



Technical Memo

March 27, 2009

To: Bruce Reid, P.Eng. Director
Watershed Sciences and Engineering Services

From: Ferdous Ahmed, Ph.D., P.Eng.
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Subject: Kemptville Creek Flood Risk Mapping –
Hydraulic Modeling and Map Production

Staff Involved: Nazrul Howlader, Amanda Soutar, Ewan Hardy, Ferdous Ahmed

This is the project completion report of the Kemptville Creek Floodplain Mapping Project that was initiated in 2007 and completed recently (see Figure 1). The mapping was done in accordance with the technical guidelines set out under the Canada-Ontario Flood Damage Reduction Program (FDRP) (MNR, 1984), and the technical guide for the flood hazard delineation in Ontario (MNR, 2002) as laid out by the Ontario Ministry of Natural Resources. This brief report documents the work done so far. A separate “documentation folder” contains all pertinent background information, data, and analyses, and is available to anyone wishing to scrutinize the details.

Introduction

Three previous flood mapping studies have been done within the Kemptville Creek subwatershed (MacLaren, 1972, 1983; Robinson 2003). However, the first two had limited spatial coverage, were done in an approximate fashion using the data available at that time, and were not up to the FDRP standard. The third study, done mainly for the Rideau River, covered only the most downstream part of the Kemptville Creek. Later on, it was found that the design flows were more conservative (higher) than needed to be,

resulting in higher flood elevations. The topographical base also left much to be desired. Therefore, the need for a more comprehensive mapping has been felt for a long time.

In recognition of this, RVCA began planning for a more comprehensive flood mapping. Since high quality topography is the key to a high quality mapping, aerial photos at a 1:6000 scale were taken in November-December 2001 and, using them, a Digital Terrain Model (DTM) was derived in December 2006 by Base Mapping Company (see Figure 2). Moreover, by that time, about 38 years of flow data had been collected on the Kemptville Creek upstream of Kemptville (Water Survey of Canada Station No. 02LA006), enabling a more adequate design flow estimate.

By 2007, sufficient data were in place to meet the standards for “engineered” flood plain mapping of a substantial stretch of the Kemptville Creek and its tributaries, and present project was initiated.

Study Area

The study area was essentially determined by the extent of the DTM (see Figure 2). At the downstream end, the present mapping was tied to the existing mapping of the Rideau River done in 2003 (Robinson, 2003). The following streams were included in this study:

- Kemptville Creek – from Rideau River to North Augusta
- Kemptville Creek North Branch – from confluence to Bolton/Kyle Road
- Barnes Creek and its two branches – from confluence to Highway 416

The major settlement areas covered are the Town of Kemptville, Oxford Mills, North Augusta, Bishops Mills, and Garreton.

Hydrological Analysis

A hydrological analysis (RVCA, 2007) was done in 2007 to determine the design flood flows at key locations along the streams mapped (Figure 3). A single station flood frequency analysis was done at the only streamflow gage location (Kemptville Creek

upstream of Kemptville, WSC Station 02LA006) to estimate the 1:100 year flood flow using the available streamflow data from 1970 through 2007. The CFA program of Environment Canada was used (Pilon and Harvey, 1993), which also produced flows with other return periods from 2 to 500 years. Flows at other locations were estimated by the method of area prorating. The 38 years of measured data was considered adequate to derive statistically valid flow estimates up to 1:100 year flow.

A report summarizing the hydrological analysis was prepared in 2007 (RVCA, 2007), and was approved by the Board of Directors in November 22, 2007.

Data Used for Flood Hazard Mapping

Aerial photo: The aerial photo was collected in November-December 2001 at a scale of 1:6000. This high quality black and white photo clearly shows the rivers, creeks, land use, houses, buildings, roads, infrastructure, vegetation and other details.

DTM: Base Mapping Company was commissioned by RVCA to produce a DTM from the aerial photos (Figure 2) in December 2006 for the flood mapping purpose according to the specifications of FDRP program (MNR, 1984). Contour lines were drawn at 1.0 m intervals with 0.5 m interpolated lines. Other standard layers showing houses, roads, depressions, etc. were also produced.

Cross-Sections: River and flood plain cross-sections – the basic building blocks of hydraulic models – were generated from the high quality DTM using standard GIS software. For the most part this procedure captured the floodplain as well as most of the low flow channel in sufficient detail to be used in floodplain mapping. However, in some places, a substantial portion of the low flow channel was under water and field surveys of the low flow channel were conducted to supplement the DTM-generated profile. The surveying was conducted by RVCA staff in August and September of 2007.

Channel Roughness: Following standard procedures (Chow, 1959), the resistance of the channel under possible high water condition was estimated from aerial photos and occasional field inspections. The Manning's n was generally 0.035 in the main channel,

and varied from 0.050 to 0.065 for the floodplains. These values were consistent with those found appropriate in earlier studies (MacLaren, 1972, 1983).

Measured Flow: As mentioned and analyzed in the hydrology report (RVCA, 2007), the measured flow data of Kemptville Creek upstream of Kemptville (02LA006) was used for deriving the design flows.

Bridges/Culverts: There are 37 bridges and culverts (Table 1) crossing the streams within the study area. Their physical dimensions and other pertinent data were collected from earlier studies (MacLaren 1972, 1983; Dillon, 1993; Robinson, 2003) where available, and were surveyed in the field in other cases. The survey was conducted by RVCA staff in 2007 and, to a lesser extent, in 2008. The coefficients of contraction and expansion associated with bridges/culverts were estimated from available information using standard procedures (USACE, 1990, 2002).

Oxford Mills Dam: This was the only water control structure in the study area. It has three sluices with adjustable logs. The dam is owned and operated by the Ministry of Natural Resources. According to their operating policy (MNR, 1985), the all logs are taken out during high flood events, leaving a sill level of 95.26 m. This setting was incorporated in the hydraulic model. The resulting water surface elevations and flood lines are therefore based on the assumption that the sluices are fully opened.

Hydraulic Modeling

Following standard procedures (MNR, 1984; USACE, 1990, 2002), a steady-state hydraulic model of Kemptville Creek and its tributaries was built. The HEC-RAS model (version 3.1.1) developed by US Corps of Engineers (USACE, 2002) was used. This has the same back water calculation procedure as HEC-2 (USACE, 1990) which has been the industry standard since 1970s, but with improved data processing and graphical capabilities.

About 276 cross-sections were used in the model. Distances between sections along the stream center and left and right overbanks were calculated using GIS software. Bridges and culverts were inserted at appropriate locations. The Oxford Mills Dam was

also incorporated with setting for flood conditions as set out in the operational policy (MNR, 1985).

The design flows taken from the hydrologic study (RVCA, 2007), with return periods ranging from 2 to 500 years (Table 2), were used in the model. The water levels at the Rideau River confluence (Table 3), as determined from the flood mapping study (Robinson, 2003) were used as downstream boundary condition of Kemptville Creek. The confluences of the streams were designated as internal junctions with matching water levels in accordance with accepted procedures (USACE, 1990, 2002).

Once the model was set up, the computed profiles and other parameters were scrutinized to assess the reasonableness of model outputs. Special attention was given to the computed water level and energy profiles near bridges, culverts and the Oxford Mills Dam. Adjustments of model parameters – mainly the channel resistance and contraction and expansion coefficients – were made as necessary.

The rating curve (relationship between the flow and water level) at the gage location was used to check the validity of the model. It was found that the model was capable of computing water levels with high degree of accuracy (Figure 4). It turned out that the Manning's n values estimated originally were adequate for the flood mapping purpose, and did not need any major adjustment. It may be pointed out that the Manning's n is generally used for calibrating steady-state hydraulic models.

The 1:100 year computed water surface elevations and other parameters are shown in Table 4. A few water surface profiles and all cross-sections are included in Appendix A.

Computed water surface elevations for various flood events with return periods ranging from 2 to 500 years are presented in Tables 5a and 5b. It should be pointed out that the model has been built and tuned to simulate the 1:100 year flood levels; therefore the water surface elevations for other events – simulated using the same parameters, especially the Manning's n values – are only approximate. This is because the river roughness varies with flow magnitude, with higher resistance associated with lower flows.

Regulatory Flood Levels

As per Section 3 of the Provincial Policy Statement under the Planning Act (MMAH, 2005), the regulatory flood in Zone 2, which includes the RVCA, is the 1:100 year flood. The computed water surface elevation is generally taken as the regulatory flood level (RFL).

However, near bridges, culverts or other water control structures, the computed water surface elevation may be substantially lower than the energy grade, with the possibility that the water level may rise to the energy grade near obstacles and under other perturbed situations. In such cases, the regulatory flood level is taken as the computed energy grade.

Another possible situation is when the water surface profile is undulant, with downstream water levels occasionally higher than upstream levels. In such cases, it is possible that the water from the (higher) downstream end backs up upstream and elevates the water level. Therefore the upstream regulatory flood level is taken as the downstream water surface elevation.

In summary, the following algorithms were followed in determining the regulatory flood level:

- By default, set RFL equal to computed water surface elevation
- If the computed water surface level is lower than the computed energy grade by more than 8 cm, set RFL equal to computed energy grade
- If the RFL at any location is lower than the RFL at the next downstream section, set the RFL equal to downstream RFL

When these rules are followed, the RFLs always fall between the water surface elevation and energy grade, equal the water surface elevation most of time, and equal to energy grade some of the times. And the RFLs always decrease in the downstream direction. These adjustments to model outputs are done because it is recognized that the numerical models can never be a perfect representation of real world hydraulic phenomena.

For the present study, the regulatory flood levels were computed this way and are tabulated in Table 4, along with the computed water surface elevations and energy grades.

Flood Line Delineation

Once the RFLs are established, the plotting of 1:100 year flood lines or flood risk limits is a relatively straightforward matter. Given the topographical information in the form of contour lines at 0.5 m interval, the inundated area below the RFLs can be easily delineated manually or by using automated computer programs. In the present case, it was done using the HEC-GeoRAS program version 4.0 (USACE, 2005), which has the ability to plot flood lines on topographical maps. The GeoRAS-generated flood lines were visually inspected to ensure that it conforms to hydraulic engineering principles. Identified anomalies (many of them actually) were corrected. Moreover, the GeoRAS-generated flood lines needed some smoothening.

At the end, the flood lines were plotted on 1:5000 scale drawings for the entire study area. In the dense urban areas, additional 1:2000 scale maps were also plotted for further clarity and convenience.

Flood Risk Maps

A set of flood map sheets is attached herewith, consisting of an index map, nineteen 1:5000 scale map sheets, and seven 1:2000 scale map sheets.

The index map shows the overall study area, the river network, major settlements, road network, and other land marks. It also shows all the map sheets in outline. It also shows the overall flood risk limits, although at a much smaller scale.

In each of the map sheets, rivers and streams with flow directions, contour lines, spot elevations, building outlines, and other land marks are shown. Cross-sections with chainage and regulatory flood levels are also shown. The floodway, which is basically the entire floodplain for the one-zone areas like the present case, has been shaded for easy identification.

Public Consultation

An open house was held on November 12, 2008 at Oxford Mills. The draft flood maps were shown to the public. The technical steps feeding in to the mapping process were explained. How the flood maps are used by the RVCA and the municipalities was also discussed. The open house was attended by 36 members of the public as well as a Board Member and a municipal staff. The open house was well received and appreciated by the public. No major issue was identified in the open house, although a few helpful suggestions were received.

The flood mapping was refined at specific locations based on the public input received during and after the open house.

The mapping was also presented to the Middle Advisory Board on January 14, 2009. Details of the mapping process and technical aspects were also explained.

Project Deliverables

The end products of this project are:

1. The Hydrology Report
2. The Modeling and Mapping Report (the current memo)
3. The flood risk maps
4. The HEC-RAS model files
5. The “documentation folder”

Closure

The hydrotechnical and cartographic procedures used in this study conform to present day standards of flood hazard delineation, as per the MNR's Natural Hazards Technical Guide (MNR, 2002). The resulting 1:100 year flood lines are suitable for use in the RVCA's regulation limits mapping (referred to in Section 12 of Ontario regulation 174/06) and in municipal land use planning and development approval processes under the Planning Act. The water surface profiles will also be of valuable use in the flood forecasting and warning services of the RVCA.



A circular blue ink seal for a Licensed Professional Engineer in the Province of Ontario. The seal contains the text "LICENSED PROFESSIONAL ENGINEER" around the top edge and "PROVINCE OF ONTARIO" around the bottom edge. In the center, it reads "F. AHMED" and "100071164". A handwritten signature in blue ink is written across the seal, and the date "27 March 2009" is written in blue ink below the seal.

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Ferdous Ahmed, Ph.D., P.Eng.

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Table 1 Bridges and Culverts

Reach	Name	Bridges/ Culvert	Chainage	Bounding xsecs ID	Deck Top m	Low chord m	Deck width m	Cc (-)	Ce (-)	Source
Kempt 1	County Road 43	B	4101.00	7180 & 7175	90.07	88.82	9.14	0.1	0.3	Maclaren, 1983
Kempt 1	Bridge Street	B	4950.00	7210 & 7205	88.32	87.32	10.07	0.1	0.3	RVCA 2007 Survey
Kempt 2	Prescott Street	B	595.50	7240 & 7235	89.85	88.69	13.50	0.1	0.3	RVCA 2007 Survey
Kempt 2	Hurd Street	B	1952.00	7285 & 7280	91.84	91.11	10.20	0.1	0.3	RVCA 2007 Survey
Kempt 2	Crossing downstream of gauge	B	3393.10	7325 & 7220	94.56	94.18	4.10	0.1	0.3	RVCA 2007 Survey
Kempt 2	Crossing at gauge 02LA006	B	3717.00	7340 & 7335	94.12	93.82	4.20	0.1	0.3	RVCA 2007 Survey
Kempt 2	Dennison Road	B	5015.10	7380 & 7375	96.90	96.01	5.50	0.1	0.3	RVCA 2007 Survey
Kempt 2	CPR	B	5125.81	7390 & 7385	99.58	95.50	9.75	0.1	0.3	Maclaren, 1983
Kempt 2	Water Street	B	7563.00	7430 & 7325	97.59	92.59	11.40	0.1	0.3	RVCA 2007 Survey
Kempt 2	Mapplewood Ave/Bridge Street	B	8598.00	7450 & 7345	97.80	96.70	11.40	0.1	0.3	RVCA 2007 Survey
Kempt 2	Pattersons Corners Road	B	11744.00	7485 & 7480	100.01	99.48	6.10	0.1	0.3	RVCA 2007 Survey
Kempt 2	Mussell Road	B	17248.25	7520 & 7515	100.68	99.68	5.00	0.1	0.3	estimated
Kempt 2	Oxford Station Rd/Conuty Rd 20	B	17917.50	7535 & 7530	102.11	100.58	10.50	0.1	0.3	Dillon, 1983
Kempt 3	Lemirick/Mckenny's Road	B	5452.56	7565 & 7560	100.05	99.47	6.10	0.1	0.3	Dillon, 1983
Kempt 3	Garreton Rd / Branch Rd 18	B	9210.00	7597 & 7596	100.54	99.43	5.90	0.1	0.3	Dillon, 1983
Kempt 3	Private crossing	B	9473.50	7605 & 7600	100.92	100.54	4.00	0.1	0.3	Dillon, 1983
Kempt 3	Private crossing	B	9989.00	7613 & 7612	101.33	100.60	8.50	0.1	0.3	Dillon, 1983
Kempt 3	Diamond Road	B	11345.00	7628 & 7627	101.33	100.60	8.50	0.1	0.3	Dillon, 1983
Kempt 3	Private crossing	B	12193.76	7638 & 7637	99.96	99.46	5.00	0.1	0.3	estimated
Kempt 3	Kyle Road	B	14351.00	7668 & 7667	101.49	101.00	8.50	0.1	0.3	RVCA 2007 Survey
Kempt 3	Private crossing	B	14751.00	7678 & 7677	101.00	100.91	4.50	0.3	0.5	RVCA 2007 Survey
Kempt 3	Private crossing	C	15584.39	7687 & 7686	101.11	100.89	5.80	0.3	0.5	RVCA 2007 Survey
Kempt 3	Klitbo Road	B	21722.50	7732 & 7730	103.30	102.60	9.30	0.1	0.3	Dillon, 1983
Kempt 3	County Road 15	B	23982.00	7755 & 7750	105.16	105.64	12.00	0.1	0.3	Dillon, 1983
Kempt 3	Branch 6 Road	B	25510.30	7773 & 7772	110.80	110.00	10.00	0.1	0.3	estimated
Kempt North	County Road 18-20 connecting	B	493.12	7825 & 7820	100.90	100.00	4.00	0.1	0.3	Dillon, 1983
Kempt North	Old County Road 18	B	552.36	7830 & 7825	100.90	100.00	4.40	0.1	0.3	Dillon, 1983
Kempt North	Mill Street	B	4791.85	7860 & 7855	102.21	101.21	9.00	0.1	0.3	RVCA 2007 Survey
Kempt North	Bolton Road	B	7221.50	7878 & 7875	105.33	104.33	9.00	0.1	0.3	RVCA 2007 Survey
Kempt North	Land Onod Road	B	7769.00	7891 & 7890	105.38	104.38	8.20	0.1	0.3	RVCA 2007 Survey
Barnes 1	Parkinson Street	C	219.00	7916 & 7914	89.54	87.69	29.00	0.1	0.3	RVCA 2007 Survey
Barnes 1	CPR	C	431.00	7922 & 7920	91.69	90.14	10.70	0.1	0.3	RVCA 2007 Survey
Barnes 1	Van Buren Street	C	539.50	7926 & 7924	90.61	89.92	19.60	0.1	0.3	RVCA 2007 Survey
Barnes 1	College Road	C	2912.64	7948 & 7946	95.22	94.52	6.75	0.1	0.3	RVCA 2007 Survey
Barnes 1	Bedell Road	C	3592.50	7955 & 7954	96.28	95.53	7.30	0.1	0.3	RVCA 2007 Survey
Barnes 2	Railway crossing	C	3923.00	7962 & 7960	97.57	96.77	16.00	0.3	0.5	RVCA 2007 Survey
BT1	HWY 416	C	235.00	7984 & 7982	96.71	96.41	102.00	0.3	0.5	RVCA 2007 Survey

Notations:
 B - bridge, C - culvert, C_c - co-efficient of contraction, C_e - co-efficient of expansion

Table 2 Design Flows at Key Locations

River/Creek	Reach	River Station #	Xsec ID	Estimated Design Flow in m ³ /s for Different Flood Events							
				500 yr	200 yr	100 yr	50 yr	20 yr	10 yr	5 yr	2 yr
Barnes Cr	BT1	496.61	7986	8.78	8.14	7.65	7.12	6.38	5.77	5.08	3.91
Barnes Cr	BT1	1.50	-	8.78	8.14	7.65	7.12	6.38	5.77	5.08	3.91
Barnes Cr	Barnes 2	4126.76	7964	4.97	4.61	4.33	4.03	3.61	3.27	2.88	2.22
Barnes Cr	Barnes 2	3601.00	-	4.97	4.61	4.33	4.03	3.61	3.27	2.88	2.22
Barnes Cr	Barnes 1	3599.50	7955	13.88	12.88	12.11	11.27	10.09	9.13	8.04	6.19
Barnes Cr	Barnes 1	52.10	7910	13.88	12.88	12.11	11.27	10.09	9.13	8.04	6.19
Kemptville Cr	Kempt 3	25551.70	7775	48.66	45.15	42.44	39.50	35.38	32.00	28.19	21.70
Kemptville Cr	Kempt 3	18205.30	7710	57.53	53.38	50.17	46.70	41.82	37.83	33.33	25.65
Kemptville Cr	Kempt 3	10652.60	7620	64.30	59.67	56.08	52.20	46.75	42.29	37.25	28.68
Kemptville Cr	Kempt 3	172.78	7543	64.30	59.67	56.08	52.20	46.75	42.29	37.25	28.68
Kemptville Cr	Kempt North	8608.00	7896	46.03	42.71	40.14	37.36	33.46	30.27	26.66	20.53
Kemptville Cr	Kempt North	84.91	7810	46.03	42.71	40.14	37.36	33.46	30.27	26.66	20.53
Kemptville Cr	Kempt 2	18231.00	7540	103.79	96.31	90.51	84.25	75.46	68.26	60.12	46.28
Kemptville Cr	Kempt 2	15899.80	7510	108.64	100.81	94.74	88.18	78.98	71.45	62.93	48.45
Kemptville Cr	Kempt 2	8678.34	7455	111.00	103.00	96.80	90.10	80.70	73.00	64.30	49.50
Kemptville Cr	Kempt 2	3694.00	7333	111.83	103.77	97.52	90.77	81.30	73.55	64.78	49.87
Kemptville Cr	Kempt 2	184.49	7220	111.83	103.77	97.52	90.77	81.30	73.55	64.78	49.87
Kemptville Cr	Kempt 1	5128.75	7215	119.39	110.79	104.12	96.91	86.80	78.52	69.16	53.24
Kemptville Cr	Kempt 1	476.97	7110	119.39	110.79	104.12	96.91	86.80	78.52	69.16	53.24

Table 3 Downstream Boundary Conditions

SI. No.	Return Period Years	Flow of Water m ³ /s	Water surface Elevation m
1	500	119.39	87.86
2	200	110.79	87.83
3	100	104.12	87.72
4	50	96.91	87.51
5	20	86.80	87.23
6	10	78.52	87.00
7	5	69.16	86.74
8	2	53.24	86.35

Table 4 Regulatory Flood Levels for 1:100 Year Flood Event

River/Creek	Reach	River station	Xsec ID #	Q (Total) m ³ /s	Computed WSEL m	EGL m	RFL m	
Kemptville Main	Kempt 1	476.97	7110	104.12	87.72	87.72	87.72	
	Kempt 1	672.18	7115	104.12	87.72	87.72	87.72	
	Kempt 1	1032.58	7120	104.12	87.72	87.72	87.72	
	Kempt 1	1275.84	7125	104.12	87.72	87.72	87.72	
	Kempt 1	1598.22	7130	104.12	87.72	87.72	87.72	
	Kempt 1	1869.13	7135	104.12	87.72	87.72	87.72	
	Kempt 1	2051.03	7140	104.12	87.72	87.72	87.72	
	Kempt 1	2307.40	7145	104.12	87.72	87.72	87.72	
	Kempt 1	2586.77	7150	104.12	87.72	87.72	87.72	
	Kempt 1	2868.38	7155	104.12	87.72	87.72	87.72	
	Kempt 1	3165.02	7160	104.12	87.72	87.72	87.72	
	Kempt 1	3429.11	7165	104.12	87.73	87.73	87.73	
	Kempt 1	3749.50	7170	104.12	87.72	87.73	87.72	
	Kempt 1	4073.86	7175	104.12	87.72	87.74	87.72	
	Kempt 1	4101.00			County Road 43 bridge			
	Kempt 1	4128.33	7180	104.12	87.77	87.78	87.77	
	Kempt 1	4307.66	7185	104.12	87.79	87.79	87.79	
	Kempt 1	4509.99	7190	104.12	87.79	87.80	87.79	
	Kempt 1	4675.75	7195	104.12	87.80	87.81	87.80	
	Kempt 1	4795.79	7200	104.12	87.81	87.82	87.81	
	Kempt 1	4932.60	7205	104.12	87.79	87.84	87.84	
	Kempt 1	4950.00			Bridge Street bridge			
	Kempt 1	4967.43	7210	104.12	87.97	88.05	87.97	
	Kempt 1	5128.75	7215	104.12	88.07	88.07	88.07	
	Kempt 2	184.49	7220	97.52	88.06	88.07	88.06	
	Kempt 2	313.00	7225	97.52	88.08	88.08	88.08	
	Kempt 2	465.25	7230	97.52	88.08	88.09	88.08	
	Kempt 2	511.87	7232	97.52	88.08	88.09	88.08	
	Kempt 2	587.30	7235	97.52	88.01	88.13	88.13	
	Kempt 2	595.50			Prescott Street bridge			
	Kempt 2	607.62	7240	97.52	88.00	88.16	88.16	
	Kempt 2	794.91	7245	97.52	88.24	88.29	88.24	
	Kempt 2	971.68	7250	97.52	88.32	88.36	88.32	
	Kempt 2	1133.39	7255	97.52	88.36	88.45	88.45	
	Kempt 2	1342.03	7260	97.52	88.63	88.73	88.73	
	Kempt 2	1517.17	7265	97.52	88.80	88.83	88.80	
	Kempt 2	1730.79	7270	97.52	88.89	88.94	88.89	
	Kempt 2	1821.06	7275	97.52	88.98	89.02	88.98	
	Kempt 2	1936.49	7280	97.52	89.35	90.03	90.03	
	Kempt 2	1952.00			Hurd Street bridge			
	Kempt 2	1975.80	7285	97.52	90.94	91.10	91.10	
	Kempt 2	2161.98	7290	97.52	91.23	91.28	91.23	
Kempt 2	2310.30	7295	97.52	91.37	91.46	91.46		
Kempt 2	2558.45	7300	97.52	91.61	91.75	91.75		
Kempt 2	2762.25	7305	97.52	91.86	91.98	91.98		
Kempt 2	3022.43	7310	97.52	92.08	92.11	92.08		
Kempt 2	3288.76	7315	97.52	92.15	92.16	92.15		
Kempt 2	3360.90	7317	97.52	92.13	92.20	92.20		
Kempt 2	3385.01	7320	97.52	91.68	92.58	92.58		
Kempt 2	3393.10			Private Crossing downstream of gauge				
Kempt 2	3406.39	7325	97.52	92.83	93.17	93.17		
Kempt 2	3513.79	7328	97.52	93.23	93.25	93.23		
Kempt 2	3563.80	7330	97.52	93.24	93.27	93.24		
Kempt 2	3694.00	7333	97.52	93.28	93.37	93.37		
Kempt 2	3707.64	7335	96.8	93.06	93.51	93.51		
Kempt 2	3717.00			Crossing at gauge 02LA006				
Kempt 2	3725.77	7340	96.8	94.12	94.22	94.22		
Kempt 2	3941.20	7345	96.8	94.28	94.29	94.28		

Table 4

Cont'd

Kemptville Main	Kempt 2	4255.89	7350	96.8	94.35	94.39	94.35	
	Kempt 2	4451.64	7355	96.8	94.42	94.47	94.42	
	Kempt 2	4577.17	7360	96.8	94.48	94.49	94.48	
	Kempt 2	4728.80	7362	96.8	94.50	94.52	94.50	
	Kempt 2	4768.86	7365	96.8	94.51	94.54	94.51	
	Kempt 2	4888.73	7370	96.8	94.55	94.57	94.55	
	Kempt 2	4997.66	7375	96.8	94.50	94.62	94.62	
	Kempt 2	5015.10			Dennison Road bridge			
	Kempt 2	5029.58	7380	96.8	94.55	94.68	94.68	
	Kempt 2	5051.77	7382	96.8	94.67	94.69	94.69	
	Kempt 2	5099.76	7385	96.8	94.67	94.71	94.71	
	Kempt 2	5125.81			CPR bridge			
	Kempt 2	5149.31	7390	96.8	94.66	94.75	94.75	
	Kempt 2	5184.47	7395	96.8	94.71	94.77	94.77	
	Kempt 2	5420.24	7400	96.8	94.82	94.84	94.82	
	Kempt 2	5837.86	7405	96.8	94.89	94.91	94.89	
	Kempt 2	6253.36	7410	96.8	94.97	94.99	94.97	
	Kempt 2	6725.08	7415	96.8	95.08	95.09	95.08	
	Kempt 2	7213.79	7420	96.8	95.19	95.20	95.19	
	Kempt 2	7541.68	7425	96.8	95.20	95.34	95.34	
	Kempt 2	7563.00			Water Street bridge			
	Kempt 2	7586.40	7430	96.8	95.31	95.40	95.40	
	Kempt 2	7823.97	7435	96.8	95.54	95.59	95.54	
	Kempt 2	8183.20	7440	96.8	95.91	96.01	96.01	
	Kempt 2	8572.53	7445	96.8	96.35	96.55	96.55	
	Kempt 2	8598.00			Mapplewood Ave/Bridge Street bridge			
	Kempt 2	8625.58	7450	96.8	96.51	96.76	96.76	
	Kempt 2	8650.00			Oxford Mills dam			
	Kempt 2	8678.34	7455	96.8	97.34	97.62	97.62	
	Kempt 2	8927.44	7457	94.74	97.72	97.73	97.72	
	Kempt 2	9129.69	7460	94.74	97.74	97.80	97.74	
	Kempt 2	9673.59	7465	94.74	98.33	98.37	98.33	
	Kempt 2	10226.68	7470	94.74	98.62	98.64	98.62	
	Kempt 2	11080.96	7475	94.74	98.83	98.84	98.83	
	Kempt 2	11711.59	7480	94.74	98.92	99.01	99.01	
	Kempt 2	11744.00			Pattersons Corners Road bridge			
	Kempt 2	11778.28	7485	94.74	98.96	99.09	99.09	
	Kempt 2	12201.21	7490	94.74	99.21	99.21	99.21	
	Kempt 2	13100.02	7495	94.74	99.30	99.30	99.30	
	Kempt 2	13866.05	7500	94.74	99.36	99.37	99.36	
	Kempt 2	14349.18	7505	94.74	99.40	99.40	99.40	
	Kempt 2	15899.87	7510	94.74	99.47	99.47	99.47	
	Kempt 2	17227.17	7515	90.51	99.51	99.57	99.51	
	Kempt 2	17248.25			Mussell Road bridge			
	Kempt 2	17266.75	7520	90.51	99.53	99.60	99.53	
	Kempt 2	17498.61	7525	90.51	99.61	99.61	99.61	
	Kempt 2	17865.95	7530	90.51	99.59	99.64	99.59	
Kempt 2	17917.50			Oxford Station Rd/Conuty Rd 20 bridge				
Kempt 2	17940.12	7535	90.51	99.62	99.67	99.67		
Kempt 2	18231.00	7540	90.51	99.68	99.68	99.68		
Kemptville South Br	Kempt 3	172.78	7543	56.08	99.68	99.68	99.68	
	Kempt 3	1289.63	7545	56.08	99.69	99.69	99.69	
	Kempt 3	3255.07	7550	56.08	99.70	99.70	99.70	
	Kempt 3	4957.20	7555	56.08	99.71	99.71	99.71	
	Kempt 3	5415.33	7560	56.08	99.69	99.73	99.73	
	Kempt 3	5452.56			Lemirick/Mckenny's Road bridge			
	Kempt 3	5482.56	7565	56.08	99.76	99.79	99.76	
Kempt 3	5857.75	7570	56.08	99.81	99.81	99.81		

Table 4

Cont'd

Kemptonville South Branch	Kempt 3	6516.72	7575	56.08	99.81	99.81	99.81
	Kempt 3	7061.50	7580	56.08	99.81	99.81	99.81
	Kempt 3	7771.07	7585	56.08	99.82	99.82	99.82
	Kempt 3	8834.30	7590	56.08	99.84	99.84	99.84
	Kempt 3	9177.29	7595	56.08	99.85	99.86	99.85
	Kempt 3	9194.41	7596	56.08	99.82	99.88	99.88
	Kempt 3	9210.00					
	Kempt 3	9217.97	7597	56.08	99.95	100.02	99.95
	Kempt 3	9443.90	7600	56.08	100.05	100.08	100.05
	Kempt 3	9473.50					
	Kempt 3	9489.13	7605	56.08	100.07	100.10	100.07
	Kempt 3	9949.66	7610	56.08	100.15	100.15	100.15
	Kempt 3	9973.83	7612	56.08	100.12	100.17	100.17
	Kempt 3	9989.00					
	Kempt 3	10005.57	7613	56.08	100.14	100.19	100.19
	Kempt 3	10028.71	7615	56.08	100.18	100.20	100.20
	Kempt 3	10652.65	7620	56.08	100.28	100.28	100.28
	Kempt 3	11295.46	7625	50.17	100.32	100.32	100.32
	Kempt 3	11326.76	7627	50.17	100.30	100.34	100.34
	Kempt 3	11345.00					
	Kempt 3	11358.33	7628	50.17	100.31	100.35	100.35
	Kempt 3	11444.88	7630	50.17	100.36	100.36	100.36
	Kempt 3	11809.40	7632	50.17	100.40	100.40	100.40
	Kempt 3	12166.32	7635	50.17	100.44	100.44	100.44
	Kempt 3	12182.25	7637	50.17	100.39	100.46	100.46
	Kempt 3	12193.76					
	Kempt 3	12207.76	7638	50.17	100.63	100.70	100.63
	Kempt 3	12236.44	7640	50.17	100.71	100.71	100.71
	Kempt 3	13214.62	7645	50.17	100.77	100.77	100.77
	Kempt 3	13852.07	7650	50.17	100.78	100.78	100.78
	Kempt 3	13878.00	7653	50.17	100.78	100.79	100.78
	Kempt 3	13926.52	7655	50.17	100.79	100.79	100.79
	Kempt 3	14140.66	7660	50.17	100.79	100.79	100.79
	Kempt 3	14314.07	7665	50.17	100.81	100.81	100.81
	Kempt 3	14337.20	7667	50.17	100.76	100.84	100.84
	Kempt 3	14351.00					
	Kempt 3	14362.40	7668	50.17	100.77	100.87	100.87
	Kempt 3	14395.49	7670	50.17	100.88	100.88	100.88
	Kempt 3	14710.27	7675	50.17	100.91	100.91	100.91
	Kempt 3	14730.26	7677	50.17	100.89	100.94	100.94
	Kempt 3	14751.00					
	Kempt 3	14761.91	7678	50.17	101.80	101.83	101.80
	Kempt 3	14792.90	7680	50.17	101.83	101.83	101.83
	Kempt 3	15097.70	7682	50.17	101.83	101.83	101.83
	Kempt 3	15548.53	7685	50.17	101.84	101.84	101.84
	Kempt 3	15572.79	7686	50.17	101.83	101.84	101.84
	Kempt 3	15584.39					
	Kempt 3	15595.99	7687	50.17	101.83	101.85	101.85
Kempt 3	15623.83	7688	50.17	101.85	101.85	101.85	
Kempt 3	15798.10	7690	50.17	101.85	101.85	101.85	
Kempt 3	16295.06	7695	50.17	101.85	101.85	101.85	
Kempt 3	17053.02	7700	50.17	101.86	101.86	101.86	
Kempt 3	17365.56	7705	50.17	101.87	101.87	101.87	
Kempt 3	18205.30	7710	50.17	101.89	101.89	101.89	
Kempt 3	19473.85	7715	42.44	101.93	101.95	101.93	
Kempt 3	20488.62	7720	42.44	102.15	102.16	102.15	
Kempt 3	21203.41	7725	42.44	102.26	102.27	102.26	
Kempt 3	21690.76	7730	42.44	102.36	102.41	102.36	

Table 4

Cont'd

Kemptville South Branch	Kempt 3	21722.50		Klitbo Road bridge			
	Kempt 3	21739.22	7732	42.44	102.38	102.44	102.38
	Kempt 3	22159.08	7735	42.44	102.52	102.53	102.52
	Kempt 3	22940.43	7740	42.44	102.69	102.70	102.69
	Kempt 3	23568.35	7745	42.44	103.26	103.31	103.26
	Kempt 3	23894.25	7750	42.44	103.94	104.00	103.94
	Kempt 3	23966.78	7753	42.44	103.93	104.24	104.24
	Kempt 3	23982.00		County Road 15 bridge			
	Kempt 3	24009.72	7755	42.44	104.35	104.59	104.59
	Kempt 3	24248.22	7757	42.44	105.05	105.11	105.05
	Kempt 3	24594.49	7760	42.44	105.47	105.56	105.56
	Kempt 3	24929.05	7765	42.44	106.13	106.19	106.13
	Kempt 3	25088.75	7766	42.44	106.43	106.47	106.43
	Kempt 3	25254.75	7767	42.44	106.78	107.32	107.32
	Kempt 3	25342.05	7768	42.44	107.88	108.22	108.22
	Kempt 3	25432.27	7770	42.44	109.21	109.53	109.53
	Kempt 3	25499.89	7772	42.44	109.66	110.25	110.25
	Kempt 3	25510.30		Branch 6 Road bridge			
Kempt 3	25526.79	7773	42.44	110.51	110.86	110.86	
Kempt 3	25551.71	7775	42.44	110.89	110.90	110.89	
Kemptville North Branch	Kempt North	84.91	7810	40.14	99.68	99.68	99.68
	Kempt North	298.75	7815	40.14	99.68	99.69	99.68
	Kempt North	466.24	7820	40.14	99.65	99.71	99.71
	Kempt North	493.12		County Road 18-20 connecting			
	Kempt North	516.62	7825	40.14	99.68	99.75	99.75
	Kempt North	538.31	7828	40.14	99.71	99.76	99.76
	Kempt North	552.36		Old County Road 18			
	Kempt North	562.86	7830	40.14	99.68	99.80	99.80
	Kempt North	858.02	7835	40.14	99.84	99.84	99.84
	Kempt North	1939.37	7840	40.14	99.90	99.90	99.90
	Kempt North	2613.49	7845	40.14	99.91	99.91	99.91
	Kempt North	3602.98	7850	40.14	99.94	99.94	99.94
	Kempt North	3953.23	7851	40.14	100.00	100.01	100.00
	Kempt North	4196.73	7852	40.14	100.13	100.15	100.13
	Kempt North	4512.19	7854	40.14	100.66	100.69	100.66
	Kempt North	4749.93	7855	40.14	101.08	101.12	101.08
	Kempt North	4771.40	7856	40.14	101.04	101.17	101.17
	Kempt North	4791.85		Mill Street bridge			
	Kempt North	4807.85	7857	40.14	101.12	101.27	101.27
	Kempt North	4853.13	7860	40.14	101.29	101.30	101.29
	Kempt North	5132.19	7862	40.14	101.56	101.59	101.56
	Kempt North	5301.39	7864	40.14	102.08	102.16	102.08
	Kempt North	5628.64	7865	40.14	103.05	103.16	103.16
	Kempt North	6050.64	7866	40.14	103.96	104.00	103.96
	Kempt North	6231.60	7867	40.14	104.14	104.16	104.14
	Kempt North	6609.12	7870	40.14	104.26	104.27	104.26
	Kempt North	7197.02	7875	40.14	104.39	104.55	104.55
	Kempt North	7221.50		Bolton Road bridge			
	Kempt North	7238.93	7878	40.14	104.68	104.78	104.78
	Kempt North	7268.27	7880	40.14	104.76	104.81	104.81
	Kempt North	7469.57	7885	40.14	104.95	104.97	104.95
	Kempt North	7750.33	7890	40.14	105.11	105.19	105.19
	Kempt North	7769.00		Land Onod Road bridge			
Kempt North	7792.07	7891	40.14	105.45	105.52	105.45	
Kempt North	7809.22	7892	40.14	105.52	105.52	105.52	
Kempt North	8213.58	7894	40.14	105.55	105.56	105.55	
Kempt North	8608.00	7896	40.14	105.66	105.67	105.66	

Table 4

Cont'd

Barnes	Barnes 1	52.10	7910	12.11	88.07	88.07	88.07
	Barnes 1	148.62	7912	12.11	88.07	88.08	88.07
	Barnes 1	198.91	7914	12.11	88.07	88.08	88.07
	Barnes 1	219.00			Parkinson Street pipe culvert		
	Barnes 1	239.47	7916	12.11	89.08	89.09	89.08
	Barnes 1	329.29	7918	12.11	89.09	89.09	89.09
	Barnes 1	419.54	7920	12.11	89.08	89.09	89.08
	Barnes 1	431.00			CPR Arch type culvert		
	Barnes 1	442.85	7922	12.11	89.49	89.53	89.49
	Barnes 1	453.14	7923	12.11	89.53	89.54	89.53
	Barnes 1	520.88	7924	12.11	89.53	89.54	89.53
	Barnes 1	539.50			Van Buren Street pipe culvert		
	Barnes 1	556.09	7926	12.11	89.74	89.76	89.74
	Barnes 1	618.81	7927	12.11	89.76	89.76	89.76
	Barnes 1	663.38	7928	12.11	89.76	89.77	89.76
	Barnes 1	725.53	7929	12.11	89.77	89.80	89.77
	Barnes 1	917.04	7930	12.11	90.06	90.08	90.06
	Barnes 1	1174.88	7932	12.11	90.57	90.59	90.57
	Barnes 1	1545.17	7934	12.11	91.00	91.02	91.00
	Barnes 1	1837.87	7936	12.11	91.32	91.33	91.32
	Barnes 1	2041.77	7938	12.11	91.60	91.65	91.60
	Barnes 1	2246.17	7940	12.11	91.98	92.05	91.98
	Barnes 1	2547.12	7942	12.11	92.64	92.70	92.64
	Barnes 1	2823.71	7944	12.11	93.50	93.58	93.50
	Barnes 1	2863.53	7945	12.11	93.62	93.85	93.85
	Barnes 1	2896.90	7946	12.11	94.01	94.33	94.33
	Barnes 1	2912.64			College Road box culvert		
	Barnes 1	2922.64	7948	12.11	94.49	94.61	94.61
	Barnes 1	3204.55	7950	12.11	95.25	95.30	95.25
	Barnes 1	3490.86	7952	12.11	95.61	95.61	95.61
	Barnes 1	3581.97	7954	12.11	95.62	95.73	95.73
	Barnes 1	3592.50			Bedell Road box culvert		
	Barnes 1	3599.50	7955	12.11	95.91	95.98	95.91
Barnes 2	3645.26	7956	4.33	95.99	95.99	95.99	
Barnes 2	3790.78	7958	4.33	95.99	95.99	95.99	
Barnes 2	3898.20	7960	4.33	95.99	96.02	96.02	
Barnes 2	3923.00			Railway crossing pipe culvert			
Barnes 2	3948.16	7962	4.33	97.07	97.08	97.07	
Barnes 2	4126.77	7964	4.33	97.08	97.08	97.08	
Barnes Trib1	BT 1	70.50	7980	7.65	95.92	95.98	95.92
	BT 1	113.95	7981	7.65	96.16	96.20	96.16
	BT 1	151.05	7982	7.65	96.17	96.25	96.25
	BT 1	235.00			HWY 416 box culvert		
	BT 1	344.36	7984	7.65	96.50	96.50	96.50
	BT 1	496.61	7986	7.65	96.51	96.51	96.51
<p>Note:</p> <p>RFL - Regulatory Flood Levels</p> <p>EGL - Energy Grade Elevation</p> <p>WSEL - Water Surface Elevation</p>							

Table 5a Computed Water Surface Elevations for Different Flood Events

River/ Creek	Reach	River station	Xsec ID #	Flow (m ³ /s) and Computed WSEL (m) for Different Flood Events								
				Q500	WL500	Q200	WL200	Q100	WL100	Q50	WL50	
Kemptville Main	Kempt 1	476.968	7110	119.39	87.86	110.79	87.83	104.12	87.72	96.91	87.51	
	Kempt 1	672.185	7115	119.39	87.86	110.79	87.83	104.12	87.72	96.91	87.51	
	Kempt 1	1032.579	7120	119.39	87.86	110.79	87.83	104.12	87.72	96.91	87.51	
	Kempt 1	1275.842	7125	119.39	87.86	110.79	87.83	104.12	87.72	96.91	87.51	
	Kempt 1	1598.217	7130	119.39	87.86	110.79	87.83	104.12	87.72	96.91	87.51	
	Kempt 1	1869.127	7135	119.39	87.86	110.79	87.83	104.12	87.72	96.91	87.51	
	Kempt 1	2051.026	7140	119.39	87.86	110.79	87.83	104.12	87.72	96.91	87.51	
	Kempt 1	2307.401	7145	119.39	87.86	110.79	87.83	104.12	87.72	96.91	87.51	
	Kempt 1	2586.765	7150	119.39	87.86	110.79	87.83	104.12	87.72	96.91	87.51	
	Kempt 1	2868.382	7155	119.39	87.86	110.79	87.83	104.12	87.72	96.91	87.51	
	Kempt 1	3165.018	7160	119.39	87.86	110.79	87.83	104.12	87.72	96.91	87.51	
	Kempt 1	3429.113	7165	119.39	87.87	110.79	87.84	104.12	87.73	96.91	87.52	
	Kempt 1	3749.500	7170	119.39	87.86	110.79	87.83	104.12	87.72	96.91	87.51	
	Kempt 1	4073.860	7175	119.39	87.86	110.79	87.83	104.12	87.72	96.91	87.51	
	Kempt 1	4101.000										
	Kempt 1	4128.330	7180	119.39	87.91	110.79	87.88	104.12	87.77	96.91	87.56	
	Kempt 1	4307.660	7185	119.39	87.93	110.79	87.90	104.12	87.79	96.91	87.57	
	Kempt 1	4509.990	7190	119.39	87.94	110.79	87.90	104.12	87.79	96.91	87.58	
	Kempt 1	4675.750	7195	119.39	87.95	110.79	87.91	104.12	87.80	96.91	87.59	
	Kempt 1	4795.790	7200	119.39	87.96	110.79	87.92	104.12	87.81	96.91	87.61	
	Kempt 1	4932.600	7205	119.39	87.93	110.79	87.90	104.12	87.79	96.91	87.59	
	Kempt 1	4950.000										
	Kempt 1	4967.430	7210	119.39	88.17	110.79	88.10	104.12	87.97	96.91	87.73	
	Kempt 1	5128.750	7215	119.39	88.29	110.79	88.21	104.12	88.07	96.91	87.83	
	Kempt 2	184.490	7220	111.83	88.28	103.77	88.20	97.52	88.06	90.77	87.83	
	Kempt 2	313.000	7225	111.83	88.30	103.77	88.22	97.52	88.08	90.77	87.84	
	Kempt 2	465.250	7230	111.83	88.30	103.77	88.22	97.52	88.08	90.77	87.85	
	Kempt 2	511.870	7232	111.83	88.30	103.77	88.22	97.52	88.08	90.77	87.85	
	Kempt 2	587.300	7235	111.83	88.22	103.77	88.14	97.52	88.01	90.77	87.77	
	Kempt 2	595.500										
	Kempt 2	607.620	7240	111.83	88.21	103.77	88.13	97.52	88.00	90.77	87.77	
	Kempt 2	794.910	7245	111.83	88.47	103.77	88.38	97.52	88.24	90.77	88.03	
	Kempt 2	971.680	7250	111.83	88.54	103.77	88.45	97.52	88.32	90.77	88.13	
	Kempt 2	1133.390	7255	111.83	88.58	103.77	88.49	97.52	88.36	90.77	88.17	
	Kempt 2	1342.030	7260	111.83	88.81	103.77	88.72	97.52	88.63	90.77	88.52	
	Kempt 2	1517.170	7265	111.83	88.97	103.77	88.88	97.52	88.80	90.77	88.70	
	Kempt 2	1730.790	7270	111.83	89.06	103.77	88.97	97.52	88.89	90.77	88.79	
	Kempt 2	1821.060	7275	111.83	89.13	103.77	89.05	97.52	88.98	90.77	88.90	
	Kempt 2	1936.490	7280	111.83	89.48	103.77	89.40	97.52	89.35	90.77	89.28	
	Kempt 2	1952.000										
	Kempt 2	1975.800	7285	111.83	91.20	103.77	91.05	97.52	90.94	90.77	90.81	
	Kempt 2	2161.980	7290	111.83	91.49	103.77	91.35	97.52	91.23	90.77	91.10	
	Kempt 2	2310.300	7295	111.83	91.60	103.77	91.47	97.52	91.37	90.77	91.24	
	Kempt 2	2558.450	7300	111.83	91.95	103.77	91.79	97.52	91.61	90.77	91.47	
	Kempt 2	2762.250	7305	111.83	92.20	103.77	92.06	97.52	91.86	90.77	91.71	
	Kempt 2	3022.430	7310	111.83	92.39	103.77	92.25	97.52	92.08	90.77	91.95	
	Kempt 2	3288.760	7315	111.83	92.44	103.77	92.31	97.52	92.15	90.77	92.02	
Kempt 2	3360.900	7317	111.83	92.43	103.77	92.30	97.52	92.13	90.77	91.99		
Kempt 2	3385.010	7320	111.83	91.85	103.77	91.75	97.52	91.68	90.77	91.60		
Kempt 2	3393.100											
Kempt 2	3406.390	7325	111.83	93.11	103.77	92.95	97.52	92.83	90.77	92.69		
Kempt 2	3513.790	7328	111.83	93.54	103.77	93.36	97.52	93.23	90.77	93.08		
Kempt 2	3563.800	7330	111.83	93.54	103.77	93.37	97.52	93.24	90.77	93.09		
Kempt 2	3694.000	7333	111.83	93.58	103.77	93.41	97.52	93.28	90.77	93.13		
Kempt 2	3707.640	7335	111	93.32	103	93.17	96.8	93.06	90.1	92.93		
Kempt 2	3717.000											
Kempt 2	3725.770	7340	111	94.46	103	94.27	96.8	94.12	90.1	93.96		
Kempt 2	3941.200	7345	111	94.60	103	94.42	96.8	94.28	90.1	94.14		

Table 5a

Cont'd

Kemptville Main	Kempt 2	4255.890	7350	111	94.64	103	94.47	96.8	94.35	90.1	94.23	
	Kempt 2	4451.640	7355	111	94.70	103	94.54	96.8	94.42	90.1	94.30	
	Kempt 2	4577.170	7360	111	94.76	103	94.60	96.8	94.48	90.1	94.36	
	Kempt 2	4728.800	7362	111	94.78	103	94.61	96.8	94.50	90.1	94.38	
	Kempt 2	4768.860	7365	111	94.79	103	94.62	96.8	94.51	90.1	94.39	
	Kempt 2	4888.730	7370	111	94.82	103	94.66	96.8	94.55	90.1	94.43	
	Kempt 2	4997.660	7375	111	94.76	103	94.61	96.8	94.50	90.1	94.38	
	Kempt 2	5015.100										
	Kempt 2	5029.580	7380	111	94.82	103	94.67	96.8	94.55	90.1	94.44	
	Kempt 2	5051.770	7382	111	94.96	103	94.80	96.8	94.67	90.1	94.55	
	Kempt 2	5099.760	7385	111	94.95	103	94.79	96.8	94.67	90.1	94.54	
	Kempt 2	5125.810										
	Kempt 2	5149.310	7390	111	94.94	103	94.78	96.8	94.66	90.1	94.54	
	Kempt 2	5184.470	7395	111	95.00	103	94.84	96.8	94.71	90.1	94.58	
	Kempt 2	5420.240	7400	111	95.10	103	94.94	96.8	94.82	90.1	94.70	
	Kempt 2	5837.860	7405	111	95.16	103	95.01	96.8	94.89	90.1	94.77	
	Kempt 2	6253.360	7410	111	95.23	103	95.09	96.8	94.97	90.1	94.86	
	Kempt 2	6725.080	7415	111	95.32	103	95.19	96.8	95.08	90.1	94.96	
	Kempt 2	7213.790	7420	111	95.40	103	95.29	96.8	95.19	90.1	95.08	
	Kempt 2	7541.680	7425	111	95.39	103	95.29	96.8	95.20	90.1	95.11	
	Kempt 2	7563.000										
	Kempt 2	7586.400	7430	111	95.50	103	95.40	96.8	95.31	90.1	95.21	
	Kempt 2	7823.970	7435	111	95.73	103	95.62	96.8	95.54	90.1	95.43	
	Kempt 2	8183.200	7440	111	96.03	103	95.96	96.8	95.91	90.1	95.82	
	Kempt 2	8572.530	7445	111	96.49	103	96.41	96.8	96.35	90.1	96.27	
	Kempt 2	8598.000										
	Kempt 2	8625.580	7450	111	96.66	103	96.58	96.8	96.51	90.1	96.42	
	Kempt 2	8650.000										
	Kempt 2	8678.340	7455	111	97.53	103	97.42	96.8	97.34	90.1	97.24	
	Kempt 2	8927.440	7457	108.64	97.94	100.81	97.82	94.74	97.72	88.18	97.61	
	Kempt 2	9129.690	7460	108.64	97.95	100.81	97.83	94.74	97.74	88.18	97.64	
	Kempt 2	9673.590	7465	108.64	98.48	100.81	98.40	94.74	98.33	88.18	98.25	
	Kempt 2	10226.680	7470	108.64	98.77	100.81	98.69	94.74	98.62	88.18	98.54	
	Kempt 2	11080.960	7475	108.64	98.97	100.81	98.89	94.74	98.83	88.18	98.75	
	Kempt 2	11711.590	7480	108.64	99.07	100.81	98.99	94.74	98.92	88.18	98.85	
	Kempt 2	11744.000										
	Kempt 2	11778.280	7485	108.64	99.11	100.81	99.02	94.74	98.96	88.18	98.88	
	Kempt 2	12201.210	7490	108.64	99.38	100.81	99.28	94.74	99.21	88.18	99.11	
	Kempt 2	13100.020	7495	108.64	99.46	100.81	99.37	94.74	99.30	88.18	99.22	
	Kempt 2	13866.050	7500	108.64	99.51	100.81	99.43	94.74	99.36	88.18	99.28	
	Kempt 2	14349.180	7505	108.64	99.55	100.81	99.47	94.74	99.40	88.18	99.32	
	Kempt 2	15899.870	7510	108.64	99.62	100.81	99.53	94.74	99.47	88.18	99.38	
Kempt 2	17227.170	7515	103.79	99.65	96.31	99.57	90.51	99.51	84.25	99.43		
Kempt 2	17248.250											
Kempt 2	17266.750	7520	103.79	99.68	96.31	99.59	90.51	99.53	84.25	99.45		
Kempt 2	17498.610	7525	103.79	99.77	96.31	99.68	90.51	99.61	84.25	99.53		
Kempt 2	17865.950	7530	103.79	99.74	96.31	99.65	90.51	99.59	84.25	99.51		
Kempt 2	17917.500											
Kempt 2	17940.120	7535	103.79	99.77	96.31	99.68	90.51	99.62	84.25	99.53		
Kempt 2	18231.000	7540	103.79	99.85	96.31	99.75	90.51	99.68	84.25	99.59		
Kemptville South Br	Kempt 3	172.778	7543	64.3	99.85	59.67	99.75	56.08	99.68	52.2	99.59	
	Kempt 3	1289.626	7545	64.3	99.85	59.67	99.76	56.08	99.69	52.2	99.60	
	Kempt 3	3255.069	7550	64.3	99.86	59.67	99.77	56.08	99.70	52.2	99.61	
	Kempt 3	4957.200	7555	64.3	99.87	59.67	99.78	56.08	99.71	52.2	99.62	
	Kempt 3	5415.325	7560	64.3	99.85	59.67	99.76	56.08	99.69	52.2	99.61	
	Kempt 3	5452.560										
	Kempt 3	5482.562	7565	64.3	99.94	59.67	99.83	56.08	99.76	52.2	99.66	
Kempt 3	5857.748	7570	64.3	99.99	59.67	99.89	56.08	99.81	52.2	99.71		

Table 5a

Cont'd

Kemptville South Branch	Kempt 3	6516.723	7575	64.3	100.00	59.67	99.89	56.08	99.81	52.2	99.71	
	Kempt 3	7061.498	7580	64.3	100.00	59.67	99.89	56.08	99.81	52.2	99.72	
	Kempt 3	7771.067	7585	64.3	100.01	59.67	99.90	56.08	99.82	52.2	99.73	
	Kempt 3	8834.296	7590	64.3	100.02	59.67	99.91	56.08	99.84	52.2	99.74	
	Kempt 3	9177.291	7595	64.3	100.04	59.67	99.93	56.08	99.85	52.2	99.76	
	Kempt 3	9194.408	7596	64.3	100.00	59.67	99.89	56.08	99.82	52.2	99.73	
	Kempt 3	9210.000										
	Kempt 3	9217.973	7597	64.3	100.19	59.67	100.05	56.08	99.95	52.2	99.84	
	Kempt 3	9443.899	7600	64.3	100.28	59.67	100.15	56.08	100.05	52.2	99.93	
	Kempt 3	9473.500										
	Kempt 3	9489.127	7605	64.3	100.31	59.67	100.17	56.08	100.07	52.2	99.95	
	Kempt 3	9949.659	7610	64.3	100.38	59.67	100.25	56.08	100.15	52.2	100.03	
	Kempt 3	9973.831	7612	64.3	100.35	59.67	100.22	56.08	100.12	52.2	100.01	
	Kempt 3	9989.000										
	Kempt 3	10005.570	7613	64.3	100.38	59.67	100.24	56.08	100.14	52.2	100.03	
	Kempt 3	10028.710	7615	64.3	100.42	59.67	100.29	56.08	100.18	52.2	100.07	
	Kempt 3	10652.650	7620	64.3	100.51	59.67	100.37	56.08	100.28	52.2	100.17	
	Kempt 3	11295.460	7625	57.53	100.55	53.38	100.41	50.17	100.32	46.7	100.22	
	Kempt 3	11326.760	7627	57.53	100.52	53.38	100.39	50.17	100.30	46.7	100.20	
	Kempt 3	11345.000										
	Kempt 3	11358.330	7628	57.53	100.54	53.38	100.40	50.17	100.31	46.7	100.21	
	Kempt 3	11444.880	7630	57.53	100.59	53.38	100.45	50.17	100.36	46.7	100.26	
	Kempt 3	11809.400	7632	57.53	100.63	53.38	100.49	50.17	100.40	46.7	100.30	
	Kempt 3	12166.320	7635	57.53	100.66	53.38	100.52	50.17	100.44	46.7	100.34	
	Kempt 3	12182.250	7637	57.53	100.61	53.38	100.47	50.17	100.39	46.7	100.30	
	Kempt 3	12193.760										
	Kempt 3	12207.760	7638	57.53	100.73	53.38	100.62	50.17	100.63	46.7	100.55	
	Kempt 3	12236.440	7640	57.53	100.78	53.38	100.71	50.17	100.71	46.7	100.62	
	Kempt 3	13214.620	7645	57.53	100.84	53.38	100.77	50.17	100.77	46.7	100.69	
	Kempt 3	13852.070	7650	57.53	100.86	53.38	100.79	50.17	100.78	46.7	100.71	
	Kempt 3	13878.000	7653	57.53	100.86	53.38	100.79	50.17	100.78	46.7	100.71	
	Kempt 3	13926.520	7655	57.53	100.86	53.38	100.79	50.17	100.79	46.7	100.71	
	Kempt 3	14140.660	7660	57.53	100.86	53.38	100.80	50.17	100.79	46.7	100.71	
	Kempt 3	14314.070	7665	57.53	100.88	53.38	100.82	50.17	100.81	46.7	100.73	
	Kempt 3	14337.200	7667	57.53	100.82	53.38	100.76	50.17	100.76	46.7	100.69	
	Kempt 3	14351.000										
	Kempt 3	14362.400	7668	57.53	100.84	53.38	100.78	50.17	100.77	46.7	100.70	
	Kempt 3	14395.490	7670	57.53	100.97	53.38	100.90	50.17	100.88	46.7	100.80	
	Kempt 3	14710.270	7675	57.53	101.00	53.38	100.93	50.17	100.91	46.7	100.83	
	Kempt 3	14730.260	7677	57.53	100.97	53.38	100.91	50.17	100.89	46.7	100.81	
	Kempt 3	14751.000										
	Kempt 3	14761.910	7678	57.53	101.91	53.38	101.87	50.17	101.80	46.7	101.74	
	Kempt 3	14792.900	7680	57.53	101.95	53.38	101.90	50.17	101.83	46.7	101.76	
Kempt 3	15097.700	7682	57.53	101.95	53.38	101.90	50.17	101.83	46.7	101.77		
Kempt 3	15548.530	7685	57.53	101.95	53.38	101.90	50.17	101.84	46.7	101.77		
Kempt 3	15572.790	7686	57.53	101.95	53.38	101.90	50.17	101.83	46.7	101.77		
Kempt 3	15584.390											
Kempt 3	15595.990	7687	57.53	101.95	53.38	101.90	50.17	101.83	46.7	101.77		
Kempt 3	15623.830	7688	57.53	101.96	53.38	101.91	50.17	101.85	46.7	101.78		
Kempt 3	15798.100	7690	57.53	101.96	53.38	101.91	50.17	101.85	46.7	101.78		
Kempt 3	16295.060	7695	57.53	101.97	53.38	101.92	50.17	101.85	46.7	101.79		
Kempt 3	17053.020	7700	57.53	101.98	53.38	101.93	50.17	101.86	46.7	101.80		
Kempt 3	17365.560	7705	57.53	101.98	53.38	101.93	50.17	101.87	46.7	101.80		
Kempt 3	18205.300	7710	57.53	102.00	53.38	101.95	50.17	101.89	46.7	101.82		
Kempt 3	19473.850	7715	48.66	102.05	45.15	101.99	42.44	101.93	39.5	101.87		
Kempt 3	20488.620	7720	48.66	102.26	45.15	102.20	42.44	102.15	39.5	102.09		
Kempt 3	21203.410	7725	48.66	102.37	45.15	102.31	42.44	102.26	39.5	102.21		
Kempt 3	21690.760	7730	48.66	102.46	45.15	102.41	42.44	102.36	39.5	102.31		

Table 5a

Cont'd

Kempville South Branch	Kempt 3	21722.500									
	Kempt 3	21739.220	7732	48.66	102.48	45.15	102.42	42.44	102.38	39.5	102.33
	Kempt 3	22159.080	7735	48.66	102.64	45.15	102.58	42.44	102.52	39.5	102.47
	Kempt 3	22940.430	7740	48.66	102.79	45.15	102.73	42.44	102.69	39.5	102.64
	Kempt 3	23568.350	7745	48.66	103.31	45.15	103.28	42.44	103.26	39.5	103.23
	Kempt 3	23894.250	7750	48.66	104.02	45.15	103.97	42.44	103.94	39.5	103.90
	Kempt 3	23966.780	7753	48.66	103.99	45.15	103.96	42.44	103.93	39.5	103.90
	Kempt 3	23982.000									
	Kempt 3	24009.720	7755	48.66	104.46	45.15	104.42	42.44	104.35	39.5	104.27
	Kempt 3	24248.220	7757	48.66	105.21	45.15	105.13	42.44	105.05	39.5	104.97
	Kempt 3	24594.490	7760	48.66	105.61	45.15	105.53	42.44	105.47	39.5	105.39
	Kempt 3	24929.050	7765	48.66	106.23	45.15	106.18	42.44	106.13	39.5	106.08
	Kempt 3	25088.750	7766	48.66	106.51	45.15	106.47	42.44	106.43	39.5	106.38
	Kempt 3	25254.750	7767	48.66	107.08	45.15	107.08	42.44	106.78	39.5	106.78
	Kempt 3	25342.050	7768	48.66	108.13	45.15	108.05	42.44	107.88	39.5	107.78
	Kempt 3	25432.270	7770	48.66	109.54	45.15	109.52	42.44	109.21	39.5	109.17
	Kempt 3	25499.890	7772	48.66	109.86	45.15	109.85	42.44	109.66	39.5	109.63
	Kempt 3	25510.300									
	Kempt 3	25526.790	7773	48.66	111.18	45.15	111.16	42.44	110.51	39.5	110.40
	Kempt 3	25551.710	7775	48.66	111.19	45.15	111.18	42.44	110.89	39.5	110.77
Kempville North Branch	Kempt North	84.910	7810	46.03	99.85	42.71	99.75	40.14	99.68	37.36	99.59
	Kempt North	298.750	7815	46.03	99.85	42.71	99.76	40.14	99.68	37.36	99.59
	Kempt North	466.240	7820	46.03	99.81	42.71	99.72	40.14	99.65	37.36	99.56
	Kempt North	493.120									
	Kempt North	516.620	7825	46.03	99.84	42.71	99.75	40.14	99.68	37.36	99.59
	Kempt North	538.310	7828	46.03	99.87	42.71	99.78	40.14	99.71	37.36	99.62
	Kempt North	552.360									
	Kempt North	562.860	7830	46.03	99.85	42.71	99.75	40.14	99.68	37.36	99.60
	Kempt North	858.020	7835	46.03	100.01	42.71	99.91	40.14	99.84	37.36	99.74
	Kempt North	1939.370	7840	46.03	100.05	42.71	99.96	40.14	99.90	37.36	99.81
	Kempt North	2613.490	7845	46.03	100.07	42.71	99.98	40.14	99.91	37.36	99.83
	Kempt North	3602.980	7850	46.03	100.08	42.71	100.00	40.14	99.94	37.36	99.86
	Kempt North	3953.230	7851	46.03	100.12	42.71	100.05	40.14	100.00	37.36	99.94
	Kempt North	4196.730	7852	46.03	100.22	42.71	100.16	40.14	100.13	37.36	100.09
	Kempt North	4512.190	7854	46.03	100.70	42.71	100.68	40.14	100.66	37.36	100.61
	Kempt North	4749.930	7855	46.03	101.15	42.71	101.11	40.14	101.08	37.36	101.05
	Kempt North	4771.400	7856	46.03	101.09	42.71	101.07	40.14	101.04	37.36	101.02
	Kempt North	4791.850									
	Kempt North	4807.850	7857	46.03	101.20	42.71	101.16	40.14	101.12	37.36	101.08
	Kempt North	4853.130	7860	46.03	101.40	42.71	101.34	40.14	101.29	37.36	101.24
	Kempt North	5132.190	7862	46.03	101.62	42.71	101.58	40.14	101.56	37.36	101.54
	Kempt North	5301.390	7864	46.03	102.12	42.71	102.10	40.14	102.08	37.36	102.06
	Kempt North	5628.640	7865	46.03	103.16	42.71	103.09	40.14	103.05	37.36	103.00
	Kempt North	6050.640	7866	46.03	104.07	42.71	104.01	40.14	103.96	37.36	103.91
	Kempt North	6231.600	7867	46.03	104.24	42.71	104.18	40.14	104.14	37.36	104.10
	Kempt North	6609.120	7870	46.03	104.36	42.71	104.30	40.14	104.26	37.36	104.21
	Kempt North	7197.020	7875	46.03	104.48	42.71	104.43	40.14	104.39	37.36	104.34
	Kempt North	7221.500									
	Kempt North	7238.930	7878	46.03	104.89	42.71	104.77	40.14	104.68	37.36	104.59
	Kempt North	7268.270	7880	46.03	104.98	42.71	104.86	40.14	104.76	37.36	104.66
	Kempt North	7469.570	7885	46.03	105.16	42.71	105.08	40.14	104.95	37.36	104.87
	Kempt North	7750.330	7890	46.03	105.28	42.71	105.25	40.14	105.11	37.36	105.04
	Kempt North	7769.000									
	Kempt North	7792.070	7891	46.03	105.67	42.71	105.60	40.14	105.45	37.36	105.36
Kempt North	7809.220	7892	46.03	105.74	42.71	105.67	40.14	105.52	37.36	105.42	
Kempt North	8213.580	7894	46.03	105.76	42.71	105.69	40.14	105.55	37.36	105.46	
Kempt North	8608.000	7896	46.03	105.85	42.71	105.78	40.14	105.66	37.36	105.57	

Table 5a

Cont'd

Barnes	Barnes 1	52.103	7910	13.88	88.30	12.88	88.21	12.11	88.07	11.27	87.84
	Barnes 1	148.616	7912	13.88	88.29	12.88	88.21	12.11	88.07	11.27	87.84
	Barnes 1	198.913	7914	13.88	88.29	12.88	88.21	12.11	88.07	11.27	87.83
	Barnes 1	219.000									
	Barnes 1	239.473	7916	13.88	89.52	12.88	89.35	12.11	89.08	11.27	88.70
	Barnes 1	329.289	7918	13.88	89.53	12.88	89.36	12.11	89.09	11.27	88.72
	Barnes 1	419.543	7920	13.88	89.52	12.88	89.35	12.11	89.08	11.27	88.71
	Barnes 1	431.000									
	Barnes 1	442.853	7922	13.88	89.92	12.88	89.73	12.11	89.49	11.27	89.24
	Barnes 1	453.145	7923	13.88	89.95	12.88	89.77	12.11	89.53	11.27	89.28
	Barnes 1	520.875	7924	13.88	89.95	12.88	89.76	12.11	89.53	11.27	89.28
	Barnes 1	539.500									
	Barnes 1	556.093	7926	13.88	90.17	12.88	89.97	12.11	89.74	11.27	89.50
	Barnes 1	618.813	7927	13.88	90.19	12.88	89.99	12.11	89.76	11.27	89.53
	Barnes 1	663.384	7928	13.88	90.19	12.88	89.99	12.11	89.76	11.27	89.53
	Barnes 1	725.531	7929	13.88	90.19	12.88	89.99	12.11	89.77	11.27	89.54
	Barnes 1	917.037	7930	13.88	90.29	12.88	90.16	12.11	90.06	11.27	89.98
	Barnes 1	1174.879	7932	13.88	90.54	12.88	90.55	12.11	90.57	11.27	90.54
	Barnes 1	1545.167	7934	13.88	91.05	12.88	91.02	12.11	91.00	11.27	90.97
	Barnes 1	1837.870	7936	13.88	91.36	12.88	91.34	12.11	91.32	11.27	91.29
	Barnes 1	2041.768	7938	13.88	91.65	12.88	91.62	12.11	91.60	11.27	91.57
	Barnes 1	2246.165	7940	13.88	92.08	12.88	92.03	12.11	91.98	11.27	91.94
	Barnes 1	2547.123	7942	13.88	92.76	12.88	92.69	12.11	92.64	11.27	92.58
	Barnes 1	2823.712	7944	13.88	93.58	12.88	93.53	12.11	93.50	11.27	93.45
	Barnes 1	2863.525	7945	13.88	93.70	12.88	93.66	12.11	93.62	11.27	93.58
	Barnes 1	2896.902	7946	13.88	94.08	12.88	94.04	12.11	94.01	11.27	93.98
	Barnes 1	2912.642									
	Barnes 1	2922.642	7948	13.88	94.61	12.88	94.54	12.11	94.49	11.27	94.43
	Barnes 1	3204.554	7950	13.88	95.31	12.88	95.28	12.11	95.25	11.27	95.22
	Barnes 1	3490.855	7952	13.88	95.65	12.88	95.63	12.11	95.61	11.27	95.58
	Barnes 1	3581.973	7954	13.88	95.65	12.88	95.64	12.11	95.62	11.27	95.60
	Barnes 1	3592.500									
Barnes 1	3599.501	7955	13.88	96.03	12.88	95.96	12.11	95.91	11.27	95.85	
Barnes 2	3645.256	7956	4.97	96.12	4.61	96.05	4.33	95.99	4.03	95.92	
Barnes 2	3790.775	7958	4.97	96.12	4.61	96.05	4.33	95.99	4.03	95.92	
Barnes 2	3898.204	7960	4.97	96.13	4.61	96.05	4.33	95.99	4.03	95.93	
Barnes 2	3923.000										
Barnes 2	3948.159	7962	4.97	97.27	4.61	97.16	4.33	97.07	4.03	96.99	
Barnes 2	4126.765	7964	4.97	96.07	4.61	95.99	4.33	97.08	4.03	95.85	
Barnes Trib1	BT 1	70.504	7980	8.78	96.21	8.14	96.15	7.65	96.11	7.12	96.06
	BT 1	113.949	7981	8.78	96.26	8.14	96.20	7.65	96.16	7.12	96.12
	BT 1	151.055	7982	8.78	96.26	8.14	96.20	7.65	96.17	7.12	96.13
	BT 1	235.000									
	BT 1	344.359	7984	8.78	96.50	8.14	96.50	7.65	96.50	7.12	96.50
	BT 1	496.611	7986	8.78	96.51	8.14	96.51	7.65	96.51	7.12	96.51

Table 5b Computed Water Surface Elevations for Different Flood Events

River/ Creek	Reach	River station	Xsec ID #	Flow (m ³ /s) and Computed WSEL (m) for Different Flood Events								
				Q20	WL20	Q10	WL10	Q5	WL5	Q2	WL2	
Kemptville Main	Kempt 1	476.968	7110	86.8	87.23	78.52	87.00	69.16	86.74	53.24	86.35	
	Kempt 1	672.185	7115	86.8	87.23	78.52	87.00	69.16	86.74	53.24	86.35	
	Kempt 1	1032.579	7120	86.8	87.23	78.52	87.00	69.16	86.74	53.24	86.35	
	Kempt 1	1275.842	7125	86.8	87.23	78.52	87.00	69.16	86.74	53.24	86.35	
	Kempt 1	1598.217	7130	86.8	87.23	78.52	87.00	69.16	86.74	53.24	86.35	
	Kempt 1	1869.127	7135	86.8	87.23	78.52	87.00	69.16	86.74	53.24	86.35	
	Kempt 1	2051.026	7140	86.8	87.23	78.52	87.00	69.16	86.74	53.24	86.35	
	Kempt 1	2307.401	7145	86.8	87.23	78.52	87.00	69.16	86.74	53.24	86.36	
	Kempt 1	2586.765	7150	86.8	87.23	78.52	87.00	69.16	86.75	53.24	86.36	
	Kempt 1	2868.382	7155	86.8	87.23	78.52	87.01	69.16	86.75	53.24	86.36	
	Kempt 1	3165.018	7160	86.8	87.24	78.52	87.01	69.16	86.75	53.24	86.36	
	Kempt 1	3429.113	7165	86.8	87.24	78.52	87.01	69.16	86.75	53.24	86.36	
	Kempt 1	3749.500	7170	86.8	87.24	78.52	87.01	69.16	86.75	53.24	86.36	
	Kempt 1	4073.860	7175	86.8	87.24	78.52	87.01	69.16	86.75	53.24	86.36	
	Kempt 1	4101.000										
	Kempt 1	4128.330	7180	86.8	87.28	78.52	87.05	69.16	86.79	53.24	86.40	
	Kempt 1	4307.660	7185	86.8	87.30	78.52	87.07	69.16	86.81	53.24	86.41	
	Kempt 1	4509.990	7190	86.8	87.31	78.52	87.08	69.16	86.82	53.24	86.43	
	Kempt 1	4675.750	7195	86.8	87.32	78.52	87.10	69.16	86.84	53.24	86.45	
	Kempt 1	4795.790	7200	86.8	87.34	78.52	87.11	69.16	86.85	53.24	86.46	
	Kempt 1	4932.600	7205	86.8	87.32	78.52	87.10	69.16	86.84	53.24	86.45	
	Kempt 1	4950.000										
	Kempt 1	4967.430	7210	86.8	87.42	78.52	87.11	69.16	86.85	53.24	87.02	
	Kempt 1	5128.750	7215	86.8	87.52	78.52	87.21	69.16	86.95	53.24	87.08	
	Kempt 2	184.490	7220	81.3	87.52	73.55	87.21	64.78	86.95	49.87	87.08	
	Kempt 2	313.000	7225	81.3	87.53	73.55	87.23	64.78	86.97	49.87	87.09	
	Kempt 2	465.250	7230	81.3	87.54	73.55	87.24	64.78	86.99	49.87	87.09	
	Kempt 2	511.870	7232	81.3	87.55	73.55	87.25	64.78	86.99	49.87	87.10	
	Kempt 2	587.300	7235	81.3	87.47	73.55	87.17	64.78	86.91	49.87	87.06	
	Kempt 2	595.500										
	Kempt 2	607.620	7240	81.3	87.46	73.55	87.17	64.78	86.92	49.87	87.06	
	Kempt 2	794.910	7245	81.3	87.72	73.55	87.45	64.78	87.24	49.87	87.22	
	Kempt 2	971.680	7250	81.3	87.84	73.55	87.61	64.78	87.42	49.87	87.33	
	Kempt 2	1133.390	7255	81.3	87.88	73.55	87.67	64.78	87.50	49.87	87.40	
	Kempt 2	1342.030	7260	81.3	88.27	73.55	88.14	64.78	88.03	49.87	87.85	
	Kempt 2	1517.170	7265	81.3	88.46	73.55	88.33	64.78	88.21	49.87	88.00	
	Kempt 2	1730.790	7270	81.3	88.57	73.55	88.44	64.78	88.31	49.87	88.08	
	Kempt 2	1821.060	7275	81.3	88.73	73.55	88.64	64.78	88.54	49.87	88.31	
	Kempt 2	1936.490	7280	81.3	89.19	73.55	89.11	64.78	89.02	49.87	88.85	
	Kempt 2	1952.000										
	Kempt 2	1975.800	7285	81.3	90.63	73.55	90.47	64.78	90.29	49.87	89.96	
	Kempt 2	2161.980	7290	81.3	90.86	73.55	90.70	64.78	90.51	49.87	90.17	
	Kempt 2	2310.300	7295	81.3	90.96	73.55	90.80	64.78	90.62	49.87	90.30	
	Kempt 2	2558.450	7300	81.3	91.22	73.55	91.07	64.78	90.89	49.87	90.58	
	Kempt 2	2762.250	7305	81.3	91.50	73.55	91.36	64.78	91.19	49.87	90.86	
	Kempt 2	3022.430	7310	81.3	91.76	73.55	91.62	64.78	91.45	49.87	91.12	
	Kempt 2	3288.760	7315	81.3	91.83	73.55	91.70	64.78	91.53	49.87	91.20	
	Kempt 2	3360.900	7317	81.3	91.80	73.55	91.67	64.78	91.49	49.87	91.17	
Kempt 2	3385.010	7320	81.3	91.47	73.55	91.37	64.78	91.25	49.87	91.03		
Kempt 2	3393.100											
Kempt 2	3406.390	7325	81.3	92.50	73.55	92.33	64.78	92.14	49.87	91.67		
Kempt 2	3513.790	7328	81.3	92.87	73.55	92.70	64.78	92.45	49.87	91.98		
Kempt 2	3563.800	7330	81.3	92.89	73.55	92.71	64.78	92.47	49.87	92.01		
Kempt 2	3694.000	7333	81.3	92.89	73.55	92.72	64.78	92.47	49.87	92.02		
Kempt 2	3707.640	7335	80.7	92.70	73	92.54	64.3	92.28	49.5	91.88		
Kempt 2	3717.000											
Kempt 2	3725.770	7340	80.7	93.71	73	93.51	64.3	93.27	49.5	92.85		
Kempt 2	3941.200	7345	80.7	93.92	73	93.74	64.3	93.53	49.5	93.05		

Table 5b

Cont'd

Kemptville Main	Kempt 2	4255.890	7350	80.7	94.03	73	93.87	64.3	93.70	49.5	93.24	
	Kempt 2	4451.640	7355	80.7	94.09	73	93.93	64.3	93.76	49.5	93.32	
	Kempt 2	4577.170	7360	80.7	94.15	73	93.99	64.3	93.82	49.5	93.38	
	Kempt 2	4728.800	7362	80.7	94.18	73	94.02	64.3	93.86	49.5	93.47	
	Kempt 2	4768.860	7365	80.7	94.19	73	94.03	64.3	93.87	49.5	93.51	
	Kempt 2	4888.730	7370	80.7	94.24	73	94.09	64.3	93.93	49.5	93.58	
	Kempt 2	4997.660	7375	80.7	94.19	73	94.05	64.3	93.89	49.5	93.55	
	Kempt 2	5015.100										
	Kempt 2	5029.580	7380	80.7	94.25	73	94.10	64.3	93.94	49.5	93.60	
	Kempt 2	5051.770	7382	80.7	94.35	73	94.19	64.3	94.02	49.5	93.65	
	Kempt 2	5099.760	7385	80.7	94.34	73	94.19	64.3	94.02	49.5	93.66	
	Kempt 2	5125.810										
	Kempt 2	5149.310	7390	80.7	94.34	73	94.18	64.3	94.02	49.5	93.66	
	Kempt 2	5184.470	7395	80.7	94.38	73	94.22	64.3	94.05	49.5	93.69	
	Kempt 2	5420.240	7400	80.7	94.50	73	94.35	64.3	94.18	49.5	93.83	
	Kempt 2	5837.860	7405	80.7	94.59	73	94.43	64.3	94.26	49.5	93.91	
	Kempt 2	6253.360	7410	80.7	94.68	73	94.52	64.3	94.36	49.5	94.00	
	Kempt 2	6725.080	7415	80.7	94.79	73	94.64	64.3	94.47	49.5	94.12	
	Kempt 2	7213.790	7420	80.7	94.93	73	94.81	64.3	94.66	49.5	94.29	
	Kempt 2	7541.680	7425	80.7	94.99	73	94.89	64.3	94.76	49.5	94.38	
	Kempt 2	7563.000										
	Kempt 2	7586.400	7430	80.7	95.09	73	94.98	64.3	94.85	49.5	94.48	
	Kempt 2	7823.970	7435	80.7	95.29	73	95.17	64.3	95.00	49.5	94.65	
	Kempt 2	8183.200	7440	80.7	95.69	73	95.57	64.3	95.36	49.5	95.04	
	Kempt 2	8572.530	7445	80.7	96.15	73	96.05	64.3	95.91	49.5	95.70	
	Kempt 2	8598.000										
	Kempt 2	8625.580	7450	80.7	96.30	73	96.19	64.3	96.06	49.5	95.83	
	Kempt 2	8650.000										
	Kempt 2	8678.340	7455	80.7	97.10	73	96.99	64.3	96.85	49.5	96.60	
	Kempt 2	8927.440	7457	78.98	97.46	71.45	97.33	62.93	97.17	48.45	96.89	
	Kempt 2	9129.690	7460	78.98	97.48	71.45	97.35	62.93	97.20	48.45	96.93	
	Kempt 2	9673.590	7465	78.98	98.09	71.45	97.97	62.93	97.83	48.45	97.55	
	Kempt 2	10226.680	7470	78.98	98.33	71.45	98.22	62.93	98.08	48.45	97.80	
	Kempt 2	11080.960	7475	78.98	98.53	71.45	98.41	62.93	98.27	48.45	97.99	
	Kempt 2	11711.590	7480	78.98	98.65	71.45	98.54	62.93	98.40	48.45	98.12	
	Kempt 2	11744.000										
	Kempt 2	11778.280	7485	78.98	98.68	71.45	98.57	62.93	98.43	48.45	98.15	
	Kempt 2	12201.210	7490	78.98	98.91	71.45	98.78	62.93	98.64	48.45	98.36	
	Kempt 2	13100.020	7495	78.98	99.03	71.45	98.92	62.93	98.79	48.45	98.55	
	Kempt 2	13866.050	7500	78.98	99.12	71.45	99.02	62.93	98.88	48.45	98.65	
	Kempt 2	14349.180	7505	78.98	99.15	71.45	99.05	62.93	98.91	48.45	98.68	
	Kempt 2	15899.870	7510	78.98	99.22	71.45	99.12	62.93	98.97	48.45	98.73	
Kempt 2	17227.170	7515	75.46	99.28	68.26	99.18	60.12	99.03	46.28	98.79		
Kempt 2	17248.250											
Kempt 2	17266.750	7520	75.46	99.30	68.26	99.20	60.12	99.04	46.28	98.80		
Kempt 2	17498.610	7525	75.46	99.37	68.26	99.26	60.12	99.10	46.28	98.84		
Kempt 2	17865.950	7530	75.46	99.35	68.26	99.25	60.12	99.09	46.28	98.84		
Kempt 2	17917.500											
Kempt 2	17940.120	7535	75.46	99.38	68.26	99.27	60.12	99.11	46.28	98.86		
Kempt 2	18231.000	7540	75.46	99.43	68.26	99.32	60.12	99.15	46.28	98.89		
Kemptville South Br	Kempt 3	172.778	7543	46.75	99.43	42.29	99.32	37.25	99.16	28.68	98.90	
	Kempt 3	1289.626	7545	46.75	99.44	42.29	99.33	37.25	99.17	28.68	98.91	
	Kempt 3	3255.069	7550	46.75	99.45	42.29	99.35	37.25	99.19	28.68	98.93	
	Kempt 3	4957.200	7555	46.75	99.46	42.29	99.35	37.25	99.20	28.68	98.95	
	Kempt 3	5415.325	7560	46.75	99.45	42.29	99.35	37.25	99.20	28.68	98.95	
	Kempt 3	5452.560										
	Kempt 3	5482.562	7565	46.75	99.47	42.29	99.36	37.25	99.21	28.68	98.96	
Kempt 3	5857.748	7570	46.75	99.51	42.29	99.40	37.25	99.25	28.68	98.99		

Table 5b

Cont'd

Kemptville South Branch	Kempt 3	6516.723	7575	46.75	99.52	42.29	99.41	37.25	99.25	28.68	99.00
	Kempt 3	7061.498	7580	46.75	99.52	42.29	99.41	37.25	99.26	28.68	99.01
	Kempt 3	7771.067	7585	46.75	99.53	42.29	99.42	37.25	99.27	28.68	99.02
	Kempt 3	8834.296	7590	46.75	99.55	42.29	99.45	37.25	99.30	28.68	99.07
	Kempt 3	9177.291	7595	46.75	99.58	42.29	99.47	37.25	99.33	28.68	99.11
	Kempt 3	9194.408	7596	46.75	99.54	42.29	99.44	37.25	99.31	28.68	99.09
	Kempt 3	9210.000									
	Kempt 3	9217.973	7597	46.75	99.62	42.29	99.49	37.25	99.31	28.68	99.09
	Kempt 3	9443.899	7600	46.75	99.72	42.29	99.60	37.25	99.41	28.68	99.18
	Kempt 3	9473.500									
	Kempt 3	9489.127	7605	46.75	99.74	42.29	99.62	37.25	99.43	28.68	99.20
	Kempt 3	9949.659	7610	46.75	99.83	42.29	99.70	37.25	99.53	28.68	99.28
	Kempt 3	9973.831	7612	46.75	99.81	42.29	99.68	37.25	99.51	28.68	99.27
	Kempt 3	9989.000									
	Kempt 3	10005.570	7613	46.75	99.83	42.29	99.71	37.25	99.53	28.68	99.29
	Kempt 3	10028.710	7615	46.75	99.86	42.29	99.73	37.25	99.56	28.68	99.31
	Kempt 3	10652.650	7620	46.75	100.00	42.29	99.88	37.25	99.73	28.68	99.51
	Kempt 3	11295.460	7625	41.82	100.05	37.83	99.94	33.33	99.80	25.65	99.59
	Kempt 3	11326.760	7627	41.82	100.03	37.83	99.92	33.33	99.78	25.65	99.58
	Kempt 3	11345.000									
	Kempt 3	11358.330	7628	41.82	100.05	37.83	99.93	33.33	99.79	25.65	99.59
	Kempt 3	11444.880	7630	41.82	100.09	37.83	99.97	33.33	99.83	25.65	99.62
	Kempt 3	11809.400	7632	41.82	100.15	37.83	100.04	33.33	99.91	25.65	99.70
	Kempt 3	12166.320	7635	41.82	100.20	37.83	100.09	33.33	99.96	25.65	99.75
	Kempt 3	12182.250	7637	41.82	100.16	37.83	100.06	33.33	99.93	25.65	99.73
	Kempt 3	12193.760									
	Kempt 3	12207.760	7638	41.82	100.40	37.83	100.28	33.33	100.13	25.65	99.86
	Kempt 3	12236.440	7640	41.82	100.46	37.83	100.33	33.33	100.18	25.65	99.90
	Kempt 3	13214.620	7645	41.82	100.54	37.83	100.42	33.33	100.28	25.65	100.04
	Kempt 3	13852.070	7650	41.82	100.58	37.83	100.46	33.33	100.34	25.65	100.14
	Kempt 3	13878.000	7653	41.82	100.58	37.83	100.46	33.33	100.34	25.65	100.15
	Kempt 3	13926.520	7655	41.82	100.58	37.83	100.46	33.33	100.34	25.65	100.15
	Kempt 3	14140.660	7660	41.82	100.59	37.83	100.47	33.33	100.36	25.65	100.18
	Kempt 3	14314.070	7665	41.82	100.61	37.83	100.50	33.33	100.39	25.65	100.22
	Kempt 3	14337.200	7667	41.82	100.57	37.83	100.46	33.33	100.36	25.65	100.20
	Kempt 3	14351.000									
	Kempt 3	14362.400	7668	41.82	100.58	37.83	100.47	33.33	100.37	25.65	100.21
	Kempt 3	14395.490	7670	41.82	100.67	37.83	100.55	33.33	100.44	25.65	100.26
	Kempt 3	14710.270	7675	41.82	100.71	37.83	100.60	33.33	100.49	25.65	100.32
	Kempt 3	14730.260	7677	41.82	100.69	37.83	100.58	33.33	100.48	25.65	100.31
	Kempt 3	14751.000									
	Kempt 3	14761.910	7678	41.82	101.65	37.83	101.57	33.33	101.47	25.65	101.31
	Kempt 3	14792.900	7680	41.82	101.67	37.83	101.59	33.33	101.49	25.65	101.32
	Kempt 3	15097.700	7682	41.82	101.67	37.83	101.59	33.33	101.49	25.65	101.32
	Kempt 3	15548.530	7685	41.82	101.67	37.83	101.59	33.33	101.49	25.65	101.32
	Kempt 3	15572.790	7686	41.82	101.67	37.83	101.59	33.33	101.49	25.65	101.32
	Kempt 3	15584.390									
	Kempt 3	15595.990	7687	41.82	101.68	37.83	101.60	33.33	101.51	25.65	101.36
	Kempt 3	15623.830	7688	41.82	101.69	37.83	101.61	33.33	101.52	25.65	101.36
	Kempt 3	15798.100	7690	41.82	101.69	37.83	101.61	33.33	101.52	25.65	101.36
Kempt 3	16295.060	7695	41.82	101.70	37.83	101.62	33.33	101.52	25.65	101.37	
Kempt 3	17053.020	7700	41.82	101.70	37.83	101.63	33.33	101.53	25.65	101.38	
Kempt 3	17365.560	7705	41.82	101.71	37.83	101.63	33.33	101.54	25.65	101.38	
Kempt 3	18205.300	7710	41.82	101.73	37.83	101.65	33.33	101.56	25.65	101.41	
Kempt 3	19473.850	7715	35.38	101.78	32	101.71	28.19	101.63	21.7	101.48	
Kempt 3	20488.620	7720	35.38	102.01	32	101.94	28.19	101.87	21.7	101.73	
Kempt 3	21203.410	7725	35.38	102.13	32	102.07	28.19	102.00	21.7	101.87	
Kempt 3	21690.760	7730	35.38	102.24	32	102.18	28.19	102.12	21.7	101.99	

Table 5b

Cont'd

Kempville South Branch	Kempt 3	21722.500									
	Kempt 3	21739.220	7732	35.38	102.26	32	102.20	28.19	102.13	21.7	102.00
	Kempt 3	22159.080	7735	35.38	102.39	32	102.32	28.19	102.24	21.7	102.10
	Kempt 3	22940.430	7740	35.38	102.57	32	102.52	28.19	102.45	21.7	102.33
	Kempt 3	23568.350	7745	35.38	103.20	32	103.17	28.19	103.12	21.7	102.97
	Kempt 3	23894.250	7750	35.38	103.83	32	103.78	28.19	103.71	21.7	103.53
	Kempt 3	23966.780	7753	35.38	103.85	32	103.80	28.19	103.74	21.7	103.58
	Kempt 3	23982.000									
	Kempt 3	24009.720	7755	35.38	104.17	32	104.08	28.19	103.98	21.7	103.80
	Kempt 3	24248.220	7757	35.38	104.85	32	104.67	28.19	104.53	21.7	104.28
	Kempt 3	24594.490	7760	35.38	105.26	32	105.04	28.19	104.90	21.7	104.62
	Kempt 3	24929.050	7765	35.38	106.01	32	105.93	28.19	105.84	21.7	105.70
	Kempt 3	25088.750	7766	35.38	106.32	32	106.27	28.19	106.20	21.7	106.09
	Kempt 3	25254.750	7767	35.38	106.76	32	106.77	28.19	106.77	21.7	106.72
	Kempt 3	25342.050	7768	35.38	107.63	32	107.52	28.19	107.42	21.7	107.26
	Kempt 3	25432.270	7770	35.38	109.10	32	109.05	28.19	108.98	21.7	108.85
	Kempt 3	25499.890	7772	35.38	109.58	32	109.53	28.19	109.48	21.7	109.35
	Kempt 3	25510.300									
	Kempt 3	25526.790	7773	35.38	110.24	32	110.06	28.19	109.91	21.7	109.64
	Kempt 3	25551.710	7775	35.38	110.59	32	110.41	28.19	110.24	21.7	109.93
Kempville North Branch	Kempt North	84.910	7810	33.46	99.43	30.27	99.32	26.66	99.15	20.53	98.89
	Kempt North	298.750	7815	33.46	99.44	30.27	99.33	26.66	99.16	20.53	98.90
	Kempt North	466.240	7820	33.46	99.40	30.27	99.30	26.66	99.14	20.53	98.89
	Kempt North	493.120									
	Kempt North	516.620	7825	33.46	99.43	30.27	99.32	26.66	99.16	20.53	98.91
	Kempt North	538.310	7828	33.46	99.46	30.27	99.35	26.66	99.19	20.53	98.93
	Kempt North	552.360									
	Kempt North	562.860	7830	33.46	99.44	30.27	99.33	26.66	99.18	20.53	98.93
	Kempt North	858.020	7835	33.46	99.58	30.27	99.46	26.66	99.30	20.53	99.05
	Kempt North	1939.370	7840	33.46	99.66	30.27	99.54	26.66	99.40	20.53	99.20
	Kempt North	2613.490	7845	33.46	99.69	30.27	99.58	26.66	99.46	20.53	99.32
	Kempt North	3602.980	7850	33.46	99.74	30.27	99.67	26.66	99.57	20.53	99.50
	Kempt North	3953.230	7851	33.46	99.87	30.27	99.83	26.66	99.80	20.53	99.75
	Kempt North	4196.730	7852	33.46	100.05	30.27	100.02	26.66	99.97	20.53	99.90
	Kempt North	4512.190	7854	33.46	100.56	30.27	100.51	26.66	100.42	20.53	100.30
	Kempt North	4749.930	7855	33.46	100.92	30.27	100.87	26.66	100.79	20.53	100.63
	Kempt North	4771.400	7856	33.46	100.90	30.27	100.86	26.66	100.78	20.53	100.63
	Kempt North	4791.850									
	Kempt North	4807.850	7857	33.46	100.97	30.27	100.91	26.66	100.83	20.53	100.67
	Kempt North	4853.130	7860	33.46	101.12	30.27	101.04	26.66	100.94	20.53	100.75
	Kempt North	5132.190	7862	33.46	101.52	30.27	101.45	26.66	101.35	20.53	101.25
	Kempt North	5301.390	7864	33.46	102.02	30.27	101.87	26.66	101.85	20.53	101.70
	Kempt North	5628.640	7865	33.46	102.94	30.27	102.86	26.66	102.76	20.53	102.61
	Kempt North	6050.640	7866	33.46	103.83	30.27	103.76	26.66	103.68	20.53	103.45
	Kempt North	6231.600	7867	33.46	104.03	30.27	103.97	26.66	103.90	20.53	103.71
	Kempt North	6609.120	7870	33.46	104.14	30.27	104.08	26.66	104.01	20.53	103.83
	Kempt North	7197.020	7875	33.46	104.28	30.27	104.22	26.66	104.14	20.53	103.97
	Kempt North	7221.500									
	Kempt North	7238.930	7878	33.46	104.53	30.27	104.49	26.66	104.21	20.53	104.03
	Kempt North	7268.270	7880	33.46	104.60	30.27	104.54	26.66	104.27	20.53	104.07
	Kempt North	7469.570	7885	33.46	104.80	30.27	104.73	26.66	104.52	20.53	104.31
	Kempt North	7750.330	7890	33.46	104.97	30.27	104.90	26.66	104.73	20.53	104.53
	Kempt North	7769.000									
	Kempt North	7792.070	7891	33.46	105.21	30.27	105.10	26.66	104.87	20.53	104.60
Kempt North	7809.220	7892	33.46	105.27	30.27	105.15	26.66	104.93	20.53	104.64	
Kempt North	8213.580	7894	33.46	105.33	30.27	105.23	26.66	105.08	20.53	104.91	
Kempt North	8608.000	7896	33.46	105.45	30.27	105.35	26.66	105.21	20.53	105.01	

Table 5b

Cont'd

Barnes	Barnes 1	52.103	7910	10.09	87.53	9.13	87.23	8.04	86.97	6.19	87.08
	Barnes 1	148.616	7912	10.09	87.53	9.13	87.23	8.04	86.96	6.19	87.08
	Barnes 1	198.913	7914	10.09	87.52	9.13	87.22	8.04	86.96	6.19	87.08
	Barnes 1	219.000									
	Barnes 1	239.473	7916	10.09	88.22	9.13	87.92	8.04	87.82	6.19	87.45
	Barnes 1	329.289	7918	10.09	88.24	9.13	87.94	8.04	87.84	6.19	87.46
	Barnes 1	419.543	7920	10.09	88.22	9.13	87.93	8.04	87.83	6.19	87.45
	Barnes 1	431.000									
	Barnes 1	442.853	7922	10.09	89.16	9.13	89.02	8.04	88.87	6.19	88.59
	Barnes 1	453.145	7923	10.09	89.19	9.13	89.05	8.04	88.90	6.19	88.61
	Barnes 1	520.875	7924	10.09	89.19	9.13	89.06	8.04	88.90	6.19	88.61
	Barnes 1	539.500									
	Barnes 1	556.093	7926	10.09	89.39	9.13	89.25	8.04	89.08	6.19	88.79
	Barnes 1	618.813	7927	10.09	89.41	9.13	89.27	8.04	89.10	6.19	88.81
	Barnes 1	663.384	7928	10.09	89.42	9.13	89.27	8.04	89.11	6.19	88.84
	Barnes 1	725.531	7929	10.09	89.43	9.13	89.30	8.04	89.16	6.19	88.99
	Barnes 1	917.037	7930	10.09	89.94	9.13	89.92	8.04	89.91	6.19	89.86
	Barnes 1	1174.879	7932	10.09	90.49	9.13	90.46	8.04	90.41	6.19	90.31
	Barnes 1	1545.167	7934	10.09	90.91	9.13	90.88	8.04	90.82	6.19	90.70
	Barnes 1	1837.870	7936	10.09	91.26	9.13	91.23	8.04	91.19	6.19	91.12
	Barnes 1	2041.768	7938	10.09	91.53	9.13	91.50	8.04	91.46	6.19	91.39
	Barnes 1	2246.165	7940	10.09	91.87	9.13	91.81	8.04	91.75	6.19	91.63
	Barnes 1	2547.123	7942	10.09	92.49	9.13	92.43	8.04	92.36	6.19	92.21
	Barnes 1	2823.712	7944	10.09	93.38	9.13	93.34	8.04	93.28	6.19	93.14
	Barnes 1	2863.525	7945	10.09	93.51	9.13	93.47	8.04	93.41	6.19	93.27
	Barnes 1	2896.902	7946	10.09	93.92	9.13	93.88	8.04	93.83	6.19	93.73
	Barnes 1	2912.642									
	Barnes 1	2922.642	7948	10.09	94.34	9.13	94.27	8.04	94.19	6.19	94.05
	Barnes 1	3204.554	7950	10.09	95.17	9.13	95.13	8.04	95.06	6.19	94.87
	Barnes 1	3490.855	7952	10.09	95.54	9.13	95.51	8.04	95.46	6.19	95.36
	Barnes 1	3581.973	7954	10.09	95.57	9.13	95.53	8.04	95.49	6.19	95.41
	Barnes 1	3592.500									
	Barnes 1	3599.501	7955	10.09	95.70	9.13	95.65	8.04	95.57	6.19	95.47
Barnes 2	3645.256	7956	3.61	95.78	3.27	95.72	2.88	95.63	2.22	95.51	
Barnes 2	3790.775	7958	3.61	95.78	3.27	95.72	2.88	95.64	2.22	95.52	
Barnes 2	3898.204	7960	3.61	95.79	3.27	95.73	2.88	95.65	2.22	95.53	
Barnes 2	3923.000										
Barnes 2	3948.159	7962	3.61	96.87	3.27	96.77	2.88	96.66	2.22	96.45	
Barnes 2	4126.765	7964	3.61	95.69	3.27	95.63	2.88	95.54	2.22	95.44	
Barnes Trib1	BT 1	70.504	7980	6.38	95.96	5.77	95.90	5.08	95.83	3.91	95.69
	BT 1	113.949	7981	6.38	96.02	5.77	95.97	5.08	95.90	3.91	95.76
	BT 1	151.055	7982	6.38	96.03	5.77	95.98	5.08	95.91	3.91	95.78
	BT 1	235.000									
	BT 1	344.359	7984	6.38	96.50	5.77	96.50	5.08	96.29	3.91	95.97
	BT 1	496.611	7986	6.38	96.51	5.77	96.51	5.08	96.39	3.91	96.14

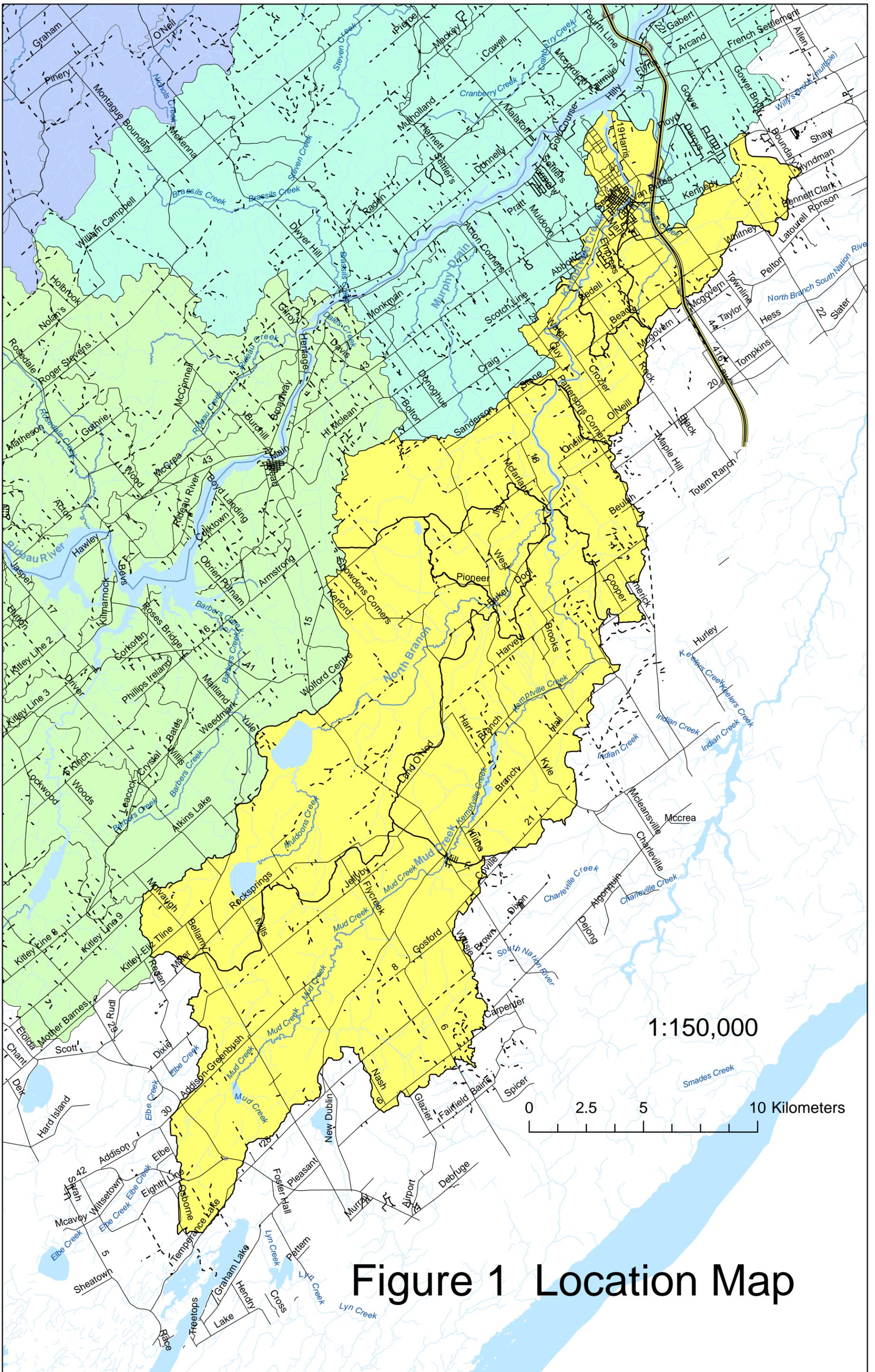


Figure 1 Location Map

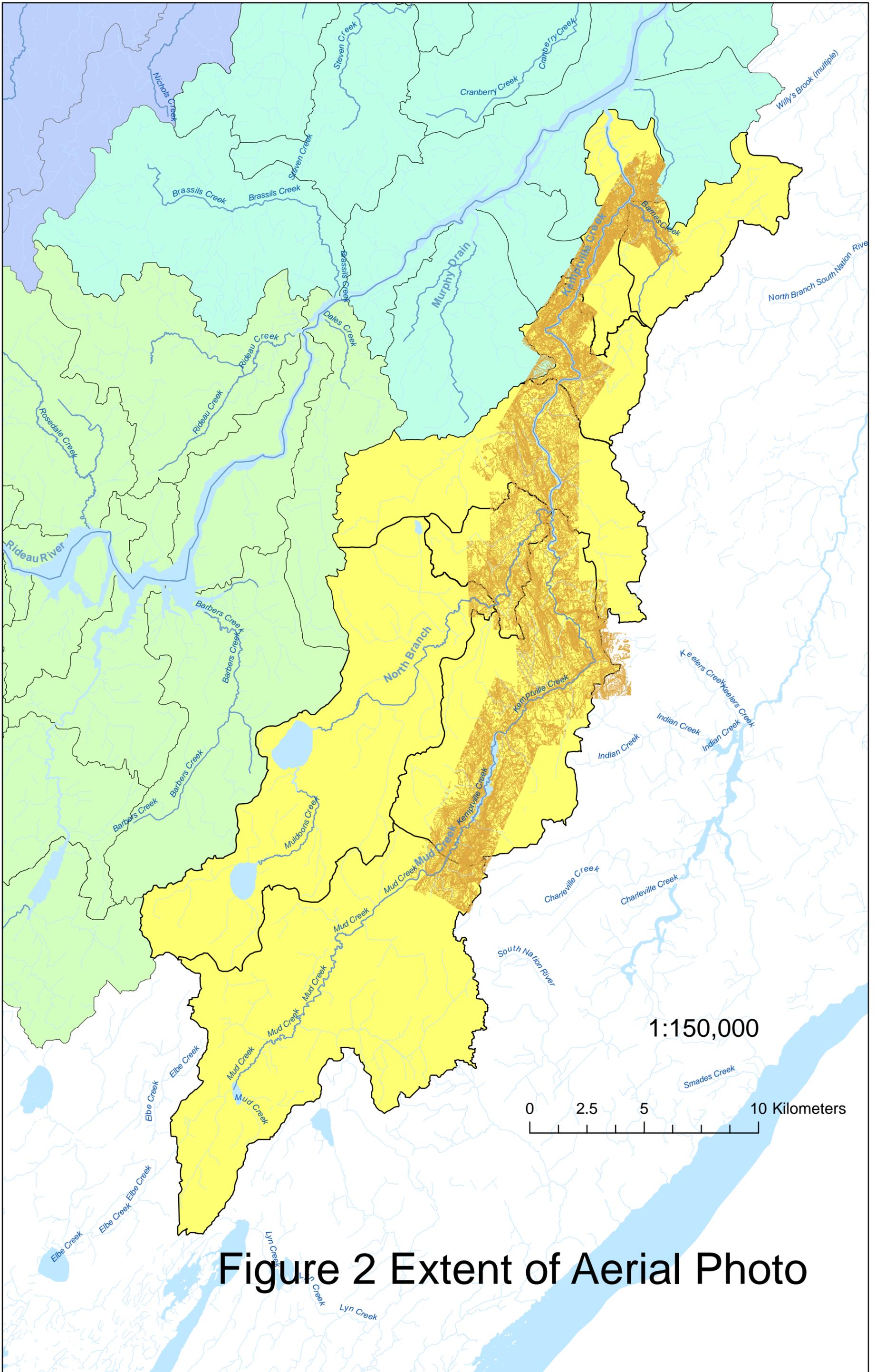


Figure 2 Extent of Aerial Photo

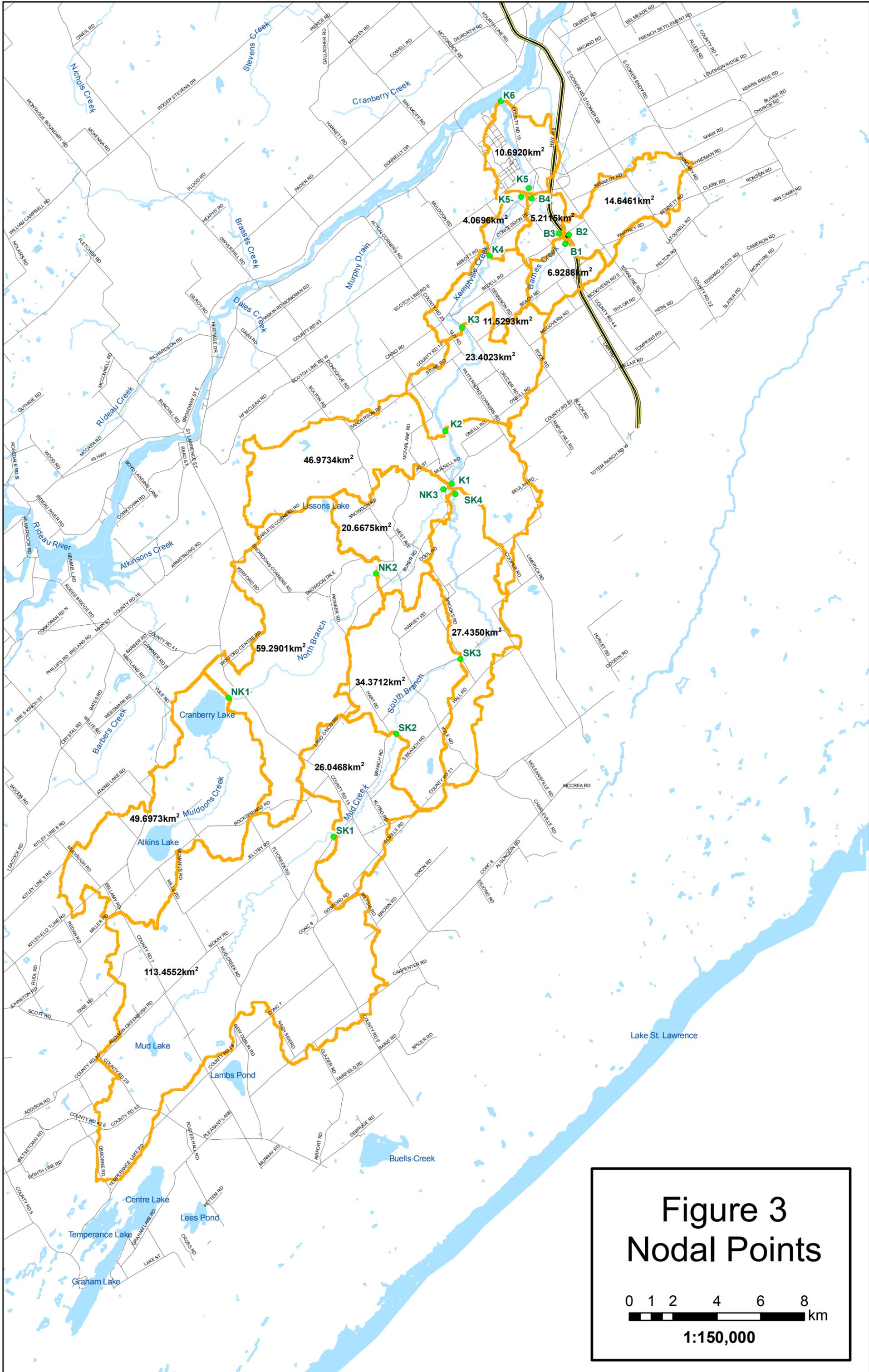
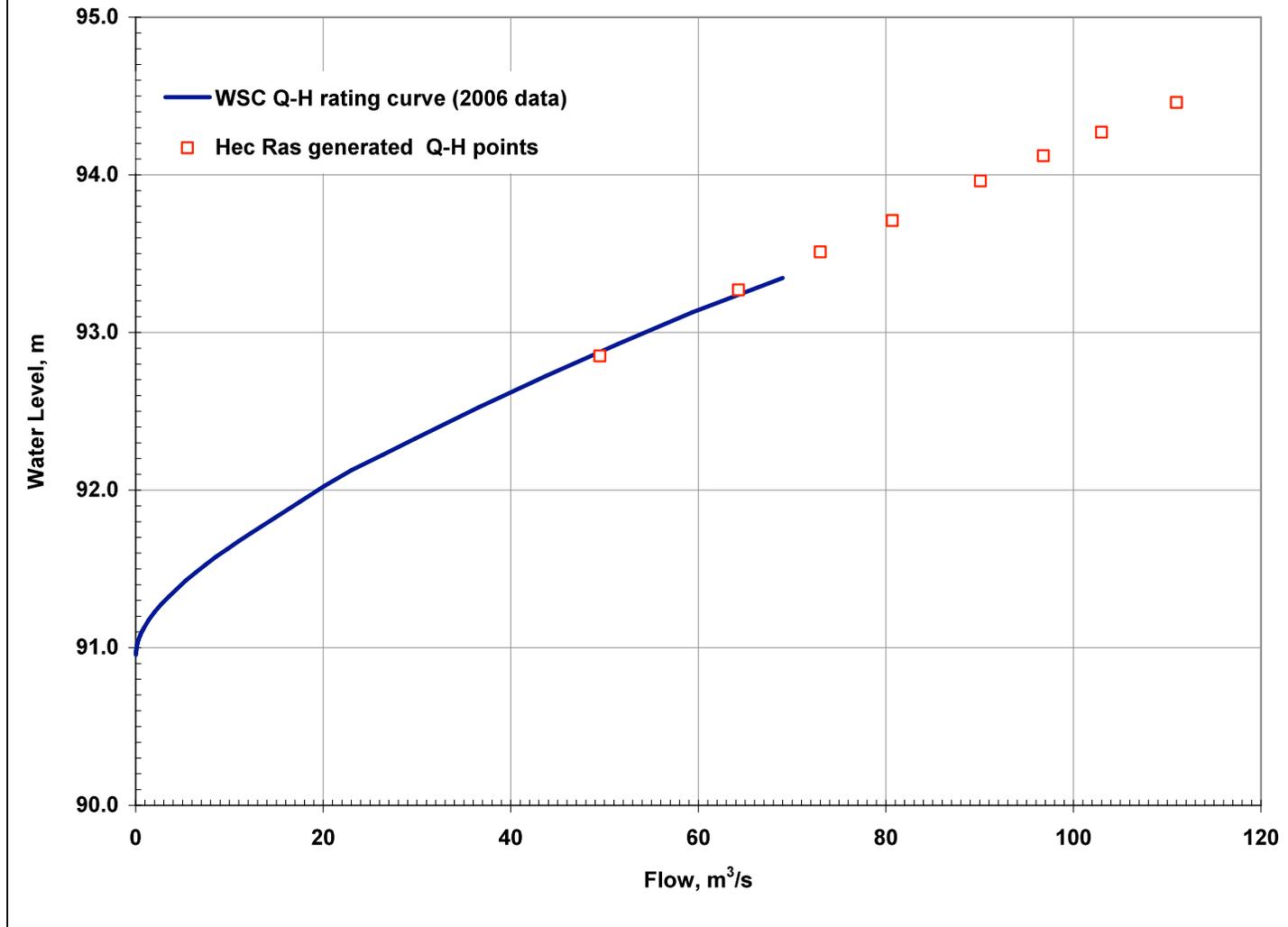


Figure 3
Nodal Points

0 1 2 4 6 8 km

1:150,000

Figure 4 Comparison of Rating Curve and HEC-RAS generated Water Levels
Location: Kemptville Creek near Kemptville Gauge (02LA006)



Appendix A
HRC-RAS Model Output

(attached file: *AppendixA.pdf*)

Longitudinal Profiles

Cross-Sections