DURHAM – SCARBOROUGH
Bus Rapid Transit

Appendix J – Stormwater Management and Fluvial Geomorphology

Prepared for Metrolinx
by IBI Group & Parsons

PARSONS

Preliminary Stormwater and Hydrology Report

Durham – Scarborough Bus Rapid Transit

Submitted to:

Metrolinx

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LIST OF ACRONYMS

CA	Conservation Authority	MECP	Ministry of the Environment, Conservation and Parks
CLOCA	Central Lake Ontario Conservation Authority	MNRF	Ministry of Natural Resources and Forestry
DS INV	Downstream Invert	MTO	Ministry of Transportation Ontario
DSBRT	Durham – Scarborough Bus Rapid Transit	NWL	Normal Water Level
ESC	Erosion and Sediment Control	Prop	Proposed
EOTL	Edge of Travelled Lane	Reg WL	Regional Water Level
EPR	Environmental Project Report	ROW	Right of Way
ES	Enhanced Swale	SC	Subcatchment
Exst	Existing	SWM	Stormwater Management
HSG	Hydrologic Soil Group	TRCA	Toronto and Region Conservation Authority
HWL	Head Water Level	US INV	Upstream Invert
IDF	Intensity-Duration-Frequency		

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1. Introduction

In 2018, Metrolinx completed the Durham-Scarborough Bus Rapid Transit (DSBRT) Initial Business Case. The study recommended a preferred Bus Rapid Transit (BRT) alignment between Downtown Oshawa (in Durham Region) and Scarborough Centre (in the City of Toronto). The project has now advanced to the Preliminary Design Business Case and Environmental Assessment/Transit Project Assessment Process (TPAP) phase, in accordance with the Metrolinx Business Case Framework for capital investment projects. IBI Group and Parsons are managing the project on behalf of Metrolinx.

1.1. Project Description

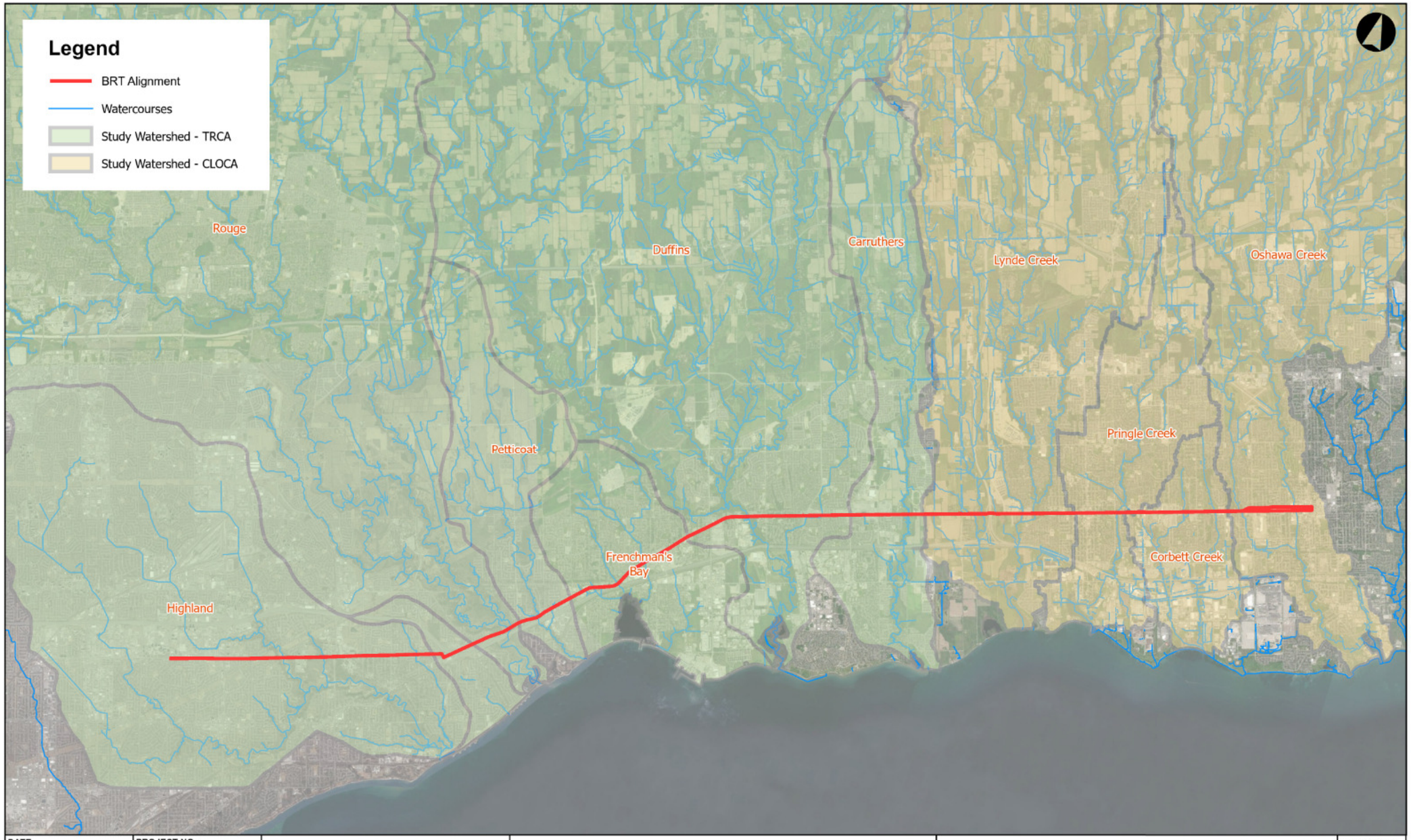
The DSBRT project proposes approximately 36 kilometres of dedicated transit infrastructure, connecting downtown Oshawa, Whitby, Ajax, Pickering, and Scarborough. This project builds on the existing PULSE bus service and will provide dedicated transit infrastructure along Highway 2 and Ellesmere Road, connecting Oshawa to Scarborough Centre. The corridor has varied traffic, land use conditions, and constraints. With rapid growth in the past decade, and an expectation for this growth to continue into the future, travel demand along the corridor will continue to increase and higher capacity transit will be needed to link communities and employment on both sides of the Toronto-Durham boundary. Transit infrastructure will include a range of design solutions in different segments of the corridor. The preliminary design concept includes segments with buses operating with transit priority measures and segments with dedicated curbside or centre-median transit lanes. The design concept varies by segment based on available space, travel demand, and land use context.

1.2. Project Background

The DSBRT corridor traverses several tributaries within the jurisdiction of Toronto and Region Conservation Authority (TRCA), including Highland Creek, Rouge River, Petticoat Creek, Frenchman's Bay, Duffin's Creek, Carruthers Creek Watersheds and within Central Lake Ontario Conservation Authority (CLOCA) including Lynde Creek, Pringle Creek, Corbett Creek, and Oshawa Creek Watersheds. The total upstream watershed area is approximately 773 km^2. The approximate drainage divide between conservation authorities, upstream drainage areas, as well we watershed boundaries are illustrated in **Figure 1.2** and **Figure 1.3**.

As shown in **Figure 1.1**, the Study Area includes the proposed DSBRT corridor, which is built upon the existing Ellesmere Road and Hwy 2 right-of-way (ROW), where existing watercourse crossing structures are to be extended or widened to accommodate any road infrastructure modification. All hydraulically connected hydrogeology features are included in the Study Area. A total of 23 watercourses were identified as regulated watercourses within the Study Area. Given these conditions, it is critical to understand the existing and proposed drainage conditions to develop a preliminary water crossing structure sizing and stormwater management (SWM) strategy to minimize the post development impacts and safely manage the flow through existing crossing locations.

FIGURE 1.1 KEY PLAN



DATE	PROJECT NO.			KEY MAP	FIGURE NO.
April 2021	477117		PARSONS	DURHAM-SCARBOROUGH BUS RAPID TRANSIT STORMWATER AND HYDROLOGY REPORT	1.1
SCALE NTS					

FIGURE 1.2 DRAINAGE MOSAIC (1 OF 2)

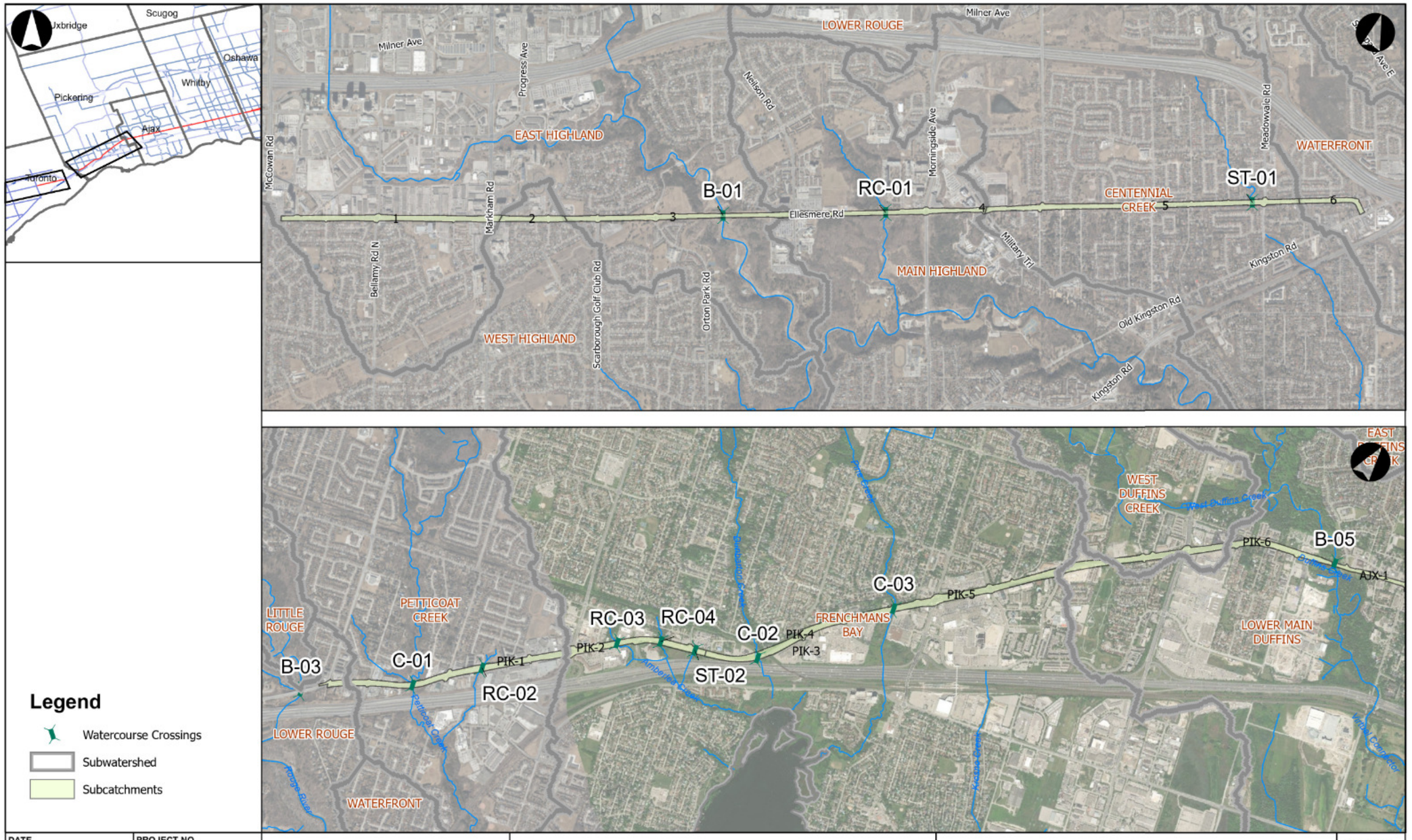
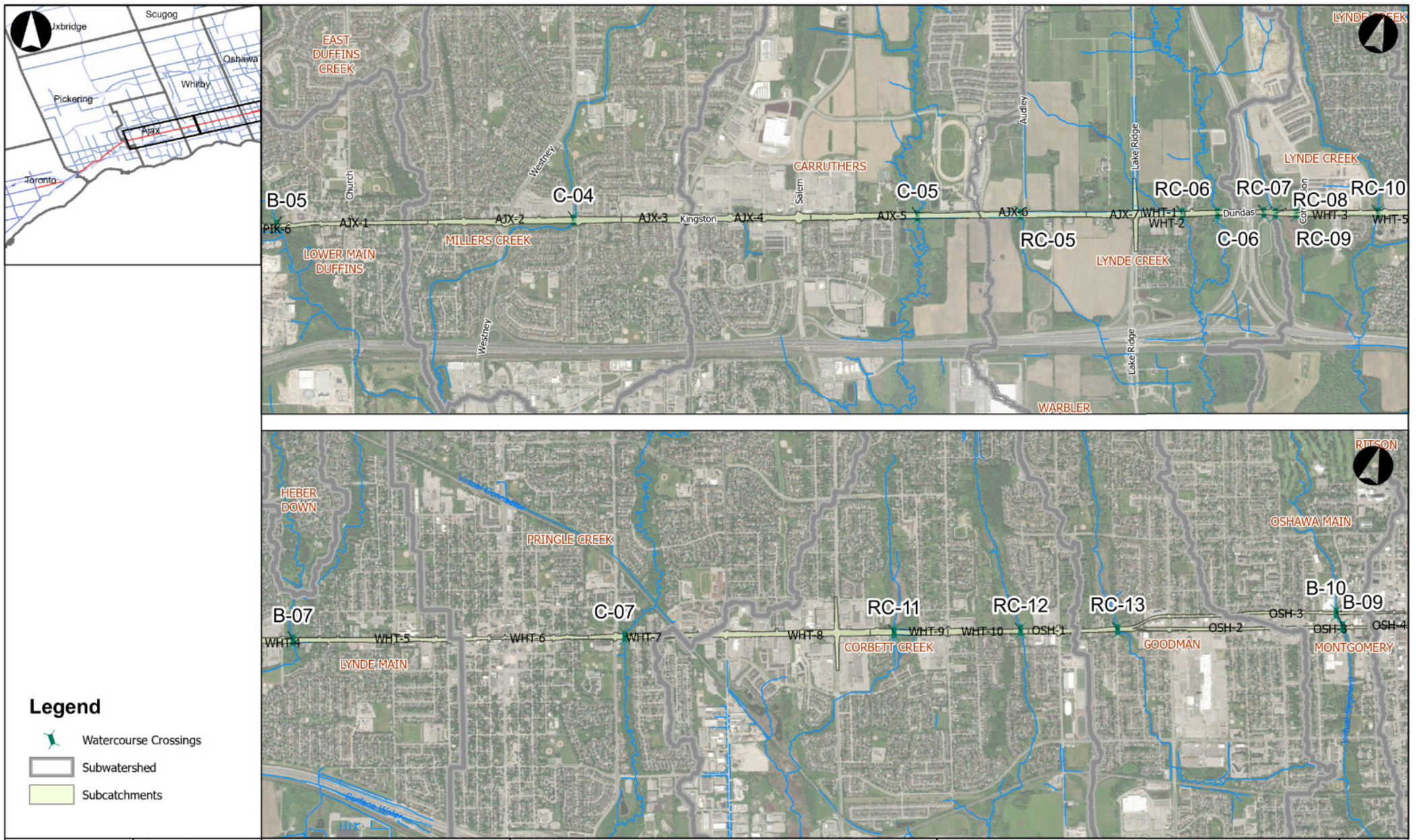


FIGURE 1.3 DRAINAGE MOSAIC (2 OF 2)



DATE	PROJECT NO.			
June 2021	477117		PARSONS	DRAINAGE MOSAIC - SHEET 2 of 2
SCALE				DURHAM-SCARBOROUGH BUS RAPID TRANSIT STORMWATER AND HYDROLOGY REPORT
NTS				FIGURE NO. 1.3

1.3. Objectives

The objective of the Stormwater and Hydrology Engineering component of the Project is to complete an analysis of the preferred BRT corridor and identify a drainage improvement strategy that will minimize adverse impacts on downstream receivers with respect to water quality and quantity, flood risk, or potential erosion. The focus of this study is to analyze and characterize the site drainage associated with the proposed DSBRT corridor under existing and proposed conditions, and to develop SWM strategies to minimize post-development impacts on the downstream receiving watercourses. The major tasks included in this analysis are as follows:

- Review all existing information including flood mapping studies and reports from previous watercourse crossing studies within the project limits.
- Conduct hydrologic analysis and hydraulic assessment for watercourses crossings
- Analyze and characterize pre-development and post-development site imperviousness to assess impacts of the proposed DSBRT project.
- Develop stormwater management (SWM) strategies for the proposed development.
- Provide recommendations.

This report is intended to illustrate how the existing drainage and stormwater management systems are affected by the proposed DSBRT and to identify possible mitigation measures required to ensure the SWM criteria can be met. In addition, storage requirements of SWM applications have been estimated to ensure Ministry of the Environment, Conservation and Parks' (MECP) and Conservation Authorities' quality and quantity control criteria are achieved for each site.

1.4. Background Information and Guiding Documents

Information sources reviewed included but were not limited to the following:

References and Guiding Documents:

- Highway Drainage Design Standards (HDDS), Ministry of Transportation, January 2008
- Drainage Management Manual (DMM), Ministry of Transportation, October 1997
- Gravity Pipe Design Guidelines, Ministry of Transportation, May 2007
- MTO Stormwater Management Requirements for Land Development Proposals, March 1999
- Stormwater Management Planning and Design Manual, Ministry of the Environment, March 2003
- Technical Guide, River and Stream Systems; Flooding Hazard Limit, Ministry of National Resources, 2002
- Technical Guide, River and Stream Systems, Erosion Hazard Limit, Ministry of National Resources, 2002
- Wet Weather Flow Management Guidelines (WWFMG), City of Toronto, November 2006
- Wet Weather Flow Management Master Plan, City of Toronto, April 2017
- Stormwater Management Criteria, TRCA, August 2012
- Crossing Guideline for Valley and Stream Corridors, TRCA, September 2015
- Technical Guidelines for Flood Hazard Mapping, TRCA, March 2017
- Erosion and Sediment Control Guide for Urban Construction, TRCA, 2019
- Engineering Design Criteria and Standard Drawings, Town of Ajax, 2011

- Stormwater Management Design Guidelines, City of Pickering, 2019
- Engineering Design Criteria, City of Oshawa, 2020
- Technical Guidelines for Stormwater Management Submissions, Central Lake Ontario Conservation Authority (CLOCA), 2020
- City of Toronto InfoWorks CS Basement Flooding Model Studies Guideline, October 2014
- Toronto Green Streets Technical Guidelines, August 2017
- Design Criteria for Sewer and Watermains, January 2021
- City of Toronto Sewer Capacity Assessment Guidelines, July 2021
- User's Guide to SWMM5, 13th Edition, CHI, November 2010.
- Toronto Requirements for Surface Light Rail Transit, Toronto Water, 2014
- Low Impact Development Stormwater Management Planning and Design Guide, TRCA, 2010
- Highland Creek Watershed Hydrologic Model Update, Matrix Solutions, 2020
- Amberlea Creek Hydrology and Floodline Mapping Study, City of Pickering, 2005
- Pine and Dunbarton Creeks Hydrologic and Hydraulic Study, TRCA, 2007
- Carruthers Creek Flood Management and Analysis, Cole Engineering, 2011
- Hydrologic Modelling for Lynde Creek, CLOCA, 2010
- Digital Floodline Mapping update for the Corbett Creek Watershed, Greck and Associates Limited, 2006
- Pringle Creek Master Drainage Plan Update, CANDEVCON Limited, 2018
- Lynde Creek Floodplain Mapping, EarthTech, 2008
- Corbett Creek Master Drainage Plan and Floodplain Mapping, TMIG, 2021
- Oshawa Creek Hydrologic and Hydraulic Modelling, CLOCA, 2014
- Frenchman's Bay Watershed Stormwater Management Master Plan, MMM, 2009
- Highway 2 Transit Priority Measures Drainage and SWM Report, AECOM, 2012

Mapping and Data:

- Highland Creek Watershed Hydraulic Model Update, Sheet No. 1, No. 3, TRCA, 2020
- Floodplain Mapping Program, Petticoat Creek, Sheet No.1, No. 2, TRCA, 2005
- Floodplain Mapping Program, Frenchman's Bay, Sheet No.1, No. 2, No. 6, TRCA, 2002
- Floodplain Mapping Program, Duffins Creek, Sheet No.1, No. 4, No. 5, No. 6, TRCA, 2020
- Carruthers Creek Floodplain Mapping Update Sheet No. 2, TRCA, 2020
- City of Toronto Open Data
- Durham Region Open Data
- TRCA Open Data
- Aerial Survey within DSBRT corridor, JD Barnes, 2019
- Ellesmere Road Record Drawings, City of Toronto

2. Design Criteria

Design criteria for the design and analysis of the drainage and stormwater component was developed through consultation with Metrolinx, MTO, TRCA, City of Toronto, Durham Region, City of Pickering, Town of Ajax, Town of Whitby, and City of Oshawa. The design criteria are summarized below.

2.1. Watercourse Crossing Design Criteria

Hydraulic analyses were undertaken for the existing and proposed water crossings to identify the headwater elevations and evaluate whether the design criteria could be met. 29 watercourse crossing structures within the study limits were identified. The existing roads where the proposed DSBRT corridor follows is classified as Major Arterial Road and Arterial B Road within the Durham Region. The hydraulic performance of watercourse crossings were assessed against the following standards from MTO Highway Drainage Design Standards (HDDS), Gravity Pipe Design Guidelines (GPDG), and Canadian Highway Bridge Design Code (CHBDC).

TABLE 2.1 SUMMARY OF HYDRAULIC DESIGN CRITERIA (MTO)

Crossing Type	Criteria	Condition	Value	References
Bridges & Culverts	Design Flow	Total Span ≤ 6.0m	50-year	WC-1 HDDS
		Total Span > 6.0m	100-year	
	Regulatory Flow	-	Hurricane Hazel	
	Check Flow	-	115% of 100-year	
Bridges	Minimum Freeboard	Design Flow	1m	WC-2, HDDS
	Minimum Clearance	Design Flow	1m	
	Water Level	Check Flow	≤ Edge of Travelled Lane	
	Design Service Life (DSL)	-	75 years	CHBDC
Culverts	Minimum Freeboard	Design Flow HWL	1m	WC-7, HDDS
	Desirable Freeboard	Design Flow EGL	1m	
	Water Level	Check Flow	≤ Edge of Travelled Lane	
	Flood Depth at Culverts	Diameter/Rise < 3m	HW/D ≤ 1.5	
		Diameter/Rise 3m to 4.5m	HW ≤ 4.5m	
		Diameter/Rise > 4.5m	HW/D ≤ 1.0	
	Minimum Diameter	Circular	800 mm	WC-8, HDDS
	Minimum Rise	Box	900 mm	
	Minimum Rise	Elliptical or Arch	800 mm	
	Design Service Life (DSL)	Freeway	50 years	GPDG

Hydraulic analyses have also been conducted following technical guidelines published by MNRF, TRCA, and CLOCA, which recommends providing a 0.3 m freeboard from the Regulatory Floodline for new infrastructure to ensure sufficient flood protection. It is also desirable to confine the overland flow to outside lanes on Regional roads such that one lane in each direction is maintained during the 100-year rainfall to facilitate safer passage of emergency vehicles and accommodate evacuation routes. As the DSBRT builds on existing infrastructure where pre-existing roads may be sub-standard, the hydraulic criteria has been identified to maintain or lower pre-existing Regulatory flood elevation under post-development condition.

A few crossing structures were designed with Relief Flow passage, where a fraction of the Regulatory Flow would bypass the main structure at a stream crossing by flowing over the roadway. When passage of Relief Flow is incorporated in the design of a crossing structure, the depth and velocity of Relief Flow needs to be verified against the overland flow characteristics criteria. The maximum depth and velocity of flow over the roadway is listed in the Table 2.2.

TABLE 2.2 SUMMARY OF RELIEF FLOW CRITERIA

	Flow Velocity	Permissible Depth (m)
WC-13, HDDS	The product of the velocity and depth on the roadway shall not exceed 0.8m²/s	0.3
MNRF	1.7	0.8
	A product depth and velocity less than or equal to 0.4 m2/s defines the low risk area	

Fish Passage needs to be considered on fish bearing streams. The requirements to facilitate Fish Passage through Culverts are listed in the **Table 2.3**.

TABLE 2.3 SUMMARY OF FISH PASSAGE DESIGN CRITERIA

Criteria	Value
Design Flow	2-year
Maximum Velocity	≤ natural channel velocity
Minimum Flow Depth	The average depth immediately upstream and downstream of the culvert

2.2. Corridor Drainage and Stormwater Management Criteria

The proposed DSBRT is designed with dual drainage considerations. Major system conveyance is only considered at this stage of design, while Minor System capacity will be evaluated during detail design. Major System flow is conveyed by the streets and major drainage channels. For segments with depressed roadways where viable overland escape routes cannot be accommodated, storm trunk sewers are proposed and sized to Major System conveyance capacity.

TABLE 2.4 SUMMARY OF CORRIDOR DRAINAGE CRITERIA

Drainage System Type	Criteria	Functional Road Classifications	Value	References
Major System	Design Flow	Rural Arterial	100-Year	SD-1, HDDS
	Design Flow	Depressed Roadways	100-Year	SD-7, HDDS
Side Storm Sewer	Design Service Life (DSL)	Freeway	75 years	GPDG

Through consultation with the TRCA, CLOCA, City of Toronto, and Local Municipalities, the following SWM criteria applies to the DSBRT corridor.

TABLE 2.5 SWM CRITERIA

Control Objectives	Watersheds	Requirements
Quantity Control	Highland Creek	Control post development peak flows to pre-development levels for all storms up to and including the 100-year storm (I.e. 2, 5, 10,25, 50 and 100-year storms)
	Petticoat Creek	No flood flow requirements downstream of Finch Ave.
	Frenchman's Bay	No quantity control required for sites draining directly to Frenchman's Bay.
	Amberlea Creek	Control post-development peak flows to pre-development levels for all storms up to and including the 100 year storm (i.e., 2, 5, 10, 25, 50, and 100 year storms) for all other areas.
	Dunbarton Creek	Control post-development peak flows to pre-development levels for all storms up to and including the 100-year storm (i.e., 2, 5,10, 25, 50, and 100-year storms)
	Pine Creek	For all other areas, control post-development peak flows to pre-development levels for all storms up to and including the 100 year storm (i.e., 2, 5, 10, 25, 50, and 100 year storms.
	Carruthers Creek	Control post-development peak flows to pre-development levels for all storms up to and including the 100 year storm (i.e., 2, 5, 10, 25, 50, and 100 year storms) using the unit flow relationships that have been

Control Objectives	Watersheds	Requirements
		established for the entire watershed (0.006 $m^3/s/ha$ in 5-year, 0.012 $m^3/s/ha$ in 25-year, 0.026 $m^3/s/ha$ in 100-year)
	Lynde Creek	Quantity control is only required on the Kinsale Branch, between Rossland Rd and the confluence with the Main branch (post development peak flow rates must not exceed corresponding pre-development rates for the 2-year through 100-year design storm events.)
	Pringle Creek	Quantity Control (2-100 and Regional Storm) required unless otherwise noted in Master Plans
	Corbett Creek	Quantity Control (2-100 and Regional Storm) required unless otherwise noted in Master Plans
	Oshawa Creek (including Goodman Creek)	Quantity Control (2-100 and Regional Storm) required unless otherwise noted in Master Plans
	City of Toronto	The required level of peak flow control from a development site contributing flow to a specific watercourse at the point of discharge shall follow Toronto and Region Conservation Authority (TRCA) Flood Flow Criteria Map The City of Toronto has adopted the 100-year storm as the level of protection for properties where feasible, against surface flooding from ponding on streets, particularly, in areas of the City experiencing chronic basement flooding, and/or when a proper major (overland flow) stormwater drainage system doe not exist.
Quality Control	TRCA	Enhanced protection (Level-1, 80% Total Suspended Solids (TSS) removal) criteria to determine the minimum permanent pool size for wet pond facilities
		Table 3.2 of the Stormwater Management Planning and Design Manual (MECP, 2003)
	CLOCA	Quality control must be provided for every site that is greater than 0.25 ha
	City of Toronto	Require long-term average removal of 80% of TSS on an annal loading basis from all runoff leaving the site. (Suspended solids removal efficiency is to be calculated based on 100% of the total runoff volume resulted from all storm events that occur in an average year.) Overall efficiency in TSS removal can be considered in combination with minimum on-site runoff retention and other conveyance & end-of-pipe controls (i.e. the treatment train approach)
Erosion Control	All Watersheds	Extended detention of 25 mm storm for 24-48 hours
	City of Toronto	Not applicable unless the infill site is located in close proximity (within 100 m) to natural watercourses.

3. Design Criteria

3.1. Watershed Characteristics

The drainage pattern crossing the project sites is generally from north to south through a variety of land use types. Maps of soil survey and land cover for the upstream study area are provided in **Appendix E**. The project site is surrounded predominantly by commercial and residential complex.

WATERSHED DETAILS

The general topography of the watersheds within the Study Area is from north to south. The most sections along the DSBRT corridor fall into the Hydrologic Soil Group (HSG) B and A classification, as shown in **Figure E.1**. These soil groups have the highest infiltration potential. The predominant soil type within the study area is sandy loam.

STREAMFLOW STATISTICS

One real-time flow monitoring station (Lynde Creek Near Whitby, Station ID 02HC018) was found within the study limits at Lynde Creek Bridge crossing Dundas Street, which has been operating since 1959. Recorded data from this station was used to calibrate the hydrologic model developed for watershed hydrologic analysis. Peak flow was identified using flood frequency analysis with 52 years of continuous recorded data for annual maximum instantaneous flows at station 02HC018. **Table 3.1** demonstrates calculated flood peak flows for selected return periods The results of the statistical analysis using HEC-FFA are presented in **Appendix D**.

TABLE 3.1 RESULTS OF SINGLE STATION FREQUENCY ANALYSIS

Station ID	Watershed	Drainage Area (km^2)	100-Year Peak Flow (m^3/s)	Unit Flow (L/s/ha)
02HC018	Lynde Creek	100	61.5	6.15

3.2. Precipitation

Rainfall information was obtained from MTO IDF Curve Lookup as shown in **Appendix E** for the sizing of new bridges. To incorporated climate change effects, the 2096 MTO IDF curve was used to develop design storms for the hydrologic analysis. SCS Type II 24-hour design storm was used to analyze the watershed hydrology for large watershed that mostly consists of undeveloped land with low impervious ratio. SCS Type II 24-hour design storm is well suited for rural and undeveloped catchments. Hurricane Hazel was identified to be the Regulatory storm for areas under the jurisdiction of TRCA and CLOCA. The Hyetograph is also shown in **Appendix E**.

3.3. Watershed Hydrology

The topography of the study watersheds is generally sloping from north to south with watercourses conveying flow crossing the corridor. Urbanization has occurred upstream of the DSBRT corridor throughout majority of the watershed areas. As urbanization in the upstream areas contributes significant peak runoff increase and the hydrologic impacts could not be accurately estimated without evaluating the effectiveness of stormwater management facilities in detail, flow rates from previous studies were summarized and reviewed to be adopted for watercourse crossing analysis.

Notably, A new hydrology model was developed using Visual OTTHYMO for crossing B-07 in the Lynde Creek Watershed. The flow rate obtained from the hydrology model was calibrated to the flow data obtained from stream flow monitoring station to update the design flow for watercourse crossing analysis. The results of hydrologic modelling are listed in **Table 4.2**. The model input file has been included in **Appendix D**.

TABLE 3.2 FLOWS TO WATER CROSSINGS WITHIN THE DSBRT CORRIDOR

	Crossing ID	NER ID	Design Flows (m^3/s)				Source
			Regulatory	100-Year	50-Year	25-Year	
TRCA	B-01	1	435.8	294.9	258.9	223	Matrix Solutions, 2020
	RC-01	2	28.8	17.2	13.9	12.1	Matrix Solutions, 2020
	ST-01	3	17	12.05	10.7	9.4	Matrix Solutions, 2020
	C-01	5	169.3	40.3	34.3	28.7	CLOCA Hydrologic Model
	C-02	10	19.9	17.5	14.9	12.7	Green Land, 2006
	B-05	12	371.3	89.42	76.8	64.9	Aquafor Beech, 2013
	C-04	13	93.5	28.1	23.8	19.1	Aquafor Beech, 2012
	C-05	14	89.6	20.1	17.4	14.9	Cole Engineering, 2011
CLOCA	RC-06	15	5.5	4.2	3.7	3.1	CLOCA. 2007
	C-06	16	134.5	42.9	36.1	29.1	CLOCA, 2007
	B-07	18	161.3	61.5	54.6	46.8	-
	C-07	19	-	92.2	78.2	65.2	CANDEVCON, 2018
	RC-11	20	13.8	13.1	10.8	9.4	Greck and Associated, 2006
	RC-12	21	36.8	29.4	24.4	21.1	Greck and Associated, 2006
	RC-13	22	52.66	9.6	8.9	8.2	CLOCA, 2014
	B-10	23	636.65	178.1	150.4	124.7	CLOCA, 2014
	B-09	23	636.65	178.1	150.4	124.7	CLOCA, 2014

4. Existing Conditions

An overall review was conducted to understand the existing drainage conditions of the DSBRT corridor. Majority of the watercourse have existing watercourse crossing structures to manage flood flows. The existing structures have defined centrelines and hydraulic conditions for most watercourses within the DSBRT corridor. Field investigations were carried out in 2020 to document conditions of existing crossing structures, stream channels, and surrounding environment. The field notes, summary of findings and site pictures are included in **Appendix B**.

The Study Area traverses several main watersheds under the jurisdictions of TRCA and CLOCA. The watercourses, watershed boundaries, and watercourse IDs, together with the conservation authority divide are shown in **Figure A.1** to **Figure A.2**. A list of watercourses is identified in **Table 4.1.** As a summary, there are 28 watercourses or drainage ditch that need to be accommodated within the project limits. 23 are mapped regulated watercourses of which current hydraulic models characterizing headwater and tailwater conditions have been provided as noted in **Table 4.1**. Five (5) watercourses are minor unregulated watercourses where the associated upstream drainage catchments are small, and no hydraulic model is available.

Existing hydrologic study reports were reviewed to quantify the peak runoff rate of existing crossing structures. Flow rates for return periods ranging from 25-year to 100-year, and Regulatory Flood events have been adopted for hydraulic analysis. Available HEC-RAS models were obtained from TRCA and CLOCA to identify headwater levels. No additional verification of flow attenuation capacity was conducted as part of this study.

4.1. Existing Site Condition

The Project encompasses distinct physiographic regions that require different drainage and stormwater management strategies to minimize any potential impacts. Five (5) segments have been identified to illustrate how the preliminary design objectives can be met. These segments (as identified below) were defined by the regional or municipal roads closest to those physiographic areas, proceeding from Scarborough Centre to Simcoe Street.

GRANGEWAY AVENUE TO THE TORONTO-PICKERING BOUNDARY

Starting from Grangeway Avenue, the DSBRT corridor is fringed by residential developments with limited road allowance available. The existing Ellesmere Road is built with an urbanized stormwater drainage system, where the existing storm sewer system is used to convey the stormwater runoff for minor and frequent rainfall events and the streets with curb barrier to manage the major system flow. The road ROW has limited lands available for the opportunity to build stormwater facilities. Three (3) watercourses are located within this segment which provide drainage outlet for the stormwater generated form road ROW and surrounding residential communities. An existing SWM pond has been identified 260 m south of Ellesmere Road, adjacent to Meadowvale Road, which provides peak flow control for its upstream contributing catchments.

TORONTO – PICKERING BOUNDARY TO ELIZABETH STREET

Starting from the west end of the Pickering boundary, no changes are proposed to the bridge over the Rouge River as part of the DSBRT project. From Altona Road to Elizabeth Street, the road ROW is serviced by a combination of rural and urban stormwater drainage systems that drain into the five watercourses the corridor traverses. The stormwater drainage was mostly designed as uncontrolled for the majority of this segment of road. Opportunities for conveyance control utilizing roadside ditches may be present at some locations.

ELIZABETH STREET TO LAKE RIDGE ROAD

From Elizabeth Street to Rotherglen Road, Kingston Road segment runs through the historic Pickering Village, where existing storm sewer system is present to convey minor system flow to the two watercourses within Duffins Creek Watershed. Between Rotherglen Road and Lake Ridge Road, the road is drained by a combination of urban and rural

stormwater drainage system consisting of roadside ditches and culverts, where two (2) existing stormwater management ponds are present to provide quantity and quality control to the stormwater runoff before it is discharged to the natural watercourse within the Carruthers Creek Watershed.

LAKE RIDGE ROAD TO WHITBY - OSHAWA BOUNDARY

From Lake Ridge Road to McQuay Boulevard, the adjacent developments mainly consist of agricultural lands and rural residential areas. From McQuay Boulevard to the Whitby Oshawa Boundary, the corridor is urbanized and surrounded by developed areas. The project site is mainly located within the Lynde Creek, Pringle Creek and Corbett Creek Watersheds. Drainage in this area is generally along the existing Kingston Road corridor conveyed in grass-lined ditches to four (4) watercourses in Lynde Creek Watershed from Lake Ridge Road to McQuay Boulevard except for a short segment between Lake Ridge Road and Halls Road. From McQuay Boulevard to Whitby – Oshawa boundary the stormwater runoff generated within the ROW is collected by catchbasins and conveyed through underground stormwater trunk to watercourses crossing the corridor in Pringle Creek, and Corbett Creek Watershed.

WHITBY - OSHAWA BOUNDARY TO SIMCOE STREET

The road ROW is mostly constrained within this segment, where an existing underground storm sewer system is present throughout the corridor. As the road allowance is limited, the opportunity to build a new stormwater facility is also limited. Two watercourses are located within this segment which provide a drainage outlet for the storm drainage major and minor systems.

4.2. Existing Watercourse Crossings

As shown in the Table 4.1, a total of 28 watercourses or drainage ditch and 29 crossing structures are listed and grouped by Conservation Authorities having jurisdiction. The hydraulic performance of the crossing structures was evaluated against criteria listed in guidelines published by MTO, Conservation Authorities, and local Municipalities.

B-01 HIGHLAND CREEK BRIDGE

B-01 is a 3-span bridge over the Highland Creek – Miliken branch. The design flow is 100-yr storm as the span is more than 6 m based on MTO hydraulic criteria. Based on the hydraulic analysis from hydraulic model obtained from TRCA, under existing conditions, the headwater level in Regulatory flood is more than 0.3 m below the elevation of road centreline, indicating the bridge opening provides sufficient hydraulic capacity. The bridge is at the low point of this segment of road, and no relief flow passage point is identified.

RC-01 HIGHLAND CREEK CULVERT

RC-01 is a large diameter storm trunk that runs under the Ellesmere Road and a residential area from north to southeast to pipe Centennial Creek through Ellesmere Road and discharge into a stormwater management pond east of Meadowvale Road. Based on the hydraulic analysis from model obtained from TRCA, under existing conditions, the headwater level in Regulatory flood is 0.5 m above the elevation of road centreline, indicating a small portion of the road segment is within the Regulatory floodline. In addition, the headwater level in 100-yr flood is below the elevation of road centreline, indicating the existing storm trunk is sized to provide 100-yr flood protection.

ST-01 CENTENNIAL CREEK STORM TRUNK

ST-01 is a large diameter storm trunk that runs under the Ellesmere Road and a residential area from north to southeast to pipe Centennial Creek through Ellesmere Road and discharge into a stormwater management pond east of Meadowvale Road. Based on the hydraulic analysis from hydraulic model obtained from TRCA, under existing conditions, the headwater level in Regulatory flood is 0.5 m above the elevation of road centreline, indicating a small portion of the

road segment is within the Regulatory floodline. In addition, the headwater level in 100-yr flood is below the elevation of road centreline, indicating the existing storm trunk is sized to provide 100-yr flood protection.

C-01 PETTICOAT CREEK BOX CULVERT

C-01 is a concrete box culvert with a span greater than 6 m that runs under the Kingston Road on Petticoat Creek. The design flow for this culvert under MTO hydraulic criteria is 100-yr storm. Based on the hydraulic analysis using model obtained from TRCA, under existing conditions, the headwater level in 100-yr flow is more than 1 m below the centreline of the road and edge of travelled lane, indicating the hydraulic condition meets the MTO hydraulic criteria. It is worth noting that this segment of road is within the Regulatory floodline as the headwater level in Regulatory flood is higher than the elevation of the road. The overland flow route is over the Kingston Road at the crossing location from the upstream to the downstream of the road. The upstream channel width has been identified as 3 m while the existing structure spans to around 6 m. The existing structure span is larger than the channel width.

RC-02 PETTICOAT CREEK ROAD CULVERT

RC-02 is a road culvert that runs under the Kingston Road on a tributary of Petticoat Creek with small associated upstream drainage catchment. The existing hydraulic model is not available as the model does not extend to upstream of Highway 401 to cover this crossing location. RC-02 is a road culvert on a tributary of Petticoat Creek. No impact to the hydraulic conditions was identified at the crossing structure RC-02. No further assessment is needed.

RC-03 AMBERLEA CREEK CULVERT 300 M EAST OF WHITES ROAD

RC-03 is a road culvert that is assessed under other projects. The existing hydraulic condition is listed in Table 4.1.

RC-04 AMBERLEA CREEK CULVERT 300 M WEST OF FAIRPORT ROAD

RC-04 is a road culvert that is assessed under other projects. The existing hydraulic condition is listed in Table 4.1.

ST-02 AMBERLEA CREEK STORM OUTLET PIPE AROUND FAIRPORT ROAD

ST-02 is a storm sewer outlet pipe that services a small upstream urban catchment. The hydraulic capacity is assessed under other projects. The existing hydraulic condition is listed in Table 4.1.

C-02 DUNBARTON CREEK CULVERT

C-02 is a concrete box culvert on Dunbarton Creek crossing the Kingston Road with a span of 3 m. The design flow is 50-yr storm as the span is less than 6 m based on MTO hydraulic criteria. Around the crossing location, a series of existing culverts carry the Dunbarton Creek from north to south under the CN Railway, Kingston Road and Highway 401. Based on the hydraulic analysis from model obtained from the TRCA, the headwater level in Regulatory flood is higher than the elevation of road centreline indicating this segment of road is within the Regulatory floodline. In addition, the headwater level in 100-yr and 50-yr flood events are higher than the elevation of road centreline, indicating overland flow over the Kingston Road would occur. Overland flow route has been identified at the crossing location over the Kingston Road from upstream to downstream side. Additional assessment of the hydraulic characteristics of the spill flow shows the depth and velocity of overland flow meet the criteria set out by MTO and TRCA.

C-03 PINE CREEK CULVERT

C-03 is a box culvert that is assessed and designed under other projects. The existing hydraulic condition is listed in Table 4.1.

B-05 WEST DUFFINS CREEK BRIDGET

B-05 is a 3-span bridge on West Duffins Creek crossing Kingston Road. The bridge is located in the Pickering (Village East) Special Policy Area (Pickering SPA) and Notion Road/Pickering Village SPA (Ajax SPA). Under existing conditions, the Pickering and Ajax SPAs experiences flooding during Regulatory flood event. Hydraulic constraints that contribute to flooding during Regulatory flood event include conveyance limitation associated with multiple crossing structures along the creek upstream and downstream of the crossing at Kingston Road. A Class Environmental Assessment (EA) on rehabilitation of the flood control dykes to mitigate the existing flooding issue upstream and downstream of the crossing carried out by TRCA has been approved.

C-04 MILLER'S CREEK CULVERT

C-04 is a 3-cell box culvert that coveys flow of Miller's Creek crossing the Kingston Road. The design flow is 100-yr storm as the span is more than 6 m based on MTO hydraulic criteria. Based on the hydraulic analysis from model obtained from TRCA, under existing conditions, the headwater level is below the elevation of road centreline. In addition, the headwater level in 100-yr storm is more than 1 m below the elevation of edge of travelled lane and road centreline, indicating the hydraulic condition meets the MTO hydraulic criteria.

C-05 CARRUTHERS CREEK CULVERT

C-05 is a box culvert that conveys flow of Carruthers Creek crossing Kingston Road with a span of 5.5 m. The design flow is 50-yr storm as the span is less than 6 m based on MTO hydraulic criteria. Based on the results of hydraulic analysis from HEC-RAS model obtained from the TRCA, under existing conditions, the headwater level is around 0.86 m below the centreline of the road. This is very close the MTO freeboard requirement of 1 m. Notably, the headwater level in Regulatory flood event is higher than the elevation of road centreline indicating this segment of road is within the Regulatory floodline. The overland flow route is from upstream to downstream over the Kingston Road at the crossing location. The flow characteristics do not meet the velocity-depth criteria.

Adjacent to the Carruthers Creek Watershed, an additional road culvert located 425 m east of Harwood Avenue, downstream of a stormwater management pond is not expected to be affected by the DSBRT project. Therefore, it was not included in the summary table.

RC-05 LYNDE CREEK CULVERT OUTLET

RC-05 is a box culvert that outlets to the south of a drainage channel south of Dundas Street, where it discharges to a ditch that runs further south as a tributary of Lynde Creek. No existing information was found on this crossing structure. Further consultation is needed to understand the drainage areas serviced by the culvert.

RC 06 TO RC-09 LYNDE CREEK ROAD CULVERTS

RC-06 is a box culvert with small associated upstream drainage catchment. The hydraulic model of Lynde Creek obtained from CLOCA does not include the crossing RC-06. An HEC-RAS model that includes the crossing structure and 300 m upstream channel has been developed to verify the existing hydraulic condition. The design flow and hydraulic conditions have been identified based on modelling results, indicating the existing condition meets the MTO hydraulic criteria for freeboard requirements of culvert crossings.

RC-07 and RC-08 are road culverts that are part of the Highway 412 drainage systems. As the culverts are not expected to be affected by the road widening needed for the DSBRT project, further hydraulic analysis was not included in the table. RC-09 is a road culvert with no associated drainage area, the hydraulic capacity was not assessed further.

Notably, an existing drainage channel on the north side of the Dundas Street needs to be realigned to provide drainage outlet for the upstream external drainage areas to crossing RC-06. Detailed discussion of the realignment is included in Section 6.1.

C-06 LYNDE CREEK STRUCTURAL CULVERT

Lynde Creek Structural Culvert is an Arch Culvert with a span of 12.8 m in watersheds under the jurisdiction of CLOCA, crossing C-06 is designed with Relief Flow for Regulatory flood event. Further evaluation of the Relief Flow shows the spill flow depth exceeds the maximum flow depth allowed by MTO. However, the flow depth and velocity conform with flow characteristics required by MNRF.

RC-10 LYNDE CREEK ROAD CULVERT

Crossing RC-10 is a long CSP culvert that outlets downstream south of a commercial development. The length of the existing culvert is approximately 180 m. The road is overtopped in the Regional flood event, while the depth and velocity of Relief Flow conform with the physical characteristics requirements by both MTO and MNRF.

B-07 LYNDE CREEK BRIDGE

B-07 is a single span bridge on Lynde Creek crossing Dundas Street with a total span of 19.2 m. The design flow is 100-yr storm as the span is more than 6 m based on MTO hydraulic criteria. Based on hydraulic analysis from HEC-RAS model obtained from CLOCA, under existing conditions, the headwater level is 0.56 m higher than the elevation of road centreline, indicating this segment of road is within the Regulatory floodline. The overland flow route has been identified at 100 m east of the bridge crossing. The depth and velocity of the overland flow in Regulatory flood event also exceed the physical criteria set out by both MTO and MNR. For MTO design flow, the headwater level is around 1.3 m below the elevation of the road centreline. Indicating the clearance is less than 1 m and does not meet the MTO hydraulic criteria. Future consultation is needed mitigate the existing issues.

C-07 PRINGLE CREEK STRUCTURAL CULVERT

C-07 is a 3-cell structural culvert crossing Dunduas Street on Pringle Creek. The design flow is 100-yr storm as the span is more than 6 m based on MTO hydraulic criteria. And the level of protection has been identified to be 100-year flood by MNRF. Based on hydraulic analysis from HEC-RAS model obtained from CLOCA, the headwater level in 100-yr storm is higher than the elevation of road centreline. In addition, the headwater level in 50-yr storm is lower than the elevation of the road centreline with a freeboard less than 1 m. Future consultation is needed to mitigate the existing issues.

RC-11 CORBETT CREEK CULVERT – WEST BRANCH

RC-11 is a box culvert on Corbett Creek – West Branch crossing Dundas Street. The design flow is 50-yr storm as the span is less than 6 m based on MTO hydraulic criteria. Based on the hydraulic analysis from HEC-RAS model obtained from CLOCA, under existing conditions, the headwater level in Regulatory flood event is 0.34 m below the elevation of road centreline. An overland flow route has been identified from north to south over the Dundas Street at 50 m east of the crossing location. The depth and velocity meet the characteristic criteria set out by MTO. Notably, the elevation of road low point is around 0.2 m lower than the headwater lever in 50-yr storm indicating the MTO hydraulic criteria was not met with the existing crossing structure.

RC-12 CORBETT CREEK CULVERT – EAST BRANCH

RC-12 is a double barrel culvert on Corbett Creek – East Branch crossing Dundas Street. The design flow is 50-yr storm as the span is less than 6 m based on MTO hydraulic criteria. Based on hydraulic analysis from HEC-RAS model obtained from CLOCA, under existing conditions, the headwater level in the Regulatory flood event is the same as the elevation of road centreline. Overland flow route has been identified from north to south over the Dundas Street at the crossing location and the hydraulic characteristics of the overland flow indicates the depth and velocity conform with flow characteristics required for overland flow by MTO. In addition, the headwater level in 50-yr storm is more than 1 m below the elevation of the edge of travelled lane, indicating the hydraulic condition meet the MTO hydraulic criteria.

RC-13 GOODMAN CREEK CULVERT

RC-13 is a box culvert located at Goodman Creek crossing. As the DSBRT would not result in modification to the culvert structure, the hydraulic condition was not assessed further in detail.

B-09 AND B-10 OSHAWA CREEK BRIDGES

B-09 and B-10 are two bridges on Oshawa Creek at Bond Street and King Street. The design flow is 100-yr storm as the span is more than 6 m based on MTO hydraulic criteria. Based on the hydraulic analysis from HEC-RAS model obtained form CLOCA, under existing conditions, the headwater level at both bridges are higher than the elevation of road centreline, indicating this segment of Bond Street and King Street is within the Regulatory floodline. The headwater level is 0.05 m higher than the elevation of road centreline at Bond Street and less than 1 m below the elevation of road centreline at King Street, indicating the MTO hydraulic criteria was not met at these two crossing locations.

TABLE 4.1 INVENTORY OF EXISTING WATERCOURSE CROSSINGS DETAILS WITHIN THE DSBRT CORRIDOR

	Crossing ID	NER ID	Approx. Sta.	Locations	Existing Structure							Existing Headwater Level (m)				Road		Existing Criteria					
					U/S (m)	D/S (m)	Length (m)	Slope (%)	Rise (mm)	Total Span (mm)	Type	Regional/ Regulatory	100yr	50yr	25yr	C/L	Spill	Freeboard >= 0.3m	MTO Freeboard	HW/D <=1.5	Spill Velocity (m/s)	Spill Depth (m)	v-D Criteria
TRCA	B-01	1	13+400	Highland Creek - Milliken Branch	-	-	29	-	-	76809	3-Span Bridge	124.33	123.31	123.01	122.12	135.30	-	Yes	Yes	-	-	-	-
	RC-01	2	14+600	Highland Creek	112.0	111.2	71	2.00%	2210	3480	Pipe Arch	116.38	114.58	114.18	113.95	123.00	-	Yes	Yes	Yes	-	-	-
	ST-01	3	17+340	Centennial Creek, Meadowvale Road	112.0	111.0	78	1.29%	2500	-	Circular	117.40	116.80	116.60	116.43	116.90	116.90	No	No	No	2.4	0.36	No
	B-03	4	50+050	Rouge River	No info, no impact					220980	6-Span Bridge	-	-	-	-	-	-	-	-	-	-	-	-
	C-01	5	50+890	Petticoat Creek	90.5	90.3	43	0.54%	2450	6150	Conc Box	97.95	93.22	92.94	92.7	97.00	97.50	No	Yes	Yes	1.11	0.63	No
	RC-02	6	51+420	Petticoat Creek	-	-	168	-	1500	1800	Conc Box	To be evaluated during detail design											
	RC-03	7	52+450	Amberlea Creek, Whites Road	95.6	95.0	45	1.49%	1500	1800	Conc Box	97.83	96.76	97.34	97.15	98.60	98.60	Yes	Yes	Yes	-	-	-
	RC-04	8	52+760	Amberlea Creek, West of Fairport Road	91.7	90.4	51	2.45%	1500	2600	Conc Box	98.44	94.55	94.05	93.62	98.70	-	No	Yes	No	-	-	-
	ST-02	9	53+040	Amberlea Creek, Fairport Road	89.9	88.7	58	1.93%	1200	-	Conc Circular	93.19	93.09	92.60	92.06	96.30	-	Yes	Yes	No	-	-	-
	C-02	10	53+500	Dunbarton Creek	79.1	77.9	57	2.54%	1800	3000	Conc Box	86.72	86.28	85.93	84.52	85.30	85.70	No	No	No	0.59	0.25	Yes
	C-03	11	54+580	Pine Creek	80.2	80.2	42	0.22%	2250	7100	Conc Box	84.15	83.17	83.02	82.94	84.32	82.90	No	No	Yes	0.24	1.16	No
	B-05	12	60+150	West Duffins Creek	-	-	24	-	-	64008	3-Span Bridge	85.12	82.05	81.80	81.55	85.10	-	No	No	-	-	-	-
	C-04	13	62+350	Miller's Creek, Chapman Dr	89.1	88.6	59	0.86%	3000	12000	2-Cell Conc Box	92.55	90.74	90.57	90.30	93.70	-	Yes	Yes	Yes	-	-	-
					89.7	89.2	59	0.86%	1600	4800	Conc Box	-	-	-	-	-	-	-	-	-	-	-	-
	C-05	14	64+900	Carruthers Creek	83.5	83.5	34	0.03%	1900	5500	Conc Box	89.77	86.57	86.44	86.33	87.30	87.30	No	No	No	0.17	2.5	No
CLOCA	RC-05	14a	65+675	Audley Rd, Low Point	-	-	-	-	1800	2400	Conc Box	To be evaluated during detail design											
	RC-06	15	70+350	Halls Road	83.5	83.0	35	0.95%	1500	1800	Conc Box	84.71	84.63	84.37	84.18	84.77	84.7	No	Yes	Yes	-	-	-
	C-06	16	70+620	216 m west of Hwy 412	81.7	81.3	28	1.61%	2350	12800	Structural Arch	84.87	83.99	83.81	83.62	86.80	84.20	Yes	No	Yes	1.09	0.75	No
	RC-07	-	70+950	Hwy 412 Road Ditch	81.5	81.0	61	0.82%	1650	-	Circular	No impact											
	RC-08	-	71+050	Hwy 412 Ramp	81.9	81.0	60	1.51%	3650	3280	Pipe Arch	No impact											
	RC-09	16a	71+200	Des Newman Blvd	83.0	82.9	41	0.25%	1200	-	CSP	To be evaluated during detail design-											
	RC-10	17	71+800	Lynde Creek, Storm Trunk	78.2	77.4	180	0.51%	2000	-	CSP	82.58	82.21	81.36	80.37	82.60	82.28	No	Yes	No	0.64	0.31	Yes
	B-07	18	72+150	Lynde Creek, McQuay Blvd	-	-	18	-		19200	Single Span Bridge	81.36	79.92	79.69	79.58	82.40	80.90	No	No	-	-	-	-
	ST-03	-	74+010	Ash Creek, Storm Trunk	-	-			2210	4572	Concrete	-	-	-	-	-	-	-	-	-	-	-	-
	C-07	19	74+610	Pringle Creek	83.0	83.0	26	-	2400	6100	Conc Box	-	86.58	86.31	86.02	86.47		-	No	Yes	-	-	-
					83.0	83.0	26	-	2400	9600	2-Cell Conc Box	-	-	-	-	-	-	-	-	-	-	-	-
	RC-11	20	76+610	Springwood St - Kathleen St	107.7	107.8	40	0.30%	1500	1800	Conc Box	111.06	111.04	111.07	111.00	111.40	110.80	Yes	No	No	0.55	0.26	Yes
	RC-12	21	80+000	Corbett Creek, Thornton Rd	96.5	96.2	40	0.52%	2300	-	Circular	102.01	100.99	99.98	99.42	102.00	102.00	No	Yes	Yes	0.46	0.21	Yes
					96.4	96.2	40	0.38%	1900	2500	CSP Arch	-	-	-	-	-	-	-	-	-	-	-	-
	RC-13	22	80+715	Goodman Creek	103.8	103.0	120	1.35%	2150	3800	Conc Box	No impact											
	B-10	23	91+650	Oshawa Creek - Bond St	-	-	20	-	2900	16300	2-Span Bridge	103.60	102.52	102.15	101.33	102.10	101.25	No	No	-	2.01	1.5	No
	B-09	23	81+390	Oshawa Creek - King St	-	-	19	-	3700	17600	Arch Bridge	102.64	101.16	101.14	100.80	101.42	100.83	No	No	-	2.01	1.2	No

4.3. Existing Corridor Drainage and Stormwater Management

CITY OF TORONTO

Existing storm sewer systems are present within the proposed DSBRT corridor within the of City of Toronto limits. Runoff from Ellesmere Road and Kingston Road are collected by the existing catchbasins, conveyed, and eventually discharged to the watercourses located in separated watersheds including Highland Creek and Centennial Creek. Table 4.2 listed the existing impervious ratio for each roadway segment discharging to each subwatershed.

No major existing stormwater management facility was identified within the DSBRT corridor through reviewing the CUMAP provided by the City of Toronto. Notably, a stormwater management pond was identified east of Meadowvale Road that provides quantity and quality control to the stormwater runoff generated from road segment east of Military Trail. Further review of existing stormwater management plans and reports are needed to understand existing water quantity control and water quality treatment capacities for the BRT corridor.

TABLE 4.2. EXISTING SUBCATCHMENT (SC) DETAILS IN TORONTO

SC ID	Road Segment			Existing Imperviousness* (%)	Subwatershed	Total Site Area (ha)
	Start Chain	End Chain	Length (m)			
1	10+000	11+700	1700	64%	West Highland	7.1
2	11+700	12+200	500	58%	East Highland	2.1
3	12+200	13+900	1700	61%	West Highland	6.4
4	13+900	15+300	1400	65%	Main Highland	5.5
5	15+300	17+700	2400	60%	Centennial	9.4
6	17+700	18+200	500	61%	Waterfront	2.0

*Analysis based on impermeable layer provided by City of Toronto Open Data (2019)

DURHAM REGION

Runoff from the proposed DSBRT corridor is primarily collected and conveyed by existing storm sewer systems. Roadside ditches are present for a road segment from Galea Drive to Lake Ridge Road to convey the runoff. Table 4.3 listed the existing imperviousness of the roadway segments discharging to each subwatershed.

Stormwater management facilities were identified for segments in Carruthers Creek Watershed along the corridor based on preliminary review of the topography of the study area and aerial imagery. Further details from existing stormwater management plans and reports are needed to understand the existing water quantity control and water quality treatment capacities within the DSBRT corridor.

TABLE 4.3. EXISTING SUBCATCHMENT (SC) DETAILS IN DURHAM REGION

SC ID	Road Segment			Existing Imperviousness* (%)	Subwatershed	Total Site Area (ha)
	Start Chain	End Chain	Length (m)			
PIK-1	50+273	52+100	1827	70%	Petticoat Creek	8.5
PIK-2	52+100	53+070	970	70%	Amberlea Creek	5.2
PIK-3	53+070	53+900	830	70%	Dunbarton Creek	3.6
PIK-4	53+900	54+200	300	70%	Hwy 401	1.3
PIK-5	54+200	55+900	1700	70%	Pine Creek	1.9
PIK-6	55+900	57+730	1830	79%	Duffins Creek	8.5
AJX-1	60+000	61+200	1200	70%	Duffins Creek	10.0
AJX-2	61+200	62+680	1480	74%	Miller Creek	3.6
AJX-3	62+680	63+200	520	79%	Miller Creek	6.5
AJX-4	63+200	64+000	800	79%	Carruthers Creek	2.2
AJX-5	64+000	65+400	1400	79%	Carruthers Creek	4.1
AJX-6	65+400	66+100	700	70%	Lynde – Kinsale	5.5
AJX-7	66+100	66+500	400	70%	Lynde – Kinsale	3.6
WHT-1	70+000	70+400	400	70%	Lynde – Kinsale	3.5
WHT-2	70+400	70+800	400	70%	Lynde – Kinsale	1.6
WHT-3	70+800	71+500	700	70%	Lynde – Kinsale	2.0
WHT-4	71+500	72+000	500	70%	Lynde RC10	2.4
WHT-5	72+000	73+500	1500	70%	Lynde B07	2.3
WHT-6	73+500	74+300	800	70%	Lynde Creek	5.1
WHT-7	74+300	74+900	600	70%	Pringle C07	2.6
WHT-8	74+900	76+400	1500	70%	Corbett Creek	2.3
WHT-9	76+400	77+000	600	70%	Corbett RC-11	7.6
WHT-10	77+000	77+500	500	70%	Corbett RC12	2.5
OSH-1	80+000	80+400	400	83%	Corbett RC12	2.2
OSH-2	80+400	81+400	1000	83%	Goodman Creek	1.4
OSH-3	90+700	91+800	1100	83%	Oshawa Creek	5.2
OSH-3	81+400	82+600	1200	83%	Oshawa Creek	2.1
OSH-4	82+600	82+860	260	83%	Harmony Creek	1.5
OSH-4	91+800	92+140	340	83%	Harmony Creek	0.4

*Estimated based on typical Major Road ROW imperviousness for PIK, AJX and WHT segments, and typical cross section of existing road forPIK-6, AJX-2, AJX-3, AJX-4, AJX-5 and OSH segments.

5. Proposed Condition

The design analysis has been based on the proposed profile and alignment of the DSBRT. The proposed work includes widening existing road to accommodate BRT infrastructure, leading to culvert extension and bridge widening. Along the DSBRT corridor, bus stops are proposed, which primarily consist of platforms and bus shelters only. **Figure A.1** to **Figure A.2** show the drainage mosaics for the proposed condition, including proposed construction limit.

The impacts to Drainage and Hydrology Engineering design related to the proposed DSBRT include:

- Extending and widening existing culverts and bridges within the project limits.
- Realignment of the drainage channel in Lynde Creek Watershed along the north side of the DSBRT corridor around Halls Road.
- Implementation of appropriate SWM practices.

5.1. Proposed DSBRT Design

The total width of paved road varies throughout the corridor. Curb and gutter with catchbasins are proposed to be installed to urbanize the corridor in the rural sections and the existing storm sewer pipe network is proposed to be utilized to provide drainage for the urbanized section of the DSBRT corridor. The proposed site conditions are further discussed in detail as below.

GRANGEWAY AVENUE TO THE TORONTO-PICKERING BOUNDARY

Starting from Grangeway Avenue, the road is proposed to be widened from 4 lanes to 6 lanes to accommodate the centre-median BRT facilities. The post-development stormwater flow is proposed to be drained by existing storm sewer system and conveyed to the three (3) watercourses within the segments. The bridge and culvert over Highland Creek are sufficient in length to accommodate the road widening. The storm trunk inlet located on Highland Creek – Centennial Tributary is expected to be relocated to the north to accommodate the road widening.

TORONTO – PICKERING BOUNDARY TO ELIZABETH STREET

The DSBRT does not propose any modification to Kingston Road between the Toronto–Pickering Boundary to Rouge River Bridge. From Altona Road, the road is proposed to be widened from 4 lanes to 6 lanes to accommodate the additional BRT facilities. A class EA has been completed to evaluate the impacts of proposed road modification. The work on this project is not expected to impact the results of this evaluation.

ELIZABETH STREET TO LAKE RIDGE ROAD

From Elizabeth Street, to Rotherglen Road, Kingston Road runs through the historic Pickering Village. The road is proposed to be widened from 4 lanes to 5 lanes to accommodate the bus lanes and predicted traffic demand. The culvert is proposed to be extended at Carruthers Creek. Post-development stormwater runoff is to be conveyed to the natural watercourse through a new storm sewer system.

LAKE RIDGE ROAD TO WHITBY-OSHAWA BOUNDARY

The road is proposed to be widened and urbanized within this segment, which leads to extension or widening of eight (8) watercourse crossing structures. Curbs and gutters and storm sewer systems need to be constructed to urbanize the road and convey the post-development runoff to the natural watercourses within Lynde Creek, Pringle Creek, and Corbett Creek Watershed.

WHITBY – OSHAWA BOUNDARY TO SIMCOE STREET

The existing road width is proposed to be maintained within this segment, where the existing storm sewer is expected to have sufficient capacity to accommodate the post-development flow. However, two bridge crossings on the Oshawa Creek are proposed to be replaced to improve the hydraulic conditions at the crossing locations along King street and Bond Street.

5.2. Proposed Watercourse Crossings

B-01 HIGHLAND CREEK BRIDGE

No impact to the hydraulic opening was identified at the crossing structure B-01. No further assessment is needed.

RC-01 HIGHLAND CREEK CULVERT

No impact to the hydraulic opening was identified at the crossing structure RC-01. No further assessment is needed.

ST-01 CENTENNIAL CREEK STORM TRUNK

ST-01 is proposed to be extended by 12 m to accommodate to the road widening due to addition of active transportation facilities and bus stop platforms around the intersection of Meadowvale Road and Ellesmere Road. As noted earlier in Section 4.2, the overland flow path downstream of crossing ST-01 is through a walkway between private properties south of the Ellesmere Road. As the total traffic lanes including BRT lanes and general traffic lanes within the road segment contributing to crossing ST-01 is proposed to remain the same as existing, no major increase in impervious area is expected, and the on-road storage and overland flow path is not expected to be affected at this crossing location. As the road widening is not needed for this segment of corridor, the hydraulic impact due to the extension of ST-01 is minimal. Hydrodynamic modelling would not be necessary for this crossing during detailed design. Further discussion is included in Section 5.3.

C-01 PETTICOAT CREEK BOX CULVERT

A culvert extension is needed for crossing C-01 on Petticoat Creek Box Culvert. As shown in Table 5.1, the headwater level in proposed condition remains the same as existing headwater level, indicating the impacts on hydraulic conditions for the crossing C-01 due to the road widening work is minimal.

RC-02 PETTICOAT CREEK ROAD CULVERT

RC-02 is a road culvert on a tributary of Petticoat Creek. No impact to the hydraulic conditions was identified at the crossing structure RC-02. No further assessment is needed.

RC-03, RC-04 AND ST-02 AMBERLEA CREEK CULVERTS

Culvert extension work is currently underway on crossing RC-03, RC-04, and ST-02. No further work is proposed on those crossings; therefore, the culvert extension was not further assessed.

C-02 DUNBARTON CREEK CULVERT

A culvert extension is proposed to connect the existing culvert under Kinston Road into the upstream culvert under CN Railway through an underground concrete vault. A ditch inlet and short drainage pipe is also needed to connect the ditch north of Kington Road into the extended culvert. As the culvert under the Kingston Road connects to culvert under the CN Rail with no surface outlet, and the Kinston road underpasses the CN Rail, the CN Rail embankment will act as a berm to contain the water ponding upstream of the crossing. In proposed condition, the existing high point around the upstream floodplain is to be maintained to prevent headwater from spilling into the underpass. Floodplain fill is proposed around crossing C-02 on Dunbarton Creek to construct the additional westbound lane of the BRT.

The upstream end of the culvert is located on the northeast side of the CN Railway. As shown in Table 5.1, the headwater level shows the water level at cross section upstream of CN Rail. The Regional flood elevation is higher than the spill elevation indicating the culvert under Kingston Road will be surcharged, but the road will not be overtopped. The upstream headwater level remains the same as existing and the Kingston Road is no longer overtopped during Regional flood event under proposed condition.

C-03 PINE CREEK CULVERT

A culvert extension is needed at Crossing C-03 on Pine Creek and will be completed under a separate project, which is currently under review. No further work is proposed around this structure; therefore, the hydraulic performance was not assessed further.

B-05 WEST DUFFINS CREEK BRIDGET

B-05 is the bridge crossing on West Duffins Creek to be widened with extended piers and abutments. Comparing the hydraulic criteria under both existing and proposed condition, the bridge widening does not cause negative impacts to the hydraulic performance of the bridge crossing. Notably, the hydraulic condition could be further assessed using the 2D model obtained from the TRCA during detail design to further refine the design, the proposed grading plan, and fill volume within the floodplain.

C-04 MILLER'S CREEK CULVERT

Culvert extension is not needed at crossing C-04. the hydraulic capacity was not further assessed.

C-05 CARRUTHERS CREEK CULVERT

A Culvert extension is needed at crossing C-05. As the hydraulic opening of existing crossing structure is sufficient to convey the flow, the impacts of culvert extension is minimal. The headwater level does not increase under proposed condition, indicating upsizing the culvert to mitigate the impact of road widening is unnecessary.

RC-05 LYNDE CREEK CULVERT OUTLET

Culvert extension on the outlet end is needed at crossing RC-05 to accommodate the road widening. As the culvert outlet serves as an outfall of an existing underground storm sewer system, impacts on hydraulic performance is to be evaluated together with road drainage design in detail design.

RC 06 TO RC-09 LYNDE CREEK ROAD CULVERTS

Crossing RC-06 needs to be extended by 10 m on both ends to accommodate the road widening. 300 m of upstream channel needs to be realigned together with the culvert extension. Results of hydraulic modelling show the headwater level remains the same as existing condition in 100-yr and Regulatory flood event. The increase in headwater level is less than 0.15 m for 25-yr and 50-yr flood events and the increase in water level in the upstream channel is limited to within the road allowance and does not encroach onto adjacent properties, indicating the hydraulic impacts of culvert extension is minimal. The creek realignment is further discussed in Section 6.1.

RC-07 and RC-08 are road culverts for roadside ditch crossing under the Highway 412 and ramp. No extension is needed to accommodate the road widening, therefore, no further evaluation is needed.

RC-09 is proposed to be relocated as it conflicts with the foundation of bus stop platform at the intersection of Dundas Street and Des Newman Boulevard.

C-06 LYNDE CREEK STRUCTURAL CULVERT

Culvert C-06 needs to be extended to accommodate the road widening. The culvert extension has minimal impacts on headwater level under proposed condition.

RC-10 LYNDE CREEK ROAD CULVERT

Crossing RC-10 needs to be extended on the inlet end by 10 m to accommodate the road widening. The outlet end is located further south downstream of the commercial development and would not be impacted. The headwater level increases less than 0.05 m under proposed condition in 25-year, 50-year, and 100-year flood event. In addition, the headwater level remains the same in Regional flood event under proposed condition. While the road is overtopped during Regional flood event, the depth and velocity of Relief Flow conform with physical characteristics required by both MTO and MNRF under existing and proposed condition.

B-07 LYNDE CREEK BRIDGE

The Lynde Creek Bridge at crossing B-07 is proposed to be replaced with a new bridge to expand the deck width and hydraulic opening and to accommodate the road widening. The expansion on bridge deck width would exacerbate the existing flooding and increases the upstream flood level in 25-year, 50-year, and 100-year flood events, and the hydraulic impact needs to be mitigated. A new bridge size was determined to minimize the increase in headwater level.

The design flow identified from an updated hydrology model that considered climate change impact for a design service life of 75 years were adopted for the hydraulic analysis. The hydraulic opening needed in proposed condition was evaluated without considering the downstream backwater effect to identify sizes needed to provide sufficient conveyance capacity. The results of hydraulic modelling show the headwater level remains the same in proposed condition with the new bridge size, indicating the hydraulic impact has been mitigated.

Notably, there is storm sewer outfalls located close to the water crossing structures that needs to be relocated. Design for relocation of storm sewer outfalls needs to be completed during detail design.

C-07 PRINGLE CREEK STRUCTURAL CULVERT

Culvert C-07 is located on Pringle Creek where a 20 m culvert extension is proposed to accommodate the road widening. The level of protection on Pringle Creek has been identified to be 100-year by MNRF and the culvert extension has minimal impacts on headwater level under proposed condition in 100-year flood. The Relief Flow in Regulatory Flood was not further evaluated. Culvert embedment should be incorporated during detailed design for the culvert extension to facilitate fish passage following requirements listed in MTO Highway Drainage Design Standards (HDDS) WC-12.

Notably, there is storm sewer outfalls located close to the water crossing structures that needs to be relocated. Design for relocation of storm sewer outfalls needs to be completed during detail design.

RC-11 AND RC-12 CORBETT CREEK CULVERTS

Culvert extension is proposed on crossing RC-11 and RC 12, where the changes in headwater level is around 0.01 m under proposed condition. The impacts of the culvert extension are minimal.

RC-13 GOODMAN CREEK CULVERT

No extension is needed on crossing RC-13. Therefore, the crossing was not evaluated further.

B-09 AND B-10 OSHAWA CREEK BRIDGES

Bridge replacements are proposed on crossing B-09 and B-10, where the hydraulic condition is improved as a larger opening is provided under proposed condition. Crossing B-09 is proposed to be replaced with a Single Span Bridge with similar dimensions. The hydraulic analysis results show that the headwater level does not increase in proposed condition. Crossing B-10 is proposed to be replaced with a single span bridge to remove the middle pier and reduce obstruction in the creek channel. The hydraulic analysis results show that the headwater level decreases in proposed condition comparing to the existing condition for 100-yr, 50-yr and 25-yr flood events, indicating the hydraulic condition is improved.

TABLE 5.1 SUMMARY OF PROPOSED WATERCOURSE CROSSING STRUCTURES WITHIN THE DSBRT CORRIDOR

	Crossing ID	Approx. Sta.	Locations	Proposed Structure					Proposed Headwater Level				Road Design		Meet Criteria					
				Length (m)	Slope (%)	Rise (mm)	Total Span (mm)	Type	Regional	100yr	50yr	25yr	C/L	Spill	Freeboard >=0.3m	HW/D <=1.5	MTO Freeboard	Spill v (m/s)	Spill Depth (m)	V-D Criteria
TRCA	B-01	13+400	Highland Creek - Milliken Branch	No impact																
	RC-01	14+600	Highland Creek	No impact																
	ST-01	17+340	Centennial Creek, Meadowvale Road	90	1.29%	2500		Circular	117.40	116.80	116.60	116.43	116.90	116.90	No	No	No	2.4	0.36	No
	B-03	50+050	Rouge River	No impact																
	C-01	50+890	Petticoat Creek	59	0.54%	2450	6150	Conc Box	97.95	93.24	92.95	92.71	97.00	97.50	No	Yes	Yes	1.11	0.63	No
	RC-02	51+420	Petticoat Creek	168		1500	1800	Conc Box	To be evaluated during detail design											
	RC-03	52+450	Amberlea Creek, Whites Rd N	71	1.49%	1500	1800	Conc Box	No further work											
	RC-04	52+760	Amberlea Creek, Whites Rd N	77	2.45%	1500	2600	Conc Box	No further work											
			Proposed added barrel	74	2.45%	1200		Circular	No further work											
	ST-02	53+040	Amberlea Creek, Fairport Rd	70	1.93%	1200		Conc Circular	No further work											
	C-02	53+500	Dunbarton Creek	128	2.54%	1800	3000	Conc Box	86.68	86.15	85.80	84.41	85.30	85.70	No	No	No	Surcharged, no spill.		
	C-03	54+580	Pine Creek	72	0.22%	2250	7100	Conc Box	No further work											
	B-05	60+150	West Duffins Creek	31	0.00%		64008	3-Span Bridge	85.16	82.05	81.80	81.55	85.10	-	No	-	No	-	-	-
	C-04	62+350	Miller's Creek, Chapman Dr	59	0.86%	3000	12000	2-Cell Conc Box	92.56	90.74	90.57	90.30	93.70	91.50	Yes	Yes	Yes	0.38	0.83	Yes
				59	0.86%	1600	4800	Conc Box	-	-	-	-	-	-	-	-	-	-	-	-
	C-05	64+900	Carruthers Creek	47	0.03%	1900	5500	Conc Box	89.77	86.59	86.45	86.33	87.30	87.30	No	Yes	No	0.17	2.5	No
CLOCA	RC-05	65+675	Audley Rd, Low Point	No info, to be evaluated during detail design																
	RC-06	70+350	Halls Road	53	0.95%	1500	1800	Conc Box	84.71	84.61	84.49	84.32	84.77	84.7	No	Yes	No	-	-	-
	C-06	70+620	216 m west of Hwy 412	38	1.61%	2350	12800	Structural Arch	84.87	83.99	83.82	83.62	86.80	84.20	Yes	Yes	Yes	1.09	0.75	No
	RC-07	70+950	Hwy 412 Road Ditch	No impact																
	RC-08	71+050	Hwy 412 Ramp	No impact																
	RC-09	71+200	Des Newman Blvd	71	0.25%			CSP	To be evaluated during detail design											
	RC-10	71+800	Lynde Creek, Storm Trunk	190	0.51%	1200		CSP	82.58	82.26	81.39	80.39	82.60	82.28	No	No	Yes	0.64	0.3	Yes
	B-07	72+150	Lynde Creek, McQuay Blvd	36	-		21200	Single Span Bridge	81.22	79.88	79.66	79.57	82.40	80.90	No	-	No	-	-	-
	ST-03	74+010	Ash Creek, Storm Trunk		-	2210	4572	Concrete	-	-	-	-	-	-	-	-	-	-	-	-
	C-07	74+610	Pringle Creek	35		2400	6100	Conc Box	-	86.59	86.33	86.03	86.47	-	-	Yes	No	-	-	-
				35		2400	9600	2-Cell Conc Box	-	-	-	-	-	-	-	-	-	-	-	-
	RC-11	76+610	Springwood St - Kathleen St	48	-0.30%	1500	1800	Conc Box	111.07	111.06	111.08	111.02	111.40	110.80	Yes	No	No	0.57	0.27	Yes
	RC-12	80+000	Corbett Creek, Thornton Rd	53	0.52%	2300		Circular	102.02	101.17	100.11	99.52	102.00	102.00	No	Yes	Yes	0.5	0.23	Yes
				53	0.38%	1900	2500	CSP Arch	-	-	-	-	-	-	-	-	-	-	-	-
	RC-13	80+715	Goodman Creek	No impact																
	B-10	91+650	Oshawa Creek - Bond St	20	-	2900	17000	Single Span Bridge	103.60	102.32	101.95	101.28	102.10	101.25	No	-	No	2.01	1.5	No
	B-09	81+390	Oshawa Creek - King St	19	-	3700	17600	Single Span Bridge	102.64	101.16	101.14	100.80	101.42	100.83	No	-	No	2.01	1.2	No

5.3. Proposed Corridor Drainage and Stormwater Management

CITY OF TORONTO

Runoff from BRT corridor within Ellesmere Road and Kingston Road is proposed to be collected and conveyed by the existing storm sewers. The existing overland flow route and on-road storage is designed to be maintained, where possible, or compensated if the existing capacity could not be maintained during detail design. Table 5.2 lists the impervious ratio and increase in impervious area in proposed condition based on proposed typical cross sections for the BRT corridor.

TABLE 5.2. PROPOSED SUBCATCHMENT (SC) DETAILS IN TORONTO

SC ID	Road Segment				Subwatershed	Proposed Imperviousness (%)	Increase in Impervious Area (ha)	Extended Detention Storage (m^3)
	Start Chain	End Chain	Length (m)	ROW Width (m)				
1	10+000	11+700	1700	36	West Highland	78%	1.0	249
2	11+700	12+200	500	36	East Highland	78%	0.4	105
3	12+200	13+900	1700	36	West Highland	78%	1.1	272
4	13+900	15+300	1400	36	Main Highland	78%	0.7	179
5	15+300	17+700	2400	36	Centennial	60%	0	0
6	17+700	18+200	500	Non-uniform width	Waterfront	61%	0	0

Detailed stormwater management plans and stormwater management reports are to be developed during detail design to verify the capacity of existing storm systems to accommodate runoff generated from roadway in proposed condition. Dual drainage system analysis with hydrodynamic modelling is needed for SC #1 to #5, to verify the flow depth of overland flow and hydraulic grade line on minor system in appropriate design storms. The maximum ponding depth for on road storage is to be verified during detail design following applicable design standards, WWFMG, and stormwater modelling guidelines developed by the City of Toronto.

Notably, substantial increase in imperviousness occurs due to the road widening, indicating stormwater management practices are to be incorporated to mitigate the water quality and quantity impacts from the Project. As shown in the Table 5.2, the road segments were divided into separate drainage subcatchments based on servicing stormwater system with different outlets. The increase in impervious area for each subcatchment due to the road widening ranges from 1 ha to less than 2 ha in the proposed conditions. Impacts from additional stormwater runoff caused by increase in impervious area needs to be mitigated to meet the water quantity, erosion and water quality control target. The detention storage volumes needed for different drainage subcatchments to achieve the stormwater management control targets are identified following MECP Stormwater Management Planning and Design Manual and listed in the Table 5.2. As the erosion control storage requirements would govern the sizing of the stormwater storage, the extended detention storage volume is adopted as the storage capacity requirements for the preliminary design of stormwater management practices.

DURHAM REGION

The existing storm sewer systems will continue to collect and convey the runoff generated from the BRT corridor. The existing overland flow route and on-road storage is designed to be maintained, where possible, or compensated if the existing capacity could not be maintained during detail design. Table 5.3 lists the impervious ratio in proposed condition based on proposed cross section for the BRT corridor.

TABLE 5.3. PROPOSED SUBCATCHMENT (SC) DETAILS IN DURHAM REGION

SC ID	Road Segment				Subwatershed	Proposed Imperviousness (%)	Approximate Increase in Impervious Area (ha)	Approximate Extended Detention Storage (m^3)
	Start Chain	End Chain	Length (m)	ROW Width (m)				
PIK-1	50+273	52+100	1827	45	Petticoat Creek	79%	0.76	191
PIK-2	52+100	53+070	970	45	Amberlea Creek	79%	0.47	118
PIK-3	53+070	53+900	830	45	Dunbarton Creek	79%	0.33	82
PIK-4	53+900	54+200	300	45	Hwy 401	79%	0.12	Exst SWM
PIK-5	54+200	55+900	1700	45	Pine Creek	79%	0.17	42
PIK-6	55+900	57+730	1830	45	Duffins Creek	79%	0	0
AJX-1	60+000	61+200	1200	30-36	Duffins Creek	79%	0.90	226
AJX-2	61+200	62+680	1480	45	Miller Creek	74%	0	36
AJX-3	62+680	63+200	520	45	Miller Creek	79%	0	146
AJX-4	63+200	64+000	800	45	Carruthers Creek	79%	0	Exst SWM
AJX-5	64+000	65+400	1400	45	Carruthers Creek	79%	0	Exst SWM
AJX-6	65+400	66+100	700	45	Lynde – Kinsale	79%	0.50	124
AJX-7	66+100	66+500	400	45	Lynde – Kinsale	79%	0.32	80
WHT-1	70+000	70+400	400	45	Lynde – Kinsale	79%	0.31	78
WHT-2	70+400	70+800	400	45	Lynde – Kinsale	79%	0.14	35
WHT-3	70+800	71+500	700	45	Lynde – Kinsale	79%	0.18	Exst SWM
WHT-4	71+500	72+000	500	45	Lynde RC10	79%	0.21	54
WHT-5	72+000	73+500	1500	42	Lynde B07	79%	0.21	52
WHT-6	73+500	74+300	800	42	Lynde Creek	74%	0.20	51
WHT-7	74+300	74+900	600	42-45	Pringle C07	74%	0.10	26
WHT-8	74+900	76+400	1500	42-45	Corbett Creek	70%	0	0
WHT-9	76+400	77+000	600	42-45	Corbett RC-11	79%	0.68	171
WHT-10	77+000	77+500	500	42-45	Corbett RC12	79%	0.23	57
OSH-1	80+000	80+400	400	30-36	Corbett RC12	79%	0.20	50
OSH-2	80+400	81+400	1000	30-36	Goodman Creek	83%	0	0
OSH-3	90+700	91+800	1100	30-36	Oshawa Creek	83%	0	0
OSH-3	81+400	82+600	1200	30-36	Oshawa Creek	83%	0	0
OSH-4	82+600	82+860	260	30-36	Harmony Creek	83%	0	0
OSH-4	91+800	92+140	340		Harmony Creek	83%	0	0

As shown in the **Table 5.3**, the increase in impervious area within Pickering, Ajax, and Whitby segments ranges from 0.1 ha to 0.9 ha. The Oshawa segments would not have significant increase in impervious area, and the storage requirements were minimal and were not further discussed. The extended detention storage volume would govern the

sizing of stormwater monument practices as listed in the **Table 5.3** and adopted for further design of the site specific stormwater management applications.

Notably, in subcatchment PIK-3, a new road drainage system needs to be designed to convey and collect the stormwater runoff generated from the added westbound lane for the BRT corridor. The new road drainage system is proposed to outlet to the water crossing structure on Dunbarton Creek that is surcharged in 50-year, 100-year and Regulatory Flood. A dual drainage system analysis with hydrodynamic modelling would be required to verify the maximum ponding depth at the BRT underpass and evaluate flooding risk. Additional storage volume would need to be provided and confirmed to minimize flooding risk when the design is further developed and external contributing drainage areas are accurately delineated. Non-return valve and pressure tight maintenance hole cover need to be used on the new stormwater drainage system to avoid backflow.

Stormwater management plans and stormwater management reports are to be developed during detail design to verify the capacity of existing storm systems to accommodate runoff generated from roadway in proposed condition. Curb cut could be provided where possible to provide overland flow route for Major System flow. The storm system is to be sized during detail design. Substantial increase in imperviousness is identified in some of the road segments except for subcatchment WHT-8, and subcatchments in the City of Oshawa, where only minor road widening around the intersection is proposed.

STORMWATER MANAGEMENT MITIGATION

Stormwater management facilities are to be designed to provide water quantity control and water quality treatment for the BRT corridor in proposed conditions. Stormwater management practices (SWMP) recommended for Highway/Roads corridors are listed as below. **Table 5.4** listed the physical constraints and applicability for each SWM Type.

- Engineered stormwater tree systems

In cities, trees can play an important role in stormwater management by reducing the amount of runoff that enters stormwater and combined sewer systems. Trees act as mini-reservoirs to control stormwater at the source. With a suspended pavement or structural cell system, the suspension system supports the weight and forces of the pavement above and allows the soil below to remain uncompacted, accommodating tree roots and filtering and managing stormwater runoff. By combining on-site stormwater management with expanded rooting volumes, suspended pavement and structural cells provide an opportunity to grow large, healthy trees and restore ecological function.

- Pervious technologies

Pervious pipe systems are perforated along their length allowing exfiltration of water through the pipe wall as it is conveyed downstream. The pipe itself is similar to that used for tile drainage on agricultural lands and is available with either a smooth-walled or corrugated interior.

- Enhanced ditches/swales

Grassed swales have historically been associated with rural drainage and have been constructed primarily for stormwater conveyance. More recently, stormwater management objectives have changed and grassed swales are now being promoted to filter and detain stormwater runoff. Swale drainage can be a useful technique in areas of low grade, as long as the distance that the flow is to be conveyed is not too long.

- Oil/grit separators

Oil/grit separators (OGS) are used to trap and retain oil and/or sediment in detention chambers, usually located below ground. They operate based on the principles of gravity-based sedimentation for the grit, and phase separation for the oil. There is minimal attenuation of flow in oil/grit separators since they are not designed with extended detention storage.

TABLE 5.4. PHYSICAL CONSTRAINTS FOR SWMP TYPES

SWMP	Topography	Soils	Bedrock	Groundwater	Drainage Area
Engineered stormwater tree systems	None	None	None	None	0.5-2 ha
Grassed Swales	<5%	None	None	None	<2 ha
Pervious Pipes	None	Loam (min. infiltration rate≥15 mm/hr)	>1 m below bottom	>1 m below bottom	None
Oil/Grit Separators	None	None	None	None	<2 ha

Stormwater management mitigation design also need to consider the environmental setting into which their drainage system will be placed. Salt vulnerable areas need to be identified and the potential for salt impacted drainage to affect these vulnerable areas must be assessed. Special design modifications to traditional stormwater management measures may be warranted to protect these salt vulnerable areas. Measures may include clay or geosynthetic liners in conveyance ditches and ponds, infiltration ponds where appropriate or use of storm sewers to transport drainage past vulnerable areas.

PRELIMINARY SIZING OF SWMP

Preliminary sizing of soil cells application to provide the required storage volumes was conducted to verify the feasibility of the proposed SWMP. Assuming 3-frame stack Silva Cells are to be implemented along the corridor within the planting zone of the corridor with 20% of the soil volume being available for static storage of water, the footprint areas required for soil cells implementation is listed in **Table 5.5**.

As shown in **Table 5.5**, the length soil cell application have been identified. The length of corridor that needs soil cells applications takes around 10% to 20% of the entire length of road to be widened. The final location is to be confirmed during detail design when design is further developed and more information on underground utilities are available. Soil cell application was not proposed for segments with minimal increase in impervious area and storage requirement such as subcatchment #6, WHT-6 and WHT-7, as the impacts is expected to be minimal and could be mitigated by absorbent landscaping practices. Notably, soil cell applications for road segments serviced with existing SWM such as subcatchment AJX-4 and AJX-5 were not further discussed. Retrofitting the existing SWM to manage the stormwater runoff would be needed during detail design when the minor system modification is designed.

TABLE 5.5. PRELIMINARY SIZING OF SOIL CELLS

SC ID	Road Segment			Extended Detention Storage (m3)	Soil Cell Footprint Area (m2)	Length (m)
	Start Chain	End Chain	Length (m)			
1	10+000	11+700	1700	249	1243	311
2	11+700	12+200	500	105	525	131
3	12+200	13+900	1700	272	1360	340
4	13+900	15+300	1400	179	894	223
5	15+300	17+700	2400	0	-	-
6	17+700	18+200	500	0	-	-
PIK-1	50+273	52+100	1827	191	954	239
PIK-2	52+100	53+070	970	118	591	148
PIK-3	53+070	53+900	830	82	409	102
PIK-4	53+900	54+200	300	Exst SWM	-	-
PIK-5	54+200	55+900	1700	42	-	-
PIK-6	55+900	57+730	1830	0	1129	282
AJX-1	60+000	61+200	1200	226	178	44

SC ID	Road Segment			Extended Detention Storage (m3)	Soil Cell Footprint Area (m2)	Length (m)
	Start Chain	End Chain	Length (m)			
AJX-2	61+200	62+680	1480	36	730	182
AJX-3	62+680	63+200	520	146	252	63
AJX-4	63+200	64+000	800	Exst SWM	-	-
AJX-5	64+000	65+400	1400	Exst SWM	-	-
AJX-6	65+400	66+100	700	124	401	100
AJX-7	66+100	66+500	400	80	388	97
WHT-1	70+000	70+400	400	78	175	44
WHT-2	70+400	70+800	400	35	226	57
WHT-3	70+800	71+500	700	Exst SWM	-	-
WHT-4	71+500	72+000	500	54	270	68
WHT-5	72+000	73+500	1500	52	260	65
WHT-6	73+500	74+300	800	51	256	64
WHT-7	74+300	74+900	600	26	129	32
WHT-8	74+900	76+400	1500	0	-	-
WHT-9	76+400	77+000	600	171	853	213
WHT-10	77+000	77+500	500	57	285	71
OSH-1	80+000	80+400	400	50	250	62
OSH-2	80+400	81+400	1000	0	0	0
OSH-3	90+700	91+800	1100	0	0	0
OSH-3	81+400	82+600	1200	0	0	0
OSH-4	82+600	82+860	260	0	0	0
OSH-4	91+800	92+140	340	0	0	0

6. Creek Realignment

6.1. Lynde Creek

A small tributary of Lynde Creek between Lake Ridge Road and Halls Road upstream of crossing RC-06 is proposed to be realigned as the footprint of widened road extends over the existing creek corridor. The creek has been identified as an intermittent or ephemeral feature and support indirect fish habitat only with warmwater thermal regime. The mitigation measures recommended include:

- Replicate functions by lot level conveyance measures (e.g. vegetated swales) connected to the natural heritage system, as feasible and/or Low Impact Development (LID) stormwater options (refer to TRCA's Water Management Guidelines for details);
- Replicate on-site flows and outlet flows at the top end of vegetated swales, bioswales, etc. to maintain feature functions.

A grass lined drainage channel that runs parallel to Dundas Street is proposed for the creek realignment. Table 6.1 listed the preliminary sizing of the drainage channel. The sizing will be refined during detail design.

TABLE 6.1. PRELIMINARY SIZING OF DRAINAGE CHANNEL FOR CREEK REALIGNMENT

Design Flow (m^3/s)	Start Chain	End Chain	Depth (m)	Longitudinal Slope	Side Slope - LT	Side Slope - RT	Bottom Width (m)	Flow Depth (m)	Velocity (m/s)
4.2	70+040	70+200	1.5	-2.9%	3:1	4:1	1	0.69	1.8
4.2	70+200	70+350	1.5	-0.65%	3:1	4:1	1	0.95	1.03

As shown in the Table 6.1, 100-year flood flow for crossing RC-06 has been adopted for the preliminary sizing of the drainage channel because the drainage channel is located immediately upstream of the RC-06. The drainage channel is proposed to run parallel to the Dundas Street with longitudinal slope similar to the road profile. The flow depth and velocity indicate sufficient freeboard has been provided and there is no concern of erosion or sedimentation with 100-year flood flow.

A ditch realignment is needed in the northeast quadrant of Dundas Street West and Halls Road North within the Lynde Creek watershed. The ditch realignment will be designed and sized during detail design.

7. Temporary Drainage and Erosion and Sediment Control During Construction

Urban construction that removes vegetative cover, alters natural drainage pathways, and strips away stable topsoil, leads to erosion of exposed soil. If left uncontrolled, the erosion could cause local air quality problems, degradation of aquatic habitats, and damage to downstream recreational areas and infrastructure. Erosion Risk Assessment (ERA) and Erosion and Sediment Control (ESC) measures are essential to mitigate the negative impacts during construction.

The ESC measures are to be developed during detail design stage following the latest TRCA, CLOCA, City of Toronto and Region of Durham guidelines. Impacts on the surrounding environment related to the construction are to be mitigated by proper ESC measures. It is recommended that a multi-barrier approach is undertaken during construction.

All ESC measures are to be inspected and monitored properly following TRCA and City of Toronto improved inspection, monitoring, and maintenance protocols to ensure ESC plan enforcement. All damaged ESC measures shall be repaired and/or replaced as required in a timely manner to the satisfaction of regulatory agencies. Proper record needs to be kept for field inspection, maintenance, and reporting activities.

Temporary drainage shall be provided during construction to manage flood risk. Temporary drainage and dewatering system will be designed at later stages when details of construction methods such as duration and temporary site grading are available. The best practices below shall be followed during construction:

- The Contractor shall monitor weather forecasts and schedule operations such that no in-water work occurs during rainfall events;
- Equipment and/or materials not being used will be stored far enough from the watercourse and outside the floodplain; and,
- At the end of each day, the Contractor shall remove all equipment and materials from the watercourse prior to leaving the site if feasible.

Design flow, volume and location of discharge from dewatering system will be determined when more information becomes available. The applicability of Permit to Take Water or Environmental Activity and Section Registry will be evaluated prior to construction.

8. Summary of Stormwater Impact Assessment, Mitigation Measures and Monitoring Activities

Table 8.1 provides a summary of the potential impacts resulting from the key project components/actives associated with the stormwater management and drainage, mitigation measures, and monitoring actives needed. Regulations, standards, and guidance documents references herein may be amended and appropriate regulatory agencies needs to be consulted to follow the most up-to-date regulations, standards, and stormwater management best management practices (BMPs).

TABLE 8.1. SUMMARY OF STORMWATER IMPACT ASSESSMENT, MITIGATION MEASURES AND MONITORING ACTIVITIES

Environmental Component	Potential Impacts (Design/Construction/Operation)	Mitigation Measures	Monitoring
During Detail Design			
Watercourses	Extension/widening of 13 existing watercourse crossing structures, including C-01, C-02, C-05, C-06, C-07, B-05, ST-01, ST-03, RC-05, RC-06, RC-10, RC-11, and RC-12. Replacement of 3 existing bridges, including B-07, B-09 and B-10. 300 m of a tributary of Lynde Creek between Lake Ridge Road and Halls Road is considered for realignment.	Conduct hydraulic analysis following *Natural Hazards Policies or the Technical Guide, River and Stream Systems; Flooding Hazard Limit* (2002) to ensure that all following flood hazard objectives are met: • Ensure that flood risk does not increase as a result of the proposed crossing for all design storm events up to, and including, the Regulatory event. • Safely convey the applicable design storm as per municipal, regional, and/or Ministry of Transportation guidelines considering implications of future land use on flooding. • Establish the requirements for crossing size (i.e., overtopping of the Regulatory event) while considering ingress/egress within the surrounding area in consultation with local municipal emergency managers. • TRCA's Crossing Guideline for Valley and Stream Corridors (2015) will be considered in setting stream crossing objectives for watercourses under TRCA jurisdiction during the detail design phase. • Coordinate with TRCA to consider the proposed works related to flood control around Duffins Creek Bridge during detailed design. Assess hydraulic conditions using TRCA's 2D hydraulic model during detailed design to further refine the design and the proposed grading plan, to ensure there is no net fill volume within the floodplain and not any off-site or on-site impact to the water surface elevation and velocities of the 2-year, 5-year, 10-year, 25-year, 50-year, 100-year, and the TRCA's Regulatory design storm floodplains. • Sizing of drainage channel will be refined during detail design	N/A N/A
Floodplain Management/ Flooding Hazards	Extension/widening of 13 existing watercourse crossing structures, including C-01, C-02, C-05, C-06, C-07, B-05, ST-01, ST-03, RC-05, RC-06, RC-10, RC-11, and RC-12. Replacement of 3 existing bridges, including B-07, B-09 and B-10.	• For all defined watercourses (floodplains), complete detailed hydraulic assessments using the HEC-RAS model. Update floodline mapping to standards of TRCA and CLOCA to determine appropriate design storm and peak flow rate associated with the watercourse at the proposed crossing location based on future land use conditions. • Size the proposed crossing to convey the appropriate peak flow rate without increasing flood elevations for the 2 to 100 year and Regional storm events. • Confirm flood hazard at the preferred crossing location using existing floodplain mapping and modeling, and update the models, as necessary to reflect more detailed topographical and flow data. • Refine the hydraulic analyses based on the detail design to ensure flooding objectives is met with regard to future land use changes. • Update the floodline mapping based on the detail design. • During detail design, TRCA will continue to be consulted to consider mitigation regarding the platform within the regulatory area. • For floodproof stops and their electrical utilities above the Regional flood event, consider design mitigation for all stops and platforms within the TRCA and CLOCA Regulatory design storm	N/A

Environmental Component	Potential Impacts (Design/Construction/Operation)	Mitigation Measures	Monitoring
		floodplains based on the latest information from the conservation authorities. • Early in detail design, in consultation with TRCA and Durham Region, review water surface elevation depths for the Regional and 350-year storms to confirm the feasibility of floodproofing the Notion Road stop at the current location or consider relocating the stop as necessary to avoid hazard to life during a flood.	
Municipal storm sewer system	Alteration to the local drainage system including catchbasin and catchbasin lead relocation, alteration of overland flow route, relocation of municipal storm sewer outfall.	• Design stormwater sewer system following guidelines and standards developed by local municipalities.	N/A
Stormwater management	Increase to impervious areas within the following corridor segment: • Ellesmere Road from Grangeway Avenue to Military Trail in Scarborough, • Kingston Road from Ellesmere Road to Raspberry Road in Scarborough, • Kingston Road from Altona Road to Rotherglen Road in Pickering and Ajax, • Dundas Street from Garden Street to Garrard Road leading to increase in peak runoff flow rate, increase in annual runoff volume generated from the project site, and increase in contaminants loading discharged to the receiving waterbodies.	• Conduct complete review of existing Toronto Water's drainage and SWM system information to verify the wet weather flow management design criteria could be satisfied. • Conduct an analysis of available drainage and SWM capacity for road segments where widening is needed. • Adhere to the local stormwater management guidelines to ensure the maximum allowable discharge flow rate, annual runoff volume targets, as well as water quality control targets set out by local stormwater management guidelines and requirements of stormwater quantify and quality controls are followed. • Where needed, refine stormwater quality control strategies to propose site specific stormwater management measures following guidelines developed by MECP and Conservation Authorities. • Prepare stormwater management reports for review and approval by local municipalities as required.	N/A
Permit to Take Water (PTTW) and Environmental Activity & Sector Registry (EASR)	Construction dewatering for the construction of foundations for structures.	• The applicability of Permit to Take Water or Environmental Activity and Section Registry will be evaluated prior to construction.	N/A
Erosion and Sediment Control	Removal of vegetation, stripping of topsoil, and alterations to topography and drainage patterns leading to release of sediment laden runoff and dust from constructions sites to the natural environment.	• Design temporary drainage and ESC measures adhering to guidelines developed by Conservation Authorities and local municipalities. • Complete an ERA and ESC plan following *Erosion and Sediment Control Guide for Urban Construction* (2019) developed by TRCA • Develop an ESC inspection program.	N/A
During Construction			
Erosion and Sediment Control	Removal of vegetation, stripping of topsoil and alterations to topography and drainage patterns leading to release of sediment laden runoff and dust from constructions sites to the natural environment.	• Implement and adhere to the requirements of the ESC Plan including the ESC inspection program	• Regularly inspect the condition and functionality of ESC measures on the site and maintain up-to-date documentation on inspection activities.
Permit to Take Water (PTTW) and Environmental Activity & Sector Registry (EASR)	Construction dewatering for extension/replacement of existing watercourse crossing structures.	• Implement and adhere to the requirements of any PTTWs and/or EASR	
During Operation			
Stormwater management and drainage	N/A	N/A	N/A

Appendix A Drainage Mosaic

Figure A.1. Drainage Mosaic (Sheet 1 of 2)

Figure A.2. Drainage Mosaic (Sheet 2 of 2)

Appendix B Field Notes

Appendix C Hydraulic Model, Input and Output Files

Appendix D Hydrologic Model, Input and Output Files

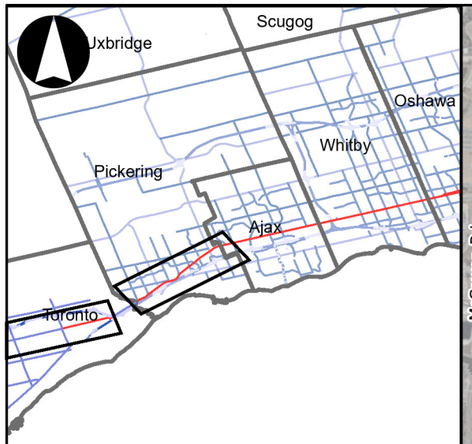
Appendix E Existing Environmental Characterization

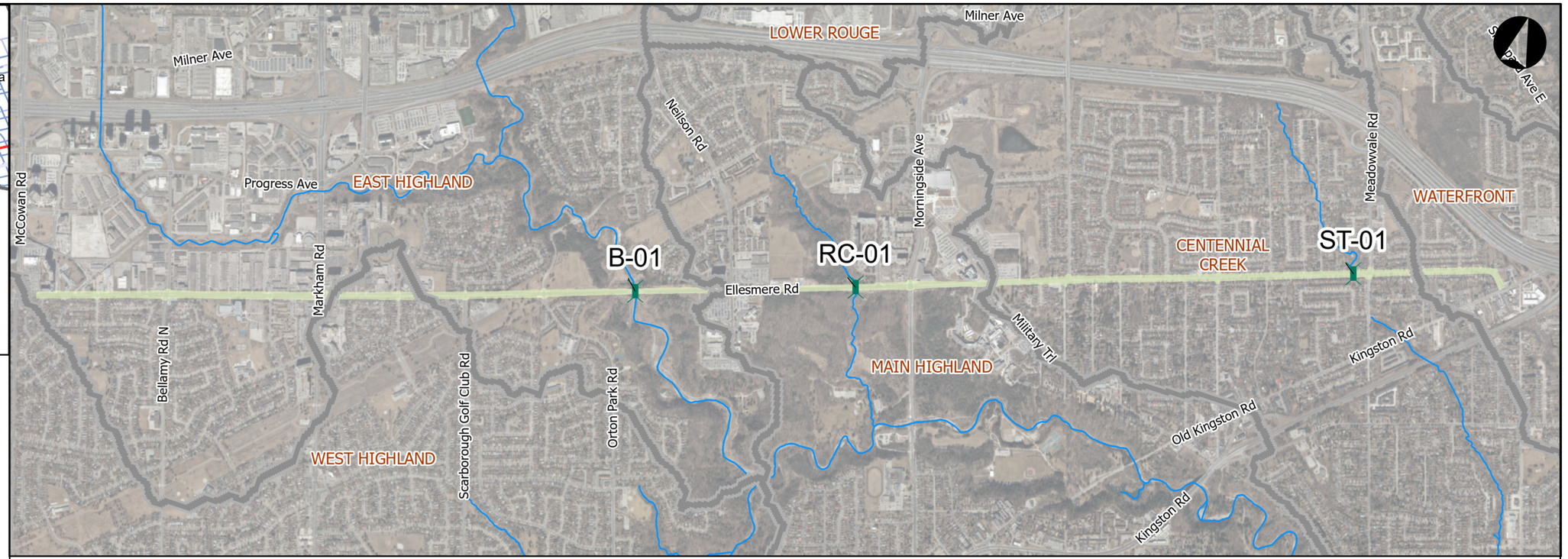
Figure E.1. Soil Map

Appendix A Drainage Mosaic

Figure A.1. Drainage Mosaic (Sheet 1 of 2)

Figure A.2. Drainage Mosaic (Sheet 2 of 2)







Legend

- Construction Limit
- Watercourse Crossings
- Subwatershed

DATE	PROJECT NO.
March 2021	477117

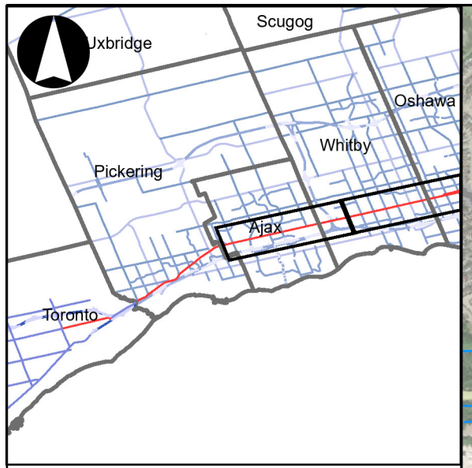
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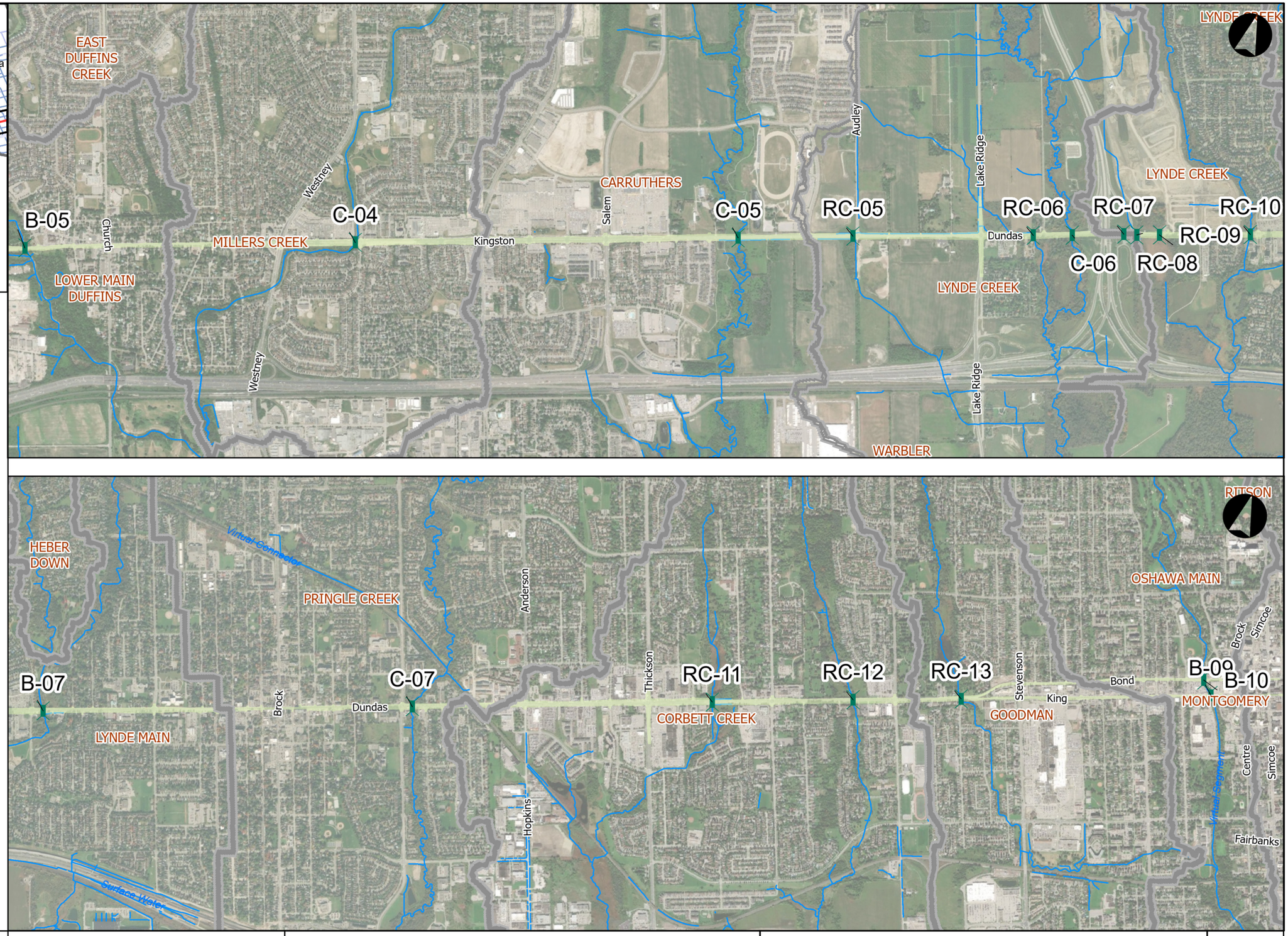
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DRAINAGE MOSAIC - SHEET 1 of 2

DURHAM-SCARBOROUGH BUS RAPID TRANSIT
STORMWATER AND HYDROLOGY REPORT

FIGURE NO. **A.1**





Legend

- Construction Limit
- Watercourse Crossings
- Subwatershed

DATE	PROJECT NO.
March 2021	477117

SCALE 0 125 250 500 750 1,000 1,250 Meters 1:25 000

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DRAINAGE MOSAIC - SHEET 2 of 2

DURHAM-SCARBOROUGH BUS RAPID TRANSIT
STORMWATER AND HYDROLOGY REPORT

FIGURE NO. **A.2**

Appendix B Field Notes

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C-01 Petticoat Creek Culvert

Form/ Process	Geomorphic Indicator		Present		Factor
	No.	Description	No	Yes	Value
Evidence of Aggradation (AI)	1	Lobate bar			
	2	Coarse material in riffles embedded		1	
	3	Siltation in pools			
	4	Medial bars		1	
	5	Accretion on point bars			
	6	Poor longitudinal sorting of bed materials		1	
	7	Deposition in the overbank zone			
		Sum of Indices			0.43
Evidence of Degradation (DI)	1	Exposed bridge footing(s)			
	2	Exposed sanitary/storm sewer/pipeline/etc.			
	3	Elevated stormsewer outfall(s)			
	4	Undermined gabion baskets/concrete aprons/etc.			
	5	Scour pools d/s of culverts/stormsewer outlets			
	6	Cut face on bar forms			
	7	Head cutting due to knick point migration			
	8	Terrace cut through older bar material			
	9	Suspended armor layer visible in bank			
	10	Channel worn into undisturbed overburden/bedrock			
		Sum of Indices			
Evidence of Widening (WI)	1	Fallen/leaning trees/fence posts/etc.			
	2	Occurrence of large organic debris			
	3	Exposed tree roots			
	4	Basal scour on inside meander bends			
	5	Basal scour on both sides of channel through riffle			
	6	Gabion baskets/concrete walls/etc. out flanked			
	7	Length of basal scour > 50% through subject reach			
	8	Exposed length of previously buried pipe/cable/etc.			
	9	Fracture lines along top of bank			
	10	Exposed building foundation			
		Sum of Indices			
Evidence of Planimetric Form Adjustment (PI)	1	Formation of chute(s)			
	2	Single thread channel to multiple channel			
	3	Evolution of pool-riffle form to low bed relief form			
	4	Cutoff channel(s)			
	5	Formation of island(s)			
	6	Thalweg alignment out of phase meander form			
	7	Bar form poorly formed/reworked/removed			
		Sum of Indices			
Stability Index (SI) = (AI +DI + WI + PI) / m					**0.11**

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C-02 Dunbarton Creek Culvert

Form/ Process	Geomorphic Indicator		Present		Factor
	No.	Description	No	Yes	Value
Evidence of Aggradation (AI)	1	Lobate bar			
	2	Coarse material in riffles embedded		1	
	3	Siltation in pools		1	
	4	Medial bars			
	5	Accretion on point bars			
	6	Poor longitudinal sorting of bed materials			
	7	Deposition in the overbank zone			
		Sum of Indices			0.29
Evidence of Degradation (DI)	1	Exposed bridge footing(s)			
	2	Exposed sanitary/storm sewer/pipeline/etc.			
	3	Elevated stormsewer outfall(s)			
	4	Undermined gabion baskets/concrete aprons/etc.			
	5	Scour pools d/s of culverts/stormsewer outlets			
	6	Cut face on bar forms			
	7	Head cutting due to knick point migration			
	8	Terrace cut through older bar material			
	9	Suspended armor layer visible in bank			
	10	Channel worn into undisturbed overburden/bedrock			
		Sum of Indices			
Evidence of Widening (WI)	1	Fallen/leaning trees/fence posts/etc.			
	2	Occurrence of large organic debris			
	3	Exposed tree roots			
	4	Basal scour on inside meander bends			
	5	Basal scour on both sides of channel through riffle			
	6	Gabion baskets/concrete walls/etc. out flanked			
	7	Length of basal scour > 50% through subject reach			
	8	Exposed length of previously buried pipe/cable/etc.			
	9	Fracture lines along top of bank			
	10	Exposed building foundation			
		Sum of Indices			
Evidence of Planimetric Form Adjustment (PI)	1	Formation of chute(s)			
	2	Single thread channel to multiple channel			
	3	Evolution of pool-riffle form to low bed relief form			
	4	Cutoff channel(s)			
	5	Formation of island(s)			
	6	Thalweg alignment out of phase meander form			
	7	Bar form poorly formed/reworked/removed			
		Sum of Indices			
Stability Index (SI) = (AI +DI + WI + PI) / m					**0.07**

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B-05 West Duffins Creek Bridge

Form/ Process	Geomorphic Indicator		Present		Factor
	No.	Description	No	Yes	Value
Evidence of Aggradation (AI)	1	Lobate bar			
	2	Coarse material in riffles embedded			
	3	Siltation in pools			
	4	Medial bars			
	5	Accretion on point bars			
	6	Poor longitudinal sorting of bed materials			
	7	Deposition in the overbank zone			
		Sum of Indices			
Evidence of Degradation (DI)	1	Exposed bridge footing(s)			
	2	Exposed sanitary/storm sewer/pipeline/etc.			
	3	Elevated stormsewer outfall(s)			
	4	Undermined gabion baskets/concrete aprons/etc.			
	5	Scour pools d/s of culverts/stormsewer outlets			
	6	Cut face on bar forms			
	7	Head cutting due to knick point migration			
	8	Terrace cut through older bar material			
	9	Suspended armor layer visible in bank			
	10	Channel worn into undisturbed overburden/bedrock			
		Sum of Indices			
Evidence of Widening (WI)	1	Fallen/leaning trees/fence posts/etc.		1	
	2	Occurrence of large organic debris			
	3	Exposed tree roots		1	
	4	Basal scour on inside meander bends			
	5	Basal scour on both sides of channel through riffle			
	6	Gabion baskets/concrete walls/etc. out flanked			
	7	Length of basal scour > 50% through subject reach			
	8	Exposed length of previously buried pipe/cable/etc.			
	9	Fracture lines along top of bank			
	10	Exposed building foundation			
		Sum of Indices			0.20
Evidence of Planimetric Form Adjustment (PI)	1	Formation of chute(s)			
	2	Single thread channel to multiple channel			
	3	Evolution of pool-riffle form to low bed relief form			
	4	Cutoff channel(s)			
	5	Formation of island(s)			
	6	Thalweg alignment out of phase meander form			
	7	Bar form poorly formed/reworked/removed			
		Sum of Indices			
Stability Index (SI) = (AI +DI + WI + PI) / m					**0.05**

C-04 Millers Creek Culvert

Form/ Process	Geomorphic Indicator		Present		Factor
	No.	Description	No	Yes	Value
Evidence of Aggradation (AI)	1	Lobate bar			
	2	Coarse material in riffles embedded			
	3	Siltation in pools			
	4	Medial bars		1	
	5	Accretion on point bars			
	6	Poor longitudinal sorting of bed materials			
	7	Deposition in the overbank zone		1	
		Sum of Indices			0.29
Evidence of Degradation (DI)	1	Exposed bridge footing(s)			
	2	Exposed sanitary/storm sewer/pipeline/etc.			
	3	Elevated stormsewer outfall(s)			
	4	Undermined gabion baskets/concrete aprons/etc.			
	5	Scour pools d/s of culverts/stormsewer outlets			
	6	Cut face on bar forms			
	7	Head cutting due to knick point migration			
	8	Terrace cut through older bar material			
	9	Suspended armor layer visible in bank			
	10	Channel worn into undisturbed overburden/bedrock			
		Sum of Indices			
Evidence of Widening (WI)	1	Fallen/leaning trees/fence posts/etc.			
	2	Occurrence of large organic debris			
	3	Exposed tree roots			
	4	Basal scour on inside meander bends			
	5	Basal scour on both sides of channel through riffle			
	6	Gabion baskets/concrete walls/etc. out flanked			
	7	Length of basal scour > 50% through subject reach			
	8	Exposed length of previously buried pipe/cable/etc.			
	9	Fracture lines along top of bank			
	10	Exposed building foundation			
		Sum of Indices			
Evidence of Planimetric Form Adjustment (PI)	1	Formation of chute(s)			
	2	Single thread channel to multiple channel			
	3	Evolution of pool-riffle form to low bed relief form			
	4	Cutoff channel(s)			
	5	Formation of island(s)			
	6	Thalweg alignment out of phase meander form			
	7	Bar form poorly formed/reworked/removed			
		Sum of Indices			
Stability Index (SI) = (AI +DI + WI + PI) / m					**0.07**

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C-05 Carruthers Creek Culvert

Form/ Process	Geomorphic Indicator		Present		Factor
	No.	Description	No	Yes	Value
Evidence of Aggradation (AI)	1	Lobate bar			
	2	Coarse material in riffles embedded			
	3	Siltation in pools		1	
	4	Medial bars			
	5	Accretion on point bars			
	6	Poor longitudinal sorting of bed materials		1	
	7	Deposition in the overbank zone		1	
		Sum of Indices			0.43
Evidence of Degradation (DI)	1	Exposed bridge footing(s)			
	2	Exposed sanitary/storm sewer/pipeline/etc.			
	3	Elevated stormsewer outfall(s)			
	4	Undermined gabion baskets/concrete aprons/etc.			
	5	Scour pools d/s of culverts/stormsewer outlets			
	6	Cut face on bar forms			
	7	Head cutting due to knick point migration		1	
	8	Terrace cut through older bar material			
	9	Suspended armor layer visible in bank			
	10	Channel worn into undisturbed overburden/bedrock			
		Sum of Indices			0.10
Evidence of Widening (WI)	1	Fallen/leaning trees/fence posts/etc.		1	
	2	Occurrence of large organic debris			
	3	Exposed tree roots		1	
	4	Basal scour on inside meander bends			
	5	Basal scour on both sides of channel through riffle			
	6	Gabion baskets/concrete walls/etc. out flanked			
	7	Length of basal scour > 50% through subject reach			
	8	Exposed length of previously buried pipe/cable/etc.			
	9	Fracture lines along top of bank			
	10	Exposed building foundation			
		Sum of Indices			0.20
Evidence of Planimetric Form Adjustment (PI)	1	Formation of chute(s)			
	2	Single thread channel to multiple channel			
	3	Evolution of pool-riffle form to low bed relief form			
	4	Cutoff channel(s)			
	5	Formation of island(s)			
	6	Thalweg alignment out of phase meander form			
	7	Bar form poorly formed/reworked/removed			
		Sum of Indices			
Stability Index (SI) = (AI +DI + WI + PI) / m					**0.18**

C-06 Lynde Creek Culvert

Form/ Process	Geomorphic Indicator		Present		Factor
	No.	Description	No	Yes	Value
Evidence of Aggradation (AI)	1	Lobate bar			
	2	Coarse material in riffles embedded			
	3	Siltation in pools		1	
	4	Medial bars		1	
	5	Accretion on point bars			
	6	Poor longitudinal sorting of bed materials			
	7	Deposition in the overbank zone		1	
		Sum of Indices			0.43
Evidence of Degradation (DI)	1	Exposed bridge footing(s)			
	2	Exposed sanitary/storm sewer/pipeline/etc.			
	3	Elevated stormsewer outfall(s)			
	4	Undermined gabion baskets/concrete aprons/etc.			
	5	Scour pools d/s of culverts/stormsewer outlets			
	6	Cut face on bar forms			
	7	Head cutting due to knick point migration			
	8	Terrace cut through older bar material			
	9	Suspended armor layer visible in bank			
	10	Channel worn into undisturbed overburden/bedrock			
		Sum of Indices			
Evidence of Widening (WI)	1	Fallen/leaning trees/fence posts/etc.			
	2	Occurrence of large organic debris		1	
	3	Exposed tree roots			
	4	Basal scour on inside meander bends			
	5	Basal scour on both sides of channel through riffle			
	6	Gabion baskets/concrete walls/etc. out flanked			
	7	Length of basal scour > 50% through subject reach			
	8	Exposed length of previously buried pipe/cable/etc.			
	9	Fracture lines along top of bank			
	10	Exposed building foundation			
		Sum of Indices			0.10
Evidence of Planimetric Form Adjustment (PI)	1	Formation of chute(s)			
	2	Single thread channel to multiple channel			
	3	Evolution of pool-riffle form to low bed relief form			
	4	Cutoff channel(s)			
	5	Formation of island(s)			
	6	Thalweg alignment out of phase meander form			
	7	Bar form poorly formed/reworked/removed			
		Sum of Indices			
Stability Index (SI) = (AI +DI + WI + PI) / m					**0.13**

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B-07 Lynde Creek Bridge

Form/ Process	Geomorphic Indicator		Present		Factor
	No.	Description	No	Yes	Value
Evidence of Aggradation (AI)	1	Lobate bar			
	2	Coarse material in riffles embedded			
	3	Siltation in pools			
	4	Medial bars			
	5	Accretion on point bars			
	6	Poor longitudinal sorting of bed materials			
	7	Deposition in the overbank zone			
		Sum of Indices			
Evidence of Degradation (DI)	1	Exposed bridge footing(s)			
	2	Exposed sanitary/storm sewer/pipeline/etc.			
	3	Elevated stormsewer outfall(s)			
	4	Undermined gabion baskets/concrete aprons/etc.			
	5	Scour pools d/s of culverts/stormsewer outlets			
	6	Cut face on bar forms			
	7	Head cutting due to knick point migration			
	8	Terrace cut through older bar material			
	9	Suspended armor layer visible in bank			
	10	Channel worn into undisturbed overburden/bedrock			
		Sum of Indices			
Evidence of Widening (WI)	1	Fallen/leaning trees/fence posts/etc.		1	
	2	Occurrence of large organic debris		1	
	3	Exposed tree roots			
	4	Basal scour on inside meander bends			
	5	Basal scour on both sides of channel through riffle			
	6	Gabion baskets/concrete walls/etc. out flanked			
	7	Length of basal scour > 50% through subject reach			
	8	Exposed length of previously buried pipe/cable/etc.			
	9	Fracture lines along top of bank			
	10	Exposed building foundation			
		Sum of Indices			0.20
Evidence of Planimetric Form Adjustment (PI)	1	Formation of chute(s)			
	2	Single thread channel to multiple channel			
	3	Evolution of pool-riffle form to low bed relief form		1	
	4	Cutoff channel(s)			
	5	Formation of island(s)			
	6	Thalweg alignment out of phase meander form			
	7	Bar form poorly formed/reworked/removed			
		Sum of Indices			0.14
Stability Index (SI) = (AI +DI + WI + PI) / m					**0.09**

PARSONS

envision more

C-07 Pringle Creek Culvert

Form/ Process	Geomorphic Indicator		Present		Factor
	No.	Description	No	Yes	Value
Evidence of Aggradation (AI)	1	Lobate bar			
	2	Coarse material in riffles embedded			
	3	Siltation in pools		1	
	4	Medial bars			
	5	Accretion on point bars			
	6	Poor longitudinal sorting of bed materials			
	7	Deposition in the overbank zone			
		Sum of Indices			0.14
Evidence of Degradation (DI)	1	Exposed bridge footing(s)			
	2	Exposed sanitary/storm sewer/pipeline/etc.			
	3	Elevated stormsewer outfall(s)			
	4	Undermined gabion baskets/concrete aprons/etc.			
	5	Scour pools d/s of culverts/stormsewer outlets			
	6	Cut face on bar forms			
	7	Head cutting due to knick point migration			
	8	Terrace cut through older bar material			
	9	Suspended armor layer visible in bank			
	10	Channel worn into undisturbed overburden/bedrock			
		Sum of Indices			
Evidence of Widening (WI)	1	Fallen/leaning trees/fence posts/etc.			
	2	Occurrence of large organic debris			
	3	Exposed tree roots			
	4	Basal scour on inside meander bends			
	5	Basal scour on both sides of channel through riffle			
	6	Gabion baskets/concrete walls/etc. out flanked			
	7	Length of basal scour > 50% through subject reach			
	8	Exposed length of previously buried pipe/cable/etc.			
	9	Fracture lines along top of bank			
	10	Exposed building foundation			
		Sum of Indices			
Evidence of Planimetric Form Adjustment (PI)	1	Formation of chute(s)			
	2	Single thread channel to multiple channel			
	3	Evolution of pool-riffle form to low bed relief form			
	4	Cutoff channel(s)			
	5	Formation of island(s)			
	6	Thalweg alignment out of phase meander form			
	7	Bar form poorly formed/reworked/removed			
		Sum of Indices			
Stability Index (SI) = (AI +DI + WI + PI) / m					**0.04**

PARSONS

envision more

RC-11 Corbett Creek Box Culvert

Form/ Process	Geomorphic Indicator		Present		Factor
	No.	Description	No	Yes	Value
Evidence of Aggradation (AI)	1	Lobate bar			
	2	Coarse material in riffles embedded			
	3	Siltation in pools		1	
	4	Medial bars			
	5	Accretion on point bars			
	6	Poor longitudinal sorting of bed materials			
	7	Deposition in the overbank zone			
		Sum of Indices			0.14
Evidence of Degradation (DI)	1	Exposed bridge footing(s)			
	2	Exposed sanitary/storm sewer/pipeline/etc.			
	3	Elevated stormsewer outfall(s)			
	4	Undermined gabion baskets/concrete aprons/etc.			
	5	Scour pools d/s of culverts/stormsewer outlets			
	6	Cut face on bar forms			
	7	Head cutting due to knick point migration			
	8	Terrace cut through older bar material			
	9	Suspended armor layer visible in bank			
	10	Channel worn into undisturbed overburden/bedrock			
		Sum of Indices			
Evidence of Widening (WI)	1	Fallen/leaning trees/fence posts/etc.			
	2	Occurrence of large organic debris			
	3	Exposed tree roots			
	4	Basal scour on inside meander bends			
	5	Basal scour on both sides of channel through riffle			
	6	Gabion baskets/concrete walls/etc. out flanked			
	7	Length of basal scour > 50% through subject reach			
	8	Exposed length of previously buried pipe/cable/etc.			
	9	Fracture lines along top of bank			
	10	Exposed building foundation			
		Sum of Indices			
Evidence of Planimetric Form Adjustment (PI)	1	Formation of chute(s)			
	2	Single thread channel to multiple channel			
	3	Evolution of pool-riffle form to low bed relief form			
	4	Cutoff channel(s)			
	5	Formation of island(s)			
	6	Thalweg alignment out of phase meander form			
	7	Bar form poorly formed/reworked/removed			
		Sum of Indices			
Stability Index (SI) = (AI +DI + WI + PI) / m					**0.04**

PARSONS

envision more

RC-12 Corbett Creek CSP Culvert

Form/ Process	Geomorphic Indicator		Present		Factor
	No.	Description	No	Yes	Value
Evidence of Aggradation (AI)	1	Lobate bar			
	2	Coarse material in riffles embedded		1	
	3	Siltation in pools		1	
	4	Medial bars			
	5	Accretion on point bars			
	6	Poor longitudinal sorting of bed materials			
	7	Deposition in the overbank zone		1	
		Sum of Indices			0.43
Evidence of Degradation (DI)	1	Exposed bridge footing(s)			
	2	Exposed sanitary/storm sewer/pipeline/etc.			
	3	Elevated stormsewer outfall(s)			
	4	Undermined gabion baskets/concrete aprons/etc.			
	5	Scour pools d/s of culverts/stormsewer outlets			
	6	Cut face on bar forms			
	7	Head cutting due to knick point migration			
	8	Terrace cut through older bar material			
	9	Suspended armor layer visible in bank			
	10	Channel worn into undisturbed overburden/bedrock			
		Sum of Indices			
Evidence of Widening (WI)	1	Fallen/leaning trees/fence posts/etc.			
	2	Occurrence of large organic debris			
	3	Exposed tree roots			
	4	Basal scour on inside meander bends			
	5	Basal scour on both sides of channel through riffle			
	6	Gabion baskets/concrete walls/etc. out flanked			
	7	Length of basal scour > 50% through subject reach			
	8	Exposed length of previously buried pipe/cable/etc.			
	9	Fracture lines along top of bank			
	10	Exposed building foundation			
		Sum of Indices			
Evidence of Planimetric Form Adjustment (PI)	1	Formation of chute(s)			
	2	Single thread channel to multiple channel			
	3	Evolution of pool-riffle form to low bed relief form			
	4	Cutoff channel(s)			
	5	Formation of island(s)			
	6	Thalweg alignment out of phase meander form			
	7	Bar form poorly formed/reworked/removed			
		Sum of Indices			
Stability Index (SI) = (AI +DI + WI + PI) / m					**0.04**

B-09 & B-10 Oshawa Creek Bridges

Form/ Process	Geomorphic Indicator		Present		Factor
	No.	Description	No	Yes	Value
Evidence of Aggradation (AI)	1	Lobate bar		1	
	2	Coarse material in riffles embedded		1	
	3	Siltation in pools			
	4	Medial bars			
	5	Accretion on point bars			
	6	Poor longitudinal sorting of bed materials			
	7	Deposition in the overbank zone			
		Sum of Indices			0.29
Evidence of Degradation (DI)	1	Exposed bridge footing(s)			
	2	Exposed sanitary/storm sewer/pipeline/etc.			
	3	Elevated stormsewer outfall(s)			
	4	Undermined gabion baskets/concrete aprons/etc.			
	5	Scour pools d/s of culverts/stormsewer outlets			
	6	Cut face on bar forms			
	7	Head cutting due to knick point migration			
	8	Terrace cut through older bar material			
	9	Suspended armor layer visible in bank			
	10	Channel worn into undisturbed overburden/bedrock			
		Sum of Indices			
Evidence of Widening (WI)	1	Fallen/leaning trees/fence posts/etc.			
	2	Occurrence of large organic debris			
	3	Exposed tree roots			
	4	Basal scour on inside meander bends			
	5	Basal scour on both sides of channel through riffle			
	6	Gabion baskets/concrete walls/etc. out flanked			
	7	Length of basal scour > 50% through subject reach			
	8	Exposed length of previously buried pipe/cable/etc.			
	9	Fracture lines along top of bank			
	10	Exposed building foundation			
		Sum of Indices			
Evidence of Planimetric Form Adjustment (PI)	1	Formation of chute(s)			
	2	Single thread channel to multiple channel			
	3	Evolution of pool-riffle form to low bed relief form			
	4	Cutoff channel(s)			
	5	Formation of island(s)			
	6	Thalweg alignment out of phase meander form			
	7	Bar form poorly formed/reworked/removed			
		Sum of Indices			
Stability Index (SI) = (AI +DI + WI + PI) / m					**0.07**

Appendix C Hydraulic Model, Input and Output Files

HEC-RAS Plan: Highland River: Ellesmere Ravine Reach: 1

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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
1	604.50	Regional	14.10	136.00	136.98	136.98	137.39	0.011794	2.95	5.94	8.52	0.97
1	604.50	100-yr	8.43	136.00	136.72	136.72	137.03	0.013330	2.52	3.86	7.21	0.98
1	604.50	50-yr	6.83	136.00	136.63	136.63	136.91	0.014064	2.37	3.26	6.78	0.98
1	604.50	25-yr	5.93	136.00	136.58	136.58	136.83	0.014472	2.26	2.92	6.53	0.98
1	604.50	10-yr	4.83	136.00	136.51	136.51	136.74	0.015356	2.13	2.48	6.19	0.99
1	604.50	5-yr	4.10	136.00	136.46	136.46	136.67	0.015895	2.02	2.19	5.95	0.99
1	604.50	2-yr	3.37	136.00	136.41	136.41	136.59	0.016858	1.90	1.88	5.69	0.99
1	604.49	Regional	14.10	135.00	136.15	136.15	136.58	0.011724	3.01	5.93	8.55	0.95
1	604.49	100-yr	8.43	135.00	135.85	135.85	136.19	0.014167	2.63	3.67	6.43	0.98
1	604.49	50-yr	6.83	135.00	135.76	135.76	136.05	0.014885	2.46	3.10	5.69	0.99
1	604.49	25-yr	5.93	135.00	135.70	135.70	135.97	0.015192	2.36	2.78	5.54	0.99
1	604.49	10-yr	4.83	135.00	135.63	135.63	135.87	0.015664	2.22	2.38	5.35	0.99
1	604.49	5-yr	4.10	135.00	135.57	135.57	135.79	0.015943	2.10	2.11	5.21	0.99
1	604.49	2-yr	3.37	135.00	135.52	135.52	135.71	0.016394	1.99	1.81	4.95	0.99
1	604.48	Regional	14.10	131.28	132.50	132.50	132.90	0.013432	2.86	5.50	7.53	1.00
1	604.48	100-yr	8.43	131.28	132.27	132.27	132.56	0.014831	2.42	3.80	7.08	0.99
1	604.48	50-yr	6.83	131.28	132.20	132.20	132.45	0.015054	2.24	3.29	6.94	0.98
1	604.48	25-yr	5.93	131.28	132.15	132.15	132.38	0.015326	2.14	2.98	6.83	0.98
1	604.48	10-yr	4.83	131.28	132.09	132.09	132.29	0.015830	2.03	2.54	6.58	0.97
1	604.48	5-yr	4.10	131.28	132.04	132.04	132.23	0.015791	1.96	2.21	6.16	0.96
1	604.48	2-yr	3.37	131.28	131.97	131.97	132.16	0.016618	1.92	1.82	5.43	0.98
1	604.47	Regional	15.90	130.00	131.58	131.58	132.00	0.014992	2.85	5.58	6.83	1.01
1	604.47	100-yr	9.49	130.00	131.27	131.27	131.61	0.015921	2.58	3.67	5.43	1.00
1	604.47	50-yr	7.69	130.00	131.16	131.16	131.47	0.016311	2.48	3.10	4.94	1.00
1	604.47	25-yr	6.67	130.00	131.09	131.09	131.39	0.016596	2.42	2.76	4.63	1.00
1	604.47	10-yr	5.44	130.00	130.99	130.99	131.27	0.017051	2.33	2.33	4.21	1.00
1	604.47	5-yr	4.61	130.00	130.92	130.92	131.18	0.017429	2.25	2.05	3.97	1.00
1	604.47	2-yr	3.79	130.00	130.84	130.84	131.08	0.018274	2.18	1.74	3.69	1.01
1	604.46	Regional	15.90	129.00	130.44	130.44	130.84	0.013378	2.82	5.87	8.21	0.98
1	604.46	100-yr	9.49	129.00	130.18	130.18	130.48	0.015305	2.44	3.93	6.82	1.00
1	604.46	50-yr	7.69	129.00	130.09	130.09	130.36	0.016022	2.32	3.33	6.34	1.00
1	604.46	25-yr	6.67	129.00	130.03	130.03	130.29	0.016719	2.25	2.96	5.84	1.01
1	604.46	10-yr	5.44	129.00	129.93	129.93	130.18	0.016715	2.23	2.44	4.83	1.00
1	604.46	5-yr	4.61	129.00	129.86	129.86	130.10	0.017399	2.17	2.12	4.52	1.01
1	604.46	2-yr	3.79	129.00	129.79	129.79	130.01	0.017716	2.08	1.82	4.20	1.01
1	604.45	Regional	15.90	128.00	128.90	128.90	129.26	0.014996	2.83	6.89	10.15	1.05
1	604.45	100-yr	9.49	128.00	128.66	128.66	128.94	0.016046	2.44	4.67	8.88	1.04
1	604.45	50-yr	7.69	128.00	128.59	128.59	128.83	0.016552	2.31	3.98	8.43	1.04
1	604.45	25-yr	6.67	128.00	128.54	128.54	128.76	0.017063	2.22	3.57	8.16	1.04
1	604.45	10-yr	5.44	128.00	128.47	128.47	128.68	0.017542	2.09	3.07	7.81	1.03
1	604.45	5-yr	4.61	128.00	128.43	128.43	128.61	0.018237	2.01	2.71	7.54	1.04
1	604.45	2-yr	3.79	128.00	128.38	128.38	128.54	0.018927	1.90	2.34	7.27	1.04
1	604.44	Regional	18.70	124.00	125.00	125.00	125.38	0.012799	2.76	7.21	10.80	0.98
1	604.44	100-yr	11.18	124.00	124.76	124.76	125.04	0.014880	2.36	4.85	9.08	1.00
1	604.44	50-yr	9.06	124.00	124.68	124.68	124.93	0.015424	2.23	4.15	8.50	1.00
1	604.44	25-yr	7.87	124.00	124.63	124.63	124.86	0.015902	2.16	3.70	8.15	1.00
1	604.44	10-yr	6.41	124.00	124.56	124.56	124.77	0.016498	2.05	3.17	7.75	1.00
1	604.44	5-yr	5.44	124.00	124.51	124.51	124.71	0.016969	1.96	2.80	7.46	1.00
1	604.44	2-yr	4.46	124.00	124.46	124.46	124.64	0.017669	1.86	2.42	7.13	1.00
1	604.43	Regional	18.70	123.00	123.65	123.65	123.93	0.006665	2.40	8.19	15.88	0.99
1	604.43	100-yr	11.18	123.00	123.47	123.47	123.68	0.007539	2.03	5.64	14.07	1.00
1	604.43	50-yr	9.06	123.00	123.42	123.42	123.60	0.007886	1.90	4.84	13.58	1.00
1	604.43	25-yr	7.87	123.00	123.38	123.38	123.55	0.008157	1.83	4.36	13.28	1.00
1	604.43	10-yr	6.41	123.00	123.33	123.33	123.49	0.008515	1.72	3.76	12.90	1.00
1	604.43	5-yr	5.44	123.00	123.30	123.30	123.44	0.008801	1.64	3.34	12.62	1.00
1	604.43	2-yr	4.46	123.00	123.27	123.27	123.39	0.009173	1.54	2.90	12.33	1.00
1	604.42	Regional	18.70	121.83	122.58	122.58	122.89	0.013530	2.57	8.82	15.66	0.99
1	604.42	100-yr	11.18	121.83	122.39	122.39	122.62	0.015113	2.18	5.97	14.29	0.99
1	604.42	50-yr	9.06	121.83	122.33	122.33	122.53	0.015914	2.04	5.08	13.81	1.00
1	604.42	25-yr	7.87	121.83	122.29	122.29	122.48	0.016228	1.94	4.59	13.53	0.99
1	604.42	10-yr	6.41	121.83	122.25	122.25	122.41	0.016992	1.82	3.95	13.15	0.99
1	604.42	5-yr	5.44	121.83	122.21	122.21	122.36	0.017711	1.73	3.49	12.88	1.00
1	604.42	2-yr	4.46	121.83	122.17	122.17	122.30	0.018451	1.62	3.02	12.59	1.00
1	604.41	Regional	18.70	121.00	121.98	121.98	122.32	0.014412	2.58	7.27	11.06	1.01
1	604.41	100-yr	11.18	121.00	121.74	121.74	122.01	0.015569	2.30	4.87	9.20	1.01
1	604.41	50-yr	9.06	121.00	121.66	121.66	121.91	0.016027	2.18	4.15	8.67	1.01
1	604.41	25-yr	7.87	121.00	121.61	121.61	121.84	0.016327	2.11	3.73	8.34	1.01
1	604.41	10-yr	6.41	121.00	121.55	121.55	121.75	0.016816	2.00	3.20	7.90	1.01

HEC-RAS Plan: Highland River: Ellesmere Ravine Reach: 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
1	604.41	5-yr	5.44	121.00	121.50	121.50	121.69	0.017334	1.93	2.82	7.57	1.01
1	604.41	2-yr	4.46	121.00	121.45	121.45	121.62	0.017869	1.83	2.44	7.22	1.01
1	604.40	Regional	21.30	120.00	121.48	121.48	121.98	0.012578	3.12	7.12	8.09	0.98
1	604.40	100-yr	12.70	120.00	121.18	121.18	121.54	0.014527	2.67	4.77	6.97	0.99
1	604.40	50-yr	10.29	120.00	121.07	121.07	121.39	0.015582	2.54	4.05	6.26	1.01
1	604.40	25-yr	8.93	120.00	120.99	120.99	121.31	0.015705	2.48	3.61	5.85	1.01
1	604.40	10-yr	7.28	120.00	120.90	120.90	121.18	0.016111	2.37	3.07	5.42	1.01
1	604.40	5-yr	6.17	120.00	120.83	120.83	121.09	0.016416	2.29	2.70	5.11	1.00
1	604.40	2-yr	5.07	120.00	120.75	120.75	120.99	0.016989	2.20	2.30	4.75	1.01
1	604.39	Regional	21.30	119.00	119.76	119.76	120.10	0.018357	2.59	8.27	12.47	1.00
1	604.39	100-yr	12.70	119.00	119.55	119.55	119.80	0.020684	2.22	5.73	11.57	1.01
1	604.39	50-yr	10.29	119.00	119.48	119.48	119.70	0.021495	2.08	4.94	11.28	1.01
1	604.39	25-yr	8.93	119.00	119.44	119.44	119.64	0.022077	2.00	4.47	11.10	1.01
1	604.39	10-yr	7.28	119.00	119.39	119.39	119.57	0.022903	1.88	3.87	10.87	1.01
1	604.39	5-yr	6.17	119.00	119.35	119.35	119.51	0.023673	1.79	3.45	10.71	1.01
1	604.39	2-yr	5.07	119.00	119.30	119.30	119.45	0.024582	1.68	3.01	10.53	1.01
1	604.38	Regional	21.30	118.00	119.11	119.11	119.54	0.011928	2.94	7.78	10.40	0.97
1	604.38	100-yr	12.70	118.00	118.82	118.82	119.15	0.014409	2.54	5.07	8.36	1.00
1	604.38	50-yr	10.29	118.00	118.73	118.73	119.02	0.015034	2.39	4.35	7.89	1.00
1	604.38	25-yr	8.93	118.00	118.67	118.67	118.94	0.015540	2.30	3.90	7.58	1.00
1	604.38	10-yr	7.28	118.00	118.60	118.60	118.84	0.016235	2.17	3.35	7.19	1.01
1	604.38	5-yr	6.17	118.00	118.55	118.55	118.77	0.016707	2.07	2.98	6.91	1.01
1	604.38	2-yr	5.07	118.00	118.49	118.49	118.68	0.017253	1.97	2.57	6.58	1.01
1	604.37	Regional	21.30	117.00	118.24		118.29	0.001352	1.07	24.51	28.98	0.34
1	604.37	100-yr	12.70	117.00	117.96		118.00	0.001479	0.90	16.63	26.57	0.33
1	604.37	50-yr	10.29	117.00	117.86		117.90	0.001462	0.84	14.22	24.89	0.33
1	604.37	25-yr	8.93	117.00	117.81		117.84	0.001443	0.80	12.83	23.87	0.32
1	604.37	10-yr	7.28	117.00	117.73		117.76	0.001406	0.75	11.10	22.53	0.31
1	604.37	5-yr	6.17	117.00	117.68		117.70	0.001375	0.70	9.89	21.55	0.30
1	604.37	2-yr	5.07	117.00	117.62		117.64	0.001359	0.65	8.61	20.58	0.30
1	604.36	Regional	21.30	117.00	118.13		118.23	0.001186	1.45	16.86	20.24	0.46
1	604.36	100-yr	12.70	117.00	117.86		117.93	0.001181	1.18	11.75	18.21	0.44
1	604.36	50-yr	10.29	117.00	117.78		117.84	0.001175	1.09	10.20	17.26	0.43
1	604.36	25-yr	8.93	117.00	117.72		117.78	0.001172	1.03	9.30	16.69	0.42
1	604.36	10-yr	7.28	117.00	117.65		117.70	0.001169	0.94	8.17	15.92	0.41
1	604.36	5-yr	6.17	117.00	117.60		117.64	0.001157	0.89	7.36	15.36	0.40
1	604.36	2-yr	5.07	117.00	117.55		117.58	0.001108	0.82	6.51	14.74	0.39
1	604.35	Regional	21.30	117.00	117.76	117.76	118.10	0.006481	2.57	8.49	13.67	1.00
1	604.35	100-yr	12.70	117.00	117.56	117.56	117.80	0.007281	2.20	5.83	12.24	1.00
1	604.35	50-yr	10.29	117.00	117.49	117.49	117.71	0.007602	2.07	4.99	11.75	1.00
1	604.35	25-yr	8.93	117.00	117.45	117.45	117.65	0.007845	1.99	4.50	11.49	1.00
1	604.35	10-yr	7.28	117.00	117.39	117.39	117.57	0.008183	1.87	3.90	11.19	1.00
1	604.35	5-yr	6.17	117.00	117.35	117.35	117.52	0.008416	1.77	3.48	10.96	1.00
1	604.35	2-yr	5.07	117.00	117.31	117.31	117.46	0.008806	1.68	3.03	10.69	1.01
1	604.34	Regional	25.90	116.00	116.99		117.10	0.003425	1.50	17.66	23.29	0.52
1	604.34	100-yr	15.47	116.00	116.77		116.84	0.003187	1.21	12.91	20.44	0.48
1	604.34	50-yr	12.54	116.00	116.70		116.76	0.003033	1.10	11.41	19.79	0.46
1	604.34	25-yr	10.88	116.00	116.65		116.70	0.002967	1.04	10.48	19.37	0.45
1	604.34	10-yr	8.87	116.00	116.59		116.63	0.002856	0.96	9.28	18.82	0.43
1	604.34	5-yr	7.52	116.00	116.54		116.58	0.002756	0.89	8.45	18.42	0.42
1	604.34	2-yr	6.18	116.00	116.50		116.53	0.002524	0.81	7.64	17.98	0.40
1	604.33	Regional	25.90	115.41	116.39	116.39	116.65	0.011522	2.51	15.51	30.75	0.93
1	604.33	100-yr	15.47	115.41	116.22	116.22	116.42	0.011379	2.10	10.41	29.26	0.88
1	604.33	50-yr	12.54	115.41	116.16	116.16	116.34	0.011773	1.98	8.60	28.72	0.88
1	604.33	25-yr	10.88	115.41	116.12	116.12	116.29	0.011787	1.89	7.58	28.41	0.87
1	604.33	10-yr	8.87	115.41	116.07	116.07	116.23	0.012161	1.78	6.15	27.96	0.87
1	604.33	5-yr	7.52	115.41	116.03	116.03	116.18	0.013027	1.72	4.97	27.60	0.88
1	604.33	2-yr	6.18	115.41	115.96	115.96	116.11	0.017397	1.76	3.59	12.79	0.99
1	604.32	Regional	25.90	114.00	116.38		116.39	0.000121	0.50	87.51	60.59	0.11
1	604.32	100-yr	15.47	114.00	114.81	114.81	115.01	0.014469	1.99	8.45	27.76	0.95
1	604.32	50-yr	12.54	114.00	114.67	114.67	114.92	0.015799	2.20	5.69	11.72	1.01
1	604.32	25-yr	10.88	114.00	114.62	114.62	114.85	0.016079	2.13	5.12	11.26	1.01
1	604.32	10-yr	8.87	114.00	114.55	114.55	114.76	0.016624	2.03	4.38	10.63	1.01
1	604.32	5-yr	7.52	114.00	114.51	114.50	114.70	0.015703	1.89	3.98	10.27	0.97
1	604.32	2-yr	6.18	114.00	114.47	114.45	114.62	0.015350	1.77	3.50	9.82	0.95
1	604.31	Regional	28.80	113.00	116.38		116.39	0.000050	0.39	115.54	52.30	0.08
1	604.31	100-yr	17.18	113.00	114.59		114.62	0.000739	0.76	32.84	40.02	0.25

HEC-RAS Plan: Highland River: Ellesmere Ravine Reach: 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
1	604.31	50-yr	13.92	113.00	114.21		114.26	0.002289	1.08	18.20	35.74	0.41
1	604.31	25-yr	12.09	113.00	114.00		114.09	0.005240	1.40	11.05	26.93	0.60
1	604.31	10-yr	9.85	113.00	113.79	113.78	113.96	0.015154	1.90	6.01	19.98	0.96
1	604.31	5-yr	8.35	113.00	113.74	113.74	113.91	0.016185	1.84	5.12	18.49	0.97
1	604.31	2-yr	6.86	113.00	113.70	113.70	113.84	0.016211	1.72	4.38	17.15	0.96
1	604.30	Regional	28.80	113.00	116.38		116.38	0.000024	0.31	163.68	77.13	0.05
1	604.30	100-yr	17.18	113.00	114.59		114.60	0.000162	0.47	53.19	51.53	0.12
1	604.30	50-yr	13.92	113.00	114.20		114.22	0.000344	0.56	33.67	48.86	0.17
1	604.30	25-yr	12.09	113.00	113.99		114.01	0.000564	0.63	23.78	37.60	0.21
1	604.30	10-yr	9.85	113.00	113.77		113.80	0.001050	0.70	15.97	32.52	0.28
1	604.30	5-yr	8.35	113.00	113.71		113.73	0.001043	0.66	14.12	31.20	0.27
1	604.30	2-yr	6.86	113.00	113.65		113.67	0.001045	0.61	12.15	29.72	0.27
1	604.29	Regional	28.80	113.00	116.38	113.96	116.38	0.000034	0.34	151.03	74.66	0.06
1	604.29	100-yr	17.18	113.00	114.58	113.77	114.60	0.000343	0.59	44.26	50.48	0.17
1	604.29	50-yr	13.92	113.00	114.18	113.68	114.21	0.001008	0.81	24.54	47.69	0.28
1	604.29	25-yr	12.09	113.00	113.95	113.64	114.00	0.002330	1.04	14.29	34.96	0.41
1	604.29	10-yr	9.85	113.00	113.57	113.57	113.76	0.017125	1.93	5.10	13.60	1.01
1	604.29	5-yr	8.35	113.00	113.52	113.52	113.70	0.017623	1.87	4.46	12.71	1.01
1	604.29	2-yr	6.86	113.00	113.47	113.47	113.64	0.018036	1.79	3.84	11.97	1.01
1	604.285		Culvert									
1	604.28	Regional	28.80	110.00	110.73	110.73	111.03	0.016821	2.67	16.35	57.22	1.09
1	604.28	100-yr	17.18	110.00	110.58	110.58	110.79	0.016778	2.20	10.16	29.45	1.04
1	604.28	50-yr	13.92	110.00	110.51	110.51	110.71	0.018463	2.09	8.42	25.00	1.06
1	604.28	25-yr	12.09	110.00	110.47	110.47	110.65	0.019694	2.01	7.49	22.84	1.08
1	604.28	10-yr	9.85	110.00	110.43	110.43	110.59	0.020031	1.87	6.50	21.84	1.06
1	604.28	5-yr	8.35	110.00	110.41	110.41	110.54	0.015748	1.69	6.13	20.47	0.95
1	604.28	2-yr	6.86	110.00	110.35	110.35	110.48	0.019753	1.74	4.86	18.56	1.04
1	604.27	Regional	31.70	108.00	109.37	109.37	109.53	0.009879	2.26	31.78	95.50	0.84
1	604.27	100-yr	18.90	108.00	109.27	109.27	109.40	0.007004	1.84	22.68	92.56	0.70
1	604.27	50-yr	15.31	108.00	109.23	109.23	109.35	0.005759	1.70	19.21	90.05	0.64
1	604.27	25-yr	13.29	108.00	109.18	109.18	109.31	0.005871	1.74	14.79	83.07	0.65
1	604.27	10-yr	10.83	108.00	108.91	108.91	109.22	0.015495	2.48	4.37	7.19	1.01
1	604.27	5-yr	9.19	108.00	108.84	108.84	109.13	0.015677	2.38	3.86	6.81	1.01
1	604.27	2-yr	7.54	108.00	108.75	108.75	109.02	0.016101	2.28	3.31	6.37	1.01
1	604.26	Regional	31.70	107.00	108.45	108.45	108.68	0.012648	2.52	23.63	58.77	0.95
1	604.26	100-yr	18.90	107.00	108.30	108.30	108.47	0.012204	2.11	15.60	47.86	0.89
1	604.26	50-yr	15.31	107.00	108.24	108.24	108.40	0.012491	1.99	12.96	45.50	0.89
1	604.26	25-yr	13.29	107.00	108.21	108.21	108.36	0.012591	1.91	11.45	44.08	0.88
1	604.26	10-yr	10.83	107.00	108.17	108.17	108.30	0.012562	1.79	9.57	42.26	0.87
1	604.26	5-yr	9.19	107.00	108.14	108.14	108.26	0.012339	1.69	8.30	40.98	0.85
1	604.26	2-yr	7.54	107.00	108.10	108.10	108.22	0.012497	1.59	6.81	39.43	0.84
1	604.25	Regional	31.70	107.00	108.07		108.11	0.001950	1.29	52.16	63.67	0.40
1	604.25	100-yr	18.90	107.00	107.82		107.84	0.001951	1.06	36.51	57.58	0.39
1	604.25	50-yr	15.31	107.00	107.73		107.75	0.001990	0.99	31.53	55.94	0.38
1	604.25	25-yr	13.29	107.00	107.68		107.70	0.002002	0.94	28.67	55.04	0.38
1	604.25	10-yr	10.83	107.00	107.61		107.63	0.002024	0.88	24.95	53.77	0.37
1	604.25	5-yr	9.19	107.00	107.56		107.58	0.002042	0.83	22.34	52.92	0.37
1	604.25	2-yr	7.54	107.00	107.51		107.52	0.002029	0.77	19.55	50.89	0.36
1	604.24	Regional	31.70	106.63	107.49	107.49	107.79	0.015905	2.72	17.07	31.91	1.07
1	604.24	100-yr	18.90	106.63	107.32	107.31	107.53	0.015952	2.23	11.94	28.90	1.02
1	604.24	50-yr	15.31	106.63	107.28	107.25	107.44	0.014753	2.01	10.62	28.04	0.97
1	604.24	25-yr	13.29	106.63	107.25	107.21	107.39	0.014095	1.88	9.81	27.49	0.93
1	604.24	10-yr	10.83	106.63	107.21	107.16	107.33	0.013306	1.70	8.71	26.74	0.89
1	604.24	5-yr	9.19	106.63	107.18	107.13	107.28	0.012659	1.57	7.94	26.19	0.86
1	604.24	2-yr	7.54	106.63	107.15	107.09	107.23	0.011954	1.43	7.10	25.59	0.82
1	604.23	Regional	35.30	106.00	106.41	106.41	106.61	0.026625	2.57	23.06	59.18	1.28
1	604.23	100-yr	21.05	106.00	106.29	106.29	106.43	0.029887	2.17	16.13	57.52	1.28
1	604.23	50-yr	17.06	106.00	106.25	106.25	106.38	0.031357	2.02	13.96	57.00	1.28
1	604.23	25-yr	14.81	106.00	106.23	106.23	106.34	0.032318	1.93	12.68	56.68	1.28
1	604.23	10-yr	12.06	106.00	106.20	106.20	106.30	0.033540	1.80	11.06	56.28	1.28
1	604.23	5-yr	10.23	106.00	106.18	106.18	106.27	0.034927	1.70	9.87	55.99	1.28
1	604.23	2-yr	8.40	106.00	106.16	106.16	106.24	0.036677	1.60	8.62	55.67	1.28
1	604.22	Regional	37.80	103.05	103.47		103.49	0.005370	1.14	80.81	276.23	0.57
1	604.22	100-yr	22.54	103.05	103.36		103.38	0.007756	1.10	50.60	257.06	0.65
1	604.22	50-yr	18.26	103.05	103.33		103.35	0.008632	1.07	42.17	247.10	0.68
1	604.22	25-yr	15.86	103.05	103.31	103.24	103.33	0.009246	1.05	37.15	236.08	0.69
1	604.22	10-yr	12.92	103.05	103.28		103.30	0.009928	1.01	31.22	221.78	0.70

HEC-RAS Plan: Highland River: Ellesmere Ravine Reach: 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
1	604.22	5-yr	10.96	103.05	103.26		103.28	0.010501	0.97	27.16	211.01	0.71
1	604.22	2-yr	9.00	103.05	103.24		103.26	0.011164	0.93	23.09	200.69	0.72
1	604.21	Regional	42.40	100.00	101.88	101.88	102.38	0.011319	3.18	14.64	17.46	0.97
1	604.21	100-yr	25.30	100.00	101.55	101.55	101.93	0.013549	2.75	9.47	14.04	1.00
1	604.21	50-yr	20.50	100.00	101.45	101.45	101.78	0.014243	2.57	8.10	12.99	1.00
1	604.21	25-yr	17.80	100.00	101.38	101.38	101.69	0.014496	2.48	7.25	12.26	1.00
1	604.21	10-yr	14.50	100.00	101.29	101.29	101.57	0.015164	2.36	6.15	11.23	1.00
1	604.21	5-yr	12.30	100.00	101.22	101.22	101.48	0.015627	2.27	5.43	10.49	1.00
1	604.21	2-yr	10.10	100.00	101.14	101.14	101.38	0.016052	2.18	4.64	9.62	1.00
1	604.20	Regional	42.40	97.78	100.50	98.83	100.55	0.000365	1.03	54.47	28.77	0.20
1	604.20	100-yr	25.30	97.78	98.90	98.56	99.04	0.003480	1.69	16.82	19.19	0.54
1	604.20	50-yr	20.50	97.78	98.70	98.47	98.84	0.004837	1.72	13.12	17.89	0.61
1	604.20	25-yr	17.80	97.78	98.50	98.42	98.70	0.009517	1.99	9.66	16.72	0.82
1	604.20	10-yr	14.50	97.78	98.35	98.35	98.58	0.015474	2.16	7.21	16.06	1.00
1	604.20	5-yr	12.30	97.78	98.30	98.30	98.51	0.016095	2.06	6.39	15.81	1.00
1	604.20	2-yr	10.10	97.78	98.24	98.24	98.43	0.016789	1.94	5.54	15.48	1.00

HEC-RAS Plan: Prop_up River: Reach #1 Reach: Main Channel B

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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Main Channel B	2488.24	2 Year	10.05	90.40	91.71	91.24	91.77	0.001997	1.12	10.37	16.62	0.39
Main Channel B	2488.24	5 Year	16.60	90.40	92.14	91.49	92.20	0.001308	1.12	19.30	27.35	0.33
Main Channel B	2488.24	10 Year	21.67	90.40	92.42	91.64	92.48	0.000971	1.12	28.70	39.33	0.30
Main Channel B	2488.24	25 Year	28.67	90.40	92.76		92.81	0.000717	1.10	44.46	53.72	0.26
Main Channel B	2488.24	50 Year	34.33	90.40	93.02		93.07	0.000573	1.08	59.78	64.81	0.24
Main Channel B	2488.24	100 Year	40.32	90.40	93.32		93.36	0.000425	1.02	81.70	79.37	0.21
Main Channel B	2488.24	Regulatory	169.29	90.40	97.68		97.69	0.000047	0.68	623.47	150.88	0.08
Main Channel B	2486.24	2 Year	10.05	90.48	91.71	91.09	91.77	0.001310	1.03	9.75	9.81	0.32
Main Channel B	2486.24	5 Year	16.60	90.48	92.12	91.32	92.19	0.001217	1.23	13.47	11.80	0.32
Main Channel B	2486.24	10 Year	21.68	90.48	92.38	91.47	92.47	0.001207	1.37	15.85	14.34	0.33
Main Channel B	2486.24	25 Year	28.67	90.48	92.68	91.65	92.80	0.001226	1.54	18.67	17.86	0.34
Main Channel B	2486.24	50 Year	34.33	90.48	92.91	91.77	93.05	0.001223	1.65	20.81	20.59	0.35
Main Channel B	2486.24	100 Year	40.32	90.48	93.20	91.90	93.35	0.001141	1.72	23.40	35.01	0.34
Main Channel B	2486.24	Regulatory	169.31	90.48	97.25	93.91	97.65	0.000843	2.79	60.61	138.80	0.35
Main Channel B	2450.26		Culvert									
Main Channel B	2438.26	2 Year	10.05	90.25	91.64	90.88	91.70	0.001103	1.00	10.16	9.81	0.29
Main Channel B	2438.26	5 Year	16.60	90.25	92.00	91.13	92.08	0.001365	1.28	13.22	12.19	0.33
Main Channel B	2438.26	10 Year	21.68	90.25	92.21	91.29	92.32	0.001520	1.47	15.15	16.47	0.35
Main Channel B	2438.26	25 Year	28.67	90.25	92.44	91.49	92.59	0.001749	1.71	17.29	21.26	0.38
Main Channel B	2438.26	50 Year	34.33	90.25	92.61	91.63	92.79	0.001898	1.88	18.86	24.79	0.41
Main Channel B	2438.26	100 Year	40.32	90.25	92.77	91.77	92.99	0.002063	2.05	20.32	28.05	0.43
Main Channel B	2438.26	Regulatory	169.31	90.25	94.07	93.88	95.57	0.008197	5.49	32.17	126.06	0.92
Main Channel B	2421.26	2 Year	10.05	90.06	91.58	91.03	91.66	0.001749	1.38	11.38	14.80	0.37
Main Channel B	2421.26	5 Year	16.60	90.06	91.94	91.33	92.05	0.001885	1.67	17.20	17.96	0.40
Main Channel B	2421.26	10 Year	21.68	90.06	92.15	91.51	92.28	0.002038	1.87	21.31	21.16	0.42
Main Channel B	2421.26	25 Year	28.67	90.06	92.40	91.72	92.55	0.002169	2.08	27.11	25.55	0.45
Main Channel B	2421.26	50 Year	34.33	90.06	92.59	91.87	92.75	0.002173	2.20	32.23	28.87	0.45
Main Channel B	2421.26	100 Year	40.32	90.06	92.75	91.99	92.93	0.002204	2.32	37.34	31.85	0.46
Main Channel B	2421.26	Regulatory	169.31	90.06	94.70	93.94	94.84	0.001483	2.77	205.38	129.69	0.41
Main Channel B	2406.26	2 Year	10.05	90.06	91.24	91.24	91.58	0.012406	2.63	4.38	8.50	0.92
Main Channel B	2406.26	5 Year	16.60	90.06	91.54	91.54	91.96	0.010501	2.98	7.45	11.70	0.89
Main Channel B	2406.26	10 Year	21.68	90.06	91.73	91.73	92.19	0.009976	3.21	9.77	13.62	0.89
Main Channel B	2406.26	25 Year	28.67	90.06	91.94	91.94	92.46	0.009630	3.48	12.88	15.83	0.90
Main Channel B	2406.26	50 Year	34.33	90.06	92.08	92.08	92.65	0.009629	3.70	15.30	17.92	0.91
Main Channel B	2406.26	100 Year	40.32	90.06	92.26	92.26	92.83	0.008773	3.78	18.78	21.06	0.89
Main Channel B	2406.26	Regulatory	169.31	90.06	93.94	93.94	94.73	0.007530	5.39	81.84	56.42	0.92
Main Channel B	2399.26	2 Year	10.05	89.99	90.25	90.48	91.28	0.222052	4.54	2.36	12.90	3.27
Main Channel B	2399.26	5 Year	16.60	89.99	90.34	90.64	91.67	0.185270	5.20	3.45	13.24	3.15
Main Channel B	2399.26	10 Year	21.68	89.99	90.40	90.76	91.90	0.163592	5.54	4.26	13.50	3.06
Main Channel B	2399.26	25 Year	28.67	89.99	90.48	90.89	92.16	0.141646	5.88	5.34	13.82	2.94
Main Channel B	2399.26	50 Year	34.33	89.99	90.54	90.99	92.35	0.129298	6.11	6.18	14.07	2.86
Main Channel B	2399.26	100 Year	40.32	89.99	90.60	91.09	92.54	0.118987	6.32	7.05	14.33	2.80
Main Channel B	2399.26	Regulatory	169.31	89.99	94.10	92.61	94.58	0.002016	3.20	60.08	80.53	0.51
Main Channel B	2300.26		Culvert									
Main Channel B	2265.26	2 Year	10.05	89.36	89.83	89.83	90.01	0.016526	2.05	6.40	19.96	1.00
Main Channel B	2265.26	5 Year	16.60	89.36	89.98	89.98	90.23	0.016256	2.45	8.91	22.10	1.04
Main Channel B	2265.26	10 Year	21.68	89.36	90.08	90.08	90.38	0.015821	2.69	10.63	23.67	1.05
Main Channel B	2265.26	25 Year	28.67	89.36	90.20	90.20	90.57	0.015366	2.96	12.79	25.64	1.07
Main Channel B	2265.26	50 Year	34.33	89.36	90.29	90.29	90.71	0.014896	3.15	14.47	27.16	1.07
Main Channel B	2265.26	100 Year	40.32	89.36	90.39	90.39	90.85	0.014218	3.30	16.26	28.75	1.06
Main Channel B	2265.26	Regulatory	169.31	89.36	93.55	91.84	93.94	0.001863	3.12	73.40	137.52	0.49
Main Channel B	2229.26	2 Year	10.05	89.20	90.43		90.47	0.001219	1.02	14.01	31.39	0.31
Main Channel B	2229.26	5 Year	16.60	89.20	90.56		90.65	0.002034	1.42	18.66	38.54	0.41
Main Channel B	2229.26	10 Year	21.68	89.20	90.66		90.77	0.002466	1.65	22.66	43.77	0.46
Main Channel B	2229.26	25 Year	28.67	89.20	90.76		90.91	0.003020	1.92	27.63	49.51	0.52
Main Channel B	2229.26	50 Year	34.33	89.20	90.85		91.02	0.003303	2.09	31.99	54.04	0.54
Main Channel B	2229.26	100 Year	40.32	89.20	90.91	90.69	91.11	0.003787	2.29	35.30	57.23	0.59
Main Channel B	2229.26	Regulatory	169.31	89.20	93.71		93.74	0.000244	1.16	391.95	152.99	0.18
Main Channel B	2141.26	2 Year	10.05	89.00	89.96	89.91	90.21	0.010580	2.22	4.90	10.78	0.86
Main Channel B	2141.26	5 Year	16.60	89.00	90.23	90.23	90.37	0.005233	1.94	21.08	83.48	0.64
Main Channel B	2141.26	10 Year	21.68	89.00	90.29	90.29	90.44	0.005819	2.14	26.74	91.29	0.68
Main Channel B	2141.26	25 Year	28.67	89.00	90.37	90.37	90.53	0.006373	2.35	34.00	100.41	0.72
Main Channel B	2141.26	50 Year	34.33	89.00	90.40	90.40	90.60	0.007329	2.58	37.87	104.95	0.78
Main Channel B	2141.26	100 Year	40.32	89.00	90.47	90.47	90.65	0.007125	2.63	44.71	112.52	0.77
Main Channel B	2141.26	Regulatory	169.31	89.00	93.71		93.72	0.000122	0.83	533.35	173.03	0.13
Main Channel B	2018.26	2 Year	10.05	88.20	89.45	89.32	89.55	0.003256	1.57	15.45	52.14	0.49
Main Channel B	2018.26	5 Year	16.60	88.20	89.68	89.50	89.75	0.002669	1.61	29.87	75.83	0.45
Main Channel B	2018.26	10 Year	21.68	88.20	89.80	89.59	89.87	0.002511	1.66	40.00	88.77	0.45

HEC-RAS Plan: Prop_up River: Reach #1 Reach: Main Channel B (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Main Channel B	2018.26	25 Year	28.67	88.20	89.94	89.69	90.00	0.002432	1.74	52.71	102.72	0.45
Main Channel B	2018.26	50 Year	34.33	88.20	90.02	89.76	90.09	0.002397	1.79	62.01	110.02	0.45
Main Channel B	2018.26	100 Year	40.32	88.20	90.25	89.81	90.28	0.001328	1.45	87.14	115.63	0.34
Main Channel B	2018.26	Regulatory	169.31	88.20	93.70		93.71	0.000089	0.76	567.21	152.63	0.11
Main Channel B	2000.26	2 Year	10.05	88.20	89.16	89.16	89.42	0.010351	2.31	5.45	19.84	0.84
Main Channel B	2000.26	5 Year	16.60	88.20	89.42	89.42	89.66	0.007284	2.36	13.82	42.37	0.74
Main Channel B	2000.26	10 Year	21.68	88.20	89.54	89.54	89.78	0.007116	2.51	19.32	52.11	0.74
Main Channel B	2000.26	25 Year	28.67	88.20	89.66	89.66	89.91	0.007201	2.69	26.19	62.18	0.76
Main Channel B	2000.26	50 Year	34.33	88.20	89.84		90.01	0.004819	2.40	38.78	77.29	0.63
Main Channel B	2000.26	100 Year	40.32	88.20	90.18		90.25	0.001809	1.69	69.24	96.91	0.40
Main Channel B	2000.26	Regulatory	169.31	88.20	93.70		93.71	0.000106	0.84	527.00	151.30	0.12
Main Channel B	1986.26	2 Year	10.05	87.65	88.21	88.49	89.06	0.078554	4.08	2.46	6.63	2.14
Main Channel B	1986.26	5 Year	16.60	87.65	88.38	88.66	89.33	0.083457	4.32	3.84	9.98	2.22
Main Channel B	1986.26	10 Year	21.68	87.65	89.16	88.76	89.28	0.002904	1.51	14.46	18.59	0.48
Main Channel B	1986.26	25 Year	28.67	87.65	89.35	88.90	89.50	0.002819	1.67	17.39	23.28	0.49
Main Channel B	1986.26	50 Year	34.33	87.65	89.86	89.00	89.96	0.001238	1.40	25.06	35.55	0.34
Main Channel B	1986.26	100 Year	40.32	87.65	90.12	89.10	90.22	0.001047	1.42	29.11	45.38	0.32
Main Channel B	1986.26	Regulatory	169.31	87.65	93.68	90.56	93.70	0.000113	0.93	449.35	151.88	0.13
Main Channel B	1980.26		Bridge									
Main Channel B	1973.26	2 Year	10.05	87.65	88.71	88.45	88.78	0.004001	1.22	8.25	14.50	0.52
Main Channel B	1973.26	5 Year	16.60	87.65	88.92	88.64	89.03	0.004234	1.42	11.66	16.85	0.55
Main Channel B	1973.26	10 Year	21.68	87.65	89.06	88.75	89.18	0.004128	1.54	14.06	19.52	0.55
Main Channel B	1973.26	25 Year	28.67	87.65	89.18	88.89	89.34	0.004502	1.77	16.21	20.97	0.59
Main Channel B	1973.26	50 Year	34.33	87.65	89.25	88.99	89.45	0.005143	1.98	17.35	21.75	0.64
Main Channel B	1973.26	100 Year	40.32	87.65	89.30	89.07	89.55	0.005858	2.19	18.38	22.44	0.69
Main Channel B	1973.26	Regulatory	169.31	87.65	93.67	90.46	93.69	0.000101	0.87	473.08	171.60	0.12
Main Channel B	1918.26	2 Year	10.05	87.20	88.14	88.14	88.39	0.010501	2.29	5.63	18.74	0.84
Main Channel B	1918.26	5 Year	16.60	87.20	88.37	88.38	88.65	0.008920	2.53	11.09	27.79	0.81
Main Channel B	1918.26	10 Year	21.68	87.20	88.49	88.49	88.79	0.009109	2.75	14.59	32.28	0.84
Main Channel B	1918.26	25 Year	28.67	87.20	88.67	88.67	88.97	0.007902	2.85	22.08	49.30	0.80
Main Channel B	1918.26	50 Year	34.33	87.20	88.79	88.79	89.08	0.007346	2.90	28.32	60.23	0.78
Main Channel B	1918.26	100 Year	40.32	87.20	88.87	88.87	89.17	0.007311	3.02	33.93	68.59	0.79
Main Channel B	1918.26	Regulatory	169.31	87.20	93.67		93.68	0.000088	0.86	520.93	135.04	0.11
Main Channel B	1867.26	2 Year	10.05	86.20	88.02	87.15	88.05	0.000530	0.86	23.75	35.37	0.21
Main Channel B	1867.26	5 Year	16.60	86.20	88.34	87.47	88.38	0.000618	1.04	37.03	48.87	0.24
Main Channel B	1867.26	10 Year	21.68	86.20	88.51	87.64	88.55	0.000690	1.16	45.80	55.98	0.26
Main Channel B	1867.26	25 Year	28.67	86.20	88.68	87.82	88.73	0.000779	1.30	56.30	62.27	0.28
Main Channel B	1867.26	50 Year	34.33	86.20	88.79	87.93	88.85	0.000871	1.42	63.13	66.05	0.29
Main Channel B	1867.26	100 Year	40.32	86.20	88.89	88.03	88.95	0.000968	1.54	69.64	69.46	0.31
Main Channel B	1867.26	Regulatory	169.31	86.20	93.66		93.67	0.000072	0.86	522.79	116.24	0.10

HEC-RAS Plan: Plan 04 River: Dunbarton Creek Reach: 01

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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
01	2938.438	2 yr	1.30	111.60	112.04	112.04	112.09	0.011148	1.33	2.68	23.24	0.64
01	2938.438	5 yr	1.89	111.60	112.18		112.19	0.002836	0.81	6.14	25.68	0.34
01	2938.438	10 yr	2.35	111.60	112.39		112.39	0.000662	0.48	11.85	28.62	0.17
01	2938.438	25 yr	2.90	111.60	113.00		113.00	0.000058	0.21	31.84	37.10	0.06
01	2938.438	50 yr	3.33	111.60	113.61		113.61	0.000017	0.14	58.72	55.30	0.03
01	2938.438	100 yr	4.02	111.60	114.84		114.84	0.000002	0.07	135.29	69.12	0.01
01	2938.438	Regional	4.91	111.60	115.48		115.48	0.000001	0.06	181.76	77.51	0.01
01	2874.652	2 yr	1.47	110.50	111.64	111.10	111.70	0.002413	1.13	1.73	2.34	0.34
01	2874.652	5 yr	2.16	110.50	111.97	111.27	112.04	0.001974	1.21	2.60	2.86	0.32
01	2874.652	10 yr	2.69	110.50	112.27	111.38	112.32	0.001462	1.18	3.70	8.75	0.28
01	2874.652	25 yr	3.34	110.50	112.96	111.51	112.99	0.000528	0.88	6.49	17.79	0.18
01	2874.652	50 yr	3.85	110.50	113.58	111.60	113.60	0.000272	0.74	9.02	26.94	0.13
01	2874.652	100 yr	4.71	110.50	114.83	111.74	114.84	0.000105	0.58	14.06	60.81	0.09
01	2874.652	Regional	5.37	110.50	115.45	111.85	115.47	0.000166	0.79	24.43	70.08	0.11
01	2872.892		Culvert									
01	2846.130	2 yr	1.55	110.00	110.54	110.54	110.81	0.025182	2.31	0.67	3.73	1.00
01	2846.130	5 yr	2.28	110.00	110.70	110.70	111.05	0.023157	2.63	0.87	5.37	1.00
01	2846.130	10 yr	2.85	110.00	110.81	110.81	111.22	0.022034	2.83	1.01	6.53	1.00
01	2846.130	25 yr	3.54	110.00	110.94	110.94	111.41	0.021038	3.05	1.16	8.10	1.01
01	2846.130	50 yr	4.08	110.00	111.03	111.03	111.55	0.020335	3.19	1.28	9.29	1.00
01	2846.130	100 yr	5.02	110.00	111.18	111.18	111.78	0.019446	3.42	1.47	11.22	1.01
01	2846.130	Regional	5.58	110.00	111.27	111.27	111.91	0.018791	3.54	1.58	12.36	1.00
01	2794.275	2 yr	1.69	107.98	108.57	108.57	108.77	0.021027	2.03	0.95	4.43	0.84
01	2794.275	5 yr	2.51	107.98	108.75	108.75	108.90	0.012619	1.88	2.37	10.97	0.68
01	2794.275	10 yr	3.12	107.98	108.81	108.81	108.96	0.012319	1.96	3.14	13.21	0.69
01	2794.275	25 yr	3.90	107.98	108.88	108.88	109.02	0.012481	2.07	4.01	15.37	0.70
01	2794.275	50 yr	4.50	107.98	108.92	108.92	109.07	0.012326	2.12	4.71	16.90	0.70
01	2794.275	100 yr	5.58	107.98	108.98	108.98	109.13	0.012659	2.24	5.79	19.03	0.72
01	2794.275	Regional	5.95	107.98	109.00	109.00	109.15	0.012504	2.26	6.21	19.79	0.71
01	2756.088	2 yr	1.79	106.27	106.83	106.83	107.09	0.028039	2.27	0.81	2.04	0.97
01	2756.088	5 yr	2.67	106.27	107.05	107.05	107.30	0.018408	2.29	1.49	4.24	0.83
01	2756.088	10 yr	3.33	106.27	107.15	107.15	107.41	0.016512	2.36	2.00	5.33	0.80
01	2756.088	25 yr	4.16	106.27	107.26	107.26	107.52	0.015469	2.47	2.64	6.73	0.79
01	2756.088	50 yr	4.81	106.27	107.34	107.34	107.59	0.014667	2.52	3.18	7.77	0.78
01	2756.088	100 yr	6.00	106.27	107.45	107.45	107.71	0.013809	2.62	4.15	9.35	0.77
01	2756.088	Regional	6.23	106.27	107.47	107.47	107.73	0.013896	2.65	4.30	9.57	0.77
01	2665.564	2 yr	2.00	104.50	105.61		105.64	0.002319	0.97	3.67	10.44	0.29
01	2665.564	5 yr	3.00	104.50	105.73		105.78	0.002859	1.16	5.09	12.79	0.33
01	2665.564	10 yr	3.74	104.50	105.79		105.85	0.003275	1.28	5.94	13.85	0.36
01	2665.564	25 yr	4.68	104.50	105.85		105.92	0.003852	1.43	6.83	14.89	0.39
01	2665.564	50 yr	5.42	104.50	105.90		105.97	0.004147	1.52	7.59	15.71	0.41
01	2665.564	100 yr	6.70	104.50	106.01		106.08	0.004103	1.59	9.28	17.42	0.41
01	2665.564	Regional	7.19	104.50	106.03		106.10	0.004364	1.65	9.62	17.74	0.43
01	2603.439	2 yr	2.14	104.50	105.22	105.22	105.35	0.011872	1.75	2.21	12.27	0.66
01	2603.439	5 yr	3.22	104.50	105.34	105.34	105.45	0.010579	1.83	4.22	22.83	0.64
01	2603.439	10 yr	4.02	104.50	105.40	105.40	105.50	0.010229	1.87	5.65	28.53	0.63
01	2603.439	25 yr	5.04	104.50	105.45	105.45	105.55	0.009807	1.91	7.35	32.57	0.63
01	2603.439	50 yr	5.84	104.50	105.47	105.47	105.58	0.010462	2.00	8.15	33.15	0.65
01	2603.439	100 yr	7.18	104.50	105.48		105.62	0.014659	2.39	8.42	33.35	0.77
01	2603.439	Regional	7.85	104.50	105.51		105.64	0.013816	2.36	9.32	33.99	0.75
01	2535.610	2 yr	2.29	103.50	104.24	104.24	104.36	0.011536	1.75	2.51	13.77	0.65
01	2535.610	5 yr	3.47	103.50	104.35	104.35	104.46	0.010889	1.86	4.30	19.36	0.65
01	2535.610	10 yr	4.33	103.50	104.39	104.39	104.52	0.011695	2.00	5.25	21.77	0.68
01	2535.610	25 yr	5.44	103.50	104.44	104.44	104.57	0.012802	2.17	6.34	24.21	0.71
01	2535.610	50 yr	6.29	103.50	104.48	104.48	104.61	0.013057	2.24	7.25	26.08	0.72
01	2535.610	100 yr	7.71	103.50	104.53	104.53	104.66	0.013640	2.37	8.62	28.68	0.75
01	2535.610	Regional	8.58	103.50	104.55	104.55	104.69	0.014127	2.45	9.37	30.00	0.76
01	2408.597	2 yr	2.59	101.50	102.61		102.68	0.003408	1.25	3.40	6.94	0.38
01	2408.597	5 yr	3.92	101.50	102.80		102.88	0.003676	1.44	4.86	8.47	0.40
01	2408.597	10 yr	4.90	101.50	102.91		103.00	0.003851	1.56	5.84	9.35	0.42
01	2408.597	25 yr	6.17	101.50	103.04		103.13	0.003985	1.68	7.07	10.37	0.43
01	2408.597	50 yr	7.15	101.50	103.12		103.22	0.004099	1.76	7.96	11.04	0.44
01	2408.597	100 yr	8.70	101.50	103.23		103.34	0.004309	1.89	9.25	11.95	0.46
01	2408.597	Regional	9.93	101.50	103.32		103.43	0.004371	1.97	10.31	12.64	0.47
01	2344.722	2 yr	2.73	101.19	101.98	101.98	102.23	0.017836	2.28	1.56	4.54	0.82
01	2344.722	5 yr	4.15	101.19	102.18	102.18	102.43	0.015194	2.44	2.68	6.69	0.78
01	2344.722	10 yr	5.19	101.19	102.29	102.29	102.54	0.014477	2.55	3.46	7.85	0.78

HEC-RAS Plan: Plan 04 River: Dunbarton Creek Reach: 01 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
01	2344.722	25 yr	6.54	101.19	102.39	102.39	102.66	0.014618	2.72	4.33	8.97	0.79
01	2344.722	50 yr	7.58	101.19	102.46	102.46	102.74	0.014624	2.83	4.99	9.74	0.80
01	2344.722	100 yr	9.19	101.19	102.56	102.56	102.85	0.014489	2.96	6.02	10.82	0.81
01	2344.722	Regional	10.61	101.19	102.64	102.64	102.94	0.014595	3.08	6.86	11.63	0.82
01	2242.929	2 yr	2.97	99.50	100.34		100.37	0.003799	1.09	6.59	22.45	0.38
01	2242.929	5 yr	4.52	99.50	100.46		100.49	0.003492	1.15	9.44	24.40	0.37
01	2242.929	10 yr	5.65	99.50	100.53		100.56	0.003386	1.19	11.29	25.58	0.37
01	2242.929	25 yr	7.13	99.50	100.63		100.65	0.003204	1.22	13.69	27.04	0.37
01	2242.929	50 yr	8.26	99.50	100.68		100.71	0.003162	1.26	15.31	27.84	0.37
01	2242.929	100 yr	9.98	99.50	100.77		100.79	0.003120	1.30	17.61	28.87	0.37
01	2242.929	Regional	11.69	99.50	100.86		100.88	0.002896	1.31	20.26	30.02	0.36
01	2126.852	2 yr	3.23	98.50	99.37	99.37	99.56	0.014194	2.16	2.47	8.18	0.74
01	2126.852	5 yr	4.94	98.50	99.53	99.53	99.73	0.013739	2.38	3.98	11.08	0.75
01	2126.852	10 yr	6.18	98.50	99.61	99.61	99.82	0.013586	2.50	5.02	12.69	0.76
01	2126.852	25 yr	7.80	98.50	99.70	99.70	99.92	0.014384	2.69	6.13	14.21	0.79
01	2126.852	50 yr	9.04	98.50	99.75	99.75	99.99	0.014646	2.81	6.99	15.28	0.80
01	2126.852	100 yr	10.88	98.50	99.83	99.83	100.07	0.014801	2.94	8.25	16.73	0.81
01	2126.852	Regional	12.92	98.50	99.88	99.88	100.16	0.017055	3.23	9.05	17.58	0.88
01	2075.951	2 yr	3.35	98.00	99.05		99.09	0.003449	1.21	6.51	19.63	0.38
01	2075.951	5 yr	5.12	98.00	99.20		99.24	0.003320	1.30	9.86	24.63	0.38
01	2075.951	10 yr	6.41	98.00	99.29		99.33	0.003295	1.36	12.09	27.46	0.38
01	2075.951	25 yr	8.10	98.00	99.39		99.43	0.003194	1.40	15.01	30.78	0.38
01	2075.951	50 yr	9.39	98.00	99.46		99.49	0.003156	1.44	17.11	32.95	0.38
01	2075.951	100 yr	11.28	98.00	99.54		99.58	0.003161	1.49	19.94	35.68	0.38
01	2075.951	Regional	13.46	98.00	99.63		99.67	0.003092	1.53	23.30	38.66	0.38
01	1996.419	2 yr	3.53	97.50	98.40	98.40	98.59	0.013652	2.17	2.89	9.59	0.73
01	1996.419	5 yr	5.41	97.50	98.55	98.55	98.75	0.013685	2.41	4.55	12.66	0.75
01	1996.419	10 yr	6.77	97.50	98.63	98.63	98.83	0.013613	2.53	5.70	14.42	0.76
01	1996.419	25 yr	8.56	97.50	98.71	98.71	98.93	0.014513	2.73	6.92	16.07	0.79
01	1996.419	50 yr	9.92	97.50	98.77	98.77	98.99	0.014956	2.86	7.83	17.20	0.81
01	1996.419	100 yr	11.89	97.50	98.84	98.84	99.08	0.015028	2.98	9.22	18.79	0.82
01	1996.419	Regional	14.31	97.50	98.92	98.92	99.16	0.015643	3.15	10.69	20.34	0.84
01	1928.584	2 yr	3.58	95.50	96.62		96.69	0.004199	1.40	5.32	13.45	0.42
01	1928.584	5 yr	5.48	95.50	96.84		96.89	0.003524	1.44	8.64	17.60	0.40
01	1928.584	10 yr	6.86	95.50	97.00		97.04	0.002782	1.38	11.73	20.72	0.36
01	1928.584	25 yr	8.67	95.50	97.21		97.25	0.002021	1.28	17.70	34.59	0.31
01	1928.584	50 yr	10.05	95.50	97.42		97.44	0.001172	1.06	26.42	47.98	0.24
01	1928.584	100 yr	12.04	95.50	97.67		97.68	0.000648	0.85	38.32	50.66	0.18
01	1928.584	Regional	14.51	95.50	97.97		97.98	0.000360	0.69	54.31	53.63	0.14
01	1915.061	2 yr	3.59	95.21	96.65	95.57	96.66	0.000164	0.42	11.24	12.93	0.11
01	1915.061	5 yr	5.50	95.21	96.86	95.69	96.87	0.000235	0.54	13.62	14.93	0.14
01	1915.061	10 yr	6.88	95.21	97.01	95.77	97.03	0.000263	0.61	15.61	17.05	0.15
01	1915.061	25 yr	8.70	95.21	97.22	95.87	97.24	0.000272	0.67	18.63	30.79	0.15
01	1915.061	50 yr	10.08	95.21	97.42	95.94	97.44	0.000249	0.68	21.56	44.14	0.15
01	1915.061	100 yr	12.07	95.21	97.65	96.04	97.67	0.000241	0.72	24.92	59.32	0.15
01	1915.061	Regional	14.55	95.21	97.94	96.15	97.97	0.000296	0.86	31.23	76.75	0.17
01	1905.401		Culvert									
01	1795.743	2 yr	3.67	94.80	96.61		96.62	0.000102	0.38	10.91	23.99	0.09
01	1795.743	5 yr	5.62	94.80	96.75		96.76	0.000177	0.53	14.09	29.99	0.12
01	1795.743	10 yr	7.03	94.80	96.83		96.85	0.000230	0.62	16.47	33.71	0.14
01	1795.743	25 yr	8.90	94.80	96.93		96.96	0.000299	0.73	19.52	37.87	0.16
01	1795.743	50 yr	10.32	94.80	97.03		97.06	0.000323	0.78	23.03	42.11	0.17
01	1795.743	100 yr	12.33	94.80	97.08		97.12	0.000408	0.89	25.19	44.50	0.19
01	1795.743	Regional	14.91	94.80	97.19		97.23	0.000472	0.99	29.68	49.06	0.20
01	1762.506	2 yr	3.70	95.60	96.51		96.59	0.008563	1.72	5.26	17.81	0.58
01	1762.506	5 yr	5.65	95.60	96.67		96.73	0.006752	1.71	8.54	23.07	0.53
01	1762.506	10 yr	7.08	95.60	96.77		96.82	0.005979	1.70	10.91	26.23	0.50
01	1762.506	25 yr	8.95	95.60	96.87		96.92	0.005397	1.71	13.85	29.67	0.48
01	1762.506	50 yr	10.38	95.60	96.97		97.02	0.005418	1.80	17.11	41.27	0.49
01	1762.506	100 yr	12.40	95.60	97.03		97.08	0.005410	1.85	19.65	43.07	0.49
01	1762.506	Regional	15.01	95.60	97.14		97.19	0.005083	1.89	25.14	56.90	0.49
01	1621.409	2 yr	3.80	94.60	95.67		95.72	0.004540	1.40	5.83	12.55	0.43
01	1621.409	5 yr	5.80	94.60	95.80		95.87	0.005578	1.68	7.62	14.33	0.49
01	1621.409	10 yr	7.26	94.60	95.88		95.96	0.006190	1.84	8.79	15.39	0.52
01	1621.409	25 yr	9.19	94.60	95.97		96.06	0.006803	2.02	10.26	16.62	0.55
01	1621.409	50 yr	10.66	94.60	96.03		96.13	0.007275	2.15	11.26	17.41	0.57
01	1621.409	100 yr	12.70	94.60	96.18		96.26	0.006073	2.10	13.96	19.38	0.53

HEC-RAS Plan: Plan 04 River: Dunbarton Creek Reach: 01 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
01	1621.409	Regional	15.44	94.60	96.28	95.93	96.37	0.006473	2.25	15.94	20.76	0.56
01	1565.360	2 yr	3.84	94.60	95.28	95.24	95.33	0.011470	1.64	5.85	23.12	0.64
01	1565.360	5 yr	5.86	94.60	95.37	95.30	95.42	0.011846	1.81	7.88	24.49	0.66
01	1565.360	10 yr	7.33	94.60	95.42	95.34	95.48	0.012028	1.90	9.20	25.34	0.67
01	1565.360	25 yr	9.29	94.60	95.48		95.54	0.012702	2.05	10.69	26.26	0.70
01	1565.360	50 yr	10.77	94.60	95.52		95.59	0.012539	2.11	11.92	27.00	0.70
01	1565.360	100 yr	12.82	94.60	95.44	95.44	95.60	0.030243	3.08	9.87	25.76	1.07
01	1565.360	Regional	15.60	94.60	95.49	95.49	95.67	0.032080	3.29	11.11	26.52	1.11
01	1458.698	2 yr	3.91	93.60	94.46		94.49	0.005733	1.35	8.55	35.48	0.47
01	1458.698	5 yr	5.97	93.60	94.56		94.59	0.005522	1.43	12.51	43.31	0.47
01	1458.698	10 yr	7.47	93.60	94.62		94.65	0.005393	1.47	15.23	47.95	0.47
01	1458.698	25 yr	9.46	93.60	94.68		94.71	0.005187	1.51	18.64	52.36	0.46
01	1458.698	50 yr	10.98	93.60	94.72		94.75	0.005351	1.57	20.61	54.29	0.47
01	1458.698	100 yr	13.05	93.60	94.94		94.96	0.001972	1.07	34.05	65.97	0.30
01	1458.698	Regional	15.92	93.60	95.07		95.08	0.001602	1.03	42.65	72.47	0.27
01	1359.244	2 yr	3.99	92.86	93.79		93.85	0.007140	1.60	6.40	21.27	0.53
01	1359.244	5 yr	6.08	92.86	93.92		93.98	0.006740	1.70	9.50	26.22	0.53
01	1359.244	10 yr	7.60	92.86	94.00		94.06	0.006503	1.75	11.66	29.17	0.52
01	1359.244	25 yr	9.63	92.86	94.09		94.15	0.006212	1.80	14.47	32.61	0.52
01	1359.244	50 yr	11.18	92.86	94.52		94.53	0.001182	0.96	31.77	48.72	0.24
01	1359.244	100 yr	13.26	92.86	94.86		94.87	0.000472	0.69	50.21	57.19	0.15
01	1359.244	Regional	16.22	92.86	94.99		95.00	0.000480	0.72	57.70	60.14	0.16
01	1293.064	2 yr	4.03	92.60	93.45		93.48	0.004404	1.18	7.97	20.89	0.41
01	1293.064	5 yr	6.15	92.60	93.58		93.61	0.004624	1.33	10.74	23.21	0.43
01	1293.064	10 yr	7.69	92.60	93.66		93.69	0.004638	1.40	12.67	24.71	0.44
01	1293.064	25 yr	9.74	92.60	93.76		93.79	0.004492	1.47	15.29	26.60	0.44
01	1293.064	50 yr	11.31	92.60	94.47		94.48	0.000477	0.66	38.84	38.29	0.15
01	1293.064	100 yr	13.41	92.60	94.84		94.85	0.000270	0.56	53.83	43.22	0.12
01	1293.064	Regional	16.42	92.60	94.97		94.97	0.000309	0.62	59.35	44.90	0.13
01	1187.532	2 yr	4.11	92.25	93.10		93.12	0.002678	0.92	10.80	28.19	0.32
01	1187.532	5 yr	6.26	92.25	93.23		93.25	0.002552	0.99	14.50	29.01	0.32
01	1187.532	10 yr	7.83	92.25	93.30		93.32	0.002736	1.07	16.42	29.42	0.33
01	1187.532	25 yr	9.92	92.25	93.50		93.52	0.001669	0.94	22.56	30.71	0.27
01	1187.532	50 yr	11.52	92.25	94.45		94.45	0.000157	0.42	54.28	36.02	0.09
01	1187.532	100 yr	13.63	92.25	94.83		94.83	0.000111	0.39	68.19	37.88	0.08
01	1187.532	Regional	16.74	92.25	94.95		94.95	0.000138	0.45	72.85	38.63	0.09
01	1058.782	2 yr	4.20	91.44	92.20	92.20	92.35	0.020855	2.38	3.65	10.84	0.87
01	1058.782	5 yr	6.39	91.44	92.31	92.31	92.49	0.022676	2.72	4.92	11.96	0.93
01	1058.782	10 yr	8.00	91.44	92.44	92.37	92.59	0.016419	2.54	6.62	13.25	0.81
01	1058.782	25 yr	10.14	91.44	93.33	92.45	93.34	0.001095	1.00	22.11	21.74	0.23
01	1058.782	50 yr	11.77	91.44	94.43	92.50	94.43	0.000176	0.55	57.25	58.88	0.10
01	1058.782	100 yr	13.91	91.44	94.81	92.56	94.81	0.000112	0.47	82.06	69.57	0.08
01	1058.782	Regional	17.13	91.44	94.93	92.65	94.93	0.000134	0.53	90.52	72.55	0.09
01	1025.205	2 yr	4.22	89.90	91.46	90.60	91.48	0.000458	0.66	10.52	17.85	0.17
01	1025.205	5 yr	6.43	89.90	92.06	90.72	92.07	0.000305	0.67	15.56	22.31	0.14
01	1025.205	10 yr	8.04	89.90	92.51	90.80	92.52	0.000235	0.66	19.38	32.48	0.13
01	1025.205	25 yr	10.19	89.90	93.32	90.89	93.33	0.000140	0.61	26.27	52.59	0.11
01	1025.205	50 yr	11.84	89.90	94.42	90.95	94.43	0.000070	0.52	35.60	78.15	0.08
01	1025.205	100 yr	13.98	89.90	94.78	91.04	94.81	0.000194	0.91	53.80	85.01	0.13
01	1025.205	Regional	17.23	89.90	94.90	91.14	94.93	0.000225	1.00	62.82	87.22	0.14
01	1014.65		Culvert									
01	974.093	2 yr	4.26	88.85	89.79		90.04	0.008240	2.23	1.91	35.26	0.73
01	974.093	5 yr	6.48	88.85	89.98		90.38	0.010102	2.80	2.31	37.68	0.84
01	974.093	10 yr	8.11	88.85	90.07	90.02	90.61	0.012280	3.25	2.50	38.91	0.94
01	974.093	25 yr	10.28	88.85	90.22	90.22	90.91	0.013588	3.68	2.79	39.92	1.01
01	974.093	50 yr	11.94	88.85	90.36	90.36	91.13	0.013121	3.87	3.08	40.94	1.00
01	974.093	100 yr	14.09	88.85	90.54	90.54	91.39	0.012541	4.08	3.45	42.76	1.00
01	974.093	Regional	17.38	88.85	90.79	90.79	91.77	0.012082	4.39	3.96	45.92	1.00
01	908.629	2 yr	4.31	88.35	89.12	89.00	89.34	0.013658	2.13	2.24	5.93	0.78
01	908.629	5 yr	6.55	88.35	89.31	89.30	89.58	0.012694	2.39	3.84	10.64	0.78
01	908.629	10 yr	8.19	88.35	89.43	89.43	89.70	0.011518	2.47	5.31	13.57	0.76
01	908.629	25 yr	10.39	88.35	89.56	89.56	89.82	0.010867	2.58	7.15	16.27	0.75
01	908.629	50 yr	12.07	88.35	89.61	89.61	89.90	0.011507	2.74	8.15	17.56	0.78
01	908.629	100 yr	14.23	88.35	89.69	89.69	90.00	0.012055	2.91	9.52	19.98	0.80
01	908.629	Regional	17.58	88.35	89.74		90.14	0.015330	3.36	10.56	22.09	0.91
01	806.957	2 yr	4.38	86.91	87.68	87.57	87.92	0.014317	2.18	2.11	4.66	0.80

HEC-RAS Plan: Plan 04 River: Dunbarton Creek Reach: 01 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
01	806.957	5 yr	6.66	86.91	87.86	87.86	88.18	0.014677	2.55	3.28	7.93	0.84
01	806.957	10 yr	8.32	86.91	88.00	88.00	88.32	0.012714	2.61	4.59	10.46	0.80
01	806.957	25 yr	10.56	86.91	88.15	88.15	88.46	0.011697	2.72	6.27	13.00	0.78
01	806.957	50 yr	12.27	86.91	88.23	88.23	88.56	0.011411	2.81	7.48	14.55	0.78
01	806.957	100 yr	14.45	86.91	88.34	88.34	88.66	0.011005	2.90	9.05	16.34	0.77
01	806.957	Regional	17.88	86.91	88.46	88.46	88.80	0.010993	3.06	11.24	18.57	0.79
01	716.296	2 yr	4.44	85.35	86.04	86.04	86.35	0.021051	2.47	1.85	4.82	0.95
01	716.296	5 yr	6.75	85.35	86.33	86.33	86.56	0.011354	2.29	4.66	14.11	0.74
01	716.296	10 yr	8.44	85.35	86.43	86.43	86.67	0.010941	2.40	6.19	16.78	0.74
01	716.296	25 yr	10.71	85.35	86.54	86.54	86.78	0.010633	2.52	8.17	19.69	0.74
01	716.296	50 yr	12.45	85.35	86.60	86.60	86.85	0.010695	2.62	9.53	21.48	0.75
01	716.296	100 yr	14.64	85.35	86.68	86.68	86.93	0.010856	2.74	11.15	23.42	0.76
01	716.296	Regional	18.15	85.35	87.10		87.18	0.003281	1.81	23.40	32.58	0.44
01	644.187	2 yr	4.50	83.35	84.37		84.40	0.001936	0.97	10.21	26.54	0.31
01	644.187	5 yr	6.83	83.35	84.49		84.52	0.002273	1.13	13.39	27.40	0.34
01	644.187	10 yr	8.54	83.35	84.56		84.60	0.002461	1.23	15.41	27.93	0.36
01	644.187	25 yr	10.83	83.35	84.96		84.98	0.000823	0.86	27.15	30.26	0.22
01	644.187	50 yr	12.59	83.35	86.19		86.19	0.000078	0.39	67.36	35.27	0.07
01	644.187	100 yr	14.80	83.35	86.60		86.60	0.000060	0.37	82.15	36.94	0.07
01	644.187	Regional	18.37	83.35	87.15		87.15	0.000048	0.37	102.95	38.95	0.06
01	611.277	2 yr	4.52	83.34	84.16	84.16	84.27	0.008596	1.73	5.39	24.44	0.61
01	611.277	5 yr	6.86	83.34	84.24	84.24	84.38	0.010110	2.00	7.47	24.78	0.67
01	611.277	10 yr	8.58	83.34	84.29	84.29	84.44	0.011393	2.19	8.60	24.97	0.72
01	611.277	25 yr	10.89	83.34	84.93	84.35	84.95	0.000948	0.90	25.51	27.57	0.23
01	611.277	50 yr	12.66	83.34	86.19	84.39	86.19	0.000089	0.41	63.27	32.65	0.08
01	611.277	100 yr	14.87	83.34	86.60	84.43	86.60	0.000070	0.39	77.00	34.31	0.07
01	611.277	Regional	18.47	83.34	87.14	84.50	87.15	0.000056	0.39	96.40	36.52	0.06
01	596.843	2 yr	4.57	82.00	83.33	82.75	83.44	0.003550	1.52	3.09	3.26	0.42
01	596.843	5 yr	6.94	82.00	83.78	82.99	83.92	0.003066	1.71	4.18	3.93	0.41
01	596.843	10 yr	8.68	82.00	84.10	83.15	84.27	0.002707	1.80	4.98	4.42	0.40
01	596.843	25 yr	11.01	82.00	84.77	83.34	84.92	0.001737	1.73	6.58	5.41	0.33
01	596.843	50 yr	12.80	82.00	86.09	83.48	86.18	0.000636	1.36	9.78	8.93	0.21
01	596.843	100 yr	15.04	82.00	86.48	83.65	86.59	0.000644	1.45	10.74	10.34	0.22
01	596.843	Regional	18.56	82.00	87.00	83.89	87.13	0.000678	1.61	12.01	12.14	0.23
01	595.768		Culvert									
01	578.689	2 yr	4.63	81.83	83.03	82.87	83.42	0.018235	2.80	1.66	2.51	0.82
01	578.689	5 yr	7.04	81.83	83.21	83.21	83.90	0.026078	3.68	1.91	2.89	1.00
01	578.689	10 yr	8.80	81.83	83.43	83.43	84.23	0.024863	3.97	2.22	3.35	1.00
01	578.689	25 yr	11.16	81.83	84.33	83.71	84.86	0.009013	3.22	3.47	5.21	0.65
01	578.689	50 yr	12.98	81.83	85.82	83.91	86.10	0.002575	2.35	5.53	7.82	0.37
01	578.689	100 yr	15.25	81.83	86.15	84.14	86.48	0.002727	2.55	5.99	8.37	0.39
01	578.689	Regional	18.68	81.83	86.56	84.48	86.97	0.003032	2.85	6.55	9.05	0.42
01	553.388	2 yr	4.72	81.88	83.10		83.12	0.002017	1.03	10.27	20.57	0.30
01	553.388	5 yr	7.18	81.88	83.36		83.38	0.001455	1.00	15.82	22.29	0.26
01	553.388	10 yr	8.97	81.88	83.62		83.63	0.000929	0.89	21.89	24.22	0.22
01	553.388	25 yr	11.37	81.88	84.58		84.59	0.000165	0.50	48.72	31.74	0.10
01	553.388	50 yr	13.23	81.88	85.96		85.96	0.000031	0.29	100.37	42.82	0.05
01	553.388	100 yr	15.54	81.88	86.31		86.31	0.000029	0.29	116.05	45.46	0.04
01	553.388	Regional	18.84	81.88	86.76		86.76	0.000027	0.30	137.19	48.82	0.04
01	545.149	2 yr	4.75	81.98	82.92	82.92	83.06	0.010950	2.02	5.02	17.14	0.67
01	545.149	5 yr	7.22	81.98	83.32		83.36	0.002582	1.25	12.56	19.93	0.34
01	545.149	10 yr	9.03	81.98	83.60		83.62	0.001412	1.04	18.31	21.54	0.26
01	545.149	25 yr	11.44	81.98	84.58		84.58	0.000217	0.56	42.31	27.67	0.11
01	545.149	50 yr	13.32	81.98	85.96		85.96	0.000041	0.33	86.71	36.71	0.05
01	545.149	100 yr	15.64	81.98	86.31		86.31	0.000039	0.33	100.16	39.04	0.05
01	545.149	Regional	18.89	81.98	86.76		86.76	0.000036	0.34	118.34	41.98	0.05
01	527.922	2 yr	4.80	81.33	82.85	82.04	82.91	0.001480	1.15	5.08	4.96	0.30
01	527.922	5 yr	7.32	81.33	83.24	82.27	83.32	0.001452	1.32	7.10	5.93	0.31
01	527.922	10 yr	9.14	81.33	83.50	82.42	83.59	0.001402	1.42	8.52	6.57	0.31
01	527.922	25 yr	11.58	81.33	84.52	82.61	84.57	0.000528	1.12	14.27	9.07	0.20
01	527.922	50 yr	13.49	81.33	85.93	82.74	85.95	0.000187	0.85	22.21	12.37	0.13
01	527.922	100 yr	15.84	81.33	86.28	82.91	86.31	0.000198	0.92	24.19	13.13	0.13
01	527.922	Regional	19.00	81.33	86.72	83.08	86.76	0.000210	1.00	26.68	14.09	0.14
01	526.532		Culvert									
01	490.146	2 yr	4.93	79.15	81.06		81.10	0.000689	0.92	5.33	6.14	0.21
01	490.146	5 yr	7.53	79.15	81.32		81.40	0.001038	1.24	6.08	6.80	0.27

HEC-RAS Plan: Plan 04 River: Dunbarton Creek Reach: 01 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
01	490.146	10 yr	9.40	79.15	81.80		81.88	0.000838	1.27	7.41	7.97	0.25
01	490.146	25 yr	11.89	79.15	84.15		84.19	0.000161	0.85	14.01	13.78	0.12
01	490.146	50 yr	13.86	79.15	85.38		85.41	0.000105	0.79	17.45	16.81	0.10
01	490.146	100 yr	16.28	79.15	85.52		85.56	0.000134	0.91	17.84	17.15	0.12
01	490.146	Regional	19.24	79.15	85.62		85.68	0.000178	1.06	18.12	17.40	0.13
01	477.872	2 yr	4.97	79.61	80.65	80.65	80.99	0.016957	2.70	2.45	4.80	0.84
01	477.872	5 yr	7.59	79.61	80.91	80.91	81.28	0.015111	2.96	3.93	6.51	0.83
01	477.872	10 yr	9.48	79.61	81.78		81.86	0.002079	1.54	11.79	11.25	0.33
01	477.872	25 yr	12.00	79.61	84.17		84.17	0.000089	0.52	53.17	24.58	0.08
01	477.872	50 yr	13.98	79.61	85.40		85.40	0.000035	0.38	88.78	33.31	0.05
01	477.872	100 yr	16.42	79.61	85.54		85.54	0.000042	0.43	93.59	34.32	0.06
01	477.872	Regional	19.32	79.61	85.65		85.65	0.000053	0.49	97.34	35.08	0.06
01	469.782	2 yr	5.00	79.45	80.46	80.46	80.78	0.017435	2.68	2.60	5.07	0.85
01	469.782	5 yr	7.64	79.45	80.71	80.71	81.06	0.015854	2.96	4.01	6.24	0.84
01	469.782	10 yr	9.53	79.45	81.78		81.84	0.001539	1.39	13.00	10.58	0.29
01	469.782	25 yr	12.06	79.45	84.17		84.17	0.000083	0.52	56.43	27.21	0.08
01	469.782	50 yr	14.06	79.45	85.40		85.40	0.000030	0.36	93.74	33.43	0.05
01	469.782	100 yr	16.52	79.45	85.54		85.54	0.000036	0.40	98.55	34.15	0.05
01	469.782	Regional	19.32	79.45	85.65		85.65	0.000045	0.45	102.27	34.69	0.06
01	457.686	2 yr	5.04	79.14	80.05	79.77	80.20	0.005806	1.69	3.16	4.39	0.56
01	457.686	5 yr	7.70	79.14	80.37	79.98	80.54	0.004758	1.86	4.72	5.40	0.54
01	457.686	10 yr	9.62	79.14	81.78	80.12	81.82	0.000466	0.97	12.33	9.87	0.19
01	457.686	25 yr	12.16	79.14	84.15	80.29	84.17	0.000078	0.61	25.14	17.39	0.09
01	457.686	50 yr	14.18	79.14	85.38	80.42	85.40	0.000057	0.60	36.10	53.23	0.08
01	457.686	100 yr	16.66	79.14	85.51	80.55	85.54	0.000084	0.74	42.43	56.30	0.09
01	457.686	Regional	19.45	79.14	85.61	80.68	85.65	0.000102	0.83	47.94	58.68	0.10
01	456.481		Culvert									
01	430.276	2 yr	5.14	77.87	78.72		78.91	0.008690	1.95	2.63	3.43	0.68
01	430.276	5 yr	7.85	77.87	80.07		80.14	0.000848	1.15	6.82	4.94	0.25
01	430.276	10 yr	9.80	77.87	81.60		81.64	0.000228	0.85	11.56	6.64	0.14
01	430.276	25 yr	12.39	77.87	83.81		83.83	0.000072	0.65	23.87	9.11	0.09
01	430.276	50 yr	14.45	77.87	84.91		84.93	0.000049	0.60	39.29	21.95	0.07
01	430.276	100 yr	16.97	77.87	84.91		84.93	0.000068	0.71	39.24	21.90	0.09
01	430.276	Regional	19.63	77.87	84.91		84.94	0.000091	0.82	39.16	21.83	0.10
01	409.546	2 yr	5.21	77.45	78.52	78.52	78.71	0.011023	2.22	4.50	13.21	0.68
01	409.546	5 yr	7.97	77.45	80.10	78.66	80.10	0.000129	0.44	45.65	40.45	0.09
01	409.546	10 yr	9.94	77.45	81.62	78.74	81.62	0.000015	0.20	122.86	62.13	0.03
01	409.546	25 yr	12.56	77.45	83.82	78.83	83.82	0.000002	0.11	293.55	94.58	0.01
01	409.546	50 yr	14.66	77.45	84.92	78.90	84.92	0.000001	0.09	401.88	102.81	0.01
01	409.546	100 yr	17.22	77.45	84.92	78.97	84.92	0.000002	0.10	401.95	102.81	0.01
01	409.546	Regional	19.76	77.45	84.92	79.03	84.92	0.000002	0.12	402.01	102.82	0.01
01	387.679	2 yr	5.28	76.14	77.94	76.69	77.96	0.000355	0.68	9.02	6.92	0.16
01	387.679	5 yr	8.09	76.14	80.09	76.87	80.10	0.000047	0.42	27.17	11.26	0.07
01	387.679	10 yr	10.09	76.14	81.61	76.99	81.62	0.000022	0.35	41.31	22.19	0.05
01	387.679	25 yr	12.74	76.14	83.82	77.13	83.82	0.000010	0.30	61.83	43.17	0.03
01	387.679	50 yr	14.88	76.14	84.91	77.24	84.92	0.000012	0.35	85.19	53.59	0.04
01	387.679	100 yr	17.47	76.14	84.91	77.37	84.92	0.000017	0.41	85.08	53.57	0.05
01	387.679	Regional	19.90	76.14	84.91	77.47	84.92	0.000022	0.47	84.96	53.54	0.05
01	384.819		Culvert									
01	211.961	2 yr	5.88	75.16	76.98		77.03	0.000871	1.03	5.72	6.80	0.24
01	211.961	5 yr	9.05	75.16	77.80		77.86	0.000597	1.09	8.29	8.34	0.21
01	211.961	10 yr	11.27	75.16	78.04		78.12	0.000692	1.25	9.05	8.80	0.23
01	211.961	25 yr	14.20	75.16	78.12		78.24	0.001002	1.53	9.30	8.95	0.28
01	211.961	50 yr	16.62	75.16	78.16		78.32	0.001318	1.77	9.42	9.02	0.33
01	211.961	100 yr	19.51	75.16	78.19		78.40	0.001756	2.05	9.51	9.07	0.38
01	211.961	Regional	21.02	75.16	78.17		78.42	0.002088	2.23	9.44	9.03	0.41
01	203.207	2 yr	5.91	75.45	76.94		77.02	0.003145	1.48	7.13	9.10	0.39
01	203.207	5 yr	9.10	75.45	77.81		77.84	0.000964	1.11	19.64	36.03	0.23
01	203.207	10 yr	11.33	75.45	78.06		78.09	0.000745	1.04	30.48	47.94	0.21
01	203.207	25 yr	14.27	75.45	78.16		78.19	0.000871	1.16	35.26	50.28	0.22
01	203.207	50 yr	16.70	75.45	78.21		78.24	0.001020	1.27	37.91	51.54	0.24
01	203.207	100 yr	19.62	75.45	78.26		78.30	0.001204	1.39	40.68	52.81	0.27
01	203.207	Regional	21.08	75.45	78.26		78.30	0.001426	1.51	40.23	52.61	0.29
01	195.311	2 yr	5.94	75.50	76.90	76.28	76.99	0.002265	1.37	5.36	6.27	0.37
01	195.311	5 yr	9.15	75.50	77.77	76.54	77.83	0.000857	1.16	10.65	51.38	0.25
01	195.311	10 yr	11.38	75.50	77.95	76.71	78.06	0.001254	1.48	16.93	91.64	0.30

HEC-RAS Plan: Plan 04 River: Dunbarton Creek Reach: 01 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
01	195.311	25 yr	14.34	75.50	78.00	76.89	78.14	0.001766	1.78	20.54	120.07	0.36
01	195.311	50 yr	16.78	75.50	77.96	77.02	78.18	0.002659	2.16	17.50	91.95	0.44
01	195.311	100 yr	19.71	75.50	78.08	77.16	78.25	0.002328	2.08	29.81	123.56	0.41
01	195.311	Regional	21.13	75.50	77.90	77.22	78.20	0.004059	2.62	12.86	89.38	0.54
01	193.471		Culvert									
01	166.629	2 yr	6.03	75.30	76.68	76.11	76.82	0.003526	1.66	3.62	97.24	0.45
01	166.629	5 yr	9.30	75.30	76.81	76.38	77.09	0.006226	2.35	3.96	98.97	0.61
01	166.629	10 yr	11.58	75.30	76.86	76.55	77.26	0.008669	2.83	4.09	99.64	0.72
01	166.629	25 yr	14.58	75.30	77.20	77.20	77.29	0.002482	1.73	35.31	173.52	0.40
01	166.629	50 yr	17.07	75.30	77.22	77.22	77.32	0.002710	1.82	39.94	174.01	0.42
01	166.629	100 yr	20.04	75.30	77.25	77.25	77.35	0.003010	1.94	44.49	174.50	0.44
01	166.629	Regional	21.31	75.30	77.26	77.26	77.36	0.003165	1.99	46.06	174.66	0.45
01	124.554	2 yr	6.18	75.45	76.50	76.42	76.58	0.007054	1.75	10.21	41.29	0.55
01	124.554	5 yr	9.53	75.45	76.61	76.55	76.69	0.007924	1.98	15.65	61.17	0.59
01	124.554	10 yr	11.86	75.45	76.67	76.62	76.75	0.008159	2.07	19.29	71.45	0.60
01	124.554	25 yr	14.93	75.45	76.73	76.66	76.80	0.008207	2.15	23.95	81.90	0.61
01	124.554	50 yr	17.48	75.45	76.77	76.72	76.84	0.008011	2.17	27.27	83.26	0.60
01	124.554	100 yr	20.53	75.45	76.81	76.76	76.88	0.007657	2.17	31.24	84.85	0.59
01	124.554	Regional	21.58	75.45	76.82	76.77	76.89	0.007913	2.21	32.01	85.16	0.60
01	85.959	2 yr	6.31	75.45	76.16	76.16	76.22	0.012099	1.77	12.75	86.46	0.67
01	85.959	5 yr	9.75	75.45	76.20	76.20	76.27	0.015390	2.07	16.19	89.40	0.76
01	85.959	10 yr	12.12	75.45	76.22	76.22	76.30	0.017419	2.24	18.15	91.02	0.81
01	85.959	25 yr	15.25	75.45	76.25	76.25	76.33	0.020326	2.47	20.26	92.75	0.88
01	85.959	50 yr	17.87	75.45	76.27	76.27	76.35	0.021666	2.60	22.20	94.94	0.92
01	85.959	100 yr	20.98	75.45	76.29	76.29	76.38	0.024488	2.80	23.84	96.82	0.98
01	85.959	Regional	21.83	75.45	76.29	76.29	76.39	0.023992	2.79	24.70	97.81	0.97

HEC-RAS Plan: Duffins_Final_Au River: Millers Creek Reach: Reach 1

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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	10728.35	REG	12.89	136.52	137.45	137.45	137.59	0.009417	2.57	15.62	44.10	0.87
Reach 1	10728.35	100Y	2.45	136.52	137.03	137.03	137.22	0.014822	2.10	1.64	14.29	0.98
Reach 1	10728.35	50Y	2.10	136.52	136.99	136.99	137.16	0.014255	1.96	1.48	13.72	0.95
Reach 1	10728.35	25Y	1.78	136.52	136.96	136.95	137.11	0.013592	1.82	1.32	13.08	0.91
Reach 1	10728.35	10Y	1.37	136.52	136.92	136.89	137.03	0.012166	1.59	1.13	11.76	0.85
Reach 1	10728.35	5Y	1.10	136.52	136.88	136.85	136.98	0.012098	1.47	0.96	9.70	0.83
Reach 1	10728.35	2Y	0.69	136.52	136.81	136.77	136.88	0.010883	1.19	0.70	7.04	0.76
Reach 1	10711.78	REG	12.89	136.28	137.12	137.22	137.39	0.019832	3.40	11.16	35.75	1.22
Reach 1	10711.78	100Y	2.45	136.28	136.81	136.81	136.98	0.014119	2.04	1.88	14.53	0.95
Reach 1	10711.78	50Y	2.10	136.28	136.77	136.77	136.93	0.014355	1.94	1.63	13.34	0.94
Reach 1	10711.78	25Y	1.78	136.28	136.73	136.73	136.88	0.014894	1.85	1.39	11.45	0.94
Reach 1	10711.78	10Y	1.37	136.28	136.67	136.67	136.80	0.016371	1.74	1.08	8.59	0.96
Reach 1	10711.78	5Y	1.10	136.28	136.63	136.63	136.75	0.016038	1.59	0.91	7.58	0.93
Reach 1	10711.78	2Y	0.69	136.28	136.56	136.56	136.65	0.017714	1.39	0.60	5.44	0.94
Reach 1	10691.07	REG	12.89	135.68	136.63	136.68	136.99	0.018318	3.39	8.86	23.83	1.19
Reach 1	10691.07	100Y	2.45	135.68	136.11	136.25	136.48	0.045148	2.77	1.08	6.13	1.58
Reach 1	10691.07	50Y	2.10	135.68	136.08	136.20	136.43	0.046762	2.65	0.92	5.27	1.58
Reach 1	10691.07	25Y	1.78	135.68	136.06	136.16	136.36	0.046697	2.49	0.80	4.52	1.56
Reach 1	10691.07	10Y	1.37	135.68	136.02	136.10	136.27	0.044090	2.21	0.67	3.69	1.48
Reach 1	10691.07	5Y	1.10	135.68	135.99	136.06	136.21	0.046891	2.07	0.56	3.44	1.49
Reach 1	10691.07	2Y	0.69	135.68	136.08	135.99	136.12	0.005335	0.88	0.90	5.14	0.53
Reach 1	10670.02	REG	12.89	135.21	136.35	136.06	136.48	0.004138	1.95	12.34	19.78	0.59
Reach 1	10670.02	100Y	2.45	135.21	136.19	135.55	136.19	0.000270	0.45	9.58	14.68	0.15
Reach 1	10670.02	50Y	2.10	135.21	136.18	135.52	136.18	0.000208	0.39	9.41	14.59	0.13
Reach 1	10670.02	25Y	1.78	135.21	136.17	135.50	136.17	0.000156	0.34	9.25	14.51	0.11
Reach 1	10670.02	10Y	1.37	135.21	136.15	135.45	136.15	0.000100	0.27	8.99	14.37	0.09
Reach 1	10670.02	5Y	1.10	135.21	136.13	135.43	136.14	0.000068	0.22	8.79	14.27	0.07
Reach 1	10670.02	2Y	0.69	135.21	136.10	135.38	136.10	0.000031	0.14	8.35	14.08	0.05
Reach 1	10655.31	REG	12.89	134.29	136.43	135.31	136.43	0.000137	0.54	76.70	96.23	0.12
Reach 1	10655.31	100Y	2.45	134.29	136.19	134.69	136.19	0.000010	0.13	55.42	78.67	0.03
Reach 1	10655.31	50Y	2.10	134.29	136.18	134.66	136.18	0.000007	0.11	54.46	77.02	0.03
Reach 1	10655.31	25Y	1.78	134.29	136.17	134.63	136.17	0.000006	0.10	53.55	74.44	0.02
Reach 1	10655.31	10Y	1.37	134.29	136.15	134.59	136.15	0.000004	0.08	52.17	73.88	0.02
Reach 1	10655.31	5Y	1.10	134.29	136.13	134.56	136.13	0.000002	0.06	51.10	73.55	0.02
Reach 1	10655.31	2Y	0.69	134.29	136.10	134.51	136.10	0.000001	0.04	48.79	72.86	0.01
Reach 1	10644.93	REG	12.89	133.82	136.31	135.19	136.42	0.001008	1.56	13.04	9.49	0.32
Reach 1	10644.93	100Y	2.45	133.82	136.19	134.38	136.19	0.000045	0.32	11.89	8.73	0.07
Reach 1	10644.93	50Y	2.10	133.82	136.18	134.34	136.18	0.000033	0.27	11.79	8.66	0.06
Reach 1	10644.93	25Y	1.78	133.82	136.17	134.31	136.17	0.000024	0.23	11.69	8.59	0.05
Reach 1	10644.93	10Y	1.37	133.82	136.15	134.25	136.15	0.000015	0.18	11.54	8.49	0.04
Reach 1	10644.93	5Y	1.10	133.82	136.13	134.20	136.13	0.000010	0.15	11.43	8.45	0.03
Reach 1	10644.93	2Y	0.69	133.82	136.10	134.13	136.10	0.000004	0.09	11.17	8.34	0.02
Reach 1	10627.77	REG	12.89	133.35	136.36	134.53	136.39	0.000238	0.86	30.19	26.65	0.16
Reach 1	10627.77	100Y	2.45	133.35	136.19	133.83	136.19	0.000011	0.18	26.04	23.17	0.04
Reach 1	10627.77	50Y	2.10	133.35	136.18	133.80	136.18	0.000009	0.15	25.77	22.99	0.03
Reach 1	10627.77	25Y	1.78	133.35	136.17	133.76	136.17	0.000006	0.13	25.50	22.80	0.03
Reach 1	10627.77	10Y	1.37	133.35	136.15	133.71	136.15	0.000004	0.10	25.10	22.50	0.02
Reach 1	10627.77	5Y	1.10	133.35	136.13	133.67	136.13	0.000003	0.08	24.78	22.25	0.02
Reach 1	10627.77	2Y	0.69	133.35	136.10	133.60	136.10	0.000001	0.05	24.09	21.84	0.01
Reach 1	10592.57	REG	12.89	132.99	136.37	133.96	136.38	0.000052	0.45	65.30	45.52	0.08
Reach 1	10592.57	100Y	2.45	132.99	136.19	133.37	136.19	0.000002	0.09	57.67	38.60	0.02
Reach 1	10592.57	50Y	2.10	132.99	136.18	133.35	136.18	0.000002	0.08	57.21	38.21	0.01
Reach 1	10592.57	25Y	1.78	132.99	136.17	133.31	136.17	0.000001	0.07	56.77	37.83	0.01
Reach 1	10592.57	10Y	1.37	132.99	136.15	133.27	136.15	0.000001	0.05	56.09	37.23	0.01
Reach 1	10592.57	5Y	1.10	132.99	136.13	133.24	136.13	0.000001	0.04	55.56	36.75	0.01
Reach 1	10592.57	2Y	0.69	132.99	136.10	133.19	136.10	0.000000	0.03	54.43	35.90	0.01
Reach 1	10588.14	REG	12.89	132.76	136.37	134.03	136.38	0.000093	0.60	54.51	62.67	0.10
Reach 1	10588.14	100Y	2.45	132.76	136.19	133.32	136.19	0.000004	0.13	45.43	39.14	0.02
Reach 1	10588.14	50Y	2.10	132.76	136.18	133.28	136.18	0.000003	0.11	44.97	38.28	0.02
Reach 1	10588.14	25Y	1.78	132.76	136.17	133.25	136.17	0.000002	0.09	44.54	37.24	0.02
Reach 1	10588.14	10Y	1.37	132.76	136.15	133.20	136.15	0.000001	0.07	43.88	36.08	0.01
Reach 1	10588.14	5Y	1.10	132.76	136.13	133.15	136.13	0.000001	0.06	43.37	35.60	0.01
Reach 1	10588.14	2Y	0.69	132.76	136.10	133.08	136.10	0.000000	0.04	42.28	33.88	0.01
Reach 1	10578.68	REG	12.89	136.07	136.28	136.28	136.37	0.036654	1.31	10.47	66.03	0.94
Reach 1	10578.68	100Y	2.45	136.07	136.15	136.15	136.19	0.038465	0.64	2.95	40.02	0.79
Reach 1	10578.68	50Y	2.10	136.07	136.14	136.14	136.17	0.035989	0.57	2.67	37.33	0.75
Reach 1	10578.68	25Y	1.78	136.07	136.13	136.13	136.16	0.039372	0.51	2.23	32.56	0.76
Reach 1	10578.68	10Y	1.37	136.07	136.11	136.11	136.15	0.038858	0.39	1.81	27.92	0.71

HEC-RAS Plan: Duffins_Final_Au River: Millers Creek Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	10578.68	5Y	1.10	136.07	136.10	136.10	136.13	0.045781	0.27	1.42	23.60	0.69
Reach 1	10578.68	2Y	0.69	136.07	136.06	136.06	136.10	0.054089		0.84	12.62	0.00
Reach 1	10567.23	REG	12.89	132.11	132.66	133.22	135.35	0.214130	7.31	1.84	4.72	3.59
Reach 1	10567.23	100Y	2.45	132.11	132.28	132.56	134.84	1.140470	7.09	0.35	3.05	6.73
Reach 1	10567.23	50Y	2.10	132.11	132.26	132.52	134.86	1.344626	7.14	0.29	2.91	7.17
Reach 1	10567.23	25Y	1.78	132.11	132.25	132.49	134.77	1.497985	7.03	0.25	2.78	7.44
Reach 1	10567.23	10Y	1.37	132.11	132.23	132.44	134.73	1.918939	7.01	0.20	2.60	8.17
Reach 1	10567.23	5Y	1.10	132.11	132.21	132.40	134.55	2.151478	6.76	0.16	2.50	8.46
Reach 1	10567.23	2Y	0.69	132.11	132.19	132.34	134.28	2.826712	6.40	0.11	2.21	9.25
Reach 1	10557.98	REG	12.89	131.80	132.55	132.97	133.96	0.066069	5.30	2.64	5.00	2.13
Reach 1	10557.98	100Y	2.45	131.80	132.14	132.27	132.56	0.068563	2.86	0.86	3.65	1.85
Reach 1	10557.98	50Y	2.10	131.80	132.12	132.24	132.50	0.069172	2.71	0.78	3.56	1.84
Reach 1	10557.98	25Y	1.78	131.80	132.10	132.20	132.43	0.066687	2.53	0.71	3.49	1.78
Reach 1	10557.98	10Y	1.37	131.80	132.07	132.15	132.34	0.065378	2.28	0.60	3.37	1.72
Reach 1	10557.98	5Y	1.10	131.80	132.05	132.11	132.27	0.060666	2.06	0.53	3.30	1.64
Reach 1	10557.98	2Y	0.69	131.80	132.01	132.05	132.16	0.053984	1.68	0.41	3.16	1.49
Reach 1	10498.06	REG	12.89	130.03	131.58	131.58	132.29	0.014731	4.07	5.03	6.62	1.11
Reach 1	10498.06	100Y	2.45	130.03	130.76	130.76	131.01	0.015286	2.25	1.23	2.93	0.97
Reach 1	10498.06	50Y	2.10	130.03	130.71	130.71	130.94	0.015711	2.14	1.09	2.79	0.97
Reach 1	10498.06	25Y	1.78	130.03	130.66	130.66	130.87	0.015973	2.02	0.96	2.66	0.96
Reach 1	10498.06	10Y	1.37	130.03	130.60	130.59	130.77	0.015118	1.79	0.81	2.50	0.92
Reach 1	10498.06	5Y	1.10	130.03	130.56	130.54	130.70	0.014301	1.62	0.71	2.39	0.87
Reach 1	10498.06	2Y	0.69	130.03	130.49	130.45	130.57	0.012917	1.30	0.54	2.18	0.80
Reach 1	10437.17	REG	12.89	129.11	130.29	130.56	131.13	0.025034	4.36	4.68	10.76	1.39
Reach 1	10437.17	100Y	2.45	129.11	129.71	129.74	129.95	0.019785	2.20	1.20	3.51	1.07
Reach 1	10437.17	50Y	2.10	129.11	129.68	129.69	129.89	0.018798	2.04	1.09	3.32	1.03
Reach 1	10437.17	25Y	1.78	129.11	129.65	129.65	129.83	0.018027	1.88	0.99	3.12	0.99
Reach 1	10437.17	10Y	1.37	129.11	129.59	129.59	129.74	0.018876	1.75	0.81	2.82	0.99
Reach 1	10437.17	5Y	1.10	129.11	129.54	129.54	129.68	0.019833	1.66	0.68	2.60	1.00
Reach 1	10437.17	2Y	0.69	129.11	129.45	129.45	129.56	0.021981	1.47	0.47	2.22	1.01
Reach 1	10394.93	REG	12.89	128.47	129.90	129.52	130.05	0.002881	1.86	10.24	11.87	0.51
Reach 1	10394.93	100Y	2.45	128.47	129.04	128.86	129.10	0.004089	1.13	2.31	5.45	0.51
Reach 1	10394.93	50Y	2.10	128.47	128.99	128.83	129.05	0.004095	1.06	2.08	5.28	0.50
Reach 1	10394.93	25Y	1.78	128.47	128.95	128.80	129.00	0.004147	1.00	1.85	5.12	0.50
Reach 1	10394.93	10Y	1.37	128.47	128.89	128.76	128.93	0.004187	0.90	1.55	4.89	0.49
Reach 1	10394.93	5Y	1.10	128.47	128.85	128.73	128.88	0.004266	0.83	1.34	4.72	0.48
Reach 1	10394.93	2Y	0.69	128.47	128.77	128.67	128.79	0.004475	0.70	0.98	4.40	0.47
Reach 1	10348.07	REG	12.89	127.98	129.32	129.32	129.79	0.011108	3.22	5.54	7.12	0.95
Reach 1	10348.07	100Y	2.45	127.98	128.56	128.56	128.75	0.016426	1.96	1.33	4.06	0.97
Reach 1	10348.07	50Y	2.10	127.98	128.51	128.51	128.69	0.017492	1.88	1.17	3.81	0.98
Reach 1	10348.07	25Y	1.78	127.98	128.47	128.47	128.64	0.018092	1.79	1.02	3.51	0.98
Reach 1	10348.07	10Y	1.37	127.98	128.41	128.41	128.56	0.019808	1.69	0.82	3.04	1.00
Reach 1	10348.07	5Y	1.10	127.98	128.37	128.37	128.50	0.020724	1.59	0.69	2.72	1.01
Reach 1	10348.07	2Y	0.69	127.98	128.28	128.28	128.39	0.022087	1.43	0.48	2.33	1.01
Reach 1	10317.19	REG	12.89	126.70	127.96	128.39	129.16	0.034340	5.24	3.71	5.90	1.62
Reach 1	10317.19	100Y	2.45	126.70	127.26	127.44	127.84	0.059489	3.38	0.77	2.66	1.79
Reach 1	10317.19	50Y	2.10	126.70	127.23	127.39	127.75	0.060115	3.20	0.69	2.52	1.77
Reach 1	10317.19	25Y	1.78	126.70	127.20	127.34	127.66	0.061673	3.02	0.61	2.38	1.76
Reach 1	10317.19	10Y	1.37	126.70	127.15	127.27	127.53	0.062324	2.73	0.51	2.19	1.73
Reach 1	10317.19	5Y	1.10	126.70	127.12	127.22	127.44	0.062552	2.51	0.44	2.05	1.69
Reach 1	10317.19	2Y	0.69	126.70	127.23	127.13	127.29	0.006190	1.04	0.70	2.54	0.57
Reach 1	10250.75	REG	12.89	126.27	127.19	127.21	127.50	0.014476	3.09	7.93	13.67	1.07
Reach 1	10250.75	100Y	2.45	126.27	126.74	126.74	126.88	0.012008	1.73	2.23	11.54	0.86
Reach 1	10250.75	50Y	2.10	126.27	126.71	126.71	126.84	0.012066	1.65	1.89	10.57	0.85
Reach 1	10250.75	25Y	1.78	126.27	126.68	126.68	126.80	0.012918	1.60	1.53	9.37	0.87
Reach 1	10250.75	10Y	1.37	126.27	126.62	126.62	126.73	0.015320	1.54	1.07	6.52	0.91
Reach 1	10250.75	5Y	1.10	126.27	126.57	126.57	126.68	0.018050	1.49	0.81	4.89	0.96
Reach 1	10250.75	2Y	0.69	126.27	126.51	126.51	126.59	0.021340	1.31	0.55	3.50	0.99
Reach 1	10203.91	REG	12.89	124.77	125.88	126.10	126.60	0.024521	4.01	4.77	9.52	1.33
Reach 1	10203.91	100Y	2.45	124.77	125.20	125.36	125.71	0.070337	3.18	0.77	2.63	1.87
Reach 1	10203.91	50Y	2.10	124.77	125.16	125.31	125.65	0.074128	3.11	0.68	2.48	1.90
Reach 1	10203.91	25Y	1.78	124.77	125.13	125.27	125.57	0.072186	2.94	0.61	2.37	1.86
Reach 1	10203.91	10Y	1.37	124.77	125.10	125.20	125.44	0.061182	2.58	0.53	2.25	1.69
Reach 1	10203.91	5Y	1.10	124.77	125.08	125.16	125.34	0.050733	2.27	0.49	2.17	1.53
Reach 1	10203.91	2Y	0.69	124.77	125.02	125.07	125.20	0.043537	1.88	0.37	1.95	1.38
Reach 1	10130.88	REG	28.80	123.21	124.94	124.82	125.12	0.004597	2.71	29.78	41.94	0.67
Reach 1	10130.88	100Y	5.46	123.21	124.21	123.97	124.33	0.003625	1.64	5.69	15.44	0.54

HEC-RAS Plan: Duffins_Final_Au River: Millers Creek Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	10130.88	50Y	4.70	123.21	124.20	123.90	124.29	0.002895	1.45	5.43	14.00	0.48
Reach 1	10130.88	25Y	3.98	123.21	124.13	123.83	124.21	0.002734	1.34	4.64	11.33	0.46
Reach 1	10130.88	10Y	3.07	123.21	124.06	123.74	124.12	0.002221	1.15	3.94	9.58	0.41
Reach 1	10130.88	5Y	2.46	123.21	123.99	123.68	124.04	0.002068	1.04	3.28	8.36	0.39
Reach 1	10130.88	2Y	1.53	123.21	123.85	123.57	123.88	0.001818	0.84	2.25	5.79	0.35
Reach 1	10080.9	REG	28.80	123.21	124.46	124.46	124.77	0.011578	3.47	19.55	28.27	1.01
Reach 1	10080.9	100Y	5.46	123.21	123.93	123.93	124.08	0.007549	1.91	5.73	23.42	0.74
Reach 1	10080.9	50Y	4.70	123.21	123.84	123.84	124.03	0.010478	2.06	3.85	18.25	0.85
Reach 1	10080.9	25Y	3.98	123.21	123.82	123.82	123.98	0.009217	1.88	3.41	15.26	0.79
Reach 1	10080.9	10Y	3.07	123.21	123.70	123.70	123.89	0.013502	1.95	1.92	9.75	0.93
Reach 1	10080.9	5Y	2.46	123.21	123.63	123.63	123.80	0.015840	1.89	1.50	4.97	0.97
Reach 1	10080.9	2Y	1.53	123.21	123.53	123.53	123.66	0.017724	1.63	1.03	4.38	0.98
Reach 1	9973.73	REG	28.80	121.27	122.84	122.24	122.90	0.001122	1.24	30.84	30.49	0.32
Reach 1	9973.73	100Y	5.46	121.27	122.19	121.83	122.20	0.000515	0.57	12.65	24.44	0.20
Reach 1	9973.73	50Y	4.70	121.27	122.13	121.80	122.14	0.000521	0.55	11.35	23.70	0.20
Reach 1	9973.73	25Y	3.98	121.27	122.07	121.78	122.08	0.000543	0.53	9.98	23.27	0.20
Reach 1	9973.73	10Y	3.07	121.27	121.99	121.65	122.00	0.000582	0.51	8.11	22.68	0.20
Reach 1	9973.73	5Y	2.46	121.27	121.92	121.60	121.93	0.000678	0.51	6.52	22.16	0.22
Reach 1	9973.73	2Y	1.53	121.27	121.80	121.52	121.81	0.000903	0.50	3.90	21.05	0.24
Reach 1	9906.27	REG	28.80	121.11	122.47	122.47	122.72	0.009587	3.26	24.27	42.40	0.92
Reach 1	9906.27	100Y	5.46	121.11	121.95	121.76	122.10	0.006869	1.94	5.36	24.39	0.71
Reach 1	9906.27	50Y	4.70	121.11	121.90	121.76	122.05	0.006804	1.85	4.33	19.29	0.70
Reach 1	9906.27	25Y	3.98	121.11	121.86	121.74	121.99	0.006328	1.71	3.70	12.46	0.67
Reach 1	9906.27	10Y	3.07	121.11	121.81	121.65	121.91	0.005316	1.48	3.11	9.67	0.61
Reach 1	9906.27	5Y	2.46	121.11	121.76	121.60	121.83	0.004499	1.29	2.68	7.21	0.55
Reach 1	9906.27	2Y	1.53	121.11	121.65	121.50	121.70	0.003732	1.02	1.97	6.18	0.48
Reach 1	9841.27	REG	28.80	120.90	121.95	121.87	122.15	0.009089	2.76	22.60	33.42	0.87
Reach 1	9841.27	100Y	5.46	120.90	121.39	121.39	121.53	0.012076	1.88	5.05	23.29	0.88
Reach 1	9841.27	50Y	4.70	120.90	121.37	121.37	121.49	0.011435	1.76	4.52	20.33	0.85
Reach 1	9841.27	25Y	3.98	120.90	121.33	121.33	121.45	0.011790	1.69	3.81	19.29	0.85
Reach 1	9841.27	10Y	3.07	120.90	121.27	121.27	121.39	0.013509	1.63	2.74	16.53	0.89
Reach 1	9841.27	5Y	2.46	120.90	121.22	121.22	121.34	0.015714	1.58	2.01	12.47	0.93
Reach 1	9841.27	2Y	1.53	120.90	121.14	121.14	121.24	0.019364	1.41	1.24	7.12	0.98
Reach 1	9793.49	REG	28.80	119.71	121.41	121.41	121.81	0.008019	3.40	17.86	23.41	0.87
Reach 1	9793.49	100Y	5.46	119.71	120.65	120.45	120.78	0.004625	1.66	4.47	7.65	0.59
Reach 1	9793.49	50Y	4.70	119.71	120.59	120.40	120.70	0.004604	1.57	4.00	7.41	0.58
Reach 1	9793.49	25Y	3.98	119.71	120.52	120.34	120.62	0.004660	1.48	3.51	7.16	0.58
Reach 1	9793.49	10Y	3.07	119.71	120.43	120.27	120.51	0.004870	1.37	2.84	6.78	0.57
Reach 1	9793.49	5Y	2.46	119.71	120.35	120.22	120.43	0.005114	1.28	2.35	6.36	0.57
Reach 1	9793.49	2Y	1.53	119.71	120.22	120.11	120.28	0.006058	1.13	1.54	5.60	0.59
Reach 1	9760.05	REG	28.80	119.36	120.92	121.06	121.40	0.014659	4.33	19.64	37.18	1.15
Reach 1	9760.05	100Y	5.46	119.36	120.36	120.28	120.55	0.007035	2.16	4.58	12.66	0.73
Reach 1	9760.05	50Y	4.70	119.36	120.30	120.21	120.48	0.006805	2.04	3.96	10.24	0.71
Reach 1	9760.05	25Y	3.98	119.36	120.25	120.15	120.40	0.006427	1.90	3.46	9.09	0.69
Reach 1	9760.05	10Y	3.07	119.36	120.17	120.05	120.30	0.005820	1.68	2.81	7.94	0.64
Reach 1	9760.05	5Y	2.46	119.36	120.10	119.97	120.21	0.005608	1.54	2.30	6.94	0.62
Reach 1	9760.05	2Y	1.53	119.36	119.98	119.84	120.06	0.004876	1.25	1.55	5.34	0.56
Reach 1	9702.64	REG	28.80	119.11	120.61	120.53	120.83	0.006575	2.97	25.38	35.20	0.79
Reach 1	9702.64	100Y	5.46	119.11	119.81	119.78	120.04	0.011690	2.31	3.53	8.39	0.92
Reach 1	9702.64	50Y	4.70	119.11	119.75	119.73	119.96	0.012356	2.23	3.05	7.48	0.93
Reach 1	9702.64	25Y	3.98	119.11	119.69	119.68	119.89	0.013372	2.15	2.60	6.96	0.95
Reach 1	9702.64	10Y	3.07	119.11	119.60	119.60	119.79	0.015053	2.03	2.04	6.24	0.98
Reach 1	9702.64	5Y	2.46	119.11	119.55	119.55	119.71	0.015325	1.88	1.72	5.97	0.96
Reach 1	9702.64	2Y	1.53	119.11	119.45	119.45	119.58	0.017278	1.64	1.15	5.34	0.97
Reach 1	9608.13	REG	28.80	118.26	119.99	119.99	120.29	0.006263	3.20	23.48	36.62	0.79
Reach 1	9608.13	100Y	5.46	118.26	119.12	118.96	119.29	0.005850	1.92	4.01	7.14	0.67
Reach 1	9608.13	50Y	4.70	118.26	119.07	118.90	119.21	0.005628	1.79	3.61	6.71	0.65
Reach 1	9608.13	25Y	3.98	118.26	119.01	118.84	119.13	0.005346	1.66	3.23	6.28	0.63
Reach 1	9608.13	10Y	3.07	118.26	118.93	118.76	119.03	0.004966	1.47	2.72	5.92	0.59
Reach 1	9608.13	5Y	2.46	118.26	118.86	118.70	118.95	0.004673	1.33	2.36	5.64	0.57
Reach 1	9608.13	2Y	1.53	118.26	118.75	118.60	118.80	0.004031	1.06	1.74	5.11	0.51
Reach 1	9565.38	REG	28.80	118.14	119.80	119.58	119.92	0.002947	2.08	33.65	43.62	0.53
Reach 1	9565.38	100Y	5.46	118.14	118.94	118.74	119.05	0.004598	1.54	4.26	7.67	0.58
Reach 1	9565.38	50Y	4.70	118.14	118.87	118.69	118.98	0.004855	1.48	3.74	7.45	0.58
Reach 1	9565.38	25Y	3.98	118.14	118.80	118.63	118.90	0.005141	1.41	3.24	7.23	0.59
Reach 1	9565.38	10Y	3.07	118.14	118.71	118.57	118.80	0.005534	1.31	2.60	6.70	0.60
Reach 1	9565.38	5Y	2.46	118.14	118.64	118.52	118.72	0.005894	1.23	2.17	6.08	0.60
Reach 1	9565.38	2Y	1.53	118.14	118.53	118.43	118.58	0.006566	1.06	1.51	5.29	0.60

HEC-RAS Plan: Duffins_Final_Au River: Millers Creek Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	9521.4	REG	28.80	117.71	119.46	119.46	119.74	0.006116	2.97	24.36	40.29	0.75
Reach 1	9521.4	100Y	5.46	117.71	118.60	118.47	118.79	0.007515	1.96	3.05	5.23	0.73
Reach 1	9521.4	50Y	4.70	117.71	118.54	118.42	118.71	0.007320	1.84	2.77	4.98	0.71
Reach 1	9521.4	25Y	3.98	117.71	118.49	118.36	118.63	0.007188	1.71	2.48	4.79	0.70
Reach 1	9521.4	10Y	3.07	117.71	118.40	118.28	118.52	0.007057	1.54	2.09	4.53	0.67
Reach 1	9521.4	5Y	2.46	117.71	118.34	118.22	118.44	0.006978	1.40	1.80	4.33	0.66
Reach 1	9521.4	2Y	1.53	117.71	118.23	118.12	118.29	0.006747	1.15	1.34	3.98	0.62
Reach 1	9487.54	REG	28.80	117.56	119.13	119.04	119.34	0.005192	2.63	26.04	37.78	0.69
Reach 1	9487.54	100Y	5.46	117.56	118.48	118.23	118.58	0.003554	1.47	5.01	14.61	0.52
Reach 1	9487.54	50Y	4.70	117.56	118.41	118.17	118.51	0.003699	1.41	4.16	9.82	0.52
Reach 1	9487.54	25Y	3.98	117.56	118.34	118.12	118.43	0.003800	1.34	3.53	8.10	0.52
Reach 1	9487.54	10Y	3.07	117.56	118.25	118.05	118.32	0.003912	1.22	2.84	6.55	0.52
Reach 1	9487.54	5Y	2.46	117.56	118.17	118.00	118.24	0.004108	1.14	2.37	6.04	0.52
Reach 1	9487.54	2Y	1.53	117.56	118.04	117.91	118.09	0.004630	0.98	1.62	5.16	0.52
Reach 1	9447.28	REG	28.80	117.33	118.83	118.83	119.11	0.008320	3.27	23.20	35.73	0.88
Reach 1	9447.28	100Y	5.46	117.33	118.13	118.08	118.37	0.009526	2.25	3.19	6.66	0.84
Reach 1	9447.28	50Y	4.70	117.33	118.07	118.01	118.28	0.009890	2.15	2.79	5.78	0.84
Reach 1	9447.28	25Y	3.98	117.33	118.00	117.95	118.20	0.010204	2.04	2.43	5.48	0.84
Reach 1	9447.28	10Y	3.07	117.33	117.92	117.87	118.09	0.010317	1.86	1.99	5.09	0.82
Reach 1	9447.28	5Y	2.46	117.33	117.87	117.81	118.00	0.009687	1.68	1.72	4.84	0.78
Reach 1	9447.28	2Y	1.53	117.33	117.78	117.70	117.87	0.007468	1.29	1.34	4.47	0.67
Reach 1	9389.66	REG	28.80	116.77	118.38	118.28	118.55	0.004846	2.50	29.64	45.79	0.66
Reach 1	9389.66	100Y	5.46	116.77	117.55	117.52	117.78	0.011157	2.15	2.99	8.18	0.87
Reach 1	9389.66	50Y	4.70	116.77	117.52	117.46	117.71	0.009947	1.96	2.75	7.45	0.82
Reach 1	9389.66	25Y	3.98	116.77	117.48	117.40	117.64	0.009069	1.79	2.47	6.72	0.77
Reach 1	9389.66	10Y	3.07	116.77	117.41	117.32	117.54	0.008586	1.59	2.07	5.10	0.74
Reach 1	9389.66	5Y	2.46	116.77	117.34	117.27	117.45	0.009087	1.48	1.74	4.84	0.74
Reach 1	9389.66	2Y	1.53	116.77	117.21	117.18	117.31	0.013119	1.38	1.13	4.33	0.83
Reach 1	9322.79	REG	28.80	116.41	118.31	117.77	118.37	0.001420	1.57	44.15	40.20	0.37
Reach 1	9322.79	100Y	5.46	116.41	117.44	117.09	117.49	0.001733	1.12	10.80	36.36	0.37
Reach 1	9322.79	50Y	4.70	116.41	117.39	117.04	117.44	0.001722	1.07	9.03	35.79	0.37
Reach 1	9322.79	25Y	3.98	116.41	117.34	116.98	117.38	0.001703	1.03	7.22	32.77	0.36
Reach 1	9322.79	10Y	3.07	116.41	117.25	116.91	117.30	0.001673	0.95	4.86	22.63	0.35
Reach 1	9322.79	5Y	2.46	116.41	117.18	116.85	117.22	0.001637	0.87	3.53	11.98	0.34
Reach 1	9322.79	2Y	1.53	116.41	117.05	116.76	117.07	0.001419	0.70	2.49	6.22	0.31
Reach 1	9276.31	REG	28.80	116.29	118.21	117.74	118.29	0.002015	1.82	40.25	45.41	0.44
Reach 1	9276.31	100Y	5.46	116.29	117.32	117.07	117.39	0.002778	1.31	8.17	26.77	0.46
Reach 1	9276.31	50Y	4.70	116.29	117.26	117.01	117.33	0.002874	1.28	6.80	25.98	0.46
Reach 1	9276.31	25Y	3.98	116.29	117.21	116.96	117.28	0.002959	1.24	5.41	24.74	0.46
Reach 1	9276.31	10Y	3.07	116.29	117.13	116.88	117.19	0.002888	1.13	3.73	16.78	0.45
Reach 1	9276.31	5Y	2.46	116.29	117.07	116.82	117.12	0.002590	1.01	2.94	9.46	0.42
Reach 1	9276.31	2Y	1.53	116.29	116.96	116.73	116.99	0.002170	0.80	2.13	6.11	0.37
Reach 1	9199.75	REG	28.80	115.73	117.61	117.61	118.01	0.006996	3.24	18.34	28.75	0.81
Reach 1	9199.75	100Y	5.46	115.73	117.23	116.55	117.27	0.000824	0.94	9.55	19.55	0.27
Reach 1	9199.75	50Y	4.70	115.73	117.20	116.49	117.23	0.000699	0.85	8.82	18.86	0.24
Reach 1	9199.75	25Y	3.98	115.73	117.16	116.43	117.18	0.000580	0.75	8.08	18.12	0.22
Reach 1	9199.75	10Y	3.07	115.73	117.09	116.36	117.11	0.000431	0.63	7.01	16.07	0.19
Reach 1	9199.75	5Y	2.46	115.73	117.04	116.30	117.06	0.000332	0.53	6.24	14.17	0.16
Reach 1	9199.75	2Y	1.53	115.73	116.94	116.19	116.95	0.000185	0.37	5.03	7.98	0.12
Reach 1	9158.53	REG	28.80	115.78	117.78	116.64	117.81	0.000354	0.77	48.06	33.18	0.19
Reach 1	9158.53	100Y	5.46	115.78	117.26	116.26	117.26	0.000045	0.21	31.35	30.09	0.06
Reach 1	9158.53	50Y	4.70	115.78	117.21	116.24	117.22	0.000038	0.19	30.10	29.80	0.06
Reach 1	9158.53	25Y	3.98	115.78	117.17	116.20	117.17	0.000031	0.17	28.81	29.50	0.05
Reach 1	9158.53	10Y	3.07	115.78	117.10	116.17	117.11	0.000023	0.14	26.88	29.05	0.04
Reach 1	9158.53	5Y	2.46	115.78	117.05	116.09	117.05	0.000017	0.12	25.33	28.76	0.04
Reach 1	9158.53	2Y	1.53	115.78	116.94	116.01	116.94	0.000010	0.08	22.31	28.20	0.03
Reach 1	9113.47	REG	28.80	116.43	117.55	117.55	117.75	0.011578	3.06	26.20	54.50	0.98
Reach 1	9113.47	100Y	5.46	116.43	117.09	117.09	117.24	0.010916	1.98	5.66	26.50	0.86
Reach 1	9113.47	50Y	4.70	116.43	117.07	117.07	117.20	0.009952	1.84	5.12	21.51	0.81
Reach 1	9113.47	25Y	3.98	116.43	117.02	117.02	117.15	0.011436	1.84	4.06	19.11	0.86
Reach 1	9113.47	10Y	3.07	116.43	116.97	116.97	117.09	0.010984	1.68	3.20	17.11	0.82
Reach 1	9113.47	5Y	2.46	116.43	116.92	116.92	117.04	0.012413	1.64	2.37	14.00	0.86
Reach 1	9113.47	2Y	1.53	116.43	116.83	116.83	116.93	0.014021	1.46	1.34	9.93	0.87
Reach 1	9066.65	REG	28.80	114.81	116.26	116.53	117.06	0.017109	4.50	13.12	26.75	1.24
Reach 1	9066.65	100Y	5.46	114.81	115.28	115.51	116.09	0.082309	4.06	1.50	5.20	2.18
Reach 1	9066.65	50Y	4.70	114.81	115.23	115.46	116.06	0.101665	4.09	1.25	5.01	2.36
Reach 1	9066.65	25Y	3.98	114.81	115.20	115.40	115.92	0.097389	3.79	1.13	4.89	2.28

HEC-RAS Plan: Duffins_Final_Au River: Millers Creek Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	9066.65	10Y	3.07	114.81	115.15	115.33	115.83	0.122121	3.67	0.87	4.43	2.46
Reach 1	9066.65	5Y	2.46	114.81	115.12	115.28	115.68	0.115383	3.33	0.76	4.19	2.35
Reach 1	9066.65	2Y	1.53	114.81	115.33	115.18	115.38	0.003809	0.97	1.81	5.39	0.48
Reach 1	9024.27	REG	28.80	114.76	116.27	115.69	116.34	0.001503	1.26	26.14	26.70	0.36
Reach 1	9024.27	100Y	5.46	114.76	115.55	115.26	115.57	0.001087	0.59	9.57	20.52	0.27
Reach 1	9024.27	50Y	4.70	114.76	115.51	115.24	115.52	0.001106	0.56	8.65	20.21	0.27
Reach 1	9024.27	25Y	3.98	114.76	115.46	115.18	115.48	0.001120	0.53	7.75	19.95	0.26
Reach 1	9024.27	10Y	3.07	114.76	115.40	115.15	115.41	0.001164	0.48	6.50	19.57	0.26
Reach 1	9024.27	5Y	2.46	114.76	115.36	115.08	115.37	0.001162	0.44	5.66	19.27	0.25
Reach 1	9024.27	2Y	1.53	114.76	115.28	115.01	115.28	0.001232	0.37	4.14	18.71	0.25
Reach 1	8979.59	REG	28.80	114.81	115.93	115.93	116.18	0.011770	3.18	22.72	41.81	0.99
Reach 1	8979.59	100Y	5.46	114.81	115.26	115.26	115.43	0.022892	2.23	4.13	13.60	1.17
Reach 1	8979.59	50Y	4.70	114.81	115.23	115.23	115.38	0.023700	2.13	3.68	13.13	1.17
Reach 1	8979.59	25Y	3.98	114.81	115.19	115.19	115.33	0.024823	2.03	3.23	12.65	1.18
Reach 1	8979.59	10Y	3.07	114.81	115.14	115.14	115.26	0.026710	1.88	2.63	11.99	1.18
Reach 1	8979.59	5Y	2.46	114.81	115.11	115.11	115.21	0.028265	1.75	2.22	11.52	1.19
Reach 1	8979.59	2Y	1.53	114.81	115.04	115.04	115.13	0.033856	1.53	1.52	10.51	1.23
Reach 1	8938.24	REG	28.80	113.86	115.09	114.88	115.16	0.004471	2.11	38.35	60.24	0.62
Reach 1	8938.24	100Y	5.46	113.86	114.57	114.49	114.63	0.004849	1.48	9.74	44.60	0.59
Reach 1	8938.24	50Y	4.70	113.86	114.54	114.46	114.60	0.004697	1.41	8.43	39.67	0.57
Reach 1	8938.24	25Y	3.98	113.86	114.50	114.43	114.56	0.004773	1.36	7.01	34.20	0.57
Reach 1	8938.24	10Y	3.07	113.86	114.43	114.38	114.50	0.005385	1.33	5.10	25.13	0.60
Reach 1	8938.24	5Y	2.46	113.86	114.38	114.31	114.45	0.005944	1.31	3.94	22.07	0.62
Reach 1	8938.24	2Y	1.53	113.86	114.28	114.20	114.34	0.006432	1.16	2.07	12.45	0.61
Reach 1	8816.65	REG	28.80	113.09	114.17	114.17	114.38	0.011948	3.10	25.82	55.85	0.99
Reach 1	8816.65	100Y	5.46	113.09	113.74	113.74	113.87	0.009326	1.89	6.12	27.06	0.80
Reach 1	8816.65	50Y	4.70	113.09	113.70	113.70	113.83	0.009870	1.85	5.06	24.62	0.81
Reach 1	8816.65	25Y	3.98	113.09	113.67	113.67	113.79	0.009576	1.74	4.26	22.56	0.79
Reach 1	8816.65	10Y	3.07	113.09	113.63	113.58	113.73	0.007994	1.52	3.51	21.34	0.71
Reach 1	8816.65	5Y	2.46	113.09	113.60	113.52	113.68	0.007001	1.36	2.88	20.00	0.66
Reach 1	8816.65	2Y	1.53	113.09	113.51	113.43	113.57	0.006381	1.12	1.74	8.83	0.61
Reach 1	8733.04	REG	28.80	112.48	113.89	113.35	113.92	0.001281	1.26	57.43	65.25	0.34
Reach 1	8733.04	100Y	5.46	112.48	113.02	113.02	113.13	0.008628	1.67	7.11	45.36	0.75
Reach 1	8733.04	50Y	4.70	112.48	113.04	112.95	113.10	0.005223	1.33	7.96	47.07	0.59
Reach 1	8733.04	25Y	3.98	112.48	113.03	112.94	113.08	0.004055	1.16	7.62	46.39	0.52
Reach 1	8733.04	10Y	3.07	112.48	112.89	112.87	112.99	0.010018	1.48	3.15	18.31	0.77
Reach 1	8733.04	5Y	2.46	112.48	112.84	112.81	112.94	0.011932	1.46	2.27	14.99	0.82
Reach 1	8733.04	2Y	1.53	112.48	112.76	112.73	112.83	0.013004	1.25	1.38	8.84	0.82
Reach 1	8633.98	REG	28.80	111.72	113.86	112.75	113.87	0.000329	0.86	97.74	79.61	0.19
Reach 1	8633.98	100Y	5.46	111.72	112.43	112.37	112.49	0.004017	1.42	10.42	41.89	0.54
Reach 1	8633.98	50Y	4.70	111.72	112.31	112.31	112.44	0.009274	1.90	5.63	31.70	0.80
Reach 1	8633.98	25Y	3.98	111.72	112.21	112.21	112.39	0.015366	2.14	3.34	16.36	1.00
Reach 1	8633.98	10Y	3.07	111.72	112.30	112.15	112.36	0.004428	1.29	5.24	26.73	0.55
Reach 1	8633.98	5Y	2.46	111.72	112.26	112.10	112.31	0.003848	1.16	4.40	21.25	0.51
Reach 1	8633.98	2Y	1.53	111.72	112.14	112.00	112.18	0.003940	0.99	2.46	12.54	0.49
Reach 1	8560.16	REG	28.80	111.27	113.84	112.32	113.85	0.000159	0.67	100.20	68.90	0.13
Reach 1	8560.16	100Y	5.46	111.27	112.41	111.90	112.42	0.000312	0.54	23.85	40.77	0.16
Reach 1	8560.16	50Y	4.70	111.27	112.25	111.91	112.26	0.000510	0.63	17.74	37.18	0.20
Reach 1	8560.16	25Y	3.98	111.27	112.09	111.77	112.11	0.001000	0.77	12.03	33.12	0.28
Reach 1	8560.16	10Y	3.07	111.27	111.76	111.76	111.88	0.010073	1.71	2.98	19.16	0.80
Reach 1	8560.16	5Y	2.46	111.27	111.68	111.66	111.82	0.013746	1.77	1.84	9.88	0.91
Reach 1	8560.16	2Y	1.53	111.27	111.60	111.57	111.69	0.012801	1.45	1.30	5.34	0.84
Reach 1	8526.47	REG	28.80	111.05	113.84	111.92	113.84	0.000062	0.44	201.17	149.10	0.08
Reach 1	8526.47	100Y	5.46	111.05	112.41	111.47	112.41	0.000072	0.30	57.05	77.14	0.08
Reach 1	8526.47	50Y	4.70	111.05	112.25	111.46	112.25	0.000103	0.33	45.22	72.21	0.10
Reach 1	8526.47	25Y	3.98	111.05	112.09	111.46	112.09	0.000172	0.38	33.77	67.86	0.12
Reach 1	8526.47	10Y	3.07	111.05	111.67	111.37	111.68	0.001473	0.79	11.31	44.43	0.32
Reach 1	8526.47	5Y	2.46	111.05	111.53	111.34	111.55	0.003736	1.05	5.94	25.57	0.49
Reach 1	8526.47	2Y	1.53	111.05	111.43	111.28	111.45	0.003664	0.88	3.74	17.76	0.47
Reach 1	8483.47	REG	28.80	110.66	113.79	112.12	113.83	0.000418	1.24	46.42	125.50	0.23
Reach 1	8483.47	100Y	5.46	110.66	112.39	111.30	112.40	0.000243	0.63	14.61	74.58	0.16
Reach 1	8483.47	50Y	4.70	110.66	112.23	111.25	112.24	0.000258	0.61	13.03	73.33	0.16
Reach 1	8483.47	25Y	3.98	110.66	112.07	111.19	112.08	0.000281	0.59	11.39	71.71	0.16
Reach 1	8483.47	10Y	3.07	110.66	111.63	111.12	111.65	0.000737	0.74	6.96	39.77	0.25
Reach 1	8483.47	5Y	2.46	110.66	111.47	111.06	111.50	0.000970	0.76	5.41	20.77	0.27
Reach 1	8483.47	2Y	1.53	110.66	111.39	110.97	111.40	0.000581	0.55	4.59	18.30	0.21
Reach 1	8466.9		Mult Open									

HEC-RAS Plan: Duffins_Final_Au River: Millers Creek Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	8447.02	REG	28.80	109.90	112.82	111.53	112.97	0.001130	1.88	26.47	77.51	0.36
Reach 1	8447.02	100Y	5.46	109.90	111.40	110.53	111.43	0.000498	0.78	8.64	9.63	0.21
Reach 1	8447.02	50Y	4.70	109.90	111.21	110.48	111.24	0.000620	0.80	7.22	8.37	0.23
Reach 1	8447.02	25Y	3.98	109.90	111.08	110.43	111.11	0.000681	0.77	6.20	7.72	0.24
Reach 1	8447.02	10Y	3.07	109.90	110.91	110.36	110.94	0.000722	0.71	5.03	7.14	0.24
Reach 1	8447.02	5Y	2.46	109.90	110.81	110.31	110.83	0.000708	0.65	4.31	6.77	0.23
Reach 1	8447.02	2Y	1.53	109.90	110.63	110.22	110.65	0.000639	0.53	3.17	6.15	0.21
Reach 1	8440.74	REG	28.80	109.99	112.88	111.85	112.91	0.000363	1.06	78.11	88.58	0.20
Reach 1	8440.74	100Y	5.46	109.99	111.38	110.67	111.42	0.000823	0.96	8.60	14.46	0.27
Reach 1	8440.74	50Y	4.70	109.99	111.19	110.62	111.23	0.001083	0.99	6.43	9.25	0.30
Reach 1	8440.74	25Y	3.98	109.99	111.05	110.56	111.09	0.001259	0.97	5.25	7.86	0.32
Reach 1	8440.74	10Y	3.07	109.99	110.89	110.49	110.93	0.001452	0.92	4.07	6.84	0.33
Reach 1	8440.74	5Y	2.46	109.99	110.78	110.44	110.82	0.001524	0.86	3.39	6.36	0.33
Reach 1	8440.74	2Y	1.53	109.99	110.61	110.35	110.64	0.001620	0.73	2.35	5.61	0.32
Reach 1	8432.03	REG	28.80	109.85	112.88	111.78	112.90	0.000255	0.90	89.14	98.88	0.17
Reach 1	8432.03	100Y	5.46	109.85	111.38	110.55	111.42	0.000584	0.83	8.45	15.18	0.23
Reach 1	8432.03	50Y	4.70	109.85	111.19	110.50	111.22	0.000744	0.84	6.59	7.93	0.25
Reach 1	8432.03	25Y	3.98	109.85	111.05	110.45	111.08	0.000836	0.82	5.53	7.20	0.26
Reach 1	8432.03	10Y	3.07	109.85	110.89	110.38	110.91	0.000914	0.76	4.42	6.45	0.26
Reach 1	8432.03	5Y	2.46	109.85	110.78	110.33	110.81	0.000914	0.70	3.77	6.07	0.26
Reach 1	8432.03	2Y	1.53	109.85	110.61	110.23	110.62	0.000869	0.57	2.77	5.46	0.24
Reach 1	8425.29	REG	28.80	109.92	112.88	111.46	112.90	0.000238	0.90	88.10	96.84	0.17
Reach 1	8425.29	100Y	5.46	109.92	111.38	110.47	111.41	0.000487	0.80	7.90	25.87	0.21
Reach 1	8425.29	50Y	4.70	109.92	111.19	110.42	111.22	0.000592	0.79	6.80	14.39	0.23
Reach 1	8425.29	25Y	3.98	109.92	111.05	110.37	111.07	0.000636	0.76	6.02	13.17	0.23
Reach 1	8425.29	10Y	3.07	109.92	110.88	110.31	110.91	0.000656	0.69	5.09	12.01	0.23
Reach 1	8425.29	5Y	2.46	109.92	110.78	110.26	110.80	0.000629	0.63	4.51	11.23	0.22
Reach 1	8425.29	2Y	1.53	109.92	110.61	110.19	110.62	0.000545	0.50	3.52	9.88	0.20
Reach 1	8394.16		Culvert									
Reach 1	8363.25	REG	28.80	109.85	112.85	111.55	112.88	0.000333	1.02	56.59	66.01	0.19
Reach 1	8363.25	100Y	5.46	109.85	110.97	110.67	111.10	0.003739	1.63	3.56	11.30	0.54
Reach 1	8363.25	50Y	4.70	109.85	110.83	110.61	110.97	0.004777	1.66	3.02	9.52	0.59
Reach 1	8363.25	25Y	3.98	109.85	110.71	110.55	110.84	0.006278	1.69	2.51	8.79	0.66
Reach 1	8363.25	10Y	3.07	109.85	110.51	110.48	110.68	0.012362	1.88	1.74	7.88	0.88
Reach 1	8363.25	5Y	2.46	109.85	110.42	110.42	110.59	0.016566	1.89	1.39	7.47	0.98
Reach 1	8363.25	2Y	1.53	109.85	110.32	110.32	110.45	0.018409	1.63	1.00	6.02	0.98
Reach 1	8360.07	REG	28.80	109.59	112.85	111.09	112.87	0.000200	0.85	64.91	79.63	0.15
Reach 1	8360.07	100Y	5.46	109.59	111.02	110.26	111.04	0.000403	0.67	11.33	14.54	0.19
Reach 1	8360.07	50Y	4.70	109.59	110.89	110.21	110.91	0.000472	0.67	9.44	13.27	0.20
Reach 1	8360.07	25Y	3.98	109.59	110.76	110.17	110.78	0.000520	0.65	7.88	11.32	0.21
Reach 1	8360.07	10Y	3.07	109.59	110.58	110.09	110.60	0.000648	0.64	5.96	10.08	0.22
Reach 1	8360.07	5Y	2.46	109.59	110.46	110.04	110.47	0.000773	0.63	4.74	9.41	0.24
Reach 1	8360.07	2Y	1.53	109.59	110.24	109.95	110.26	0.001129	0.60	2.88	8.12	0.27
Reach 1	8357.46	REG	28.80	109.62	112.85	111.08	112.87	0.000236	0.95	62.55	91.24	0.17
Reach 1	8357.46	100Y	5.46	109.62	111.01	110.20	111.04	0.000478	0.76	8.21	13.11	0.21
Reach 1	8357.46	50Y	4.70	109.62	110.88	110.14	110.90	0.000510	0.73	7.33	11.90	0.21
Reach 1	8357.46	25Y	3.98	109.62	110.75	110.10	110.77	0.000536	0.70	6.51	10.80	0.21
Reach 1	8357.46	10Y	3.07	109.62	110.58	110.02	110.60	0.000597	0.66	5.34	9.27	0.22
Reach 1	8357.46	5Y	2.46	109.62	110.45	109.97	110.47	0.000644	0.62	4.53	8.30	0.22
Reach 1	8357.46	2Y	1.53	109.62	110.24	109.89	110.26	0.000759	0.55	3.14	6.92	0.23
Reach 1	8335.39		Culvert									
Reach 1	8313.88	REG	28.80	109.55	111.06	111.06	111.63	0.012346	4.09	11.93	34.89	1.08
Reach 1	8313.88	100Y	5.46	109.55	110.44	110.20	110.53	0.003853	1.58	5.71	28.62	0.55
Reach 1	8313.88	50Y	4.70	109.55	110.39	110.16	110.48	0.003578	1.46	5.26	24.57	0.52
Reach 1	8313.88	25Y	3.98	109.55	110.36	110.10	110.42	0.003131	1.32	4.88	23.31	0.49
Reach 1	8313.88	10Y	3.07	109.55	110.25	110.03	110.32	0.003408	1.25	3.84	11.90	0.49
Reach 1	8313.88	5Y	2.46	109.55	110.18	109.98	110.23	0.003264	1.14	3.25	8.03	0.48
Reach 1	8313.88	2Y	1.53	109.55	110.05	109.89	110.09	0.003310	0.96	2.26	6.94	0.46
Reach 1	8309.62	REG	28.80	109.54	110.88	110.88	111.15	0.009828	3.34	22.63	35.41	0.94
Reach 1	8309.62	100Y	5.46	109.54	110.28	110.28	110.48	0.009819	2.19	4.35	16.11	0.85
Reach 1	8309.62	50Y	4.70	109.54	110.22	110.22	110.42	0.010367	2.13	3.59	12.00	0.86
Reach 1	8309.62	25Y	3.98	109.54	110.13	110.13	110.35	0.013882	2.22	2.58	9.30	0.97
Reach 1	8309.62	10Y	3.07	109.54	110.06	110.06	110.25	0.013734	2.02	2.05	6.83	0.94
Reach 1	8309.62	5Y	2.46	109.54	110.00	110.00	110.17	0.014691	1.90	1.65	6.06	0.95
Reach 1	8309.62	2Y	1.53	109.54	109.89	109.89	110.03	0.017143	1.67	1.06	4.70	0.97

HEC-RAS Plan: Duffins_Final_Au River: Millers Creek Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	8251.25	REG	28.80	109.03	110.58	110.41	110.76	0.004901	2.62	25.16	31.35	0.68
Reach 1	8251.25	100Y	5.46	109.03	109.80	109.69	109.93	0.005970	1.78	5.40	18.72	0.67
Reach 1	8251.25	50Y	4.70	109.03	109.75	109.62	109.87	0.005806	1.67	4.51	14.94	0.65
Reach 1	8251.25	25Y	3.98	109.03	109.69	109.56	109.80	0.005778	1.58	3.77	13.04	0.64
Reach 1	8251.25	10Y	3.07	109.03	109.62	109.49	109.71	0.005487	1.42	2.95	9.33	0.61
Reach 1	8251.25	5Y	2.46	109.03	109.57	109.43	109.65	0.005002	1.27	2.54	7.30	0.57
Reach 1	8251.25	2Y	1.53	109.03	109.48	109.34	109.52	0.004066	1.00	1.91	6.28	0.50
Reach 1	8209.25	REG	28.80	108.67	110.45	110.16	110.58	0.003220	2.21	28.61	33.03	0.56
Reach 1	8209.25	100Y	5.46	108.67	109.50	109.40	109.65	0.007364	1.85	4.24	13.17	0.72
Reach 1	8209.25	50Y	4.70	108.67	109.43	109.34	109.58	0.007852	1.79	3.49	9.87	0.74
Reach 1	8209.25	25Y	3.98	108.67	109.37	109.29	109.51	0.008574	1.73	2.90	7.93	0.75
Reach 1	8209.25	10Y	3.07	108.67	109.27	109.22	109.40	0.010218	1.65	2.21	6.74	0.80
Reach 1	8209.25	5Y	2.46	108.67	109.20	109.17	109.33	0.012399	1.61	1.75	6.18	0.85
Reach 1	8209.25	2Y	1.53	108.67	109.08	109.08	109.20	0.018995	1.53	1.06	5.22	0.99
Reach 1	8157.68	REG	28.80	108.38	110.36	109.94	110.45	0.001808	1.88	36.22	45.03	0.43
Reach 1	8157.68	100Y	5.46	108.38	109.35	108.99	109.43	0.002419	1.33	6.01	13.44	0.44
Reach 1	8157.68	50Y	4.70	108.38	109.29	108.93	109.36	0.002365	1.26	5.20	12.13	0.43
Reach 1	8157.68	25Y	3.98	108.38	109.23	108.88	109.29	0.002096	1.13	4.64	8.97	0.40
Reach 1	8157.68	10Y	3.07	108.38	109.15	108.81	109.20	0.001756	0.97	4.01	7.30	0.36
Reach 1	8157.68	5Y	2.46	108.38	109.09	108.76	109.13	0.001547	0.86	3.57	7.00	0.34
Reach 1	8157.68	2Y	1.53	108.38	108.98	108.67	109.00	0.001165	0.65	2.80	6.43	0.28
Reach 1	8151.6	REG	28.80	108.46	110.29	110.07	110.43	0.002943	2.21	30.43	40.70	0.54
Reach 1	8151.6	100Y	5.46	108.46	109.25	109.13	109.39	0.006738	1.79	4.36	9.58	0.70
Reach 1	8151.6	50Y	4.70	108.46	109.20	109.08	109.32	0.006586	1.68	3.90	8.83	0.68
Reach 1	8151.6	25Y	3.98	108.46	109.15	109.03	109.26	0.006421	1.57	3.46	8.49	0.66
Reach 1	8151.6	10Y	3.07	108.46	109.07	108.96	109.16	0.006302	1.42	2.85	7.98	0.64
Reach 1	8151.6	5Y	2.46	108.46	109.02	108.91	109.10	0.006185	1.30	2.42	7.61	0.62
Reach 1	8151.6	2Y	1.53	108.46	108.92	108.82	108.97	0.005889	1.07	1.71	6.63	0.58
Reach 1	8148		Bridge									
Reach 1	8144.39	REG	28.80	108.38	109.97	109.97	110.28	0.006689	3.05	20.49	31.97	0.79
Reach 1	8144.39	100Y	5.46	108.38	109.05	109.04	109.27	0.011634	2.15	3.28	8.54	0.89
Reach 1	8144.39	50Y	4.70	108.38	109.00	108.99	109.20	0.012641	2.09	2.80	7.88	0.92
Reach 1	8144.39	25Y	3.98	108.38	108.95	108.94	109.14	0.012681	1.97	2.45	7.32	0.90
Reach 1	8144.39	10Y	3.07	108.38	108.86	108.86	109.04	0.014846	1.87	1.87	6.34	0.95
Reach 1	8144.39	5Y	2.46	108.38	108.81	108.81	108.96	0.015954	1.76	1.54	5.81	0.96
Reach 1	8144.39	2Y	1.53	108.38	108.72	108.71	108.83	0.016943	1.49	1.07	4.94	0.94
Reach 1	8135.65	REG	28.80	108.31	109.46	109.70	110.09	0.018725	4.16	13.31	25.53	1.27
Reach 1	8135.65	100Y	5.46	108.31	109.06	108.88	109.15	0.004025	1.43	5.92	13.37	0.54
Reach 1	8135.65	50Y	4.70	108.31	109.00	108.83	109.08	0.004371	1.40	5.05	12.57	0.56
Reach 1	8135.65	25Y	3.98	108.31	108.94	108.78	109.02	0.004428	1.32	4.38	11.92	0.55
Reach 1	8135.65	10Y	3.07	108.31	108.84	108.71	108.91	0.005595	1.30	3.20	10.57	0.60
Reach 1	8135.65	5Y	2.46	108.31	108.75	108.66	108.83	0.007580	1.32	2.33	8.23	0.68
Reach 1	8135.65	2Y	1.53	108.31	108.62	108.58	108.70	0.011310	1.24	1.43	6.47	0.78
Reach 1	8089.75	REG	39.27	107.90	109.56	109.28	109.68	0.003035	2.14	43.40	50.27	0.54
Reach 1	8089.75	100Y	10.08	107.90	108.86	108.63	108.97	0.003696	1.62	11.70	34.68	0.54
Reach 1	8089.75	50Y	8.81	107.90	108.84	108.58	108.93	0.002927	1.42	11.06	31.49	0.48
Reach 1	8089.75	25Y	7.55	107.90	108.80	108.53	108.87	0.002699	1.32	9.80	26.72	0.46
Reach 1	8089.75	10Y	5.74	107.90	108.68	108.44	108.75	0.002863	1.23	7.11	18.97	0.46
Reach 1	8089.75	5Y	4.42	107.90	108.58	108.37	108.64	0.002916	1.12	5.44	15.06	0.45
Reach 1	8089.75	2Y	2.76	107.90	108.44	108.25	108.49	0.002944	0.96	3.58	12.17	0.44
Reach 1	8048.67	REG	39.27	107.68	109.13	109.10	109.46	0.008830	3.28	25.53	32.30	0.90
Reach 1	8048.67	100Y	10.08	107.68	108.57	108.57	108.76	0.007250	2.09	8.65	27.98	0.75
Reach 1	8048.67	50Y	8.81	107.68	108.47	108.47	108.71	0.010218	2.27	5.92	24.25	0.87
Reach 1	8048.67	25Y	7.55	107.68	108.36	108.36	108.64	0.014222	2.40	4.04	12.05	0.99
Reach 1	8048.67	10Y	5.74	107.68	108.27	108.27	108.51	0.014487	2.18	3.13	9.01	0.98
Reach 1	8048.67	5Y	4.42	107.68	108.20	108.20	108.40	0.014553	1.98	2.53	8.10	0.95
Reach 1	8048.67	2Y	2.76	107.68	108.08	108.08	108.24	0.017182	1.73	1.68	6.19	0.98
Reach 1	8015.52	REG	39.27	106.51	109.08	108.40	109.30	0.002099	2.37	31.32	25.32	0.48
Reach 1	8015.52	100Y	10.08	106.51	107.85	107.36	107.95	0.002167	1.51	8.69	10.48	0.44
Reach 1	8015.52	50Y	8.81	106.51	107.76	107.30	107.86	0.002186	1.44	7.77	10.02	0.43
Reach 1	8015.52	25Y	7.55	106.51	107.66	107.24	107.75	0.002184	1.36	6.86	9.51	0.43
Reach 1	8015.52	10Y	5.74	106.51	107.52	107.14	107.59	0.002130	1.22	5.58	8.41	0.41
Reach 1	8015.52	5Y	4.42	106.51	107.41	107.05	107.47	0.002036	1.09	4.66	7.64	0.39
Reach 1	8015.52	2Y	2.76	106.51	107.24	106.94	107.28	0.001844	0.88	3.45	6.76	0.36
Reach 1	8006	REG	39.27	106.57	108.47	108.47	109.13	0.009327	3.87	14.01	14.88	0.94
Reach 1	8006	100Y	10.08	106.57	107.48	107.48	107.84	0.013580	2.67	4.02	6.73	0.98
Reach 1	8006	50Y	8.81	106.57	107.41	107.41	107.74	0.014001	2.55	3.61	6.24	0.99

HEC-RAS Plan: Duffins_Final_Au River: Millers Creek Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	8006	25Y	7.55	106.57	107.35	107.35	107.65	0.014449	2.43	3.21	5.97	0.98
Reach 1	8006	10Y	5.74	106.57	107.25	107.25	107.50	0.015400	2.22	2.62	5.56	0.99
Reach 1	8006	5Y	4.42	106.57	107.16	107.16	107.38	0.016632	2.05	2.16	5.20	1.00
Reach 1	8006	2Y	2.76	106.57	107.03	107.03	107.20	0.017982	1.80	1.53	4.59	0.99
Reach 1	7990.86		Culvert									
Reach 1	7969.27	REG	39.27	106.34	108.34	108.34	109.00	0.008842	4.06	15.89	13.07	0.94
Reach 1	7969.27	100Y	10.08	106.34	107.38	107.30	107.68	0.008582	2.51	5.09	7.93	0.83
Reach 1	7969.27	50Y	8.81	106.34	107.32	107.23	107.59	0.008293	2.36	4.63	7.34	0.80
Reach 1	7969.27	25Y	7.55	106.34	107.26	107.16	107.49	0.007930	2.19	4.18	6.97	0.78
Reach 1	7969.27	10Y	5.74	106.34	107.15	107.04	107.34	0.007537	1.95	3.46	6.45	0.74
Reach 1	7969.27	5Y	4.42	106.34	107.05	106.95	107.21	0.007506	1.76	2.85	6.00	0.72
Reach 1	7969.27	2Y	2.76	106.34	106.90	106.81	107.01	0.008187	1.51	1.97	5.28	0.72
Reach 1	7946.28	REG	39.27	106.25	107.75	108.10	108.67	0.015683	4.57	13.47	18.38	1.21
Reach 1	7946.28	100Y	10.08	106.25	107.34	107.02	107.48	0.003560	1.74	7.27	9.35	0.55
Reach 1	7946.28	50Y	8.81	106.25	107.28	106.96	107.40	0.003395	1.63	6.69	9.02	0.53
Reach 1	7946.28	25Y	7.55	106.25	107.21	106.90	107.32	0.003166	1.51	6.12	8.69	0.50
Reach 1	7946.28	10Y	5.74	106.25	107.10	106.80	107.19	0.002857	1.32	5.20	8.16	0.47
Reach 1	7946.28	5Y	4.42	106.25	107.00	106.72	107.07	0.002719	1.17	4.39	7.75	0.45
Reach 1	7946.28	2Y	2.76	106.25	106.83	106.61	106.88	0.002819	0.99	3.11	7.06	0.43
Reach 1	7897.26	REG	39.27	106.00	107.73	107.68	108.07	0.007318	3.37	26.26	30.46	0.84
Reach 1	7897.26	100Y	10.08	106.00	107.09	106.97	107.27	0.005326	2.06	8.58	21.80	0.66
Reach 1	7897.26	50Y	8.81	106.00	107.04	106.91	107.20	0.004915	1.92	7.67	18.66	0.63
Reach 1	7897.26	25Y	7.55	106.00	106.99	106.81	107.13	0.004579	1.79	6.77	16.14	0.60
Reach 1	7897.26	10Y	5.74	106.00	106.90	106.68	107.02	0.004139	1.58	5.42	13.98	0.56
Reach 1	7897.26	5Y	4.42	106.00	106.81	106.59	106.90	0.004047	1.44	4.17	11.97	0.54
Reach 1	7897.26	2Y	2.76	106.00	106.63	106.46	106.71	0.004237	1.22	2.64	6.47	0.53
Reach 1	7823.59	REG	39.27	105.75	107.50	107.25	107.66	0.003781	2.49	38.86	41.61	0.61
Reach 1	7823.59	100Y	10.08	105.75	106.90	106.70	106.98	0.002607	1.54	15.02	36.41	0.47
Reach 1	7823.59	50Y	8.81	105.75	106.86	106.53	106.93	0.002462	1.46	13.56	35.77	0.46
Reach 1	7823.59	25Y	7.55	105.75	106.80	106.49	106.87	0.002502	1.42	11.46	34.71	0.45
Reach 1	7823.59	10Y	5.74	105.75	106.70	106.38	106.78	0.002443	1.31	8.34	30.38	0.44
Reach 1	7823.59	5Y	4.42	105.75	106.62	106.30	106.68	0.002192	1.16	6.30	21.33	0.41
Reach 1	7823.59	2Y	2.76	105.75	106.47	106.16	106.51	0.001695	0.89	4.26	10.03	0.35
Reach 1	7746.23	REG	39.27	105.70	107.33	107.02	107.42	0.002678	2.02	48.50	56.05	0.51
Reach 1	7746.23	100Y	10.08	105.70	106.74	106.50	106.80	0.002173	1.34	18.00	45.42	0.43
Reach 1	7746.23	50Y	8.81	105.70	106.72	106.44	106.77	0.001875	1.23	17.00	44.88	0.39
Reach 1	7746.23	25Y	7.55	105.70	106.66	106.36	106.71	0.001823	1.17	14.49	42.42	0.38
Reach 1	7746.23	10Y	5.74	105.70	106.57	106.26	106.62	0.001724	1.06	11.22	33.90	0.37
Reach 1	7746.23	5Y	4.42	105.70	106.49	106.18	106.53	0.001689	0.98	8.56	30.47	0.36
Reach 1	7746.23	2Y	2.76	105.70	106.37	106.05	106.39	0.001342	0.78	5.46	17.83	0.31
Reach 1	7668.59	REG	39.27	105.64	107.12	106.80	107.21	0.003332	2.12	46.78	55.31	0.56
Reach 1	7668.59	100Y	10.08	105.64	106.59	106.35	106.63	0.002319	1.31	19.88	45.55	0.43
Reach 1	7668.59	50Y	8.81	105.64	106.61	106.33	106.64	0.001579	1.09	20.81	46.05	0.36
Reach 1	7668.59	25Y	7.55	105.64	106.55	106.31	106.58	0.001666	1.07	18.00	44.53	0.36
Reach 1	7668.59	10Y	5.74	105.64	106.45	106.25	106.48	0.001859	1.05	13.71	42.49	0.38
Reach 1	7668.59	5Y	4.42	105.64	106.36	106.20	106.39	0.002014	1.01	10.05	35.14	0.38
Reach 1	7668.59	2Y	2.76	105.64	106.21	106.02	106.25	0.002661	0.99	5.51	28.55	0.43
Reach 1	7641.39	REG	39.27	105.61	107.00	106.80	107.11	0.004006	2.19	41.17	57.82	0.60
Reach 1	7641.39	100Y	10.08	105.61	106.50	106.35	106.57	0.002930	1.38	15.79	42.48	0.48
Reach 1	7641.39	50Y	8.81	105.61	106.56	106.31	106.60	0.001535	1.05	18.63	45.34	0.35
Reach 1	7641.39	25Y	7.55	105.61	106.50	106.27	106.54	0.001663	1.04	15.71	42.34	0.36
Reach 1	7641.39	10Y	5.74	105.61	106.39	106.15	106.43	0.001894	1.01	11.52	37.83	0.38
Reach 1	7641.39	5Y	4.42	105.61	106.29	106.06	106.33	0.002448	1.04	7.70	33.70	0.42
Reach 1	7641.39	2Y	2.76	105.61	106.12	105.95	106.17	0.003483	1.01	3.38	13.95	0.47
Reach 1	7633.99	REG	39.27	105.54	106.99	106.77	107.07	0.003253	2.01	41.96	58.58	0.54
Reach 1	7633.99	100Y	10.08	105.54	106.46	106.24	106.54	0.003408	1.51	14.17	41.34	0.52
Reach 1	7633.99	50Y	8.81	105.54	106.55	106.24	106.59	0.001496	1.07	18.22	47.35	0.35
Reach 1	7633.99	25Y	7.55	105.54	106.48	106.24	106.52	0.001736	1.09	14.98	44.67	0.37
Reach 1	7633.99	10Y	5.74	105.54	106.37	106.18	106.42	0.002184	1.12	10.42	37.57	0.41
Reach 1	7633.99	5Y	4.42	105.54	106.22	106.04	106.30	0.004104	1.33	5.25	25.44	0.54
Reach 1	7633.99	2Y	2.76	105.54	106.05	105.92	106.13	0.005375	1.24	2.51	8.26	0.58
Reach 1	7630.39		Bridge									
Reach 1	7629.75	REG	39.27	105.55	107.01	106.67	107.06	0.001906	1.57	45.84	61.02	0.42
Reach 1	7629.75	100Y	10.08	105.55	106.37	106.34	106.45	0.004702	1.66	11.32	40.53	0.60
Reach 1	7629.75	50Y	8.81	105.55	106.31	106.31	106.50	0.008847	2.17	5.75	37.51	0.81
Reach 1	7629.75	25Y	7.55	105.55	106.27	106.27	106.45	0.008739	2.06	5.10	36.17	0.80

HEC-RAS Plan: Duffins_Final_Au River: Millers Creek Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	7629.75	10Y	5.74	105.55	106.12	106.12	106.34	0.013291	2.17	3.22	19.45	0.95
Reach 1	7629.75	5Y	4.42	105.55	106.03	106.03	106.23	0.015629	2.07	2.43	6.53	0.99
Reach 1	7629.75	2Y	2.76	105.55	105.92	105.92	106.06	0.017194	1.78	1.72	6.01	0.99
Reach 1	7620.9	REG	39.27	105.29	106.92	106.70	107.03	0.003238	2.17	46.14	61.12	0.56
Reach 1	7620.9	100Y	10.08	105.29	106.31	106.21	106.42	0.003638	1.65	13.66	41.98	0.54
Reach 1	7620.9	50Y	8.81	105.29	106.26	106.00	106.37	0.003755	1.62	11.59	39.56	0.55
Reach 1	7620.9	25Y	7.55	105.29	106.21	105.93	106.31	0.003835	1.56	9.52	35.36	0.55
Reach 1	7620.9	10Y	5.74	105.29	106.11	105.88	106.21	0.004151	1.49	6.20	25.18	0.56
Reach 1	7620.9	5Y	4.42	105.29	106.02	105.80	106.10	0.004103	1.36	4.35	15.84	0.54
Reach 1	7620.9	2Y	2.76	105.29	105.87	105.69	105.93	0.003685	1.09	2.99	7.20	0.49
Reach 1	7587.9	REG	39.27	105.18	106.83	106.53	106.92	0.002972	2.08	47.88	60.90	0.53
Reach 1	7587.9	100Y	10.08	105.18	106.24	106.07	106.31	0.002633	1.42	16.86	46.48	0.46
Reach 1	7587.9	50Y	8.81	105.18	106.18	105.98	106.25	0.002909	1.43	14.09	44.77	0.48
Reach 1	7587.9	25Y	7.55	105.18	106.11	105.82	106.19	0.003188	1.42	11.20	40.45	0.50
Reach 1	7587.9	10Y	5.74	105.18	105.98	105.78	106.07	0.004193	1.45	6.73	26.61	0.55
Reach 1	7587.9	5Y	4.42	105.18	105.87	105.70	105.96	0.004858	1.39	4.44	16.37	0.58
Reach 1	7587.9	2Y	2.76	105.18	105.70	105.59	105.78	0.006044	1.24	2.72	8.59	0.61
Reach 1	7536.04	REG	39.27	104.81	106.62	106.45	106.76	0.003708	2.48	45.43	61.72	0.61
Reach 1	7536.04	100Y	10.08	104.81	105.96	105.74	106.13	0.004658	2.00	10.00	35.88	0.63
Reach 1	7536.04	50Y	8.81	104.81	105.90	105.63	106.06	0.004531	1.91	8.35	28.38	0.61
Reach 1	7536.04	25Y	7.55	104.81	105.85	105.60	106.00	0.004345	1.80	6.96	23.57	0.59
Reach 1	7536.04	10Y	5.74	104.81	105.76	105.48	105.87	0.003542	1.52	5.35	13.51	0.53
Reach 1	7536.04	5Y	4.42	104.81	105.68	105.40	105.76	0.003037	1.32	4.43	10.06	0.48
Reach 1	7536.04	2Y	2.76	104.81	105.51	105.27	105.56	0.002849	1.08	3.10	6.66	0.45
Reach 1	7477.89	REG	39.27	104.66	106.52	106.19	106.61	0.002360	2.08	52.78	59.25	0.49
Reach 1	7477.89	100Y	10.08	104.66	105.88	105.64	105.95	0.001932	1.41	17.86	44.48	0.41
Reach 1	7477.89	50Y	8.81	104.66	105.80	105.60	105.87	0.002229	1.44	14.40	41.89	0.44
Reach 1	7477.89	25Y	7.55	104.66	105.73	105.38	105.81	0.002252	1.39	11.86	36.84	0.44
Reach 1	7477.89	10Y	5.74	104.66	105.64	105.26	105.71	0.002110	1.27	8.77	31.94	0.42
Reach 1	7477.89	5Y	4.42	104.66	105.56	105.18	105.62	0.001939	1.15	6.40	25.71	0.39
Reach 1	7477.89	2Y	2.76	104.66	105.41	105.05	105.44	0.001534	0.90	4.01	9.07	0.34
Reach 1	7411.6	REG	39.27	104.63	106.43	105.99	106.49	0.001759	1.75	61.10	65.39	0.42
Reach 1	7411.6	100Y	10.08	104.63	105.79	105.52	105.84	0.001497	1.20	22.92	52.65	0.36
Reach 1	7411.6	50Y	8.81	104.63	105.69	105.48	105.74	0.001847	1.25	17.92	43.85	0.39
Reach 1	7411.6	25Y	7.55	104.63	105.61	105.44	105.67	0.002142	1.28	14.49	40.91	0.42
Reach 1	7411.6	10Y	5.74	104.63	105.51	105.23	105.57	0.002256	1.22	10.68	36.57	0.42
Reach 1	7411.6	5Y	4.42	104.63	105.41	105.15	105.47	0.002707	1.23	7.09	32.25	0.45
Reach 1	7411.6	2Y	2.76	104.63	105.25	105.02	105.31	0.002944	1.09	3.23	8.90	0.45
Reach 1	7343.1	REG	39.27	104.44	106.28	105.94	106.36	0.002110	1.93	55.23	64.62	0.46
Reach 1	7343.1	100Y	10.08	104.44	105.71	105.28	105.75	0.001101	1.09	21.63	42.22	0.31
Reach 1	7343.1	50Y	8.81	104.44	105.59	105.15	105.64	0.001361	1.13	17.07	34.55	0.34
Reach 1	7343.1	25Y	7.55	104.44	105.51	105.11	105.55	0.001386	1.08	14.45	28.72	0.34
Reach 1	7343.1	10Y	5.74	104.44	105.42	105.03	105.46	0.001234	0.96	11.95	27.27	0.32
Reach 1	7343.1	5Y	4.42	104.44	105.31	104.95	105.34	0.001371	0.92	8.90	25.23	0.33
Reach 1	7343.1	2Y	2.76	104.44	105.13	104.82	105.16	0.001476	0.82	5.09	16.96	0.32
Reach 1	7335.58	REG	39.27	104.45	106.25	105.97	106.34	0.003329	2.38	51.14	62.57	0.57
Reach 1	7335.58	100Y	10.08	104.45	105.68	105.41	105.74	0.002166	1.49	19.93	43.14	0.43
Reach 1	7335.58	50Y	8.81	104.45	105.51	105.38	105.61	0.003985	1.82	13.29	35.17	0.57
Reach 1	7335.58	25Y	7.55	104.45	105.35	105.31	105.50	0.006723	2.11	8.52	26.26	0.72
Reach 1	7335.58	10Y	5.74	104.45	105.24	105.16	105.40	0.008036	2.10	5.94	20.54	0.77
Reach 1	7335.58	5Y	4.42	104.45	105.17	104.97	105.29	0.006560	1.79	4.74	15.85	0.69
Reach 1	7335.58	2Y	2.76	104.45	105.04	104.90	105.12	0.006076	1.48	3.09	9.73	0.64
Reach 1	7331.32		Bridge									
Reach 1	7326.95	REG	39.27	104.36	106.21	105.80	106.27	0.001619	1.69	55.91	65.16	0.40
Reach 1	7326.95	100Y	10.08	104.36	105.40	105.25	105.52	0.003972	1.76	11.90	40.82	0.57
Reach 1	7326.95	50Y	8.81	104.36	105.35	105.19	105.47	0.004025	1.72	10.04	35.89	0.57
Reach 1	7326.95	25Y	7.55	104.36	105.29	105.06	105.41	0.003944	1.63	8.26	27.51	0.56
Reach 1	7326.95	10Y	5.74	104.36	105.21	104.95	105.30	0.003392	1.42	6.40	18.92	0.51
Reach 1	7326.95	5Y	4.42	104.36	105.14	104.88	105.21	0.003057	1.26	5.22	16.73	0.48
Reach 1	7326.95	2Y	2.76	104.36	105.01	104.76	105.05	0.002469	0.99	3.60	9.07	0.41
Reach 1	7316.29	REG	39.27	104.33	106.20	105.70	106.25	0.001411	1.59	65.46	65.91	0.38
Reach 1	7316.29	100Y	10.08	104.33	105.39	105.21	105.46	0.002613	1.45	16.93	47.95	0.46
Reach 1	7316.29	50Y	8.81	104.33	105.34	105.14	105.41	0.002530	1.38	14.77	44.17	0.45
Reach 1	7316.29	25Y	7.55	104.33	105.29	105.10	105.35	0.002577	1.34	12.44	37.73	0.45
Reach 1	7316.29	10Y	5.74	104.33	105.20	104.93	105.26	0.002568	1.24	9.30	33.73	0.44
Reach 1	7316.29	5Y	4.42	104.33	105.12	104.85	105.18	0.002440	1.13	6.91	28.26	0.43
Reach 1	7316.29	2Y	2.76	104.33	104.98	104.73	105.03	0.002298	0.96	3.86	15.93	0.40

HEC-RAS Plan: Duffins_Final_Au River: Millers Creek Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	7262.16	REG	39.27	104.26	106.13	105.52	106.18	0.001346	1.58	62.48	57.70	0.37
Reach 1	7262.16	100Y	10.08	104.26	105.29	105.06	105.34	0.001951	1.27	18.91	43.86	0.40
Reach 1	7262.16	50Y	8.81	104.26	105.24	105.02	105.29	0.001938	1.23	16.85	42.95	0.40
Reach 1	7262.16	25Y	7.55	104.26	105.19	104.88	105.23	0.001861	1.16	14.69	38.67	0.39
Reach 1	7262.16	10Y	5.74	104.26	105.10	104.79	105.14	0.001837	1.08	11.35	36.32	0.38
Reach 1	7262.16	5Y	4.42	104.26	105.02	104.69	105.06	0.001781	0.99	8.71	33.89	0.37
Reach 1	7262.16	2Y	2.76	104.26	104.90	104.58	104.93	0.001473	0.80	5.26	20.29	0.32
Reach 1	7182.76	REG	39.27	104.05	106.04	105.39	106.09	0.001250	1.57	63.83	52.63	0.36
Reach 1	7182.76	100Y	10.08	104.05	105.13	104.93	105.19	0.002242	1.37	18.55	44.11	0.43
Reach 1	7182.76	50Y	8.81	104.05	105.08	104.88	105.13	0.002289	1.34	16.33	43.07	0.43
Reach 1	7182.76	25Y	7.55	104.05	105.03	104.85	105.08	0.002256	1.28	14.16	39.20	0.43
Reach 1	7182.76	10Y	5.74	104.05	104.95	104.68	105.00	0.002057	1.15	11.32	33.56	0.40
Reach 1	7182.76	5Y	4.42	104.05	104.88	104.60	104.92	0.001923	1.05	9.09	31.43	0.38
Reach 1	7182.76	2Y	2.76	104.05	104.76	104.47	104.80	0.001798	0.91	5.61	27.63	0.36
Reach 1	7120.06	REG	39.27	103.97	105.99	105.20	106.03	0.000903	1.36	70.01	56.55	0.31
Reach 1	7120.06	100Y	10.08	103.97	105.04	104.78	105.07	0.001530	1.14	21.82	42.16	0.36
Reach 1	7120.06	50Y	8.81	103.97	104.99	104.75	105.02	0.001522	1.10	19.68	41.44	0.35
Reach 1	7120.06	25Y	7.55	103.97	104.94	104.72	104.97	0.001480	1.05	17.62	40.86	0.35
Reach 1	7120.06	10Y	5.74	103.97	104.87	104.64	104.89	0.001315	0.94	14.77	40.14	0.32
Reach 1	7120.06	5Y	4.42	103.97	104.80	104.47	104.83	0.001192	0.85	12.28	39.40	0.30
Reach 1	7120.06	2Y	2.76	103.97	104.69	104.34	104.71	0.001148	0.75	7.79	37.20	0.29
Reach 1	7065.2	REG	49.90	103.87	105.94	105.18	105.98	0.001247	1.60	77.00	58.73	0.36
Reach 1	7065.2	100Y	12.81	103.87	104.89	104.75	104.96	0.003447	1.64	20.93	45.54	0.53
Reach 1	7065.2	50Y	11.20	103.87	104.82	104.72	104.90	0.003914	1.66	17.93	44.33	0.56
Reach 1	7065.2	25Y	9.59	103.87	104.75	104.68	104.83	0.004702	1.72	14.67	43.05	0.60
Reach 1	7065.2	10Y	7.30	103.87	104.64	104.63	104.75	0.006325	1.81	10.03	40.27	0.68
Reach 1	7065.2	5Y	5.62	103.87	104.57	104.57	104.69	0.006678	1.74	7.40	38.43	0.69
Reach 1	7065.2	2Y	3.51	103.87	104.49	104.37	104.58	0.005580	1.45	4.35	28.90	0.62
Reach 1	6992.88	REG	49.90	103.65	105.88	104.85	105.91	0.000743	1.31	90.01	62.81	0.28
Reach 1	6992.88	100Y	12.81	103.65	104.81	104.41	104.83	0.001029	0.99	31.12	46.63	0.30
Reach 1	6992.88	50Y	11.20	103.65	104.74	104.38	104.76	0.001072	0.97	27.83	45.87	0.30
Reach 1	6992.88	25Y	9.59	103.65	104.65	104.38	104.68	0.001175	0.96	24.04	45.00	0.31
Reach 1	6992.88	10Y	7.30	103.65	104.51	104.28	104.54	0.001497	0.97	17.83	43.35	0.34
Reach 1	6992.88	5Y	5.62	103.65	104.39	104.22	104.42	0.002051	1.02	12.64	41.25	0.39
Reach 1	6992.88	2Y	3.51	103.65	104.22	104.04	104.27	0.003290	1.08	6.22	31.32	0.47
Reach 1	6932.07	REG	49.90	103.29	105.81	105.02	105.86	0.000965	1.62	68.91	52.41	0.33
Reach 1	6932.07	100Y	12.81	103.29	104.68	104.37	104.75	0.001833	1.48	19.27	34.94	0.41
Reach 1	6932.07	50Y	11.20	103.29	104.60	104.29	104.67	0.001892	1.45	16.85	30.03	0.41
Reach 1	6932.07	25Y	9.59	103.29	104.51	104.16	104.58	0.002052	1.43	14.10	28.64	0.42
Reach 1	6932.07	10Y	7.30	103.29	104.32	104.01	104.41	0.002798	1.49	9.08	25.80	0.48
Reach 1	6932.07	5Y	5.62	103.29	104.16	103.93	104.26	0.003475	1.48	5.94	14.36	0.52
Reach 1	6932.07	2Y	3.51	103.29	103.94	103.77	104.03	0.004507	1.37	3.21	8.82	0.56
Reach 1	6917.96	REG	49.90	103.17	105.71	104.85	105.83	0.001491	2.03	42.22	25.66	0.41
Reach 1	6917.96	100Y	12.81	103.17	104.67	104.18	104.71	0.001073	1.21	19.15	21.60	0.32
Reach 1	6917.96	50Y	11.20	103.17	104.60	104.11	104.64	0.001045	1.15	17.61	21.34	0.31
Reach 1	6917.96	25Y	9.59	103.17	104.50	104.01	104.54	0.001066	1.11	15.67	21.00	0.31
Reach 1	6917.96	10Y	7.30	103.17	104.32	103.87	104.36	0.001293	1.10	11.89	20.33	0.33
Reach 1	6917.96	5Y	5.62	103.17	104.15	103.76	104.21	0.001684	1.13	8.56	19.72	0.37
Reach 1	6917.96	2Y	3.51	103.17	103.92	103.62	103.97	0.002056	1.04	4.88	11.78	0.39
Reach 1	6905.96		Bridge									
Reach 1	6887.32	REG	49.90	103.04	105.06	104.90	105.34	0.004805	3.02	33.21	31.52	0.70
Reach 1	6887.32	100Y	12.81	103.04	104.59	103.96	104.65	0.001316	1.30	18.81	29.16	0.35
Reach 1	6887.32	50Y	11.20	103.04	104.52	103.95	104.58	0.001270	1.24	16.94	28.64	0.34
Reach 1	6887.32	25Y	9.59	103.04	104.43	103.88	104.49	0.001299	1.20	14.46	27.91	0.34
Reach 1	6887.32	10Y	7.30	103.04	104.25	103.76	104.31	0.001580	1.19	9.50	23.75	0.37
Reach 1	6887.32	5Y	5.62	103.04	104.09	103.67	104.15	0.001767	1.13	6.60	14.97	0.38
Reach 1	6887.32	2Y	3.51	103.04	103.87	103.53	103.91	0.001795	0.95	4.32	8.06	0.36
Reach 1	6876.94	REG	49.90	103.06	105.03	104.97	105.26	0.004974	3.07	49.34	69.08	0.71
Reach 1	6876.94	100Y	12.81	103.06	104.39	104.19	104.59	0.004296	2.17	12.28	42.72	0.62
Reach 1	6876.94	50Y	11.20	103.06	104.34	104.06	104.52	0.003946	2.03	10.50	35.36	0.59
Reach 1	6876.94	25Y	9.59	103.06	104.26	103.97	104.43	0.004096	1.97	8.02	24.43	0.59
Reach 1	6876.94	10Y	7.30	103.06	104.12	103.83	104.26	0.003911	1.76	5.55	11.99	0.56
Reach 1	6876.94	5Y	5.62	103.06	103.99	103.72	104.11	0.003854	1.59	4.41	7.35	0.55
Reach 1	6876.94	2Y	3.51	103.06	103.79	103.56	103.87	0.003791	1.33	3.08	5.98	0.52
Reach 1	6783.37	REG	49.90	102.78	104.77	104.59	104.94	0.003758	2.72	52.66	61.16	0.62
Reach 1	6783.37	100Y	12.81	102.78	104.24	103.72	104.32	0.001893	1.56	21.84	53.76	0.42

HEC-RAS Plan: Duffins_Final_Au River: Millers Creek Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	6783.37	50Y	11.20	102.78	104.17	103.65	104.26	0.002045	1.56	18.09	52.71	0.43
Reach 1	6783.37	25Y	9.59	102.78	104.09	103.58	104.17	0.001974	1.47	13.88	44.11	0.42
Reach 1	6783.37	10Y	7.30	102.78	103.95	103.47	104.02	0.001751	1.29	9.32	22.83	0.39
Reach 1	6783.37	5Y	5.62	102.78	103.83	103.38	103.88	0.001599	1.13	7.67	11.14	0.36
Reach 1	6783.37	2Y	3.51	102.78	103.63	103.24	103.66	0.001419	0.92	5.59	9.78	0.33
Reach 1	6649.24	REG	49.90	102.46	104.46	104.32	104.58	0.003566	2.59	62.74	84.81	0.60
Reach 1	6649.24	100Y	12.81	102.46	103.83	103.69	104.00	0.004535	2.23	13.99	42.62	0.63
Reach 1	6649.24	50Y	11.20	102.46	103.78	103.63	103.93	0.004075	2.06	12.32	29.80	0.59
Reach 1	6649.24	25Y	9.59	102.46	103.73	103.53	103.86	0.003630	1.89	10.94	23.50	0.56
Reach 1	6649.24	10Y	7.30	102.46	103.64	103.38	103.74	0.003089	1.66	8.95	20.83	0.51
Reach 1	6649.24	5Y	5.62	102.46	103.55	103.24	103.64	0.002577	1.43	7.34	16.03	0.46
Reach 1	6649.24	2Y	3.51	102.46	103.39	103.08	103.45	0.002208	1.18	4.80	13.80	0.41
Reach 1	6554.89	REG	49.90	102.14	104.16	103.95	104.29	0.003572	2.64	53.79	60.85	0.60
Reach 1	6554.89	100Y	12.81	102.14	103.61	103.50	103.70	0.002339	1.71	22.09	53.41	0.46
Reach 1	6554.89	50Y	11.20	102.14	103.57	103.46	103.65	0.002228	1.64	19.95	52.68	0.45
Reach 1	6554.89	25Y	9.59	102.14	103.52	103.17	103.60	0.002146	1.57	17.40	51.59	0.44
Reach 1	6554.89	10Y	7.30	102.14	103.44	103.03	103.52	0.001948	1.44	13.57	46.72	0.41
Reach 1	6554.89	5Y	5.62	102.14	103.38	102.91	103.45	0.001674	1.29	10.64	43.02	0.38
Reach 1	6554.89	2Y	3.51	102.14	103.25	102.73	103.29	0.001225	1.02	5.88	24.72	0.32
Reach 1	6475.93	REG	49.90	102.11	103.91	103.68	103.98	0.004000	2.56	65.17	87.30	0.62
Reach 1	6475.93	100Y	12.81	102.11	103.41	103.32	103.48	0.003300	1.85	25.47	69.57	0.54
Reach 1	6475.93	50Y	11.20	102.11	103.37	103.29	103.44	0.003313	1.82	22.82	67.61	0.53
Reach 1	6475.93	25Y	9.59	102.11	103.33	103.25	103.40	0.003219	1.75	20.01	61.84	0.52
Reach 1	6475.93	10Y	7.30	102.11	103.25	103.19	103.32	0.003296	1.69	15.42	57.02	0.52
Reach 1	6475.93	5Y	5.62	102.11	103.17	102.94	103.26	0.003674	1.69	11.06	48.55	0.55
Reach 1	6475.93	2Y	3.51	102.11	103.02	102.81	103.12	0.004435	1.65	4.62	26.06	0.58
Reach 1	6416.55	REG	49.90	102.01	103.60	103.45	103.70	0.006015	2.93	64.33	115.64	0.76
Reach 1	6416.55	100Y	12.81	102.01	103.20	103.07	103.26	0.003905	1.92	25.09	75.45	0.58
Reach 1	6416.55	50Y	11.20	102.01	103.17	103.06	103.23	0.003619	1.82	23.17	69.80	0.55
Reach 1	6416.55	25Y	9.59	102.01	103.14	102.97	103.20	0.003427	1.74	20.84	68.01	0.54
Reach 1	6416.55	10Y	7.30	102.01	103.04	102.82	103.11	0.003920	1.74	14.66	57.33	0.57
Reach 1	6416.55	5Y	5.62	102.01	103.00	102.74	103.05	0.002949	1.47	12.63	47.22	0.49
Reach 1	6416.55	2Y	3.51	102.01	102.85	102.59	102.90	0.002802	1.27	6.89	31.01	0.46
Reach 1	6405.4	REG	49.90	101.92	103.59	103.35	103.63	0.002413	1.93	75.87	132.53	0.48
Reach 1	6405.4	100Y	12.81	101.92	103.19	102.87	103.22	0.001916	1.42	29.77	96.01	0.41
Reach 1	6405.4	50Y	11.20	101.92	103.16	102.87	103.19	0.001798	1.36	27.36	89.64	0.40
Reach 1	6405.4	25Y	9.59	101.92	103.13	102.87	103.16	0.001678	1.29	24.59	81.54	0.38
Reach 1	6405.4	10Y	7.30	101.92	103.02	102.82	103.07	0.002412	1.44	16.61	68.19	0.45
Reach 1	6405.4	5Y	5.62	101.92	102.98	102.82	103.02	0.001834	1.23	14.35	60.73	0.39
Reach 1	6405.4	2Y	3.51	101.92	102.78	102.54	102.86	0.003780	1.52	5.45	26.51	0.54
Reach 1	6402.5		Bridge									
Reach 1	6399.67	REG	49.90	101.90	103.57	103.25	103.60	0.001862	1.73	83.67	134.58	0.43
Reach 1	6399.67	100Y	12.81	101.90	103.17	102.98	103.19	0.001109	1.11	37.21	102.82	0.32
Reach 1	6399.67	50Y	11.20	101.90	103.15	102.96	103.16	0.001019	1.05	34.65	101.07	0.30
Reach 1	6399.67	25Y	9.59	101.90	103.11	102.93	103.13	0.000955	1.00	31.49	94.75	0.29
Reach 1	6399.67	10Y	7.30	101.90	103.05	102.88	103.06	0.000940	0.96	25.52	87.05	0.29
Reach 1	6399.67	5Y	5.62	101.90	102.97	102.55	102.99	0.001119	0.99	18.77	81.14	0.31
Reach 1	6399.67	2Y	3.51	101.90	102.74	102.39	102.81	0.002849	1.35	5.86	26.34	0.47
Reach 1	6388.36	REG	49.90	101.92	103.47	103.34	103.56	0.004550	2.57	69.84	126.97	0.66
Reach 1	6388.36	100Y	12.81	101.92	103.04	103.03	103.14	0.004625	2.08	22.81	85.36	0.63
Reach 1	6388.36	50Y	11.20	101.92	103.01	103.01	103.11	0.004631	2.04	20.18	83.12	0.63
Reach 1	6388.36	25Y	9.59	101.92	102.96	102.95	103.08	0.004816	2.02	16.74	73.40	0.64
Reach 1	6388.36	10Y	7.30	101.92	102.90	102.90	103.01	0.004663	1.90	12.26	61.00	0.62
Reach 1	6388.36	5Y	5.62	101.92	102.81	102.63	102.93	0.005066	1.86	7.61	39.56	0.63
Reach 1	6388.36	2Y	3.51	101.92	102.65	102.45	102.76	0.004656	1.57	3.58	12.87	0.59
Reach 1	6344.91	REG	49.90	101.70	103.33	103.15	103.39	0.003024	2.13	85.46	152.16	0.54
Reach 1	6344.91	100Y	12.81	101.70	102.87	102.84	102.96	0.003641	1.86	23.79	86.99	0.56
Reach 1	6344.91	50Y	11.20	101.70	102.84	102.77	102.93	0.003580	1.81	21.14	77.86	0.55
Reach 1	6344.91	25Y	9.59	101.70	102.80	102.74	102.89	0.003613	1.77	18.09	75.65	0.55
Reach 1	6344.91	10Y	7.30	101.70	102.73	102.54	102.82	0.003314	1.62	13.06	68.35	0.52
Reach 1	6344.91	5Y	5.62	101.70	102.66	102.40	102.75	0.003216	1.53	8.95	55.37	0.51
Reach 1	6344.91	2Y	3.51	101.70	102.53	102.23	102.60	0.002619	1.25	4.28	16.08	0.45
Reach 1	6240.27	REG	56.77	101.39	103.04	102.82	103.11	0.004453	2.57	78.32	120.39	0.65
Reach 1	6240.27	100Y	14.58	101.39	102.64	102.50	102.68	0.002650	1.63	33.91	91.81	0.48
Reach 1	6240.27	50Y	12.74	101.39	102.60	102.49	102.64	0.002809	1.64	29.73	87.45	0.49
Reach 1	6240.27	25Y	10.91	101.39	102.56	102.46	102.60	0.002709	1.57	26.58	85.25	0.48
Reach 1	6240.27	10Y	8.30	101.39	102.49	102.35	102.53	0.002679	1.50	20.72	80.37	0.47

HEC-RAS Plan: Duffins_Final_Au River: Millers Creek Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	6240.27	5Y	6.39	101.39	102.45	102.28	102.49	0.002282	1.34	17.31	78.24	0.43
Reach 1	6240.27	2Y	4.00	101.39	102.33	102.10	102.37	0.002053	1.17	10.41	39.87	0.40
Reach 1	6086.27	REG	56.77	101.01	102.76	102.49	102.81	0.002892	2.20	88.37	121.14	0.54
Reach 1	6086.27	100Y	14.58	101.01	102.17	102.17	102.29	0.006420	2.48	22.89	86.34	0.74
Reach 1	6086.27	50Y	12.74	101.01	102.16	102.16	102.26	0.005319	2.24	22.05	85.67	0.68
Reach 1	6086.27	25Y	10.91	101.01	102.12	102.12	102.23	0.005177	2.16	19.08	81.77	0.66
Reach 1	6086.27	10Y	8.30	101.01	102.08	102.08	102.18	0.004337	1.93	15.80	78.66	0.60
Reach 1	6086.27	5Y	6.39	101.01	101.99	101.99	102.11	0.005212	1.99	9.36	56.71	0.65
Reach 1	6086.27	2Y	4.00	101.01	101.83	101.67	101.97	0.005782	1.86	4.19	20.56	0.67
Reach 1	5996.55	REG	56.77	100.95	102.60	102.07	102.63	0.001750	1.65	97.16	117.50	0.41
Reach 1	5996.55	100Y	14.58	100.95	101.97	101.76	101.99	0.001886	1.24	33.90	80.44	0.40
Reach 1	5996.55	50Y	12.74	100.95	101.92	101.73	101.95	0.001896	1.20	30.57	75.13	0.39
Reach 1	5996.55	25Y	10.91	100.95	101.88	101.71	101.90	0.001878	1.16	27.42	69.60	0.39
Reach 1	5996.55	10Y	8.30	100.95	101.81	101.67	101.83	0.001826	1.09	22.73	68.45	0.38
Reach 1	5996.55	5Y	6.39	100.95	101.75	101.64	101.78	0.001778	1.02	18.83	66.63	0.37
Reach 1	5996.55	2Y	4.00	100.95	101.66	101.56	101.69	0.001786	0.94	12.84	64.08	0.36
Reach 1	5864.7	REG	56.77	100.48	102.27	101.86	102.35	0.003549	2.50	64.93	69.16	0.60
Reach 1	5864.7	100Y	14.58	100.48	101.53	101.47	101.63	0.005890	2.26	20.34	50.47	0.71
Reach 1	5864.7	50Y	12.74	100.48	101.50	101.44	101.59	0.005518	2.14	18.75	49.12	0.68
Reach 1	5864.7	25Y	10.91	100.48	101.45	101.40	101.54	0.005633	2.09	16.44	47.48	0.68
Reach 1	5864.7	10Y	8.30	100.48	101.37	101.35	101.47	0.005979	2.03	12.80	42.83	0.69
Reach 1	5864.7	5Y	6.39	100.48	101.31	101.02	101.41	0.006195	1.96	10.06	39.75	0.69
Reach 1	5864.7	2Y	4.00	100.48	101.18	101.01	101.29	0.006808	1.84	5.78	27.74	0.71
Reach 1	5748.13	REG	56.77	99.99	102.02	101.45	102.08	0.001914	1.96	75.92	66.87	0.44
Reach 1	5748.13	100Y	14.58	99.99	101.23	100.99	101.28	0.001928	1.41	28.44	50.88	0.41
Reach 1	5748.13	50Y	12.74	99.99	101.11	100.96	101.17	0.002764	1.57	22.38	48.59	0.48
Reach 1	5748.13	25Y	10.91	99.99	101.05	100.92	101.12	0.002832	1.53	19.59	47.42	0.48
Reach 1	5748.13	10Y	8.30	99.99	100.96	100.79	101.03	0.002823	1.44	15.49	45.47	0.48
Reach 1	5748.13	5Y	6.39	99.99	100.89	100.71	100.95	0.002882	1.37	11.96	43.23	0.47
Reach 1	5748.13	2Y	4.00	99.99	100.74	100.51	100.80	0.002994	1.23	6.72	28.91	0.47
Reach 1	5683.82	REG	56.77	99.75	101.90	101.30	101.97	0.001775	1.97	75.45	63.83	0.43
Reach 1	5683.82	100Y	14.58	99.75	101.15	100.82	101.18	0.001271	1.23	31.52	51.41	0.34
Reach 1	5683.82	50Y	12.74	99.75	100.96	100.79	101.02	0.002287	1.50	22.36	47.38	0.45
Reach 1	5683.82	25Y	10.91	99.75	100.90	100.74	100.96	0.002289	1.45	19.57	45.84	0.44
Reach 1	5683.82	10Y	8.30	99.75	100.82	100.64	100.88	0.002097	1.32	15.99	44.31	0.42
Reach 1	5683.82	5Y	6.39	99.75	100.66	100.50	100.75	0.003541	1.52	9.20	35.46	0.53
Reach 1	5683.82	2Y	4.00	99.75	100.48	100.28	100.57	0.004221	1.42	4.08	20.00	0.55
Reach 1	5647.58	REG	56.77	99.75	101.84	101.14	101.91	0.001673	1.91	70.05	51.62	0.42
Reach 1	5647.58	100Y	14.58	99.75	101.12	100.62	101.14	0.000839	1.02	35.13	45.37	0.28
Reach 1	5647.58	50Y	12.74	99.75	100.91	100.59	100.95	0.001487	1.21	25.99	43.62	0.36
Reach 1	5647.58	25Y	10.91	99.75	100.86	100.49	100.89	0.001426	1.15	23.52	42.97	0.35
Reach 1	5647.58	10Y	8.30	99.75	100.79	100.27	100.81	0.001179	1.00	20.53	42.17	0.31
Reach 1	5647.58	5Y	6.39	99.75	100.59	100.22	100.64	0.002111	1.17	12.79	35.94	0.41
Reach 1	5647.58	2Y	4.00	99.75	100.39	100.11	100.43	0.002865	1.12	6.64	23.22	0.45
Reach 1	5634.51	REG	56.77	99.57	101.77	101.30	101.88	0.002291	2.26	61.35	56.43	0.49
Reach 1	5634.51	100Y	14.58	99.57	101.08	100.73	101.12	0.001266	1.29	27.35	41.43	0.34
Reach 1	5634.51	50Y	12.74	99.57	100.73	100.65	100.88	0.004690	2.07	13.68	35.63	0.63
Reach 1	5634.51	25Y	10.91	99.57	100.72	100.59	100.84	0.003655	1.82	13.26	35.17	0.56
Reach 1	5634.51	10Y	8.30	99.57	100.71	100.41	100.78	0.002227	1.41	12.92	34.79	0.43
Reach 1	5634.51	5Y	6.39	99.57	100.43	100.27	100.57	0.005183	1.76	5.30	18.96	0.63
Reach 1	5634.51	2Y	4.00	99.57	100.27	100.09	100.37	0.004853	1.47	3.52	9.26	0.59
Reach 1	5631.41		Bridge									
Reach 1	5628.39	REG	56.77	99.53	101.74	101.32	101.82	0.001669	1.95	60.71	61.37	0.42
Reach 1	5628.39	100Y	14.58	99.53	100.59	100.56	100.98	0.010408	2.96	6.32	11.10	0.93
Reach 1	5628.39	50Y	12.74	99.53	100.58	100.50	100.88	0.008194	2.60	6.19	10.03	0.82
Reach 1	5628.39	25Y	10.91	99.53	100.55	100.40	100.79	0.006706	2.31	5.91	8.79	0.74
Reach 1	5628.39	10Y	8.30	99.53	100.47	100.27	100.64	0.005225	1.93	5.26	8.19	0.65
Reach 1	5628.39	5Y	6.39	99.53	100.40	100.17	100.52	0.004171	1.63	4.69	7.63	0.57
Reach 1	5628.39	2Y	4.00	99.53	100.25	100.01	100.33	0.003348	1.28	3.61	6.67	0.49
Reach 1	5610.29	REG	56.77	99.43	101.75	100.36	101.78	0.000918	1.50	96.34	66.80	0.32
Reach 1	5610.29	100Y	14.58	99.43	100.74	100.03	100.76	0.000948	1.03	35.20	46.21	0.29
Reach 1	5610.29	50Y	12.74	99.43	100.69	99.99	100.71	0.000868	0.96	32.92	44.43	0.28
Reach 1	5610.29	25Y	10.91	99.43	100.63	99.95	100.65	0.000795	0.89	30.40	43.71	0.26
Reach 1	5610.29	10Y	8.30	99.43	100.53	99.87	100.54	0.000718	0.80	25.83	41.98	0.25
Reach 1	5610.29	5Y	6.39	99.43	100.44	99.82	100.45	0.000630	0.70	22.16	39.35	0.23
Reach 1	5610.29	2Y	4.00	99.43	100.27	99.74	100.28	0.000433	0.51	16.60	27.85	0.18

HEC-RAS Plan: Duffins_Final_Au River: Millers Creek Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	5554.38	REG	56.77	99.38	101.69	100.96	101.73	0.001177	1.69	90.99	67.76	0.36
Reach 1	5554.38	100Y	14.58	99.38	100.56	100.43	100.67	0.004403	2.06	20.43	47.74	0.62
Reach 1	5554.38	50Y	12.74	99.38	100.51	100.40	100.62	0.004368	1.99	18.22	46.42	0.61
Reach 1	5554.38	25Y	10.91	99.38	100.46	100.37	100.57	0.004240	1.90	15.95	43.94	0.60
Reach 1	5554.38	10Y	8.30	99.38	100.36	100.27	100.46	0.004190	1.77	12.04	36.21	0.58
Reach 1	5554.38	5Y	6.39	99.38	100.27	100.22	100.37	0.004440	1.70	8.86	31.98	0.59
Reach 1	5554.38	2Y	4.00	99.38	100.11	99.92	100.21	0.004819	1.55	4.45	20.34	0.59
Reach 1	5472.01	REG	56.77	98.99	101.65	100.67	101.68	0.000675	1.40	110.77	71.79	0.28
Reach 1	5472.01	100Y	14.58	98.99	100.31	100.13	100.40	0.003168	1.88	23.45	51.95	0.53
Reach 1	5472.01	50Y	12.74	98.99	100.26	100.09	100.35	0.003197	1.84	20.77	50.63	0.53
Reach 1	5472.01	25Y	10.91	98.99	100.21	100.05	100.30	0.003216	1.79	18.01	49.31	0.53
Reach 1	5472.01	10Y	8.30	98.99	100.11	99.95	100.20	0.003075	1.65	13.59	39.81	0.51
Reach 1	5472.01	5Y	6.39	98.99	100.03	99.71	100.10	0.002829	1.50	10.51	32.23	0.48
Reach 1	5472.01	2Y	4.00	98.99	99.87	99.59	99.93	0.002631	1.29	6.27	21.07	0.45
Reach 1	5399.41	REG	56.77	98.86	101.61	100.44	101.63	0.000628	1.40	111.27	71.12	0.27
Reach 1	5399.41	100Y	14.58	98.86	100.11	99.93	100.19	0.002949	1.79	23.77	48.60	0.51
Reach 1	5399.41	50Y	12.74	98.86	100.06	99.90	100.14	0.002970	1.74	21.19	47.26	0.51
Reach 1	5399.41	25Y	10.91	98.86	100.00	99.87	100.08	0.003061	1.71	18.34	46.05	0.51
Reach 1	5399.41	10Y	8.30	98.86	99.91	99.74	99.99	0.002877	1.57	14.51	41.71	0.49
Reach 1	5399.41	5Y	6.39	98.86	99.82	99.67	99.90	0.002940	1.50	11.10	38.06	0.49
Reach 1	5399.41	2Y	4.00	98.86	99.63	99.36	99.71	0.003645	1.43	5.40	22.20	0.53
Reach 1	5332.43	REG	56.77	98.65	101.58	100.27	101.60	0.000351	1.08	128.62	72.33	0.20
Reach 1	5332.43	100Y	14.58	98.65	99.96	99.79	100.03	0.002075	1.52	25.26	52.46	0.43
Reach 1	5332.43	50Y	12.74	98.65	99.91	99.73	99.97	0.002136	1.50	22.20	51.56	0.43
Reach 1	5332.43	25Y	10.91	98.65	99.82	99.62	99.90	0.002489	1.54	17.90	49.94	0.46
Reach 1	5332.43	10Y	8.30	98.65	99.76	99.44	99.83	0.002017	1.34	15.06	48.25	0.41
Reach 1	5332.43	5Y	6.39	98.65	99.70	99.29	99.75	0.001699	1.18	12.18	40.59	0.37
Reach 1	5332.43	2Y	4.00	98.65	99.47	99.14	99.52	0.002145	1.11	5.71	19.57	0.40
Reach 1	5253.22	REG	73.19	98.37	101.59	100.05	101.60	0.000008	0.17	581.28	324.82	0.03
Reach 1	5253.22	100Y	21.96	98.37	99.76	99.62	99.85	0.002948	1.87	33.99	206.67	0.52
Reach 1	5253.22	50Y	18.63	98.37	99.65	99.58	99.76	0.003810	2.00	26.86	204.76	0.58
Reach 1	5253.22	25Y	14.98	98.37	99.61	99.52	99.70	0.003004	1.74	24.68	204.05	0.51
Reach 1	5253.22	10Y	11.09	98.37	99.41	99.38	99.57	0.005413	2.06	13.27	190.07	0.67
Reach 1	5253.22	5Y	8.67	98.37	99.27	99.14	99.47	0.007553	2.19	7.77	172.59	0.77
Reach 1	5253.22	2Y	4.93	98.37	99.05	98.95	99.21	0.008018	1.84	3.55	150.02	0.75
Reach 1	5205.86	REG	73.19	97.81	101.58	99.94	101.59	0.000209	0.97	253.78	244.25	0.16
Reach 1	5205.86	100Y	21.96	97.81	99.68	99.41	99.75	0.001627	1.67	39.22	63.28	0.40
Reach 1	5205.86	50Y	18.63	97.81	99.33	99.19	99.56	0.004933	2.50	18.63	47.04	0.67
Reach 1	5205.86	25Y	14.98	97.81	99.01	99.01	99.43	0.010765	3.12	8.16	19.12	0.95
Reach 1	5205.86	10Y	11.09	97.81	98.84	98.84	99.20	0.011217	2.84	5.67	11.12	0.94
Reach 1	5205.86	5Y	8.67	97.81	98.72	98.72	99.04	0.011425	2.62	4.48	9.06	0.93
Reach 1	5205.86	2Y	4.93	97.81	98.47	98.47	98.71	0.013841	2.25	2.59	6.08	0.96
Reach 1	5199.67	REG	73.19	97.42	101.33	100.38	101.53	0.001713	2.70	57.26	175.59	0.44
Reach 1	5199.67	100Y	21.96	97.42	99.41	99.16	99.68	0.004069	2.59	14.95	16.19	0.60
Reach 1	5199.67	50Y	18.63	97.42	99.24	99.04	99.51	0.004442	2.55	12.31	15.29	0.62
Reach 1	5199.67	25Y	14.98	97.42	99.03	98.77	99.32	0.005068	2.50	9.27	14.12	0.65
Reach 1	5199.67	10Y	11.09	97.42	98.84	98.56	99.08	0.004917	2.24	6.70	10.45	0.63
Reach 1	5199.67	5Y	8.67	97.42	98.71	98.39	98.90	0.004366	1.97	5.55	7.83	0.58
Reach 1	5199.67	2Y	4.93	97.42	98.44	98.13	98.55	0.003556	1.50	3.74	5.77	0.50
Reach 1	5172.93		Culvert									
Reach 1	5151	REG	73.19	97.33	100.78	100.20	101.27	0.003493	3.71	35.18	26.01	0.65
Reach 1	5151	100Y	21.96	97.33	99.37	98.96	99.61	0.003033	2.40	14.83	13.45	0.55
Reach 1	5151	50Y	18.63	97.33	99.24	98.84	99.46	0.002894	2.24	13.12	12.89	0.53
Reach 1	5151	25Y	14.98	97.33	99.08	98.57	99.27	0.002738	2.05	11.09	12.39	0.51
Reach 1	5151	10Y	11.09	97.33	98.88	98.37	99.03	0.002514	1.80	8.72	11.78	0.48
Reach 1	5151	5Y	8.67	97.33	98.74	98.23	98.86	0.002319	1.61	7.02	11.06	0.45
Reach 1	5151	2Y	4.93	97.33	98.45	97.99	98.52	0.001793	1.20	4.81	6.42	0.38
Reach 1	5138.58	REG	73.19	97.31	100.80	100.13	101.17	0.002780	3.31	46.99	28.59	0.58
Reach 1	5138.58	100Y	21.96	97.31	99.35	98.84	99.56	0.002712	2.24	15.74	15.79	0.52
Reach 1	5138.58	50Y	18.63	97.31	99.22	98.70	99.41	0.002599	2.10	13.75	14.69	0.50
Reach 1	5138.58	25Y	14.98	97.31	99.06	98.52	99.22	0.002427	1.90	11.54	13.11	0.48
Reach 1	5138.58	10Y	11.09	97.31	98.87	98.32	98.99	0.002167	1.65	9.18	11.30	0.44
Reach 1	5138.58	5Y	8.67	97.31	98.72	98.18	98.82	0.001985	1.47	7.63	9.97	0.41
Reach 1	5138.58	2Y	4.93	97.31	98.44	97.95	98.50	0.001556	1.10	5.19	6.82	0.35
Reach 1	5112.4	REG	73.19	97.30	100.77	99.96	101.08	0.002562	3.17	52.67	32.10	0.55
Reach 1	5112.4	100Y	21.96	97.30	99.30	98.84	99.48	0.002610	2.17	18.29	17.63	0.51
Reach 1	5112.4	50Y	18.63	97.30	99.17	98.70	99.33	0.002563	2.05	15.99	16.69	0.50

HEC-RAS Plan: Duffins_Final_Au River: Millers Creek Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	5112.4	25Y	14.98	97.30	99.01	98.58	99.15	0.002506	1.89	13.35	15.54	0.48
Reach 1	5112.4	10Y	11.09	97.30	98.81	98.39	98.93	0.002396	1.69	10.43	14.16	0.46
Reach 1	5112.4	5Y	8.67	97.30	98.66	98.22	98.77	0.002306	1.54	8.45	12.56	0.44
Reach 1	5112.4	2Y	4.93	97.30	98.37	97.98	98.45	0.002136	1.24	5.16	10.06	0.41
Reach 1	5075.87	REG	73.19	97.30	100.70	99.83	100.99	0.002334	3.00	53.33	36.01	0.53
Reach 1	5075.87	100Y	21.96	97.30	99.22	98.70	99.39	0.002457	2.06	18.23	17.39	0.49
Reach 1	5075.87	50Y	18.63	97.30	99.09	98.60	99.24	0.002408	1.94	16.00	16.51	0.48
Reach 1	5075.87	25Y	14.98	97.30	98.93	98.45	99.06	0.002345	1.79	13.42	15.37	0.47
Reach 1	5075.87	10Y	11.09	97.30	98.73	98.29	98.84	0.002199	1.58	10.62	13.84	0.44
Reach 1	5075.87	5Y	8.67	97.30	98.59	98.16	98.68	0.002126	1.44	8.69	12.65	0.43
Reach 1	5075.87	2Y	4.93	97.30	98.31	97.92	98.37	0.001968	1.15	5.47	10.10	0.39
Reach 1	5013.03	REG	73.19	97.28	100.47	99.77	100.82	0.002995	3.32	50.11	41.74	0.60
Reach 1	5013.03	100Y	21.96	97.28	98.80	98.64	99.14	0.006270	2.88	12.45	14.42	0.76
Reach 1	5013.03	50Y	18.63	97.28	98.64	98.52	98.98	0.007177	2.85	10.21	13.17	0.80
Reach 1	5013.03	25Y	14.98	97.28	98.44	98.37	98.79	0.008575	2.79	7.84	11.35	0.85
Reach 1	5013.03	10Y	11.09	97.28	98.21	98.21	98.55	0.011467	2.75	5.42	9.30	0.94
Reach 1	5013.03	5Y	8.67	97.28	98.09	98.09	98.39	0.012221	2.57	4.33	8.48	0.95
Reach 1	5013.03	2Y	4.93	97.28	97.87	97.87	98.09	0.013762	2.16	2.67	6.88	0.95
Reach 1	4937.51	REG	73.19	96.46	100.31	99.24	100.63	0.001997	2.98	49.64	32.73	0.50
Reach 1	4937.51	100Y	21.96	96.46	98.70	97.95	98.86	0.001728	1.89	18.22	14.36	0.42
Reach 1	4937.51	50Y	18.63	96.46	98.55	97.82	98.69	0.001668	1.77	16.10	13.59	0.41
Reach 1	4937.51	25Y	14.98	96.46	98.37	97.66	98.48	0.001591	1.61	13.66	12.66	0.39
Reach 1	4937.51	10Y	11.09	96.46	98.14	97.49	98.23	0.001486	1.42	10.92	11.43	0.37
Reach 1	4937.51	5Y	8.67	96.46	97.98	97.36	98.05	0.001395	1.27	9.13	10.54	0.35
Reach 1	4937.51	2Y	4.93	96.46	97.67	97.13	97.72	0.001163	0.98	6.17	8.62	0.31
Reach 1	4870.05	REG	73.19	96.47	100.29	98.91	100.48	0.001331	2.51	75.28	86.23	0.41
Reach 1	4870.05	100Y	21.96	96.47	98.64	97.78	98.74	0.001265	1.67	23.85	18.32	0.37
Reach 1	4870.05	50Y	18.63	96.47	98.49	97.68	98.58	0.001224	1.56	21.12	17.35	0.35
Reach 1	4870.05	25Y	14.98	96.47	98.30	97.55	98.38	0.001166	1.42	18.03	16.14	0.34
Reach 1	4870.05	10Y	11.09	96.47	98.07	97.38	98.14	0.001097	1.26	14.48	14.91	0.32
Reach 1	4870.05	5Y	8.67	96.47	97.91	97.24	97.96	0.001037	1.14	12.13	14.03	0.31
Reach 1	4870.05	2Y	4.93	96.47	97.61	97.03	97.65	0.000868	0.89	8.18	12.25	0.27
Reach 1	4850.56	REG	73.19	96.48	100.10	99.26	100.43	0.003394	3.71	55.75	56.02	0.63
Reach 1	4850.56	100Y	21.96	96.48	98.43	98.11	98.68	0.004778	2.86	16.09	15.58	0.67
Reach 1	4850.56	50Y	18.63	96.48	98.28	97.99	98.52	0.004907	2.74	13.85	14.44	0.67
Reach 1	4850.56	25Y	14.98	96.48	98.10	97.85	98.32	0.005090	2.59	11.37	13.16	0.67
Reach 1	4850.56	10Y	11.09	96.48	97.88	97.68	98.08	0.005368	2.39	8.65	11.62	0.67
Reach 1	4850.56	5Y	8.67	96.48	97.72	97.56	97.91	0.005536	2.24	6.95	10.60	0.67
Reach 1	4850.56	2Y	4.93	96.48	97.46	97.27	97.60	0.005214	1.82	4.41	8.78	0.62
Reach 1	4846.7	REG	73.19	96.42	100.10	99.25	100.40	0.002904	3.54	56.99	53.69	0.60
Reach 1	4846.7	100Y	21.96	96.42	98.41	98.07	98.66	0.004203	2.79	16.48	15.58	0.65
Reach 1	4846.7	50Y	18.63	96.42	98.26	97.94	98.50	0.004278	2.67	14.23	14.54	0.64
Reach 1	4846.7	25Y	14.98	96.42	98.08	97.79	98.30	0.004362	2.51	11.72	13.30	0.64
Reach 1	4846.7	10Y	11.09	96.42	97.87	97.59	98.06	0.004403	2.28	9.02	11.63	0.63
Reach 1	4846.7	5Y	8.67	96.42	97.72	97.42	97.88	0.004301	2.09	7.38	10.50	0.61
Reach 1	4846.7	2Y	4.93	96.42	97.46	97.17	97.57	0.003464	1.61	4.98	8.38	0.52
Reach 1	4841.84		Bridge									
Reach 1	4836.96	REG	73.19	96.53	100.08	99.14	100.34	0.002770	3.42	58.61	56.12	0.58
Reach 1	4836.96	100Y	21.96	96.53	98.36	97.99	98.59	0.004551	2.79	16.69	15.67	0.67
Reach 1	4836.96	50Y	18.63	96.53	98.21	97.88	98.43	0.004728	2.67	14.38	14.59	0.67
Reach 1	4836.96	25Y	14.98	96.53	98.02	97.76	98.23	0.004990	2.53	11.80	13.29	0.68
Reach 1	4836.96	10Y	11.09	96.53	97.80	97.60	97.99	0.005411	2.35	8.98	11.84	0.68
Reach 1	4836.96	5Y	8.67	96.53	97.63	97.49	97.81	0.006022	2.25	7.10	11.08	0.70
Reach 1	4836.96	2Y	4.93	96.53	97.32	97.28	97.50	0.008365	2.10	3.91	9.42	0.78
Reach 1	4818.58	REG	73.19	96.29	100.04	98.92	100.29	0.002505	3.33	61.23	58.89	0.55
Reach 1	4818.58	100Y	21.96	96.29	98.32	97.82	98.49	0.003078	2.43	19.94	17.07	0.55
Reach 1	4818.58	50Y	18.63	96.29	98.17	97.73	98.33	0.003152	2.32	17.35	16.17	0.55
Reach 1	4818.58	25Y	14.98	96.29	97.98	97.60	98.13	0.003271	2.20	14.38	15.05	0.55
Reach 1	4818.58	10Y	11.09	96.29	97.74	97.44	97.88	0.003516	2.05	10.99	13.72	0.56
Reach 1	4818.58	5Y	8.67	96.29	97.57	97.32	97.70	0.003834	1.96	8.70	12.74	0.57
Reach 1	4818.58	2Y	4.93	96.29	97.23	97.06	97.36	0.005064	1.80	4.76	10.35	0.62
Reach 1	4764.56	REG	73.19	95.93	99.92	98.82	100.17	0.001829	2.96	65.48	47.69	0.48
Reach 1	4764.56	100Y	21.96	95.93	98.17	97.57	98.35	0.002199	2.18	18.82	17.00	0.48
Reach 1	4764.56	50Y	18.63	95.93	98.02	97.44	98.19	0.002145	2.05	16.40	15.83	0.47
Reach 1	4764.56	25Y	14.98	95.93	97.84	97.26	97.99	0.002068	1.89	13.67	14.42	0.45
Reach 1	4764.56	10Y	11.09	95.93	97.61	97.03	97.74	0.001972	1.68	10.59	12.65	0.43
Reach 1	4764.56	5Y	8.67	95.93	97.45	96.88	97.55	0.001877	1.53	8.62	11.26	0.41

HEC-RAS Plan: Duffins_Final_Au River: Millers Creek Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	4764.56	2Y	4.93	95.93	97.13	96.63	97.20	0.001616	1.19	5.50	8.26	0.37
Reach 1	4673.95	REG	73.19	95.91	99.80	98.61	100.00	0.001601	2.72	67.40	43.95	0.45
Reach 1	4673.95	100Y	21.96	95.91	97.93	97.42	98.13	0.002806	2.29	18.11	17.63	0.53
Reach 1	4673.95	50Y	18.63	95.91	97.78	97.31	97.96	0.002868	2.18	15.51	16.33	0.53
Reach 1	4673.95	25Y	14.98	95.91	97.60	97.15	97.77	0.002898	2.04	12.71	14.68	0.52
Reach 1	4673.95	10Y	11.09	95.91	97.38	96.98	97.52	0.002847	1.83	9.77	12.45	0.50
Reach 1	4673.95	5Y	8.67	95.91	97.23	96.85	97.35	0.002797	1.68	7.93	11.08	0.49
Reach 1	4673.95	2Y	4.93	95.91	96.93	96.60	97.01	0.002690	1.36	4.97	8.81	0.46
Reach 1	4586.71	REG	73.19	95.84	99.64	98.46	99.86	0.001534	2.68	62.33	36.55	0.44
Reach 1	4586.71	100Y	21.96	95.84	97.63	97.21	97.86	0.003253	2.35	15.18	15.04	0.57
Reach 1	4586.71	50Y	18.63	95.84	97.47	97.09	97.69	0.003380	2.25	12.92	13.75	0.57
Reach 1	4586.71	25Y	14.98	95.84	97.29	96.93	97.48	0.003545	2.12	10.48	12.39	0.57
Reach 1	4586.71	10Y	11.09	95.84	97.07	96.74	97.24	0.003726	1.93	7.91	10.74	0.57
Reach 1	4586.71	5Y	8.67	95.84	96.91	96.61	97.06	0.003826	1.78	6.35	9.49	0.56
Reach 1	4586.71	2Y	4.93	95.84	96.62	96.39	96.72	0.004082	1.47	3.94	7.01	0.55
Reach 1	4484.43	REG	73.19	95.39	99.51	97.96	99.72	0.001255	2.56	69.99	44.49	0.41
Reach 1	4484.43	100Y	21.96	95.39	97.44	96.74	97.59	0.001882	1.95	19.60	16.26	0.44
Reach 1	4484.43	50Y	18.63	95.39	97.28	96.63	97.41	0.001896	1.84	17.02	15.16	0.44
Reach 1	4484.43	25Y	14.98	95.39	97.08	96.48	97.20	0.001898	1.71	14.20	13.94	0.43
Reach 1	4484.43	10Y	11.09	95.39	96.86	96.31	96.95	0.001848	1.53	11.20	12.54	0.41
Reach 1	4484.43	5Y	8.67	95.39	96.70	96.19	96.78	0.001763	1.38	9.33	11.64	0.39
Reach 1	4484.43	2Y	4.93	95.39	96.42	95.96	96.47	0.001500	1.07	6.29	9.79	0.35
Reach 1	4475.9	REG	73.19	95.36	99.51	97.87	99.69	0.001436	2.70	77.52	58.44	0.43
Reach 1	4475.9	100Y	21.96	95.36	97.43	96.85	97.57	0.002278	2.10	20.37	18.05	0.48
Reach 1	4475.9	50Y	18.63	95.36	97.26	96.76	97.39	0.002371	2.02	17.84	17.05	0.48
Reach 1	4475.9	25Y	14.98	95.36	97.06	96.63	97.18	0.002531	1.93	14.85	15.88	0.49
Reach 1	4475.9	10Y	11.09	95.36	96.81	96.47	96.93	0.002848	1.83	11.34	14.45	0.50
Reach 1	4475.9	5Y	8.67	95.36	96.64	96.36	96.76	0.003148	1.75	8.99	13.35	0.52
Reach 1	4475.9	2Y	4.93	95.36	96.34	96.09	96.44	0.003477	1.52	5.31	11.20	0.52
Reach 1	4461.05		Culvert									
Reach 1	4448.25	REG	93.52	95.37	98.82	98.08	99.18	0.003227	3.67	60.16	30.42	0.63
Reach 1	4448.25	100Y	28.06	95.37	97.26	96.89	97.51	0.003954	2.70	18.06	19.09	0.63
Reach 1	4448.25	50Y	23.81	95.37	97.12	96.78	97.34	0.003931	2.55	16.21	18.46	0.62
Reach 1	4448.25	25Y	19.14	95.37	96.94	96.65	97.14	0.003965	2.38	13.91	17.71	0.61
Reach 1	4448.25	10Y	14.17	95.37	96.71	96.50	96.90	0.004154	2.19	11.06	16.76	0.61
Reach 1	4448.25	5Y	11.08	95.37	96.56	96.39	96.73	0.004341	2.06	9.06	16.10	0.61
Reach 1	4448.25	2Y	6.31	95.37	96.27	96.05	96.42	0.004863	1.80	5.39	14.17	0.62
Reach 1	4426.97	REG	93.52	95.23	98.84	97.58	99.06	0.001800	2.78	74.43	43.63	0.47
Reach 1	4426.97	100Y	28.06	95.23	97.28	96.55	97.39	0.001639	1.79	29.65	22.55	0.41
Reach 1	4426.97	50Y	23.81	95.23	97.13	96.46	97.23	0.001625	1.69	26.30	21.76	0.40
Reach 1	4426.97	25Y	19.14	95.23	96.95	96.35	97.03	0.001619	1.56	22.34	20.77	0.39
Reach 1	4426.97	10Y	14.17	95.23	96.72	96.21	96.79	0.001635	1.42	17.73	19.46	0.39
Reach 1	4426.97	5Y	11.08	95.23	96.56	96.11	96.62	0.001634	1.31	14.69	18.52	0.38
Reach 1	4426.97	2Y	6.31	95.23	96.26	95.91	96.31	0.001607	1.08	9.53	16.85	0.36
Reach 1	4351.51	REG	93.52	95.23	98.37	97.76	98.84	0.003969	3.78	52.48	35.45	0.69
Reach 1	4351.51	100Y	28.06	95.23	96.95	96.57	97.19	0.004002	2.51	18.88	17.68	0.62
Reach 1	4351.51	50Y	23.81	95.23	96.81	96.45	97.03	0.004061	2.38	16.46	16.71	0.62
Reach 1	4351.51	25Y	19.14	95.23	96.63	96.32	96.83	0.004216	2.24	13.62	15.45	0.62
Reach 1	4351.51	10Y	14.17	95.23	96.41	96.16	96.59	0.004591	2.06	10.36	13.67	0.63
Reach 1	4351.51	5Y	11.08	95.23	96.25	96.04	96.41	0.004960	1.94	8.30	12.62	0.63
Reach 1	4351.51	2Y	6.31	95.23	95.96	95.83	96.09	0.006228	1.70	4.90	10.62	0.67
Reach 1	4274.56	REG	93.52	94.59	98.19	97.46	98.55	0.002893	3.40	61.45	47.12	0.59
Reach 1	4274.56	100Y	28.06	94.59	96.72	96.19	96.93	0.002771	2.28	21.34	18.97	0.52
Reach 1	4274.56	50Y	23.81	94.59	96.59	96.07	96.77	0.002679	2.14	18.82	17.90	0.51
Reach 1	4274.56	25Y	19.14	94.59	96.41	95.92	96.57	0.002640	1.98	15.73	16.59	0.50
Reach 1	4274.56	10Y	14.17	94.59	96.17	95.74	96.31	0.002680	1.80	12.04	14.42	0.49
Reach 1	4274.56	5Y	11.08	94.59	96.01	95.62	96.13	0.002617	1.64	9.86	12.96	0.47
Reach 1	4274.56	2Y	6.31	94.59	95.71	95.36	95.79	0.002468	1.32	6.30	10.72	0.44
Reach 1	4264.59	REG	93.52	94.55	98.18	97.44	98.51	0.002682	3.32	61.43	45.59	0.57
Reach 1	4264.59	100Y	28.06	94.55	96.69	96.18	96.90	0.002772	2.32	21.60	19.74	0.53
Reach 1	4264.59	50Y	23.81	94.55	96.55	96.06	96.74	0.002681	2.18	18.98	18.58	0.51
Reach 1	4264.59	25Y	19.14	94.55	96.38	95.90	96.54	0.002560	1.99	15.95	16.82	0.49
Reach 1	4264.59	10Y	14.17	94.55	96.14	95.71	96.28	0.002580	1.81	12.21	14.76	0.48
Reach 1	4264.59	5Y	11.08	94.55	95.98	95.57	96.10	0.002514	1.65	9.95	13.44	0.47
Reach 1	4264.59	2Y	6.31	94.55	95.69	95.30	95.77	0.002246	1.31	6.35	10.66	0.42
Reach 1	4259.89		Bridge									

HEC-RAS Plan: Duffins_Final_Au River: Millers Creek Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	4255.29	REG	93.52	94.51	98.05	97.41	98.46	0.003089	3.53	56.24	43.96	0.61
Reach 1	4255.29	100Y	28.06	94.51	96.63	96.10	96.86	0.002779	2.33	19.74	17.60	0.53
Reach 1	4255.29	50Y	23.81	94.51	96.50	95.97	96.70	0.002662	2.18	17.38	16.30	0.51
Reach 1	4255.29	25Y	19.14	94.51	96.32	95.82	96.49	0.002557	1.99	14.61	14.83	0.49
Reach 1	4255.29	10Y	14.17	94.51	96.07	95.62	96.22	0.002608	1.81	11.17	12.91	0.49
Reach 1	4255.29	5Y	11.08	94.51	95.90	95.47	96.03	0.002563	1.65	9.12	11.71	0.47
Reach 1	4255.29	2Y	6.31	94.51	95.60	95.22	95.68	0.002349	1.31	5.88	9.46	0.43
Reach 1	4236.16	REG	93.52	94.43	98.11	97.36	98.31	0.001985	2.83	79.76	61.74	0.48
Reach 1	4236.16	100Y	28.06	94.43	96.59	96.12	96.79	0.003120	2.42	23.68	24.66	0.55
Reach 1	4236.16	50Y	23.81	94.43	96.44	96.01	96.64	0.003105	2.29	20.32	22.18	0.54
Reach 1	4236.16	25Y	19.14	94.43	96.26	95.87	96.43	0.003179	2.16	16.42	19.36	0.54
Reach 1	4236.16	10Y	14.17	94.43	95.97	95.69	96.15	0.003797	2.07	11.52	15.53	0.57
Reach 1	4236.16	5Y	11.08	94.43	95.78	95.56	95.95	0.004399	2.01	8.67	13.60	0.60
Reach 1	4236.16	2Y	6.31	94.43	95.42	95.26	95.58	0.006407	1.88	4.32	10.72	0.68
Reach 1	4142.31	REG	93.52	93.88	97.95	96.97	98.14	0.001751	2.95	85.56	69.09	0.47
Reach 1	4142.31	100Y	28.06	93.88	96.38	95.65	96.55	0.002122	2.32	27.76	25.87	0.48
Reach 1	4142.31	50Y	23.81	93.88	96.23	95.54	96.39	0.002092	2.21	24.09	24.34	0.47
Reach 1	4142.31	25Y	19.14	93.88	96.05	95.37	96.19	0.001994	2.04	19.88	20.76	0.45
Reach 1	4142.31	10Y	14.17	93.88	95.77	95.17	95.89	0.001896	1.81	15.07	15.09	0.43
Reach 1	4142.31	5Y	11.08	93.88	95.57	95.01	95.67	0.001869	1.66	12.24	13.38	0.42
Reach 1	4142.31	2Y	6.31	93.88	95.19	94.70	95.27	0.001834	1.37	7.62	10.78	0.40
Reach 1	4007.03	REG	93.52	93.64	97.76	96.67	97.91	0.001440	2.75	94.73	59.36	0.44
Reach 1	4007.03	100Y	28.06	93.64	96.12	95.41	96.27	0.001860	2.22	30.39	29.89	0.45
Reach 1	4007.03	50Y	23.81	93.64	95.97	95.27	96.12	0.001891	2.15	25.97	28.70	0.45
Reach 1	4007.03	25Y	19.14	93.64	95.77	95.10	95.92	0.001990	2.07	20.42	26.72	0.46
Reach 1	4007.03	10Y	14.17	93.64	95.51	94.87	95.63	0.001887	1.84	14.79	15.25	0.44
Reach 1	4007.03	5Y	11.08	93.64	95.33	94.72	95.43	0.001752	1.65	12.22	13.21	0.41
Reach 1	4007.03	2Y	6.31	93.64	94.97	94.40	95.04	0.001509	1.30	8.00	10.48	0.37
Reach 1	3896.94	REG	93.52	93.64	97.68	96.43	97.77	0.000928	2.19	126.30	82.08	0.35
Reach 1	3896.94	100Y	28.06	93.64	95.62	95.24	95.95	0.004908	3.10	22.24	32.77	0.71
Reach 1	3896.94	50Y	23.81	93.64	95.49	95.17	95.79	0.004898	2.95	18.41	25.67	0.70
Reach 1	3896.94	25Y	19.14	93.64	95.33	95.01	95.59	0.004677	2.71	14.80	19.95	0.68
Reach 1	3896.94	10Y	14.17	93.64	95.13	94.84	95.33	0.004118	2.33	11.47	14.47	0.62
Reach 1	3896.94	5Y	11.08	93.64	94.98	94.70	95.15	0.003815	2.09	9.51	12.67	0.59
Reach 1	3896.94	2Y	6.31	93.64	94.62	94.43	94.76	0.004542	1.84	5.46	9.81	0.61
Reach 1	3799.75	REG	93.52	93.18	97.58	95.97	97.68	0.000838	2.17	119.78	70.96	0.33
Reach 1	3799.75	100Y	28.06	93.18	94.82	94.82	95.32	0.008522	3.51	13.94	16.66	0.90
Reach 1	3799.75	50Y	23.81	93.18	94.70	94.70	95.16	0.008670	3.34	11.93	15.41	0.89
Reach 1	3799.75	25Y	19.14	93.18	94.54	94.54	94.97	0.008986	3.15	9.63	13.92	0.89
Reach 1	3799.75	10Y	14.17	93.18	94.34	94.34	94.73	0.009811	2.93	7.00	11.77	0.90
Reach 1	3799.75	5Y	11.08	93.18	94.17	94.17	94.54	0.011256	2.81	5.23	9.48	0.94
Reach 1	3799.75	2Y	6.31	93.18	93.99	93.89	94.19	0.007852	2.03	3.78	6.88	0.76
Reach 1	3783.55	REG	93.52	92.99	97.57	95.54	97.66	0.000665	2.00	106.83	78.39	0.30
Reach 1	3783.55	100Y	28.06	92.99	94.30	94.51	95.04	0.020047	4.61	9.23	16.26	1.33
Reach 1	3783.55	50Y	23.81	92.99	94.22	94.42	94.89	0.019659	4.36	8.23	15.39	1.30
Reach 1	3783.55	25Y	19.14	92.99	94.12	94.28	94.72	0.018810	4.02	7.12	14.56	1.25
Reach 1	3783.55	10Y	14.17	92.99	94.02	94.15	94.50	0.016803	3.54	5.93	13.81	1.16
Reach 1	3783.55	5Y	11.08	92.99	93.96	94.05	94.33	0.014041	3.10	5.25	13.36	1.05
Reach 1	3783.55	2Y	6.31	92.99	93.75	93.75	94.01	0.012711	2.47	3.31	7.22	0.96
Reach 1	3768.1		Culvert									
Reach 1	3752.74	REG	93.52	92.66	96.78	95.25	97.03	0.002098	3.25	75.07	35.70	0.52
Reach 1	3752.74	100Y	28.06	92.66	94.08	94.08	94.57	0.013701	3.95	13.18	15.09	1.10
Reach 1	3752.74	50Y	23.81	92.66	93.98	93.98	94.42	0.013819	3.74	11.73	14.67	1.09
Reach 1	3752.74	25Y	19.14	92.66	93.85	93.85	94.24	0.013887	3.48	10.06	14.14	1.07
Reach 1	3752.74	10Y	14.17	92.66	93.70	93.70	94.02	0.013696	3.13	8.19	13.52	1.04
Reach 1	3752.74	5Y	11.08	92.66	93.59	93.59	93.87	0.013904	2.90	6.84	13.02	1.02
Reach 1	3752.74	2Y	6.31	92.66	93.39	93.39	93.60	0.013281	2.36	4.61	11.66	0.96
Reach 1	3737.02	REG	93.52	92.21	96.83	94.75	96.95	0.000738	2.14	116.09	58.25	0.32
Reach 1	3737.02	100Y	28.06	92.21	94.65	93.64	94.75	0.001052	1.67	32.41	22.35	0.34
Reach 1	3737.02	50Y	23.81	92.21	94.44	93.52	94.53	0.001111	1.61	27.71	20.90	0.35
Reach 1	3737.02	25Y	19.14	92.21	94.17	93.35	94.26	0.001210	1.54	22.37	19.19	0.35
Reach 1	3737.02	10Y	14.17	92.21	93.84	93.18	93.92	0.001408	1.47	16.38	16.92	0.37
Reach 1	3737.02	5Y	11.08	92.21	93.60	93.03	93.69	0.001609	1.42	12.61	15.27	0.39
Reach 1	3737.02	2Y	6.31	92.21	93.21	92.79	93.28	0.001849	1.21	7.36	11.28	0.39
Reach 1	3628.23	REG	93.52	91.98	96.64	94.86	96.85	0.001016	2.48	79.20	31.48	0.37
Reach 1	3628.23	100Y	28.06	91.98	94.50	93.43	94.63	0.001190	1.76	26.18	17.69	0.36

HEC-RAS Plan: Duffins_Final_Au River: Millers Creek Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	3628.23	50Y	23.81	91.98	94.28	93.30	94.40	0.001232	1.69	22.46	16.41	0.36
Reach 1	3628.23	25Y	19.14	91.98	94.01	93.15	94.12	0.001299	1.59	18.27	14.74	0.36
Reach 1	3628.23	10Y	14.17	91.98	93.67	92.96	93.77	0.001460	1.48	13.57	12.66	0.37
Reach 1	3628.23	5Y	11.08	91.98	93.42	92.83	93.51	0.001647	1.41	10.60	11.15	0.38
Reach 1	3628.23	2Y	6.31	91.98	93.00	92.59	93.07	0.002030	1.22	6.33	9.06	0.40
Reach 1	3615.15	REG	93.52	91.86	96.64	94.45	96.83	0.001086	2.62	72.51	20.71	0.39
Reach 1	3615.15	100Y	28.06	91.86	94.51	93.31	94.59	0.000960	1.65	33.57	17.17	0.33
Reach 1	3615.15	50Y	23.81	91.86	94.29	93.20	94.36	0.000966	1.56	29.85	16.80	0.32
Reach 1	3615.15	25Y	19.14	91.86	94.02	93.08	94.09	0.000992	1.46	25.37	16.32	0.32
Reach 1	3615.15	10Y	14.17	91.86	93.67	92.94	93.73	0.001097	1.36	19.81	15.70	0.33
Reach 1	3615.15	5Y	11.08	91.86	93.42	92.84	93.48	0.001252	1.31	15.87	15.24	0.34
Reach 1	3615.15	2Y	6.31	91.86	92.98	92.57	93.03	0.001673	1.21	9.41	14.24	0.37
Reach 1	3602.63		Culvert									
Reach 1	3591.25	REG	93.52	91.87	96.43	94.39	96.60	0.001184	2.69	73.00	22.75	0.40
Reach 1	3591.25	100Y	28.06	91.87	94.49	93.29	94.56	0.000976	1.68	35.71	18.85	0.33
Reach 1	3591.25	50Y	23.81	91.87	94.27	93.19	94.34	0.000986	1.59	31.68	18.39	0.33
Reach 1	3591.25	25Y	19.14	91.87	94.00	93.07	94.06	0.001019	1.49	26.83	17.80	0.33
Reach 1	3591.25	10Y	14.17	91.87	93.66	92.90	93.71	0.001141	1.40	20.83	17.04	0.34
Reach 1	3591.25	5Y	11.08	91.87	93.41	92.79	93.46	0.001312	1.36	16.61	16.38	0.35
Reach 1	3591.25	2Y	6.31	91.87	92.97	92.59	93.02	0.001783	1.26	9.79	14.87	0.39
Reach 1	3578.33	REG	93.52	91.79	95.37	95.37	96.33	0.006901	5.47	38.44	21.68	0.93
Reach 1	3578.33	100Y	28.06	91.79	93.68	93.68	94.35	0.009071	4.06	11.59	10.50	0.96
Reach 1	3578.33	50Y	23.81	91.79	93.51	93.51	94.14	0.009415	3.88	9.91	9.60	0.96
Reach 1	3578.33	25Y	19.14	91.79	93.30	93.30	93.88	0.010223	3.68	7.96	8.42	0.98
Reach 1	3578.33	10Y	14.17	91.79	93.08	93.05	93.55	0.010272	3.31	6.22	7.33	0.95
Reach 1	3578.33	5Y	11.08	91.79	92.96	92.89	93.33	0.008942	2.89	5.40	6.79	0.87
Reach 1	3578.33	2Y	6.31	91.79	92.72	92.58	92.93	0.006873	2.16	3.89	5.98	0.74
Reach 1	3549.6	REG	93.52	91.83	94.70	94.95	96.08	0.007716	5.61	26.52	16.58	1.07
Reach 1	3549.6	100Y	28.06	91.83	93.17	93.35	94.03	0.012203	4.17	7.84	8.54	1.18
Reach 1	3549.6	50Y	23.81	91.83	93.06	93.21	93.82	0.012120	3.91	6.91	8.09	1.16
Reach 1	3549.6	25Y	19.14	91.83	92.94	93.04	93.57	0.011416	3.53	5.97	7.50	1.11
Reach 1	3549.6	10Y	14.17	91.83	92.85	92.83	93.27	0.008575	2.88	5.31	7.03	0.94
Reach 1	3549.6	5Y	11.08	91.83	92.70	92.68	93.07	0.009479	2.70	4.30	6.30	0.96
Reach 1	3549.6	2Y	6.31	91.83	92.48	92.44	92.71	0.008801	2.11	3.03	5.60	0.88
Reach 1	3527.5	REG	93.52	91.51	94.90	94.56	95.60	0.005028	4.42	41.06	22.66	0.78
Reach 1	3527.5	100Y	28.06	91.51	93.36	93.19	93.77	0.005551	3.06	13.92	13.21	0.73
Reach 1	3527.5	50Y	23.81	91.51	93.18	93.05	93.58	0.005980	2.97	11.71	12.60	0.75
Reach 1	3527.5	25Y	19.14	91.51	92.97	92.72	93.36	0.006823	2.88	9.09	11.78	0.78
Reach 1	3527.5	10Y	14.17	91.51	92.72	92.59	93.07	0.007613	2.67	6.47	7.89	0.80
Reach 1	3527.5	5Y	11.08	91.51	92.55	92.44	92.85	0.008360	2.50	5.17	6.82	0.81
Reach 1	3527.5	2Y	6.31	91.51	92.18	92.18	92.46	0.014370	2.37	2.87	5.71	0.98
Reach 1	3494.57	REG	93.52	90.90	94.89	94.24	95.42	0.003502	4.08	50.24	24.22	0.66
Reach 1	3494.57	100Y	28.06	90.90	93.33	92.84	93.60	0.002854	2.61	19.32	15.77	0.55
Reach 1	3494.57	50Y	23.81	90.90	93.16	92.67	93.41	0.002818	2.47	16.74	14.75	0.54
Reach 1	3494.57	25Y	19.14	90.90	92.95	92.48	93.17	0.002787	2.29	13.78	13.52	0.52
Reach 1	3494.57	10Y	14.17	90.90	92.69	92.17	92.88	0.002775	2.08	10.42	11.98	0.51
Reach 1	3494.57	5Y	11.08	90.90	92.49	91.99	92.66	0.002762	1.91	8.23	10.60	0.50
Reach 1	3494.57	2Y	6.31	90.90	92.11	91.69	92.23	0.002614	1.53	5.00	6.35	0.46
Reach 1	3423.04	REG	93.52	90.54	94.75	93.84	95.18	0.002499	3.58	55.08	24.60	0.57
Reach 1	3423.04	100Y	28.06	90.54	93.26	92.36	93.42	0.001522	2.06	24.20	16.76	0.41
Reach 1	3423.04	50Y	23.81	90.54	93.09	92.19	93.24	0.001435	1.92	21.51	15.89	0.39
Reach 1	3423.04	25Y	19.14	90.54	92.89	91.98	93.01	0.001329	1.74	18.36	14.80	0.37
Reach 1	3423.04	10Y	14.17	90.54	92.63	91.76	92.73	0.001201	1.52	14.71	13.42	0.35
Reach 1	3423.04	5Y	11.08	90.54	92.44	91.59	92.52	0.001105	1.36	12.25	12.35	0.33
Reach 1	3423.04	2Y	6.31	90.54	92.05	91.31	92.11	0.000910	1.05	8.02	9.52	0.29
Reach 1	3348.59	REG	93.52	90.48	94.46	93.89	94.94	0.004131	4.49	55.39	28.33	0.72
Reach 1	3348.59	100Y	28.06	90.48	93.01	92.53	93.26	0.003122	2.86	22.29	17.69	0.58
Reach 1	3348.59	50Y	23.81	90.48	92.85	92.39	93.08	0.003039	2.70	19.58	16.68	0.57
Reach 1	3348.59	25Y	19.14	90.48	92.66	92.22	92.86	0.002918	2.50	16.47	15.36	0.55
Reach 1	3348.59	10Y	14.17	90.48	92.41	91.97	92.59	0.002749	2.23	12.97	13.74	0.52
Reach 1	3348.59	5Y	11.08	90.48	92.24	91.68	92.39	0.002616	2.04	10.63	12.57	0.50
Reach 1	3348.59	2Y	6.31	90.48	91.89	91.38	92.00	0.002229	1.62	6.76	9.50	0.45
Reach 1	3296.3	REG	93.52	90.41	94.27	93.70	94.72	0.003830	4.12	56.69	31.13	0.68
Reach 1	3296.3	100Y	28.06	90.41	92.87	92.37	93.10	0.002862	2.60	22.40	18.75	0.54
Reach 1	3296.3	50Y	23.81	90.41	92.71	92.21	92.92	0.002780	2.45	19.62	17.55	0.53
Reach 1	3296.3	25Y	19.14	90.41	92.52	92.04	92.71	0.002683	2.27	16.42	16.19	0.51
Reach 1	3296.3	10Y	14.17	90.41	92.29	91.78	92.45	0.002539	2.03	12.82	14.45	0.49

HEC-RAS Plan: Duffins_Final_Au River: Millers Creek Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	3296.3	5Y	11.08	90.41	92.12	91.64	92.26	0.002372	1.83	10.51	12.94	0.46
Reach 1	3296.3	2Y	6.31	90.41	91.80	91.30	91.89	0.001928	1.42	6.80	9.97	0.40
Reach 1	3211.49	REG	93.52	90.66	94.23	93.46	94.43	0.001833	2.82	91.23	88.33	0.48
Reach 1	3211.49	100Y	28.06	90.66	92.51	92.18	92.80	0.004235	2.74	17.81	16.74	0.65
Reach 1	3211.49	50Y	23.81	90.66	92.36	92.04	92.63	0.004331	2.61	15.35	15.63	0.65
Reach 1	3211.49	25Y	19.14	90.66	92.17	91.89	92.42	0.004464	2.45	12.60	14.17	0.65
Reach 1	3211.49	10Y	14.17	90.66	91.94	91.70	92.16	0.004673	2.24	9.59	12.31	0.64
Reach 1	3211.49	5Y	11.08	90.66	91.78	91.56	91.97	0.004963	2.09	7.63	11.09	0.65
Reach 1	3211.49	2Y	6.31	90.66	91.45	91.31	91.61	0.006177	1.83	4.41	8.79	0.68
Reach 1	3177.48	REG	93.52	90.25	94.08	93.36	94.35	0.002306	3.28	78.20	70.35	0.54
Reach 1	3177.48	100Y	28.06	90.25	92.40	92.00	92.66	0.003396	2.67	20.02	17.54	0.59
Reach 1	3177.48	50Y	23.81	90.25	92.25	91.86	92.49	0.003329	2.52	17.50	16.31	0.58
Reach 1	3177.48	25Y	19.14	90.25	92.07	91.70	92.28	0.003289	2.34	14.59	15.03	0.57
Reach 1	3177.48	10Y	14.17	90.25	91.84	91.49	92.02	0.003257	2.11	11.29	13.43	0.55
Reach 1	3177.48	5Y	11.08	90.25	91.66	91.36	91.83	0.003247	1.95	9.11	12.16	0.54
Reach 1	3177.48	2Y	6.31	90.25	91.32	91.01	91.45	0.003454	1.65	5.30	10.12	0.53
Reach 1	3169.13	REG	93.52	89.91	94.07	93.22	94.33	0.001905	3.03	75.28	57.71	0.48
Reach 1	3169.13	100Y	28.06	89.91	92.40	91.74	92.62	0.002208	2.28	21.48	18.41	0.48
Reach 1	3169.13	50Y	23.81	89.91	92.26	91.58	92.44	0.002090	2.12	18.86	17.06	0.46
Reach 1	3169.13	25Y	19.14	89.91	92.07	91.37	92.23	0.001938	1.92	15.88	15.42	0.44
Reach 1	3169.13	10Y	14.17	89.91	91.84	91.13	91.97	0.001731	1.68	12.59	13.45	0.40
Reach 1	3169.13	5Y	11.08	89.91	91.68	90.98	91.78	0.001568	1.49	10.44	11.95	0.38
Reach 1	3169.13	2Y	6.31	89.91	91.34	90.69	91.40	0.001238	1.13	6.92	8.80	0.32
Reach 1	3165.5		Bridge									
Reach 1	3162.67	REG	93.52	89.90	93.93	93.34	94.25	0.002221	3.30	70.61	52.49	0.53
Reach 1	3162.67	100Y	28.06	89.90	92.35	91.72	92.59	0.002375	2.42	20.34	16.91	0.51
Reach 1	3162.67	50Y	23.81	89.90	92.20	91.55	92.41	0.002253	2.26	17.88	15.79	0.49
Reach 1	3162.67	25Y	19.14	89.90	92.01	91.30	92.19	0.002091	2.05	15.08	14.40	0.46
Reach 1	3162.67	10Y	14.17	89.90	91.78	91.09	91.92	0.001868	1.79	11.97	12.61	0.43
Reach 1	3162.67	5Y	11.08	89.90	91.61	90.93	91.73	0.001690	1.59	9.94	11.16	0.40
Reach 1	3162.67	2Y	6.31	89.90	91.27	90.65	91.34	0.001303	1.19	6.72	7.72	0.34
Reach 1	3147.56	REG	93.52	89.93	93.83	93.05	94.19	0.002605	3.51	65.54	43.54	0.58
Reach 1	3147.56	100Y	28.06	89.93	92.33	91.74	92.54	0.002226	2.33	22.64	19.51	0.49
Reach 1	3147.56	50Y	23.81	89.93	92.18	91.59	92.37	0.002143	2.18	19.78	18.16	0.47
Reach 1	3147.56	25Y	19.14	89.93	91.99	91.38	92.15	0.002029	2.00	16.54	16.54	0.45
Reach 1	3147.56	10Y	14.17	89.93	91.76	91.11	91.89	0.001880	1.77	12.91	14.74	0.43
Reach 1	3147.56	5Y	11.08	89.93	91.59	90.94	91.70	0.001757	1.60	10.51	13.25	0.41
Reach 1	3147.56	2Y	6.31	89.93	91.24	90.66	91.32	0.001459	1.23	6.65	9.25	0.36
Reach 1	3080.03	REG	93.52	89.94	93.69	93.11	94.00	0.002724	3.49	73.24	46.82	0.58
Reach 1	3080.03	100Y	28.06	89.94	92.10	91.73	92.35	0.003343	2.65	21.18	19.81	0.59
Reach 1	3080.03	50Y	23.81	89.94	91.94	91.60	92.18	0.003392	2.53	18.17	18.46	0.58
Reach 1	3080.03	25Y	19.14	89.94	91.75	91.45	91.97	0.003459	2.38	14.79	16.84	0.58
Reach 1	3080.03	10Y	14.17	89.94	91.52	91.25	91.72	0.003565	2.19	11.05	14.89	0.57
Reach 1	3080.03	5Y	11.08	89.94	91.34	91.09	91.53	0.003652	2.05	8.63	13.39	0.57
Reach 1	3080.03	2Y	6.31	89.94	91.02	90.71	91.16	0.003704	1.71	4.78	9.90	0.55
Reach 1	2985.05	REG	93.52	89.76	93.52	92.42	93.77	0.001836	2.92	82.73	62.06	0.48
Reach 1	2985.05	100Y	28.06	89.76	91.97	91.18	92.10	0.001625	1.92	26.02	19.48	0.42
Reach 1	2985.05	50Y	23.81	89.76	91.82	91.08	91.94	0.001542	1.78	23.21	18.36	0.40
Reach 1	2985.05	25Y	19.14	89.76	91.63	90.94	91.74	0.001443	1.62	19.95	17.15	0.38
Reach 1	2985.05	10Y	14.17	89.76	91.40	90.77	91.49	0.001326	1.42	16.20	15.86	0.36
Reach 1	2985.05	5Y	11.08	89.76	91.24	90.60	91.30	0.001252	1.28	13.59	15.04	0.34
Reach 1	2985.05	2Y	6.31	89.76	90.91	90.34	90.95	0.001134	1.02	8.88	13.58	0.31
Reach 1	2921.79	REG	93.52	89.67	93.33	92.32	93.63	0.002618	3.34	69.07	39.74	0.57
Reach 1	2921.79	100Y	28.06	89.67	91.75	91.29	91.96	0.003053	2.43	22.04	19.71	0.56
Reach 1	2921.79	50Y	23.81	89.67	91.61	91.18	91.80	0.003001	2.29	19.32	18.54	0.54
Reach 1	2921.79	25Y	19.14	89.67	91.43	91.03	91.60	0.002955	2.13	16.18	17.19	0.53
Reach 1	2921.79	10Y	14.17	89.67	91.22	90.85	91.36	0.002892	1.91	12.65	15.52	0.51
Reach 1	2921.79	5Y	11.08	89.67	91.05	90.72	91.18	0.002876	1.76	10.26	14.28	0.50
Reach 1	2921.79	2Y	6.31	89.67	90.74	90.42	90.84	0.002960	1.48	6.12	12.00	0.48
Reach 1	2850.79	REG	93.52	89.47	93.15	92.21	93.45	0.002512	3.33	71.92	48.92	0.56
Reach 1	2850.79	100Y	28.06	89.47	91.48	91.13	91.73	0.003482	2.58	20.66	19.75	0.59
Reach 1	2850.79	50Y	23.81	89.47	91.34	91.01	91.57	0.003449	2.44	18.00	18.57	0.58
Reach 1	2850.79	25Y	19.14	89.47	91.17	90.86	91.38	0.003438	2.28	14.90	17.18	0.57
Reach 1	2850.79	10Y	14.17	89.47	90.96	90.68	91.14	0.003387	2.06	11.47	15.53	0.56
Reach 1	2850.79	5Y	11.08	89.47	90.80	90.47	90.96	0.003387	1.90	9.13	14.15	0.55
Reach 1	2850.79	2Y	6.31	89.47	90.49	90.19	90.61	0.003497	1.59	5.05	10.33	0.53

HEC-RAS Plan: Duffins_Final_Au River: Millers Creek Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	2838.63	REG	93.52	89.46	93.18	92.17	93.37	0.001644	2.73	83.08	52.00	0.46
Reach 1	2838.63	100Y	28.06	89.46	91.46	91.03	91.68	0.003018	2.42	21.58	21.60	0.56
Reach 1	2838.63	50Y	23.81	89.46	91.31	90.90	91.52	0.003006	2.30	18.72	19.50	0.55
Reach 1	2838.63	25Y	19.14	89.46	91.14	90.75	91.33	0.002918	2.12	15.58	17.49	0.53
Reach 1	2838.63	10Y	14.17	89.46	90.94	90.56	91.09	0.002782	1.89	12.17	15.46	0.51
Reach 1	2838.63	5Y	11.08	89.46	90.78	90.37	90.91	0.002717	1.73	9.86	14.04	0.49
Reach 1	2838.63	2Y	6.31	89.46	90.46	90.11	90.56	0.002706	1.42	5.87	11.33	0.47
Reach 1	2835.5		Bridge									
Reach 1	2832.61	REG	93.52	89.48	93.14	92.35	93.32	0.001637	2.69	82.49	53.45	0.45
Reach 1	2832.61	100Y	28.06	89.48	91.37	91.08	91.64	0.004009	2.67	19.22	19.55	0.63
Reach 1	2832.61	50Y	23.81	89.48	91.22	90.95	91.48	0.004119	2.56	16.45	18.30	0.63
Reach 1	2832.61	25Y	19.14	89.48	91.05	90.80	91.29	0.004175	2.40	13.45	16.76	0.63
Reach 1	2832.61	10Y	14.17	89.48	90.85	90.61	91.05	0.004143	2.17	10.25	14.80	0.61
Reach 1	2832.61	5Y	11.08	89.48	90.70	90.39	90.88	0.004169	2.00	8.12	13.31	0.60
Reach 1	2832.61	2Y	6.31	89.48	90.41	90.15	90.53	0.004011	1.62	4.75	7.40	0.56
Reach 1	2818.5	REG	93.52	89.30	92.10	92.10	93.04	0.010364	5.50	37.25	26.12	1.07
Reach 1	2818.5	100Y	28.06	89.30	91.28	91.03	91.57	0.004509	2.85	18.90	19.03	0.66
Reach 1	2818.5	50Y	23.81	89.30	91.12	90.91	91.41	0.004696	2.75	16.07	17.74	0.67
Reach 1	2818.5	25Y	19.14	89.30	90.95	90.76	91.22	0.004776	2.58	13.13	16.33	0.66
Reach 1	2818.5	10Y	14.17	89.30	90.74	90.54	90.98	0.004868	2.37	9.88	14.60	0.65
Reach 1	2818.5	5Y	11.08	89.30	90.60	90.40	90.80	0.004769	2.17	7.88	13.01	0.63
Reach 1	2818.5	2Y	6.31	89.30	90.34	90.06	90.47	0.004018	1.69	4.86	10.31	0.56
Reach 1	2801.15	REG	93.52	89.24	91.68	91.93	92.84	0.014067	5.41	28.88	22.78	1.19
Reach 1	2801.15	100Y	28.06	89.24	91.31	90.83	91.49	0.002706	2.09	20.99	19.72	0.50
Reach 1	2801.15	50Y	23.81	89.24	91.15	90.72	91.32	0.002816	2.00	18.00	18.58	0.51
Reach 1	2801.15	25Y	19.14	89.24	90.97	90.58	91.13	0.002909	1.88	14.79	17.45	0.51
Reach 1	2801.15	10Y	14.17	89.24	90.75	90.40	90.89	0.003065	1.72	11.17	15.80	0.50
Reach 1	2801.15	5Y	11.08	89.24	90.60	90.27	90.72	0.003199	1.60	8.82	14.42	0.50
Reach 1	2801.15	2Y	6.31	89.24	90.31	90.03	90.40	0.003371	1.33	5.21	10.88	0.49
Reach 1	2760.33	REG	93.52	88.92	92.36	91.87	92.38	0.000362	1.10	166.44	229.16	0.20
Reach 1	2760.33	100Y	28.06	88.92	91.23	90.58	91.38	0.001921	1.90	24.24	25.92	0.42
Reach 1	2760.33	50Y	23.81	88.92	91.06	90.45	91.21	0.002069	1.86	20.05	22.95	0.43
Reach 1	2760.33	25Y	19.14	88.92	90.88	90.30	91.01	0.002026	1.72	16.43	16.86	0.42
Reach 1	2760.33	10Y	14.17	88.92	90.67	90.06	90.78	0.001874	1.51	13.05	15.24	0.40
Reach 1	2760.33	5Y	11.08	88.92	90.52	89.91	90.61	0.001733	1.36	10.85	14.13	0.37
Reach 1	2760.33	2Y	6.31	88.92	90.25	89.65	90.30	0.001337	1.03	7.22	12.71	0.32
Reach 1	2705.01	REG	93.52	88.92	92.26	92.12	92.35	0.001071	1.94	109.89	217.36	0.35
Reach 1	2705.01	100Y	28.06	88.92	91.00	90.44	91.24	0.002933	2.28	16.55	14.27	0.53
Reach 1	2705.01	50Y	23.81	88.92	90.86	90.30	91.07	0.002763	2.11	14.71	12.96	0.51
Reach 1	2705.01	25Y	19.14	88.92	90.72	90.12	90.89	0.002400	1.86	13.01	12.04	0.47
Reach 1	2705.01	10Y	14.17	88.92	90.55	89.95	90.67	0.001997	1.57	10.97	11.27	0.42
Reach 1	2705.01	5Y	11.08	88.92	90.42	89.82	90.51	0.001700	1.36	9.58	10.61	0.38
Reach 1	2705.01	2Y	6.31	88.92	90.19	89.59	90.24	0.001098	0.96	7.28	8.94	0.30
Reach 1	2658.51	REG	93.52	88.97	92.29	91.89	92.30	0.000225	0.84	243.22	504.80	0.16
Reach 1	2658.51	100Y	28.06	88.97	90.91	90.45	91.08	0.002953	1.99	20.52	18.35	0.51
Reach 1	2658.51	50Y	23.81	88.97	90.76	90.36	90.92	0.003107	1.90	17.82	17.71	0.52
Reach 1	2658.51	25Y	19.14	88.97	90.62	90.25	90.75	0.002958	1.73	15.43	17.05	0.50
Reach 1	2658.51	10Y	14.17	88.97	90.45	90.11	90.55	0.002877	1.54	12.46	16.58	0.48
Reach 1	2658.51	5Y	11.08	88.97	90.32	90.01	90.41	0.002808	1.40	10.42	16.26	0.46
Reach 1	2658.51	2Y	6.31	88.97	90.10	89.70	90.16	0.002530	1.11	6.89	15.33	0.42
Reach 1	2649.87	REG	93.52	88.99	92.27	91.79	92.30	0.000352	1.00	154.12	246.91	0.19
Reach 1	2649.87	100Y	28.06	88.99	90.74	90.50	91.01	0.006911	2.68	15.91	14.65	0.73
Reach 1	2649.87	50Y	23.81	88.99	90.57	90.41	90.84	0.008171	2.66	13.44	14.41	0.78
Reach 1	2649.87	25Y	19.14	88.99	90.30	90.30	90.64	0.013726	2.91	9.66	14.02	0.97
Reach 1	2649.87	10Y	14.17	88.99	90.16	90.16	90.45	0.013939	2.64	7.75	13.68	0.95
Reach 1	2649.87	5Y	11.08	88.99	90.07	90.07	90.32	0.013822	2.41	6.50	13.46	0.93
Reach 1	2649.87	2Y	6.31	88.99	89.90	89.90	90.08	0.013315	1.98	4.24	13.07	0.88
Reach 1	2615.15		Culvert									
Reach 1	2578.92	REG	128.49	88.50	91.39	91.33	92.29	0.014728	5.38	39.38	56.02	1.13
Reach 1	2578.92	100Y	42.09	88.50	90.75	90.31	90.96	0.005205	2.57	26.78	19.28	0.63
Reach 1	2578.92	50Y	36.48	88.50	90.59	90.22	90.79	0.005657	2.51	23.74	19.18	0.65
Reach 1	2578.92	25Y	30.45	88.50	90.40	90.12	90.60	0.006546	2.46	20.10	19.06	0.68
Reach 1	2578.92	10Y	23.17	88.50	90.07	89.99	90.32	0.011557	2.70	13.84	18.81	0.87
Reach 1	2578.92	5Y	17.66	88.50	89.88	89.88	90.15	0.015592	2.73	10.33	18.64	0.97
Reach 1	2578.92	2Y	11.43	88.50	89.72	89.72	89.94	0.016286	2.39	7.27	18.30	0.96
Reach 1	2559.08	REG	128.49	88.29	91.66	91.66	91.85	0.002456	2.99	110.11	273.86	0.54

HEC-RAS Plan: Duffins_Final_Au River: Millers Creek Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	2559.08	100Y	42.09	88.29	90.51	90.07	90.83	0.004397	2.96	23.96	16.65	0.67
Reach 1	2559.08	50Y	36.48	88.29	90.39	89.96	90.68	0.004164	2.77	21.99	16.23	0.64
Reach 1	2559.08	25Y	30.45	88.29	90.24	89.81	90.49	0.003894	2.54	19.70	15.72	0.61
Reach 1	2559.08	10Y	23.17	88.29	89.95	89.63	90.18	0.004525	2.42	15.21	14.67	0.64
Reach 1	2559.08	5Y	17.66	88.29	89.70	89.48	89.92	0.005244	2.31	11.75	13.65	0.67
Reach 1	2559.08	2Y	11.43	88.29	89.39	89.28	89.59	0.006738	2.15	7.72	12.39	0.72
Reach 1	2448.9	REG	128.49	87.33	91.38	90.86	91.55	0.001815	2.98	122.38	173.84	0.48
Reach 1	2448.9	100Y	42.09	87.33	90.09	89.82	90.42	0.003293	3.08	33.50	46.39	0.60
Reach 1	2448.9	50Y	36.48	87.33	89.90	89.71	90.25	0.003557	3.05	26.67	29.48	0.62
Reach 1	2448.9	25Y	30.45	87.33	89.68	89.28	90.04	0.004009	3.04	20.46	25.91	0.65
Reach 1	2448.9	10Y	23.17	87.33	89.38	89.03	89.70	0.004055	2.78	14.12	13.72	0.64
Reach 1	2448.9	5Y	17.66	87.33	89.12	88.82	89.40	0.004128	2.55	10.89	11.67	0.63
Reach 1	2448.9	2Y	11.43	87.33	88.76	88.45	89.00	0.004394	2.25	7.10	9.60	0.62
Reach 1	2354.04	REG	128.49	86.86	90.89	90.65	91.31	0.003123	3.92	86.84	59.69	0.63
Reach 1	2354.04	100Y	42.09	86.86	89.98	89.06	90.17	0.001554	2.32	42.01	39.31	0.43
Reach 1	2354.04	50Y	36.48	86.86	89.78	88.92	89.98	0.001698	2.32	34.29	37.44	0.44
Reach 1	2354.04	25Y	30.45	86.86	89.51	88.71	89.74	0.001977	2.35	24.91	34.02	0.47
Reach 1	2354.04	10Y	23.17	86.86	89.23	88.38	89.42	0.001774	2.06	18.21	15.33	0.43
Reach 1	2354.04	5Y	17.66	86.86	88.99	88.14	89.13	0.001602	1.81	14.74	13.12	0.40
Reach 1	2354.04	2Y	11.43	86.86	88.64	87.85	88.74	0.001368	1.48	10.57	10.89	0.36
Reach 1	2271.33	REG	128.49	87.01	90.65	90.44	91.01	0.003845	4.15	86.89	58.40	0.70
Reach 1	2271.33	100Y	42.09	87.01	89.30	89.09	89.90	0.006892	4.06	22.18	25.59	0.86
Reach 1	2271.33	50Y	36.48	87.01	89.15	88.98	89.70	0.006735	3.84	18.94	19.59	0.84
Reach 1	2271.33	25Y	30.45	87.01	88.99	88.83	89.45	0.006374	3.53	16.14	14.87	0.81
Reach 1	2271.33	10Y	23.17	87.01	88.75	88.62	89.15	0.006211	3.20	12.84	12.93	0.78
Reach 1	2271.33	5Y	17.66	87.01	88.54	88.41	88.88	0.006063	2.90	10.31	11.83	0.76
Reach 1	2271.33	2Y	11.43	87.01	88.26	88.09	88.53	0.005757	2.46	7.22	10.09	0.71
Reach 1	2155.6	REG	128.49	86.64	90.33	89.96	90.63	0.002689	3.51	87.67	65.44	0.59
Reach 1	2155.6	100Y	42.09	86.64	88.93	88.44	89.25	0.003629	2.96	25.92	18.56	0.63
Reach 1	2155.6	50Y	36.48	86.64	88.79	88.30	89.08	0.003502	2.79	23.37	17.68	0.61
Reach 1	2155.6	25Y	30.45	86.64	88.59	88.15	88.86	0.003567	2.63	19.98	16.28	0.61
Reach 1	2155.6	10Y	23.17	86.64	88.35	87.93	88.57	0.003457	2.37	16.24	14.91	0.58
Reach 1	2155.6	5Y	17.66	86.64	88.21	87.73	88.37	0.002795	2.01	14.22	14.19	0.52
Reach 1	2155.6	2Y	11.43	86.64	88.02	87.48	88.12	0.001954	1.54	11.58	13.17	0.42
Reach 1	2118.58	REG	128.49	86.81	90.42	89.44	90.50	0.001327	2.39	140.26	86.25	0.41
Reach 1	2118.58	100Y	42.09	86.81	88.88	88.36	89.07	0.004009	2.84	36.53	46.63	0.64
Reach 1	2118.58	50Y	36.48	86.81	88.70	88.26	88.91	0.004613	2.86	29.41	29.03	0.68
Reach 1	2118.58	25Y	30.45	86.81	88.48	88.16	88.68	0.005203	2.78	24.06	22.36	0.70
Reach 1	2118.58	10Y	23.17	86.81	88.16	88.01	88.39	0.007623	2.90	17.25	20.54	0.82
Reach 1	2118.58	5Y	17.66	86.81	87.93	87.89	88.19	0.010532	2.97	12.62	19.22	0.93
Reach 1	2118.58	2Y	11.43	86.81	87.73	87.73	87.96	0.011497	2.69	8.86	18.20	0.94
Reach 1	1995.43	REG	128.49	85.75	90.24	89.29	90.36	0.000942	2.20	143.78	74.69	0.34
Reach 1	1995.43	100Y	42.09	85.75	88.48	87.59	88.72	0.002115	2.33	30.84	41.44	0.46
Reach 1	1995.43	50Y	36.48	85.75	88.28	87.43	88.52	0.002228	2.27	23.94	28.52	0.47
Reach 1	1995.43	25Y	30.45	85.75	88.07	87.27	88.28	0.002187	2.11	18.81	14.84	0.46
Reach 1	1995.43	10Y	23.17	85.75	87.66	87.05	87.86	0.002684	2.03	13.71	11.18	0.49
Reach 1	1995.43	5Y	17.66	85.75	87.44	86.86	87.60	0.002527	1.80	11.33	10.02	0.46
Reach 1	1995.43	2Y	11.43	85.75	87.15	86.61	87.26	0.002180	1.46	8.64	8.90	0.42
Reach 1	1942.46	REG	128.49	85.81	90.10	89.16	90.29	0.001345	2.55	105.82	56.03	0.40
Reach 1	1942.46	100Y	42.09	85.81	88.35	87.60	88.60	0.002388	2.33	27.05	32.00	0.49
Reach 1	1942.46	50Y	36.48	85.81	88.16	87.46	88.39	0.002457	2.23	21.99	18.87	0.49
Reach 1	1942.46	25Y	30.45	85.81	87.94	87.30	88.15	0.002545	2.11	18.29	15.14	0.49
Reach 1	1942.46	10Y	23.17	85.81	87.36	87.09	87.65	0.005493	2.43	10.70	11.31	0.68
Reach 1	1942.46	5Y	17.66	85.81	87.07	86.92	87.37	0.007514	2.41	7.74	9.45	0.76
Reach 1	1942.46	2Y	11.43	85.81	86.79	86.68	87.03	0.009570	2.18	5.27	7.80	0.81
Reach 1	1897.35	REG	128.49	85.70	90.17	88.33	90.22	0.000376	1.48	203.59	115.60	0.23
Reach 1	1897.35	100Y	42.09	85.70	88.42	87.05	88.49	0.000653	1.39	61.17	52.49	0.27
Reach 1	1897.35	50Y	36.48	85.70	88.23	86.95	88.29	0.000655	1.32	52.30	39.59	0.27
Reach 1	1897.35	25Y	30.45	85.70	87.99	86.77	88.05	0.000701	1.27	43.58	34.85	0.27
Reach 1	1897.35	10Y	23.17	85.70	87.39	86.60	87.48	0.001387	1.45	25.72	25.26	0.37
Reach 1	1897.35	5Y	17.66	85.70	87.06	86.52	87.15	0.001868	1.44	18.26	20.49	0.41
Reach 1	1897.35	2Y	11.43	85.70	86.68	86.34	86.77	0.002743	1.38	11.36	16.01	0.47
Reach 1	1870.6	REG	128.49	85.74	90.14	87.62	90.21	0.000189	1.05	111.36	50.40	0.16
Reach 1	1870.6	100Y	42.09	85.74	88.43	86.89	88.46	0.000159	0.69	58.51	33.31	0.14
Reach 1	1870.6	50Y	36.48	85.74	88.24	86.84	88.26	0.000167	0.67	52.65	32.29	0.14
Reach 1	1870.6	25Y	30.45	85.74	88.00	86.73	88.02	0.000172	0.64	45.78	30.26	0.14
Reach 1	1870.6	10Y	23.17	85.74	87.40	86.55	87.43	0.000414	0.80	29.56	27.10	0.20
Reach 1	1870.6	5Y	17.66	85.74	87.06	86.44	87.09	0.000753	0.92	20.58	25.53	0.26

HEC-RAS Plan: Duffins_Final_Au River: Millers Creek Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	1870.6	2Y	11.43	85.74	86.64	86.30	86.70	0.001377	0.97	11.14	18.58	0.33
Reach 1	1852.92		Bridge									
Reach 1	1834.81	REG	128.49	85.51	89.92	88.07	90.08	0.001070	2.49	106.55	124.92	0.38
Reach 1	1834.81	100Y	42.09	85.51	88.37	86.97	88.43	0.000664	1.47	58.07	31.33	0.28
Reach 1	1834.81	50Y	36.48	85.51	88.18	86.86	88.24	0.000667	1.40	52.41	30.24	0.28
Reach 1	1834.81	25Y	30.45	85.51	87.95	86.70	88.00	0.000681	1.33	45.76	28.94	0.27
Reach 1	1834.81	10Y	23.17	85.51	87.31	86.55	87.39	0.001346	1.53	28.87	24.79	0.37
Reach 1	1834.81	5Y	17.66	85.51	86.95	86.43	87.04	0.001979	1.59	20.27	22.36	0.43
Reach 1	1834.81	2Y	11.43	85.51	86.51	86.21	86.61	0.003483	1.64	11.51	17.39	0.53
Reach 1	1815.31	REG	128.49	85.17	89.97	88.30	90.01	0.000330	1.44	251.20	213.42	0.21
Reach 1	1815.31	100Y	42.09	85.17	88.36	86.87	88.42	0.000495	1.34	71.49	59.60	0.24
Reach 1	1815.31	50Y	36.48	85.17	88.16	86.75	88.22	0.000547	1.35	59.78	56.96	0.25
Reach 1	1815.31	25Y	30.45	85.17	87.91	86.62	87.98	0.000630	1.36	46.07	53.19	0.27
Reach 1	1815.31	10Y	23.17	85.17	87.27	86.37	87.36	0.001097	1.49	25.46	20.37	0.34
Reach 1	1815.31	5Y	17.66	85.17	86.91	86.19	87.01	0.001378	1.47	18.54	18.11	0.37
Reach 1	1815.31	2Y	11.43	85.17	86.47	85.97	86.56	0.001936	1.41	10.98	15.48	0.41
Reach 1	1772.62	REG	139.36	84.68	89.89	88.50	89.99	0.000659	2.14	194.97	141.06	0.30
Reach 1	1772.62	100Y	45.65	84.68	88.30	86.85	88.39	0.000691	1.71	71.97	59.47	0.29
Reach 1	1772.62	50Y	39.57	84.68	88.09	86.69	88.19	0.000773	1.73	59.58	57.87	0.30
Reach 1	1772.62	25Y	33.03	84.68	87.82	86.50	87.95	0.000922	1.79	44.55	54.45	0.33
Reach 1	1772.62	10Y	25.13	84.68	87.12	86.22	87.30	0.001637	2.00	19.95	16.95	0.42
Reach 1	1772.62	5Y	19.15	84.68	86.78	85.97	86.93	0.001692	1.83	15.21	12.29	0.41
Reach 1	1772.62	2Y	12.40	84.68	86.36	85.69	86.48	0.001723	1.58	10.46	10.23	0.40
Reach 1	1706.43	REG	139.36	84.56	89.88	88.31	89.94	0.000475	1.85	231.37	163.84	0.26
Reach 1	1706.43	100Y	45.65	84.56	88.28	86.75	88.34	0.000519	1.52	86.99	67.36	0.25
Reach 1	1706.43	50Y	39.57	84.56	88.07	86.63	88.14	0.000585	1.55	72.71	65.86	0.27
Reach 1	1706.43	25Y	33.03	84.56	87.79	86.42	87.88	0.000722	1.63	54.91	63.45	0.29
Reach 1	1706.43	10Y	25.13	84.56	86.98	86.12	87.18	0.001847	2.14	19.18	19.10	0.44
Reach 1	1706.43	5Y	19.15	84.56	86.65	85.86	86.81	0.001860	1.94	14.40	12.25	0.43
Reach 1	1706.43	2Y	12.40	84.56	86.23	85.55	86.36	0.001848	1.65	9.82	9.68	0.42
Reach 1	1664.09	REG	139.36	84.53	89.84	88.39	89.91	0.000637	2.14	196.18	127.59	0.30
Reach 1	1664.09	100Y	45.65	84.53	88.23	86.88	88.32	0.000715	1.77	76.59	59.78	0.30
Reach 1	1664.09	50Y	39.57	84.53	88.01	86.72	88.11	0.000825	1.82	63.43	57.95	0.32
Reach 1	1664.09	25Y	33.03	84.53	87.71	86.53	87.84	0.001076	1.96	46.66	54.12	0.36
Reach 1	1664.09	10Y	25.13	84.53	86.86	86.28	87.09	0.002509	2.41	18.50	15.11	0.51
Reach 1	1664.09	5Y	19.15	84.53	86.47	86.04	86.71	0.003160	2.38	13.09	12.74	0.56
Reach 1	1664.09	2Y	12.40	84.53	86.01	85.66	86.24	0.004108	2.25	7.83	9.85	0.61
Reach 1	1650.76	REG	139.36	84.61	89.72	88.71	89.88	0.001049	2.72	152.65	91.25	0.39
Reach 1	1650.76	100Y	45.65	84.61	88.01	86.66	88.26	0.001548	2.51	31.11	47.67	0.44
Reach 1	1650.76	50Y	39.57	84.61	87.85	86.49	88.06	0.001421	2.32	28.97	42.66	0.42
Reach 1	1650.76	25Y	33.03	84.61	87.63	86.30	87.81	0.001312	2.13	26.17	31.43	0.40
Reach 1	1650.76	10Y	25.13	84.61	86.83	86.04	87.05	0.002362	2.31	16.84	10.16	0.50
Reach 1	1650.76	5Y	19.15	84.61	86.45	85.83	86.65	0.002710	2.18	13.13	9.32	0.52
Reach 1	1650.76	2Y	12.40	84.61	85.99	85.57	86.15	0.003215	1.94	9.08	8.46	0.54
Reach 1	1635.08		Bridge									
Reach 1	1618.08	REG	139.36	84.42	89.49	88.59	89.65	0.001024	2.61	136.26	143.57	0.37
Reach 1	1618.08	100Y	45.65	84.42	87.34	86.41	87.60	0.002122	2.56	24.99	15.85	0.49
Reach 1	1618.08	50Y	39.57	84.42	87.12	86.27	87.35	0.002191	2.46	22.16	12.11	0.49
Reach 1	1618.08	25Y	33.03	84.42	86.87	86.11	87.08	0.002267	2.34	19.26	11.30	0.49
Reach 1	1618.08	10Y	25.13	84.42	86.54	85.89	86.73	0.002306	2.13	15.71	10.65	0.48
Reach 1	1618.08	5Y	19.15	84.42	86.24	85.70	86.41	0.002475	1.98	12.60	10.05	0.49
Reach 1	1618.08	2Y	12.40	84.42	85.84	85.46	85.98	0.002920	1.79	8.69	9.20	0.50
Reach 1	1601.76	REG	139.36	84.36	89.50	88.27	89.62	0.000800	2.34	151.04	63.81	0.33
Reach 1	1601.76	100Y	45.65	84.36	87.09	86.59	87.50	0.003627	3.24	25.08	18.48	0.63
Reach 1	1601.76	50Y	39.57	84.36	86.82	86.42	87.25	0.004156	3.23	20.61	15.50	0.67
Reach 1	1601.76	25Y	33.03	84.36	86.54	86.21	86.97	0.004738	3.17	16.53	13.63	0.70
Reach 1	1601.76	10Y	25.13	84.36	86.24	85.94	86.62	0.004959	2.93	12.71	11.63	0.70
Reach 1	1601.76	5Y	19.15	84.36	85.97	85.70	86.30	0.005187	2.70	9.87	9.78	0.69
Reach 1	1601.76	2Y	12.40	84.36	85.61	85.40	85.88	0.005712	2.37	6.67	8.02	0.70
Reach 1	1557.39	REG	139.36	84.15	89.42	87.78	89.58	0.000763	2.30	136.61	60.78	0.32
Reach 1	1557.39	100Y	45.65	84.15	87.14	85.95	87.34	0.001415	2.13	34.94	29.51	0.40
Reach 1	1557.39	50Y	39.57	84.15	86.86	85.80	87.07	0.001646	2.14	27.33	24.83	0.42
Reach 1	1557.39	25Y	33.03	84.15	86.60	85.62	86.78	0.001615	1.98	22.50	14.30	0.41
Reach 1	1557.39	10Y	25.13	84.15	86.28	85.40	86.43	0.001573	1.77	18.25	12.80	0.40
Reach 1	1557.39	5Y	19.15	84.15	86.00	85.22	86.12	0.001566	1.60	14.80	11.52	0.39
Reach 1	1557.39	2Y	12.40	84.15	85.61	84.98	85.70	0.001589	1.36	10.63	9.91	0.37

HEC-RAS Plan: Duffins_Final_Au River: Millers Creek Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	1512.7	REG	139.36	84.13	89.41	87.69	89.54	0.000797	2.41	148.33	61.42	0.34
Reach 1	1512.7	100Y	45.65	84.13	86.20	86.06	87.14	0.010193	4.58	16.38	20.16	1.03
Reach 1	1512.7	50Y	39.57	84.13	86.14	86.04	86.88	0.008432	4.08	15.28	16.08	0.93
Reach 1	1512.7	25Y	33.03	84.13	85.95	85.91	86.59	0.008425	3.80	12.74	11.79	0.91
Reach 1	1512.7	10Y	25.13	84.13	85.67	85.65	86.25	0.009171	3.54	9.73	10.12	0.93
Reach 1	1512.7	5Y	19.15	84.13	85.44	85.40	85.94	0.009870	3.28	7.53	8.40	0.93
Reach 1	1512.7	2Y	12.40	84.13	85.12	85.10	85.52	0.011358	2.90	5.15	6.75	0.96
Reach 1	1463.36	REG	139.36	83.63	89.41	87.33	89.49	0.000497	2.04	167.84	56.67	0.27
Reach 1	1463.36	100Y	45.65	83.63	86.14	85.79	86.69	0.004908	3.67	22.05	27.86	0.74
Reach 1	1463.36	50Y	39.57	83.63	86.04	85.61	86.51	0.004358	3.37	19.99	16.20	0.70
Reach 1	1463.36	25Y	33.03	83.63	85.85	85.41	86.24	0.004022	3.06	17.34	12.64	0.66
Reach 1	1463.36	10Y	25.13	83.63	85.57	85.12	85.89	0.003895	2.75	13.98	11.25	0.63
Reach 1	1463.36	5Y	19.15	83.63	85.31	84.90	85.58	0.003797	2.47	11.31	10.09	0.61
Reach 1	1463.36	2Y	12.40	83.63	84.96	84.60	85.16	0.003779	2.10	8.02	8.43	0.59
Reach 1	1409.57	REG	139.36	83.35	89.41	86.89	89.46	0.000333	1.72	223.91	68.61	0.22
Reach 1	1409.57	100Y	45.65	83.35	85.80	85.41	86.41	0.005585	3.83	25.15	40.45	0.79
Reach 1	1409.57	50Y	39.57	83.35	85.67	85.30	86.24	0.005418	3.63	20.42	34.21	0.77
Reach 1	1409.57	25Y	33.03	83.35	85.56	85.10	86.01	0.004522	3.21	16.93	26.28	0.70
Reach 1	1409.57	10Y	25.13	83.35	85.39	84.84	85.69	0.003384	2.63	14.23	10.02	0.59
Reach 1	1409.57	5Y	19.15	83.35	85.16	84.62	85.39	0.003028	2.29	12.04	9.25	0.55
Reach 1	1409.57	2Y	12.40	83.35	84.82	84.33	84.98	0.002723	1.88	9.04	8.28	0.50
Reach 1	1306.48	REG	139.36	82.99	89.41	86.25	89.43	0.000149	1.18	369.75	134.33	0.15
Reach 1	1306.48	100Y	45.65	82.99	85.89	85.40	86.01	0.001302	2.03	59.08	53.54	0.39
Reach 1	1306.48	50Y	39.57	82.99	85.71	85.29	85.84	0.001443	2.05	49.91	50.51	0.40
Reach 1	1306.48	25Y	33.03	82.99	85.48	84.84	85.64	0.001753	2.12	38.46	48.81	0.44
Reach 1	1306.48	10Y	25.13	82.99	85.16	84.55	85.37	0.002384	2.25	23.18	45.03	0.50
Reach 1	1306.48	5Y	19.15	82.99	84.92	84.29	85.11	0.002320	2.05	14.48	23.06	0.48
Reach 1	1306.48	2Y	12.40	82.99	84.60	84.00	84.73	0.002016	1.68	9.97	10.42	0.43
Reach 1	1261.43	REG	139.36	83.08	89.40	86.09	89.42	0.000150	1.16	369.95	151.84	0.15
Reach 1	1261.43	100Y	45.65	83.08	85.85	84.80	85.95	0.001088	1.79	60.54	54.41	0.35
Reach 1	1261.43	50Y	39.57	83.08	85.67	84.63	85.77	0.001187	1.79	50.96	51.84	0.36
Reach 1	1261.43	25Y	33.03	83.08	85.45	84.51	85.55	0.001285	1.75	40.63	40.85	0.37
Reach 1	1261.43	10Y	25.13	83.08	85.16	84.32	85.25	0.001309	1.61	30.64	30.91	0.36
Reach 1	1261.43	5Y	19.15	83.08	84.91	84.15	85.00	0.001283	1.47	23.76	25.16	0.35
Reach 1	1261.43	2Y	12.40	83.08	84.57	83.94	84.64	0.001233	1.25	16.24	19.02	0.33
Reach 1	1244.7	REG	139.36	83.16	89.36	86.50	89.41	0.000277	1.58	230.47	101.28	0.20
Reach 1	1244.7	100Y	45.65	83.16	85.63	85.02	85.90	0.002901	2.71	31.33	23.20	0.56
Reach 1	1244.7	50Y	39.57	83.16	85.48	84.90	85.73	0.002855	2.58	27.93	22.00	0.55
Reach 1	1244.7	25Y	33.03	83.16	85.28	84.76	85.51	0.002885	2.43	23.78	20.06	0.55
Reach 1	1244.7	10Y	25.13	83.16	85.02	84.55	85.21	0.002869	2.21	18.85	17.45	0.53
Reach 1	1244.7	5Y	19.15	83.16	84.79	84.36	84.96	0.002867	2.01	15.06	15.79	0.52
Reach 1	1244.7	2Y	12.40	83.16	84.46	84.05	84.60	0.003099	1.78	10.19	13.65	0.52
Reach 1	1233.77	REG	139.36	83.02	89.32	86.46	89.40	0.000404	1.94	172.68	57.47	0.25
Reach 1	1233.77	100Y	45.65	83.02	85.42	85.10	85.82	0.004494	3.37	26.01	19.44	0.70
Reach 1	1233.77	50Y	39.57	83.02	84.96	84.96	85.57	0.008381	3.98	17.90	16.48	0.93
Reach 1	1233.77	25Y	33.03	83.02	84.80	84.80	85.36	0.008398	3.75	15.34	15.50	0.91
Reach 1	1233.77	10Y	25.13	83.02	84.59	84.59	85.08	0.008345	3.43	12.17	14.30	0.89
Reach 1	1233.77	5Y	19.15	83.02	84.40	84.40	84.83	0.008447	3.15	9.53	13.23	0.88
Reach 1	1233.77	2Y	12.40	83.02	84.07	84.07	84.46	0.010711	2.92	5.70	8.86	0.94
Reach 1	1209.93		Culvert									
Reach 1	1190.31	REG	139.36	82.46	88.73	85.73	88.84	0.000488	2.14	138.35	60.56	0.27
Reach 1	1190.31	100Y	45.65	82.46	84.97	84.20	85.22	0.002693	2.72	25.13	14.46	0.55
Reach 1	1190.31	50Y	39.57	82.46	84.69	84.06	84.95	0.003200	2.73	21.20	13.47	0.59
Reach 1	1190.31	25Y	33.03	82.46	84.44	83.92	84.69	0.003526	2.65	17.93	12.64	0.61
Reach 1	1190.31	10Y	25.13	82.46	84.18	83.72	84.39	0.003505	2.40	14.73	11.74	0.59
Reach 1	1190.31	5Y	19.15	82.46	83.98	83.55	84.15	0.003219	2.11	12.49	11.07	0.55
Reach 1	1190.31	2Y	12.40	82.46	83.66	83.33	83.79	0.003399	1.84	9.04	10.25	0.55
Reach 1	1174.87	REG	139.36	82.30	88.75	85.41	88.81	0.000255	1.57	180.59	78.79	0.20
Reach 1	1174.87	100Y	45.65	82.30	84.99	83.92	85.15	0.001456	2.08	32.74	19.30	0.41
Reach 1	1174.87	50Y	39.57	82.30	84.71	83.80	84.87	0.001707	2.09	27.50	17.56	0.43
Reach 1	1174.87	25Y	33.03	82.30	84.45	83.66	84.60	0.001866	2.02	23.17	16.28	0.44
Reach 1	1174.87	10Y	25.13	82.30	84.18	83.47	84.31	0.001844	1.83	18.93	14.96	0.43
Reach 1	1174.87	5Y	19.15	82.30	83.98	83.31	84.08	0.001653	1.61	16.05	13.74	0.40
Reach 1	1174.87	2Y	12.40	82.30	83.65	83.10	83.73	0.001581	1.35	11.86	12.05	0.38
Reach 1	1126.65	REG	139.36	81.96	88.77	85.08	88.79	0.000107	1.05	283.75	147.12	0.13
Reach 1	1126.65	100Y	45.65	81.96	84.99	84.16	85.07	0.000890	1.76	49.35	35.05	0.33

HEC-RAS Plan: Duffins_Final_Au River: Millers Creek Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	1126.65	50Y	39.57	81.96	84.67	84.07	84.78	0.001221	1.92	38.86	32.31	0.37
Reach 1	1126.65	25Y	33.03	81.96	84.38	83.57	84.51	0.001634	2.05	29.69	29.79	0.42
Reach 1	1126.65	10Y	25.13	81.96	84.02	83.45	84.20	0.002376	2.22	19.56	26.72	0.50
Reach 1	1126.65	5Y	19.15	81.96	83.78	83.20	83.97	0.002667	2.16	13.64	20.31	0.52
Reach 1	1126.65	2Y	12.40	81.96	83.50	82.93	83.63	0.002131	1.72	9.52	10.08	0.45
Reach 1	1060.8	REG	139.36	81.98	88.77	84.63	88.78	0.000058	0.77	373.95	152.26	0.10
Reach 1	1060.8	100Y	45.65	81.98	84.98	83.89	85.02	0.000394	1.16	71.80	45.39	0.22
Reach 1	1060.8	50Y	39.57	81.98	84.67	83.81	84.71	0.000537	1.26	57.84	43.27	0.25
Reach 1	1060.8	25Y	33.03	81.98	84.37	83.72	84.42	0.000728	1.35	45.11	41.36	0.28
Reach 1	1060.8	10Y	25.13	81.98	83.99	83.29	84.07	0.001179	1.53	29.80	38.64	0.35
Reach 1	1060.8	5Y	19.15	81.98	83.70	83.08	83.81	0.001720	1.66	19.16	34.94	0.41
Reach 1	1060.8	2Y	12.40	81.98	83.39	82.82	83.49	0.001902	1.53	9.99	16.96	0.42
Reach 1	1008.47	REG	139.36	82.02	88.76	84.69	88.78	0.000078	0.89	338.51	139.76	0.11
Reach 1	1008.47	100Y	45.65	82.02	84.94	83.84	84.99	0.000554	1.34	59.00	37.00	0.25
Reach 1	1008.47	50Y	39.57	82.02	84.62	83.75	84.68	0.000744	1.44	47.38	34.30	0.29
Reach 1	1008.47	25Y	33.03	82.02	84.30	83.64	84.38	0.000991	1.52	37.05	31.81	0.33
Reach 1	1008.47	10Y	25.13	82.02	83.89	83.48	83.99	0.001659	1.71	24.46	28.88	0.41
Reach 1	1008.47	5Y	19.15	82.02	83.52	83.19	83.69	0.003054	2.00	14.61	23.85	0.53
Reach 1	1008.47	2Y	12.40	82.02	83.13	82.90	83.33	0.004937	2.06	6.99	11.45	0.64
Reach 1	981.66	REG	139.36	81.91	88.76	84.78	88.77	0.000086	0.94	322.39	155.78	0.12
Reach 1	981.66	100Y	45.65	81.91	84.91	83.81	84.98	0.000640	1.47	53.74	33.67	0.27
Reach 1	981.66	50Y	39.57	81.91	84.58	83.54	84.65	0.000868	1.58	42.83	31.49	0.31
Reach 1	981.66	25Y	33.03	81.91	84.25	83.46	84.34	0.001185	1.69	32.84	29.33	0.36
Reach 1	981.66	10Y	25.13	81.91	83.80	83.17	83.94	0.002021	1.91	20.65	24.77	0.45
Reach 1	981.66	5Y	19.15	81.91	83.43	83.01	83.60	0.003027	2.02	13.13	15.96	0.53
Reach 1	981.66	2Y	12.40	81.91	83.04	82.78	83.20	0.004136	1.92	7.97	10.41	0.59
Reach 1	967.62	REG	139.36	81.75	88.74	85.13	88.77	0.000124	1.14	293.27	161.65	0.14
Reach 1	967.62	100Y	45.65	81.75	84.76	83.62	84.93	0.001270	2.04	29.59	18.17	0.38
Reach 1	967.62	50Y	39.57	81.75	84.43	83.46	84.61	0.001543	2.07	24.89	16.12	0.41
Reach 1	967.62	25Y	33.03	81.75	84.12	83.28	84.30	0.001783	2.04	20.69	14.43	0.43
Reach 1	967.62	10Y	25.13	81.75	83.72	83.06	83.90	0.002201	1.99	15.50	12.26	0.47
Reach 1	967.62	5Y	19.15	81.75	83.40	82.87	83.57	0.002571	1.90	11.84	10.53	0.49
Reach 1	967.62	2Y	12.40	81.75	83.00	82.63	83.14	0.003156	1.72	8.02	8.80	0.52
Reach 1	950.52		Culvert									
Reach 1	935	REG	139.36	81.66	88.69	85.62	88.75	0.000255	1.62	225.99	168.27	0.20
Reach 1	935	100Y	45.65	81.66	83.62	83.62	84.44	0.009750	4.11	12.46	8.22	0.98
Reach 1	935	50Y	39.57	81.66	83.46	83.46	84.21	0.010207	3.94	11.13	7.99	0.98
Reach 1	935	25Y	33.03	81.66	83.28	83.28	83.96	0.010587	3.72	9.72	7.73	0.98
Reach 1	935	10Y	25.13	81.66	83.04	83.04	83.62	0.011122	3.40	7.96	7.44	0.98
Reach 1	935	5Y	19.15	81.66	82.85	82.85	83.33	0.011621	3.10	6.55	7.22	0.97
Reach 1	935	2Y	12.40	81.66	82.59	82.59	82.96	0.013117	2.72	4.71	6.78	0.98
Reach 1	918.09	REG	139.36	81.60	88.71	84.50	88.73	0.000057	0.80	410.90	239.07	0.10
Reach 1	918.09	100Y	45.65	81.60	83.59	83.23	83.89	0.003722	2.75	24.04	20.37	0.62
Reach 1	918.09	50Y	39.57	81.60	83.42	83.10	83.71	0.004064	2.70	20.67	18.82	0.64
Reach 1	918.09	25Y	33.03	81.60	83.23	82.96	83.52	0.004469	2.63	17.22	17.26	0.66
Reach 1	918.09	10Y	25.13	81.60	82.99	82.77	83.25	0.004928	2.47	13.30	15.07	0.67
Reach 1	918.09	5Y	19.15	81.60	82.72	82.52	83.00	0.006516	2.47	9.61	13.07	0.75
Reach 1	918.09	2Y	12.40	81.60	82.43	82.32	82.67	0.008276	2.26	6.29	9.43	0.80
Reach 1	898.06	REG	139.36	81.10	88.72	84.63	88.72	0.000033	0.62	591.44	296.91	0.07
Reach 1	898.06	100Y	45.65	81.10	83.13	83.10	83.75	0.008125	3.96	16.39	13.37	0.90
Reach 1	898.06	50Y	39.57	81.10	82.99	82.99	83.57	0.008275	3.80	14.55	12.72	0.90
Reach 1	898.06	25Y	33.03	81.10	82.83	82.83	83.37	0.008455	3.61	12.55	12.15	0.90
Reach 1	898.06	10Y	25.13	81.10	82.58	82.58	83.09	0.009608	3.45	9.59	10.84	0.93
Reach 1	898.06	5Y	19.15	81.10	82.35	82.35	82.81	0.010660	3.23	7.37	8.85	0.95
Reach 1	898.06	2Y	12.40	81.10	82.08	82.08	82.45	0.011506	2.83	5.17	7.71	0.95
Reach 1	884.14	REG	139.36	81.13	88.70		88.72	0.000091	1.04	389.13	330.42	0.12
Reach 1	884.14	100Y	45.65	81.13	83.33		83.47	0.001795	1.99	31.38	22.83	0.44
Reach 1	884.14	50Y	39.57	81.13	83.14	82.41	83.27	0.001916	1.93	27.89	21.98	0.44
Reach 1	884.14	25Y	33.03	81.13	82.94	82.31	83.06	0.002023	1.85	24.34	21.38	0.45
Reach 1	884.14	10Y	25.13	81.13	82.66	82.17	82.77	0.002310	1.75	19.50	20.46	0.46
Reach 1	884.14	5Y	19.15	81.13	82.39	82.06	82.50	0.003039	1.75	14.94	19.89	0.51
Reach 1	884.14	2Y	12.40	81.13	82.14	81.91	82.23	0.003364	1.58	10.86	19.08	0.52
Reach 1	806.36		Culvert									
Reach 1	706.44	REG	139.36	80.24	83.47	83.47	84.59	0.008915	5.79	45.00	52.27	1.04
Reach 1	706.44	100Y	45.65	80.24	82.74	82.16	82.99	0.002747	2.69	30.48	24.45	0.55
Reach 1	706.44	50Y	39.57	80.24	82.53	81.97	82.79	0.002930	2.63	26.74	22.78	0.56

HEC-RAS Plan: Duffins_Final_Au River: Millers Creek Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	706.44	25Y	33.03	80.24	82.32	81.83	82.56	0.003082	2.52	22.88	19.70	0.57
Reach 1	706.44	10Y	25.13	80.24	82.05	81.58	82.27	0.003226	2.34	18.15	17.41	0.57
Reach 1	706.44	5Y	19.15	80.24	81.82	81.41	82.01	0.003262	2.14	14.40	15.32	0.56
Reach 1	706.44	2Y	12.40	80.24	81.49	81.17	81.64	0.003430	1.86	9.81	12.27	0.55
Reach 1	686.8	REG	139.36	80.14	83.60	83.35	83.92	0.003321	3.67	109.25	78.46	0.64
Reach 1	686.8	100Y	45.65	80.14	82.14	82.13	82.79	0.008000	3.91	18.54	16.81	0.90
Reach 1	686.8	50Y	39.57	80.14	82.08	81.99	82.62	0.006887	3.55	17.46	16.32	0.83
Reach 1	686.8	25Y	33.03	80.14	81.99	81.83	82.42	0.005838	3.16	16.02	15.67	0.76
Reach 1	686.8	10Y	25.13	80.14	81.81	81.58	82.15	0.005109	2.76	13.36	14.54	0.70
Reach 1	686.8	5Y	19.15	80.14	81.62	81.35	81.90	0.004805	2.46	10.77	13.00	0.66
Reach 1	686.8	2Y	12.40	80.14	81.36	81.07	81.55	0.004173	2.00	7.84	9.65	0.60
Reach 1	631.79	REG	140.88	79.77	82.90	82.86	83.62	0.008292	5.30	63.50	37.85	0.98
Reach 1	631.79	100Y	46.15	79.77	81.91	81.91	82.34	0.006431	3.57	28.99	32.79	0.81
Reach 1	631.79	50Y	40.00	79.77	81.82	81.82	82.22	0.006187	3.39	26.01	32.35	0.79
Reach 1	631.79	25Y	33.39	79.77	81.72	81.72	82.09	0.005845	3.17	22.62	31.84	0.76
Reach 1	631.79	10Y	25.40	79.77	81.44	81.36	81.82	0.006982	3.10	14.77	20.42	0.81
Reach 1	631.79	5Y	19.36	79.77	81.27	81.17	81.59	0.006712	2.80	11.52	17.01	0.77
Reach 1	631.79	2Y	12.53	79.77	81.03	80.88	81.28	0.006053	2.34	7.94	13.79	0.71
Reach 1	538.61	REG	140.88	79.56	82.90	82.15	83.13	0.002570	3.19	108.61	52.84	0.56
Reach 1	538.61	100Y	46.15	79.56	81.59	81.31	81.80	0.003415	2.62	42.28	48.12	0.59
Reach 1	538.61	50Y	40.00	79.56	81.46	81.07	81.68	0.003648	2.60	36.29	47.69	0.61
Reach 1	538.61	25Y	33.39	79.56	81.32	81.02	81.55	0.003933	2.56	29.52	47.19	0.62
Reach 1	538.61	10Y	25.40	79.56	81.18	80.85	81.36	0.003278	2.21	23.86	37.75	0.56
Reach 1	538.61	5Y	19.36	79.56	80.99	80.65	81.14	0.003264	2.02	17.75	24.92	0.55
Reach 1	538.61	2Y	12.53	79.56	80.69	80.42	80.83	0.003678	1.82	11.07	19.25	0.56
Reach 1	479.67	REG	140.88	79.20	82.01	82.01	82.83	0.009568	5.49	58.30	33.92	1.05
Reach 1	479.67	100Y	46.15	79.20	81.08	81.08	81.51	0.006993	3.58	28.09	31.23	0.84
Reach 1	479.67	50Y	40.00	79.20	81.00	81.00	81.39	0.006596	3.37	25.54	31.04	0.81
Reach 1	479.67	25Y	33.39	79.20	80.89	80.89	81.26	0.006280	3.16	22.28	30.81	0.78
Reach 1	479.67	10Y	25.40	79.20	80.62	80.62	81.05	0.008452	3.25	14.22	26.20	0.88
Reach 1	479.67	5Y	19.36	79.20	80.41	80.41	80.82	0.009329	3.07	9.91	16.24	0.90
Reach 1	479.67	2Y	12.53	79.20	80.19	80.14	80.50	0.008856	2.60	6.67	12.55	0.85
Reach 1	397.98	REG	140.88	78.70	81.69	81.31	82.09	0.005003	4.08	80.51	43.42	0.77
Reach 1	397.98	100Y	46.15	78.70	80.75	80.29	80.95	0.003435	2.60	41.11	40.58	0.59
Reach 1	397.98	50Y	40.00	78.70	80.49	80.11	80.78	0.005464	2.98	30.49	39.75	0.73
Reach 1	397.98	25Y	33.39	78.70	80.33	80.04	80.59	0.005362	2.77	24.37	34.62	0.71
Reach 1	397.98	10Y	25.40	78.70	80.11	79.92	80.34	0.005656	2.56	18.46	22.02	0.71
Reach 1	397.98	5Y	19.36	78.70	79.94	79.79	80.14	0.005708	2.34	14.89	20.53	0.70
Reach 1	397.98	2Y	12.53	78.70	79.72	79.59	79.89	0.005705	2.04	10.62	19.43	0.68
Reach 1	260.29	REG	140.88	77.66	80.98	80.01	81.53	0.005314	4.46	75.51	44.12	0.80
Reach 1	260.29	100Y	46.15	77.66	79.16	79.16	80.08	0.019942	4.92	15.31	15.61	1.34
Reach 1	260.29	50Y	40.00	77.66	79.31	79.31	79.87	0.010627	3.85	17.98	18.61	1.00
Reach 1	260.29	25Y	33.39	77.66	79.10	79.10	79.63	0.012244	3.74	14.40	15.21	1.04
Reach 1	260.29	10Y	25.40	77.66	78.93	78.93	79.36	0.011782	3.34	11.90	14.25	1.00
Reach 1	260.29	5Y	19.36	77.66	78.77	78.77	79.14	0.012048	3.06	9.68	13.65	0.99
Reach 1	260.29	2Y	12.53	77.66	78.55	78.55	78.85	0.012634	2.66	6.88	12.65	0.97
Reach 1	189.86	REG	140.88	76.94	81.21	79.30	81.28	0.000686	1.92	175.47	61.47	0.30
Reach 1	189.86	100Y	46.15	76.94	79.07	78.51	79.17	0.001851	1.95	52.80	43.37	0.44
Reach 1	189.86	50Y	40.00	76.94	79.02	78.45	79.10	0.001575	1.77	50.49	41.05	0.40
Reach 1	189.86	25Y	33.39	76.94	78.85	78.28	78.93	0.001620	1.70	43.93	40.30	0.40
Reach 1	189.86	10Y	25.40	76.94	78.66	78.17	78.73	0.001587	1.56	36.28	39.72	0.39
Reach 1	189.86	5Y	19.36	76.94	78.52	78.02	78.58	0.001442	1.40	30.66	39.29	0.37
Reach 1	189.86	2Y	12.53	76.94	78.09	77.79	78.18	0.002959	1.60	15.24	30.11	0.49
Reach 1	150.4	REG	140.88	76.80	81.17	79.34	81.26	0.000812	2.14	170.86	63.09	0.33
Reach 1	150.4	100Y	46.15	76.80	78.97	78.30	79.10	0.002410	2.27	47.06	38.20	0.50
Reach 1	150.4	50Y	40.00	76.80	78.93	78.26	79.04	0.001957	2.02	45.76	38.11	0.45
Reach 1	150.4	25Y	33.39	76.80	78.77	78.22	78.87	0.002045	1.95	39.49	37.68	0.46
Reach 1	150.4	10Y	25.40	76.80	78.58	78.05	78.67	0.002009	1.80	32.37	37.18	0.44
Reach 1	150.4	5Y	19.36	76.80	78.45	77.76	78.53	0.001736	1.59	27.61	36.30	0.41
Reach 1	150.4	2Y	12.53	76.80	77.95	77.58	78.07	0.003701	1.79	13.19	22.35	0.56
Reach 1	75.35	REG	140.88	75.71	81.18	79.02	81.22	0.000308	1.51	258.06	84.87	0.21
Reach 1	75.35	100Y	46.15	75.71	78.94	77.53	79.01	0.000678	1.56	80.51	69.54	0.28
Reach 1	75.35	50Y	40.00	75.71	78.91	77.42	78.97	0.000539	1.38	78.52	69.19	0.25
Reach 1	75.35	25Y	33.39	75.71	78.75	77.31	78.80	0.000528	1.32	67.10	67.33	0.25
Reach 1	75.35	10Y	25.40	75.71	78.57	77.12	78.61	0.000371	1.06	55.93	61.80	0.21
Reach 1	75.35	5Y	19.36	75.71	78.45	76.97	78.47	0.000269	0.87	48.99	50.39	0.17
Reach 1	75.35	2Y	12.53	75.71	77.98	76.71	77.99	0.000253	0.74	32.59	25.32	0.16

HEC-RAS Plan: Prop River: Main Carruthers Reach: Reach 1

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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	6224	Regional	79.90	89.99	92.18	91.46	92.22	0.002160	1.40	112.98	112.52	0.32
Reach 1	6224	50-yr	17.44	89.99	91.35	90.99	91.37	0.001631	0.85	38.94	70.70	0.25
Reach 1	6224	100-yr	20.11	89.99	91.40	91.03	91.42	0.001675	0.88	42.88	71.67	0.26
Reach 1	6224	25-yr	14.92	89.99	91.28	90.92	91.30	0.001660	0.82	34.33	69.52	0.25
Reach 1	5986	Regional	79.90	89.20	91.35		91.53	0.003950	2.60	73.54	75.42	0.61
Reach 1	5986	50-yr	17.44	89.20	90.49	90.33	90.69	0.005727	2.08	12.29	40.55	0.66
Reach 1	5986	100-yr	20.11	89.20	90.59	90.49	90.78	0.004840	2.04	17.61	63.27	0.62
Reach 1	5986	25-yr	14.92	89.20	90.41	90.19	90.61	0.005979	2.01	9.27	32.78	0.66
Reach 1	5800	Regional	79.90	88.72	90.67		90.84	0.003458	2.53	72.07	71.25	0.59
Reach 1	5800	50-yr	17.44	88.72	89.81		89.91	0.003017	1.58	17.40	41.40	0.50
Reach 1	5800	100-yr	20.11	88.72	89.87		89.99	0.003523	1.77	19.99	49.80	0.54
Reach 1	5800	25-yr	14.92	88.72	89.76		89.84	0.002794	1.46	15.28	30.68	0.47
Reach 1	5603	Regional	79.90	88.46	90.39	89.73	90.46	0.001486	1.48	96.68	84.12	0.38
Reach 1	5603	50-yr	17.44	88.46	89.59	89.25	89.62	0.001074	0.79	36.21	69.83	0.29
Reach 1	5603	100-yr	20.11	88.46	89.65	89.29	89.68	0.001085	0.83	40.05	70.25	0.29
Reach 1	5603	25-yr	14.92	88.46	89.54	89.21	89.56	0.001058	0.75	32.40	69.37	0.28
Reach 1	5580	Regional	79.90	88.58	90.31	89.68	90.36	0.001506	1.50	116.37	101.23	0.38
Reach 1	5580	50-yr	17.44	88.58	89.52	89.15	89.55	0.001370	0.90	41.37	85.13	0.32
Reach 1	5580	100-yr	20.11	88.58	89.58	89.18	89.60	0.001355	0.94	46.12	86.96	0.32
Reach 1	5580	25-yr	14.92	88.58	89.47	89.12	89.49	0.001386	0.87	36.70	83.51	0.32
Reach 1	5538	Regional	79.90	88.49	90.24	89.64	90.29	0.001907	1.78	92.85	103.95	0.44
Reach 1	5538	50-yr	17.44	88.49	89.46	89.17	89.48	0.001710	1.12	34.27	64.11	0.37
Reach 1	5538	100-yr	20.11	88.49	89.51	89.19	89.54	0.001765	1.18	37.80	67.73	0.38
Reach 1	5538	25-yr	14.92	88.49	89.40	89.14	89.43	0.001708	1.08	30.75	62.79	0.37
Reach 1	5517		Bridge									
Reach 1	5481	Regional	79.90	87.47	89.85	89.25	89.89	0.002063	1.18	102.71	132.36	0.27
Reach 1	5481	50-yr	17.44	87.47	88.83	88.47	88.92	0.008194	1.45	16.44	51.84	0.47
Reach 1	5481	100-yr	20.11	87.47	88.87	88.54	88.98	0.008559	1.53	18.79	54.50	0.49
Reach 1	5481	25-yr	14.92	87.47	88.80	88.39	88.88	0.006921	1.31	15.10	49.23	0.43
Reach 1	5440	Regional	79.90	87.41	89.81	88.99	89.84	0.000662	1.15	183.81	162.70	0.26
Reach 1	5440	50-yr	17.44	87.41	88.71	88.47	88.76	0.001914	1.15	33.92	91.07	0.38
Reach 1	5440	100-yr	20.11	87.41	88.75	88.51	88.80	0.002069	1.23	37.15	91.47	0.40
Reach 1	5440	25-yr	14.92	87.41	88.72	88.39	88.75	0.001322	0.96	34.81	91.18	0.32
Reach 1	5341	Regional	79.90	87.36	89.79	88.64	89.79	0.000270	0.51	291.80	208.46	0.11
Reach 1	5341	50-yr	17.44	87.36	88.56	88.24	88.57	0.001837	0.80	53.87	169.92	0.24
Reach 1	5341	100-yr	20.11	87.36	88.57	88.40	88.58	0.002273	0.89	55.89	170.99	0.27
Reach 1	5341	25-yr	14.92	87.36	88.44	88.18	88.50	0.006434	1.39	21.80	73.69	0.45
Reach 1	5021	Regional	89.64	86.39	89.78	88.07	89.78	0.000050	0.20	482.54	271.23	0.04
Reach 1	5021	50-yr	17.44	86.39	87.80	87.54	87.84	0.006937	1.20	27.61	103.64	0.37
Reach 1	5021	100-yr	20.11	86.39	87.91	87.60	87.94	0.004103	0.99	41.76	137.35	0.29
Reach 1	5021	25-yr	14.92	86.39	88.03	87.45	88.04	0.000978	0.51	59.13	153.91	0.14
Reach 1	4776	Regional	89.64	86.23	89.77	87.76	89.77	0.000016	0.13	636.65	301.05	0.02
Reach 1	4776	50-yr	17.44	86.23	87.77	87.32	87.78	0.000112	0.18	101.95	197.00	0.05
Reach 1	4776	100-yr	20.11	86.23	87.89	87.36	87.89	0.000092	0.17	125.76	217.20	0.05
Reach 1	4776	25-yr	14.92	86.23	87.72	87.26	87.74	0.002713	0.84	24.05	40.28	0.26
Reach 1	4453	Regional	89.64	85.48	89.77	87.11	89.77	0.000011	0.15	814.18	349.09	0.02
Reach 1	4453	50-yr	17.44	85.48	86.78	86.48	86.83	0.005051	1.36	25.69	73.72	0.41
Reach 1	4453	100-yr	20.11	85.48	86.85	86.56	86.90	0.004368	1.32	31.65	95.60	0.38
Reach 1	4453	25-yr	14.92	85.48	86.71	86.36	86.77	0.005792	1.40	20.87	55.66	0.43
Reach 1	4078	Regional	89.64	84.47	89.77		89.77	0.000010	0.24	791.79	409.63	0.03
Reach 1	4078	50-yr	17.44	84.47	86.50		86.52	0.000320	0.65	47.36	125.56	0.17
Reach 1	4078	100-yr	20.11	84.47	86.64		86.66	0.000234	0.59	66.62	147.23	0.15
Reach 1	4078	25-yr	14.92	84.47	86.37		86.39	0.000382	0.68	32.79	96.93	0.19
Reach 1	4045	Regional	89.64	83.94	89.77	86.76	89.77	0.000007	0.21	931.69	413.55	0.03
Reach 1	4045	50-yr	17.44	83.94	86.45	85.12	86.50	0.000629	1.00	20.51	116.94	0.23
Reach 1	4045	100-yr	20.11	83.94	86.59	85.21	86.64	0.000639	1.05	22.73	136.22	0.23
Reach 1	4045	25-yr	14.92	83.94	86.34	85.02	86.37	0.000590	0.93	18.58	72.61	0.22
Reach 1	4025		Culvert									
Reach 1	3998	Regional	89.64	83.99	89.77	86.48	89.77	0.000006	0.18	984.11	459.03	0.03
Reach 1	3998	50-yr	17.44	83.99	86.19	85.10	86.25	0.001106	1.05	16.92	109.10	0.30
Reach 1	3998	100-yr	20.11	83.99	86.23	85.24	86.30	0.001329	1.17	17.56	113.56	0.33

HEC-RAS Plan: Prop River: Main Carruthers Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	3998	25-yr	14.92	83.99	86.15	84.99	86.19	0.000905	0.93	16.26	104.44	0.27
Reach 1	3969	Regional	89.64	84.45	89.77	86.44	89.77	0.000004	0.16	1094.43	440.13	0.02
Reach 1	3969	50-yr	17.44	84.45	86.17	85.83	86.21	0.001065	1.15	36.41	100.20	0.30
Reach 1	3969	100-yr	20.11	84.45	86.21	85.90	86.25	0.001084	1.18	40.75	100.57	0.30
Reach 1	3969	25-yr	14.92	84.45	86.13	85.76	86.16	0.001055	1.12	31.79	99.81	0.30
Reach 1	3787	Regional	89.64	84.98	89.77	85.97	89.77	0.000004	0.11	1355.75	465.50	0.02
Reach 1	3787	50-yr	17.44	84.98	85.96	85.55	85.97	0.001474	0.63	59.97	145.26	0.22
Reach 1	3787	100-yr	20.11	84.98	86.00	85.58	86.01	0.001452	0.65	66.10	146.12	0.22
Reach 1	3787	25-yr	14.92	84.98	85.92	85.52	85.92	0.001536	0.62	53.41	144.32	0.22
Reach 1	3457	Regional	89.64	84.58	89.77		89.77	0.000006	0.17	1372.62	460.30	0.02
Reach 1	3457	50-yr	17.44	84.58	85.60		85.62	0.001906	0.93	41.60	112.34	0.34
Reach 1	3457	100-yr	20.11	84.58	85.64		85.67	0.001952	0.97	46.84	124.49	0.35
Reach 1	3457	25-yr	14.92	84.58	85.56		85.58	0.001794	0.87	37.62	102.31	0.33
Reach 1	3261	Regional	89.64	84.54	89.76	85.34	89.77	0.000005	0.12	1469.84	464.94	0.02
Reach 1	3261	50-yr	17.44	84.54	85.25	85.02	85.26	0.003280	0.77	43.11	124.93	0.32
Reach 1	3261	100-yr	20.11	84.54	85.28	85.05	85.29	0.003325	0.81	47.29	127.88	0.32
Reach 1	3261	25-yr	14.92	84.54	85.21	85.01	85.22	0.003307	0.75	38.66	122.59	0.31
Reach 1	3103	Regional	89.64	83.88	89.76	85.04	89.76	0.000002	0.10	1752.48	515.01	0.01
Reach 1	3103	50-yr	17.44	83.88	84.97	84.74	84.98	0.001016	0.65	52.94	143.14	0.21
Reach 1	3103	100-yr	20.11	83.88	85.02	84.76	85.03	0.000973	0.65	59.47	144.89	0.21
Reach 1	3103	25-yr	14.92	83.88	84.92	84.71	84.93	0.001085	0.65	46.03	138.98	0.22
Reach 1	2707	Regional	89.64	83.17	89.76	84.78	89.76	0.000003	0.09	1900.90	585.49	0.01
Reach 1	2707	50-yr	17.44	83.17	84.58	84.19	84.61	0.002195	0.89	34.86	62.91	0.26
Reach 1	2707	100-yr	20.11	83.17	84.65	84.23	84.67	0.002178	0.91	38.91	64.12	0.26
Reach 1	2707	25-yr	14.92	83.17	84.53	84.14	84.55	0.002059	0.83	31.36	59.48	0.25
Reach 1	2487	Regional	89.64	82.81	89.76	84.30	89.76	0.000009	0.19	942.04	267.36	0.02
Reach 1	2487	50-yr	17.44	82.81	84.29	83.88	84.30	0.000941	0.58	54.49	98.27	0.18
Reach 1	2487	100-yr	20.11	82.81	84.40	83.92	84.41	0.000732	0.55	65.45	99.32	0.16
Reach 1	2487	25-yr	14.92	82.81	84.19	83.80	84.20	0.001235	0.62	44.35	97.18	0.21
Reach 1	2222	Regional	100.26	82.17	89.75	83.98	89.76	0.000052	0.38	297.61	539.59	0.05
Reach 1	2222	50-yr	17.44	82.17	84.16	83.10	84.17	0.000571	0.46	48.04	109.26	0.12
Reach 1	2222	100-yr	20.11	82.17	84.30	83.15	84.30	0.000535	0.47	53.88	110.22	0.11
Reach 1	2222	25-yr	14.92	82.17	84.03	83.04	84.04	0.000614	0.45	42.22	108.31	0.12
Reach 1	2173		Culvert									
Reach 1	2080	Regional	100.26	82.13	85.33	84.55	85.49	0.001771	2.32	82.93	155.38	0.44
Reach 1	2080	50-yr	17.44	82.13	83.93	83.21	83.99	0.001044	1.16	23.81	32.85	0.30
Reach 1	2080	100-yr	20.11	82.13	84.02	83.29	84.08	0.001107	1.23	26.58	37.52	0.31
Reach 1	2080	25-yr	14.92	82.13	83.85	83.13	83.90	0.000986	1.08	21.04	31.11	0.29
Reach 1	2067	Regional	100.26	82.48	85.34	84.65	85.45	0.002976	2.11	91.72	69.60	0.42
Reach 1	2067	50-yr	17.44	82.48	83.87	83.56	83.97	0.004958	1.57	16.70	26.65	0.47
Reach 1	2067	100-yr	20.11	82.48	83.96	83.62	84.06	0.004796	1.62	19.29	30.69	0.47
Reach 1	2067	25-yr	14.92	82.48	83.78	83.50	83.88	0.005239	1.52	14.33	24.68	0.48
Reach 1	2054		Bridge									
Reach 1	2033	Regional	100.26	82.53	84.22	83.61	84.26	0.001418	1.30	129.35	135.23	0.34
Reach 1	2033	50-yr	17.44	82.53	83.51	83.34	83.52	0.000772	0.64	43.17	101.39	0.23
Reach 1	2033	100-yr	20.11	82.53	83.54	83.39	83.56	0.000831	0.68	46.91	102.32	0.24
Reach 1	2033	25-yr	14.92	82.53	83.47	83.27	83.48	0.000708	0.59	39.39	99.08	0.22
Reach 1	1959	Regional	100.26	82.53	84.07		84.12	0.002679	1.74	143.00	156.75	0.49
Reach 1	1959	50-yr	17.44	82.53	83.35	83.27	83.39	0.004596	1.33	35.90	139.55	0.56
Reach 1	1959	100-yr	20.11	82.53	83.39		83.43	0.004158	1.32	41.51	141.44	0.54
Reach 1	1959	25-yr	14.92	82.53	83.32	83.25	83.36	0.004857	1.31	31.04	137.61	0.57
Reach 1	1807	Regional	100.26	81.71	83.85	83.26	83.87	0.001769	1.27	177.84	185.01	0.29
Reach 1	1807	50-yr	17.44	81.71	83.11	82.66	83.13	0.001214	0.77	56.41	148.10	0.22
Reach 1	1807	100-yr	20.11	81.71	83.15	82.79	83.17	0.001240	0.80	62.56	149.67	0.22
Reach 1	1807	25-yr	14.92	81.71	83.07	82.58	83.08	0.001184	0.74	50.01	146.42	0.22
Reach 1	1648	Regional	100.26	81.47	83.48	82.99	83.51	0.003024	1.10	153.71	191.32	0.28
Reach 1	1648	50-yr	17.44	81.47	82.86	82.45	82.87	0.002273	0.70	48.89	146.54	0.22
Reach 1	1648	100-yr	20.11	81.47	82.89	82.53	82.90	0.002405	0.73	53.46	148.46	0.23
Reach 1	1648	25-yr	14.92	81.47	82.82	82.37	82.84	0.002204	0.67	43.69	143.65	0.22
Reach 1	1442	Regional	100.26	81.46	83.25	82.68	83.27	0.002002	0.98	182.78	210.54	0.26

HEC-RAS Plan: Prop River: Main Carruthers Reach: Reach 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Reach 1	1442	50-yr	17.44	81.46	82.60	82.40	82.61	0.002004	0.67	58.13	176.62	0.23
Reach 1	1442	100-yr	20.11	81.46	82.63	82.40	82.64	0.001963	0.68	64.35	179.34	0.23
Reach 1	1442	25-yr	14.92	81.46	82.56	82.40	82.57	0.001973	0.64	51.69	174.24	0.23
Reach 1	1139	Regional	100.26	80.83	82.96	82.36	82.98	0.001605	0.93	214.73	302.67	0.22
Reach 1	1139	50-yr	17.44	80.83	82.18	81.80	82.20	0.002180	0.75	47.04	140.28	0.23
Reach 1	1139	100-yr	20.11	80.83	82.23	81.87	82.24	0.002249	0.78	53.00	147.17	0.24
Reach 1	1139	25-yr	14.92	80.83	82.15	81.72	82.16	0.002134	0.72	41.78	137.05	0.23
Reach 1	888	Regional	100.26	80.49	82.83	81.93	82.83	0.000610	0.57	349.63	419.88	0.13
Reach 1	888	50-yr	17.44	80.49	81.89	81.60	81.90	0.001294	0.56	67.51	211.78	0.17
Reach 1	888	100-yr	20.11	80.49	81.93	81.63	81.93	0.001309	0.57	75.35	218.14	0.17
Reach 1	888	25-yr	14.92	80.49	81.85	81.51	81.85	0.001323	0.55	58.57	197.76	0.17
Reach 1	524	Regional	105.76	80.04	82.74	81.71	82.75	0.000263	0.50	432.12	341.38	0.10
Reach 1	524	50-yr	17.44	80.04	81.46	81.24	81.48	0.001926	0.84	52.17	167.35	0.25
Reach 1	524	100-yr	20.11	80.04	81.50	81.27	81.52	0.001957	0.86	58.77	183.47	0.25
Reach 1	524	25-yr	14.92	80.04	81.43	81.21	81.45	0.001785	0.79	46.92	155.18	0.24
Reach 1	358	Regional	105.76	79.99	82.72	81.48	82.73	0.000216	0.61	395.21	307.92	0.13
Reach 1	358	50-yr	17.44	79.99	81.30	81.10	81.32	0.001379	0.86	48.21	147.65	0.28
Reach 1	358	100-yr	20.11	79.99	81.34	81.12	81.36	0.001358	0.88	54.30	152.06	0.27
Reach 1	358	25-yr	14.92	79.99	81.18	81.07	81.21	0.002595	1.09	31.92	129.81	0.37
Reach 1	277	Regional	105.76	79.94	82.71	81.21	82.71	0.000159	0.54	337.64	205.37	0.11
Reach 1	277	50-yr	17.44	79.94	81.26	80.78	81.27	0.000349	0.47	60.76	110.51	0.14
Reach 1	277	100-yr	20.11	79.94	81.30	80.81	81.31	0.000389	0.51	64.98	116.06	0.15
Reach 1	277	25-yr	14.92	79.94	81.13	80.75	81.14	0.000535	0.53	47.00	97.38	0.17
Reach 1	199	Regional	105.76	79.65	82.69	81.65	82.69	0.000513	0.81	317.65	314.41	0.15
Reach 1	199	50-yr	17.44	79.65	81.17	80.57	81.21	0.002356	1.06	22.73	55.78	0.29
Reach 1	199	100-yr	20.11	79.65	81.18	80.62	81.23	0.002999	1.21	23.08	55.91	0.32
Reach 1	199	25-yr	14.92	79.65	81.01	80.51	81.05	0.002817	1.07	19.17	54.56	0.31
Reach 1	183		Bridge									
Reach 1	163	Regional	105.76	79.58	81.62	81.62	82.32	0.011917	4.68	34.28	65.12	1.09
Reach 1	163	50-yr	17.44	79.58	80.86	80.58	80.95	0.002692	1.58	16.74	31.81	0.48
Reach 1	163	100-yr	20.11	79.58	80.90	80.63	81.00	0.003091	1.73	17.61	33.55	0.51
Reach 1	163	25-yr	14.92	79.58	80.82	80.53	80.89	0.002295	1.43	15.87	30.21	0.44
Reach 1	100	Regional	105.76	79.51	81.63	80.94	81.66	0.002435	0.99	141.40	134.13	0.22
Reach 1	100	50-yr	17.44	79.51	80.68	80.47	80.71	0.004617	0.90	29.19	80.95	0.27
Reach 1	100	100-yr	20.11	79.51	80.69	80.50	80.72	0.006069	1.03	29.32	81.11	0.31
Reach 1	100	25-yr	14.92	79.51	80.68	80.44	80.70	0.003417	0.77	29.07	80.80	0.24

HEC-RAS Plan: Prop River: Kinsale Reach: 3

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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
3	6222	2-Year (Ex)	8.57	86.71	88.21	87.70	88.21	0.000035	0.12	108.94	209.52	0.04
3	6222	5-Year (Ex)	16.13	86.71	88.44	87.75	88.44	0.000038	0.14	159.21	217.31	0.04
3	6222	10-Year (Ex)	20.44	86.71	88.51	87.77	88.51	0.000047	0.16	173.13	219.66	0.05
3	6222	25-Year (Ex)	29.09	86.71	88.60	87.80	88.60	0.000067	0.20	193.54	223.26	0.05
3	6222	50-Year (Ex)	36.09	86.71	88.65	87.82	88.65	0.000086	0.24	205.46	225.44	0.06
3	6222	100-Year (Ex)	41.69	86.71	88.68	87.84	88.68	0.000104	0.26	212.22	226.69	0.07
3	6222	Future 100-Year	42.90	86.71	88.69	87.85	88.69	0.000107	0.27	214.17	227.04	0.07
3	6222	Future Regional	134.46	86.71	89.05	88.06	89.06	0.000377	0.58	299.59	245.43	0.14
3	6176	2-Year (Ex)	8.57	86.55	88.21	87.52	88.21	0.000030	0.11	117.91	223.76	0.03
3	6176	5-Year (Ex)	16.13	86.55	88.44	87.65	88.44	0.000034	0.13	172.96	242.61	0.04
3	6176	10-Year (Ex)	20.44	86.55	88.50	87.68	88.50	0.000041	0.15	188.41	244.44	0.04
3	6176	25-Year (Ex)	29.09	86.55	88.60	87.73	88.60	0.000058	0.19	210.94	247.07	0.05
3	6176	50-Year (Ex)	36.09	86.55	88.65	87.75	88.65	0.000074	0.22	223.99	248.89	0.06
3	6176	100-Year (Ex)	41.69	86.55	88.68	87.77	88.68	0.000089	0.24	231.33	249.83	0.06
3	6176	Future 100-Year	42.90	86.55	88.69	87.77	88.69	0.000092	0.24	233.46	250.10	0.06
3	6176	Future Regional	134.46	86.55	89.04	88.02	89.05	0.000320	0.53	325.14	265.83	0.12
3	6130	2-Year (Ex)	8.57	86.49	88.20	87.40	88.20	0.000019	0.10	129.98	207.74	0.03
3	6130	5-Year (Ex)	16.13	86.49	88.44	87.49	88.44	0.000025	0.13	179.60	214.20	0.03
3	6130	10-Year (Ex)	20.44	86.49	88.50	87.54	88.50	0.000032	0.15	193.20	215.95	0.04
3	6130	25-Year (Ex)	29.09	86.49	88.59	87.59	88.60	0.000047	0.19	212.98	218.45	0.05
3	6130	50-Year (Ex)	36.09	86.49	88.65	87.62	88.65	0.000062	0.22	224.40	219.88	0.05
3	6130	100-Year (Ex)	41.69	86.49	88.68	87.64	88.68	0.000075	0.25	230.77	220.67	0.06
3	6130	Future 100-Year	42.90	86.49	88.68	87.65	88.69	0.000078	0.25	232.63	220.90	0.06
3	6130	Future Regional	134.46	86.49	89.03	87.91	89.04	0.000311	0.56	311.99	236.26	0.12
3	6084	2-Year (Ex)	8.57	86.33	88.20	87.31	88.20	0.000014	0.09	147.76	207.75	0.02
3	6084	5-Year (Ex)	16.13	86.33	88.44	87.39	88.44	0.000020	0.12	197.87	216.99	0.03
3	6084	10-Year (Ex)	20.44	86.33	88.50	87.43	88.50	0.000026	0.14	211.61	218.66	0.03
3	6084	25-Year (Ex)	29.09	86.33	88.59	87.50	88.59	0.000040	0.17	231.59	221.09	0.04
3	6084	50-Year (Ex)	36.09	86.33	88.65	87.53	88.65	0.000053	0.20	243.09	222.41	0.05
3	6084	100-Year (Ex)	41.69	86.33	88.67	87.55	88.68	0.000065	0.23	249.50	223.15	0.05
3	6084	Future 100-Year	42.90	86.33	88.68	87.55	88.68	0.000068	0.23	251.37	223.36	0.06
3	6084	Future Regional	134.46	86.33	89.02	87.80	89.03	0.000287	0.54	330.73	237.15	0.12
3	6035	2-Year (Ex)	8.57	86.33	88.20	87.12	88.20	0.000009	0.07	159.78	203.45	0.02
3	6035	5-Year (Ex)	16.13	86.33	88.44	87.22	88.44	0.000015	0.10	208.97	214.61	0.03
3	6035	10-Year (Ex)	20.44	86.33	88.50	87.26	88.50	0.000020	0.12	222.58	217.03	0.03
3	6035	25-Year (Ex)	29.09	86.33	88.59	87.35	88.59	0.000032	0.16	242.38	219.84	0.04
3	6035	50-Year (Ex)	36.09	86.33	88.64	87.39	88.65	0.000043	0.19	253.77	221.45	0.04
3	6035	100-Year (Ex)	41.69	86.33	88.67	87.39	88.67	0.000053	0.21	260.11	222.33	0.05
3	6035	Future 100-Year	42.90	86.33	88.68	87.39	88.68	0.000055	0.22	261.97	222.59	0.05
3	6035	Future Regional	134.46	86.33	89.02	87.71	89.03	0.000247	0.51	340.77	237.64	0.11
3	5994	2-Year (Ex)	8.57	86.33	88.20	87.04	88.20	0.000008	0.07	171.56	217.79	0.02
3	5994	5-Year (Ex)	16.13	86.33	88.44	87.14	88.44	0.000013	0.10	224.33	230.67	0.02
3	5994	10-Year (Ex)	20.44	86.33	88.50	87.19	88.50	0.000018	0.11	238.93	232.79	0.03
3	5994	25-Year (Ex)	29.09	86.33	88.59	87.28	88.59	0.000028	0.15	260.13	235.73	0.04
3	5994	50-Year (Ex)	36.09	86.33	88.64	87.31	88.65	0.000038	0.17	272.32	237.37	0.04
3	5994	100-Year (Ex)	41.69	86.33	88.67	87.37	88.67	0.000047	0.20	279.09	238.24	0.05
3	5994	Future 100-Year	42.90	86.33	88.68	87.37	88.68	0.000049	0.20	281.08	238.49	0.05
3	5994	Future Regional	134.46	86.33	89.02	87.68	89.02	0.000220	0.48	365.40	254.14	0.11
3	5962	2-Year (Ex)	8.57	86.33	88.20	87.12	88.20	0.000009	0.07	166.03	216.59	0.02
3	5962	5-Year (Ex)	16.13	86.33	88.44	87.21	88.44	0.000015	0.10	218.97	231.97	0.03
3	5962	10-Year (Ex)	20.44	86.33	88.50	87.26	88.50	0.000020	0.12	233.62	234.11	0.03
3	5962	25-Year (Ex)	29.09	86.33	88.59	87.32	88.59	0.000031	0.16	254.88	237.25	0.04
3	5962	50-Year (Ex)	36.09	86.33	88.64	87.37	88.64	0.000041	0.19	267.10	239.31	0.04
3	5962	100-Year (Ex)	41.69	86.33	88.67	87.39	88.67	0.000051	0.21	273.86	240.29	0.05
3	5962	Future 100-Year	42.90	86.33	88.68	87.39	88.68	0.000053	0.22	275.86	240.57	0.05
3	5962	Future Regional	134.46	86.33	89.01	87.72	89.02	0.000239	0.52	360.15	257.02	0.11
3	5936	2-Year (Ex)	8.57	86.23	88.20		88.20	0.000009	0.08	172.08	227.20	0.02
3	5936	5-Year (Ex)	16.13	86.23	88.44		88.44	0.000015	0.11	229.25	260.60	0.03
3	5936	10-Year (Ex)	20.44	86.23	88.50		88.50	0.000020	0.13	246.05	274.44	0.03
3	5936	25-Year (Ex)	29.09	86.23	88.59		88.59	0.000033	0.17	271.48	289.98	0.04
3	5936	50-Year (Ex)	36.09	86.23	88.64		88.64	0.000043	0.20	286.48	297.18	0.05
3	5936	100-Year (Ex)	41.69	86.23	88.67		88.67	0.000054	0.23	294.85	300.21	0.05
3	5936	Future 100-Year	42.90	86.23	88.68		88.68	0.000055	0.23	297.34	300.65	0.05
3	5936	Future Regional	134.46	86.23	89.01		89.01	0.000233	0.53	398.49	317.66	0.11
3	5893	2-Year (Ex)	8.57	86.09	88.20		88.20	0.000009	0.08	175.56	271.39	0.02
3	5893	5-Year (Ex)	16.13	86.09	88.44		88.44	0.000014	0.11	243.93	312.59	0.03
3	5893	10-Year (Ex)	20.44	86.09	88.50		88.50	0.000018	0.13	263.75	320.46	0.03
3	5893	25-Year (Ex)	29.09	86.09	88.59		88.59	0.000027	0.16	293.00	331.54	0.04
3	5893	50-Year (Ex)	36.09	86.09	88.64		88.64	0.000035	0.19	310.01	337.09	0.04
3	5893	100-Year (Ex)	41.69	86.09	88.67		88.67	0.000044	0.21	319.39	338.81	0.05
3	5893	Future 100-Year	42.90	86.09	88.68		88.68	0.000045	0.22	322.18	339.32	0.05

HEC-RAS Plan: Prop River: Kinsale Reach: 3 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
3	5893	Future Regional	134.46	86.09	89.00		89.01	0.000188	0.48	434.86	357.69	0.10
3	5847	2-Year (Ex)	8.57	85.95	88.20		88.20	0.000009	0.08	154.38	174.56	0.02
3	5847	5-Year (Ex)	16.13	85.95	88.44		88.44	0.000016	0.11	200.04	215.44	0.03
3	5847	10-Year (Ex)	20.44	85.95	88.50		88.50	0.000022	0.14	214.15	234.06	0.03
3	5847	25-Year (Ex)	29.09	85.95	88.59		88.59	0.000035	0.18	235.21	238.76	0.04
3	5847	50-Year (Ex)	36.09	85.95	88.64		88.64	0.000047	0.21	247.32	243.54	0.05
3	5847	100-Year (Ex)	41.69	85.95	88.67		88.67	0.000058	0.24	254.04	249.30	0.05
3	5847	Future 100-Year	42.90	85.95	88.67		88.68	0.000061	0.24	256.08	252.12	0.05
3	5847	Future Regional	134.46	85.95	88.99		89.00	0.000297	0.59	340.03	273.10	0.12
3	5845	2-Year (Ex)	8.57	85.90	88.15	86.92	88.20	0.001245	1.02	8.43	180.50	0.23
3	5845	5-Year (Ex)	16.13	85.90	88.40	87.30	88.43	0.001996	1.06	37.43	218.20	0.28
3	5845	10-Year (Ex)	20.44	85.90	88.47	87.49	88.50	0.001515	0.96	54.46	223.56	0.25
3	5845	25-Year (Ex)	29.09	85.90	88.57	88.43	88.59	0.001364	0.94	75.68	227.52	0.24
3	5845	50-Year (Ex)	36.09	85.90	88.62	88.46	88.64	0.001442	0.99	87.10	230.27	0.24
3	5845	100-Year (Ex)	41.69	85.90	88.64	88.48	88.67	0.001611	1.06	92.95	231.87	0.26
3	5845	Future 100-Year	42.90	85.90	88.65	88.49	88.67	0.001612	1.06	94.86	232.40	0.26
3	5845	Future Regional	134.46	85.90	88.95	88.70	88.99	0.003103	1.64	169.28	262.69	0.37
3	5833		Culvert									
3	5822	2-Year (Ex)	8.57	85.76	86.97	86.94	87.31	0.019440	2.59	3.31	32.80	0.94
3	5822	5-Year (Ex)	16.13	85.76	87.33	87.33	87.90	0.019439	3.33	4.84	118.06	1.00
3	5822	10-Year (Ex)	20.44	85.76	87.52	87.52	88.19	0.018470	3.61	5.66	132.73	1.00
3	5822	25-Year (Ex)	29.09	85.76	88.41	88.41	88.50	0.002754	1.75	45.62	199.82	0.41
3	5822	50-Year (Ex)	36.09	85.76	88.44	88.44	88.54	0.003240	1.92	52.14	202.07	0.45
3	5822	100-Year (Ex)	41.69	85.76	88.47	88.47	88.57	0.003440	2.00	57.90	203.27	0.46
3	5822	Future 100-Year	42.90	85.76	88.48	88.48	88.58	0.003484	2.02	59.05	203.46	0.47
3	5822	Future Regional	134.46	85.76	88.72	88.72	88.89	0.007228	3.14	110.24	222.70	0.69
3	5814	2-Year (Ex)	8.57	85.75	87.12	86.29	87.12	0.000766	0.38	35.44	97.52	0.11
3	5814	5-Year (Ex)	16.13	85.75	87.28	86.67	87.29	0.000998	0.48	53.10	120.38	0.13
3	5814	10-Year (Ex)	20.44	85.75	87.36	86.81	87.37	0.001016	0.50	63.32	128.72	0.14
3	5814	25-Year (Ex)	29.09	85.75	87.51	86.92	87.52	0.000985	0.53	83.42	141.86	0.14
3	5814	50-Year (Ex)	36.09	85.75	87.62	86.99	87.63	0.000931	0.54	99.64	151.11	0.13
3	5814	100-Year (Ex)	41.69	85.75	87.71	87.03	87.71	0.000883	0.54	112.38	156.50	0.13
3	5814	Future 100-Year	42.90	85.75	87.72	87.05	87.73	0.000873	0.54	115.12	157.61	0.13
3	5814	Future Regional	134.46	85.75	88.70	87.42	88.71	0.000582	0.60	303.07	228.26	0.12
3	5757	2-Year (Ex)	8.57	85.70	87.08	86.72	87.08	0.001753	0.41	32.66	106.03	0.16
3	5757	5-Year (Ex)	16.13	85.70	87.24	86.82	87.25	0.001595	0.44	50.02	110.05	0.15
3	5757	10-Year (Ex)	20.44	85.70	87.32	86.86	87.33	0.001498	0.45	59.24	112.92	0.15
3	5757	25-Year (Ex)	29.09	85.70	87.48	86.94	87.48	0.001344	0.47	76.59	116.94	0.15
3	5757	50-Year (Ex)	36.09	85.70	87.59	87.03	87.60	0.001250	0.49	89.87	120.37	0.14
3	5757	100-Year (Ex)	41.69	85.70	87.67	87.06	87.68	0.001193	0.50	100.10	124.05	0.14
3	5757	Future 100-Year	42.90	85.70	87.69	87.06	87.70	0.001182	0.50	102.30	125.04	0.14
3	5757	Future Regional	134.46	85.70	88.67	87.34	88.68	0.000903	0.64	247.06	175.92	0.14
3	5627	2-Year (Ex)	8.57	85.49	86.96	86.50	86.96	0.001215	0.38	36.94	114.71	0.14
3	5627	5-Year (Ex)	16.13	85.49	87.14	86.66	87.14	0.001056	0.41	57.83	115.87	0.13
3	5627	10-Year (Ex)	20.44	85.49	87.23	86.73	87.23	0.001000	0.42	68.20	116.45	0.13
3	5627	25-Year (Ex)	29.09	85.49	87.39	86.85	87.39	0.000926	0.44	86.97	117.46	0.13
3	5627	50-Year (Ex)	36.09	85.49	87.50	86.88	87.51	0.000884	0.46	100.78	118.16	0.13
3	5627	100-Year (Ex)	41.69	85.49	87.59	86.92	87.60	0.000861	0.47	111.08	118.64	0.13
3	5627	Future 100-Year	42.90	85.49	87.61	86.92	87.62	0.000856	0.48	113.24	118.75	0.13
3	5627	Future Regional	134.46	85.49	88.59	87.18	88.61	0.000819	0.66	232.83	124.14	0.13
3	5547	2-Year (Ex)	8.57	85.40	86.87	86.62	86.88	0.001581	0.48	28.05	71.48	0.16
3	5547	5-Year (Ex)	16.13	85.40	87.06	86.71	87.07	0.001682	0.56	41.51	72.63	0.17
3	5547	10-Year (Ex)	20.44	85.40	87.15	86.74	87.16	0.001693	0.60	48.16	73.20	0.17
3	5547	25-Year (Ex)	29.09	85.40	87.31	86.80	87.33	0.001696	0.65	60.16	74.21	0.18
3	5547	50-Year (Ex)	36.09	85.40	87.43	86.84	87.45	0.001692	0.69	68.98	74.94	0.18
3	5547	100-Year (Ex)	41.69	85.40	87.52	86.86	87.54	0.001691	0.71	75.54	75.49	0.18
3	5547	Future 100-Year	42.90	85.40	87.54	86.87	87.55	0.001691	0.72	76.92	75.60	0.18
3	5547	Future Regional	134.46	85.40	88.51	87.23	88.55	0.001888	1.04	153.04	81.56	0.21
3	5501	2-Year (Ex)	8.57	85.34	86.76	86.57	86.78	0.004816	0.81	16.88	53.50	0.28
3	5501	5-Year (Ex)	16.13	85.34	86.95	86.71	86.98	0.004319	0.88	27.26	54.29	0.27
3	5501	10-Year (Ex)	20.44	85.34	87.05	86.76	87.07	0.004128	0.91	32.33	54.67	0.27
3	5501	25-Year (Ex)	29.09	85.34	87.21	86.82	87.24	0.003894	0.96	41.36	55.34	0.27
3	5501	50-Year (Ex)	36.09	85.34	87.33	86.87	87.36	0.003770	1.00	47.94	55.85	0.27
3	5501	100-Year (Ex)	41.69	85.34	87.42	86.91	87.45	0.003710	1.03	52.80	56.22	0.27
3	5501	Future 100-Year	42.90	85.34	87.43	86.92	87.47	0.003699	1.04	53.82	56.29	0.27
3	5501	Future Regional	134.46	85.34	88.37	87.36	88.45	0.003976	1.48	108.41	60.21	0.30
3	5462	2-Year (Ex)	8.57	85.32	86.62	86.32	86.63	0.003417	0.61	20.72	60.28	0.23
3	5462	5-Year (Ex)	16.13	85.32	86.84	86.47	86.85	0.002773	0.62	34.47	67.00	0.21
3	5462	10-Year (Ex)	20.44	85.32	86.94	86.53	86.95	0.002593	0.64	41.41	70.49	0.21

HEC-RAS Plan: Prop River: Kinsale Reach: 3 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
3	5462	25-Year (Ex)	29.09	85.32	87.11	86.60	87.13	0.002334	0.68	53.98	73.24	0.20
3	5462	50-Year (Ex)	36.09	85.32	87.24	86.68	87.25	0.002229	0.71	63.26	75.88	0.20
3	5462	100-Year (Ex)	41.69	85.32	87.33	86.67	87.35	0.002144	0.73	70.23	77.32	0.20
3	5462	Future 100-Year	42.90	85.32	87.35	86.68	87.37	0.002127	0.74	71.70	77.64	0.20
3	5462	Future Regional	134.46	85.32	88.30	87.10	88.34	0.002050	1.03	148.61	83.45	0.21
3	5442	2-Year (Ex)	8.57	85.31	86.57	86.12	86.58	0.002468	0.51	21.36	46.43	0.19
3	5442	5-Year (Ex)	16.13	85.31	86.78	86.28	86.80	0.002540	0.62	31.62	47.99	0.21
3	5442	10-Year (Ex)	20.44	85.31	86.88	86.38	86.90	0.002614	0.67	36.50	49.01	0.21
3	5442	25-Year (Ex)	29.09	85.31	87.06	86.46	87.08	0.002712	0.76	45.14	50.23	0.22
3	5442	50-Year (Ex)	36.09	85.31	87.18	86.52	87.21	0.002784	0.82	51.36	51.09	0.23
3	5442	100-Year (Ex)	41.69	85.31	87.27	86.56	87.30	0.002847	0.87	55.97	51.81	0.23
3	5442	Future 100-Year	42.90	85.31	87.29	86.57	87.32	0.002864	0.88	56.94	52.04	0.24
3	5442	Future Regional	134.46	85.31	88.24	87.07	88.29	0.003591	1.38	143.51	135.50	0.29
3	5392	2-Year (Ex)	8.57	85.11	86.50	86.09	86.51	0.001666	0.46	24.76	56.42	0.16
3	5392	5-Year (Ex)	16.13	85.11	86.71	86.22	86.72	0.001788	0.55	37.19	58.68	0.17
3	5392	10-Year (Ex)	20.44	85.11	86.81	86.27	86.83	0.001841	0.60	43.08	59.69	0.18
3	5392	25-Year (Ex)	29.09	85.11	86.99	86.36	87.00	0.001920	0.67	53.54	61.38	0.19
3	5392	50-Year (Ex)	36.09	85.11	87.11	86.41	87.13	0.001975	0.72	61.09	62.62	0.19
3	5392	100-Year (Ex)	41.69	85.11	87.20	86.46	87.22	0.002014	0.76	66.70	63.49	0.20
3	5392	Future 100-Year	42.90	85.11	87.22	86.47	87.24	0.002022	0.77	67.87	63.67	0.20
3	5392	Future Regional	134.46	85.11	88.16	86.93	88.20	0.002186	1.10	167.20	126.78	0.22
3	5321	2-Year (Ex)	8.57	84.85	86.38	86.09	86.39	0.002054	0.52	22.77	50.94	0.18
3	5321	5-Year (Ex)	16.13	84.85	86.59	86.19	86.60	0.002222	0.63	33.52	52.66	0.20
3	5321	10-Year (Ex)	20.44	84.85	86.69	86.24	86.70	0.002307	0.68	38.57	53.47	0.20
3	5321	25-Year (Ex)	29.09	84.85	86.85	86.31	86.87	0.002432	0.76	47.56	54.90	0.21
3	5321	50-Year (Ex)	36.09	84.85	86.97	86.36	86.99	0.002513	0.82	54.05	55.90	0.22
3	5321	100-Year (Ex)	41.69	84.85	87.06	86.39	87.08	0.002575	0.86	58.84	56.63	0.22
3	5321	Future 100-Year	42.90	84.85	87.07	86.40	87.10	0.002587	0.87	59.84	56.78	0.22
3	5321	Future Regional	134.46	84.85	88.04	86.86	88.08	0.002030	1.07	154.83	101.21	0.22
3	5261	2-Year (Ex)	8.57	84.68	86.29		86.30	0.001604	0.56	22.52	49.70	0.17
3	5261	5-Year (Ex)	16.13	84.68	86.48		86.50	0.002183	0.73	32.38	53.38	0.20
3	5261	10-Year (Ex)	20.44	84.68	86.57		86.59	0.002388	0.80	37.21	54.98	0.22
3	5261	25-Year (Ex)	29.09	84.68	86.73		86.76	0.002638	0.90	46.19	57.84	0.23
3	5261	50-Year (Ex)	36.09	84.68	86.85		86.87	0.002779	0.97	52.85	60.01	0.24
3	5261	100-Year (Ex)	41.69	84.68	86.93		86.96	0.002853	1.01	57.90	61.31	0.24
3	5261	Future 100-Year	42.90	84.68	86.95		86.98	0.002865	1.02	58.96	61.53	0.25
3	5261	Future Regional	134.46	84.68	87.90		87.97	0.003005	1.40	123.84	77.08	0.27
3	5222	2-Year (Ex)	8.57	84.65	86.19		86.21	0.004650	0.78	16.83	62.06	0.27
3	5222	5-Year (Ex)	16.13	84.65	86.39		86.41	0.003719	0.81	29.16	64.42	0.25
3	5222	10-Year (Ex)	20.44	84.65	86.48		86.50	0.003423	0.82	35.13	65.49	0.25
3	5222	25-Year (Ex)	29.09	84.65	86.64		86.67	0.003032	0.84	45.98	67.40	0.24
3	5222	50-Year (Ex)	36.09	84.65	86.76		86.78	0.002857	0.87	53.83	68.75	0.23
3	5222	100-Year (Ex)	41.69	84.65	86.84		86.87	0.002758	0.88	59.70	69.74	0.23
3	5222	Future 100-Year	42.90	84.65	86.86		86.89	0.002740	0.89	60.93	69.95	0.23
3	5222	Future Regional	134.46	84.65	87.83		87.88	0.002298	1.13	134.43	81.95	0.23
3	5192	2-Year (Ex)	8.57	84.50	86.09		86.10	0.003222	0.72	19.00	52.91	0.23
3	5192	5-Year (Ex)	16.13	84.50	86.29		86.31	0.003036	0.79	30.13	55.45	0.23
3	5192	10-Year (Ex)	20.44	84.50	86.39		86.41	0.002966	0.83	35.52	56.62	0.23
3	5192	25-Year (Ex)	29.09	84.50	86.56		86.58	0.002849	0.88	45.27	58.41	0.23
3	5192	50-Year (Ex)	36.09	84.50	86.67		86.70	0.002817	0.92	52.19	59.62	0.23
3	5192	100-Year (Ex)	41.69	84.50	86.76		86.79	0.002803	0.95	57.34	60.51	0.23
3	5192	Future 100-Year	42.90	84.50	86.78		86.81	0.002801	0.95	58.41	60.69	0.23
3	5192	Future Regional	134.46	84.50	87.75		87.81	0.002801	1.29	122.18	72.46	0.25
3	5149	2-Year (Ex)	8.57	84.41	85.99		86.01	0.002456	0.65	19.42	40.89	0.20
3	5149	5-Year (Ex)	16.13	84.41	86.19		86.21	0.003079	0.82	27.69	42.57	0.23
3	5149	10-Year (Ex)	20.44	84.41	86.29		86.31	0.003298	0.89	31.70	43.37	0.25
3	5149	25-Year (Ex)	29.09	84.41	86.45		86.48	0.003602	1.00	38.92	44.77	0.26
3	5149	50-Year (Ex)	36.09	84.41	86.56		86.60	0.003815	1.08	44.04	45.73	0.27
3	5149	100-Year (Ex)	41.69	84.41	86.65		86.69	0.003964	1.14	47.85	46.43	0.28
3	5149	Future 100-Year	42.90	84.41	86.66		86.71	0.003994	1.15	48.64	46.57	0.28
3	5149	Future Regional	134.46	84.41	87.61		87.70	0.004751	1.69	104.40	78.67	0.33
3	5061	2-Year (Ex)	8.57	84.29	85.81		85.82	0.003639	0.76	18.03	48.50	0.24
3	5061	5-Year (Ex)	16.13	84.29	86.01		86.03	0.003607	0.86	27.93	49.83	0.25
3	5061	10-Year (Ex)	20.44	84.29	86.10		86.12	0.003637	0.90	32.56	50.43	0.26
3	5061	25-Year (Ex)	29.09	84.29	86.26		86.29	0.003657	0.98	40.89	51.50	0.26
3	5061	50-Year (Ex)	36.09	84.29	86.37		86.41	0.003758	1.05	46.58	52.22	0.27
3	5061	100-Year (Ex)	41.69	84.29	86.45		86.49	0.003841	1.09	50.76	52.74	0.27
3	5061	Future 100-Year	42.90	84.29	86.47		86.51	0.003859	1.10	51.63	52.84	0.27
3	5061	Future Regional	134.46	84.29	87.40		87.49	0.004395	1.59	103.68	59.05	0.32
3	4994	2-Year (Ex)	8.57	84.29	85.60		85.62	0.003381	0.72	16.23	40.80	0.24

HEC-RAS Plan: Prop River: Kinsale Reach: 3 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
3	4994	5-Year (Ex)	16.13	84.29	85.81		85.84	0.003988	0.89	25.00	45.40	0.27
3	4994	10-Year (Ex)	20.44	84.29	85.90		85.93	0.004196	0.97	29.28	47.49	0.28
3	4994	25-Year (Ex)	29.09	84.29	86.05		86.09	0.004488	1.08	36.95	50.61	0.30
3	4994	50-Year (Ex)	36.09	84.29	86.16		86.21	0.004636	1.16	42.39	51.71	0.31
3	4994	100-Year (Ex)	41.69	84.29	86.24		86.29	0.004763	1.21	46.35	52.52	0.31
3	4994	Future 100-Year	42.90	84.29	86.25		86.30	0.004790	1.23	47.18	52.68	0.31
3	4994	Future Regional	134.46	84.29	87.20		87.29	0.004651	1.66	107.24	83.24	0.33
3	4970	2-Year (Ex)	8.57	84.23	85.52		85.54	0.004269	0.78	14.05	34.99	0.27
3	4970	5-Year (Ex)	16.13	84.23	85.71		85.75	0.005517	1.01	20.97	38.23	0.32
3	4970	10-Year (Ex)	20.44	84.23	85.79		85.84	0.005924	1.10	24.38	39.73	0.33
3	4970	25-Year (Ex)	29.09	84.23	85.94		86.00	0.006552	1.26	30.46	42.27	0.36
3	4970	50-Year (Ex)	36.09	84.23	86.04		86.11	0.006996	1.37	34.79	43.99	0.37
3	4970	100-Year (Ex)	41.69	84.23	86.11		86.19	0.007237	1.44	38.01	44.70	0.38
3	4970	Future 100-Year	42.90	84.23	86.13		86.20	0.007285	1.46	38.68	44.83	0.38
3	4970	Future Regional	134.46	84.23	87.05		87.20	0.007328	2.02	83.74	52.38	0.42
3	4931	2-Year (Ex)	8.57	84.18	85.44		85.45	0.001885	0.51	24.72	60.04	0.18
3	4931	5-Year (Ex)	16.13	84.18	85.63		85.64	0.002165	0.62	36.14	63.15	0.20
3	4931	10-Year (Ex)	20.44	84.18	85.72		85.73	0.002288	0.68	41.72	65.46	0.20
3	4931	25-Year (Ex)	29.09	84.18	85.87		85.88	0.002416	0.76	51.78	67.92	0.21
3	4931	50-Year (Ex)	36.09	84.18	85.97		85.99	0.002517	0.81	58.71	68.76	0.22
3	4931	100-Year (Ex)	41.69	84.18	86.04		86.06	0.002591	0.85	63.81	69.38	0.23
3	4931	Future 100-Year	42.90	84.18	86.06		86.08	0.002606	0.86	64.87	69.50	0.23
3	4931	Future Regional	134.46	84.18	87.02		87.07	0.002618	1.21	135.80	78.03	0.25
3	4884	2-Year (Ex)	8.57	84.13	85.36		85.38	0.004070	0.67	19.37	57.62	0.25
3	4884	5-Year (Ex)	16.13	84.13	85.56		85.57	0.003495	0.72	30.61	58.59	0.24
3	4884	10-Year (Ex)	20.44	84.13	85.64		85.66	0.003434	0.76	35.73	59.02	0.24
3	4884	25-Year (Ex)	29.09	84.13	85.79		85.81	0.003449	0.84	44.52	59.77	0.25
3	4884	50-Year (Ex)	36.09	84.13	85.89		85.92	0.003560	0.90	50.44	60.27	0.26
3	4884	100-Year (Ex)	41.69	84.13	85.96		85.99	0.003651	0.94	54.77	60.63	0.26
3	4884	Future 100-Year	42.90	84.13	85.98		86.01	0.003671	0.95	55.66	60.70	0.26
3	4884	Future Regional	134.46	84.13	86.93		87.00	0.003475	1.33	116.13	65.58	0.28
3	4812	2-Year (Ex)	8.57	84.04	85.28		85.29	0.001271	0.43	27.42	55.48	0.15
3	4812	5-Year (Ex)	16.13	84.04	85.48		85.49	0.001599	0.55	38.35	57.02	0.17
3	4812	10-Year (Ex)	20.44	84.04	85.56		85.57	0.001768	0.61	43.24	57.70	0.18
3	4812	25-Year (Ex)	29.09	84.04	85.71		85.72	0.002067	0.71	51.58	58.84	0.20
3	4812	50-Year (Ex)	36.09	84.04	85.80		85.82	0.002319	0.79	57.09	59.58	0.21
3	4812	100-Year (Ex)	41.69	84.04	85.87		85.89	0.002502	0.84	61.13	60.12	0.22
3	4812	Future 100-Year	42.90	84.04	85.88		85.91	0.002541	0.85	61.96	60.23	0.23
3	4812	Future Regional	134.46	84.04	86.84		86.90	0.002995	1.30	123.45	67.90	0.27
3	4771	2-Year (Ex)	8.57	83.91	85.21		85.23	0.003678	0.70	18.45	51.50	0.24
3	4771	5-Year (Ex)	16.13	83.91	85.40		85.42	0.003797	0.82	28.75	58.37	0.26
3	4771	10-Year (Ex)	20.44	83.91	85.48		85.50	0.003939	0.87	33.56	61.21	0.27
3	4771	25-Year (Ex)	29.09	83.91	85.61		85.64	0.004330	0.99	42.45	77.66	0.28
3	4771	50-Year (Ex)	36.09	83.91	85.70		85.74	0.004351	1.04	49.49	78.61	0.29
3	4771	100-Year (Ex)	41.69	83.91	85.77		85.80	0.004358	1.07	54.67	79.34	0.29
3	4771	Future 100-Year	42.90	83.91	85.78		85.82	0.004361	1.08	55.74	79.49	0.29
3	4771	Future Regional	134.46	83.91	86.78		86.83	0.002539	1.18	140.83	91.46	0.24
3	4754	2-Year (Ex)	8.57	83.84	85.16		85.17	0.002571	0.60	19.01	44.49	0.21
3	4754	5-Year (Ex)	16.13	83.84	85.33		85.35	0.003596	0.81	27.14	51.06	0.25
3	4754	10-Year (Ex)	20.44	83.84	85.40		85.43	0.004108	0.90	30.90	54.17	0.27
3	4754	25-Year (Ex)	29.09	83.84	85.52		85.56	0.004814	1.05	37.77	59.42	0.30
3	4754	50-Year (Ex)	36.09	83.84	85.61		85.65	0.005154	1.13	43.00	63.75	0.32
3	4754	100-Year (Ex)	41.69	83.84	85.67		85.72	0.005358	1.19	47.13	71.41	0.33
3	4754	Future 100-Year	42.90	83.84	85.68		85.73	0.005391	1.20	48.08	74.08	0.33
3	4754	Future Regional	134.46	83.84	86.73		86.79	0.002711	1.24	134.32	92.60	0.25
3	4707	2-Year (Ex)	8.57	83.61	85.08		85.09	0.001819	0.54	25.82	71.06	0.18
3	4707	5-Year (Ex)	16.13	83.61	85.22		85.24	0.002515	0.70	37.46	87.17	0.21
3	4707	10-Year (Ex)	20.44	83.61	85.29		85.30	0.002694	0.75	43.03	87.82	0.22
3	4707	25-Year (Ex)	29.09	83.61	85.40		85.42	0.002919	0.83	52.93	88.96	0.23
3	4707	50-Year (Ex)	36.09	83.61	85.48		85.50	0.003019	0.88	60.22	89.79	0.24
3	4707	100-Year (Ex)	41.69	83.61	85.54		85.56	0.003067	0.91	65.73	90.41	0.24
3	4707	Future 100-Year	42.90	83.61	85.55		85.58	0.003075	0.92	66.89	90.55	0.24
3	4707	Future Regional	134.46	83.61	86.68		86.71	0.001440	0.93	175.57	102.44	0.18
3	4598	2-Year (Ex)	8.57	83.60	84.75		84.79	0.009666	1.04	12.67	65.27	0.39
3	4598	5-Year (Ex)	16.13	83.60	84.92		84.95	0.006244	0.96	23.75	67.35	0.32
3	4598	10-Year (Ex)	20.44	83.60	84.99		85.02	0.005860	0.97	28.44	68.21	0.32
3	4598	25-Year (Ex)	29.09	83.60	85.11		85.14	0.005401	1.01	36.79	69.71	0.31
3	4598	50-Year (Ex)	36.09	83.60	85.19		85.23	0.005158	1.04	42.92	70.82	0.31
3	4598	100-Year (Ex)	41.69	83.60	85.26		85.30	0.005009	1.06	47.55	71.66	0.31
3	4598	Future 100-Year	42.90	83.60	85.27		85.32	0.004978	1.07	48.53	71.84	0.31
3	4598	Future Regional	134.46	83.60	86.60		86.63	0.001094	0.81	185.02	124.68	0.16

HEC-RAS Plan: Prop River: Kinsale Reach: 3 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
3	4577	2-Year (Ex)	8.57	83.36	84.66		84.68	0.003550	0.68	15.99	46.01	0.24
3	4577	5-Year (Ex)	16.13	83.36	84.84		84.86	0.003546	0.77	24.62	49.76	0.25
3	4577	10-Year (Ex)	20.44	83.36	84.91		84.94	0.003847	0.84	27.97	50.62	0.26
3	4577	25-Year (Ex)	29.09	83.36	85.03		85.06	0.004273	0.95	33.96	52.14	0.28
3	4577	50-Year (Ex)	36.09	83.36	85.11		85.15	0.004514	1.02	38.35	53.22	0.29
3	4577	100-Year (Ex)	41.69	83.36	85.17		85.22	0.004653	1.07	41.69	54.03	0.30
3	4577	Future 100-Year	42.90	83.36	85.18		85.24	0.004677	1.08	42.40	54.20	0.30
3	4577	Future Regional	134.46	83.36	86.57		86.61	0.001542	1.00	154.92	117.25	0.19
3	4553	2-Year (Ex)	8.57	83.36	84.60		84.61	0.003446	0.62	17.34	56.84	0.23
3	4553	5-Year (Ex)	16.13	83.36	84.79		84.81	0.002606	0.63	28.33	58.51	0.21
3	4553	10-Year (Ex)	20.44	83.36	84.85		84.87	0.002830	0.69	32.03	59.10	0.22
3	4553	25-Year (Ex)	29.09	83.36	84.96		84.99	0.003136	0.78	38.69	60.14	0.24
3	4553	50-Year (Ex)	36.09	83.36	85.04		85.08	0.003302	0.84	43.58	60.89	0.25
3	4553	100-Year (Ex)	41.69	83.36	85.10		85.15	0.003390	0.88	47.32	61.46	0.25
3	4553	Future 100-Year	42.90	83.36	85.12		85.16	0.003404	0.89	48.12	61.59	0.25
3	4553	Future Regional	134.46	83.36	86.55		86.58	0.001050	0.82	180.83	131.14	0.16
3	4504	2-Year (Ex)	8.57	83.33	84.40		84.46	0.005665	1.25	10.12	27.43	0.45
3	4504	5-Year (Ex)	16.13	83.33	84.58		84.67	0.007521	1.66	16.48	51.74	0.54
3	4504	10-Year (Ex)	20.44	83.33	84.66		84.74	0.007187	1.70	20.30	52.30	0.53
3	4504	25-Year (Ex)	29.09	83.33	84.78		84.86	0.006969	1.80	26.60	53.21	0.54
3	4504	50-Year (Ex)	36.09	83.33	84.86		84.95	0.006847	1.87	31.10	53.84	0.54
3	4504	100-Year (Ex)	41.69	83.33	84.93		85.02	0.006677	1.91	34.60	54.34	0.54
3	4504	Future 100-Year	42.90	83.33	84.94		85.04	0.006628	1.92	35.36	54.44	0.53
3	4504	Future Regional	134.46	83.33	86.52		86.56	0.001045	1.29	173.50	128.47	0.24
3	4480	2-Year (Ex)	8.57	83.16	84.33		84.36	0.003010	0.93	13.78	42.27	0.33
3	4480	5-Year (Ex)	16.13	83.16	84.50		84.54	0.003563	1.15	22.42	59.38	0.37
3	4480	10-Year (Ex)	20.44	83.16	84.58		84.62	0.003614	1.22	27.15	65.68	0.38
3	4480	25-Year (Ex)	29.09	83.16	84.71		84.75	0.003435	1.28	36.10	72.23	0.38
3	4480	50-Year (Ex)	36.09	83.16	84.80		84.84	0.003281	1.32	42.73	73.09	0.37
3	4480	100-Year (Ex)	41.69	83.16	84.87		84.92	0.003148	1.34	47.90	73.91	0.37
3	4480	Future 100-Year	42.90	83.16	84.88		84.93	0.003116	1.34	49.03	74.14	0.37
3	4480	Future Regional	134.46	83.16	86.52		86.54	0.000461	0.87	233.68	149.61	0.16
3	4408	2-Year (Ex)	8.57	82.90	84.15		84.18	0.003340	0.93	12.91	42.98	0.35
3	4408	5-Year (Ex)	16.13	82.90	84.32		84.36	0.003564	1.10	20.66	47.45	0.37
3	4408	10-Year (Ex)	20.44	82.90	84.39		84.44	0.003650	1.18	24.39	49.44	0.38
3	4408	25-Year (Ex)	29.09	82.90	84.52		84.58	0.003785	1.30	31.06	52.81	0.39
3	4408	50-Year (Ex)	36.09	82.90	84.62		84.68	0.003785	1.38	36.27	55.40	0.40
3	4408	100-Year (Ex)	41.69	82.90	84.70		84.76	0.003708	1.42	40.58	57.82	0.40
3	4408	Future 100-Year	42.90	82.90	84.71		84.78	0.003681	1.43	41.56	58.44	0.40
3	4408	Future Regional	134.46	82.90	86.51		86.53	0.000429	0.87	227.08	142.14	0.16
3	4383	2-Year (Ex)	8.57	82.89	84.10		84.12	0.001673	0.68	17.66	51.37	0.25
3	4383	5-Year (Ex)	16.13	82.89	84.27		84.29	0.001973	0.85	26.84	58.55	0.28
3	4383	10-Year (Ex)	20.44	82.89	84.35		84.37	0.002069	0.91	31.40	61.50	0.29
3	4383	25-Year (Ex)	29.09	82.89	84.48		84.51	0.002201	1.02	39.72	66.56	0.30
3	4383	50-Year (Ex)	36.09	82.89	84.57		84.61	0.002200	1.08	46.42	70.09	0.31
3	4383	100-Year (Ex)	41.69	82.89	84.65		84.69	0.002129	1.10	52.08	72.65	0.31
3	4383	Future 100-Year	42.90	82.89	84.67		84.71	0.002105	1.11	53.37	73.22	0.30
3	4383	Future Regional	134.46	82.89	86.50		86.52	0.000295	0.73	255.83	144.59	0.13
3	4361	2-Year (Ex)	8.57	82.89	84.07		84.08	0.001709	0.68	18.21	53.10	0.25
3	4361	5-Year (Ex)	16.13	82.89	84.23		84.25	0.002066	0.85	27.28	59.75	0.28
3	4361	10-Year (Ex)	20.44	82.89	84.30		84.33	0.002182	0.92	31.81	62.81	0.29
3	4361	25-Year (Ex)	29.09	82.89	84.43		84.46	0.002333	1.03	40.14	68.08	0.31
3	4361	50-Year (Ex)	36.09	82.89	84.53		84.56	0.002319	1.08	47.04	72.16	0.31
3	4361	100-Year (Ex)	41.69	82.89	84.61		84.65	0.002223	1.11	53.04	75.53	0.31
3	4361	Future 100-Year	42.90	82.89	84.63		84.67	0.002192	1.11	54.43	76.29	0.31
3	4361	Future Regional	134.46	82.89	86.50		86.51	0.000295	0.74	250.35	131.55	0.13
3	4343	2-Year (Ex)	8.57	82.89	84.05		84.06	0.001349	0.59	20.24	53.17	0.22
3	4343	5-Year (Ex)	16.13	82.89	84.20		84.22	0.001806	0.77	29.09	61.35	0.26
3	4343	10-Year (Ex)	20.44	82.89	84.27		84.30	0.001950	0.85	33.63	64.72	0.28
3	4343	25-Year (Ex)	29.09	82.89	84.40		84.43	0.002141	0.96	42.07	70.55	0.30
3	4343	50-Year (Ex)	36.09	82.89	84.50		84.53	0.002145	1.02	49.27	75.35	0.30
3	4343	100-Year (Ex)	41.69	82.89	84.58		84.61	0.002064	1.05	55.69	79.78	0.30
3	4343	Future 100-Year	42.90	82.89	84.60		84.63	0.002013	1.05	57.22	80.08	0.30
3	4343	Future Regional	134.46	82.89	86.49		86.51	0.000291	0.73	227.17	101.55	0.13
3	4335	2-Year (Ex)	8.57	82.89	84.04		84.05	0.001264	0.57	21.72	60.43	0.21
3	4335	5-Year (Ex)	16.13	82.89	84.19		84.20	0.001602	0.73	31.44	67.22	0.25
3	4335	10-Year (Ex)	20.44	82.89	84.26		84.28	0.001702	0.79	36.32	69.78	0.26
3	4335	25-Year (Ex)	29.09	82.89	84.38		84.41	0.001844	0.90	45.23	74.43	0.28
3	4335	50-Year (Ex)	36.09	82.89	84.48		84.51	0.001821	0.94	52.78	77.80	0.28
3	4335	100-Year (Ex)	41.69	82.89	84.56		84.59	0.001729	0.96	59.41	80.58	0.27

HEC-RAS Plan: Prop River: Kinsale Reach: 3 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
3	4335	Future 100-Year	42.90	82.89	84.58		84.61	0.001699	0.96	60.98	81.24	0.27
3	4335	Future Regional	134.46	82.89	86.49		86.50	0.000262	0.69	232.59	99.14	0.12
3	4316	2-Year (Ex)	8.57	82.87	83.98		84.01	0.003595	0.92	14.54	59.64	0.35
3	4316	5-Year (Ex)	16.13	82.87	84.13		84.16	0.003457	1.03	24.23	67.69	0.36
3	4316	10-Year (Ex)	20.44	82.87	84.20		84.24	0.003287	1.06	29.24	70.16	0.35
3	4316	25-Year (Ex)	29.09	82.87	84.33		84.36	0.003094	1.12	38.29	74.42	0.35
3	4316	50-Year (Ex)	36.09	82.87	84.43		84.47	0.002782	1.13	46.18	77.95	0.34
3	4316	100-Year (Ex)	41.69	82.87	84.52		84.56	0.002471	1.12	53.22	81.03	0.32
3	4316	Future 100-Year	42.90	82.87	84.54		84.58	0.002396	1.12	54.90	81.86	0.32
3	4316	Future Regional	134.46	82.87	86.48		86.50	0.000270	0.70	234.16	106.83	0.13
3	4299	2-Year (Ex)	8.57	82.79	83.86		83.92	0.006604	1.21	10.54	46.83	0.48
3	4299	5-Year (Ex)	16.13	82.79	84.01		84.07	0.006371	1.37	18.18	55.18	0.48
3	4299	10-Year (Ex)	20.44	82.79	84.09		84.15	0.006025	1.41	22.89	64.22	0.48
3	4299	25-Year (Ex)	29.09	82.79	84.24		84.29	0.004590	1.37	32.86	70.92	0.43
3	4299	50-Year (Ex)	36.09	82.79	84.36		84.41	0.003649	1.31	41.82	77.32	0.39
3	4299	100-Year (Ex)	41.69	82.79	84.46		84.50	0.002997	1.26	49.93	82.64	0.36
3	4299	Future 100-Year	42.90	82.79	84.48		84.53	0.002853	1.24	51.89	83.77	0.35
3	4299	Future Regional	134.46	82.79	86.48		86.49	0.000223	0.65	262.91	120.69	0.11
3	4201	2-Year (Ex)	8.57	82.43	83.73		83.74	0.001146	0.57	23.33	82.74	0.20
3	4201	5-Year (Ex)	16.13	82.43	83.92		83.93	0.000970	0.60	40.52	93.00	0.19
3	4201	10-Year (Ex)	20.44	82.43	84.01		84.02	0.000897	0.62	49.13	96.33	0.19
3	4201	25-Year (Ex)	29.09	82.43	84.18		84.19	0.000764	0.63	65.46	97.36	0.18
3	4201	50-Year (Ex)	36.09	82.43	84.31		84.33	0.000672	0.63	78.36	98.17	0.17
3	4201	100-Year (Ex)	41.69	82.43	84.42		84.43	0.000600	0.62	89.07	98.84	0.16
3	4201	Future 100-Year	42.90	82.43	84.45		84.46	0.000583	0.62	91.56	98.99	0.16
3	4201	Future Regional	134.46	82.43	86.47		86.48	0.000135	0.53	310.84	125.15	0.09
3	4179	2-Year (Ex)	8.57	82.43	83.70		83.71	0.001259	0.62	26.43	87.93	0.22
3	4179	5-Year (Ex)	16.13	82.43	83.90		83.91	0.001147	0.68	44.44	93.30	0.21
3	4179	10-Year (Ex)	20.44	82.43	83.99		84.00	0.001084	0.70	53.12	93.87	0.21
3	4179	25-Year (Ex)	29.09	82.43	84.16		84.17	0.000975	0.73	69.29	94.93	0.21
3	4179	50-Year (Ex)	36.09	82.43	84.30		84.31	0.000888	0.75	82.06	95.76	0.20
3	4179	100-Year (Ex)	41.69	82.43	84.41		84.42	0.000810	0.75	92.65	96.44	0.19
3	4179	Future 100-Year	42.90	82.43	84.43		84.45	0.000789	0.75	95.12	96.60	0.19
3	4179	Future Regional	134.46	82.43	86.47		86.48	0.000207	0.67	306.49	115.52	0.11
3	4156	2-Year (Ex)	8.57	82.37	83.68		83.69	0.001411	0.64	27.33	90.64	0.23
3	4156	5-Year (Ex)	16.13	82.37	83.87		83.89	0.001184	0.68	46.04	96.27	0.22
3	4156	10-Year (Ex)	20.44	82.37	83.97		83.98	0.001108	0.69	55.18	97.37	0.21
3	4156	25-Year (Ex)	29.09	82.37	84.14		84.15	0.000987	0.72	72.28	99.39	0.20
3	4156	50-Year (Ex)	36.09	82.37	84.28		84.29	0.000892	0.74	85.89	100.81	0.20
3	4156	100-Year (Ex)	41.69	82.37	84.39		84.40	0.000808	0.74	97.25	101.88	0.19
3	4156	Future 100-Year	42.90	82.37	84.42		84.43	0.000787	0.74	99.90	102.17	0.19
3	4156	Future Regional	134.46	82.37	86.47		86.48	0.000196	0.65	334.64	150.38	0.11
3	4110	2-Year (Ex)	8.57	82.33	83.57		83.60	0.004290	0.80	14.81	51.91	0.27
3	4110	5-Year (Ex)	16.13	82.33	83.79		83.82	0.003656	0.86	28.92	66.80	0.26
3	4110	10-Year (Ex)	20.44	82.33	83.90		83.92	0.003360	0.87	35.91	70.19	0.25
3	4110	25-Year (Ex)	29.09	82.33	84.08		84.11	0.002805	0.88	49.44	74.08	0.24
3	4110	50-Year (Ex)	36.09	82.33	84.23		84.25	0.002435	0.87	60.16	76.06	0.22
3	4110	100-Year (Ex)	41.69	82.33	84.34		84.36	0.002164	0.86	69.22	78.35	0.21
3	4110	Future 100-Year	42.90	82.33	84.37		84.39	0.002099	0.86	71.37	78.96	0.21
3	4110	Future Regional	134.46	82.33	86.46		86.47	0.000393	0.64	279.17	158.07	0.10
3	4091	2-Year (Ex)	8.57	82.33	83.55		83.55	0.001092	0.38	28.49	56.82	0.14
3	4091	5-Year (Ex)	16.13	82.33	83.76		83.77	0.001303	0.49	41.14	60.36	0.15
3	4091	10-Year (Ex)	20.44	82.33	83.86		83.87	0.001383	0.54	47.25	61.96	0.16
3	4091	25-Year (Ex)	29.09	82.33	84.05		84.06	0.001447	0.61	58.94	64.91	0.17
3	4091	50-Year (Ex)	36.09	82.33	84.19		84.21	0.001419	0.64	68.46	66.89	0.17
3	4091	100-Year (Ex)	41.69	82.33	84.31		84.33	0.001366	0.67	76.55	69.09	0.17
3	4091	Future 100-Year	42.90	82.33	84.34		84.35	0.001346	0.67	78.48	69.61	0.17
3	4091	Future Regional	134.46	82.33	86.45		86.46	0.000389	0.63	275.42	148.51	0.10
3	4033	2-Year (Ex)	8.57	82.33	83.51		83.51	0.001047	0.37	31.17	66.20	0.13
3	4033	5-Year (Ex)	16.13	82.33	83.72		83.73	0.001157	0.45	45.67	69.28	0.14
3	4033	10-Year (Ex)	20.44	82.33	83.82		83.83	0.001199	0.49	52.56	70.18	0.15
3	4033	25-Year (Ex)	29.09	82.33	84.00		84.01	0.001211	0.55	65.67	71.85	0.15
3	4033	50-Year (Ex)	36.09	82.33	84.15		84.16	0.001167	0.58	76.28	73.17	0.15
3	4033	100-Year (Ex)	41.69	82.33	84.27		84.28	0.001140	0.60	85.22	76.36	0.15
3	4033	Future 100-Year	42.90	82.33	84.30		84.31	0.001123	0.60	87.42	77.07	0.15
3	4033	Future Regional	134.46	82.33	86.44		86.45	0.000309	0.56	303.34	134.04	0.09
3	4009	2-Year (Ex)	8.57	82.33	83.48		83.48	0.001149	0.37	27.08	50.57	0.14
3	4009	5-Year (Ex)	16.13	82.33	83.68		83.69	0.001520	0.50	38.86	64.40	0.16
3	4009	10-Year (Ex)	20.44	82.33	83.78		83.79	0.001596	0.54	45.14	65.24	0.17
3	4009	25-Year (Ex)	29.09	82.33	83.96		83.98	0.001606	0.61	57.28	66.76	0.18

HEC-RAS Plan: Prop River: Kinsale Reach: 3 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
3	4009	50-Year (Ex)	36.09	82.33	84.11		84.13	0.001528	0.64	67.24	67.98	0.17
3	4009	100-Year (Ex)	41.69	82.33	84.23		84.25	0.001429	0.65	75.61	68.99	0.17
3	4009	Future 100-Year	42.90	82.33	84.26		84.28	0.001442	0.67	77.61	70.68	0.17
3	4009	Future Regional	134.46	82.33	86.43		86.44	0.000306	0.55	298.54	131.99	0.09
3	3967	2-Year (Ex)	8.57	82.33	83.38		83.40	0.005231	0.77	15.14	45.41	0.29
3	3967	5-Year (Ex)	16.13	82.33	83.57		83.60	0.005213	0.90	24.07	48.09	0.30
3	3967	10-Year (Ex)	20.44	82.33	83.67		83.70	0.004941	0.94	28.88	49.47	0.30
3	3967	25-Year (Ex)	29.09	82.33	83.86		83.89	0.004323	0.98	38.41	52.10	0.29
3	3967	50-Year (Ex)	36.09	82.33	84.01		84.05	0.003729	0.99	46.83	58.48	0.27
3	3967	100-Year (Ex)	41.69	82.33	84.14		84.18	0.003435	1.01	55.94	80.16	0.27
3	3967	Future 100-Year	42.90	82.33	84.17		84.21	0.003238	1.00	58.51	80.44	0.26
3	3967	Future Regional	134.46	82.33	86.41		86.43	0.000403	0.64	262.95	107.29	0.11
3	3941	2-Year (Ex)	8.57	82.23	83.26		83.28	0.005050	0.71	17.29	57.16	0.28
3	3941	5-Year (Ex)	16.13	82.23	83.48		83.49	0.003713	0.74	30.83	66.66	0.25
3	3941	10-Year (Ex)	20.44	82.23	83.59		83.61	0.003074	0.73	39.98	98.59	0.23
3	3941	25-Year (Ex)	29.09	82.23	83.80		83.82	0.002009	0.67	62.54	110.16	0.20
3	3941	50-Year (Ex)	36.09	82.23	83.98		83.99	0.001420	0.62	81.73	111.97	0.17
3	3941	100-Year (Ex)	41.69	82.23	84.12		84.13	0.001120	0.59	97.27	113.26	0.15
3	3941	Future 100-Year	42.90	82.23	84.15		84.16	0.001054	0.58	101.10	113.58	0.15
3	3941	Future Regional	134.46	82.23	86.41		86.42	0.000187	0.44	396.17	164.78	0.07
3	3886	2-Year (Ex)	8.57	81.78	83.02	82.57	83.04	0.003756	0.58	16.78	43.71	0.24
3	3886	5-Year (Ex)	16.13	81.78	83.30	82.77	83.32	0.002648	0.63	29.36	45.52	0.21
3	3886	10-Year (Ex)	20.44	81.78	83.44	82.90	83.46	0.002378	0.66	35.56	46.39	0.21
3	3886	25-Year (Ex)	29.09	81.78	83.69	83.01	83.71	0.002014	0.70	47.24	47.99	0.20
3	3886	50-Year (Ex)	36.09	81.78	83.88	83.08	83.90	0.001772	0.72	56.65	49.24	0.19
3	3886	100-Year (Ex)	41.69	81.78	84.03	83.12	84.05	0.001618	0.73	64.09	50.21	0.18
3	3886	Future 100-Year	42.90	81.78	84.07	83.13	84.09	0.001569	0.73	65.95	50.45	0.18
3	3886	Future Regional	134.46	81.78	86.41	83.67	86.41	0.000052	0.24	809.06	451.14	0.04
3	3880	2-Year (Ex)	8.57	81.71	82.96	82.37	83.01	0.004932	0.94	9.09	37.67	0.29
3	3880	5-Year (Ex)	16.13	81.71	83.17	82.62	83.28	0.009498	1.48	10.91	44.01	0.42
3	3880	10-Year (Ex)	20.44	81.71	83.26	82.75	83.42	0.012217	1.75	11.66	44.66	0.48
3	3880	25-Year (Ex)	29.09	81.71	83.39	82.96	83.66	0.017991	2.27	12.83	45.66	0.60
3	3880	50-Year (Ex)	36.09	81.71	83.48	83.13	83.84	0.022719	2.65	13.62	46.33	0.68
3	3880	100-Year (Ex)	41.69	81.71	83.54	83.25	83.98	0.027030	2.96	14.09	46.73	0.74
3	3880	Future 100-Year	42.90	81.71	83.56	83.28	84.02	0.027312	3.00	14.29	46.90	0.75
3	3880	Future Regional	134.46	81.71	84.81	84.81	86.27	0.040946	5.35	25.12	57.84	1.01
3	3857		Culvert									
3	3834	2-Year (Ex)	8.57	81.26	82.98	81.94	83.00	0.001694	0.66	12.96	55.23	0.18
3	3834	5-Year (Ex)	16.13	81.26	83.20	82.25	83.25	0.003608	1.07	15.10	65.93	0.27
3	3834	10-Year (Ex)	20.44	81.26	83.29	82.41	83.37	0.004770	1.28	16.01	69.69	0.32
3	3834	25-Year (Ex)	29.09	81.26	83.44	82.61	83.58	0.007221	1.67	17.47	75.84	0.40
3	3834	50-Year (Ex)	36.09	81.26	83.60	82.76	83.62	0.001607	0.66	67.91	82.68	0.18
3	3834	100-Year (Ex)	41.69	81.26	83.67	82.87	83.69	0.001743	0.71	73.33	85.65	0.19
3	3834	Future 100-Year	42.90	81.26	83.69	82.90	83.71	0.001753	0.72	74.98	87.40	0.19
3	3834	Future Regional	134.46	81.26	84.59	83.70	84.59	0.000292	0.41	434.73	298.56	0.08
3	3820	2-Year (Ex)	8.57	81.23	82.95	82.41	82.96	0.003007	0.54	16.67	37.21	0.22
3	3820	5-Year (Ex)	16.13	81.23	83.17	82.61	83.19	0.003154	0.67	29.09	72.34	0.23
3	3820	10-Year (Ex)	20.44	81.23	83.27	82.70	83.29	0.002960	0.70	36.79	80.21	0.23
3	3820	25-Year (Ex)	29.09	81.23	83.44	82.85	83.47	0.002549	0.73	51.34	85.31	0.22
3	3820	50-Year (Ex)	36.09	81.23	83.57	82.94	83.59	0.002331	0.75	62.20	88.98	0.21
3	3820	100-Year (Ex)	41.69	81.23	83.66	83.00	83.67	0.000439	0.34	168.58	238.51	0.09
3	3820	Future 100-Year	42.90	81.23	83.68	83.07	83.69	0.000433	0.34	173.19	239.96	0.09
3	3820	Future Regional	134.46	81.23	84.59	83.54	84.59	0.000324	0.42	425.07	295.32	0.09
3	3806	2-Year (Ex)	8.57	81.21	82.92	82.36	82.93	0.001993	0.44	21.46	55.56	0.18
3	3806	5-Year (Ex)	16.13	81.21	83.14	82.55	83.15	0.002039	0.55	33.87	57.85	0.19
3	3806	10-Year (Ex)	20.44	81.21	83.24	82.63	83.25	0.002056	0.59	39.75	59.01	0.19
3	3806	25-Year (Ex)	29.09	81.21	83.41	82.76	83.43	0.002088	0.67	50.22	61.32	0.20
3	3806	50-Year (Ex)	36.09	81.21	83.54	82.88	83.56	0.002110	0.72	57.99	63.70	0.21
3	3806	100-Year (Ex)	41.69	81.21	83.63	82.93	83.65	0.002120	0.76	63.87	65.28	0.21
3	3806	Future 100-Year	42.90	81.21	83.65	82.94	83.67	0.002122	0.76	65.11	65.61	0.21
3	3806	Future Regional	134.46	81.21	84.58	83.41	84.59	0.000282	0.39	442.07	305.97	0.08
3	3778	2-Year (Ex)	8.57	81.20	82.89	82.14	82.89	0.000789	0.34	27.28	42.17	0.12
3	3778	5-Year (Ex)	16.13	81.20	83.10	82.32	83.11	0.001232	0.48	36.37	45.42	0.15
3	3778	10-Year (Ex)	20.44	81.20	83.19	82.40	83.21	0.001422	0.55	40.81	46.99	0.16
3	3778	25-Year (Ex)	29.09	81.20	83.36	82.52	83.38	0.001716	0.66	48.90	49.75	0.18
3	3778	50-Year (Ex)	36.09	81.20	83.48	82.60	83.50	0.001892	0.73	54.96	51.73	0.20
3	3778	100-Year (Ex)	41.69	81.20	83.57	82.67	83.59	0.002008	0.79	59.58	53.20	0.20
3	3778	Future 100-Year	42.90	81.20	83.58	82.68	83.61	0.002030	0.80	60.55	53.50	0.21
3	3778	Future Regional	134.46	81.20	84.57	83.31	84.58	0.000241	0.38	463.94	322.24	0.08

HEC-RAS Plan: Prop River: Kinsale Reach: 3 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
3	3750	2-Year (Ex)	8.57	81.19	82.87		82.87	0.000760	0.34	29.67	48.22	0.11
3	3750	5-Year (Ex)	16.13	81.19	83.06		83.07	0.001195	0.49	39.54	52.77	0.15
3	3750	10-Year (Ex)	20.44	81.19	83.15		83.17	0.001376	0.55	44.45	54.72	0.16
3	3750	25-Year (Ex)	29.09	81.19	83.31		83.33	0.001639	0.65	53.47	57.69	0.18
3	3750	50-Year (Ex)	36.09	81.19	83.43		83.45	0.001791	0.72	60.26	59.83	0.19
3	3750	100-Year (Ex)	41.69	81.19	83.52		83.54	0.001887	0.77	65.45	61.41	0.20
3	3750	Future 100-Year	42.90	81.19	83.53		83.56	0.001905	0.78	66.55	61.74	0.20
3	3750	Future Regional	134.46	81.19	84.50		84.56	0.002568	1.24	135.99	83.36	0.25
3	3725	2-Year (Ex)	8.57	81.18	82.85		82.86	0.000534	0.28	36.56	62.20	0.09
3	3725	5-Year (Ex)	16.13	81.18	83.04		83.05	0.000834	0.39	48.64	65.48	0.12
3	3725	10-Year (Ex)	20.44	81.18	83.13		83.14	0.000954	0.44	54.52	67.08	0.13
3	3725	25-Year (Ex)	29.09	81.18	83.29		83.30	0.001131	0.53	65.30	69.91	0.15
3	3725	50-Year (Ex)	36.09	81.18	83.40		83.42	0.001233	0.58	73.38	71.96	0.15
3	3725	100-Year (Ex)	41.69	81.18	83.49		83.50	0.001297	0.62	79.53	73.49	0.16
3	3725	Future 100-Year	42.90	81.18	83.51		83.52	0.001309	0.63	80.83	73.80	0.16
3	3725	Future Regional	134.46	81.18	84.47		84.51	0.001758	1.00	160.13	90.94	0.20
3	3704	2-Year (Ex)	8.57	81.17	82.83		82.84	0.003352	0.54	21.11	61.35	0.22
3	3704	5-Year (Ex)	16.13	81.17	83.01		83.02	0.003259	0.62	32.52	64.02	0.22
3	3704	10-Year (Ex)	20.44	81.17	83.09		83.11	0.003234	0.65	38.10	65.45	0.23
3	3704	25-Year (Ex)	29.09	81.17	83.25		83.27	0.003161	0.71	48.41	68.03	0.23
3	3704	50-Year (Ex)	36.09	81.17	83.36		83.38	0.003115	0.75	56.17	70.26	0.23
3	3704	100-Year (Ex)	41.69	81.17	83.44		83.47	0.003076	0.78	62.13	71.92	0.23
3	3704	Future 100-Year	42.90	81.17	83.46		83.49	0.003068	0.78	63.39	72.27	0.23
3	3704	Future Regional	134.46	81.17	84.42		84.47	0.002685	1.08	138.22	82.68	0.24
3	3680	2-Year (Ex)	8.57	81.16	82.68		82.71	0.008224	0.82	13.46	62.06	0.35
3	3680	5-Year (Ex)	16.13	81.16	82.89		82.91	0.005341	0.79	26.99	66.29	0.29
3	3680	10-Year (Ex)	20.44	81.16	82.99		83.01	0.004670	0.80	33.34	68.07	0.28
3	3680	25-Year (Ex)	29.09	81.16	83.15		83.18	0.003914	0.83	44.88	70.77	0.26
3	3680	50-Year (Ex)	36.09	81.16	83.27		83.30	0.003547	0.85	53.32	71.90	0.25
3	3680	100-Year (Ex)	41.69	81.16	83.36		83.38	0.003340	0.86	59.63	72.56	0.25
3	3680	Future 100-Year	42.90	81.16	83.38		83.40	0.003303	0.87	60.95	72.69	0.25
3	3680	Future Regional	134.46	81.16	84.35		84.40	0.002644	1.14	136.90	83.65	0.25
3	3638	2-Year (Ex)	8.57	81.15	82.60		82.61	0.001074	0.40	24.54	58.52	0.14
3	3638	5-Year (Ex)	16.13	81.15	82.80		82.81	0.001507	0.54	36.51	61.99	0.17
3	3638	10-Year (Ex)	20.44	81.15	82.89		82.91	0.001633	0.59	42.39	63.10	0.18
3	3638	25-Year (Ex)	29.09	81.15	83.06		83.08	0.001777	0.68	53.07	65.07	0.19
3	3638	50-Year (Ex)	36.09	81.15	83.18		83.20	0.001837	0.73	61.01	66.47	0.19
3	3638	100-Year (Ex)	41.69	81.15	83.27		83.29	0.001873	0.77	66.97	67.52	0.20
3	3638	Future 100-Year	42.90	81.15	83.29		83.31	0.001880	0.77	68.22	67.75	0.20
3	3638	Future Regional	134.46	81.15	84.26		84.31	0.002224	1.16	139.60	78.99	0.23
3	3599	2-Year (Ex)	8.57	81.14	82.54		82.55	0.003001	0.63	21.45	67.39	0.22
3	3599	5-Year (Ex)	16.13	81.14	82.73		82.74	0.002646	0.68	34.73	69.12	0.21
3	3599	10-Year (Ex)	20.44	81.14	82.82		82.84	0.002513	0.70	41.29	69.97	0.21
3	3599	25-Year (Ex)	29.09	81.14	82.99		83.01	0.002330	0.74	53.14	71.43	0.21
3	3599	50-Year (Ex)	36.09	81.14	83.11		83.13	0.002225	0.77	61.92	72.50	0.21
3	3599	100-Year (Ex)	41.69	81.14	83.20		83.22	0.002168	0.79	68.46	73.29	0.21
3	3599	Future 100-Year	42.90	81.14	83.22		83.24	0.002158	0.80	69.83	73.45	0.21
3	3599	Future Regional	134.46	81.14	84.19		84.24	0.002160	1.11	145.50	82.51	0.23
3	3578	2-Year (Ex)	8.57	81.14	82.47		82.48	0.003584	0.63	20.15	60.75	0.24
3	3578	5-Year (Ex)	16.13	81.14	82.67		82.69	0.003013	0.66	32.77	62.52	0.22
3	3578	10-Year (Ex)	20.44	81.14	82.77		82.79	0.002856	0.68	38.89	63.36	0.22
3	3578	25-Year (Ex)	29.09	81.14	82.94		82.96	0.002637	0.72	49.85	64.83	0.22
3	3578	50-Year (Ex)	36.09	81.14	83.07		83.09	0.002525	0.76	57.94	65.90	0.22
3	3578	100-Year (Ex)	41.69	81.14	83.16		83.18	0.002469	0.79	63.94	66.68	0.22
3	3578	Future 100-Year	42.90	81.14	83.17		83.20	0.002460	0.79	65.19	66.84	0.22
3	3578	Future Regional	134.46	81.14	84.14		84.19	0.002579	1.16	133.71	76.48	0.24
3	3549	2-Year (Ex)	8.57	81.14	82.41		82.42	0.001940	0.49	22.83	55.99	0.18
3	3549	5-Year (Ex)	16.13	81.14	82.62		82.63	0.002060	0.59	34.92	59.57	0.19
3	3549	10-Year (Ex)	20.44	81.14	82.72		82.73	0.002084	0.63	40.88	61.25	0.20
3	3549	25-Year (Ex)	29.09	81.14	82.89		82.91	0.002105	0.70	51.74	64.15	0.20
3	3549	50-Year (Ex)	36.09	81.14	83.02		83.04	0.002096	0.75	59.87	65.93	0.20
3	3549	100-Year (Ex)	41.69	81.14	83.11		83.13	0.002095	0.78	65.94	67.18	0.21
3	3549	Future 100-Year	42.90	81.14	83.13		83.15	0.002096	0.79	67.21	67.44	0.21
3	3549	Future Regional	134.46	81.14	84.09		84.14	0.002414	1.18	138.17	80.16	0.24
3	3528	2-Year (Ex)	8.57	81.10	82.34		82.36	0.004511	0.70	15.45	42.58	0.27
3	3528	5-Year (Ex)	16.13	81.10	82.54		82.57	0.004633	0.84	24.37	46.18	0.28
3	3528	10-Year (Ex)	20.44	81.10	82.64		82.67	0.004572	0.89	28.93	47.94	0.29
3	3528	25-Year (Ex)	29.09	81.10	82.81		82.84	0.004412	0.97	37.42	50.91	0.29
3	3528	50-Year (Ex)	36.09	81.10	82.93		82.97	0.004284	1.02	43.84	52.82	0.29
3	3528	100-Year (Ex)	41.69	81.10	83.02		83.06	0.004226	1.06	48.67	54.54	0.29
3	3528	Future 100-Year	42.90	81.10	83.04		83.08	0.004216	1.07	49.68	54.89	0.29

HEC-RAS Plan: Prop River: Kinsale Reach: 3 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
3	3528	Future Regional	134.46	81.10	83.98		84.07	0.004324	1.53	109.26	70.40	0.32
3	3504	2-Year (Ex)	8.57	80.98	82.20		82.23	0.007105	0.86	12.79	44.43	0.33
3	3504	5-Year (Ex)	16.13	80.98	82.43		82.46	0.005402	0.91	23.32	47.31	0.30
3	3504	10-Year (Ex)	20.44	80.98	82.53		82.56	0.004963	0.94	28.38	48.66	0.30
3	3504	25-Year (Ex)	29.09	80.98	82.71		82.75	0.004471	0.99	37.46	51.01	0.29
3	3504	50-Year (Ex)	36.09	80.98	82.84		82.88	0.004238	1.04	44.16	52.77	0.29
3	3504	100-Year (Ex)	41.69	80.98	82.93		82.98	0.004138	1.07	49.10	54.11	0.29
3	3504	Future 100-Year	42.90	80.98	82.95		83.00	0.004122	1.08	50.13	54.39	0.29
3	3504	Future Regional	134.46	80.98	83.89		83.97	0.004399	1.56	108.09	70.22	0.32
3	3483	2-Year (Ex)	8.57	80.97	82.06		82.09	0.005692	0.78	12.27	34.40	0.30
3	3483	5-Year (Ex)	16.13	80.97	82.31		82.35	0.005195	0.91	21.44	39.25	0.30
3	3483	10-Year (Ex)	20.44	80.97	82.42		82.46	0.005033	0.97	25.91	41.30	0.30
3	3483	25-Year (Ex)	29.09	80.97	82.61		82.66	0.004881	1.07	33.99	45.30	0.31
3	3483	50-Year (Ex)	36.09	80.97	82.74		82.79	0.004776	1.13	40.17	48.44	0.31
3	3483	100-Year (Ex)	41.69	80.97	82.84		82.89	0.004753	1.17	44.77	50.70	0.31
3	3483	Future 100-Year	42.90	80.97	82.85		82.91	0.004750	1.18	45.74	51.18	0.31
3	3483	Future Regional	134.46	80.97	83.78		83.88	0.005132	1.70	103.64	72.63	0.35
3	3466	2-Year (Ex)	8.57	80.96	82.02		82.03	0.002576	0.56	17.34	32.17	0.21
3	3466	5-Year (Ex)	16.13	80.96	82.26		82.28	0.003024	0.73	25.86	37.77	0.23
3	3466	10-Year (Ex)	20.44	80.96	82.37		82.39	0.003201	0.81	30.10	40.27	0.24
3	3466	25-Year (Ex)	29.09	80.96	82.55		82.59	0.003539	0.94	37.98	46.20	0.26
3	3466	50-Year (Ex)	36.09	80.96	82.68		82.72	0.003642	1.02	44.28	50.09	0.27
3	3466	100-Year (Ex)	41.69	80.96	82.77		82.82	0.003742	1.07	49.00	53.07	0.28
3	3466	Future 100-Year	42.90	80.96	82.79		82.84	0.003760	1.09	50.00	53.69	0.28
3	3466	Future Regional	134.46	80.96	83.71		83.80	0.004320	1.59	113.04	79.40	0.32
3	3445	2-Year (Ex)	8.57	80.95	81.88		81.93	0.012436	1.02	9.47	24.57	0.43
3	3445	5-Year (Ex)	16.13	80.95	82.11		82.17	0.011045	1.21	16.27	34.03	0.43
3	3445	10-Year (Ex)	20.44	80.95	82.22		82.29	0.010203	1.26	20.24	38.35	0.42
3	3445	25-Year (Ex)	29.09	80.95	82.41		82.48	0.008934	1.34	28.04	44.89	0.41
3	3445	50-Year (Ex)	36.09	80.95	82.55		82.62	0.007954	1.37	34.66	49.76	0.39
3	3445	100-Year (Ex)	41.69	80.95	82.64		82.72	0.007540	1.40	39.55	53.03	0.39
3	3445	Future 100-Year	42.90	80.95	82.66		82.74	0.007451	1.40	40.60	53.64	0.38
3	3445	Future Regional	134.46	80.95	83.61		83.71	0.005793	1.76	102.20	74.64	0.37
3	3427	2-Year (Ex)	8.57	80.87	81.75		81.78	0.006014	0.83	12.26	26.11	0.31
3	3427	5-Year (Ex)	16.13	80.87	81.99		82.03	0.006360	1.03	19.36	32.63	0.34
3	3427	10-Year (Ex)	20.44	80.87	82.11		82.15	0.006427	1.12	23.35	37.23	0.34
3	3427	25-Year (Ex)	29.09	80.87	82.31		82.36	0.006117	1.22	31.60	44.79	0.35
3	3427	50-Year (Ex)	36.09	80.87	82.46		82.51	0.005551	1.26	38.84	49.86	0.34
3	3427	100-Year (Ex)	41.69	80.87	82.56		82.62	0.005388	1.30	44.00	53.28	0.33
3	3427	Future 100-Year	42.90	80.87	82.58		82.64	0.005346	1.30	45.12	53.92	0.33
3	3427	Future Regional	134.46	80.87	83.54		83.63	0.004835	1.71	108.34	75.13	0.34
3	3399	2-Year (Ex)	8.57	80.80	81.64		81.66	0.003535	0.62	15.81	31.49	0.24
3	3399	5-Year (Ex)	16.13	80.80	81.88		81.91	0.003819	0.78	23.68	34.39	0.26
3	3399	10-Year (Ex)	20.44	80.80	82.00		82.03	0.003868	0.85	27.70	35.79	0.27
3	3399	25-Year (Ex)	29.09	80.80	82.20		82.24	0.003853	0.96	35.31	38.28	0.27
3	3399	50-Year (Ex)	36.09	80.80	82.36		82.40	0.003810	1.03	41.55	42.76	0.28
3	3399	100-Year (Ex)	41.69	80.80	82.46		82.51	0.003956	1.10	45.96	47.84	0.29
3	3399	Future 100-Year	42.90	80.80	82.48		82.53	0.003974	1.11	46.96	49.03	0.29
3	3399	Future Regional	134.46	80.80	83.45		83.54	0.003913	1.54	111.00	76.99	0.31
3	3373	2-Year (Ex)	8.57	80.74	81.51		81.54	0.006402	0.78	13.77	39.52	0.35
3	3373	5-Year (Ex)	16.13	80.74	81.78		81.81	0.003813	0.79	24.90	42.75	0.29
3	3373	10-Year (Ex)	20.44	80.74	81.91		81.93	0.003400	0.83	30.20	44.21	0.28
3	3373	25-Year (Ex)	29.09	80.74	82.12		82.15	0.002921	0.88	40.05	46.85	0.27
3	3373	50-Year (Ex)	36.09	80.74	82.29		82.32	0.002611	0.91	47.96	48.91	0.26
3	3373	100-Year (Ex)	41.69	80.74	82.38		82.42	0.002606	0.96	52.82	50.14	0.26
3	3373	Future 100-Year	42.90	80.74	82.41		82.44	0.002601	0.97	53.87	50.40	0.26
3	3373	Future Regional	134.46	80.74	83.36		83.45	0.003426	1.57	109.74	72.66	0.33
3	3346	2-Year (Ex)	8.57	80.34	81.46		81.47	0.001285	0.39	24.06	40.40	0.14
3	3346	5-Year (Ex)	16.13	80.34	81.74		81.75	0.001369	0.50	35.73	43.83	0.16
3	3346	10-Year (Ex)	20.44	80.34	81.86		81.88	0.001430	0.55	41.21	45.34	0.16
3	3346	25-Year (Ex)	29.09	80.34	82.08		82.10	0.001498	0.63	51.39	48.01	0.17
3	3346	50-Year (Ex)	36.09	80.34	82.25		82.27	0.001488	0.68	59.59	50.11	0.18
3	3346	100-Year (Ex)	41.69	80.34	82.34		82.37	0.001574	0.73	64.52	51.40	0.18
3	3346	Future 100-Year	42.90	80.34	82.37		82.39	0.001589	0.74	65.58	51.68	0.18
3	3346	Future Regional	134.46	80.34	83.30		83.37	0.002790	1.32	118.87	62.92	0.26
3	3320	2-Year (Ex)	8.57	80.34	81.43		81.44	0.001185	0.42	24.41	41.13	0.14
3	3320	5-Year (Ex)	16.13	80.34	81.70		81.72	0.001326	0.54	36.31	45.48	0.16
3	3320	10-Year (Ex)	20.44	80.34	81.83		81.84	0.001402	0.59	41.95	47.40	0.17
3	3320	25-Year (Ex)	29.09	80.34	82.04		82.06	0.001477	0.67	52.58	50.69	0.17
3	3320	50-Year (Ex)	36.09	80.34	82.21		82.23	0.001460	0.72	61.30	53.13	0.18

HEC-RAS Plan: Prop River: Kinsale Reach: 3 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
3	3320	100-Year (Ex)	41.69	80.34	82.31		82.33	0.001548	0.76	66.41	54.50	0.18
3	3320	Future 100-Year	42.90	80.34	82.33		82.35	0.001562	0.77	67.53	54.80	0.19
3	3320	Future Regional	134.46	80.34	83.22		83.29	0.002987	1.40	123.94	77.00	0.27
3	3300	2-Year (Ex)	8.57	80.25	81.41		81.42	0.000725	0.34	28.20	40.02	0.11
3	3300	5-Year (Ex)	16.13	80.25	81.68		81.69	0.000959	0.47	39.59	44.28	0.14
3	3300	10-Year (Ex)	20.44	80.25	81.80		81.81	0.001065	0.53	44.99	46.15	0.15
3	3300	25-Year (Ex)	29.09	80.25	82.02		82.03	0.001201	0.62	55.24	49.65	0.16
3	3300	50-Year (Ex)	36.09	80.25	82.18		82.20	0.001231	0.67	63.80	52.50	0.16
3	3300	100-Year (Ex)	41.69	80.25	82.28		82.30	0.001332	0.72	68.75	54.09	0.17
3	3300	Future 100-Year	42.90	80.25	82.30		82.32	0.001350	0.73	69.84	54.43	0.17
3	3300	Future Regional	134.46	80.25	83.17		83.23	0.002600	1.32	131.95	87.53	0.26
3	3273	2-Year (Ex)	8.57	80.24	81.38		81.39	0.001203	0.43	22.62	34.18	0.15
3	3273	5-Year (Ex)	16.13	80.24	81.64		81.66	0.001574	0.59	32.03	38.33	0.17
3	3273	10-Year (Ex)	20.44	80.24	81.76		81.78	0.001745	0.66	36.51	40.19	0.19
3	3273	25-Year (Ex)	29.09	80.24	81.96		81.99	0.001972	0.77	45.23	45.30	0.20
3	3273	50-Year (Ex)	36.09	80.24	82.13		82.16	0.002019	0.84	53.34	53.75	0.21
3	3273	100-Year (Ex)	41.69	80.24	82.22		82.25	0.002177	0.90	58.31	58.71	0.22
3	3273	Future 100-Year	42.90	80.24	82.24		82.27	0.002201	0.91	59.45	59.80	0.22
3	3273	Future Regional	134.46	80.24	83.07		83.15	0.003405	1.47	122.82	89.44	0.29
3	3258	2-Year (Ex)	8.57	80.22	81.36		81.37	0.001590	0.48	20.19	31.22	0.17
3	3258	5-Year (Ex)	16.13	80.22	81.61		81.63	0.002076	0.65	28.50	34.96	0.20
3	3258	10-Year (Ex)	20.44	80.22	81.72		81.75	0.002299	0.73	32.45	36.61	0.21
3	3258	25-Year (Ex)	29.09	80.22	81.92		81.95	0.002652	0.87	40.41	45.62	0.23
3	3258	50-Year (Ex)	36.09	80.22	82.09		82.12	0.002686	0.94	48.71	56.03	0.24
3	3258	100-Year (Ex)	41.69	80.22	82.17		82.21	0.002792	0.99	53.86	61.58	0.24
3	3258	Future 100-Year	42.90	80.22	82.19		82.23	0.002799	1.00	55.05	62.47	0.25
3	3258	Future Regional	134.46	80.22	83.02		83.10	0.003656	1.49	122.55	98.92	0.30
3	3238	2-Year (Ex)	8.57	80.22	81.30	80.85	81.32	0.003851	0.72	13.45	23.89	0.25
3	3238	5-Year (Ex)	16.13	80.22	81.52	81.04	81.57	0.005125	0.98	19.14	26.89	0.31
3	3238	10-Year (Ex)	20.44	80.22	81.62	81.13	81.67	0.005821	1.10	21.87	30.39	0.33
3	3238	25-Year (Ex)	29.09	80.22	81.80	81.28	81.87	0.006320	1.27	28.10	37.76	0.35
3	3238	50-Year (Ex)	36.09	80.22	81.97	81.40	82.04	0.005673	1.31	35.13	44.62	0.34
3	3238	100-Year (Ex)	41.69	80.22	82.05	81.46	82.13	0.005947	1.38	38.77	47.16	0.35
3	3238	Future 100-Year	42.90	80.22	82.07	81.47	82.15	0.005961	1.40	39.65	47.74	0.35
3	3238	Future Regional	134.46	80.22	82.81	82.30	82.98	0.009181	2.23	83.75	70.91	0.47
3	3225	2-Year (Ex)	8.57	80.22	81.24	80.86	81.27	0.004920	0.67	13.87	28.64	0.27
3	3225	5-Year (Ex)	16.13	80.22	81.46	81.04	81.49	0.005468	0.87	20.88	35.88	0.30
3	3225	10-Year (Ex)	20.44	80.22	81.55	81.12	81.59	0.005729	0.95	24.34	38.53	0.32
3	3225	25-Year (Ex)	29.09	80.22	81.74	81.24	81.79	0.005487	1.06	32.07	44.73	0.32
3	3225	50-Year (Ex)	36.09	80.22	81.92	81.33	81.97	0.004456	1.05	40.95	51.86	0.30
3	3225	100-Year (Ex)	41.69	80.22	82.00	81.40	82.05	0.004645	1.12	45.12	55.30	0.31
3	3225	Future 100-Year	42.90	80.22	82.02	81.41	82.07	0.004644	1.13	46.15	56.12	0.31
3	3225	Future Regional	134.46	80.22	82.74	82.08	82.86	0.007036	1.83	94.94	78.26	0.40
3	3216	2-Year (Ex)	8.57	80.22	81.21	80.79	81.23	0.003384	0.59	16.14	35.06	0.23
3	3216	5-Year (Ex)	16.13	80.22	81.42	80.95	81.45	0.003978	0.77	24.85	46.56	0.26
3	3216	10-Year (Ex)	20.44	80.22	81.51	81.03	81.54	0.004108	0.83	29.31	49.36	0.27
3	3216	25-Year (Ex)	29.09	80.22	81.71	81.15	81.74	0.003758	0.90	39.48	56.80	0.27
3	3216	50-Year (Ex)	36.09	80.22	81.90	81.24	81.93	0.002904	0.88	51.24	64.48	0.24
3	3216	100-Year (Ex)	41.69	80.22	81.98	81.30	82.01	0.003033	0.93	56.41	68.93	0.25
3	3216	Future 100-Year	42.90	80.22	82.00	81.32	82.03	0.003030	0.94	57.72	70.01	0.25
3	3216	Future Regional	134.46	80.22	82.71	81.91	82.79	0.004572	1.51	116.19	91.28	0.33
3	3201	2-Year (Ex)	8.57	80.22	81.16		81.17	0.002936	0.51	18.29	37.68	0.21
3	3201	5-Year (Ex)	16.13	80.22	81.36		81.38	0.003409	0.67	26.86	46.55	0.24
3	3201	10-Year (Ex)	20.44	80.22	81.45		81.48	0.003626	0.74	31.21	50.76	0.25
3	3201	25-Year (Ex)	29.09	80.22	81.65		81.68	0.003284	0.81	42.16	59.49	0.25
3	3201	50-Year (Ex)	36.09	80.22	81.86		81.89	0.002452	0.79	55.43	68.02	0.22
3	3201	100-Year (Ex)	41.69	80.22	81.94		81.96	0.002586	0.84	60.73	71.84	0.23
3	3201	Future 100-Year	42.90	80.22	81.96		81.98	0.002583	0.84	62.09	72.63	0.23
3	3201	Future Regional	134.46	80.22	82.65		82.72	0.004275	1.42	120.38	93.08	0.31
3	3166	2-Year (Ex)	8.57	80.12	81.08		81.09	0.001915	0.41	23.45	49.31	0.17
3	3166	5-Year (Ex)	16.13	80.12	81.27		81.29	0.002268	0.54	33.19	52.38	0.19
3	3166	10-Year (Ex)	20.44	80.12	81.35		81.37	0.002506	0.60	37.47	54.33	0.21
3	3166	25-Year (Ex)	29.09	80.12	81.56		81.58	0.002201	0.65	49.65	62.34	0.20
3	3166	50-Year (Ex)	36.09	80.12	81.80		81.82	0.001573	0.63	65.39	72.08	0.18
3	3166	100-Year (Ex)	41.69	80.12	81.87		81.89	0.001693	0.68	70.68	74.44	0.18
3	3166	Future 100-Year	42.90	80.12	81.89		81.91	0.001698	0.69	72.09	75.05	0.19
3	3166	Future Regional	134.46	80.12	82.51		82.58	0.003668	1.29	124.72	91.60	0.29
3	3110	2-Year (Ex)	8.57	80.10	81.04	80.63	81.04	0.000756	0.28	37.11	80.13	0.11
3	3110	5-Year (Ex)	16.13	80.10	81.22	80.73	81.23	0.000923	0.36	52.21	82.21	0.13
3	3110	10-Year (Ex)	20.44	80.10	81.30	80.76	81.30	0.001040	0.41	58.44	83.05	0.14

HEC-RAS Plan: Prop River: Kinsale Reach: 3 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
3	3110	25-Year (Ex)	29.09	80.10	81.52	80.81	81.53	0.000879	0.43	77.13	85.52	0.13
3	3110	50-Year (Ex)	36.09	80.10	81.77	80.85	81.77	0.000625	0.42	98.67	88.33	0.11
3	3110	100-Year (Ex)	41.69	80.10	81.84	80.89	81.85	0.000690	0.45	104.85	89.13	0.12
3	3110	Future 100-Year	42.90	80.10	81.86	80.89	81.86	0.000695	0.46	106.52	89.34	0.12
3	3110	Future Regional	134.46	80.10	82.43	81.25	82.47	0.001945	0.95	160.10	96.89	0.21
3	3046	2-Year (Ex)	8.57	80.07	81.00		81.00	0.000810	0.29	38.64	89.15	0.11
3	3046	5-Year (Ex)	16.13	80.07	81.18		81.18	0.000938	0.37	54.90	91.78	0.13
3	3046	10-Year (Ex)	20.44	80.07	81.25		81.25	0.001063	0.41	61.26	92.79	0.14
3	3046	25-Year (Ex)	29.09	80.07	81.48		81.49	0.000815	0.42	83.26	96.27	0.12
3	3046	50-Year (Ex)	36.09	80.07	81.74		81.75	0.000554	0.40	110.66	124.99	0.11
3	3046	100-Year (Ex)	41.69	80.07	81.81		81.81	0.000605	0.43	119.23	130.76	0.11
3	3046	Future 100-Year	42.90	80.07	81.83		81.83	0.000606	0.43	121.70	133.36	0.11
3	3046	Future Regional	134.46	80.07	82.36		82.38	0.001498	0.83	201.95	162.53	0.19
3	3008	2-Year (Ex)	8.57	79.81	80.97		80.97	0.001275	0.37	28.00	62.86	0.14
3	3008	5-Year (Ex)	16.13	79.81	81.14		81.15	0.001721	0.50	39.93	76.93	0.17
3	3008	10-Year (Ex)	20.44	79.81	81.20		81.21	0.002022	0.56	44.88	81.27	0.19
3	3008	25-Year (Ex)	29.09	79.81	81.45		81.46	0.001428	0.55	66.82	98.74	0.16
3	3008	50-Year (Ex)	36.09	79.81	81.72		81.73	0.000820	0.48	96.20	115.39	0.13
3	3008	100-Year (Ex)	41.69	79.81	81.78		81.79	0.000879	0.52	104.19	128.54	0.13
3	3008	Future 100-Year	42.90	79.81	81.80		81.81	0.000876	0.52	106.63	132.04	0.13
3	3008	Future Regional	134.46	79.81	82.31		82.34	0.001951	0.94	190.35	196.49	0.21
3	2977	2-Year (Ex)	8.57	79.70	80.91		80.92	0.002846	0.53	21.39	71.25	0.21
3	2977	5-Year (Ex)	16.13	79.70	81.07		81.08	0.003618	0.60	34.89	100.60	0.24
3	2977	10-Year (Ex)	20.44	79.70	81.12		81.13	0.004164	0.67	40.35	113.12	0.26
3	2977	25-Year (Ex)	29.09	79.70	81.41		81.42	0.001345	0.46	79.72	151.84	0.15
3	2977	50-Year (Ex)	36.09	79.70	81.70		81.71	0.000496	0.33	130.04	183.66	0.10
3	2977	100-Year (Ex)	41.69	79.70	81.77		81.77	0.000507	0.35	142.21	190.73	0.10
3	2977	Future 100-Year	42.90	79.70	81.79		81.79	0.000498	0.35	145.85	192.89	0.10
3	2977	Future Regional	134.46	79.70	82.28		82.29	0.001041	0.62	249.48	230.58	0.15
3	2956	2-Year (Ex)	8.57	79.65	80.83	80.57	80.85	0.004247	0.61	19.84	79.65	0.25
3	2956	5-Year (Ex)	16.13	79.65	80.98		80.99	0.005105	0.66	33.98	118.75	0.28
3	2956	10-Year (Ex)	20.44	79.65	81.01		81.03	0.006309	0.73	38.15	127.97	0.31
3	2956	25-Year (Ex)	29.09	79.65	81.39		81.39	0.000876	0.34	99.07	183.41	0.12
3	2956	50-Year (Ex)	36.09	79.65	81.70		81.70	0.000303	0.25	159.73	211.32	0.07
3	2956	100-Year (Ex)	41.69	79.65	81.76		81.77	0.000314	0.26	173.72	219.41	0.08
3	2956	Future 100-Year	42.90	79.65	81.78		81.78	0.000310	0.26	177.93	221.69	0.08
3	2956	Future Regional	134.46	79.65	82.26		82.27	0.000714	0.50	292.95	259.23	0.12
3	2937	2-Year (Ex)	9.68	79.65	80.50	80.50	80.63	0.050692	1.61	6.68	33.16	0.82
3	2937	5-Year (Ex)	18.14	79.65	80.67	80.67	80.77	0.041354	1.56	15.41	76.90	0.75
3	2937	10-Year (Ex)	22.96	79.65	80.80		80.84	0.019352	1.12	27.11	107.91	0.52
3	2937	25-Year (Ex)	32.61	79.65	81.38		81.38	0.000578	0.30	125.98	204.42	0.10
3	2937	50-Year (Ex)	40.38	79.65	81.69		81.70	0.000229	0.23	195.12	238.70	0.07
3	2937	100-Year (Ex)	46.58	79.65	81.76		81.76	0.000242	0.25	210.85	247.16	0.07
3	2937	Future 100-Year	48.02	79.65	81.78		81.78	0.000240	0.25	215.60	248.71	0.07
3	2937	Future Regional	145.33	79.65	82.25		82.26	0.000574	0.47	343.10	289.57	0.11

HEC-RAS Plan: Prop River: LyndeT1 Reach: 1

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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
1	2529	2-Year (Ex)	0.89	96.69	97.06	96.82	97.06	0.000130	0.13	7.21	31.23	0.08
1	2529	5-Year (Ex)	1.57	96.69	97.13	96.86	97.13	0.000171	0.17	9.56	33.48	0.10
1	2529	10-Year (Ex)	1.95	96.69	97.16	96.87	97.17	0.000181	0.19	10.74	34.39	0.10
1	2529	25-Year (Ex)	2.70	96.69	97.22	96.90	97.22	0.000205	0.22	12.70	35.95	0.11
1	2529	50-Year (Ex)	3.28	96.69	97.26	96.92	97.26	0.000219	0.24	14.10	36.51	0.12
1	2529	100-Year (Ex)	3.73	96.69	97.28	96.93	97.29	0.000232	0.26	15.04	36.89	0.12
1	2529	Future 100-Year	4.19	96.69	97.31	96.94	97.31	0.000243	0.27	15.96	37.25	0.13
1	2529	Future Regional	11.57	96.69	97.58	97.07	97.59	0.000378	0.46	26.71	41.10	0.17
1	2496	2-Year (Ex)	0.89	96.69	97.05		97.05	0.000342	0.21	4.49	21.29	0.13
1	2496	5-Year (Ex)	1.57	96.69	97.12		97.12	0.000436	0.28	6.00	22.12	0.16
1	2496	10-Year (Ex)	1.95	96.69	97.15		97.16	0.000466	0.31	6.75	22.52	0.17
1	2496	25-Year (Ex)	2.70	96.69	97.20		97.21	0.000537	0.36	7.97	23.15	0.18
1	2496	50-Year (Ex)	3.28	96.69	97.24		97.25	0.000578	0.40	8.83	23.59	0.19
1	2496	100-Year (Ex)	3.73	96.69	97.27		97.27	0.000616	0.43	9.40	23.88	0.20
1	2496	Future 100-Year	4.19	96.69	97.29		97.30	0.000649	0.45	9.97	24.16	0.21
1	2496	Future Regional	11.57	96.69	97.54		97.57	0.001075	0.77	16.53	27.37	0.28
1	2467	2-Year (Ex)	0.89	96.44	97.04		97.04	0.000122	0.14	6.91	27.68	0.08
1	2467	5-Year (Ex)	1.57	96.44	97.11		97.11	0.000179	0.20	8.83	28.68	0.10
1	2467	10-Year (Ex)	1.95	96.44	97.14		97.15	0.000201	0.22	9.78	29.17	0.11
1	2467	25-Year (Ex)	2.70	96.44	97.20		97.20	0.000247	0.27	11.32	30.02	0.13
1	2467	50-Year (Ex)	3.28	96.44	97.23		97.24	0.000275	0.30	12.42	30.65	0.13
1	2467	100-Year (Ex)	3.73	96.44	97.26		97.26	0.000299	0.32	13.15	31.05	0.14
1	2467	Future 100-Year	4.19	96.44	97.28		97.28	0.000321	0.34	13.88	31.45	0.15
1	2467	Future Regional	11.57	96.44	97.53		97.54	0.000594	0.60	22.29	35.53	0.21
1	2419	2-Year (Ex)	0.89	96.69	97.03		97.03	0.001361	0.33	3.22	27.52	0.25
1	2419	5-Year (Ex)	1.57	96.69	97.09		97.10	0.001095	0.36	5.03	28.37	0.24
1	2419	10-Year (Ex)	1.95	96.69	97.12		97.13	0.000982	0.37	5.98	28.78	0.23
1	2419	25-Year (Ex)	2.70	96.69	97.17		97.18	0.000972	0.41	7.38	29.38	0.23
1	2419	50-Year (Ex)	3.28	96.69	97.21		97.22	0.000944	0.44	8.43	29.82	0.24
1	2419	100-Year (Ex)	3.73	96.69	97.23		97.24	0.000972	0.46	9.07	30.08	0.24
1	2419	Future 100-Year	4.19	96.69	97.25		97.26	0.000984	0.48	9.73	30.35	0.24
1	2419	Future Regional	11.57	96.69	97.48		97.51	0.001304	0.75	17.06	33.19	0.30
1	2357	2-Year (Ex)	0.89	96.69	96.95		96.96	0.001146	0.30	2.92	16.52	0.23
1	2357	5-Year (Ex)	1.57	96.69	97.02		97.02	0.001508	0.39	4.01	19.13	0.27
1	2357	10-Year (Ex)	1.95	96.69	97.05		97.06	0.001490	0.41	4.73	20.60	0.28
1	2357	25-Year (Ex)	2.70	96.69	97.09		97.10	0.001826	0.48	5.59	22.44	0.31
1	2357	50-Year (Ex)	3.28	96.69	97.13		97.14	0.001929	0.51	6.38	24.29	0.32
1	2357	100-Year (Ex)	3.73	96.69	97.14		97.16	0.002089	0.55	6.78	24.75	0.34
1	2357	Future 100-Year	4.19	96.69	97.16		97.18	0.002161	0.58	7.26	25.28	0.34
1	2357	Future Regional	11.57	96.69	97.34		97.39	0.003566	0.95	12.29	31.73	0.47
1	2316	2-Year (Ex)	0.89	96.69	96.82	96.82	96.84	0.025970	0.63	1.40	27.42	0.90
1	2316	5-Year (Ex)	1.57	96.69	96.84	96.84	96.87	0.023756	0.76	2.06	28.62	0.91
1	2316	10-Year (Ex)	1.95	96.69	96.85	96.85	96.89	0.030960	0.90	2.17	28.68	1.04
1	2316	25-Year (Ex)	2.70	96.69	96.87	96.87	96.92	0.027399	0.98	2.75	28.98	1.02
1	2316	50-Year (Ex)	3.28	96.69	96.88	96.88	96.94	0.024873	1.03	3.19	29.17	0.99
1	2316	100-Year (Ex)	3.73	96.69	96.89	96.89	96.95	0.024771	1.08	3.45	29.27	1.00
1	2316	Future 100-Year	4.19	96.69	96.90	96.90	96.97	0.024264	1.12	3.73	29.38	1.01
1	2316	Future Regional	11.57	96.69	97.09		97.17	0.009028	1.22	9.51	31.56	0.71
1	2263	2-Year (Ex)	0.89	96.17	96.46	96.37	96.47	0.002978	0.52	1.95	14.94	0.38
1	2263	5-Year (Ex)	1.57	96.17	96.53	96.42	96.54	0.002604	0.59	3.46	25.81	0.37
1	2263	10-Year (Ex)	1.95	96.17	96.55	96.45	96.57	0.002443	0.60	4.15	26.02	0.36
1	2263	25-Year (Ex)	2.70	96.17	96.60	96.48	96.62	0.002106	0.61	5.49	26.41	0.35
1	2263	50-Year (Ex)	3.28	96.17	96.64	96.53	96.65	0.002008	0.63	6.35	26.66	0.34
1	2263	100-Year (Ex)	3.73	96.17	96.67	96.54	96.68	0.001819	0.63	7.14	26.89	0.33
1	2263	Future 100-Year	4.19	96.17	96.69	96.55	96.70	0.001803	0.65	7.73	27.06	0.33
1	2263	Future Regional	11.57	96.17	96.97		97.00	0.001526	0.80	15.69	29.24	0.33
1	2215	2-Year (Ex)	0.89	95.93	96.25		96.27	0.005685	0.64	1.39	8.58	0.51
1	2215	5-Year (Ex)	1.57	95.93	96.31		96.35	0.006933	0.80	1.96	10.04	0.58
1	2215	10-Year (Ex)	1.95	95.93	96.34		96.38	0.007548	0.87	2.24	10.71	0.61
1	2215	25-Year (Ex)	2.70	95.93	96.38		96.43	0.008975	1.01	2.67	11.67	0.67
1	2215	50-Year (Ex)	3.28	95.93	96.40		96.47	0.010253	1.12	2.94	12.23	0.73
1	2215	100-Year (Ex)	3.73	95.93	96.42		96.49	0.010607	1.17	3.19	12.71	0.74
1	2215	Future 100-Year	4.19	95.93	96.44		96.52	0.011352	1.24	3.39	13.08	0.77
1	2215	Future Regional	11.57	95.93	96.62	96.62	96.80	0.015520	1.93	6.06	16.65	0.98
1	2166	2-Year (Ex)	0.89	95.71	95.98		96.00	0.005398	0.55	1.61	11.83	0.48
1	2166	5-Year (Ex)	1.57	95.71	96.06		96.07	0.004489	0.60	2.63	15.07	0.46
1	2166	10-Year (Ex)	1.95	95.71	96.09		96.11	0.004040	0.61	3.19	16.60	0.44
1	2166	25-Year (Ex)	2.70	95.71	96.15		96.17	0.003374	0.64	4.29	19.96	0.42
1	2166	50-Year (Ex)	3.28	95.71	96.19		96.21	0.002956	0.66	5.12	21.60	0.40
1	2166	100-Year (Ex)	3.73	95.71	96.22		96.24	0.002720	0.67	5.75	22.58	0.39
1	2166	Future 100-Year	4.19	95.71	96.25		96.27	0.002539	0.69	6.37	23.52	0.38

HEC-RAS Plan: Prop River: LyndeT1 Reach: 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
1	2166	Future Regional	11.57	95.71	96.56	96.27	96.59	0.001413	0.80	17.00	39.44	0.32
1	2129	2-Year (Ex)	0.89	95.58	95.92		95.92	0.000948	0.30	3.05	17.77	0.21
1	2129	5-Year (Ex)	1.57	95.58	96.01		96.01	0.000811	0.35	4.72	20.74	0.21
1	2129	10-Year (Ex)	1.95	95.58	96.04		96.05	0.000791	0.38	5.54	22.00	0.21
1	2129	25-Year (Ex)	2.70	95.58	96.11		96.12	0.000762	0.42	7.02	23.27	0.21
1	2129	50-Year (Ex)	3.28	95.58	96.15		96.16	0.000759	0.45	8.00	23.63	0.22
1	2129	100-Year (Ex)	3.73	95.58	96.18		96.19	0.000763	0.47	8.70	23.89	0.22
1	2129	Future 100-Year	4.19	95.58	96.21		96.22	0.000770	0.49	9.37	24.13	0.22
1	2129	Future Regional	11.57	95.58	96.52		96.55	0.000904	0.74	17.33	26.84	0.26
1	2092	2-Year (Ex)	0.89	95.49	95.89		95.90	0.000592	0.28	3.43	17.16	0.18
1	2092	5-Year (Ex)	1.57	95.49	95.98		95.99	0.000608	0.34	5.06	19.31	0.19
1	2092	10-Year (Ex)	1.95	95.49	96.02		96.03	0.000622	0.37	5.81	19.71	0.19
1	2092	25-Year (Ex)	2.70	95.49	96.08		96.09	0.000648	0.42	7.10	20.37	0.20
1	2092	50-Year (Ex)	3.28	95.49	96.12		96.13	0.000680	0.45	7.95	20.80	0.21
1	2092	100-Year (Ex)	3.73	95.49	96.15		96.16	0.000706	0.48	8.55	21.09	0.22
1	2092	Future 100-Year	4.19	95.49	96.18		96.19	0.000732	0.51	9.12	21.37	0.22
1	2092	Future Regional	11.57	95.49	96.48		96.51	0.001039	0.81	15.99	24.47	0.28
1	2043	2-Year (Ex)	0.89	95.47	95.85		95.86	0.001397	0.38	2.41	12.90	0.26
1	2043	5-Year (Ex)	1.57	95.47	95.93		95.94	0.001339	0.45	3.65	15.51	0.27
1	2043	10-Year (Ex)	1.95	95.47	95.97		95.98	0.001338	0.49	4.24	16.44	0.28
1	2043	25-Year (Ex)	2.70	95.47	96.03		96.05	0.001344	0.55	5.31	18.02	0.28
1	2043	50-Year (Ex)	3.28	95.47	96.07		96.09	0.001391	0.60	6.02	18.99	0.29
1	2043	100-Year (Ex)	3.73	95.47	96.10		96.12	0.001435	0.63	6.52	19.62	0.30
1	2043	Future 100-Year	4.19	95.47	96.12		96.14	0.001475	0.67	7.01	20.13	0.31
1	2043	Future Regional	11.57	95.47	96.40		96.44	0.001851	1.01	12.98	23.25	0.37
1	2004	2-Year (Ex)	0.89	95.42	95.77		95.78	0.002504	0.45	1.98	11.20	0.34
1	2004	5-Year (Ex)	1.57	95.42	95.87		95.88	0.002245	0.50	3.16	14.15	0.34
1	2004	10-Year (Ex)	1.95	95.42	95.90		95.92	0.002222	0.52	3.73	15.37	0.34
1	2004	25-Year (Ex)	2.70	95.42	95.96		95.98	0.002317	0.58	4.68	17.19	0.35
1	2004	50-Year (Ex)	3.28	95.42	96.00		96.02	0.002385	0.62	5.32	18.24	0.36
1	2004	100-Year (Ex)	3.73	95.42	96.02		96.04	0.002424	0.65	5.77	18.80	0.37
1	2004	Future 100-Year	4.19	95.42	96.05		96.07	0.002476	0.68	6.20	19.36	0.38
1	2004	Future Regional	11.57	95.42	96.31		96.36	0.002627	1.01	11.74	22.90	0.43
1	1964	2-Year (Ex)	0.96	95.29	95.71		95.72	0.001316	0.37	2.60	12.19	0.26
1	1964	5-Year (Ex)	1.70	95.29	95.80		95.81	0.001531	0.45	3.81	15.11	0.28
1	1964	10-Year (Ex)	2.11	95.29	95.83		95.84	0.001661	0.48	4.37	16.32	0.30
1	1964	25-Year (Ex)	2.93	95.29	95.89		95.90	0.001779	0.55	5.30	19.02	0.33
1	1964	50-Year (Ex)	3.56	95.29	95.92		95.94	0.001867	0.60	6.00	22.50	0.36
1	1964	100-Year (Ex)	4.05	95.29	95.94		95.96	0.001974	0.63	6.47	22.85	0.37
1	1964	Future 100-Year	4.55	95.29	95.96		95.98	0.002094	0.67	6.89	23.16	0.38
1	1964	Future Regional	12.57	95.29	96.20		96.25	0.002744	1.02	12.94	27.21	0.44
1	1905	2-Year (Ex)	0.96	95.28	95.54		95.55	0.008695	0.49	1.95	14.38	0.43
1	1905	5-Year (Ex)	1.70	95.28	95.61		95.63	0.007780	0.55	3.08	17.56	0.42
1	1905	10-Year (Ex)	2.11	95.28	95.65		95.66	0.007138	0.57	3.72	19.56	0.41
1	1905	25-Year (Ex)	2.93	95.28	95.71		95.72	0.005605	0.59	5.19	28.85	0.38
1	1905	50-Year (Ex)	3.56	95.28	95.75		95.76	0.004819	0.60	6.51	39.99	0.36
1	1905	100-Year (Ex)	4.05	95.28	95.77		95.79	0.004241	0.60	7.67	42.27	0.34
1	1905	Future 100-Year	4.55	95.28	95.80		95.82	0.003817	0.60	8.77	43.15	0.33
1	1905	Future Regional	12.57	95.28	96.09		96.10	0.002126	0.67	21.63	46.38	0.27
1	1873	2-Year (Ex)	0.96	95.28	95.52		95.52	0.000286	0.12	7.88	36.42	0.08
1	1873	5-Year (Ex)	1.70	95.28	95.59		95.59	0.000381	0.16	10.33	37.75	0.10
1	1873	10-Year (Ex)	2.11	95.28	95.62		95.62	0.000406	0.18	11.63	38.43	0.11
1	1873	25-Year (Ex)	2.93	95.28	95.68		95.69	0.000436	0.21	14.05	39.67	0.11
1	1873	50-Year (Ex)	3.56	95.28	95.72		95.73	0.000466	0.23	15.60	40.45	0.12
1	1873	100-Year (Ex)	4.05	95.28	95.75		95.75	0.000487	0.24	16.72	41.01	0.12
1	1873	Future 100-Year	4.55	95.28	95.78		95.78	0.000513	0.26	17.75	41.64	0.13
1	1873	Future Regional	12.57	95.28	96.06		96.07	0.000725	0.42	29.96	43.80	0.16
1	1816	2-Year (Ex)	0.96	95.28	95.47		95.47	0.006547	0.38	2.54	22.49	0.36
1	1816	5-Year (Ex)	1.70	95.28	95.53		95.54	0.004819	0.43	3.97	23.13	0.33
1	1816	10-Year (Ex)	2.11	95.28	95.56		95.57	0.004288	0.45	4.71	23.46	0.32
1	1816	25-Year (Ex)	2.93	95.28	95.62		95.63	0.003623	0.48	6.09	24.06	0.31
1	1816	50-Year (Ex)	3.56	95.28	95.65		95.67	0.003553	0.51	6.93	24.41	0.31
1	1816	100-Year (Ex)	4.05	95.28	95.68		95.69	0.003530	0.54	7.53	24.66	0.31
1	1816	Future 100-Year	4.55	95.28	95.70		95.72	0.003617	0.57	8.05	24.88	0.32
1	1816	Future Regional	12.57	95.28	95.94		95.98	0.004461	0.88	14.34	27.39	0.38
1	1784	2-Year (Ex)	0.96	94.91	95.25		95.27	0.007128	0.55	1.75	9.37	0.41
1	1784	5-Year (Ex)	1.70	94.91	95.34		95.36	0.006904	0.62	2.74	11.92	0.41
1	1784	10-Year (Ex)	2.11	94.91	95.39		95.41	0.006915	0.65	3.25	13.27	0.42
1	1784	25-Year (Ex)	2.93	94.91	95.45		95.48	0.006818	0.69	4.24	15.54	0.42
1	1784	50-Year (Ex)	3.56	94.91	95.50		95.53	0.006499	0.71	5.21	30.56	0.42

HEC-RAS Plan: Prop River: LyndeT1 Reach: 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
1	1784	100-Year (Ex)	4.05	94.91	95.53		95.55	0.006055	0.72	6.21	38.73	0.41
1	1784	Future 100-Year	4.55	94.91	95.55		95.58	0.005608	0.72	7.15	38.92	0.40
1	1784	Future Regional	12.57	94.91	95.84		95.86	0.003008	0.78	18.62	41.18	0.32
1	1751	2-Year (Ex)	0.96	94.73	95.11		95.12	0.003015	0.37	2.56	12.82	0.27
1	1751	5-Year (Ex)	1.70	94.73	95.21		95.22	0.002921	0.43	3.98	15.93	0.27
1	1751	10-Year (Ex)	2.11	94.73	95.25		95.26	0.003002	0.46	4.63	17.17	0.28
1	1751	25-Year (Ex)	2.93	94.73	95.31		95.33	0.003051	0.50	5.88	19.34	0.29
1	1751	50-Year (Ex)	3.56	94.73	95.36		95.38	0.003059	0.52	6.82	20.93	0.29
1	1751	100-Year (Ex)	4.05	94.73	95.39		95.41	0.003089	0.54	7.44	21.60	0.30
1	1751	Future 100-Year	4.55	94.73	95.42		95.44	0.003095	0.56	8.09	22.42	0.30
1	1751	Future Regional	12.57	94.73	95.73		95.77	0.002973	0.80	15.86	26.35	0.32
1	1706	2-Year (Ex)	0.96	94.52	94.84		94.87	0.014241	0.75	1.29	7.32	0.57
1	1706	5-Year (Ex)	1.70	94.52	94.91		94.95	0.016195	0.91	1.88	8.80	0.63
1	1706	10-Year (Ex)	2.11	94.52	94.94		94.99	0.016604	0.96	2.19	9.48	0.64
1	1706	25-Year (Ex)	2.93	94.52	95.00		95.06	0.016970	1.06	2.77	10.65	0.66
1	1706	50-Year (Ex)	3.56	94.52	95.04		95.10	0.017016	1.11	3.20	11.43	0.67
1	1706	100-Year (Ex)	4.05	94.52	95.07		95.14	0.016936	1.15	3.53	12.00	0.67
1	1706	Future 100-Year	4.55	94.52	95.10		95.17	0.016824	1.18	3.86	12.54	0.68
1	1706	Future Regional	12.57	94.52	95.37		95.50	0.017556	1.58	7.98	17.26	0.74
1	1678	2-Year (Ex)	0.96	94.32	94.66		94.67	0.003800	0.39	2.48	14.09	0.29
1	1678	5-Year (Ex)	1.70	94.32	94.74		94.76	0.003575	0.44	3.82	16.82	0.30
1	1678	10-Year (Ex)	2.11	94.32	94.78		94.79	0.003533	0.47	4.49	17.98	0.30
1	1678	25-Year (Ex)	2.93	94.32	94.85		94.86	0.003466	0.51	5.74	19.98	0.30
1	1678	50-Year (Ex)	3.56	94.32	94.89		94.91	0.003455	0.54	6.62	21.29	0.31
1	1678	100-Year (Ex)	4.05	94.32	94.92		94.94	0.003441	0.55	7.30	22.34	0.31
1	1678	Future 100-Year	4.55	94.32	94.95		94.97	0.003431	0.57	7.98	23.37	0.31
1	1678	Future Regional	12.57	94.32	95.26		95.29	0.003085	0.77	16.61	31.12	0.32
1	1639	2-Year (Ex)	0.96	94.10	94.54		94.54	0.002351	0.35	2.74	12.63	0.24
1	1639	5-Year (Ex)	1.70	94.10	94.61		94.62	0.002999	0.45	3.82	14.68	0.28
1	1639	10-Year (Ex)	2.11	94.10	94.65		94.66	0.003054	0.48	4.39	15.24	0.29
1	1639	25-Year (Ex)	2.93	94.10	94.71		94.72	0.003512	0.56	5.23	16.02	0.31
1	1639	50-Year (Ex)	3.56	94.10	94.75		94.77	0.003664	0.60	5.89	16.59	0.32
1	1639	100-Year (Ex)	4.05	94.10	94.78		94.80	0.003784	0.64	6.36	17.00	0.33
1	1639	Future 100-Year	4.55	94.10	94.80		94.82	0.003903	0.67	6.82	17.38	0.34
1	1639	Future Regional	12.57	94.10	95.09		95.14	0.005038	1.03	12.26	20.51	0.42
1	1588	2-Year (Ex)	0.96	94.08	94.36		94.36	0.006127	0.28	3.46	25.32	0.24
1	1588	5-Year (Ex)	1.70	94.08	94.42		94.42	0.005882	0.33	5.08	27.15	0.25
1	1588	10-Year (Ex)	2.11	94.08	94.45		94.45	0.005914	0.36	5.84	27.87	0.25
1	1588	25-Year (Ex)	2.93	94.08	94.49		94.50	0.005811	0.40	7.24	28.96	0.26
1	1588	50-Year (Ex)	3.56	94.08	94.52		94.53	0.005986	0.44	8.09	29.31	0.27
1	1588	100-Year (Ex)	4.05	94.08	94.54		94.56	0.006108	0.47	8.70	29.56	0.27
1	1588	Future 100-Year	4.55	94.08	94.56		94.58	0.006186	0.49	9.31	29.80	0.28
1	1588	Future Regional	12.57	94.08	94.79		94.82	0.007897	0.78	16.34	32.56	0.34
1	1511	2-Year (Ex)	0.96	93.21	93.45		93.46	0.029680	0.57	1.69	13.77	0.52
1	1511	5-Year (Ex)	1.70	93.21	93.50		93.52	0.032610	0.68	2.50	16.60	0.56
1	1511	10-Year (Ex)	2.11	93.21	93.53		93.55	0.032652	0.72	2.92	17.76	0.57
1	1511	25-Year (Ex)	2.93	93.21	93.56		93.60	0.034142	0.81	3.64	19.46	0.59
1	1511	50-Year (Ex)	3.56	93.21	93.60		93.63	0.031654	0.83	4.31	20.99	0.58
1	1511	100-Year (Ex)	4.05	93.21	93.62		93.66	0.030222	0.84	4.83	22.23	0.57
1	1511	Future 100-Year	4.55	93.21	93.64		93.68	0.029398	0.86	5.30	23.02	0.57
1	1511	Future Regional	12.57	93.21	93.91		93.97	0.016918	1.00	12.56	28.56	0.48
1	1444	2-Year (Ex)	1.03	92.41	92.78		92.79	0.005159	0.32	3.21	16.58	0.23
1	1444	5-Year (Ex)	1.82	92.41	92.89		92.89	0.004576	0.35	5.16	21.04	0.23
1	1444	10-Year (Ex)	2.27	92.41	92.93		92.94	0.004373	0.37	6.19	23.04	0.23
1	1444	25-Year (Ex)	3.14	92.41	93.01		93.02	0.003976	0.38	8.16	26.31	0.22
1	1444	50-Year (Ex)	3.82	92.41	93.06		93.07	0.003949	0.41	9.30	27.06	0.22
1	1444	100-Year (Ex)	4.35	92.41	93.09		93.10	0.003921	0.43	10.17	27.65	0.23
1	1444	Future 100-Year	4.88	92.41	93.12		93.13	0.003921	0.44	10.98	28.20	0.23
1	1444	Future Regional	13.48	92.41	93.42		93.45	0.004489	0.67	20.26	31.53	0.26
1	1390	2-Year (Ex)	1.03	91.87	92.34		92.36	0.014403	0.60	1.71	7.29	0.40
1	1390	5-Year (Ex)	1.82	91.87	92.42		92.45	0.019167	0.78	2.35	8.55	0.47
1	1390	10-Year (Ex)	2.27	91.87	92.47		92.50	0.021116	0.83	2.74	9.70	0.50
1	1390	25-Year (Ex)	3.14	91.87	92.54		92.58	0.025409	0.89	3.55	13.10	0.54
1	1390	50-Year (Ex)	3.82	91.87	92.59		92.63	0.025861	0.90	4.23	15.40	0.55
1	1390	100-Year (Ex)	4.35	91.87	92.62		92.66	0.026572	0.93	4.70	16.78	0.56
1	1390	Future 100-Year	4.88	91.87	92.64		92.69	0.026695	0.94	5.18	18.11	0.56
1	1390	Future Regional	13.48	91.87	92.95		93.02	0.017540	1.18	11.39	21.29	0.52
1	1345	2-Year (Ex)	1.03	91.58	91.91		91.92	0.006828	0.34	2.99	17.06	0.26
1	1345	5-Year (Ex)	1.82	91.58	91.99		92.00	0.005962	0.41	4.47	18.24	0.26
1	1345	10-Year (Ex)	2.27	91.58	92.03		92.04	0.005700	0.44	5.21	18.79	0.26

HEC-RAS Plan: Prop River: LyndeT1 Reach: 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
1	1345	25-Year (Ex)	3.14	91.58	92.10		92.11	0.005479	0.49	6.46	19.36	0.27
1	1345	50-Year (Ex)	3.82	91.58	92.15		92.16	0.005308	0.52	7.37	19.69	0.27
1	1345	100-Year (Ex)	4.35	91.58	92.18		92.19	0.005253	0.54	8.02	19.92	0.27
1	1345	Future 100-Year	4.88	91.58	92.21		92.23	0.005169	0.56	8.67	20.13	0.27
1	1345	Future Regional	13.48	91.58	92.57		92.60	0.005379	0.83	16.33	22.50	0.31
1	1297	2-Year (Ex)	1.03	91.08	91.52		91.53	0.009072	0.46	2.22	10.06	0.31
1	1297	5-Year (Ex)	1.82	91.08	91.62		91.63	0.010270	0.56	3.26	12.18	0.35
1	1297	10-Year (Ex)	2.27	91.08	91.65		91.67	0.010960	0.61	3.75	13.08	0.36
1	1297	25-Year (Ex)	3.14	91.08	91.72		91.74	0.012177	0.68	4.60	14.49	0.39
1	1297	50-Year (Ex)	3.82	91.08	91.76		91.78	0.012868	0.74	5.19	15.24	0.40
1	1297	100-Year (Ex)	4.35	91.08	91.78		91.81	0.013390	0.78	5.59	15.56	0.41
1	1297	Future 100-Year	4.88	91.08	91.81		91.85	0.013215	0.80	6.07	15.93	0.42
1	1297	Future Regional	13.48	91.08	92.10		92.17	0.016943	1.22	11.06	19.14	0.51
1	1257	2-Year (Ex)	1.03	90.72	91.05		91.06	0.015911	0.50	2.04	12.44	0.40
1	1257	5-Year (Ex)	1.82	90.72	91.13		91.14	0.013989	0.57	3.19	15.52	0.40
1	1257	10-Year (Ex)	2.27	90.72	91.16		91.18	0.013323	0.60	3.76	16.86	0.41
1	1257	25-Year (Ex)	3.14	90.72	91.22		91.24	0.012316	0.65	4.83	19.19	0.41
1	1257	50-Year (Ex)	3.82	90.72	91.26		91.28	0.011918	0.68	5.59	20.69	0.42
1	1257	100-Year (Ex)	4.35	90.72	91.29		91.31	0.011695	0.71	6.16	21.74	0.42
1	1257	Future 100-Year	4.88	90.72	91.31		91.34	0.011445	0.73	6.73	22.73	0.43
1	1257	Future Regional	13.48	90.72	91.57		91.62	0.010843	1.01	13.31	27.22	0.46
1	1190	2-Year (Ex)	1.03	90.10	90.48		90.49	0.005293	0.33	3.17	16.27	0.24
1	1190	5-Year (Ex)	1.82	90.10	90.56		90.57	0.005895	0.39	4.65	19.60	0.26
1	1190	10-Year (Ex)	2.27	90.10	90.60		90.61	0.006029	0.42	5.43	21.16	0.26
1	1190	25-Year (Ex)	3.14	90.10	90.66		90.67	0.006345	0.46	6.81	23.76	0.28
1	1190	50-Year (Ex)	3.82	90.10	90.71		90.72	0.006415	0.49	7.87	25.63	0.28
1	1190	100-Year (Ex)	4.35	90.10	90.73		90.75	0.006467	0.50	8.63	26.72	0.28
1	1190	Future 100-Year	4.88	90.10	90.76		90.77	0.006560	0.52	9.34	27.69	0.29
1	1190	Future Regional	13.48	90.10	91.05		91.08	0.006359	0.72	18.81	34.96	0.31
1	1138	2-Year (Ex)	1.03	89.80	90.15		90.16	0.008044	0.36	2.84	16.95	0.28
1	1138	5-Year (Ex)	1.82	89.80	90.24		90.25	0.006738	0.39	4.66	21.85	0.27
1	1138	10-Year (Ex)	2.27	89.80	90.28		90.29	0.006608	0.41	5.54	23.85	0.27
1	1138	25-Year (Ex)	3.14	89.80	90.35		90.36	0.006037	0.43	7.29	27.15	0.27
1	1138	50-Year (Ex)	3.82	89.80	90.39		90.40	0.005952	0.45	8.48	29.20	0.27
1	1138	100-Year (Ex)	4.35	89.80	90.42		90.43	0.005939	0.47	9.34	30.58	0.27
1	1138	Future 100-Year	4.88	89.80	90.45		90.46	0.005870	0.48	10.17	31.56	0.27
1	1138	Future Regional	13.48	89.80	90.72		90.75	0.006291	0.67	20.05	39.78	0.30
1	1080	2-Year (Ex)	1.08	89.05	89.37	89.29	89.39	0.023213	0.62	1.75	10.40	0.48
1	1080	5-Year (Ex)	1.91	89.05	89.41	89.35	89.45	0.037365	0.86	2.21	11.40	0.63
1	1080	10-Year (Ex)	2.38	89.05	89.44	89.38	89.49	0.039555	0.92	2.58	12.56	0.65
1	1080	25-Year (Ex)	3.29	89.05	89.47	89.42	89.54	0.052799	1.11	2.98	13.70	0.76
1	1080	50-Year (Ex)	4.00	89.05	89.50	89.46	89.57	0.058849	1.18	3.40	15.48	0.80
1	1080	100-Year (Ex)	4.55	89.05	89.52	89.48	89.60	0.060373	1.22	3.72	16.22	0.82
1	1080	Future 100-Year	5.11	89.05	89.54	89.51	89.62	0.063482	1.29	3.96	16.53	0.84
1	1080	Future Regional	14.12	89.05	89.76	89.73	89.91	0.050748	1.66	8.49	26.13	0.93
1	1031	2-Year (Ex)	1.08	88.66	88.96		88.97	0.004405	0.25	4.37	33.59	0.21
1	1031	5-Year (Ex)	1.91	88.66	89.03		89.04	0.003681	0.29	6.77	36.28	0.21
1	1031	10-Year (Ex)	2.38	88.66	89.07		89.07	0.003471	0.31	7.98	37.57	0.21
1	1031	25-Year (Ex)	3.29	88.66	89.12		89.13	0.003129	0.33	10.23	39.99	0.20
1	1031	50-Year (Ex)	4.00	88.66	89.16		89.17	0.003011	0.35	11.81	41.73	0.20
1	1031	100-Year (Ex)	4.55	88.66	89.19		89.20	0.002940	0.36	12.99	42.98	0.20
1	1031	Future 100-Year	5.11	88.66	89.22		89.22	0.002864	0.37	14.18	44.20	0.20
1	1031	Future Regional	14.12	88.66	89.51		89.52	0.002748	0.50	28.79	56.20	0.22
1	1010	2-Year (Ex)	1.08	88.55	88.87		88.87	0.004059	0.28	3.81	20.77	0.21
1	1010	5-Year (Ex)	1.91	88.55	88.95		88.95	0.004077	0.35	5.52	22.44	0.22
1	1010	10-Year (Ex)	2.38	88.55	88.98		88.99	0.004253	0.38	6.29	23.18	0.23
1	1010	25-Year (Ex)	3.29	88.55	89.04		89.05	0.004544	0.42	7.75	25.28	0.24
1	1010	50-Year (Ex)	4.00	88.55	89.08		89.09	0.004792	0.46	8.73	26.49	0.25
1	1010	100-Year (Ex)	4.55	88.55	89.11		89.12	0.004938	0.48	9.47	27.36	0.26
1	1010	Future 100-Year	5.11	88.55	89.13		89.15	0.005009	0.50	10.24	28.23	0.26
1	1010	Future Regional	14.12	88.55	89.41		89.43	0.006821	0.74	19.20	37.81	0.33
1	952	2-Year (Ex)	1.08	88.19	88.38	88.38	88.41	0.020835	0.84	1.29	14.16	0.88
1	952	5-Year (Ex)	1.91	88.19	88.41	88.41	88.47	0.025094	1.04	1.84	16.84	1.00
1	952	10-Year (Ex)	2.38	88.19	88.43	88.43	88.49	0.024319	1.08	2.20	18.31	1.00
1	952	25-Year (Ex)	3.29	88.19	88.46	88.46	88.53	0.023834	1.16	2.83	20.88	1.01
1	952	50-Year (Ex)	4.00	88.19	88.49	88.49	88.56	0.022569	1.19	3.35	22.84	1.00
1	952	100-Year (Ex)	4.55	88.19	88.50	88.50	88.58	0.022210	1.22	3.72	24.12	1.00
1	952	Future 100-Year	5.11	88.19	88.52	88.52	88.60	0.022761	1.27	4.02	25.13	1.01
1	952	Future Regional	14.12	88.19	88.68	88.68	88.80	0.019154	1.55	9.14	37.45	1.00
1	913	2-Year (Ex)	1.08	87.59	87.87	87.78	87.88	0.003814	0.48	2.27	16.24	0.41

HEC-RAS Plan: Prop River: LyndeT1 Reach: 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
1	913	5-Year (Ex)	1.91	87.59	87.94	87.84	87.96	0.003425	0.53	3.61	20.31	0.40
1	913	10-Year (Ex)	2.38	87.59	87.97	87.86	87.99	0.003448	0.56	4.25	21.97	0.41
1	913	25-Year (Ex)	3.29	87.59	88.02	87.90	88.04	0.003475	0.61	5.36	24.39	0.42
1	913	50-Year (Ex)	4.00	87.59	88.06	87.92	88.08	0.003241	0.63	6.38	26.59	0.41
1	913	100-Year (Ex)	4.55	87.59	88.09	87.94	88.11	0.003108	0.65	7.05	27.27	0.41
1	913	Future 100-Year	5.11	87.59	88.11	87.95	88.13	0.003052	0.67	7.67	27.96	0.41
1	913	Future Regional	14.12	87.59	88.33	88.13	88.38	0.003676	0.97	14.57	34.75	0.48
1	867	2-Year (Ex)	1.08	87.15	87.45	87.45	87.52	0.022634	1.20	0.90	6.00	1.00
1	867	5-Year (Ex)	1.91	87.15	87.53	87.53	87.62	0.020903	1.36	1.41	7.42	1.00
1	867	10-Year (Ex)	2.38	87.15	87.56	87.56	87.66	0.020292	1.42	1.67	8.04	1.00
1	867	25-Year (Ex)	3.29	87.15	87.65	87.62	87.74	0.013787	1.34	2.45	9.64	0.85
1	867	50-Year (Ex)	4.00	87.15	87.68	87.66	87.79	0.014599	1.44	2.78	10.25	0.88
1	867	100-Year (Ex)	4.55	87.15	87.71	87.68	87.82	0.014168	1.47	3.09	10.80	0.88
1	867	Future 100-Year	5.11	87.15	87.74	87.71	87.85	0.013989	1.51	3.39	11.30	0.88
1	867	Future Regional	14.12	87.15	87.99	87.99	88.11	0.010202	1.68	10.17	37.83	0.80
1	811	2-Year (Ex)	1.08	86.30	86.69	86.64	86.74	0.009615	0.91	1.19	6.36	0.67
1	811	5-Year (Ex)	1.91	86.30	86.80	86.72	86.85	0.007852	0.97	1.97	8.18	0.63
1	811	10-Year (Ex)	2.38	86.30	86.85	86.76	86.90	0.007138	0.99	2.41	9.05	0.61
1	811	25-Year (Ex)	3.29	86.30	86.84	86.82	86.95	0.014932	1.41	2.33	8.90	0.88
1	811	50-Year (Ex)	4.00	86.30	86.89	86.85	87.00	0.013920	1.44	2.77	9.70	0.86
1	811	100-Year (Ex)	4.55	86.30	86.92	86.88	87.03	0.014320	1.51	3.02	10.13	0.88
1	811	Future 100-Year	5.11	86.30	86.94	86.91	87.07	0.014460	1.56	3.28	10.56	0.89
1	811	Future Regional	14.12	86.30	87.20	87.23	87.43	0.016636	2.14	6.88	21.82	1.02
1	762	2-Year (Ex)	1.08	85.66	86.15		86.22	0.011101	1.16	0.93	3.70	0.74
1	762	5-Year (Ex)	1.91	85.66	86.26	86.21	86.36	0.012393	1.40	1.36	4.47	0.81
1	762	10-Year (Ex)	2.38	85.66	86.30	86.24	86.42	0.013755	1.53	1.66	13.44	0.86
1	762	25-Year (Ex)	3.29	85.66	86.40	86.40	86.46	0.006834	1.19	4.06	32.25	0.62
1	762	50-Year (Ex)	4.00	85.66	86.41	86.41	86.48	0.007942	1.30	4.55	32.99	0.67
1	762	100-Year (Ex)	4.55	85.66	86.43	86.43	86.49	0.008211	1.34	5.03	33.70	0.69
1	762	Future 100-Year	5.11	85.66	86.44	86.44	86.51	0.008607	1.39	5.45	34.30	0.70
1	762	Future Regional	14.12	85.66	86.63	86.57	86.70	0.006623	1.47	12.65	39.89	0.65
1	738	2-Year (Ex)	1.08	85.48	85.81	85.80	85.87	0.019731	1.16	0.93	5.91	0.94
1	738	5-Year (Ex)	1.91	85.48	85.87	85.87	85.97	0.021890	1.39	1.37	7.24	1.02
1	738	10-Year (Ex)	2.38	85.48	85.91	85.91	86.02	0.020945	1.44	1.65	7.95	1.01
1	738	25-Year (Ex)	3.29	85.48	85.91	85.96	86.11	0.038071	1.96	1.68	8.02	1.37
1	738	50-Year (Ex)	4.00	85.48	85.97	86.00	86.14	0.029041	1.85	2.16	9.11	1.22
1	738	100-Year (Ex)	4.55	85.48	86.00	86.02	86.17	0.025493	1.82	2.50	9.81	1.15
1	738	Future 100-Year	5.11	85.48	86.05	86.05	86.20	0.019727	1.70	3.00	10.77	1.03
1	738	Future Regional	14.12	85.48	86.31	86.31	86.47	0.012130	1.92	8.57	26.63	0.88
1	681	2-Year (Ex)	1.08	84.35	84.59	84.59	84.65	0.023725	1.11	0.97	7.70	0.99
1	681	5-Year (Ex)	1.91	84.35	84.65	84.65	84.73	0.021697	1.27	1.50	9.01	1.00
1	681	10-Year (Ex)	2.38	84.35	84.68	84.68	84.77	0.022496	1.37	1.73	9.53	1.03
1	681	25-Year (Ex)	3.29	84.35	84.73	84.73	84.84	0.020734	1.46	2.25	10.60	1.01
1	681	50-Year (Ex)	4.00	84.35	84.76	84.76	84.88	0.020079	1.53	2.62	11.28	1.01
1	681	100-Year (Ex)	4.55	84.35	84.79	84.79	84.91	0.019142	1.55	2.93	11.82	1.00
1	681	Future 100-Year	5.11	84.35	84.79	84.81	84.94	0.024801	1.76	2.90	11.77	1.14
1	681	Future Regional	14.12	84.35	84.96	85.06	85.34	0.036346	2.75	5.13	14.31	1.46
1	650	2-Year (Ex)	1.08	82.62	82.79	82.87	83.09	0.167645	2.43	0.44	4.65	2.51
1	650	5-Year (Ex)	1.91	82.62	82.83	82.94	83.25	0.173627	2.87	0.67	5.59	2.65
1	650	10-Year (Ex)	2.38	82.62	82.85	82.97	83.29	0.156850	2.93	0.81	6.13	2.56
1	650	25-Year (Ex)	3.29	82.62	82.89	83.03	83.42	0.162526	3.22	1.02	6.82	2.66
1	650	50-Year (Ex)	4.00	82.62	82.91	83.06	83.49	0.160498	3.38	1.19	7.33	2.68
1	650	100-Year (Ex)	4.55	82.62	82.92	83.09	83.55	0.163925	3.52	1.29	7.64	2.73
1	650	Future 100-Year	5.11	82.62	82.96	83.11	83.48	0.117376	3.20	1.60	8.46	2.35
1	650	Future Regional	14.12	82.62	83.19	83.38	83.82	0.069323	3.53	4.00	12.30	1.98
1	591	2-Year (Ex)	1.08	82.28	82.44	82.44	82.49	0.023214	0.90	1.19	12.56	0.94
1	591	5-Year (Ex)	1.91	82.28	82.49	82.49	82.55	0.022399	1.04	1.84	15.39	0.96
1	591	10-Year (Ex)	2.38	82.28	82.51	82.51	82.57	0.022758	1.10	2.16	16.64	0.98
1	591	25-Year (Ex)	3.29	82.28	82.54	82.54	82.62	0.022629	1.20	2.75	18.60	1.00
1	591	50-Year (Ex)	4.00	82.28	82.57	82.57	82.65	0.021970	1.25	3.20	19.85	1.00
1	591	100-Year (Ex)	4.55	82.28	82.58	82.58	82.67	0.022253	1.30	3.49	20.62	1.01
1	591	Future 100-Year	5.11	82.28	82.60	82.60	82.69	0.021909	1.34	3.82	21.46	1.01
1	591	Future Regional	14.12	82.28	82.77	82.77	82.92	0.018515	1.74	8.13	27.14	1.01
1	541	2-Year (Ex)	1.15	81.30	81.61		81.65	0.012749	0.93	1.23	7.85	0.75
1	541	5-Year (Ex)	2.04	81.30	81.69		81.74	0.012248	1.04	1.95	10.25	0.76
1	541	10-Year (Ex)	2.54	81.30	81.72		81.78	0.011828	1.08	2.34	11.30	0.76
1	541	25-Year (Ex)	3.51	81.30	81.79	81.73	81.85	0.010600	1.12	3.12	13.16	0.74
1	541	50-Year (Ex)	4.27	81.30	81.83	81.76	81.90	0.010046	1.15	3.70	14.38	0.73
1	541	100-Year (Ex)	4.86	81.30	82.06	81.79	82.08	0.001788	0.63	7.72	21.06	0.33
1	541	Future 100-Year	5.46	81.30	82.22	81.81	82.23	0.000692	0.49	11.52	26.00	0.21
1	541	Future Regional	15.07	81.30	82.58	82.06	82.61	0.000799	0.72	22.48	32.09	0.25

HEC-RAS Plan: Prop River: LyndeT1 Reach: 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
1	503	2-Year (Ex)	1.15	80.94	81.34		81.36	0.004945	0.69	1.67	8.31	0.49
1	503	5-Year (Ex)	2.04	80.94	81.45		81.48	0.004374	0.76	2.69	10.48	0.48
1	503	10-Year (Ex)	2.54	80.94	81.50		81.53	0.004135	0.79	3.23	11.49	0.47
1	503	25-Year (Ex)	3.51	80.94	81.58		81.61	0.003851	0.84	4.20	12.93	0.47
1	503	50-Year (Ex)	4.27	80.94	81.63		81.67	0.003650	0.86	4.95	13.93	0.46
1	503	100-Year (Ex)	4.86	80.94	82.04		82.05	0.000329	0.37	15.11	46.17	0.15
1	503	Future 100-Year	5.46	80.94	82.21		82.22	0.000140	0.28	23.21	47.89	0.10
1	503	Future Regional	15.07	80.94	82.58		82.59	0.000198	0.42	41.57	51.57	0.13
1	465	2-Year (Ex)	1.15	80.63	81.10	81.01	81.14	0.006550	0.88	1.31	5.47	0.57
1	465	5-Year (Ex)	2.04	80.63	81.20	81.11	81.26	0.007609	1.07	1.90	6.58	0.64
1	465	10-Year (Ex)	2.54	80.63	81.25	81.15	81.31	0.007836	1.15	2.22	7.09	0.65
1	465	25-Year (Ex)	3.51	80.63	81.35	81.22	81.42	0.006745	1.18	2.99	8.20	0.62
1	465	50-Year (Ex)	4.27	80.63	81.39	81.27	81.47	0.007369	1.28	3.34	8.67	0.66
1	465	100-Year (Ex)	4.86	80.63	82.04	81.31	82.04	0.000025	0.13	43.43	62.31	0.04
1	465	Future 100-Year	5.46	80.63	82.21	81.34	82.22	0.000015	0.11	54.16	63.19	0.04
1	465	Future Regional	15.07	80.63	82.58	81.60	82.59	0.000037	0.20	77.88	65.09	0.06
1	441	2-Year (Ex)	1.15	80.63	80.95	80.88	80.98	0.007144	0.78	1.47	7.96	0.58
1	441	5-Year (Ex)	2.04	80.63	81.03	80.96	81.08	0.007854	0.93	2.20	9.84	0.63
1	441	10-Year (Ex)	2.54	80.63	81.06	80.99	81.12	0.008430	1.01	2.52	10.52	0.66
1	441	25-Year (Ex)	3.51	80.63	81.04	81.04	81.16	0.020177	1.52	2.31	10.10	1.01
1	441	50-Year (Ex)	4.27	80.63	81.36		81.37	0.001973	0.62	6.86	19.93	0.34
1	441	100-Year (Ex)	4.86	80.63	82.04		82.04	0.000016	0.10	53.96	79.12	0.04
1	441	Future 100-Year	5.46	80.63	82.21		82.21	0.000010	0.09	67.64	80.73	0.03
1	441	Future Regional	15.07	80.63	82.58		82.59	0.000023	0.17	98.32	84.85	0.05
1	382	2-Year (Ex)	1.15	80.00	80.20	80.20	80.25	0.025743	0.98	1.17	11.73	1.00
1	382	5-Year (Ex)	2.04	80.00	80.26	80.26	80.32	0.023912	1.10	1.85	14.92	1.00
1	382	10-Year (Ex)	2.54	80.00	80.28	80.28	80.35	0.022444	1.15	2.20	15.74	0.98
1	382	25-Year (Ex)	3.51	80.00	80.43	80.31	80.45	0.004176	0.72	4.90	20.24	0.47
1	382	50-Year (Ex)	4.27	80.00	81.37		81.37	0.000017	0.12	39.45	52.94	0.04
1	382	100-Year (Ex)	4.86	80.00	82.04		82.04	0.000003	0.07	83.04	74.06	0.02
1	382	Future 100-Year	5.46	80.00	82.21		82.21	0.000002	0.07	95.89	76.05	0.02
1	382	Future Regional	15.07	80.00	82.58		82.58	0.000009	0.14	124.76	80.29	0.03
1	334	2-Year (Ex)	1.15	79.47	79.90	79.76	79.91	0.002939	0.55	2.11	10.06	0.38
1	334	5-Year (Ex)	2.04	79.47	80.05	79.84	80.06	0.001863	0.52	3.89	13.94	0.32
1	334	10-Year (Ex)	2.54	79.47	80.13		80.14	0.001567	0.49	5.18	18.07	0.29
1	334	25-Year (Ex)	3.51	79.47	80.41		80.42	0.000255	0.28	13.94	41.31	0.13
1	334	50-Year (Ex)	4.27	79.47	81.36		81.37	0.000005	0.08	66.48	69.46	0.02
1	334	100-Year (Ex)	4.86	79.47	82.04		82.04	0.000001	0.05	116.49	78.22	0.01
1	334	Future 100-Year	5.46	79.47	82.21		82.21	0.000001	0.05	130.08	80.46	0.01
1	334	Future Regional	15.07	79.47	82.58		82.58	0.000004	0.11	160.73	85.54	0.02
1	266	2-Year (Ex)	1.15	78.43	79.20	79.20	79.42	0.031549	2.09	0.55	1.27	1.01
1	266	5-Year (Ex)	2.04	78.43	79.42	79.42	79.71	0.030648	2.39	0.85	1.46	1.00
1	266	10-Year (Ex)	2.54	78.43	79.56	79.56	79.83	0.027510	2.30	1.10	2.03	1.00
1	266	25-Year (Ex)	3.51	78.43	80.37		80.38	0.001093	0.57	6.16	11.77	0.25
1	266	50-Year (Ex)	4.27	78.43	81.36		81.36	0.000052	0.18	24.73	26.71	0.05
1	266	100-Year (Ex)	4.86	78.43	82.04		82.04	0.000012	0.12	47.69	46.12	0.03
1	266	Future 100-Year	5.46	78.43	82.21		82.21	0.000011	0.12	55.91	49.81	0.03
1	266	Future Regional	15.07	78.43	82.58		82.58	0.000039	0.25	81.75	97.65	0.05
1	263	2-Year (Ex)	1.15	78.24	79.03	78.57	79.05	0.001165	0.61	1.87	2.92	0.24
1	263	5-Year (Ex)	2.04	78.24	79.31	78.71	79.34	0.001273	0.74	2.76	3.35	0.26
1	263	10-Year (Ex)	2.54	78.24	79.55	78.78	79.57	0.000980	0.70	3.61	3.84	0.23
1	263	25-Year (Ex)	3.51	78.24	80.37	78.90	80.38	0.000234	0.47	7.40	8.61	0.12
1	263	50-Year (Ex)	4.27	78.24	81.36	78.98	81.36	0.000063	0.35	12.34	18.30	0.07
1	263	100-Year (Ex)	4.86	78.24	82.04	79.04	82.04	0.000036	0.31	15.74	37.55	0.06
1	263	Future 100-Year	5.46	78.24	82.21	79.10	82.21	0.000015	0.15	45.03	46.36	0.03
1	263	Future Regional	15.07	78.24	82.58	79.80	82.58	0.000052	0.31	70.46	96.56	0.06
1	245		Culvert									
1	105	2-Year (Ex)	1.15	77.39	78.32	77.72	78.33	0.000566	0.26	4.46	9.12	0.10
1	105	5-Year (Ex)	2.04	77.39	78.85	77.80	78.85	0.000299	0.27	7.61	11.88	0.08
1	105	10-Year (Ex)	2.54	77.39	79.25	77.85	79.25	0.000187	0.25	10.00	14.33	0.06
1	105	25-Year (Ex)	3.51	77.39	79.98	77.91	79.98	0.000107	0.24	14.36	18.81	0.05
1	105	50-Year (Ex)	4.27	77.39	80.77	77.96	80.77	0.000061	0.22	19.10	26.62	0.04
1	105	100-Year (Ex)	4.86	77.39	81.27	77.99	81.27	0.000049	0.22	22.11	42.31	0.04
1	105	Future 100-Year	5.46	77.39	81.24	78.02	81.24	0.000063	0.25	21.92	41.17	0.04
1	105	Future Regional	15.07	77.39	81.82	78.44	81.83	0.000294	0.59	25.40	71.55	0.09
1	95	2-Year (Ex)	1.15	77.38	78.31	77.81	78.32	0.001611	0.32	3.64	7.80	0.15
1	95	5-Year (Ex)	2.04	77.38	78.85	77.92	78.85	0.000442	0.23	8.93	11.77	0.08
1	95	10-Year (Ex)	2.54	77.38	79.25	77.98	79.25	0.000179	0.18	14.14	14.26	0.06
1	95	25-Year (Ex)	3.51	77.38	79.98	78.06	79.98	0.000058	0.14	26.17	18.77	0.03

HEC-RAS Plan: Prop River: LyndeT1 Reach: 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
1	95	50-Year (Ex)	4.27	77.38	80.77	78.11	80.77	0.000021	0.11	43.97	27.62	0.02
1	95	100-Year (Ex)	4.86	77.38	81.27	78.15	81.27	0.000013	0.10	61.38	44.67	0.02
1	95	Future 100-Year	5.46	77.38	81.24	78.19	81.24	0.000017	0.11	60.02	42.95	0.02
1	95	Future Regional	15.07	77.38	81.82	78.59	81.82	0.000051	0.22	92.51	61.10	0.04
1	85	2-Year (Ex)	1.22	77.34	78.29	77.81	78.30	0.002201	0.37	3.28	6.92	0.17
1	85	5-Year (Ex)	2.15	77.34	78.84	77.93	78.84	0.000601	0.27	8.00	10.30	0.10
1	85	10-Year (Ex)	2.67	77.34	79.24	77.99	79.25	0.000263	0.21	12.66	12.82	0.07
1	85	25-Year (Ex)	3.70	77.34	79.97	78.08	79.98	0.000082	0.16	23.72	17.80	0.04
1	85	50-Year (Ex)	4.50	77.34	80.77	78.13	80.77	0.000028	0.12	41.13	26.31	0.03
1	85	100-Year (Ex)	5.12	77.34	81.27	78.18	81.27	0.000017	0.11	57.82	45.13	0.02
1	85	Future 100-Year	5.75	77.34	81.24	78.22	81.24	0.000022	0.12	56.43	43.45	0.02
1	85	Future Regional	15.87	77.34	81.82	78.65	81.82	0.000066	0.24	89.64	73.21	0.04

HEC-RAS Plan: Prop River: Lynde Reach: 1

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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
1	1301	2-Year (Ex)	45.05	73.00	75.95		75.96	0.000044	0.18	273.92	336.81	0.06
1	1301	5-Year (Ex)	85.12	73.00	76.29		76.29	0.000051	0.24	387.72	344.96	0.07
1	1301	10-Year (Ex)	107.51	73.00	76.45		76.45	0.000053	0.26	442.14	348.58	0.07
1	1301	25-Year (Ex)	154.92	73.00	76.71		76.71	0.000060	0.31	535.19	354.90	0.07
1	1301	50-Year (Ex)	193.37	73.00	76.88		76.89	0.000066	0.34	596.37	360.34	0.08
1	1301	100-Year (Ex)	225.07	73.00	77.01		77.01	0.000071	0.37	642.58	367.02	0.08
1	1301	Future 100-Year	225.78	73.00	77.01		77.02	0.000071	0.37	643.81	367.15	0.08
1	1301	Future Regional	938.02	73.00	78.67		78.70	0.000141	0.78	1331.96	486.31	0.13
1	1172	2-Year (Ex)	45.05	73.00	75.94	75.31	75.95	0.000173	0.34	140.47	173.64	0.11
1	1172	5-Year (Ex)	85.12	73.00	76.27	75.41	76.28	0.000202	0.45	198.19	177.87	0.13
1	1172	10-Year (Ex)	107.51	73.00	76.42	75.46	76.44	0.000212	0.50	225.92	180.65	0.13
1	1172	25-Year (Ex)	154.92	73.00	76.68	75.56	76.70	0.000240	0.59	273.33	185.32	0.15
1	1172	50-Year (Ex)	193.37	73.00	76.85	75.63	76.87	0.000267	0.67	304.80	193.74	0.16
1	1172	100-Year (Ex)	225.07	73.00	76.97	75.69	77.00	0.000286	0.72	329.29	203.45	0.17
1	1172	Future 100-Year	225.78	73.00	76.98	75.69	77.00	0.000287	0.72	329.96	203.95	0.17
1	1172	Future Regional	938.02	73.00	78.61	76.58	78.67	0.000399	1.28	910.54	412.48	0.22
1	1060	2-Year (Ex)	45.05	73.00	75.91	75.32	75.92	0.000278	0.48	107.21	127.53	0.15
1	1060	5-Year (Ex)	85.12	73.00	76.23	75.44	76.25	0.000348	0.64	148.52	130.93	0.18
1	1060	10-Year (Ex)	107.51	73.00	76.38	75.50	76.40	0.000372	0.71	168.38	132.55	0.19
1	1060	25-Year (Ex)	154.92	73.00	76.63	75.62	76.66	0.000435	0.85	201.79	135.23	0.21
1	1060	50-Year (Ex)	193.37	73.00	76.79	75.70	76.83	0.000493	0.96	223.22	136.87	0.22
1	1060	100-Year (Ex)	225.07	73.00	76.91	75.77	76.95	0.000537	1.04	239.22	138.21	0.23
1	1060	Future 100-Year	225.78	73.00	76.91	75.77	76.96	0.000537	1.04	239.66	138.25	0.23
1	1060	Future Regional	938.02	73.00	78.48	76.86	78.60	0.000835	1.90	625.26	324.94	0.32
1	859	2-Year (Ex)	45.05	73.00	75.87		75.87	0.000281	0.43	115.12	152.71	0.14
1	859	5-Year (Ex)	85.12	73.00	76.18		76.19	0.000322	0.56	163.15	155.11	0.16
1	859	10-Year (Ex)	107.51	73.00	76.33		76.34	0.000333	0.61	186.30	156.25	0.17
1	859	25-Year (Ex)	154.92	73.00	76.57		76.59	0.000379	0.73	224.36	158.11	0.19
1	859	50-Year (Ex)	193.37	73.00	76.72		76.75	0.000426	0.82	248.18	159.27	0.20
1	859	100-Year (Ex)	225.07	73.00	76.83		76.87	0.000463	0.89	265.87	160.11	0.21
1	859	Future 100-Year	225.78	73.00	76.83		76.87	0.000463	0.90	266.38	160.13	0.21
1	859	Future Regional	938.02	73.00	78.28		78.45	0.001022	1.95	531.49	228.18	0.34
1	696	2-Year (Ex)	45.05	73.00	75.79	75.36	75.81	0.000825	0.65	72.49	107.64	0.24
1	696	5-Year (Ex)	85.12	73.00	76.08	75.51	76.12	0.000901	0.85	104.75	110.89	0.26
1	696	10-Year (Ex)	107.51	73.00	76.23	75.58	76.27	0.000914	0.93	120.90	114.18	0.27
1	696	25-Year (Ex)	154.92	73.00	76.45	75.71	76.50	0.001036	1.11	146.82	120.05	0.30
1	696	50-Year (Ex)	193.37	73.00	76.58	75.80	76.65	0.001184	1.26	162.55	123.93	0.32
1	696	100-Year (Ex)	225.07	73.00	76.67	75.88	76.75	0.001300	1.37	174.27	126.56	0.34
1	696	Future 100-Year	225.78	73.00	76.67	75.88	76.76	0.001299	1.37	174.67	126.65	0.34
1	696	Future Regional	938.02	73.00	77.72	77.11	78.15	0.004093	3.39	332.95	182.71	0.66
1	528	2-Year (Ex)	45.05	73.00	75.65		75.66	0.000845	0.65	80.14	141.09	0.24
1	528	5-Year (Ex)	85.12	73.00	75.94		75.97	0.000827	0.81	126.34	184.14	0.26
1	528	10-Year (Ex)	107.51	73.00	76.09		76.12	0.000805	0.88	155.30	205.43	0.26
1	528	25-Year (Ex)	154.92	73.00	76.31		76.34	0.000834	1.00	203.29	235.47	0.27
1	528	50-Year (Ex)	193.37	73.00	76.43		76.47	0.000890	1.09	232.37	249.62	0.28
1	528	100-Year (Ex)	225.07	73.00	76.51		76.56	0.000936	1.16	254.44	260.10	0.29
1	528	Future 100-Year	225.78	73.00	76.52		76.56	0.000932	1.16	255.41	260.53	0.29
1	528	Future Regional	938.02	73.00	77.43		77.59	0.002092	2.35	574.09	422.67	0.47
1	319	2-Year (Ex)	45.05	73.00	75.51		75.52	0.000556	0.41	122.90	312.22	0.18
1	319	5-Year (Ex)	85.12	73.00	75.86		75.87	0.000260	0.40	240.43	357.96	0.14
1	319	10-Year (Ex)	107.51	73.00	76.03		76.03	0.000209	0.40	299.71	370.23	0.13
1	319	25-Year (Ex)	154.92	73.00	76.25		76.25	0.000214	0.46	384.72	413.48	0.13
1	319	50-Year (Ex)	193.37	73.00	76.36		76.37	0.000226	0.50	434.19	424.55	0.14
1	319	100-Year (Ex)	225.07	73.00	76.45		76.46	0.000237	0.53	470.54	431.75	0.14
1	319	Future 100-Year	225.78	73.00	76.45		76.46	0.000235	0.53	472.35	432.11	0.14
1	319	Future Regional	938.02	73.00	77.28		77.34	0.000632	1.18	892.03	593.33	0.25
1	240	2-Year (Ex)	45.05	73.00	75.46		75.47	0.000654	0.50	115.32	300.76	0.21
1	240	5-Year (Ex)	85.12	73.00	75.84		75.85	0.000230	0.42	242.95	370.72	0.13
1	240	10-Year (Ex)	107.51	73.00	76.01		76.02	0.000198	0.43	306.88	415.46	0.13
1	240	25-Year (Ex)	154.92	73.00	76.23		76.24	0.000198	0.48	404.87	473.89	0.13
1	240	50-Year (Ex)	193.37	73.00	76.35		76.36	0.000209	0.52	461.38	491.08	0.14
1	240	100-Year (Ex)	225.07	73.00	76.43		76.44	0.000219	0.56	503.55	505.77	0.14
1	240	Future 100-Year	225.78	73.00	76.44		76.45	0.000217	0.55	505.72	506.23	0.14
1	240	Future Regional	938.02	73.00	77.24		77.29	0.000596	1.21	977.05	650.50	0.25
1	119	2-Year (Ex)	39.04	73.00	75.36	75.23	75.37	0.001050	0.68	93.87	338.99	0.27
1	119	5-Year (Ex)	75.29	73.00	75.82	75.29	75.83	0.000162	0.38	264.90	391.37	0.11
1	119	10-Year (Ex)	95.85	73.00	75.99	75.32	76.00	0.000129	0.37	332.61	403.11	0.10
1	119	25-Year (Ex)	139.85	73.00	76.21	75.37	76.22	0.000127	0.41	425.59	457.36	0.11
1	119	50-Year (Ex)	175.70	73.00	76.33	75.41	76.33	0.000140	0.45	482.68	507.87	0.11
1	119	100-Year (Ex)	204.38	73.00	76.41	75.44	76.42	0.000162	0.50	524.83	516.80	0.12
1	119	Future 100-Year	206.12	73.00	76.41	75.45	76.42	0.000163	0.51	527.03	517.22	0.12

HEC-RAS Plan: Prop River: Lynde Reach: 1 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
1	119	Future Regional	940.70	73.00	77.16	76.01	77.21	0.000609	1.24	942.30	600.16	0.25
1	28	2-Year (Ex)	39.04	73.00	74.70	74.68	75.10	0.012641	2.82	13.87	16.31	0.98
1	28	5-Year (Ex)	75.29	73.00	75.22	75.22	75.73	0.012511	3.17	23.73	23.25	1.00
1	28	10-Year (Ex)	95.85	73.00	75.63	75.63	75.93	0.006806	2.51	45.79	108.16	0.76
1	28	25-Year (Ex)	139.85	73.00	75.84	75.84	76.15	0.006403	2.72	75.30	197.24	0.75
1	28	50-Year (Ex)	175.70	73.00	76.01	76.01	76.27	0.005154	2.64	115.87	269.60	0.69
1	28	100-Year (Ex)	204.38	73.00	76.10	76.10	76.35	0.004894	2.68	142.72	316.61	0.68
1	28	Future 100-Year	206.12	73.00	76.11	76.11	76.36	0.004891	2.68	144.10	318.02	0.68
1	28	Future Regional	940.70	73.00	76.83	76.83	77.08	0.005297	3.58	574.60	628.74	0.75

HEC-RAS Plan: PropReg River: corbett creek Reach: west branch

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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
west branch	800	Regional Storm	9.40	114.80	115.27	115.27	115.39	0.018384	1.71	7.72	35.36	0.83
west branch	800	RegWCwithencroac	9.40	114.80	115.27	115.27	115.39	0.018384	1.71	7.72	35.36	0.83
west branch	800	100yr Future	16.40	114.80	115.54	115.39	115.60	0.005527	1.30	20.83	60.14	0.50
west branch	790	Regional Storm	9.40	113.40	114.45	114.00	114.47	0.001053	0.60	20.00	46.20	0.22
west branch	790	RegWCwithencroac	9.40	113.40	114.45	114.00	114.47	0.001053	0.60	20.00	46.20	0.22
west branch	790	100yr Future	16.40	113.40	115.57		115.57	0.000053	0.24	106.21	99.01	0.06
west branch	780	Regional Storm	9.40	112.50	114.43		114.44	0.000144	0.38	42.89	48.08	0.09
west branch	780	RegWCwithencroac	9.40	112.50	114.43		114.44	0.000144	0.38	42.89	48.08	0.09
west branch	780	100yr Future	16.40	112.50	115.56		115.56	0.000035	0.26	113.94	75.26	0.05
west branch	770	Regional Storm	9.40	112.29	114.19	113.46	114.36	0.002060	1.81	5.18	37.21	0.44
west branch	770	RegWCwithencroac	9.40	112.29	114.19	113.46	114.36	0.002060	1.81	5.18	37.21	0.44
west branch	770	100yr Future	16.40	112.29	115.31	113.91	115.50	0.001183	1.92	8.55	48.50	0.36
west branch	765		Culvert									
west branch	760	Regional Storm	13.84	112.00	113.50	113.37	114.03	0.013366	3.24	4.27	51.97	0.87
west branch	760	RegWCwithencroac	13.84	112.00	113.50	113.37	114.03	0.013366	3.24	4.27	51.97	0.87
west branch	760	100yr Future	13.10	112.00	113.47	113.32	113.97	0.012821	3.13	4.19	51.16	0.85
west branch	750	Regional Storm	13.84	110.80	111.64	111.64	111.81	0.021816	2.74	9.82	27.68	0.98
west branch	750	RegWCwithencroac	13.84	110.80	111.64	111.64	111.81	0.021816	2.74	9.82	27.68	0.98
west branch	750	100yr Future	13.10	110.80	111.62	111.62	111.79	0.022296	2.73	9.32	26.93	0.99
west branch	740	Regional Storm	13.84	109.80	111.07	110.20	111.07	0.000143	0.33	71.90	79.01	0.10
west branch	740	RegWCwithencroac	13.84	109.80	111.07	110.20	111.07	0.000143	0.33	71.90	79.01	0.10
west branch	740	100yr Future	13.10	109.80	111.05	110.20	111.05	0.000137	0.32	70.33	78.45	0.09
west branch	730	Regional Storm	13.84	108.90	111.07		111.07	0.000009	0.12	200.28	124.61	0.03
west branch	730	RegWCwithencroac	13.84	108.90	111.07		111.07	0.000009	0.12	200.28	124.61	0.03
west branch	730	100yr Future	13.10	108.90	111.05		111.05	0.000008	0.12	197.80	124.15	0.03
west branch	720	Regional Storm	13.84	108.50	111.07		111.07	0.000001	0.04	379.21	179.46	0.01
west branch	720	RegWCwithencroac	13.84	108.50	111.07		111.07	0.000001	0.04	379.21	179.46	0.01
west branch	720	100yr Future	13.10	108.50	111.05		111.05	0.000001	0.04	375.64	179.05	0.01
west branch	710	Regional Storm	13.84	108.10	111.07		111.07	0.000002	0.06	377.79	174.32	0.01
west branch	710	RegWCwithencroac	13.84	108.10	111.07		111.07	0.000002	0.06	377.79	174.32	0.01
west branch	710	100yr Future	13.10	108.10	111.05		111.05	0.000001	0.06	374.32	173.95	0.01
west branch	700	Regional Storm	13.84	108.10	111.07		111.07	0.000000	0.04	453.58	187.36	0.01
west branch	700	RegWCwithencroac	13.84	108.10	111.07		111.07	0.000000	0.04	453.58	187.36	0.01
west branch	700	100yr Future	13.10	108.10	111.05		111.05	0.000000	0.03	449.85	186.97	0.01
west branch	690	Regional Storm	13.84	108.10	111.07		111.07	0.000001	0.04	418.47	193.34	0.01
west branch	690	RegWCwithencroac	13.84	108.10	111.07		111.07	0.000001	0.04	418.47	193.34	0.01
west branch	690	100yr Future	13.10	108.10	111.05		111.05	0.000001	0.04	414.63	192.81	0.01
west branch	680	Regional Storm	13.84	108.10	111.07		111.07	0.000001	0.06	319.80	206.30	0.01
west branch	680	RegWCwithencroac	13.84	108.10	111.07		111.07	0.000001	0.06	319.80	206.30	0.01
west branch	680	100yr Future	13.10	108.10	111.05		111.05	0.000001	0.06	315.70	206.21	0.01
west branch	670	Regional Storm	13.84	107.69	111.07	109.60	111.07	0.000001	0.06	349.48	170.87	0.01
west branch	670	RegWCwithencroac	13.84	107.69	111.07	109.60	111.07	0.000001	0.06	349.48	170.87	0.01
west branch	670	100yr Future	13.10	107.69	111.05	109.53	111.05	0.000001	0.05	346.26	170.33	0.01
west branch	664		Culvert									
west branch	660	Regional Storm	20.36	107.81	110.00	110.00	110.07	0.002070	1.20	16.97	12.00	0.32
west branch	660	RegWCwithencroac	20.36	107.81	110.00	110.00	110.07	0.002070	1.20	16.97	12.00	0.32
west branch	660	100yr Future	17.70	107.81	110.00	110.00	110.06	0.001565	1.04	16.97	12.00	0.28
west branch	650	Regional Storm	20.36	107.80	108.85	108.27	108.85	0.000501	0.49	61.28	104.08	0.16
west branch	650	RegWCwithencroac	20.36	107.80	108.85	108.27	108.85	0.000501	0.49	61.28	104.08	0.16
west branch	650	100yr Future	17.70	107.80	108.84	108.25	108.84	0.000394	0.43	60.39	103.41	0.14
west branch	640	Regional Storm	20.36	107.80	108.85		108.85	0.000048	0.16	133.72	140.62	0.05
west branch	640	RegWCwithencroac	20.36	107.80	108.85		108.85	0.000048	0.16	133.72	140.62	0.05
west branch	640	100yr Future	17.70	107.80	108.84		108.84	0.000037	0.14	132.54	140.43	0.04
west branch	630	Regional Storm	20.36	107.80	108.84		108.84	0.000120	0.24	91.39	111.64	0.08
west branch	630	RegWCwithencroac	20.36	107.80	108.84		108.84	0.000120	0.24	91.39	111.64	0.08
west branch	630	100yr Future	17.70	107.80	108.83		108.83	0.000093	0.21	90.69	111.40	0.07
west branch	620	Regional Storm	20.36	107.80	108.58	108.58	108.80	0.021906	2.08	10.18	26.36	0.94
west branch	620	RegWCwithencroac	20.36	107.80	108.58	108.58	108.80	0.021906	2.08	10.18	26.36	0.94
west branch	620	100yr Future	17.70	107.80	108.72		108.81	0.006888	1.37	13.96	28.62	0.55
west branch	615	Regional Storm	20.36	107.24	108.42	108.08	108.55	0.006464	1.57	12.97	15.42	0.55
west branch	615	RegWCwithencroac	20.36	107.24	108.42	108.08	108.55	0.006464	1.57	12.97	15.42	0.55

HEC-RAS Plan: PropReg River: corbett creek Reach: west branch (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
west branch	615	100yr Future	17.70	107.24	108.72		108.77	0.001789	0.99	18.37	21.88	0.30
west branch	612	Regional Storm	20.36	106.61	108.27		108.50	0.008782	2.13	9.54	7.51	0.60
west branch	612	RegWCwithencroac	20.36	106.61	108.27		108.50	0.008782	2.13	9.54	7.51	0.60
west branch	612	100yr Future	17.70	106.61	108.66		108.76	0.002906	1.40	12.87	11.72	0.36
west branch	610	Regional Storm	20.36	106.01	108.31	107.01	108.41	0.001230	1.36	14.98	23.89	0.29
west branch	610	RegWCwithencroac	20.36	106.01	108.31	107.01	108.41	0.001230	1.36	14.98	23.89	0.29
west branch	610	100yr Future	17.70	106.01	108.67	106.92	108.72	0.000577	1.02	17.28	30.50	0.20
west branch	605		Culvert									
west branch	600	Regional Storm	31.94	105.82	108.06	107.17	108.30	0.002629	2.19	14.56	14.18	0.47
west branch	600	RegWCwithencroac	31.94	105.82	108.06	107.17	108.30	0.002629	2.19	14.56	14.18	0.47
west branch	600	100yr Future	41.00	105.82	108.32	107.42	108.64	0.003012	2.53	16.23	19.35	0.51
west branch	590	Regional Storm	31.94	105.80	107.97		108.14	0.002910	2.20	20.03	15.82	0.49
west branch	590	RegWCwithencroac	31.94	105.80	107.97		108.14	0.002910	2.20	20.03	15.82	0.49
west branch	590	100yr Future	41.00	105.80	108.25		108.44	0.002838	2.36	24.80	18.02	0.49
west branch	580	Regional Storm	31.94	105.50	107.87		107.97	0.001917	1.79	25.40	20.94	0.39
west branch	580	RegWCwithencroac	31.94	105.50	107.87		107.97	0.001917	1.79	25.40	20.94	0.39
west branch	580	100yr Future	41.00	105.50	108.16		108.28	0.001850	1.91	32.14	26.93	0.39
west branch	570	Regional Storm	31.94	105.30	107.82		107.90	0.001085	1.38	28.21	18.26	0.30
west branch	570	RegWCwithencroac	31.94	105.30	107.82		107.90	0.001085	1.38	28.21	18.26	0.30
west branch	570	100yr Future	41.00	105.30	108.11		108.20	0.001106	1.51	33.69	19.74	0.31
west branch	560	Regional Storm	31.94	105.00	107.16	107.16	107.72	0.019394	3.89	10.14	8.90	0.90
west branch	560	RegWCwithencroac	31.94	105.00	107.16	107.16	107.72	0.019394	3.89	10.14	8.90	0.90
west branch	560	100yr Future	41.00	105.00	107.38	107.38	108.01	0.019235	4.16	12.15	9.45	0.91
west branch	550	Regional Storm	31.94	104.00	106.52	106.00	106.53	0.000409	0.51	71.39	80.02	0.12
west branch	550	RegWCwithencroac	31.94	104.00	106.52	106.00	106.53	0.000409	0.51	71.39	80.02	0.12
west branch	550	100yr Future	41.00	104.00	106.54	106.00	106.56	0.000615	0.63	73.76	80.92	0.15
west branch	548	Regional Storm	31.94	102.72	106.51	104.90	106.51	0.000138	0.39	109.41	102.05	0.07
west branch	548	RegWCwithencroac	31.94	102.72	106.51	104.90	106.51	0.000138	0.39	109.41	102.05	0.07
west branch	548	100yr Future	41.00	102.72	106.53	105.29	106.54	0.000213	0.49	112.00	102.57	0.08
west branch	547	Regional Storm	31.94	102.72	106.42	105.03	106.49	0.001980	1.45	39.52	76.14	0.25
west branch	547	RegWCwithencroac	31.94	102.72	106.42	105.03	106.49	0.001980	1.45	39.52	76.14	0.25
west branch	547	100yr Future	41.00	102.72	106.31	106.19	106.49	0.004844	2.23	31.61	64.03	0.38
west branch	545		Culvert									
west branch	540	Regional Storm	31.94	101.55	103.86	103.86	105.02	0.009077	4.76	6.71	19.04	1.00
west branch	540	RegWCwithencroac	31.94	101.55	103.86	103.86	105.02	0.009077	4.76	6.71	19.04	1.00
west branch	540	100yr Future	41.00	101.55	104.28	104.28	105.65	0.008559	5.17	7.93	21.14	1.00
west branch	530	Regional Storm	31.94	98.20	98.88	99.44	101.88	0.265357	7.68	4.16	10.42	3.88
west branch	530	RegWCwithencroac	31.94	98.20	98.88	99.44	101.88	0.265357	7.68	4.16	10.42	3.88
west branch	530	100yr Future	41.00	98.20	98.94	99.60	102.51	0.281334	8.36	4.91	11.29	4.05
west branch	520	Regional Storm	31.94	94.20	95.92	95.96	96.21	0.013146	3.39	15.73	29.60	0.88
west branch	520	RegWCwithencroac	31.94	94.20	95.92	95.96	96.21	0.013146	3.39	15.73	29.60	0.88
west branch	520	100yr Future	41.00	94.20	96.01	96.06	96.34	0.014114	3.66	18.63	32.12	0.92
west branch	510	Regional Storm	31.94	91.80	93.55	94.05	95.04	0.025104	6.28	6.99	6.64	1.54
west branch	510	RegWCwithencroac	31.94	91.80	93.55	94.05	95.04	0.025104	6.28	6.99	6.64	1.54
west branch	510	100yr Future	41.00	91.80	93.89	94.31	95.27	0.019217	6.21	9.41	7.66	1.39
west branch	500	Regional Storm	31.94	89.40	91.05	90.40	91.08	0.001235	1.32	38.32	42.47	0.33
west branch	500	RegWCwithencroac	31.94	89.40	91.05	90.40	91.08	0.001235	1.32	38.32	42.47	0.33
west branch	500	100yr Future	41.00	89.40	91.17	90.50	91.22	0.001384	1.47	43.55	43.68	0.35
west branch	499	Regional Storm	31.94	88.96	91.01	90.47	91.05	0.000815	1.02	43.75	51.52	0.27
west branch	499	RegWCwithencroac	31.94	88.96	91.01	90.47	91.05	0.000815	1.02	43.75	51.52	0.27
west branch	499	100yr Future	41.00	88.96	91.13	90.56	91.18	0.000958	1.17	49.99	55.72	0.30
west branch	495		Bridge									
west branch	491	Regional Storm	31.94	88.95	90.48	90.61	90.96	0.013471	3.09	10.99	21.14	1.02
west branch	491	RegWCwithencroac	31.94	88.95	90.48	90.61	90.96	0.013471	3.09	10.99	21.14	1.02
west branch	491	100yr Future	44.80	88.95	90.84	90.84	91.15	0.006407	2.65	23.06	45.46	0.74
west branch	490	Regional Storm	36.80	87.30	88.54	87.64	88.54	0.000024	0.14	338.83	415.22	0.04
west branch	490	RegWCwithencroac	36.80	87.30	88.54	87.64	88.54	0.000024	0.14	338.46	415.13	0.04
west branch	490	100yr Future	44.80	87.30	88.57	87.65	88.57	0.000032	0.16	349.01	417.72	0.05
west branch	480	Regional Storm	36.80	86.60	88.54		88.54	0.000002	0.04	1034.35	703.90	0.01
west branch	480	RegWCwithencroac	36.80	86.60	88.54		88.54	0.000002	0.04	1033.70	703.86	0.01

HEC-RAS Plan: PropReg River: corbett creek Reach: west branch (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
west branch	480	100yr Future	44.80	86.60	88.57		88.57	0.000002	0.05	1051.59	705.03	0.01
west branch	470	Regional Storm	36.80	84.88	88.54	88.37	88.54	0.000326	0.56	209.82	732.34	0.10
west branch	470	RegWCwithencroac	36.80	84.88	88.54	88.37	88.54	0.000329	0.56	209.17	732.28	0.10
west branch	470	100yr Future	44.80	84.88	88.56	88.38	88.56	0.000384	0.61	225.72	733.81	0.10
west branch	467		Culvert									
west branch	465	Regional Storm	47.88	84.67	87.98	87.28	87.98	0.000002	0.05	1187.65	697.19	0.01
west branch	465	RegWCwithencroac	50.91	84.67	88.02	87.28	88.02	0.000002	0.05	1217.29	699.73	0.01
west branch	465	100yr Future	36.90	84.67	87.75	87.28	87.75	0.000002	0.05	1033.85	680.44	0.01
west branch	462	Regional Storm	47.88	85.10	87.98		87.98	0.000001	0.05	1250.90	674.72	0.01
west branch	462	RegWCwithencroac	50.91	85.10	88.02		88.02	0.000003	0.07	860.78	362.70	0.01
west branch	462	100yr Future	36.90	85.10	87.75		87.75	0.000001	0.05	1102.59	653.74	0.01
west branch	460	Regional Storm	47.88	85.10	87.98		87.98	0.000001	0.04	1368.60	635.36	0.01
west branch	460	RegWCwithencroac	50.91	85.10	88.01		88.02	0.000040	0.27	227.17	91.40	0.05
west branch	460	100yr Future	36.90	85.10	87.75		87.75	0.000001	0.04	1227.41	629.44	0.01
west branch	450	Regional Storm	47.88	84.80	87.98		87.98	0.000001	0.06	1129.54	482.26	0.01
west branch	450	RegWCwithencroac	50.91	84.80	88.01		88.01	0.000021	0.22	274.21	91.40	0.04
west branch	450	100yr Future	36.90	84.80	87.75		87.75	0.000001	0.05	1022.63	475.57	0.01
west branch	440	Regional Storm	47.88	84.50	87.98		87.98	0.000004	0.10	749.60	389.31	0.02
west branch	440	RegWCwithencroac	50.91	84.50	88.01		88.01	0.000026	0.25	257.11	91.40	0.04
west branch	440	100yr Future	36.90	84.50	87.75		87.75	0.000003	0.08	663.42	383.06	0.02
west branch	430	Regional Storm	47.88	84.00	87.97		87.98	0.000004	0.11	745.96	414.70	0.02
west branch	430	RegWCwithencroac	50.91	84.00	88.01		88.01	0.000012	0.19	323.66	91.40	0.03
west branch	430	100yr Future	36.90	84.00	87.75		87.75	0.000002	0.07	664.19	237.42	0.01
west branch	420	Regional Storm	47.88	83.50	87.97		87.98	0.000003	0.10	865.96	442.44	0.02
west branch	420	RegWCwithencroac	50.91	83.50	88.01		88.01	0.000009	0.17	356.61	91.40	0.03
west branch	420	100yr Future	36.90	83.50	87.75		87.75	0.000002	0.08	769.89	380.22	0.01
west branch	410	Regional Storm	47.88	82.50	87.97		87.97	0.000001	0.05	1329.83	377.29	0.01
west branch	410	RegWCwithencroac	50.91	82.50	88.01		88.01	0.000005	0.14	428.83	91.40	0.02
west branch	410	100yr Future	36.90	82.50	87.75		87.75	0.000000	0.04	1246.40	371.05	0.01
west branch	400	Regional Storm	47.88	82.40	87.97		87.97	0.000001	0.06	1252.71	358.60	0.01
west branch	400	RegWCwithencroac	50.91	82.40	88.01		88.01	0.000001	0.08	813.06	171.70	0.01
west branch	400	100yr Future	36.90	82.40	87.75		87.75	0.000000	0.05	1173.60	351.08	0.01
west branch	390	Regional Storm	47.88	82.20	87.97	84.16	87.97	0.000001	0.06	1178.36	348.24	0.01
west branch	390	RegWCwithencroac	50.91	82.20	88.01	84.23	88.01	0.000001	0.06	1190.31	348.94	0.01
west branch	390	100yr Future	36.90	82.20	87.75	83.88	87.75	0.000001	0.05	1101.19	344.03	0.01
west branch	385		Culvert									
west branch	380	Regional Storm	48.43	82.60	87.97	84.56	87.97	0.000003	0.12	847.62	383.84	0.02
west branch	380	RegWCwithencroac	50.16	82.60	88.01	84.61	88.01	0.000003	0.12	862.44	386.96	0.02
west branch	380	100yr Future	27.10	82.60	87.75	83.94	87.75	0.000001	0.06	766.27	267.20	0.01
west branch	370	Regional Storm	48.43	82.60	87.97		87.97	0.000003	0.11	784.26	318.03	0.02
west branch	370	RegWCwithencroac	50.16	82.60	88.01		88.01	0.000002	0.09	707.18	149.00	0.01
west branch	370	100yr Future	27.10	82.60	87.75		87.75	0.000001	0.05	729.00	172.64	0.01
west branch	360	Regional Storm	48.43	82.50	87.97		87.97	0.000007	0.17	609.16	304.60	0.02
west branch	360	RegWCwithencroac	50.16	82.50	88.01		88.01	0.000004	0.13	522.48	110.00	0.02
west branch	360	100yr Future	27.10	82.50	87.75		87.75	0.000001	0.07	558.11	136.71	0.01
west branch	350	Regional Storm	48.43	81.87	87.97	83.99	87.97	0.000008	0.21	491.01	289.48	0.03
west branch	350	RegWCwithencroac	50.16	81.87	88.01	84.04	88.01	0.000009	0.21	500.40	292.59	0.03
west branch	350	100yr Future	27.10	81.87	87.69	83.31	87.73	0.000168	0.93	29.05	182.14	0.12
west branch	345		Culvert									
west branch	340	Regional Storm	53.13	81.40	87.13	83.66	87.31	0.000677	1.85	28.68	183.95	0.25
west branch	340	RegWCwithencroac	53.84	81.40	87.29	83.68	87.29	0.000032	0.30	334.36	185.99	0.04
west branch	340	100yr Future	33.50	81.40	87.47	83.06	87.47	0.000009	0.17	367.75	188.36	0.02
west branch	330	Regional Storm	53.13	82.30	87.22		87.22	0.000012	0.22	479.42	245.89	0.03
west branch	330	RegWCwithencroac	53.84	82.30	87.29		87.29	0.000008	0.18	458.41	141.57	0.03
west branch	330	100yr Future	33.50	82.30	87.47		87.47	0.000004	0.12	546.86	287.93	0.02
west branch	320	Regional Storm	53.13	82.20	87.22		87.22	0.000013	0.22	386.03	131.88	0.03
west branch	320	RegWCwithencroac	53.84	82.20	87.28		87.29	0.000013	0.22	379.15	122.08	0.03
west branch	320	100yr Future	33.50	82.20	87.46		87.47	0.000004	0.13	419.43	136.37	0.02
west branch	310	Regional Storm	53.13	82.29	87.21	84.58	87.22	0.000022	0.28	432.31	365.00	0.04
west branch	310	RegWCwithencroac	53.84	82.29	87.28	84.61	87.28	0.000009	0.17	632.92	369.83	0.03

HEC-RAS Plan: PropReg River: corbett creek Reach: west branch (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
west branch	310	100yr Future	33.50	82.29	87.46	83.98	87.46	0.000003	0.10	700.76	382.27	0.01
west branch	305		Culvert									
west branch	300	Regional Storm	53.13	82.00	87.21	84.29	87.21	0.000006	0.15	595.34	303.26	0.02
west branch	300	RegWCwithencroac	53.84	82.00	87.28	84.31	87.28	0.000005	0.15	616.76	306.36	0.02
west branch	300	100yr Future	33.50	82.00	87.46	83.68	87.46	0.000002	0.08	673.05	307.86	0.01
west branch	290	Regional Storm	53.13	82.00	87.21		87.21	0.000006	0.16	500.31	226.64	0.02
west branch	290	RegWCwithencroac	53.84	82.00	87.28		87.28	0.000006	0.17	481.42	126.96	0.02
west branch	290	100yr Future	33.50	82.00	87.46		87.46	0.000003	0.12	573.82	427.95	0.02
west branch	280	Regional Storm	53.13	81.80	87.21		87.21	0.000006	0.16	668.08	302.15	0.02
west branch	280	RegWCwithencroac	53.84	81.80	87.28		87.28	0.000006	0.17	520.73	150.63	0.02
west branch	280	100yr Future	33.50	81.80	87.46		87.46	0.000002	0.09	744.78	302.81	0.01
west branch	279	Regional Storm	53.13	81.87	87.21		87.69	0.002579	3.40	22.59	299.11	0.47
west branch	279	RegWCwithencroac	53.84	81.87	87.28		87.74	0.002463	3.36	23.31	299.35	0.46
west branch	279	100yr Future	33.50	81.87	87.22	84.68	87.41	0.001015	2.14	22.69	299.15	0.30
west branch	275		Mult Open									
west branch	270	Regional Storm	57.67	81.74	86.07	85.72	86.63	0.004860	3.90	22.14	271.30	0.60
west branch	270	RegWCwithencroac	58.73	81.74	86.11	85.75	86.67	0.004812	3.90	22.53	272.03	0.60
west branch	270	100yr Future	38.50	81.74	85.52	85.24	86.00	0.004525	3.44	16.51	242.62	0.57
west branch	260	Regional Storm	57.67	81.70	86.34		86.34	0.000030	0.29	360.89	162.82	0.04
west branch	260	RegWCwithencroac	58.73	81.70	86.38		86.38	0.000035	0.31	320.69	132.19	0.05
west branch	260	100yr Future	38.50	81.70	85.75		85.75	0.000033	0.27	266.81	154.51	0.04
west branch	250	Regional Storm	57.67	81.50	86.34		86.34	0.000064	0.44	295.04	173.51	0.06
west branch	250	RegWCwithencroac	58.73	81.50	86.37		86.37	0.000076	0.48	238.31	116.27	0.07
west branch	250	100yr Future	38.50	81.50	85.74		85.75	0.000072	0.43	202.11	137.06	0.07
west branch	240	Regional Storm	57.67	81.20	86.30		86.33	0.000238	0.96	91.26	40.41	0.14
west branch	240	RegWCwithencroac	58.73	81.20	86.33		86.37	0.000240	0.97	92.67	41.53	0.14
west branch	240	100yr Future	38.50	81.20	85.72		85.74	0.000169	0.74	72.31	28.72	0.12
west branch	239	Regional Storm	57.67	81.19	86.07	83.50	86.28	0.001081	2.00	28.77	19.44	0.30
west branch	239	RegWCwithencroac	58.73	81.19	86.10	83.53	86.31	0.001098	2.03	28.94	19.71	0.30
west branch	239	100yr Future	38.50	81.19	85.60	83.01	85.71	0.000691	1.49	25.81	15.70	0.23
west branch	235		Culvert									
west branch	230	Regional Storm	57.67	81.30	85.69	83.62	85.76	0.000616	1.39	65.48	30.94	0.22
west branch	230	RegWCwithencroac	58.73	81.30	85.71	83.65	85.77	0.000630	1.41	65.86	31.10	0.22
west branch	230	100yr Future	38.50	81.30	85.45	83.14	85.48	0.000356	1.01	58.25	27.91	0.16
west branch	220	Regional Storm	57.67	81.20	85.65		85.74	0.000784	1.56	58.60	31.16	0.24
west branch	220	RegWCwithencroac	58.73	81.20	85.67		85.76	0.000803	1.58	58.96	31.32	0.25
west branch	220	100yr Future	38.50	81.20	85.43		85.48	0.000452	1.14	51.84	27.96	0.18
west branch	210	Regional Storm	57.67	81.20	85.62		85.67	0.000589	1.34	68.57	31.69	0.21
west branch	210	RegWCwithencroac	58.73	81.20	85.63		85.69	0.000604	1.35	68.90	31.76	0.21
west branch	210	100yr Future	38.50	81.20	85.40		85.44	0.000338	0.98	61.97	30.42	0.16
west branch	200	Regional Storm	57.67	81.10	85.61		85.65	0.000483	1.20	81.98	38.90	0.19
west branch	200	RegWCwithencroac	58.73	81.10	85.62		85.66	0.000494	1.22	82.39	38.99	0.19
west branch	200	100yr Future	38.50	81.10	85.40		85.42	0.000280	0.88	73.92	37.21	0.14
west branch	180	Regional Storm	57.67	80.60	85.60		85.61	0.000148	0.77	150.86	71.57	0.11
west branch	180	RegWCwithencroac	58.73	80.60	85.61		85.62	0.000151	0.78	151.59	71.74	0.11
west branch	180	100yr Future	38.50	80.60	85.39		85.40	0.000085	0.56	136.44	68.28	0.08
west branch	170	Regional Storm	57.67	80.50	85.59		85.61	0.000153	0.77	154.84	76.69	0.11
west branch	170	RegWCwithencroac	58.73	80.50	85.60		85.62	0.000156	0.78	155.62	76.87	0.11
west branch	170	100yr Future	38.50	80.50	85.39		85.40	0.000089	0.57	139.56	73.01	0.08
west branch	160	Regional Storm	57.67	79.70	85.58		85.59	0.000158	0.86	151.83	70.91	0.11
west branch	160	RegWCwithencroac	58.73	79.70	85.59		85.60	0.000162	0.87	152.52	70.96	0.11
west branch	160	100yr Future	38.50	79.70	85.38		85.39	0.000093	0.64	137.81	69.91	0.09
west branch	150	Regional Storm	57.67	79.40	85.58		85.59	0.000064	0.57	200.36	77.80	0.07
west branch	150	RegWCwithencroac	58.73	79.40	85.59		85.60	0.000066	0.57	201.12	77.90	0.07
west branch	150	100yr Future	38.50	79.40	85.38		85.39	0.000035	0.41	185.12	75.82	0.05
west branch	149	Regional Storm	57.67	79.14	85.57	82.92	85.58	0.000162	0.79	170.51	100.77	0.10
west branch	149	RegWCwithencroac	58.73	79.14	85.58	82.96	85.59	0.000166	0.80	171.48	101.14	0.10
west branch	149	100yr Future	38.50	79.14	85.38	82.04	85.38	0.000094	0.59	151.51	93.34	0.08
west branch	145		Culvert									

HEC-RAS Plan: PropReg River: corbett creek Reach: west branch (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
west branch	140	Regional Storm	58.86	78.95	82.50	82.50	82.78	0.004346	2.75	30.18	16.00	0.47
west branch	140	RegWCwithencroac	60.16	78.95	82.50	82.50	82.79	0.004540	2.81	30.18	16.00	0.48
west branch	140	100yr Future	27.00	78.95	81.17	81.17	82.29	0.015373	4.68	5.76	10.67	1.00
west branch	130	Regional Storm	58.86	78.70	80.10	80.62	81.80	0.066841	6.88	12.74	16.82	1.88
west branch	130	RegWCwithencroac	60.16	78.70	80.12	80.63	81.81	0.065327	6.87	13.07	16.98	1.86
west branch	130	100yr Future	27.00	78.70	79.71	80.09	80.88	0.063927	5.35	6.87	12.48	1.74
west branch	120	Regional Storm	58.86	77.60	79.61	79.40	79.93	0.008217	3.06	29.14	27.28	0.71
west branch	120	RegWCwithencroac	60.16	77.60	79.62	79.42	79.95	0.008281	3.09	29.56	27.46	0.71
west branch	120	100yr Future	27.00	77.60	79.13	78.86	79.32	0.006187	2.20	17.58	21.60	0.59
west branch	110	Regional Storm	58.86	77.10	78.63	78.54	78.99	0.013450	3.34	26.59	28.32	0.88
west branch	110	RegWCwithencroac	60.16	77.10	78.65	78.56	79.01	0.013367	3.36	27.08	28.49	0.88
west branch	110	100yr Future	27.00	77.10	78.14	78.14	78.43	0.016770	2.85	13.86	23.39	0.91
west branch	100	Regional Storm	58.86	76.40	78.19		78.39	0.003797	2.57	36.19	31.13	0.62
west branch	100	RegWCwithencroac	60.16	76.40	78.20		78.40	0.003827	2.59	36.64	31.21	0.62
west branch	100	100yr Future	27.00	76.40	77.81	77.35	77.90	0.002206	1.67	25.08	27.77	0.45
west branch	90	Regional Storm	58.86	75.70	78.15		78.19	0.000713	1.35	69.50	39.59	0.28
west branch	90	RegWCwithencroac	60.16	75.70	78.16		78.21	0.000728	1.37	70.04	39.65	0.28
west branch	90	100yr Future	27.00	75.70	77.80		77.82	0.000283	0.76	56.05	37.60	0.17
west branch	80	Regional Storm	58.86	75.30	78.14		78.16	0.000166	0.73	131.92	64.86	0.14
west branch	80	RegWCwithencroac	60.16	75.30	78.16		78.17	0.000169	0.74	132.81	64.95	0.14
west branch	80	100yr Future	27.00	75.30	77.80		77.80	0.000060	0.40	109.93	61.98	0.08
west branch	70	Regional Storm	58.86	74.69	78.11	77.44	78.13	0.000207	0.90	142.60	142.03	0.16
west branch	70	RegWCwithencroac	60.16	74.69	78.13	77.32	78.14	0.000210	0.91	144.48	142.50	0.16
west branch	70	100yr Future	27.00	74.69	77.79	76.79	77.79	0.000065	0.47	108.78	81.09	0.09
west branch	65		Culvert									
west branch	60	Regional Storm	58.86	74.69	76.60	76.60	76.61	0.000203	0.59	180.03	162.00	0.14
west branch	60	RegWCwithencroac	60.16	74.69	76.60	76.60	76.61	0.000212	0.60	180.03	162.00	0.15
west branch	60	100yr Future	27.00	74.69	76.60	76.60	76.60	0.000043	0.27	180.02	161.99	0.07
west branch	50	Regional Storm	58.86	74.70	74.93	75.18	76.16	0.233965	4.93	11.94	56.01	3.41
west branch	50	RegWCwithencroac	60.16	74.70	74.93	75.18	76.16	0.225516	4.91	12.24	56.15	3.36
west branch	50	100yr Future	27.00	74.70	74.80	75.04	76.17	0.721728	5.19	5.21	52.70	5.27
west branch	40	Regional Storm	58.86	74.00	74.77	74.27	74.78	0.000546	0.54	109.14	150.30	0.20
west branch	40	RegWCwithencroac	60.16	74.00	74.77	74.27	74.78	0.000569	0.55	109.24	150.31	0.21
west branch	40	100yr Future	27.00	74.00	74.75	74.16	74.76	0.000121	0.25	107.37	150.06	0.09
west branch	30	Regional Storm	58.86	74.00	74.75	74.16	74.75	0.000124	0.26	225.03	300.00	0.10
west branch	30	RegWCwithencroac	60.16	74.00	74.75	74.16	74.75	0.000129	0.27	225.03	300.00	0.10
west branch	30	100yr Future	27.00	74.00	74.75	74.09	74.75	0.000026	0.12	225.03	300.00	0.04

HEC-RAS Plan: PropReg River: corbett creek Reach: east branch

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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
east branch	5062	Regional Storm	17.96	121.44	123.20	123.20	123.25	0.001246	1.09	20.82	17.80	0.27
east branch	5062	RegWCwithencroac	17.96	121.44	123.20	123.20	123.25	0.001246	1.09	20.82	17.80	0.27
east branch	5062	100yr Future	21.70	121.44	123.20	123.20	123.27	0.001819	1.32	20.82	17.80	0.33
east branch	5061	Regional Storm	17.96	118.50	121.16	119.60	121.19	0.000415	0.81	29.50	17.95	0.17
east branch	5061	RegWCwithencroac	17.96	118.50	121.16	119.60	121.19	0.000415	0.81	29.50	17.95	0.17
east branch	5061	100yr Future	21.70	118.50	121.39	119.70	121.42	0.000440	0.89	33.91	20.69	0.17
east branch	5060	Regional Storm	17.96	117.80	121.13		121.14	0.000285	0.82	41.48	32.68	0.14
east branch	5060	RegWCwithencroac	17.96	117.80	121.13		121.14	0.000285	0.82	41.48	32.68	0.14
east branch	5060	100yr Future	21.70	117.80	121.35		121.37	0.000331	0.92	50.53	48.07	0.16
east branch	5059	Regional Storm	17.96	117.80	121.12		121.13	0.000086	0.58	62.55	60.83	0.10
east branch	5059	RegWCwithencroac	17.96	117.80	121.12		121.13	0.000086	0.58	62.55	60.83	0.10
east branch	5059	100yr Future	21.70	117.80	121.34		121.35	0.000086	0.60	77.88	74.94	0.10
east branch	5058	Regional Storm	17.96	117.50	121.11	118.69	121.12	0.000067	0.54	61.74	52.89	0.09
east branch	5058	RegWCwithencroac	17.96	117.50	121.11	118.69	121.12	0.000067	0.54	61.74	52.89	0.09
east branch	5058	100yr Future	21.70	117.50	121.34	118.85	121.35	0.000068	0.57	74.66	61.73	0.09
east branch	5057.5		Culvert									
east branch	5057	Regional Storm	17.96	117.62	120.52	118.78	120.53	0.000148	0.68	41.91	32.86	0.13
east branch	5057	RegWCwithencroac	17.96	117.62	120.52	118.78	120.53	0.000148	0.68	41.91	32.86	0.13
east branch	5057	100yr Future	21.70	117.62	120.66	118.93	120.68	0.000170	0.76	46.95	36.22	0.14
east branch	5056	Regional Storm	17.96	117.30	120.51		120.53	0.000125	0.64	45.69	35.31	0.12
east branch	5056	RegWCwithencroac	17.96	117.30	120.51		120.53	0.000125	0.64	45.69	35.31	0.12
east branch	5056	100yr Future	21.70	117.30	120.66		120.68	0.000144	0.71	51.07	38.51	0.13
east branch	5055	Regional Storm	17.96	117.00	120.51		120.52	0.000092	0.55	55.59	37.27	0.09
east branch	5055	RegWCwithencroac	17.96	117.00	120.51		120.52	0.000092	0.55	55.59	37.27	0.09
east branch	5055	100yr Future	21.70	117.00	120.65		120.67	0.000110	0.62	61.29	41.61	0.10
east branch	5054	Regional Storm	17.96	116.04	120.51	118.16	120.51	0.000073	0.43	67.38	36.35	0.07
east branch	5054	RegWCwithencroac	17.96	116.04	120.51	118.16	120.51	0.000073	0.43	67.38	36.35	0.07
east branch	5054	100yr Future	21.70	116.04	120.65	118.43	120.66	0.000095	0.51	73.06	42.66	0.08
east branch	5053.5		Culvert									
east branch	5053	Regional Storm	17.96	115.80	117.82	117.82	118.83	0.015743	4.45	4.03	19.72	1.00
east branch	5053	RegWCwithencroac	17.96	115.80	117.82	117.82	118.83	0.015743	4.45	4.03	19.72	1.00
east branch	5053	100yr Future	21.70	115.80	118.09	118.09	119.23	0.015034	4.74	4.58	21.27	1.00
east branch	5052	Regional Storm	17.96	114.60	115.20	115.52	116.55	0.195693	5.58	3.94	13.40	2.71
east branch	5052	RegWCwithencroac	17.96	114.60	115.20	115.52	116.55	0.195693	5.58	3.94	13.40	2.71
east branch	5052	100yr Future	21.70	114.60	115.22	115.60	116.90	0.229496	6.27	4.26	13.57	2.96
east branch	5051	Regional Storm	17.96	113.75	115.02	114.61	115.13	0.004794	1.70	13.10	14.16	0.50
east branch	5051	RegWCwithencroac	17.96	113.75	115.02	114.61	115.13	0.004794	1.70	13.10	14.16	0.50
east branch	5051	100yr Future	21.70	113.75	115.13	114.70	115.27	0.005068	1.86	14.79	15.31	0.52
east branch	5050	Regional Storm	17.96	112.50	115.05		115.06	0.000174	0.51	51.24	32.22	0.11
east branch	5050	RegWCwithencroac	17.96	112.50	115.05		115.06	0.000174	0.51	51.24	32.22	0.11
east branch	5050	100yr Future	21.70	112.50	115.18		115.19	0.000203	0.57	55.21	32.71	0.12
east branch	5049	Regional Storm	17.96	111.57	115.05	113.16	115.06	0.000060	0.36	80.08	42.11	0.06
east branch	5049	RegWCwithencroac	17.96	111.57	115.05	113.16	115.06	0.000060	0.36	80.08	42.11	0.06
east branch	5049	100yr Future	21.70	111.57	115.17	113.33	115.18	0.000073	0.40	85.29	43.16	0.07
east branch	5048.5		Culvert									
east branch	5048	Regional Storm	17.96	110.33	111.92	111.92	112.55	0.019448	3.52	5.10	10.97	1.00
east branch	5048	RegWCwithencroac	17.96	110.33	111.92	111.92	112.55	0.019448	3.52	5.10	10.97	1.00
east branch	5048	100yr Future	21.70	110.33	112.09	112.09	112.81	0.018654	3.75	5.79	12.21	1.00
east branch	5047	Regional Storm	17.96	109.80	110.56	110.49	110.72	0.021468	2.36	10.72	22.32	0.87
east branch	5047	RegWCwithencroac	17.96	109.80	110.56	110.49	110.72	0.021468	2.36	10.72	22.32	0.87
east branch	5047	100yr Future	21.70	109.80	110.66	110.55	110.81	0.018168	2.36	12.91	23.56	0.82
east branch	5046	Regional Storm	17.96	107.30	108.38	108.34	108.53	0.012933	2.11	12.30	26.90	0.76
east branch	5046	RegWCwithencroac	17.96	107.30	108.38	108.34	108.53	0.012933	2.11	12.30	26.90	0.76
east branch	5046	100yr Future	21.70	107.30	108.42	108.39	108.60	0.015167	2.36	13.27	27.08	0.83
east branch	5045	Regional Storm	29.89	105.30	106.01	105.90	106.12	0.015636	2.06	20.85	44.10	0.82
east branch	5045	RegWCwithencroac	29.89	105.30	106.01	105.90	106.12	0.015636	2.06	20.85	44.10	0.82
east branch	5045	100yr Future	25.70	105.30	105.97	105.86	106.07	0.015178	1.94	19.08	43.47	0.80
east branch	5044	Regional Storm	29.89	102.70	103.27	103.27	103.39	0.028037	2.17	21.75	79.89	1.04

HEC-RAS Plan: PropReg River: corbett creek Reach: east branch (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
east branch	5044	RegWCwithencroac	29.89	102.70	103.27	103.27	103.39	0.028037	2.17	21.75	79.89	1.04
east branch	5044	100yr Future	25.70	102.70	103.24	103.24	103.35	0.028602	2.10	19.58	78.99	1.04
east branch	5043	Regional Storm	29.89	101.80	102.41	102.23	102.44	0.006284	1.15	39.27	105.71	0.50
east branch	5043	RegWCwithencroac	29.89	101.80	102.41	102.23	102.44	0.006284	1.15	39.27	105.71	0.50
east branch	5043	100yr Future	25.70	101.80	102.44	102.21	102.46	0.003530	0.90	42.93	107.46	0.38
east branch	5042	Regional Storm	29.89	100.80	102.01		102.05	0.003254	1.36	44.06	95.24	0.41
east branch	5042	RegWCwithencroac	29.89	100.80	102.01		102.05	0.003254	1.36	44.06	95.24	0.41
east branch	5042	100yr Future	25.70	100.80	101.78	101.78	101.90	0.013200	2.36	23.47	79.48	0.79
east branch	5041	Regional Storm	29.89	99.80	102.03		102.03	0.000034	0.22	189.76	107.13	0.05
east branch	5041	RegWCwithencroac	29.89	99.80	102.03		102.03	0.000034	0.22	189.76	107.13	0.05
east branch	5041	100yr Future	25.70	99.80	101.35	100.26	101.36	0.000110	0.30	119.48	102.48	0.08
east branch	5040	Regional Storm	29.89	98.70	102.02		102.02	0.000009	0.13	309.61	130.19	0.02
east branch	5040	RegWCwithencroac	29.89	98.70	102.02		102.02	0.000009	0.13	309.61	130.19	0.02
east branch	5040	100yr Future	25.70	98.70	101.35		101.35	0.000018	0.15	224.75	122.22	0.03
east branch	5039	Regional Storm	29.89	97.70	102.02		102.02	0.000002	0.08	572.72	183.66	0.01
east branch	5039	RegWCwithencroac	29.89	97.70	102.02		102.02	0.000002	0.08	572.72	183.66	0.01
east branch	5039	100yr Future	25.70	97.70	101.35		101.35	0.000003	0.08	453.47	171.80	0.01
east branch	5037	Regional Storm	36.84	96.37	102.02	98.05	102.02	0.000001	0.08	744.88	221.63	0.01
east branch	5037	RegWCwithencroac	36.84	96.37	102.02	98.05	102.02	0.000001	0.08	744.88	221.63	0.01
east branch	5037	100yr Future	29.40	96.37	101.30	97.85	101.34	0.000225	0.91	32.41	211.78	0.13
east branch	5036.5		Culvert									
east branch	5036	Regional Storm	36.84	96.20	98.59	97.51	98.79	0.002474	1.98	18.64	32.36	0.41
east branch	5036	RegWCwithencroac	36.84	96.20	98.59	97.51	98.79	0.002474	1.98	18.64	32.36	0.41
east branch	5036	100yr Future	29.40	96.20	98.27	97.33	98.44	0.002535	1.82	16.17	22.81	0.40
east branch	5035	Regional Storm	36.84	96.30	98.57		98.62	0.001259	1.24	55.10	80.95	0.28
east branch	5035	RegWCwithencroac	36.84	96.30	98.57		98.62	0.001259	1.24	55.10	80.95	0.28
east branch	5035	100yr Future	29.40	96.30	98.12		98.25	0.003938	1.85	25.90	46.11	0.47
east branch	5034	Regional Storm	36.84	95.43	98.23	97.06	98.45	0.002844	2.09	17.79	51.88	0.41
east branch	5034	RegWCwithencroac	36.84	95.43	98.23	97.06	98.45	0.002844	2.09	17.79	51.88	0.41
east branch	5034	100yr Future	29.40	95.43	97.81	96.86	98.01	0.003259	1.99	14.90	16.46	0.43
east branch	5033.5		Culvert									
east branch	5033	Regional Storm	36.84	95.60	97.45	97.01	97.82	0.004719	2.69	13.68	25.06	0.65
east branch	5033	RegWCwithencroac	36.84	95.60	97.45	97.01	97.82	0.004719	2.69	13.68	25.06	0.65
east branch	5033	100yr Future	29.40	95.60	97.30	96.83	97.58	0.003997	2.34	12.56	22.47	0.59
east branch	5032	Regional Storm	36.84	95.70	96.90	96.90	97.11	0.010529	3.07	23.12	47.83	0.93
east branch	5032	RegWCwithencroac	36.84	95.70	96.90	96.90	97.11	0.010529	3.07	23.12	47.83	0.93
east branch	5032	100yr Future	29.40	95.70	96.89	96.84	97.03	0.007014	2.49	22.76	47.74	0.76
east branch	5031	Regional Storm	36.84	94.80	96.56	95.99	96.60	0.001008	1.28	56.03	71.64	0.31
east branch	5031	RegWCwithencroac	36.84	94.80	96.56	95.99	96.60	0.001008	1.28	56.03	71.64	0.31
east branch	5031	100yr Future	29.40	94.80	96.07		96.19	0.004515	2.16	25.79	49.69	0.63
east branch	5030	Regional Storm	36.84	93.70	96.52		96.53	0.000173	0.73	89.58	61.54	0.14
east branch	5030	RegWCwithencroac	36.84	93.70	96.52		96.53	0.000173	0.73	89.58	61.54	0.14
east branch	5030	100yr Future	29.40	93.70	96.01		96.03	0.000290	0.82	61.34	50.24	0.18
east branch	5029	Regional Storm	36.84	93.14	96.52	94.96	96.52	0.000049	0.43	157.05	102.68	0.08
east branch	5029	RegWCwithencroac	36.84	93.14	96.52	94.96	96.52	0.000049	0.43	157.05	102.68	0.08
east branch	5029	100yr Future	29.40	93.14	95.62	94.72	95.91	0.002212	2.40	12.24	73.70	0.50
east branch	5028.5		Culvert									
east branch	5028	Regional Storm	36.84	93.00	95.33	94.56	95.68	0.002721	2.61	14.13	49.45	0.55
east branch	5028	RegWCwithencroac	36.84	93.00	95.33	94.56	95.68	0.002721	2.61	14.13	49.45	0.55
east branch	5028	100yr Future	29.40	93.00	94.95	94.35	95.27	0.003126	2.48	11.84	26.27	0.57
east branch	5027	Regional Storm	36.84	92.80	95.45		95.46	0.000232	0.74	84.75	76.70	0.15
east branch	5027	RegWCwithencroac	36.84	92.80	95.45		95.46	0.000232	0.74	84.75	76.70	0.15
east branch	5027	100yr Future	29.40	92.80	95.01		95.03	0.000459	0.91	54.65	62.42	0.21
east branch	5026	Regional Storm	36.84	92.04	95.43	93.58	95.44	0.000107	0.63	108.65	97.86	0.11
east branch	5026	RegWCwithencroac	36.84	92.04	95.43	93.58	95.44	0.000107	0.63	108.65	97.86	0.11
east branch	5026	100yr Future	29.40	92.04	94.84	93.40	94.96	0.000777	1.48	20.18	57.76	0.29
east branch	5025.5		Culvert									

HEC-RAS Plan: PropReg River: corbett creek Reach: east branch (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
east branch	5025	Regional Storm	40.23	92.21	95.23	93.71	95.24	0.000041	0.27	249.62	143.65	0.05
east branch	5025	RegWCwithencroac	40.23	92.21	95.23	93.71	95.24	0.000041	0.27	249.62	143.65	0.05
east branch	5025	100yr Future	29.40	92.21	94.82	93.44	94.82	0.000044	0.25	194.61	127.64	0.05
east branch	5024	Regional Storm	40.23	92.00	95.22		95.22	0.000141	0.52	130.18	74.70	0.09
east branch	5024	RegWCwithencroac	40.23	92.00	95.22		95.22	0.000141	0.52	130.18	74.70	0.09
east branch	5024	100yr Future	29.40	92.00	94.81		94.81	0.000125	0.45	104.25	58.64	0.08
east branch	5023	Regional Storm	40.23	91.40	95.21		95.22	0.000040	0.29	174.32	204.52	0.05
east branch	5023	RegWCwithencroac	40.23	91.40	95.21		95.22	0.000040	0.29	174.32	204.52	0.05
east branch	5023	100yr Future	29.40	91.40	94.81		94.81	0.000033	0.24	147.05	182.23	0.04
east branch	5022	Regional Storm	40.23	91.31	94.68	93.41	95.09	0.003952	2.83	14.23	70.47	0.49
east branch	5022	RegWCwithencroac	40.23	91.31	94.68	93.41	95.09	0.003952	2.83	14.23	70.47	0.49
east branch	5022	100yr Future	29.40	91.31	94.49	93.01	94.73	0.002584	2.20	13.39	66.41	0.39
east branch	5021.5		Culvert									
east branch	5021	Regional Storm	40.23	91.30	93.61	93.61	94.65	0.021810	4.56	8.92	25.09	1.00
east branch	5021	RegWCwithencroac	40.23	91.30	93.61	93.61	94.65	0.021810	4.56	8.92	25.09	1.00
east branch	5021	100yr Future	29.40	91.30	94.19	93.21	94.53	0.005122	2.60	11.43	36.84	0.50
east branch	5020	Regional Storm	40.23	90.60	92.20	92.52	93.29	0.036011	4.85	9.63	9.11	1.28
east branch	5020	RegWCwithencroac	40.23	90.60	92.20	92.52	93.29	0.036011	4.85	9.63	9.11	1.28
east branch	5020	100yr Future	29.40	90.60	94.30		94.32	0.000386	0.91	59.18	46.45	0.15
east branch	5019	Regional Storm	42.00	89.80	91.53	91.28	91.75	0.009202	2.69	23.40	23.77	0.66
east branch	5019	RegWCwithencroac	42.00	89.80	91.53	91.28	91.75	0.009202	2.69	23.40	23.77	0.66
east branch	5019	100yr Future	29.10	89.80	94.31		94.31	0.000026	0.27	215.88	128.31	0.04
east branch	5015	Regional Storm	42.00	88.80	90.55	90.55	90.75	0.009680	2.78	32.30	65.38	0.68
east branch	5015	RegWCwithencroac	42.00	88.80	90.55	90.55	90.75	0.009680	2.78	32.30	65.38	0.68
east branch	5015	100yr Future	29.10	88.80	94.31		94.31	0.000003	0.11	537.13	226.58	0.01
east branch	5014	Regional Storm	49.78	87.70	90.09	88.98	90.10	0.000218	0.51	185.32	170.67	0.11
east branch	5014	RegWCwithencroac	49.78	87.70	90.09	88.98	90.10	0.000218	0.51	185.32	170.67	0.11
east branch	5014	100yr Future	41.50	87.70	94.31		94.31	0.000000	0.05	1453.90	383.16	0.01
east branch	5013	Regional Storm	49.78	86.30	90.02		90.03	0.000353	0.82	132.34	179.25	0.14
east branch	5013	RegWCwithencroac	49.78	86.30	90.02		90.03	0.000353	0.82	132.34	179.25	0.14
east branch	5013	100yr Future	41.50	86.30	94.31		94.31	0.000001	0.06	1241.30	291.40	0.01
east branch	5012	Regional Storm	49.78	85.30	89.99		90.00	0.000113	0.56	131.60	48.92	0.09
east branch	5012	RegWCwithencroac	49.78	85.30	89.99		90.00	0.000113	0.56	131.60	48.92	0.09
east branch	5012	100yr Future	41.50	85.30	94.31		94.31	0.000001	0.07	1163.09	295.00	0.01
east branch	5011	Regional Storm	49.78	84.92	89.99	87.30	90.00	0.000152	0.62	121.03	64.90	0.09
east branch	5011	RegWCwithencroac	49.78	84.92	89.99	87.30	90.00	0.000152	0.62	121.03	64.90	0.09
east branch	5011	100yr Future	41.50	84.92	94.31	87.07	94.31	0.000001	0.07	996.68	219.00	0.01
east branch	5010.5		Culvert									
east branch	5010	Regional Storm	49.78	84.60	89.17	86.56	89.19	0.000119	0.84	137.43	110.45	0.13
east branch	5010	RegWCwithencroac	49.78	84.60	89.17	86.56	89.19	0.000119	0.84	137.43	110.45	0.13
east branch	5010	100yr Future	41.50	84.60	94.31	86.34	94.31	0.000001	0.10	797.35	130.00	0.01
east branch	5009	Regional Storm	49.78	84.10	89.17		89.18	0.000033	0.47	209.61	86.85	0.07
east branch	5009	RegWCwithencroac	49.78	84.10	89.17		89.18	0.000033	0.47	209.61	86.85	0.07
east branch	5009	100yr Future	41.50	84.10	94.31		94.31	0.000001	0.11	675.27	91.00	0.01
east branch	5008	Regional Storm	49.78	82.20	89.17		89.17	0.000010	0.32	274.49	61.00	0.04
east branch	5008	RegWCwithencroac	49.78	82.20	89.17		89.17	0.000010	0.32	274.49	61.00	0.04
east branch	5008	100yr Future	41.50	82.20	94.31		94.31	0.000001	0.12	587.81	61.00	0.01

HEC-RAS Plan: Prop River: Oshawa Reach: 2

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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
2	12300	Ex 100	180.43	123.47	128.03		128.15	0.001750	1.55	146.61	106.44	0.23
2	12300	Ex HH	635.40	123.47	131.48		131.56	0.000502	1.22	626.39	199.46	0.14
2	12300	2a (NW) 100	345.46	123.47	129.54		129.62	0.000862	1.32	322.69	127.52	0.17
2	12300	2a (NW) HH	641.23	123.47	131.52		131.59	0.000497	1.21	633.30	201.91	0.14
2	12300	2a (NW) HH RR CP	641.23	123.47	131.52		131.59	0.000497	1.21	633.30	201.91	0.14
2	12150	Ex 100	180.43	123.35	127.87		127.96	0.000879	1.62	147.99	64.38	0.24
2	12150	Ex HH	635.40	123.35	131.32		131.46	0.000678	2.07	430.33	104.42	0.23
2	12150	2a (NW) 100	345.46	123.35	129.39		129.50	0.000749	1.81	257.42	77.83	0.24
2	12150	2a (NW) HH	641.23	123.35	131.36		131.50	0.000676	2.08	433.91	104.94	0.23
2	12150	2a (NW) HH RR CP	641.23	123.35	131.36		131.50	0.000676	2.08	433.91	104.94	0.23
2	12052.7	Ex 100	180.43	123.33	127.79		127.85	0.001165	1.22	179.48	68.25	0.19
2	12052.7	Ex HH	635.40	123.33	131.27		131.38	0.000943	1.62	453.23	95.15	0.18
2	12052.7	2a (NW) 100	345.46	123.33	129.33		129.41	0.000973	1.37	289.97	75.78	0.18
2	12052.7	2a (NW) HH	641.23	123.33	131.30		131.41	0.000941	1.63	456.51	95.61	0.18
2	12052.7	2a (NW) HH RR CP	641.23	123.33	131.30		131.41	0.000941	1.63	456.51	95.61	0.18
2	12010.13	Ex 100	180.43	122.82	127.62	125.23	127.80	0.000763	1.97	99.00	77.63	0.29
2	12010.13	Ex HH	635.40	122.82	130.47	127.66	131.25	0.001787	4.10	164.02	92.21	0.47
2	12010.13	2a (NW) 100	345.46	122.82	128.96	126.23	129.33	0.001153	2.85	129.54	85.19	0.37
2	12010.13	2a (NW) HH	641.23	122.82	130.50	127.68	131.29	0.001799	4.13	164.59	92.32	0.48
2	12010.13	2a (NW) HH RR CP	641.23	122.82	130.50	127.68	131.29	0.001799	4.13	164.59	92.32	0.48
2	11998.06		Bridge									
2	11985.93	Ex 100	180.43	122.85	127.52	125.68	127.75	0.001806	2.38	86.94	58.19	0.35
2	11985.93	Ex HH	635.40	122.85	130.16	128.11	131.13	0.003999	4.76	147.00	89.46	0.56
2	11985.93	2a (NW) 100	345.46	122.85	128.79	126.69	129.26	0.002581	3.33	115.98	77.02	0.44
2	11985.93	2a (NW) HH	641.23	122.85	130.18	128.13	131.16	0.004028	4.79	147.49	89.69	0.56
2	11985.93	2a (NW) HH RR CP	641.23	122.85	130.18	128.13	131.16	0.004028	4.79	147.49	89.69	0.56
2	11898.87	Ex 100	180.43	122.88	127.37		127.50	0.003139	2.01	124.53	56.21	0.31
2	11898.87	Ex HH	635.40	122.88	130.22		130.45	0.003085	2.78	317.81	76.22	0.33
2	11898.87	2a (NW) 100	345.46	122.88	128.70		128.87	0.002935	2.32	209.01	67.63	0.31
2	11898.87	2a (NW) HH	641.23	122.88	130.24		130.47	0.003089	2.79	319.72	76.37	0.33
2	11898.87	2a (NW) HH RR CP	641.23	122.88	130.24		130.47	0.003089	2.79	319.72	76.37	0.33
2	11850	Ex 100	180.43	122.88	127.12		127.31	0.004513	2.33	104.69	47.92	0.36
2	11850	Ex HH	635.40	122.88	129.97		130.27	0.004116	3.15	284.24	75.22	0.38
2	11850	2a (NW) 100	345.46	122.88	128.47		128.69	0.004122	2.68	180.07	63.19	0.36
2	11850	2a (NW) HH	641.23	122.88	130.00		130.30	0.004118	3.15	286.11	75.42	0.38
2	11850	2a (NW) HH RR CP	641.23	122.88	130.00		130.30	0.004118	3.15	286.11	75.42	0.38
2	11700	Ex 100	180.43	122.35	126.64		126.81	0.002453	2.33	109.09	45.37	0.36
2	11700	Ex HH	635.40	122.35	129.49		129.78	0.002548	3.36	302.32	79.87	0.40
2	11700	2a (NW) 100	345.46	122.35	128.00		128.22	0.002408	2.79	192.03	68.08	0.38
2	11700	2a (NW) HH	641.23	122.35	129.51		129.81	0.002552	3.37	304.24	80.08	0.40
2	11700	2a (NW) HH RR CP	641.23	122.35	129.51		129.81	0.002552	3.37	304.24	80.08	0.40
2	11550	Ex 100	180.43	122.17	126.05		126.36	0.003492	2.89	82.85	32.38	0.47
2	11550	Ex HH	635.40	122.17	128.42		129.19	0.005409	4.97	199.10	67.15	0.64
2	11550	2a (NW) 100	345.46	122.17	127.12		127.68	0.004894	4.04	124.62	47.03	0.58
2	11550	2a (NW) HH	641.23	122.17	128.44		129.21	0.005419	4.98	200.50	67.43	0.64
2	11550	2a (NW) HH RR CP	641.23	122.17	128.44		129.21	0.005419	4.98	200.50	67.43	0.64
2	11400	Ex 100	180.43	121.97	125.49		125.66	0.005490	2.25	105.74	49.05	0.39
2	11400	Ex HH	635.40	121.97	127.78		128.16	0.006686	3.48	242.69	74.05	0.47
2	11400	2a (NW) 100	345.46	121.97	126.48		126.74	0.006426	2.88	158.09	56.33	0.44
2	11400	2a (NW) HH	641.23	121.97	127.80		128.18	0.006701	3.50	244.15	74.31	0.47
2	11400	2a (NW) HH RR CP	641.23	121.97	127.80		128.18	0.006701	3.50	244.15	74.31	0.47
2	11250	Ex 100	180.43	121.86	124.69		124.84	0.005305	1.93	106.86	62.66	0.37
2	11250	Ex HH	635.40	121.86	127.32		127.55	0.002412	2.03	316.44	92.35	0.28
2	11250	2a (NW) 100	345.46	121.86	125.83		126.02	0.003526	1.98	189.01	79.09	0.32
2	11250	2a (NW) HH	641.23	121.86	127.34		127.57	0.002414	2.03	318.25	92.52	0.28
2	11250	2a (NW) HH RR CP	641.23	121.86	127.34		127.57	0.002414	2.03	318.25	92.52	0.28
2	11100	Ex 100	180.43	120.32	123.84		124.12	0.004124	2.96	90.33	40.92	0.50
2	11100	Ex HH	635.40	120.32	126.06	124.93	126.88	0.007626	5.57	214.46	97.21	0.74
2	11100	2a (NW) 100	345.46	120.32	124.94		125.36	0.004764	3.81	139.86	49.22	0.57
2	11100	2a (NW) HH	641.23	120.32	126.07	124.95	126.90	0.007710	5.61	215.23	97.50	0.75
2	11100	2a (NW) HH RR CP	641.23	120.32	126.07	124.95	126.90	0.007710	5.61	215.23	97.50	0.75
2	10950	Ex 100	180.43	119.73	122.72		123.08	0.013333	3.19	73.52	39.36	0.59
2	10950	Ex HH	635.40	119.73	124.56	123.76	125.19	0.016489	4.88	209.73	100.67	0.71
2	10950	2a (NW) 100	345.46	119.73	123.43		124.06	0.019001	4.39	107.56	64.95	0.73
2	10950	2a (NW) HH	641.23	119.73	124.59	123.77	125.21	0.016009	4.83	213.26	100.87	0.70
2	10950	2a (NW) HH RR CP	641.23	119.73	124.59	123.77	125.21	0.016009	4.83	213.26	100.87	0.70

HEC-RAS Plan: Prop River: Oshawa Reach: 2 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
2	10800	Ex 100	178.64	118.48	121.51		121.65	0.006424	2.24	117.79	87.29	0.41
2	10800	Ex HH	635.82	118.48	122.97		123.30	0.008944	3.43	265.93	113.34	0.52
2	10800	2a (NW) 100	303.29	118.48	122.11		122.29	0.006542	2.55	174.07	99.03	0.43
2	10800	2a (NW) HH	653.92	118.48	123.01		123.34	0.009055	3.47	270.05	113.77	0.52
2	10800	2a (NW) HH RR CP	653.92	118.48	123.01		123.34	0.009055	3.47	270.05	113.77	0.52
2	10650	Ex 100	178.64	117.31	120.35		120.60	0.007373	2.39	84.72	76.86	0.44
2	10650	Ex HH	635.82	117.31	121.75		122.10	0.006823	2.97	251.88	139.32	0.45
2	10650	2a (NW) 100	303.29	117.31	120.88		121.18	0.007933	2.76	138.72	121.84	0.47
2	10650	2a (NW) HH	653.92	117.31	121.79		122.14	0.006755	2.97	257.69	140.19	0.45
2	10650	2a (NW) HH RR CP	653.92	117.31	121.79		122.14	0.006755	2.97	257.69	140.19	0.45
2	10500	Ex 100	178.64	116.50	119.39		119.54	0.006064	2.02	108.28	85.96	0.39
2	10500	Ex HH	635.82	116.50	121.00		121.27	0.004036	2.25	306.10	143.94	0.34
2	10500	2a (NW) 100	303.29	116.50	119.94		120.14	0.005464	2.17	164.94	118.12	0.38
2	10500	2a (NW) HH	653.92	116.50	121.05		121.32	0.003989	2.25	313.27	144.80	0.34
2	10500	2a (NW) HH RR CP	653.92	116.50	121.05		121.32	0.003989	2.25	313.27	144.80	0.34
2	10350	Ex 100	178.64	115.73	118.69		118.87	0.003279	2.29	103.32	81.78	0.43
2	10350	Ex HH	635.82	115.73	120.35		120.70	0.003334	3.14	248.61	93.61	0.47
2	10350	2a (NW) 100	303.29	115.73	119.28		119.50	0.003221	2.57	152.92	86.28	0.44
2	10350	2a (NW) HH	653.92	115.73	120.40		120.75	0.003342	3.17	253.11	94.04	0.47
2	10350	2a (NW) HH RR CP	653.92	115.73	120.40		120.75	0.003342	3.17	253.11	94.04	0.47
2	10200	Ex 100	178.64	115.18	118.38		118.48	0.001864	1.85	144.52	96.76	0.33
2	10200	Ex HH	635.82	115.18	119.98		120.21	0.002638	2.90	318.19	119.11	0.43
2	10200	2a (NW) 100	303.29	115.18	118.95		119.08	0.002135	2.22	201.95	106.04	0.37
2	10200	2a (NW) HH	653.92	115.18	120.03		120.26	0.002659	2.93	323.80	119.80	0.43
2	10200	2a (NW) HH RR CP	653.92	115.18	120.03		120.26	0.002659	2.93	323.80	119.80	0.43
2	10050	Ex 100	178.64	114.45	117.55		117.85	0.013367	2.96	81.82	83.94	0.58
2	10050	Ex HH	635.82	114.45	119.04		119.46	0.011429	3.68	235.32	115.54	0.58
2	10050	2a (NW) 100	303.29	114.45	118.10		118.41	0.012129	3.19	134.49	100.33	0.57
2	10050	2a (NW) HH	653.92	114.45	119.08		119.50	0.011437	3.71	240.23	116.93	0.58
2	10050	2a (NW) HH RR CP	653.92	114.45	119.08		119.50	0.011437	3.71	240.23	116.93	0.58
2	9900	Ex 100	178.64	113.25	116.42		116.55	0.005827	2.15	127.15	96.79	0.39
2	9900	Ex HH	635.82	113.25	117.97		118.20	0.006096	2.88	319.65	154.14	0.43
2	9900	2a (NW) 100	303.29	113.25	116.91		117.09	0.006499	2.50	180.15	116.35	0.42
2	9900	2a (NW) HH	653.92	113.25	118.01		118.24	0.006105	2.90	326.28	154.88	0.43
2	9900	2a (NW) HH RR CP	653.92	113.25	118.01		118.24	0.006105	2.90	326.28	154.88	0.43
2	9747.308	Ex 100	178.64	112.62	115.13		115.30	0.011386	2.62	107.50	94.81	0.53
2	9747.308	Ex HH	635.82	112.62	116.93		117.18	0.006840	2.91	290.58	108.79	0.45
2	9747.308	2a (NW) 100	303.29	112.62	115.75		115.93	0.008513	2.62	167.43	99.86	0.47
2	9747.308	2a (NW) HH	653.92	112.62	116.93		117.20	0.007172	2.99	291.39	108.82	0.46
2	9747.308	2a (NW) HH RR CP	653.92	112.62	116.93		117.20	0.007172	2.99	291.39	108.82	0.46
2	9600	Ex 100	178.64	111.74	114.38		114.44	0.003275	1.37	158.56	99.51	0.28
2	9600	Ex HH	635.82	111.74	116.38		116.52	0.002836	1.90	376.65	120.12	0.29
2	9600	2a (NW) 100	303.29	111.74	115.19		115.27	0.002480	1.44	241.68	105.25	0.26
2	9600	2a (NW) HH	653.92	111.74	116.33		116.49	0.003129	1.99	371.46	119.75	0.30
2	9600	2a (NW) HH RR CP	653.92	111.74	116.33		116.49	0.003129	1.99	371.46	119.75	0.30
2	9450	Ex 100	178.64	110.92	113.70		113.87	0.004229	2.56	108.70	84.23	0.49
2	9450	Ex HH	635.82	110.92	115.93		116.15	0.002053	2.65	317.32	101.81	0.38
2	9450	2a (NW) 100	303.29	110.92	114.86		114.97	0.001588	1.98	212.14	93.71	0.32
2	9450	2a (NW) HH	653.92	110.92	115.82		116.07	0.002434	2.84	305.52	100.98	0.41
2	9450	2a (NW) HH RR CP	653.92	110.92	115.82		116.07	0.002434	2.84	305.52	100.98	0.41
2	9330.982	Ex 100	178.64	109.88	113.07		113.32	0.004633	2.80	96.87	86.48	0.52
2	9330.982	Ex HH	635.82	109.88	115.72		115.91	0.001821	2.69	358.78	107.35	0.36
2	9330.982	2a (NW) 100	303.29	109.88	114.71		114.80	0.001128	1.85	253.77	101.45	0.28
2	9330.982	2a (NW) HH	653.92	109.88	115.55		115.77	0.002237	2.92	340.84	106.37	0.40
2	9330.982	2a (NW) HH RR CP	653.92	109.88	115.55		115.77	0.002237	2.92	340.84	106.37	0.40
2	9248.709	Ex 100	178.64	108.94	112.17	111.81	112.86	0.005413	4.02	51.82	25.34	0.71
2	9248.709	Ex HH	635.82	108.94	115.61	114.20	115.80	0.001003	2.80	407.00	188.57	0.35
2	9248.709	2a (NW) 100	303.29	108.94	114.59	113.34	114.72	0.000746	2.17	237.43	122.47	0.29
2	9248.709	2a (NW) HH	653.92	108.94	115.36	114.25	115.62	0.001437	3.27	360.81	181.37	0.41
2	9248.709	2a (NW) HH RR CP	653.92	108.94	115.36	114.25	115.62	0.001437	3.27	360.81	181.37	0.41
2	9235.702		Bridge									
2	9222.698	Ex 100	178.64	108.75	112.08	111.42	112.64	0.004361	3.68	55.76	30.64	0.64
2	9222.698	Ex HH	635.82	108.75	113.79	113.79	115.30	0.008871	6.92	134.75	63.65	0.98
2	9222.698	2a (NW) 100	303.29	108.75	111.78	112.31	113.87	0.018252	7.08	49.58	28.95	1.30
2	9222.698	2a (NW) HH	653.92	108.75	114.76	114.76	115.36	0.003724	5.04	265.62	175.96	0.66

HEC-RAS Plan: Prop River: Oshawa Reach: 2 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
2	9222.698	2a (NW) HH RR CP	653.92	108.75	114.76	114.76	115.36	0.003724	5.04	265.62	175.96	0.66
2	9093.109	Ex 100	178.64	108.50	111.09	111.09	111.66	0.015589	3.63	61.09	69.25	0.79
2	9093.109	Ex HH	635.82	108.50	111.78	112.20	113.17	0.034905	6.54	156.30	182.90	1.23
2	9093.109	2a (NW) 100	303.29	108.50	111.73	111.73	112.09	0.009180	3.31	146.69	180.36	0.63
2	9093.109	2a (NW) HH	653.92	108.50	111.66	112.22	113.71	0.051150	7.69	135.05	177.13	1.48
2	9093.109	2a (NW) HH RR CP	653.92	108.50	111.66	112.22	113.71	0.051150	7.69	135.05	177.13	1.48
2	9000	Ex 100	178.64	107.91	110.35	109.89	110.44	0.001684	1.78	158.21	170.65	0.38
2	9000	Ex HH	635.82	107.91	111.77	110.74	111.87	0.001282	2.14	545.77	312.01	0.35
2	9000	2a (NW) 100	303.29	107.91	110.87	110.17	110.96	0.001481	1.92	267.95	251.58	0.36
2	9000	2a (NW) HH	653.92	107.91	111.81	110.75	111.91	0.001277	2.16	558.23	312.30	0.35
2	9000	2a (NW) HH RR CP	653.92	107.91	111.81	110.75	111.91	0.001277	2.16	558.23	312.30	0.35
2	8850	Ex 100	178.64	106.96	109.33	109.33	109.95	0.006350	4.04	62.19	53.23	0.84
2	8850	Ex HH	635.82	106.96	110.76	110.76	111.46	0.005560	5.18	222.19	150.33	0.85
2	8850	2a (NW) 100	303.29	106.96	110.01	110.01	110.55	0.004723	4.12	126.20	119.97	0.75
2	8850	2a (NW) HH	653.92	106.96	110.80	110.80	111.50	0.005554	5.21	228.45	155.91	0.85
2	8850	2a (NW) HH RR CP	653.92	106.96	110.80	110.80	111.50	0.005554	5.21	228.45	155.91	0.85
2	8700	Ex 100	178.64	106.28	108.81	108.35	108.98	0.002196	2.47	105.12	84.36	0.50
2	8700	Ex HH	635.82	106.28	110.65	109.62	110.82	0.001227	2.66	373.82	174.34	0.41
2	8700	2a (NW) 100	303.29	106.28	109.63	108.73	109.77	0.001438	2.41	203.73	157.62	0.42
2	8700	2a (NW) HH	653.92	106.28	110.70	109.63	110.87	0.001228	2.68	381.21	175.08	0.41
2	8700	2a (NW) HH RR CP	653.92	106.28	110.70	109.63	110.87	0.001228	2.68	381.21	175.08	0.41
2	8550	Ex 100	178.64	105.51	108.35		108.59	0.002962	2.71	88.15	51.05	0.52
2	8550	Ex HH	635.82	105.51	109.95		110.47	0.004316	4.42	223.34	111.15	0.67
2	8550	2a (NW) 100	303.29	105.51	109.18		109.45	0.002845	3.16	145.35	80.78	0.53
2	8550	2a (NW) HH	653.92	105.51	109.98		110.51	0.004375	4.47	226.75	111.47	0.68
2	8550	2a (NW) HH RR CP	653.92	105.51	109.98		110.51	0.004375	4.47	226.75	111.47	0.68
2	8400	Ex 100	178.64	104.66	107.57		108.00	0.004778	3.30	67.17	39.50	0.65
2	8400	Ex HH	635.82	104.66	109.12	109.12	109.73	0.005292	4.72	233.12	160.24	0.73
2	8400	2a (NW) 100	303.29	104.66	108.50	107.77	108.94	0.003803	3.59	137.10	140.86	0.61
2	8400	2a (NW) HH	653.92	104.66	109.15	109.15	109.76	0.005353	4.76	237.07	160.56	0.74
2	8400	2a (NW) HH RR CP	653.92	104.66	109.15	109.15	109.76	0.005353	4.76	237.07	160.56	0.74
2	8250	Ex 100	178.64	103.93	106.83		107.27	0.004950	3.40	65.62	37.23	0.66
2	8250	Ex HH	635.82	103.93	108.42	108.12	108.69	0.002896	3.54	334.95	233.30	0.55
2	8250	2a (NW) 100	303.29	103.93	107.20	107.20	108.06	0.008722	4.91	83.43	82.53	0.90
2	8250	2a (NW) HH	653.92	103.93	108.52	108.14	108.76	0.002570	3.39	356.89	233.86	0.52
2	8250	2a (NW) HH RR CP	653.92	103.93	108.52	108.14	108.76	0.002570	3.39	356.89	233.86	0.52
2	8100	Ex 100	177.84	103.64	106.48		106.64	0.002678	2.37	130.33	170.94	0.47
2	8100	Ex HH	636.65	103.64	108.32		108.42	0.000890	1.95	487.24	221.53	0.29
2	8100	2a (NW) 100	286.87	103.64	106.96	106.55	107.09	0.001876	2.22	215.36	181.44	0.40
2	8100	2a (NW) HH	673.15	103.64	108.40		108.50	0.000902	1.99	505.77	225.76	0.30
2	8100	2a (NW) HH RR CP	673.15	103.64	108.40		108.50	0.000902	1.99	505.77	225.76	0.30
2	7950	Ex 100	177.84	102.79	106.10		106.17	0.003124	1.61	164.97	119.95	0.29
2	7950	Ex HH	636.65	102.79	108.10		108.21	0.002433	1.96	457.51	195.32	0.28
2	7950	2a (NW) 100	286.87	102.79	106.60		106.70	0.003342	1.84	228.06	129.19	0.30
2	7950	2a (NW) HH	673.15	102.79	108.17		108.29	0.002490	2.01	473.01	201.18	0.28
2	7950	2a (NW) HH RR CP	673.15	102.79	108.17		108.29	0.002490	2.01	473.01	201.18	0.28
2	7800	Ex 100	177.84	101.99	105.45	105.07	105.65	0.003620	2.53	117.74	122.02	0.45
2	7800	Ex HH	636.65	101.99	107.85		107.95	0.001173	2.10	533.27	219.93	0.28
2	7800	2a (NW) 100	286.87	101.99	105.99		106.19	0.003268	2.67	191.82	143.80	0.44
2	7800	2a (NW) HH	673.15	101.99	107.92		108.03	0.001207	2.15	548.93	220.54	0.29
2	7800	2a (NW) HH RR CP	673.15	101.99	107.92		108.03	0.001207	2.15	548.93	220.54	0.29
2	7687.07	Ex 100	177.84	101.69	104.35	104.35	104.92	0.012284	3.99	67.38	66.60	0.82
2	7687.07	Ex HH	636.65	101.69	107.78		107.84	0.000600	1.59	677.06	240.89	0.21
2	7687.07	2a (NW) 100	286.87	101.69	105.82		105.91	0.001542	1.94	262.20	162.01	0.31
2	7687.07	2a (NW) HH	673.15	101.69	107.85		107.92	0.000628	1.64	693.55	243.67	0.21
2	7687.07	2a (NW) HH RR CP	673.15	101.69	107.85		107.92	0.000628	1.64	693.55	243.67	0.21
2	7587.867	Ex 100	177.84	100.30	103.95	102.56	104.38	0.002409	2.91	61.16	19.44	0.49
2	7587.867	Ex HH	636.65	100.30	107.39	106.65	107.72	0.001691	3.80	352.81	202.13	0.46
2	7587.867	2a (NW) 100	286.87	100.30	104.95	103.41	105.64	0.002798	3.68	77.89	29.94	0.55
2	7587.867	2a (NW) HH	673.15	100.30	107.45	106.75	107.79	0.001761	3.89	363.82	204.38	0.46
2	7587.867	2a (NW) HH RR CP	673.15	100.30	107.45	106.75	107.79	0.001761	3.89	363.82	204.38	0.46
2	7578.43		Bridge									
2	7568.992	Ex 100	177.84	100.58	103.67	102.83	104.27	0.004210	3.44	51.72	18.55	0.62
2	7568.992	Ex HH	636.65	100.58	106.87	106.87	107.46	0.003819	5.26	271.20	181.82	0.67
2	7568.992	2a (NW) 100	286.87	100.58	103.83	103.69	105.24	0.009232	5.27	54.45	18.64	0.93

HEC-RAS Plan: Prop River: Oshawa Reach: 2 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
2	7568.992	2a (NW) HH	673.15	100.58	106.93	106.93	107.53	0.003858	5.33	282.60	184.63	0.67
2	7568.992	2a (NW) HH RR CP	673.15	100.58	106.93	106.93	107.53	0.003858	5.33	282.60	184.63	0.67
2	7472.049	Ex 100	177.84	100.77	103.61		103.71	0.002493	1.95	136.09	121.82	0.38
2	7472.049	Ex HH	636.65	100.77	105.19	103.97	105.37	0.001931	2.33	343.94	139.19	0.36
2	7472.049	2a (NW) 100	286.87	100.77	104.10		104.22	0.002143	2.02	198.34	129.17	0.36
2	7472.049	2a (NW) HH	673.15	100.77	105.27	104.03	105.47	0.001941	2.37	355.94	139.88	0.36
2	7472.049	2a (NW) HH RR CP	673.15	100.77	105.27	104.03	105.47	0.001940	2.37	355.99	139.89	0.36
2	7350	Ex 100	177.84	100.39	103.26		103.42	0.002213	2.34	117.57	76.35	0.44
2	7350	Ex HH	636.65	100.39	104.40	103.90	104.97	0.005119	4.47	220.27	141.75	0.72
2	7350	2a (NW) 100	286.87	100.39	103.64		103.89	0.002973	2.96	148.39	83.22	0.53
2	7350	2a (NW) HH	673.15	100.39	104.47	103.97	105.06	0.005263	4.58	230.30	181.80	0.73
2	7350	2a (NW) HH RR CP	673.15	100.39	104.47	103.97	105.06	0.005218	4.56	231.50	187.32	0.72
2	7200	Ex 100	177.84	99.58	103.27		103.29	0.000244	0.51	344.96	194.81	0.09
2	7200	Ex HH	636.65	99.58	104.59		104.65	0.000476	0.87	619.99	221.65	0.13
2	7200	2a (NW) 100	286.87	99.58	103.69		103.72	0.000314	0.62	427.12	197.20	0.10
2	7200	2a (NW) HH	673.15	99.58	104.66		104.72	0.000492	0.90	635.52	222.17	0.13
2	7200	2a (NW) HH RR CP	673.15	99.58	104.67		104.72	0.000489	0.90	636.53	222.20	0.13
2	7034.698	Ex 100	177.84	99.06	102.74	102.74	103.13	0.011710	3.45	94.96	110.89	0.58
2	7034.698	Ex HH	636.65	99.06	103.77	103.77	104.36	0.017758	5.02	224.77	153.54	0.74
2	7034.698	2a (NW) 100	286.87	99.06	103.04	103.04	103.51	0.014784	4.09	128.97	112.25	0.66
2	7034.698	2a (NW) HH	673.15	99.06	103.95		104.44	0.014471	4.64	252.01	154.96	0.67
2	7034.698	2a (NW) HH RR CP	673.15	99.06	103.80	103.80	104.43	0.018729	5.18	229.65	153.80	0.76
2	6946.907	Ex 100	177.84	98.10	102.52	100.33	102.60	0.000682	1.50	175.61	117.80	0.23
2	6946.907	Ex HH	636.65	98.10	103.60	102.78	103.84	0.001856	2.86	338.44	173.73	0.39
2	6946.907	2a (NW) 100	286.87	98.10	102.93	101.94	103.05	0.000975	1.90	230.39	145.79	0.28
2	6946.907	2a (NW) HH	673.15	98.10	103.84	102.80	104.05	0.001505	2.65	381.60	180.62	0.35
2	6946.907	2a (NW) HH RR CP	673.15	98.10	103.66	102.80	103.92	0.001900	2.91	349.83	175.67	0.39
2	6935.837		Bridge									
2	6924.769	Ex 100	177.84	98.10	101.62	100.33	102.01	0.003177	2.82	75.04	82.95	0.48
2	6924.769	Ex HH	636.65	98.10	103.34	102.86	103.70	0.002738	3.42	289.84	166.29	0.48
2	6924.769	2a (NW) 100	286.87	98.10	102.82	101.98	102.97	0.001170	2.08	210.72	140.05	0.31
2	6924.769	2a (NW) HH	673.15	98.10	103.70	102.93	103.96	0.001903	2.98	352.71	183.94	0.40
2	6924.769	2a (NW) HH RR CP	673.15	98.10	103.40	102.93	103.77	0.002819	3.49	300.01	169.34	0.48
2	6884.784	Ex 100	177.84	98.00	101.25		101.74	0.014900	3.49	59.54	23.32	0.63
2	6884.784	Ex HH	636.65	98.00	102.74	102.74	103.38	0.017003	4.82	227.46	155.00	0.72
2	6884.784	2a (NW) 100	286.87	98.00	101.39	101.24	102.54	0.032955	5.34	62.72	23.48	0.94
2	6884.784	2a (NW) HH	673.15	98.00	103.59		103.82	0.005345	3.03	364.25	169.23	0.41
2	6884.784	2a (NW) HH RR CP	673.15	98.00	102.80	102.80	103.45	0.017188	4.89	236.61	155.29	0.72
2	6832.49	Ex 100	177.84	97.16	101.16	99.34	101.45	0.002140	2.43	87.74	104.83	0.39
2	6832.49	Ex HH	636.65	97.16	102.64	102.14	102.89	0.002085	2.96	346.15	198.01	0.40
2	6832.49	2a (NW) 100	286.87	97.16	101.67	100.17	101.98	0.002393	2.78	158.85	170.81	0.42
2	6832.49	2a (NW) HH	673.15	97.16	103.61	102.17	103.70	0.000651	1.84	558.88	238.50	0.23
2	6832.49	2a (NW) HH RR CP	673.15	97.16	102.62	102.17	102.92	0.002377	3.15	343.48	197.08	0.43
2	6821.114		Culvert									
2	6809.793	Ex 100	177.84	97.34	100.61	99.52	101.10	0.003393	3.06	57.53	22.65	0.54
2	6809.793	Ex HH	636.65	97.34	102.57	101.93	102.78	0.001634	2.90	375.35	198.14	0.41
2	6809.793	2a (NW) 100	286.87	97.34	100.89	100.34	101.79	0.005916	4.26	69.72	22.92	0.72
2	6809.793	2a (NW) HH	673.15	97.34	103.59	101.97	103.67	0.000540	1.88	603.30	246.95	0.24
2	6809.793	2a (NW) HH RR CP	673.15	97.34	102.48	101.97	102.75	0.002067	3.23	357.89	195.80	0.45
2	6705.93	Ex 100	177.84	97.41	100.55		100.59	0.002240	1.31	231.62	194.47	0.24
2	6705.93	Ex HH	636.65	97.41	102.50		102.56	0.001193	1.33	643.88	219.38	0.19
2	6705.93	2a (NW) 100	286.87	97.41	100.94		100.99	0.002395	1.47	309.23	202.45	0.25
2	6705.93	2a (NW) HH	673.15	97.41	103.56		103.59	0.000500	0.98	885.33	241.82	0.13
2	6705.93	2a (NW) HH RR CP	673.15	97.41	102.40		102.46	0.001497	1.47	620.83	218.99	0.21
2	6600	Ex 100	177.84	96.83	100.14	99.51	100.25	0.004516	1.99	142.55	142.44	0.35
2	6600	Ex HH	636.65	96.83	102.39	100.55	102.44	0.000977	1.31	684.31	253.74	0.18
2	6600	2a (NW) 100	286.87	96.83	100.59	99.87	100.68	0.003576	1.92	256.38	225.10	0.32
2	6600	2a (NW) HH	673.15	96.83	103.52	100.59	103.55	0.000351	0.89	982.63	272.20	0.11
2	6600	2a (NW) HH RR CP	673.15	96.83	102.25	100.59	102.31	0.001281	1.47	649.38	250.86	0.20
2	6503.613	Ex 100	177.84	95.88	99.66	99.23	99.79	0.004995	2.28	138.23	137.21	0.38
2	6503.613	Ex HH	636.65	95.88	102.31	100.19	102.35	0.000781	1.29	732.47	267.93	0.16
2	6503.613	2a (NW) 100	286.87	95.88	100.16	99.59	100.29	0.004476	2.35	211.89	159.76	0.36
2	6503.613	2a (NW) HH	673.15	95.88	103.50	100.20	103.52	0.000288	0.87	1073.16	308.81	0.10
2	6503.613	2a (NW) HH RR CP	673.15	95.88	102.15	100.20	102.20	0.001048	1.46	688.43	262.11	0.19

HEC-RAS Plan: Prop River: Oshawa Reach: 2 (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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
2	6403.231	Ex 100	177.84	95.53	99.07	98.54	99.24	0.005982	2.46	118.37	106.75	0.42
2	6403.231	Ex HH	636.65	95.53	102.23	99.78	102.27	0.000832	1.40	755.77	269.26	0.17
2	6403.231	2a (NW) 100	286.87	95.53	99.59	98.90	99.77	0.005879	2.67	186.67	153.93	0.42
2	6403.231	2a (NW) HH	673.15	95.53	103.46	99.84	103.48	0.000346	1.01	1111.60	317.77	0.11
2	6403.231	2a (NW) HH RR CP	673.15	95.53	102.03	99.84	102.09	0.001128	1.60	703.42	266.40	0.20
2	6393.918		Bridge									
2	6384.608	Ex 100	177.84	95.53	98.73	98.54	99.04	0.011915	3.25	89.79	71.59	0.58
2	6384.608	Ex HH	636.65	95.53	102.18	99.77	102.23	0.000872	1.43	744.29	268.56	0.18
2	6384.608	2a (NW) 100	286.87	95.53	99.19	98.90	99.54	0.012418	3.62	131.54	117.60	0.61
2	6384.608	2a (NW) HH	673.15	95.53	103.45	99.85	103.47	0.000351	1.02	1105.94	316.66	0.12
2	6384.608	2a (NW) HH RR CP	673.15	95.53	101.98	99.85	102.04	0.001199	1.64	688.71	265.71	0.21
2	6282.752	Ex 100	177.31	95.22	98.30		98.36	0.003075	1.56	178.90	230.99	0.28
2	6282.752	Ex HH	636.79	95.22	102.18		102.19	0.000109	0.51	1290.46	359.09	0.06
2	6282.752	2a (NW) 100	276.10	95.22	99.14		99.17	0.000767	0.92	391.25	264.24	0.15
2	6282.752	2a (NW) HH	677.24	95.22	103.44		103.45	0.000050	0.39	1791.50	439.44	0.04
2	6282.752	2a (NW) HH RR CP	677.24	95.22	101.96		101.98	0.000146	0.57	1215.67	345.65	0.07
2	6150	Ex 100	177.31	94.87	98.04		98.07	0.001611	1.02	228.10	252.59	0.20
2	6150	Ex HH	636.79	94.87	102.17		102.18	0.000053	0.34	1683.75	453.12	0.04
2	6150	2a (NW) 100	276.10	94.87	99.09		99.10	0.000330	0.58	510.60	281.53	0.10
2	6150	2a (NW) HH	677.24	94.87	103.44		103.44	0.000024	0.26	2302.94	524.58	0.03
2	6150	2a (NW) HH RR CP	677.24	94.87	101.96		101.97	0.000071	0.39	1587.52	445.72	0.05
2	5997.008	Ex 100	177.31	93.70	97.29	96.42	97.70	0.002797	2.86	62.08	24.30	0.56
2	5997.008	Ex HH	636.79	93.70	102.17	98.76	102.17	0.000029	0.58	2135.58	608.54	0.07
2	5997.008	2a (NW) 100	276.10	93.70	99.01	97.05	99.05	0.000293	1.28	467.28	443.25	0.20
2	5997.008	2a (NW) HH	677.24	93.70	103.44	98.80	103.44	0.000013	0.44	2951.63	690.95	0.05
2	5997.008	2a (NW) HH RR CP	677.24	93.70	101.95	98.80	101.96	0.000040	0.67	2005.41	597.00	0.08
2	5986.99		Bridge									
2	5976.971	Ex 100	177.31	93.70	97.18	96.42	97.63	0.003191	2.97	59.67	24.21	0.59
2	5976.971	Ex HH	636.79	93.70	102.16	98.76	102.17	0.000029	0.58	2134.68	608.45	0.07
2	5976.971	2a (NW) 100	276.10	93.70	98.06	97.04	98.50	0.002339	3.09	134.26	259.55	0.53
2	5976.971	2a (NW) HH	677.24	93.70	103.44	98.80	103.44	0.000013	0.44	2951.19	690.90	0.05
2	5976.971	2a (NW) HH RR CP	677.24	93.70	101.95	98.80	101.96	0.000040	0.67	2004.19	596.91	0.08
2	5850	Ex 100	177.31	93.91	97.02		97.07	0.002628	1.38	203.90	247.08	0.26
2	5850	Ex HH	636.79	93.91	102.16		102.17	0.000026	0.27	2827.47	711.42	0.03
2	5850	2a (NW) 100	276.10	93.91	98.17		98.18	0.000428	0.70	523.14	334.34	0.11
2	5850	2a (NW) HH	677.24	93.91	103.44		103.44	0.000013	0.21	3770.75	782.25	0.02
2	5850	2a (NW) HH RR CP	677.24	93.91	101.94		101.95	0.000034	0.30	2674.12	698.28	0.03
2	5720.403	Ex 100	177.31	93.19	96.94		96.95	0.000370	0.90	368.56	339.11	0.15
2	5720.403	Ex HH	636.79	93.19	102.16		102.16	0.000014	0.31	3497.45	826.18	0.03
2	5720.403	2a (NW) 100	276.10	93.19	98.15		98.15	0.000112	0.60	810.28	396.95	0.09
2	5720.403	2a (NW) HH	677.24	93.19	103.43		103.44	0.000007	0.25	4597.00	894.73	0.03
2	5720.403	2a (NW) HH RR CP	677.24	93.19	101.94		101.94	0.000018	0.35	3320.36	805.09	0.04

Appendix D Hydrologic Model, Input and Output Files

Distribution Fitting Analysis

--- Input Data ---

Analysis Name: FFA
Description:

Data Set Name: AnnualExtreme
DSS File Name: C:\Users\p001130E\OneDrive - Parsons Corp\Desktop\Lynde_Creek_FFA\Lynde_Creek_FFA.dss
DSS Pathname: /////IR-CENTURY//

Project Path: C:\Users\p001130E\OneDrive - Parsons Corp\Desktop\Lynde_Creek_FFA
Result File Name: FFA.xml
Report File Name: C:\Users\p001130E\OneDrive - Parsons Corp\Desktop\Lynde_Creek_FFA\DistributionFitting\FFA\FFA.rpt

Parameter Type: Flow

Data Filters: None

Number of Original Data Values: 36

Number of Filtered Data Value: 36

--- End of Input Data ---

--- Analysis ---

Statistic	Original Data	Processed Data
Sample Size	36	36
Min	11.300	11.300
Max	54.200	54.200
Median	25.100	25.100
Mode	11.300	11.300

Product Moments

Statistic	Original Data	Processed Data
Mean	27.144	27.144
Standard Dev	10.212	10.212

Skew	0.789	0.789
Kurtosis	0.386	0.386

L-Moment Ratios

Statistic	Original Data	Processed Data
L-Mean	27.144	27.144
L-CV	0.211	0.211
L-Skew	0.162	0.162
L-Kurtosis	0.161	0.161

Fitting Method: Standard Product Moments

Distribution	Kolmogorov-Smirnov	Parameter
(Test Statistic)		
Beta	Shape0=NaN ,Shape1=NaN	
NaN		
4 Parameter Beta	Shape0=NaN ,Shape1=NaN ,Left=NaN ,Right=NaN	
NaN		
Empirical		
NaN		User-defined
Exponential	Scale=27.144	
0.346		
Gamma	Shape=7.066 ,Scale=3.842	
0.086		
Generalized Extreme Value	Loctn=22.704 ,Scale=8.618 ,Shape=0.066	
0.084		
Generalized Logistic	Loctn=NaN ,Scale=NaN ,Shape=NaN	
NaN		
Generalized Pareto	Loctn=13.678 ,Scale=18.442 ,Shape=0.369	
0.111		
Gumbel	Loctn=22.549 ,Scale=7.962	
0.069		
Logistic	Loctn=27.144 ,Scale=5.630	
0.143		
Normal	Mean=27.144 ,StDv=10.212	
0.136		
Pearson III	Mean=27.144 ,StDv=10.212 ,Skew=0.789	
0.084		
Uniform	Left=9.457 ,Right=44.832	
0.140		

Triangular	0.107	Left=12.703 ,Peak=12.703 ,Right=56.028
Log-Logistic	0.063	Scale=25.359 ,Shape=4.800
Ln-Normal	0.072	MeanLn=3.233 ,StDvLn=0.378
Log10-Normal	0.072	MeanLog=1.404 ,StDvLog=0.164
Log-Pearson III	0.074	MeanLog=1.404 ,StDvLog=0.164 ,Skew=-0.134
Shifted Exponential	0.139	Scale=10.212 ,Shift=16.933
Shifted Gamma	0.084	Shape=6.430 ,Scale=4.027 ,Shift=1.250

Plotting Position Type: MEDIAN

--- End Of Analysis ---

--- Results ---

Selected Distribution: Selected Distribution: Log-Pearson III (Standard Product Moments)

Parameter
MeanLog=1.40 ,StDvLog=0.16 ,Skew=-0.13

Kolmogorov-Smirnov (Test Statistic)
0.074

Median Curve	Expected Probability	Percent Chance Exceedance	Confidence Limits 0.05	Confidence Limits 0.95
70.8	82.3	0.002	100.9	50.5
64.0	70.0	0.005	85.6	48.1
58.8	61.5	0.010	75.3	45.9
53.6	54.6	0.020	65.7	43.4
46.5	46.8	0.050	54.3	39.3
40.9	41.0	0.100	46.5	35.5

34.9	35.0	0.200	39.0	30.9
25.6	25.7	0.500	28.6	22.9
18.5	18.5	0.800	21.0	16.4
15.5	15.6	0.900	18.1	13.4
13.4	13.4	0.950	16.2	11.2
10.1	9.5	0.990	13.5	7.6

--- End Of Results ---

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

       V    V   I    SSSSS  U   U    A    L             (v 5.2.2003)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  D E T A I L E D   O U T P U T *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.2\VO2\voin.dat
  Output  filename: C:\Users\p001130E\AppData\Local\Civica\VH5\4f27382c-c718-4437-8f6d-cea7dac08ef7\f9c74268-1
  Summary filename: C:\Users\p001130E\AppData\Local\Civica\VH5\4f27382c-c718-4437-8f6d-cea7dac08ef7\f9c74268-1


DATE: 10/19/2021                          TIME: 02:18:59

USER:


COMMENTS: _____________________________________________________________

----------------------------------------------------------------------------------------------------------
  ************************************************
  ** SIMULATION : Run 01                        **
  ************************************************


--------------------
|    READ STORM    |    Filename: C:\Users\p001130E\AppD
|                  |              ata\Local\Temp\
|                  |              3d3602d2-1f1b-4e02-af2e-210be2955c31\68e7c94d
| Ptotal=134.40 mm |    Comments: 100yr 24hr 15min SCS
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.25    0.00 |  6.50    2.42 | 12.75   19.35 | 19.00    2.42
                0.50    1.48 |  6.75    2.42 | 13.00    9.95 | 19.25    2.42
                0.75    1.48 |  7.00    2.42 | 13.25    9.95 | 19.50    2.42
                1.00    1.48 |  7.25    2.42 | 13.50    7.26 | 19.75    2.42
                1.25    1.48 |  7.50    2.96 | 13.75    7.26 | 20.00    2.42
                1.50    1.48 |  7.75    2.96 | 14.00    5.64 | 20.25    2.42
                1.75    1.48 |  8.00    2.96 | 14.25    5.64 | 20.50    1.61
                2.00    1.48 |  8.25    2.96 | 14.50    4.03 | 20.75    1.61
                2.25    1.48 |  8.50    3.49 | 14.75    4.03 | 21.00    1.61
                2.50    1.75 |  8.75    3.49 | 15.00    4.03 | 21.25    1.61
                2.75    1.75 |  9.00    3.76 | 15.25    4.03 | 21.50    1.61
                3.00    1.75 |  9.25    3.76 | 15.50    4.03 | 21.75    1.61
                3.25    1.75 |  9.50    4.30 | 15.75    4.03 | 22.00    1.61
                3.50    1.75 |  9.75    4.30 | 16.00    4.03 | 22.25    1.61
                3.75    1.75 | 10.00    4.84 | 16.25    4.03 | 22.50    1.61
                4.00    1.75 | 10.25    4.84 | 16.50    2.42 | 22.75    1.61
                4.25    1.75 | 10.50    6.18 | 16.75    2.42 | 23.00    1.61
                4.50    2.15 | 10.75    6.18 | 17.00    2.42 | 23.25    1.61
                4.75    2.15 | 11.00    8.33 | 17.25    2.42 | 23.50    1.61
                5.00    2.15 | 11.25    8.33 | 17.50    2.42 | 23.75    1.61
                5.25    2.15 | 11.50   12.90 | 17.75    2.42 | 24.00    1.61
                5.50    2.15 | 11.75   12.90 | 18.00    2.42 | 24.25    1.61
                5.75    2.15 | 12.00   39.78 | 18.25    2.42 |
                6.00    2.15 | 12.25  164.51 | 18.50    2.42 |
                6.25    2.15 | 12.50   19.35 | 18.75    2.42 |

--------------------------------------------------------------------------------

--------------------
| CALIB            |
| NASHYD   (  0004)|   Area    (ha)=*******   Curve Number   (CN)= 68.6
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=  12.30

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.
```

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	2.15	12.250	164.51	18.33	2.42
0.167	0.00	6.250	2.15	12.333	19.37	18.42	2.42
0.250	0.00	6.333	2.42	12.417	19.35	18.50	2.42
0.333	1.48	6.417	2.42	12.500	19.35	18.58	2.42
0.417	1.48	6.500	2.42	12.583	19.35	18.67	2.42
0.500	1.48	6.583	2.42	12.667	19.35	18.75	2.42
0.583	1.48	6.667	2.42	12.750	19.35	18.83	2.42
0.667	1.48	6.750	2.42	12.833	9.95	18.92	2.42
0.750	1.48	6.833	2.42	12.917	9.95	19.00	2.42
0.833	1.48	6.917	2.42	13.000	9.95	19.08	2.42
0.917	1.48	7.000	2.42	13.083	9.95	19.17	2.42
1.000	1.48	7.083	2.42	13.167	9.95	19.25	2.42
1.083	1.48	7.167	2.42	13.250	9.95	19.33	2.42
1.167	1.48	7.250	2.42	13.333	7.26	19.42	2.42
1.250	1.48	7.333	2.96	13.417	7.26	19.50	2.42
1.333	1.48	7.417	2.96	13.500	7.26	19.58	2.42
1.417	1.48	7.500	2.96	13.583	7.26	19.67	2.42
1.500	1.48	7.583	2.96	13.667	7.26	19.75	2.42
1.583	1.48	7.667	2.96	13.750	7.26	19.83	2.42
1.667	1.48	7.750	2.96	13.833	5.65	19.92	2.42
1.750	1.48	7.833	2.96	13.917	5.64	20.00	2.42
1.833	1.48	7.917	2.96	14.000	5.64	20.08	2.42
1.917	1.48	8.000	2.96	14.083	5.64	20.17	2.42
2.000	1.48	8.083	2.96	14.167	5.64	20.25	2.42
2.083	1.48	8.167	2.96	14.250	5.64	20.33	1.61
2.167	1.48	8.250	2.96	14.333	4.03	20.42	1.61
2.250	1.48	8.333	3.49	14.417	4.03	20.50	1.61
2.333	1.75	8.417	3.49	14.500	4.03	20.58	1.61
2.417	1.75	8.500	3.49	14.583	4.03	20.67	1.61
2.500	1.75	8.583	3.49	14.667	4.03	20.75	1.61
2.583	1.75	8.667	3.49	14.750	4.03	20.83	1.61
2.667	1.75	8.750	3.49	14.833	4.03	20.92	1.61
2.750	1.75	8.833	3.76	14.917	4.03	21.00	1.61
2.833	1.75	8.917	3.76	15.000	4.03	21.08	1.61
2.917	1.75	9.000	3.76	15.083	4.03	21.17	1.61
3.000	1.75	9.083	3.76	15.167	4.03	21.25	1.61
3.083	1.75	9.167	3.76	15.250	4.03	21.33	1.61
3.167	1.75	9.250	3.76	15.333	4.03	21.42	1.61
3.250	1.75	9.333	4.30	15.417	4.03	21.50	1.61
3.333	1.75	9.417	4.30	15.500	4.03	21.58	1.61
3.417	1.75	9.500	4.30	15.583	4.03	21.67	1.61
3.500	1.75	9.583	4.30	15.667	4.03	21.75	1.61
3.583	1.75	9.667	4.30	15.750	4.03	21.83	1.61
3.667	1.75	9.750	4.30	15.833	4.03	21.92	1.61
3.750	1.75	9.833	4.84	15.917	4.03	22.00	1.61
3.833	1.75	9.917	4.84	16.000	4.03	22.08	1.61
3.917	1.75	10.000	4.84	16.083	4.03	22.17	1.61
4.000	1.75	10.083	4.84	16.167	4.03	22.25	1.61
4.083	1.75	10.167	4.84	16.250	4.03	22.33	1.61
4.167	1.75	10.250	4.84	16.333	2.42	22.42	1.61
4.250	1.75	10.333	6.18	16.417	2.42	22.50	1.61
4.333	2.15	10.417	6.18	16.500	2.42	22.58	1.61
4.417	2.15	10.500	6.18	16.583	2.42	22.67	1.61
4.500	2.15	10.583	6.18	16.667	2.42	22.75	1.61
4.583	2.15	10.667	6.18	16.750	2.42	22.83	1.61
4.667	2.15	10.750	6.18	16.833	2.42	22.92	1.61
4.750	2.15	10.833	8.33	16.917	2.42	23.00	1.61
4.833	2.15	10.917	8.33	17.000	2.42	23.08	1.61
4.917	2.15	11.000	8.33	17.083	2.42	23.17	1.61
5.000	2.15	11.083	8.33	17.167	2.42	23.25	1.61
5.083	2.15	11.167	8.33	17.250	2.42	23.33	1.61
5.167	2.15	11.250	8.33	17.333	2.42	23.42	1.61
5.250	2.15	11.333	12.90	17.417	2.42	23.50	1.61
5.333	2.15	11.417	12.90	17.500	2.42	23.58	1.61
5.417	2.15	11.500	12.90	17.583	2.42	23.67	1.61
5.500	2.15	11.583	12.90	17.667	2.42	23.75	1.61
5.583	2.15	11.667	12.90	17.750	2.42	23.83	1.61
5.667	2.15	11.750	12.90	17.833	2.42	23.92	1.61
5.750	2.15	11.833	39.78	17.917	2.42	24.00	1.61
5.833	2.15	11.917	39.78	18.000	2.42	24.08	1.61
5.917	2.15	12.000	39.78	18.083	2.42	24.17	1.61
6.000	2.15	12.083	164.49	18.167	2.42	24.25	1.61
6.083	2.15	12.167	164.51	18.250	2.42		

Unit Hyd Qpeak (cms)= 31.060

PEAK FLOW (cms)= 73.549 (i)
TIME TO PEAK (hrs)= 26.750
RUNOFF VOLUME (mm)= 65.231
TOTAL RAINFALL (mm)= 134.400

RUNOFF COEFFICIENT = 0.485

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
       V    V   I    SSSSS  U   U    A    L              (v 5.2.2003)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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

***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 5.2\VO2\voin.dat
Output filename: C:\Users\p001130E\AppData\Local\Civica\VH5\4f27382c-c718-4437-8f6d-cea7dac08ef7\9fb90fde-9
Summary filename: C:\Users\p001130E\AppData\Local\Civica\VH5\4f27382c-c718-4437-8f6d-cea7dac08ef7\9fb90fde-9

DATE: 10/19/2021 TIME: 02:19:00

USER:

COMMENTS: _____

****
** SIMULATION : Run 02 **
****

READ STORM	Ptotal=220.00 mm
Filename:	C:\Users\p001130E\AppData\Local\Temp\3d3602d2-1f1b-4e02-af2e-210be2955c31\27473c15
Comments:	Hazel_48hr

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.20	0.00	12.40	0.00	24.60	0.00	36.80	6.00
0.40	0.00	12.60	0.00	24.80	0.00	37.00	6.00
0.60	0.00	12.80	0.00	25.00	0.00	37.20	6.00
0.80	0.00	13.00	0.00	25.20	2.00	37.40	6.00
1.00	0.00	13.20	2.00	25.40	0.00	37.60	6.00
1.20	0.00	13.40	0.00	25.60	0.00	37.80	6.00
1.40	0.00	13.60	0.00	25.80	0.00	38.00	6.00
1.60	0.00	13.80	0.00	26.00	0.00	38.20	6.00
1.80	0.00	14.00	0.00	26.20	2.00	38.40	6.00
2.00	0.00	14.20	2.00	26.40	0.00	38.60	6.00
2.20	0.00	14.40	0.00	26.60	0.00	38.80	6.00
2.40	0.00	14.60	0.00	26.80	0.00	39.00	6.00
2.60	0.00	14.80	0.00	27.00	0.00	39.20	13.00
2.80	0.00	15.00	0.00	27.20	2.00	39.40	13.00
3.00	0.00	15.20	2.00	27.40	0.00	39.60	13.00
3.20	1.00	15.40	0.00	27.60	0.00	39.80	13.00
3.40	0.00	15.60	0.00	27.80	0.00	40.00	13.00
3.60	0.00	15.80	0.00	28.00	0.00	40.20	13.00
3.80	0.00	16.00	0.00	28.20	2.00	40.40	13.00
4.00	0.00	16.20	2.00	28.40	0.00	40.60	13.00
4.20	2.00	16.40	0.00	28.60	0.00	40.80	13.00
4.40	0.00	16.60	0.00	28.80	0.00	41.00	13.00
4.60	0.00	16.80	0.00	29.00	0.00	41.20	13.00
4.80	0.00	17.00	0.00	29.20	2.00	41.40	13.00
5.00	0.00	17.20	2.00	29.40	0.00	41.60	13.00
5.20	2.00	17.40	0.00	29.60	0.00	41.80	13.00
5.40	0.00	17.60	0.00	29.80	0.00	42.00	13.00
5.60	0.00	17.80	0.00	30.00	0.00	42.20	23.00
5.80	0.00	18.00	0.00	30.20	2.00	42.40	23.00
6.00	0.00	18.20	2.00	30.40	0.00	42.60	23.00
6.20	2.00	18.40	0.00	30.60	0.00	42.80	23.00
6.40	0.00	18.60	0.00	30.80	0.00	43.00	23.00
6.60	0.00	18.80	0.00	31.00	0.00	43.20	13.00
6.80	0.00	19.00	0.00	31.20	2.00	43.40	13.00
7.00	0.00	19.20	2.00	31.40	0.00	43.60	13.00
7.20	2.00	19.40	0.00	31.60	0.00	43.80	13.00

7.40	0.00	19.60	0.00	31.80	0.00	44.00	13.00
7.60	0.00	19.80	0.00	32.00	0.00	44.20	13.00
7.80	0.00	20.00	0.00	32.20	2.00	44.40	13.00
8.00	0.00	20.20	2.00	32.40	0.00	44.60	13.00
8.20	2.00	20.40	0.00	32.60	0.00	44.80	13.00
8.40	0.00	20.60	0.00	32.80	0.00	45.00	13.00
8.60	0.00	20.80	0.00	33.00	0.00	45.20	53.00
8.80	0.00	21.00	0.00	33.20	2.00	45.40	53.00
9.00	0.00	21.20	2.00	33.40	0.00	45.60	53.00
9.20	2.00	21.40	0.00	33.60	0.00	45.80	53.00
9.40	0.00	21.60	0.00	33.80	0.00	46.00	38.00
9.60	0.00	21.80	0.00	34.00	0.00	46.20	38.00
9.80	0.00	22.00	0.00	34.20	2.00	46.40	38.00
10.00	0.00	22.20	2.00	34.40	0.00	46.60	38.00
10.20	2.00	22.40	0.00	34.60	0.00	46.80	38.00
10.40	0.00	22.60	0.00	34.80	0.00	47.00	38.00
10.60	0.00	22.80	0.00	35.00	0.00	47.20	13.00
10.80	0.00	23.00	0.00	35.20	2.00	47.40	13.00
11.00	0.00	23.20	2.00	35.40	0.00	47.60	13.00
11.20	2.00	23.40	0.00	35.60	0.00	47.80	13.00
11.40	0.00	23.60	0.00	35.80	0.00	48.00	13.00
11.60	0.00	23.80	0.00	36.00	0.00	48.20	0.00
11.80	0.00	24.00	0.00	36.20	6.00		
12.00	0.00	24.20	2.00	36.40	6.00		
12.20	2.00	24.40	0.00	36.60	6.00		

CALIB			
NASHYD (0004)	Area (ha)=*******	Curve Number (CN)= 68.6	
ID= 1 DT= 5.0 min	Ia (mm)= 8.70	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 12.30		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	12.167	2.00	24.250	0.80	36.33	6.00
0.167	0.00	12.250	0.80	24.333	0.00	36.42	6.00
0.250	0.00	12.333	0.00	24.417	0.00	36.50	6.00
0.333	0.00	12.417	0.00	24.500	0.00	36.58	6.00
0.417	0.00	12.500	0.00	24.583	0.00	36.67	6.00
0.500	0.00	12.583	0.00	24.667	0.00	36.75	6.00
0.583	0.00	12.667	0.00	24.750	0.00	36.83	6.00
0.667	0.00	12.750	0.00	24.833	0.00	36.92	6.00
0.750	0.00	12.833	0.00	24.917	0.00	37.00	6.00
0.833	0.00	12.917	0.00	25.000	0.00	37.08	6.00
0.917	0.00	13.000	0.00	25.083	2.00	37.17	6.00
1.000	0.00	13.083	2.00	25.167	2.00	37.25	6.00
1.083	0.00	13.167	2.00	25.250	0.80	37.33	6.00
1.167	0.00	13.250	0.80	25.333	0.00	37.42	6.00
1.250	0.00	13.333	0.00	25.417	0.00	37.50	6.00
1.333	0.00	13.417	0.00	25.500	0.00	37.58	6.00
1.417	0.00	13.500	0.00	25.583	0.00	37.67	6.00
1.500	0.00	13.583	0.00	25.667	0.00	37.75	6.00
1.583	0.00	13.667	0.00	25.750	0.00	37.83	6.00
1.667	0.00	13.750	0.00	25.833	0.00	37.92	6.00
1.750	0.00	13.833	0.00	25.917	0.00	38.00	6.00
1.833	0.00	13.917	0.00	26.000	0.00	38.08	6.00
1.917	0.00	14.000	0.00	26.083	2.00	38.17	6.00
2.000	0.00	14.083	2.00	26.167	2.00	38.25	6.00
2.083	0.00	14.167	2.00	26.250	0.80	38.33	6.00
2.167	0.00	14.250	0.80	26.333	0.00	38.42	6.00
2.250	0.00	14.333	0.00	26.417	0.00	38.50	6.00
2.333	0.00	14.417	0.00	26.500	0.00	38.58	6.00
2.417	0.00	14.500	0.00	26.583	0.00	38.67	6.00
2.500	0.00	14.583	0.00	26.667	0.00	38.75	6.00
2.583	0.00	14.667	0.00	26.750	0.00	38.83	6.00
2.667	0.00	14.750	0.00	26.833	0.00	38.92	6.00
2.750	0.00	14.833	0.00	26.917	0.00	39.00	6.00
2.833	0.00	14.917	0.00	27.000	0.00	39.08	13.00
2.917	0.00	15.000	0.00	27.083	2.00	39.17	13.00
3.000	0.00	15.083	2.00	27.167	2.00	39.25	13.00
3.083	1.00	15.167	2.00	27.250	0.80	39.33	13.00
3.167	1.00	15.250	0.80	27.333	0.00	39.42	13.00
3.250	0.40	15.333	0.00	27.417	0.00	39.50	13.00
3.333	0.00	15.417	0.00	27.500	0.00	39.58	13.00
3.417	0.00	15.500	0.00	27.583	0.00	39.67	13.00
3.500	0.00	15.583	0.00	27.667	0.00	39.75	13.00
3.583	0.00	15.667	0.00	27.750	0.00	39.83	13.00
3.667	0.00	15.750	0.00	27.833	0.00	39.92	13.00

3.750	0.00	15.833	0.00	27.917	0.00	40.00	13.00
3.833	0.00	15.917	0.00	28.000	0.00	40.08	13.00
3.917	0.00	16.000	0.00	28.083	2.00	40.17	13.00
4.000	0.00	16.083	2.00	28.167	2.00	40.25	13.00
4.083	2.00	16.167	2.00	28.250	0.80	40.33	13.00
4.167	2.00	16.250	0.80	28.333	0.00	40.42	13.00
4.250	0.80	16.333	0.00	28.417	0.00	40.50	13.00
4.333	0.00	16.417	0.00	28.500	0.00	40.58	13.00
4.417	0.00	16.500	0.00	28.583	0.00	40.67	13.00
4.500	0.00	16.583	0.00	28.667	0.00	40.75	13.00
4.583	0.00	16.667	0.00	28.750	0.00	40.83	13.00
4.667	0.00	16.750	0.00	28.833	0.00	40.92	13.00
4.750	0.00	16.833	0.00	28.917	0.00	41.00	13.00
4.833	0.00	16.917	0.00	29.000	0.00	41.08	13.00
4.917	0.00	17.000	0.00	29.083	2.00	41.17	13.00
5.000	0.00	17.083	2.00	29.167	2.00	41.25	13.00
5.083	2.00	17.167	2.00	29.250	0.80	41.33	13.00
5.167	2.00	17.250	0.80	29.333	0.00	41.42	13.00
5.250	0.80	17.333	0.00	29.417	0.00	41.50	13.00
5.333	0.00	17.417	0.00	29.500	0.00	41.58	13.00
5.417	0.00	17.500	0.00	29.583	0.00	41.67	13.00
5.500	0.00	17.583	0.00	29.667	0.00	41.75	13.00
5.583	0.00	17.667	0.00	29.750	0.00	41.83	13.00
5.667	0.00	17.750	0.00	29.833	0.00	41.92	13.00
5.750	0.00	17.833	0.00	29.917	0.00	42.00	13.00
5.833	0.00	17.917	0.00	30.000	0.00	42.08	22.99
5.917	0.00	18.000	0.00	30.083	2.00	42.17	23.00
6.000	0.00	18.083	2.00	30.167	2.00	42.25	23.00
6.083	2.00	18.167	2.00	30.250	0.80	42.33	23.00
6.167	2.00	18.250	0.80	30.333	0.00	42.42	23.00
6.250	0.80	18.333	0.00	30.417	0.00	42.50	23.00
6.333	0.00	18.417	0.00	30.500	0.00	42.58	23.00
6.417	0.00	18.500	0.00	30.583	0.00	42.67	23.00
6.500	0.00	18.583	0.00	30.667	0.00	42.75	23.00
6.583	0.00	18.667	0.00	30.750	0.00	42.83	23.00
6.667	0.00	18.750	0.00	30.833	0.00	42.92	23.00
6.750	0.00	18.833	0.00	30.917	0.00	43.00	23.00
6.833	0.00	18.917	0.00	31.000	0.00	43.08	13.01
6.917	0.00	19.000	0.00	31.083	2.00	43.17	13.00
7.000	0.00	19.083	2.00	31.167	2.00	43.25	13.00
7.083	2.00	19.167	2.00	31.250	0.80	43.33	13.00
7.167	2.00	19.250	0.80	31.333	0.00	43.42	13.00
7.250	0.80	19.333	0.00	31.417	0.00	43.50	13.00
7.333	0.00	19.417	0.00	31.500	0.00	43.58	13.00
7.417	0.00	19.500	0.00	31.583	0.00	43.67	13.00
7.500	0.00	19.583	0.00	31.667	0.00	43.75	13.00
7.583	0.00	19.667	0.00	31.750	0.00	43.83	13.00
7.667	0.00	19.750	0.00	31.833	0.00	43.92	13.00
7.750	0.00	19.833	0.00	31.917	0.00	44.00	13.00
7.833	0.00	19.917	0.00	32.000	0.00	44.08	13.00
7.917	0.00	20.000	0.00	32.083	2.00	44.17	13.00
8.000	0.00	20.083	2.00	32.167	2.00	44.25	13.00
8.083	2.00	20.167	2.00	32.250	0.80	44.33	13.00
8.167	2.00	20.250	0.80	32.333	0.00	44.42	13.00
8.250	0.80	20.333	0.00	32.417	0.00	44.50	13.00
8.333	0.00	20.417	0.00	32.500	0.00	44.58	13.00
8.417	0.00	20.500	0.00	32.583	0.00	44.67	13.00
8.500	0.00	20.583	0.00	32.667	0.00	44.75	13.00
8.583	0.00	20.667	0.00	32.750	0.00	44.83	13.00
8.667	0.00	20.750	0.00	32.833	0.00	44.92	13.00
8.750	0.00	20.833	0.00	32.917	0.00	45.00	13.00
8.833	0.00	20.917	0.00	33.000	0.00	45.08	52.95
8.917	0.00	21.000	0.00	33.083	2.00	45.17	53.00
9.000	0.00	21.083	2.00	33.167	2.00	45.25	53.00
9.083	2.00	21.167	2.00	33.250	0.80	45.33	53.00
9.167	2.00	21.250	0.80	33.333	0.00	45.42	53.00
9.250	0.80	21.333	0.00	33.417	0.00	45.50	53.00
9.333	0.00	21.417	0.00	33.500	0.00	45.58	53.00
9.417	0.00	21.500	0.00	33.583	0.00	45.67	53.00
9.500	0.00	21.583	0.00	33.667	0.00	45.75	53.00
9.583	0.00	21.667	0.00	33.750	0.00	45.83	47.02
9.667	0.00	21.750	0.00	33.833	0.00	45.92	38.00
9.750	0.00	21.833	0.00	33.917	0.00	46.00	38.00
9.833	0.00	21.917	0.00	34.000	0.00	46.08	38.00
9.917	0.00	22.000	0.00	34.083	2.00	46.17	38.00
10.000	0.00	22.083	2.00	34.167	2.00	46.25	38.00
10.083	2.00	22.167	2.00	34.250	0.80	46.33	38.00
10.167	2.00	22.250	0.80	34.333	0.00	46.42	38.00
10.250	0.80	22.333	0.00	34.417	0.00	46.50	38.00
10.333	0.00	22.417	0.00	34.500	0.00	46.58	38.00
10.417	0.00	22.500	0.00	34.583	0.00	46.67	38.00
10.500	0.00	22.583	0.00	34.667	0.00	46.75	38.00
10.583	0.00	22.667	0.00	34.750	0.00	46.83	38.00
10.667	0.00	22.750	0.00	34.833	0.00	46.92	38.00

10.750	0.00	22.833	0.00	34.917	0.00	47.00	38.00
10.833	0.00	22.917	0.00	35.000	0.00	47.08	13.04
10.917	0.00	23.000	0.00	35.083	2.00	47.17	13.00
11.000	0.00	23.083	2.00	35.167	2.00	47.25	13.00
11.083	2.00	23.167	2.00	35.250	0.80	47.33	13.00
11.167	2.00	23.250	0.80	35.333	0.00	47.42	13.00
11.250	0.80	23.333	0.00	35.417	0.00	47.50	13.00
11.333	0.00	23.417	0.00	35.500	0.00	47.58	13.00
11.417	0.00	23.500	0.00	35.583	0.00	47.67	13.00
11.500	0.00	23.583	0.00	35.667	0.00	47.75	13.00
11.583	0.00	23.667	0.00	35.750	0.00	47.83	13.00
11.667	0.00	23.750	0.00	35.833	0.00	47.92	13.00
11.750	0.00	23.833	0.00	35.917	0.00	48.00	13.00
11.833	0.00	23.917	0.00	36.000	0.00	48.08	0.02
11.917	0.00	24.000	0.00	36.083	6.00	48.17	0.00
12.000	0.00	24.083	2.00	36.167	6.00		
12.083	2.00	24.167	2.00	36.250	6.00		

Unit Hyd Qpeak (cms)= 31.060

PEAK FLOW (cms)= 161.323 (i)
TIME TO PEAK (hrs)= 57.250
RUNOFF VOLUME (mm)= 129.229
TOTAL RAINFALL (mm)= 220.002
RUNOFF COEFFICIENT = 0.587

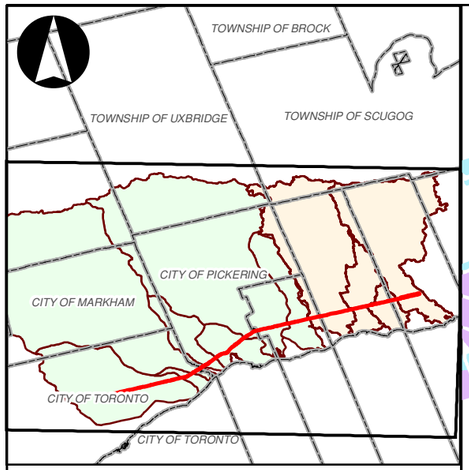
(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

FINISH

==========

Appendix E Existing Environmental Characterization

Figure E.1. Soil Map



LEGEND

- Preferred Alignment
- Watercourses
- Watersheds
- Built Up Area
- Water

DATE	PROJECT NO.
OCTOBER 2021	477117
SCALE	N.T.S

PARSONS

DURHAM SCARBOROUGH BUS RAPID TRANSIT: SOIL GROUPS

DURHAM SCARBOROUGH BUS RAPID TRANSIT

FIGURE NO.

E.1

Active coordinate

43° 52' 45" N, 78° 57' 45" W (43.879167,-78.962500)

Retrieved: Thu, 21 Oct 2021 11:09:57 GMT



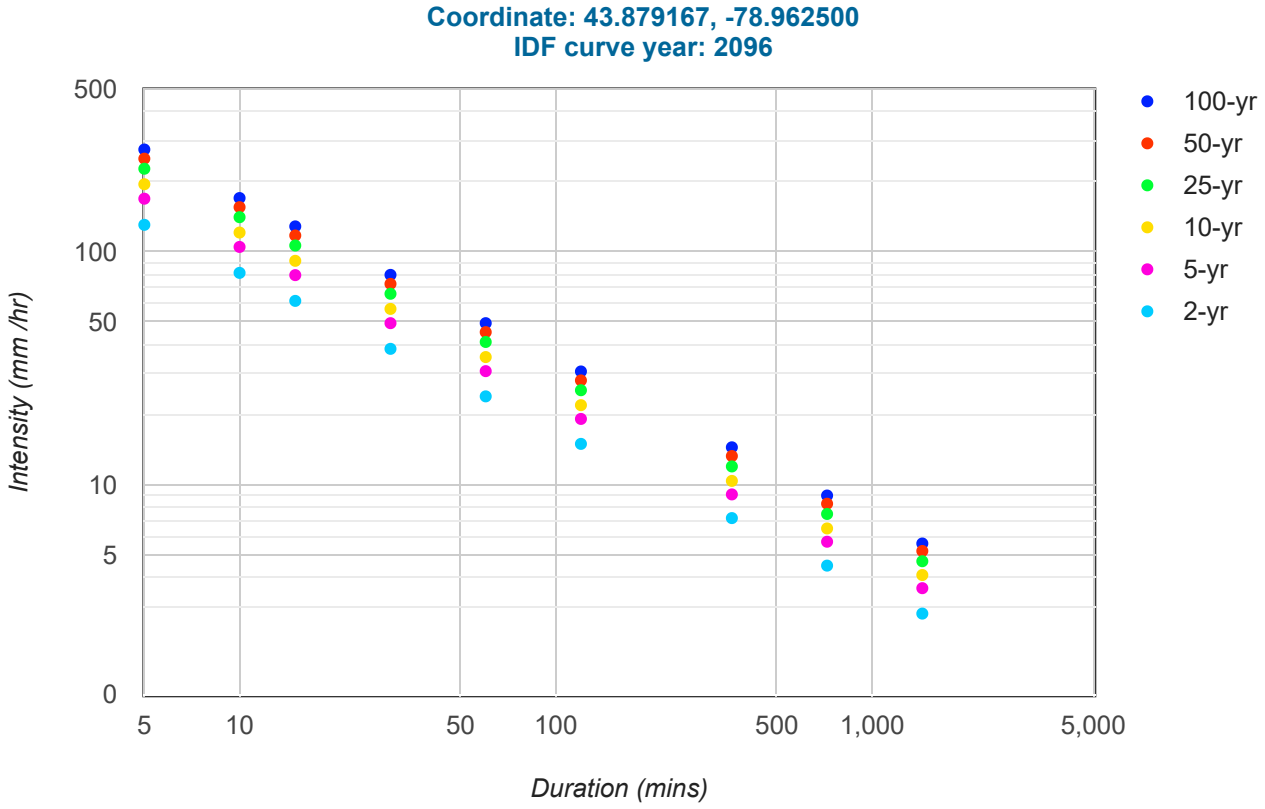
Location summary

These are the locations in the selection.

IDF Curve: 43° 52' 45" N, 78° 57' 45" W (43.879167,-78.962500)

Results

An IDF curve was found.



Coefficient summary

IDF Curve: 43° 52' 45" N, 78° 57' 45" W (43.879167,-78.962500)

Retrieved: Thu, 21 Oct 2021 11:09:57 GMT

Data year: 2010
IDF curve year: 2096

Statistics

Rainfall intensity (mm hr^{-1})

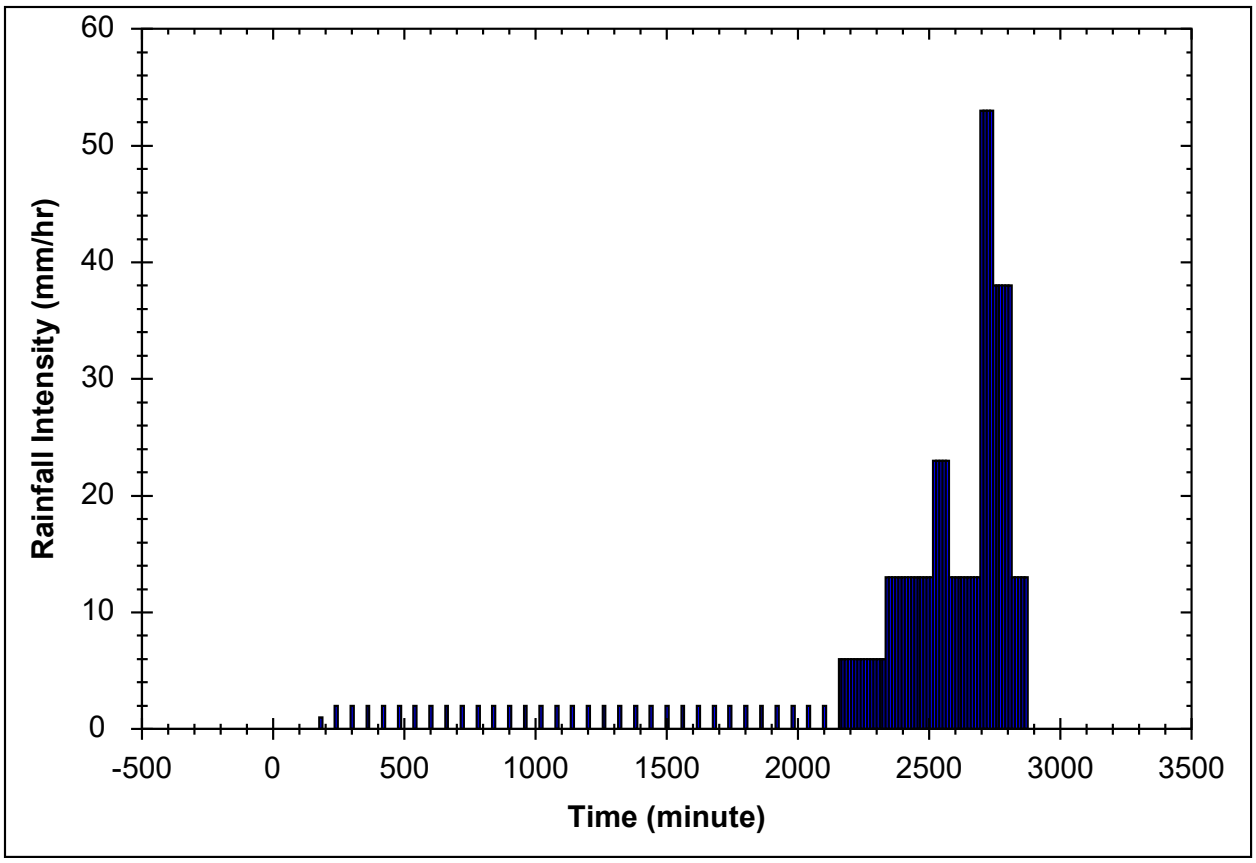
Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	130.9	81.4	61.7	38.4	24.0	15.0	7.2	4.5	2.8
5-yr	169.5	105.2	79.6	49.5	30.8	19.2	9.1	5.7	3.6
10-yr	195.6	121.3	91.7	57.0	35.4	22.0	10.4	6.5	4.1
25-yr	228.0	141.2	106.7	66.2	41.1	25.5	12.0	7.5	4.7
50-yr	251.9	155.9	117.8	73.0	45.3	28.1	13.3	8.3	5.2
100-yr	275.7	170.6	128.9	79.8	49.5	30.7	14.5	9.0	5.6

Rainfall depth (mm)

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	10.9	13.6	15.4	19.2	24.0	30.0	43.2	54.0	67.2
5-yr	14.1	17.5	19.9	24.8	30.8	38.4	54.6	68.4	86.4
10-yr	16.3	20.2	22.9	28.5	35.4	44.0	62.4	78.0	98.4
25-yr	19.0	23.5	26.7	33.1	41.1	51.0	72.0	90.0	112.8
50-yr	21.0	26.0	29.4	36.5	45.3	56.2	79.8	99.6	124.8
100-yr	23.0	28.4	32.2	39.9	49.5	61.4	87.0	108.0	134.4

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Rainfall Intensity (mm/hr)
60
50
40
30
20
10
0
-500
0
500
1000
1500
2000
2500
3000
3500
Time (minute)