	-0.27
South Service Rd	81.13	81.83	0.7	81.19	80.92	-0.27
QEW	80.22	78.75	-1.47	80.57	79.93	-0.64

Other areas of notable reduction in the lateral extent of the floodplain are located at the Barton St and QEW crossings along Watercourse 5.0; and at the CN Rail and South Service Rd crossings along Watercourse 6.0. The reduced floodplain at the QEW crossing reflects the improvements undertaken by MTO, whereas the other crossings reflect the reduced flows to the crossing, which resulted in a modest reduction in water surface elevations (approximately 0.3m). Furthermore, the current contour data (generated from the City's DTM) provides a better resolution of the physical topography compared to the data from the FDRP mapping. This also has contributed to a reduced flooding extent at the CN Rail crossing on Watercourse 6.0.

The updated existing conditions floodplain mapping also demonstrated that the crossings at Fruitland Rd and Barton St along Watercourse 5.0 no longer overtop the roadways during the

100yr flood. However, the model indicates that all structures are under pressure flow during the 100 year event.

The detailed HEC-RAS summary table for the updated existing conditions hydraulics is in *Appendix E*.

### 4.3 Summary of Modelling Results (Future Conditions)

*Figure 3* illustrates 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 significantly reduces the backwater affect of the large rail berm and lowered the 50 year and 100 year levels by more than 1m. More modest reductions were observed for the CN Rail crossings on Watercourses 5.0 and 6.1. *Table 5* compares the 50 year and 100 year water levels for each recommended crossing improvement under existing and future conditions. The Barton St crossing on Watercourse 6.0 still overtops the roadway; however the overtopping depth has been reduced from 0.37m to 0.25m.

**Table 5- Comparison of the 50yr and 100yr water levels under existing and future conditions.**

Reach	Crossing Location	HECRAS River Sta	50yr WSEL (m)		DIFF (m)	100yr WSEL (m)		DIFF (m)
			Existing	Future		Existing	Future	
wc5	xing Fruitland, north of Hwy 8	2240.61	93.24	93.30	0.06	93.23	93.16	-0.07
wc5	xing Barton, east of Fruitland	1307.9	87.44	86.72	-0.72	87.36	87.17	-0.19
wc5	xing Arvin, east of Fruitland	937.1887	83.53	83.54	0.01	83.65	83.65	0.00
wc5	xing CNR, east of Fruitland	655	82.82	82.57	-0.25	83.02	82.71	-0.31
wc5	xing SouthService RD, east of Fruitland	503.04	81.60	81.40	-0.20	81.83	81.60	-0.23
wc5	xing QEW, plus ramps	215	78.40	78.40	0.00	78.75	78.75	0.00
wc6	xing Barton, east of Jones, twin culverts	1598.12	86.53	86.58	0.05	86.67	86.55	-0.12
wc6	xing CNR, east of Jones	939.548	84.78	83.29	-1.49	84.59	83.51	-1.08
wc6	xing SouthService RD, east of Jones	549.12	80.73	80.70	-0.03	80.92	80.93	0.01
wc6	xing QEW	315	79.61	79.61	0.00	79.93	79.93	0.00
wc6.1	xing Barton, west of Glover	1778.1	88.55	88.20	-0.35	88.57	88.29	-0.28
wc6.1	xing Arvin, west of Glover	1393.68	86.42	85.26	-1.16	86.86	85.31	-1.55
wc6.1	xing CNR, west of Glover	1154.78	83.69	83.21	-0.48	84.24	83.35	-0.89
wc6.3	xing Arvin, east of Glover	1364.866	87.48	87.18	-0.30	87.58	87.23	-0.35
wc6.3	xing CNR, east of Glover	982.657	84.77	83.71	-1.06	85.03	83.77	-1.26

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

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

## 5. Additional Design Considerations and Studies

*Table 6* summarizes the crossings improvements considered in this study and the Class EA schedule anticipated for each of the recommended undertakings. This revised set of recommendations will be used to update the draft EA document 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 the more detailed hydraulic analysis undertaken in this study and to factor recent planning processes undertaken by the City.

**Table 6 - Summary of recommended crossing improvements and anticipated Class EA Schedule**

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

As these individual studies proceed, additional considerations should be given for the following:

- minimum acceptable level of service for each crossing;
- fluvial geomorphology impacts;
- structural design;
- employment lands north of Barton St; and
- consultations with CN Rail for any improvements within the rail corridor.



## 6. Conclusions and Recommendations

The updated existing conditions hydraulic assessment was generally in good agreement with the previous FDRP mapping. Any discrepancy between the two floodplain assessments could be reasonably explained by the updated hydrology and availability of recent, improved topographic information. The future conditions hydraulic assessment demonstrated that the recommended crossing improvements could potentially improve existing flooding issues. Additional studies would be required to meet the Municipal Class EA requirements and detailed design of each recommended crossing improvement.

We recommend the following next steps:

- Pending the City's review of this study, we recommend a meeting with HCA to further discuss these modelling results and obtain Authority approval for this hydraulic study;
- Pending any potential revisions from HCA and/or the City, we recommend that the results of this hydraulic assessment be incorporated into the EA document for finalization and issuance of the notice of completion.

Respectfully submitted:

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

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Ken Luong, P. Eng.  
Water Resources Engineer



# Watercourse 5 & 6 Hydraulic Assessment

## Figure 1: Study Area

### Legend

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

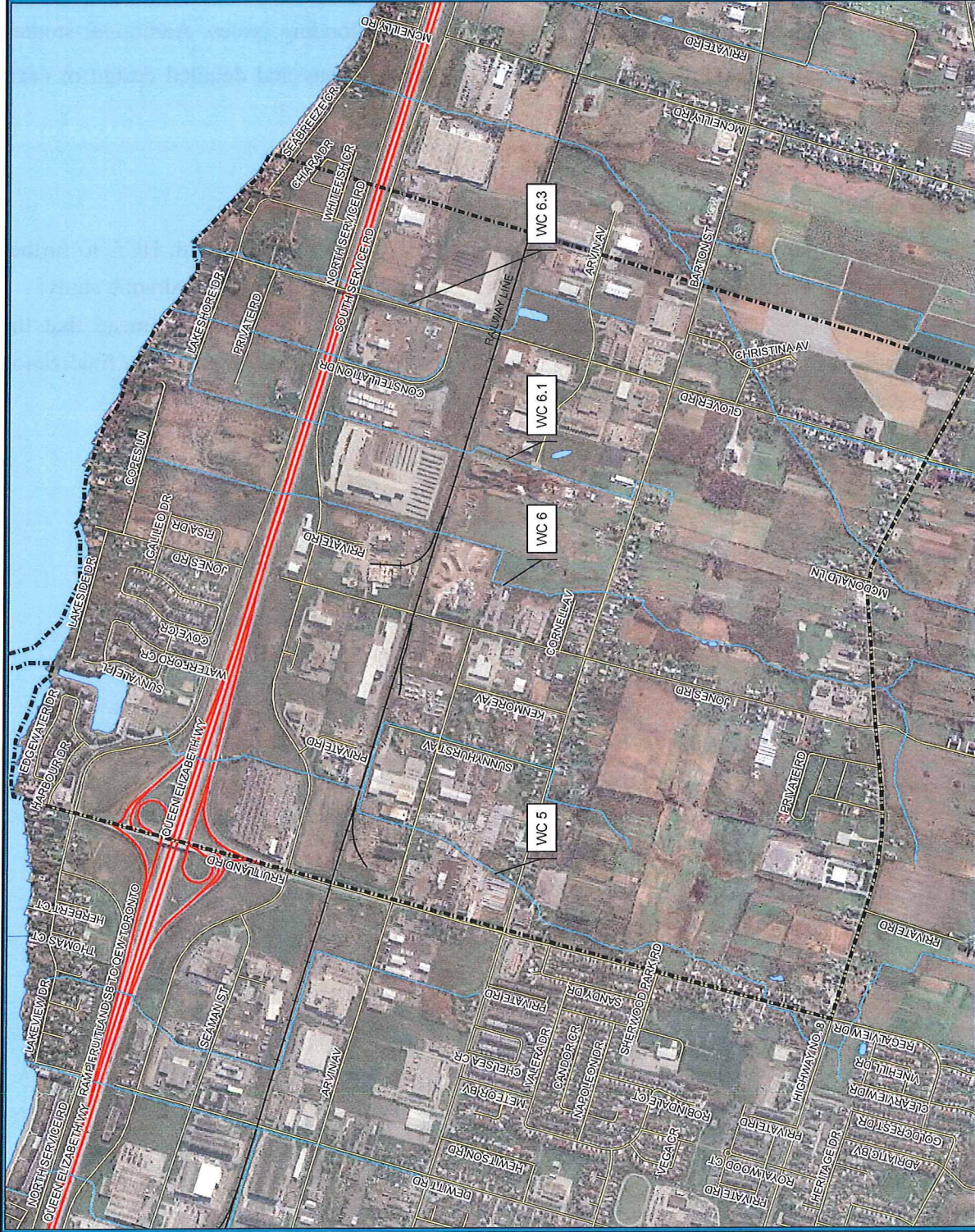


1:12,000  
Meters



**DILLON**  
CONSULTING

Project Name: Watercourse 5 & 6  
Map Created By: VUS  
Map Date: 10/10/08  
Data Created: 10/10/08  
Date Modified: 10/06/09  
File Name: 100127 WC\_5\_6 Study Area.mxd

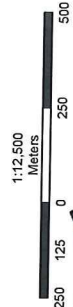




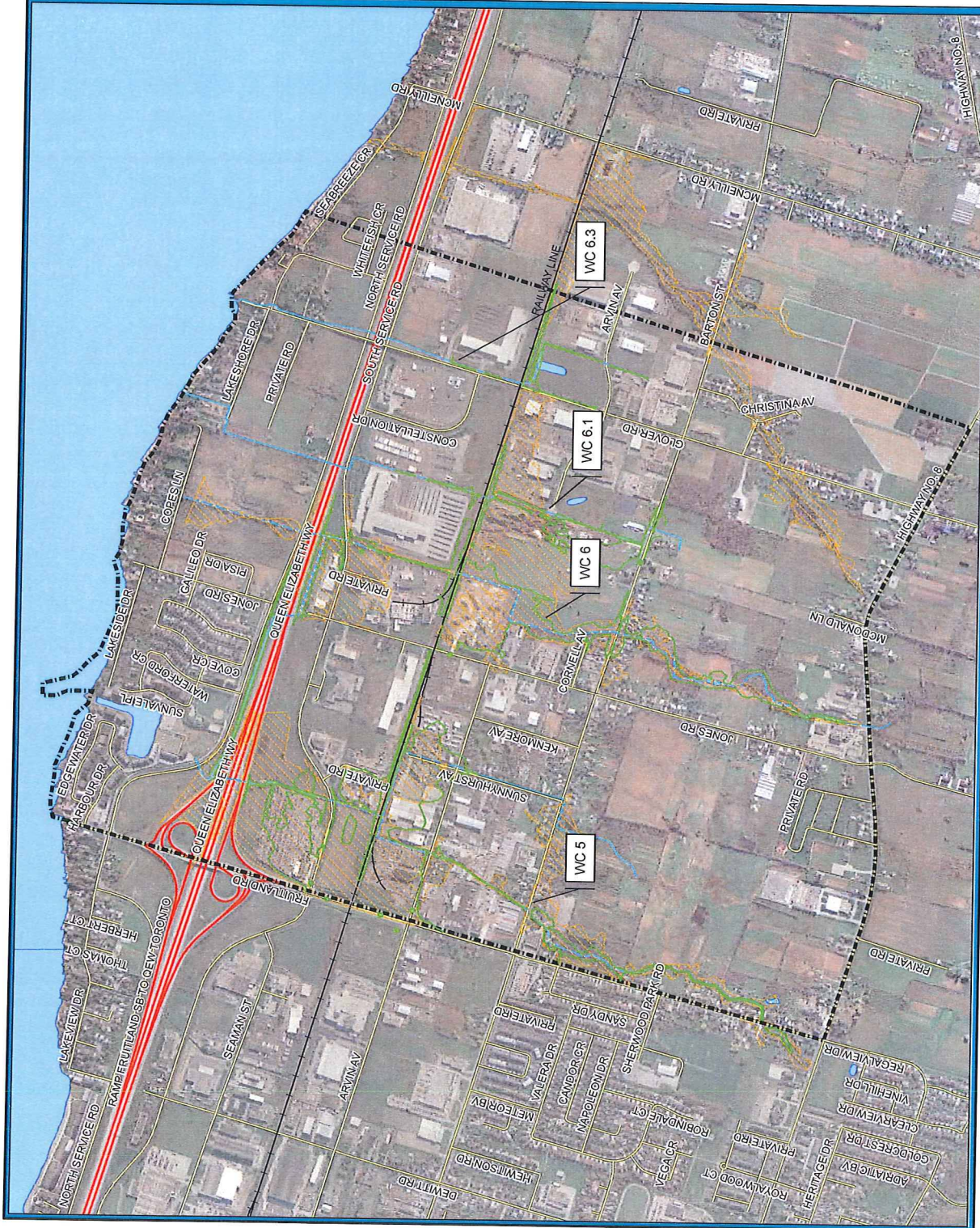
# Watercourse 5 & 6 Hydraulic Assessment Figure 2: Existing Floodplain Mapping

- Legend**
- Approximate Study Area Boundary
  - Updated Existing Floodlines \*\*
  - Existing Floodlines \*
  - Centrilines
  - Surface Waterbodies
  - Railway
  - Highways and Ramps
  - City Streets

\* Floodlines based on MDP (June, 1989)  
 \*\* Floodlines based on hydraulic updates  
 performed by Dilin Consulting (June, 2016)



Project Name: Watercourse 5 & 6  
 Map Checked By: VL  
 Date Created: 10/10/16  
 Date Modified: 10/09/16  
 File Name: 100127 WC 5 & 6 Study Area.mxd  
 Source: 100127 WC 5 & 6 Study Area.mxd





Appendix A  
Culvert Inventory Spreadsheet

Waterway Opening Dimensions

XING ID	Point#D/S	Point # U/S	Location	Type	Length (m)	Height/Diameter		US Inv	D/S Inv	Comments
						Width (mm)	(mm)			
WC5-8	145	144	xing Hwy 8, west of Fruitland	Conc Box	37.7	183.00	144.00	94.29	94.44	D/S inv higher than U/S????
WC5-7	47	46	xing Fruitland, north of Hwy 8	Conc Box	32.7	120.00	95.00	91.96	92.00	D/S inv higher than U/S????
WC5-6	32	7	xing Barton, east of Fruitland	Conc Box	20.3	186.0	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	D/S inv higher than U/S????
WC5-4	40		xing CNR, east of Fruitland	Conc Box	11.1 (U/S,south)	1800	1540	81.14	81.10	U/S survey point missing
WC5-3	103	104	xing SouthService RD, east of Fruitland	extended section	6.7 (D/S,north)	2230	1450	n/a	81.14	Armour stone wing walls, steel/wood bridge deck
WC5-2	30	28	xing QEW, plus ramps	CIP conc struc	27.2	3665	1400	80.16	80.14	cast-in-place conc structure
WC5-1	26	27	xing North Service RD	CIP conc struc	111.9	5000	1600	76.71	76.44	D/S inv higher than U/S????
WC5-7	143	43	xing Hwy 8, west of Jones	Conc Box	35.50	244.00	84.00	91.81	91.90	Need more info for twin box culverts immediately north of NSR xing
WC5-6	34	35	xing Barton, east of Jones, twin culverts	East: CIP arch conc struc West: elliptical CSP	18.5	1250	1400	84.78	84.70	Several dimensions missing from field notes and dwg U/S extended with box CIP conc struc, U/S end extended with CSP (1300x1000)
WC5-5	138	137	xing CNR, east of Jones	CSP	24.70	n/a	1150	82.09	81.97	U/S survey point missing
WC5-4	2	1	xing SouthService RD, east of Jones	CIP conc struc	23.8	3860	1130	79.63	79.48	U/S survey point missing
WC5-3	No Crossing	????	xing QEW	CIP conc struc	?	2960	1100	79.07	?	No survey data available, access problems? Verify
WC5-2	21		xing North Service RD	Conc Box	?	3970	1200	78.53	77.63	Does this correspond to survey points 24 and 25? Verify
WC5-1	25	24	Diversion culvert	Conc Box	?	3970	1200	78.53	77.63	
WC5.1-6	10	9	xing Barton, west of Glover	CSP	18.8	n/a	600	87.63	87.47	
WC5.1-5	11	12	xing Arvin, west of Glover	CSP	46.7	n/a	900	84.57	84.22	twin barrels? Need picture
WC5.1-4	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 880x300
WC5.1-3	23	19	xing SouthService RD, west of Glover	CIP conc struc	93.70	2440	1400	79.58	79.26	only two survey points (19,23) between these 3 culvert crossings shown on dwg
WC5.1-2	See 6.103		xing QEW	Conc Box	?	2400	1800	?	?	Confirm if additional data available?
WC5.1-1	See 6.1-3		xing North Service RD	CIP conc struc	?	2440	1300	?	?	Confirm if additional data available?
WC5.2-3	17	20	xing SouthService RD, east of Constellation	elliptical CSP	95	1300	1500	79.05	79.05	only two survey points (17,20) between these 3 culvert crossings shown on dwg
WC5.2-2	?	?	xing QEW	Conc Circular	?	n/a	1200	?	?	Confirm if additional data available?
WC5.2-1	?	?	xing North Service RD	CIP conc struc	?	1200	1200	?	?	
WC5.3-5	14	13	xing Arvin, east of Glover	PVC	25.2	n/a	730	86.8	86	inlet has 1220x630 DICB
WC5.3-4	16	15	xing CNR, east of Glover	east iron pipe	12.5	n/a	750	83.62	83.54	
WC5.3-3	?	?	xing SouthService RD, east of Glover	CIP conc struc	94	1830	1200	79.22	78.59	only two survey points (18,29) between these 3 culvert crossings shown on dwg
WC5.3-2	?	?	xing QEW	Conc culvert (open bottom)	?	1800	1200	?	?	Confirm if additional data available?
WC5.3-1	?	?	xing North Service RD	CIP conc struc	?	1830	900	?	?	

Notes:

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

Appendix B  
SCUBE West Flow Data

**SCUBE West Study  
Preliminary Flows**

Location	Flows					
	2	5	10	20	50	100
<b>Watercourse 5.0</b>						
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

<b>Watercourse 6.0</b>						
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 Service 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

<b>Watercourse 6.1</b>						
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

<b>Watercourse 6.2</b>						
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

<b>Watercourse 6.3</b>						
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

<b>Watercourse 7.0</b>						
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

<b>Watercourse 7.2</b>						
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



## Appendix C

### FDRP Floodplain Mapping and HEC-2 Results





















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

\*\*\*\*\*  
 \* S U M P O \*  
 \* Interactive Summary PrintOut \*  
 \* for the IBM PC/XT/AT \*  
 \* January 1987 version \*  
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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.

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

Appendix D  
HCA Channel Survey Data

HCA Survey Data

Watercourse 5.0				Watercourse 6.0				Watercourse 6.1 and 6.3			
Survey ID	GIS Station	Elevation(m)	F Code	SurveyID	GIS Station	Elevation (m)	F Code	Survey ID	GIS Station	Elevation(m)	F Code
5-1	94.8	96.872	CP 1	06-09-01	0	93.488	EL	6-1-01	0	89.041	EL
5-1-01	0	95.283	TB	06-09-02	4.98	93.485	EL	6-1-02	17.2	88.620	EL
5-1-02	6.1	93.663	BB	06-09-03	8.88	93.528	EL	6-1-03	23.2	88.407	EL
5-1-03	14.8	93.534	EL	06-09-04	12.63	93.525	EL	6-1-04	30.8	88.247	TB
5-1-04	23.2	93.594	TB	06-09-05	15.58	92.874	EL	6-1-05	31.4	87.986	CL
5-1-05	25.2	93.035	BB	06-09-06	18.38	92.677	EL	6-1-06	31.6	87.885	BB
5-1-06	26.2	92.940	CL	06-09-07	20.49	92.534	TB	6-1-07	31.8	88.006	BB
5-1-07	27.4	93.009	BB	06-09-08	20.98	92.193	BB	6-1-08	33.2	88.445	TB
5-1-08	27.9	93.300	TB	06-09-09	22.95	91.899	CL	6-1-09	34.3	89.469	RW
5-1-09	29.8	93.563	EL	06-09-10	24.08	92.202	BB	6-1-10	41.6	89.760	EL
5-1-10	36.1	93.602	EL	06-09-11	24.62	92.522	TB	6-1-11	51.2	89.808	EL
5-1-11	45.4	93.996	BB	06-09-12	27.76	92.480	EL	6-2-01	0	87.225	EL
5-1-12	50.1	95.695	TB	06-09-13	30.61	92.578	EL	6-2-02	28.2	87.435	EL
5-1-13	65.6	96.795	EL	06-09-14	33.63	93.191	EL	6-2-03	64.1	87.061	TB
5-2	0	93.433	CP 2	06-09-15	36.26	93.244	EL	6-2-04	44.6	86.385	BB
5-2-01	3.3	93.191	EL	06-10-01	0	94.277	EL	6-2-05	45.7	86.099	CL
5-2-02	23.4	91.977	EL	06-10-02	28.93	93.408	EL	6-2-06	46.4	86.508	BB
5-2-03	41.1	91.557	EL	06-10-03	50.42	92.917	EL	6-2-07	46.6	86.674	TB
5-2-04	51.7	91.308	TB	06-10-04	70.84	92.522	EL	6-2-08	63.6	87.074	EL
5-2-05	52	90.551	BB	06-10-05	77.37	91.889	EL	6-2-09	88.7	87.160	EL
5-2-06	53.1	90.360	CL	06-10-06	80.78	91.394	TB	6-3-01	0	85.426	EL
5-2-07	54.3	90.453	BB	06-10-07	83.28	91.075	BB	6-3-02	2.1	86.117	EL
5-2-08	56.4	91.814	TB	06-10-08	83.98	90.436	CL	6-3-03	6.7	86.091	TB
5-2-09	71.7	92.453	EL	06-10-09	93.06	90.574	CL	6-3-04	9.7	84.824	BB
5-2-10	88.3	92.864	EL	06-10-10	93.54	90.763	BB	6-3-05	14	84.615	BB
5-3	36.6	90.974	CP 3	06-10-11	94.03	91.239	TB	6-3-06	18.5	86.359	TB
5-3 BM	0	90.742	BM 07720020003	06-10-12	95.89	91.366	EL	6-3-07	26.2	86.987	EL
5-3-01	52.9	90.855	EL	06-10-13	97.05	91.403	EL	6-3-08	50.9	87.179	EL
5-3-02	95.9	90.389	EL	06-10-14	100.04	91.445	EL	6-4-01	0	81.428	EL
5-3-03	125.6	90.329	EL	06-10-15	106.61	91.416	EL	6-4-02	26.1	81.030	EL
5-3-04	133.2	89.951	TB	06-10-16	115.72	92.140	EL	6-4-03	34.6	81.420	TB
5-3-05	134.5	88.642	BB	06-10-17	121.29	92.402	EL	6-4-04	36.2	80.522	BB
5-3-06	135.2	88.530	CL	06-10-18	139.04	92.564	EL	6-4-05	37.1	80.398	CL
5-3-07	136.3	88.731	BB	06-11-01	0	90.515	EL	6-4-06	38.8	80.539	BB
5-3-08	137.6	89.722	TB	06-11-02	20.34	90.525	EL	6-4-07	40.5	81.207	TB
5-3-09	143.2	90.071	EL	06-11-03	24.52	89.866	EL	6-4-08	52.8	81.638	EL
5-3-10	166.4	90.576	EL	06-11-04	38.42	89.938	TB	6-4-09	76.5	81.709	EL
5-4	0	88.018	CP 4	06-11-05	39.13	89.501	BB	6-4-10	100.7	81.757	EL
5-4-01	5.4	88.071	EL	06-11-06	39.81	89.414	CL	6-5-01	Not Plotted	80.513	TB
5-4-02	34.4	87.834	EL	06-11-07	40.39	89.396	BB	6-5-02	Not Plotted	80.096	BB
5-4-03	50	87.457	EL	06-11-08	41.04	89.892	TB	6-5-03	Not Plotted	80.005	CL
5-4-04	53.4	87.149	TB	06-11-09	45.99	90.101	EL	6-5-04	Not Plotted	80.171	BB
5-4-05	54.3	86.498	BB	06-11-10	49.58	90.495	EL	6-5-05	Not Plotted	80.740	TB
5-4-06	55.1	86.500	CL	06-11-11	53.61	90.546	EL	6-5-06	Not Plotted	80.861	EP
5-4-07	55.6	86.557	BB	06-12-01	0	87.869	EL	6-5-07	Not Plotted	80.949	CL road
5-4-08	56.9	87.212	TB	06-12-02	8.91	87.868	EL	6-5-08	Not Plotted	80.867	EP
5-4-09	73.8	87.251	EL	06-12-03	14.81	87.583	EL	6-5-09	Not Plotted	80.691	TB
5-4-10	89.9	87.880	EL	06-12-04	21.49	88.067	TB	6-5-10	Not Plotted	80.338	BB
5-5-01	0	84.289	EL	06-12-05	21.77	87.334	BB	6-5-11	Not Plotted	80.234	CL
5-5-02	12.8	84.308	EL	06-12-06	23.65	87.071	CL	6-5-12	Not Plotted	80.355	BB
5-5-03	20.6	83.826	TB	06-12-07	24.43	87.234	BB	6-5-13	Not Plotted	81.970	TB
5-5-04	22.5	82.663	BB	06-12-08	24.56	87.503	TB	6-5-14	Not Plotted	81.504	EL
5-5-05	23.5	82.621	CL	06-12-09	26.14	87.942	EL	6-5-15	Not Plotted	81.571	EL
5-5-06	24.3	82.698	BB	06-12-10	33.67	88.072	EL	6-6-01	0	82.238	FL
5-5-07	26.2	83.734	TB	06-12-11	37.03	88.588	EL	6-6-02	3.7	83.235	EL
5-5-08	34.8	84.034	EL	06-12-12	54.04	89.132	EL	6-6-03	5.8	83.351	EL
5-5-09	46.4	84.004	EL	06-12-13	69.63	89.137	EL	6-6-04	7.4	83.286	TB
5-5-6	NA	83.973	CP 5/6	06-13-01	0	85.552	EL	6-6-05	10.6	82.206	BB
5-6-01	0	83.444	EL	06-13-02	15.76	85.309	EL	6-6-06	14.9	81.949	CL
5-6-02	17.8	83.409	TB	06-13-03	26.56	85.176	EL	6-6-07	16	82.058	BB
5-6-03	19.8	82.414	BB	06-13-04	29.34	84.454	EL	6-6-08	18.1	82.520	TB
5-6-04	20.6	82.428	BB	06-13-05	31.33	85.186	EL	6-6-09	21.1	82.790	EP
5-6-05	20.9	82.725	EL	06-13-06	42.09	85.149	TB	6-6-10	24.6	82.867	CL road
5-6-06	23.1	83.117	EL	06-13-07	43.01	84.408	BB	6-6-11	28.3	82.730	EP
5-6-07	25.5	84.267	TB	06-13-08	44.37	84.111	CL	6-6-12	30.9	82.537	TB
5-6-08	40.8	84.147	EL	06-13-09	45.57	84.212	BB	6-6-13	34.5	81.335	BB
5-7	NA	82.423	CP 7	06-13-10	48.57	85.328	TB	6-6-14	34.6	81.287	BB
5-7-01	0	81.729	EL	06-13-11	53.28	85.405	EP	6-6-15	34.8	81.304	BB
5-7-02	24.8	81.551	TB	06-13-12	67.33	85.812	BLDG	6-6-16	34.8	81.432	BB
5-7-03	28.4	80.341	BB	06-14-01	0	83.620	EL	6-6-17	43.8	83.559	TB
5-7-04	29.3	80.141	CL	06-14-02	5.13	83.735	EL	6-6-18	48.3	82.872	BB
5-7-05	29.8	80.150	BB	06-14-03	9.77	83.559	TB	6-6-19	57.8	82.964	BB
5-7-06	31.6	80.647	TB	06-14-04	12.01	82.209	BB	6-6-20	64.6	84.683	TB
5-7-07	39.4	81.636	EL	06-14-05	12.84	82.006	CL	6-6-21	76.5	84.999	EL
5-8	NA	81.836	CP 8	06-14-06	13.67	82.127	BB	6-6-22	93.8	85.104	EL
5-8-01	0	80.336	FENCE	06-14-07	15.91	83.338	TB	6-7-01	0	87.630	EL
5-8-02	1.5	80.170	TB	06-14-08	23.76	83.370	EL	6-7-02	16.4	88.053	EL
5-8-03	3.3	78.868	BB	06-14-09	29.75	84.972	EL	6-7-03	18.2	87.976	TB
5-8-04	4.3	78.845	CL	06-14-10	35.37	84.410	EL	6-7-04	19.9	87.315	BB
5-8-05	5	79.026	BB	06-14-11	52.89	84.720	EL	6-7-05	21.1	86.921	CL
5-8-06	6.7	80.239	TB	06-15-01	0	82.694	EL	6-7-06	21.7	87.128	BB
5-8-07	13.4	80.308	EL	06-15-02	6.98	80.694	EL	6-7-07	22.9	87.316	TB
5-8-08	42.4	80.339	EL	06-15-03	16.3	80.983	TB	6-7-08	32.1	87.506	CL
5-8-09	79.5	80.683	EL	06-15-04	18.08	79.680	BB	6-7-09	36.3	87.796	TB
				06-15-05	18.54	79.500	CL	6-7-10	40.3	85.863	BB
				06-15-06	20.18	79.387	BB	6-7-11	40.9	85.628	CL
				06-15-07	21.7	80.660	TB	6-7-12	42.7	85.820	BB
				06-15-08	27.84	80.680	EL	6-7-13	47.9	86.322	TB
				06-15-09	36.34	80.825	EL	6-7-14	55	89.072	BLDG
				06-15-10	40.74	81.983	EL	6-8-01	0	88.556	EL
				06-15-11	52.25	82.192	CC	6-8-02	6.7	88.364	EL
				06-15-12	65.02	82.213	BLDG	6-8-03	16.6	88.311	EL
				06-16-01	0	80.729	EL	6-8-04	26.7	88.488	BLDG
				06-16-02	29.08	80.682	EL	6-8-05	31.2	88.478	EL
				06-16-03	33.37	79.999	TB	6-8-06	44.7	88.482	EL
				06-16-04	34.11	79.326	BB	6-8-07	52.2	87.828	TB
				06-16-05	35.63	79.252	CL	6-8-08	53.4	87.273	BB
				06-16-06	36.23	79.518	BB	6-8-09	54.1	86.973	CL
				06-16-07	38.08	80.485	TB	6-8-10	54.7	87.065	BB
				06-16-08	53.02	80.831	EL	6-8-11	57.7	88.163	TB
				06-16-09	82.12	80.941	EL	6-8-12	64.6	88.361	EL
								6-8-13	81.4	88.462	EL
								6-8-14	98.2	88.663	EL
								6-8-15	115.4	88.997	BLDG
								6-8-16	124.2	89.122	BLDG



Appendix E  
HEC-RAS Summary Output Tables

HEC-RAS Plan: EX 5&6

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc5	2388.964	AB 2yr	1.31	92.94	93.29	93.29	93.41	0.019896	1.52	0.86	3.59	0.99
wc5	2388.964	AB 5yr	2.16	92.94	93.40	93.40	93.54	0.019382	1.66	1.30	4.68	1.01
wc5	2388.964	AB 10yr	2.93	92.94	93.59	93.47	93.66	0.006711	1.18	2.84	23.36	0.62
wc5	2388.964	AB 20yr	3.86	92.94	93.73	93.55	93.76	0.002281	0.85	6.98	33.25	0.38
wc5	2388.964	AB 50yr	5.42	92.94	93.87	93.68	93.88	0.001210	0.73	11.82	37.02	0.29
wc5	2388.964	AB 100yr	6.90	92.94	94.09	93.72	94.10	0.000421	0.52	20.63	41.16	0.18
wc5	2290	AB 2yr	1.31	92.11	92.89		92.91	0.000985	0.55	2.39	4.62	0.24
wc5	2290	AB 5yr	2.16	92.11	93.24		93.25	0.000578	0.51	4.23	6.07	0.20
wc5	2290	AB 10yr	2.93	92.11	93.53		93.54	0.000384	0.47	6.22	7.40	0.16
wc5	2290	AB 20yr	3.86	92.11	93.62		93.63	0.000513	0.56	6.88	7.82	0.19
wc5	2290	AB 50yr	5.42	92.11	93.72		93.75	0.000753	0.70	7.74	8.94	0.23
wc5	2290	AB 100yr	6.90	92.11	94.00		94.02	0.000508	0.67	11.22	17.33	0.20
wc5	2256	AB 2yr	1.31	91.88	92.81	92.33	92.86	0.001362	1.01	1.30	5.22	0.33
wc5	2256	AB 5yr	2.16	91.88	93.14	92.50	93.21	0.001360	1.23	1.76	6.34	0.35
wc5	2256	AB 10yr	2.93	91.88	93.40	92.64	93.50	0.008824	1.36	2.17	9.85	0.69
wc5	2256	AB 20yr	3.86	91.88	93.46	92.80	93.58	0.009122	1.52	2.80	11.75	0.72
wc5	2256	AB 50yr	5.42	91.88	93.24	93.03	93.65	0.006653	2.85	1.90	6.67	0.78
wc5	2256	AB 100yr	6.90	91.88	93.23	93.23	93.91	0.010999	3.66	1.89	6.64	1.01
wc5	2240.61		Culvert									
wc5	2221	AB 2yr	1.31	91.59	92.04	92.04	92.26	0.015239	2.07	0.63	3.30	0.99
wc5	2221	AB 5yr	2.16	91.59	92.22	92.22	92.53	0.014237	2.48	0.87	3.99	1.01
wc5	2221	AB 10yr	2.93	91.59	92.36	92.36	92.74	0.013283	2.75	1.07	4.55	1.00
wc5	2221	AB 20yr	3.86	91.59	92.51	92.51	92.97	0.012460	3.01	1.28	5.16	1.00
wc5	2221	AB 50yr	5.42	91.59	92.74	92.74	93.32	0.011596	3.37	1.61	7.73	1.00
wc5	2221	AB 100yr	6.90	91.59	92.94	92.94	93.62	0.010990	3.66	1.89	9.06	1.00
wc5	2198	AB 2yr	1.31	91.41	91.86		91.93	0.008566	1.21	1.09	3.31	0.67
wc5	2198	AB 5yr	2.16	91.41	92.00		92.09	0.008412	1.38	1.57	3.85	0.69
wc5	2198	AB 10yr	2.93	91.41	92.09		92.21	0.008311	1.49	1.97	4.24	0.70
wc5	2198	AB 20yr	3.86	91.41	92.20		92.33	0.008255	1.60	2.42	4.65	0.71
wc5	2198	AB 50yr	5.42	91.41	92.34		92.49	0.008109	1.73	3.13	5.22	0.71
wc5	2198	AB 100yr	6.90	91.41	92.44		92.62	0.008304	1.88	3.68	6.02	0.74
wc5	2150	AB 2yr	1.31	91.07	91.55		91.61	0.006821	1.11	1.18	3.42	0.60
wc5	2150	AB 5yr	2.16	91.07	91.69		91.77	0.006755	1.27	1.70	3.98	0.62
wc5	2150	AB 10yr	2.93	91.07	91.80		91.89	0.006601	1.37	2.14	4.40	0.63
wc5	2150	AB 20yr	3.86	91.07	91.91		92.02	0.006360	1.45	2.66	4.85	0.62
wc5	2150	AB 50yr	5.42	91.07	92.07		92.19	0.005941	1.54	3.51	5.52	0.62
wc5	2150	AB 100yr	6.90	91.07	92.19		92.33	0.005462	1.66	4.26	7.43	0.61
wc5	2068.437	AB 2yr	1.31	90.36	90.80		90.89	0.011843	1.38	0.95	2.93	0.77
wc5	2068.437	AB 5yr	2.16	90.36	90.93		91.06	0.011839	1.61	1.34	3.18	0.79
wc5	2068.437	AB 10yr	2.93	90.36	91.02		91.18	0.011970	1.77	1.65	3.36	0.81
wc5	2068.437	AB 20yr	3.86	90.36	91.12		91.31	0.012285	1.94	1.99	3.55	0.83
wc5	2068.437	AB 50yr	5.42	90.36	91.25		91.50	0.013014	2.18	2.49	3.81	0.86
wc5	2068.437	AB 100yr	6.90	90.36	91.35	91.29	91.65	0.013869	2.40	2.92	5.92	0.90
wc5	2044.707	AB 2yr	1.31	89.83	90.30		90.36	0.007514	1.15	1.14	3.37	0.63
wc5	2044.707	AB 5yr	2.16	89.83	90.43	90.31	90.52	0.007542	1.32	1.63	3.91	0.65
wc5	2044.707	AB 10yr	2.93	89.83	90.53	90.39	90.64	0.007584	1.44	2.04	4.31	0.67
wc5	2044.707	AB 20yr	3.86	89.83	90.63	90.48	90.75	0.007650	1.55	2.49	4.71	0.68
wc5	2044.707	AB 50yr	5.42	89.83	90.78	90.61	90.92	0.007539	1.69	3.21	5.29	0.69
wc5	2044.707	AB 100yr	6.90	89.83	90.88	90.71	91.05	0.007520	1.83	3.80	6.41	0.70
wc5	1986.134	AB 2yr	1.31	89.59	89.97	89.95	90.08	0.015977	1.51	0.87	3.03	0.90
wc5	1986.134	AB 5yr	2.16	89.59	90.08	90.06	90.24	0.016250	1.75	1.24	3.48	0.94
wc5	1986.134	AB 10yr	2.93	89.59	90.16	90.15	90.35	0.016437	1.91	1.54	3.81	0.96
wc5	1986.134	AB 20yr	3.86	89.59	90.25	90.24	90.47	0.016354	2.05	1.88	4.16	0.97
wc5	1986.134	AB 50yr	5.42	89.59	90.37	90.37	90.63	0.016857	2.27	2.39	4.62	1.01
wc5	1986.134	AB 100yr	6.90	89.59	90.47	90.47	90.76	0.016320	2.39	2.89	5.04	1.01
wc5	1901.030	AB 2yr	1.31	88.78	89.29		89.35	0.005246	1.01	1.30	3.55	0.53
wc5	1901.030	AB 5yr	2.16	88.78	89.45		89.52	0.004869	1.13	1.92	4.19	0.53
wc5	1901.030	AB 10yr	2.93	88.78	89.57		89.65	0.004592	1.20	2.45	4.67	0.53
wc5	1901.030	AB 20yr	3.86	88.78	89.70		89.78	0.004349	1.26	3.06	5.17	0.52
wc5	1901.030	AB 50yr	5.42	88.78	89.87		89.96	0.003858	1.36	4.03	6.33	0.51
wc5	1901.030	AB 100yr	6.90	88.78	90.01		90.11	0.003435	1.44	4.99	7.60	0.49
wc5	1874.583	AB 2yr	1.31	88.53	89.08		89.16	0.008935	1.30	1.01	2.69	0.68
wc5	1874.583	AB 5yr	2.16	88.53	89.22		89.34	0.009453	1.53	1.41	3.01	0.71
wc5	1874.583	AB 10yr	2.93	88.53	89.32		89.47	0.009922	1.70	1.73	3.25	0.74
wc5	1874.583	AB 20yr	3.86	88.53	89.42		89.60	0.010455	1.86	2.07	3.48	0.77
wc5	1874.583	AB 50yr	5.42	88.53	89.56		89.78	0.011617	2.12	2.56	3.79	0.82
wc5	1874.583	AB 100yr	6.90	88.53	89.64	89.58	89.93	0.013535	2.39	2.89	3.98	0.90

HEC-RAS Plan: EX 5&6 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc5	1845.237	AB 2yr	1.31	88.39	88.91		88.96	0.005004	0.99	1.32	3.58	0.52
wc5	1845.237	AB 5yr	2.16	88.39	89.06		89.12	0.005009	1.14	1.90	4.17	0.54
wc5	1845.237	AB 10yr	2.93	88.39	89.17		89.24	0.005004	1.23	2.37	4.61	0.55
wc5	1845.237	AB 20yr	3.86	88.39	89.28		89.37	0.005013	1.33	2.91	5.05	0.56
wc5	1845.237	AB 50yr	5.42	88.39	89.42		89.53	0.005013	1.47	3.71	6.72	0.57
wc5	1845.237	AB 100yr	6.90	88.39	89.53		89.66	0.004934	1.60	4.49	8.08	0.58
wc5	1801.453	AB 2yr	1.31	88.17	88.69		88.74	0.005138	1.00	1.31	3.56	0.53
wc5	1801.453	AB 5yr	2.16	88.17	88.84		88.90	0.005088	1.15	1.89	4.16	0.54
wc5	1801.453	AB 10yr	2.93	88.17	88.95		89.02	0.005049	1.24	2.37	4.60	0.55
wc5	1801.453	AB 20yr	3.86	88.17	89.06		89.15	0.005057	1.33	2.90	5.04	0.56
wc5	1801.453	AB 50yr	5.42	88.17	89.21		89.32	0.004947	1.46	3.72	5.98	0.57
wc5	1801.453	AB 100yr	6.90	88.17	89.31		89.44	0.004823	1.59	4.53	9.31	0.58
wc5	1693.967	AB 2yr	1.31	87.76	88.28		88.33	0.004838	0.98	1.33	3.60	0.51
wc5	1693.967	AB 5yr	2.16	87.76	88.43		88.50	0.004937	1.13	1.91	4.18	0.54
wc5	1693.967	AB 10yr	2.93	87.76	88.54		88.62	0.004976	1.23	2.38	4.61	0.55
wc5	1693.967	AB 20yr	3.86	87.76	88.65		88.74	0.005011	1.33	2.91	5.05	0.56
wc5	1693.967	AB 50yr	5.42	87.76	88.77		88.89	0.005558	1.51	3.58	5.61	0.60
wc5	1693.967	AB 100yr	6.90	87.76	88.86		89.01	0.005995	1.71	4.08	6.26	0.63
wc5	1602.883	AB 2yr	1.31	87.17	87.68		87.73	0.005374	1.02	1.28	3.54	0.54
wc5	1602.883	AB 5yr	2.16	87.17	87.83		87.90	0.005150	1.15	1.88	4.16	0.55
wc5	1602.883	AB 10yr	2.93	87.17	87.95		88.02	0.005063	1.24	2.36	4.60	0.55
wc5	1602.883	AB 20yr	3.86	87.17	88.06		88.15	0.005003	1.33	2.91	5.05	0.56
wc5	1602.883	AB 50yr	5.42	87.17	88.26	87.95	88.35	0.003746	1.34	4.28	11.47	0.50
wc5	1602.883	AB 100yr	6.90	87.17	88.37	88.05	88.46	0.003509	1.42	6.22	26.84	0.50
wc5	1537.467	AB 2yr	1.31	86.84	87.41		87.45	0.003502	0.87	1.50	3.78	0.44
wc5	1537.467	AB 5yr	2.16	86.84	87.57		87.62	0.003541	1.00	2.15	4.41	0.46
wc5	1537.467	AB 10yr	2.93	86.84	87.65		87.72	0.004181	1.16	2.54	4.75	0.50
wc5	1537.467	AB 20yr	3.86	86.84	87.71		87.81	0.005389	1.36	2.83	4.99	0.58
wc5	1537.467	AB 50yr	5.42	86.84	87.62	87.62	87.88	0.016888	2.27	2.39	4.62	1.01
wc5	1537.467	AB 100yr	6.90	86.84	87.72	87.72	88.01	0.016320	2.39	2.89	5.04	1.01
wc5	1471.795	AB 2yr	1.31	86.50	87.00		87.09	0.009476	1.30	1.01	2.87	0.70
wc5	1471.795	AB 5yr	2.16	86.50	87.15	87.04	87.26	0.009305	1.48	1.46	3.36	0.72
wc5	1471.795	AB 10yr	2.93	86.50	87.27	87.27	87.37	0.006677	1.45	2.68	22.31	0.63
wc5	1471.795	AB 20yr	3.86	86.50	87.33	87.33	87.43	0.006225	1.50	4.05	24.46	0.62
wc5	1471.795	AB 50yr	5.42	86.50	87.61		87.63	0.001063	0.80	12.60	39.23	0.27
wc5	1471.795	AB 100yr	6.90	86.50	87.70		87.72	0.000916	0.79	16.47	45.36	0.26
wc5	1439.675	AB 2yr	1.31	86.27	86.72	86.63	86.80	0.008357	1.20	1.10	3.32	0.66
wc5	1439.675	AB 5yr	2.16	86.27	86.82	86.75	86.94	0.010626	1.50	1.44	3.71	0.77
wc5	1439.675	AB 10yr	2.93	86.27	86.90	86.84	87.04	0.011640	1.68	1.74	4.02	0.82
wc5	1439.675	AB 20yr	3.86	86.27	87.06	86.92	87.19	0.007952	1.57	2.45	4.68	0.69
wc5	1439.675	AB 50yr	5.42	86.27	87.60	87.05	87.61	0.000323	0.47	19.94	47.82	0.15
wc5	1439.675	AB 100yr	6.90	86.27	87.69	87.27	87.70	0.000293	0.48	25.14	60.63	0.15
wc5	1320.692	AB 2yr	1.56	85.57	86.13		86.19	0.005310	1.07	1.46	3.74	0.54
wc5	1320.692	AB 5yr	2.53	85.57	86.36		86.42	0.003417	1.03	2.45	4.68	0.45
wc5	1320.692	AB 10yr	3.40	85.57	86.57		86.62	0.002348	0.97	3.50	5.51	0.39
wc5	1320.692	AB 20yr	4.43	85.57	86.99		87.01	0.000702	0.74	6.45	8.64	0.23
wc5	1320.692	AB 50yr	6.23	85.57	87.56		87.58	0.000254	0.60	15.41	33.41	0.15
wc5	1320.692	AB 100yr	8.82	85.57	87.64		87.66	0.000400	0.77	18.15	39.83	0.19
wc5	1316.508	AB 2yr	1.56	85.38	85.91	85.79	86.03	0.006963	1.51	1.04	3.63	0.67
wc5	1316.508	AB 5yr	2.53	85.38	86.18	85.94	86.31	0.004621	1.62	1.56	4.69	0.58
wc5	1316.508	AB 10yr	3.40	85.38	86.38	86.06	86.53	0.003842	1.72	1.97	5.51	0.55
wc5	1316.508	AB 20yr	4.43	85.38	86.86	86.19	86.98	0.001740	1.51	2.93	8.46	0.40
wc5	1316.508	AB 50yr	6.23	85.38	87.44	86.39	87.55	0.001148	1.53	4.08	22.64	0.34
wc5	1316.508	AB 100yr	8.82	85.38	87.36	86.65	87.62	0.002602	2.24	3.93	18.44	0.51
wc5	1307.90			Culvert								
wc5	1291.617	AB 2yr	1.56	85.19	85.69		85.82	0.008951	1.63	0.96	3.48	0.75
wc5	1291.617	AB 5yr	2.53	85.19	85.81	85.75	86.03	0.010660	2.08	1.22	4.00	0.85
wc5	1291.617	AB 10yr	3.40	85.19	85.90	85.87	86.21	0.012495	2.45	1.39	4.33	0.94
wc5	1291.617	AB 20yr	4.43	85.19	86.00	86.00	86.40	0.013654	2.80	1.58	4.73	1.01
wc5	1291.617	AB 50yr	6.23	85.19	86.20	86.20	86.70	0.012626	3.14	1.99	5.53	1.00
wc5	1291.617	AB 100yr	8.82	85.19	86.46	86.46	87.09	0.011588	3.51	2.51	6.24	1.00
wc5	1288.054	AB 2yr	1.56	85.00	85.52		85.59	0.007309	1.20	1.30	3.56	0.63
wc5	1288.054	AB 5yr	2.53	85.00	85.66		85.75	0.007292	1.36	1.86	4.14	0.65
wc5	1288.054	AB 10yr	3.40	85.00	85.76		85.87	0.007299	1.47	2.31	4.55	0.66
wc5	1288.054	AB 20yr	4.43	85.00	85.87		85.99	0.007325	1.58	2.80	4.96	0.67
wc5	1288.054	AB 50yr	6.23	85.00	86.02		86.17	0.007297	1.74	3.59	5.51	0.69
wc5	1288.054	AB 100yr	8.82	85.00	86.16		86.37	0.007365	2.00	4.42	5.63	0.71

HEC-RAS Plan: EX 5&6 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc5	1225.493	AB 2yr	1.56	84.72	85.23		85.31	0.007601	1.21	1.29	3.54	0.64
wc5	1225.493	AB 5yr	2.53	84.72	85.37		85.47	0.007602	1.38	1.83	4.11	0.66
wc5	1225.493	AB 10yr	3.40	84.72	85.47		85.59	0.007600	1.50	2.27	4.52	0.67
wc5	1225.493	AB 20yr	4.43	84.72	85.58		85.71	0.007598	1.60	2.76	4.93	0.68
wc5	1225.493	AB 50yr	6.23	84.72	85.73		85.89	0.007602	1.76	3.54	5.53	0.70
wc5	1225.493	AB 100yr	8.82	84.72	85.88		86.08	0.007582	2.02	4.41	6.13	0.72
wc5	1157.883	AB 2yr	1.56	84.21	84.72		84.80	0.007443	1.20	1.30	3.55	0.64
wc5	1157.883	AB 5yr	2.53	84.21	84.87		84.96	0.007419	1.37	1.84	4.12	0.65
wc5	1157.883	AB 10yr	3.40	84.21	84.97		85.08	0.007405	1.48	2.29	4.54	0.67
wc5	1157.883	AB 20yr	4.43	84.21	85.07		85.20	0.007392	1.59	2.79	4.96	0.68
wc5	1157.883	AB 50yr	6.23	84.21	85.22		85.38	0.007401	1.74	3.57	5.58	0.69
wc5	1157.883	AB 100yr	8.82	84.21	85.37		85.58	0.007405	2.00	4.47	6.47	0.72
wc5	1131.031	AB 2yr	1.56	84.01	84.53		84.60	0.007071	1.18	1.32	3.58	0.62
wc5	1131.031	AB 5yr	2.53	84.01	84.67		84.77	0.007098	1.35	1.87	4.15	0.64
wc5	1131.031	AB 10yr	3.40	84.01	84.78		84.89	0.007137	1.46	2.32	4.57	0.65
wc5	1131.031	AB 20yr	4.43	84.01	84.88		85.01	0.007154	1.57	2.82	4.98	0.67
wc5	1131.031	AB 50yr	6.23	84.01	85.03		85.18	0.007135	1.73	3.61	5.68	0.68
wc5	1131.031	AB 100yr	8.82	84.01	85.18		85.38	0.007089	1.97	4.57	7.02	0.70
wc5	1112.568	AB 2yr	1.56	83.88	84.39	84.28	84.47	0.007532	1.21	1.29	3.55	0.64
wc5	1112.568	AB 5yr	2.53	83.88	84.53	84.40	84.63	0.007507	1.38	1.84	4.12	0.66
wc5	1112.568	AB 10yr	3.40	83.88	84.64	84.49	84.75	0.007571	1.49	2.27	4.52	0.67
wc5	1112.568	AB 20yr	4.43	83.88	84.74	84.59	84.87	0.007554	1.60	2.77	4.94	0.68
wc5	1112.568	AB 50yr	6.23	83.88	84.89	84.72	85.05	0.007551	1.76	3.55	5.56	0.70
wc5	1112.568	AB 100yr	8.82	83.88	85.04	84.88	85.24	0.007520	2.01	4.45	6.47	0.72
wc5	1071.480	AB 2yr	1.56	83.57	84.08		84.15	0.007627	1.21	1.28	3.54	0.64
wc5	1071.480	AB 5yr	2.53	83.57	84.22		84.32	0.007586	1.38	1.83	4.11	0.66
wc5	1071.480	AB 10yr	3.40	83.57	84.33		84.44	0.007504	1.49	2.28	4.53	0.67
wc5	1071.480	AB 20yr	4.43	83.57	84.43		84.56	0.007366	1.59	2.79	4.96	0.67
wc5	1071.480	AB 50yr	6.23	83.57	84.58		84.74	0.007463	1.75	3.56	5.53	0.69
wc5	1071.480	AB 100yr	8.82	83.57	84.73		84.94	0.007448	2.01	4.42	5.95	0.72
wc5	1034.499	AB 2yr	1.56	83.29	83.81	83.69	83.88	0.006867	1.17	1.33	3.59	0.61
wc5	1034.499	AB 5yr	2.53	83.29	83.97	83.81	84.06	0.006362	1.30	1.95	4.23	0.61
wc5	1034.499	AB 10yr	3.40	83.29	84.09	83.90	84.18	0.006046	1.38	2.47	4.69	0.61
wc5	1034.499	AB 20yr	4.43	83.29	84.21	84.00	84.32	0.005718	1.44	3.07	5.17	0.60
wc5	1034.499	AB 50yr	6.23	83.29	84.35	84.13	84.49	0.005829	1.62	3.84	5.61	0.62
wc5	1034.499	AB 100yr	8.82	83.29	84.47	84.29	84.67	0.006844	1.96	4.53	5.83	0.69
wc5	1013.774	AB 2yr	1.56	83.14	83.69	83.54	83.75	0.005635	1.09	1.43	3.70	0.56
wc5	1013.774	AB 5yr	2.53	83.14	83.87	83.66	83.94	0.004953	1.18	2.14	4.40	0.54
wc5	1013.774	AB 10yr	3.40	83.14	83.99	83.75	84.07	0.004673	1.25	2.72	4.90	0.54
wc5	1013.774	AB 20yr	4.43	83.14	84.12	83.84	84.21	0.004400	1.31	3.38	5.41	0.53
wc5	1013.774	AB 50yr	6.23	83.14	84.26	83.98	84.37	0.004427	1.49	4.22	6.40	0.55
wc5	1013.774	AB 100yr	8.82	83.14	84.35	84.14	84.53	0.006092	1.89	4.81	7.06	0.66
wc5	951.8970	AB 2yr	2.17	82.62	83.24	83.12	83.33	0.007584	1.35	1.61	3.74	0.65
wc5	951.8970	AB 5yr	3.50	82.62	83.39	83.26	83.52	0.008473	1.60	2.19	4.25	0.71
wc5	951.8970	AB 10yr	4.66	82.62	83.49	83.36	83.65	0.008997	1.76	2.64	4.60	0.74
wc5	951.8970	AB 20yr	6.00	82.62	83.58	83.47	83.77	0.009999	1.96	3.06	4.91	0.79
wc5	951.8970	AB 50yr	8.14	82.62	83.76	83.61	83.97	0.008867	2.04	4.00	6.13	0.76
wc5	951.8970	AB 100yr	10.30	82.62	83.95	83.74	84.14	0.006290	1.98	5.83	13.66	0.66
wc5	942.8887	AB 2yr	2.17	82.59	83.20	83.07	83.29	0.007168	1.30	1.67	3.95	0.64
wc5	942.8887	AB 5yr	3.50	82.59	83.35	83.21	83.47	0.007736	1.54	2.27	4.52	0.68
wc5	942.8887	AB 10yr	4.66	82.59	83.44	83.31	83.60	0.007682	1.72	2.71	4.92	0.70
wc5	942.8887	AB 20yr	6.00	82.59	83.52	83.40	83.72	0.008842	1.99	3.02	5.20	0.77
wc5	942.8887	AB 50yr	8.14	82.59	83.53	83.53	83.89	0.014977	2.63	3.09	5.27	1.00
wc5	942.8887	AB 100yr	10.30	82.59	83.65	83.65	84.06	0.014148	2.84	3.63	6.89	1.00
wc5	937.1887		Culvert									
wc5	931	AB 2yr	2.17	82.47	83.23	82.95	83.28	0.002796	0.96	2.27	4.54	0.41
wc5	931	AB 5yr	3.50	82.47	83.37	83.09	83.45	0.003535	1.22	2.88	5.11	0.48
wc5	931	AB 10yr	4.66	82.47	83.47	83.19	83.57	0.003981	1.41	3.30	5.49	0.52
wc5	931	AB 20yr	6.00	82.47	83.54	83.29	83.68	0.004825	1.66	3.62	6.52	0.58
wc5	931	AB 50yr	8.14	82.47	83.50	83.42	83.79	0.010642	2.37	3.43	6.71	0.86
wc5	931	AB 100yr	10.30	82.47	83.72	83.54	84.00	0.007307	2.33	4.42	66.88	0.74
wc5	918.3739	AB 2yr	2.17	82.41	83.06	83.02	83.18	0.014793	1.57	1.38	4.27	0.88
wc5	918.3739	AB 5yr	3.50	82.41	83.21	83.15	83.35	0.011740	1.65	2.13	5.11	0.82
wc5	918.3739	AB 10yr	4.66	82.41	83.35	83.24	83.48	0.009202	1.65	2.83	5.65	0.74
wc5	918.3739	AB 20yr	6.00	82.41	83.47	83.33	83.60	0.007416	1.64	4.31	25.52	0.68
wc5	918.3739	AB 50yr	8.14	82.41	83.63	83.57	83.63	0.000413	0.44	42.69	184.66	0.17
wc5	918.3739	AB 100yr	10.30	82.41	83.86	83.57	83.86	0.000076	0.22	85.81	185.15	0.07

HEC-RAS Plan: EX 5&6 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc5	815.3577	AB 2yr	2.17	81.85	82.62	82.33	82.66	0.002849	0.93	2.34	4.58	0.41
wc5	815.3577	AB 5yr	3.50	81.85	82.84	82.47	82.89	0.002621	1.02	3.44	5.45	0.41
wc5	815.3577	AB 10yr	4.66	81.85	83.02	82.57	83.07	0.002486	1.03	4.54	6.89	0.40
wc5	815.3577	AB 20yr	6.00	81.85	83.16	82.68	83.22	0.002544	1.08	5.57	8.03	0.41
wc5	815.3577	AB 50yr	8.14	81.85	83.52	82.82	83.56	0.001407	0.90	9.05	11.04	0.32
wc5	815.3577	AB 100yr	10.30	81.85	83.86	82.95	83.86	0.000001	0.03	329.17	243.15	0.01
wc5	680.8133	AB 2yr	2.52	81.64	82.55	82.16	82.58	0.001949	0.84	3.01	5.13	0.35
wc5	680.8133	AB 5yr	4.00	81.64	82.77	82.31	82.82	0.001729	0.94	4.25	5.79	0.34
wc5	680.8133	AB 10yr	5.25	81.64	82.96	82.41	83.01	0.001443	1.00	5.36	6.20	0.33
wc5	680.8133	AB 20yr	6.67	81.64	83.20	82.51	83.20	0.000005	0.07	142.03	155.43	0.02
wc5	680.8133	AB 50yr	8.89	81.64	83.55	82.65	83.55	0.000003	0.06	196.90	155.68	0.02
wc5	680.8133	AB 100yr	11.00	81.64	83.86	82.75	83.86	0.000002	0.06	245.85	176.52	0.01
wc5	678.6898	AB 2yr	2.52	81.55	82.53	82.07	82.56	0.001405	0.74	3.40	5.42	0.30
wc5	678.6898	AB 5yr	4.00	81.55	82.76	82.22	82.80	0.001262	0.86	4.69	5.85	0.30
wc5	678.6898	AB 10yr	5.25	81.55	82.95	82.32	82.99	0.001107	0.92	5.81	6.17	0.29
wc5	678.6898	AB 20yr	6.67	81.55	83.20	82.42	83.20	0.000006	0.08	133.36	154.38	0.02
wc5	678.6898	AB 50yr	8.89	81.55	83.55	82.56	83.55	0.000003	0.07	187.84	154.47	0.02
wc5	678.6898	AB 100yr	11.00	81.55	83.86	82.66	83.86	0.000002	0.07	245.25	231.76	0.02
wc5	665	AB 2yr	2.52	81.40	82.38	82.10	82.41	0.002386	0.74	3.39	8.38	0.37
wc5	665	AB 5yr	4.00	81.40	82.71	82.22	82.72	0.000543	0.47	14.36	91.79	0.19
wc5	665	AB 10yr	5.25	81.40	82.95	82.30	82.95	0.000095	0.25	44.91	159.61	0.08
wc5	665	AB 20yr	6.67	81.40	83.20	82.38	83.20	0.000024	0.15	88.31	178.22	0.04
wc5	665	AB 50yr	8.89	81.40	83.55	82.49	83.55	0.000006	0.08	211.98	388.44	0.02
wc5	665	AB 100yr	11.00	81.40	83.86	82.68	83.86	0.000002	0.06	332.00	388.44	0.01
wc5	660	AB 2yr	2.52	81.32	82.09	82.09	82.37	0.016592	2.36	1.07	3.73	1.00
wc5	660	AB 5yr	4.00	81.32	82.29	82.29	82.67	0.015100	2.76	1.45	4.56	1.01
wc5	660	AB 10yr	5.25	81.32	82.44	82.44	82.90	0.013952	3.00	1.75	5.20	1.00
wc5	660	AB 20yr	6.67	81.32	82.60	82.60	83.14	0.013250	3.26	2.05	5.86	1.00
wc5	660	AB 50yr	8.89	81.32	82.82	82.82	83.48	0.012585	3.60	2.47	6.78	1.01
wc5	660	AB 100yr	11.00	81.32	83.02	83.02	83.78	0.011988	3.86	2.85	7.81	1.01
wc5	655		Culvert									
wc5	651.8919	AB 2yr	2.52	80.93	81.58	81.50	81.79	0.009385	2.02	1.25	4.11	0.81
wc5	651.8919	AB 5yr	4.00	80.93	81.73	81.70	82.08	0.011918	2.61	1.53	4.70	0.94
wc5	651.8919	AB 10yr	5.25	80.93	81.85	81.85	82.30	0.012828	2.97	1.77	5.17	1.00
wc5	651.8919	AB 20yr	6.67	80.93	82.00	82.00	82.53	0.012232	3.23	2.07	9.60	1.00
wc5	651.8919	AB 50yr	8.89	80.93	82.23	82.23	82.87	0.011470	3.55	2.50	44.23	1.00
wc5	651.8919	AB 100yr	11.00	80.93	82.43	82.43	83.16	0.010873	3.81	2.89	260.43	1.00
wc5	648.3854	AB 2yr	2.52	80.78	81.34	81.30	81.49	0.014262	1.74	1.45	3.72	0.89
wc5	648.3854	AB 5yr	4.00	80.78	81.45	81.45	81.68	0.017188	2.11	1.90	4.17	1.00
wc5	648.3854	AB 10yr	5.25	80.78	81.55	81.55	81.81	0.016778	2.25	2.34	4.58	1.00
wc5	648.3854	AB 20yr	6.67	80.78	81.65	81.65	81.94	0.016019	2.35	2.84	4.99	1.00
wc5	648.3854	AB 50yr	8.89	80.78	81.79	81.79	82.11	0.015515	2.51	3.54	5.68	1.00
wc5	648.3854	AB 100yr	11.00	80.78	82.03	81.93	82.03	0.000054	0.18	109.03	231.47	0.06
wc5	553.6066	AB 2yr	2.52	80.14	80.91	80.70	80.96	0.004094	0.94	2.67	6.98	0.49
wc5	553.6066	AB 5yr	4.00	80.14	81.15	80.83	81.19	0.002452	0.86	4.66	9.59	0.39
wc5	553.6066	AB 10yr	5.25	80.14	81.33	80.92	81.36	0.001752	0.81	6.52	11.51	0.34
wc5	553.6066	AB 20yr	6.67	80.14	81.51	81.00	81.54	0.001275	0.76	8.83	13.51	0.30
wc5	553.6066	AB 50yr	8.89	80.14	81.76	81.10	81.78	0.000290	0.43	39.07	149.89	0.15
wc5	553.6066	AB 100yr	11.00	80.14	82.02	81.18	82.03	0.000077	0.26	77.86	161.51	0.08
wc5	521.5115	AB 2yr	2.52	80.04	80.85	80.56	80.90	0.003074	0.99	2.54	4.75	0.43
wc5	521.5115	AB 5yr	4.00	80.04	81.09	80.71	81.15	0.002490	1.05	3.81	6.26	0.40
wc5	521.5115	AB 10yr	5.25	80.04	81.27	80.81	81.33	0.001923	1.08	5.17	8.82	0.37
wc5	521.5115	AB 20yr	6.67	80.04	81.47	80.91	81.52	0.001362	1.04	8.37	22.75	0.32
wc5	521.5115	AB 50yr	8.89	80.04	81.78	81.05	81.78	0.000014	0.13	143.67	238.98	0.03
wc5	521.5115	AB 100yr	11.00	80.04	82.03	81.16	82.03	0.000007	0.10	202.33	239.74	0.03
wc5	518.7136	AB 2yr	2.89	79.98	80.80	80.54	80.87	0.003663	1.21	2.39	4.76	0.49
wc5	518.7136	AB 5yr	4.54	79.98	81.02	80.69	81.12	0.003266	1.40	3.24	5.90	0.48
wc5	518.7136	AB 10yr	5.90	79.98	81.18	80.79	81.30	0.003062	1.53	3.86	7.58	0.48
wc5	518.7136	AB 20yr	7.43	79.98	81.36	80.90	81.49	0.002894	1.65	4.51	12.02	0.48
wc5	518.7136	AB 50yr	9.80	79.98	81.60	81.04	81.76	0.002708	1.80	5.44	42.23	0.48
wc5	518.7136	AB 100yr	11.90	79.98	81.83	81.17	82.01	0.002442	1.89	6.30	188.00	0.47
wc5	503.04		Culvert									
wc5	487.5449	AB 2yr	2.89	79.68	80.31	80.18	80.42	0.006691	1.47	1.97	6.12	0.65
wc5	487.5449	AB 5yr	4.54	79.68	80.46	80.32	80.62	0.007201	1.80	2.52	9.65	0.70
wc5	487.5449	AB 10yr	5.90	79.68	80.54	80.42	80.76	0.008296	2.08	2.83	10.51	0.77
wc5	487.5449	AB 20yr	7.43	79.68	80.60	80.52	80.90	0.010133	2.43	3.06	11.16	0.86
wc5	487.5449	AB 50yr	9.80	79.68	80.67	80.67	81.11	0.013268	2.94	3.33	11.92	1.00

HEC-RAS Plan: EX 5&6 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc5	487.5449	AB 100yr	11.90	79.68	80.79	80.79	81.29	0.012768	3.14	3.79	13.47	1.00
wc5	484.1846	AB 2yr	2.89	79.63	80.29	80.13	80.36	0.005364	1.13	2.56	6.26	0.56
wc5	484.1846	AB 5yr	4.54	79.63	80.46	80.25	80.54	0.004516	1.21	3.80	9.34	0.54
wc5	484.1846	AB 10yr	5.90	79.63	80.57	80.34	80.65	0.004084	1.28	5.11	20.93	0.52
wc5	484.1846	AB 20yr	7.43	79.63	80.68	80.42	80.75	0.002961	1.21	8.98	42.01	0.46
wc5	484.1846	AB 50yr	9.80	79.63	80.79	80.65	80.84	0.002161	1.14	14.29	50.65	0.40
wc5	484.1846	AB 100yr	11.90	79.63	80.83	80.71	80.89	0.002467	1.25	16.14	52.97	0.43
wc5	381.2556	AB 2yr	2.89	79.11	79.91	79.67	79.98	0.004299	1.16	2.49	4.70	0.51
wc5	381.2556	AB 5yr	4.54	79.11	80.12	79.82	80.20	0.004018	1.28	3.55	5.50	0.51
wc5	381.2556	AB 10yr	5.90	79.11	80.25	79.93	80.34	0.003718	1.39	4.25	5.55	0.50
wc5	381.2556	AB 20yr	7.43	79.11	80.37	80.03	80.48	0.003609	1.51	4.94	5.60	0.51
wc5	381.2556	AB 50yr	9.80	79.11	80.55	80.16	80.65	0.002768	1.49	10.50	62.30	0.46
wc5	381.2556	AB 100yr	11.90	79.11	80.69	80.25	80.74	0.001510	1.20	20.06	72.71	0.35
wc5	359.8282	AB 2yr	2.89	78.85	79.67	79.48	79.77	0.006348	1.41	2.05	3.70	0.61
wc5	359.8282	AB 5yr	4.54	78.85	79.86	79.65	79.99	0.006564	1.61	2.82	4.24	0.63
wc5	359.8282	AB 10yr	5.90	78.85	79.97	79.76	80.14	0.007099	1.78	3.32	4.56	0.66
wc5	359.8282	AB 20yr	7.43	78.85	80.06	79.88	80.27	0.008170	1.99	3.74	4.81	0.72
wc5	359.8282	AB 50yr	9.80	78.85	80.18	80.03	80.44	0.009740	2.28	4.30	5.18	0.79
wc5	359.8282	AB 100yr	11.90	78.85	80.25	80.15	80.58	0.010980	2.53	4.74	7.31	0.85
wc5	304.0528	AB 2yr	2.89	78.22	79.04	78.98	79.19	0.012442	1.68	1.72	4.16	0.84
wc5	304.0528	AB 5yr	4.54	78.22	79.18	79.13	79.37	0.013757	1.96	2.32	4.83	0.90
wc5	304.0528	AB 10yr	5.90	78.22	79.27	79.27	79.49	0.013511	2.08	2.96	8.71	0.91
wc5	304.0528	AB 20yr	7.43	78.22	79.36	79.36	79.59	0.012578	2.18	3.76	9.53	0.90
wc5	304.0528	AB 50yr	9.80	78.22	79.47	79.47	79.72	0.011684	2.34	4.83	10.51	0.89
wc5	304.0528	AB 100yr	11.90	78.22	79.55	79.55	79.83	0.011062	2.45	5.74	11.30	0.88
wc5	250	AB 2yr	2.89	77.55	78.11	78.11	78.28	0.018726	1.80	1.61	5.01	1.01
wc5	250	AB 5yr	4.54	77.55	78.23	78.23	78.44	0.017442	2.02	2.25	5.53	1.01
wc5	250	AB 10yr	5.90	77.55	78.32	78.32	78.56	0.016757	2.16	2.73	5.90	1.01
wc5	250	AB 20yr	7.43	77.55	78.41	78.41	78.67	0.016177	2.28	3.26	6.27	1.01
wc5	250	AB 50yr	9.80	77.55	78.52	78.52	78.83	0.015543	2.44	4.02	6.79	1.01
wc5	250	AB 100yr	11.90	77.55	78.67	78.62	78.95	0.012187	2.36	5.05	7.42	0.91
wc5	230	AB 2yr	2.89	76.75	77.51	77.38	77.59	0.006197	1.27	2.27	6.54	0.61
wc5	230	AB 5yr	4.54	76.75	77.76	77.49	77.84	0.003274	1.26	3.61	8.59	0.48
wc5	230	AB 10yr	5.90	76.75	77.93	77.57	78.02	0.002647	1.31	4.50	9.68	0.45
wc5	230	AB 20yr	7.43	76.75	78.11	77.66	78.20	0.002288	1.38	5.40	10.61	0.43
wc5	230	AB 50yr	9.80	76.75	78.40	77.78	78.50	0.001742	1.42	6.92	12.39	0.39
wc5	230	AB 100yr	11.90	76.75	78.75	77.88	78.84	0.001185	1.36	8.73	19.60	0.34
wc5	215		Culvert									
wc5	200	AB 2yr	2.89	76.48	77.50		77.53	0.001314	0.80	3.62	7.49	0.31
wc5	200	AB 5yr	4.54	76.48	77.72		77.77	0.001277	0.95	4.79	8.48	0.32
wc5	200	AB 10yr	5.90	76.48	77.88		77.93	0.001284	1.05	5.60	9.32	0.32
wc5	200	AB 20yr	7.43	76.48	78.03		78.10	0.001313	1.16	6.38	10.32	0.34
wc5	200	AB 50yr	9.80	76.48	78.23		78.31	0.001387	1.32	7.42	11.60	0.35
wc5	200	AB 100yr	11.90	76.48	78.45		78.55	0.001248	1.38	8.60	13.05	0.34
wc5	170	AB 2yr	2.89	76.48	77.50	77.01	77.51	0.000585	0.49	5.96	10.56	0.20
wc5	170	AB 5yr	4.54	76.48	77.73	77.12	77.75	0.000481	0.55	8.58	12.22	0.19
wc5	170	AB 10yr	5.90	76.48	77.89	77.19	77.91	0.000440	0.59	10.62	13.37	0.19
wc5	170	AB 20yr	7.43	76.48	78.05	77.26	78.07	0.000396	0.62	13.63	16.64	0.18
wc5	170	AB 50yr	9.80	76.48	78.26	77.36	78.28	0.000369	0.67	17.15	17.28	0.18
wc5	170	AB 100yr	11.90	76.48	78.49	77.43	78.51	0.000299	0.67	21.26	18.00	0.17
wc6	2457.382	AB 2yr	1.12	91.31	91.81		91.88	0.006231	1.11	1.01	2.51	0.56
wc6	2457.382	AB 5yr	1.86	91.31	91.96		92.05	0.006107	1.35	1.40	2.85	0.58
wc6	2457.382	AB 10yr	2.54	91.31	92.06		92.18	0.006276	1.54	1.71	3.10	0.61
wc6	2457.382	AB 20yr	3.39	91.31	92.17		92.32	0.006658	1.75	2.05	3.35	0.64
wc6	2457.382	AB 50yr	5.21	91.31	92.34		92.56	0.007725	2.15	2.64	3.75	0.71
wc6	2457.382	AB 100yr	7.98	91.31	92.51	92.43	92.86	0.009774	2.71	3.82	4.16	0.83
wc6	2408.649	AB 2yr	1.12	91.02	91.59	91.37	91.63	0.003819	0.96	1.18	3.01	0.45
wc6	2408.649	AB 5yr	1.86	91.02	91.74	91.50	91.81	0.003888	1.17	1.73	4.18	0.47
wc6	2408.649	AB 10yr	2.54	91.02	91.84	91.60	91.92	0.004177	1.33	2.17	4.92	0.50
wc6	2408.649	AB 20yr	3.39	91.02	91.93	91.72	92.04	0.004490	1.51	2.69	5.81	0.53
wc6	2408.649	AB 50yr	5.21	91.02	92.09	91.91	92.23	0.005011	1.79	3.75	7.37	0.58
wc6	2408.649	AB 100yr	7.98	91.02	92.27	92.12	92.45	0.005491	2.10	5.26	9.30	0.62
wc6	2359.898	AB 2yr	1.12	90.74	91.09	91.09	91.24	0.021562	1.72	0.65	2.20	1.01
wc6	2359.898	AB 5yr	1.86	90.74	91.22	91.22	91.42	0.020434	1.96	0.95	2.46	1.01
wc6	2359.898	AB 10yr	2.54	90.74	91.33	91.33	91.53	0.017991	1.97	1.32	3.84	0.97
wc6	2359.898	AB 20yr	3.39	90.74	91.43	91.43	91.65	0.015397	2.09	1.73	4.67	0.93
wc6	2359.898	AB 50yr	5.21	90.74	91.60	91.60	91.85	0.012752	2.29	2.62	6.11	0.89

HEC-RAS Plan: EX 586 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6	2359.898	AB 100yr	7.98	90.74	91.79	91.79	92.07	0.011026	2.52	3.96	7.77	0.86
wc6	2308.859	AB 2yr	1.12	90.44	90.79		90.79	0.001279	0.42	2.67	9.97	0.26
wc6	2308.859	AB 5yr	1.86	90.44	90.86		90.88	0.001532	0.54	3.46	10.13	0.29
wc6	2308.859	AB 10yr	2.54	90.44	90.92		90.94	0.001785	0.63	4.01	10.25	0.32
wc6	2308.859	AB 20yr	3.39	90.44	90.99		91.01	0.001871	0.72	4.74	10.40	0.34
wc6	2308.859	AB 50yr	5.21	90.44	91.09		91.13	0.002308	0.90	5.81	10.72	0.39
wc6	2308.859	AB 100yr	7.98	90.44	91.21		91.27	0.002857	1.13	7.15	11.78	0.44
wc6	2232.182	AB 2yr	1.12	90.33	90.61		90.63	0.004676	0.54	2.08	14.51	0.45
wc6	2232.182	AB 5yr	1.86	90.33	90.66		90.68	0.005307	0.68	2.78	16.97	0.50
wc6	2232.182	AB 10yr	2.54	90.33	90.71		90.73	0.004535	0.73	3.65	19.73	0.48
wc6	2232.182	AB 20yr	3.39	90.33	90.71		90.75	0.007958	0.97	3.67	19.60	0.64
wc6	2232.182	AB 50yr	5.21	90.33	90.77		90.83	0.008180	1.15	5.01	24.16	0.67
wc6	2232.182	AB 100yr	7.98	90.33	90.84		90.93	0.008363	1.34	6.97	29.36	0.71
wc6	2193.265	AB 2yr	1.12	89.88	90.18	90.18	90.29	0.021058	1.43	0.78	3.69	1.00
wc6	2193.265	AB 5yr	1.86	89.88	90.31	90.29	90.38	0.012113	1.22	1.70	10.89	0.78
wc6	2193.265	AB 10yr	2.54	89.88	90.34	90.34	90.44	0.014601	1.44	2.06	12.57	0.87
wc6	2193.265	AB 20yr	3.39	89.88	90.38	90.38	90.44	0.008474	1.20	4.79	42.20	0.68
wc6	2193.265	AB 50yr	5.21	89.88	90.42	90.42	90.48	0.010051	1.40	6.40	43.75	0.75
wc6	2193.265	AB 100yr	7.98	89.88	90.46	90.46	90.54	0.011754	1.62	8.37	45.58	0.82
wc6	2135.859	AB 2yr	1.12	89.59	90.17	89.94	90.17	0.000427	0.33	8.29	70.66	0.15
wc6	2135.859	AB 5yr	1.86	89.59	90.16	90.07	90.17	0.001567	0.62	7.44	69.99	0.29
wc6	2135.859	AB 10yr	2.54	89.59	90.19	90.14	90.20	0.001363	0.60	9.90	73.19	0.27
wc6	2135.859	AB 20yr	3.39	89.59	90.23	90.15	90.23	0.001268	0.61	12.59	79.19	0.26
wc6	2135.859	AB 50yr	5.21	89.59	90.30	90.18	90.30	0.001045	0.60	18.19	82.94	0.25
wc6	2135.859	AB 100yr	7.98	89.59	90.38	90.21	90.39	0.000895	0.60	25.53	86.94	0.23
wc6	2096.869	AB 2yr	1.12	89.40	89.91	89.81	89.98	0.008892	1.25	0.90	2.89	0.67
wc6	2096.869	AB 5yr	1.86	89.40	89.99	89.99	89.95	0.006956	1.25	2.46	19.56	0.61
wc6	2096.869	AB 10yr	2.54	89.40	90.03	90.02	90.09	0.007078	1.34	3.26	20.75	0.63
wc6	2096.869	AB 20yr	3.39	89.40	90.08	90.05	90.14	0.006081	1.34	4.42	22.37	0.59
wc6	2096.869	AB 50yr	5.21	89.40	90.11	90.11	90.20	0.009756	1.76	5.15	23.15	0.76
wc6	2096.869	AB 100yr	7.98	89.40	90.18	90.18	90.29	0.011537	2.06	6.66	24.13	0.84
wc6	2000	AB 2yr	1.12	88.47	88.77	88.77	88.90	0.021398	1.62	0.69	2.60	1.01
wc6	2000	AB 5yr	1.86	88.47	88.88	88.88	89.06	0.020058	1.87	0.99	2.82	1.01
wc6	2000	AB 10yr	2.54	88.47	88.97	88.97	89.18	0.019288	2.03	1.25	3.00	1.00
wc6	2000	AB 20yr	3.39	88.47	89.07	89.07	89.31	0.018766	2.19	1.55	3.19	1.01
wc6	2000	AB 50yr	5.21	88.47	89.41	89.41	89.52	0.005151	1.59	5.43	40.28	0.57
wc6	2000	AB 100yr	7.98	88.47	89.50	89.50	89.60	0.005159	1.71	9.47	49.02	0.58
wc6	1893.020	AB 2yr	1.12	87.07	87.61	87.45	87.65	0.004950	0.94	1.19	3.28	0.50
wc6	1893.020	AB 5yr	1.86	87.07	87.76	87.56	87.82	0.005105	1.09	1.71	3.86	0.52
wc6	1893.020	AB 10yr	2.54	87.07	87.86	87.64	87.93	0.005173	1.18	2.14	4.29	0.53
wc6	1893.020	AB 20yr	3.39	87.07	87.97	87.74	88.06	0.005194	1.29	2.65	6.27	0.54
wc6	1893.020	AB 50yr	5.21	87.07	87.90	87.90	88.16	0.017913	2.26	2.31	4.43	1.00
wc6	1893.020	AB 100yr	7.98	87.07	88.07	88.07	88.13	0.005298	1.43	9.09	34.98	0.56
wc6	1785.033	AB 2yr	1.12	86.31	86.61	86.61	86.74	0.021303	1.62	0.69	2.60	1.00
wc6	1785.033	AB 5yr	1.86	86.31	86.72	86.72	86.90	0.020081	1.87	0.99	2.82	1.01
wc6	1785.033	AB 10yr	2.54	86.31	86.81	86.81	87.02	0.019366	2.03	1.25	3.00	1.01
wc6	1785.033	AB 20yr	3.39	86.31	86.91	86.91	87.15	0.018633	2.19	1.55	3.19	1.00
wc6	1785.033	AB 50yr	5.21	86.31	87.16	87.16	87.36	0.018533	1.98	2.63	6.63	1.00
wc6	1785.033	AB 100yr	7.98	86.31	87.38	87.36	87.47	0.006392	1.50	8.35	47.19	0.63
wc6	1657.344	AB 2yr	1.12	85.34	86.04	85.64	86.06	0.001132	0.59	1.90	3.41	0.25
wc6	1657.344	AB 5yr	1.86	85.34	86.30	85.75	86.32	0.000886	0.67	2.86	4.15	0.24
wc6	1657.344	AB 10yr	2.54	85.34	86.46	85.84	86.49	0.000877	0.75	3.57	4.61	0.24
wc6	1657.344	AB 20yr	3.39	85.34	86.62	85.94	86.65	0.000924	0.85	4.33	5.07	0.25
wc6	1657.344	AB 50yr	5.21	85.34	86.76	86.11	86.82	0.001445	1.15	5.12	6.88	0.33
wc6	1657.344	AB 100yr	7.98	85.34	86.91	86.32	87.02	0.002214	1.53	6.93	19.25	0.41
wc6	1611.292	AB 2yr	1.58	84.99	86.02		86.03	0.000488	0.52	3.10	4.01	0.18
wc6	1611.292	AB 5yr	2.60	84.99	86.27		86.29	0.000557	0.66	4.17	4.49	0.20
wc6	1611.292	AB 10yr	3.52	84.99	86.42		86.45	0.000647	0.78	4.90	4.78	0.22
wc6	1611.292	AB 20yr	4.62	84.99	86.57		86.61	0.000757	0.90	5.63	5.06	0.24
wc6	1611.292	AB 50yr	6.45	84.99	86.70		86.77	0.001083	1.14	6.32	5.51	0.29
wc6	1611.292	AB 100yr	9.20	84.99	86.81		86.93	0.001793	1.54	7.05	9.66	0.38
wc6	1608.895	AB 2yr	1.58	84.96	85.74	85.74	86.00	0.018331	2.26	0.71	3.83	0.97
wc6	1608.895	AB 5yr	2.60	84.96	85.99	85.99	86.26	0.012711	2.40	1.26	5.14	0.85
wc6	1608.895	AB 10yr	3.52	84.96	86.16	86.16	86.42	0.010275	2.45	1.79	6.07	0.79
wc6	1608.895	AB 20yr	4.62	84.96	86.27	86.27	86.58	0.010553	2.68	2.17	7.30	0.82
wc6	1608.895	AB 50yr	6.45	84.96	86.53	86.53	86.74	0.017623	2.30	3.48	8.97	0.99
wc6	1608.895	AB 100yr	9.20	84.96	86.67	86.67	86.90	0.014304	2.42	5.01	12.87	0.92

HEC-RAS Plan: EX 5&6 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6	1598.12		Culvert									
wc6	1587.120	AB 2yr	1.58	84.79	85.69	85.69	85.84	0.014978	1.85	1.03	16.37	0.81
wc6	1587.120	AB 5yr	2.60	84.79	85.81	85.81	86.01	0.016275	2.21	1.42	33.64	0.87
wc6	1587.120	AB 10yr	3.52	84.79	85.90	85.90	86.15	0.016630	2.44	1.72	40.02	0.90
wc6	1587.120	AB 20yr	4.62	84.79	86.00	86.00	86.29	0.017093	2.68	2.03	47.62	0.93
wc6	1587.120	AB 50yr	6.45	84.79	86.14	86.14	86.51	0.017241	3.00	2.49	60.14	0.96
wc6	1587.120	AB 100yr	9.20	84.79	86.54	86.54	86.57	0.005948	1.39	19.12	181.13	0.58
wc6	1584.698	AB 2yr	1.58	84.73	85.18	85.10	85.28	0.010988	1.44	1.09	2.89	0.75
wc6	1584.698	AB 5yr	2.60	84.73	85.31	85.24	85.46	0.012415	1.75	1.48	3.15	0.82
wc6	1584.698	AB 10yr	3.52	84.73	85.40	85.34	85.60	0.013062	1.95	1.80	3.35	0.85
wc6	1584.698	AB 20yr	4.62	84.73	85.45	85.45	85.73	0.017581	2.36	1.96	3.62	0.99
wc6	1584.698	AB 50yr	6.45	84.73	85.68	85.68	85.93	0.010420	2.27	3.30	11.52	0.81
wc6	1584.698	AB 100yr	9.20	84.73	85.89	85.89	86.02	0.005129	1.87	9.19	38.78	0.59
wc6	1501.817	AB 2yr	1.58	84.11	84.70	84.53	84.75	0.004546	0.98	1.61	4.23	0.51
wc6	1501.817	AB 5yr	2.60	84.11	84.87	84.65	84.93	0.003982	1.08	2.42	4.92	0.49
wc6	1501.817	AB 10yr	3.52	84.11	85.00	84.74	85.07	0.003820	1.15	3.05	5.40	0.49
wc6	1501.817	AB 20yr	4.62	84.11	85.19	84.82	85.24	0.002153	0.98	6.26	23.03	0.38
wc6	1501.817	AB 50yr	6.45	84.11	85.31	84.95	85.35	0.002040	1.03	9.47	32.70	0.37
wc6	1501.817	AB 100yr	9.20	84.11	85.45	85.11	85.48	0.001658	1.03	15.06	47.94	0.35
wc6	1414.879	AB 2yr	1.58	83.78	84.42	84.14	84.45	0.002618	0.84	1.88	3.91	0.39
wc6	1414.879	AB 5yr	2.60	83.78	84.59	84.27	84.64	0.002850	1.00	2.60	4.43	0.42
wc6	1414.879	AB 10yr	3.52	83.78	84.66	84.74	85.07	0.003766	1.20	2.93	4.65	0.48
wc6	1414.879	AB 20yr	4.62	83.78	85.05	85.05	85.09	0.001326	0.94	5.23	13.68	0.31
wc6	1414.879	AB 50yr	6.45	83.78	85.08	85.16	85.16	0.002241	1.26	5.80	17.85	0.40
wc6	1414.879	AB 100yr	9.20	83.78	85.13	85.26	85.26	0.003773	1.68	6.63	19.92	0.52
wc6	1334.030	AB 2yr	1.58	83.47	83.83	83.83	83.98	0.019671	1.71	0.92	3.09	1.00
wc6	1334.030	AB 5yr	2.60	83.47	83.96	83.96	84.15	0.018092	1.93	1.35	3.47	0.99
wc6	1334.030	AB 10yr	3.52	83.47	84.37	84.05	84.44	0.003472	1.16	3.02	4.70	0.46
wc6	1334.030	AB 20yr	4.62	83.47	85.04	84.15	85.05	0.000179	0.42	20.72	53.03	0.12
wc6	1334.030	AB 50yr	6.45	83.47	85.08	84.30	85.09	0.000285	0.54	22.80	56.60	0.15
wc6	1334.030	AB 100yr	9.20	83.47	85.13	84.47	85.15	0.000444	0.69	25.87	61.48	0.19
wc6	1037.318	AB 2yr	1.58	82.35	83.30	82.71	83.31	0.000582	0.49	3.23	4.84	0.19
wc6	1037.318	AB 5yr	2.60	82.35	83.77	82.84	83.78	0.000252	0.45	6.11	7.39	0.14
wc6	1037.318	AB 10yr	3.52	82.35	84.33	82.93	84.33	0.000102	0.38	11.13	11.25	0.09
wc6	1037.318	AB 20yr	4.62	82.35	85.03	83.03	85.03	0.000027	0.24	40.14	79.05	0.05
wc6	1037.318	AB 50yr	6.45	82.35	85.06	83.17	85.06	0.000047	0.33	42.33	81.05	0.07
wc6	1037.318	AB 100yr	9.20	82.35	85.09	83.35	85.10	0.000086	0.45	45.00	83.72	0.09
wc6	947.3374	AB 2yr	1.72	82.01	83.26	82.52	83.26	0.000384	0.43	4.04	5.49	0.16
wc6	947.3374	AB 5yr	2.82	82.01	83.76	82.66	83.76	0.000123	0.32	12.58	37.81	0.10
wc6	947.3374	AB 10yr	3.81	82.01	84.33	82.76	84.33	0.000018	0.16	44.37	71.34	0.04
wc6	947.3374	AB 20yr	4.99	82.01	85.03	82.87	85.03	0.000004	0.09	120.83	151.73	0.02
wc6	947.3374	AB 50yr	6.94	82.01	85.06	83.02	85.06	0.000006	0.12	125.10	156.69	0.02
wc6	947.3374	AB 100yr	8.79	82.01	85.09	83.14	85.09	0.000009	0.15	130.44	161.27	0.03
wc6	940	AB 2yr	1.72	81.96	83.17	82.59	83.25	0.001597	1.29	1.33	9.28	0.38
wc6	940	AB 5yr	2.82	81.96	83.63	82.84	83.75	0.001455	1.53	1.84	70.91	0.38
wc6	940	AB 10yr	3.81	81.96	84.19	83.03	84.32	0.001010	1.55	2.46	131.61	0.33
wc6	940	AB 20yr	4.99	81.96	84.90	83.24	85.02	0.000695	1.54	3.23	203.58	0.29
wc6	940	AB 50yr	6.94	81.96	84.78	83.56	85.03	0.001545	2.24	3.10	180.66	0.43
wc6	940	AB 100yr	8.79	81.96	84.56	83.83	85.04	0.003220	3.07	2.86	158.38	0.61
wc6	939.548		Culvert									
wc6	910.4732	AB 2yr	1.72	81.74	82.35	82.35	82.66	0.014091	2.44	0.70	3.84	1.00
wc6	910.4732	AB 5yr	2.82	81.74	82.59	82.59	83.01	0.012749	2.89	0.98	4.54	1.00
wc6	910.4732	AB 10yr	3.81	81.74	82.78	82.78	83.30	0.011889	3.19	1.19	9.07	1.00
wc6	910.4732	AB 20yr	4.99	81.74	82.98	82.98	83.60	0.011326	3.51	1.42	219.75	1.01
wc6	910.4732	AB 50yr	6.94	81.74	83.29	83.29	84.06	0.010447	3.90	1.78	288.91	1.00
wc6	910.4732	AB 100yr	8.79	81.74	83.55	83.55	84.46	0.009825	4.21	2.09	345.91	1.00
wc6	900	AB 2yr	1.72	81.67	82.19	82.05	82.26	0.006619	1.20	1.43	3.55	0.60
wc6	900	AB 5yr	2.82	81.67	82.42	82.18	82.49	0.004602	1.21	2.32	4.24	0.52
wc6	900	AB 10yr	3.81	81.67	82.43	82.28	82.56	0.007677	1.59	2.40	4.29	0.68
wc6	900	AB 20yr	4.99	81.67	82.66	82.38	82.77	0.004877	1.45	3.44	4.97	0.56
wc6	900	AB 50yr	6.94	81.67	82.81	82.53	82.94	0.004764	1.62	4.71	10.96	0.57
wc6	900	AB 100yr	8.79	81.67	82.92	82.64	83.06	0.004564	1.73	6.34	18.24	0.57
wc6	801.4135	AB 2yr	1.72	80.95	81.43	81.33	81.52	0.008394	1.31	1.32	3.45	0.67
wc6	801.4135	AB 5yr	2.82	80.95	81.46	81.46	81.66	0.018252	1.99	1.42	3.54	1.00
wc6	801.4135	AB 10yr	3.81	80.95	81.75	81.56	81.86	0.006345	1.48	2.57	4.41	0.62
wc6	801.4135	AB 20yr	4.99	80.95	81.66	81.66	81.93	0.016946	2.28	2.19	4.14	1.00
wc6	801.4135	AB 50yr	6.94	80.95	81.81	81.81	82.12	0.016395	2.47	2.82	4.57	1.00



HEC-RAS Plan: EX 5&6 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6	801.4135	AB 100yr	8.79	80.95	81.93	81.93	82.27	0.015962	2.60	3.38	4.93	1.00
wc6	730.3979	AB 2yr	1.72	80.43	80.87	80.78	80.94	0.007779	1.13	1.52	4.85	0.65
wc6	730.3979	AB 5yr	2.82	80.43	81.02	80.89	81.02	0.000010	0.05	75.47	196.76	0.02
wc6	730.3979	AB 10yr	3.81	80.43	80.97	80.97	81.15	0.017584	1.90	2.01	5.46	1.00
wc6	730.3979	AB 20yr	4.99	80.43	81.01	81.01	81.01	0.000033	0.09	73.99	196.37	0.04
wc6	730.3979	AB 50yr	6.94	80.43	81.07	81.01	81.07	0.000040	0.10	85.83	198.02	0.05
wc6	730.3979	AB 100yr	8.79	80.43	81.11	81.01	81.12	0.000046	0.12	94.73	199.09	0.05
wc6	634.0483	AB 2yr	1.72	79.73	80.29	80.11	80.35	0.004905	1.08	1.59	3.68	0.52
wc6	634.0483	AB 5yr	2.82	79.73	80.48	80.24	80.55	0.004584	1.21	2.33	4.24	0.52
wc6	634.0483	AB 10yr	3.81	79.73	80.61	80.34	80.70	0.004395	1.30	2.94	4.65	0.52
wc6	634.0483	AB 20yr	4.99	79.73	80.76	80.45	80.85	0.004143	1.38	3.64	6.00	0.52
wc6	634.0483	AB 50yr	6.94	79.73	80.94	80.59	81.05	0.003594	1.49	5.33	15.27	0.50
wc6	634.0483	AB 100yr	8.79	79.73	81.10	80.71	81.11	0.000209	0.40	59.27	232.56	0.12
wc6	586.5527	AB 2yr	1.72	79.39	80.09	79.86	80.14	0.003785	1.01	1.71	3.50	0.46
wc6	586.5527	AB 5yr	2.82	79.39	80.27	80.00	80.35	0.004000	1.18	2.39	3.97	0.49
wc6	586.5527	AB 10yr	3.81	79.39	80.42	80.10	80.50	0.003999	1.28	2.98	4.33	0.49
wc6	586.5527	AB 20yr	4.99	79.39	80.56	80.21	80.66	0.003947	1.37	3.64	4.71	0.50
wc6	586.5527	AB 50yr	6.94	79.39	80.78	80.36	80.88	0.003439	1.43	5.74	19.84	0.48
wc6	586.5527	AB 100yr	8.79	79.39	81.04	80.49	81.08	0.001406	1.04	12.99	31.39	0.31
wc6	564.4214	AB 2yr	1.72	79.36	80.06	79.74	80.10	0.002032	0.80	2.15	4.11	0.35
wc6	564.4214	AB 5yr	2.82	79.36	80.25	79.87	80.30	0.002053	0.98	2.89	4.67	0.37
wc6	564.4214	AB 10yr	3.81	79.36	80.39	79.97	80.45	0.002075	1.11	3.45	6.70	0.38
wc6	564.4214	AB 20yr	4.99	79.36	80.53	80.07	80.61	0.002125	1.24	4.02	21.96	0.39
wc6	564.4214	AB 50yr	6.94	79.36	80.73	80.20	80.84	0.002265	1.44	4.81	24.53	0.42
wc6	564.4214	AB 100yr	8.79	79.36	80.92	80.31	81.05	0.002223	1.58	5.58	25.78	0.43
wc6	549.12											
			Culvert									
wc6	535.9677	AB 2yr	1.72	79.30	80.00	79.88	80.03	0.002037	0.82	2.09	4.10	0.35
wc6	535.9677	AB 5yr	2.82	79.30	80.18	79.81	80.23	0.002284	1.01	2.80	4.64	0.39
wc6	535.9677	AB 10yr	3.81	79.30	80.31	79.91	80.38	0.002374	1.15	3.31	5.80	0.40
wc6	535.9677	AB 20yr	4.99	79.30	80.43	80.01	80.52	0.002595	1.32	3.79	8.75	0.43
wc6	535.9677	AB 50yr	6.94	79.30	80.58	80.16	80.71	0.003044	1.58	4.40	29.75	0.48
wc6	535.9677	AB 100yr	8.79	79.30	80.69	80.27	80.86	0.003540	1.81	4.85	68.52	0.53
wc6	533.8168	AB 2yr	1.72	79.29	79.99	79.67	80.02	0.002174	0.81	2.13	4.10	0.36
wc6	533.8168	AB 5yr	2.82	79.29	80.17	79.80	80.22	0.002432	0.96	2.93	4.64	0.39
wc6	533.8168	AB 10yr	3.81	79.29	80.30	79.90	80.36	0.002576	1.07	3.56	5.26	0.41
wc6	533.8168	AB 20yr	4.99	79.29	80.43	80.00	80.50	0.002555	1.19	4.39	8.75	0.41
wc6	533.8168	AB 50yr	6.94	79.29	80.59	80.15	80.67	0.002360	1.29	6.81	19.82	0.41
wc6	533.8168	AB 100yr	8.79	79.29	80.73	80.27	80.80	0.002027	1.30	9.99	28.27	0.39
wc6	502.0329	AB 2yr	1.72	79.25	79.71	79.71	79.88	0.019791	1.81	0.95	2.91	1.01
wc6	502.0329	AB 5yr	2.82	79.25	79.85	79.85	80.06	0.018665	2.04	1.38	3.33	1.01
wc6	502.0329	AB 10yr	3.81	79.25	79.95	79.95	80.20	0.017982	2.19	1.74	3.64	1.01
wc6	502.0329	AB 20yr	4.99	79.25	80.06	80.06	80.33	0.016765	2.32	2.17	4.28	0.99
wc6	502.0329	AB 50yr	6.94	79.25	80.22	80.22	80.52	0.014494	2.44	2.96	5.60	0.95
wc6	502.0329	AB 100yr	8.79	79.25	80.35	80.35	80.66	0.013213	2.53	3.74	6.65	0.93
wc6	480	AB 2yr	1.72	78.69	79.33	79.12	79.35	0.002480	0.66	2.60	8.14	0.37
wc6	480	AB 5yr	2.82	78.69	79.46	79.21	79.49	0.002282	0.75	3.83	10.58	0.37
wc6	480	AB 10yr	3.81	78.69	79.55	79.28	79.59	0.002070	0.81	4.90	12.52	0.37
wc6	480	AB 20yr	4.99	78.69	79.66	79.35	79.70	0.001743	0.85	6.37	14.11	0.35
wc6	480	AB 50yr	6.94	78.69	79.85	79.44	79.89	0.001214	0.85	9.77	19.99	0.30
wc6	480	AB 100yr	8.79	78.69	80.11	79.52	80.13	0.000624	0.73	15.48	25.36	0.23
wc6	400	AB 2yr	1.72	78.36	79.18	78.84	79.20	0.001177	0.53	3.26	8.12	0.27
wc6	400	AB 5yr	2.82	78.36	79.30	78.95	79.32	0.001526	0.66	4.25	9.33	0.31
wc6	400	AB 10yr	3.81	78.36	79.40	79.03	79.43	0.001380	0.73	5.34	10.86	0.31
wc6	400	AB 20yr	4.99	78.36	79.54	79.10	79.57	0.001132	0.76	6.96	12.77	0.29
wc6	400	AB 50yr	6.94	78.36	79.77	79.20	79.80	0.000739	0.74	11.26	20.14	0.24
wc6	400	AB 100yr	8.79	78.36	80.07	79.29	80.09	0.000390	0.63	17.63	22.75	0.18
wc6	350	AB 2yr	1.72	78.63	78.98	78.84	79.00	0.002764	0.55	3.19	15.54	0.37
wc6	350	AB 5yr	2.82	78.63	79.17	78.91	79.18	0.000872	0.46	6.43	18.49	0.23
wc6	350	AB 10yr	3.81	78.63	79.32	78.96	79.33	0.000525	0.44	9.39	20.83	0.19
wc6	350	AB 20yr	4.99	78.63	79.49	78.99	79.49	0.000356	0.43	13.02	23.30	0.16
wc6	350	AB 50yr	6.94	78.63	79.75	79.05	79.75	0.000177	0.38	24.53	41.09	0.12
wc6	350	AB 100yr	8.79	78.63	80.06	79.10	80.06	0.000088	0.32	38.86	50.05	0.09
wc6	330	AB 2yr	1.72	78.44	78.92	78.77	78.97	0.004192	1.03	1.67	11.21	0.51
wc6	330	AB 5yr	2.82	78.44	79.09	78.87	79.17	0.003530	1.19	2.36	15.18	0.50
wc6	330	AB 10yr	3.81	78.44	79.23	78.95	79.32	0.003240	1.31	2.91	24.14	0.49
wc6	330	AB 20yr	4.99	78.44	79.38	79.04	79.48	0.003013	1.43	3.49	26.57	0.49
wc6	330	AB 50yr	6.94	78.44	79.61	79.18	79.74	0.002610	1.56	4.44	30.41	0.47

HEC-RAS Plan: EX 5&6 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6	330	AB 100yr	8.79	78.44	79.93	79.29	80.05	0.001827	1.54	5.70	34.48	0.41
wc6	315		Culvert									
wc6	300	AB 2yr	1.72	77.99	78.80	78.44	78.82	0.001093	0.68	2.54	9.56	0.28
wc6	300	AB 5yr	2.82	77.99	78.96	78.54	79.00	0.001368	0.88	3.19	11.63	0.32
wc6	300	AB 10yr	3.81	77.99	79.07	78.63	79.13	0.001582	1.04	3.66	12.85	0.35
wc6	300	AB 20yr	4.99	77.99	79.19	78.71	79.26	0.001831	1.21	4.12	13.88	0.39
wc6	300	AB 50yr	6.94	77.99	79.33	78.84	79.44	0.002234	1.47	4.73	15.10	0.44
wc6	300	AB 100yr	8.79	77.99	79.44	78.96	79.59	0.002649	1.70	5.18	15.97	0.48
wc6	280	AB 2yr	1.72	77.96	78.80	78.38	78.80	0.000505	0.36	4.83	11.76	0.18
wc6	280	AB 5yr	2.82	77.96	78.96	78.47	78.97	0.000437	0.41	6.96	13.87	0.17
wc6	280	AB 10yr	3.81	77.96	79.08	78.54	79.09	0.000416	0.46	8.73	15.37	0.17
wc6	280	AB 20yr	4.99	77.96	79.20	78.60	79.22	0.000408	0.50	10.67	16.83	0.18
wc6	280	AB 50yr	6.94	77.96	79.37	78.70	79.38	0.000409	0.57	13.60	18.94	0.18
wc6	280	AB 100yr	8.79	77.96	79.49	78.76	79.51	0.000405	0.61	17.34	26.97	0.19
wc6	250	AB 2yr	1.72	77.87	78.74	78.39	78.76	0.001164	0.58	3.01	6.95	0.27
wc6	250	AB 5yr	2.82	77.87	78.90	78.50	78.93	0.001245	0.69	4.27	8.26	0.29
wc6	250	AB 10yr	3.81	77.87	79.02	78.58	79.05	0.001288	0.76	5.30	9.21	0.30
wc6	250	AB 20yr	4.99	77.87	79.14	78.66	79.17	0.001337	0.83	6.43	10.14	0.31
wc6	250	AB 50yr	6.94	77.87	79.30	78.78	79.34	0.001370	0.92	8.14	11.40	0.32
wc6	250	AB 100yr	8.79	77.87	79.42	78.87	79.47	0.001368	1.01	9.57	12.34	0.33
wc6	200	AB 2yr	1.72	77.71	78.44		78.47	0.003142	0.80	2.14	5.86	0.42
wc6	200	AB 5yr	2.82	77.71	78.61		78.65	0.002758	0.86	3.26	7.23	0.41
wc6	200	AB 10yr	3.81	77.71	78.73		78.77	0.002608	0.91	4.17	8.18	0.41
wc6	200	AB 20yr	4.99	77.71	78.84		78.89	0.002507	0.96	5.18	9.12	0.41
wc6	200	AB 50yr	6.94	77.71	79.01		79.06	0.002387	1.03	6.76	10.41	0.41
wc6	200	AB 100yr	8.79	77.71	79.13		79.19	0.002279	1.08	8.17	11.44	0.40
wc6	150	AB 2yr	1.72	77.17	78.02	77.76	78.05	0.002222	0.84	2.14	5.08	0.37
wc6	150	AB 5yr	2.82	77.17	78.13	77.88	78.19	0.002981	1.11	2.75	5.77	0.45
wc6	150	AB 10yr	3.81	77.17	78.23	77.97	78.31	0.003228	1.27	3.34	6.36	0.47
wc6	150	AB 20yr	4.99	77.17	78.34	78.07	78.43	0.003318	1.41	4.06	7.01	0.49
wc6	150	AB 50yr	6.94	77.17	78.49	78.20	78.61	0.003321	1.59	5.24	7.97	0.51
wc6	150	AB 100yr	8.79	77.17	78.65	78.31	78.77	0.002988	1.66	6.58	8.93	0.49
wc6	100	AB 2yr	1.72	76.83	77.43	77.36	77.51	0.010109	1.26	1.36	4.53	0.73
wc6	100	AB 5yr	2.82	76.83	77.69	77.48	77.75	0.003896	1.00	2.83	6.53	0.48
wc6	100	AB 10yr	3.81	76.83	77.86	77.56	77.91	0.002773	0.95	4.02	7.79	0.42
wc6	100	AB 20yr	4.99	76.83	78.02	77.64	78.07	0.002207	0.93	5.37	8.99	0.38
wc6	100	AB 50yr	6.94	76.83	78.23	77.76	78.28	0.001805	0.94	7.41	10.57	0.36
wc6	100	AB 100yr	8.79	76.83	78.47	77.85	78.51	0.001251	0.87	10.15	12.37	0.31
5&6combined	50	AB 2yr	5.06	76.42	77.29	77.29	77.51	0.016724	2.11	2.40	5.29	1.00
5&6combined	50	AB 5yr	8.05	76.42	77.47	77.47	77.75	0.015790	2.33	3.45	6.22	1.00
5&6combined	50	AB 10yr	10.60	76.42	77.60	77.60	77.91	0.015144	2.47	4.30	6.89	1.00
5&6combined	50	AB 20yr	13.50	76.42	77.72	77.72	78.07	0.014694	2.59	5.21	7.57	1.00
5&6combined	50	AB 50yr	18.00	76.42	77.89	77.89	78.28	0.014171	2.75	6.55	8.48	1.00
5&6combined	50	AB 100yr	23.90	76.42	78.07	78.07	78.51	0.013545	2.93	8.17	9.52	1.00
5&6combined	40	AB 2yr	5.06	76.27	77.10	76.97	77.19	0.006900	1.36	3.71	8.43	0.65
5&6combined	40	AB 5yr	8.05	76.27	77.25	77.11	77.38	0.006834	1.60	5.09	9.69	0.68
5&6combined	40	AB 10yr	10.60	76.27	77.36	77.21	77.51	0.006889	1.76	6.16	10.56	0.69
5&6combined	40	AB 20yr	13.50	76.27	77.46	77.31	77.65	0.006893	1.93	7.26	11.41	0.71
5&6combined	40	AB 50yr	18.00	76.27	77.58	77.45	77.82	0.007190	2.18	8.74	12.46	0.74
5&6combined	40	AB 100yr	23.90	76.27	77.72	77.61	78.02	0.007614	2.47	10.50	13.58	0.78
5&6combined	30	AB 2yr	5.06	76.22	77.07	76.86	77.12	0.003830	1.06	4.78	10.40	0.49
5&6combined	30	AB 5yr	8.05	76.22	77.23	76.99	77.31	0.003846	1.24	6.58	11.74	0.51
5&6combined	30	AB 10yr	10.60	76.22	77.34	77.08	77.43	0.003892	1.36	7.96	12.68	0.53
5&6combined	30	AB 20yr	13.50	76.22	77.45	77.17	77.56	0.003982	1.47	9.40	13.59	0.54
5&6combined	30	AB 50yr	18.00	76.22	77.59	77.30	77.72	0.004227	1.64	11.34	14.73	0.57
5&6combined	30	AB 100yr	23.90	76.22	77.74	77.44	77.91	0.004213	1.82	13.74	16.06	0.58
5&6combined	20	AB 2yr	5.06	76.16	77.02	76.85	77.10	0.005001	1.18	4.30	9.72	0.56
5&6combined	20	AB 5yr	8.05	76.16	77.18	76.99	77.28	0.005006	1.37	5.96	11.37	0.58
5&6combined	20	AB 10yr	10.60	76.16	77.29	77.08	77.41	0.005007	1.49	7.30	12.53	0.59
5&6combined	20	AB 20yr	13.50	76.16	77.40	77.18	77.53	0.005003	1.60	8.71	13.62	0.60
5&6combined	20	AB 50yr	18.00	76.16	77.53	77.31	77.69	0.005001	1.79	10.55	14.69	0.62
5&6combined	20	AB 100yr	23.90	76.16	77.68	77.45	77.88	0.005004	2.00	12.83	15.93	0.64

HEC-RAS Plan: EX 6.1&6.3

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6.1	1815.549	AB 2yr	0.44	87.89	88.35	88.29	88.37	0.008860	0.59	0.74	6.96	0.58
wc6.1	1815.549	AB 5yr	0.69	87.89	88.51	88.34	88.51	0.008854	0.30	2.38	12.91	0.21
wc6.1	1815.549	AB 10yr	0.88	87.89	88.55	88.36	88.55	0.000783	0.32	2.91	14.06	0.20
wc6.1	1815.549	AB 20yr	1.09	87.89	88.56	88.39	88.57	0.000971	0.38	3.14	14.53	0.23
wc6.1	1815.549	AB 50yr	1.39	87.89	88.58	88.41	88.59	0.001297	0.45	3.37	14.99	0.26
wc6.1	1815.549	AB 100yr	1.64	87.89	88.59	88.43	88.61	0.001519	0.50	3.59	15.41	0.29
wc6.1	1791.246	AB 2yr	0.44	87.75	88.34	88.06	88.34	0.000516	0.37	2.06	13.11	0.17
wc6.1	1791.246	AB 5yr	0.69	87.75	88.50	88.14	88.51	0.000185	0.27	5.78	36.80	0.11
wc6.1	1791.246	AB 10yr	0.88	87.75	88.54	88.21	88.55	0.000189	0.29	7.48	49.23	0.11
wc6.1	1791.246	AB 20yr	1.09	87.75	88.56	88.25	88.56	0.000245	0.33	8.31	57.57	0.13
wc6.1	1791.246	AB 50yr	1.39	87.75	88.57	88.30	88.58	0.000335	0.39	9.22	65.59	0.15
wc6.1	1791.246	AB 100yr	1.64	87.75	88.59	88.32	88.59	0.000391	0.43	10.21	73.25	0.16
wc6.1	1788.428	AB 2yr	0.44	87.68	88.28	88.02	88.33	0.002750	1.01	0.44	15.68	0.42
wc6.1	1788.428	AB 5yr	0.69	87.68	88.41	88.14	88.49	0.003435	1.29	0.53	24.96	0.49
wc6.1	1788.428	AB 10yr	0.88	87.68	88.37	88.22	88.53	0.006616	1.73	0.51	20.74	0.67
wc6.1	1788.428	AB 20yr	1.09	87.68	88.53	88.53	88.55	0.003929	0.95	3.15	53.86	0.47
wc6.1	1788.428	AB 50yr	1.39	87.68	88.55	88.54	88.57	0.003114	0.88	4.55	61.29	0.42
wc6.1	1788.428	AB 100yr	1.64	87.68	88.57	88.55	88.58	0.002546	0.82	5.81	67.28	0.38
wc6.1	1778.1											
wc6.1	1767.800	AB 2yr	0.44	87.46	87.82	87.82	87.99	0.018197	1.83	0.24	3.03	1.00
wc6.1	1767.800	AB 5yr	0.69	87.46	87.94	87.94	88.17	0.016637	2.13	0.32	8.33	1.00
wc6.1	1767.800	AB 10yr	0.88	87.46	88.02	88.02	88.29	0.015619	2.31	0.38	21.36	1.00
wc6.1	1767.800	AB 20yr	1.09	87.46	88.10	88.10	88.42	0.015082	2.49	0.44	30.83	1.00
wc6.1	1767.800	AB 50yr	1.39	87.46	88.51	88.51	88.52	0.002024	0.74	8.42	213.59	0.34
wc6.1	1767.800	AB 100yr	1.64	87.46	88.51	88.51	88.52	0.002305	0.79	9.17	213.66	0.37
wc6.1	1765.227	AB 2yr	0.44	87.41	87.72	87.72	87.82	0.022871	1.39	0.32	1.74	1.00
wc6.1	1765.227	AB 5yr	0.69	87.41	87.80	87.80	87.91	0.016766	1.50	0.50	2.79	0.90
wc6.1	1765.227	AB 10yr	0.88	87.41	87.86	87.86	87.97	0.013765	1.53	0.68	3.84	0.84
wc6.1	1765.227	AB 20yr	1.09	87.41	87.91	87.91	88.01	0.011303	1.53	0.94	5.75	0.78
wc6.1	1765.227	AB 50yr	1.39	87.41	87.96	87.96	88.06	0.009988	1.56	1.29	7.67	0.75
wc6.1	1765.227	AB 100yr	1.64	87.41	88.05	88.00	88.11	0.005359	1.29	2.15	13.64	0.57
wc6.1	1618.352	AB 2yr	0.44	86.58	87.02	86.89	87.05	0.003820	0.80	0.60	2.64	0.44
wc6.1	1618.352	AB 5yr	0.69	86.58	87.10	86.97	87.14	0.004311	0.97	0.83	3.20	0.49
wc6.1	1618.352	AB 10yr	0.88	86.58	87.14	87.02	87.20	0.004631	1.08	0.98	3.53	0.51
wc6.1	1618.352	AB 20yr	1.09	86.58	87.19	87.07	87.25	0.004996	1.19	1.14	4.08	0.54
wc6.1	1618.352	AB 50yr	1.39	86.58	87.24	87.12	87.32	0.005356	1.33	1.39	5.11	0.57
wc6.1	1618.352	AB 100yr	1.64	86.58	87.16	87.16	87.33	0.014150	1.93	1.03	3.70	0.90
wc6.1	1549.359	AB 2yr	0.44	86.10	86.45	86.45	86.53	0.019437	1.28	0.37	2.72	0.92
wc6.1	1549.359	AB 5yr	0.69	86.10	86.52	86.52	86.61	0.016542	1.39	0.59	3.87	0.88
wc6.1	1549.359	AB 10yr	0.88	86.10	86.55	86.55	86.65	0.015323	1.47	0.74	4.50	0.87
wc6.1	1549.359	AB 20yr	1.09	86.10	86.59	86.59	86.69	0.014212	1.53	0.92	5.12	0.86
wc6.1	1549.359	AB 50yr	1.39	86.10	86.63	86.63	86.74	0.013802	1.63	1.15	5.82	0.86
wc6.1	1549.359	AB 100yr	1.64	86.10	86.87		86.89	0.001553	0.77	3.84	18.04	0.31
wc6.1	1423.360	AB 2yr	0.44	84.60	85.30	84.76	85.30	0.000118	0.19	2.37	4.79	0.08
wc6.1	1423.360	AB 5yr	0.69	84.60	85.43	84.82	85.44	0.000147	0.23	3.03	5.32	0.10
wc6.1	1423.360	AB 10yr	0.88	84.60	85.74	84.85	85.74	0.000061	0.18	4.86	6.78	0.07
wc6.1	1423.360	AB 20yr	1.09	84.60	86.01	84.88	86.01	0.000034	0.17	6.92	8.36	0.05
wc6.1	1423.360	AB 50yr	1.39	84.60	86.45	84.93	86.45	0.000016	0.14	11.17	10.93	0.04
wc6.1	1423.360	AB 100yr	1.64	84.60	86.88	84.96	86.88	0.000008	0.12	16.41	13.43	0.03
wc6.1	1420.606	AB 2yr	0.44	84.57	85.28	84.83	85.30	0.000666	0.59	0.75	4.85	0.22
wc6.1	1420.606	AB 5yr	0.69	84.57	85.40	84.92	85.43	0.000987	0.79	0.87	5.32	0.28
wc6.1	1420.606	AB 10yr	0.88	84.57	85.71	84.99	85.74	0.000558	0.74	1.20	6.54	0.22
wc6.1	1420.606	AB 20yr	1.09	84.57	85.98	85.05	86.01	0.000420	0.74	1.48	7.59	0.20
wc6.1	1420.606	AB 50yr	1.39	84.57	86.42	85.13	86.45	0.000275	0.71	1.95	10.32	0.17
wc6.1	1420.606	AB 100yr	1.64	84.57	86.86	85.20	86.88	0.000190	0.68	2.40	15.22	0.14
wc6.1	1393.68											
wc6.1	1368.765	AB 2yr	0.44	84.77	85.04	85.04	85.18	0.018655	1.63	0.27	3.99	1.00
wc6.1	1368.765	AB 5yr	0.69	84.77	85.13	85.13	85.32	0.016893	1.89	0.36	4.68	1.00
wc6.1	1368.765	AB 10yr	0.88	84.77	85.20	85.20	85.41	0.016011	2.05	0.43	5.15	1.00
wc6.1	1368.765	AB 20yr	1.09	84.77	85.26	85.26	85.51	0.015376	2.21	0.49	5.63	1.01
wc6.1	1368.765	AB 50yr	1.39	84.77	85.35	85.35	85.64	0.014558	2.40	0.58	6.26	1.00
wc6.1	1368.765	AB 100yr	1.64	84.77	85.42	85.42	85.74	0.014017	2.53	0.65	6.76	1.00
wc6.1	1366.013	AB 2yr	0.44	84.75	84.99		85.02	0.005993	0.74	0.59	2.96	0.53
wc6.1	1366.013	AB 5yr	0.69	84.75	85.04		85.08	0.007309	0.91	0.76	3.17	0.60
wc6.1	1366.013	AB 10yr	0.88	84.75	85.08		85.13	0.008024	1.02	0.87	3.31	0.63

HEC-RAS Plan: EX 6.1&6.3 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6.1	1366.013	AB 20yr	1.09	84.75	85.11		85.17	0.008760	1.12	0.97	3.43	0.67
wc6.1	1366.013	AB 50yr	1.39	84.75	85.15		85.23	0.009703	1.25	1.12	3.59	0.71
wc6.1	1366.013	AB 100yr	1.64	84.75	85.21	85.11	85.29	0.007826	1.21	1.35	3.85	0.65
wc6.1	1346.971	AB 2yr	0.44	84.61	84.85	84.81	84.87	0.009785	0.70	0.62	4.96	0.63
wc6.1	1346.971	AB 5yr	0.69	84.61	84.89	84.85	84.92	0.009810	0.83	0.83	5.16	0.66
wc6.1	1346.971	AB 10yr	0.88	84.61	84.92	84.87	84.96	0.009831	0.91	0.97	5.29	0.67
wc6.1	1346.971	AB 20yr	1.09	84.61	84.94	84.89	84.99	0.009800	0.98	1.12	5.43	0.69
wc6.1	1346.971	AB 50yr	1.39	84.61	84.98		85.04	0.009787	1.06	1.31	5.60	0.70
wc6.1	1346.971	AB 100yr	1.64	84.61	84.95	84.95	85.05	0.021296	1.45	1.13	5.44	1.01
wc6.1	1273.903	AB 2yr	0.44	83.57	83.73	83.73	83.80	0.023935	1.18	0.37	2.64	1.00
wc6.1	1273.903	AB 5yr	0.69	83.57	83.78	83.78	83.87	0.022508	1.34	0.52	2.85	1.01
wc6.1	1273.903	AB 10yr	0.88	83.57	83.82	83.82	83.92	0.021677	1.43	0.62	2.99	1.01
wc6.1	1273.903	AB 20yr	1.09	83.57	83.85	83.85	83.97	0.020991	1.51	0.72	3.12	1.01
wc6.1	1273.903	AB 50yr	1.39	83.57	83.90	83.90	84.03	0.020242	1.61	0.86	3.30	1.01
wc6.1	1273.903	AB 100yr	1.64	83.57	84.28		84.30	0.001426	0.65	2.65	6.02	0.29
wc6.1	1166.891	AB 2yr	0.66	82.04	82.61		82.62	0.000583	0.37	1.78	4.27	0.18
wc6.1	1166.891	AB 5yr	1.04	82.04	82.82		82.83	0.000417	0.37	2.80	5.14	0.16
wc6.1	1166.891	AB 10yr	1.34	82.04	83.04		83.04	0.000266	0.34	3.97	5.98	0.13
wc6.1	1166.891	AB 20yr	1.66	82.04	83.28		83.28	0.000125	0.28	7.57	25.23	0.10
wc6.1	1166.891	AB 50yr	2.14	82.04	83.77		83.77	0.000017	0.14	27.78	55.15	0.04
wc6.1	1166.891	AB 100yr	2.55	82.04	84.30		84.30	0.000003	0.08	64.38	82.24	0.02
wc6.1	1163.643	AB 2yr	0.66	81.98	82.55	82.31	82.61	0.002902	1.06	0.63	4.27	0.45
wc6.1	1163.643	AB 5yr	1.04	81.98	82.74	82.43	82.82	0.002721	1.24	0.84	5.04	0.45
wc6.1	1163.643	AB 10yr	1.34	81.98	82.95	82.51	83.03	0.002008	1.26	1.07	5.88	0.41
wc6.1	1163.643	AB 20yr	1.66	81.98	83.19	82.59	83.27	0.001477	1.25	1.33	10.22	0.36
wc6.1	1163.643	AB 50yr	2.14	81.98	83.69	82.71	83.76	0.000769	1.13	1.89	134.70	0.28
wc6.1	1163.643	AB 100yr	2.55	81.98	84.24	82.80	84.29	0.000437	1.03	2.48	238.55	0.22
wc6.1	1154.78		Culvert									
wc6.1	1145.920	AB 2yr	0.66	81.99	82.32	82.32	82.49	0.017544	1.81	0.36	5.38	1.00
wc6.1	1145.920	AB 5yr	1.04	81.99	82.44	82.44	82.66	0.015804	2.11	0.49	6.58	1.00
wc6.1	1145.920	AB 10yr	1.34	81.99	82.52	82.52	82.79	0.014956	2.29	0.58	7.42	1.00
wc6.1	1145.920	AB 20yr	1.66	81.99	82.60	82.60	82.91	0.014255	2.46	0.67	8.26	1.00
wc6.1	1145.920	AB 50yr	2.14	81.99	82.72	82.72	83.08	0.013523	2.68	0.80	9.40	1.01
wc6.1	1145.920	AB 100yr	2.55	81.99	82.81	82.81	83.22	0.012989	2.84	0.90	10.32	1.00
wc6.1	1141.721	AB 2yr	0.66	81.96	82.26		82.29	0.006107	0.85	0.78	3.20	0.55
wc6.1	1141.721	AB 5yr	1.04	81.96	82.32		82.38	0.007443	1.04	1.00	3.46	0.62
wc6.1	1141.721	AB 10yr	1.34	81.96	82.36		82.43	0.008288	1.17	1.15	3.63	0.66
wc6.1	1141.721	AB 20yr	1.66	81.96	82.40		82.49	0.009250	1.29	1.29	3.78	0.71
wc6.1	1141.721	AB 50yr	2.14	81.96	82.45		82.56	0.010523	1.46	1.47	3.97	0.76
wc6.1	1141.721	AB 100yr	2.55	81.96	82.48		82.61	0.011601	1.58	1.61	4.11	0.81
wc6.1	1024.484	AB 2yr	0.66	81.15	81.39		81.43	0.009048	0.84	0.79	4.50	0.64
wc6.1	1024.484	AB 5yr	1.04	81.15	81.47		81.51	0.007279	0.88	1.18	5.34	0.60
wc6.1	1024.484	AB 10yr	1.34	81.15	81.52		81.57	0.006517	0.91	1.48	5.89	0.58
wc6.1	1024.484	AB 20yr	1.66	81.15	81.58		81.62	0.005918	0.93	1.79	6.41	0.56
wc6.1	1024.484	AB 50yr	2.14	81.15	81.64		81.69	0.005297	0.95	2.25	7.11	0.54
wc6.1	1024.484	AB 100yr	2.55	81.15	81.69		81.74	0.004910	0.97	2.63	7.65	0.53
wc6.1	953.3818	AB 2yr	0.66	80.66	81.00	80.87	81.03	0.003760	0.72	0.92	3.37	0.44
wc6.1	953.3818	AB 5yr	1.04	80.66	81.09	80.94	81.13	0.004204	0.85	1.22	3.71	0.47
wc6.1	953.3818	AB 10yr	1.34	80.66	81.14	80.98	81.19	0.004435	0.93	1.43	3.93	0.49
wc6.1	953.3818	AB 20yr	1.66	80.66	81.20	81.02	81.25	0.004612	1.01	1.65	4.14	0.51
wc6.1	953.3818	AB 50yr	2.14	80.66	81.27	81.08	81.33	0.004857	1.10	1.94	4.42	0.53
wc6.1	953.3818	AB 100yr	2.55	80.66	81.32	81.12	81.39	0.005042	1.17	2.17	4.62	0.55
wc6.1	915.3637	AB 2yr	0.66	80.40	80.65	80.65	80.74	0.022115	1.27	0.52	3.13	0.99
wc6.1	915.3637	AB 5yr	1.04	80.40	80.72	80.71	80.82	0.019777	1.42	0.73	3.41	0.97
wc6.1	915.3637	AB 10yr	1.34	80.40	80.76	80.76	80.88	0.018535	1.50	0.89	3.60	0.96
wc6.1	915.3637	AB 20yr	1.66	80.40	80.81	80.80	80.93	0.017234	1.56	1.06	3.80	0.94
wc6.1	915.3637	AB 50yr	2.14	80.40	80.87	80.85	81.01	0.016183	1.65	1.30	4.06	0.93
wc6.1	915.3637	AB 100yr	2.55	80.40	80.92	80.89	81.07	0.015481	1.71	1.49	4.26	0.93
wc6.1	860.6113	AB 2yr	0.66	79.87	80.19	80.08	80.22	0.005003	0.79	0.84	3.27	0.50
wc6.1	860.6113	AB 5yr	1.04	79.87	80.28	80.14	80.32	0.005007	0.91	1.15	3.63	0.51
wc6.1	860.6113	AB 10yr	1.34	79.87	80.34	80.19	80.38	0.005001	0.98	1.37	3.87	0.52
wc6.1	860.6113	AB 20yr	1.66	79.87	80.39	80.23	80.45	0.005002	1.04	1.60	4.10	0.53
wc6.1	860.6113	AB 50yr	2.14	79.87	80.47	80.29	80.53	0.005007	1.12	1.92	4.40	0.54
wc6.1	860.6113	AB 100yr	2.55	79.87	80.53	80.33	80.59	0.005004	1.17	2.18	4.63	0.54
wc6.3	1400.840	AB 2yr	0.16	86.97	87.17	87.17	87.23	0.027212	1.06	0.15	1.35	1.01

HEC-RAS Plan: EX 6.1&6.3 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6.3	1400.840	AB 5yr	0.26	86.97	87.22	87.22	87.29	0.022467	1.13	0.23	1.62	0.95
wc6.3	1400.840	AB 10yr	0.34	86.97	87.32		87.35	0.008568	0.85	0.40	2.08	0.62
wc6.3	1400.840	AB 20yr	0.43	86.97	87.40		87.42	0.004875	0.73	0.59	2.48	0.48
wc6.3	1400.840	AB 50yr	0.57	86.97	87.51		87.53	0.002680	0.63	0.90	3.04	0.37
wc6.3	1400.840	AB 100yr	0.70	86.97	87.61		87.63	0.001743	0.57	1.24	3.53	0.31
wc6.3	1381.230	AB 2yr	0.16	86.73	87.15	86.83	87.15	0.000170	0.16	0.98	3.17	0.09
wc6.3	1381.230	AB 5yr	0.26	86.73	87.25	86.87	87.26	0.000190	0.19	1.34	3.60	0.10
wc6.3	1381.230	AB 10yr	0.34	86.73	87.33	86.89	87.33	0.000194	0.21	1.61	3.89	0.10
wc6.3	1381.230	AB 20yr	0.43	86.73	87.40	86.91	87.41	0.000192	0.22	1.92	4.20	0.11
wc6.3	1381.230	AB 50yr	0.57	86.73	87.52	86.95	87.52	0.000182	0.24	2.41	4.64	0.10
wc6.3	1381.230	AB 100yr	0.70	86.73	87.61	86.98	87.62	0.000167	0.24	2.89	5.04	0.10
wc6.3	1378.833	AB 2yr	0.16	86.70	87.14	86.85	87.15	0.000574	0.39	0.41	3.60	0.19
wc6.3	1378.833	AB 5yr	0.26	86.70	87.24	86.90	87.25	0.000764	0.52	0.50	4.08	0.23
wc6.3	1378.833	AB 10yr	0.34	86.70	87.31	86.94	87.33	0.000876	0.60	0.56	4.41	0.25
wc6.3	1378.833	AB 20yr	0.43	86.70	87.38	86.98	87.40	0.000968	0.68	0.63	4.75	0.27
wc6.3	1378.833	AB 50yr	0.57	86.70	87.48	87.04	87.51	0.001059	0.79	0.72	5.25	0.28
wc6.3	1378.833	AB 100yr	0.70	86.70	87.58	87.09	87.61	0.001098	0.86	0.81	5.69	0.30
wc6.3	1364.866		Culvert									
wc6.3	1350.769	AB 2yr	0.16	86.00	86.25	86.24	86.31	0.019530	1.10	0.15	1.23	0.89
wc6.3	1350.769	AB 5yr	0.26	86.00	86.30	86.29	86.40	0.020299	1.35	0.19	1.48	0.95
wc6.3	1350.769	AB 10yr	0.34	86.00	86.33	86.33	86.45	0.021748	1.54	0.22	1.60	1.01
wc6.3	1350.769	AB 20yr	0.43	86.00	86.37	86.37	86.51	0.020645	1.66	0.26	1.77	1.01
wc6.3	1350.769	AB 50yr	0.57	86.00	86.43	86.43	86.60	0.019081	1.82	0.31	2.00	1.00
wc6.3	1350.769	AB 100yr	0.70	86.00	86.48	86.48	86.67	0.018232	1.95	0.36	2.20	1.00
wc6.3	1348.373	AB 2yr	0.16	85.90	86.21	86.16	86.24	0.010906	0.80	0.20	1.29	0.65
wc6.3	1348.373	AB 5yr	0.26	85.90	86.27	86.22	86.31	0.011446	0.92	0.28	1.53	0.69
wc6.3	1348.373	AB 10yr	0.34	85.90	86.30	86.25	86.35	0.011741	1.00	0.34	1.68	0.71
wc6.3	1348.373	AB 20yr	0.43	85.90	86.34	86.29	86.40	0.011925	1.06	0.40	1.82	0.72
wc6.3	1348.373	AB 50yr	0.57	85.90	86.39	86.33	86.45	0.012262	1.16	0.49	2.01	0.74
wc6.3	1348.373	AB 100yr	0.70	85.90	86.42	86.37	86.50	0.012720	1.23	0.57	2.15	0.77
wc6.3	1290.277	AB 2yr	0.16	85.63	85.86	85.80	85.88	0.004818	0.50	0.32	2.49	0.44
wc6.3	1290.277	AB 5yr	0.26	85.63	85.91	85.83	85.93	0.004981	0.59	0.44	2.68	0.47
wc6.3	1290.277	AB 10yr	0.34	85.63	85.94	85.86	85.96	0.005083	0.65	0.52	2.80	0.48
wc6.3	1290.277	AB 20yr	0.43	85.63	85.97	85.88	85.99	0.005183	0.70	0.61	2.93	0.49
wc6.3	1290.277	AB 50yr	0.57	85.63	86.01	85.91	86.04	0.005316	0.78	0.73	3.10	0.51
wc6.3	1290.277	AB 100yr	0.70	85.63	86.05	85.94	86.08	0.005234	0.82	0.85	3.25	0.51
wc6.3	1100	AB 2yr	0.16	84.92	85.02	85.02	85.06	0.027612	0.94	0.17	1.90	1.00
wc6.3	1100	AB 5yr	0.26	84.92	85.06	85.06	85.11	0.025583	1.08	0.24	2.04	1.00
wc6.3	1100	AB 10yr	0.34	84.92	85.08	85.08	85.15	0.024512	1.16	0.29	2.14	1.00
wc6.3	1100	AB 20yr	0.43	84.92	85.11	85.11	85.18	0.023397	1.23	0.35	2.25	1.00
wc6.3	1100	AB 50yr	0.57	84.92	85.14	85.14	85.23	0.022190	1.32	0.43	2.39	0.99
wc6.3	1100	AB 100yr	0.70	84.92	85.17	85.17	85.27	0.022768	1.42	0.49	2.49	1.02
wc6.3	991.7830	AB 2yr	0.36	83.12	84.16		84.16	0.000021	0.10	3.74	5.86	0.04
wc6.3	991.7830	AB 5yr	0.57	83.12	84.33		84.33	0.000025	0.12	4.84	7.30	0.04
wc6.3	991.7830	AB 10yr	0.74	83.12	84.45		84.45	0.000026	0.14	5.83	8.38	0.04
wc6.3	991.7830	AB 20yr	0.92	83.12	84.59		84.59	0.000025	0.15	7.03	10.18	0.04
wc6.3	991.7830	AB 50yr	1.20	83.12	84.81		84.81	0.000017	0.13	16.98	86.42	0.04
wc6.3	991.7830	AB 100yr	1.43	83.12	85.07		85.07	0.000004	0.08	44.38	126.10	0.02
wc6.3	990.0710	AB 2yr	0.36	83.10	84.15	83.35	84.16	0.000150	0.36	1.00	5.57	0.11
wc6.3	990.0710	AB 5yr	0.57	83.10	84.31	83.44	84.32	0.000234	0.50	1.15	5.78	0.14
wc6.3	990.0710	AB 10yr	0.74	83.10	84.43	83.50	84.45	0.000288	0.59	1.26	5.94	0.16
wc6.3	990.0710	AB 20yr	0.92	83.10	84.56	83.56	84.58	0.000328	0.67	1.38	6.81	0.18
wc6.3	990.0710	AB 50yr	1.20	83.10	84.77	83.65	84.80	0.000354	0.76	1.59	8.37	0.19
wc6.3	990.0710	AB 100yr	1.43	83.10	85.03	83.72	85.06	0.000313	0.78	1.83	10.24	0.18
wc6.3	982.657		Culvert									
wc6.3	975.2448	AB 2yr	0.36	82.96	83.20	83.20	83.32	0.019163	1.55	0.23	2.48	1.00
wc6.3	975.2448	AB 5yr	0.57	82.96	83.29	83.29	83.45	0.017147	1.80	0.32	2.83	0.99
wc6.3	975.2448	AB 10yr	0.74	82.96	83.35	83.35	83.55	0.016522	1.98	0.37	3.08	1.00
wc6.3	975.2448	AB 20yr	0.92	82.96	83.42	83.42	83.64	0.015407	2.11	0.44	3.34	0.99
wc6.3	975.2448	AB 50yr	1.20	82.96	83.50	83.50	83.78	0.014713	2.31	0.52	3.68	1.00
wc6.3	975.2448	AB 100yr	1.43	82.96	83.57	83.57	83.88	0.014071	2.45	0.58	3.96	1.00
wc6.3	973.5334	AB 2yr	0.36	82.94	83.14	83.11	83.19	0.013822	0.97	0.37	2.28	0.77
wc6.3	973.5334	AB 5yr	0.57	82.94	83.20		83.26	0.012331	1.08	0.53	2.55	0.76
wc6.3	973.5334	AB 10yr	0.74	82.94	83.25		83.32	0.011152	1.13	0.66	2.74	0.73
wc6.3	973.5334	AB 20yr	0.92	82.94	83.30		83.37	0.010328	1.17	0.79	2.93	0.72

HEC-RAS Plan: EX 6.1&6.3 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6.3	973.5334	AB 50yr	1.20	82.94	83.36		83.44	0.009824	1.24	0.97	3.16	0.71
wc6.3	973.5334	AB 100yr	1.43	82.94	83.40		83.49	0.009474	1.28	1.11	3.34	0.71
wc6.3	910.8146	AB 2yr	0.36	82.41	82.67	82.58	82.70	0.004934	0.68	0.53	2.54	0.48
wc6.3	910.8146	AB 5yr	0.57	82.41	82.74	82.63	82.77	0.005219	0.80	0.72	2.82	0.51
wc6.3	910.8146	AB 10yr	0.74	82.41	82.78	82.67	82.82	0.005705	0.89	0.83	2.99	0.54
wc6.3	910.8146	AB 20yr	0.92	82.41	82.82	82.71	82.87	0.006143	0.97	0.95	3.14	0.56
wc6.3	910.8146	AB 50yr	1.20	82.41	82.87	82.75	82.93	0.006573	1.07	1.12	3.35	0.59
wc6.3	910.8146	AB 100yr	1.43	82.41	82.91	82.79	82.98	0.006881	1.14	1.25	3.50	0.61
wc6.3	867.1168	AB 2yr	0.36	82.04	82.21	82.21	82.28	0.024698	1.18	0.30	2.16	1.01
wc6.3	867.1168	AB 5yr	0.57	82.04	82.26	82.26	82.35	0.022160	1.32	0.43	2.39	0.99
wc6.3	867.1168	AB 10yr	0.74	82.04	82.31	82.30	82.40	0.018706	1.35	0.55	2.58	0.93
wc6.3	867.1168	AB 20yr	0.92	82.04	82.36	82.34	82.45	0.016339	1.37	0.67	2.76	0.89
wc6.3	867.1168	AB 50yr	1.20	82.04	82.42	82.38	82.52	0.014191	1.41	0.85	3.01	0.85
wc6.3	867.1168	AB 100yr	1.43	82.04	82.46	82.42	82.57	0.013060	1.44	0.99	3.19	0.82
wc6.3	814.7598	AB 2yr	0.36	81.60	81.91	81.76	81.92	0.002619	0.55	0.66	2.74	0.36
wc6.3	814.7598	AB 5yr	0.57	81.60	81.99	81.82	82.01	0.002798	0.64	0.89	3.06	0.38
wc6.3	814.7598	AB 10yr	0.74	81.60	82.04	81.86	82.06	0.002966	0.70	1.05	3.27	0.39
wc6.3	814.7598	AB 20yr	0.92	81.60	82.09	81.89	82.12	0.003087	0.76	1.22	3.46	0.41
wc6.3	814.7598	AB 50yr	1.20	81.60	82.15	81.94	82.19	0.003272	0.83	1.44	3.71	0.43
wc6.3	814.7598	AB 100yr	1.43	81.60	82.19	81.98	82.23	0.003437	0.89	1.61	3.89	0.44
wc6.3	777.7424	AB 2yr	0.36	81.29	81.62	81.62	81.70	0.025322	1.21	0.30	1.97	0.99
wc6.3	777.7424	AB 5yr	0.57	81.29	81.68	81.68	81.77	0.023847	1.32	0.43	2.41	1.00
wc6.3	777.7424	AB 10yr	0.74	81.29	81.72	81.72	81.82	0.023086	1.39	0.53	2.69	1.00
wc6.3	777.7424	AB 20yr	0.92	81.29	81.76	81.76	81.87	0.022283	1.45	0.63	2.96	1.00
wc6.3	777.7424	AB 50yr	1.20	81.29	81.81	81.81	81.93	0.021679	1.53	0.78	3.30	1.00
wc6.3	777.7424	AB 100yr	1.43	81.29	81.84	81.84	81.97	0.020796	1.58	0.91	3.56	1.00
wc6.3	610.3315	AB 2yr	0.36	79.21	79.47	79.38	79.50	0.005001	0.68	0.53	2.54	0.48
wc6.3	610.3315	AB 5yr	0.57	79.21	79.55	79.43	79.58	0.005010	0.79	0.73	2.84	0.50
wc6.3	610.3315	AB 10yr	0.74	79.21	79.60	79.47	79.63	0.005005	0.85	0.87	3.04	0.50
wc6.3	610.3315	AB 20yr	0.92	79.21	79.65	79.51	79.69	0.005002	0.90	1.02	3.23	0.51
wc6.3	610.3315	AB 50yr	1.20	79.21	79.71	79.55	79.76	0.005001	0.97	1.24	3.49	0.52
wc6.3	610.3315	AB 100yr	1.43	79.21	79.76	79.59	79.81	0.005006	1.02	1.40	3.67	0.53

HEC-RAS Plan: prim sen ana

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc5	2388.964	AB 2yr	1.31	92.94	93.29	93.29	93.41	0.019896	1.52	0.86	3.59	0.99
wc5	2388.964	AB 5yr	2.16	92.94	93.40	93.40	93.54	0.019382	1.66	1.30	4.68	1.01
wc5	2388.964	AB 10yr	2.93	92.94	93.59	93.47	93.66	0.006711	1.18	2.84	23.36	0.62
wc5	2388.964	AB 20yr	3.86	92.94	93.73	93.55	93.76	0.002281	0.85	6.98	33.25	0.38
wc5	2388.964	AB 50yr	5.42	92.94	93.87	93.68	93.88	0.001210	0.73	11.82	37.02	0.29
wc5	2388.964	AB 100yr	6.90	92.94	94.09	93.72	94.10	0.000421	0.52	20.63	41.16	0.18
wc5	2290	AB 2yr	1.31	92.11	92.89		92.91	0.000985	0.55	2.39	4.62	0.24
wc5	2290	AB 5yr	2.16	92.11	93.24		93.25	0.000578	0.51	4.23	6.07	0.20
wc5	2290	AB 10yr	2.93	92.11	93.53		93.54	0.000384	0.47	6.22	7.40	0.16
wc5	2290	AB 20yr	3.86	92.11	93.62		93.63	0.000513	0.56	6.88	7.82	0.19
wc5	2290	AB 50yr	5.42	92.11	93.72		93.75	0.000753	0.70	7.74	8.94	0.23
wc5	2290	AB 100yr	6.90	92.11	94.00		94.02	0.000508	0.67	11.22	17.33	0.20
wc5	2256	AB 2yr	1.31	91.88	92.81	92.33	92.86	0.001362	1.01	1.30	5.22	0.33
wc5	2256	AB 5yr	2.16	91.88	92.50	92.50	93.21	0.001360	1.23	1.76	6.34	0.35
wc5	2256	AB 10yr	2.93	91.88	93.40	92.64	93.50	0.008824	1.36	2.17	9.85	0.69
wc5	2256	AB 20yr	3.86	91.88	93.46	92.80	93.58	0.009122	1.52	2.80	11.75	0.72
wc5	2256	AB 50yr	5.42	91.88	93.24	93.03	93.65	0.006653	2.85	1.90	6.67	0.78
wc5	2256	AB 100yr	6.90	91.88	93.23	93.23	93.91	0.010999	3.66	1.89	6.64	1.01
wc5	2240.61		Culvert									
wc5	2221	AB 2yr	1.31	91.59	92.04	92.04	92.26	0.015239	2.07	0.63	3.30	0.99
wc5	2221	AB 5yr	2.16	91.59	92.22	92.22	92.53	0.014237	2.48	0.87	3.99	1.01
wc5	2221	AB 10yr	2.93	91.59	92.36	92.36	92.74	0.013283	2.75	1.07	4.55	1.00
wc5	2221	AB 20yr	3.86	91.59	92.51	92.51	92.97	0.012460	3.01	1.28	5.16	1.00
wc5	2221	AB 50yr	5.42	91.59	92.74	92.74	93.32	0.011596	3.37	1.61	7.73	1.00
wc5	2221	AB 100yr	6.90	91.59	92.94	92.94	93.62	0.010990	3.66	1.89	9.06	1.00
wc5	2198	AB 2yr	1.31	91.41	91.86		91.93	0.008566	1.21	1.09	3.31	0.67
wc5	2198	AB 5yr	2.16	91.41	92.00		92.09	0.008412	1.38	1.57	3.85	0.69
wc5	2198	AB 10yr	2.93	91.41	92.09		92.21	0.008311	1.49	1.97	4.24	0.70
wc5	2198	AB 20yr	3.86	91.41	92.20		92.33	0.008255	1.60	2.42	4.65	0.71
wc5	2198	AB 50yr	5.42	91.41	92.34		92.49	0.008109	1.73	3.13	5.22	0.71
wc5	2198	AB 100yr	6.90	91.41	92.44		92.62	0.008304	1.88	3.68	6.02	0.74
wc5	2150	AB 2yr	1.31	91.07	91.55		91.61	0.006821	1.11	1.18	3.42	0.60
wc5	2150	AB 5yr	2.16	91.07	91.69		91.77	0.006755	1.27	1.70	3.98	0.62
wc5	2150	AB 10yr	2.93	91.07	91.80		91.89	0.006601	1.37	2.14	4.40	0.63
wc5	2150	AB 20yr	3.86	91.07	91.91		92.02	0.006360	1.45	2.66	4.85	0.62
wc5	2150	AB 50yr	5.42	91.07	92.07		92.19	0.005941	1.54	3.51	5.52	0.62
wc5	2150	AB 100yr	6.90	91.07	92.19		92.33	0.005462	1.66	4.26	7.43	0.61
wc5	2068.437	AB 2yr	1.31	90.36	90.80		90.89	0.011843	1.38	0.95	2.93	0.77
wc5	2068.437	AB 5yr	2.16	90.36	90.93		91.06	0.011839	1.61	1.34	3.18	0.79
wc5	2068.437	AB 10yr	2.93	90.36	91.02		91.18	0.011970	1.77	1.65	3.36	0.81
wc5	2068.437	AB 20yr	3.86	90.36	91.12		91.31	0.012285	1.94	1.99	3.55	0.83
wc5	2068.437	AB 50yr	5.42	90.36	91.25		91.50	0.013014	2.18	2.49	3.81	0.86
wc5	2068.437	AB 100yr	6.90	90.36	91.35	91.29	91.65	0.013869	2.40	2.92	5.92	0.90
wc5	2044.707	AB 2yr	1.31	89.83	90.30		90.36	0.007514	1.15	1.14	3.37	0.63
wc5	2044.707	AB 5yr	2.16	89.83	90.43	90.31	90.52	0.007542	1.32	1.63	3.91	0.65
wc5	2044.707	AB 10yr	2.93	89.83	90.53	90.39	90.64	0.007584	1.44	2.04	4.31	0.67
wc5	2044.707	AB 20yr	3.86	89.83	90.63	90.48	90.75	0.007650	1.55	2.49	4.71	0.68
wc5	2044.707	AB 50yr	5.42	89.83	90.78	90.61	90.92	0.007539	1.69	3.21	5.29	0.69
wc5	2044.707	AB 100yr	6.90	89.83	90.88	90.71	91.05	0.007520	1.83	3.80	6.41	0.70
wc5	1986.134	AB 2yr	1.31	89.59	89.97	89.95	90.08	0.015977	1.51	0.87	3.03	0.90
wc5	1986.134	AB 5yr	2.16	89.59	90.08	90.06	90.24	0.016250	1.75	1.24	3.48	0.94
wc5	1986.134	AB 10yr	2.93	89.59	90.16	90.15	90.35	0.016437	1.91	1.54	3.81	0.96
wc5	1986.134	AB 20yr	3.86	89.59	90.25	90.24	90.47	0.016354	2.05	1.88	4.16	0.97
wc5	1986.134	AB 50yr	5.42	89.59	90.37	90.37	90.63	0.016857	2.27	2.39	4.62	1.01
wc5	1986.134	AB 100yr	6.90	89.59	90.47	90.47	90.76	0.016320	2.39	2.89	5.04	1.01
wc5	1901.030	AB 2yr	1.31	88.78	89.29		89.35	0.005246	1.01	1.30	3.55	0.53
wc5	1901.030	AB 5yr	2.16	88.78	89.45		89.52	0.004869	1.13	1.92	4.19	0.53
wc5	1901.030	AB 10yr	2.93	88.78	89.57		89.65	0.004592	1.20	2.45	4.67	0.53
wc5	1901.030	AB 20yr	3.86	88.78	89.70		89.78	0.004349	1.26	3.06	5.17	0.52
wc5	1901.030	AB 50yr	5.42	88.78	89.87		89.96	0.003858	1.36	4.03	6.33	0.51
wc5	1901.030	AB 100yr	6.90	88.78	90.01		90.11	0.003435	1.44	4.99	7.60	0.49
wc5	1874.583	AB 2yr	1.31	88.53	89.08		89.16	0.008935	1.30	1.01	2.69	0.68
wc5	1874.583	AB 5yr	2.16	88.53	89.22		89.34	0.009453	1.53	1.41	3.01	0.71
wc5	1874.583	AB 10yr	2.93	88.53	89.32		89.47	0.009922	1.70	1.73	3.25	0.74
wc5	1874.583	AB 20yr	3.86	88.53	89.42		89.60	0.010455	1.86	2.07	3.48	0.77
wc5	1874.583	AB 50yr	5.42	88.53	89.56		89.78	0.011617	2.12	2.56	3.79	0.82
wc5	1874.583	AB 100yr	6.90	88.53	89.64	89.58	89.93	0.013535	2.39	2.89	3.98	0.90

HEC-RAS Plan: prim sen ana (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc5	1845.237	AB 2yr	1.31	88.39	88.91		88.96	0.005004	0.99	1.32	3.58	0.52
wc5	1845.237	AB 5yr	2.16	88.39	89.06		89.12	0.005009	1.14	1.90	4.17	0.54
wc5	1845.237	AB 10yr	2.93	88.39	89.17		89.24	0.005004	1.23	2.37	4.61	0.55
wc5	1845.237	AB 20yr	3.86	88.39	89.28		89.37	0.005013	1.33	2.91	5.05	0.56
wc5	1845.237	AB 50yr	5.42	88.39	89.42		89.53	0.005013	1.47	3.71	6.72	0.57
wc5	1845.237	AB 100yr	6.90	88.39	89.53		89.66	0.004934	1.60	4.49	8.08	0.58
wc5	1801.453	AB 2yr	1.31	88.17	88.69		88.74	0.005138	1.00	1.31	3.56	0.53
wc5	1801.453	AB 5yr	2.16	88.17	88.84		88.90	0.005088	1.15	1.89	4.16	0.54
wc5	1801.453	AB 10yr	2.93	88.17	88.95		89.02	0.005049	1.24	2.37	4.60	0.55
wc5	1801.453	AB 20yr	3.86	88.17	89.06		89.15	0.005057	1.33	2.90	5.04	0.56
wc5	1801.453	AB 50yr	5.42	88.17	89.21		89.32	0.004947	1.46	3.72	5.98	0.57
wc5	1801.453	AB 100yr	6.90	88.17	89.31		89.44	0.004823	1.59	4.53	9.31	0.58
wc5	1693.967	AB 2yr	1.31	87.76	88.28		88.33	0.004838	0.98	1.33	3.60	0.51
wc5	1693.967	AB 5yr	2.16	87.76	88.43		88.50	0.004937	1.13	1.91	4.18	0.54
wc5	1693.967	AB 10yr	2.93	87.76	88.54		88.62	0.004976	1.23	2.38	4.61	0.55
wc5	1693.967	AB 20yr	3.86	87.76	88.65		88.74	0.005011	1.33	2.91	5.05	0.56
wc5	1693.967	AB 50yr	5.42	87.76	88.77		88.89	0.005558	1.51	3.58	5.61	0.60
wc5	1693.967	AB 100yr	6.90	87.76	88.86		89.01	0.005995	1.71	4.08	6.26	0.63
wc5	1602.883	AB 2yr	1.31	87.17	87.68		87.73	0.005374	1.02	1.28	3.54	0.54
wc5	1602.883	AB 5yr	2.16	87.17	87.83		87.90	0.005150	1.15	1.88	4.16	0.55
wc5	1602.883	AB 10yr	2.93	87.17	87.95		88.02	0.005063	1.24	2.36	4.60	0.55
wc5	1602.883	AB 20yr	3.86	87.17	88.06		88.15	0.005003	1.33	2.91	5.05	0.56
wc5	1602.883	AB 50yr	5.42	87.17	88.26	87.95	88.35	0.003746	1.34	4.28	11.47	0.50
wc5	1602.883	AB 100yr	6.90	87.17	88.37	88.05	88.46	0.003509	1.42	6.22	26.84	0.50
wc5	1537.467	AB 2yr	1.31	86.84	87.41		87.45	0.003502	0.87	1.50	3.78	0.44
wc5	1537.467	AB 5yr	2.16	86.84	87.57		87.62	0.003541	1.00	2.15	4.41	0.46
wc5	1537.467	AB 10yr	2.93	86.84	87.65		87.72	0.004181	1.16	2.54	4.75	0.50
wc5	1537.467	AB 20yr	3.86	86.84	87.71		87.81	0.005389	1.36	2.83	4.99	0.58
wc5	1537.467	AB 50yr	5.42	86.84	87.62	87.62	87.88	0.016888	2.27	2.39	4.62	1.01
wc5	1537.467	AB 100yr	6.90	86.84	87.72	87.72	88.01	0.016320	2.39	2.89	5.04	1.01
wc5	1471.795	AB 2yr	1.31	86.50	87.00		87.09	0.009476	1.30	1.01	2.87	0.70
wc5	1471.795	AB 5yr	2.16	86.50	87.15	87.04	87.26	0.009305	1.48	1.46	3.36	0.72
wc5	1471.795	AB 10yr	2.93	86.50	87.27	87.27	87.37	0.006677	1.45	2.68	22.31	0.63
wc5	1471.795	AB 20yr	3.86	86.50	87.33	87.33	87.43	0.006225	1.50	4.05	24.46	0.62
wc5	1471.795	AB 50yr	5.42	86.50	87.61		87.63	0.001063	0.80	12.60	39.23	0.27
wc5	1471.795	AB 100yr	6.90	86.50	87.70		87.72	0.000916	0.79	16.47	45.36	0.26
wc5	1439.675	AB 2yr	1.31	86.27	86.72	86.63	86.80	0.008357	1.20	1.10	3.32	0.66
wc5	1439.675	AB 5yr	2.16	86.27	86.82	86.75	86.94	0.010626	1.50	1.44	3.71	0.77
wc5	1439.675	AB 10yr	2.93	86.27	86.90	86.84	87.04	0.011640	1.68	1.74	4.02	0.82
wc5	1439.675	AB 20yr	3.86	86.27	87.06	86.92	87.19	0.007952	1.57	2.45	4.68	0.69
wc5	1439.675	AB 50yr	5.42	86.27	87.60	87.05	87.61	0.000323	0.47	19.94	47.82	0.15
wc5	1439.675	AB 100yr	6.90	86.27	87.69	87.27	87.70	0.000293	0.48	25.14	60.63	0.15
wc5	1320.692	AB 2yr	1.56	85.57	86.13		86.19	0.005310	1.07	1.46	3.74	0.54
wc5	1320.692	AB 5yr	2.53	85.57	86.36		86.42	0.003417	1.03	2.45	4.68	0.45
wc5	1320.692	AB 10yr	3.40	85.57	86.57		86.62	0.002348	0.97	3.50	5.51	0.39
wc5	1320.692	AB 20yr	4.43	85.57	86.99		87.01	0.000702	0.74	6.45	8.64	0.23
wc5	1320.692	AB 50yr	6.23	85.57	87.56		87.58	0.000254	0.60	15.41	33.41	0.15
wc5	1320.692	AB 100yr	8.82	85.57	87.64		87.66	0.000400	0.77	18.15	39.83	0.19
wc5	1316.508	AB 2yr	1.56	85.38	85.91	85.79	86.03	0.006963	1.51	1.04	3.63	0.67
wc5	1316.508	AB 5yr	2.53	85.38	86.18	85.94	86.31	0.004621	1.62	1.56	4.69	0.58
wc5	1316.508	AB 10yr	3.40	85.38	86.38	86.06	86.53	0.003842	1.72	1.97	5.51	0.55
wc5	1316.508	AB 20yr	4.43	85.38	86.86	86.19	86.98	0.001740	1.51	2.93	8.46	0.40
wc5	1316.508	AB 50yr	6.23	85.38	87.44	86.39	87.55	0.001148	1.53	4.08	22.64	0.34
wc5	1316.508	AB 100yr	8.82	85.38	87.36	86.65	87.62	0.002602	2.24	3.93	18.44	0.51
wc5	1307.90		Culvert									
wc5	1291.617	AB 2yr	1.56	85.19	85.69		85.82	0.008951	1.63	0.96	3.48	0.75
wc5	1291.617	AB 5yr	2.53	85.19	85.81	85.75	86.03	0.010660	2.08	1.22	4.00	0.85
wc5	1291.617	AB 10yr	3.40	85.19	85.90	85.87	86.21	0.012495	2.45	1.39	4.33	0.94
wc5	1291.617	AB 20yr	4.43	85.19	86.00	86.00	86.40	0.013654	2.80	1.58	4.73	1.01
wc5	1291.617	AB 50yr	6.23	85.19	86.20	86.20	86.70	0.012626	3.14	1.99	5.53	1.00
wc5	1291.617	AB 100yr	8.82	85.19	86.46	86.46	87.09	0.011588	3.51	2.51	6.24	1.00
wc5	1288.054	AB 2yr	1.56	85.00	85.52		85.59	0.007309	1.20	1.30	3.56	0.63
wc5	1288.054	AB 5yr	2.53	85.00	85.66		85.75	0.007292	1.36	1.86	4.14	0.65
wc5	1288.054	AB 10yr	3.40	85.00	85.76		85.87	0.007299	1.47	2.31	4.55	0.66
wc5	1288.054	AB 20yr	4.43	85.00	85.87		85.99	0.007325	1.58	2.80	4.96	0.67
wc5	1288.054	AB 50yr	6.23	85.00	86.02		86.17	0.007297	1.74	3.59	5.51	0.69
wc5	1288.054	AB 100yr	8.82	85.00	86.16		86.37	0.007365	2.00	4.42	5.63	0.71



HEC-RAS Plan: prim sen ana (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc5	1225.493	AB 2yr	1.56	84.72	85.23		85.31	0.007601	1.21	1.29	3.54	0.64
wc5	1225.493	AB 5yr	2.53	84.72	85.37		85.47	0.007602	1.38	1.83	4.11	0.66
wc5	1225.493	AB 10yr	3.40	84.72	85.47		85.59	0.007600	1.50	2.27	4.52	0.67
wc5	1225.493	AB 20yr	4.43	84.72	85.58		85.71	0.007598	1.60	2.76	4.93	0.68
wc5	1225.493	AB 50yr	6.23	84.72	85.73		85.89	0.007602	1.76	3.54	5.53	0.70
wc5	1225.493	AB 100yr	8.82	84.72	85.88		86.08	0.007582	2.02	4.41	6.13	0.72
wc5	1157.883	AB 2yr	1.56	84.21	84.72		84.80	0.007443	1.20	1.30	3.55	0.64
wc5	1157.883	AB 5yr	2.53	84.21	84.87		84.96	0.007419	1.37	1.84	4.12	0.65
wc5	1157.883	AB 10yr	3.40	84.21	84.97		85.08	0.007405	1.48	2.29	4.54	0.67
wc5	1157.883	AB 20yr	4.43	84.21	85.07		85.20	0.007392	1.59	2.79	4.96	0.68
wc5	1157.883	AB 50yr	6.23	84.21	85.22		85.38	0.007401	1.74	3.57	5.58	0.69
wc5	1157.883	AB 100yr	8.82	84.21	85.37		85.58	0.007405	2.00	4.47	6.47	0.72
wc5	1131.031	AB 2yr	1.56	84.01	84.53		84.60	0.007071	1.18	1.32	3.58	0.62
wc5	1131.031	AB 5yr	2.53	84.01	84.67		84.77	0.007098	1.35	1.87	4.15	0.64
wc5	1131.031	AB 10yr	3.40	84.01	84.78		84.89	0.007137	1.46	2.32	4.57	0.65
wc5	1131.031	AB 20yr	4.43	84.01	84.88		85.01	0.007154	1.57	2.82	4.98	0.67
wc5	1131.031	AB 50yr	6.23	84.01	85.03		85.18	0.007135	1.73	3.61	5.68	0.68
wc5	1131.031	AB 100yr	8.82	84.01	85.18		85.38	0.007089	1.97	4.57	7.02	0.70
wc5	1112.568	AB 2yr	1.56	83.88	84.39	84.28	84.47	0.007532	1.21	1.29	3.55	0.64
wc5	1112.568	AB 5yr	2.53	83.88	84.53	84.40	84.63	0.007507	1.38	1.84	4.12	0.66
wc5	1112.568	AB 10yr	3.40	83.88	84.64	84.49	84.75	0.007571	1.49	2.27	4.52	0.67
wc5	1112.568	AB 20yr	4.43	83.88	84.74	84.59	84.87	0.007554	1.60	2.77	4.94	0.68
wc5	1112.568	AB 50yr	6.23	83.88	84.89	84.72	85.05	0.007551	1.76	3.55	5.56	0.70
wc5	1112.568	AB 100yr	8.82	83.88	85.04	84.88	85.24	0.007520	2.01	4.45	6.47	0.72
wc5	1071.480	AB 2yr	1.56	83.57	84.08		84.15	0.007627	1.21	1.28	3.54	0.64
wc5	1071.480	AB 5yr	2.53	83.57	84.22		84.32	0.007586	1.38	1.83	4.11	0.66
wc5	1071.480	AB 10yr	3.40	83.57	84.33		84.44	0.007504	1.49	2.28	4.53	0.67
wc5	1071.480	AB 20yr	4.43	83.57	84.43		84.56	0.007366	1.59	2.79	4.96	0.67
wc5	1071.480	AB 50yr	6.23	83.57	84.58		84.74	0.007463	1.75	3.56	5.53	0.69
wc5	1071.480	AB 100yr	8.82	83.57	84.73		84.94	0.007448	2.01	4.42	5.95	0.72
wc5	1034.499	AB 2yr	1.56	83.29	83.81	83.69	83.88	0.006867	1.17	1.33	3.59	0.61
wc5	1034.499	AB 5yr	2.53	83.29	83.97	83.81	84.06	0.006362	1.30	1.95	4.23	0.61
wc5	1034.499	AB 10yr	3.40	83.29	84.09	83.90	84.18	0.006046	1.38	2.47	4.69	0.61
wc5	1034.499	AB 20yr	4.43	83.29	84.21	84.00	84.32	0.005718	1.44	3.07	5.17	0.60
wc5	1034.499	AB 50yr	6.23	83.29	84.35	84.13	84.49	0.005829	1.62	3.84	5.61	0.62
wc5	1034.499	AB 100yr	8.82	83.29	84.47	84.29	84.67	0.006844	1.96	4.53	5.83	0.69
wc5	1013.774	AB 2yr	1.56	83.14	83.69	83.54	83.75	0.005635	1.09	1.43	3.70	0.56
wc5	1013.774	AB 5yr	2.53	83.14	83.87	83.66	83.94	0.004953	1.18	2.14	4.40	0.54
wc5	1013.774	AB 10yr	3.40	83.14	83.99	83.75	84.07	0.004673	1.25	2.72	4.90	0.54
wc5	1013.774	AB 20yr	4.43	83.14	84.12	83.84	84.21	0.004400	1.31	3.38	5.41	0.53
wc5	1013.774	AB 50yr	6.23	83.14	84.26	83.98	84.37	0.004427	1.49	4.22	6.40	0.55
wc5	1013.774	AB 100yr	8.82	83.14	84.35	84.14	84.53	0.006092	1.89	4.81	7.06	0.66
wc5	951.8970	AB 2yr	2.17	82.62	83.24	83.12	83.33	0.007584	1.35	1.61	3.74	0.65
wc5	951.8970	AB 5yr	3.50	82.62	83.39	83.26	83.52	0.008473	1.60	2.19	4.25	0.71
wc5	951.8970	AB 10yr	4.66	82.62	83.49	83.36	83.65	0.008997	1.76	2.64	4.60	0.74
wc5	951.8970	AB 20yr	6.00	82.62	83.58	83.47	83.77	0.009999	1.96	3.06	4.91	0.79
wc5	951.8970	AB 50yr	8.14	82.62	83.76	83.61	83.97	0.008867	2.04	4.00	6.13	0.76
wc5	951.8970	AB 100yr	10.30	82.62	83.95	83.74	84.14	0.006290	1.98	5.83	13.66	0.66
wc5	942.8887	AB 2yr	2.17	82.59	83.20	83.07	83.29	0.007168	1.30	1.67	3.95	0.64
wc5	942.8887	AB 5yr	3.50	82.59	83.35	83.21	83.47	0.007736	1.54	2.27	4.52	0.68
wc5	942.8887	AB 10yr	4.66	82.59	83.44	83.31	83.60	0.007682	1.72	2.71	4.92	0.70
wc5	942.8887	AB 20yr	6.00	82.59	83.52	83.40	83.72	0.008842	1.99	3.02	5.20	0.77
wc5	942.8887	AB 50yr	8.14	82.59	83.53	83.53	83.89	0.014977	2.63	3.09	5.27	1.00
wc5	942.8887	AB 100yr	10.30	82.59	83.65	83.65	84.06	0.014148	2.84	3.63	6.89	1.00
wc5	937.1887		Culvert									
wc5	931	AB 2yr	2.17	82.47	83.23	82.95	83.28	0.002796	0.96	2.27	4.54	0.41
wc5	931	AB 5yr	3.50	82.47	83.37	83.09	83.45	0.003535	1.22	2.88	5.11	0.48
wc5	931	AB 10yr	4.66	82.47	83.47	83.19	83.57	0.003981	1.41	3.30	5.49	0.52
wc5	931	AB 20yr	6.00	82.47	83.54	83.29	83.68	0.004825	1.66	3.62	5.52	0.58
wc5	931	AB 50yr	8.14	82.47	83.50	83.42	83.79	0.010642	2.37	3.43	6.71	0.86
wc5	931	AB 100yr	10.30	82.47	83.72	83.54	84.00	0.007307	2.33	4.42	66.88	0.74
wc5	918.3739	AB 2yr	2.17	82.41	83.06	83.02	83.18	0.014793	1.57	1.38	4.27	0.88
wc5	918.3739	AB 5yr	3.50	82.41	83.21	83.15	83.35	0.011740	1.65	2.13	5.11	0.82
wc5	918.3739	AB 10yr	4.66	82.41	83.35	83.24	83.48	0.009202	1.65	2.83	5.65	0.74
wc5	918.3739	AB 20yr	6.00	82.41	83.47	83.33	83.60	0.007416	1.64	4.31	25.52	0.68
wc5	918.3739	AB 50yr	8.14	82.41	83.63	83.57	83.63	0.000413	0.44	42.69	184.66	0.17
wc5	918.3739	AB 100yr	10.30	82.41	83.86	83.57	83.86	0.000076	0.22	85.81	185.15	0.07

HEC-RAS Plan: prim sen ana (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc5	815.3577	AB 2yr	2.17	81.85	82.62	82.33	82.66	0.002849	0.93	2.34	4.58	0.41
wc5	815.3577	AB 5yr	3.50	81.85	82.84	82.47	82.89	0.002621	1.02	3.44	5.45	0.41
wc5	815.3577	AB 10yr	4.66	81.85	83.02	82.57	83.07	0.002486	1.03	4.54	6.89	0.40
wc5	815.3577	AB 20yr	6.00	81.85	83.16	82.68	83.22	0.002544	1.08	5.57	8.03	0.41
wc5	815.3577	AB 50yr	8.14	81.85	83.52	82.82	83.56	0.001407	0.90	9.05	11.04	0.32
wc5	815.3577	AB 100yr	10.30	81.85	83.86	82.95	83.86	0.000001	0.03	329.17	243.15	0.01
wc5	680.8133	AB 2yr	2.52	81.64	82.55	82.16	82.58	0.001949	0.84	3.01	5.13	0.35
wc5	680.8133	AB 5yr	4.00	81.64	82.77	82.31	82.82	0.001729	0.94	4.25	5.79	0.34
wc5	680.8133	AB 10yr	5.25	81.64	82.96	82.41	83.01	0.001443	1.00	5.36	6.20	0.33
wc5	680.8133	AB 20yr	6.67	81.64	83.20	82.51	83.20	0.000005	0.07	142.03	155.43	0.02
wc5	680.8133	AB 50yr	8.89	81.64	83.55	82.65	83.55	0.000003	0.06	196.90	155.68	0.02
wc5	680.8133	AB 100yr	11.00	81.64	83.86	82.75	83.86	0.000002	0.06	245.85	176.52	0.01
wc5	678.6898	AB 2yr	2.52	81.55	82.53	82.07	82.56	0.001405	0.74	3.40	5.42	0.30
wc5	678.6898	AB 5yr	4.00	81.55	82.76	82.22	82.80	0.001262	0.86	4.69	5.85	0.30
wc5	678.6898	AB 10yr	5.25	81.55	82.95	82.32	82.99	0.001107	0.92	5.81	6.17	0.29
wc5	678.6898	AB 20yr	6.67	81.55	83.20	82.42	83.20	0.000006	0.08	133.36	154.38	0.02
wc5	678.6898	AB 50yr	8.89	81.55	83.55	82.56	83.55	0.000003	0.07	187.84	154.47	0.02
wc5	678.6898	AB 100yr	11.00	81.55	83.86	82.66	83.86	0.000002	0.07	245.25	231.76	0.02
wc5	665	AB 2yr	2.52	81.40	82.38	82.10	82.41	0.002386	0.74	3.39	8.38	0.37
wc5	665	AB 5yr	4.00	81.40	82.71	82.22	82.72	0.000543	0.47	14.36	91.79	0.19
wc5	665	AB 10yr	5.25	81.40	82.95	82.30	82.95	0.000095	0.25	44.91	159.61	0.08
wc5	665	AB 20yr	6.67	81.40	83.20	82.38	83.20	0.000024	0.15	88.31	178.22	0.04
wc5	665	AB 50yr	8.89	81.40	83.55	82.49	83.55	0.000006	0.08	211.98	388.44	0.02
wc5	665	AB 100yr	11.00	81.40	83.86	82.68	83.86	0.000002	0.06	332.00	388.44	0.01
wc5	660	AB 2yr	2.52	81.32	82.09	82.09	82.37	0.016592	2.36	1.07	3.73	1.00
wc5	660	AB 5yr	4.00	81.32	82.29	82.29	82.67	0.015100	2.76	1.45	4.56	1.01
wc5	660	AB 10yr	5.25	81.32	82.44	82.44	82.90	0.013952	3.00	1.75	5.20	1.00
wc5	660	AB 20yr	6.67	81.32	82.60	82.60	83.14	0.013250	3.26	2.05	5.86	1.00
wc5	660	AB 50yr	8.89	81.32	82.82	82.82	83.48	0.012585	3.60	2.47	6.78	1.01
wc5	660	AB 100yr	11.00	81.32	83.02	83.02	83.78	0.011988	3.86	2.85	7.81	1.01
wc5	655		Culvert									
wc5	651.8919	AB 2yr	2.52	80.93	81.58	81.50	81.79	0.009385	2.02	1.25	4.11	0.81
wc5	651.8919	AB 5yr	4.00	80.93	81.73	81.70	82.08	0.011918	2.61	1.53	4.70	0.94
wc5	651.8919	AB 10yr	5.25	80.93	81.85	81.85	82.30	0.012828	2.97	1.77	5.17	1.00
wc5	651.8919	AB 20yr	6.67	80.93	82.00	82.00	82.53	0.012232	3.23	2.07	9.60	1.00
wc5	651.8919	AB 50yr	8.89	80.93	82.23	82.23	82.87	0.011470	3.55	2.50	44.23	1.00
wc5	651.8919	AB 100yr	11.00	80.93	82.43	82.43	83.16	0.010873	3.81	2.89	260.43	1.00
wc5	648.3854	AB 2yr	2.52	80.78	81.34	81.30	81.49	0.014262	1.74	1.45	3.72	0.89
wc5	648.3854	AB 5yr	4.00	80.78	81.45	81.45	81.68	0.017188	2.11	1.90	4.17	1.00
wc5	648.3854	AB 10yr	5.25	80.78	81.55	81.55	81.81	0.016778	2.25	2.34	4.58	1.00
wc5	648.3854	AB 20yr	6.67	80.78	81.65	81.65	81.94	0.016019	2.35	2.84	4.99	1.00
wc5	648.3854	AB 50yr	8.89	80.78	81.79	81.79	82.11	0.015515	2.51	3.54	5.68	1.00
wc5	648.3854	AB 100yr	11.00	80.78	82.03	81.93	82.03	0.000054	0.18	109.03	231.47	0.06
wc5	553.6066	AB 2yr	2.52	80.14	80.91	80.70	80.96	0.004094	0.94	2.67	6.98	0.49
wc5	553.6066	AB 5yr	4.00	80.14	81.15	80.83	81.19	0.002452	0.86	4.66	9.59	0.39
wc5	553.6066	AB 10yr	5.25	80.14	81.33	80.92	81.36	0.001752	0.81	6.52	11.51	0.34
wc5	553.6066	AB 20yr	6.67	80.14	81.51	81.00	81.54	0.001275	0.76	8.83	13.51	0.30
wc5	553.6066	AB 50yr	8.89	80.14	81.78	81.10	81.78	0.000290	0.43	39.07	149.89	0.15
wc5	553.6066	AB 100yr	11.00	80.14	82.02	81.18	82.03	0.000077	0.26	77.86	161.51	0.08
wc5	521.5115	AB 2yr	2.52	80.04	80.85	80.56	80.90	0.003074	0.99	2.54	4.75	0.43
wc5	521.5115	AB 5yr	4.00	80.04	81.09	80.71	81.15	0.002490	1.05	3.81	6.26	0.40
wc5	521.5115	AB 10yr	5.25	80.04	81.27	80.81	81.33	0.001923	1.08	5.17	8.82	0.37
wc5	521.5115	AB 20yr	6.67	80.04	81.47	80.91	81.52	0.001362	1.04	8.37	22.75	0.32
wc5	521.5115	AB 50yr	8.89	80.04	81.78	81.05	81.78	0.000014	0.13	143.67	238.98	0.03
wc5	521.5115	AB 100yr	11.00	80.04	82.03	81.16	82.03	0.000007	0.10	202.33	239.74	0.03
wc5	518.7136	AB 2yr	2.89	79.98	80.80	80.54	80.87	0.003663	1.21	2.39	4.76	0.49
wc5	518.7136	AB 5yr	4.54	79.98	81.02	80.69	81.12	0.003266	1.40	3.24	5.90	0.48
wc5	518.7136	AB 10yr	5.90	79.98	81.18	80.79	81.30	0.003062	1.53	3.86	7.58	0.48
wc5	518.7136	AB 20yr	7.43	79.98	81.36	80.90	81.49	0.002894	1.65	4.51	12.02	0.48
wc5	518.7136	AB 50yr	9.80	79.98	81.60	81.04	81.76	0.002708	1.80	5.44	42.23	0.48
wc5	518.7136	AB 100yr	11.90	79.98	81.83	81.17	82.01	0.002442	1.89	6.30	188.00	0.47
wc5	503.04		Culvert									
wc5	487.5449	AB 2yr	2.89	79.68	80.31	80.18	80.42	0.006717	1.47	1.96	6.11	0.65
wc5	487.5449	AB 5yr	4.54	79.68	80.46	80.32	80.62	0.007214	1.80	2.52	9.64	0.71
wc5	487.5449	AB 10yr	5.90	79.68	80.54	80.42	80.76	0.008296	2.08	2.83	10.51	0.77
wc5	487.5449	AB 20yr	7.43	79.68	80.60	80.52	80.90	0.010137	2.43	3.06	11.16	0.86
wc5	487.5449	AB 50yr	9.80	79.68	80.67	80.67	81.11	0.013268	2.94	3.33	11.92	1.00

HEC-RAS Plan: prim sen ana

Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chl
wc5	2388.964	AB 2yr	1.31	92.94	93.29	93.29	93.41	0.019896	1.52	0.85	3.59	0.99
wc5	2388.964	AB 5yr	2.16	92.94	93.40	93.40	93.54	0.019382	1.66	1.30	4.68	1.01
wc5	2388.964	AB 10yr	2.93	92.94	93.59	93.47	93.66	0.006711	1.18	2.84	23.36	0.62
wc5	2388.964	AB 20yr	3.86	92.94	93.73	93.55	93.76	0.002281	0.85	6.98	33.25	0.38
wc5	2388.964	AB 50yr	5.42	92.94	93.87	93.68	93.88	0.001210	0.73	11.82	37.02	0.29
wc5	2388.964	AB 100yr	6.90	92.94	94.09	93.72	94.10	0.000421	0.52	20.63	41.16	0.18
wc5	2290	AB 2yr	1.31	92.11	92.89		92.91	0.000985	0.55	2.39	4.62	0.24
wc5	2290	AB 5yr	2.16	92.11	93.24		93.25	0.000578	0.51	4.23	6.07	0.20
wc5	2290	AB 10yr	2.93	92.11	93.53		93.54	0.000384	0.47	6.22	7.40	0.16
wc5	2290	AB 20yr	3.86	92.11	93.62		93.63	0.000513	0.56	6.88	7.82	0.19
wc5	2290	AB 50yr	5.42	92.11	93.72		93.75	0.000753	0.70	7.74	8.94	0.23
wc5	2290	AB 100yr	6.90	92.11	94.00		94.02	0.000508	0.67	11.22	17.33	0.20
wc5	2256	AB 2yr	1.31	91.88	92.81	92.33	92.86	0.001362	1.01	1.30	5.22	0.33
wc5	2256	AB 5yr	2.16	91.88	93.14	92.50	93.21	0.001360	1.23	1.76	6.34	0.35
wc5	2256	AB 10yr	2.93	91.88	93.40	92.64	93.50	0.008824	1.36	2.17	9.85	0.69
wc5	2256	AB 20yr	3.86	91.88	93.46	92.80	93.58	0.009122	1.52	2.80	11.75	0.72
wc5	2256	AB 50yr	5.42	91.88	93.24	93.03	93.65	0.006653	2.85	1.90	6.67	0.78
wc5	2256	AB 100yr	6.90	91.88	93.23	93.23	93.91	0.010999	3.66	1.89	6.64	1.01
wc5	2240.61		Culvert									
wc5	2221	AB 2yr	1.31	91.59	92.04	92.04	92.26	0.015239	2.07	0.63	3.30	0.99
wc5	2221	AB 5yr	2.16	91.59	92.22	92.22	92.53	0.014237	2.48	0.87	3.99	1.01
wc5	2221	AB 10yr	2.93	91.59	92.36	92.36	92.74	0.013283	2.75	1.07	4.55	1.00
wc5	2221	AB 20yr	3.86	91.59	92.51	92.51	92.97	0.012460	3.01	1.28	5.16	1.00
wc5	2221	AB 50yr	5.42	91.59	92.74	92.74	93.32	0.011596	3.37	1.61	7.73	1.00
wc5	2221	AB 100yr	6.90	91.59	92.94	92.94	93.62	0.010990	3.66	1.89	9.06	1.00
wc5	2198	AB 2yr	1.31	91.41	91.86		91.93	0.008566	1.21	1.09	3.31	0.67
wc5	2198	AB 5yr	2.16	91.41	92.00		92.09	0.008412	1.38	1.57	3.85	0.69
wc5	2198	AB 10yr	2.93	91.41	92.09		92.21	0.008311	1.49	1.97	4.24	0.70
wc5	2198	AB 20yr	3.86	91.41	92.20		92.33	0.008255	1.60	2.42	4.65	0.71
wc5	2198	AB 50yr	5.42	91.41	92.34		92.49	0.008109	1.73	3.13	5.22	0.71
wc5	2198	AB 100yr	6.90	91.41	92.44		92.62	0.008304	1.88	3.68	6.02	0.74
wc5	2150	AB 2yr	1.31	91.07	91.55		91.61	0.006821	1.11	1.18	3.42	0.60
wc5	2150	AB 5yr	2.16	91.07	91.69		91.77	0.006755	1.27	1.70	3.98	0.62
wc5	2150	AB 10yr	2.93	91.07	91.80		91.89	0.006601	1.37	2.14	4.40	0.63
wc5	2150	AB 20yr	3.86	91.07	91.91		92.02	0.006360	1.45	2.66	4.85	0.62
wc5	2150	AB 50yr	5.42	91.07	92.07		92.19	0.005941	1.54	3.51	5.52	0.62
wc5	2150	AB 100yr	6.90	91.07	92.19		92.33	0.005462	1.66	4.26	7.43	0.61
wc5	2068.437	AB 2yr	1.31	90.36	90.80		90.89	0.011843	1.38	0.95	2.93	0.77
wc5	2068.437	AB 5yr	2.16	90.36	90.93		91.06	0.011839	1.61	1.34	3.18	0.79
wc5	2068.437	AB 10yr	2.93	90.36	91.02		91.18	0.011970	1.77	1.65	3.36	0.81
wc5	2068.437	AB 20yr	3.86	90.36	91.12		91.31	0.012285	1.94	1.99	3.55	0.83
wc5	2068.437	AB 50yr	5.42	90.36	91.25		91.50	0.013014	2.18	2.49	3.81	0.86
wc5	2068.437	AB 100yr	6.90	90.36	91.35	91.29	91.65	0.013869	2.40	2.92	5.92	0.90
wc5	2044.707	AB 2yr	1.31	89.83	90.30		90.36	0.007514	1.15	1.14	3.37	0.63
wc5	2044.707	AB 5yr	2.16	89.83	90.43	90.31	90.52	0.007542	1.32	1.63	3.91	0.65
wc5	2044.707	AB 10yr	2.93	89.83	90.53	90.39	90.64	0.007584	1.44	2.04	4.31	0.67
wc5	2044.707	AB 20yr	3.86	89.83	90.63	90.48	90.75	0.007650	1.55	2.49	4.71	0.68
wc5	2044.707	AB 50yr	5.42	89.83	90.78	90.61	90.92	0.007539	1.69	3.21	5.29	0.69
wc5	2044.707	AB 100yr	6.90	89.83	90.88	90.71	91.05	0.007520	1.83	3.80	6.41	0.70
wc5	1986.134	AB 2yr	1.31	89.59	89.97	89.95	90.08	0.015977	1.51	0.87	3.03	0.90
wc5	1986.134	AB 5yr	2.16	89.59	90.08	90.06	90.24	0.016250	1.75	1.24	3.48	0.94
wc5	1986.134	AB 10yr	2.93	89.59	90.16	90.15	90.35	0.016437	1.91	1.54	3.81	0.96
wc5	1986.134	AB 20yr	3.86	89.59	90.25	90.24	90.47	0.016354	2.05	1.88	4.16	0.97
wc5	1986.134	AB 50yr	5.42	89.59	90.37	90.37	90.63	0.016857	2.27	2.39	4.62	1.01
wc5	1986.134	AB 100yr	6.90	89.59	90.47	90.47	90.76	0.016320	2.39	2.89	5.04	1.01
wc5	1901.030	AB 2yr	1.31	88.78	89.29		89.35	0.005246	1.01	1.30	3.55	0.53
wc5	1901.030	AB 5yr	2.16	88.78	89.45		89.52	0.004869	1.13	1.92	4.19	0.53
wc5	1901.030	AB 10yr	2.93	88.78	89.57		89.65	0.004592	1.20	2.45	4.67	0.53
wc5	1901.030	AB 20yr	3.86	88.78	89.70		89.78	0.004349	1.26	3.06	5.17	0.52
wc5	1901.030	AB 50yr	5.42	88.78	89.87		89.96	0.003858	1.36	4.03	6.33	0.51
wc5	1901.030	AB 100yr	6.90	88.78	90.01		90.11	0.003435	1.44	4.99	7.60	0.49
wc5	1874.583	AB 2yr	1.31	88.53	89.08		89.16	0.008935	1.30	1.01	2.69	0.68
wc5	1874.583	AB 5yr	2.16	88.53	89.22		89.34	0.009453	1.53	1.41	3.01	0.71
wc5	1874.583	AB 10yr	2.93	88.53	89.32		89.47	0.009922	1.70	1.73	3.25	0.74
wc5	1874.583	AB 20yr	3.86	88.53	89.42		89.60	0.010455	1.86	2.07	3.48	0.77
wc5	1874.583	AB 50yr	5.42	88.53	89.56		89.78	0.011617	2.12	2.56	3.79	0.82
wc5	1874.583	AB 100yr	6.90	88.53	89.64	89.58	89.93	0.013535	2.39	2.89	3.98	0.90

HEC-RAS Plan: prim sen ana (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc5	1845.237	AB 2yr	1.31	88.39	88.91		89.96	0.005004	0.99	1.32	3.58	0.52
wc5	1845.237	AB 5yr	2.16	88.39	89.06		89.12	0.005009	1.14	1.90	4.17	0.54
wc5	1845.237	AB 10yr	2.93	88.39	89.17		89.24	0.005004	1.23	2.37	4.61	0.55
wc5	1845.237	AB 20yr	3.86	88.39	89.28		89.37	0.005013	1.33	2.91	5.05	0.56
wc5	1845.237	AB 50yr	5.42	88.39	89.42		89.53	0.005013	1.47	3.71	6.72	0.57
wc5	1845.237	AB 100yr	6.90	88.39	89.53		89.66	0.004934	1.60	4.49	8.08	0.58
wc5	1801.453	AB 2yr	1.31	88.17	88.69		88.74	0.005138	1.00	1.31	3.56	0.53
wc5	1801.453	AB 5yr	2.16	88.17	88.84		88.90	0.005088	1.15	1.89	4.16	0.54
wc5	1801.453	AB 10yr	2.93	88.17	88.95		89.02	0.005049	1.24	2.37	4.60	0.55
wc5	1801.453	AB 20yr	3.86	88.17	89.06		89.15	0.005057	1.33	2.90	5.04	0.56
wc5	1801.453	AB 50yr	5.42	88.17	89.21		89.32	0.004947	1.46	3.72	5.98	0.57
wc5	1801.453	AB 100yr	6.90	88.17	89.31		89.44	0.004823	1.59	4.53	9.31	0.58
wc5	1693.967	AB 2yr	1.31	87.76	88.28		88.33	0.004838	0.98	1.33	3.60	0.51
wc5	1693.967	AB 5yr	2.16	87.76	88.43		88.50	0.004937	1.13	1.91	4.18	0.54
wc5	1693.967	AB 10yr	2.93	87.76	88.54		88.62	0.004976	1.23	2.38	4.61	0.55
wc5	1693.967	AB 20yr	3.86	87.76	88.65		88.74	0.005011	1.33	2.91	5.05	0.56
wc5	1693.967	AB 50yr	5.42	87.76	88.77		88.89	0.005558	1.51	3.58	5.61	0.60
wc5	1693.967	AB 100yr	6.90	87.76	88.86		89.01	0.005995	1.71	4.08	6.26	0.63
wc5	1602.883	AB 2yr	1.31	87.17	87.68		87.73	0.005374	1.02	1.28	3.54	0.54
wc5	1602.883	AB 5yr	2.16	87.17	87.83		87.90	0.005150	1.15	1.88	4.16	0.55
wc5	1602.883	AB 10yr	2.93	87.17	87.95		88.02	0.005063	1.24	2.36	4.60	0.55
wc5	1602.883	AB 20yr	3.86	87.17	88.06		88.15	0.005003	1.33	2.91	5.05	0.56
wc5	1602.883	AB 50yr	5.42	87.17	88.26	87.95	88.35	0.003746	1.34	4.28	11.47	0.50
wc5	1602.883	AB 100yr	6.90	87.17	88.37	88.05	88.46	0.003509	1.42	6.22	26.84	0.50
wc5	1537.467	AB 2yr	1.31	86.84	87.41		87.45	0.003502	0.87	1.50	3.78	0.44
wc5	1537.467	AB 5yr	2.16	86.84	87.57		87.62	0.003541	1.00	2.15	4.41	0.46
wc5	1537.467	AB 10yr	2.93	86.84	87.65		87.72	0.004181	1.16	2.54	4.75	0.50
wc5	1537.467	AB 20yr	3.86	86.84	87.71		87.81	0.005389	1.36	2.83	4.99	0.58
wc5	1537.467	AB 50yr	5.42	86.84	87.62	87.62	87.88	0.016888	2.27	2.39	4.62	1.01
wc5	1537.467	AB 100yr	6.90	86.84	87.72	87.72	88.01	0.016320	2.39	2.89	5.04	1.01
wc5	1471.795	AB 2yr	1.31	86.50	87.00		87.09	0.009476	1.30	1.01	2.87	0.70
wc5	1471.795	AB 5yr	2.16	86.50	87.15	87.04	87.26	0.009305	1.48	1.46	3.36	0.72
wc5	1471.795	AB 10yr	2.93	86.50	87.27	87.27	87.37	0.006677	1.45	2.68	22.31	0.63
wc5	1471.795	AB 20yr	3.86	86.50	87.33	87.33	87.43	0.006225	1.50	4.05	24.46	0.62
wc5	1471.795	AB 50yr	5.42	86.50	87.61		87.63	0.001063	0.80	12.60	39.23	0.27
wc5	1471.795	AB 100yr	6.90	86.50	87.70		87.72	0.000916	0.79	16.47	45.36	0.26
wc5	1439.675	AB 2yr	1.31	86.27	86.72	86.63	86.80	0.008357	1.20	1.10	3.32	0.66
wc5	1439.675	AB 5yr	2.16	86.27	86.82	86.75	86.94	0.010626	1.50	1.44	3.71	0.77
wc5	1439.675	AB 10yr	2.93	86.27	86.90	86.84	87.04	0.011640	1.68	1.74	4.02	0.82
wc5	1439.675	AB 20yr	3.86	86.27	87.06	86.92	87.19	0.007952	1.57	2.45	4.68	0.69
wc5	1439.675	AB 50yr	5.42	86.27	87.60	87.05	87.61	0.000323	0.47	19.94	47.82	0.15
wc5	1439.675	AB 100yr	6.90	86.27	87.69	87.27	87.70	0.000293	0.48	25.14	60.63	0.15
wc5	1320.692	AB 2yr	1.56	85.57	86.13		86.19	0.005310	1.07	1.46	3.74	0.54
wc5	1320.692	AB 5yr	2.53	85.57	86.36		86.42	0.003417	1.03	2.45	4.68	0.45
wc5	1320.692	AB 10yr	3.40	85.57	86.57		86.62	0.002348	0.97	3.50	5.51	0.39
wc5	1320.692	AB 20yr	4.43	85.57	86.99		87.01	0.000702	0.74	6.45	8.64	0.23
wc5	1320.692	AB 50yr	6.23	85.57	87.56		87.58	0.000254	0.60	15.41	33.41	0.15
wc5	1320.692	AB 100yr	8.82	85.57	87.64		87.66	0.000400	0.77	18.15	39.83	0.19
wc5	1316.508	AB 2yr	1.56	85.38	85.91	85.79	86.03	0.006963	1.51	1.04	3.63	0.67
wc5	1316.508	AB 5yr	2.53	85.38	86.18	85.94	86.31	0.004621	1.62	1.56	4.69	0.58
wc5	1316.508	AB 10yr	3.40	85.38	86.38	86.06	86.53	0.003842	1.72	1.97	5.51	0.55
wc5	1316.508	AB 20yr	4.43	85.38	86.86	86.19	86.98	0.001740	1.51	2.93	8.46	0.40
wc5	1316.508	AB 50yr	6.23	85.38	87.44	86.39	87.55	0.001148	1.53	4.08	22.64	0.34
wc5	1316.508	AB 100yr	8.82	85.38	87.36	86.65	87.62	0.002602	2.24	3.93	18.44	0.51
wc5	1307.90		Culvert									
wc5	1291.617	AB 2yr	1.56	85.19	85.69		85.82	0.008951	1.63	0.96	3.48	0.75
wc5	1291.617	AB 5yr	2.53	85.19	85.81	85.75	86.03	0.010660	2.08	1.22	4.00	0.85
wc5	1291.617	AB 10yr	3.40	85.19	85.90	85.87	86.21	0.012495	2.45	1.39	4.33	0.94
wc5	1291.617	AB 20yr	4.43	85.19	86.00	86.00	86.40	0.013654	2.80	1.58	4.73	1.01
wc5	1291.617	AB 50yr	6.23	85.19	86.20	86.20	86.70	0.012626	3.14	1.99	5.53	1.00
wc5	1291.617	AB 100yr	8.82	85.19	86.46	86.46	87.09	0.011588	3.51	2.51	6.24	1.00
wc5	1288.054	AB 2yr	1.56	85.00	85.52		85.59	0.007309	1.20	1.30	3.56	0.63
wc5	1288.054	AB 5yr	2.53	85.00	85.66		85.75	0.007292	1.36	1.86	4.14	0.65
wc5	1288.054	AB 10yr	3.40	85.00	85.76		85.87	0.007299	1.47	2.31	4.55	0.66
wc5	1288.054	AB 20yr	4.43	85.00	85.87		85.99	0.007325	1.58	2.80	4.96	0.67
wc5	1288.054	AB 50yr	6.23	85.00	86.02		86.17	0.007297	1.74	3.59	5.51	0.69
wc5	1288.054	AB 100yr	8.82	85.00	86.16		86.37	0.007365	2.00	4.42	5.63	0.71

HEC-RAS Plan: prim sen ana (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc5	487.5449	AB 100yr	11.90	79.68	80.79	80.79	81.29	0.012768	3.14	3.79	13.47	1.00
wc5	484.1846	AB 2yr	2.89	79.63	80.29	80.13	80.35	0.005392	1.13	2.56	6.25	0.56
wc5	484.1846	AB 5yr	4.54	79.63	80.46	80.25	80.54	0.004528	1.22	3.80	9.33	0.54
wc5	484.1846	AB 10yr	5.90	79.63	80.57	80.34	80.65	0.004084	1.28	5.11	20.93	0.52
wc5	484.1846	AB 20yr	7.43	79.63	80.68	80.42	80.75	0.002963	1.21	8.98	42.00	0.46
wc5	484.1846	AB 50yr	9.80	79.63	80.79	80.65	80.84	0.002160	1.14	14.30	50.66	0.40
wc5	484.1846	AB 100yr	11.90	79.63	80.83	80.71	80.89	0.002467	1.25	16.14	52.97	0.43
wc5	381.2556	AB 2yr	2.89	79.11	79.92	79.67	79.98	0.004185	1.15	2.51	4.73	0.50
wc5	381.2556	AB 5yr	4.54	79.11	80.12	79.82	80.21	0.003927	1.27	3.57	5.50	0.50
wc5	381.2556	AB 10yr	5.90	79.11	80.25	79.93	80.34	0.003718	1.39	4.25	5.55	0.50
wc5	381.2556	AB 20yr	7.43	79.11	80.37	80.03	80.48	0.003617	1.51	4.93	5.60	0.51
wc5	381.2556	AB 50yr	9.80	79.11	80.55	80.16	80.65	0.002770	1.49	10.50	62.29	0.46
wc5	381.2556	AB 100yr	11.90	79.11	80.69	80.25	80.74	0.001509	1.20	20.06	72.72	0.35
wc5	359.8282	AB 2yr	2.89	78.85	79.70	79.48	79.79	0.005328	1.32	2.18	3.80	0.56
wc5	359.8282	AB 5yr	4.54	78.85	79.88	79.65	80.01	0.005939	1.55	2.92	4.31	0.60
wc5	359.8282	AB 10yr	5.90	78.85	79.97	79.76	80.14	0.007104	1.76	3.32	4.56	0.66
wc5	359.8282	AB 20yr	7.43	78.85	80.06	79.88	80.26	0.008325	2.00	3.72	4.79	0.72
wc5	359.8282	AB 50yr	9.80	78.85	80.18	80.03	80.44	0.009789	2.28	4.30	5.16	0.79
wc5	359.8282	AB 100yr	11.90	78.85	80.25	80.15	80.58	0.010942	2.53	4.74	7.41	0.85
wc5	304.0528	AB 2yr	2.89	78.22	78.98	78.98	79.18	0.018237	1.94	1.49	3.87	1.00
wc5	304.0528	AB 5yr	4.54	78.22	79.14	79.14	79.37	0.017242	2.13	2.13	4.63	1.00
wc5	304.0528	AB 10yr	5.90	78.22	79.27	79.27	79.49	0.013507	2.08	2.96	8.71	0.91
wc5	304.0528	AB 20yr	7.43	78.22	79.36	79.36	79.59	0.012201	2.16	3.81	9.57	0.88
wc5	304.0528	AB 50yr	9.80	78.22	79.47	79.47	79.72	0.011684	2.34	4.83	10.51	0.89
wc5	304.0528	AB 100yr	11.90	78.22	79.55	79.55	79.83	0.011062	2.45	5.74	11.30	0.88
wc5	250	AB 2yr	2.89	77.55	78.82		78.83	0.000406	0.47	6.20	8.07	0.17
wc5	250	AB 5yr	4.54	77.55	78.84		78.87	0.000913	0.71	6.42	8.19	0.26
wc5	250	AB 10yr	5.90	77.55	78.88		78.92	0.001380	0.88	6.68	8.33	0.31
wc5	250	AB 20yr	7.43	77.55	78.92		78.98	0.001857	1.05	7.09	8.54	0.37
wc5	250	AB 50yr	9.80	77.55	79.03		79.11	0.002309	1.22	8.02	9.01	0.41
wc5	250	AB 100yr	11.90	77.55	79.17		79.25	0.002255	1.28	9.33	9.62	0.41
wc5	230	AB 2yr	2.89	76.75	78.82	77.38	78.82	0.000061	0.32	9.10	28.43	0.08
wc5	230	AB 5yr	4.54	76.75	78.85	77.49	78.86	0.000142	0.49	9.25	29.06	0.12
wc5	230	AB 10yr	5.90	76.75	78.88	77.57	78.90	0.000225	0.63	9.42	29.81	0.15
wc5	230	AB 20yr	7.43	76.75	78.93	77.66	78.96	0.000327	0.77	9.68	30.91	0.18
wc5	230	AB 50yr	9.80	76.75	79.03	77.78	79.08	0.000475	0.96	10.22	38.32	0.22
wc5	230	AB 100yr	11.90	76.75	79.17	77.88	79.23	0.000562	1.09	10.91	54.30	0.24
wc5	215		Culvert									
wc5	200	AB 2yr	2.89	76.48	78.80		78.80	0.000039	0.28	10.41	15.89	0.06
wc5	200	AB 5yr	4.54	76.48	78.80		78.81	0.000096	0.44	10.42	15.91	0.10
wc5	200	AB 10yr	5.90	76.48	78.81		78.82	0.000161	0.57	10.43	15.93	0.13
wc5	200	AB 20yr	7.43	76.48	78.81		78.83	0.000254	0.71	10.45	15.96	0.16
wc5	200	AB 50yr	9.80	76.48	78.82		78.86	0.000436	0.93	10.49	16.02	0.21
wc5	200	AB 100yr	11.90	76.48	78.84		78.90	0.000619	1.12	10.61	16.31	0.25
wc5	170	AB 2yr	2.89	76.48	78.80	77.01	78.80	0.000009	0.13	27.06	18.97	0.03
wc5	170	AB 5yr	4.54	76.48	78.81	77.12	78.81	0.000022	0.20	27.13	18.99	0.05
wc5	170	AB 10yr	5.90	76.48	78.81	77.19	78.81	0.000037	0.26	27.23	19.00	0.06
wc5	170	AB 20yr	7.43	76.48	78.82	77.26	78.82	0.000057	0.33	27.37	19.03	0.08
wc5	170	AB 50yr	9.80	76.48	78.83	77.36	78.84	0.000097	0.43	27.66	19.07	0.10
wc5	170	AB 100yr	11.90	76.48	78.86	77.43	78.88	0.000134	0.51	28.24	19.17	0.12
wc6	2457.382	AB 2yr	1.12	91.31	91.81		91.88	0.006231	1.11	1.01	2.51	0.56
wc6	2457.382	AB 5yr	1.86	91.31	91.96		92.05	0.006107	1.35	1.40	2.85	0.58
wc6	2457.382	AB 10yr	2.54	91.31	92.06		92.18	0.006276	1.54	1.71	3.10	0.61
wc6	2457.382	AB 20yr	3.39	91.31	92.17		92.32	0.006658	1.75	2.05	3.35	0.64
wc6	2457.382	AB 50yr	5.21	91.31	92.34		92.56	0.007725	2.15	2.64	3.75	0.71
wc6	2457.382	AB 100yr	7.98	91.31	92.51	92.43	92.86	0.009774	2.71	3.32	4.16	0.83
wc6	2408.649	AB 2yr	1.12	91.02	91.59	91.37	91.63	0.003819	0.96	1.18	3.01	0.45
wc6	2408.649	AB 5yr	1.86	91.02	91.74	91.50	91.81	0.003888	1.17	1.73	4.18	0.47
wc6	2408.649	AB 10yr	2.54	91.02	91.84	91.60	91.92	0.004177	1.33	2.17	4.92	0.50
wc6	2408.649	AB 20yr	3.39	91.02	91.93	91.72	92.04	0.004490	1.51	2.69	5.81	0.53
wc6	2408.649	AB 50yr	5.21	91.02	92.09	91.91	92.23	0.005011	1.79	3.75	7.37	0.58
wc6	2408.649	AB 100yr	7.98	91.02	92.27	92.12	92.45	0.005491	2.10	5.26	9.30	0.62
wc6	2359.898	AB 2yr	1.12	90.74	91.09	91.09	91.24	0.021562	1.72	0.65	2.20	1.01
wc6	2359.898	AB 5yr	1.86	90.74	91.22	91.22	91.42	0.020434	1.96	0.95	2.46	1.01
wc6	2359.898	AB 10yr	2.54	90.74	91.33	91.33	91.53	0.017991	1.97	1.32	3.84	0.97
wc6	2359.898	AB 20yr	3.39	90.74	91.43	91.43	91.65	0.015397	2.09	1.73	4.67	0.93
wc6	2359.898	AB 50yr	5.21	90.74	91.60	91.60	91.85	0.012752	2.29	2.62	6.11	0.89

HEC-RAS Plan: prim sen ana (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6	2359.898	AB 100yr	7.98	90.74	91.79	91.79	92.07	0.011026	2.52	3.96	7.77	0.86
wc6	2308.859	AB 2yr	1.12	90.44	90.79		90.79	0.001279	0.42	2.67	9.97	0.26
wc6	2308.859	AB 5yr	1.86	90.44	90.86		90.88	0.001532	0.54	3.46	10.13	0.29
wc6	2308.859	AB 10yr	2.54	90.44	90.92		90.94	0.001785	0.63	4.01	10.25	0.32
wc6	2308.859	AB 20yr	3.39	90.44	90.99		91.01	0.001871	0.72	4.74	10.40	0.34
wc6	2308.859	AB 50yr	5.21	90.44	91.09		91.13	0.002308	0.90	5.81	10.72	0.39
wc6	2308.859	AB 100yr	7.98	90.44	91.21		91.27	0.002857	1.13	7.15	11.78	0.44
wc6	2232.182	AB 2yr	1.12	90.33	90.61		90.63	0.004676	0.54	2.08	14.51	0.45
wc6	2232.182	AB 5yr	1.86	90.33	90.66		90.68	0.005307	0.68	2.78	16.97	0.50
wc6	2232.182	AB 10yr	2.54	90.33	90.71		90.73	0.004535	0.73	3.65	19.73	0.48
wc6	2232.182	AB 20yr	3.39	90.33	90.71		90.75	0.007958	0.97	3.67	19.80	0.64
wc6	2232.182	AB 50yr	5.21	90.33	90.77		90.83	0.008180	1.15	5.01	24.16	0.67
wc6	2232.182	AB 100yr	7.98	90.33	90.84		90.93	0.008363	1.34	6.97	29.36	0.71
wc6	2193.265	AB 2yr	1.12	89.88	90.18	90.18	90.29	0.021058	1.43	0.78	3.69	1.00
wc6	2193.265	AB 5yr	1.86	89.88	90.31	90.29	90.38	0.012113	1.22	1.70	10.89	0.78
wc6	2193.265	AB 10yr	2.54	89.88	90.34	90.34	90.44	0.014601	1.44	2.06	12.57	0.87
wc6	2193.265	AB 20yr	3.39	89.88	90.38	90.38	90.44	0.008474	1.20	4.79	42.20	0.68
wc6	2193.265	AB 50yr	5.21	89.88	90.42	90.42	90.48	0.010051	1.40	6.40	43.75	0.75
wc6	2193.265	AB 100yr	7.98	89.88	90.46	90.46	90.54	0.011754	1.62	8.37	45.58	0.82
wc6	2135.859	AB 2yr	1.12	89.59	90.17	89.94	90.17	0.000427	0.33	8.29	70.66	0.15
wc6	2135.859	AB 5yr	1.86	89.59	90.16	90.07	90.17	0.001567	0.82	7.44	69.99	0.29
wc6	2135.859	AB 10yr	2.54	89.59	90.19	90.14	90.20	0.001363	0.60	9.90	73.19	0.27
wc6	2135.859	AB 20yr	3.39	89.59	90.23	90.15	90.23	0.001268	0.61	12.59	79.19	0.26
wc6	2135.859	AB 50yr	5.21	89.59	90.30	90.18	90.30	0.001045	0.60	18.19	82.94	0.25
wc6	2135.859	AB 100yr	7.98	89.59	90.38	90.21	90.39	0.000895	0.60	25.53	86.94	0.23
wc6	2096.869	AB 2yr	1.12	89.40	89.91	89.81	89.98	0.008892	1.25	0.90	2.89	0.67
wc6	2096.869	AB 5yr	1.86	89.40	89.99	89.99	90.05	0.006956	1.25	2.46	19.56	0.61
wc6	2096.869	AB 10yr	2.54	89.40	90.03	90.02	90.09	0.007078	1.34	3.26	20.75	0.63
wc6	2096.869	AB 20yr	3.39	89.40	90.08	90.05	90.14	0.006081	1.34	4.42	22.37	0.59
wc6	2096.869	AB 50yr	5.21	89.40	90.11	90.11	90.20	0.009756	1.76	5.15	23.15	0.76
wc6	2096.869	AB 100yr	7.98	89.40	90.18	90.18	90.29	0.011537	2.06	6.66	24.13	0.84
wc6	2000	AB 2yr	1.12	88.47	88.77	88.77	88.90	0.021398	1.62	0.69	2.60	1.01
wc6	2000	AB 5yr	1.86	88.47	88.88	88.88	89.06	0.020058	1.87	0.99	2.82	1.01
wc6	2000	AB 10yr	2.54	88.47	88.97	88.97	89.18	0.019288	2.03	1.25	3.00	1.00
wc6	2000	AB 20yr	3.39	88.47	89.07	89.07	89.31	0.018766	2.19	1.55	3.19	1.01
wc6	2000	AB 50yr	5.21	88.47	89.41	89.41	89.52	0.005151	1.59	5.43	40.28	0.57
wc6	2000	AB 100yr	7.98	88.47	89.50	89.50	89.60	0.005159	1.71	9.47	49.02	0.58
wc6	1893.020	AB 2yr	1.12	87.07	87.61	87.45	87.65	0.004950	0.94	1.19	3.28	0.50
wc6	1893.020	AB 5yr	1.86	87.07	87.76	87.56	87.82	0.005105	1.09	1.71	3.86	0.52
wc6	1893.020	AB 10yr	2.54	87.07	87.86	87.64	87.93	0.005173	1.18	2.14	4.29	0.53
wc6	1893.020	AB 20yr	3.39	87.07	87.97	87.74	88.06	0.005194	1.29	2.65	6.27	0.54
wc6	1893.020	AB 50yr	5.21	87.07	87.90	87.90	88.16	0.017913	2.26	2.31	4.43	1.00
wc6	1893.020	AB 100yr	7.98	87.07	88.07	88.07	88.13	0.005298	1.43	9.09	34.98	0.56
wc6	1785.033	AB 2yr	1.12	86.31	86.61	86.61	86.74	0.021303	1.62	0.69	2.60	1.00
wc6	1785.033	AB 5yr	1.86	86.31	86.72	86.72	86.90	0.020081	1.87	0.99	2.82	1.01
wc6	1785.033	AB 10yr	2.54	86.31	86.81	86.81	87.02	0.019366	2.03	1.25	3.00	1.01
wc6	1785.033	AB 20yr	3.39	86.31	86.91	86.91	87.15	0.018633	2.19	1.55	3.19	1.00
wc6	1785.033	AB 50yr	5.21	86.31	87.16	87.16	87.36	0.018533	1.98	2.63	6.63	1.00
wc6	1785.033	AB 100yr	7.98	86.31	87.38	87.36	87.47	0.006392	1.50	8.35	47.19	0.63
wc6	1657.344	AB 2yr	1.12	85.34	86.04	85.64	86.06	0.001132	0.59	1.90	3.41	0.25
wc6	1657.344	AB 5yr	1.86	85.34	86.30	85.75	86.32	0.000886	0.67	2.86	4.15	0.24
wc6	1657.344	AB 10yr	2.54	85.34	86.46	85.84	86.49	0.000877	0.75	3.57	4.61	0.24
wc6	1657.344	AB 20yr	3.39	85.34	86.62	85.94	86.65	0.000924	0.85	4.33	5.07	0.25
wc6	1657.344	AB 50yr	5.21	85.34	86.76	86.11	86.82	0.001445	1.15	5.12	6.88	0.33
wc6	1657.344	AB 100yr	7.98	85.34	86.91	86.32	87.02	0.002214	1.53	6.93	19.25	0.41
wc6	1611.292	AB 2yr	1.58	84.99	86.02		86.03	0.000488	0.52	3.10	4.01	0.18
wc6	1611.292	AB 5yr	2.60	84.99	86.27		86.29	0.000557	0.66	4.17	4.49	0.20
wc6	1611.292	AB 10yr	3.52	84.99	86.42		86.45	0.000647	0.78	4.90	4.78	0.22
wc6	1611.292	AB 20yr	4.62	84.99	86.57		86.61	0.000757	0.90	5.63	5.06	0.24
wc6	1611.292	AB 50yr	6.45	84.99	86.70		86.77	0.001083	1.14	6.32	5.51	0.29
wc6	1611.292	AB 100yr	9.20	84.99	86.81		86.93	0.001793	1.54	7.05	9.66	0.38
wc6	1608.895	AB 2yr	1.58	84.96	85.74	85.74	86.00	0.018331	2.26	0.71	3.83	0.97
wc6	1608.895	AB 5yr	2.60	84.96	85.99	85.99	86.26	0.012711	2.40	1.26	5.14	0.85
wc6	1608.895	AB 10yr	3.52	84.96	86.16	86.16	86.42	0.010275	2.45	1.79	6.07	0.79
wc6	1608.895	AB 20yr	4.62	84.96	86.27	86.27	86.58	0.010553	2.68	2.17	7.30	0.82
wc6	1608.895	AB 50yr	6.45	84.96	86.53	86.53	86.74	0.017623	2.30	3.48	8.97	0.99
wc6	1608.895	AB 100yr	9.20	84.96	86.67	86.67	86.90	0.014304	2.42	5.01	12.87	0.92

HEC-RAS Plan: prim sen ana

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc5	2388.964	AB 2yr	1.31	92.94	93.29	93.29	93.41	0.019896	1.52	0.86	3.59	0.99
wc5	2388.964	AB 5yr	2.16	92.94	93.40	93.40	93.54	0.019382	1.66	1.30	4.68	1.01
wc5	2388.964	AB 10yr	2.93	92.94	93.59	93.47	93.66	0.006711	1.18	2.84	23.36	0.62
wc5	2388.964	AB 20yr	3.86	92.94	93.73	93.55	93.76	0.002281	0.85	6.98	33.25	0.38
wc5	2388.964	AB 50yr	5.42	92.94	93.87	93.68	93.88	0.001210	0.73	11.82	37.02	0.29
wc5	2388.964	AB 100yr	6.90	92.94	94.09	93.72	94.10	0.000421	0.52	20.63	41.16	0.18
wc5	2290	AB 2yr	1.31	92.11	92.89		92.91	0.000985	0.55	2.39	4.62	0.24
wc5	2290	AB 5yr	2.16	92.11	93.24		93.25	0.000578	0.51	4.23	6.07	0.20
wc5	2290	AB 10yr	2.93	92.11	93.53		93.54	0.000384	0.47	6.22	7.40	0.16
wc5	2290	AB 20yr	3.86	92.11	93.62		93.63	0.000513	0.56	6.88	7.82	0.19
wc5	2290	AB 50yr	5.42	92.11	93.72		93.75	0.000753	0.70	7.74	8.94	0.23
wc5	2290	AB 100yr	6.90	92.11	94.00		94.02	0.000508	0.67	11.22	17.33	0.20
wc5	2256	AB 2yr	1.31	91.88	92.81	92.33	92.86	0.001362	1.01	1.30	5.22	0.33
wc5	2256	AB 5yr	2.16	91.88	93.14	92.50	93.21	0.001360	1.23	1.76	6.34	0.35
wc5	2256	AB 10yr	2.93	91.88	93.40	92.64	93.50	0.008824	1.36	2.17	9.85	0.69
wc5	2256	AB 20yr	3.86	91.88	93.46	92.80	93.58	0.009122	1.52	2.80	11.75	0.72
wc5	2256	AB 50yr	5.42	91.88	93.24	93.03	93.65	0.006653	2.85	1.90	6.67	0.78
wc5	2256	AB 100yr	6.90	91.88	93.23	93.23	93.91	0.010999	3.66	1.89	6.64	1.01
wc5	2240.61		Culvert									
wc5	2221	AB 2yr	1.31	91.59	92.04	92.04	92.26	0.015239	2.07	0.63	3.30	0.99
wc5	2221	AB 5yr	2.16	91.59	92.22	92.22	92.53	0.014237	2.48	0.87	3.99	1.01
wc5	2221	AB 10yr	2.93	91.59	92.36	92.36	92.74	0.013283	2.75	1.07	4.55	1.00
wc5	2221	AB 20yr	3.86	91.59	92.51	92.51	92.97	0.012460	3.01	1.28	5.16	1.00
wc5	2221	AB 50yr	5.42	91.59	92.74	92.74	93.32	0.011596	3.37	1.61	7.73	1.00
wc5	2221	AB 100yr	6.90	91.59	92.94	92.94	93.62	0.010990	3.66	1.89	9.06	1.00
wc5	2198	AB 2yr	1.31	91.41	91.86		91.93	0.008566	1.21	1.09	3.31	0.67
wc5	2198	AB 5yr	2.16	91.41	92.00		92.09	0.008412	1.38	1.57	3.85	0.69
wc5	2198	AB 10yr	2.93	91.41	92.09		92.21	0.008311	1.49	1.97	4.24	0.70
wc5	2198	AB 20yr	3.86	91.41	92.20		92.33	0.008255	1.60	2.42	4.65	0.71
wc5	2198	AB 50yr	5.42	91.41	92.34		92.49	0.008109	1.73	3.13	5.22	0.71
wc5	2198	AB 100yr	6.90	91.41	92.44		92.62	0.008304	1.88	3.68	6.02	0.74
wc5	2150	AB 2yr	1.31	91.07	91.55		91.61	0.006821	1.11	1.18	3.42	0.60
wc5	2150	AB 5yr	2.16	91.07	91.69		91.77	0.006755	1.27	1.70	3.98	0.62
wc5	2150	AB 10yr	2.93	91.07	91.80		91.89	0.006601	1.37	2.14	4.40	0.63
wc5	2150	AB 20yr	3.86	91.07	91.91		92.02	0.006360	1.45	2.66	4.85	0.62
wc5	2150	AB 50yr	5.42	91.07	92.07		92.19	0.005941	1.54	3.51	5.52	0.62
wc5	2150	AB 100yr	6.90	91.07	92.19		92.33	0.005462	1.66	4.26	7.43	0.61
wc5	2068.437	AB 2yr	1.31	90.36	90.80		90.89	0.011843	1.38	0.95	2.93	0.77
wc5	2068.437	AB 5yr	2.16	90.36	90.93		91.06	0.011839	1.61	1.34	3.18	0.79
wc5	2068.437	AB 10yr	2.93	90.36	91.02		91.18	0.011970	1.77	1.65	3.36	0.81
wc5	2068.437	AB 20yr	3.86	90.36	91.12		91.31	0.012285	1.94	1.99	3.55	0.83
wc5	2068.437	AB 50yr	5.42	90.36	91.25		91.50	0.013014	2.18	2.49	3.81	0.86
wc5	2068.437	AB 100yr	6.90	90.36	91.35	91.29	91.65	0.013869	2.40	2.92	5.92	0.90
wc5	2044.707	AB 2yr	1.31	89.83	90.30		90.36	0.007514	1.15	1.14	3.37	0.63
wc5	2044.707	AB 5yr	2.16	89.83	90.43	90.31	90.52	0.007542	1.32	1.63	3.91	0.65
wc5	2044.707	AB 10yr	2.93	89.83	90.53	90.39	90.64	0.007584	1.44	2.04	4.31	0.67
wc5	2044.707	AB 20yr	3.86	89.83	90.63	90.48	90.75	0.007650	1.55	2.49	4.71	0.68
wc5	2044.707	AB 50yr	5.42	89.83	90.78	90.61	90.92	0.007539	1.69	3.21	5.29	0.69
wc5	2044.707	AB 100yr	6.90	89.83	90.88	90.71	91.05	0.007520	1.83	3.80	6.41	0.70
wc5	1986.134	AB 2yr	1.31	89.59	89.97	89.95	90.08	0.015977	1.51	0.87	3.03	0.90
wc5	1986.134	AB 5yr	2.16	89.59	90.08	90.06	90.24	0.016250	1.75	1.24	3.48	0.94
wc5	1986.134	AB 10yr	2.93	89.59	90.16	90.15	90.35	0.016437	1.91	1.54	3.81	0.96
wc5	1986.134	AB 20yr	3.86	89.59	90.25	90.24	90.47	0.016354	2.05	1.88	4.16	0.97
wc5	1986.134	AB 50yr	5.42	89.59	90.37	90.37	90.63	0.016857	2.27	2.39	4.62	1.01
wc5	1986.134	AB 100yr	6.90	89.59	90.47	90.47	90.76	0.016320	2.39	2.89	5.04	1.01
wc5	1901.030	AB 2yr	1.31	88.78	89.29		89.35	0.005246	1.01	1.30	3.55	0.53
wc5	1901.030	AB 5yr	2.16	88.78	89.45		89.52	0.004869	1.13	1.92	4.19	0.53
wc5	1901.030	AB 10yr	2.93	88.78	89.57		89.65	0.004592	1.20	2.45	4.67	0.53
wc5	1901.030	AB 20yr	3.86	88.78	89.70		89.78	0.004349	1.26	3.06	5.17	0.52
wc5	1901.030	AB 50yr	5.42	88.78	89.87		89.96	0.003858	1.36	4.03	6.33	0.51
wc5	1901.030	AB 100yr	6.90	88.78	90.01		90.11	0.003435	1.44	4.99	7.60	0.49
wc5	1874.583	AB 2yr	1.31	88.53	89.08		89.16	0.008935	1.30	1.01	2.69	0.68
wc5	1874.583	AB 5yr	2.16	88.53	89.22		89.34	0.009453	1.53	1.41	3.01	0.71
wc5	1874.583	AB 10yr	2.93	88.53	89.32		89.47	0.009922	1.70	1.73	3.25	0.74
wc5	1874.583	AB 20yr	3.86	88.53	89.42		89.60	0.010455	1.86	2.07	3.48	0.77
wc5	1874.583	AB 50yr	5.42	88.53	89.56		89.78	0.011617	2.12	2.56	3.79	0.82
wc5	1874.583	AB 100yr	6.90	88.53	89.64	89.58	89.93	0.013535	2.39	2.89	3.98	0.90

HEC-RAS Plan: prim sen ana (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc5	1845.237	AB 2yr	1.31	88.39	88.91		88.96	0.005004	0.99	1.32	3.58	0.52
wc5	1845.237	AB 5yr	2.16	88.39	89.06		89.12	0.005009	1.14	1.90	4.17	0.54
wc5	1845.237	AB 10yr	2.93	88.39	89.17		89.24	0.005004	1.23	2.37	4.61	0.55
wc5	1845.237	AB 20yr	3.86	88.39	89.28		89.37	0.005013	1.33	2.91	5.05	0.56
wc5	1845.237	AB 50yr	5.42	88.39	89.42		89.53	0.005013	1.47	3.71	6.72	0.57
wc5	1845.237	AB 100yr	6.90	88.39	89.53		89.66	0.004934	1.60	4.49	8.08	0.58
wc5	1801.453	AB 2yr	1.31	88.17	88.69		88.74	0.005138	1.00	1.31	3.56	0.53
wc5	1801.453	AB 5yr	2.16	88.17	88.84		88.90	0.005088	1.15	1.89	4.16	0.54
wc5	1801.453	AB 10yr	2.93	88.17	88.95		89.02	0.005049	1.24	2.37	4.60	0.55
wc5	1801.453	AB 20yr	3.86	88.17	89.06		89.15	0.005057	1.33	2.90	5.04	0.56
wc5	1801.453	AB 50yr	5.42	88.17	89.21		89.32	0.004947	1.46	3.72	5.98	0.57
wc5	1801.453	AB 100yr	6.90	88.17	89.31		89.44	0.004823	1.59	4.53	9.31	0.58
wc5	1693.967	AB 2yr	1.31	87.76	88.28		88.33	0.004838	0.98	1.33	3.60	0.51
wc5	1693.967	AB 5yr	2.16	87.76	88.43		88.50	0.004937	1.13	1.91	4.18	0.54
wc5	1693.967	AB 10yr	2.93	87.76	88.54		88.62	0.004976	1.23	2.38	4.61	0.55
wc5	1693.967	AB 20yr	3.86	87.76	88.65		88.74	0.005011	1.33	2.91	5.05	0.56
wc5	1693.967	AB 50yr	5.42	87.76	88.77		88.89	0.005558	1.51	3.58	5.61	0.60
wc5	1693.967	AB 100yr	6.90	87.76	88.86		89.01	0.005995	1.71	4.08	6.26	0.63
wc5	1602.883	AB 2yr	1.31	87.17	87.68		87.73	0.005374	1.02	1.28	3.54	0.54
wc5	1602.883	AB 5yr	2.16	87.17	87.83		87.90	0.005150	1.15	1.88	4.16	0.55
wc5	1602.883	AB 10yr	2.93	87.17	87.95		88.02	0.005063	1.24	2.36	4.60	0.55
wc5	1602.883	AB 20yr	3.86	87.17	88.06		88.15	0.005003	1.33	2.91	5.05	0.56
wc5	1602.883	AB 50yr	5.42	87.17	88.26	87.95	88.35	0.003746	1.34	4.28	11.47	0.50
wc5	1602.883	AB 100yr	6.90	87.17	88.37	88.05	88.46	0.003509	1.42	6.22	26.84	0.50
wc5	1537.467	AB 2yr	1.31	86.84	87.41		87.45	0.003502	0.87	1.50	3.78	0.44
wc5	1537.467	AB 5yr	2.16	86.84	87.57		87.62	0.003541	1.00	2.15	4.41	0.46
wc5	1537.467	AB 10yr	2.93	86.84	87.65		87.72	0.004181	1.16	2.54	4.75	0.50
wc5	1537.467	AB 20yr	3.86	86.84	87.71		87.81	0.005389	1.36	2.83	4.99	0.58
wc5	1537.467	AB 50yr	5.42	86.84	87.62	87.62	87.88	0.016888	2.27	2.39	4.62	1.01
wc5	1537.467	AB 100yr	6.90	86.84	87.72	87.72	88.01	0.016320	2.39	2.89	5.04	1.01
wc5	1471.795	AB 2yr	1.31	86.50	87.00		87.09	0.009476	1.30	1.01	2.87	0.70
wc5	1471.795	AB 5yr	2.16	86.50	87.15	87.04	87.26	0.009305	1.48	1.46	3.36	0.72
wc5	1471.795	AB 10yr	2.93	86.50	87.27	87.27	87.37	0.006677	1.45	2.68	22.31	0.63
wc5	1471.795	AB 20yr	3.86	86.50	87.33	87.33	87.43	0.006225	1.50	4.05	24.46	0.62
wc5	1471.795	AB 50yr	5.42	86.50	87.61		87.63	0.001063	0.80	12.60	39.23	0.27
wc5	1471.795	AB 100yr	6.90	86.50	87.70		87.72	0.000916	0.79	16.47	45.36	0.26
wc5	1439.675	AB 2yr	1.31	86.27	86.72	86.63	86.80	0.008357	1.20	1.10	3.32	0.66
wc5	1439.675	AB 5yr	2.16	86.27	86.82	86.75	86.94	0.010626	1.50	1.44	3.71	0.77
wc5	1439.675	AB 10yr	2.93	86.27	86.90	86.84	87.04	0.011640	1.68	1.74	4.02	0.82
wc5	1439.675	AB 20yr	3.86	86.27	87.06	86.92	87.19	0.007952	1.57	2.45	4.68	0.69
wc5	1439.675	AB 50yr	5.42	86.27	87.60	87.05	87.61	0.000323	0.47	19.94	47.82	0.15
wc5	1439.675	AB 100yr	6.90	86.27	87.69	87.27	87.70	0.000293	0.48	25.14	60.63	0.15
wc5	1320.692	AB 2yr	1.56	85.57	86.13		86.19	0.005310	1.07	1.46	3.74	0.54
wc5	1320.692	AB 5yr	2.53	85.57	86.36		86.42	0.003417	1.03	2.45	4.68	0.45
wc5	1320.692	AB 10yr	3.40	85.57	86.57		86.62	0.002348	0.97	3.50	5.51	0.39
wc5	1320.692	AB 20yr	4.43	85.57	86.99		87.01	0.000702	0.74	6.45	8.64	0.23
wc5	1320.692	AB 50yr	6.23	85.57	87.56		87.58	0.000254	0.60	15.41	33.41	0.15
wc5	1320.692	AB 100yr	8.82	85.57	87.64		87.66	0.000400	0.77	18.15	39.83	0.19
wc5	1316.508	AB 2yr	1.56	85.38	85.91	85.79	86.03	0.006963	1.51	1.04	3.63	0.67
wc5	1316.508	AB 5yr	2.53	85.38	86.18	85.94	86.31	0.004621	1.62	1.56	4.69	0.58
wc5	1316.508	AB 10yr	3.40	85.38	86.38	86.06	86.53	0.003842	1.72	1.97	5.51	0.55
wc5	1316.508	AB 20yr	4.43	85.38	86.86	86.19	86.98	0.001740	1.51	2.93	8.46	0.40
wc5	1316.508	AB 50yr	6.23	85.38	87.44	86.39	87.55	0.001148	1.53	4.08	22.64	0.34
wc5	1316.508	AB 100yr	8.82	85.38	87.36	86.65	87.62	0.002602	2.24	3.93	18.44	0.51
wc5	1307.90		Culvert									
wc5	1291.617	AB 2yr	1.56	85.19	85.69		85.82	0.008951	1.63	0.96	3.48	0.75
wc5	1291.617	AB 5yr	2.53	85.19	85.81	85.75	86.03	0.010660	2.08	1.22	4.00	0.85
wc5	1291.617	AB 10yr	3.40	85.19	85.90	85.87	86.21	0.012495	2.45	1.39	4.33	0.94
wc5	1291.617	AB 20yr	4.43	85.19	86.00	86.00	86.40	0.013654	2.80	1.58	4.73	1.01
wc5	1291.617	AB 50yr	6.23	85.19	86.20	86.20	86.70	0.012626	3.14	1.99	5.53	1.00
wc5	1291.617	AB 100yr	8.82	85.19	86.46	86.46	87.09	0.011588	3.51	2.51	6.24	1.00
wc5	1288.054	AB 2yr	1.56	85.00	85.52		85.59	0.007309	1.20	1.30	3.56	0.63
wc5	1288.054	AB 5yr	2.53	85.00	85.66		85.75	0.007292	1.36	1.86	4.14	0.65
wc5	1288.054	AB 10yr	3.40	85.00	85.76		85.87	0.007299	1.47	2.31	4.55	0.66
wc5	1288.054	AB 20yr	4.43	85.00	85.87		85.99	0.007325	1.58	2.80	4.96	0.67
wc5	1288.054	AB 50yr	6.23	85.00	86.02		86.17	0.007297	1.74	3.59	5.51	0.69
wc5	1288.054	AB 100yr	8.82	85.00	86.16		86.37	0.007365	2.00	4.42	5.63	0.71



HEC-RAS Plan: prim sen ana (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6	1598.12		Culvert									
wc6	1587.120	AB 2yr	1.58	84.79	85.69	85.69	85.84	0.014978	1.85	1.03	16.37	0.81
wc6	1587.120	AB 5yr	2.60	84.79	85.81	85.81	86.01	0.016275	2.21	1.42	33.64	0.87
wc6	1587.120	AB 10yr	3.52	84.79	85.90	85.90	86.15	0.016630	2.44	1.72	40.02	0.90
wc6	1587.120	AB 20yr	4.62	84.79	86.00	86.00	86.29	0.017093	2.68	2.03	47.62	0.93
wc6	1587.120	AB 50yr	6.45	84.79	86.14	86.14	86.51	0.017241	3.00	2.49	60.14	0.96
wc6	1587.120	AB 100yr	9.20	84.79	86.54	86.54	86.57	0.005948	1.39	19.12	181.13	0.58
wc6	1584.698	AB 2yr	1.58	84.73	85.18	85.10	85.28	0.010988	1.44	1.09	2.89	0.75
wc6	1584.698	AB 5yr	2.60	84.73	85.31	85.24	85.46	0.012415	1.75	1.48	3.15	0.82
wc6	1584.698	AB 10yr	3.52	84.73	85.40	85.34	85.60	0.013062	1.95	1.80	3.35	0.85
wc6	1584.698	AB 20yr	4.62	84.73	85.45	85.45	85.73	0.017581	2.36	1.96	3.62	0.99
wc6	1584.698	AB 50yr	6.45	84.73	85.68	85.68	85.93	0.010420	2.27	3.30	11.52	0.81
wc6	1584.698	AB 100yr	9.20	84.73	85.89	85.89	86.02	0.005129	1.87	9.19	38.78	0.59
wc6	1501.817	AB 2yr	1.58	84.11	84.70	84.53	84.75	0.004546	0.98	1.61	4.23	0.51
wc6	1501.817	AB 5yr	2.60	84.11	84.87	84.65	84.93	0.003982	1.08	2.42	4.92	0.49
wc6	1501.817	AB 10yr	3.52	84.11	85.00	84.74	85.07	0.003820	1.15	3.05	5.40	0.49
wc6	1501.817	AB 20yr	4.62	84.11	85.19	84.82	85.24	0.002153	0.98	6.26	23.03	0.38
wc6	1501.817	AB 50yr	6.45	84.11	85.31	84.95	85.35	0.002040	1.03	9.47	32.70	0.37
wc6	1501.817	AB 100yr	9.20	84.11	85.45	85.11	85.48	0.001658	1.03	15.06	47.94	0.35
wc6	1414.879	AB 2yr	1.58	83.78	84.42	84.14	84.45	0.002618	0.84	1.88	3.91	0.39
wc6	1414.879	AB 5yr	2.60	83.78	84.59	84.27	84.64	0.002850	1.00	2.60	4.43	0.42
wc6	1414.879	AB 10yr	3.52	83.78	84.66	84.74	84.74	0.003766	1.20	2.93	4.65	0.48
wc6	1414.879	AB 20yr	4.62	83.78	85.05	85.09	85.09	0.001326	0.94	5.23	13.68	0.31
wc6	1414.879	AB 50yr	6.45	83.78	85.08	85.16	85.16	0.002241	1.26	5.80	17.85	0.40
wc6	1414.879	AB 100yr	9.20	83.78	85.13	85.26	85.26	0.003773	1.68	6.63	19.92	0.52
wc6	1334.030	AB 2yr	1.58	83.47	83.83	83.83	83.98	0.019671	1.71	0.92	3.09	1.00
wc6	1334.030	AB 5yr	2.60	83.47	83.96	83.96	84.15	0.018092	1.93	1.35	3.47	0.99
wc6	1334.030	AB 10yr	3.52	83.47	84.37	84.05	84.44	0.003472	1.16	3.02	4.70	0.46
wc6	1334.030	AB 20yr	4.62	83.47	85.04	84.15	85.05	0.000179	0.42	20.72	53.03	0.12
wc6	1334.030	AB 50yr	6.45	83.47	85.08	84.30	85.09	0.000285	0.54	22.80	56.60	0.15
wc6	1334.030	AB 100yr	9.20	83.47	85.13	84.47	85.15	0.000444	0.69	25.87	61.48	0.19
wc6	1037.318	AB 2yr	1.58	82.35	83.30	82.71	83.31	0.000582	0.49	3.23	4.84	0.19
wc6	1037.318	AB 5yr	2.60	82.35	83.77	82.84	83.78	0.000252	0.45	6.11	7.39	0.14
wc6	1037.318	AB 10yr	3.52	82.35	84.33	82.93	84.33	0.000102	0.38	11.13	11.25	0.09
wc6	1037.318	AB 20yr	4.62	82.35	85.03	83.03	85.03	0.000027	0.24	40.14	79.05	0.05
wc6	1037.318	AB 50yr	6.45	82.35	85.06	83.17	85.06	0.000047	0.33	42.33	81.05	0.07
wc6	1037.318	AB 100yr	9.20	82.35	85.09	83.35	85.10	0.000086	0.45	45.00	83.72	0.09
wc6	947.3374	AB 2yr	1.72	82.01	83.26	82.52	83.26	0.000384	0.43	4.04	5.49	0.16
wc6	947.3374	AB 5yr	2.82	82.01	83.76	82.66	83.76	0.000123	0.32	12.58	37.81	0.10
wc6	947.3374	AB 10yr	3.81	82.01	84.33	82.76	84.33	0.000018	0.16	44.37	71.34	0.04
wc6	947.3374	AB 20yr	4.99	82.01	85.03	82.87	85.03	0.000004	0.09	120.83	151.73	0.02
wc6	947.3374	AB 50yr	6.94	82.01	85.06	83.02	85.06	0.000006	0.12	125.10	156.69	0.02
wc6	947.3374	AB 100yr	8.79	82.01	85.09	83.14	85.09	0.000009	0.15	130.44	161.27	0.03
wc6	940	AB 2yr	1.72	81.96	83.17	82.59	83.25	0.001597	1.29	1.33	9.28	0.38
wc6	940	AB 5yr	2.82	81.96	83.63	82.84	83.75	0.001455	1.53	1.84	70.91	0.38
wc6	940	AB 10yr	3.81	81.96	84.19	83.03	84.32	0.001010	1.55	2.46	131.61	0.33
wc6	940	AB 20yr	4.99	81.96	84.90	83.24	85.02	0.000695	1.54	3.23	203.58	0.29
wc6	940	AB 50yr	6.94	81.96	84.78	83.56	85.03	0.001545	2.24	3.10	180.66	0.43
wc6	940	AB 100yr	8.79	81.96	84.56	83.83	85.04	0.003220	3.07	2.86	158.38	0.61
wc6	939.548		Culvert									
wc6	910.4732	AB 2yr	1.72	81.74	82.35	82.35	82.66	0.014091	2.44	0.70	3.84	1.00
wc6	910.4732	AB 5yr	2.82	81.74	82.59	82.59	83.01	0.012749	2.89	0.98	4.54	1.00
wc6	910.4732	AB 10yr	3.81	81.74	82.78	82.78	83.30	0.011889	3.19	1.19	9.07	1.00
wc6	910.4732	AB 20yr	4.99	81.74	82.98	82.98	83.60	0.011326	3.51	1.42	219.75	1.01
wc6	910.4732	AB 50yr	6.94	81.74	83.29	83.29	84.06	0.010447	3.90	1.78	288.91	1.00
wc6	910.4732	AB 100yr	8.79	81.74	83.55	83.55	84.46	0.009825	4.21	2.09	345.91	1.00
wc6	900	AB 2yr	1.72	81.67	82.19	82.05	82.26	0.006619	1.20	1.43	3.55	0.60
wc6	900	AB 5yr	2.82	81.67	82.42	82.18	82.49	0.004602	1.21	2.32	4.24	0.52
wc6	900	AB 10yr	3.81	81.67	82.43	82.28	82.56	0.007677	1.59	2.40	4.29	0.68
wc6	900	AB 20yr	4.99	81.67	82.66	82.38	82.77	0.004877	1.45	3.44	4.97	0.56
wc6	900	AB 50yr	6.94	81.67	82.81	82.53	82.94	0.004764	1.62	4.71	10.96	0.57
wc6	900	AB 100yr	8.79	81.67	82.92	82.64	83.06	0.004564	1.73	6.34	18.24	0.57
wc6	801.4135	AB 2yr	1.72	80.95	81.43	81.33	81.52	0.008394	1.31	1.32	3.45	0.67
wc6	801.4135	AB 5yr	2.82	80.95	81.46	81.46	81.66	0.018252	1.99	1.42	3.54	1.00
wc6	801.4135	AB 10yr	3.81	80.95	81.75	81.56	81.86	0.006345	1.48	2.57	4.41	0.62
wc6	801.4135	AB 20yr	4.99	80.95	81.66	81.66	81.93	0.016946	2.28	2.19	4.14	1.00
wc6	801.4135	AB 50yr	6.94	80.95	81.81	81.81	82.12	0.016395	2.47	2.82	4.57	1.00

HEC-RAS Plan: prim sen ana (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6	801.4135	AB 100yr	8.79	80.95	81.93	81.93	82.27	0.015962	2.60	3.38	4.93	1.00
wc6	730.3979	AB 2yr	1.72	80.43	80.87	80.78	80.94	0.007779	1.13	1.52	4.85	0.65
wc6	730.3979	AB 5yr	2.82	80.43	81.02	80.89	81.02	0.000010	0.05	75.47	196.76	0.02
wc6	730.3979	AB 10yr	3.81	80.43	80.97	80.97	81.15	0.017584	1.90	2.01	5.46	1.00
wc6	730.3979	AB 20yr	4.99	80.43	81.01	81.01	81.01	0.000033	0.09	73.99	196.37	0.04
wc6	730.3979	AB 50yr	6.94	80.43	81.07	81.01	81.07	0.000040	0.10	85.83	198.02	0.05
wc6	730.3979	AB 100yr	8.79	80.43	81.11	81.01	81.12	0.000046	0.12	94.73	199.09	0.05
wc6	634.0483	AB 2yr	1.72	79.73	80.29	80.11	80.35	0.004905	1.08	1.59	3.68	0.52
wc6	634.0483	AB 5yr	2.82	79.73	80.48	80.24	80.55	0.004584	1.21	2.33	4.24	0.52
wc6	634.0483	AB 10yr	3.81	79.73	80.61	80.34	80.70	0.004395	1.30	2.94	4.65	0.52
wc6	634.0483	AB 20yr	4.99	79.73	80.76	80.45	80.85	0.004143	1.38	3.64	6.00	0.52
wc6	634.0483	AB 50yr	6.94	79.73	80.94	80.59	81.05	0.003594	1.49	5.33	15.27	0.50
wc6	634.0483	AB 100yr	8.79	79.73	81.10	80.71	81.11	0.000209	0.40	59.27	232.56	0.12
wc6	586.5527	AB 2yr	1.72	79.39	80.09	79.86	80.14	0.003785	1.01	1.71	3.50	0.46
wc6	586.5527	AB 5yr	2.82	79.39	80.27	80.00	80.35	0.004000	1.18	2.39	3.97	0.49
wc6	586.5527	AB 10yr	3.81	79.39	80.42	80.10	80.50	0.003999	1.28	2.98	4.33	0.49
wc6	586.5527	AB 20yr	4.99	79.39	80.56	80.21	80.66	0.003947	1.37	3.64	4.71	0.50
wc6	586.5527	AB 50yr	6.94	79.39	80.78	80.36	80.88	0.003439	1.43	5.74	19.84	0.48
wc6	586.5527	AB 100yr	8.79	79.39	81.04	80.49	81.08	0.001406	1.04	12.99	31.39	0.31
wc6	564.4214	AB 2yr	1.72	79.36	80.06	79.74	80.10	0.002032	0.80	2.15	4.11	0.35
wc6	564.4214	AB 5yr	2.82	79.36	80.25	79.87	80.30	0.002053	0.98	2.89	4.67	0.37
wc6	564.4214	AB 10yr	3.81	79.36	80.39	79.97	80.45	0.002075	1.11	3.45	6.70	0.38
wc6	564.4214	AB 20yr	4.99	79.36	80.53	80.07	80.61	0.002125	1.24	4.02	21.96	0.39
wc6	564.4214	AB 50yr	6.94	79.36	80.73	80.20	80.84	0.002265	1.44	4.81	24.53	0.42
wc6	564.4214	AB 100yr	8.79	79.36	80.92	80.31	81.05	0.002223	1.58	5.58	25.78	0.43
wc6	549.12		Culvert									
wc6	535.9677	AB 2yr	1.72	79.30	80.00	79.68	80.03	0.002037	0.82	2.09	4.10	0.35
wc6	535.9677	AB 5yr	2.82	79.30	80.18	79.81	80.23	0.002284	1.01	2.80	4.64	0.39
wc6	535.9677	AB 10yr	3.81	79.30	80.31	79.91	80.38	0.002374	1.15	3.31	5.80	0.40
wc6	535.9677	AB 20yr	4.99	79.30	80.43	80.01	80.52	0.002594	1.32	3.79	8.75	0.43
wc6	535.9677	AB 50yr	6.94	79.30	80.58	80.16	80.71	0.003044	1.58	4.40	29.75	0.48
wc6	535.9677	AB 100yr	8.79	79.30	80.69	80.27	80.86	0.003540	1.81	4.85	68.52	0.53
wc6	533.8168	AB 2yr	1.72	79.29	79.99	79.67	80.02	0.002174	0.81	2.13	4.10	0.36
wc6	533.8168	AB 5yr	2.82	79.29	80.17	79.80	80.22	0.002431	0.96	2.93	4.64	0.39
wc6	533.8168	AB 10yr	3.81	79.29	80.30	79.90	80.36	0.002576	1.07	3.56	5.26	0.41
wc6	533.8168	AB 20yr	4.99	79.29	80.43	80.00	80.50	0.002555	1.19	4.39	8.75	0.41
wc6	533.8168	AB 50yr	6.94	79.29	80.59	80.15	80.67	0.002360	1.29	6.81	19.82	0.41
wc6	533.8168	AB 100yr	8.79	79.29	80.73	80.27	80.80	0.002027	1.30	9.99	28.27	0.39
wc6	502.0329	AB 2yr	1.72	79.25	79.71	79.71	79.88	0.019791	1.81	0.95	2.91	1.01
wc6	502.0329	AB 5yr	2.82	79.25	79.85	79.85	80.06	0.018665	2.04	1.38	3.33	1.01
wc6	502.0329	AB 10yr	3.81	79.25	79.95	79.95	80.20	0.017982	2.19	1.74	3.64	1.01
wc6	502.0329	AB 20yr	4.99	79.25	80.06	80.06	80.33	0.016768	2.32	2.17	4.28	0.99
wc6	502.0329	AB 50yr	6.94	79.25	80.22	80.22	80.52	0.014496	2.44	2.96	5.60	0.95
wc6	502.0329	AB 100yr	8.79	79.25	80.35	80.35	80.66	0.013213	2.53	3.74	6.65	0.93
wc6	480	AB 2yr	1.72	78.69	79.33	79.12	79.35	0.002493	0.66	2.60	8.13	0.37
wc6	480	AB 5yr	2.82	78.69	79.46	79.21	79.49	0.002264	0.74	3.84	10.61	0.37
wc6	480	AB 10yr	3.81	78.69	79.56	79.28	79.59	0.002036	0.81	4.93	12.56	0.36
wc6	480	AB 20yr	4.99	78.69	79.67	79.35	79.70	0.001709	0.85	6.42	14.15	0.34
wc6	480	AB 50yr	6.94	78.69	79.86	79.44	79.89	0.001182	0.84	9.87	20.05	0.30
wc6	480	AB 100yr	8.79	78.69	80.12	79.52	80.14	0.000608	0.73	15.65	25.54	0.23
wc6	400	AB 2yr	1.72	78.36	79.18	78.84	79.19	0.001196	0.53	3.24	8.09	0.27
wc6	400	AB 5yr	2.82	78.36	79.30	78.95	79.32	0.001467	0.66	4.30	9.41	0.30
wc6	400	AB 10yr	3.81	78.36	79.41	79.03	79.44	0.001322	0.72	5.42	10.97	0.30
wc6	400	AB 20yr	4.99	78.36	79.55	79.10	79.58	0.001094	0.75	7.05	12.87	0.28
wc6	400	AB 50yr	6.94	78.36	79.78	79.20	79.80	0.000715	0.73	11.41	20.21	0.24
wc6	400	AB 100yr	8.79	78.36	80.08	79.29	80.09	0.000370	0.63	17.81	22.81	0.18
wc6	350	AB 2yr	1.72	78.63	79.02	78.84	79.03	0.001668	0.47	3.75	16.09	0.30
wc6	350	AB 5yr	2.82	78.63	79.19	78.91	79.20	0.000734	0.44	6.81	18.81	0.21
wc6	350	AB 10yr	3.81	78.63	79.33	78.96	79.34	0.000482	0.43	9.68	21.04	0.18
wc6	350	AB 20yr	4.99	78.63	79.49	78.99	79.50	0.000340	0.43	13.24	23.44	0.16
wc6	350	AB 50yr	6.94	78.63	79.76	79.05	79.76	0.000170	0.37	24.89	41.20	0.12
wc6	350	AB 100yr	8.79	78.63	80.07	79.10	80.07	0.000085	0.32	39.27	50.14	0.09
wc6	330	AB 2yr	1.72	78.44	78.97	78.77	79.01	0.002909	0.92	1.86	12.17	0.43
wc6	330	AB 5yr	2.82	78.44	79.12	78.87	79.19	0.003032	1.14	2.48	17.49	0.46
wc6	330	AB 10yr	3.81	78.44	79.25	78.95	79.33	0.002986	1.28	2.98	24.44	0.47
wc6	330	AB 20yr	4.99	78.44	79.39	79.04	79.49	0.002870	1.41	3.54	26.78	0.48
wc6	330	AB 50yr	6.94	78.44	79.63	79.18	79.75	0.002523	1.55	4.49	30.58	0.47

HEC-RAS Plan: prim sen ana (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6	330	AB 100yr	8.79	78.44	79.94	79.29	80.06	0.001786	1.53	5.74	34.61	0.41
wc6	315		Culvert									
wc6	300	AB 2yr	1.72	77.99	78.91	78.44	78.93	0.000633	0.58	2.99	11.04	0.22
wc6	300	AB 5yr	2.82	77.99	79.02	78.54	79.05	0.001070	0.82	3.44	12.30	0.29
wc6	300	AB 10yr	3.81	77.99	79.11	78.63	79.16	0.001377	1.00	3.82	13.22	0.33
wc6	300	AB 20yr	4.99	77.99	79.21	78.71	79.28	0.001685	1.18	4.22	14.09	0.37
wc6	300	AB 50yr	6.94	77.99	79.35	78.84	79.46	0.002149	1.45	4.78	15.21	0.43
wc6	300	AB 100yr	8.79	77.99	79.45	78.96	79.60	0.002594	1.69	5.21	16.04	0.48
wc6	280	AB 2yr	1.72	77.96	78.91	78.38	78.91	0.000224	0.28	6.26	13.21	0.12
wc6	280	AB 5yr	2.82	77.96	79.02	78.47	79.03	0.000311	0.37	7.83	14.64	0.15
wc6	280	AB 10yr	3.81	77.96	79.12	78.54	79.13	0.000345	0.43	9.33	15.84	0.16
wc6	280	AB 20yr	4.99	77.96	79.23	78.60	79.24	0.000366	0.49	11.10	17.15	0.17
wc6	280	AB 50yr	6.94	77.96	79.38	78.70	79.40	0.000390	0.56	13.85	19.11	0.18
wc6	280	AB 100yr	8.79	77.96	79.50	78.76	79.52	0.000394	0.61	17.55	27.05	0.18
wc6	250	AB 2yr	1.72	77.87	78.88	78.39	78.89	0.000511	0.44	4.11	8.11	0.18
wc6	250	AB 5yr	2.82	77.87	78.98	78.50	79.00	0.000849	0.60	4.94	8.89	0.24
wc6	250	AB 10yr	3.81	77.87	79.07	78.58	79.10	0.001036	0.70	5.76	9.60	0.27
wc6	250	AB 20yr	4.99	77.87	79.17	78.66	79.20	0.001174	0.79	6.76	10.40	0.29
wc6	250	AB 50yr	6.94	77.87	79.32	78.78	79.35	0.001277	0.90	8.34	11.53	0.31
wc6	250	AB 100yr	8.79	77.87	79.43	78.87	79.48	0.001319	1.00	9.70	12.42	0.32
wc6	200	AB 2yr	1.72	77.71	78.82		78.83	0.000327	0.34	5.00	8.96	0.15
wc6	200	AB 5yr	2.82	77.71	78.86		78.87	0.000740	0.53	5.34	9.25	0.22
wc6	200	AB 10yr	3.81	77.71	78.90		78.93	0.001110	0.66	5.75	9.60	0.27
wc6	200	AB 20yr	4.99	77.71	78.96		79.00	0.001467	0.79	6.34	10.08	0.32
wc6	200	AB 50yr	6.94	77.71	79.07		79.12	0.001834	0.93	7.47	10.94	0.36
wc6	200	AB 100yr	8.79	77.71	79.18		79.23	0.001893	1.02	8.66	11.78	0.37
wc6	150	AB 2yr	1.72	77.17	78.80	77.76	78.81	0.000069	0.28	8.01	9.85	0.08
wc6	150	AB 5yr	2.82	77.17	78.81	77.88	78.82	0.000182	0.45	8.09	9.90	0.12
wc6	150	AB 10yr	3.81	77.17	78.82	77.97	78.84	0.000323	0.60	8.18	9.96	0.17
wc6	150	AB 20yr	4.99	77.17	78.84	78.07	78.86	0.000531	0.77	8.33	10.04	0.21
wc6	150	AB 50yr	6.94	77.17	78.87	78.20	78.91	0.000940	1.04	8.63	10.22	0.28
wc6	150	AB 100yr	8.79	77.17	78.91	78.31	78.98	0.001324	1.26	9.08	10.49	0.34
wc6	100	AB 2yr	1.72	76.83	78.80	77.36	78.80	0.000018	0.12	14.68	14.88	0.04
wc6	100	AB 5yr	2.82	76.83	78.81	77.48	78.81	0.000047	0.19	14.74	14.91	0.06
wc6	100	AB 10yr	3.81	76.83	78.81	77.56	78.81	0.000085	0.26	14.81	14.94	0.08
wc6	100	AB 20yr	4.99	76.83	78.82	77.64	78.82	0.000142	0.33	14.91	15.00	0.11
wc6	100	AB 50yr	6.94	76.83	78.83	77.76	78.84	0.000264	0.46	15.12	15.10	0.15
wc6	100	AB 100yr	8.79	76.83	78.86	77.85	78.88	0.000390	0.57	15.55	15.31	0.18
5&6combined	50	AB 2yr	5.06	76.42	78.80	77.29	78.80	0.000081	0.32	16.75	14.06	0.08
5&6combined	50	AB 5yr	8.05	76.42	78.80	77.47	78.81	0.000206	0.51	16.71	14.05	0.13
5&6combined	50	AB 10yr	10.60	76.42	78.79	77.60	78.81	0.000360	0.67	16.66	14.03	0.18
5&6combined	50	AB 20yr	13.50	76.42	78.79	77.72	78.82	0.000590	0.85	16.59	14.00	0.23
5&6combined	50	AB 50yr	18.00	76.42	78.78	77.89	78.84	0.001077	1.15	16.45	13.93	0.31
5&6combined	50	AB 100yr	23.90	76.42	78.76	78.07	78.88	0.001992	1.54	16.17	13.81	0.41
5&6combined	40	AB 2yr	5.06	76.27	78.80	76.97	78.80	0.000022	0.21	29.67	21.52	0.05
5&6combined	40	AB 5yr	8.05	76.27	78.80	77.11	78.80	0.000055	0.34	29.66	21.52	0.08
5&6combined	40	AB 10yr	10.60	76.27	78.80	77.21	78.81	0.000095	0.45	29.66	21.51	0.10
5&6combined	40	AB 20yr	13.50	76.27	78.80	77.31	78.81	0.000154	0.57	29.65	21.51	0.13
5&6combined	40	AB 50yr	18.00	76.27	78.80	77.45	78.82	0.000274	0.76	29.63	21.50	0.17
5&6combined	40	AB 100yr	23.90	76.27	78.80	77.61	78.84	0.000485	1.01	29.59	21.49	0.22
5&6combined	30	AB 2yr	5.06	76.22	78.80	76.86	78.80	0.000014	0.17	34.99	23.99	0.04
5&6combined	30	AB 5yr	8.05	76.22	78.80	76.99	78.80	0.000035	0.27	34.99	23.99	0.06
5&6combined	30	AB 10yr	10.60	76.22	78.80	77.08	78.81	0.000060	0.35	35.00	23.99	0.08
5&6combined	30	AB 20yr	13.50	76.22	78.80	77.17	78.81	0.000098	0.45	35.00	23.99	0.10
5&6combined	30	AB 50yr	18.00	76.22	78.80	77.30	78.82	0.000174	0.60	35.01	24.00	0.13
5&6combined	30	AB 100yr	23.90	76.22	78.80	77.44	78.83	0.000306	0.80	35.04	24.00	0.18
5&6combined	20	AB 2yr	5.06	76.16	78.80	76.85	78.80	0.000014	0.17	35.89	25.38	0.04
5&6combined	20	AB 5yr	8.05	76.16	78.80	76.99	78.80	0.000035	0.28	35.89	25.38	0.06
5&6combined	20	AB 10yr	10.60	76.16	78.80	77.08	78.81	0.000061	0.36	35.89	25.38	0.08
5&6combined	20	AB 20yr	13.50	76.16	78.80	77.18	78.81	0.000099	0.46	35.89	25.38	0.10
5&6combined	20	AB 50yr	18.00	76.16	78.80	77.31	78.82	0.000175	0.62	35.89	25.38	0.14
5&6combined	20	AB 100yr	23.90	76.16	78.80	77.45	78.83	0.000309	0.82	35.89	25.38	0.18

HEC-RAS Plan: 2ndary senAna

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6.1	1815.549	AB 2yr	0.44	87.89	88.35	88.29	88.37	0.008860	0.59	0.74	6.96	0.58
wc6.1	1815.549	AB 5yr	0.69	87.89	88.51	88.34	88.51	0.000854	0.30	2.38	12.91	0.21
wc6.1	1815.549	AB 10yr	0.88	87.89	88.55	88.36	88.55	0.000783	0.32	2.91	14.06	0.20
wc6.1	1815.549	AB 20yr	1.09	87.89	88.56	88.39	88.57	0.000971	0.38	3.14	14.53	0.23
wc6.1	1815.549	AB 50yr	1.39	87.89	88.58	88.41	88.59	0.001297	0.45	3.37	14.99	0.26
wc6.1	1815.549	AB 100yr	1.64	87.89	88.59	88.43	88.61	0.001519	0.50	3.59	15.41	0.29
wc6.1	1791.246	AB 2yr	0.44	87.75	88.34	88.06	88.34	0.000516	0.37	2.06	13.11	0.17
wc6.1	1791.246	AB 5yr	0.69	87.75	88.50	88.14	88.51	0.000185	0.27	5.78	36.80	0.11
wc6.1	1791.246	AB 10yr	0.88	87.75	88.54	88.21	88.55	0.000189	0.29	7.48	49.23	0.11
wc6.1	1791.246	AB 20yr	1.09	87.75	88.56	88.25	88.56	0.000245	0.33	8.31	57.57	0.13
wc6.1	1791.246	AB 50yr	1.39	87.75	88.57	88.30	88.58	0.000335	0.39	9.22	65.59	0.15
wc6.1	1791.246	AB 100yr	1.64	87.75	88.59	88.32	88.59	0.000391	0.43	10.21	73.25	0.16
wc6.1	1788.428	AB 2yr	0.44	87.68	88.28	88.02	88.33	0.002750	1.01	0.44	15.68	0.42
wc6.1	1788.428	AB 5yr	0.69	87.68	88.41	88.14	88.49	0.003435	1.29	0.53	24.96	0.49
wc6.1	1788.428	AB 10yr	0.88	87.68	88.37	88.22	88.53	0.006616	1.73	0.51	20.74	0.67
wc6.1	1788.428	AB 20yr	1.09	87.68	88.53	88.53	88.55	0.003929	0.95	3.15	53.86	0.47
wc6.1	1788.428	AB 50yr	1.39	87.68	88.55	88.54	88.57	0.003114	0.88	4.55	61.29	0.42
wc6.1	1788.428	AB 100yr	1.64	87.68	88.57	88.55	88.58	0.002546	0.82	5.81	67.28	0.38
wc6.1	1778.1		Culvert									
wc6.1	1767.800	AB 2yr	0.44	87.46	87.82	87.82	87.99	0.018197	1.83	0.24	3.03	1.00
wc6.1	1767.800	AB 5yr	0.69	87.46	87.94	87.94	88.17	0.016637	2.13	0.32	8.33	1.00
wc6.1	1767.800	AB 10yr	0.88	87.46	88.02	88.02	88.29	0.015619	2.31	0.38	21.36	1.00
wc6.1	1767.800	AB 20yr	1.09	87.46	88.10	88.10	88.42	0.015082	2.49	0.44	30.83	1.00
wc6.1	1767.800	AB 50yr	1.39	87.46	88.51	88.51	88.52	0.002024	0.74	8.42	213.59	0.34
wc6.1	1767.800	AB 100yr	1.64	87.46	88.51	88.51	88.52	0.002305	0.79	9.17	213.66	0.37
wc6.1	1765.227	AB 2yr	0.44	87.41	87.72	87.72	87.82	0.022871	1.39	0.32	1.74	1.00
wc6.1	1765.227	AB 5yr	0.69	87.41	87.80	87.80	87.91	0.016766	1.50	0.50	2.79	0.90
wc6.1	1765.227	AB 10yr	0.88	87.41	87.86	87.86	87.97	0.013765	1.53	0.68	3.84	0.84
wc6.1	1765.227	AB 20yr	1.09	87.41	87.91	87.91	88.01	0.011303	1.53	0.94	5.75	0.78
wc6.1	1765.227	AB 50yr	1.39	87.41	87.96	87.96	88.06	0.009988	1.56	1.29	7.67	0.75
wc6.1	1765.227	AB 100yr	1.64	87.41	88.05	88.00	88.11	0.005359	1.29	2.15	13.64	0.57
wc6.1	1618.352	AB 2yr	0.44	86.58	87.02	86.89	87.05	0.003820	0.80	0.60	2.64	0.44
wc6.1	1618.352	AB 5yr	0.69	86.58	87.10	86.97	87.14	0.004311	0.97	0.83	3.20	0.49
wc6.1	1618.352	AB 10yr	0.88	86.58	87.14	87.02	87.20	0.004631	1.08	0.98	3.53	0.51
wc6.1	1618.352	AB 20yr	1.09	86.58	87.19	87.07	87.25	0.004996	1.19	1.14	4.08	0.54
wc6.1	1618.352	AB 50yr	1.39	86.58	87.24	87.12	87.32	0.005356	1.33	1.39	5.11	0.57
wc6.1	1618.352	AB 100yr	1.64	86.58	87.16	87.16	87.33	0.014150	1.93	1.03	3.70	0.90
wc6.1	1549.359	AB 2yr	0.44	86.10	86.45	86.45	86.53	0.019437	1.28	0.37	2.72	0.92
wc6.1	1549.359	AB 5yr	0.69	86.10	86.52	86.52	86.61	0.016542	1.39	0.59	3.87	0.88
wc6.1	1549.359	AB 10yr	0.88	86.10	86.55	86.55	86.65	0.015323	1.47	0.74	4.50	0.87
wc6.1	1549.359	AB 20yr	1.09	86.10	86.59	86.59	86.69	0.014212	1.53	0.92	5.12	0.86
wc6.1	1549.359	AB 50yr	1.39	86.10	86.63	86.63	86.74	0.013802	1.63	1.15	5.82	0.86
wc6.1	1549.359	AB 100yr	1.64	86.10	86.87		86.89	0.001553	0.77	3.84	18.04	0.31
wc6.1	1423.360	AB 2yr	0.44	84.60	85.30	84.76	85.30	0.000118	0.19	2.37	4.79	0.08
wc6.1	1423.360	AB 5yr	0.69	84.60	85.43	84.82	85.44	0.000147	0.23	3.03	5.32	0.10
wc6.1	1423.360	AB 10yr	0.88	84.60	85.74	84.85	85.74	0.000061	0.18	4.86	6.78	0.07
wc6.1	1423.360	AB 20yr	1.09	84.60	86.01	84.88	86.01	0.000034	0.17	6.92	8.36	0.05
wc6.1	1423.360	AB 50yr	1.39	84.60	86.45	84.93	86.45	0.000016	0.14	11.17	10.93	0.04
wc6.1	1423.360	AB 100yr	1.64	84.60	86.88	84.96	86.88	0.000008	0.12	16.41	13.43	0.03
wc6.1	1420.606	AB 2yr	0.44	84.57	85.28	84.83	85.30	0.000666	0.59	0.75	4.85	0.22
wc6.1	1420.606	AB 5yr	0.69	84.57	85.40	84.92	85.43	0.000987	0.79	0.87	5.32	0.28
wc6.1	1420.606	AB 10yr	0.88	84.57	85.71	84.99	85.74	0.000558	0.74	1.20	6.54	0.22
wc6.1	1420.606	AB 20yr	1.09	84.57	85.98	85.05	86.01	0.000420	0.74	1.48	7.59	0.20
wc6.1	1420.606	AB 50yr	1.39	84.57	86.42	85.13	86.45	0.000275	0.71	1.95	10.32	0.17
wc6.1	1420.606	AB 100yr	1.64	84.57	86.86	85.20	86.88	0.000190	0.68	2.40	15.22	0.14
wc6.1	1393.68		Culvert									
wc6.1	1368.765	AB 2yr	0.44	84.77	85.04	85.04	85.18	0.018655	1.63	0.27	3.99	1.00
wc6.1	1368.765	AB 5yr	0.69	84.77	85.13	85.13	85.32	0.016893	1.89	0.36	4.68	1.00
wc6.1	1368.765	AB 10yr	0.88	84.77	85.20	85.20	85.41	0.016011	2.05	0.43	5.15	1.00
wc6.1	1368.765	AB 20yr	1.09	84.77	85.26	85.26	85.51	0.015376	2.21	0.49	5.63	1.01
wc6.1	1368.765	AB 50yr	1.39	84.77	85.35	85.35	85.64	0.014558	2.40	0.58	6.26	1.00
wc6.1	1368.765	AB 100yr	1.64	84.77	85.42	85.42	85.74	0.014017	2.53	0.65	6.76	1.00
wc6.1	1366.013	AB 2yr	0.44	84.75	84.99		85.02	0.005993	0.74	0.59	2.96	0.53
wc6.1	1366.013	AB 5yr	0.69	84.75	85.04		85.08	0.007309	0.91	0.76	3.17	0.60
wc6.1	1366.013	AB 10yr	0.88	84.75	85.08		85.13	0.008024	1.02	0.87	3.31	0.63

HEC-RAS Plan: prim sen ana (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6	1598.12		Culvert									
wc6	1587.120	AB 2yr	1.58	84.79	85.69	85.69	85.84	0.014978	1.85	1.03	16.37	0.81
wc6	1587.120	AB 5yr	2.60	84.79	85.81	85.81	86.01	0.016275	2.21	1.42	33.64	0.87
wc6	1587.120	AB 10yr	3.52	84.79	85.90	85.90	86.15	0.016630	2.44	1.72	40.02	0.90
wc6	1587.120	AB 20yr	4.62	84.79	86.00	86.00	86.29	0.017093	2.68	2.03	47.62	0.93
wc6	1587.120	AB 50yr	6.45	84.79	86.14	86.14	86.51	0.017241	3.00	2.49	60.14	0.96
wc6	1587.120	AB 100yr	9.20	84.79	86.54	86.54	86.57	0.005948	1.39	19.12	181.13	0.58
wc6	1584.698	AB 2yr	1.58	84.73	85.18	85.10	85.28	0.010988	1.44	1.09	2.89	0.75
wc6	1584.698	AB 5yr	2.60	84.73	85.31	85.24	85.46	0.012415	1.75	1.48	3.15	0.82
wc6	1584.698	AB 10yr	3.52	84.73	85.40	85.34	85.60	0.013062	1.95	1.80	3.35	0.85
wc6	1584.698	AB 20yr	4.62	84.73	85.45	85.45	85.73	0.017581	2.36	1.96	3.62	0.99
wc6	1584.698	AB 50yr	6.45	84.73	85.68	85.68	85.93	0.010420	2.27	3.30	11.52	0.81
wc6	1584.698	AB 100yr	9.20	84.73	85.89	85.89	86.02	0.005129	1.87	9.19	38.78	0.59
wc6	1501.817	AB 2yr	1.58	84.11	84.70	84.53	84.75	0.004546	0.98	1.61	4.23	0.51
wc6	1501.817	AB 5yr	2.60	84.11	84.87	84.65	84.93	0.003982	1.08	2.42	4.92	0.49
wc6	1501.817	AB 10yr	3.52	84.11	85.00	84.74	85.07	0.003820	1.15	3.05	5.40	0.49
wc6	1501.817	AB 20yr	4.62	84.11	85.19	84.82	85.24	0.002153	0.98	6.26	23.03	0.38
wc6	1501.817	AB 50yr	6.45	84.11	85.31	84.95	85.35	0.002040	1.03	9.47	32.70	0.37
wc6	1501.817	AB 100yr	9.20	84.11	85.45	85.11	85.48	0.001658	1.03	15.06	47.94	0.35
wc6	1414.879	AB 2yr	1.58	83.78	84.42	84.14	84.45	0.002618	0.84	1.88	3.91	0.39
wc6	1414.879	AB 5yr	2.60	83.78	84.59	84.27	84.64	0.002850	1.00	2.60	4.43	0.42
wc6	1414.879	AB 10yr	3.52	83.78	84.66		84.74	0.003766	1.20	2.93	4.65	0.48
wc6	1414.879	AB 20yr	4.62	83.78	85.05		85.09	0.001326	0.94	5.23	13.68	0.31
wc6	1414.879	AB 50yr	6.45	83.78	85.08		85.16	0.002241	1.26	5.80	17.85	0.40
wc6	1414.879	AB 100yr	9.20	83.78	85.13		85.26	0.003773	1.68	6.63	19.92	0.52
wc6	1334.030	AB 2yr	1.58	83.47	83.83	83.83	83.98	0.019671	1.71	0.92	3.09	1.00
wc6	1334.030	AB 5yr	2.60	83.47	83.96	83.96	84.15	0.018092	1.93	1.35	3.47	0.99
wc6	1334.030	AB 10yr	3.52	83.47	84.37	84.05	84.44	0.003472	1.16	3.02	4.70	0.46
wc6	1334.030	AB 20yr	4.62	83.47	85.04	84.15	85.05	0.000179	0.42	20.72	53.03	0.12
wc6	1334.030	AB 50yr	6.45	83.47	85.08	84.30	85.09	0.000285	0.54	22.80	56.60	0.15
wc6	1334.030	AB 100yr	9.20	83.47	85.13	84.47	85.15	0.000444	0.69	25.87	61.48	0.19
wc6	1037.318	AB 2yr	1.58	82.35	83.30	82.71	83.31	0.000582	0.49	3.23	4.84	0.19
wc6	1037.318	AB 5yr	2.60	82.35	83.77	82.84	83.78	0.000252	0.45	6.11	7.39	0.14
wc6	1037.318	AB 10yr	3.52	82.35	84.33	82.93	84.33	0.000102	0.38	11.13	11.25	0.09
wc6	1037.318	AB 20yr	4.62	82.35	85.03	83.03	85.03	0.000027	0.24	40.14	79.05	0.05
wc6	1037.318	AB 50yr	6.45	82.35	85.06	83.17	85.06	0.000047	0.33	42.33	81.05	0.07
wc6	1037.318	AB 100yr	9.20	82.35	85.09	83.35	85.10	0.000086	0.45	45.00	83.72	0.09
wc6	947.3374	AB 2yr	1.72	82.01	83.26	82.52	83.26	0.000384	0.43	4.04	5.49	0.16
wc6	947.3374	AB 5yr	2.82	82.01	83.76	82.66	83.76	0.000123	0.32	12.58	37.81	0.10
wc6	947.3374	AB 10yr	3.81	82.01	84.33	82.76	84.33	0.000018	0.16	44.37	71.34	0.04
wc6	947.3374	AB 20yr	4.99	82.01	85.03	82.87	85.03	0.000004	0.09	120.83	151.73	0.02
wc6	947.3374	AB 50yr	6.94	82.01	85.06	83.02	85.06	0.000006	0.12	125.10	156.69	0.02
wc6	947.3374	AB 100yr	8.79	82.01	85.09	83.14	85.09	0.000009	0.15	130.44	161.27	0.03
wc6	940	AB 2yr	1.72	81.96	83.17	82.59	83.25	0.001597	1.29	1.33	9.28	0.38
wc6	940	AB 5yr	2.82	81.96	83.63	82.84	83.75	0.001455	1.53	1.84	70.91	0.38
wc6	940	AB 10yr	3.81	81.96	84.19	83.03	84.32	0.001010	1.55	2.46	131.61	0.33
wc6	940	AB 20yr	4.99	81.96	84.90	83.24	85.02	0.000695	1.54	3.23	203.58	0.29
wc6	940	AB 50yr	6.94	81.96	84.78	83.56	85.03	0.001545	2.24	3.10	180.66	0.43
wc6	940	AB 100yr	8.79	81.96	84.56	83.83	85.04	0.003220	3.07	2.86	158.38	0.61
wc6	939.548		Culvert									
wc6	910.4732	AB 2yr	1.72	81.74	82.35	82.35	82.66	0.014091	2.44	0.70	3.84	1.00
wc6	910.4732	AB 5yr	2.82	81.74	82.59	82.59	83.01	0.012749	2.89	0.98	4.54	1.00
wc6	910.4732	AB 10yr	3.81	81.74	82.78	82.78	83.30	0.011889	3.19	1.19	9.07	1.00
wc6	910.4732	AB 20yr	4.99	81.74	82.98	82.98	83.60	0.011326	3.51	1.42	219.75	1.01
wc6	910.4732	AB 50yr	6.94	81.74	83.29	83.29	84.06	0.010447	3.90	1.78	289.91	1.00
wc6	910.4732	AB 100yr	8.79	81.74	83.55	83.55	84.46	0.009825	4.21	2.09	345.91	1.00
wc6	900	AB 2yr	1.72	81.67	82.19	82.05	82.26	0.006619	1.20	1.43	3.55	0.60
wc6	900	AB 5yr	2.82	81.67	82.42	82.18	82.49	0.004602	1.21	2.32	4.24	0.52
wc6	900	AB 10yr	3.81	81.67	82.43	82.28	82.56	0.007677	1.59	2.40	4.29	0.68
wc6	900	AB 20yr	4.99	81.67	82.66	82.38	82.77	0.004877	1.45	3.44	4.97	0.56
wc6	900	AB 50yr	6.94	81.67	82.81	82.53	82.94	0.004764	1.62	4.71	10.96	0.57
wc6	900	AB 100yr	8.79	81.67	82.92	82.64	83.06	0.004564	1.73	6.34	18.24	0.57
wc6	801.4135	AB 2yr	1.72	80.95	81.43	81.33	81.52	0.008394	1.31	1.32	3.45	0.67
wc6	801.4135	AB 5yr	2.82	80.95	81.46	81.46	81.66	0.018252	1.99	1.42	3.54	1.00
wc6	801.4135	AB 10yr	3.81	80.95	81.75	81.56	81.86	0.006345	1.48	2.57	4.41	0.62
wc6	801.4135	AB 20yr	4.99	80.95	81.66	81.66	81.93	0.016946	2.28	2.19	4.14	1.00
wc6	801.4135	AB 50yr	6.94	80.95	81.81	81.81	82.12	0.016395	2.47	2.82	4.57	1.00

HEC-RAS Plan: prim sen ana (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6	801.4135	AB 100yr	8.79	80.95	81.93	81.93	82.27	0.015962	2.60	3.38	4.93	1.00
wc6	730.3979	AB 2yr	1.72	80.43	80.87	80.78	80.94	0.007779	1.13	1.52	4.85	0.65
wc6	730.3979	AB 5yr	2.82	80.43	81.02	80.89	81.02	0.000010	0.05	75.47	196.76	0.02
wc6	730.3979	AB 10yr	3.81	80.43	80.97	80.97	81.15	0.017584	1.90	2.01	5.46	1.00
wc6	730.3979	AB 20yr	4.99	80.43	81.01	81.01	81.01	0.000033	0.09	73.99	196.37	0.04
wc6	730.3979	AB 50yr	6.94	80.43	81.07	81.01	81.07	0.000040	0.10	85.83	198.02	0.05
wc6	730.3979	AB 100yr	8.79	80.43	81.11	81.01	81.12	0.000046	0.12	94.73	199.09	0.05
wc6	634.0483	AB 2yr	1.72	79.73	80.29	80.11	80.35	0.004905	1.08	1.59	3.68	0.52
wc6	634.0483	AB 5yr	2.82	79.73	80.48	80.24	80.55	0.004584	1.21	2.33	4.24	0.52
wc6	634.0483	AB 10yr	3.81	79.73	80.61	80.34	80.70	0.004395	1.30	2.94	4.65	0.52
wc6	634.0483	AB 20yr	4.99	79.73	80.76	80.45	80.85	0.004143	1.38	3.64	6.00	0.52
wc6	634.0483	AB 50yr	6.94	79.73	80.94	80.59	81.05	0.003594	1.49	5.33	15.27	0.50
wc6	634.0483	AB 100yr	8.79	79.73	81.10	80.71	81.11	0.000209	0.40	59.27	232.56	0.12
wc6	586.5527	AB 2yr	1.72	79.39	80.09	79.86	80.14	0.003785	1.01	1.71	3.50	0.46
wc6	586.5527	AB 5yr	2.82	79.39	80.27	80.00	80.35	0.004000	1.18	2.39	3.97	0.49
wc6	586.5527	AB 10yr	3.81	79.39	80.42	80.10	80.50	0.003999	1.28	2.98	4.33	0.49
wc6	586.5527	AB 20yr	4.99	79.39	80.56	80.21	80.66	0.003947	1.37	3.64	4.71	0.50
wc6	586.5527	AB 50yr	6.94	79.39	80.78	80.36	80.88	0.003439	1.43	5.74	19.84	0.48
wc6	586.5527	AB 100yr	8.79	79.39	81.04	80.49	81.08	0.001406	1.04	12.99	31.39	0.31
wc6	564.4214	AB 2yr	1.72	79.36	80.06	79.74	80.10	0.002032	0.80	2.15	4.11	0.35
wc6	564.4214	AB 5yr	2.82	79.36	80.25	79.87	80.30	0.002053	0.98	2.89	4.67	0.37
wc6	564.4214	AB 10yr	3.81	79.36	80.39	79.97	80.45	0.002075	1.11	3.45	6.70	0.38
wc6	564.4214	AB 20yr	4.99	79.36	80.53	80.07	80.61	0.002125	1.24	4.02	21.96	0.39
wc6	564.4214	AB 50yr	6.94	79.36	80.73	80.20	80.84	0.002265	1.44	4.81	24.53	0.42
wc6	564.4214	AB 100yr	8.79	79.36	80.92	80.31	81.05	0.002223	1.58	5.58	25.78	0.43
wc6	549.12		Culvert									
wc6	535.9677	AB 2yr	1.72	79.30	80.00	79.68	80.03	0.002037	0.82	2.09	4.10	0.35
wc6	535.9677	AB 5yr	2.82	79.30	80.18	79.81	80.23	0.002284	1.01	2.80	4.64	0.39
wc6	535.9677	AB 10yr	3.81	79.30	80.31	79.91	80.38	0.002374	1.15	3.31	5.80	0.40
wc6	535.9677	AB 20yr	4.99	79.30	80.43	80.01	80.52	0.002594	1.32	3.79	8.75	0.43
wc6	535.9677	AB 50yr	6.94	79.30	80.58	80.16	80.71	0.003044	1.58	4.40	29.75	0.48
wc6	535.9677	AB 100yr	8.79	79.30	80.69	80.27	80.86	0.003540	1.81	4.85	68.52	0.53
wc6	533.8168	AB 2yr	1.72	79.29	79.99	79.67	80.02	0.002174	0.81	2.13	4.10	0.36
wc6	533.8168	AB 5yr	2.82	79.29	80.17	79.80	80.22	0.002431	0.96	2.93	4.64	0.39
wc6	533.8168	AB 10yr	3.81	79.29	80.30	79.90	80.36	0.002576	1.07	3.56	5.26	0.41
wc6	533.8168	AB 20yr	4.99	79.29	80.43	80.00	80.50	0.002555	1.19	4.39	8.75	0.41
wc6	533.8168	AB 50yr	6.94	79.29	80.59	80.15	80.67	0.002360	1.29	6.81	19.82	0.41
wc6	533.8168	AB 100yr	8.79	79.29	80.73	80.27	80.80	0.002027	1.30	9.99	28.27	0.39
wc6	502.0329	AB 2yr	1.72	79.25	79.71	79.71	79.88	0.019791	1.81	0.95	2.91	1.01
wc6	502.0329	AB 5yr	2.82	79.25	79.85	79.85	80.06	0.018665	2.04	1.38	3.33	1.01
wc6	502.0329	AB 10yr	3.81	79.25	79.95	79.95	80.20	0.017982	2.19	1.74	3.64	1.01
wc6	502.0329	AB 20yr	4.99	79.25	80.06	80.06	80.33	0.016768	2.32	2.17	4.28	0.99
wc6	502.0329	AB 50yr	6.94	79.25	80.22	80.22	80.52	0.014496	2.44	2.96	5.60	0.95
wc6	502.0329	AB 100yr	8.79	79.25	80.35	80.35	80.66	0.013213	2.53	3.74	6.65	0.93
wc6	480	AB 2yr	1.72	78.69	79.33	79.12	79.35	0.002493	0.66	2.60	8.13	0.37
wc6	480	AB 5yr	2.82	78.69	79.46	79.21	79.49	0.002264	0.74	3.84	10.61	0.37
wc6	480	AB 10yr	3.81	78.69	79.56	79.28	79.59	0.002036	0.81	4.93	12.56	0.36
wc6	480	AB 20yr	4.99	78.69	79.67	79.35	79.70	0.001709	0.85	6.42	14.15	0.34
wc6	480	AB 50yr	6.94	78.69	79.86	79.44	79.89	0.001182	0.84	9.87	20.05	0.30
wc6	480	AB 100yr	8.79	78.69	80.12	79.52	80.14	0.000608	0.73	15.65	25.54	0.23
wc6	400	AB 2yr	1.72	78.36	79.18	78.84	79.19	0.001196	0.53	3.24	8.09	0.27
wc6	400	AB 5yr	2.82	78.36	79.30	78.95	79.32	0.001467	0.66	4.30	9.41	0.30
wc6	400	AB 10yr	3.81	78.36	79.41	79.03	79.44	0.001322	0.72	5.42	10.97	0.30
wc6	400	AB 20yr	4.99	78.36	79.55	79.10	79.58	0.001094	0.75	7.05	12.87	0.28
wc6	400	AB 50yr	6.94	78.36	79.78	79.20	79.80	0.000715	0.73	11.41	20.21	0.24
wc6	400	AB 100yr	8.79	78.36	80.08	79.29	80.09	0.000370	0.63	17.81	22.81	0.18
wc6	350	AB 2yr	1.72	78.63	79.02	78.84	79.03	0.001668	0.47	3.75	16.09	0.30
wc6	350	AB 5yr	2.82	78.63	79.19	78.91	79.20	0.000734	0.44	6.81	18.81	0.21
wc6	350	AB 10yr	3.81	78.63	79.33	78.96	79.34	0.000482	0.43	9.68	21.04	0.18
wc6	350	AB 20yr	4.99	78.63	79.49	78.99	79.50	0.000340	0.43	13.24	23.44	0.16
wc6	350	AB 50yr	6.94	78.63	79.76	79.05	79.76	0.000170	0.37	24.89	41.20	0.12
wc6	350	AB 100yr	8.79	78.63	80.07	79.10	80.07	0.000085	0.32	39.27	50.14	0.09
wc6	330	AB 2yr	1.72	78.44	78.97	78.77	79.01	0.002909	0.92	1.86	12.17	0.43
wc6	330	AB 5yr	2.82	78.44	79.12	78.87	79.19	0.003032	1.14	2.48	17.49	0.46
wc6	330	AB 10yr	3.81	78.44	79.25	78.95	79.33	0.002986	1.28	2.98	24.44	0.47
wc6	330	AB 20yr	4.99	78.44	79.39	79.04	79.49	0.002870	1.41	3.54	26.78	0.48
wc6	330	AB 50yr	6.94	78.44	79.63	79.18	79.75	0.002523	1.55	4.49	30.58	0.47

HEC-RAS Plan: 2ndary senAna (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6.1	1366.013	AB 20yr	1.09	84.75	85.11		85.17	0.008760	1.12	0.97	3.43	0.67
wc6.1	1366.013	AB 50yr	1.39	84.75	85.15		85.23	0.009703	1.25	1.12	3.59	0.71
wc6.1	1366.013	AB 100yr	1.64	84.75	85.21	85.11	85.29	0.007830	1.21	1.35	3.85	0.65
wc6.1	1346.971	AB 2yr	0.44	84.61	84.85	84.81	84.87	0.009785	0.70	0.62	4.96	0.63
wc6.1	1346.971	AB 5yr	0.69	84.61	84.89	84.85	84.92	0.009810	0.83	0.83	5.16	0.66
wc6.1	1346.971	AB 10yr	0.88	84.61	84.92	84.87	84.96	0.009831	0.91	0.97	5.29	0.67
wc6.1	1346.971	AB 20yr	1.09	84.61	84.94	84.89	84.99	0.009800	0.98	1.12	5.43	0.69
wc6.1	1346.971	AB 50yr	1.39	84.61	84.98		85.04	0.009787	1.06	1.31	5.60	0.70
wc6.1	1346.971	AB 100yr	1.64	84.61	84.95	84.95	85.05	0.021275	1.45	1.13	5.44	1.01
wc6.1	1273.903	AB 2yr	0.44	83.57	83.73	83.73	83.80	0.023935	1.18	0.37	2.64	1.00
wc6.1	1273.903	AB 5yr	0.69	83.57	83.78	83.78	83.87	0.022508	1.34	0.52	2.85	1.01
wc6.1	1273.903	AB 10yr	0.88	83.57	83.82	83.82	83.92	0.021677	1.43	0.62	2.99	1.01
wc6.1	1273.903	AB 20yr	1.09	83.57	83.85	83.85	83.97	0.020991	1.51	0.72	3.12	1.01
wc6.1	1273.903	AB 50yr	1.39	83.57	83.90	83.90	84.03	0.020242	1.61	0.86	3.30	1.01
wc6.1	1273.903	AB 100yr	1.64	83.57	84.28		84.30	0.001429	0.65	2.64	6.01	0.29
wc6.1	1166.891	AB 2yr	0.66	82.04	82.61		82.62	0.000583	0.37	1.78	4.27	0.18
wc6.1	1166.891	AB 5yr	1.04	82.04	82.82		82.83	0.000417	0.37	2.80	5.14	0.16
wc6.1	1166.891	AB 10yr	1.34	82.04	83.04		83.04	0.000266	0.34	3.97	5.98	0.13
wc6.1	1166.891	AB 20yr	1.66	82.04	83.28		83.28	0.000125	0.28	7.57	25.23	0.10
wc6.1	1166.891	AB 50yr	2.14	82.04	83.77		83.77	0.000017	0.14	27.78	55.15	0.04
wc6.1	1166.891	AB 100yr	2.55	82.04	84.30		84.30	0.000003	0.08	64.36	82.23	0.02
wc6.1	1163.643	AB 2yr	0.66	81.98	82.55	82.31	82.61	0.002902	1.06	0.63	4.27	0.45
wc6.1	1163.643	AB 5yr	1.04	81.98	82.74	82.43	82.82	0.002721	1.24	0.84	5.04	0.45
wc6.1	1163.643	AB 10yr	1.34	81.98	82.95	82.51	83.03	0.002008	1.26	1.07	5.88	0.41
wc6.1	1163.643	AB 20yr	1.66	81.98	83.19	82.59	83.27	0.001477	1.25	1.33	10.22	0.36
wc6.1	1163.643	AB 50yr	2.14	81.98	83.69	82.71	83.76	0.000769	1.13	1.89	134.70	0.28
wc6.1	1163.643	AB 100yr	2.55	81.98	84.24	82.80	84.29	0.000437	1.03	2.48	238.55	0.22
wc6.1	1154.78		Culvert									
wc6.1	1145.920	AB 2yr	0.66	81.99	82.32	82.32	82.49	0.017544	1.81	0.36	5.38	1.00
wc6.1	1145.920	AB 5yr	1.04	81.99	82.44	82.44	82.66	0.015804	2.11	0.49	6.58	1.00
wc6.1	1145.920	AB 10yr	1.34	81.99	82.52	82.52	82.79	0.014956	2.29	0.58	7.42	1.00
wc6.1	1145.920	AB 20yr	1.66	81.99	82.60	82.60	82.91	0.014255	2.46	0.67	8.26	1.00
wc6.1	1145.920	AB 50yr	2.14	81.99	82.72	82.72	83.08	0.013523	2.68	0.80	9.40	1.01
wc6.1	1145.920	AB 100yr	2.55	81.99	82.81	82.81	83.22	0.013006	2.84	0.90	10.32	1.01
wc6.1	1141.721	AB 2yr	0.66	81.96	82.26		82.29	0.006107	0.85	0.78	3.20	0.55
wc6.1	1141.721	AB 5yr	1.04	81.96	82.32		82.38	0.007443	1.04	1.00	3.46	0.62
wc6.1	1141.721	AB 10yr	1.34	81.96	82.36		82.43	0.008288	1.17	1.15	3.63	0.66
wc6.1	1141.721	AB 20yr	1.66	81.96	82.40		82.49	0.009250	1.29	1.29	3.78	0.71
wc6.1	1141.721	AB 50yr	2.14	81.96	82.45		82.56	0.010523	1.46	1.47	3.97	0.76
wc6.1	1141.721	AB 100yr	2.55	81.96	82.47		82.61	0.012337	1.62	1.57	4.07	0.83
wc6.1	1024.484	AB 2yr	0.66	81.15	81.39		81.43	0.009048	0.84	0.79	4.50	0.64
wc6.1	1024.484	AB 5yr	1.04	81.15	81.47		81.51	0.007279	0.88	1.18	5.34	0.60
wc6.1	1024.484	AB 10yr	1.34	81.15	81.52		81.57	0.006517	0.91	1.48	5.89	0.58
wc6.1	1024.484	AB 20yr	1.66	81.15	81.58		81.62	0.005918	0.93	1.79	6.41	0.56
wc6.1	1024.484	AB 50yr	2.14	81.15	81.64		81.69	0.005297	0.95	2.25	7.11	0.54
wc6.1	1024.484	AB 100yr	2.55	81.15	81.70		81.75	0.004637	0.95	2.69	7.73	0.51
wc6.1	953.3818	AB 2yr	0.66	80.66	81.00	80.87	81.03	0.003760	0.72	0.92	3.37	0.44
wc6.1	953.3818	AB 5yr	1.04	80.66	81.09	80.94	81.13	0.004204	0.85	1.22	3.71	0.47
wc6.1	953.3818	AB 10yr	1.34	80.66	81.14	80.98	81.19	0.004435	0.93	1.43	3.93	0.49
wc6.1	953.3818	AB 20yr	1.66	80.66	81.20	81.02	81.25	0.004612	1.01	1.65	4.14	0.51
wc6.1	953.3818	AB 50yr	2.14	80.66	81.27	81.08	81.33	0.004857	1.10	1.94	4.42	0.53
wc6.1	953.3818	AB 100yr	2.55	80.66	81.28	81.12	81.36	0.006276	1.27	2.01	4.48	0.61
wc6.1	915.3637	AB 2yr	0.66	80.40	80.65	80.65	80.74	0.022115	1.27	0.52	3.13	0.99
wc6.1	915.3637	AB 5yr	1.04	80.40	80.72	80.71	80.82	0.019777	1.42	0.73	3.41	0.97
wc6.1	915.3637	AB 10yr	1.34	80.40	80.76	80.76	80.88	0.018535	1.50	0.89	3.60	0.96
wc6.1	915.3637	AB 20yr	1.66	80.40	80.81	80.80	80.93	0.017234	1.56	1.06	3.80	0.94
wc6.1	915.3637	AB 50yr	2.14	80.40	80.87	80.85	81.01	0.016183	1.65	1.30	4.06	0.93
wc6.1	915.3637	AB 100yr	2.55	80.40	81.02		81.11	0.007173	1.30	1.96	4.71	0.65
wc6.1	860.6113	AB 2yr	0.66	79.87	80.19	80.08	80.22	0.005003	0.79	0.84	3.27	0.50
wc6.1	860.6113	AB 5yr	1.04	79.87	80.28	80.14	80.32	0.005007	0.91	1.15	3.63	0.51
wc6.1	860.6113	AB 10yr	1.34	79.87	80.34	80.19	80.38	0.005001	0.98	1.37	3.87	0.52
wc6.1	860.6113	AB 20yr	1.66	79.87	80.39	80.23	80.45	0.005002	1.04	1.60	4.10	0.53
wc6.1	860.6113	AB 50yr	2.14	79.87	80.47	80.29	80.53	0.005007	1.12	1.92	4.40	0.54
wc6.1	860.6113	AB 100yr	2.55	79.87	81.00	80.33	81.01	0.000517	0.53	4.83	6.51	0.19
wc6.3	1400.840	AB 2yr	0.16	86.97	87.17	87.17	87.23	0.027212	1.06	0.15	1.35	1.01

HEC-RAS Plan: 2ndary senAna (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6.3	1400.840	AB 5yr	0.26	86.97	87.22	87.22	87.29	0.022467	1.13	0.23	1.62	0.95
wc6.3	1400.840	AB 10yr	0.34	86.97	87.32		87.35	0.008568	0.85	0.40	2.08	0.62
wc6.3	1400.840	AB 20yr	0.43	86.97	87.40		87.42	0.004875	0.73	0.59	2.48	0.48
wc6.3	1400.840	AB 50yr	0.57	86.97	87.51		87.53	0.002680	0.63	0.90	3.04	0.37
wc6.3	1400.840	AB 100yr	0.70	86.97	87.61		87.63	0.001743	0.57	1.24	3.53	0.31
wc6.3	1381.230	AB 2yr	0.16	86.73	87.15	86.83	87.15	0.000170	0.16	0.98	3.17	0.09
wc6.3	1381.230	AB 5yr	0.26	86.73	87.25	86.87	87.26	0.000190	0.19	1.34	3.60	0.10
wc6.3	1381.230	AB 10yr	0.34	86.73	87.33	86.89	87.33	0.000194	0.21	1.61	3.89	0.10
wc6.3	1381.230	AB 20yr	0.43	86.73	87.40	86.91	87.41	0.000192	0.22	1.92	4.20	0.11
wc6.3	1381.230	AB 50yr	0.57	86.73	87.52	86.95	87.52	0.000182	0.24	2.41	4.64	0.10
wc6.3	1381.230	AB 100yr	0.70	86.73	87.61	86.98	87.62	0.000167	0.24	2.89	5.04	0.10
wc6.3	1378.833	AB 2yr	0.16	86.70	87.14	86.85	87.15	0.000574	0.39	0.41	3.60	0.19
wc6.3	1378.833	AB 5yr	0.26	86.70	87.24	86.90	87.25	0.000764	0.52	0.50	4.08	0.23
wc6.3	1378.833	AB 10yr	0.34	86.70	87.31	86.94	87.33	0.000876	0.60	0.56	4.41	0.25
wc6.3	1378.833	AB 20yr	0.43	86.70	87.38	86.98	87.40	0.000968	0.68	0.63	4.75	0.27
wc6.3	1378.833	AB 50yr	0.57	86.70	87.48	87.04	87.51	0.001059	0.79	0.72	5.25	0.28
wc6.3	1378.833	AB 100yr	0.70	86.70	87.58	87.09	87.61	0.001098	0.86	0.81	5.69	0.30
wc6.3	1364.866		Culvert									
wc6.3	1350.769	AB 2yr	0.16	86.00	86.25	86.24	86.31	0.019530	1.10	0.15	1.23	0.89
wc6.3	1350.769	AB 5yr	0.26	86.00	86.30	86.29	86.40	0.020299	1.35	0.19	1.48	0.95
wc6.3	1350.769	AB 10yr	0.34	86.00	86.33	86.33	86.45	0.021748	1.54	0.22	1.60	1.01
wc6.3	1350.769	AB 20yr	0.43	86.00	86.37	86.37	86.51	0.020645	1.66	0.26	1.77	1.01
wc6.3	1350.769	AB 50yr	0.57	86.00	86.43	86.43	86.60	0.019081	1.82	0.31	2.00	1.00
wc6.3	1350.769	AB 100yr	0.70	86.00	86.48	86.48	86.67	0.018232	1.95	0.36	2.20	1.00
wc6.3	1348.373	AB 2yr	0.16	85.90	86.21	86.16	86.24	0.010906	0.80	0.20	1.29	0.65
wc6.3	1348.373	AB 5yr	0.26	85.90	86.27	86.22	86.31	0.011446	0.92	0.28	1.53	0.69
wc6.3	1348.373	AB 10yr	0.34	85.90	86.30	86.25	86.35	0.011741	1.00	0.34	1.68	0.71
wc6.3	1348.373	AB 20yr	0.43	85.90	86.34	86.29	86.40	0.011925	1.06	0.40	1.82	0.72
wc6.3	1348.373	AB 50yr	0.57	85.90	86.39	86.33	86.45	0.012262	1.16	0.49	2.01	0.74
wc6.3	1348.373	AB 100yr	0.70	85.90	86.42	86.37	86.50	0.012720	1.23	0.57	2.15	0.77
wc6.3	1290.277	AB 2yr	0.16	85.63	85.86	85.80	85.88	0.004818	0.50	0.32	2.49	0.44
wc6.3	1290.277	AB 5yr	0.26	85.63	85.91	85.83	85.93	0.004981	0.59	0.44	2.68	0.47
wc6.3	1290.277	AB 10yr	0.34	85.63	85.94	85.86	85.96	0.005083	0.65	0.52	2.80	0.48
wc6.3	1290.277	AB 20yr	0.43	85.63	85.97	85.88	85.99	0.005183	0.70	0.61	2.93	0.49
wc6.3	1290.277	AB 50yr	0.57	85.63	86.01	85.91	86.04	0.005316	0.78	0.73	3.10	0.51
wc6.3	1290.277	AB 100yr	0.70	85.63	86.05	85.94	86.08	0.005234	0.82	0.85	3.25	0.51
wc6.3	1100	AB 2yr	0.16	84.92	85.02	85.02	85.06	0.027612	0.94	0.17	1.90	1.00
wc6.3	1100	AB 5yr	0.26	84.92	85.06	85.06	85.11	0.025583	1.08	0.24	2.04	1.00
wc6.3	1100	AB 10yr	0.34	84.92	85.08	85.08	85.15	0.024512	1.16	0.29	2.14	1.00
wc6.3	1100	AB 20yr	0.43	84.92	85.11	85.11	85.18	0.023397	1.23	0.35	2.25	1.00
wc6.3	1100	AB 50yr	0.57	84.92	85.14	85.14	85.23	0.022190	1.32	0.43	2.39	0.99
wc6.3	1100	AB 100yr	0.70	84.92	85.17	85.17	85.27	0.022768	1.42	0.49	2.49	1.02
wc6.3	991.7830	AB 2yr	0.36	83.12	84.16		84.16	0.000021	0.10	3.74	5.86	0.04
wc6.3	991.7830	AB 5yr	0.57	83.12	84.33		84.33	0.000025	0.12	4.84	7.30	0.04
wc6.3	991.7830	AB 10yr	0.74	83.12	84.45		84.45	0.000026	0.14	5.83	8.38	0.04
wc6.3	991.7830	AB 20yr	0.92	83.12	84.59		84.59	0.000025	0.15	7.03	10.18	0.04
wc6.3	991.7830	AB 50yr	1.20	83.12	84.81		84.81	0.000017	0.13	16.98	86.42	0.04
wc6.3	991.7830	AB 100yr	1.43	83.12	85.07		85.07	0.000004	0.08	44.38	126.10	0.02
wc6.3	990.0710	AB 2yr	0.36	83.10	84.15	83.35	84.16	0.000150	0.36	1.00	5.57	0.11
wc6.3	990.0710	AB 5yr	0.57	83.10	84.31	83.44	84.32	0.000234	0.50	1.15	5.78	0.14
wc6.3	990.0710	AB 10yr	0.74	83.10	84.43	83.50	84.45	0.000288	0.59	1.26	5.94	0.16
wc6.3	990.0710	AB 20yr	0.92	83.10	84.56	83.56	84.58	0.000328	0.67	1.38	6.81	0.18
wc6.3	990.0710	AB 50yr	1.20	83.10	84.77	83.65	84.80	0.000354	0.76	1.59	8.37	0.19
wc6.3	990.0710	AB 100yr	1.43	83.10	85.03	83.72	85.06	0.000313	0.78	1.83	10.24	0.18
wc6.3	982.657		Culvert									
wc6.3	975.2448	AB 2yr	0.36	82.96	83.20	83.20	83.32	0.019163	1.55	0.23	2.48	1.00
wc6.3	975.2448	AB 5yr	0.57	82.96	83.29	83.29	83.45	0.017147	1.80	0.32	2.83	0.99
wc6.3	975.2448	AB 10yr	0.74	82.96	83.35	83.35	83.55	0.016522	1.98	0.37	3.08	1.00
wc6.3	975.2448	AB 20yr	0.92	82.96	83.42	83.42	83.64	0.015407	2.11	0.44	3.34	0.99
wc6.3	975.2448	AB 50yr	1.20	82.96	83.50	83.50	83.78	0.014713	2.31	0.52	3.68	1.00
wc6.3	975.2448	AB 100yr	1.43	82.96	83.57	83.57	83.88	0.014071	2.45	0.58	3.96	1.00
wc6.3	973.5334	AB 2yr	0.36	82.94	83.14	83.11	83.19	0.013822	0.97	0.37	2.28	0.77
wc6.3	973.5334	AB 5yr	0.57	82.94	83.20		83.26	0.012331	1.08	0.53	2.55	0.76
wc6.3	973.5334	AB 10yr	0.74	82.94	83.25		83.32	0.011152	1.13	0.66	2.74	0.73
wc6.3	973.5334	AB 20yr	0.92	82.94	83.30		83.37	0.010328	1.17	0.79	2.93	0.72



HEC-RAS Plan: 2ndary senAna (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6.3	973.5334	AB 50yr	1.20	82.94	83.36		83.44	0.009824	1.24	0.97	3.16	0.71
wc6.3	973.5334	AB 100yr	1.43	82.94	83.40		83.49	0.009482	1.28	1.11	3.34	0.71
wc6.3	910.8146	AB 2yr	0.36	82.41	82.67	82.58	82.70	0.004934	0.68	0.53	2.54	0.48
wc6.3	910.8146	AB 5yr	0.57	82.41	82.74	82.63	82.77	0.005219	0.80	0.72	2.82	0.51
wc6.3	910.8146	AB 10yr	0.74	82.41	82.78	82.67	82.82	0.005705	0.89	0.83	2.99	0.54
wc6.3	910.8146	AB 20yr	0.92	82.41	82.82	82.71	82.87	0.006143	0.97	0.95	3.14	0.56
wc6.3	910.8146	AB 50yr	1.20	82.41	82.87	82.75	82.93	0.006573	1.07	1.12	3.35	0.59
wc6.3	910.8146	AB 100yr	1.43	82.41	82.91	82.79	82.98	0.006870	1.14	1.25	3.50	0.61
wc6.3	867.1168	AB 2yr	0.36	82.04	82.21	82.21	82.28	0.024698	1.18	0.30	2.16	1.01
wc6.3	867.1168	AB 5yr	0.57	82.04	82.26	82.26	82.35	0.022160	1.32	0.43	2.39	0.99
wc6.3	867.1168	AB 10yr	0.74	82.04	82.31	82.30	82.40	0.018706	1.35	0.55	2.58	0.93
wc6.3	867.1168	AB 20yr	0.92	82.04	82.36	82.34	82.45	0.016339	1.37	0.67	2.76	0.89
wc6.3	867.1168	AB 50yr	1.20	82.04	82.42	82.38	82.52	0.014191	1.41	0.85	3.01	0.85
wc6.3	867.1168	AB 100yr	1.43	82.04	82.46	82.42	82.57	0.013102	1.44	0.99	3.19	0.83
wc6.3	814.7598	AB 2yr	0.36	81.60	81.91	81.76	81.92	0.002619	0.55	0.66	2.74	0.36
wc6.3	814.7598	AB 5yr	0.57	81.60	81.99	81.82	82.01	0.002798	0.64	0.89	3.06	0.38
wc6.3	814.7598	AB 10yr	0.74	81.60	82.04	81.86	82.06	0.002966	0.70	1.05	3.27	0.39
wc6.3	814.7598	AB 20yr	0.92	81.60	82.09	81.89	82.12	0.003087	0.76	1.22	3.46	0.41
wc6.3	814.7598	AB 50yr	1.20	81.60	82.15	81.94	82.19	0.003272	0.83	1.44	3.71	0.43
wc6.3	814.7598	AB 100yr	1.43	81.60	82.20	81.98	82.24	0.003412	0.89	1.61	3.89	0.44
wc6.3	777.7424	AB 2yr	0.36	81.29	81.62	81.62	81.70	0.025322	1.21	0.30	1.97	0.99
wc6.3	777.7424	AB 5yr	0.57	81.29	81.68	81.68	81.77	0.023847	1.32	0.43	2.41	1.00
wc6.3	777.7424	AB 10yr	0.74	81.29	81.72	81.72	81.82	0.023086	1.39	0.53	2.69	1.00
wc6.3	777.7424	AB 20yr	0.92	81.29	81.76	81.76	81.87	0.022283	1.45	0.63	2.96	1.00
wc6.3	777.7424	AB 50yr	1.20	81.29	81.81	81.81	81.93	0.021679	1.53	0.78	3.30	1.00
wc6.3	777.7424	AB 100yr	1.43	81.29	81.84	81.84	81.97	0.020796	1.58	0.91	3.56	1.00
wc6.3	610.3315	AB 2yr	0.36	79.21	79.47	79.38	79.50	0.005001	0.68	0.53	2.54	0.48
wc6.3	610.3315	AB 5yr	0.57	79.21	79.55	79.43	79.58	0.005010	0.79	0.73	2.84	0.50
wc6.3	610.3315	AB 10yr	0.74	79.21	79.60	79.47	79.63	0.005005	0.85	0.87	3.04	0.50
wc6.3	610.3315	AB 20yr	0.92	79.21	79.65	79.51	79.69	0.005002	0.90	1.02	3.23	0.51
wc6.3	610.3315	AB 50yr	1.20	79.21	79.71	79.55	79.76	0.005001	0.97	1.24	3.49	0.52
wc6.3	610.3315	AB 100yr	1.43	79.21	81.50	79.59	81.50	0.000010	0.13	10.88	6.40	0.03

HEC-RAS Plan: FUT2ndary

Reach	River Sta	Profile	Q Total (m <sup>3</sup> /s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m <sup>2</sup> )	Top Width (m)	Froude # Chl
wc6.1	1815.549	AB 10yr	0.88	87.89	88.40	88.36	88.43	0.011436	0.74	1.18	9.66	0.68
wc6.1	1815.549	AB 20yr	1.09	87.89	88.42	88.39	88.45	0.011214	0.80	1.37	10.33	0.69
wc6.1	1815.549	AB 50yr	1.39	87.89	88.45	88.41	88.49	0.009038	0.82	1.72	11.32	0.64
wc6.1	1815.549	AB 100yr	1.64	87.89	88.49	88.43	88.52	0.006067	0.77	2.20	12.49	0.54
wc6.1	1791.246	AB 10yr	0.88	87.75	88.26	88.21	88.31	0.005559	1.09	1.22	8.90	0.55
wc6.1	1791.246	AB 20yr	1.09	87.75	88.32	88.25	88.36	0.004123	1.03	1.81	11.97	0.49
wc6.1	1791.246	AB 50yr	1.39	87.75	88.39	88.30	88.42	0.002671	0.91	2.82	15.54	0.40
wc6.1	1791.246	AB 100yr	1.64	87.75	88.45	88.32	88.47	0.002115	0.87	3.99	26.57	0.36
wc6.1	1788.428	AB 10yr	0.88	87.68	88.11	88.11	88.23	0.015900	1.59	0.61	5.31	0.90
wc6.1	1788.428	AB 20yr	1.09	87.68	88.15	88.15	88.28	0.015720	1.71	0.71	9.50	0.91
wc6.1	1788.428	AB 50yr	1.39	87.68	88.20	88.20	88.36	0.015816	1.87	0.83	11.80	0.93
wc6.1	1788.428	AB 100yr	1.64	87.68	88.29	88.23	88.42	0.009932	1.71	1.07	16.38	0.77
wc6.1	1778.1		Culvert									
wc6.1	1767.800	AB 10yr	0.88	87.46	87.96	87.89	88.04	0.007707	1.27	0.77	14.05	0.65
wc6.1	1767.800	AB 20yr	1.09	87.46	87.97	87.94	88.08	0.010763	1.52	0.80	16.24	0.77
wc6.1	1767.800	AB 50yr	1.39	87.46	88.01	87.99	88.15	0.012668	1.75	0.89	20.16	0.85
wc6.1	1767.800	AB 100yr	1.64	87.46	88.03	88.03	88.21	0.014814	1.95	0.94	22.42	0.92
wc6.1	1765.227	AB 10yr	0.88	87.41	87.86	87.86	87.97	0.013765	1.53	0.68	3.84	0.84
wc6.1	1765.227	AB 20yr	1.09	87.41	87.91	87.91	88.01	0.011303	1.53	0.94	5.75	0.78
wc6.1	1765.227	AB 50yr	1.39	87.41	87.96	87.96	88.06	0.009988	1.56	1.29	7.67	0.75
wc6.1	1765.227	AB 100yr	1.64	87.41	88.00	88.00	88.10	0.009703	1.62	1.57	9.21	0.75
wc6.1	1618.352	AB 10yr	0.88	86.58	87.14	87.02	87.20	0.004631	1.08	0.98	3.53	0.51
wc6.1	1618.352	AB 20yr	1.09	86.58	87.19	87.07	87.25	0.004996	1.19	1.14	4.08	0.54
wc6.1	1618.352	AB 50yr	1.39	86.58	87.24	87.12	87.32	0.005356	1.33	1.39	5.11	0.57
wc6.1	1618.352	AB 100yr	1.64	86.58	87.28	87.16	87.37	0.005613	1.42	1.61	6.23	0.59
wc6.1	1549.359	AB 10yr	0.88	86.10	86.55	86.55	86.65	0.015323	1.47	0.74	4.50	0.87
wc6.1	1549.359	AB 20yr	1.09	86.10	86.59	86.59	86.69	0.014212	1.53	0.92	5.12	0.86
wc6.1	1549.359	AB 50yr	1.39	86.10	86.63	86.63	86.74	0.013802	1.63	1.15	5.82	0.86
wc6.1	1549.359	AB 100yr	1.64	86.10	86.66	86.66	86.78	0.013576	1.71	1.33	6.32	0.86
wc6.1	1423.360	AB 10yr	0.88	84.60	85.16	84.85	85.18	0.001095	0.50	1.75	4.24	0.25
wc6.1	1423.360	AB 20yr	1.09	84.60	85.22	84.88	85.23	0.001201	0.55	1.97	4.45	0.26
wc6.1	1423.360	AB 50yr	1.39	84.60	85.28	84.93	85.30	0.001292	0.61	2.29	4.73	0.28
wc6.1	1423.360	AB 100yr	1.64	84.60	85.34	84.96	85.36	0.001327	0.64	2.56	4.95	0.28
wc6.1	1420.606	AB 10yr	0.88	84.57	85.15	84.82	85.17	0.001016	0.62	1.43	4.33	0.26
wc6.1	1420.606	AB 20yr	1.09	84.57	85.20	84.85	85.23	0.001192	0.71	1.55	4.52	0.29
wc6.1	1420.606	AB 50yr	1.39	84.57	85.26	84.90	85.30	0.001404	0.82	1.70	4.78	0.32
wc6.1	1420.606	AB 100yr	1.64	84.57	85.31	84.94	85.35	0.001548	0.90	1.83	4.97	0.34
wc6.1	1393.68		Culvert									
wc6.1	1368.765	AB 10yr	0.88	84.77	85.09		85.16	0.007342	1.12	0.78	4.37	0.64
wc6.1	1368.765	AB 20yr	1.09	84.77	85.12		85.20	0.008215	1.26	0.86	4.60	0.69
wc6.1	1368.765	AB 50yr	1.39	84.77	85.16		85.27	0.009464	1.45	0.96	4.87	0.75
wc6.1	1368.765	AB 100yr	1.64	84.77	85.19		85.32	0.010507	1.60	1.02	5.07	0.80
wc6.1	1366.013	AB 10yr	0.88	84.75	85.08		85.13	0.008024	1.02	0.87	3.31	0.63
wc6.1	1366.013	AB 20yr	1.09	84.75	85.11		85.17	0.008762	1.12	0.97	3.43	0.67
wc6.1	1366.013	AB 50yr	1.39	84.75	85.15		85.23	0.009705	1.25	1.11	3.59	0.71
wc6.1	1366.013	AB 100yr	1.64	84.75	85.18		85.27	0.010351	1.34	1.22	3.71	0.74
wc6.1	1346.971	AB 10yr	0.88	84.61	84.92	84.87	84.96	0.009829	0.91	0.97	5.29	0.67
wc6.1	1346.971	AB 20yr	1.09	84.61	84.94	84.89	84.99	0.009795	0.98	1.12	5.43	0.69
wc6.1	1346.971	AB 50yr	1.39	84.61	84.98		85.04	0.009777	1.06	1.31	5.60	0.70
wc6.1	1346.971	AB 100yr	1.64	84.61	85.00		85.07	0.009773	1.12	1.46	5.74	0.71
wc6.1	1273.903	AB 10yr	0.88	83.57	83.82	83.82	83.92	0.021691	1.43	0.62	2.99	1.01
wc6.1	1273.903	AB 20yr	1.09	83.57	83.85	83.85	83.97	0.021008	1.51	0.72	3.12	1.01
wc6.1	1273.903	AB 50yr	1.39	83.57	83.90	83.90	84.03	0.020271	1.61	0.86	3.30	1.01
wc6.1	1273.903	AB 100yr	1.64	83.57	83.93	83.93	84.07	0.019665	1.68	0.98	3.51	1.00
wc6.1	1166.891	AB 10yr	1.34	82.04	82.95		82.96	0.000381	0.38	3.48	5.64	0.16
wc6.1	1166.891	AB 20yr	1.66	82.04	83.08		83.08	0.000337	0.39	4.23	7.11	0.15
wc6.1	1166.891	AB 50yr	2.14	82.04	83.25		83.26	0.000231	0.38	7.05	22.05	0.13
wc6.1	1166.891	AB 100yr	2.55	82.04	83.40		83.41	0.000149	0.34	11.52	35.39	0.11
wc6.1	1163.643	AB 10yr	1.34	81.98	82.92	82.36	82.95	0.000831	0.79	1.69	5.76	0.26
wc6.1	1163.643	AB 20yr	1.66	81.98	83.04	82.42	83.08	0.000862	0.87	1.91	9.38	0.27
wc6.1	1163.643	AB 50yr	2.14	81.98	83.21	82.50	83.25	0.000879	0.97	2.21	10.31	0.28

HEC-RAS Plan: FUT2ndary (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6.1	1163.643	AB 100yr	2.55	81.98	83.35	82.57	83.40	0.000871	1.04	2.46	11.08	0.28
wc6.1	1154.78		Culvert									
wc6.1	1145.920	AB 10yr	1.34	81.99	82.39	82.39	82.59	0.016536	1.99	0.68	6.05	1.01
wc6.1	1145.920	AB 20yr	1.66	81.99	82.45	82.45	82.68	0.015752	2.13	0.78	6.68	1.01
wc6.1	1145.920	AB 50yr	2.14	81.99	82.53	82.53	82.81	0.014889	2.32	0.92	7.54	1.01
wc6.1	1145.920	AB 100yr	2.55	81.99	82.60	82.60	82.91	0.014320	2.46	1.04	8.23	1.01
wc6.1	1141.721	AB 10yr	1.34	81.96	82.36		82.43	0.008288	1.17	1.15	3.63	0.66
wc6.1	1141.721	AB 20yr	1.66	81.96	82.40		82.49	0.009250	1.29	1.29	3.78	0.71
wc6.1	1141.721	AB 50yr	2.14	81.96	82.45		82.56	0.010523	1.46	1.47	3.97	0.76
wc6.1	1141.721	AB 100yr	2.55	81.96	82.48		82.61	0.011601	1.58	1.61	4.11	0.81
wc6.1	1024.484	AB 10yr	1.34	81.15	81.52		81.57	0.006517	0.91	1.48	5.89	0.58
wc6.1	1024.484	AB 20yr	1.66	81.15	81.58		81.62	0.005918	0.93	1.79	6.41	0.56
wc6.1	1024.484	AB 50yr	2.14	81.15	81.64		81.69	0.005297	0.95	2.25	7.11	0.54
wc6.1	1024.484	AB 100yr	2.55	81.15	81.69		81.74	0.004910	0.97	2.63	7.65	0.53
wc6.1	953.3818	AB 10yr	1.34	80.66	81.14	80.98	81.19	0.004435	0.93	1.43	3.93	0.49
wc6.1	953.3818	AB 20yr	1.66	80.66	81.20	81.02	81.25	0.004612	1.01	1.65	4.14	0.51
wc6.1	953.3818	AB 50yr	2.14	80.66	81.27	81.08	81.33	0.004857	1.10	1.94	4.42	0.53
wc6.1	953.3818	AB 100yr	2.55	80.66	81.32	81.12	81.39	0.005042	1.17	2.17	4.62	0.55
wc6.1	915.3637	AB 10yr	1.34	80.40	80.76	80.76	80.88	0.018535	1.50	0.89	3.60	0.96
wc6.1	915.3637	AB 20yr	1.66	80.40	80.81	80.80	80.93	0.017234	1.56	1.06	3.80	0.94
wc6.1	915.3637	AB 50yr	2.14	80.40	80.87	80.85	81.01	0.016183	1.65	1.30	4.06	0.93
wc6.1	915.3637	AB 100yr	2.55	80.40	80.92	80.89	81.07	0.015481	1.71	1.49	4.26	0.93
wc6.1	860.6113	AB 10yr	1.34	79.87	80.34	80.19	80.38	0.005001	0.98	1.37	3.87	0.52
wc6.1	860.6113	AB 20yr	1.66	79.87	80.39	80.23	80.45	0.005002	1.04	1.60	4.10	0.53
wc6.1	860.6113	AB 50yr	2.14	79.87	80.47	80.29	80.53	0.005007	1.12	1.92	4.40	0.54
wc6.1	860.6113	AB 100yr	2.55	79.87	80.53	80.33	80.59	0.005004	1.17	2.18	4.63	0.54
wc6.3	1400.840	AB 10yr	0.34	86.97	87.25	87.25	87.33	0.023984	1.24	0.27	1.75	1.00
wc6.3	1400.840	AB 20yr	0.43	86.97	87.28	87.28	87.37	0.023390	1.31	0.33	1.90	1.00
wc6.3	1400.840	AB 50yr	0.57	86.97	87.32	87.32	87.42	0.022872	1.40	0.41	2.09	1.01
wc6.3	1400.840	AB 100yr	0.70	86.97	87.35	87.35	87.46	0.022324	1.46	0.48	2.25	1.01
wc6.3	1381.230	AB 10yr	0.34	86.73	87.07	86.89	87.08	0.001641	0.46	0.75	2.87	0.28
wc6.3	1381.230	AB 20yr	0.43	86.73	87.12	86.91	87.13	0.001646	0.49	0.88	3.05	0.29
wc6.3	1381.230	AB 50yr	0.57	86.73	87.18	86.95	87.20	0.001603	0.52	1.09	3.31	0.29
wc6.3	1381.230	AB 100yr	0.70	86.73	87.24	86.98	87.25	0.001535	0.55	1.28	3.54	0.29
wc6.3	1378.833	AB 10yr	0.34	86.70	87.07	86.86	87.08	0.001025	0.42	0.81	3.26	0.24
wc6.3	1378.833	AB 20yr	0.43	86.70	87.12	86.89	87.13	0.001060	0.47	0.92	3.48	0.25
wc6.3	1378.833	AB 50yr	0.57	86.70	87.18	86.92	87.19	0.001088	0.53	1.08	3.79	0.26
wc6.3	1378.833	AB 100yr	0.70	86.70	87.23	86.95	87.25	0.001101	0.57	1.22	4.05	0.26
wc6.3	1364.866		Culvert									
wc6.3	1350.769	AB 10yr	0.34	86.00	86.35	86.33	86.42	0.016835	1.12	0.30	1.68	0.84
wc6.3	1350.769	AB 20yr	0.43	86.00	86.39	86.36	86.46	0.016129	1.18	0.37	1.83	0.84
wc6.3	1350.769	AB 50yr	0.57	86.00	86.44	86.41	86.52	0.015535	1.25	0.46	2.01	0.84
wc6.3	1350.769	AB 100yr	0.70	86.00	86.47	86.44	86.56	0.015330	1.31	0.53	2.16	0.84
wc6.3	1348.373	AB 10yr	0.34	85.90	86.30	86.25	86.35	0.011741	1.00	0.34	1.68	0.71
wc6.3	1348.373	AB 20yr	0.43	85.90	86.34	86.29	86.40	0.011925	1.06	0.40	1.82	0.72
wc6.3	1348.373	AB 50yr	0.57	85.90	86.39	86.33	86.45	0.012262	1.16	0.49	2.01	0.74
wc6.3	1348.373	AB 100yr	0.70	85.90	86.42	86.37	86.50	0.012720	1.23	0.57	2.15	0.77
wc6.3	1290.277	AB 10yr	0.34	85.63	85.94	85.86	85.96	0.005083	0.65	0.52	2.80	0.48
wc6.3	1290.277	AB 20yr	0.43	85.63	85.97	85.88	85.99	0.005183	0.70	0.61	2.93	0.49
wc6.3	1290.277	AB 50yr	0.57	85.63	86.01	85.91	86.04	0.005316	0.78	0.73	3.10	0.51
wc6.3	1290.277	AB 100yr	0.70	85.63	86.05	85.94	86.08	0.005234	0.82	0.85	3.25	0.51
wc6.3	1100	AB 10yr	0.34	84.92	85.08	85.08	85.15	0.024512	1.16	0.29	2.14	1.00
wc6.3	1100	AB 20yr	0.43	84.92	85.11	85.11	85.18	0.023397	1.23	0.35	2.25	1.00
wc6.3	1100	AB 50yr	0.57	84.92	85.14	85.14	85.23	0.022190	1.32	0.43	2.39	0.99
wc6.3	1100	AB 100yr	0.70	84.92	85.17	85.17	85.27	0.022768	1.42	0.49	2.49	1.02
wc6.3	991.7830	AB 10yr	0.74	83.12	83.58		83.60	0.002538	0.66	1.11	3.34	0.37
wc6.3	991.7830	AB 20yr	0.92	83.12	83.64		83.66	0.002434	0.69	1.32	3.58	0.36
wc6.3	991.7830	AB 50yr	1.20	83.12	83.73		83.75	0.002259	0.73	1.65	3.93	0.36
wc6.3	991.7830	AB 100yr	1.43	83.12	83.79		83.82	0.002107	0.74	1.93	4.20	0.35
wc6.3	990.0710	AB 10yr	0.74	83.10	83.57	83.36	83.60	0.002109	0.71	1.04	3.37	0.35

HEC-RAS Plan: FUT2ndary (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m <sup>3</sup> /s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m <sup>2</sup> )	(m)	
wc6.3	990.0710	AB 20yr	0.92	83.10	83.63	83.39	83.66	0.002133	0.78	1.18	3.59	0.36
wc6.3	990.0710	AB 50yr	1.20	83.10	83.71	83.44	83.75	0.002142	0.87	1.39	3.92	0.37
wc6.3	990.0710	AB 100yr	1.43	83.10	83.77	83.47	83.81	0.002138	0.93	1.54	4.17	0.38
wc6.3	982.657		Culvert									
wc6.3	975.2448	AB 10yr	0.74	82.96	83.27		83.33	0.009730	1.12	0.66	2.75	0.70
wc6.3	975.2448	AB 20yr	0.92	82.96	83.31		83.39	0.009100	1.20	0.77	2.93	0.69
wc6.3	975.2448	AB 50yr	1.20	82.96	83.37		83.46	0.008877	1.33	0.91	3.15	0.70
wc6.3	975.2448	AB 100yr	1.43	82.96	83.41		83.51	0.008829	1.42	1.01	3.31	0.71
wc6.3	973.5334	AB 10yr	0.74	82.94	83.25		83.32	0.011152	1.13	0.66	2.74	0.73
wc6.3	973.5334	AB 20yr	0.92	82.94	83.30		83.37	0.010328	1.17	0.79	2.93	0.72
wc6.3	973.5334	AB 50yr	1.20	82.94	83.36		83.44	0.009824	1.24	0.97	3.16	0.71
wc6.3	973.5334	AB 100yr	1.43	82.94	83.40		83.49	0.009474	1.28	1.11	3.34	0.71
wc6.3	910.8146	AB 10yr	0.74	82.41	82.78	82.67	82.82	0.005705	0.89	0.83	2.99	0.54
wc6.3	910.8146	AB 20yr	0.92	82.41	82.82	82.71	82.87	0.006143	0.97	0.95	3.14	0.56
wc6.3	910.8146	AB 50yr	1.20	82.41	82.87	82.75	82.93	0.006573	1.07	1.12	3.35	0.59
wc6.3	910.8146	AB 100yr	1.43	82.41	82.91	82.79	82.98	0.006881	1.14	1.25	3.50	0.61
wc6.3	867.1168	AB 10yr	0.74	82.04	82.31	82.30	82.40	0.018706	1.35	0.55	2.58	0.93
wc6.3	867.1168	AB 20yr	0.92	82.04	82.36	82.34	82.45	0.016339	1.37	0.67	2.76	0.89
wc6.3	867.1168	AB 50yr	1.20	82.04	82.42	82.38	82.52	0.014191	1.41	0.85	3.01	0.85
wc6.3	867.1168	AB 100yr	1.43	82.04	82.46	82.42	82.57	0.013060	1.44	0.99	3.19	0.82
wc6.3	814.7598	AB 10yr	0.74	81.60	82.04	81.86	82.06	0.002966	0.70	1.05	3.27	0.39
wc6.3	814.7598	AB 20yr	0.92	81.60	82.09	81.89	82.12	0.003087	0.76	1.22	3.46	0.41
wc6.3	814.7598	AB 50yr	1.20	81.60	82.15	81.94	82.19	0.003272	0.83	1.44	3.71	0.43
wc6.3	814.7598	AB 100yr	1.43	81.60	82.19	81.98	82.23	0.003437	0.89	1.61	3.89	0.44
wc6.3	777.7424	AB 10yr	0.74	81.29	81.72	81.72	81.82	0.023086	1.39	0.53	2.69	1.00
wc6.3	777.7424	AB 20yr	0.92	81.29	81.76	81.76	81.87	0.022283	1.45	0.63	2.96	1.00
wc6.3	777.7424	AB 50yr	1.20	81.29	81.81	81.81	81.93	0.021679	1.53	0.78	3.30	1.00
wc6.3	777.7424	AB 100yr	1.43	81.29	81.84	81.84	81.97	0.020796	1.58	0.91	3.56	1.00
wc6.3	610.3315	AB 10yr	0.74	79.21	79.60	79.47	79.63	0.005005	0.85	0.87	3.04	0.50
wc6.3	610.3315	AB 20yr	0.92	79.21	79.65	79.51	79.69	0.005002	0.90	1.02	3.23	0.51
wc6.3	610.3315	AB 50yr	1.20	79.21	79.71	79.55	79.76	0.005001	0.97	1.24	3.49	0.52
wc6.3	610.3315	AB 100yr	1.43	79.21	79.76	79.59	79.81	0.005006	1.02	1.40	3.67	0.53

HEC-RAS Plan: 2ndary senAna (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6.3	973.5334	AB 50yr	1.20	82.94	83.36		83.44	0.009824	1.24	0.97	3.16	0.71
wc6.3	973.5334	AB 100yr	1.43	82.94	83.40		83.49	0.009482	1.28	1.11	3.34	0.71
wc6.3	910.8146	AB 2yr	0.36	82.41	82.67	82.58	82.70	0.004934	0.68	0.53	2.54	0.48
wc6.3	910.8146	AB 5yr	0.57	82.41	82.74	82.63	82.77	0.005219	0.80	0.72	2.82	0.51
wc6.3	910.8146	AB 10yr	0.74	82.41	82.78	82.67	82.82	0.005705	0.89	0.83	2.99	0.54
wc6.3	910.8146	AB 20yr	0.92	82.41	82.82	82.71	82.87	0.006143	0.97	0.95	3.14	0.56
wc6.3	910.8146	AB 50yr	1.20	82.41	82.87	82.75	82.93	0.006573	1.07	1.12	3.35	0.59
wc6.3	910.8146	AB 100yr	1.43	82.41	82.91	82.79	82.98	0.006870	1.14	1.25	3.50	0.61
wc6.3	867.1168	AB 2yr	0.36	82.04	82.21	82.21	82.28	0.024698	1.18	0.30	2.16	1.01
wc6.3	867.1168	AB 5yr	0.57	82.04	82.26	82.26	82.35	0.022160	1.32	0.43	2.39	0.99
wc6.3	867.1168	AB 10yr	0.74	82.04	82.31	82.30	82.40	0.018706	1.35	0.55	2.58	0.93
wc6.3	867.1168	AB 20yr	0.92	82.04	82.36	82.34	82.45	0.016339	1.37	0.67	2.76	0.89
wc6.3	867.1168	AB 50yr	1.20	82.04	82.42	82.38	82.52	0.014191	1.41	0.85	3.01	0.85
wc6.3	867.1168	AB 100yr	1.43	82.04	82.46	82.42	82.57	0.013102	1.44	0.99	3.19	0.83
wc6.3	814.7598	AB 2yr	0.36	81.60	81.91	81.76	81.92	0.002619	0.55	0.66	2.74	0.36
wc6.3	814.7598	AB 5yr	0.57	81.60	81.99	81.82	82.01	0.002798	0.64	0.89	3.06	0.38
wc6.3	814.7598	AB 10yr	0.74	81.60	82.04	81.86	82.06	0.002966	0.70	1.05	3.27	0.39
wc6.3	814.7598	AB 20yr	0.92	81.60	82.09	81.89	82.12	0.003087	0.76	1.22	3.46	0.41
wc6.3	814.7598	AB 50yr	1.20	81.60	82.15	81.94	82.19	0.003272	0.83	1.44	3.71	0.43
wc6.3	814.7598	AB 100yr	1.43	81.60	82.20	81.98	82.24	0.003412	0.89	1.61	3.89	0.44
wc6.3	777.7424	AB 2yr	0.36	81.29	81.62	81.62	81.70	0.025322	1.21	0.30	1.97	0.99
wc6.3	777.7424	AB 5yr	0.57	81.29	81.68	81.68	81.77	0.023847	1.32	0.43	2.41	1.00
wc6.3	777.7424	AB 10yr	0.74	81.29	81.72	81.72	81.82	0.023086	1.39	0.53	2.69	1.00
wc6.3	777.7424	AB 20yr	0.92	81.29	81.76	81.76	81.87	0.022283	1.45	0.63	2.96	1.00
wc6.3	777.7424	AB 50yr	1.20	81.29	81.81	81.81	81.93	0.021679	1.53	0.78	3.30	1.00
wc6.3	777.7424	AB 100yr	1.43	81.29	81.84	81.84	81.97	0.020796	1.58	0.91	3.56	1.00
wc6.3	610.3315	AB 2yr	0.36	79.21	79.47	79.38	79.50	0.005001	0.68	0.53	2.54	0.48
wc6.3	610.3315	AB 5yr	0.57	79.21	79.55	79.43	79.58	0.005010	0.79	0.73	2.84	0.50
wc6.3	610.3315	AB 10yr	0.74	79.21	79.60	79.47	79.63	0.005005	0.85	0.87	3.04	0.50
wc6.3	610.3315	AB 20yr	0.92	79.21	79.65	79.51	79.69	0.005002	0.90	1.02	3.23	0.51
wc6.3	610.3315	AB 50yr	1.20	79.21	79.71	79.55	79.76	0.005001	0.97	1.24	3.49	0.52
wc6.3	610.3315	AB 100yr	1.43	79.21	81.50	79.59	81.50	0.000010	0.13	10.88	6.40	0.03

HEC-RAS Plan: FUT2ndary

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6.1	1815.549	AB 10yr	0.88	87.89	88.40	88.36	88.43	0.011436	0.74	1.18	9.66	0.68
wc6.1	1815.549	AB 20yr	1.09	87.89	88.42	88.39	88.45	0.011214	0.80	1.37	10.33	0.69
wc6.1	1815.549	AB 50yr	1.39	87.89	88.45	88.41	88.49	0.009038	0.82	1.72	11.32	0.64
wc6.1	1815.549	AB 100yr	1.64	87.89	88.49	88.43	88.52	0.006067	0.77	2.20	12.49	0.54
wc6.1	1791.246	AB 10yr	0.88	87.75	88.26	88.21	88.31	0.005559	1.09	1.22	8.90	0.55
wc6.1	1791.246	AB 20yr	1.09	87.75	88.32	88.25	88.36	0.004123	1.03	1.81	11.97	0.49
wc6.1	1791.246	AB 50yr	1.39	87.75	88.39	88.30	88.42	0.002671	0.91	2.82	15.54	0.40
wc6.1	1791.246	AB 100yr	1.64	87.75	88.45	88.32	88.47	0.002115	0.87	3.99	26.57	0.36
wc6.1	1788.428	AB 10yr	0.88	87.68	88.11	88.11	88.23	0.015900	1.59	0.61	5.31	0.90
wc6.1	1788.428	AB 20yr	1.09	87.68	88.15	88.15	88.28	0.015720	1.71	0.71	9.50	0.91
wc6.1	1788.428	AB 50yr	1.39	87.68	88.20	88.20	88.36	0.015816	1.87	0.83	11.80	0.93
wc6.1	1788.428	AB 100yr	1.64	87.68	88.29	88.23	88.42	0.009932	1.71	1.07	16.38	0.77
wc6.1	1778.1		Culvert									
wc6.1	1767.800	AB 10yr	0.88	87.46	87.96	87.89	88.04	0.007707	1.27	0.77	14.05	0.65
wc6.1	1767.800	AB 20yr	1.09	87.46	87.97	87.94	88.08	0.010763	1.52	0.80	16.24	0.77
wc6.1	1767.800	AB 50yr	1.39	87.46	88.01	87.99	88.15	0.012668	1.75	0.89	20.16	0.85
wc6.1	1767.800	AB 100yr	1.64	87.46	88.03	88.03	88.21	0.014814	1.95	0.94	22.42	0.92
wc6.1	1765.227	AB 10yr	0.88	87.41	87.86	87.86	87.97	0.013765	1.53	0.68	3.84	0.84
wc6.1	1765.227	AB 20yr	1.09	87.41	87.91	87.91	88.01	0.011303	1.53	0.94	5.75	0.78
wc6.1	1765.227	AB 50yr	1.39	87.41	87.96	87.96	88.06	0.009988	1.56	1.29	7.67	0.75
wc6.1	1765.227	AB 100yr	1.64	87.41	88.00	88.00	88.10	0.009703	1.62	1.57	9.21	0.75
wc6.1	1618.352	AB 10yr	0.88	86.58	87.14	87.02	87.20	0.004631	1.08	0.98	3.53	0.51
wc6.1	1618.352	AB 20yr	1.09	86.58	87.19	87.07	87.25	0.004996	1.19	1.14	4.08	0.54
wc6.1	1618.352	AB 50yr	1.39	86.58	87.24	87.12	87.32	0.005356	1.33	1.39	5.11	0.57
wc6.1	1618.352	AB 100yr	1.64	86.58	87.28	87.16	87.37	0.005613	1.42	1.61	6.23	0.59
wc6.1	1549.359	AB 10yr	0.88	86.10	86.55	86.55	86.65	0.015323	1.47	0.74	4.50	0.87
wc6.1	1549.359	AB 20yr	1.09	86.10	86.59	86.59	86.69	0.014212	1.53	0.92	5.12	0.86
wc6.1	1549.359	AB 50yr	1.39	86.10	86.63	86.63	86.74	0.013802	1.63	1.15	5.82	0.86
wc6.1	1549.359	AB 100yr	1.64	86.10	86.66	86.66	86.78	0.013576	1.71	1.33	6.32	0.86
wc6.1	1423.360	AB 10yr	0.88	84.60	85.16	84.85	85.18	0.001095	0.50	1.75	4.24	0.25
wc6.1	1423.360	AB 20yr	1.09	84.60	85.22	84.88	85.23	0.001201	0.55	1.97	4.45	0.26
wc6.1	1423.360	AB 50yr	1.39	84.60	85.28	84.93	85.30	0.001292	0.61	2.29	4.73	0.28
wc6.1	1423.360	AB 100yr	1.64	84.60	85.34	84.96	85.36	0.001327	0.64	2.56	4.95	0.28
wc6.1	1420.606	AB 10yr	0.88	84.57	85.15	84.82	85.17	0.001016	0.62	1.43	4.33	0.26
wc6.1	1420.606	AB 20yr	1.09	84.57	85.20	84.85	85.23	0.001192	0.71	1.55	4.52	0.29
wc6.1	1420.606	AB 50yr	1.39	84.57	85.26	84.90	85.30	0.001404	0.82	1.70	4.78	0.32
wc6.1	1420.606	AB 100yr	1.64	84.57	85.31	84.94	85.35	0.001548	0.90	1.83	4.97	0.34
wc6.1	1393.68		Culvert									
wc6.1	1368.765	AB 10yr	0.88	84.77	85.09		85.16	0.007342	1.12	0.78	4.37	0.64
wc6.1	1368.765	AB 20yr	1.09	84.77	85.12		85.20	0.008215	1.26	0.86	4.60	0.69
wc6.1	1368.765	AB 50yr	1.39	84.77	85.16		85.27	0.009464	1.45	0.96	4.87	0.75
wc6.1	1368.765	AB 100yr	1.64	84.77	85.19		85.32	0.010507	1.60	1.02	5.07	0.80
wc6.1	1366.013	AB 10yr	0.88	84.75	85.08		85.13	0.008024	1.02	0.87	3.31	0.63
wc6.1	1366.013	AB 20yr	1.09	84.75	85.11		85.17	0.008762	1.12	0.97	3.43	0.67
wc6.1	1366.013	AB 50yr	1.39	84.75	85.15		85.23	0.009705	1.25	1.11	3.59	0.71
wc6.1	1366.013	AB 100yr	1.64	84.75	85.18		85.27	0.010351	1.34	1.22	3.71	0.74
wc6.1	1346.971	AB 10yr	0.88	84.61	84.92	84.87	84.96	0.009829	0.91	0.97	5.29	0.67
wc6.1	1346.971	AB 20yr	1.09	84.61	84.94	84.89	84.99	0.009795	0.98	1.12	5.43	0.69
wc6.1	1346.971	AB 50yr	1.39	84.61	84.98		85.04	0.009777	1.06	1.31	5.60	0.70
wc6.1	1346.971	AB 100yr	1.64	84.61	85.00		85.07	0.009773	1.12	1.46	5.74	0.71
wc6.1	1273.903	AB 10yr	0.88	83.57	83.82	83.82	83.92	0.021691	1.43	0.62	2.99	1.01
wc6.1	1273.903	AB 20yr	1.09	83.57	83.85	83.85	83.97	0.021008	1.51	0.72	3.12	1.01
wc6.1	1273.903	AB 50yr	1.39	83.57	83.90	83.90	84.03	0.020271	1.61	0.86	3.30	1.01
wc6.1	1273.903	AB 100yr	1.64	83.57	83.93	83.93	84.07	0.019665	1.68	0.98	3.51	1.00
wc6.1	1166.891	AB 10yr	1.34	82.04	82.95		82.96	0.000381	0.38	3.48	5.64	0.16
wc6.1	1166.891	AB 20yr	1.66	82.04	83.08		83.08	0.000337	0.39	4.23	7.11	0.15
wc6.1	1166.891	AB 50yr	2.14	82.04	83.25		83.26	0.000231	0.38	7.05	22.05	0.13
wc6.1	1166.891	AB 100yr	2.55	82.04	83.40		83.41	0.000149	0.34	11.52	35.39	0.11
wc6.1	1163.643	AB 10yr	1.34	81.98	82.92	82.36	82.95	0.000831	0.79	1.69	5.76	0.26
wc6.1	1163.643	AB 20yr	1.66	81.98	83.04	82.42	83.08	0.000862	0.87	1.91	9.38	0.27
wc6.1	1163.643	AB 50yr	2.14	81.98	83.21	82.50	83.25	0.000879	0.97	2.21	10.31	0.28

HEC-RAS Plan: FUT 5&6

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc5	2388.964	AB 2yr	1.31	92.94	93.29	93.29	93.41	0.019896	1.52	0.86	3.59	0.99
wc5	2388.964	AB 5yr	2.16	92.94	93.40	93.40	93.54	0.019382	1.66	1.30	4.68	1.01
wc5	2388.964	AB 10yr	2.93	92.94	93.47	93.47	93.63	0.018529	1.74	1.69	5.51	1.00
wc5	2388.964	AB 20yr	3.86	92.94	93.66	93.55	93.72	0.004890	1.13	4.88	31.47	0.55
wc5	2388.964	AB 50yr	5.42	92.94	93.81	93.68	93.84	0.001986	0.88	9.76	35.46	0.37
wc5	2388.964	AB 100yr	6.90	92.94	93.95	93.72	93.97	0.001048	0.73	14.95	39.26	0.27
wc5	2290	AB 2yr	1.31	92.11	92.72		92.75	0.002742	0.80	1.64	3.92	0.39
wc5	2290	AB 5yr	2.16	92.11	93.00		93.03	0.001554	0.74	2.92	5.06	0.31
wc5	2290	AB 10yr	2.93	92.11	93.24		93.27	0.001043	0.69	4.26	6.09	0.26
wc5	2290	AB 20yr	3.86	92.11	93.53		93.55	0.000678	0.62	6.18	7.38	0.22
wc5	2290	AB 50yr	5.42	92.11	93.61		93.64	0.001025	0.79	6.84	7.78	0.27
wc5	2290	AB 100yr	6.90	92.11	93.77		93.81	0.001057	0.85	8.17	9.96	0.28
wc5	2256	AB 2yr	1.31	91.88	92.60	92.28	92.66	0.002268	1.08	1.22	4.38	0.41
wc5	2256	AB 5yr	2.16	91.88	92.88	92.43	92.96	0.002073	1.28	1.69	5.49	0.41
wc5	2256	AB 10yr	2.93	91.88	93.11	92.56	93.21	0.001892	1.41	2.08	6.25	0.41
wc5	2256	AB 20yr	3.86	91.88	93.38	92.69	93.50	0.001670	1.51	2.55	8.67	0.39
wc5	2256	AB 50yr	5.42	91.88	93.30	92.89	93.56	0.003972	2.25	2.41	6.89	0.60
wc5	2256	AB 100yr	6.90	91.88	93.16	93.07	93.68	0.009268	3.20	2.16	6.41	0.91
wc5	2240.61		Culvert									
wc5	2221	AB 2yr	1.31	91.59	92.04		92.20	0.011001	1.73	0.76	3.30	0.83
wc5	2221	AB 5yr	2.16	91.59	92.16	92.14	92.42	0.013957	2.27	0.95	3.76	0.97
wc5	2221	AB 10yr	2.93	91.59	92.27	92.27	92.61	0.014156	2.58	1.14	4.19	1.01
wc5	2221	AB 20yr	3.86	91.59	92.40	92.40	92.81	0.013323	2.82	1.37	4.73	1.01
wc5	2221	AB 50yr	5.42	91.59	92.61	92.61	93.12	0.012341	3.16	1.71	5.84	1.01
wc5	2221	AB 100yr	6.90	91.59	92.78	92.78	93.38	0.011690	3.43	2.01	8.00	1.00
wc5	2198	AB 2yr	1.31	91.41	91.86		91.93	0.008566	1.21	1.09	3.31	0.67
wc5	2198	AB 5yr	2.16	91.41	92.00		92.09	0.008412	1.38	1.57	3.85	0.69
wc5	2198	AB 10yr	2.93	91.41	92.09		92.21	0.008311	1.49	1.97	4.24	0.70
wc5	2198	AB 20yr	3.86	91.41	92.20		92.33	0.008255	1.60	2.42	4.65	0.71
wc5	2198	AB 50yr	5.42	91.41	92.34		92.49	0.008109	1.73	3.13	5.22	0.71
wc5	2198	AB 100yr	6.90	91.41	92.44		92.62	0.008304	1.88	3.68	6.02	0.74
wc5	2150	AB 2yr	1.31	91.07	91.55		91.61	0.006821	1.11	1.18	3.42	0.60
wc5	2150	AB 5yr	2.16	91.07	91.69		91.77	0.006755	1.27	1.70	3.98	0.62
wc5	2150	AB 10yr	2.93	91.07	91.80		91.89	0.006601	1.37	2.14	4.40	0.63
wc5	2150	AB 20yr	3.86	91.07	91.91		92.02	0.006360	1.45	2.66	4.85	0.62
wc5	2150	AB 50yr	5.42	91.07	92.07		92.19	0.005940	1.54	3.51	5.53	0.62
wc5	2150	AB 100yr	6.90	91.07	92.19		92.33	0.005462	1.66	4.26	7.43	0.61
wc5	2068.437	AB 2yr	1.31	90.36	90.80		90.89	0.011843	1.38	0.95	2.93	0.77
wc5	2068.437	AB 5yr	2.16	90.36	90.93		91.06	0.011839	1.61	1.34	3.18	0.79
wc5	2068.437	AB 10yr	2.93	90.36	91.02		91.18	0.011970	1.77	1.65	3.36	0.81
wc5	2068.437	AB 20yr	3.86	90.36	91.12		91.31	0.012285	1.94	1.99	3.55	0.83
wc5	2068.437	AB 50yr	5.42	90.36	91.25		91.50	0.013020	2.18	2.49	3.81	0.86
wc5	2068.437	AB 100yr	6.90	90.36	91.35	91.29	91.65	0.013669	2.40	2.92	5.92	0.90
wc5	2044.707	AB 2yr	1.31	89.83	90.30		90.36	0.007514	1.15	1.14	3.37	0.63
wc5	2044.707	AB 5yr	2.16	89.83	90.43	90.31	90.52	0.007542	1.32	1.63	3.91	0.65
wc5	2044.707	AB 10yr	2.93	89.83	90.53	90.39	90.64	0.007584	1.44	2.04	4.31	0.67
wc5	2044.707	AB 20yr	3.86	89.83	90.63	90.48	90.75	0.007650	1.55	2.49	4.71	0.68
wc5	2044.707	AB 50yr	5.42	89.83	90.78	90.61	90.92	0.007532	1.69	3.22	5.29	0.69
wc5	2044.707	AB 100yr	6.90	89.83	90.88	90.71	91.05	0.007520	1.83	3.80	6.41	0.70
wc5	1986.134	AB 2yr	1.31	89.59	89.97	89.95	90.08	0.015977	1.51	0.87	3.03	0.90
wc5	1986.134	AB 5yr	2.16	89.59	90.08	90.06	90.24	0.016250	1.75	1.24	3.48	0.94
wc5	1986.134	AB 10yr	2.93	89.59	90.16	90.15	90.35	0.016437	1.91	1.54	3.81	0.96
wc5	1986.134	AB 20yr	3.86	89.59	90.25	90.24	90.47	0.016354	2.05	1.88	4.16	0.97
wc5	1986.134	AB 50yr	5.42	89.59	90.37	90.37	90.63	0.016889	2.27	2.39	4.62	1.01
wc5	1986.134	AB 100yr	6.90	89.59	90.47	90.47	90.76	0.016320	2.39	2.89	5.04	1.01
wc5	1901.030	AB 2yr	1.31	88.78	89.29		89.35	0.005246	1.01	1.30	3.55	0.53
wc5	1901.030	AB 5yr	2.16	88.78	89.45		89.52	0.004869	1.13	1.92	4.19	0.53
wc5	1901.030	AB 10yr	2.93	88.78	89.57		89.65	0.004592	1.20	2.45	4.67	0.53
wc5	1901.030	AB 20yr	3.86	88.78	89.70		89.78	0.004349	1.26	3.06	5.17	0.52
wc5	1901.030	AB 50yr	5.42	88.78	89.87		89.96	0.003858	1.36	4.03	6.33	0.51
wc5	1901.030	AB 100yr	6.90	88.78	90.01		90.11	0.003435	1.44	4.99	7.60	0.49
wc5	1874.583	AB 2yr	1.31	88.53	89.08		89.16	0.008935	1.30	1.01	2.69	0.68
wc5	1874.583	AB 5yr	2.16	88.53	89.22		89.34	0.009453	1.53	1.41	3.01	0.71
wc5	1874.583	AB 10yr	2.93	88.53	89.32		89.47	0.009922	1.70	1.73	3.25	0.74
wc5	1874.583	AB 20yr	3.86	88.53	89.42		89.60	0.010455	1.86	2.07	3.48	0.77
wc5	1874.583	AB 50yr	5.42	88.53	89.56		89.78	0.011617	2.12	2.56	3.79	0.82
wc5	1874.583	AB 100yr	6.90	88.53	89.64	89.58	89.93	0.013540	2.39	2.89	3.98	0.90

HEC-RAS Plan: FUT 5&6 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc5	1845.237	AB 2yr	1.31	88.39	88.91		88.96	0.005004	0.99	1.32	3.58	0.52
wc5	1845.237	AB 5yr	2.16	88.39	89.06		89.12	0.005009	1.14	1.90	4.17	0.54
wc5	1845.237	AB 10yr	2.93	88.39	89.17		89.24	0.005004	1.23	2.37	4.61	0.55
wc5	1845.237	AB 20yr	3.86	88.39	89.28		89.37	0.005013	1.33	2.91	5.05	0.56
wc5	1845.237	AB 50yr	5.42	88.39	89.42		89.53	0.005013	1.47	3.71	6.72	0.57
wc5	1845.237	AB 100yr	6.90	88.39	89.53		89.66	0.004958	1.61	4.48	8.07	0.58
wc5	1801.453	AB 2yr	1.31	88.17	88.69		88.74	0.005138	1.00	1.31	3.56	0.53
wc5	1801.453	AB 5yr	2.16	88.17	88.84		88.90	0.005087	1.14	1.89	4.16	0.54
wc5	1801.453	AB 10yr	2.93	88.17	88.95		89.02	0.005049	1.24	2.37	4.60	0.55
wc5	1801.453	AB 20yr	3.86	88.17	89.06		89.15	0.005057	1.33	2.90	5.04	0.56
wc5	1801.453	AB 50yr	5.42	88.17	89.20		89.31	0.005049	1.47	3.69	5.93	0.57
wc5	1801.453	AB 100yr	6.90	88.17	89.31		89.44	0.005021	1.61	4.44	9.02	0.59
wc5	1693.967	AB 2yr	1.31	87.76	88.28		88.33	0.004838	0.98	1.33	3.60	0.51
wc5	1693.967	AB 5yr	2.16	87.76	88.43		88.50	0.004941	1.13	1.91	4.18	0.54
wc5	1693.967	AB 10yr	2.93	87.76	88.54		88.62	0.004976	1.23	2.38	4.61	0.55
wc5	1693.967	AB 20yr	3.86	87.76	88.65		88.74	0.005011	1.33	2.91	5.05	0.56
wc5	1693.967	AB 50yr	5.42	87.76	88.79		88.90	0.005189	1.48	3.66	5.72	0.58
wc5	1693.967	AB 100yr	6.90	87.76	88.91		89.04	0.004862	1.60	4.38	6.62	0.58
wc5	1602.883	AB 2yr	1.31	87.17	87.68		87.73	0.005373	1.02	1.28	3.54	0.54
wc5	1602.883	AB 5yr	2.16	87.17	87.83		87.90	0.005139	1.15	1.88	4.16	0.55
wc5	1602.883	AB 10yr	2.93	87.17	87.95		88.02	0.005063	1.24	2.36	4.60	0.55
wc5	1602.883	AB 20yr	3.86	87.17	88.06		88.15	0.005003	1.33	2.91	5.05	0.56
wc5	1602.883	AB 50yr	5.42	87.17	88.23		88.33	0.004498	1.42	3.91	9.12	0.54
wc5	1602.883	AB 100yr	6.90	87.17	88.27		88.42	0.005706	1.67	4.43	12.26	0.62
wc5	1537.467	AB 2yr	1.31	86.84	87.41		87.45	0.003489	0.87	1.50	3.78	0.44
wc5	1537.467	AB 5yr	2.16	86.84	87.57		87.62	0.003453	0.99	2.17	4.43	0.45
wc5	1537.467	AB 10yr	2.93	86.84	87.65		87.72	0.004184	1.16	2.54	4.75	0.50
wc5	1537.467	AB 20yr	3.86	86.84	87.71		87.81	0.005390	1.36	2.83	4.99	0.58
wc5	1537.467	AB 50yr	5.42	86.84	87.73		87.91	0.009595	1.84	2.94	5.08	0.77
wc5	1537.467	AB 100yr	6.90	86.84	87.91	87.91	88.04	0.005724	1.63	5.99	38.90	0.62
wc5	1471.795	AB 2yr	1.31	86.50	87.00		87.09	0.009616	1.31	1.00	2.87	0.71
wc5	1471.795	AB 5yr	2.16	86.50	87.13		87.25	0.010369	1.54	1.40	3.31	0.75
wc5	1471.795	AB 10yr	2.93	86.50	87.27	87.27	87.37	0.006677	1.45	2.68	22.31	0.63
wc5	1471.795	AB 20yr	3.86	86.50	87.33	87.33	87.43	0.006225	1.50	4.05	24.46	0.62
wc5	1471.795	AB 50yr	5.42	86.50	87.46		87.51	0.003486	1.28	7.48	29.22	0.48
wc5	1471.795	AB 100yr	6.90	86.50	87.51		87.57	0.003735	1.38	9.01	32.53	0.50
wc5	1439.675	AB 2yr	1.31	86.27	86.73	86.63	86.80	0.007929	1.17	1.12	3.34	0.65
wc5	1439.675	AB 5yr	2.16	86.27	86.89	86.75	86.97	0.006655	1.26	1.71	3.99	0.62
wc5	1439.675	AB 10yr	2.93	86.27	86.98	86.84	87.08	0.007439	1.43	2.05	4.32	0.66
wc5	1439.675	AB 20yr	3.86	86.27	87.05	86.92	87.19	0.008383	1.60	2.41	4.64	0.71
wc5	1439.675	AB 50yr	5.42	86.27	87.15	87.05	87.33	0.009725	1.85	3.26	16.11	0.78
wc5	1439.675	AB 100yr	6.90	86.27	87.46	87.27	87.49	0.001421	0.90	13.50	44.81	0.32
wc5	1320.692	AB 2yr	1.56	85.57	86.12	85.97	86.18	0.005741	1.10	1.42	3.69	0.56
wc5	1320.692	AB 5yr	2.53	85.57	86.23		86.33	0.007148	1.35	1.87	4.15	0.64
wc5	1320.692	AB 10yr	3.40	85.57	86.38		86.47	0.005790	1.35	2.51	4.73	0.59
wc5	1320.692	AB 20yr	4.43	85.57	86.56		86.64	0.004204	1.29	3.44	5.45	0.52
wc5	1320.692	AB 50yr	6.23	85.57	86.86		86.93	0.002225	1.21	5.39	7.66	0.40
wc5	1320.692	AB 100yr	8.82	85.57	87.31		87.37	0.001036	1.08	9.75	13.76	0.29
wc5	1316.508	AB 2yr	1.56	85.38	85.77	85.77	85.93	0.019106	1.74	0.90	3.08	1.00
wc5	1316.508	AB 5yr	2.53	85.38	86.03	85.89	86.15	0.006597	1.51	1.67	4.12	0.65
wc5	1316.508	AB 10yr	3.40	85.38	86.22	85.98	86.34	0.004548	1.52	2.23	4.87	0.56
wc5	1316.508	AB 20yr	4.43	85.38	86.42	86.09	86.54	0.003554	1.57	2.82	5.65	0.52
wc5	1316.508	AB 50yr	6.23	85.38	86.72	86.24	86.86	0.002764	1.67	3.73	6.88	0.48
wc5	1316.508	AB 100yr	8.82	85.38	87.17	86.43	87.32	0.001973	1.74	5.08	15.95	0.43
wc5	1307.90		Culvert									
wc5	1291.617	AB 2yr	1.56	85.19	85.69		85.78	0.007162	1.32	1.19	3.50	0.65
wc5	1291.617	AB 5yr	2.53	85.19	85.82		85.96	0.007516	1.62	1.56	4.03	0.69
wc5	1291.617	AB 10yr	3.40	85.19	85.92		86.10	0.007956	1.85	1.83	4.42	0.73
wc5	1291.617	AB 20yr	4.43	85.19	86.01		86.24	0.008634	2.11	2.10	4.80	0.78
wc5	1291.617	AB 50yr	6.23	85.19	86.14	86.06	86.47	0.010124	2.54	2.45	5.31	0.87
wc5	1291.617	AB 100yr	8.82	85.19	86.27	86.27	86.77	0.013068	3.15	2.80	5.71	1.01
wc5	1288.054	AB 2yr	1.56	85.00	85.52		85.59	0.007309	1.20	1.30	3.56	0.63
wc5	1288.054	AB 5yr	2.53	85.00	85.66		85.75	0.007292	1.36	1.86	4.14	0.65
wc5	1288.054	AB 10yr	3.40	85.00	85.76		85.87	0.007299	1.47	2.31	4.55	0.66
wc5	1288.054	AB 20yr	4.43	85.00	85.87		85.99	0.007325	1.58	2.80	4.96	0.67
wc5	1288.054	AB 50yr	6.23	85.00	86.02		86.17	0.007297	1.74	3.59	5.51	0.69
wc5	1288.054	AB 100yr	8.82	85.00	86.16		86.37	0.007365	2.00	4.42	5.63	0.71



HEC-RAS Plan: FUT 5&6 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc5	1225.493	AB 2yr	1.56	84.72	85.23		85.31	0.007601	1.21	1.29	3.54	0.64
wc5	1225.493	AB 5yr	2.53	84.72	85.37		85.47	0.007602	1.38	1.83	4.11	0.66
wc5	1225.493	AB 10yr	3.40	84.72	85.47		85.59	0.007600	1.50	2.27	4.52	0.67
wc5	1225.493	AB 20yr	4.43	84.72	85.58		85.71	0.007598	1.60	2.76	4.93	0.68
wc5	1225.493	AB 50yr	6.23	84.72	85.73		85.89	0.007602	1.76	3.54	5.53	0.70
wc5	1225.493	AB 100yr	8.82	84.72	85.88		86.08	0.007582	2.02	4.41	6.13	0.72
wc5	1157.883	AB 2yr	1.56	84.21	84.72		84.80	0.007443	1.20	1.30	3.55	0.64
wc5	1157.883	AB 5yr	2.53	84.21	84.87		84.96	0.007420	1.37	1.84	4.12	0.65
wc5	1157.883	AB 10yr	3.40	84.21	84.97		85.08	0.007405	1.48	2.29	4.54	0.67
wc5	1157.883	AB 20yr	4.43	84.21	85.07		85.20	0.007392	1.59	2.79	4.96	0.68
wc5	1157.883	AB 50yr	6.23	84.21	85.22		85.38	0.007401	1.74	3.57	5.58	0.69
wc5	1157.883	AB 100yr	8.82	84.21	85.37		85.58	0.007406	2.00	4.47	6.47	0.72
wc5	1131.031	AB 2yr	1.56	84.01	84.53		84.60	0.007071	1.18	1.32	3.58	0.62
wc5	1131.031	AB 5yr	2.53	84.01	84.67		84.77	0.007099	1.35	1.87	4.15	0.64
wc5	1131.031	AB 10yr	3.40	84.01	84.78		84.89	0.007136	1.46	2.32	4.57	0.65
wc5	1131.031	AB 20yr	4.43	84.01	84.88		85.01	0.007154	1.57	2.82	4.98	0.67
wc5	1131.031	AB 50yr	6.23	84.01	85.03		85.18	0.007136	1.73	3.61	5.68	0.68
wc5	1131.031	AB 100yr	8.82	84.01	85.18		85.38	0.007091	1.98	4.57	7.02	0.70
wc5	1112.568	AB 2yr	1.56	83.88	84.39	84.28	84.47	0.007533	1.21	1.29	3.55	0.64
wc5	1112.568	AB 5yr	2.53	83.88	84.53	84.40	84.63	0.007511	1.38	1.84	4.12	0.66
wc5	1112.568	AB 10yr	3.40	83.88	84.64	84.49	84.75	0.007568	1.49	2.27	4.52	0.67
wc5	1112.568	AB 20yr	4.43	83.88	84.74	84.59	84.87	0.007553	1.60	2.77	4.94	0.68
wc5	1112.568	AB 50yr	6.23	83.88	84.89	84.72	85.05	0.007553	1.76	3.55	5.56	0.70
wc5	1112.568	AB 100yr	8.82	83.88	85.04	84.88	85.24	0.007522	2.01	4.45	6.47	0.72
wc5	1071.480	AB 2yr	1.56	83.57	84.08		84.15	0.007623	1.21	1.28	3.54	0.64
wc5	1071.480	AB 5yr	2.53	83.57	84.22		84.32	0.007581	1.38	1.83	4.11	0.66
wc5	1071.480	AB 10yr	3.40	83.57	84.33		84.44	0.007509	1.49	2.28	4.53	0.67
wc5	1071.480	AB 20yr	4.43	83.57	84.43		84.56	0.007377	1.59	2.79	4.96	0.68
wc5	1071.480	AB 50yr	6.23	83.57	84.58		84.74	0.007444	1.75	3.57	5.53	0.69
wc5	1071.480	AB 100yr	8.82	83.57	84.73		84.94	0.007402	2.00	4.43	5.96	0.72
wc5	1034.499	AB 2yr	1.56	83.29	83.81	83.69	83.88	0.006887	1.17	1.33	3.59	0.61
wc5	1034.499	AB 5yr	2.53	83.29	83.97	83.81	84.06	0.006416	1.30	1.95	4.22	0.61
wc5	1034.499	AB 10yr	3.40	83.29	84.09	83.90	84.18	0.006127	1.38	2.46	4.68	0.61
wc5	1034.499	AB 20yr	4.43	83.29	84.21	84.00	84.31	0.005781	1.45	3.05	5.17	0.60
wc5	1034.499	AB 50yr	6.23	83.29	84.36	84.13	84.49	0.005679	1.61	3.87	5.82	0.61
wc5	1034.499	AB 100yr	8.82	83.29	84.49	84.29	84.67	0.006466	1.92	4.61	5.86	0.67
wc5	1013.774	AB 2yr	1.56	83.14	83.69	83.54	83.75	0.005703	1.09	1.43	3.70	0.56
wc5	1013.774	AB 5yr	2.53	83.14	83.86	83.66	83.93	0.005050	1.19	2.12	4.39	0.55
wc5	1013.774	AB 10yr	3.40	83.14	83.98	83.75	84.07	0.004793	1.26	2.69	4.88	0.54
wc5	1013.774	AB 20yr	4.43	83.14	84.11	83.84	84.20	0.004480	1.32	3.36	5.39	0.53
wc5	1013.774	AB 50yr	6.23	83.14	84.27	83.98	84.38	0.004238	1.47	4.28	6.48	0.54
wc5	1013.774	AB 100yr	8.82	83.14	84.38	84.14	84.55	0.005384	1.82	5.03	7.29	0.62
wc5	951.8970	AB 2yr	2.17	82.62	83.25	83.12	83.34	0.007393	1.33	1.63	3.76	0.65
wc5	951.8970	AB 5yr	3.50	82.62	83.40	83.26	83.52	0.008073	1.57	2.23	4.28	0.69
wc5	951.8970	AB 10yr	4.66	82.62	83.51	83.36	83.66	0.008364	1.72	2.72	4.66	0.72
wc5	951.8970	AB 20yr	6.00	82.62	83.59	83.47	83.78	0.009495	1.92	3.12	4.95	0.77
wc5	951.8970	AB 50yr	8.14	82.62	83.72	83.61	83.95	0.010224	2.14	3.80	5.41	0.81
wc5	951.8970	AB 100yr	10.30	82.62	83.88	83.74	84.12	0.008328	2.17	5.04	10.77	0.76
wc5	942.8887	AB 2yr	2.17	82.59	83.21	83.07	83.29	0.006912	1.28	1.69	3.97	0.63
wc5	942.8887	AB 5yr	3.50	82.59	83.36	83.21	83.47	0.007532	1.50	2.33	4.57	0.67
wc5	942.8887	AB 10yr	4.66	82.59	83.47	83.31	83.60	0.007253	1.63	2.85	5.02	0.68
wc5	942.8887	AB 20yr	6.00	82.59	83.55	83.41	83.72	0.008044	1.86	3.22	5.32	0.73
wc5	942.8887	AB 50yr	8.14	82.59	83.54	83.54	83.87	0.015298	2.55	3.19	5.29	1.00
wc5	942.8887	AB 100yr	10.30	82.59	83.65	83.65	84.04	0.014546	2.76	3.73	6.83	1.00
wc5	937.1887		Culvert									
wc5	931	AB 2yr	2.17	82.47	83.23	82.95	83.28	0.002842	0.94	2.30	4.55	0.42
wc5	931	AB 5yr	3.50	82.47	83.38	83.09	83.45	0.003509	1.19	2.95	5.13	0.48
wc5	931	AB 10yr	4.66	82.47	83.48	83.19	83.57	0.003903	1.36	3.44	5.87	0.51
wc5	931	AB 20yr	6.00	82.47	83.55	83.29	83.68	0.004752	1.59	3.77	6.68	0.57
wc5	931	AB 50yr	8.14	82.47	83.45	83.42	83.76	0.013681	2.47	3.30	5.42	0.95
wc5	931	AB 100yr	10.30	82.47	83.54	83.54	83.93	0.014649	2.77	3.72	8.40	1.00
wc5	918.3739	AB 2yr	2.17	82.41	83.07	83.02	83.19	0.014024	1.54	1.41	4.32	0.86
wc5	918.3739	AB 5yr	3.50	82.41	83.23	83.15	83.36	0.010571	1.59	2.20	5.17	0.78
wc5	918.3739	AB 10yr	4.66	82.41	83.35	83.24	83.49	0.008793	1.62	2.88	5.68	0.73
wc5	918.3739	AB 20yr	6.00	82.41	83.47	83.33	83.60	0.007174	1.62	4.42	25.85	0.67
wc5	918.3739	AB 50yr	8.14	82.41	83.57	83.57	83.58	0.000873	0.61	32.90	184.55	0.24
wc5	918.3739	AB 100yr	10.30	82.41	83.57	83.57	83.59	0.001365	0.77	33.18	184.55	0.30

HEC-RAS Plan: FUT 5&6 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc5	815.3577	AB 2yr	2.17	81.85	82.61	82.33	82.65	0.003035	0.95	2.29	4.53	0.43
wc5	815.3577	AB 5yr	3.50	81.85	82.78	82.47	82.85	0.003319	1.11	3.15	5.24	0.46
wc5	815.3577	AB 10yr	4.66	81.85	82.90	82.57	82.98	0.003686	1.22	3.81	5.95	0.49
wc5	815.3577	AB 20yr	6.00	81.85	83.01	82.68	83.10	0.004248	1.34	4.48	6.81	0.53
wc5	815.3577	AB 50yr	8.14	81.85	83.20	82.82	83.29	0.004077	1.38	5.90	8.36	0.52
wc5	815.3577	AB 100yr	10.30	81.85	83.14	82.95	83.32	0.007927	1.89	5.44	7.89	0.73
wc5	680.8133	AB 2yr	2.52	81.64	82.53	82.16	82.57	0.002119	0.86	2.92	5.06	0.36
wc5	680.8133	AB 5yr	4.00	81.64	82.69	82.31	82.75	0.002504	1.06	3.79	5.62	0.41
wc5	680.8133	AB 10yr	5.25	81.64	82.80	82.41	82.88	0.002620	1.19	4.43	5.86	0.43
wc5	680.8133	AB 20yr	6.67	81.64	82.88	82.51	82.98	0.003069	1.38	4.90	6.03	0.47
wc5	680.8133	AB 50yr	8.89	81.64	83.06	82.65	83.18	0.002948	1.52	5.99	6.42	0.47
wc5	680.8133	AB 100yr	11.00	81.64	83.27	82.75	83.27	0.000011	0.10	152.83	155.48	0.03
wc5	678.6898	AB 2yr	2.52	81.55	82.51	82.07	82.54	0.001531	0.77	3.29	5.34	0.31
wc5	678.6898	AB 5yr	4.00	81.55	82.67	82.22	82.72	0.001826	0.96	4.18	5.70	0.35
wc5	678.6898	AB 10yr	5.25	81.55	82.78	82.32	82.84	0.002001	1.10	4.81	5.89	0.38
wc5	678.6898	AB 20yr	6.67	81.55	82.86	82.42	82.94	0.002443	1.28	5.26	6.02	0.42
wc5	678.6898	AB 50yr	8.89	81.55	83.03	82.56	83.14	0.002428	1.44	6.34	6.31	0.43
wc5	678.6898	AB 100yr	11.00	81.55	83.27	82.66	83.27	0.000013	0.12	144.07	154.40	0.03
wc5	665	AB 2yr	2.52	81.40	82.21	82.10	82.28	0.008052	1.19	2.12	6.43	0.66
wc5	665	AB 5yr	4.00	81.40	82.45	82.22	82.50	0.004128	1.01	3.95	9.27	0.50
wc5	665	AB 10yr	5.25	81.40	82.62	82.30	82.66	0.002110	0.85	7.99	50.16	0.37
wc5	665	AB 20yr	6.67	81.40	82.81	82.38	82.82	0.000512	0.51	25.83	123.09	0.19
wc5	665	AB 50yr	8.89	81.40	83.06	82.49	83.06	0.000113	0.29	63.66	177.85	0.09
wc5	665	AB 100yr	11.00	81.40	83.26	82.68	83.26	0.000044	0.21	100.46	178.40	0.06
wc5	660	AB 2yr	2.52	81.32	82.02	82.02	82.23	0.019081	2.03	1.24	3.47	1.02
wc5	660	AB 5yr	4.00	81.32	82.18	82.18	82.45	0.017609	2.33	1.72	4.10	1.01
wc5	660	AB 10yr	5.25	81.32	82.29	82.29	82.61	0.016968	2.53	2.07	4.56	1.01
wc5	660	AB 20yr	6.67	81.32	82.41	82.41	82.78	0.016194	2.71	2.46	5.06	1.00
wc5	660	AB 50yr	8.89	81.32	82.57	82.57	83.01	0.015629	2.95	3.02	5.74	1.00
wc5	660	AB 100yr	11.00	81.32	82.71	82.71	83.21	0.015284	3.13	3.51	6.32	1.00
wc5	655		Culvert									
wc5	651.8919	AB 2yr	2.52	80.93	81.60	81.45	81.70	0.005763	1.34	1.88	4.20	0.59
wc5	651.8919	AB 5yr	4.00	80.93	81.78	81.58	81.91	0.005587	1.60	2.50	4.89	0.61
wc5	651.8919	AB 10yr	5.25	80.93	81.89	81.68	82.06	0.005860	1.81	2.90	5.33	0.64
wc5	651.8919	AB 20yr	6.67	80.93	81.97	81.79	82.19	0.006821	2.09	3.20	9.13	0.71
wc5	651.8919	AB 50yr	8.89	80.93	82.06	81.94	82.39	0.008815	2.53	3.52	12.67	0.82
wc5	651.8919	AB 100yr	11.00	80.93	82.07	82.07	82.56	0.013221	3.11	3.54	13.58	1.00
wc5	648.3854	AB 2yr	2.52	80.78	81.38	81.30	81.50	0.010732	1.57	1.61	3.89	0.78
wc5	648.3854	AB 5yr	4.00	80.78	81.47	81.45	81.68	0.015301	2.02	1.98	4.25	0.95
wc5	648.3854	AB 10yr	5.25	80.78	81.55	81.55	81.81	0.016778	2.25	2.34	4.58	1.00
wc5	648.3854	AB 20yr	6.67	80.78	81.65	81.65	81.94	0.016019	2.35	2.84	4.99	1.00
wc5	648.3854	AB 50yr	8.89	80.78	81.79	81.79	82.11	0.015515	2.51	3.54	5.68	1.00
wc5	648.3854	AB 100yr	11.00	80.78	81.93	81.93	81.93	0.000115	0.25	86.29	231.21	0.09
wc5	553.6066	AB 2yr	2.52	80.14	80.86	80.70	80.92	0.005941	1.09	2.30	6.39	0.58
wc5	553.6066	AB 5yr	4.00	80.14	81.06	80.83	81.11	0.004159	1.05	3.80	8.56	0.50
wc5	553.6066	AB 10yr	5.25	80.14	81.22	80.92	81.27	0.003018	0.99	5.30	10.29	0.44
wc5	553.6066	AB 20yr	6.67	80.14	81.39	81.00	81.43	0.002131	0.92	7.26	12.19	0.38
wc5	553.6066	AB 50yr	8.89	80.14	81.66	81.10	81.68	0.000762	0.64	22.76	118.42	0.24
wc5	553.6066	AB 100yr	11.00	80.14	81.87	81.18	81.87	0.000214	0.40	53.08	155.70	0.13
wc5	521.5115	AB 2yr	2.52	80.04	80.77	80.56	80.84	0.004912	1.18	2.14	4.40	0.54
wc5	521.5115	AB 5yr	4.00	80.04	80.96	80.71	81.04	0.004717	1.31	3.05	5.16	0.54
wc5	521.5115	AB 10yr	5.25	80.04	81.12	80.81	81.21	0.003744	1.33	4.00	6.67	0.50
wc5	521.5115	AB 20yr	6.67	80.04	81.31	80.91	81.39	0.002682	1.31	5.49	9.33	0.44
wc5	521.5115	AB 50yr	8.89	80.04	81.61	81.05	81.66	0.001336	1.12	12.45	38.58	0.33
wc5	521.5115	AB 100yr	11.00	80.04	81.87	81.16	81.87	0.000014	0.13	165.28	239.25	0.03
wc5	518.7136	AB 2yr	2.89	79.98	80.54	80.54	80.74	0.017449	2.02	1.43	3.73	1.00
wc5	518.7136	AB 5yr	4.54	79.98	80.77	80.69	80.97	0.010381	1.98	2.29	4.66	0.82
wc5	518.7136	AB 10yr	5.90	79.98	80.96	80.79	81.15	0.007074	1.96	3.01	5.41	0.70
wc5	518.7136	AB 20yr	7.43	79.98	81.14	80.90	81.35	0.005571	2.00	3.71	7.16	0.65
wc5	518.7136	AB 50yr	9.80	79.98	81.40	81.04	81.62	0.004473	2.10	4.68	14.03	0.60
wc5	518.7136	AB 100yr	11.90	79.98	81.60	81.17	81.85	0.003935	2.18	5.46	44.35	0.58
wc5	503.04		Culvert									
wc5	487.5449	AB 2yr	2.89	79.68	80.31	80.18	80.42	0.006691	1.47	1.97	6.12	0.65
wc5	487.5449	AB 5yr	4.54	79.68	80.46	80.32	80.62	0.007201	1.80	2.52	9.65	0.70
wc5	487.5449	AB 10yr	5.90	79.68	80.54	80.42	80.76	0.008296	2.08	2.83	10.51	0.77
wc5	487.5449	AB 20yr	7.43	79.68	80.60	80.52	80.90	0.010133	2.43	3.06	11.16	0.86
wc5	487.5449	AB 50yr	9.80	79.68	80.67	80.67	81.11	0.013268	2.94	3.33	11.92	1.00

HEC-RAS Plan: FUT 5&6 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc5	487.5449	AB 100yr	11.90	79.68	80.79	80.79	81.29	0.012768	3.14	3.79	13.47	1.00
wc5	484.1846	AB 2yr	2.89	79.63	80.29	80.13	80.36	0.005364	1.13	2.56	6.26	0.56
wc5	484.1846	AB 5yr	4.54	79.63	80.46	80.25	80.54	0.004516	1.21	3.80	9.34	0.54
wc5	484.1846	AB 10yr	5.90	79.63	80.57	80.34	80.65	0.004084	1.28	5.11	20.93	0.52
wc5	484.1846	AB 20yr	7.43	79.63	80.68	80.42	80.75	0.002961	1.21	8.98	42.01	0.46
wc5	484.1846	AB 50yr	9.80	79.63	80.79	80.65	80.84	0.002161	1.14	14.29	50.65	0.40
wc5	484.1846	AB 100yr	11.90	79.63	80.83	80.71	80.89	0.002467	1.25	16.14	52.97	0.43
wc5	381.2556	AB 2yr	2.89	79.11	79.91	79.67	79.98	0.004299	1.16	2.49	4.70	0.51
wc5	381.2556	AB 5yr	4.54	79.11	80.12	79.82	80.20	0.004018	1.28	3.55	5.50	0.51
wc5	381.2556	AB 10yr	5.90	79.11	80.25	79.93	80.34	0.003718	1.39	4.25	5.55	0.50
wc5	381.2556	AB 20yr	7.43	79.11	80.37	80.03	80.48	0.003609	1.51	4.94	5.60	0.51
wc5	381.2556	AB 50yr	9.80	79.11	80.55	80.16	80.65	0.002768	1.49	10.50	62.30	0.46
wc5	381.2556	AB 100yr	11.90	79.11	80.69	80.25	80.74	0.001510	1.20	20.06	72.71	0.35
wc5	359.8282	AB 2yr	2.89	78.85	79.67	79.48	79.77	0.006348	1.41	2.05	3.70	0.61
wc5	359.8282	AB 5yr	4.54	78.85	79.86	79.65	79.99	0.006564	1.61	2.82	4.24	0.63
wc5	359.8282	AB 10yr	5.90	78.85	79.97	79.76	80.14	0.007099	1.78	3.32	4.56	0.66
wc5	359.8282	AB 20yr	7.43	78.85	80.06	79.88	80.27	0.008170	1.99	3.74	4.81	0.72
wc5	359.8282	AB 50yr	9.80	78.85	80.18	80.03	80.44	0.009740	2.28	4.30	5.18	0.79
wc5	359.8282	AB 100yr	11.90	78.85	80.25	80.15	80.58	0.010980	2.53	4.74	7.31	0.85
wc5	304.0528	AB 2yr	2.89	78.22	79.04	78.98	79.19	0.012442	1.68	1.72	4.16	0.84
wc5	304.0528	AB 5yr	4.54	78.22	79.18	79.13	79.37	0.013757	1.96	2.32	4.83	0.90
wc5	304.0528	AB 10yr	5.90	78.22	79.27	79.27	79.49	0.013511	2.08	2.96	8.71	0.91
wc5	304.0528	AB 20yr	7.43	78.22	79.36	79.36	79.59	0.012578	2.18	3.76	9.53	0.90
wc5	304.0528	AB 50yr	9.80	78.22	79.47	79.47	79.72	0.011684	2.34	4.83	10.51	0.89
wc5	304.0528	AB 100yr	11.90	78.22	79.55	79.55	79.83	0.011062	2.45	5.74	11.30	0.88
wc5	250	AB 2yr	2.89	77.55	78.11	78.11	78.28	0.018726	1.80	1.61	5.01	1.01
wc5	250	AB 5yr	4.54	77.55	78.23	78.23	78.44	0.017442	2.02	2.25	5.53	1.01
wc5	250	AB 10yr	5.90	77.55	78.32	78.32	78.56	0.016757	2.16	2.73	5.90	1.01
wc5	250	AB 20yr	7.43	77.55	78.41	78.41	78.67	0.016177	2.28	3.26	6.27	1.01
wc5	250	AB 50yr	9.80	77.55	78.52	78.52	78.83	0.015543	2.44	4.02	6.79	1.01
wc5	250	AB 100yr	11.90	77.55	78.67	78.62	78.95	0.012187	2.36	5.05	7.42	0.91
wc5	230	AB 2yr	2.89	76.75	77.51	77.38	77.59	0.006197	1.27	2.27	6.54	0.61
wc5	230	AB 5yr	4.54	76.75	77.76	77.49	77.84	0.003274	1.26	3.61	8.59	0.48
wc5	230	AB 10yr	5.90	76.75	77.93	77.57	78.02	0.002647	1.31	4.50	9.68	0.45
wc5	230	AB 20yr	7.43	76.75	78.11	77.66	78.20	0.002288	1.38	5.40	10.61	0.43
wc5	230	AB 50yr	9.80	76.75	78.40	77.78	78.50	0.001742	1.42	6.92	12.39	0.39
wc5	230	AB 100yr	11.90	76.75	78.75	77.88	78.84	0.001185	1.36	8.73	19.60	0.34
wc5	215		Culvert									
wc5	200	AB 2yr	2.89	76.48	77.50		77.53	0.001314	0.80	3.62	7.49	0.31
wc5	200	AB 5yr	4.54	76.48	77.72		77.77	0.001277	0.95	4.79	8.48	0.32
wc5	200	AB 10yr	5.90	76.48	77.88		77.93	0.001284	1.05	5.60	9.32	0.32
wc5	200	AB 20yr	7.43	76.48	78.03		78.10	0.001313	1.16	6.38	10.32	0.34
wc5	200	AB 50yr	9.80	76.48	78.23		78.31	0.001387	1.32	7.42	11.60	0.35
wc5	200	AB 100yr	11.90	76.48	78.45		78.55	0.001248	1.38	8.60	13.05	0.34
wc5	170	AB 2yr	2.89	76.48	77.50	77.01	77.51	0.000585	0.49	5.96	10.56	0.20
wc5	170	AB 5yr	4.54	76.48	77.73	77.12	77.75	0.000481	0.55	8.58	12.22	0.19
wc5	170	AB 10yr	5.90	76.48	77.89	77.19	77.91	0.000440	0.59	10.62	13.37	0.19
wc5	170	AB 20yr	7.43	76.48	78.05	77.26	78.07	0.000396	0.62	13.63	16.64	0.18
wc5	170	AB 50yr	9.80	76.48	78.26	77.36	78.28	0.000369	0.67	17.15	17.28	0.18
wc5	170	AB 100yr	11.90	76.48	78.49	77.43	78.51	0.000299	0.67	21.26	18.00	0.17
wc6	2457.382	AB 2yr	1.12	91.31	91.81		91.88	0.006231	1.11	1.01	2.51	0.56
wc6	2457.382	AB 5yr	1.86	91.31	91.96		92.05	0.006107	1.35	1.40	2.85	0.58
wc6	2457.382	AB 10yr	2.54	91.31	92.06		92.18	0.006276	1.54	1.71	3.10	0.61
wc6	2457.382	AB 20yr	3.39	91.31	92.17		92.32	0.006658	1.75	2.05	3.35	0.64
wc6	2457.382	AB 50yr	5.21	91.31	92.34		92.56	0.007725	2.15	2.64	3.75	0.71
wc6	2457.382	AB 100yr	7.98	91.31	92.51	92.43	92.86	0.009774	2.71	3.32	4.16	0.83
wc6	2408.649	AB 2yr	1.12	91.02	91.59	91.37	91.63	0.003819	0.96	1.18	3.01	0.45
wc6	2408.649	AB 5yr	1.86	91.02	91.74	91.50	91.81	0.003888	1.17	1.73	4.18	0.47
wc6	2408.649	AB 10yr	2.54	91.02	91.84	91.60	91.92	0.004177	1.33	2.17	4.92	0.50
wc6	2408.649	AB 20yr	3.39	91.02	91.93	91.72	92.04	0.004490	1.51	2.69	5.81	0.53
wc6	2408.649	AB 50yr	5.21	91.02	92.09	91.91	92.23	0.005011	1.79	3.75	7.37	0.58
wc6	2408.649	AB 100yr	7.98	91.02	92.27	92.12	92.45	0.005491	2.10	5.26	9.30	0.62
wc6	2359.898	AB 2yr	1.12	90.74	91.09	91.09	91.24	0.021562	1.72	0.65	2.20	1.01
wc6	2359.898	AB 5yr	1.86	90.74	91.22	91.22	91.42	0.020434	1.96	0.95	2.46	1.01
wc6	2359.898	AB 10yr	2.54	90.74	91.33	91.33	91.53	0.017991	1.97	1.32	3.84	0.97
wc6	2359.898	AB 20yr	3.39	90.74	91.43	91.43	91.65	0.015397	2.09	1.73	4.67	0.93
wc6	2359.898	AB 50yr	5.21	90.74	91.60	91.60	91.85	0.012752	2.29	2.62	6.11	0.89

HEC-RAS Plan: FUT 5&6 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6	2359.898	AB 100yr	7.98	90.74	91.79	91.79	92.07	0.011026	2.52	3.96	7.77	0.86
wc6	2308.859	AB 2yr	1.12	90.44	90.79		90.79	0.001279	0.42	2.67	9.97	0.26
wc6	2308.859	AB 5yr	1.86	90.44	90.86		90.88	0.001532	0.54	3.46	10.13	0.29
wc6	2308.859	AB 10yr	2.54	90.44	90.92		90.94	0.001785	0.63	4.01	10.25	0.32
wc6	2308.859	AB 20yr	3.39	90.44	90.99		91.01	0.001871	0.72	4.74	10.40	0.34
wc6	2308.859	AB 50yr	5.21	90.44	91.09		91.13	0.002308	0.90	5.81	10.72	0.39
wc6	2308.859	AB 100yr	7.98	90.44	91.21		91.27	0.002857	1.13	7.15	11.78	0.44
wc6	2232.182	AB 2yr	1.12	90.33	90.61		90.63	0.004676	0.54	2.08	14.51	0.45
wc6	2232.182	AB 5yr	1.86	90.33	90.66		90.68	0.005307	0.68	2.78	16.97	0.50
wc6	2232.182	AB 10yr	2.54	90.33	90.71		90.73	0.004535	0.73	3.65	19.73	0.48
wc6	2232.182	AB 20yr	3.39	90.33	90.71		90.75	0.007958	0.97	3.67	19.80	0.64
wc6	2232.182	AB 50yr	5.21	90.33	90.77		90.83	0.008180	1.15	5.01	24.16	0.67
wc6	2232.182	AB 100yr	7.98	90.33	90.84		90.93	0.008363	1.34	6.97	29.36	0.71
wc6	2193.265	AB 2yr	1.12	89.88	90.18	90.18	90.29	0.021058	1.43	0.78	3.69	1.00
wc6	2193.265	AB 5yr	1.86	89.88	90.31	90.29	90.38	0.012113	1.22	1.70	10.89	0.78
wc6	2193.265	AB 10yr	2.54	89.88	90.34	90.34	90.44	0.014601	1.44	2.06	12.57	0.87
wc6	2193.265	AB 20yr	3.39	89.88	90.38	90.38	90.44	0.008474	1.20	4.79	42.20	0.68
wc6	2193.265	AB 50yr	5.21	89.88	90.42	90.42	90.48	0.010051	1.40	6.40	43.75	0.75
wc6	2193.265	AB 100yr	7.98	89.88	90.46	90.46	90.54	0.011754	1.62	8.37	45.58	0.82
wc6	2135.859	AB 2yr	1.12	89.59	90.17	89.94	90.18	0.000401	0.32	8.49	70.81	0.15
wc6	2135.859	AB 5yr	1.86	89.59	90.16	90.07	90.17	0.001567	0.62	7.44	69.99	0.29
wc6	2135.859	AB 10yr	2.54	89.59	90.19	90.14	90.20	0.001363	0.60	9.90	73.19	0.27
wc6	2135.859	AB 20yr	3.39	89.59	90.23	90.15	90.23	0.001268	0.61	12.59	79.19	0.26
wc6	2135.859	AB 50yr	5.21	89.59	90.30	90.18	90.30	0.001045	0.60	18.19	82.94	0.25
wc6	2135.859	AB 100yr	7.98	89.59	90.38	90.21	90.39	0.000895	0.60	25.53	86.94	0.23
wc6	2096.869	AB 2yr	1.12	89.40	89.90	89.81	89.98	0.009546	1.28	0.88	2.69	0.69
wc6	2096.869	AB 5yr	1.86	89.40	89.99	89.99	90.05	0.006956	1.25	2.46	19.56	0.61
wc6	2096.869	AB 10yr	2.54	89.40	90.03	90.02	90.09	0.007078	1.34	3.26	20.75	0.63
wc6	2096.869	AB 20yr	3.39	89.40	90.08	90.05	90.14	0.006081	1.34	4.42	22.37	0.59
wc6	2096.869	AB 50yr	5.21	89.40	90.11	90.11	90.20	0.009756	1.76	5.15	23.15	0.76
wc6	2096.869	AB 100yr	7.98	89.40	90.18	90.18	90.29	0.011537	2.06	6.66	24.13	0.84
wc6	2000	AB 2yr	1.12	88.47	88.78	88.77	88.90	0.019278	1.57	0.71	2.62	0.96
wc6	2000	AB 5yr	1.86	88.47	88.88	88.88	89.06	0.020058	1.87	0.99	2.82	1.01
wc6	2000	AB 10yr	2.54	88.47	88.97	88.97	89.18	0.019288	2.03	1.25	3.00	1.00
wc6	2000	AB 20yr	3.39	88.47	89.07	89.07	89.31	0.018766	2.19	1.55	3.19	1.01
wc6	2000	AB 50yr	5.21	88.47	89.41	89.41	89.52	0.005151	1.59	5.43	40.28	0.57
wc6	2000	AB 100yr	7.98	88.47	89.50	89.50	89.60	0.005159	1.71	9.47	49.02	0.58
wc6	1893.020	AB 2yr	1.12	87.07	87.57	87.45	87.63	0.006579	1.05	1.07	3.13	0.57
wc6	1893.020	AB 5yr	1.86	87.07	87.74	87.56	87.81	0.005517	1.12	1.66	3.81	0.54
wc6	1893.020	AB 10yr	2.54	87.07	87.86	87.64	87.93	0.005175	1.18	2.14	4.29	0.53
wc6	1893.020	AB 20yr	3.39	87.07	87.97	87.74	88.06	0.005174	1.29	2.66	6.31	0.54
wc6	1893.020	AB 50yr	5.21	87.07	87.90	87.90	88.16	0.017913	2.26	2.31	4.43	1.00
wc6	1893.020	AB 100yr	7.98	87.07	88.07	88.07	88.13	0.005298	1.43	9.09	34.98	0.56
wc6	1785.033	AB 2yr	1.12	86.31	86.67		86.76	0.011919	1.33	0.84	2.71	0.76
wc6	1785.033	AB 5yr	1.86	86.31	86.74	86.72	86.90	0.016978	1.77	1.05	2.87	0.93
wc6	1785.033	AB 10yr	2.54	86.31	86.81	86.81	87.02	0.019346	2.03	1.25	3.00	1.01
wc6	1785.033	AB 20yr	3.39	86.31	86.91	86.91	87.15	0.018784	2.19	1.55	3.19	1.01
wc6	1785.033	AB 50yr	5.21	86.31	87.16	87.16	87.36	0.018496	1.98	2.63	6.64	1.00
wc6	1785.033	AB 100yr	7.98	86.31	87.39	87.36	87.47	0.005843	1.45	8.81	49.32	0.61
wc6	1657.344	AB 2yr	1.12	85.34	85.82	85.64	85.86	0.004470	0.95	1.18	2.95	0.48
wc6	1657.344	AB 5yr	1.86	85.34	86.05	85.75	86.10	0.003047	0.97	1.92	3.42	0.41
wc6	1657.344	AB 10yr	2.54	85.34	86.25	85.84	86.30	0.002042	0.97	2.66	4.00	0.35
wc6	1657.344	AB 20yr	3.39	85.34	86.55	85.94	86.59	0.001154	0.91	3.99	4.87	0.28
wc6	1657.344	AB 50yr	5.21	85.34	86.71	86.11	86.78	0.001640	1.19	4.82	5.50	0.34
wc6	1657.344	AB 100yr	7.98	85.34	86.82	86.32	86.96	0.002868	1.67	5.67	10.98	0.46
wc6	1611.292	AB 2yr	1.58	84.99	85.68		85.72	0.002404	0.85	1.86	3.38	0.36
wc6	1611.292	AB 5yr	2.60	84.99	85.95		86.00	0.001697	0.93	2.85	3.90	0.33
wc6	1611.292	AB 10yr	3.52	84.99	86.18		86.22	0.001373	0.98	3.76	4.31	0.31
wc6	1611.292	AB 20yr	4.62	84.99	86.50		86.54	0.000920	0.96	5.24	4.92	0.26
wc6	1611.292	AB 50yr	6.45	84.99	86.65		86.71	0.001240	1.19	6.00	5.25	0.31
wc6	1611.292	AB 100yr	9.20	84.99	86.72		86.84	0.002137	1.62	6.39	5.57	0.41
wc6	1608.895	AB 2yr	1.58	84.96	85.66	85.33	85.71	0.002045	0.96	1.64	3.41	0.37
wc6	1608.895	AB 5yr	2.60	84.96	85.92	85.47	85.99	0.001900	1.15	2.27	4.80	0.38
wc6	1608.895	AB 10yr	3.52	84.96	86.13	85.58	86.21	0.001785	1.27	2.77	5.92	0.38
wc6	1608.895	AB 20yr	4.62	84.96	86.44	85.70	86.53	0.002470	1.31	3.55	7.99	0.41
wc6	1608.895	AB 50yr	6.45	84.96	86.58	85.88	86.70	0.002951	1.56	4.77	9.59	0.46
wc6	1608.895	AB 100yr	9.20	84.96	86.55	86.12	86.82	0.006752	2.31	4.46	9.21	0.69

HEC-RAS Plan: FUT 5&6 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6	1598.12		Culvert									
wc6	1587.120	AB 2yr	1.58	84.79	85.25	85.16	85.36	0.009107	1.50	1.05	2.91	0.73
wc6	1587.120	AB 5yr	2.60	84.79	85.38	85.30	85.56	0.010312	1.90	1.36	3.17	0.81
wc6	1587.120	AB 10yr	3.52	84.79	85.47	85.41	85.72	0.011562	2.23	1.58	3.35	0.87
wc6	1587.120	AB 20yr	4.62	84.79	85.55	85.53	85.89	0.013631	2.61	1.77	11.47	0.97
wc6	1587.120	AB 50yr	6.45	84.79	85.71	85.71	86.16	0.013557	2.97	2.17	28.42	1.00
wc6	1587.120	AB 100yr	9.20	84.79	85.95	85.95	86.52	0.012571	3.35	2.75	44.13	1.00
wc6	1584.698	AB 2yr	1.58	84.73	85.17	85.10	85.28	0.011286	1.46	1.08	2.89	0.76
wc6	1584.698	AB 5yr	2.60	84.73	85.31	85.24	85.46	0.012335	1.75	1.49	3.15	0.81
wc6	1584.698	AB 10yr	3.52	84.73	85.40	85.34	85.60	0.013067	1.95	1.80	3.35	0.85
wc6	1584.698	AB 20yr	4.62	84.73	85.50	85.45	85.74	0.013426	2.18	2.15	4.16	0.88
wc6	1584.698	AB 50yr	6.45	84.73	85.68	85.68	85.93	0.010420	2.27	3.30	11.52	0.81
wc6	1584.698	AB 100yr	9.20	84.73	85.89	85.89	86.02	0.005129	1.87	9.19	38.78	0.59
wc6	1501.817	AB 2yr	1.58	84.11	84.70	84.53	84.75	0.004383	0.97	1.64	4.25	0.50
wc6	1501.817	AB 5yr	2.60	84.11	84.87	84.65	84.93	0.004022	1.08	2.41	4.91	0.49
wc6	1501.817	AB 10yr	3.52	84.11	85.00	84.74	85.07	0.003818	1.15	3.05	5.41	0.49
wc6	1501.817	AB 20yr	4.62	84.11	85.13	84.82	85.20	0.003663	1.22	3.78	5.91	0.49
wc6	1501.817	AB 50yr	6.45	84.11	85.28	84.95	85.33	0.002498	1.11	8.46	30.00	0.41
wc6	1501.817	AB 100yr	9.20	84.11	85.44	85.11	85.48	0.001709	1.04	14.84	47.48	0.35
wc6	1414.879	AB 2yr	1.58	83.78	84.37		84.42	0.003383	0.92	1.71	3.78	0.44
wc6	1414.879	AB 5yr	2.60	83.78	84.54		84.60	0.003667	1.09	2.38	4.27	0.47
wc6	1414.879	AB 10yr	3.52	83.78	84.66		84.73	0.003797	1.20	2.92	4.64	0.48
wc6	1414.879	AB 20yr	4.62	83.78	84.79		84.88	0.003837	1.30	3.54	5.06	0.49
wc6	1414.879	AB 50yr	6.45	83.78	84.94		85.06	0.003855	1.49	4.41	6.18	0.51
wc6	1414.879	AB 100yr	9.20	83.78	85.07	84.78	85.24	0.004847	1.83	5.54	16.28	0.59
wc6	1334.030	AB 2yr	1.58	83.47	83.95	83.83	84.03	0.007174	1.20	1.31	3.45	0.62
wc6	1334.030	AB 5yr	2.60	83.47	84.14	83.96	84.22	0.005937	1.30	2.00	4.00	0.59
wc6	1334.030	AB 10yr	3.52	83.47	84.28	84.05	84.37	0.005167	1.35	2.62	4.44	0.56
wc6	1334.030	AB 20yr	4.62	83.47	84.41	84.15	84.52	0.005027	1.44	3.22	4.83	0.56
wc6	1334.030	AB 50yr	6.45	83.47	84.57	84.30	84.70	0.004958	1.61	4.14	9.21	0.57
wc6	1334.030	AB 100yr	9.20	83.47	84.76	84.47	84.88	0.003724	1.61	8.51	32.42	0.51
wc6	1037.318	AB 2yr	1.58	82.35	83.06	82.71	83.09	0.001733	0.73	2.18	4.13	0.32
wc6	1037.318	AB 5yr	2.60	82.35	83.25	82.84	83.29	0.001895	0.86	3.02	4.70	0.34
wc6	1037.318	AB 10yr	3.52	82.35	83.36	82.93	83.41	0.002163	0.98	3.58	5.09	0.37
wc6	1037.318	AB 20yr	4.62	82.35	83.48	83.03	83.54	0.002261	1.11	4.20	5.74	0.39
wc6	1037.318	AB 50yr	6.45	82.35	83.66	83.17	83.74	0.002213	1.26	5.35	6.78	0.40
wc6	1037.318	AB 100yr	9.20	82.35	83.81	83.35	83.93	0.002748	1.54	6.43	7.64	0.45
wc6	947.3374	AB 2yr	1.72	82.01	82.52	82.52	82.69	0.019489	1.80	0.95	2.92	1.01
wc6	947.3374	AB 5yr	2.82	82.01	82.66	82.66	82.87	0.018168	2.01	1.40	3.41	1.00
wc6	947.3374	AB 10yr	3.81	82.01	82.84	82.76	83.02	0.011295	1.83	2.08	4.05	0.82
wc6	947.3374	AB 20yr	4.99	82.01	83.04	82.87	83.19	0.007707	1.71	2.93	4.72	0.69
wc6	947.3374	AB 50yr	6.94	82.01	83.33	83.02	83.45	0.004803	1.56	4.46	5.75	0.56
wc6	947.3374	AB 100yr	8.79	82.01	83.62	83.14	83.70	0.002224	1.26	8.52	19.79	0.40
wc6	940	AB 2yr	1.72	81.96	82.50	82.34	82.56	0.005404	1.15	1.49	3.61	0.55
wc6	940	AB 5yr	2.82	81.96	82.70	82.47	82.78	0.004100	1.29	2.18	4.22	0.51
wc6	940	AB 10yr	3.81	81.96	82.86	82.56	82.96	0.003570	1.40	2.73	4.70	0.50
wc6	940	AB 20yr	4.99	81.96	83.03	82.66	83.15	0.003194	1.51	3.31	6.25	0.49
wc6	940	AB 50yr	6.94	81.96	83.29	82.81	83.43	0.002824	1.66	4.19	19.07	0.48
wc6	940	AB 100yr	8.79	81.96	83.51	82.94	83.67	0.002604	1.78	4.95	52.51	0.47
wc6	939.548		Culvert									
wc6	910.4732	AB 2yr	1.72	81.74	82.25	82.12	82.33	0.006394	1.23	1.40	3.53	0.60
wc6	910.4732	AB 5yr	2.82	81.74	82.45	82.25	82.55	0.004712	1.36	2.07	4.13	0.55
wc6	910.4732	AB 10yr	3.81	81.74	82.49	82.34	82.65	0.006910	1.73	2.21	4.26	0.67
wc6	910.4732	AB 20yr	4.99	81.74	82.68	82.44	82.84	0.005172	1.76	2.83	4.83	0.61
wc6	910.4732	AB 50yr	6.94	81.74	82.81	82.59	83.04	0.006332	2.14	3.25	12.52	0.69
wc6	910.4732	AB 100yr	8.79	81.74	82.89	82.72	83.21	0.007827	2.50	3.51	47.32	0.77
wc6	900	AB 2yr	1.72	81.67	82.19	82.05	82.26	0.006585	1.20	1.44	3.55	0.60
wc6	900	AB 5yr	2.82	81.67	82.42	82.18	82.49	0.004602	1.21	2.32	4.24	0.52
wc6	900	AB 10yr	3.81	81.67	82.43	82.28	82.56	0.007677	1.59	2.40	4.29	0.68
wc6	900	AB 20yr	4.99	81.67	82.66	82.38	82.77	0.004877	1.45	3.44	4.97	0.56
wc6	900	AB 50yr	6.94	81.67	82.81	82.53	82.94	0.004764	1.62	4.71	10.96	0.57
wc6	900	AB 100yr	8.79	81.67	82.92	82.64	83.06	0.004564	1.73	6.34	18.24	0.57
wc6	801.4135	AB 2yr	1.72	80.95	81.43	81.33	81.52	0.008472	1.31	1.31	3.45	0.68
wc6	801.4135	AB 5yr	2.82	80.95	81.46	81.46	81.66	0.018252	1.99	1.42	3.54	1.00
wc6	801.4135	AB 10yr	3.81	80.95	81.75	81.56	81.86	0.006345	1.48	2.57	4.41	0.62
wc6	801.4135	AB 20yr	4.99	80.95	81.66	81.66	81.93	0.016946	2.28	2.19	4.14	1.00
wc6	801.4135	AB 50yr	6.94	80.95	81.81	81.81	82.12	0.016395	2.47	2.82	4.57	1.00

HEC-RAS Plan: FUT 5&6 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6	801.4135	AB 100yr	8.79	80.95	81.93	81.93	82.27	0.015962	2.60	3.38	4.93	1.00
wc6	730.3979	AB 2yr	1.72	80.43	80.87	80.78	80.94	0.007655	1.13	1.53	4.86	0.64
wc6	730.3979	AB 5yr	2.82	80.43	81.02	80.89	81.02	0.000009	0.05	76.62	196.90	0.02
wc6	730.3979	AB 10yr	3.81	80.43	80.97	80.97	81.15	0.017584	1.90	2.01	5.46	1.00
wc6	730.3979	AB 20yr	4.99	80.43	81.01	81.01	81.01	0.000033	0.09	73.99	196.37	0.04
wc6	730.3979	AB 50yr	6.94	80.43	81.06	81.01	81.06	0.000042	0.10	84.54	197.86	0.05
wc6	730.3979	AB 100yr	8.79	80.43	81.11	81.01	81.11	0.000047	0.12	94.21	199.03	0.05
wc6	634.0483	AB 2yr	1.72	79.73	80.29	80.11	80.35	0.005032	1.09	1.58	3.67	0.53
wc6	634.0483	AB 5yr	2.82	79.73	80.47	80.24	80.54	0.004771	1.23	2.29	4.21	0.53
wc6	634.0483	AB 10yr	3.81	79.73	80.60	80.34	80.69	0.004605	1.32	2.89	4.62	0.53
wc6	634.0483	AB 20yr	4.99	79.73	80.74	80.45	80.84	0.004524	1.41	3.53	5.29	0.54
wc6	634.0483	AB 50yr	6.94	79.73	80.93	80.59	81.04	0.003781	1.51	5.16	14.00	0.51
wc6	634.0483	AB 100yr	8.79	79.73	81.10	80.71	81.10	0.000216	0.41	58.60	232.21	0.13
wc6	586.5527	AB 2yr	1.72	79.39	80.05	79.86	80.11	0.004922	1.11	1.55	3.39	0.52
wc6	586.5527	AB 5yr	2.82	79.39	80.24	80.00	80.32	0.004755	1.26	2.24	3.88	0.53
wc6	586.5527	AB 10yr	3.81	79.39	80.37	80.10	80.47	0.004721	1.36	2.80	4.23	0.53
wc6	586.5527	AB 20yr	4.99	79.39	80.49	80.21	80.61	0.005063	1.50	3.32	4.53	0.56
wc6	586.5527	AB 50yr	6.94	79.39	80.73	80.36	80.85	0.004115	1.53	5.00	15.85	0.52
wc6	586.5527	AB 100yr	8.79	79.39	81.04	80.49	81.08	0.001440	1.05	12.85	31.35	0.32
wc6	564.4214	AB 2yr	1.72	79.36	80.01	79.74	80.05	0.002892	0.89	1.92	3.94	0.41
wc6	564.4214	AB 5yr	2.82	79.36	80.20	79.87	80.26	0.002628	1.03	2.74	4.53	0.41
wc6	564.4214	AB 10yr	3.81	79.36	80.34	79.97	80.41	0.002517	1.15	3.32	4.95	0.41
wc6	564.4214	AB 20yr	4.99	79.36	80.46	80.07	80.55	0.002743	1.31	3.81	19.91	0.44
wc6	564.4214	AB 50yr	6.94	79.36	80.70	80.21	80.80	0.002449	1.45	4.80	24.31	0.43
wc6	564.4214	AB 100yr	8.79	79.36	80.93	80.32	81.04	0.002123	1.52	5.77	25.82	0.41
wc6	549.12		Culvert									
wc6	535.9677	AB 2yr	1.72	79.30	80.00	79.68	80.03	0.002046	0.81	2.11	4.10	0.35
wc6	535.9677	AB 5yr	2.82	79.30	80.18	79.81	80.23	0.002271	0.99	2.84	4.64	0.38
wc6	535.9677	AB 10yr	3.81	79.30	80.31	79.90	80.38	0.002383	1.13	3.38	5.92	0.40
wc6	535.9677	AB 20yr	4.99	79.30	80.43	80.01	80.52	0.002566	1.28	3.88	8.79	0.43
wc6	535.9677	AB 50yr	6.94	79.30	80.59	80.15	80.71	0.002964	1.53	4.53	30.69	0.47
wc6	535.9677	AB 100yr	8.79	79.30	80.70	80.27	80.86	0.003410	1.75	5.01	68.78	0.51
wc6	533.8168	AB 2yr	1.72	79.29	79.99	79.67	80.02	0.002174	0.81	2.13	4.10	0.36
wc6	533.8168	AB 5yr	2.82	79.29	80.17	79.80	80.22	0.002432	0.96	2.93	4.64	0.39
wc6	533.8168	AB 10yr	3.81	79.29	80.30	79.90	80.36	0.002576	1.07	3.56	5.26	0.41
wc6	533.8168	AB 20yr	4.99	79.29	80.43	80.00	80.50	0.002555	1.19	4.39	8.75	0.41
wc6	533.8168	AB 50yr	6.94	79.29	80.59	80.15	80.67	0.002360	1.29	6.81	19.82	0.41
wc6	533.8168	AB 100yr	8.79	79.29	80.73	80.27	80.80	0.002027	1.30	9.99	28.27	0.39
wc6	502.0329	AB 2yr	1.72	79.25	79.71	79.71	79.88	0.019791	1.81	0.95	2.91	1.01
wc6	502.0329	AB 5yr	2.82	79.25	79.85	79.85	80.06	0.018665	2.04	1.38	3.33	1.01
wc6	502.0329	AB 10yr	3.81	79.25	79.95	79.95	80.20	0.017982	2.19	1.74	3.64	1.01
wc6	502.0329	AB 20yr	4.99	79.25	80.06	80.06	80.33	0.016765	2.32	2.17	4.28	0.99
wc6	502.0329	AB 50yr	6.94	79.25	80.22	80.22	80.52	0.014494	2.44	2.96	5.60	0.95
wc6	502.0329	AB 100yr	8.79	79.25	80.35	80.35	80.66	0.013213	2.53	3.74	6.65	0.93
wc6	480	AB 2yr	1.72	78.69	79.33	79.12	79.35	0.002480	0.66	2.60	8.14	0.37
wc6	480	AB 5yr	2.82	78.69	79.46	79.21	79.49	0.002282	0.75	3.83	10.58	0.37
wc6	480	AB 10yr	3.81	78.69	79.55	79.28	79.59	0.002070	0.81	4.90	12.52	0.37
wc6	480	AB 20yr	4.99	78.69	79.66	79.35	79.70	0.001743	0.85	6.37	14.11	0.35
wc6	480	AB 50yr	6.94	78.69	79.85	79.44	79.89	0.001214	0.85	9.77	19.99	0.30
wc6	480	AB 100yr	8.79	78.69	80.11	79.52	80.13	0.000624	0.73	15.48	25.36	0.23
wc6	400	AB 2yr	1.72	78.36	79.18	78.84	79.20	0.001177	0.53	3.26	8.12	0.27
wc6	400	AB 5yr	2.82	78.36	79.30	78.95	79.32	0.001526	0.66	4.25	9.33	0.31
wc6	400	AB 10yr	3.81	78.36	79.40	79.03	79.43	0.001380	0.73	5.34	10.86	0.31
wc6	400	AB 20yr	4.99	78.36	79.54	79.10	79.57	0.001132	0.76	6.96	12.77	0.29
wc6	400	AB 50yr	6.94	78.36	79.77	79.20	79.80	0.000739	0.74	11.26	20.14	0.24
wc6	400	AB 100yr	8.79	78.36	80.07	79.29	80.09	0.000380	0.63	17.63	22.75	0.18
wc6	350	AB 2yr	1.72	78.63	78.98	78.84	79.00	0.002764	0.55	3.19	15.54	0.37
wc6	350	AB 5yr	2.82	78.63	79.17	78.91	79.18	0.000872	0.46	6.43	18.49	0.23
wc6	350	AB 10yr	3.81	78.63	79.32	78.96	79.33	0.000525	0.44	9.39	20.83	0.19
wc6	350	AB 20yr	4.99	78.63	79.49	78.99	79.49	0.000356	0.43	13.02	23.30	0.16
wc6	350	AB 50yr	6.94	78.63	79.75	79.05	79.75	0.000177	0.38	24.53	41.09	0.12
wc6	350	AB 100yr	8.79	78.63	80.06	79.10	80.06	0.000088	0.32	38.86	50.05	0.09
wc6	330	AB 2yr	1.72	78.44	78.92	78.77	78.97	0.004192	1.03	1.67	11.21	0.51
wc6	330	AB 5yr	2.82	78.44	79.09	78.87	79.17	0.003530	1.19	2.36	15.18	0.50
wc6	330	AB 10yr	3.81	78.44	79.23	78.95	79.32	0.003240	1.31	2.91	24.14	0.49
wc6	330	AB 20yr	4.99	78.44	79.38	79.04	79.48	0.003013	1.43	3.49	26.57	0.49
wc6	330	AB 50yr	6.94	78.44	79.61	79.18	79.74	0.002610	1.56	4.44	30.41	0.47

HEC-RAS Plan: FUT 5&6 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6	330	AB 100yr	8.79	78.44	79.93	79.29	80.05	0.001827	1.54	5.70	34.48	0.41
wc6	315		Culvert									
wc6	300	AB 2yr	1.72	77.99	78.80	78.44	78.82	0.001093	0.68	2.54	9.56	0.28
wc6	300	AB 5yr	2.82	77.99	78.96	78.54	79.00	0.001368	0.88	3.19	11.63	0.32
wc6	300	AB 10yr	3.81	77.99	79.07	78.63	79.13	0.001582	1.04	3.66	12.85	0.35
wc6	300	AB 20yr	4.99	77.99	79.19	78.71	79.26	0.001831	1.21	4.12	13.88	0.39
wc6	300	AB 50yr	6.94	77.99	79.33	78.84	79.44	0.002234	1.47	4.73	15.10	0.44
wc6	300	AB 100yr	8.79	77.99	79.44	78.96	79.59	0.002649	1.70	5.18	15.97	0.48
wc6	280	AB 2yr	1.72	77.96	78.80	78.38	78.80	0.000505	0.36	4.83	11.76	0.18
wc6	280	AB 5yr	2.82	77.96	78.96	78.47	78.97	0.000437	0.41	6.96	13.87	0.17
wc6	280	AB 10yr	3.81	77.96	79.08	78.54	79.09	0.000416	0.46	8.73	15.37	0.17
wc6	280	AB 20yr	4.99	77.96	79.20	78.60	79.22	0.000408	0.50	10.67	16.83	0.18
wc6	280	AB 50yr	6.94	77.96	79.37	78.70	79.38	0.000409	0.57	13.60	18.94	0.18
wc6	280	AB 100yr	8.79	77.96	79.49	78.76	79.51	0.000405	0.61	17.34	26.97	0.19
wc6	250	AB 2yr	1.72	77.87	78.74	78.39	78.76	0.001164	0.58	3.01	6.95	0.27
wc6	250	AB 5yr	2.82	77.87	78.90	78.50	78.93	0.001245	0.69	4.27	8.26	0.29
wc6	250	AB 10yr	3.81	77.87	79.02	78.58	79.05	0.001288	0.76	5.30	9.21	0.30
wc6	250	AB 20yr	4.99	77.87	79.14	78.66	79.17	0.001337	0.83	6.43	10.14	0.31
wc6	250	AB 50yr	6.94	77.87	79.30	78.78	79.34	0.001370	0.92	8.14	11.40	0.32
wc6	250	AB 100yr	8.79	77.87	79.42	78.87	79.47	0.001368	1.01	9.57	12.34	0.33
wc6	200	AB 2yr	1.72	77.71	78.44		78.47	0.003142	0.80	2.14	5.86	0.42
wc6	200	AB 5yr	2.82	77.71	78.61		78.65	0.002758	0.86	3.26	7.23	0.41
wc6	200	AB 10yr	3.81	77.71	78.73		78.77	0.002608	0.91	4.17	8.18	0.41
wc6	200	AB 20yr	4.99	77.71	78.84		78.89	0.002507	0.96	5.18	9.12	0.41
wc6	200	AB 50yr	6.94	77.71	79.01		79.06	0.002387	1.03	6.76	10.41	0.41
wc6	200	AB 100yr	8.79	77.71	79.13		79.19	0.002279	1.08	8.17	11.44	0.40
wc6	150	AB 2yr	1.72	77.17	78.02	77.76	78.05	0.002222	0.84	2.14	5.08	0.37
wc6	150	AB 5yr	2.82	77.17	78.13	77.88	78.19	0.002981	1.11	2.75	5.77	0.45
wc6	150	AB 10yr	3.81	77.17	78.23	77.97	78.31	0.003228	1.27	3.34	6.36	0.47
wc6	150	AB 20yr	4.99	77.17	78.34	78.07	78.43	0.003318	1.41	4.06	7.01	0.49
wc6	150	AB 50yr	6.94	77.17	78.49	78.20	78.61	0.003321	1.59	5.24	7.97	0.51
wc6	150	AB 100yr	8.79	77.17	78.65	78.31	78.77	0.002988	1.66	6.58	8.93	0.49
wc6	100	AB 2yr	1.72	76.83	77.43	77.36	77.51	0.010109	1.26	1.36	4.53	0.73
wc6	100	AB 5yr	2.82	76.83	77.69	77.48	77.75	0.003896	1.00	2.83	6.53	0.48
wc6	100	AB 10yr	3.81	76.83	77.86	77.56	77.91	0.002773	0.95	4.02	7.79	0.42
wc6	100	AB 20yr	4.99	76.83	78.02	77.64	78.07	0.002207	0.93	5.37	8.99	0.38
wc6	100	AB 50yr	6.94	76.83	78.23	77.76	78.28	0.001805	0.94	7.41	10.57	0.36
wc6	100	AB 100yr	8.79	76.83	78.47	77.85	78.51	0.001251	0.87	10.15	12.37	0.31
5&6combined	50	AB 2yr	5.06	76.42	77.29	77.29	77.51	0.016724	2.11	2.40	5.29	1.00
5&6combined	50	AB 5yr	8.05	76.42	77.47	77.47	77.75	0.015790	2.33	3.45	6.22	1.00
5&6combined	50	AB 10yr	10.60	76.42	77.60	77.60	77.91	0.015144	2.47	4.30	6.89	1.00
5&6combined	50	AB 20yr	13.50	76.42	77.72	77.72	78.07	0.014694	2.59	5.21	7.57	1.00
5&6combined	50	AB 50yr	18.00	76.42	77.89	77.89	78.28	0.014171	2.75	6.55	8.48	1.00
5&6combined	50	AB 100yr	23.90	76.42	78.07	78.07	78.51	0.013545	2.93	8.17	9.52	1.00
5&6combined	40	AB 2yr	5.06	76.27	77.10	76.97	77.19	0.006900	1.36	3.71	8.43	0.65
5&6combined	40	AB 5yr	8.05	76.27	77.25	77.11	77.38	0.006834	1.60	5.09	9.69	0.68
5&6combined	40	AB 10yr	10.60	76.27	77.36	77.21	77.51	0.006889	1.76	6.16	10.56	0.69
5&6combined	40	AB 20yr	13.50	76.27	77.46	77.31	77.65	0.006893	1.93	7.26	11.41	0.71
5&6combined	40	AB 50yr	18.00	76.27	77.58	77.45	77.82	0.007190	2.18	8.74	12.46	0.74
5&6combined	40	AB 100yr	23.90	76.27	77.72	77.61	78.02	0.007614	2.47	10.50	13.58	0.78
5&6combined	30	AB 2yr	5.06	76.22	77.07	76.86	77.12	0.003830	1.06	4.78	10.40	0.49
5&6combined	30	AB 5yr	8.05	76.22	77.23	76.99	77.31	0.003846	1.24	6.58	11.74	0.51
5&6combined	30	AB 10yr	10.60	76.22	77.34	77.08	77.43	0.003892	1.36	7.96	12.68	0.53
5&6combined	30	AB 20yr	13.50	76.22	77.45	77.17	77.56	0.003982	1.47	9.40	13.59	0.54
5&6combined	30	AB 50yr	18.00	76.22	77.59	77.30	77.72	0.004227	1.64	11.34	14.73	0.57
5&6combined	30	AB 100yr	23.90	76.22	77.74	77.44	77.91	0.004213	1.82	13.74	16.06	0.58
5&6combined	20	AB 2yr	5.06	76.16	77.02	76.85	77.10	0.005001	1.18	4.30	9.72	0.56
5&6combined	20	AB 5yr	8.05	76.16	77.18	76.99	77.28	0.005006	1.37	5.96	11.37	0.58
5&6combined	20	AB 10yr	10.60	76.16	77.29	77.08	77.41	0.005007	1.49	7.30	12.53	0.59
5&6combined	20	AB 20yr	13.50	76.16	77.40	77.18	77.53	0.005003	1.60	8.71	13.62	0.60
5&6combined	20	AB 50yr	18.00	76.16	77.53	77.31	77.69	0.005001	1.79	10.55	14.69	0.62
5&6combined	20	AB 100yr	23.90	76.16	77.68	77.45	77.88	0.005004	2.00	12.83	15.93	0.64

Appendix F  
CulvertMaster Output



## 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	0.95
Computed Headwater Elev:	80.74 m	Discharge	2.5500 m <sup>3</sup> /s
Inlet Control HW Elev.	80.66 m	Tailwater Elevation	80.66 m
Outlet Control HW Elev.	80.74 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	CompositePressureProfileS1	Depth, Downstream	1.40 m
Slope Type	N/A	Normal Depth	0.48 m
Flow Regime	Subcritical	Critical Depth	0.48 m
Velocity Downstream	0.86 m/s	Critical Slope	0.003296 m/m
Section			
Section Shape	Box	Mannings Coefficient	0.013
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.	80.74 m	Upstream Velocity Head	0.05 m
Ke	0.20	Entrance Loss	0.01 m
Inlet Control Properties			
Inlet Control HW Elev.	80.66 m	Flow Control	N/A
Inlet Type	90° headwall w 45° bevels	Area Full	3.0 m <sup>2</sup>
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 6.3 @ 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	0.54
Computed Headwater Elev.	79.88 m	Discharge	1.4300 m <sup>3</sup> /s
Inlet Control HW Elev.	79.84 m	Tailwater Elevation	79.79 m
Outlet Control HW Elev.	79.88 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	S1	Depth, Downstream	1.20 m
Slope Type	Steep	Normal Depth	0.32 m
Flow Regime	Subcritical	Critical Depth	0.40 m
Velocity Downstream	0.65 m/s	Critical Slope	0.003647 m/m

Section			
Section Shape	Box	Mannings Coefficient	0.013
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.	79.88 m	Upstream Velocity Head	0.11 m
Ke	0.20	Entrance Loss	0.02 m

Inlet Control Properties			
Inlet Control HW Elev.	79.84 m	Flow Control	N/A
Inlet Type	90° headwall w 45° bevels	Area Full	2.2 m <sup>2</sup>
K	0.49500	HDS 5 Chart	10
M	0.66700	HDS 5 Scale	2
C	0.03140	Equation Form	2
Y	0.82000		

HEC-RAS Plan: FUT 5&6 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
wc6	330	AB 100yr	8.79	78.44	79.93	79.29	80.05	0.001827	1.54	5.70	34.48	0.41
wc6	315		Culvert									
wc6	300	AB 2yr	1.72	77.99	78.80	78.44	78.82	0.001093	0.68	2.54	9.56	0.28
wc6	300	AB 5yr	2.82	77.99	78.96	78.54	79.00	0.001368	0.88	3.19	11.63	0.32
wc6	300	AB 10yr	3.81	77.99	79.07	78.63	79.13	0.001582	1.04	3.66	12.85	0.35
wc6	300	AB 20yr	4.99	77.99	79.19	78.71	79.26	0.001831	1.21	4.12	13.88	0.39
wc6	300	AB 50yr	6.94	77.99	79.33	78.84	79.44	0.002234	1.47	4.73	15.10	0.44
wc6	300	AB 100yr	8.79	77.99	79.44	78.96	79.59	0.002649	1.70	5.18	15.97	0.48
wc6	280	AB 2yr	1.72	77.96	78.80	78.38	78.80	0.000505	0.36	4.83	11.76	0.18
wc6	280	AB 5yr	2.82	77.96	78.96	78.47	78.97	0.000437	0.41	6.96	13.87	0.17
wc6	280	AB 10yr	3.81	77.96	79.08	78.54	79.09	0.000416	0.46	8.73	15.37	0.17
wc6	280	AB 20yr	4.99	77.96	79.20	78.60	79.22	0.000408	0.50	10.67	16.83	0.18
wc6	280	AB 50yr	6.94	77.96	79.37	78.70	79.38	0.000409	0.57	13.60	18.94	0.18
wc6	280	AB 100yr	8.79	77.96	79.49	78.76	79.51	0.000405	0.61	17.34	26.97	0.19
wc6	250	AB 2yr	1.72	77.87	78.74	78.39	78.76	0.001164	0.58	3.01	6.95	0.27
wc6	250	AB 5yr	2.82	77.87	78.90	78.50	78.93	0.001245	0.69	4.27	8.26	0.29
wc6	250	AB 10yr	3.81	77.87	79.02	78.58	79.05	0.001288	0.76	5.30	9.21	0.30
wc6	250	AB 20yr	4.99	77.87	79.14	78.66	79.17	0.001337	0.83	6.43	10.14	0.31
wc6	250	AB 50yr	6.94	77.87	79.30	78.78	79.34	0.001370	0.92	8.14	11.40	0.32
wc6	250	AB 100yr	8.79	77.87	79.42	78.87	79.47	0.001368	1.01	9.57	12.34	0.33
wc6	200	AB 2yr	1.72	77.71	78.44		78.47	0.003142	0.80	2.14	5.86	0.42
wc6	200	AB 5yr	2.82	77.71	78.61		78.65	0.002758	0.86	3.26	7.23	0.41
wc6	200	AB 10yr	3.81	77.71	78.73		78.77	0.002608	0.91	4.17	8.18	0.41
wc6	200	AB 20yr	4.99	77.71	78.84		78.89	0.002507	0.96	5.18	9.12	0.41
wc6	200	AB 50yr	6.94	77.71	79.01		79.06	0.002387	1.03	6.76	10.41	0.41
wc6	200	AB 100yr	8.79	77.71	79.13		79.19	0.002279	1.08	8.17	11.44	0.40
wc6	150	AB 2yr	1.72	77.17	78.02	77.76	78.05	0.002222	0.84	2.14	5.08	0.37
wc6	150	AB 5yr	2.82	77.17	78.13	77.88	78.19	0.002981	1.11	2.75	5.77	0.45
wc6	150	AB 10yr	3.81	77.17	78.23	77.97	78.31	0.003228	1.27	3.34	6.36	0.47
wc6	150	AB 20yr	4.99	77.17	78.34	78.07	78.43	0.003318	1.41	4.06	7.01	0.49
wc6	150	AB 50yr	6.94	77.17	78.49	78.20	78.61	0.003321	1.59	5.24	7.97	0.51
wc6	150	AB 100yr	8.79	77.17	78.65	78.31	78.77	0.002988	1.66	6.58	8.93	0.49
wc6	100	AB 2yr	1.72	76.83	77.43	77.36	77.51	0.010109	1.26	1.36	4.53	0.73
wc6	100	AB 5yr	2.82	76.83	77.69	77.48	77.75	0.003896	1.00	2.83	6.53	0.48
wc6	100	AB 10yr	3.81	76.83	77.86	77.56	77.91	0.002773	0.95	4.02	7.79	0.42
wc6	100	AB 20yr	4.99	76.83	78.02	77.64	78.07	0.002207	0.93	5.37	8.99	0.38
wc6	100	AB 50yr	6.94	76.83	78.23	77.76	78.28	0.001805	0.94	7.41	10.57	0.36
wc6	100	AB 100yr	8.79	76.83	78.47	77.85	78.51	0.001251	0.87	10.15	12.37	0.31
5&6combined	50	AB 2yr	5.06	76.42	77.29	77.29	77.51	0.016724	2.11	2.40	5.29	1.00
5&6combined	50	AB 5yr	8.05	76.42	77.47	77.47	77.75	0.015790	2.33	3.45	6.22	1.00
5&6combined	50	AB 10yr	10.60	76.42	77.60	77.60	77.91	0.015144	2.47	4.30	6.89	1.00
5&6combined	50	AB 20yr	13.50	76.42	77.72	77.72	78.07	0.014694	2.59	5.21	7.57	1.00
5&6combined	50	AB 50yr	18.00	76.42	77.89	77.89	78.28	0.014171	2.75	6.55	8.48	1.00
5&6combined	50	AB 100yr	23.90	76.42	78.07	78.07	78.51	0.013545	2.93	8.17	9.52	1.00
5&6combined	40	AB 2yr	5.06	76.27	77.10	76.97	77.19	0.006900	1.36	3.71	8.43	0.65
5&6combined	40	AB 5yr	8.05	76.27	77.25	77.11	77.38	0.006834	1.60	5.09	9.69	0.68
5&6combined	40	AB 10yr	10.60	76.27	77.36	77.21	77.51	0.006889	1.76	6.16	10.56	0.69
5&6combined	40	AB 20yr	13.50	76.27	77.46	77.31	77.65	0.006893	1.93	7.26	11.41	0.71
5&6combined	40	AB 50yr	18.00	76.27	77.58	77.45	77.82	0.007190	2.18	8.74	12.46	0.74
5&6combined	40	AB 100yr	23.90	76.27	77.72	77.61	78.02	0.007614	2.47	10.50	13.58	0.78
5&6combined	30	AB 2yr	5.06	76.22	77.07	76.86	77.12	0.003830	1.06	4.78	10.40	0.49
5&6combined	30	AB 5yr	8.05	76.22	77.23	76.99	77.31	0.003846	1.24	6.58	11.74	0.51
5&6combined	30	AB 10yr	10.60	76.22	77.34	77.08	77.43	0.003892	1.36	7.96	12.68	0.53
5&6combined	30	AB 20yr	13.50	76.22	77.45	77.17	77.56	0.003982	1.47	9.40	13.59	0.54
5&6combined	30	AB 50yr	18.00	76.22	77.59	77.30	77.72	0.004227	1.64	11.34	14.73	0.57
5&6combined	30	AB 100yr	23.90	76.22	77.74	77.44	77.91	0.004213	1.82	13.74	16.06	0.58
5&6combined	20	AB 2yr	5.06	76.16	77.02	76.85	77.10	0.005001	1.18	4.30	9.72	0.56
5&6combined	20	AB 5yr	8.05	76.16	77.18	76.99	77.28	0.005006	1.37	5.96	11.37	0.58
5&6combined	20	AB 10yr	10.60	76.16	77.29	77.08	77.41	0.005007	1.49	7.30	12.53	0.59
5&6combined	20	AB 20yr	13.50	76.16	77.40	77.18	77.53	0.005003	1.60	8.71	13.62	0.60
5&6combined	20	AB 50yr	18.00	76.16	77.53	77.31	77.69	0.005001	1.79	10.55	14.69	0.62
5&6combined	20	AB 100yr	23.90	76.16	77.68	77.45	77.88	0.005004	2.00	12.83	15.93	0.64

Appendix F  
CulvertMaster Output

Appendix G  
Updated Floodplain Mapping, Dillon Consulting

