

Appendix D

Hydraulic Modelling Information

TABLE D-1
CITY OF OTTAWA
SHIRLEY'S BROOK & WATT'S CREEK - PHASE 2 STORMWATER MANAGEMENT STUDY
HEC-RAS FLOW LOCATION SUMMARY - WATT'S CREEK / KIZELL DRAIN



Version 1.0
 Project No.: 60264539
 Date: 2/6/2015
 Design: GAF/OC

- Notes: 1. Design Flows based on 24 hour Chicago distribution.
 2. SWMHYMO flow points located at U/S side of hydraulic structure locations.
 3. Flow changes in HEC-RAS shifted upstream and are read in a downstream direction.
 4. Interpolated flows based on 20% maximum increase between flow points. 20%
 5. Flow change locations shifted to next upstream flow point in HEC-RAS in order to be read in a downstream direction.
 6. Blue values input to HEC-RAS model.

HEC-RAS River Station (Ref. to Fig. X.X)	Description	SWMHYMO Flow Point (Ref. to Fig. X.X)	SWMHYMO Design Storm Peak Flows (m ³ /s)							HEC-RAS Flow Change Locations						
			2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	Jul-79	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	Jul-79
10234.89	U/S Study Limit	KFP-1	0.32	0.47	0.61	0.73	0.81	0.91	0.76	0.33	0.51	0.66	0.80	0.90	1.02	0.87
9793.271		KFP-2	0.33	0.51	0.66	0.80	0.90	1.02	0.87							
9781.939	640830 - CN Rail Crossing															
9759.191	640820 - Station Road Crossing															
9746.919										0.39	0.63	0.81	1.02	1.17	1.37	1.30
9657.568			0.39	0.63	0.81	1.02	1.17	1.37	1.30	0.45	0.74	0.97	1.25	1.45	1.72	1.74
9442.479			0.45	0.74	0.97	1.25	1.45	1.72	1.74	0.52	0.86	1.12	1.47	1.73	2.07	2.17
9363.261			0.52	0.86	1.12	1.47	1.73	2.07	2.17	0.58	0.97	1.27	1.70	2.00	2.41	2.61
9327.433	K5 - Nordion Utility Crossing															
9252.569			0.58	0.97	1.27	1.70	2.00	2.41	2.61	0.64	1.09	1.43	1.92	2.28	2.76	3.04
9169.896	K4 - Nordion Internal Crossing															
9094.472		KFP-3	0.64	1.09	1.43	1.92	2.28	2.76	3.04							
9086.378	648310 - Station/March Road Crossing															
8991.378	D/S March Road Crossing (not Modelled)									1.13	1.95	2.51	3.34	3.94	4.74	5.31
8730.992	640800 - Legget Road Crossing															
8703.631			1.13	1.95	2.51	3.34	3.94	4.74	5.31	1.62	2.80	3.60	4.76	5.60	6.73	7.58
8510.656	648870 - KRP Pedestrian Crossing															
8236.271			1.62	2.80	3.60	4.76	5.60	6.73	7.58	2.11	3.66	4.69	6.18	7.26	8.71	9.85
7847.556			2.11	3.66	4.69	6.18	7.26	8.71	9.8	2.60	4.52	5.78	7.60	8.92	10.7	12.1
7573.092	647390 - Marsh Sparrow Road Crossing															
7438.877			2.60	4.52	5.78	7.60	8.92	10.7	12.1	3.09	5.38	6.86	9.02	10.6	12.7	14.4
7259.491	647300-1 & 2 Legget Road Crossing															
7020.547		KFP-4	3.09	5.38	6.86	9.02	10.6	12.7	14.4							
7000.502	117100 - Herzberg Road Crossing															
6984.227										2.97	4.80	6.19	8.12	9.7	11.5	12.9
6542.144		KFP-5	2.97	4.80	6.19	8.12	9.74	11.5	12.9							
6522.792	117060 - Carling Ave. Crossing															
6500.704										3.59	6.01	7.61	9.9	11.7	13.9	15.8
6384.713			3.59	6.01	7.61	9.9	11.7	13.9	15.8	4.10	6.65	8.35	10.7	12.7	15.2	17.1
6137.62			4.10	6.65	8.35	10.7	12.7	15.2	17.1	4.60	7.28	9.10	11.5	13.8	16.5	18.5
6129.747	K2 - Pedestrian Crossing															
5934.876			4.60	7.28	9.10	11.5	13.8	16.5	18.5	5.11	7.92	9.8	12.4	14.9	17.7	19.9
5846.72			5.11	7.92	9.85	12.4	14.9	17.7	19.9							
5691.871										5.61	8.56	10.6	13.2	16.0	19.0	21.2
5574.705	U/S Confluence with Watt's Creek	KFP-6	5.6	8.6	10.6	13.2	16.0	19.0	21.2	11.2	17.4	21.2	27.0	32.4	37.5	42.8
5432.364	D/S Confluence with Watt's Creek	WFP-2	11.2	17.4	21.2	27.0	32.4	37.5	42.8	11.3	17.7	21.6	27.6	33.1	38.4	43.6
4958.865	Confluence with South Trib	WFP-3	11.3	17.7	21.6	27.6	33.1	38.4	43.6	11.3	17.7	21.6	27.6	33.1	38.4	43.6
4717.456	W4 - CN Rail Crossing															
3691.656	117110 - Carling Ave. Crossing	WFP-4	11.1	17.5	21.4	27.4	32.7	37.7	42.2							
3669.048										10.5	16.5	20.3	26.0	31.0	35.8	39.5
2964.234			10.5	16.5	20.3	26.0	31.0	35.8	39.5	9.9	15.5	19.1	24.6	29.4	33.9	36.8
2958.099	117270 - Sandhill Crossing															
2266.167			9.9	15.5	19.1	24.6	29.4	33.9	36.8	9.29	14.5	18.0	23.2	27.7	32.0	34.2
1491.815			9.3	14.5	18.0	23.2	27.7	32.0	34.2	8.68	13.5	16.9	21.8	26.0	30.1	31.5
673.4133			8.7	13.5	16.9	21.8	26.0	30.1	31.5	8.06	12.5	15.7	20.4	24.3	28.2	28.8
507.9618	117160 - Malibar Crossing															
357.438	117120 - Shirley's Crossing															
44.72172		WFP-5	8.1	12.5	15.7	20.4	24.3	28.2	28.8							



TABLE D-2
CITY OF OTTAWA
SHIRLEY'S BROOK & WATT'S CREEK - PHASE 2 STORMWATER MANAGEMENT STUDY
HEC-RAS FLOW LOCATION SUMMARY - SHIRLEY'S BROOK



Version 1.0
 Project No.: 60164823
 Date: 2/6/2015
 Design: GAF/OC

- Notes: 1. Design Flows based on 24 hour Chicago distribution.
 2. SWMHYMO flow points located at U/S side of hydraulic structure locations.
 3. Flow changes in HEC-RAS shifted upstream and are read in a downstream direction.
 4. Interpolated flows based on 20% maximum increase between flow points.
 5. Flow change locations shifted to next upstream flow point in HEC-RAS in order to be read in a downstream direction.
 6. Blue values input to HEC-RAS model.

HEC-RAS River Station (Ref. to Fig. X.X)	Description	SWMHYMO Flow Point (Ref. to Fig. X.X)	SWMHYMO Design Storm Peak Flows (m ³ /s)							HEC-RAS Flow Change Locations (m ³ /s)						
			2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	Jul-79	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	Jul-79
12308.03	U/S Study Limit									0.31	1.12	1.91	3.08	4.14	5.38	5.74
10781.03		SBF-1	0.31	1.12	1.91	3.08	4.14	5.38	5.74							
10770.63	648640 - Goulbourn Forced Road															
10758.25										0.39	1.27	2.11	3.35	4.47	5.76	6.08
10470.06		SPF-2	0.39	1.27	2.11	3.35	4.47	5.76	6.08							
10463.11	645000 - CN Rail Crossing															
10453.9										0.37	1.22	2.04	3.30	4.42	5.70	5.75
9320.319		SPF-3	0.37	1.22	2.04	3.30	4.42	5.70	5.75							
9296.913	Pedestrian Trail @ Hydro Corridor															
9269.78										0.63	1.61	2.51	3.85	5.02	6.38	6.22
8464.13	Hines Road															
8190.341		SPF-4	0.63	1.61	2.51	3.85	5.02	6.38	6.22							
8168.672	647310 - March Road Crossing															
8147.386										1.13	1.88	2.81	4.20	5.43	6.83	6.25
7840.144	Legget Road Crossing															
6678.357		SPF-5	1.13	1.88	2.81	4.20	5.43	6.83	6.25							
6662.563	647320 - Terry Fox Drive Crossing															
6646.137										1.52	2.50	3.50	5.06	6.29	7.65	7.44
6518.839			1.52	2.50	3.50	5.06	6.29	7.65	7.44	1.91	3.12	4.20	5.91	7.14	8.48	8.64
6337.265			1.91	3.12	4.20	5.91	7.14	8.48	8.64	2.31	3.73	4.89	6.77	8.00	9.30	9.84
6178.128			2.31	3.73	4.89	6.77	8.00	9.30	9.84	2.70	4.35	5.59	7.62	8.86	10.12	11.04
6155.664	Culvert															
6095.834			2.70	4.35	5.59	7.62	8.86	10.12	11.04	3.09	4.97	6.28	8.48	9.72	10.94	12.24
5887.91		SPF-6	3.09	4.97	6.28	8.48	9.72	10.94	12.24							
5854.557	SWF-1215 On-Line SWM Pond Outlet															
5760.031			3.36	5.18	6.60	8.83	10.27	11.36	12.8	3.63	5.40	6.92	9.19	10.82	11.8	13.3
5629.195			3.63	5.40	6.92	9.19	10.82	11.8	13.3	3.90	5.62	7.24	9.55	11.4	12.2	13.8
5536.916			3.90	5.62	7.24	9.55	11.4	12.2	13.8	4.17	5.84	7.56	9.91	11.9	12.6	14.4
5531.699	Culvert															
5435.197			4.17	5.84	7.56	9.91	11.9	12.6	14.4	4.43	6.06	7.89	10.26	12.5	13.1	14.9
5373.434		SPF-7	4.43	6.06	7.89	10.26	12.48	13.1	14.9							
5361.118	647650 - Klondike Road Crossing															
5349.394										4.38	6.05	7.85	10.18	12.4	12.5	14.6
4998.115	U/S of confluence with North Branch	SPF-8	4.38	6.05	7.85	10.18	12.4	12.5	14.6							
4901.173										5.90	8.30	10.79	14.1	16.9	18.5	21.0
4525.185		SPF-9	5.90	8.30	10.79	14.1	16.9	18.5	21.0							
4507.086	647380 - Marconi															
4486.599										5.90	8.30	10.79	14.1	16.9	18.5	21.0
4110.796		SPF-10	5.83	8.27	10.70	13.8	16.6	18.2	20.5							
4090.206	645030 - CN Railway									5.95	8.57	10.96	14.2	17.1	18.9	21.4
3320.636		SPF-11	5.95	8.57	10.96	14.2	17.1	18.9	21.4							
3308.937	648620 - 4th Line															
3301.163										5.71	8.38	10.80	14.0	16.7	17.9	20.0
3100.236	Culvert															
2011.088		SPF-12	5.71	8.38	10.80	14.0	16.7	17.9	20.0							
1869.72	Stream Gauge Location															
1754.4										5.82	8.84	11.4	14.7	17.6	18.6	20.1
1276.827	SB7 - DND Crossing															
29.9602	Outlet	SPF-13	5.82	8.84	11.4	14.7	17.6	18.6	20.1							



TABLE D-3
CITY OF OTTAWA
SHIRLEY'S BROOK & WATT'S CREEK - PHASE 2 STORMWATER MANAGEMENT STUDY
EXISTING CONDITION HYDRAULIC STRUCTURE CAPACITY ASSESSMENT - WATT'S CREEK - KIZELL DRAIN



Version: 1
 Project No.: 60264539
 Date: 2/6/2015
 Design: GAF/SN

Culvert Overtopping Guidelines (City of Ottawa SCG Table 6.4)

	< 6 m Span	> 6 m Span
Local Rural	10	25
Local Urban	25	50
Collector	25	50
Rural Arterial	25	50
Urban Arterial	50	100

- Notes: 1. 49 m - 2500 mm x 1500 mm box culvert beneath March Road not modelled in HEC-RAS. Encroachment option used to reflect culvert width.
 2. Road classification obtained from City of Ottawa OP Schedules
 3. Hydraulic performance information (i.e., design water level, flood depth, capacity prior to overtopping etc.) obtained from HEC-RAS model.
 4. For crossings not within SDG Table 6.4 - 100-year design flow assumed for CN Rail crossings. Minimum 10-year flow assumed for pedestrian and private crossings < 6 m span and 25-year > 6 m span.
 5. Blue highlighted values calculated. Red highlighted values do not meet specific criteria.

Hydraulic Structure Information					Hydraulic Performance Details ³								City of Ottawa Crossing Criteria		MTO Drainage Design Standard (January, 2008)						Comment	
Structure ID (Refer to Figure X.X)	Watercourse	Location	Type of Crossing	Road Classification ²	HEC-RAS Section No.	Design U/S EGL (m)	Design U/S Flood Depth (m)	Total Span (m)	Rise/Dia m. (m)	U/S Invert (m)	Min. Top of Road (m)	Capacity Prior to Overtopping (Year)	Design Flow (SDG Table 6.4) ⁴ (Year)	Meet City Standard? YES/NO	Minimum Freeboard (WC-2 / WC-7)		Minimum Clearance (WC-2 / WC-7)		Maximum Allowable HW/D (WC-7)			Meet MTO Standard? (YES/NO)
															Required (m)	Actual (m)	Required (m)	Actual (m)	Allowable	Actual		
640830	Kizell Drain	CN Rail	Culvert	n/a	9781.939	84.73	0.90	-	1.20	83.83	87.68	100	100	YES	1.0	3.0			1.5	0.8	YES	
640820	Kizell Drain	Station Road (U/S)	Culvert	Local Urban	9759.191	82.96	0.84	-	1.20	82.12	84.40	100	25	YES	0.3	1.4			1.5	0.7	YES	
K5	Kizell Drain	Nordion Utility ⁴	Culvert	Private	9327.433	79.76	1.07	3.00	0.50	78.69	82.00	100	10	YES	0.3	2.2			1.5	2.1	NO	Does not meet MTO HW/D requirements
K4	Kizell Drain	Nordion Internal ⁴	Culvert	Private	9161.24	79.57	1.09	-	1.20	78.48	80.20	25	10	YES	0.3	0.6			1.5	0.9	YES	
640830	Kizell Drain	March Road (Station Road D/S) ¹	Culvert	Urban Arterial	9086.378	79.98	1.83	-	1.20	78.15	81.15	100	50	YES	1.0	1.2			1.5	1.5	YES	
640800	Kizell Drain	Legget Drive (U/S)	Culvert	Collector	8730.992	78.02	1.56	-	1.20	76.46	78.20	25	25	YES	1.0	0.2			1.5	1.3	NO	Does not meet MTO freeboard requirements
648470	Kizell Drain	Pedestrian Crossing ⁴	Bridge	n/a	8510.656	77.04	0.94	10.00	1.50	76.10	77.50	100	25	YES	1.0	0.5	0.3	0.6			NO	Does not meet MTO freeboard requirements
647390	Kizell Drain	Marsh Sparrow Private	Culvert	Local Urban	7573.092	75.63	1.85	-	1.50	73.78	76.50	50	25	YES	0.3	0.9			1.5	1.2	YES	
647300	Kizell Drain	Legget Drive (D/S)	Culvert	Collector	7259.491	74.87	2.17	-	1.50	72.70	74.70	10	25	NO	1.0	-0.2			1.5	1.4	NO	Does not meet City of Ottawa criteria or MTO freeboard requirements
117100	Kizell Drain	Herzberg Road	Culvert	Collector	7000.502	74.16	2.06	3.00	2.00	72.10	74.67	50	25	YES	1.0	0.5			1.5	1.0	NO	Does not meet MTO freeboard requirements
117060	Kizell Drain	Carling Avenue	Culvert	Urban Arterial	6522.792	74.13	2.63	4.80	1.20	71.50	74.40	50	50	YES	1.0	0.3			1.5	2.2	NO	Does not meet MTO freeboard or HW/D requirements
K2	Kizell Drain	Pedestrian ⁴	Culvert	n/a	6129.747	73.52	2.11	2.36	1.80	71.41	73.30	2	10	NO	0.3	-0.2			1.5	1.2	NO	Does not meet City of Ottawa criteria or MTO freeboard requirements
W4	Watt's Creek	CN Rail ⁴	Culvert	n/a	4717.456	73.75	3.85	-	2.50	69.90	80.10	100	100	YES	1.0	6.3			1.5	1.5	YES	
117110	Watt's Creek	Carling Avenue	Bridge	Urban Arterial	3691.656	67.24	2.52	9.20	3.70	64.72	68.30	100	100	YES	1.0	1.1	1.0	1.2			YES	
117270	Watt's Creek	Sandhill Road	Bridge	Local Urban	2958.099	65.00	2.67	7.00	2.30	62.33	65.10	100	50	YES	0.3	0.1	0.3	-0.4			NO	Does not meet MTO freeboard or clearance requirements
117160	Watt's Creek	Malibar Boulevard	Culvert	Local Urban	507.9618	60.63	3.17	4.10	2.70	57.46	60.80	25	25	YES	0.3	0.2			1.5	1.2	NO	Does not meet MTO freeboard requirements
117120	Watt's Creek	Shirley Boulevard	Bridge	Local Urban	357.438	60.18	1.58	9.00	2.10	58.60	60.80	100	50	YES	1.0	0.6	0.3	0.5			NO	Does not meet MTO freeboard requirements



TABLE D-4
CITY OF OTTAWA
SHIRLEY'S BROOK & WATT'S CREEK - PHASE 2 STORMWATER MANAGEMENT STUDY
EXISTING CONDITION HYDRAULIC STRUCTURE CAPACITY ASSESSMENT - SHIRLEY'S BROOK



Version: 1
 Project No.: 60264539
 Date: 2/6/2015
 Design: GAF/SN

Culvert Overtopping Guidelines (City of Ottawa SCG Table 6.4)

	< 6 m Span	> 6 m Span
Local Rural	10	25
Local Urban	25	50
Collector	25	50
Rural Arterial	25	50
Urban Arterial	50	100

- Notes: 1. 49 m - 2500 mm x 1500 mm box culvert beneath March Road not modelled in HEC-RAS. Encroachment option used to reflect culvert width.
 2. Road classification obtained from City of Ottawa OP Schedules
 3. Hydraulic performance information (i.e., design water level, flood depth, capacity prior to overtopping etc.) obtained from HEC-RAS model.
 4. For crossings not within SDG Table 6.4 - 100-year design flow assumed for CN Rail crossings. Minimum 10-year flow assumed for pedestrian and private crossings < 6 m span and 25-year > 6 m span.
 5. Blue highlighted values calculated. Red highlighted values do not meet specific criteria.
 6. 4th Line March Valley Road CSPA culvert replaced with a 1.5 m H x 3.0 m W concrete box culvert in 2013.

Hydraulic Structure Information					Hydraulic Performance Details ³								City of Ottawa Crossing Criteria		MTO Drainage Design Standard (January, 2008)						Comment	
Structure ID (Refer to Figure X.X)	Watercourse	Location	Type of Crossing	Road Classification ²	HEC-RAS Section No.	Design U/S EGL (m)	Design U/S Flood Depth (m)	Total Span (m)	Rise/Diam. (m)	U/S Invert (m)	Min. Top of Road (m)	Capacity Prior to Overtopping (Year)	Design Flow (SDG Table 6.4) ⁴ (Year)	Meet City Standard? YES/NO	Minimum Freeboard (WC-2 / WC-7)		Minimum Clearance (WC-2 / WC-7)		Maximum Allowable HW/D (WC-7)			Meet MTO Standard? (YES/NO)
															Required (m)	Actual (m)	Required (m)	Actual (m)	Allowable	Actual		
648680	Shirley's Brook	Goulbourn Forced Road	Culvert	Major Collector	10770.63	98.22	1.42	-	1.42	96.80	98.10	5	25	NO	1.0	-0.1			1.5	1.0	NO	Does not meet MTO freeboard requirements
645000	Shirley's Brook	CN Rail ⁴	Bridge	n/a	10463.11	95.90	1.20	2.70	1.60	94.70	96.71	100	100	YES	1.0	0.8	0.3	0.4			NO	Does not meet MTO freeboard requirements
640810	Shirley's Brook	Hines Road	Culvert	Collector	8464.13	80.25	1.17	2.30	1.70	79.08	81.20	100	25	YES	1.0	1.0			1.5	0.7	YES	
647310	Shirley's Brook	March Road	Culvert	Arterial	8186.672	78.95	1.44	3.10	1.50	77.51	80.40	100	50	YES	1.0	1.5			1.5	1.0	YES	
640550	Shirley's Brook	Legget Drive	Culvert	Collector	7840.144	77.73	1.41	1.90	1.00	76.32	78.83	100	25	YES	1.0	1.1			1.5	1.4	YES	
647320	Shirley's Brook	Terry Fox Drive	Culvert	Major Collector	6662.563	75.08	1.45	3.10	0.90	73.63	75.80	100	25	YES	1.0	0.7			1.5	1.6	NO	Does not meet MTO freeboard requirements
647330	Shirley's Brook	Shirley's Brook Drive	Culvert	Collector	6155.664	74.53	1.56	4.80	0.90	72.97	74.60	25	25	YES	1.0	0.1			1.5	1.7	NO	Does not meet MTO freeboard or HW/D requirements
SB6	Shirley's Brook	Private - Abandoned Farm Crossing ⁴	Culvert	n/a	5531.699	73.34	1.98	3.00	1.70	71.36	73.70	10	10	YES	0.3	0.4			1.5	1.2	YES	
647650	Shirley's Brook	Klondike Road	Culvert	Collector	5361.118	73.51	1.97	3.00	1.40	71.54	74.10	100	25	YES	1.0	0.6			1.5	1.4	NO	Does not meet MTO freeboard requirements
647380	Shirley's Brook	Marconi	Culvert	Collector	4507.086	69.67	2.09	8.00	2.55	67.58	70.40	100	50	YES	1.0	0.7			1.5	0.8	NO	Does not meet MTO freeboard requirements
645030	Shirley's Brook	CN Rail ⁴	Culvert	n/a	4090.206	69.46	1.90	5.40	1.36	67.56	70.15	100	100	YES	1.0	0.7			1.5	1.4	NO	Does not meet MTO freeboard requirements
648620	Shirley's Brook	4th Line March Valley ⁶	Culvert	Collector	3308.937	67.42	2.23	3.00	1.50	65.19	67.20	2	25	NO	1.0	-0.2			1.5	1.5	NO	Does not meet City of Ottawa criteria or MTO freeboard requirements
SB7	Shirley's Brook	DND Crossing ⁴	Culvert	n/a	3100.236	66.71	2.05	-	2.75	64.66	66.40	5	10	NO	0.3	-0.3			1.5	0.7	NO	Does not meet City of Ottawa criteria or MTO freeboard requirements
SB8	Shirley's Brook	DND Crossing ⁴	Bridge	n/a	1276.827	63.91	1.33	10.00	1.30	62.58	64.40	100	25	YES	1.0	0.5	0.3	0.0			NO	Does not meet MTO freeboard or clearance requirements



TABLE D-5
CITY OF OTTAWA
SHIRLEY'S BROOK & WATT'S CREEK - PHASE 2 STORMWATER MANAGEMENT STUDY
SUMMARY OF EXISTING FLOOD VULNERABLE SITES - WATT'S CREEK - KIZELL DRAIN



Version: 1
 Project No.: 60264539
 Date: 2/6/2015
 Design: GAF/SN

- Notes: 1. Closest HEC-RAS cross section representing flood levels at FVS.
 2. Estimated minimum ground elevation obtained from LiDAR data.
 3. Flooding threshold represent estimated return period at which flooding is anticipated
 4. Flood threshold does not account for existing perimeter berm around existing pumping station

FVS (Refer to)	Watercourse	Flood Map Sheet No.	Nearest Intersection	Assumed Land Use	HEC-RAS X-Section	100-Year Flood	Minimum Ground Elev.	Max. 100-Year Flood Depth	Flood Threshold	Approximate Flow at Threshold	Comments
1	Kizell Drain	10	Legget Road & Herzberg Road	Industrial	7058.474	74.8	74.6	0.2	100	11.9	
2	Kizell Drain	10	Legget Road & Herzberg Road	Industrial	7161.913	74.8	73.0	1.8	2	3.1	Berm located along west side of channel provides 5-year flood protection
3	Kizell Drain	10	Legget Road & Herzberg Road	March Road P.S.	7324.579	75.0	73.9	1.1	2 ⁴	3.1	Backwater area created by culvert connection to remnant channel Flood berm constructed previously around pumping station to increase protection
4	Kizell Drain	13	March Road / Station Road	Nordion	9131.887	80.5	79.5	1.0	25	1.6	
5	Kizell Drain	13	March Road / Station Road	Nordion	9176.041	80.8	79.9	0.9	25	1.9	



TABLE D-6
CITY OF OTTAWA
SHIRLEY'S BROOK & WATT'S CREEK - PHASE 2 STORMWATER MANAGEMENT STUDY
SUMMARY OF FLOOD ROUTING - KIZELL DRAIN U/S OF MARCH ROAD (NORDION PROPERTY)

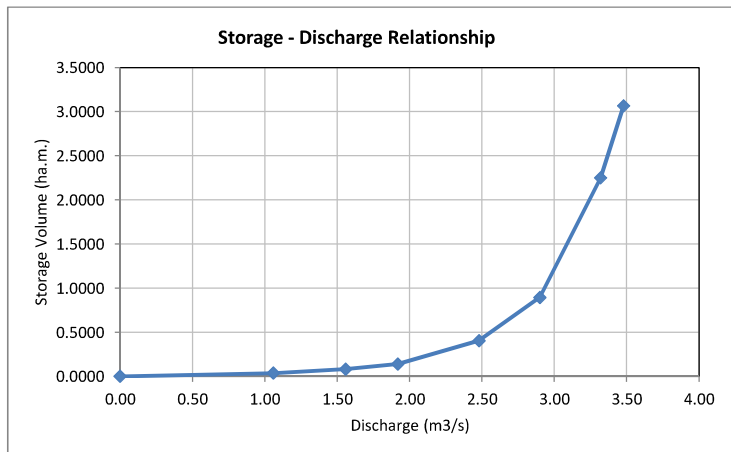


Version: 1
 Project No.: 60264539
 Date: 2/6/2015
 Design: GAF/OC

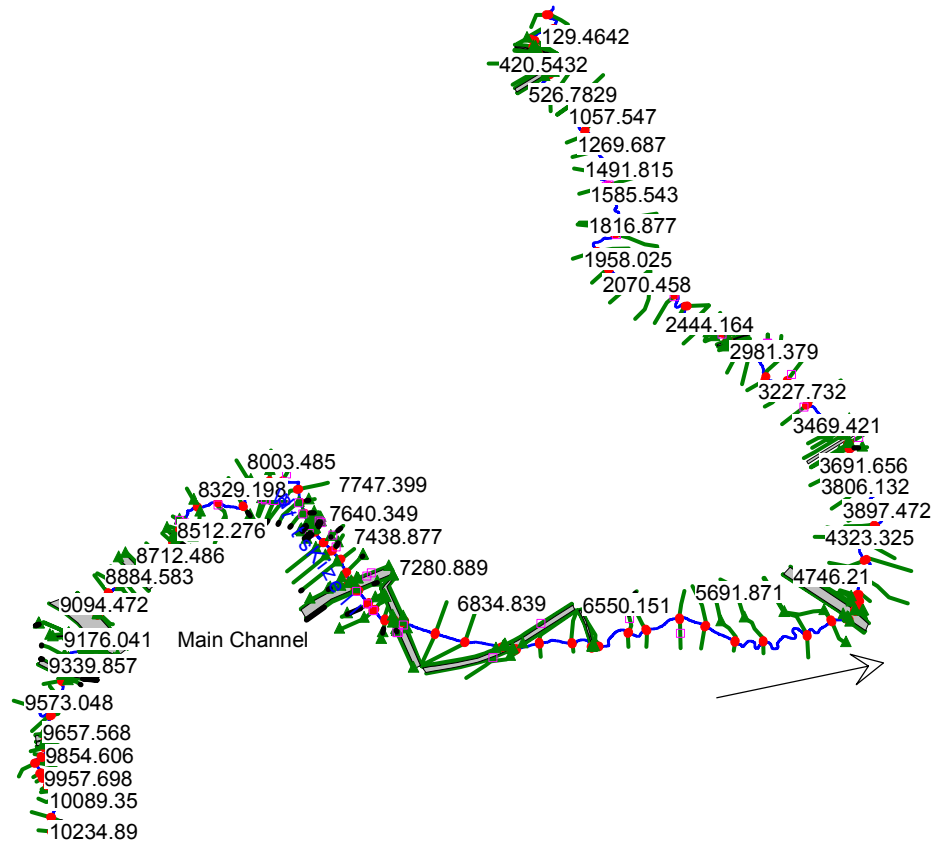
- Notes: 1. Inflow discharge values obtained from SWMHYMO model KFP3.
 2. Routed flows input to HEC-RAS model upstream of March / Station Road culvert crossing.
 3. Water level interpolated from maximum storage volume obtained from SWMHYMO output.
 4. Routed water level obtained from HEC-RAS output upstream of March / Station Road culvert crossing.
 5. Elevation / Stage values obtained from HEC-RAS Cross-Section 9096.603 using inflow discharge values (unrouted).
 6. Storage volume calculated between HEC-RAS Cross Section 9096.603 and 9315.228.

Return Period	Return Period Storm Events						Historical Storm (July 1979)
	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	
Inflow (m ³ /s) ¹	0.64	1.09	1.43	1.92	2.28	2.76	3.04
Outflow (m ³ /s) ²	0.64	1.08	1.37	1.76	1.98	2.24	2.39
Max Storage Used (ha-m) SWMHYMO	0.021	0.037	0.064	0.115	0.170	0.292	0.365
Max. Water Level (m) ³	78.75	79.16	79.32	79.56	79.73	79.96	80.09
HEC-RAS Water Level ⁴ (Cross Section 9096.603)	78.90	79.15	79.31	79.54	79.72	80.02	80.24

Elevation / Stage (m) ⁵	Storage Volume (ha.m) ⁶	Discharge (m ³ /s)
78.15	0.000	0.00
79.15	0.036	1.06
79.42	0.081	1.56
79.67	0.140	1.92
80.17	0.405	2.48
80.6	0.894	2.90
81.09	2.249	3.32
81.29	3.065	3.48



Watt's Creek / Kizell Drain 2-100 Year HEC-RAS Model Summary Output



HEC-RAS Plan: 2015-01-27unrout River: WattsKizell Reach: Main Channel

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Main Channel	10234.89	2-Year	0.33	89.00	89.47		89.48	0.000814	0.34	0.99	5.12	0.23
Main Channel	10234.89	5-Year	0.51	89.00	89.55		89.55	0.000836	0.38	1.53	8.76	0.22
Main Channel	10234.89	10-Year	0.66	89.00	89.59		89.60	0.000876	0.42	1.95	10.15	0.22
Main Channel	10234.89	25-Year	0.80	89.00	89.63		89.64	0.000885	0.44	2.34	10.85	0.22
Main Channel	10234.89	50-Year	0.90	89.00	89.65		89.66	0.000895	0.45	2.58	11.11	0.22
Main Channel	10234.89	100-Year	1.02	89.00	89.67		89.68	0.000901	0.47	2.87	11.39	0.22
Main Channel	10234.89	Jul-79	0.87	89.00	89.64		89.65	0.000893	0.45	2.51	11.03	0.22
Main Channel	10170.75	2-Year	0.33	88.98	89.24	89.24	89.31	0.047619	1.15	0.29	2.04	0.98
Main Channel	10170.75	5-Year	0.51	88.98	89.29	89.29	89.37	0.062419	1.25	0.41	2.59	1.01
Main Channel	10170.75	10-Year	0.66	88.98	89.34	89.33	89.42	0.057202	1.18	0.56	3.21	0.91
Main Channel	10170.75	25-Year	0.80	88.98	89.40		89.46	0.044782	1.09	0.73	3.71	0.79
Main Channel	10170.75	50-Year	0.90	88.98	89.42		89.48	0.037634	1.08	0.83	3.95	0.73
Main Channel	10170.75	100-Year	1.02	88.98	89.45		89.51	0.031257	1.08	0.96	4.17	0.68
Main Channel	10170.75	Jul-79	0.87	88.98	89.41		89.47	0.039638	1.08	0.80	3.88	0.75
Main Channel	10089.35	2-Year	0.33	88.50	88.93		88.94	0.001117	0.32	1.02	4.82	0.22
Main Channel	10089.35	5-Year	0.51	88.50	89.01		89.01	0.001275	0.36	1.41	5.56	0.23
Main Channel	10089.35	10-Year	0.66	88.50	89.06		89.06	0.001362	0.39	1.69	6.05	0.23
Main Channel	10089.35	25-Year	0.80	88.50	89.10		89.11	0.001430	0.42	1.94	6.42	0.23
Main Channel	10089.35	50-Year	0.90	88.50	89.12		89.13	0.001478	0.44	2.11	6.62	0.23
Main Channel	10089.35	100-Year	1.02	88.50	89.15		89.16	0.001545	0.46	2.30	6.83	0.23
Main Channel	10089.35	Jul-79	0.87	88.50	89.11		89.12	0.001465	0.43	2.06	6.57	0.23
Main Channel	10047.1	2-Year	0.33	88.50	88.76	88.76	88.82	0.013723	1.10	0.30	2.45	1.00
Main Channel	10047.1	5-Year	0.51	88.50	88.80	88.80	88.88	0.015556	1.21	0.42	2.90	1.02
Main Channel	10047.1	10-Year	0.66	88.50	88.83	88.83	88.92	0.016715	1.29	0.51	3.15	1.02
Main Channel	10047.1	25-Year	0.80	88.50	88.86	88.86	88.95	0.017710	1.35	0.59	3.33	1.02
Main Channel	10047.1	50-Year	0.90	88.50	88.88	88.88	88.97	0.017988	1.38	0.65	3.46	1.01
Main Channel	10047.1	100-Year	1.02	88.50	88.90	88.90	89.00	0.018381	1.41	0.72	3.61	1.01
Main Channel	10047.1	Jul-79	0.87	88.50	88.87	88.87	88.97	0.017873	1.37	0.64	3.42	1.01
Main Channel	10018.26	2-Year	0.33	87.60	87.85	87.85	87.93	0.042358	1.21	0.27	1.83	1.01
Main Channel	10018.26	5-Year	0.51	87.60	87.91	87.91	88.00	0.045259	1.27	0.40	2.50	1.01
Main Channel	10018.26	10-Year	0.66	87.60	87.95	87.95	88.04	0.044356	1.33	0.50	2.79	1.01
Main Channel	10018.26	25-Year	0.80	87.60	87.98	87.98	88.08	0.044149	1.39	0.58	3.03	1.01
Main Channel	10018.26	50-Year	0.90	87.60	88.00	88.00	88.10	0.043687	1.42	0.63	3.16	1.01
Main Channel	10018.26	100-Year	1.02	87.60	88.02	88.02	88.12	0.043610	1.46	0.70	3.31	1.02
Main Channel	10018.26	Jul-79	0.87	87.60	87.99	87.99	88.09	0.043804	1.41	0.62	3.12	1.01
Main Channel	9980.843	2-Year	0.33	86.17	86.48		86.51	0.006567	0.80	0.41	3.04	0.69
Main Channel	9980.843	5-Year	0.51	86.17	86.54		86.57	0.006796	0.82	0.62	3.81	0.65
Main Channel	9980.843	10-Year	0.66	86.17	86.58		86.62	0.006520	0.82	0.81	4.38	0.61
Main Channel	9980.843	25-Year	0.80	86.17	86.62	86.54	86.65	0.006277	0.82	0.98	4.75	0.56
Main Channel	9980.843	50-Year	0.90	86.17	86.64	86.55	86.68	0.006282	0.83	1.09	4.95	0.55
Main Channel	9980.843	100-Year	1.02	86.17	86.66	86.57	86.70	0.006340	0.86	1.21	5.16	0.54
Main Channel	9980.843	Jul-79	0.87	86.17	86.63	86.55	86.67	0.006264	0.83	1.06	4.89	0.55
Main Channel	9957.698	2-Year	0.33	86.00	86.29		86.33	0.008977	0.90	0.37	3.06	0.83
Main Channel	9957.698	5-Year	0.51	86.00	86.34		86.38	0.009845	0.91	0.56	4.68	0.85
Main Channel	9957.698	10-Year	0.66	86.00	86.36	86.35	86.41	0.012378	1.01	0.66	5.23	0.91
Main Channel	9957.698	25-Year	0.80	86.00	86.37	86.37	86.43	0.015420	1.11	0.72	5.78	1.00
Main Channel	9957.698	50-Year	0.90	86.00	86.38	86.38	86.45	0.016902	1.15	0.78	6.16	1.03
Main Channel	9957.698	100-Year	1.02	86.00	86.39	86.39	86.46	0.018412	1.18	0.86	6.43	1.03
Main Channel	9957.698	Jul-79	0.87	86.00	86.38	86.38	86.44	0.016539	1.14	0.76	6.05	1.02
Main Channel	9907.851	2-Year	0.33	85.68	85.98	85.87	85.98	0.005216	0.41	1.00	14.35	0.36
Main Channel	9907.851	5-Year	0.51	85.68	86.01	85.95	86.02	0.005283	0.45	1.64	24.06	0.37
Main Channel	9907.851	10-Year	0.66	85.68	86.03	85.97	86.04	0.004698	0.45	2.08	24.73	0.36
Main Channel	9907.851	25-Year	0.80	85.68	86.05	85.98	86.05	0.004203	0.46	2.49	25.33	0.34
Main Channel	9907.851	50-Year	0.90	85.68	86.06	86.00	86.06	0.003913	0.46	2.77	25.74	0.33
Main Channel	9907.851	100-Year	1.02	85.68	86.07	85.99	86.08	0.003757	0.47	3.07	26.17	0.33
Main Channel	9907.851	Jul-79	0.87	85.68	86.05	86.00	86.06	0.003984	0.46	2.69	25.62	0.33
Main Channel	9854.606	2-Year	0.33	85.40	85.66		85.70	0.005164	0.78	0.42	3.08	0.67
Main Channel	9854.606	5-Year	0.51	85.40	85.73		85.75	0.004314	0.68	0.75	6.40	0.61
Main Channel	9854.606	10-Year	0.66	85.40	85.77		85.79	0.004064	0.67	1.01	7.46	0.53
Main Channel	9854.606	25-Year	0.80	85.40	85.80		85.82	0.003887	0.68	1.25	8.48	0.50
Main Channel	9854.606	50-Year	0.90	85.40	85.82		85.84	0.003791	0.69	1.43	9.93	0.48
Main Channel	9854.606	100-Year	1.02	85.40	85.84		85.86	0.003668	0.70	1.64	10.62	0.46
Main Channel	9854.606	Jul-79	0.87	85.40	85.81		85.83	0.003820	0.69	1.37	9.75	0.49
Main Channel	9806.144	2-Year	0.33	85.00	85.19	85.19	85.27	0.017775	1.22	0.27	1.78	1.00
Main Channel	9806.144	5-Year	0.51	85.00	85.25	85.25	85.34	0.023643	1.29	0.39	2.34	1.01
Main Channel	9806.144	10-Year	0.66	85.00	85.29	85.29	85.39	0.025102	1.37	0.48	2.58	1.01
Main Channel	9806.144	25-Year	0.80	85.00	85.32	85.32	85.42	0.025877	1.42	0.56	2.77	1.01
Main Channel	9806.144	50-Year	0.90	85.00	85.34	85.34	85.45	0.026261	1.46	0.62	2.90	1.01

HEC-RAS Plan: 2015-01-27unrout River: WattsKizell Reach: Main Channel (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Main Channel	9806.144	100-Year	1.02	85.00	85.36	85.36	85.47	0.026735	1.49	0.68	3.05	1.01
Main Channel	9806.144	Jul-79	0.87	85.00	85.33	85.33	85.44	0.026209	1.45	0.60	2.86	1.01
Main Channel	9795.745	2-Year	0.33	84.30	84.49	84.49	84.57	0.017714	1.22	0.27	1.78	1.00
Main Channel	9795.745	5-Year	0.51	84.30	84.55	84.55	84.65	0.016744	1.39	0.37	1.85	1.00
Main Channel	9795.745	10-Year	0.66	84.30	84.59	84.59	84.70	0.016391	1.51	0.44	1.89	1.00
Main Channel	9795.745	25-Year	0.80	84.30	84.65	84.65	84.74	0.010642	1.32	0.60	3.35	0.99
Main Channel	9795.745	50-Year	0.90	84.30	84.67	84.67	84.76	0.010733	1.34	0.67	3.75	1.00
Main Channel	9795.745	100-Year	1.02	84.30	84.69	84.69	84.78	0.011157	1.38	0.74	4.11	1.00
Main Channel	9795.745	Jul-79	0.87	84.30	84.66	84.66	84.75	0.010579	1.33	0.66	3.66	1.00
Main Channel	9793.271	2-Year	0.33	83.80	84.29	84.09	84.32	0.002940	0.70	0.47	1.60	0.36
Main Channel	9793.271	5-Year	0.51	83.80	84.41	84.16	84.45	0.002949	0.83	0.61	1.76	0.37
Main Channel	9793.271	10-Year	0.66	83.80	84.49	84.21	84.54	0.002971	0.93	0.71	1.88	0.38
Main Channel	9793.271	25-Year	0.80	83.80	84.57	84.26	84.62	0.002989	1.00	0.80	1.97	0.39
Main Channel	9793.271	50-Year	0.90	83.80	84.61	84.29	84.67	0.002998	1.05	0.86	2.04	0.40
Main Channel	9793.271	100-Year	1.02	83.80	84.67	84.32	84.73	0.002952	1.10	0.93	2.44	0.40
Main Channel	9793.271	Jul-79	0.87	83.80	84.60	84.28	84.65	0.002996	1.04	0.84	2.02	0.40
Main Channel	9781.939		Culvert									
Main Channel	9771.594	2-Year	0.33	82.33	82.67	82.60	82.72	0.005834	1.03	0.32	1.61	0.64
Main Channel	9771.594	5-Year	0.51	82.33	82.77	82.67	82.84	0.004584	1.14	0.45	6.94	0.60
Main Channel	9771.594	10-Year	0.66	82.33	82.83	82.72	82.92	0.004665	1.28	0.52	7.72	0.62
Main Channel	9771.594	25-Year	0.80	82.33	82.89	82.76	82.99	0.004500	1.36	0.59	8.21	0.62
Main Channel	9771.594	50-Year	0.90	82.33	82.93	82.79	83.03	0.004390	1.42	0.64	8.55	0.62
Main Channel	9771.594	100-Year	1.02	82.33	82.98	82.82	83.09	0.004328	1.48	0.69	9.00	0.63
Main Channel	9771.594	Jul-79	0.87	82.33	82.96	82.78	83.04	0.003559	1.31	0.66	8.74	0.66
Main Channel	9767.958	2-Year	0.33	82.12	82.68	82.40	82.70	0.002190	0.57	0.58	3.10	0.26
Main Channel	9767.958	5-Year	0.51	82.12	82.79	82.46	82.82	0.002696	0.72	0.71	5.86	0.30
Main Channel	9767.958	10-Year	0.66	82.12	82.85	82.51	82.89	0.003225	0.84	0.79	7.58	0.33
Main Channel	9767.958	25-Year	0.80	82.12	82.91	82.55	82.96	0.003540	0.93	0.86	10.26	0.35
Main Channel	9767.958	50-Year	0.90	82.12	82.95	82.58	83.00	0.003722	0.99	0.91	10.97	0.36
Main Channel	9767.958	100-Year	1.02	82.12	83.00	82.62	83.06	0.003940	1.06	0.96	11.65	0.38
Main Channel	9767.958	Jul-79	0.87	82.12	82.97	82.58	83.02	0.003199	0.93	0.93	11.26	0.34
Main Channel	9759.191		Culvert									
Main Channel	9746.919	2-Year	0.39	81.96	82.64	82.28	82.66	0.001737	0.56	0.70	5.13	0.23
Main Channel	9746.919	5-Year	0.63	81.96	82.72	82.37	82.76	0.002955	0.79	0.79	9.45	0.31
Main Channel	9746.919	10-Year	0.81	81.96	82.76	82.42	82.81	0.004143	0.97	0.83	13.70	0.37
Main Channel	9746.919	25-Year	1.02	81.96	82.78	82.48	82.85	0.005837	1.18	0.86	15.95	0.44
Main Channel	9746.919	50-Year	1.17	81.96	82.80	82.52	82.89	0.007259	1.33	0.88	17.54	0.50
Main Channel	9746.919	100-Year	1.37	81.96	82.79	82.57	82.92	0.010067	1.57	0.88	17.37	0.59
Main Channel	9746.919	Jul-79	1.30	81.96	82.81	82.56	82.92	0.008354	1.45	0.90	18.92	0.54
Main Channel	9743.627	2-Year	0.39	82.30	82.64	82.53	82.65	0.002236	0.53	0.73	9.10	0.42
Main Channel	9743.627	5-Year	0.63	82.30	82.73	82.58	82.74	0.001899	0.53	1.24	15.10	0.36
Main Channel	9743.627	10-Year	0.81	82.30	82.77	82.62	82.79	0.001826	0.54	1.75	20.52	0.34
Main Channel	9743.627	25-Year	1.02	82.30	82.81	82.65	82.83	0.001740	0.56	2.28	21.15	0.33
Main Channel	9743.627	50-Year	1.17	82.30	82.84	82.67	82.85	0.001693	0.57	2.63	21.59	0.32
Main Channel	9743.627	100-Year	1.37	82.30	82.86	82.69	82.87	0.001888	0.62	2.89	21.91	0.34
Main Channel	9743.627	Jul-79	1.30	82.30	82.87	82.69	82.88	0.001519	0.56	3.03	22.08	0.30
Main Channel	9657.568	2-Year	0.45	81.80	82.04	82.04	82.12	0.031621	1.29	0.35	2.05	1.00
Main Channel	9657.568	5-Year	0.74	81.80	82.12	82.12	82.20	0.063718	1.29	0.57	3.44	1.01
Main Channel	9657.568	10-Year	0.97	81.80	82.16	82.16	82.25	0.068407	1.35	0.72	3.97	1.01
Main Channel	9657.568	25-Year	1.25	81.80	82.20	82.20	82.30	0.072334	1.41	0.89	4.50	1.01
Main Channel	9657.568	50-Year	1.45	81.80	82.22	82.22	82.33	0.072894	1.46	0.99	4.72	1.02
Main Channel	9657.568	100-Year	1.72	81.80	82.32	82.39	82.39	0.031887	1.14	1.52	5.65	0.68
Main Channel	9657.568	Jul-79	1.74	81.80	82.25	82.25	82.37	0.072624	1.52	1.14	5.00	1.01
Main Channel	9573.048	2-Year	0.45	80.50	80.90	80.92	80.92	0.003749	0.50	0.90	4.30	0.35
Main Channel	9573.048	5-Year	0.74	80.50	81.02	81.04	81.04	0.002999	0.50	1.49	5.79	0.31
Main Channel	9573.048	10-Year	0.97	80.50	81.09	81.10	81.10	0.002765	0.51	1.92	6.89	0.30
Main Channel	9573.048	25-Year	1.25	80.50	81.14	81.15	81.15	0.002957	0.55	2.38	12.03	0.31
Main Channel	9573.048	50-Year	1.45	80.50	81.12	81.14	81.14	0.004892	0.69	2.13	10.12	0.40
Main Channel	9573.048	100-Year	1.72	80.50	81.09	81.13	81.13	0.008457	0.89	1.94	6.92	0.52
Main Channel	9573.048	Jul-79	1.74	80.50	81.30	81.30	81.30	0.000991	0.41	5.55	24.93	0.19
Main Channel	9442.479	2-Year	0.52	79.60	79.85	79.85	79.95	0.017064	1.41	0.37	1.85	1.01
Main Channel	9442.479	5-Year	0.86	79.60	79.94	79.94	80.06	0.027846	1.55	0.55	2.28	1.01
Main Channel	9442.479	10-Year	1.12	79.60	80.00	80.00	80.13	0.035772	1.61	0.69	2.66	1.01
Main Channel	9442.479	25-Year	1.47	79.60	80.15	80.23	80.23	0.024058	1.25	1.18	3.70	0.71
Main Channel	9442.479	50-Year	1.73	79.60	80.50	80.51	80.51	0.004725	0.59	2.93	6.45	0.28
Main Channel	9442.479	100-Year	2.07	79.60	80.87	80.88	80.88	0.000917	0.36	5.93	9.68	0.13

HEC-RAS Plan: 2015-01-27unrout River: WattsKizell Reach: Main Channel (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Main Channel	9442.479	Jul-79	2.17	79.60	81.25		81.25	0.000212	0.23	11.96	21.57	0.07
Main Channel	9363.261	2-Year	0.58	78.90	79.39	79.18	79.40	0.001503	0.47	1.24	4.63	0.28
Main Channel	9363.261	5-Year	0.97	78.90	79.58	79.26	79.59	0.000693	0.45	2.23	5.58	0.21
Main Channel	9363.261	10-Year	1.27	78.90	79.76	79.30	79.77	0.000377	0.41	3.29	6.30	0.16
Main Channel	9363.261	25-Year	1.70	78.90	80.18	79.36	80.18	0.000110	0.31	6.23	7.83	0.10
Main Channel	9363.261	50-Year	2.00	78.90	80.49	79.39	80.50	0.000058	0.27	8.91	9.23	0.07
Main Channel	9363.261	100-Year	2.41	78.90	80.87	79.43	80.87	0.000033	0.24	12.71	11.11	0.06
Main Channel	9363.261	Jul-79	2.61	78.90	81.25	79.44	81.25	0.000018	0.20	17.45	13.79	0.04
Main Channel	9339.857	2-Year	0.58	78.90	79.34	79.17	79.35	0.002954	0.45	1.28	5.66	0.30
Main Channel	9339.857	5-Year	0.97	78.90	79.57	79.25	79.57	0.000953	0.36	2.70	6.89	0.18
Main Channel	9339.857	10-Year	1.27	78.90	79.75	79.28	79.76	0.000448	0.32	4.06	7.59	0.13
Main Channel	9339.857	25-Year	1.70	78.90	80.18	79.33	80.18	0.000120	0.24	7.59	9.16	0.08
Main Channel	9339.857	50-Year	2.00	78.90	80.49	79.35	80.49	0.000062	0.20	10.67	10.38	0.06
Main Channel	9339.857	100-Year	2.41	78.90	80.87	79.39	80.87	0.000036	0.18	14.92	31.34	0.05
Main Channel	9339.857	Jul-79	2.61	78.90	81.25	79.40	81.25	0.000019	0.15	20.07	38.08	0.03
Main Channel	9338.062	2-Year	0.58	78.69	79.35	78.85	79.35	0.000136	0.29	1.97	4.86	0.12
Main Channel	9338.062	5-Year	0.97	78.69	79.57	78.91	79.57	0.000146	0.37	2.63	6.09	0.13
Main Channel	9338.062	10-Year	1.27	78.69	79.75	78.95	79.76	0.000133	0.40	3.18	6.90	0.12
Main Channel	9338.062	25-Year	1.70	78.69	80.17	79.01	80.18	0.000078	0.38	4.44	8.69	0.10
Main Channel	9338.062	50-Year	2.00	78.69	80.49	79.04	80.49	0.000057	0.37	5.39	10.11	0.09
Main Channel	9338.062	100-Year	2.41	78.69	80.86	79.09	80.87	0.000044	0.37	6.51	32.40	0.08
Main Channel	9338.062	Jul-79	2.61	78.69	81.24	79.12	81.25	0.000030	0.34	7.66	39.30	0.07
Main Channel	9327.433		Culvert									
Main Channel	9318.861	2-Year	0.58	78.64	79.33	78.80	79.33	0.000116	0.28	2.07	6.18	0.11
Main Channel	9318.861	5-Year	0.97	78.64	79.51	78.86	79.51	0.000151	0.37	2.60	7.28	0.13
Main Channel	9318.861	10-Year	1.27	78.64	79.65	78.90	79.66	0.000158	0.42	3.02	8.02	0.13
Main Channel	9318.861	25-Year	1.70	78.64	79.98	78.96	79.99	0.000110	0.42	4.01	9.55	0.12
Main Channel	9318.861	50-Year	2.00	78.64	80.21	79.00	80.22	0.000088	0.42	4.72	10.49	0.11
Main Channel	9318.861	100-Year	2.41	78.64	80.46	79.04	80.47	0.000078	0.44	5.47	11.67	0.10
Main Channel	9318.861	Jul-79	2.61	78.64	80.78	79.06	80.78	0.000054	0.41	6.41	24.22	0.09
Main Channel	9315.228	2-Year	0.58	78.73	79.33	79.00	79.33	0.000401	0.28	2.04	7.16	0.17
Main Channel	9315.228	5-Year	0.97	78.73	79.51	79.12	79.51	0.000305	0.28	3.44	8.36	0.14
Main Channel	9315.228	10-Year	1.27	78.73	79.65	79.16	79.65	0.000233	0.27	4.68	9.22	0.12
Main Channel	9315.228	25-Year	1.70	78.73	79.98	79.20	79.98	0.000094	0.22	7.98	10.69	0.08
Main Channel	9315.228	50-Year	2.00	78.73	80.22	79.23	80.22	0.000058	0.20	10.65	11.71	0.06
Main Channel	9315.228	100-Year	2.41	78.73	80.47	79.26	80.47	0.000042	0.19	13.71	12.74	0.05
Main Channel	9315.228	Jul-79	2.61	78.73	80.78	79.27	80.78	0.000023	0.16	17.93	25.16	0.04
Main Channel	9252.569	2-Year	0.64	78.80	79.28	79.00	79.29	0.001209	0.47	1.35	3.84	0.25
Main Channel	9252.569	5-Year	1.09	78.80	79.47	79.08	79.48	0.001168	0.49	2.25	5.53	0.24
Main Channel	9252.569	10-Year	1.43	78.80	79.62	79.13	79.63	0.000730	0.47	3.16	6.43	0.20
Main Channel	9252.569	25-Year	1.92	78.80	79.97	79.20	79.97	0.000249	0.37	5.72	8.29	0.12
Main Channel	9252.569	50-Year	2.28	78.80	80.21	79.24	80.22	0.000151	0.34	7.96	12.20	0.10
Main Channel	9252.569	100-Year	2.76	78.80	80.46	79.31	80.47	0.000098	0.31	11.43	57.33	0.08
Main Channel	9252.569	Jul-79	3.04	78.80	80.78	79.34	80.78	0.000047	0.25	16.53	109.81	0.06
Main Channel	9176.041	2-Year	0.64	78.70	79.16		79.17	0.001750	0.47	1.37	4.71	0.28
Main Channel	9176.041	5-Year	1.09	78.70	79.40		79.40	0.000668	0.42	2.70	6.29	0.19
Main Channel	9176.041	10-Year	1.43	78.70	79.58		79.58	0.000395	0.40	3.92	7.20	0.15
Main Channel	9176.041	25-Year	1.92	78.70	79.95		79.96	0.000141	0.32	7.16	10.74	0.10
Main Channel	9176.041	50-Year	2.28	78.70	80.20		80.21	0.000065	0.25	16.59	64.43	0.07
Main Channel	9176.041	100-Year	2.76	78.70	80.46		80.46	0.000020	0.15	34.47	76.51	0.04
Main Channel	9176.041	Jul-79	3.04	78.70	80.78		80.78	0.000006	0.09	62.10	110.57	0.02
Main Channel	9169.896	2-Year	0.64	78.48	79.10	78.87	79.15	0.006360	0.99	0.64	3.64	0.43
Main Channel	9169.896	5-Year	1.09	78.48	79.31	79.00	79.39	0.005918	1.20	0.90	5.62	0.44
Main Channel	9169.896	10-Year	1.43	78.48	79.48	79.09	79.57	0.005178	1.29	1.11	6.80	0.43
Main Channel	9169.896	25-Year	1.92	78.48	79.87	79.20	79.95	0.002902	1.22	1.57	9.49	0.34
Main Channel	9169.896	50-Year	2.28	78.48	80.20	79.28	80.21	0.000136	0.26	11.49	35.39	0.07
Main Channel	9169.896	100-Year	2.76	78.48	80.46	79.38	80.46	0.000049	0.18	24.85	64.50	0.05
Main Channel	9169.896	Jul-79	3.04	78.48	80.78	79.43	80.78	0.000012	0.10	51.54	107.14	0.02
Main Channel	9161.24		Culvert									
Main Channel	9154.916	2-Year	0.64	78.41	78.94	78.77	79.00	0.003218	1.10	0.58	5.81	0.51
Main Channel	9154.916	5-Year	1.09	78.41	79.14	78.90	79.23	0.002976	1.33	0.82	10.57	0.52
Main Channel	9154.916	10-Year	1.43	78.41	79.30	78.98	79.40	0.002497	1.41	1.01	12.41	0.49
Main Channel	9154.916	25-Year	1.92	78.41	79.62	79.10	79.72	0.001564	1.38	1.39	16.55	0.41
Main Channel	9154.916	50-Year	2.28	78.41	79.93	79.18	80.01	0.001000	1.29	1.76	49.60	0.34
Main Channel	9154.916	100-Year	2.76	78.41	80.46	79.27	80.46	0.000010	0.14	50.31	94.09	0.03
Main Channel	9154.916	Jul-79	3.04	78.41	80.78	79.33	80.78	0.000004	0.09	78.43	114.68	0.02

HEC-RAS Plan: 2015-01-27unrout River: WattsKizell Reach: Main Channel (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Main Channel	9151.77	2-Year	0.64	78.40	78.96		78.97	0.002057	0.47	1.37	8.81	0.27
Main Channel	9151.77	5-Year	1.09	78.40	79.18		79.19	0.000924	0.44	2.56	14.25	0.20
Main Channel	9151.77	10-Year	1.43	78.40	79.36		79.37	0.000554	0.41	3.71	16.46	0.16
Main Channel	9151.77	25-Year	1.92	78.40	79.68		79.68	0.000237	0.35	6.44	21.38	0.11
Main Channel	9151.77	50-Year	2.28	78.40	79.98		79.99	0.000088	0.25	14.06	63.90	0.07
Main Channel	9151.77	100-Year	2.76	78.40	80.46		80.46	0.000010	0.10	52.79	98.37	0.02
Main Channel	9151.77	Jul-79	3.04	78.40	80.78		80.78	0.000004	0.07	81.77	134.85	0.02
Main Channel	9131.887	2-Year	0.64	78.35	78.93		78.93	0.000543	0.20	3.16	19.18	0.12
Main Channel	9131.887	5-Year	1.09	78.35	79.18		79.18	0.000176	0.18	6.24	30.30	0.08
Main Channel	9131.887	10-Year	1.43	78.35	79.36		79.36	0.000108	0.17	8.64	35.37	0.07
Main Channel	9131.887	25-Year	1.92	78.35	79.68		79.68	0.000052	0.15	13.31	48.13	0.05
Main Channel	9131.887	50-Year	2.28	78.35	79.98		79.99	0.000028	0.13	18.54	74.99	0.04
Main Channel	9131.887	100-Year	2.76	78.35	80.46		80.46	0.000007	0.08	50.60	132.76	0.02
Main Channel	9131.887	Jul-79	3.04	78.35	80.78		80.78	0.000003	0.06	80.31	163.04	0.01
Main Channel	9096.603	2-Year	0.64	78.20	78.90	78.48	78.91	0.000726	0.45	1.43	5.04	0.19
Main Channel	9096.603	5-Year	1.09	78.20	79.16	78.58	79.17	0.000783	0.45	2.61	19.35	0.19
Main Channel	9096.603	10-Year	1.43	78.20	79.34	78.63	79.35	0.000479	0.42	3.79	25.60	0.15
Main Channel	9096.603	25-Year	1.92	78.20	79.67	78.71	79.68	0.000226	0.36	6.06	34.75	0.11
Main Channel	9096.603	50-Year	2.28	78.20	79.98	78.76	79.98	0.000123	0.32	8.45	45.99	0.08
Main Channel	9096.603	100-Year	2.76	78.20	80.46	78.83	80.46	0.000057	0.26	12.29	102.95	0.06
Main Channel	9096.603	Jul-79	3.04	78.20	80.77	78.86	80.78	0.000038	0.24	14.85	127.23	0.05
Main Channel	9094.472	2-Year	0.64	78.15	78.87	78.55	78.90	0.004250	0.74	0.87	4.44	0.32
Main Channel	9094.472	5-Year	1.09	78.15	79.12	78.68	79.16	0.003532	0.86	1.26	7.77	0.31
Main Channel	9094.472	10-Year	1.43	78.15	79.30	78.76	79.35	0.003080	0.92	1.55	8.86	0.30
Main Channel	9094.472	25-Year	1.92	78.15	79.63	78.86	79.67	0.002129	0.93	2.06	10.39	0.26
Main Channel	9094.472	50-Year	2.28	78.15	79.94	78.92	79.98	0.001464	0.89	2.56	11.76	0.22
Main Channel	9094.472	100-Year	2.76	78.15	80.42	79.00	80.46	0.000896	0.83	3.33	16.84	0.18
Main Channel	9094.472	Jul-79	3.04	78.15	80.74	79.05	80.77	0.000675	0.79	3.84	58.31	0.16
Main Channel	9086.378		Culvert									
Main Channel	9040.378	2-Year	0.64	78.10	78.41	78.41	78.57	0.012948	1.74	0.37	6.63	1.00
Main Channel	9040.378	5-Year	1.09	78.10	78.55	78.55	78.76	0.011337	2.07	0.53	8.27	0.99
Main Channel	9040.378	10-Year	1.43	78.10	78.63	78.63	78.90	0.010876	2.28	0.63	10.27	1.00
Main Channel	9040.378	25-Year	1.92	78.10	78.75	78.75	79.07	0.010249	2.52	0.76	18.69	1.00
Main Channel	9040.378	50-Year	2.28	78.10	78.94	78.82	79.21	0.005952	2.29	0.99	48.06	0.80
Main Channel	9040.378	100-Year	2.76	78.10	79.15	78.92	79.40	0.004199	2.23	1.24	58.01	0.69
Main Channel	9040.378	Jul-79	3.04	78.10	79.27	78.98	79.52	0.003500	2.19	1.39	64.52	0.65
Main Channel	8991.378	2-Year	1.13	77.29	78.30	77.74	78.34	0.000804	0.95	1.19	5.85	0.30
Main Channel	8991.378	5-Year	1.95	77.29	78.40	77.94	78.51	0.001732	1.49	1.31	6.54	0.45
Main Channel	8991.378	10-Year	2.51	77.29	78.44	78.06	78.62	0.002522	1.84	1.36	6.90	0.55
Main Channel	8991.378	25-Year	3.34	77.29	78.46	78.23	78.76	0.004312	2.43	1.38	7.01	0.72
Main Channel	8991.378	50-Year	3.94	77.29	78.39	78.33	78.86	0.007290	3.03	1.30	6.47	0.92
Main Channel	8991.378	100-Year	4.74	77.29	78.47	78.47	79.06	0.008322	3.40	1.39	7.14	1.00
Main Channel	8991.378	Jul-79	5.31	77.29	78.56	78.56	79.20	0.008121	3.53	1.50	8.60	1.00
Main Channel	8985.021	2-Year	1.13	77.70	78.31		78.33	0.001067	0.53	2.34	6.88	0.25
Main Channel	8985.021	5-Year	1.95	77.70	78.46		78.48	0.001235	0.67	3.42	8.36	0.28
Main Channel	8985.021	10-Year	2.51	77.70	78.54		78.56	0.001274	0.73	4.19	11.35	0.28
Main Channel	8985.021	25-Year	3.34	77.70	78.63		78.66	0.001384	0.82	5.97	30.62	0.30
Main Channel	8985.021	50-Year	3.94	77.70	78.68		78.71	0.001359	0.84	7.54	32.30	0.30
Main Channel	8985.021	100-Year	4.74	77.70	78.74		78.77	0.001301	0.86	9.56	35.20	0.29
Main Channel	8985.021	Jul-79	5.31	77.70	78.78		78.81	0.001261	0.87	10.97	37.18	0.29
Main Channel	8942.456	2-Year	1.13	77.70	78.20		78.23	0.006442	0.81	1.39	4.80	0.48
Main Channel	8942.456	5-Year	1.95	77.70	78.33		78.38	0.005711	0.97	2.06	5.71	0.48
Main Channel	8942.456	10-Year	2.51	77.70	78.41		78.46	0.005323	1.05	2.56	11.84	0.47
Main Channel	8942.456	25-Year	3.34	77.70	78.51		78.56	0.004449	1.08	3.91	18.61	0.45
Main Channel	8942.456	50-Year	3.94	77.70	78.57		78.62	0.003644	1.05	5.17	19.89	0.41
Main Channel	8942.456	100-Year	4.74	77.70	78.64		78.69	0.003070	1.03	6.73	22.73	0.38
Main Channel	8942.456	Jul-79	5.31	77.70	78.69		78.73	0.002783	1.02	7.80	24.16	0.37
Main Channel	8884.583	2-Year	1.13	77.30	77.90		77.93	0.004311	0.79	1.43	3.81	0.41
Main Channel	8884.583	5-Year	1.95	77.30	78.06		78.10	0.003943	0.96	2.09	4.65	0.42
Main Channel	8884.583	10-Year	2.51	77.30	78.15		78.20	0.003810	1.04	2.53	5.23	0.42
Main Channel	8884.583	25-Year	3.34	77.30	78.28		78.34	0.003412	1.12	3.66	7.87	0.41
Main Channel	8884.583	50-Year	3.94	77.30	78.37		78.43	0.002917	1.12	4.19	9.24	0.39
Main Channel	8884.583	100-Year	4.74	77.30	78.45		78.51	0.002946	1.19	4.92	10.23	0.40
Main Channel	8884.583	Jul-79	5.31	77.30	78.49		78.56	0.002994	1.24	5.40	10.90	0.40
Main Channel	8831.092	2-Year	1.13	77.00	77.67	77.39	77.70	0.004244	0.80	1.42	3.37	0.39
Main Channel	8831.092	5-Year	1.95	77.00	77.84	77.55	77.88	0.004258	0.97	2.03	3.95	0.41

HEC-RAS Plan: 2015-01-27unrout River: WattsKizell Reach: Main Channel (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Main Channel	8831.092	10-Year	2.51	77.00	77.93	77.62	77.98	0.004300	1.08	2.40	4.33	0.42
Main Channel	8831.092	25-Year	3.34	77.00	78.09	77.72	78.15	0.003479	1.12	3.21	5.74	0.39
Main Channel	8831.092	50-Year	3.94	77.00	78.23	77.77	78.28	0.002549	1.07	4.49	9.99	0.35
Main Channel	8831.092	100-Year	4.74	77.00	78.30	77.84	78.36	0.002677	1.15	5.23	11.34	0.36
Main Channel	8831.092	Jul-79	5.31	77.00	78.34	77.89	78.41	0.002833	1.21	5.66	13.10	0.37
Main Channel	8796.271	2-Year	1.13	76.90	77.40	77.30	77.48	0.010327	1.20	0.94	2.95	0.68
Main Channel	8796.271	5-Year	1.95	76.90	77.63	77.45	77.69	0.007372	1.10	1.77	4.49	0.55
Main Channel	8796.271	10-Year	2.51	76.90	77.78	77.53	77.83	0.004213	1.02	2.55	5.93	0.43
Main Channel	8796.271	25-Year	3.34	76.90	78.02	77.61	78.06	0.001934	0.88	4.63	16.49	0.31
Main Channel	8796.271	50-Year	3.94	76.90	78.19	77.66	78.22	0.001124	0.76	6.81	26.81	0.25
Main Channel	8796.271	100-Year	4.74	76.90	78.26	77.73	78.29	0.001172	0.82	7.79	30.09	0.25
Main Channel	8796.271	Jul-79	5.31	76.90	78.30	77.77	78.33	0.001247	0.86	8.32	31.79	0.26
Main Channel	8751.318	2-Year	1.13	76.70	77.38		77.39	0.000602	0.36	3.18	8.39	0.18
Main Channel	8751.318	5-Year	1.95	76.70	77.62		77.62	0.000426	0.38	5.33	13.44	0.15
Main Channel	8751.318	10-Year	2.51	76.70	77.78		77.78	0.000339	0.38	7.03	19.08	0.14
Main Channel	8751.318	25-Year	3.34	76.70	78.02		78.03	0.000200	0.34	12.31	32.52	0.11
Main Channel	8751.318	50-Year	3.94	76.70	78.19		78.20	0.000139	0.32	16.46	35.81	0.09
Main Channel	8751.318	100-Year	4.74	76.70	78.27		78.27	0.000156	0.35	18.24	37.31	0.10
Main Channel	8751.318	Jul-79	5.31	76.70	78.30		78.31	0.000172	0.37	19.22	38.01	0.10
Main Channel	8748.076	2-Year	1.13	76.46	77.38	76.71	77.39	0.000166	0.40	2.83	6.59	0.13
Main Channel	8748.076	5-Year	1.95	76.46	77.61	76.82	77.62	0.000232	0.55	3.54	7.14	0.17
Main Channel	8748.076	10-Year	2.51	76.46	77.76	76.88	77.78	0.000252	0.62	4.02	7.55	0.18
Main Channel	8748.076	25-Year	3.34	76.46	78.00	76.96	78.02	0.000253	0.70	4.77	18.01	0.18
Main Channel	8748.076	50-Year	3.94	76.46	78.19	77.02	78.20	0.000134	0.38	11.68	26.36	0.10
Main Channel	8748.076	100-Year	4.74	76.46	78.26	77.09	78.27	0.000158	0.42	13.51	28.18	0.11
Main Channel	8748.076	Jul-79	5.31	76.46	78.30	77.14	78.31	0.000177	0.45	14.56	28.69	0.12
Main Channel	8730.992											
			Culvert									
Main Channel	8712.486	2-Year	1.13	76.14	77.35	76.40	77.35	0.000067	0.30	3.72	6.45	0.09
Main Channel	8712.486	5-Year	1.95	76.14	77.52	76.50	77.53	0.000128	0.46	4.24	7.08	0.13
Main Channel	8712.486	10-Year	2.51	76.14	77.60	76.56	77.62	0.000172	0.56	4.52	7.40	0.15
Main Channel	8712.486	25-Year	3.34	76.14	77.71	76.65	77.74	0.000241	0.69	4.85	7.78	0.18
Main Channel	8712.486	50-Year	3.94	76.14	77.78	76.71	77.81	0.000291	0.78	5.06	8.01	0.20
Main Channel	8712.486	100-Year	4.74	76.14	77.86	76.78	77.90	0.000357	0.89	5.31	8.33	0.22
Main Channel	8712.486	Jul-79	5.31	76.14	77.91	76.83	77.96	0.000403	0.97	5.49	8.61	0.23
Main Channel	8703.631	2-Year	1.62	76.70	77.31	77.06	77.35	0.001873	0.84	1.99	5.71	0.40
Main Channel	8703.631	5-Year	2.80	76.70	77.46	77.22	77.52	0.002222	1.05	2.94	6.73	0.44
Main Channel	8703.631	10-Year	3.60	76.70	77.54	77.29	77.61	0.002426	1.17	3.49	7.24	0.46
Main Channel	8703.631	25-Year	4.76	76.70	77.64	77.38	77.72	0.002676	1.32	4.22	7.85	0.48
Main Channel	8703.631	50-Year	5.60	76.70	77.70	77.44	77.80	0.002829	1.42	4.71	8.26	0.50
Main Channel	8703.631	100-Year	6.73	76.70	77.78	77.51	77.89	0.002998	1.53	5.36	8.85	0.51
Main Channel	8703.631	Jul-79	7.58	76.70	77.83	77.56	77.95	0.003125	1.62	5.81	9.27	0.53
Main Channel	8616.693	2-Year	1.62	76.60	77.13	76.99	77.16	0.002428	0.74	2.18	8.02	0.45
Main Channel	8616.693	5-Year	2.80	76.60	77.27		77.31	0.002510	0.83	3.38	9.14	0.43
Main Channel	8616.693	10-Year	3.60	76.60	77.34		77.38	0.002742	0.92	3.97	9.59	0.44
Main Channel	8616.693	25-Year	4.76	76.60	77.41		77.46	0.003115	1.04	4.68	10.12	0.46
Main Channel	8616.693	50-Year	5.60	76.60	77.46		77.52	0.003278	1.12	5.20	10.50	0.47
Main Channel	8616.693	100-Year	6.73	76.60	77.52		77.60	0.003421	1.20	5.93	12.60	0.48
Main Channel	8616.693	Jul-79	7.58	76.60	77.57		77.65	0.003468	1.25	6.53	13.53	0.48
Main Channel	8531.291	2-Year	1.62	76.25	76.63	76.60	76.76	0.011351	1.61	1.01	3.15	0.91
Main Channel	8531.291	5-Year	2.80	76.25	76.78	76.77	76.92	0.009619	1.72	1.73	7.39	0.93
Main Channel	8531.291	10-Year	3.60	76.25	76.87	76.84	77.00	0.007576	1.67	2.53	9.29	0.80
Main Channel	8531.291	25-Year	4.76	76.25	76.99		77.11	0.005757	1.62	3.73	10.72	0.69
Main Channel	8531.291	50-Year	5.60	76.25	77.06		77.18	0.005021	1.61	4.54	11.25	0.64
Main Channel	8531.291	100-Year	6.73	76.25	77.14		77.26	0.004571	1.64	5.48	11.85	0.62
Main Channel	8531.291	Jul-79	7.58	76.25	77.20		77.31	0.004401	1.67	6.13	12.24	0.61
Main Channel	8512.276	2-Year	1.62	76.10	76.67	76.47	76.67	0.001160	0.43	3.76	13.63	0.26
Main Channel	8512.276	5-Year	2.80	76.10	76.83	76.54	76.84	0.000949	0.46	6.08	15.89	0.23
Main Channel	8512.276	10-Year	3.60	76.10	76.92	76.57	76.93	0.000907	0.49	7.32	17.00	0.22
Main Channel	8512.276	25-Year	4.76	76.10	77.03	76.61	77.04	0.000879	0.54	8.90	18.34	0.22
Main Channel	8512.276	50-Year	5.60	76.10	77.10	76.65	77.11	0.000872	0.57	9.91	19.66	0.22
Main Channel	8512.276	100-Year	6.73	76.10	77.18	76.68	77.20	0.000893	0.61	11.07	20.62	0.22
Main Channel	8512.276	Jul-79	7.58	76.10	77.23	76.71	77.25	0.000918	0.64	11.83	21.23	0.23
Main Channel	8510.656											
			Bridge									
Main Channel	8508.619	2-Year	1.62	76.10	76.65	76.47	76.67	0.001685	0.54	2.98	12.67	0.36
Main Channel	8508.619	5-Year	2.80	76.10	76.82	76.57	76.84	0.001285	0.54	5.23	14.32	0.28
Main Channel	8508.619	10-Year	3.60	76.10	76.91	76.62	76.92	0.001199	0.56	6.46	15.04	0.26

HEC-RAS Plan: 2015-01-27unrout River: WattsKizell Reach: Main Channel (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Main Channel	8508.619	25-Year	4.76	76.10	77.02	76.66	77.04	0.001119	0.59	8.04	18.26	0.25
Main Channel	8508.619	50-Year	5.60	76.10	77.09	76.69	77.11	0.001090	0.62	9.06	19.17	0.25
Main Channel	8508.619	100-Year	6.73	76.10	77.17	76.73	77.19	0.001095	0.66	10.21	20.19	0.25
Main Channel	8508.619	Jul-79	7.58	76.10	77.22	76.75	77.25	0.001115	0.69	10.97	20.88	0.25
Main Channel	8470.617	2-Year	1.62	76.00	76.35	76.35	76.51	0.015004	1.76	0.92	2.95	1.01
Main Channel	8470.617	5-Year	2.80	76.00	76.51	76.51	76.69	0.020248	1.88	1.49	4.34	1.01
Main Channel	8470.617	10-Year	3.60	76.00	76.59	76.59	76.79	0.018006	2.01	1.83	5.10	0.98
Main Channel	8470.617	25-Year	4.76	76.00	76.68	76.68	76.91	0.015473	2.13	2.37	6.19	0.94
Main Channel	8470.617	50-Year	5.60	76.00	76.75	76.75	76.99	0.013671	2.18	2.84	7.41	0.90
Main Channel	8470.617	100-Year	6.73	76.00	76.85	76.85	77.07	0.011306	2.19	3.67	10.30	0.84
Main Channel	8470.617	Jul-79	7.58	76.00	76.89	76.89	77.13	0.010937	2.25	4.17	11.10	0.84
Main Channel	8428.704	2-Year	1.62	75.60	76.29	75.95	76.30	0.001385	0.58	3.44	11.18	0.26
Main Channel	8428.704	5-Year	2.80	75.60	76.46	76.14	76.47	0.001162	0.65	5.70	14.01	0.25
Main Channel	8428.704	10-Year	3.60	75.60	76.55	76.19	76.57	0.001083	0.68	7.03	14.62	0.25
Main Channel	8428.704	25-Year	4.76	75.60	76.66	76.26	76.68	0.001038	0.73	8.72	15.41	0.25
Main Channel	8428.704	50-Year	5.60	75.60	76.74	76.30	76.76	0.001018	0.77	9.86	15.92	0.25
Main Channel	8428.704	100-Year	6.73	75.60	76.85	76.30	76.87	0.000910	0.78	11.71	16.86	0.24
Main Channel	8428.704	Jul-79	7.58	75.60	76.92	76.40	76.95	0.000870	0.80	13.00	17.91	0.24
Main Channel	8329.198	2-Year	1.62	75.40	76.13	75.95	76.16	0.001464	0.74	2.54	22.99	0.33
Main Channel	8329.198	5-Year	2.80	75.40	76.31	76.35	76.55	0.001434	0.85	4.21	35.34	0.33
Main Channel	8329.198	10-Year	3.60	75.40	76.41	76.45	76.65	0.001414	0.91	5.24	43.54	0.33
Main Channel	8329.198	25-Year	4.76	75.40	76.52	76.56	76.76	0.001437	0.99	6.55	45.47	0.34
Main Channel	8329.198	50-Year	5.60	75.40	76.59	76.64	76.84	0.001454	1.04	7.43	46.64	0.34
Main Channel	8329.198	100-Year	6.73	75.40	76.73	76.77	76.97	0.001223	1.03	9.18	55.26	0.32
Main Channel	8329.198	Jul-79	7.58	75.40	76.81	76.85	77.05	0.001138	1.04	10.33	57.22	0.31
Main Channel	8236.271	2-Year	2.11	75.20	75.94	75.76	75.98	0.002412	0.86	2.71	9.08	0.43
Main Channel	8236.271	5-Year	3.66	75.20	76.13	75.88	76.17	0.002315	0.97	4.52	10.54	0.41
Main Channel	8236.271	10-Year	4.69	75.20	76.22	75.95	76.27	0.002311	1.04	5.59	12.60	0.40
Main Channel	8236.271	25-Year	6.18	75.20	76.32	76.03	76.38	0.002493	1.16	6.96	15.20	0.42
Main Channel	8236.271	50-Year	7.26	75.20	76.39	76.08	76.46	0.002498	1.21	8.08	16.87	0.42
Main Channel	8236.271	100-Year	8.71	75.20	76.60	76.14	76.64	0.001493	1.05	12.07	23.42	0.33
Main Channel	8236.271	Jul-79	9.85	75.20	76.70	76.19	76.74	0.001246	1.02	14.83	29.45	0.30
Main Channel	8115.263	2-Year	2.11	74.80	75.41	75.49	75.51	0.006792	1.41	1.50	4.76	0.79
Main Channel	8115.263	5-Year	3.66	74.80	75.56	75.49	75.70	0.007455	1.66	2.31	6.29	0.77
Main Channel	8115.263	10-Year	4.69	74.80	75.64	75.57	75.80	0.007482	1.78	2.87	10.11	0.76
Main Channel	8115.263	25-Year	6.18	74.80	75.81	75.75	75.95	0.005410	1.72	4.17	14.73	0.65
Main Channel	8115.263	50-Year	7.26	74.80	76.05	76.01	76.14	0.002716	1.42	6.29	23.55	0.46
Main Channel	8115.263	100-Year	8.71	74.80	76.52	76.52	76.54	0.000506	0.77	23.40	102.73	0.21
Main Channel	8115.263	Jul-79	9.85	74.80	76.66	76.66	76.67	0.000302	0.63	36.21	130.83	0.16
Main Channel	8003.485	2-Year	2.11	74.50	75.23	74.95	75.24	0.001092	0.52	5.12	23.04	0.24
Main Channel	8003.485	5-Year	3.66	74.50	75.42	75.05	75.44	0.000923	0.58	8.88	30.82	0.23
Main Channel	8003.485	10-Year	4.69	74.50	75.55	75.10	75.56	0.000769	0.58	11.75	34.28	0.21
Main Channel	8003.485	25-Year	6.18	74.50	75.77	75.16	75.78	0.000505	0.55	17.42	44.15	0.17
Main Channel	8003.485	50-Year	7.26	74.50	76.04	75.20	76.04	0.000285	0.48	27.20	102.22	0.13
Main Channel	8003.485	100-Year	8.71	74.50	76.52	75.26	76.52	0.000038	0.21	91.72	156.53	0.05
Main Channel	8003.485	Jul-79	9.85	74.50	76.66	75.30	76.66	0.000027	0.19	113.14	162.85	0.04
Main Channel	7903.683	2-Year	2.11	74.27	75.05	74.84	75.09	0.002061	0.90	2.77	44.74	0.41
Main Channel	7903.683	5-Year	3.66	74.27	75.29	74.99	75.33	0.001443	0.90	5.33	49.39	0.34
Main Channel	7903.683	10-Year	4.69	74.27	75.45	75.06	75.48	0.001092	0.87	7.29	51.94	0.29
Main Channel	7903.683	25-Year	6.18	74.27	75.71	75.16	75.73	0.000635	0.76	11.36	57.98	0.23
Main Channel	7903.683	50-Year	7.26	74.27	76.01	75.22	76.02	0.000289	0.59	19.99	85.38	0.16
Main Channel	7903.683	100-Year	8.71	74.27	76.52	75.28	76.52	0.000060	0.32	52.51	177.23	0.07
Main Channel	7903.683	Jul-79	9.85	74.27	76.65	75.32	76.65	0.000047	0.30	66.47	195.18	0.07
Main Channel	7847.556	2-Year	2.60	74.10	74.95	74.68	74.99	0.001717	0.81	3.57	9.48	0.35
Main Channel	7847.556	5-Year	4.52	74.10	75.23	74.82	75.26	0.001147	0.81	8.00	27.90	0.28
Main Channel	7847.556	10-Year	5.78	74.10	75.41	74.89	75.43	0.000645	0.68	15.46	52.80	0.22
Main Channel	7847.556	25-Year	7.60	74.10	75.70	75.00	75.71	0.000228	0.47	32.51	62.51	0.13
Main Channel	7847.556	50-Year	8.92	74.10	76.01	75.07	76.01	0.000088	0.33	52.77	70.46	0.08
Main Channel	7847.556	100-Year	10.70	74.10	76.52	75.17	76.52	0.000021	0.19	110.57	129.45	0.04
Main Channel	7847.556	Jul-79	12.10	74.10	76.65	75.23	76.65	0.000018	0.18	128.84	141.24	0.04
Main Channel	7747.399	2-Year	2.60	73.90	74.81	74.49	74.84	0.001294	0.72	3.89	8.36	0.30
Main Channel	7747.399	5-Year	4.52	73.90	75.13	74.62	75.15	0.000933	0.77	6.86	10.60	0.26
Main Channel	7747.399	10-Year	5.78	73.90	75.34	74.69	75.36	0.000711	0.75	9.27	12.40	0.23
Main Channel	7747.399	25-Year	7.60	73.90	75.66	74.78	75.68	0.000435	0.68	14.95	24.45	0.18
Main Channel	7747.399	50-Year	8.92	73.90	75.99	74.85	76.00	0.000216	0.55	24.56	42.71	0.13
Main Channel	7747.399	100-Year	10.70	73.90	76.51	74.92	76.51	0.000062	0.34	56.38	80.38	0.07
Main Channel	7747.399	Jul-79	12.10	73.90	76.65	74.98	76.65	0.000052	0.33	68.52	98.23	0.07

HEC-RAS Plan: 2015-01-27unrout River: WattsKizell Reach: Main Channel (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Main Channel	7691.759	2-Year	2.60	73.80	74.75	74.38	74.77	0.000987	0.77	4.51	9.33	0.28
Main Channel	7691.759	5-Year	4.52	73.80	75.09	74.53	75.11	0.000662	0.79	8.90	16.87	0.24
Main Channel	7691.759	10-Year	5.78	73.80	75.31	74.61	75.33	0.000435	0.72	12.98	18.96	0.20
Main Channel	7691.759	25-Year	7.60	73.80	75.65	74.71	75.66	0.000248	0.62	19.66	129.86	0.15
Main Channel	7691.759	50-Year	8.92	73.80	75.98	74.78	75.99	0.000141	0.53	26.69	131.85	0.12
Main Channel	7691.759	100-Year	10.70	73.80	76.50	74.84	76.51	0.000069	0.43	38.60	137.84	0.09
Main Channel	7691.759	Jul-79	12.10	73.80	76.64	74.98	76.65	0.000070	0.45	41.82	140.81	0.09
Main Channel	7640.349	2-Year	2.60	73.70	74.71	74.26	74.73	0.000664	0.58	5.22	9.26	0.21
Main Channel	7640.349	5-Year	4.52	73.70	75.06	74.39	75.08	0.000522	0.64	8.71	11.26	0.20
Main Channel	7640.349	10-Year	5.78	73.70	75.29	74.47	75.31	0.000439	0.66	12.04	17.58	0.18
Main Channel	7640.349	25-Year	7.60	73.70	75.64	74.56	75.65	0.000174	0.48	31.73	79.55	0.12
Main Channel	7640.349	50-Year	8.92	73.70	75.98	74.62	75.98	0.000049	0.28	59.12	81.53	0.06
Main Channel	7640.349	100-Year	10.70	73.70	76.51	74.69	76.51	0.000013	0.17	103.77	90.21	0.03
Main Channel	7640.349	Jul-79	12.10	73.70	76.64	74.75	76.64	0.000012	0.17	116.44	99.14	0.03
Main Channel	7596.24	2-Year	2.60	73.56	74.70	74.15	74.71	0.000383	0.61	6.96	11.91	0.19
Main Channel	7596.24	5-Year	4.52	73.56	75.05	74.30	75.06	0.000317	0.68	11.59	14.63	0.18
Main Channel	7596.24	10-Year	5.78	73.56	75.28	74.37	75.29	0.000258	0.68	15.20	16.31	0.17
Main Channel	7596.24	25-Year	7.60	73.56	75.63	74.47	75.64	0.000182	0.65	21.28	18.63	0.15
Main Channel	7596.24	50-Year	8.92	73.56	75.97	74.55	75.98	0.000113	0.57	28.07	21.42	0.12
Main Channel	7596.24	100-Year	10.70	73.56	76.50	74.63	76.51	0.000059	0.47	40.74	30.00	0.09
Main Channel	7596.24	Jul-79	12.10	73.56	76.64	74.68	76.64	0.000059	0.48	45.77	32.14	0.09
Main Channel	7588.42	2-Year	2.60	73.78	74.67	74.17	74.70	0.002061	0.83	3.13	9.40	0.28
Main Channel	7588.42	5-Year	4.52	73.78	74.99	74.34	75.05	0.002154	1.05	4.31	11.51	0.31
Main Channel	7588.42	10-Year	5.78	73.78	75.22	74.43	75.28	0.002003	1.13	5.10	12.99	0.30
Main Channel	7588.42	25-Year	7.60	73.78	75.55	74.56	75.63	0.001701	1.20	6.32	15.49	0.29
Main Channel	7588.42	50-Year	8.92	73.78	75.90	74.65	75.97	0.001297	1.18	7.54	16.90	0.26
Main Channel	7588.42	100-Year	10.70	73.78	76.49	74.76	76.50	0.000267	0.63	20.87	20.82	0.12
Main Channel	7588.42	Jul-79	12.10	73.78	76.63	74.84	76.64	0.000124	0.44	36.41	24.89	0.08
Main Channel	7573.092		Culvert									
Main Channel	7559.345	2-Year	2.60	73.56	74.28	73.96	74.33	0.002845	1.04	2.49	5.96	0.40
Main Channel	7559.345	5-Year	4.52	73.56	74.56	74.13	74.64	0.002731	1.29	3.52	7.21	0.41
Main Channel	7559.345	10-Year	5.78	73.56	74.76	74.22	74.86	0.002392	1.36	4.24	8.20	0.40
Main Channel	7559.345	25-Year	7.60	73.56	74.92	74.35	75.05	0.002726	1.58	4.81	9.12	0.44
Main Channel	7559.345	50-Year	8.92	73.56	74.97	74.44	75.13	0.003309	1.79	4.99	9.39	0.48
Main Channel	7559.345	100-Year	10.70	73.56	75.12	74.55	75.20	0.001996	1.36	9.84	11.03	0.36
Main Channel	7559.345	Jul-79	12.10	73.56	75.17	74.63	75.26	0.002281	1.49	10.34	11.71	0.38
Main Channel	7547.932	2-Year	2.60	73.24	74.28	73.84	74.31	0.000783	0.66	4.47	7.86	0.24
Main Channel	7547.932	5-Year	4.52	73.24	74.59	73.98	74.61	0.000738	0.77	7.11	9.81	0.24
Main Channel	7547.932	10-Year	5.78	73.24	74.80	74.06	74.82	0.000621	0.78	9.37	11.67	0.22
Main Channel	7547.932	25-Year	7.60	73.24	74.97	74.16	75.01	0.000655	0.87	11.56	13.37	0.23
Main Channel	7547.932	50-Year	8.92	73.24	75.04	74.23	75.08	0.000747	0.96	12.53	14.34	0.25
Main Channel	7547.932	100-Year	10.70	73.24	75.13	74.31	75.18	0.000842	1.05	13.99	18.40	0.26
Main Channel	7547.932	Jul-79	12.10	73.24	75.18	74.37	75.23	0.000944	1.13	14.91	19.41	0.28
Main Channel	7489.235	2-Year	2.60	73.20	74.25	73.78	74.27	0.000530	0.58	6.26	25.19	0.20
Main Channel	7489.235	5-Year	4.52	73.20	74.56	73.93	74.58	0.000418	0.62	11.31	33.06	0.19
Main Channel	7489.235	10-Year	5.78	73.20	74.78	74.01	74.79	0.000327	0.61	16.62	51.11	0.17
Main Channel	7489.235	25-Year	7.60	73.20	74.96	74.09	74.97	0.000282	0.61	22.52	57.50	0.16
Main Channel	7489.235	50-Year	8.92	73.20	75.03	74.15	75.05	0.000316	0.67	25.03	62.64	0.17
Main Channel	7489.235	100-Year	10.70	73.20	75.12	74.21	75.14	0.000334	0.71	28.53	65.62	0.17
Main Channel	7489.235	Jul-79	12.10	73.20	75.17	74.27	75.19	0.000365	0.76	30.52	68.23	0.18
Main Channel	7438.877	2-Year	3.09	73.10	74.21	73.73	74.23	0.001158	0.61	5.50	21.14	0.23
Main Channel	7438.877	5-Year	5.38	73.10	74.53	73.89	74.55	0.000842	0.66	9.52	24.99	0.21
Main Channel	7438.877	10-Year	6.86	73.10	74.75	73.96	74.77	0.000619	0.65	12.89	27.98	0.18
Main Channel	7438.877	25-Year	9.02	73.10	74.93	74.07	74.95	0.000665	0.73	16.48	47.34	0.19
Main Channel	7438.877	50-Year	10.60	73.10	74.99	74.15	75.02	0.000755	0.81	18.10	51.33	0.21
Main Channel	7438.877	100-Year	12.70	73.10	75.08	74.23	75.11	0.000896	0.91	20.67	68.31	0.23
Main Channel	7438.877	Jul-79	14.40	73.10	75.12	74.29	75.16	0.000993	0.97	22.25	72.04	0.24
Main Channel	7386.879	2-Year	3.09	73.11	74.17		74.18	0.000638	0.48	6.49	21.83	0.19
Main Channel	7386.879	5-Year	5.38	73.11	74.50		74.51	0.000534	0.52	10.49	26.49	0.18
Main Channel	7386.879	10-Year	6.86	73.11	74.73		74.74	0.000407	0.51	13.89	47.41	0.16
Main Channel	7386.879	25-Year	9.02	73.11	74.91		74.92	0.000426	0.57	17.36	63.87	0.16
Main Channel	7386.879	50-Year	10.60	73.11	74.97		74.99	0.000494	0.63	18.78	65.91	0.18
Main Channel	7386.879	100-Year	12.70	73.11	75.05		75.07	0.000574	0.71	20.65	69.56	0.19
Main Channel	7386.879	Jul-79	14.40	73.11	75.08		75.11	0.000666	0.77	21.63	71.66	0.20
Main Channel	7324.579	2-Year	3.09	73.20	74.10		74.12	0.001611	0.56	5.56	15.61	0.25
Main Channel	7324.579	5-Year	5.38	73.20	74.45		74.47	0.000854	0.57	9.75	24.00	0.20
Main Channel	7324.579	10-Year	6.86	73.20	74.70		74.71	0.000572	0.55	13.19	34.91	0.17

HEC-RAS Plan: 2015-01-27unrout River: WattsKizell Reach: Main Channel (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Main Channel	7324.579	25-Year	9.02	73.20	74.87		74.89	0.000581	0.61	15.92	45.26	0.17
Main Channel	7324.579	50-Year	10.60	73.20	74.93		74.95	0.000689	0.68	16.85	54.49	0.19
Main Channel	7324.579	100-Year	12.70	73.20	75.00		75.03	0.000820	0.77	18.18	59.99	0.21
Main Channel	7324.579	Jul-79	14.40	73.20	75.03		75.06	0.000968	0.85	19.52	102.56	0.23
Main Channel	7280.889	2-Year	3.09	73.22	74.08	73.53	74.08	0.000470	0.36	8.52	16.88	0.14
Main Channel	7280.889	5-Year	5.38	73.22	74.43	73.64	74.44	0.000375	0.39	13.64	40.25	0.13
Main Channel	7280.889	10-Year	6.86	73.22	74.69	73.69	74.69	0.000304	0.39	17.79	52.23	0.12
Main Channel	7280.889	25-Year	9.02	73.22	74.86	73.76	74.87	0.000307	0.43	21.56	75.05	0.13
Main Channel	7280.889	50-Year	10.60	73.22	74.91	73.81	74.93	0.000362	0.48	23.41	116.01	0.14
Main Channel	7280.889	100-Year	12.70	73.22	74.98	73.87	75.00	0.000417	0.54	26.78	141.98	0.15
Main Channel	7280.889	Jul-79	14.40	73.22	75.01	73.91	75.03	0.000490	0.59	28.39	175.16	0.16
Main Channel	7276.354	2-Year	3.09	72.70	74.07	73.09	74.08	0.000292	0.52	5.96	11.11	0.14
Main Channel	7276.354	5-Year	5.38	72.70	74.42	73.25	74.44	0.000373	0.68	9.69	27.13	0.17
Main Channel	7276.354	10-Year	6.86	72.70	74.67	73.35	74.69	0.000311	0.69	15.08	40.17	0.16
Main Channel	7276.354	25-Year	9.02	72.70	74.86	73.47	74.87	0.000132	0.37	34.47	80.59	0.09
Main Channel	7276.354	50-Year	10.60	72.70	74.92	73.56	74.92	0.000153	0.41	38.39	111.14	0.10
Main Channel	7276.354	100-Year	12.70	72.70	74.99	73.67	74.99	0.000175	0.45	44.32	126.88	0.11
Main Channel	7276.354	Jul-79	14.40	72.70	75.01	73.75	75.02	0.000212	0.50	47.19	145.33	0.12
Main Channel	7259.491		Culvert									
Main Channel	7242.107	2-Year	3.09	72.68	73.93	73.11	73.95	0.000438	0.58	5.28	7.71	0.17
Main Channel	7242.107	5-Year	5.38	72.68	74.04	73.27	74.08	0.001001	0.94	5.75	8.20	0.26
Main Channel	7242.107	10-Year	6.86	72.68	74.02	73.36	74.10	0.001689	1.21	5.69	8.10	0.34
Main Channel	7242.107	25-Year	9.02	72.68	74.20	73.49	74.30	0.001896	1.39	6.47	22.33	0.37
Main Channel	7242.107	50-Year	10.60	72.68	74.43	73.58	74.45	0.000765	0.76	23.98	89.29	0.21
Main Channel	7242.107	100-Year	12.70	72.68	74.80	73.68	74.80	0.000156	0.40	64.82	133.88	0.10
Main Channel	7242.107	Jul-79	14.40	72.68	74.85	73.76	74.86	0.000151	0.40	72.45	137.56	0.10
Main Channel	7229.969	2-Year	3.09	73.03	73.92	73.39	73.94	0.000893	0.56	5.56	8.41	0.22
Main Channel	7229.969	5-Year	5.38	73.03	74.03	73.53	74.06	0.001864	0.84	6.44	8.92	0.31
Main Channel	7229.969	10-Year	6.86	73.03	74.00	73.61	74.06	0.003301	1.10	6.23	8.81	0.42
Main Channel	7229.969	25-Year	9.02	73.03	74.25	73.72	74.26	0.000433	0.47	26.46	50.43	0.16
Main Channel	7229.969	50-Year	10.60	73.03	74.44	73.79	74.44	0.000333	0.46	45.12	121.11	0.14
Main Channel	7229.969	100-Year	12.70	73.03	74.80	73.87	74.80	0.000064	0.24	93.53	149.32	0.06
Main Channel	7229.969	Jul-79	14.40	73.03	74.85	73.93	74.85	0.000064	0.25	101.83	151.99	0.07
Main Channel	7161.913	2-Year	3.09	73.04	73.84	73.40	73.87	0.001301	0.72	4.29	7.42	0.30
Main Channel	7161.913	5-Year	5.38	73.04	74.04	73.56	74.04	0.000039	0.15	36.78	53.32	0.05
Main Channel	7161.913	10-Year	6.86	73.04	74.03	73.65	74.03	0.000066	0.19	36.28	52.19	0.07
Main Channel	7161.913	25-Year	9.02	73.04	74.25	73.78	74.25	0.000058	0.21	45.98	62.83	0.07
Main Channel	7161.913	50-Year	10.60	73.04	74.43	73.85	74.44	0.000047	0.22	54.36	66.91	0.06
Main Channel	7161.913	100-Year	12.70	73.04	74.79	73.94	74.79	0.000029	0.20	71.56	135.88	0.05
Main Channel	7161.913	Jul-79	14.40	73.04	74.85	74.01	74.85	0.000033	0.22	75.03	163.52	0.06
Main Channel	7125.073	2-Year	3.09	72.80	73.78	73.38	73.80	0.002345	0.71	4.37	7.59	0.30
Main Channel	7125.073	5-Year	5.38	72.80	74.04	73.53	74.04	0.000011	0.05	62.47	126.20	0.02
Main Channel	7125.073	10-Year	6.86	72.80	74.03	73.61	74.03	0.000018	0.07	61.78	126.03	0.03
Main Channel	7125.073	25-Year	9.02	72.80	74.25	73.72	74.25	0.000017	0.08	74.56	130.58	0.03
Main Channel	7125.073	50-Year	10.60	72.80	74.43	73.79	74.43	0.000015	0.09	85.71	133.05	0.03
Main Channel	7125.073	100-Year	12.70	72.80	74.79	73.87	74.79	0.000010	0.09	112.01	206.22	0.02
Main Channel	7125.073	Jul-79	14.40	72.80	74.85	73.94	74.85	0.000012	0.09	117.21	219.77	0.02
Main Channel	7058.454	2-Year	3.09	72.70	73.57		73.61	0.003731	0.83	3.72	7.26	0.37
Main Channel	7058.454	5-Year	5.38	72.70	73.82		73.87	0.003564	0.94	5.73	8.98	0.37
Main Channel	7058.454	10-Year	6.86	72.70	73.97		74.02	0.002873	0.97	7.18	10.30	0.34
Main Channel	7058.454	25-Year	9.02	72.70	74.19		74.24	0.002077	0.97	10.06	15.60	0.31
Main Channel	7058.454	50-Year	10.60	72.70	74.39		74.43	0.001403	0.89	13.89	23.04	0.26
Main Channel	7058.454	100-Year	12.70	72.70	74.78		74.79	0.000404	0.58	35.79	126.84	0.15
Main Channel	7058.454	Jul-79	14.40	72.70	74.83		74.85	0.000398	0.59	40.67	138.17	0.14
Main Channel	7025.94	2-Year	3.09	72.60	73.26	73.20	73.37	0.018480	1.48	2.09	5.99	0.80
Main Channel	7025.94	5-Year	5.38	72.60	73.67	73.35	73.73	0.004992	1.06	5.08	8.44	0.44
Main Channel	7025.94	10-Year	6.86	72.60	73.86	73.43	73.92	0.003608	1.01	6.83	9.86	0.38
Main Channel	7025.94	25-Year	9.02	72.60	74.12	73.54	74.17	0.002185	0.96	9.68	12.23	0.31
Main Channel	7025.94	50-Year	10.60	72.60	74.34	73.61	74.38	0.001492	0.91	12.61	62.16	0.26
Main Channel	7025.94	100-Year	12.70	72.60	74.77	73.69	74.78	0.000200	0.41	56.59	186.13	0.10
Main Channel	7025.94	Jul-79	14.40	72.60	74.83	73.75	74.83	0.000163	0.38	71.28	200.03	0.09
Main Channel	7020.547	2-Year	3.09	72.10	73.30	72.58	73.34	0.000518	0.86	3.60	6.33	0.25
Main Channel	7020.547	5-Year	5.38	72.10	73.65	72.79	73.72	0.000668	1.15	4.66	8.35	0.30
Main Channel	7020.547	10-Year	6.86	72.10	73.81	72.91	73.90	0.000782	1.33	5.14	9.73	0.33
Main Channel	7020.547	25-Year	9.02	72.10	74.03	73.07	74.16	0.000906	1.56	5.80	12.39	0.36
Main Channel	7020.547	50-Year	10.60	72.10	74.22	73.18	74.36	0.000917	1.67	6.36	43.89	0.37
Main Channel	7020.547	100-Year	12.70	72.10	74.77	73.32	74.78	0.000098	0.52	68.18	187.20	0.11

HEC-RAS Plan: 2015-01-27unrout River: WattsKizell Reach: Main Channel (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Main Channel	7020.547	Jul-79	14.40	72.10	74.83	73.43	74.83	0.000097	0.53	77.05	196.64	0.11
Main Channel	7000.502		Culvert									
Main Channel	6984.227	2-Year	2.97	72.10	73.25	72.56	73.29	0.000546	0.86	3.46	16.85	0.25
Main Channel	6984.227	5-Year	4.80	72.10	73.58	72.74	73.64	0.000630	1.08	4.43	67.02	0.29
Main Channel	6984.227	10-Year	6.19	72.10	73.71	72.86	73.79	0.000783	1.28	4.83	83.03	0.32
Main Channel	6984.227	25-Year	8.12	72.10	73.89	73.01	74.00	0.000953	1.51	5.36	95.55	0.36
Main Channel	6984.227	50-Year	9.70	72.10	74.04	73.12	74.19	0.001026	1.66	5.83	108.21	0.38
Main Channel	6984.227	100-Year	11.50	72.10	74.43	73.24	74.43	0.000025	0.27	101.19	272.21	0.06
Main Channel	6984.227	Jul-79	12.90	72.10	74.53	73.34	74.54	0.000022	0.26	117.15	287.21	0.06
Main Channel	6974.809	2-Year	2.97	72.20	73.27	72.56	73.28	0.000319	0.41	9.45	104.95	0.14
Main Channel	6974.809	5-Year	4.80	72.20	73.61	72.69	73.62	0.000146	0.34	22.02	181.72	0.10
Main Channel	6974.809	10-Year	6.19	72.20	73.76	72.78	73.77	0.000128	0.35	29.20	238.40	0.09
Main Channel	6974.809	25-Year	8.12	72.20	73.96	72.89	73.97	0.000100	0.34	40.03	266.71	0.09
Main Channel	6974.809	50-Year	9.70	72.20	74.14	72.96	74.14	0.000078	0.32	49.52	286.56	0.08
Main Channel	6974.809	100-Year	11.50	72.20	74.43	73.03	74.43	0.000007	0.11	195.88	308.98	0.02
Main Channel	6974.809	Jul-79	12.90	72.20	74.54	73.09	74.54	0.000007	0.11	216.04	315.81	0.02
Main Channel	6834.839	2-Year	2.97	72.10	73.27	72.56	73.27	0.000036	0.16	39.18	111.59	0.05
Main Channel	6834.839	5-Year	4.80	72.10	73.61	72.69	73.61	0.000012	0.11	92.91	195.19	0.03
Main Channel	6834.839	10-Year	6.19	72.10	73.76	72.78	73.76	0.000009	0.10	123.15	201.90	0.03
Main Channel	6834.839	25-Year	8.12	72.10	73.96	72.89	73.96	0.000007	0.10	164.50	209.33	0.02
Main Channel	6834.839	50-Year	9.70	72.10	74.14	72.96	74.14	0.000005	0.09	202.14	221.75	0.02
Main Channel	6834.839	100-Year	11.50	72.10	74.43	73.03	74.43	0.000003	0.08	268.23	234.89	0.02
Main Channel	6834.839	Jul-79	12.90	72.10	74.53	73.09	74.53	0.000003	0.08	293.24	237.70	0.02
Main Channel	6705.311	2-Year	2.97	72.00	73.26	72.56	73.26	0.000013	0.13	65.00	176.99	0.04
Main Channel	6705.311	5-Year	4.80	72.00	73.61	72.69	73.61	0.000005	0.09	141.67	242.55	0.02
Main Channel	6705.311	10-Year	6.19	72.00	73.76	72.78	73.76	0.000004	0.09	179.22	249.76	0.02
Main Channel	6705.311	25-Year	8.12	72.00	73.96	72.89	73.96	0.000003	0.09	230.65	262.90	0.02
Main Channel	6705.311	50-Year	9.70	72.00	74.14	72.96	74.14	0.000003	0.08	277.40	272.10	0.02
Main Channel	6705.311	100-Year	11.50	72.00	74.43	73.03	74.43	0.000002	0.07	358.62	288.77	0.02
Main Channel	6705.311	Jul-79	12.90	72.00	74.53	73.09	74.53	0.000002	0.08	389.50	293.45	0.02
Main Channel	6550.151	2-Year	2.97	72.10	73.26	72.47	73.26	0.000046	0.19	24.00	238.90	0.06
Main Channel	6550.151	5-Year	4.80	72.10	73.61	72.59	73.61	0.000029	0.19	38.92	346.08	0.05
Main Channel	6550.151	10-Year	6.19	72.10	73.76	72.64	73.76	0.000030	0.20	45.46	359.92	0.05
Main Channel	6550.151	25-Year	8.12	72.10	73.96	72.71	73.96	0.000031	0.22	54.05	371.90	0.05
Main Channel	6550.151	50-Year	9.70	72.10	74.14	72.77	74.14	0.000029	0.23	61.55	396.71	0.05
Main Channel	6550.151	100-Year	11.50	72.10	74.43	72.79	74.43	0.000004	0.09	231.76	430.89	0.02
Main Channel	6550.151	Jul-79	12.90	72.10	74.53	72.80	74.53	0.000001	0.05	538.58	436.28	0.01
Main Channel	6542.144	2-Year	2.97	71.50	73.25	71.84	73.26	0.000148	0.35	8.41	211.58	0.09
Main Channel	6542.144	5-Year	4.80	71.50	73.60	71.97	73.61	0.000212	0.48	10.06	328.35	0.11
Main Channel	6542.144	10-Year	6.19	71.50	73.74	72.05	73.76	0.000282	0.58	10.76	348.02	0.12
Main Channel	6542.144	25-Year	8.12	71.50	73.93	72.16	73.96	0.000368	0.69	11.69	369.87	0.14
Main Channel	6542.144	50-Year	9.70	71.50	74.10	72.25	74.13	0.000421	0.78	12.50	382.31	0.15
Main Channel	6542.144	100-Year	11.50	71.50	74.43	72.34	74.43	0.000005	0.09	203.55	417.78	0.02
Main Channel	6542.144	Jul-79	12.90	71.50	74.53	72.40	74.53	0.000001	0.04	533.34	442.06	0.01
Main Channel	6522.792		Culvert									
Main Channel	6500.704	2-Year	3.59	71.43	73.23	71.81	73.24	0.000198	0.42	8.63	130.24	0.10
Main Channel	6500.704	5-Year	6.01	71.43	73.52	71.97	73.54	0.000334	0.60	10.05	146.74	0.13
Main Channel	6500.704	10-Year	7.61	71.43	73.62	72.06	73.65	0.000460	0.72	10.52	157.35	0.16
Main Channel	6500.704	25-Year	9.90	71.43	73.72	72.19	73.76	0.000670	0.90	11.00	161.91	0.19
Main Channel	6500.704	50-Year	11.70	71.43	73.80	72.27	73.85	0.000842	1.03	11.35	164.98	0.21
Main Channel	6500.704	100-Year	13.90	71.43	73.99	72.38	74.00	0.000015	0.12	175.41	175.41	0.03
Main Channel	6500.704	Jul-79	15.80	71.43	74.40	72.46	74.40	0.000007	0.09	257.43	249.94	0.02
Main Channel	6486.45	2-Year	3.59	72.00	73.23	72.63	73.23	0.000046	0.15	39.52	189.98	0.05
Main Channel	6486.45	5-Year	6.01	72.00	73.53	72.70	73.54	0.000028	0.14	63.92	235.03	0.04
Main Channel	6486.45	10-Year	7.61	72.00	73.64	72.76	73.64	0.000030	0.15	72.21	237.58	0.04
Main Channel	6486.45	25-Year	9.90	72.00	73.75	72.78	73.75	0.000035	0.17	81.09	243.26	0.05
Main Channel	6486.45	50-Year	11.70	72.00	73.83	72.85	73.83	0.000037	0.19	87.67	246.92	0.05
Main Channel	6486.45	100-Year	13.90	72.00	73.99	72.88	74.00	0.000008	0.09	245.91	253.74	0.02
Main Channel	6486.45	Jul-79	15.80	72.00	74.40	72.90	74.40	0.000003	0.07	351.34	269.11	0.02
Main Channel	6384.713	2-Year	4.10	71.90	73.22	72.56	73.22	0.000274	0.36	20.07	69.47	0.12
Main Channel	6384.713	5-Year	6.65	71.90	73.53	72.69	73.53	0.000130	0.29	45.82	92.21	0.08
Main Channel	6384.713	10-Year	8.35	71.90	73.63	72.78	73.63	0.000128	0.30	55.64	98.72	0.08
Main Channel	6384.713	25-Year	10.70	71.90	73.74	72.89	73.74	0.000130	0.32	66.70	101.95	0.08
Main Channel	6384.713	50-Year	12.70	71.90	73.82	72.96	73.82	0.000132	0.33	75.12	104.64	0.08
Main Channel	6384.713	100-Year	15.20	71.90	73.99	73.03	73.99	0.000104	0.31	93.16	109.80	0.08
Main Channel	6384.713	Jul-79	17.10	71.90	74.40	73.09	74.40	0.000041	0.22	139.97	126.78	0.05

HEC-RAS Plan: 2015-01-27unrout River: WattsKizell Reach: Main Channel (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Main Channel	6243.84	2-Year	4.10	71.90	73.15		73.17	0.000609	0.54	9.66	29.68	0.17
Main Channel	6243.84	5-Year	6.65	71.90	73.49		73.50	0.000360	0.50	23.85	49.20	0.14
Main Channel	6243.84	10-Year	8.35	71.90	73.59		73.60	0.000375	0.54	29.99	64.27	0.14
Main Channel	6243.84	25-Year	10.70	71.90	73.70		73.71	0.000379	0.57	37.36	69.11	0.15
Main Channel	6243.84	50-Year	12.70	71.90	73.78		73.79	0.000378	0.59	43.06	70.76	0.15
Main Channel	6243.84	100-Year	15.20	71.90	73.96		73.97	0.000286	0.55	58.35	93.22	0.13
Main Channel	6243.84	Jul-79	17.10	71.90	74.39		74.39	0.000083	0.34	99.78	99.11	0.07
Main Channel	6137.62	2-Year	4.60	71.80	73.02		73.05	0.002176	0.83	6.22	8.51	0.26
Main Channel	6137.62	5-Year	7.28	71.80	73.39		73.43	0.001598	0.88	11.77	33.19	0.24
Main Channel	6137.62	10-Year	9.10	71.80	73.49		73.53	0.001755	0.97	15.55	44.03	0.25
Main Channel	6137.62	25-Year	11.50	71.80	73.60		73.64	0.001805	1.03	21.09	53.55	0.26
Main Channel	6137.62	50-Year	13.80	71.80	73.68		73.72	0.001957	1.10	25.80	62.89	0.27
Main Channel	6137.62	100-Year	16.50	71.80	73.90		73.92	0.001078	0.89	40.67	68.77	0.21
Main Channel	6137.62	Jul-79	18.50	71.80	74.37		74.38	0.000279	0.52	74.78	74.74	0.11
Main Channel	6135.225	2-Year	4.60	71.41	72.96	72.14	73.04	0.001076	1.26	3.66	7.92	0.32
Main Channel	6135.225	5-Year	7.28	71.41	73.36	72.40	73.42	0.000872	1.13	8.98	28.53	0.27
Main Channel	6135.225	10-Year	9.10	71.41	73.44	72.56	73.52	0.001116	1.32	11.41	38.08	0.31
Main Channel	6135.225	25-Year	11.50	71.41	73.52	72.75	73.63	0.001455	1.55	14.64	50.14	0.36
Main Channel	6135.225	50-Year	13.80	71.41	73.58	72.93	73.71	0.001743	1.73	17.43	54.66	0.39
Main Channel	6135.225	100-Year	16.50	71.41	73.88	73.12	73.92	0.000725	1.07	40.19	69.37	0.23
Main Channel	6135.225	Jul-79	18.50	71.41	74.37	73.25	74.38	0.000212	0.66	75.41	74.91	0.13
Main Channel	6129.747		Culvert									
Main Channel	6126.151	2-Year	4.60	71.32	72.81	72.05	72.90	0.001220	1.30	3.53	7.23	0.34
Main Channel	6126.151	5-Year	7.28	71.32	72.93	72.31	73.12	0.002385	1.92	3.80	13.99	0.48
Main Channel	6126.151	10-Year	9.10	71.32	72.97	72.47	73.25	0.003451	2.34	3.89	14.84	0.58
Main Channel	6126.151	25-Year	11.50	71.32	73.04	72.66	73.45	0.004755	2.83	4.06	16.70	0.69
Main Channel	6126.151	50-Year	13.80	71.32	73.50	72.84	73.58	0.001549	1.45	23.40	60.00	0.35
Main Channel	6126.151	100-Year	16.50	71.32	73.89	73.03	73.91	0.000401	0.79	52.17	69.89	0.18
Main Channel	6126.151	Jul-79	18.50	71.32	74.37	73.36	74.37	0.000140	0.54	87.58	77.77	0.11
Main Channel	6104.633	2-Year	4.60	71.60	72.81		72.86	0.001353	1.05	6.17	9.78	0.31
Main Channel	6104.633	5-Year	7.28	71.60	72.95		73.04	0.002173	1.43	7.64	11.57	0.41
Main Channel	6104.633	10-Year	9.10	71.60	73.01		73.13	0.002788	1.67	8.39	12.10	0.46
Main Channel	6104.633	25-Year	11.50	71.60	73.15		73.29	0.002997	1.85	10.12	13.61	0.49
Main Channel	6104.633	50-Year	13.80	71.60	73.42		73.54	0.002112	1.74	14.31	17.11	0.42
Main Channel	6104.633	100-Year	16.50	71.60	73.80		73.89	0.001302	1.56	27.04	55.30	0.34
Main Channel	6104.633	Jul-79	18.50	71.60	74.34		74.37	0.000367	0.96	61.73	83.81	0.19
Main Channel	5934.876	2-Year	5.11	71.56	72.65	72.23	72.67	0.000934	0.71	14.96	69.76	0.25
Main Channel	5934.876	5-Year	7.92	71.56	72.82	72.37	72.83	0.000710	0.68	29.20	95.21	0.22
Main Channel	5934.876	10-Year	9.80	71.56	72.93	72.50	72.94	0.000537	0.63	39.65	98.06	0.19
Main Channel	5934.876	25-Year	12.40	71.56	73.15	72.64	73.15	0.000259	0.48	61.68	99.80	0.14
Main Channel	5934.876	50-Year	14.90	71.56	73.45	72.67	73.46	0.000114	0.36	92.35	101.94	0.09
Main Channel	5934.876	100-Year	17.70	71.56	73.84	72.75	73.84	0.000054	0.28	132.25	104.76	0.06
Main Channel	5934.876	Jul-79	19.90	71.56	74.35	72.77	74.35	0.000023	0.21	187.11	108.45	0.04
Main Channel	5846.72	2-Year	5.11	71.50	72.49	72.18	72.54	0.002564	0.96	5.35	9.44	0.39
Main Channel	5846.72	5-Year	7.92	71.50	72.65	72.31	72.72	0.003179	1.18	6.87	10.78	0.43
Main Channel	5846.72	10-Year	9.80	71.50	72.76	72.39	72.84	0.003151	1.26	8.16	12.61	0.43
Main Channel	5846.72	25-Year	12.40	71.50	73.04	72.48	73.10	0.001893	1.14	12.62	18.72	0.34
Main Channel	5846.72	50-Year	14.90	71.50	73.40	72.56	73.43	0.000794	0.87	27.99	69.75	0.22
Main Channel	5846.72	100-Year	17.70	71.50	73.83	72.65	73.83	0.000209	0.52	67.25	114.31	0.12
Main Channel	5846.72	Jul-79	19.90	71.50	74.35	72.71	74.35	0.000044	0.28	130.47	126.99	0.06
Main Channel	5691.871	2-Year	5.61	71.10	72.43	71.64	72.44	0.000261	0.54	15.25	44.89	0.16
Main Channel	5691.871	5-Year	8.56	71.10	72.59	71.76	72.61	0.000259	0.59	34.15	119.64	0.16
Main Channel	5691.871	10-Year	10.60	71.10	72.74	71.85	72.75	0.000181	0.52	53.11	132.04	0.14
Main Channel	5691.871	25-Year	13.20	71.10	73.05	71.94	73.06	0.000069	0.36	95.37	137.59	0.09
Main Channel	5691.871	50-Year	16.00	71.10	73.41	72.04	73.41	0.000031	0.28	146.56	147.59	0.06
Main Channel	5691.871	100-Year	19.00	71.10	73.82	72.13	73.82	0.000016	0.22	208.64	153.35	0.04
Main Channel	5691.871	Jul-79	21.20	71.10	74.35	72.19	74.35	0.000007	0.17	289.88	157.54	0.03
Main Channel	5574.705	2-Year	11.20	71.13	72.38		72.39	0.000675	0.66	37.92	148.90	0.21
Main Channel	5574.705	5-Year	17.40	71.13	72.56		72.57	0.000399	0.57	66.27	157.23	0.16
Main Channel	5574.705	10-Year	21.20	71.13	72.72		72.72	0.000233	0.47	91.37	159.21	0.13
Main Channel	5574.705	25-Year	27.00	71.13	73.04		73.05	0.000095	0.34	143.69	162.11	0.08
Main Channel	5574.705	50-Year	32.40	71.13	73.41		73.41	0.000046	0.27	203.15	167.16	0.06
Main Channel	5574.705	100-Year	37.50	71.13	73.82		73.82	0.000025	0.22	273.74	172.85	0.05
Main Channel	5574.705	Jul-79	42.80	71.13	74.35		74.35	0.000013	0.18	365.71	178.91	0.03
Main Channel	5432.364	2-Year	11.30	71.00	72.22		72.25	0.001611	0.90	19.55	79.62	0.28
Main Channel	5432.364	5-Year	17.70	71.00	72.44		72.47	0.001315	0.93	29.04	87.75	0.26

HEC-RAS Plan: 2015-01-27unrout River: WattsKizell Reach: Main Channel (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Main Channel	5432.364	10-Year	21.60	71.00	72.64		72.66	0.000925	0.85	37.49	92.26	0.23
Main Channel	5432.364	25-Year	27.60	71.00	73.00		73.02	0.000517	0.74	53.57	100.75	0.18
Main Channel	5432.364	50-Year	33.10	71.00	73.38		73.39	0.000323	0.66	71.02	110.62	0.14
Main Channel	5432.364	100-Year	38.40	71.00	73.80		73.81	0.000204	0.59	92.26	126.84	0.12
Main Channel	5432.364	Jul-79	43.60	71.00	74.33		74.34	0.000122	0.52	121.56	138.49	0.09
Main Channel	5258.586	2-Year	11.30	70.66	71.91		71.98	0.001754	1.29	14.31	38.89	0.39
Main Channel	5258.586	5-Year	17.70	70.66	72.28		72.32	0.000814	1.07	29.22	45.09	0.28
Main Channel	5258.586	10-Year	21.60	70.66	72.54		72.56	0.000521	0.95	39.74	55.89	0.23
Main Channel	5258.586	25-Year	27.60	70.66	72.94		72.96	0.000301	0.83	57.32	87.22	0.18
Main Channel	5258.586	50-Year	33.10	70.66	73.34		73.36	0.000193	0.74	77.18	114.35	0.15
Main Channel	5258.586	100-Year	38.40	70.66	73.78		73.79	0.000123	0.66	103.54	134.88	0.12
Main Channel	5258.586	Jul-79	43.60	70.66	74.32		74.33	0.000073	0.57	141.02	161.36	0.10
Main Channel	4958.865	2-Year	11.30	70.40	71.78		71.79	0.000330	0.61	33.86	57.52	0.18
Main Channel	4958.865	5-Year	17.70	70.40	72.22		72.23	0.000165	0.52	61.13	66.04	0.13
Main Channel	4958.865	10-Year	21.60	70.40	72.50		72.50	0.000117	0.48	80.06	71.30	0.11
Main Channel	4958.865	25-Year	27.60	70.40	72.92		72.93	0.000076	0.44	112.04	143.88	0.09
Main Channel	4958.865	50-Year	33.10	70.40	73.33		73.33	0.000052	0.40	146.28	172.21	0.08
Main Channel	4958.865	100-Year	38.40	70.40	73.77		73.78	0.000038	0.38	187.37	197.84	0.07
Main Channel	4958.865	Jul-79	43.60	70.40	74.32		74.32	0.000024	0.34	247.71	235.07	0.06
Main Channel	4811.161	2-Year	11.30	70.20	71.71	71.04	71.73	0.000649	0.62	24.43	39.17	0.19
Main Channel	4811.161	5-Year	17.70	70.20	72.19	71.29	72.20	0.000318	0.55	46.87	57.20	0.14
Main Channel	4811.161	10-Year	21.60	70.20	72.48	71.39	72.48	0.000212	0.50	64.81	67.14	0.12
Main Channel	4811.161	25-Year	27.60	70.20	72.91	71.48	72.91	0.000127	0.45	98.22	148.28	0.09
Main Channel	4811.161	50-Year	33.10	70.20	73.32	71.55	73.33	0.000080	0.40	138.31	190.71	0.08
Main Channel	4811.161	100-Year	38.40	70.20	73.77	71.60	73.77	0.000049	0.34	189.00	221.67	0.06
Main Channel	4811.161	Jul-79	43.60	70.20	74.31	71.65	74.31	0.000026	0.28	263.13	279.96	0.05
Main Channel	4746.21	2-Year	11.30	70.20	71.68	70.84	71.70	0.000383	0.65	25.38	60.41	0.18
Main Channel	4746.21	5-Year	17.70	70.20	72.16	71.02	72.18	0.000271	0.66	42.96	68.46	0.16
Main Channel	4746.21	10-Year	21.60	70.20	72.45	71.12	72.47	0.000223	0.66	54.58	74.58	0.15
Main Channel	4746.21	25-Year	27.60	70.20	72.89	71.25	72.90	0.000167	0.64	73.54	194.30	0.13
Main Channel	4746.21	50-Year	33.10	70.20	73.31	71.35	73.32	0.000130	0.62	91.59	312.13	0.12
Main Channel	4746.21	100-Year	38.40	70.20	73.75	71.47	73.77	0.000099	0.59	111.06	367.86	0.10
Main Channel	4746.21	Jul-79	43.60	70.20	74.30	71.55	74.31	0.000071	0.55	134.86	376.72	0.09
Main Channel	4739.756	2-Year	11.30	69.90	71.62	70.71	71.69	0.000644	1.16	9.71	50.64	0.29
Main Channel	4739.756	5-Year	17.70	69.90	72.07	70.96	72.17	0.000701	1.43	12.40	78.38	0.32
Main Channel	4739.756	10-Year	21.60	69.90	72.34	71.10	72.46	0.000695	1.54	14.01	85.73	0.32
Main Channel	4739.756	25-Year	27.60	69.90	72.75	71.29	72.89	0.000661	1.68	16.47	176.35	0.32
Main Channel	4739.756	50-Year	33.10	69.90	73.15	71.46	73.30	0.000605	1.75	18.86	251.08	0.32
Main Channel	4739.756	100-Year	38.40	69.90	73.59	71.61	73.75	0.000526	1.79	21.50	334.99	0.30
Main Channel	4739.756	Jul-79	43.60	69.90	74.14	71.75	74.30	0.000421	1.76	24.80	371.21	0.28
Main Channel	4717.456		Culvert									
Main Channel	4696.874	2-Year	11.30	69.78	71.26	70.62	71.35	0.001180	1.39	8.11	23.16	0.38
Main Channel	4696.874	5-Year	17.70	69.78	71.34	70.87	71.55	0.002379	2.06	8.60	27.31	0.55
Main Channel	4696.874	10-Year	21.60	69.78	71.39	71.00	71.69	0.003129	2.42	8.93	28.63	0.63
Main Channel	4696.874	25-Year	27.60	69.78	71.47	71.19	71.91	0.004293	2.93	9.41	29.96	0.75
Main Channel	4696.874	50-Year	33.10	69.78	71.52	71.36	72.11	0.005547	3.41	9.71	31.03	0.85
Main Channel	4696.874	100-Year	38.40	69.78	71.53	71.51	72.32	0.007419	3.95	9.73	31.09	0.99
Main Channel	4696.874	Jul-79	43.60	69.78	71.66	71.66	72.53	0.007388	4.15	10.51	33.47	1.00
Main Channel	4677.806	2-Year	11.30	70.50	71.14	71.14	71.29	0.025857	1.91	8.53	27.53	0.78
Main Channel	4677.806	5-Year	17.70	70.50	71.25	71.25	71.44	0.028700	2.24	11.54	28.17	0.84
Main Channel	4677.806	10-Year	21.60	70.50	71.37	71.31	71.53	0.020737	2.11	14.93	28.82	0.73
Main Channel	4677.806	25-Year	27.60	70.50	71.56	71.38	71.69	0.013574	1.95	20.45	29.85	0.61
Main Channel	4677.806	50-Year	33.10	70.50	71.71	71.45	71.83	0.011109	1.93	25.11	32.24	0.57
Main Channel	4677.806	100-Year	38.40	70.50	71.84	71.50	71.96	0.009436	1.91	29.55	33.81	0.53
Main Channel	4677.806	Jul-79	43.60	70.50	71.97	71.56	72.08	0.008290	1.91	33.86	35.22	0.51
Main Channel	4649.787	2-Year	11.30	69.90	70.69	70.57	70.86	0.005176	1.89	7.55	15.10	0.70
Main Channel	4649.787	5-Year	17.70	69.90	70.87	70.78	71.12	0.005841	2.30	10.40	16.67	0.76
Main Channel	4649.787	10-Year	21.60	69.90	70.96	70.86	71.25	0.006131	2.51	11.98	17.64	0.80
Main Channel	4649.787	25-Year	27.60	69.90	71.09	71.02	71.44	0.006494	2.79	14.26	18.83	0.83
Main Channel	4649.787	50-Year	33.10	69.90	71.19	71.13	71.59	0.006810	3.02	16.20	19.69	0.87
Main Channel	4649.787	100-Year	38.40	69.90	71.28	71.24	71.73	0.007005	3.21	18.04	20.42	0.89
Main Channel	4649.787	Jul-79	43.60	69.90	71.37	71.32	71.86	0.007029	3.37	19.96	21.35	0.90
Main Channel	4623.083	2-Year	11.30	69.64	70.54		70.66	0.010263	1.59	7.66	17.22	0.61
Main Channel	4623.083	5-Year	17.70	69.64	70.74		70.90	0.009747	1.84	11.27	18.73	0.62
Main Channel	4623.083	10-Year	21.60	69.64	70.84		71.02	0.009506	1.95	13.33	20.17	0.62
Main Channel	4623.083	25-Year	27.60	69.64	71.00		71.20	0.008852	2.08	16.65	22.02	0.62
Main Channel	4623.083	50-Year	33.10	69.64	71.13		71.34	0.008449	2.18	19.57	23.36	0.61

HEC-RAS Plan: 2015-01-27unrout River: WattsKizell Reach: Main Channel (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Main Channel	4623.083	100-Year	38.40	69.64	71.25		71.47	0.008018	2.25	22.45	24.65	0.61
Main Channel	4623.083	Jul-79	43.60	69.64	71.38		71.60	0.007346	2.28	25.66	25.88	0.59
Main Channel	4542.956	2-Year	11.30	68.83	69.67	69.67	69.93	0.008027	2.38	6.83	16.80	0.86
Main Channel	4542.956	5-Year	17.70	68.83	69.87	69.87	70.19	0.007919	2.74	10.24	17.88	0.89
Main Channel	4542.956	10-Year	21.60	68.83	69.97	69.97	70.32	0.007891	2.93	12.08	18.29	0.90
Main Channel	4542.956	25-Year	27.60	68.83	70.10	70.10	70.51	0.008092	3.20	14.52	18.88	0.93
Main Channel	4542.956	50-Year	33.10	68.83	70.21	70.21	70.66	0.008102	3.40	16.72	19.40	0.94
Main Channel	4542.956	100-Year	38.40	68.83	70.31	70.31	70.81	0.008200	3.59	18.66	20.05	0.96
Main Channel	4542.956	Jul-79	43.60	68.83	70.38	70.38	70.94	0.008743	3.83	20.09	20.73	1.00
Main Channel	4446.172	2-Year	11.30	68.15	69.35		69.40	0.001424	1.00	14.75	26.38	0.34
Main Channel	4446.172	5-Year	17.70	68.15	69.58		69.64	0.001531	1.16	20.85	27.24	0.35
Main Channel	4446.172	10-Year	21.60	68.15	69.69		69.75	0.001628	1.26	23.79	27.53	0.36
Main Channel	4446.172	25-Year	27.60	68.15	69.83		69.91	0.001744	1.38	27.90	27.91	0.38
Main Channel	4446.172	50-Year	33.10	68.15	69.97		70.05	0.001783	1.47	31.65	28.29	0.38
Main Channel	4446.172	100-Year	38.40	68.15	70.07		70.17	0.001866	1.56	34.69	28.63	0.39
Main Channel	4446.172	Jul-79	43.60	68.15	70.17		70.28	0.001935	1.64	37.53	28.94	0.40
Main Channel	4323.325	2-Year	11.30	67.89	68.78	68.71	68.97	0.014935	1.98	5.78	12.82	0.85
Main Channel	4323.325	5-Year	17.70	67.89	68.96	68.94	69.20	0.013090	2.22	8.85	19.67	0.83
Main Channel	4323.325	10-Year	21.60	67.89	69.05	69.03	69.31	0.012101	2.31	10.72	20.43	0.82
Main Channel	4323.325	25-Year	27.60	67.89	69.17	69.14	69.45	0.011576	2.47	13.18	21.55	0.82
Main Channel	4323.325	50-Year	33.10	67.89	69.23	69.23	69.57	0.012830	2.72	14.54	22.07	0.87
Main Channel	4323.325	100-Year	38.40	67.89	69.31	69.31	69.67	0.012806	2.85	16.24	22.57	0.88
Main Channel	4323.325	Jul-79	43.60	67.89	69.38	69.38	69.76	0.012832	2.97	17.78	22.83	0.89
Main Channel	4298.712	2-Year	11.30	67.60	68.64	68.37	68.74	0.005329	1.44	8.37	17.15	0.53
Main Channel	4298.712	5-Year	17.70	67.60	68.85	68.59	68.98	0.004947	1.64	12.79	25.07	0.54
Main Channel	4298.712	10-Year	21.60	67.60	68.96	68.70	69.10	0.004651	1.71	15.70	28.05	0.53
Main Channel	4298.712	25-Year	27.60	67.60	69.11	68.80	69.25	0.004251	1.78	19.99	30.42	0.52
Main Channel	4298.712	50-Year	33.10	67.60	69.16		69.33	0.005108	2.01	21.50	31.37	0.57
Main Channel	4298.712	100-Year	38.40	67.60	69.24		69.42	0.005152	2.10	24.17	33.04	0.58
Main Channel	4298.712	Jul-79	43.60	67.60	69.32		69.51	0.005137	2.18	26.77	34.26	0.58
Main Channel	4180.449	2-Year	11.30	66.80	67.56	67.56	67.83	0.011540	2.34	4.86	9.24	1.01
Main Channel	4180.449	5-Year	17.70	66.80	67.76	67.76	68.12	0.011421	2.67	6.82	10.37	0.98
Main Channel	4180.449	10-Year	21.60	66.80	67.86	67.86	68.27	0.011308	2.84	7.99	11.84	0.98
Main Channel	4180.449	25-Year	27.60	66.80	68.02	68.02	68.48	0.010768	3.03	10.05	15.05	0.96
Main Channel	4180.449	50-Year	33.10	66.80	68.26	68.26	68.64	0.007186	2.79	16.44	33.33	0.79
Main Channel	4180.449	100-Year	38.40	66.80	68.37	68.37	68.75	0.007021	2.88	19.82	34.08	0.79
Main Channel	4180.449	Jul-79	43.60	66.80	68.45	68.45	68.84	0.007001	2.98	22.75	34.96	0.79
Main Channel	4071.257	2-Year	11.30	65.80	67.20		67.26	0.002062	1.21	18.80	91.79	0.37
Main Channel	4071.257	5-Year	17.70	65.80	67.34		67.41	0.002390	1.39	30.62	125.02	0.40
Main Channel	4071.257	10-Year	21.60	65.80	67.41		67.48	0.002509	1.46	37.57	142.45	0.41
Main Channel	4071.257	25-Year	27.60	65.80	67.51		67.58	0.002626	1.56	49.07	161.35	0.42
Main Channel	4071.257	50-Year	33.10	65.80	67.61		67.67	0.002231	1.49	61.67	172.21	0.39
Main Channel	4071.257	100-Year	38.40	65.80	67.68		67.73	0.002161	1.50	71.26	186.65	0.38
Main Channel	4071.257	Jul-79	43.60	65.80	67.77		67.82	0.002019	1.50	87.27	200.68	0.37
Main Channel	3897.472	2-Year	11.30	65.20	66.78		66.84	0.003100	1.19	15.25	57.15	0.34
Main Channel	3897.472	5-Year	17.70	65.20	66.96		67.01	0.002624	1.20	26.28	64.89	0.32
Main Channel	3897.472	10-Year	21.60	65.20	67.05		67.09	0.002431	1.20	31.94	66.91	0.31
Main Channel	3897.472	25-Year	27.60	65.20	67.18		67.22	0.002087	1.18	41.10	71.16	0.29
Main Channel	3897.472	50-Year	33.10	65.20	67.31		67.35	0.002020	1.22	52.15	98.01	0.29
Main Channel	3897.472	100-Year	38.40	65.20	67.43		67.46	0.001529	1.11	64.65	102.99	0.26
Main Channel	3897.472	Jul-79	43.60	65.20	67.57		67.59	0.001128	1.00	79.30	110.49	0.22
Main Channel	3806.132	2-Year	11.30	65.20	66.53	66.11	66.55	0.002935	0.67	24.40	60.70	0.23
Main Channel	3806.132	5-Year	17.70	65.20	66.75	66.23	66.76	0.002344	0.70	40.55	87.79	0.22
Main Channel	3806.132	10-Year	21.60	65.20	66.87	66.28	66.88	0.001817	0.66	51.07	93.85	0.20
Main Channel	3806.132	25-Year	27.60	65.20	67.04	66.37	67.05	0.001387	0.63	67.75	116.31	0.17
Main Channel	3806.132	50-Year	33.10	65.20	67.19	66.42	67.20	0.001095	0.60	84.15	131.06	0.16
Main Channel	3806.132	100-Year	38.40	65.20	67.34	66.48	67.35	0.000875	0.58	103.54	152.53	0.14
Main Channel	3806.132	Jul-79	43.60	65.20	67.50	66.50	67.51	0.000669	0.54	125.28	166.98	0.13
Main Channel	3736.303	2-Year	11.30	65.17	66.36	65.87	66.38	0.001879	0.91	24.11	62.84	0.29
Main Channel	3736.303	5-Year	17.70	65.17	66.63	66.02	66.65	0.001178	0.85	40.08	68.61	0.24
Main Channel	3736.303	10-Year	21.60	65.17	66.77	66.02	66.79	0.001010	0.84	48.44	81.11	0.22
Main Channel	3736.303	25-Year	27.60	65.17	66.95	66.34	66.97	0.000886	0.85	59.58	90.16	0.21
Main Channel	3736.303	50-Year	33.10	65.17	67.12	66.39	67.13	0.000796	0.86	69.68	117.36	0.20
Main Channel	3736.303	100-Year	38.40	65.17	67.28	66.44	67.29	0.000701	0.85	82.22	153.56	0.19
Main Channel	3736.303	Jul-79	43.60	65.17	67.45	66.47	67.46	0.000619	0.85	98.74	181.37	0.19
Main Channel	3712.739	2-Year	11.30	64.72	66.28	65.58	66.33	0.002754	1.04	10.91	34.12	0.30
Main Channel	3712.739	5-Year	17.70	64.72	66.51	65.81	66.60	0.003755	1.36	13.01	52.72	0.37

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Main Channel	3712.739	10-Year	21.60	64.72	66.62	65.92	66.74	0.004345	1.54	14.03	54.44	0.40
Main Channel	3712.739	25-Year	27.60	64.72	66.75	66.06	66.92	0.005363	1.81	15.26	58.57	0.45
Main Channel	3712.739	50-Year	33.10	64.72	66.87	66.19	67.08	0.006148	2.03	16.34	68.05	0.49
Main Channel	3712.739	100-Year	38.40	64.72	66.99	66.30	67.24	0.006641	2.20	17.45	100.36	0.51
Main Channel	3712.739	Jul-79	43.60	64.72	67.13	66.41	67.40	0.006743	2.33	18.75	137.83	0.52
Main Channel	3691.656		Bridge									
Main Channel	3669.048	2-Year	10.50	64.85	66.18	65.60	66.24	0.002174	1.10	9.56	12.18	0.34
Main Channel	3669.048	5-Year	16.50	64.85	66.36	65.83	66.47	0.003145	1.47	11.22	14.31	0.42
Main Channel	3669.048	10-Year	20.30	64.85	66.44	65.94	66.59	0.003892	1.70	11.92	15.95	0.48
Main Channel	3669.048	25-Year	26.00	64.85	66.49	66.08	66.71	0.005618	2.10	12.39	16.73	0.58
Main Channel	3669.048	50-Year	31.00	64.85	66.50	66.19	66.82	0.007739	2.48	12.51	16.95	0.68
Main Channel	3669.048	100-Year	35.80	64.85	66.49	66.30	66.91	0.010711	2.89	12.37	16.70	0.80
Main Channel	3669.048	Jul-79	39.50	64.85	66.46	66.38	67.00	0.014113	3.27	12.08	16.21	0.91
Main Channel	3649.255	2-Year	10.50	64.60	66.17	65.40	66.22	0.000645	0.99	14.80	25.23	0.26
Main Channel	3649.255	5-Year	16.50	64.60	66.36	65.64	66.43	0.000890	1.25	21.69	43.19	0.32
Main Channel	3649.255	10-Year	20.30	64.60	66.45	65.77	66.53	0.001014	1.38	25.74	48.33	0.34
Main Channel	3649.255	25-Year	26.00	64.60	66.53	65.99	66.63	0.001354	1.64	29.71	69.06	0.39
Main Channel	3649.255	50-Year	31.00	64.60	66.58	66.10	66.70	0.001620	1.82	33.19	78.85	0.43
Main Channel	3649.255	100-Year	35.80	64.60	66.60	66.37	66.76	0.001997	2.04	35.23	92.68	0.48
Main Channel	3649.255	Jul-79	39.50	64.60	66.64	66.41	66.80	0.002149	2.14	38.06	96.33	0.50
Main Channel	3627.228	2-Year	10.50	64.70	66.16	65.49	66.19	0.002288	0.75	20.39	86.36	0.25
Main Channel	3627.228	5-Year	16.50	64.70	66.38	65.81	66.39	0.001170	0.62	44.06	130.15	0.18
Main Channel	3627.228	10-Year	20.30	64.70	66.48	65.94	66.49	0.000950	0.59	56.12	137.36	0.17
Main Channel	3627.228	25-Year	26.00	64.70	66.57	66.08	66.58	0.000961	0.62	67.00	147.65	0.17
Main Channel	3627.228	50-Year	31.00	64.70	66.62	66.24	66.64	0.001040	0.66	74.37	166.59	0.18
Main Channel	3627.228	100-Year	35.80	64.70	66.67	66.27	66.68	0.001137	0.71	79.73	169.35	0.19
Main Channel	3627.228	Jul-79	39.50	64.70	66.71	66.29	66.72	0.001149	0.73	84.82	171.02	0.19
Main Channel	3469.421	2-Year	10.50	64.60	66.02	65.31	66.05	0.000479	0.71	25.42	49.14	0.21
Main Channel	3469.421	5-Year	16.50	64.60	66.24	65.49	66.27	0.000570	0.85	38.11	67.24	0.23
Main Channel	3469.421	10-Year	20.30	64.60	66.35	65.60	66.38	0.000559	0.88	68.00	229.51	0.23
Main Channel	3469.421	25-Year	26.00	64.60	66.44	65.82	66.46	0.000573	0.92	88.32	232.95	0.23
Main Channel	3469.421	50-Year	31.00	64.60	66.48	65.90	66.51	0.000647	1.00	98.91	234.14	0.25
Main Channel	3469.421	100-Year	35.80	64.60	66.50	65.97	66.53	0.000797	1.11	102.69	234.56	0.27
Main Channel	3469.421	Jul-79	39.50	64.60	66.53	66.00	66.57	0.000822	1.14	111.39	241.37	0.28
Main Channel	3328.888	2-Year	10.50	64.50	65.88	65.35	65.91	0.003084	0.67	16.10	29.11	0.26
Main Channel	3328.888	5-Year	16.50	64.50	66.08	65.58	66.11	0.002961	0.79	22.28	33.87	0.27
Main Channel	3328.888	10-Year	20.30	64.50	66.19	65.66	66.22	0.002970	0.85	26.14	41.24	0.28
Main Channel	3328.888	25-Year	26.00	64.50	66.28	65.74	66.31	0.002814	0.88	41.17	102.81	0.27
Main Channel	3328.888	50-Year	31.00	64.50	66.28	65.81	66.33	0.003914	1.04	41.59	103.07	0.32
Main Channel	3328.888	100-Year	35.80	64.50	66.35	65.87	66.37	0.001759	0.73	85.37	243.42	0.22
Main Channel	3328.888	Jul-79	39.50	64.50	66.39	65.91	66.41	0.001602	0.71	95.29	244.43	0.21
Main Channel	3227.732	2-Year	10.50	64.27	65.14	65.14	65.32	0.013720	1.87	5.62	16.49	1.01
Main Channel	3227.732	5-Year	16.50	64.27	65.27	65.27	65.50	0.016223	2.15	7.81	17.73	0.99
Main Channel	3227.732	10-Year	20.30	64.27	65.34	65.34	65.61	0.016913	2.28	9.13	18.35	0.98
Main Channel	3227.732	25-Year	26.00	64.27	65.50	65.44	65.75	0.013812	2.26	12.12	20.11	0.85
Main Channel	3227.732	50-Year	31.00	64.27	65.63	65.52	65.88	0.011659	2.23	14.98	22.65	0.78
Main Channel	3227.732	100-Year	35.80	64.27	65.75	65.60	65.99	0.010356	2.23	18.02	33.75	0.73
Main Channel	3227.732	Jul-79	39.50	64.27	65.83	65.65	66.07	0.009443	2.22	21.27	43.29	0.69
Main Channel	3098.158	2-Year	10.50	63.00	64.51	63.78	64.56	0.001624	0.94	11.74	14.43	0.28
Main Channel	3098.158	5-Year	16.50	63.00	64.79	64.02	64.85	0.001752	1.13	16.96	19.76	0.30
Main Channel	3098.158	10-Year	20.30	63.00	64.92	64.12	64.99	0.001846	1.23	19.59	20.32	0.31
Main Channel	3098.158	25-Year	26.00	63.00	65.10	64.27	65.19	0.001909	1.34	23.38	21.56	0.32
Main Channel	3098.158	50-Year	31.00	63.00	65.24	64.39	65.33	0.001979	1.43	26.37	22.89	0.33
Main Channel	3098.158	100-Year	35.80	63.00	65.36	64.50	65.46	0.002031	1.51	29.15	24.07	0.34
Main Channel	3098.158	Jul-79	39.50	63.00	65.44	64.67	65.54	0.002092	1.57	31.09	25.23	0.35
Main Channel	3020.422	2-Year	10.50	62.90	64.36	63.66	64.41	0.002080	1.04	10.97	13.27	0.30
Main Channel	3020.422	5-Year	16.50	62.90	64.61	63.87	64.69	0.002626	1.31	15.26	23.19	0.34
Main Channel	3020.422	10-Year	20.30	62.90	64.71	63.99	64.81	0.003064	1.48	17.82	26.58	0.37
Main Channel	3020.422	25-Year	26.00	62.90	64.88	64.16	65.00	0.003246	1.63	22.59	30.97	0.39
Main Channel	3020.422	50-Year	31.00	62.90	65.01	64.29	65.14	0.003267	1.72	26.93	32.82	0.40
Main Channel	3020.422	100-Year	35.80	62.90	65.13	64.40	65.27	0.003262	1.79	30.97	34.59	0.40
Main Channel	3020.422	Jul-79	39.50	62.90	65.21	64.58	65.35	0.003335	1.86	33.67	38.43	0.41
Main Channel	2981.379	2-Year	10.50	62.80	64.30	63.56	64.34	0.001294	0.92	17.63	46.84	0.25
Main Channel	2981.379	5-Year	16.50	62.80	64.57	63.77	64.60	0.001159	0.98	32.93	79.13	0.25
Main Channel	2981.379	10-Year	20.30	62.80	64.68	63.89	64.71	0.001156	1.02	40.24	83.65	0.25
Main Channel	2981.379	25-Year	26.00	62.80	64.86	64.07	64.89	0.001010	1.02	53.16	90.75	0.24
Main Channel	2981.379	50-Year	31.00	62.80	65.00	64.33	65.04	0.000936	1.04	63.61	100.58	0.23

HEC-RAS Plan: 2015-01-27unrout River: WattsKizell Reach: Main Channel (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Main Channel	2981.379	100-Year	35.80	62.80	65.13	64.47	65.16	0.000866	1.04	75.14	127.08	0.23
Main Channel	2981.379	Jul-79	39.50	62.80	65.22	64.51	65.24	0.000809	1.03	99.93	139.43	0.22
Main Channel	2964.234	2-Year	9.90	62.33	64.29	63.08	64.33	0.000548	0.84	11.95	19.50	0.20
Main Channel	2964.234	5-Year	15.50	62.33	64.51	63.35	64.58	0.000907	1.17	13.48	51.93	0.27
Main Channel	2964.234	10-Year	19.10	62.33	64.59	63.48	64.69	0.001209	1.39	14.03	64.34	0.31
Main Channel	2964.234	25-Year	24.60	62.33	64.72	63.66	64.86	0.001631	1.68	14.94	74.60	0.36
Main Channel	2964.234	50-Year	29.40	62.33	64.81	63.80	65.00	0.002034	1.93	15.57	84.10	0.41
Main Channel	2964.234	100-Year	33.90	62.33	64.88	63.93	65.12	0.002425	2.16	16.09	94.82	0.45
Main Channel	2964.234	Jul-79	36.80	62.33	64.93	64.00	65.20	0.002674	2.29	16.42	100.49	0.47
Main Channel	2958.099		Bridge									
Main Channel	2951.912	2-Year	9.90	62.41	64.28	63.16	64.32	0.000663	0.89	11.24	10.17	0.22
Main Channel	2951.912	5-Year	15.50	62.41	64.49	63.41	64.57	0.001085	1.24	12.72	17.52	0.29
Main Channel	2951.912	10-Year	19.10	62.41	64.56	63.57	64.67	0.001457	1.47	13.20	26.13	0.34
Main Channel	2951.912	25-Year	24.60	62.41	64.66	63.75	64.82	0.002057	1.80	13.87	45.23	0.40
Main Channel	2951.912	50-Year	29.40	62.41	64.71	63.89	64.94	0.002679	2.09	14.26	52.49	0.46
Main Channel	2951.912	100-Year	33.90	62.41	64.75	64.02	65.03	0.003372	2.37	14.50	56.76	0.52
Main Channel	2951.912	Jul-79	36.80	62.41	64.76	64.09	65.09	0.003881	2.56	14.61	59.13	0.56
Main Channel	2920.728	2-Year	9.90	62.74	64.26	63.48	64.29	0.001134	0.80	14.59	24.15	0.23
Main Channel	2920.728	5-Year	15.50	62.74	64.49	63.67	64.52	0.001106	0.89	29.30	60.03	0.23
Main Channel	2920.728	10-Year	19.10	62.74	64.57	63.77	64.61	0.001269	0.98	34.25	64.83	0.25
Main Channel	2920.728	25-Year	24.60	62.74	64.69	63.91	64.73	0.001363	1.07	41.92	67.07	0.26
Main Channel	2920.728	50-Year	29.40	62.74	64.77	64.06	64.82	0.001470	1.15	47.32	89.47	0.28
Main Channel	2920.728	100-Year	33.90	62.74	64.84	64.20	64.89	0.001589	1.22	51.53	100.33	0.29
Main Channel	2920.728	Jul-79	36.80	62.74	64.88	64.28	64.93	0.001665	1.27	54.02	101.62	0.30
Main Channel	2817.591	2-Year	9.90	62.80	64.05	63.53	64.11	0.003146	1.09	10.01	22.41	0.34
Main Channel	2817.591	5-Year	15.50	62.80	64.30	63.71	64.36	0.002882	1.20	20.66	70.90	0.34
Main Channel	2817.591	10-Year	19.10	62.80	64.33	63.82	64.41	0.003736	1.40	22.60	72.02	0.39
Main Channel	2817.591	25-Year	24.60	62.80	64.45	63.97	64.54	0.003947	1.52	29.18	83.80	0.40
Main Channel	2817.591	50-Year	29.40	62.80	64.53	64.29	64.62	0.003989	1.58	35.17	103.60	0.41
Main Channel	2817.591	100-Year	33.90	62.80	64.60	64.35	64.69	0.003895	1.61	41.02	107.13	0.41
Main Channel	2817.591	Jul-79	36.80	62.80	64.64	64.38	64.73	0.003854	1.63	44.55	110.16	0.41
Main Channel	2743.763	2-Year	9.90	62.54	63.87	63.28	63.93	0.001967	1.03	10.61	19.34	0.31
Main Channel	2743.763	5-Year	15.50	62.54	64.09	63.47	64.17	0.002324	1.27	16.45	30.33	0.35
Main Channel	2743.763	10-Year	19.10	62.54	64.18	63.58	64.23	0.001641	1.11	34.14	72.68	0.30
Main Channel	2743.763	25-Year	24.60	62.54	64.28	63.73	64.33	0.001859	1.23	41.64	81.48	0.32
Main Channel	2743.763	50-Year	29.40	62.54	64.35	63.81	64.41	0.001997	1.32	47.69	86.24	0.33
Main Channel	2743.763	100-Year	33.90	62.54	64.41	64.07	64.47	0.002125	1.40	52.95	90.73	0.35
Main Channel	2743.763	Jul-79	36.80	62.54	64.45	64.12	64.51	0.002186	1.44	56.23	92.59	0.35
Main Channel	2564.664	2-Year	9.90	62.12	63.56		63.61	0.001637	0.91	11.32	12.56	0.27
Main Channel	2564.664	5-Year	15.50	62.12	63.81		63.86	0.001833	1.10	20.18	84.31	0.30
Main Channel	2564.664	10-Year	19.10	62.12	63.90		63.96	0.001826	1.15	29.24	104.73	0.30
Main Channel	2564.664	25-Year	24.60	62.12	64.03		64.08	0.001608	1.14	43.56	116.25	0.29
Main Channel	2564.664	50-Year	29.40	62.12	64.12		64.16	0.001556	1.16	53.30	118.60	0.28
Main Channel	2564.664	100-Year	33.90	62.12	64.19		64.23	0.001497	1.17	61.69	119.66	0.28
Main Channel	2564.664	Jul-79	36.80	62.12	64.23		64.27	0.001487	1.18	66.41	120.48	0.28
Main Channel	2444.164	2-Year	9.90	62.12	63.37	62.83	63.42	0.001469	1.08	10.73	14.92	0.33
Main Channel	2444.164	5-Year	15.50	62.12	63.62	63.02	63.68	0.001358	1.19	20.43	50.08	0.33
Main Channel	2444.164	10-Year	19.10	62.12	63.74	63.13	63.79	0.001273	1.22	26.59	57.66	0.32
Main Channel	2444.164	25-Year	24.60	62.12	63.88	63.32	63.93	0.001197	1.26	34.92	59.66	0.32
Main Channel	2444.164	50-Year	29.40	62.12	63.95	63.40	64.01	0.001317	1.36	39.17	60.51	0.34
Main Channel	2444.164	100-Year	33.90	62.12	64.01	63.53	64.08	0.001408	1.44	42.94	61.26	0.35
Main Channel	2444.164	Jul-79	36.80	62.12	64.04	63.70	64.11	0.001497	1.50	44.82	61.65	0.36
Main Channel	2266.167	2-Year	9.29	61.80	63.10		63.18	0.001298	1.29	8.63	11.55	0.37
Main Channel	2266.167	5-Year	14.50	61.80	63.29	62.76	63.42	0.001802	1.67	12.99	33.50	0.45
Main Channel	2266.167	10-Year	18.00	61.80	63.38	62.91	63.53	0.002003	1.84	16.90	45.47	0.48
Main Channel	2266.167	25-Year	23.20	61.80	63.51	63.10	63.68	0.002188	2.03	24.70	74.27	0.50
Main Channel	2266.167	50-Year	27.70	61.80	63.60	63.46	63.75	0.002049	2.04	31.79	76.51	0.49
Main Channel	2266.167	100-Year	32.00	61.80	63.68		63.82	0.001957	2.05	37.93	79.06	0.48
Main Channel	2266.167	Jul-79	34.20	61.80	63.72		63.86	0.001912	2.05	40.92	79.85	0.48
Main Channel	2205.163	2-Year	9.29	61.70	63.03		63.07	0.001848	0.93	12.12	25.29	0.28
Main Channel	2205.163	5-Year	14.50	61.70	63.20	62.76	63.26	0.002508	1.19	18.42	43.99	0.33
Main Channel	2205.163	10-Year	18.00	61.70	63.29	62.91	63.36	0.002745	1.30	22.26	44.89	0.35
Main Channel	2205.163	25-Year	23.20	61.70	63.40	63.10	63.48	0.002989	1.43	27.50	46.80	0.37
Main Channel	2205.163	50-Year	27.70	61.70	63.48	63.10	63.56	0.003293	1.54	31.03	48.54	0.39
Main Channel	2205.163	100-Year	32.00	61.70	63.54		63.64	0.003524	1.64	34.22	49.63	0.41
Main Channel	2205.163	Jul-79	34.20	61.70	63.57		63.67	0.003628	1.68	35.79	50.12	0.41

HEC-RAS Plan: 2015-01-27unrout River: WattsKizell Reach: Main Channel (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Main Channel	2070.458	2-Year	9.29	61.60	62.79		62.86	0.001391	1.22	12.41	43.89	0.37
Main Channel	2070.458	5-Year	14.50	61.60	62.98		63.04	0.001251	1.29	22.99	63.04	0.36
Main Channel	2070.458	10-Year	18.00	61.60	63.07		63.13	0.001185	1.31	29.21	67.59	0.36
Main Channel	2070.458	25-Year	23.20	61.60	63.19		63.24	0.001169	1.38	38.72	86.60	0.36
Main Channel	2070.458	50-Year	27.70	61.60	63.28		63.33	0.001091	1.38	46.32	87.97	0.35
Main Channel	2070.458	100-Year	32.00	61.60	63.35		63.40	0.001050	1.40	52.77	89.08	0.35
Main Channel	2070.458	Jul-79	34.20	61.60	63.38		63.43	0.001037	1.41	55.86	89.69	0.34
Main Channel	1958.025	2-Year	9.29	61.40	62.62		62.68	0.001805	1.12	12.52	29.66	0.34
Main Channel	1958.025	5-Year	14.50	61.40	62.77		62.85	0.002459	1.42	17.61	40.55	0.40
Main Channel	1958.025	10-Year	18.00	61.40	62.86		62.94	0.002546	1.51	21.41	42.54	0.41
Main Channel	1958.025	25-Year	23.20	61.40	62.96		63.06	0.002747	1.65	25.95	44.14	0.44
Main Channel	1958.025	50-Year	27.70	61.40	63.04		63.14	0.002844	1.74	29.67	45.66	0.45
Main Channel	1958.025	100-Year	32.00	61.40	63.11		63.22	0.003000	1.84	32.65	47.24	0.46
Main Channel	1958.025	Jul-79	34.20	61.40	63.14		63.25	0.003069	1.88	34.11	47.73	0.47
Main Channel	1816.877	2-Year	9.29	61.00	62.33	61.81	62.39	0.002250	1.19	9.81	16.67	0.36
Main Channel	1816.877	5-Year	14.50	61.00	62.50	62.01	62.55	0.001810	1.16	28.92	78.89	0.33
Main Channel	1816.877	10-Year	18.00	61.00	62.52	62.13	62.59	0.002523	1.38	30.77	81.87	0.39
Main Channel	1816.877	25-Year	23.20	61.00	62.60	62.33	62.67	0.002754	1.49	37.66	87.59	0.40
Main Channel	1816.877	50-Year	27.70	61.00	62.67	62.45	62.74	0.002954	1.59	43.90	99.33	0.42
Main Channel	1816.877	100-Year	32.00	61.00	62.72	62.55	62.80	0.003041	1.65	49.27	100.63	0.43
Main Channel	1816.877	Jul-79	34.20	61.00	62.75	62.57	62.82	0.003096	1.68	51.75	101.03	0.43
Main Channel	1752.297	2-Year	9.29	60.60	62.17	61.49	62.23	0.002835	1.12	10.37	14.67	0.31
Main Channel	1752.297	5-Year	14.50	60.60	62.42	61.71	62.44	0.001243	0.83	35.98	90.49	0.21
Main Channel	1752.297	10-Year	18.00	60.60	62.34	61.85	62.39	0.003156	1.28	28.98	88.94	0.33
Main Channel	1752.297	25-Year	23.20	60.60	62.37	61.98	62.44	0.004255	1.51	31.83	89.64	0.39
Main Channel	1752.297	50-Year	27.70	60.60	62.40	62.24	62.48	0.004894	1.64	34.87	90.23	0.42
Main Channel	1752.297	100-Year	32.00	60.60	62.44	62.27	62.52	0.005273	1.73	38.06	91.02	0.43
Main Channel	1752.297	Jul-79	34.20	60.60	62.46	62.38	62.54	0.005289	1.75	40.08	91.51	0.44
Main Channel	1585.543	2-Year	9.29	60.40	61.53	61.37	61.75	0.005238	2.18	5.46	9.94	0.69
Main Channel	1585.543	5-Year	14.50	60.40	61.77	61.66	62.04	0.005333	2.53	8.17	13.13	0.72
Main Channel	1585.543	10-Year	18.00	60.40	61.80	61.80	61.90	0.002909	1.90	31.34	119.36	0.53
Main Channel	1585.543	25-Year	23.20	60.40	61.91	61.84	61.97	0.002111	1.71	44.31	121.41	0.46
Main Channel	1585.543	50-Year	27.70	60.40	62.00	61.87	62.04	0.001683	1.59	55.13	123.03	0.41
Main Channel	1585.543	100-Year	32.00	60.40	62.07	61.90	62.11	0.001438	1.52	64.70	124.34	0.39
Main Channel	1585.543	Jul-79	34.20	60.40	62.10	61.91	62.14	0.001395	1.51	68.52	124.65	0.38
Main Channel	1491.815	2-Year	8.68	60.30	61.32	60.96	61.40	0.002237	1.33	7.54	10.52	0.45
Main Channel	1491.815	5-Year	13.50	60.30	61.52	61.14	61.66	0.002759	1.66	9.86	12.68	0.50
Main Channel	1491.815	10-Year	16.90	60.30	61.63	61.26	61.69	0.001694	1.37	27.45	54.01	0.40
Main Channel	1491.815	25-Year	21.80	60.30	61.74	61.40	61.82	0.001786	1.49	34.18	61.38	0.41
Main Channel	1491.815	50-Year	26.00	60.30	61.83	61.50	61.91	0.001843	1.57	39.50	64.71	0.42
Main Channel	1491.815	100-Year	30.10	60.30	61.91	61.58	61.99	0.001874	1.64	44.62	67.86	0.43
Main Channel	1491.815	Jul-79	31.50	60.30	61.94	61.60	62.02	0.001819	1.64	47.03	69.26	0.42
Main Channel	1383.557	2-Year	8.68	60.10	61.11	60.66	61.18	0.001887	1.14	8.05	9.83	0.37
Main Channel	1383.557	5-Year	13.50	60.10	61.31	60.83	61.39	0.002040	1.34	16.85	57.80	0.40
Main Channel	1383.557	10-Year	16.90	60.10	61.42	60.94	61.50	0.001965	1.40	23.64	65.13	0.40
Main Channel	1383.557	25-Year	21.80	60.10	61.55	61.08	61.63	0.001895	1.46	32.04	67.50	0.40
Main Channel	1383.557	50-Year	26.00	60.10	61.63	61.36	61.71	0.001978	1.55	37.46	70.83	0.41
Main Channel	1383.557	100-Year	30.10	60.10	61.71	61.46	61.79	0.001949	1.60	43.51	78.82	0.41
Main Channel	1383.557	Jul-79	31.50	60.10	61.73	61.46	61.83	0.002025	1.65	45.66	81.22	0.42
Main Channel	1269.687	2-Year	8.68	59.70	60.85		60.91	0.002871	1.12	10.59	30.53	0.36
Main Channel	1269.687	5-Year	13.50	59.70	61.05		61.12	0.002860	1.27	17.71	38.96	0.37
Main Channel	1269.687	10-Year	16.90	59.70	61.19		61.25	0.002527	1.28	23.28	41.59	0.35
Main Channel	1269.687	25-Year	21.80	59.70	61.32		61.39	0.002631	1.39	28.68	44.11	0.37
Main Channel	1269.687	50-Year	26.00	59.70	61.36		61.44	0.003279	1.58	30.52	46.00	0.41
Main Channel	1269.687	100-Year	30.10	59.70	61.43		61.52	0.003486	1.68	33.89	48.53	0.43
Main Channel	1269.687	Jul-79	31.50	59.70	61.45		61.55	0.003586	1.72	34.81	48.97	0.44
Main Channel	1057.547	2-Year	8.68	59.00	60.29		60.37	0.002547	1.37	10.95	24.29	0.41
Main Channel	1057.547	5-Year	13.50	59.00	60.57		60.64	0.002233	1.47	18.18	29.45	0.39
Main Channel	1057.547	10-Year	16.90	59.00	60.64		60.75	0.002972	1.74	20.90	48.21	0.46
Main Channel	1057.547	25-Year	21.80	59.00	60.80		60.90	0.002752	1.79	33.36	97.61	0.44
Main Channel	1057.547	50-Year	26.00	59.00	61.04		61.08	0.001366	1.37	60.84	134.20	0.32
Main Channel	1057.547	100-Year	30.10	59.00	61.17		61.20	0.001095	1.28	79.02	142.31	0.29
Main Channel	1057.547	Jul-79	31.50	59.00	61.19		61.22	0.001102	1.29	81.69	142.60	0.29
Main Channel	920.3455	2-Year	8.68	58.90	60.02	59.60	60.11	0.001674	1.37	7.89	11.98	0.42
Main Channel	920.3455	5-Year	13.50	58.90	60.30	59.80	60.41	0.001695	1.61	11.53	14.64	0.44
Main Channel	920.3455	10-Year	16.90	58.90	60.47	59.97	60.54	0.001059	1.38	28.13	74.47	0.36
Main Channel	920.3455	25-Year	21.80	58.90	60.73	60.14	60.76	0.000594	1.14	53.07	133.13	0.27
Main Channel	920.3455	50-Year	26.00	58.90	61.02	60.27	61.03	0.000234	0.79	92.53	137.68	0.18

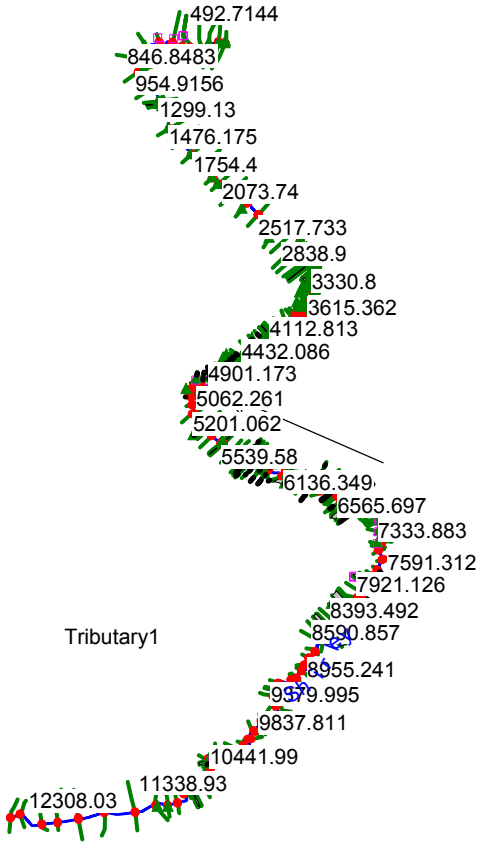
HEC-RAS Plan: 2015-01-27unrout River: WattsKizell Reach: Main Channel (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Main Channel	920.3455	100-Year	30.10	58.90	61.15	60.49	61.16	0.000194	0.75	111.07	139.13	0.16
Main Channel	920.3455	Jul-79	31.50	58.90	61.17	60.51	61.18	0.000200	0.77	113.54	139.28	0.16
Main Channel	673.4133	2-Year	8.06	58.56	59.85		59.88	0.000553	0.84	11.32	16.84	0.24
Main Channel	673.4133	5-Year	12.50	58.56	60.11		60.16	0.000640	1.02	17.39	33.71	0.27
Main Channel	673.4133	10-Year	15.70	58.56	60.31		60.37	0.000589	1.07	26.37	71.61	0.26
Main Channel	673.4133	25-Year	20.40	58.56	60.65		60.68	0.000317	0.88	65.86	136.01	0.20
Main Channel	673.4133	50-Year	24.30	58.56	60.99		61.00	0.000140	0.65	112.52	139.12	0.14
Main Channel	673.4133	100-Year	28.20	58.56	61.13		61.14	0.000127	0.64	131.80	140.22	0.13
Main Channel	673.4133	Jul-79	28.80	58.56	61.14		61.15	0.000126	0.64	134.31	140.37	0.13
Main Channel	526.7829	2-Year	8.06	58.38	59.81	58.92	59.82	0.000292	0.51	19.19	51.72	0.15
Main Channel	526.7829	5-Year	12.50	58.38	60.07	59.08	60.09	0.000316	0.61	26.89	85.00	0.16
Main Channel	526.7829	10-Year	15.70	58.38	60.29	59.19	60.30	0.000267	0.61	35.99	116.05	0.15
Main Channel	526.7829	25-Year	20.40	58.38	60.63	59.30	60.64	0.000186	0.57	50.76	131.05	0.13
Main Channel	526.7829	50-Year	24.30	58.38	60.98	59.38	60.98	0.000127	0.53	65.57	134.41	0.11
Main Channel	526.7829	100-Year	28.20	58.38	61.11	59.46	61.12	0.000133	0.56	71.48	136.36	0.11
Main Channel	526.7829	Jul-79	28.80	58.38	61.13	59.45	61.14	0.000134	0.56	72.24	136.52	0.11
Main Channel	517.7993	2-Year	8.06	57.46	59.77	58.19	59.81	0.000589	0.85	9.49	68.33	0.18
Main Channel	517.7993	5-Year	12.50	57.46	60.01	58.44	60.08	0.001030	1.20	10.44	86.43	0.24
Main Channel	517.7993	10-Year	15.70	57.46	60.19	58.60	60.29	0.001287	1.40	11.20	99.43	0.27
Main Channel	517.7993	25-Year	20.40	57.46	60.49	58.82	60.63	0.001536	1.64	12.43	117.25	0.30
Main Channel	517.7993	50-Year	24.30	57.46	60.97	58.99	60.98	0.000230	0.56	73.80	139.77	0.10
Main Channel	517.7993	100-Year	28.20	57.46	61.11	59.15	61.12	0.000226	0.57	84.08	143.12	0.10
Main Channel	517.7993	Jul-79	28.80	57.46	61.13	59.17	61.14	0.000226	0.57	85.42	143.52	0.10
Main Channel	507.9618		Culvert									
Main Channel	497.982	2-Year	8.06	57.43	59.72	58.16	59.76	0.000391	0.86	9.39	53.06	0.18
Main Channel	497.982	5-Year	12.50	57.43	59.88	58.41	59.95	0.000755	1.25	10.03	65.92	0.25
Main Channel	497.982	10-Year	15.70	57.43	59.98	58.57	60.10	0.001035	1.50	10.46	97.70	0.30
Main Channel	497.982	25-Year	20.40	57.43	60.10	58.79	60.28	0.001498	1.86	10.95	111.46	0.36
Main Channel	497.982	50-Year	24.30	57.43	60.33	58.96	60.36	0.000497	0.86	43.41	118.13	0.19
Main Channel	497.982	100-Year	28.20	57.43	60.46	59.12	60.48	0.000435	0.84	51.66	125.39	0.18
Main Channel	497.982	Jul-79	28.80	57.43	60.48	59.14	60.50	0.000426	0.83	52.95	125.96	0.18
Main Channel	482.8587	2-Year	8.06	58.50	59.73	59.00	59.74	0.000595	0.43	24.49	62.21	0.13
Main Channel	482.8587	5-Year	12.50	58.50	59.91	59.12	59.92	0.000714	0.52	31.86	86.68	0.15
Main Channel	482.8587	10-Year	15.70	58.50	60.04	59.21	60.05	0.000715	0.55	38.15	94.50	0.15
Main Channel	482.8587	25-Year	20.40	58.50	60.20	59.32	60.21	0.000683	0.58	48.21	107.15	0.15
Main Channel	482.8587	50-Year	24.30	58.50	60.33	59.39	60.34	0.000620	0.59	57.01	111.00	0.15
Main Channel	482.8587	100-Year	28.20	58.50	60.46	59.44	60.47	0.000568	0.59	66.90	125.14	0.14
Main Channel	482.8587	Jul-79	28.80	58.50	60.48	59.45	60.49	0.000558	0.59	68.61	126.36	0.14
Main Channel	420.5432	2-Year	8.06	58.42	59.69	58.95	59.71	0.000462	0.65	20.35	85.95	0.19
Main Channel	420.5432	5-Year	12.50	58.42	59.85	59.14	59.88	0.000666	0.85	27.14	147.29	0.23
Main Channel	420.5432	10-Year	15.70	58.42	59.97	59.27	60.01	0.000807	0.98	35.92	203.16	0.26
Main Channel	420.5432	25-Year	20.40	58.42	60.15	59.40	60.18	0.000670	0.96	52.04	216.26	0.24
Main Channel	420.5432	50-Year	24.30	58.42	60.29	59.49	60.31	0.000566	0.93	65.08	225.13	0.22
Main Channel	420.5432	100-Year	28.20	58.42	60.42	59.56	60.45	0.000484	0.91	77.85	248.71	0.21
Main Channel	420.5432	Jul-79	28.80	58.42	60.45	59.57	60.47	0.000473	0.90	79.82	249.81	0.21
Main Channel	381.5255	2-Year	8.06	58.55	59.66	59.08	59.68	0.001103	0.74	15.49	83.65	0.24
Main Channel	381.5255	5-Year	12.50	58.55	59.81	59.24	59.85	0.001397	0.92	20.65	133.78	0.27
Main Channel	381.5255	10-Year	15.70	58.55	59.93	59.34	59.97	0.001434	0.99	24.66	153.78	0.28
Main Channel	381.5255	25-Year	20.40	58.55	60.10	59.48	60.14	0.001383	1.06	30.80	157.18	0.28
Main Channel	381.5255	50-Year	24.30	58.55	60.24	59.56	60.28	0.001304	1.09	36.07	160.32	0.28
Main Channel	381.5255	100-Year	28.20	58.55	60.38	59.68	60.42	0.001209	1.11	41.30	161.91	0.27
Main Channel	381.5255	Jul-79	28.80	58.55	60.40	59.69	60.44	0.001194	1.11	42.11	162.15	0.27
Main Channel	369.3561	2-Year	8.06	58.60	59.58	59.13	59.64	0.001250	1.05	7.93	69.26	0.35
Main Channel	369.3561	5-Year	12.50	58.60	59.66	59.28	59.77	0.002273	1.49	8.66	72.79	0.48
Main Channel	369.3561	10-Year	15.70	58.60	59.73	59.38	59.88	0.002918	1.75	9.24	88.16	0.55
Main Channel	369.3561	25-Year	20.40	58.60	59.83	59.52	60.05	0.003639	2.08	10.16	101.60	0.62
Main Channel	369.3561	50-Year	24.30	58.60	59.92	59.62	60.18	0.004079	2.30	10.94	110.20	0.66
Main Channel	369.3561	100-Year	28.20	58.60	60.01	59.71	60.32	0.004337	2.48	11.78	115.67	0.68
Main Channel	369.3561	Jul-79	28.80	58.60	60.02	59.73	60.34	0.004354	2.50	11.92	116.56	0.69
Main Channel	357.438		Bridge									
Main Channel	343.1997	2-Year	8.06	58.40	59.56	58.97	59.60	0.001516	0.88	9.17	84.72	0.28
Main Channel	343.1997	5-Year	12.50	58.40	59.62	59.12	59.71	0.003042	1.30	9.68	98.81	0.40
Main Channel	343.1997	10-Year	15.70	58.40	59.66	59.21	59.79	0.004207	1.57	10.07	103.95	0.47
Main Channel	343.1997	25-Year	20.40	58.40	59.73	59.35	59.92	0.005933	1.93	10.63	113.45	0.56
Main Channel	343.1997	50-Year	24.30	58.40	59.77	59.45	60.02	0.007509	2.22	11.00	115.05	0.64
Main Channel	343.1997	100-Year	28.20	58.40	59.80	59.54	60.12	0.009301	2.51	11.29	115.49	0.71

HEC-RAS Plan: 2015-01-27unrout River: WattsKizell Reach: Main Channel (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Main Channel	343.1997	Jul-79	28.80	58.40	59.80	59.56	60.14	0.009602	2.56	11.32	115.53	0.72
Main Channel	310.2693	2-Year	8.06	58.47	59.56	58.88	59.57	0.000293	0.48	18.54	85.43	0.16
Main Channel	310.2693	5-Year	12.50	58.47	59.63	59.00	59.65	0.000566	0.69	21.35	114.37	0.22
Main Channel	310.2693	10-Year	15.70	58.47	59.68	59.06	59.71	0.000738	0.81	24.57	116.62	0.25
Main Channel	310.2693	25-Year	20.40	58.47	59.77	59.15	59.81	0.000919	0.95	29.99	118.21	0.28
Main Channel	310.2693	50-Year	24.30	58.47	59.84	59.21	59.89	0.001019	1.03	34.45	118.72	0.30
Main Channel	310.2693	100-Year	28.20	58.47	59.91	59.27	59.96	0.001087	1.10	38.86	119.29	0.31
Main Channel	310.2693	Jul-79	28.80	58.47	59.92	59.28	59.98	0.001096	1.11	39.52	119.36	0.31
Main Channel	129.4642	2-Year	8.06	58.30	59.53		59.54	0.000173	0.48	29.55	48.42	0.14
Main Channel	129.4642	5-Year	12.50	58.30	59.55		59.57	0.000384	0.72	30.67	49.23	0.21
Main Channel	129.4642	10-Year	15.70	58.30	59.57		59.60	0.000562	0.88	31.79	49.98	0.25
Main Channel	129.4642	25-Year	20.40	58.30	59.61		59.66	0.000839	1.10	33.87	53.15	0.31
Main Channel	129.4642	50-Year	24.30	58.30	59.65		59.72	0.001038	1.25	36.03	53.76	0.35
Main Channel	129.4642	100-Year	28.20	58.30	59.70		59.77	0.001206	1.37	38.49	54.56	0.38
Main Channel	129.4642	Jul-79	28.80	58.30	59.71		59.78	0.001228	1.39	38.89	54.66	0.38
Main Channel	44.72172	2-Year	8.06	58.51	59.51	58.90	59.52	0.000306	0.50	36.56	111.81	0.16
Main Channel	44.72172	5-Year	12.50	58.51	59.51	59.03	59.53	0.000735	0.78	36.56	111.81	0.25
Main Channel	44.72172	10-Year	15.70	58.51	59.51	59.13	59.54	0.001160	0.98	36.56	111.81	0.32
Main Channel	44.72172	25-Year	20.40	58.51	59.51	59.34	59.57	0.001958	1.27	36.56	111.81	0.41
Main Channel	44.72172	50-Year	24.30	58.51	59.51	59.39	59.59	0.002778	1.51	36.56	111.81	0.49
Main Channel	44.72172	100-Year	28.20	58.51	59.51	59.43	59.62	0.003741	1.76	36.56	111.81	0.57
Main Channel	44.72172	Jul-79	28.80	58.51	59.51	59.44	59.63	0.003902	1.80	36.56	111.81	0.58

Shirely's Brook 2-100 Year
HEC-RAS Model Summary Output



Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary1	12308.03	2-Year	0.31	101.00	101.42		101.42	0.001154	0.32	1.01	7.32	0.23
Tributary1	12308.03	5-Year	1.12	101.00	101.59		101.60	0.000794	0.32	9.20	87.87	0.17
Tributary1	12308.03	10-Year	1.91	101.00	101.66		101.67	0.000633	0.31	16.55	109.56	0.15
Tributary1	12308.03	25-Year	3.08	101.00	101.73		101.74	0.000611	0.32	24.65	123.79	0.15
Tributary1	12308.03	50-Year	4.14	101.00	101.78		101.78	0.000592	0.33	30.67	128.12	0.14
Tributary1	12308.03	100-Year	5.38	101.00	101.83		101.83	0.000588	0.35	37.29	136.55	0.14
Tributary1	12308.03	Jul-79	5.74	101.00	101.84		101.85	0.000581	0.35	39.12	137.56	0.14
Tributary1	12233.64	2-Year	0.31	100.90	101.38		101.38	0.000343	0.19	2.45	14.77	0.12
Tributary1	12233.64	5-Year	1.12	100.90	101.56		101.56	0.000291	0.21	13.42	84.55	0.10
Tributary1	12233.64	10-Year	1.91	100.90	101.63		101.63	0.000341	0.24	20.17	105.08	0.11
Tributary1	12233.64	25-Year	3.08	100.90	101.70		101.70	0.000382	0.27	27.42	110.00	0.12
Tributary1	12233.64	50-Year	4.14	100.90	101.74		101.75	0.000434	0.30	32.71	117.29	0.12
Tributary1	12233.64	100-Year	5.38	100.90	101.79		101.79	0.000455	0.32	38.49	119.50	0.13
Tributary1	12233.64	Jul-79	5.74	100.90	101.81		101.81	0.000470	0.33	40.05	122.91	0.13
Tributary1	12033.7	2-Year	0.31	100.80	101.20		101.21	0.004345	0.42	0.74	4.05	0.31
Tributary1	12033.7	5-Year	1.12	100.80	101.39		101.40	0.006464	0.56	2.32	17.23	0.36
Tributary1	12033.7	10-Year	1.91	100.80	101.47		101.48	0.003466	0.50	5.94	56.44	0.28
Tributary1	12033.7	25-Year	3.08	100.80	101.54		101.55	0.002141	0.45	11.24	82.63	0.22
Tributary1	12033.7	50-Year	4.14	100.80	101.59		101.60	0.001572	0.41	15.59	88.49	0.20
Tributary1	12033.7	100-Year	5.38	100.80	101.66		101.67	0.000956	0.36	22.41	96.75	0.16
Tributary1	12033.7	Jul-79	5.74	100.80	101.68		101.68	0.000949	0.36	23.45	97.64	0.16
Tributary1	11917.4	2-Year	0.31	100.70	101.14	100.89	101.14	0.000234	0.12	3.18	21.54	0.08
Tributary1	11917.4	5-Year	1.12	100.70	101.26	101.05	101.26	0.000468	0.23	6.34	28.35	0.13
Tributary1	11917.4	10-Year	1.91	100.70	101.33	101.09	101.33	0.000611	0.30	8.37	31.06	0.15
Tributary1	11917.4	25-Year	3.08	100.70	101.41	101.13	101.41	0.000751	0.37	10.88	35.85	0.17
Tributary1	11917.4	50-Year	4.14	100.70	101.46	101.16	101.47	0.000849	0.43	12.95	39.58	0.18
Tributary1	11917.4	100-Year	5.38	100.70	101.54	101.20	101.55	0.001068	0.53	18.37	96.14	0.21
Tributary1	11917.4	Jul-79	5.74	100.70	101.56	101.21	101.56	0.001054	0.53	19.55	98.11	0.21
Tributary1	11762.56	2-Year	0.31	100.90	101.03	101.03	101.03	0.008414	0.47	1.33	43.39	0.69
Tributary1	11762.56	5-Year	1.12	100.90	101.08	101.04	101.08	0.006259	0.46	3.63	47.83	0.49
Tributary1	11762.56	10-Year	1.91	100.90	101.12		101.13	0.004883	0.46	5.69	59.52	0.42
Tributary1	11762.56	25-Year	3.08	100.90	101.16		101.16	0.005387	0.54	7.93	72.96	0.44
Tributary1	11762.56	50-Year	4.14	100.90	101.18	101.10	101.19	0.006173	0.61	9.40	83.08	0.47
Tributary1	11762.56	100-Year	5.38	100.90	101.20		101.21	0.006622	0.67	11.17	89.44	0.49
Tributary1	11762.56	Jul-79	5.74	100.90	101.21		101.22	0.006823	0.70	12.42	100.85	0.50
Tributary1	11567.16	2-Year	0.31	99.80	100.13		100.15	0.002021	0.58	0.54	2.61	0.41
Tributary1	11567.16	5-Year	1.12	99.80	100.36		100.38	0.002316	0.64	1.76	8.02	0.43
Tributary1	11567.16	10-Year	1.91	99.80	100.49		100.52	0.002141	0.65	3.04	12.18	0.37
Tributary1	11567.16	25-Year	3.08	99.80	100.60	100.40	100.62	0.001724	0.64	7.79	59.44	0.32
Tributary1	11567.16	50-Year	4.14	99.80	100.66		100.67	0.001469	0.62	11.53	65.05	0.29
Tributary1	11567.16	100-Year	5.38	99.80	100.71		100.72	0.001303	0.62	15.24	68.22	0.27
Tributary1	11567.16	Jul-79	5.74	99.80	100.73		100.74	0.001279	0.62	16.20	69.24	0.27
Tributary1	11338.93	2-Year	0.31	99.33	99.54		99.56	0.003349	0.60	0.51	2.81	0.45
Tributary1	11338.93	5-Year	1.12	99.33	99.79		99.82	0.002590	0.84	1.33	4.54	0.50
Tributary1	11338.93	10-Year	1.91	99.33	99.92		99.96	0.002738	0.92	2.08	6.92	0.53
Tributary1	11338.93	25-Year	3.08	99.33	100.04		100.09	0.003099	1.01	3.12	11.11	0.53
Tributary1	11338.93	50-Year	4.14	99.33	100.12		100.18	0.003333	1.10	4.26	21.02	0.52
Tributary1	11338.93	100-Year	5.38	99.33	100.18	100.03	100.25	0.003753	1.21	5.70	30.95	0.54
Tributary1	11338.93	Jul-79	5.74	99.33	100.19	100.05	100.26	0.003811	1.23	6.20	34.74	0.55
Tributary1	11169.32	2-Year	0.31	98.90	99.27	99.09	99.28	0.000975	0.37	0.84	4.54	0.28
Tributary1	11169.32	5-Year	1.12	98.90	99.50	99.27	99.51	0.001310	0.48	2.38	10.19	0.29
Tributary1	11169.32	10-Year	1.91	98.90	99.62	99.36	99.64	0.001357	0.55	3.83	16.11	0.28
Tributary1	11169.32	25-Year	3.08	98.90	99.74	99.46	99.76	0.001294	0.60	6.93	32.78	0.27
Tributary1	11169.32	50-Year	4.14	98.90	99.82	99.52	99.84	0.001264	0.64	9.98	72.62	0.27
Tributary1	11169.32	100-Year	5.38	98.90	99.90	99.58	99.91	0.001149	0.65	13.65	92.25	0.25
Tributary1	11169.32	Jul-79	5.74	98.90	99.92	99.60	99.93	0.001119	0.65	14.89	99.42	0.25
Tributary1	11073.3	2-Year	0.31	98.81	99.09	99.00	99.11	0.003660	0.69	0.45	2.73	0.55
Tributary1	11073.3	5-Year	1.12	98.81	99.27	99.19	99.31	0.003944	0.92	2.01	21.67	0.51
Tributary1	11073.3	10-Year	1.91	98.81	99.38	99.27	99.42	0.004041	1.06	3.29	28.37	0.51
Tributary1	11073.3	25-Year	3.08	98.81	99.49	99.34	99.55	0.004337	1.24	5.13	36.08	0.53
Tributary1	11073.3	50-Year	4.14	98.81	99.57	99.40	99.63	0.004374	1.34	6.73	39.87	0.54
Tributary1	11073.3	100-Year	5.38	98.81	99.65	99.51	99.71	0.004421	1.43	8.55	48.08	0.54
Tributary1	11073.3	Jul-79	5.74	98.81	99.67	99.53	99.73	0.004436	1.46	9.06	50.27	0.54
Tributary1	10997.52	2-Year	0.31	98.60	98.90		98.91	0.002035	0.37	0.88	10.61	0.33
Tributary1	10997.52	5-Year	1.12	98.60	99.07		99.08	0.002218	0.48	3.07	14.48	0.28
Tributary1	10997.52	10-Year	1.91	98.60	99.17		99.18	0.002454	0.57	4.73	19.02	0.29
Tributary1	10997.52	25-Year	3.08	98.60	99.27		99.29	0.002589	0.66	6.85	21.62	0.30
Tributary1	10997.52	50-Year	4.14	98.60	99.35		99.37	0.002608	0.72	8.58	22.91	0.30

HEC-RAS Plan: 2015-01-30 River: Shirley Reach: Tributary1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary1	10997.52	100-Year	5.38	98.60	99.43		99.45	0.002570	0.76	10.63	27.96	0.30
Tributary1	10997.52	Jul-79	5.74	98.60	99.45		99.47	0.002560	0.78	11.23	29.21	0.30
Tributary1	10873.1	2-Year	0.31	98.10	98.41	98.28	98.42	0.010248	0.52	0.60	3.62	0.41
Tributary1	10873.1	5-Year	1.12	98.10	98.63		98.65	0.006427	0.60	2.36	13.43	0.33
Tributary1	10873.1	10-Year	1.91	98.10	98.74		98.76	0.005025	0.65	4.05	16.03	0.31
Tributary1	10873.1	25-Year	3.08	98.10	98.87		98.89	0.004289	0.70	6.16	17.68	0.30
Tributary1	10873.1	50-Year	4.14	98.10	98.96		98.98	0.003884	0.74	7.89	18.68	0.29
Tributary1	10873.1	100-Year	5.38	98.10	99.06		99.08	0.003569	0.78	9.84	19.99	0.28
Tributary1	10873.1	Jul-79	5.74	98.10	99.09		99.11	0.003487	0.79	10.39	20.30	0.28
Tributary1	10823.93	2-Year	0.31	97.50	97.69	97.69	97.76	0.018079	1.21	0.26	1.75	1.01
Tributary1	10823.93	5-Year	1.12	97.50	97.90	97.90	98.04	0.031659	1.65	0.68	2.46	1.00
Tributary1	10823.93	10-Year	1.91	97.50	98.03	98.03	98.20	0.044367	1.82	1.05	3.19	1.01
Tributary1	10823.93	25-Year	3.08	97.50	98.17	98.17	98.37	0.049773	2.01	1.53	3.79	1.01
Tributary1	10823.93	50-Year	4.14	97.50	98.26	98.26	98.50	0.051617	2.16	1.92	4.14	1.01
Tributary1	10823.93	100-Year	5.38	97.50	98.37	98.37	98.63	0.051931	2.27	2.37	4.53	1.00
Tributary1	10823.93	Jul-79	5.74	97.50	98.39	98.39	98.66	0.052174	2.30	2.49	4.62	1.00
Tributary1	10784.32	2-Year	0.31	96.76	97.27		97.28	0.000132	0.13	3.53	19.36	0.07
Tributary1	10784.32	5-Year	1.12	96.76	97.76		97.76	0.000043	0.11	16.16	30.41	0.04
Tributary1	10784.32	10-Year	1.91	96.76	98.11		98.11	0.000028	0.11	27.47	33.76	0.03
Tributary1	10784.32	25-Year	3.08	96.76	98.22		98.23	0.000050	0.16	31.41	34.76	0.04
Tributary1	10784.32	50-Year	4.14	96.76	98.28		98.28	0.000076	0.20	33.38	35.30	0.06
Tributary1	10784.32	100-Year	5.38	96.76	98.33		98.33	0.000111	0.25	35.11	35.80	0.07
Tributary1	10784.32	Jul-79	5.74	96.76	98.33		98.33	0.000125	0.26	35.22	35.83	0.07
Tributary1	10781.03	2-Year	0.31	96.79	97.25	97.01	97.27	0.000968	0.59	0.52	15.94	0.29
Tributary1	10781.03	5-Year	1.12	96.79	97.69	97.27	97.75	0.001238	1.07	1.05	47.71	0.36
Tributary1	10781.03	10-Year	1.91	96.79	98.11	97.46	98.11	0.000015	0.15	31.64	50.26	0.04
Tributary1	10781.03	25-Year	3.08	96.79	98.22	97.70	98.22	0.000026	0.20	36.21	50.90	0.06
Tributary1	10781.03	50-Year	4.14	96.79	98.28	97.88	98.28	0.000039	0.26	38.44	51.19	0.07
Tributary1	10781.03	100-Year	5.38	96.79	98.33	98.10	98.33	0.000029	0.22	52.05	51.47	0.06
Tributary1	10781.03	Jul-79	5.74	96.79	98.33	98.10	98.33	0.000033	0.24	52.21	51.49	0.06
Tributary1	10770.63		Culvert									
Tributary1	10758.25	2-Year	0.39	96.22	96.57	96.50	96.64	0.006108	1.12	0.35	2.99	0.67
Tributary1	10758.25	5-Year	1.27	96.22	96.77	96.77	97.01	0.011743	2.19	0.58	9.01	1.01
Tributary1	10758.25	10-Year	2.11	96.22	96.90	96.90	97.02	0.008849	1.55	1.36	24.55	0.83
Tributary1	10758.25	25-Year	3.35	96.22	96.98	96.98	97.18	0.011439	2.01	1.71	26.32	0.97
Tributary1	10758.25	50-Year	4.47	96.22	97.12	97.12	97.27	0.006395	1.81	3.40	34.79	0.76
Tributary1	10758.25	100-Year	5.76	96.22	97.18	97.18	97.35	0.006633	1.98	4.24	35.24	0.79
Tributary1	10758.25	Jul-79	6.08	96.22	97.20	97.20	97.37	0.006581	2.00	4.46	35.36	0.79
Tributary1	10753.84	2-Year	0.39	96.30	96.54		96.60	0.010981	1.10	0.35	1.84	0.81
Tributary1	10753.84	5-Year	1.27	96.30	96.71	96.71	96.77	0.009509	1.15	1.36	12.07	0.86
Tributary1	10753.84	10-Year	2.11	96.30	96.76	96.76	96.84	0.011663	1.30	2.08	13.80	0.92
Tributary1	10753.84	25-Year	3.35	96.30	96.83	96.83	96.91	0.012433	1.39	3.21	20.25	0.90
Tributary1	10753.84	50-Year	4.47	96.30	96.88	96.87	96.96	0.012185	1.45	4.24	23.52	0.86
Tributary1	10753.84	100-Year	5.76	96.30	96.93	96.89	97.02	0.012021	1.52	5.82	34.02	0.83
Tributary1	10753.84	Jul-79	6.08	96.30	96.94	96.89	97.03	0.011631	1.52	6.18	34.17	0.81
Tributary1	10709.87	2-Year	0.39	96.10	96.39		96.39	0.002239	0.44	1.59	17.65	0.44
Tributary1	10709.87	5-Year	1.27	96.10	96.50		96.51	0.002368	0.46	4.24	25.67	0.35
Tributary1	10709.87	10-Year	2.11	96.10	96.56		96.57	0.002454	0.53	6.18	33.02	0.34
Tributary1	10709.87	25-Year	3.35	96.10	96.62		96.63	0.003000	0.64	8.20	38.19	0.37
Tributary1	10709.87	50-Year	4.47	96.10	96.66		96.67	0.003512	0.73	9.55	38.77	0.40
Tributary1	10709.87	100-Year	5.76	96.10	96.69		96.71	0.003948	0.81	10.95	39.34	0.43
Tributary1	10709.87	Jul-79	6.08	96.10	96.70		96.72	0.004084	0.84	11.23	39.45	0.44
Tributary1	10633.91	2-Year	0.39	95.80	96.04	96.04	96.09	0.009365	0.92	0.43	4.74	0.96
Tributary1	10633.91	5-Year	1.27	95.80	96.14	96.14	96.18	0.010233	0.92	2.08	29.92	0.79
Tributary1	10633.91	10-Year	2.11	95.80	96.17	96.17	96.22	0.012558	1.07	3.08	33.79	0.83
Tributary1	10633.91	25-Year	3.35	95.80	96.23		96.26	0.009575	1.02	5.13	38.42	0.69
Tributary1	10633.91	50-Year	4.47	95.80	96.28		96.31	0.007417	0.98	6.94	39.59	0.60
Tributary1	10633.91	100-Year	5.76	95.80	96.32		96.35	0.006127	0.96	8.88	41.14	0.54
Tributary1	10633.91	Jul-79	6.08	95.80	96.34		96.36	0.005783	0.95	9.40	41.41	0.53
Tributary1	10574.15	2-Year	0.39	95.50	95.77	95.74	95.78	0.003025	0.51	1.20	16.30	0.49
Tributary1	10574.15	5-Year	1.27	95.50	95.89	95.81	95.90	0.002146	0.36	4.49	31.84	0.29
Tributary1	10574.15	10-Year	2.11	95.50	95.96		95.96	0.002026	0.38	6.65	32.72	0.25
Tributary1	10574.15	25-Year	3.35	95.50	96.04		96.04	0.001957	0.41	9.26	33.56	0.24
Tributary1	10574.15	50-Year	4.47	95.50	96.09		96.10	0.002078	0.45	11.02	34.05	0.24
Tributary1	10574.15	100-Year	5.76	95.50	96.16		96.17	0.001873	0.47	13.49	34.59	0.23
Tributary1	10574.15	Jul-79	6.08	95.50	96.18		96.19	0.001745	0.46	14.31	34.76	0.22

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Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary1	10515.42	2-Year	0.39	95.22	95.46	95.46	95.49	0.009476	0.77	0.51	7.93	0.96
Tributary1	10515.42	5-Year	1.27	95.22	95.53	95.53	95.59	0.026782	1.07	1.19	11.11	1.04
Tributary1	10515.42	10-Year	2.11	95.22	95.58	95.58	95.65	0.033658	1.23	1.71	11.71	1.03
Tributary1	10515.42	25-Year	3.35	95.22	95.63	95.63	95.73	0.038722	1.41	2.38	12.30	1.02
Tributary1	10515.42	50-Year	4.47	95.22	95.73		95.81	0.022550	1.23	3.63	12.84	0.74
Tributary1	10515.42	100-Year	5.76	95.22	95.93		95.97	0.007880	0.92	6.26	13.55	0.43
Tributary1	10515.42	Jul-79	6.08	95.22	95.98		96.02	0.006552	0.88	6.90	13.69	0.39
Tributary1	10473.51	2-Year	0.39	94.50	94.92		94.92	0.000527	0.23	1.68	8.72	0.17
Tributary1	10473.51	5-Year	1.27	94.50	95.16		95.17	0.000551	0.31	4.16	11.47	0.16
Tributary1	10473.51	10-Year	2.11	94.50	95.34		95.34	0.000475	0.34	6.28	12.57	0.15
Tributary1	10473.51	25-Year	3.35	94.50	95.56		95.57	0.000385	0.37	9.20	13.99	0.14
Tributary1	10473.51	50-Year	4.47	94.50	95.73		95.74	0.000336	0.39	11.79	15.20	0.13
Tributary1	10473.51	100-Year	5.76	94.50	95.92		95.93	0.000297	0.41	14.69	16.06	0.13
Tributary1	10473.51	Jul-79	6.08	94.50	95.97		95.98	0.000287	0.42	15.44	16.34	0.12
Tributary1	10470.06	2-Year	0.39	94.70	94.89	94.83	94.92	0.005141	0.78	0.50	5.28	0.58
Tributary1	10470.06	5-Year	1.27	94.70	95.07	94.98	95.15	0.005445	1.27	1.00	9.41	0.67
Tributary1	10470.06	10-Year	2.11	94.70	95.20	95.10	95.33	0.005469	1.56	1.35	11.55	0.70
Tributary1	10470.06	25-Year	3.35	94.70	95.37	95.24	95.54	0.005391	1.87	1.79	13.44	0.73
Tributary1	10470.06	50-Year	4.47	94.70	95.50	95.36	95.72	0.005326	2.09	2.14	15.07	0.75
Tributary1	10470.06	100-Year	5.76	94.70	95.63	95.48	95.90	0.005273	2.30	2.50	16.58	0.76
Tributary1	10470.06	Jul-79	6.08	94.70	95.67	95.50	95.95	0.005128	2.34	2.60	17.04	0.76
Tributary1	10463.11		Bridge									
Tributary1	10453.9	2-Year	0.37	94.60	94.72	94.72	94.79	0.018333	1.11	0.33	14.36	1.02
Tributary1	10453.9	5-Year	1.22	94.60	94.87	94.87	95.01	0.014047	1.66	0.74	18.10	1.01
Tributary1	10453.9	10-Year	2.04	94.60	94.99	94.99	95.18	0.012028	1.94	1.05	21.23	1.00
Tributary1	10453.9	25-Year	3.30	94.60	95.13	95.13	95.40	0.010843	2.28	1.45	26.76	1.00
Tributary1	10453.9	50-Year	4.42	94.60	95.25	95.25	95.57	0.010292	2.53	1.75	28.58	1.00
Tributary1	10453.9	100-Year	5.70	94.60	95.37	95.37	95.75	0.009637	2.74	2.08	30.18	1.00
Tributary1	10453.9	Jul-79	5.75	94.60	95.37	95.37	95.76	0.009628	2.75	2.09	30.23	1.00
Tributary1	10441.99	2-Year	0.37	94.20	94.43	94.43	94.47	0.011087	0.89	0.42	5.21	1.01
Tributary1	10441.99	5-Year	1.22	94.20	94.53	94.53	94.59	0.019515	1.08	1.22	14.54	0.96
Tributary1	10441.99	10-Year	2.04	94.20	94.61		94.65	0.013614	0.97	2.93	25.00	0.68
Tributary1	10441.99	25-Year	3.30	94.20	94.70		94.73	0.009717	0.92	5.18	26.15	0.54
Tributary1	10441.99	50-Year	4.42	94.20	94.76		94.79	0.008457	0.93	6.82	26.75	0.50
Tributary1	10441.99	100-Year	5.70	94.20	94.82		94.85	0.007732	0.96	8.48	27.35	0.47
Tributary1	10441.99	Jul-79	5.75	94.20	94.82		94.85	0.007717	0.96	8.53	27.37	0.47
Tributary1	10343.18	2-Year	0.37	93.40	93.74		93.74	0.001963	0.43	1.22	19.35	0.42
Tributary1	10343.18	5-Year	1.22	93.40	93.84		93.85	0.003550	0.49	3.48	25.70	0.41
Tributary1	10343.18	10-Year	2.04	93.40	93.88		93.89	0.004985	0.59	4.74	28.70	0.43
Tributary1	10343.18	25-Year	3.30	93.40	93.93		93.95	0.006828	0.72	6.18	29.94	0.47
Tributary1	10343.18	50-Year	4.42	93.40	93.96		93.99	0.008183	0.82	7.22	30.53	0.50
Tributary1	10343.18	100-Year	5.70	93.40	94.00		94.03	0.009471	0.91	8.27	31.05	0.52
Tributary1	10343.18	Jul-79	5.75	93.40	94.00		94.03	0.009506	0.92	8.31	31.07	0.52
Tributary1	10149.12	2-Year	0.37	92.76	92.97	92.97	93.02	0.010689	1.00	0.52	6.33	0.86
Tributary1	10149.12	5-Year	1.22	92.76	93.08	93.04	93.09	0.005008	0.45	3.06	30.16	0.45
Tributary1	10149.12	10-Year	2.04	92.76	93.15		93.15	0.003495	0.45	5.10	32.77	0.35
Tributary1	10149.12	25-Year	3.30	92.76	93.22		93.23	0.002662	0.47	7.76	34.52	0.31
Tributary1	10149.12	50-Year	4.42	92.76	93.28		93.29	0.002300	0.50	9.86	35.42	0.29
Tributary1	10149.12	100-Year	5.70	92.76	93.35		93.36	0.002048	0.52	12.06	35.91	0.28
Tributary1	10149.12	Jul-79	5.75	92.76	93.35		93.36	0.002041	0.52	12.14	35.93	0.28
Tributary1	10028.23	2-Year	0.37	92.10	92.44		92.45	0.002009	0.43	0.86	5.61	0.35
Tributary1	10028.23	5-Year	1.22	92.10	92.62		92.63	0.003057	0.57	2.24	11.94	0.36
Tributary1	10028.23	10-Year	2.04	92.10	92.70		92.73	0.003814	0.69	3.32	13.27	0.38
Tributary1	10028.23	25-Year	3.30	92.10	92.80	92.62	92.84	0.004498	0.83	4.71	14.31	0.40
Tributary1	10028.23	50-Year	4.42	92.10	92.87	92.67	92.91	0.004980	0.93	5.73	14.90	0.41
Tributary1	10028.23	100-Year	5.70	92.10	92.95	92.73	92.99	0.005355	1.02	6.84	15.83	0.43
Tributary1	10028.23	Jul-79	5.75	92.10	92.95	92.73	93.00	0.005363	1.02	6.88	15.86	0.43
Tributary1	9916.492	2-Year	0.37	91.90	91.94	91.93	91.95	0.017195	0.47	0.78	22.14	0.80
Tributary1	9916.492	5-Year	1.22	91.90	91.98	91.97	92.00	0.013457	0.70	1.73	22.31	0.81
Tributary1	9916.492	10-Year	2.04	91.90	92.01	92.00	92.05	0.011252	0.82	2.50	22.45	0.78
Tributary1	9916.492	25-Year	3.30	91.90	92.05		92.10	0.010664	0.97	3.40	22.61	0.80
Tributary1	9916.492	50-Year	4.42	91.90	92.08		92.14	0.010380	1.08	4.09	22.73	0.81
Tributary1	9916.492	100-Year	5.70	91.90	92.11		92.19	0.010543	1.20	4.77	24.46	0.84
Tributary1	9916.492	Jul-79	5.75	91.90	92.11		92.19	0.010568	1.21	4.79	24.48	0.84
Tributary1	9837.811	2-Year	0.37	91.26	91.54	91.49	91.54	0.002608	0.29	1.71	30.04	0.38
Tributary1	9837.811	5-Year	1.22	91.26	91.61		91.61	0.002673	0.35	4.63	55.54	0.31
Tributary1	9837.811	10-Year	2.04	91.26	91.64		91.65	0.002899	0.41	6.74	56.73	0.31

HEC-RAS Plan: 2015-01-30 River: Shirley Reach: Tributary1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary1	9837.811	25-Year	3.30	91.26	91.69		91.70	0.002964	0.46	9.43	58.29	0.32
Tributary1	9837.811	50-Year	4.42	91.26	91.73		91.74	0.002965	0.51	11.77	61.42	0.32
Tributary1	9837.811	100-Year	5.70	91.26	91.77		91.77	0.002942	0.54	13.94	62.28	0.32
Tributary1	9837.811	Jul-79	5.75	91.26	91.77		91.78	0.002939	0.55	14.02	62.31	0.32
Tributary1	9740.979	2-Year	0.37	90.80	91.03	91.03	91.05	0.015361	0.72	0.67	16.88	1.04
Tributary1	9740.979	5-Year	1.22	90.80	91.10	91.08	91.12	0.014544	0.72	2.09	25.39	0.75
Tributary1	9740.979	10-Year	2.04	90.80	91.15	91.12	91.17	0.011670	0.74	3.27	26.36	0.63
Tributary1	9740.979	25-Year	3.30	90.80	91.20	91.15	91.23	0.010271	0.81	4.81	29.31	0.59
Tributary1	9740.979	50-Year	4.42	90.80	91.24	91.17	91.27	0.010215	0.88	5.87	30.23	0.59
Tributary1	9740.979	100-Year	5.70	90.80	91.28		91.31	0.009773	0.94	7.06	31.11	0.58
Tributary1	9740.979	Jul-79	5.75	90.80	91.28		91.31	0.009771	0.94	7.10	31.14	0.58
Tributary1	9623.555	2-Year	0.37	90.00	90.33	90.28	90.34	0.003305	0.59	0.93	10.18	0.50
Tributary1	9623.555	5-Year	1.22	90.00	90.46		90.48	0.003184	0.71	2.72	16.84	0.43
Tributary1	9623.555	10-Year	2.04	90.00	90.54		90.56	0.003354	0.82	4.58	30.10	0.44
Tributary1	9623.555	25-Year	3.30	90.00	90.62		90.64	0.003512	0.93	7.27	43.20	0.45
Tributary1	9623.555	50-Year	4.42	90.00	90.66		90.68	0.003553	0.98	9.10	45.01	0.45
Tributary1	9623.555	100-Year	5.70	90.00	90.70		90.73	0.003721	1.05	10.95	48.44	0.47
Tributary1	9623.555	Jul-79	5.75	90.00	90.70		90.73	0.003723	1.05	11.01	48.46	0.47
Tributary1	9473.968	2-Year	0.37	89.50	89.82		89.83	0.003793	0.47	0.79	6.66	0.44
Tributary1	9473.968	5-Year	1.22	89.50	89.98		90.00	0.003773	0.58	2.10	11.47	0.40
Tributary1	9473.968	10-Year	2.04	89.50	90.07		90.09	0.003666	0.63	3.75	23.13	0.39
Tributary1	9473.968	25-Year	3.30	89.50	90.15		90.17	0.003776	0.70	5.83	31.59	0.39
Tributary1	9473.968	50-Year	4.42	89.50	90.20		90.23	0.003742	0.76	7.66	38.07	0.39
Tributary1	9473.968	100-Year	5.70	89.50	90.25		90.27	0.003639	0.79	9.49	39.18	0.39
Tributary1	9473.968	Jul-79	5.75	89.50	90.25		90.28	0.003639	0.80	9.55	39.22	0.39
Tributary1	9379.995	2-Year	0.37	88.90	89.11	89.11	89.19	0.015184	1.19	0.31	2.16	1.00
Tributary1	9379.995	5-Year	1.22	88.90	89.28	89.28	89.35	0.015970	1.17	1.04	7.24	0.99
Tributary1	9379.995	10-Year	2.04	88.90	89.36	89.35	89.43	0.018576	1.18	1.73	11.06	0.95
Tributary1	9379.995	25-Year	3.30	88.90	89.45		89.52	0.017296	1.14	2.89	13.08	0.78
Tributary1	9379.995	50-Year	4.42	88.90	89.52		89.59	0.016494	1.17	3.77	13.50	0.71
Tributary1	9379.995	100-Year	5.70	88.90	89.58	89.50	89.66	0.015783	1.21	4.69	13.93	0.67
Tributary1	9379.995	Jul-79	5.75	88.90	89.59	89.50	89.66	0.015697	1.21	4.74	13.95	0.67
Tributary1	9320.319	2-Year	0.37	86.97	87.18	87.18	87.26	0.017411	1.26	0.29	1.81	1.00
Tributary1	9320.319	5-Year	1.22	86.97	87.38	87.38	87.49	0.054936	1.50	0.81	3.57	1.00
Tributary1	9320.319	10-Year	2.04	86.97	87.48	87.48	87.63	0.056699	1.70	1.20	4.09	1.00
Tributary1	9320.319	25-Year	3.30	86.97	87.60	87.60	87.79	0.057220	1.90	1.74	4.71	1.00
Tributary1	9320.319	50-Year	4.42	86.97	87.69	87.69	87.90	0.057561	2.04	2.17	5.08	1.00
Tributary1	9320.319	100-Year	5.70	86.97	87.78	87.78	88.02	0.057666	2.17	2.62	5.44	1.00
Tributary1	9320.319	Jul-79	5.75	86.97	87.78	87.78	88.02	0.058129	2.18	2.63	5.45	1.00
Tributary1	9296.913	2-Year	0.37	84.14	84.35	84.35	84.43	0.027496	1.22	0.30	2.03	1.01
Tributary1	9296.913	5-Year	1.22	84.14	84.54	84.54	84.65	0.057420	1.48	0.83	3.74	1.00
Tributary1	9296.913	10-Year	2.04	84.14	84.63	84.63	84.77	0.062195	1.66	1.23	4.52	1.01
Tributary1	9296.913	25-Year	3.30	84.14	84.75	84.75	84.92	0.063934	1.82	1.81	5.44	1.01
Tributary1	9296.913	50-Year	4.42	84.14	84.83	84.83	85.02	0.063439	1.94	2.27	5.97	1.01
Tributary1	9296.913	100-Year	5.70	84.14	84.91	84.91	85.13	0.063921	2.07	2.76	6.46	1.01
Tributary1	9296.913	Jul-79	5.75	84.14	84.91	84.91	85.13	0.063987	2.07	2.77	6.48	1.01
Tributary1	9269.78	2-Year	0.63	83.00	83.29	83.29	83.36	0.010428	1.13	0.73	7.59	0.90
Tributary1	9269.78	5-Year	1.61	83.00	83.40	83.40	83.50	0.014145	1.51	1.60	8.70	0.94
Tributary1	9269.78	10-Year	2.51	83.00	83.47	83.47	83.59	0.015930	1.75	2.20	9.09	0.97
Tributary1	9269.78	25-Year	3.85	83.00	83.55	83.55	83.71	0.017093	2.01	2.98	9.53	1.00
Tributary1	9269.78	50-Year	5.02	83.00	83.61	83.61	83.80	0.017947	2.21	3.58	9.82	1.02
Tributary1	9269.78	100-Year	6.38	83.00	83.68	83.68	83.89	0.018407	2.39	4.23	10.15	1.04
Tributary1	9269.78	Jul-79	6.22	83.00	83.67	83.67	83.88	0.018218	2.36	4.17	10.12	1.03
Tributary1	9213.969	2-Year	0.63	82.60	83.00		83.02	0.002750	0.62	1.16	21.13	0.47
Tributary1	9213.969	5-Year	1.61	82.60	83.13	83.05	83.14	0.002071	0.54	4.65	34.90	0.37
Tributary1	9213.969	10-Year	2.51	82.60	83.19		83.20	0.001893	0.55	6.84	35.98	0.33
Tributary1	9213.969	25-Year	3.85	82.60	83.26		83.28	0.001780	0.58	9.51	36.92	0.31
Tributary1	9213.969	50-Year	5.02	82.60	83.31		83.32	0.001890	0.63	11.26	38.24	0.32
Tributary1	9213.969	100-Year	6.38	82.60	83.38		83.39	0.001720	0.65	13.99	41.61	0.30
Tributary1	9213.969	Jul-79	6.22	82.60	83.37		83.38	0.001755	0.65	13.65	41.43	0.30
Tributary1	9087.692	2-Year	0.63	81.90	82.22		82.28	0.019629	1.11	0.57	3.05	0.82
Tributary1	9087.692	5-Year	1.61	81.90	82.35	82.35	82.47	0.039068	1.53	1.05	4.48	1.01
Tributary1	9087.692	10-Year	2.51	81.90	82.45	82.45	82.58	0.042260	1.63	1.54	5.89	1.02
Tributary1	9087.692	25-Year	3.85	81.90	82.55	82.55	82.70	0.037649	1.74	2.25	8.50	0.98
Tributary1	9087.692	50-Year	5.02	81.90	82.65	82.65	82.78	0.023629	1.65	3.40	14.39	0.81
Tributary1	9087.692	100-Year	6.38	81.90	82.67	82.67	82.85	0.032120	1.98	3.66	14.72	0.95
Tributary1	9087.692	Jul-79	6.22	81.90	82.66	82.66	82.84	0.030916	1.94	3.64	14.70	0.93

HEC-RAS Plan: 2015-01-30 River: Shirley Reach: Tributary1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary1	9037.473	2-Year	0.63	81.70	82.04		82.05	0.001721	0.45	2.25	19.05	0.42
Tributary1	9037.473	5-Year	1.61	81.70	82.16		82.16	0.001708	0.47	4.63	22.80	0.34
Tributary1	9037.473	10-Year	2.51	81.70	82.23		82.24	0.001802	0.52	6.57	28.11	0.33
Tributary1	9037.473	25-Year	3.85	81.70	82.30		82.31	0.001992	0.59	8.50	29.03	0.33
Tributary1	9037.473	50-Year	5.02	81.70	82.35		82.37	0.002056	0.64	10.13	30.21	0.34
Tributary1	9037.473	100-Year	6.38	81.70	82.41		82.43	0.002107	0.69	11.79	30.87	0.34
Tributary1	9037.473	Jul-79	6.22	81.70	82.40		82.42	0.002100	0.69	11.61	30.82	0.34
Tributary1	8955.241	2-Year	0.63	81.40	81.71	81.71	81.77	0.009338	1.14	0.78	7.93	0.88
Tributary1	8955.241	5-Year	1.61	81.40	81.82	81.82	81.88	0.011205	1.21	2.26	19.94	0.92
Tributary1	8955.241	10-Year	2.51	81.40	81.86	81.86	81.93	0.013491	1.36	3.19	21.07	0.92
Tributary1	8955.241	25-Year	3.85	81.40	81.95	81.91	82.01	0.010374	1.29	5.16	23.16	0.74
Tributary1	8955.241	50-Year	5.02	81.40	82.02	81.95	82.07	0.008701	1.27	6.83	24.51	0.66
Tributary1	8955.241	100-Year	6.38	81.40	82.09		82.14	0.007845	1.29	8.51	25.45	0.61
Tributary1	8955.241	Jul-79	6.22	81.40	82.08		82.13	0.007982	1.29	8.30	25.34	0.62
Tributary1	8866.257	2-Year	0.63	80.60	81.12		81.14	0.001349	0.60	1.05	3.68	0.36
Tributary1	8866.257	5-Year	1.61	80.60	81.38		81.40	0.001497	0.66	2.49	7.90	0.34
Tributary1	8866.257	10-Year	2.51	80.60	81.48		81.51	0.001934	0.79	3.93	19.88	0.36
Tributary1	8866.257	25-Year	3.85	80.60	81.58		81.62	0.002394	0.93	6.27	25.92	0.38
Tributary1	8866.257	50-Year	5.02	80.60	81.66		81.70	0.002544	1.00	8.33	28.33	0.39
Tributary1	8866.257	100-Year	6.38	80.60	81.73		81.78	0.002628	1.05	10.48	29.36	0.39
Tributary1	8866.257	Jul-79	6.22	80.60	81.73		81.77	0.002570	1.04	10.34	29.31	0.38
Tributary1	8793.795	2-Year	0.63	80.40	80.97		80.99	0.003475	0.49	1.28	3.99	0.28
Tributary1	8793.795	5-Year	1.61	80.40	81.22		81.24	0.003525	0.58	3.69	21.52	0.27
Tributary1	8793.795	10-Year	2.51	80.40	81.32		81.33	0.003271	0.63	6.37	30.70	0.27
Tributary1	8793.795	25-Year	3.85	80.40	81.42		81.43	0.002875	0.66	9.56	31.30	0.26
Tributary1	8793.795	50-Year	5.02	80.40	81.50		81.52	0.002496	0.66	12.25	31.77	0.24
Tributary1	8793.795	100-Year	6.38	80.40	81.58	81.32	81.60	0.002371	0.69	14.76	32.17	0.24
Tributary1	8793.795	Jul-79	6.22	80.40	81.59	81.31	81.60	0.002218	0.67	14.84	32.18	0.23
Tributary1	8725.256	2-Year	0.63	80.30	80.71		80.75	0.003425	0.84	0.75	2.89	0.52
Tributary1	8725.256	5-Year	1.61	80.30	80.85	80.80	80.92	0.006018	1.18	1.53	9.02	0.72
Tributary1	8725.256	10-Year	2.51	80.30	80.96		81.03	0.005914	1.24	2.66	11.79	0.64
Tributary1	8725.256	25-Year	3.85	80.30	81.07		81.16	0.005972	1.35	4.25	15.71	0.62
Tributary1	8725.256	50-Year	5.02	80.30	81.12	81.06	81.23	0.007932	1.61	5.03	22.97	0.70
Tributary1	8725.256	100-Year	6.38	80.30	81.15	81.15	81.29	0.010006	1.85	5.80	23.78	0.78
Tributary1	8725.256	Jul-79	6.22	80.30	81.12	81.09	81.29	0.011810	1.97	5.12	23.07	0.86
Tributary1	8590.857	2-Year	0.63	79.67	80.00		80.07	0.008146	1.13	0.56	2.78	0.80
Tributary1	8590.857	5-Year	1.61	79.67	80.28		80.32	0.003404	0.82	1.96	6.63	0.48
Tributary1	8590.857	10-Year	2.51	79.67	80.44		80.47	0.003005	0.81	3.10	8.06	0.42
Tributary1	8590.857	25-Year	3.85	79.67	80.62		80.65	0.002497	0.80	5.81	34.92	0.35
Tributary1	8590.857	50-Year	5.02	79.67	80.76		80.78	0.001762	0.73	10.99	43.83	0.28
Tributary1	8590.857	100-Year	6.38	79.67	80.92		80.93	0.001033	0.61	18.38	47.27	0.21
Tributary1	8590.857	Jul-79	6.22	79.67	80.89		80.91	0.001120	0.63	17.32	46.94	0.22
Tributary1	8546.309	2-Year	0.63	79.40	79.91		79.92	0.001511	0.59	1.06	3.69	0.35
Tributary1	8546.309	5-Year	1.61	79.40	80.20		80.22	0.001504	0.68	2.35	5.56	0.34
Tributary1	8546.309	10-Year	2.51	79.40	80.34		80.37	0.001757	0.76	3.29	7.33	0.36
Tributary1	8546.309	25-Year	3.85	79.40	80.53		80.56	0.001780	0.76	5.42	17.55	0.35
Tributary1	8546.309	50-Year	5.02	79.40	80.69		80.71	0.001405	0.71	9.76	35.06	0.28
Tributary1	8546.309	100-Year	6.38	79.40	80.87		80.89	0.000856	0.59	17.53	46.21	0.21
Tributary1	8546.309	Jul-79	6.22	79.40	80.85		80.86	0.000929	0.61	16.33	45.37	0.22
Tributary1	8481.811	2-Year	0.63	79.30	79.58	79.58	79.69	0.016395	1.43	0.44	2.13	1.01
Tributary1	8481.811	5-Year	1.61	79.30	79.80	79.80	79.93	0.048142	1.59	1.01	3.98	1.01
Tributary1	8481.811	10-Year	2.51	79.30	79.95		80.06	0.038447	1.48	1.70	5.28	0.83
Tributary1	8481.811	25-Year	3.85	79.30	80.26		80.31	0.013360	1.03	3.74	7.80	0.47
Tributary1	8481.811	50-Year	5.02	79.30	80.50		80.54	0.006942	0.82	6.32	13.73	0.34
Tributary1	8481.811	100-Year	6.38	79.30	80.78		80.80	0.002763	0.67	10.89	19.71	0.23
Tributary1	8481.811	Jul-79	6.22	79.30	80.74		80.77	0.003066	0.68	10.23	18.87	0.24
Tributary1	8478.137	2-Year	0.63	79.08	79.42	79.28	79.45	0.018047	0.81	0.77	3.54	0.45
Tributary1	8478.137	5-Year	1.61	79.08	79.67	79.45	79.74	0.017907	1.18	1.36	4.48	0.49
Tributary1	8478.137	10-Year	2.51	79.08	79.87	79.57	79.96	0.017078	1.39	1.81	6.36	0.50
Tributary1	8478.137	25-Year	3.85	79.08	80.12	79.74	80.25	0.015717	1.61	2.39	10.18	0.50
Tributary1	8478.137	50-Year	5.02	79.08	80.34	79.87	80.49	0.014264	1.74	2.89	16.27	0.49
Tributary1	8478.137	100-Year	6.38	79.08	80.59	80.00	80.76	0.012372	1.83	3.48	25.46	0.48
Tributary1	8478.137	Jul-79	6.22	79.08	80.56	79.99	80.73	0.012656	1.83	3.41	23.35	0.48
Tributary1	8464.13											
		Culvert										
Tributary1	8451.362	2-Year	0.63	78.67	79.37	78.87	79.38	0.000608	0.39	1.62	3.23	0.15
Tributary1	8451.362	5-Year	1.61	78.67	79.55	79.04	79.58	0.001866	0.79	2.03	3.47	0.27
Tributary1	8451.362	10-Year	2.51	78.67	79.66	79.17	79.72	0.003047	1.10	2.28	3.71	0.35

HEC-RAS Plan: 2015-01-30 River: Shirley Reach: Tributary1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary1	8451.362	25-Year	3.85	78.67	79.76	79.33	79.88	0.005294	1.54	2.50	4.97	0.47
Tributary1	8451.362	50-Year	5.02	78.67	79.80	79.46	79.99	0.008013	1.94	2.59	5.88	0.58
Tributary1	8451.362	100-Year	6.38	78.67	79.83	79.59	80.12	0.011631	2.39	2.67	6.69	0.71
Tributary1	8451.362	Jul-79	6.22	78.67	79.83	79.58	80.11	0.011122	2.33	2.67	6.65	0.69
Tributary1	8443.007	2-Year	0.63	78.90	79.34	79.18	79.37	0.002741	0.79	0.80	2.63	0.45
Tributary1	8443.007	5-Year	1.61	78.90	79.45	79.38	79.55	0.006632	1.38	1.16	3.73	0.79
Tributary1	8443.007	10-Year	2.51	78.90	79.54	79.51	79.68	0.008440	1.63	1.54	4.70	0.91
Tributary1	8443.007	25-Year	3.85	78.90	79.65	79.65	79.82	0.009688	1.79	2.15	6.40	0.98
Tributary1	8443.007	50-Year	5.02	78.90	79.73	79.73	79.91	0.010466	1.88	2.67	7.31	0.99
Tributary1	8443.007	100-Year	6.38	78.90	79.81	79.80	80.00	0.010928	1.96	3.26	7.99	0.98
Tributary1	8443.007	Jul-79	6.22	78.90	79.80	79.79	79.99	0.010869	1.95	3.19	7.91	0.98
Tributary1	8393.492	2-Year	0.63	78.70	78.98	78.98	79.09	0.016296	1.43	0.44	2.13	1.00
Tributary1	8393.492	5-Year	1.61	78.70	79.25	79.16	79.28	0.004035	0.78	2.06	9.28	0.53
Tributary1	8393.492	10-Year	2.51	78.70	79.36	79.22	79.39	0.003405	0.78	3.24	11.04	0.46
Tributary1	8393.492	25-Year	3.85	78.70	79.49	79.29	79.52	0.003255	0.81	4.76	14.10	0.44
Tributary1	8393.492	50-Year	5.02	78.70	79.60	79.35	79.63	0.002677	0.78	6.42	15.76	0.39
Tributary1	8393.492	100-Year	6.38	78.70	79.67	79.40	79.71	0.002836	0.84	7.63	17.17	0.40
Tributary1	8393.492	Jul-79	6.22	78.70	79.67	79.39	79.70	0.002755	0.82	7.57	17.10	0.39
Tributary1	8196.676	2-Year	0.63	77.74	78.38		78.39	0.001270	0.44	1.45	4.09	0.23
Tributary1	8196.676	5-Year	1.61	77.74	78.53		78.56	0.003286	0.74	2.19	5.27	0.36
Tributary1	8196.676	10-Year	2.51	77.74	78.69		78.73	0.003362	0.81	3.12	6.35	0.37
Tributary1	8196.676	25-Year	3.85	77.74	78.88		78.92	0.002855	0.88	4.46	8.44	0.35
Tributary1	8196.676	50-Year	5.02	77.74	78.90		78.96	0.004322	1.10	4.65	8.72	0.43
Tributary1	8196.676	100-Year	6.38	77.74	79.10		79.15	0.002783	1.05	6.52	10.56	0.36
Tributary1	8196.676	Jul-79	6.22	77.74	79.05		79.11	0.003291	1.10	6.00	9.99	0.39
Tributary1	8190.341	2-Year	0.63	77.51	78.38	77.67	78.38	0.000105	0.23	2.70	6.06	0.08
Tributary1	8190.341	5-Year	1.61	77.51	78.54	77.81	78.55	0.000392	0.50	3.19	8.00	0.16
Tributary1	8190.341	10-Year	2.51	77.51	78.69	77.92	78.72	0.000599	0.68	3.67	10.84	0.20
Tributary1	8190.341	25-Year	3.85	77.51	78.87	78.05	78.91	0.000890	0.91	4.21	24.44	0.25
Tributary1	8190.341	50-Year	5.02	77.51	78.88	78.16	78.95	0.001478	1.18	4.24	24.61	0.32
Tributary1	8190.341	100-Year	6.38	77.51	79.04	78.27	79.14	0.001628	1.34	4.76	30.48	0.35
Tributary1	8190.341	Jul-79	6.22	77.51	79.00	78.25	79.09	0.001714	1.35	4.61	27.14	0.35
Tributary1	8168.672		Culvert									
Tributary1	8147.386	2-Year	1.13	77.54	78.37	77.78	78.38	0.000398	0.44	2.57	6.20	0.15
Tributary1	8147.386	5-Year	1.88	77.54	78.51	77.87	78.53	0.000647	0.62	3.01	6.87	0.20
Tributary1	8147.386	10-Year	2.81	77.54	78.65	77.98	78.68	0.000932	0.82	3.44	7.62	0.25
Tributary1	8147.386	25-Year	4.20	77.54	78.79	78.11	78.85	0.001381	1.08	3.89	8.62	0.31
Tributary1	8147.386	50-Year	5.43	77.54	78.74	78.22	78.85	0.002672	1.46	3.72	8.25	0.43
Tributary1	8147.386	100-Year	6.83	77.54	78.87	78.33	79.01	0.003000	1.66	4.12	9.47	0.46
Tributary1	8147.386	Jul-79	6.25	77.54	78.84	78.29	78.96	0.002743	1.56	4.02	9.07	0.44
Tributary1	8134.654	2-Year	1.13	77.72	78.34	78.12	78.36	0.003812	0.72	1.56	4.50	0.39
Tributary1	8134.654	5-Year	1.88	77.72	78.48	78.23	78.51	0.004354	0.83	2.26	5.48	0.41
Tributary1	8134.654	10-Year	2.81	77.72	78.62	78.33	78.66	0.004646	0.91	3.10	6.68	0.42
Tributary1	8134.654	25-Year	4.20	77.72	78.77	78.45	78.82	0.004958	0.98	4.35	11.72	0.44
Tributary1	8134.654	50-Year	5.43	77.72	78.54	78.54	78.76	0.025666	2.07	2.62	6.02	1.00
Tributary1	8134.654	100-Year	6.83	77.72	78.94	78.63	78.95	0.001213	0.58	16.86	45.27	0.23
Tributary1	8134.654	Jul-79	6.25	77.72	78.79	78.59	78.89	0.009419	1.40	4.62	12.27	0.60
Tributary1	7984.847	2-Year	1.13	77.00	77.56		77.60	0.007097	0.93	1.21	4.01	0.54
Tributary1	7984.847	5-Year	1.88	77.00	77.75		77.79	0.005357	0.87	2.16	5.72	0.45
Tributary1	7984.847	10-Year	2.81	77.00	77.90		77.94	0.004921	0.91	3.10	6.97	0.43
Tributary1	7984.847	25-Year	4.20	77.00	78.08		78.13	0.004336	0.94	4.49	8.43	0.41
Tributary1	7984.847	50-Year	5.43	77.00	78.32		78.36	0.002720	0.78	6.97	12.95	0.32
Tributary1	7984.847	100-Year	6.83	77.00	78.87		78.88	0.000304	0.40	23.08	46.02	0.12
Tributary1	7984.847	Jul-79	6.25	77.00	78.58		78.60	0.000954	0.59	12.48	29.27	0.20
Tributary1	7921.126	2-Year	1.13	76.80	77.38		77.40	0.001657	0.63	1.81	4.30	0.31
Tributary1	7921.126	5-Year	1.88	76.80	77.56		77.58	0.002109	0.70	2.69	5.61	0.32
Tributary1	7921.126	10-Year	2.81	76.80	77.70		77.73	0.002344	0.80	3.51	6.14	0.34
Tributary1	7921.126	25-Year	4.20	76.80	77.89		77.93	0.002337	0.89	4.73	6.73	0.34
Tributary1	7921.126	50-Year	5.43	76.80	78.21		78.24	0.001293	0.76	7.65	17.79	0.25
Tributary1	7921.126	100-Year	6.83	76.80	78.86		78.87	0.000115	0.32	35.29	59.83	0.08
Tributary1	7921.126	Jul-79	6.25	76.80	78.55		78.56	0.000354	0.49	19.28	43.76	0.14
Tributary1	7867.032	2-Year	1.13	76.59	77.04	77.04	77.16	0.031248	1.51	0.75	3.29	1.01
Tributary1	7867.032	5-Year	1.88	76.59	77.15	77.15	77.29	0.030361	1.65	1.14	4.04	1.00
Tributary1	7867.032	10-Year	2.81	76.59	77.24	77.24	77.41	0.030270	1.82	1.54	4.61	1.00
Tributary1	7867.032	25-Year	4.20	76.59	77.71	77.35	77.76	0.004437	0.98	4.30	7.23	0.40
Tributary1	7867.032	50-Year	5.43	76.59	78.15	77.44	78.17	0.001107	0.68	8.70	16.18	0.22
Tributary1	7867.032	100-Year	6.83	76.59	78.86	77.53	78.86	0.000053	0.21	65.13	144.10	0.05

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Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary1	7867.032	Jul-79	6.25	76.59	78.54	77.49	78.54	0.000287	0.43	23.59	76.44	0.12
Tributary1	7863.271	2-Year	1.13	76.32	76.80	76.65	76.88	0.003758	1.25	0.91	2.42	0.58
Tributary1	7863.271	5-Year	1.88	76.32	76.99	76.78	77.10	0.003387	1.48	1.27	3.40	0.58
Tributary1	7863.271	10-Year	2.81	76.32	77.19	76.93	77.34	0.003092	1.69	1.66	4.07	0.58
Tributary1	7863.271	25-Year	4.20	76.32	77.58	77.11	77.73	0.002056	1.76	2.39	6.38	0.50
Tributary1	7863.271	50-Year	5.43	76.32	78.01	77.26	78.16	0.001278	1.69	3.21	11.77	0.42
Tributary1	7863.271	100-Year	6.83	76.32	78.74	77.41	78.85	0.000614	1.49	4.59	142.25	0.31
Tributary1	7863.271	Jul-79	6.25	76.32	78.40	77.35	78.53	0.000845	1.58	3.96	39.26	0.35
Tributary1	7840.144		Culvert									
Tributary1	7818.661	2-Year	1.13	76.16	76.62	76.49	76.71	0.004174	1.29	0.88	2.50	0.60
Tributary1	7818.661	5-Year	1.88	76.16	76.71	76.62	76.87	0.006628	1.81	1.04	2.88	0.78
Tributary1	7818.661	10-Year	2.81	76.16	76.77	76.77	77.07	0.010416	2.44	1.15	3.49	1.00
Tributary1	7818.661	25-Year	4.20	76.16	76.95	76.95	77.35	0.009654	2.80	1.50	6.03	1.01
Tributary1	7818.661	50-Year	5.43	76.16	77.10	77.10	77.57	0.008984	3.04	1.79	6.78	1.00
Tributary1	7818.661	100-Year	6.83	76.16	77.25	77.25	77.80	0.008599	3.28	2.08	7.61	1.00
Tributary1	7818.661	Jul-79	6.25	76.16	77.19	77.19	77.71	0.008702	3.18	1.97	7.28	1.00
Tributary1	7809.326	2-Year	1.13	76.10	76.59		76.65	0.007142	1.04	1.09	4.42	0.67
Tributary1	7809.326	5-Year	1.88	76.10	76.72		76.78	0.006706	1.08	1.74	5.92	0.63
Tributary1	7809.326	10-Year	2.81	76.10	76.84		76.90	0.006081	1.11	2.53	6.92	0.59
Tributary1	7809.326	25-Year	4.20	76.10	76.99		77.06	0.005486	1.14	3.69	8.47	0.55
Tributary1	7809.326	50-Year	5.43	76.10	77.11		77.18	0.005047	1.15	4.74	9.75	0.52
Tributary1	7809.326	100-Year	6.83	76.10	77.22		77.29	0.004716	1.14	5.99	11.58	0.51
Tributary1	7809.326	Jul-79	6.25	76.10	77.18		77.25	0.004894	1.14	5.48	11.11	0.52
Tributary1	7750.895	2-Year	1.13	75.80	76.42		76.44	0.001990	0.46	2.46	7.48	0.26
Tributary1	7750.895	5-Year	1.88	75.80	76.55		76.57	0.002003	0.54	3.48	8.22	0.26
Tributary1	7750.895	10-Year	2.81	75.80	76.68		76.70	0.002057	0.62	4.55	8.84	0.27
Tributary1	7750.895	25-Year	4.20	75.80	76.83		76.86	0.002099	0.70	5.97	9.54	0.28
Tributary1	7750.895	50-Year	5.43	75.80	76.95		76.98	0.002140	0.76	7.13	10.17	0.29
Tributary1	7750.895	100-Year	6.83	75.80	77.06		77.10	0.002212	0.82	8.31	10.77	0.30
Tributary1	7750.895	Jul-79	6.25	75.80	77.02		77.05	0.002185	0.80	7.83	10.54	0.30
Tributary1	7692.484	2-Year	1.13	75.69	76.30		76.31	0.002186	0.46	2.44	7.82	0.27
Tributary1	7692.484	5-Year	1.88	75.69	76.44		76.45	0.002031	0.53	3.53	8.59	0.26
Tributary1	7692.484	10-Year	2.81	75.69	76.56		76.58	0.002091	0.61	4.62	9.29	0.28
Tributary1	7692.484	25-Year	4.20	75.69	76.71		76.74	0.002119	0.69	6.10	10.16	0.28
Tributary1	7692.484	50-Year	5.43	75.69	76.83		76.85	0.002161	0.74	7.32	10.95	0.29
Tributary1	7692.484	100-Year	6.83	75.69	76.93		76.97	0.002266	0.80	8.55	11.90	0.30
Tributary1	7692.484	Jul-79	6.25	75.69	76.89		76.92	0.002217	0.78	8.05	11.42	0.30
Tributary1	7591.312	2-Year	1.13	75.40	75.94		75.97	0.006007	0.81	1.40	4.55	0.46
Tributary1	7591.312	5-Year	1.88	75.40	76.09		76.13	0.005607	0.82	2.28	6.37	0.44
Tributary1	7591.312	10-Year	2.81	75.40	76.22		76.26	0.005049	0.89	3.16	7.12	0.43
Tributary1	7591.312	25-Year	4.20	75.40	76.38		76.43	0.004729	0.97	4.31	7.93	0.42
Tributary1	7591.312	50-Year	5.43	75.40	76.48		76.54	0.004887	1.05	5.16	8.56	0.43
Tributary1	7591.312	100-Year	6.83	75.40	76.57		76.64	0.004838	1.14	6.00	9.30	0.44
Tributary1	7591.312	Jul-79	6.25	75.40	76.54		76.60	0.004885	1.11	5.66	8.98	0.44
Tributary1	7501.981	2-Year	1.13	75.00	75.64		75.66	0.002260	0.54	2.11	5.80	0.28
Tributary1	7501.981	5-Year	1.88	75.00	75.77		75.79	0.002685	0.65	2.90	6.64	0.31
Tributary1	7501.981	10-Year	2.81	75.00	75.89		75.92	0.003072	0.75	3.73	7.39	0.34
Tributary1	7501.981	25-Year	4.20	75.00	76.02		76.06	0.003487	0.88	4.79	8.30	0.37
Tributary1	7501.981	50-Year	5.43	75.00	76.11		76.16	0.003608	0.98	5.56	8.76	0.38
Tributary1	7501.981	100-Year	6.83	75.00	76.20		76.26	0.003716	1.08	6.38	9.19	0.40
Tributary1	7501.981	Jul-79	6.25	75.00	76.17		76.22	0.003652	1.04	6.06	9.05	0.39
Tributary1	7465.594	2-Year	1.13	74.95	75.50	75.34	75.53	0.006477	0.76	1.49	5.44	0.46
Tributary1	7465.594	5-Year	1.88	74.95	75.59	75.44	75.63	0.008202	0.93	2.02	6.30	0.53
Tributary1	7465.594	10-Year	2.81	74.95	75.67	75.53	75.73	0.009806	1.10	2.56	7.01	0.58
Tributary1	7465.594	25-Year	4.20	74.95	75.76	75.63	75.84	0.011568	1.30	3.22	7.62	0.64
Tributary1	7465.594	50-Year	5.43	74.95	75.82	75.70	75.93	0.012930	1.46	3.71	7.96	0.68
Tributary1	7465.594	100-Year	6.83	74.95	75.86		76.01	0.015949	1.69	4.05	8.19	0.77
Tributary1	7465.594	Jul-79	6.25	74.95	75.82	75.74	75.97	0.016917	1.68	3.73	7.97	0.78
Tributary1	7451.432	2-Year	1.13	75.00	75.33	75.33	75.39	0.015846	1.08	1.05	8.71	1.00
Tributary1	7451.432	5-Year	1.88	75.00	75.38	75.38	75.46	0.019034	1.25	1.50	9.27	1.00
Tributary1	7451.432	10-Year	2.81	75.00	75.43	75.43	75.53	0.020813	1.41	1.99	9.81	1.00
Tributary1	7451.432	25-Year	4.20	75.00	75.49	75.49	75.62	0.021736	1.58	2.66	10.52	1.00
Tributary1	7451.432	50-Year	5.43	75.00	75.54	75.54	75.69	0.022079	1.70	3.20	10.94	1.00
Tributary1	7451.432	100-Year	6.83	75.00	75.80	75.60	75.86	0.005510	1.11	6.17	12.54	0.50
Tributary1	7451.432	Jul-79	6.25	75.00	75.72	75.58	75.79	0.007267	1.19	5.25	12.08	0.58
Tributary1	7333.883	2-Year	1.13	74.60	75.04	74.90	75.04	0.000466	0.25	5.69	28.88	0.16

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Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary1	7333.883	5-Year	1.88	74.60	75.15	74.92	75.15	0.000325	0.25	8.89	29.87	0.14
Tributary1	7333.883	10-Year	2.81	74.60	75.26	74.95	75.27	0.000250	0.26	12.46	30.69	0.12
Tributary1	7333.883	25-Year	4.20	74.60	75.42	74.98	75.42	0.000201	0.28	17.25	31.74	0.11
Tributary1	7333.883	50-Year	5.43	74.60	75.58	75.01	75.58	0.000149	0.28	22.39	32.95	0.10
Tributary1	7333.883	100-Year	6.83	74.60	75.81	75.03	75.81	0.000094	0.26	30.17	34.73	0.08
Tributary1	7333.883	Jul-79	6.25	74.60	75.74	75.02	75.74	0.000102	0.26	27.75	34.18	0.09
Tributary1	7207.136	2-Year	1.13	74.40	74.95	74.74	74.95	0.001227	0.40	2.86	11.06	0.25
Tributary1	7207.136	5-Year	1.88	74.40	75.07	74.82	75.08	0.001108	0.44	4.30	12.01	0.23
Tributary1	7207.136	10-Year	2.81	74.40	75.20	74.87	75.21	0.001004	0.48	5.92	13.12	0.22
Tributary1	7207.136	25-Year	4.20	74.40	75.36	74.93	75.38	0.000916	0.54	8.13	14.48	0.21
Tributary1	7207.136	50-Year	5.43	74.40	75.53	74.98	75.55	0.000706	0.54	10.71	15.78	0.19
Tributary1	7207.136	100-Year	6.83	74.40	75.78	75.03	75.79	0.000444	0.50	14.76	17.32	0.15
Tributary1	7207.136	Jul-79	6.25	74.40	75.70	75.01	75.72	0.000478	0.50	13.52	16.89	0.16
Tributary1	7140.229	2-Year	1.13	74.30	74.85	74.65	74.86	0.001739	0.45	2.51	9.33	0.28
Tributary1	7140.229	5-Year	1.88	74.30	74.99	74.73	75.00	0.001276	0.48	3.93	10.48	0.25
Tributary1	7140.229	10-Year	2.81	74.30	75.13	74.78	75.14	0.001067	0.51	5.48	13.05	0.24
Tributary1	7140.229	25-Year	4.20	74.30	75.30	74.85	75.32	0.000793	0.54	8.19	16.41	0.21
Tributary1	7140.229	50-Year	5.43	74.30	75.49	74.91	75.50	0.000516	0.52	11.44	18.08	0.18
Tributary1	7140.229	100-Year	6.83	74.30	75.75	74.96	75.76	0.000279	0.46	18.09	34.10	0.14
Tributary1	7140.229	Jul-79	6.25	74.30	75.68	74.94	75.69	0.000314	0.46	15.69	29.76	0.15
Tributary1	7047.343	2-Year	1.13	74.10	74.80	74.44	74.80	0.000280	0.22	5.15	13.13	0.11
Tributary1	7047.343	5-Year	1.88	74.10	74.94	74.49	74.95	0.000310	0.26	7.12	14.11	0.12
Tributary1	7047.343	10-Year	2.81	74.10	75.08	74.54	75.09	0.000347	0.31	9.16	15.55	0.13
Tributary1	7047.343	25-Year	4.20	74.10	75.26	74.61	75.27	0.000363	0.35	12.08	17.14	0.13
Tributary1	7047.343	50-Year	5.43	74.10	75.46	74.65	75.47	0.000297	0.35	15.67	18.85	0.12
Tributary1	7047.343	100-Year	6.83	74.10	75.73	74.70	75.74	0.000203	0.32	21.14	21.11	0.10
Tributary1	7047.343	Jul-79	6.25	74.10	75.66	74.68	75.66	0.000215	0.32	19.55	20.49	0.10
Tributary1	6893.653	2-Year	1.13	74.10	74.70	74.44	74.71	0.001790	0.45	2.48	7.14	0.25
Tributary1	6893.653	5-Year	1.88	74.10	74.84	74.52	74.85	0.001686	0.54	3.53	8.20	0.25
Tributary1	6893.653	10-Year	2.81	74.10	74.97	74.59	74.99	0.001663	0.63	4.62	8.95	0.26
Tributary1	6893.653	25-Year	4.20	74.10	75.14	74.68	75.17	0.001515	0.71	6.26	9.91	0.26
Tributary1	6893.653	50-Year	5.43	74.10	75.37	74.75	75.39	0.001008	0.69	8.67	11.50	0.22
Tributary1	6893.653	100-Year	6.83	74.10	75.67	74.81	75.69	0.000587	0.63	12.55	13.88	0.17
Tributary1	6893.653	Jul-79	6.25	74.10	75.59	74.79	75.61	0.000624	0.62	11.47	13.23	0.18
Tributary1	6812.767	2-Year	1.13	74.00	74.54	74.37	74.56	0.001967	0.57	1.97	6.95	0.34
Tributary1	6812.767	5-Year	1.88	74.00	74.70	74.44	74.72	0.001668	0.60	3.14	8.21	0.31
Tributary1	6812.767	10-Year	2.81	74.00	74.83	74.51	74.86	0.001543	0.65	4.49	15.62	0.29
Tributary1	6812.767	25-Year	4.20	74.00	75.09	74.60	75.10	0.000477	0.45	16.22	73.34	0.16
Tributary1	6812.767	50-Year	5.43	74.00	75.36	74.67	75.36	0.000106	0.25	38.16	83.73	0.08
Tributary1	6812.767	100-Year	6.83	74.00	75.68	74.73	75.68	0.000036	0.17	65.78	91.66	0.05
Tributary1	6812.767	Jul-79	6.25	74.00	75.60	74.71	75.60	0.000042	0.18	58.50	89.24	0.05
Tributary1	6747.781	2-Year	1.13	73.83	74.55	73.94	74.55	0.000023	0.10	10.78	20.72	0.05
Tributary1	6747.781	5-Year	1.88	73.83	74.71	73.98	74.71	0.000030	0.13	14.08	21.97	0.05
Tributary1	6747.781	10-Year	2.81	73.83	74.84	74.03	74.84	0.000038	0.16	17.13	22.94	0.06
Tributary1	6747.781	25-Year	4.20	73.83	75.09	74.09	75.09	0.000037	0.18	23.05	24.77	0.06
Tributary1	6747.781	50-Year	5.43	73.83	75.36	74.14	75.36	0.000030	0.18	30.00	26.85	0.05
Tributary1	6747.781	100-Year	6.83	73.83	75.67	74.19	75.68	0.000021	0.17	46.65	91.55	0.05
Tributary1	6747.781	Jul-79	6.25	73.83	75.59	74.17	75.60	0.000022	0.17	39.30	90.56	0.05
Tributary1	6683.657	2-Year	1.13	73.90	74.55	74.09	74.55	0.000114	0.19	6.01	14.90	0.09
Tributary1	6683.657	5-Year	1.88	73.90	74.70	74.21	74.70	0.000125	0.22	8.39	16.08	0.10
Tributary1	6683.657	10-Year	2.81	73.90	74.83	74.26	74.84	0.000144	0.26	10.61	17.00	0.11
Tributary1	6683.657	25-Year	4.20	73.90	75.08	74.32	75.09	0.000120	0.28	15.04	18.66	0.10
Tributary1	6683.657	50-Year	5.43	73.90	75.35	74.36	75.36	0.000085	0.27	20.30	20.20	0.09
Tributary1	6683.657	100-Year	6.83	73.90	75.67	74.41	75.67	0.000060	0.25	27.03	22.79	0.07
Tributary1	6683.657	Jul-79	6.25	73.90	75.59	74.39	75.59	0.000062	0.25	25.23	21.86	0.07
Tributary1	6678.357	2-Year	1.13	73.63	74.54	73.87	74.55	0.000164	0.40	2.82	13.49	0.13
Tributary1	6678.357	5-Year	1.88	73.63	74.68	73.96	74.70	0.000278	0.58	3.27	14.77	0.18
Tributary1	6678.357	10-Year	2.81	73.63	74.80	74.07	74.83	0.000433	0.77	3.64	15.86	0.23
Tributary1	6678.357	25-Year	4.20	73.63	75.03	74.20	75.08	0.000533	0.96	4.35	17.18	0.26
Tributary1	6678.357	50-Year	5.43	73.63	75.30	74.31	75.35	0.000504	1.05	5.16	18.50	0.26
Tributary1	6678.357	100-Year	6.83	73.63	75.60	74.42	75.67	0.000453	1.12	6.12	20.75	0.25
Tributary1	6678.357	Jul-79	6.25	73.63	75.53	74.38	75.59	0.000431	1.06	5.89	20.07	0.25
Tributary1	6662.563		Culvert									
Tributary1	6646.137	2-Year	1.52	73.59	74.52	73.88	74.53	0.000275	0.53	2.89	11.94	0.17
Tributary1	6646.137	5-Year	2.50	73.59	74.64	73.99	74.67	0.000505	0.77	3.24	13.29	0.24
Tributary1	6646.137	10-Year	3.50	73.59	74.70	74.09	74.76	0.000802	1.01	3.45	13.99	0.31
Tributary1	6646.137	25-Year	5.06	73.59	74.79	74.24	74.88	0.001305	1.36	3.72	14.90	0.40

HEC-RAS Plan: 2015-01-30 River: Shirley Reach: Tributary1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary1	6646.137	50-Year	6.29	73.59	74.86	74.34	74.99	0.001652	1.59	3.95	15.51	0.45
Tributary1	6646.137	100-Year	7.65	73.59	74.90	74.44	75.08	0.002256	1.89	4.05	15.72	0.53
Tributary1	6646.137	Jul-79	7.44	73.59	74.94	74.43	75.10	0.001905	1.78	4.19	16.01	0.49
Tributary1	6631.114	2-Year	1.52	73.20	74.53		74.53	0.000002	0.05	29.90	28.61	0.02
Tributary1	6631.114	5-Year	2.50	73.20	74.66		74.66	0.000005	0.07	33.54	29.35	0.02
Tributary1	6631.114	10-Year	3.50	73.20	74.74		74.74	0.000008	0.10	36.01	29.83	0.03
Tributary1	6631.114	25-Year	5.06	73.20	74.86		74.86	0.000012	0.13	39.51	30.54	0.04
Tributary1	6631.114	50-Year	6.29	73.20	74.95		74.95	0.000015	0.15	42.53	31.12	0.04
Tributary1	6631.114	100-Year	7.65	73.20	75.02		75.02	0.000020	0.17	44.64	31.50	0.05
Tributary1	6631.114	Jul-79	7.44	73.20	75.05		75.05	0.000018	0.16	45.61	31.70	0.04
Tributary1	6596.294	2-Year	1.52	73.20	74.53		74.53	0.000004	0.07	20.90	18.26	0.02
Tributary1	6596.294	5-Year	2.50	73.20	74.66		74.66	0.000008	0.11	23.20	18.51	0.03
Tributary1	6596.294	10-Year	3.50	73.20	74.74		74.74	0.000014	0.14	24.75	18.96	0.04
Tributary1	6596.294	25-Year	5.06	73.20	74.85		74.86	0.000023	0.19	27.00	20.08	0.05
Tributary1	6596.294	50-Year	6.29	73.20	74.95		74.95	0.000028	0.22	29.00	20.94	0.06
Tributary1	6596.294	100-Year	7.65	73.20	75.02		75.02	0.000036	0.25	30.42	21.60	0.07
Tributary1	6596.294	Jul-79	7.44	73.20	75.05		75.05	0.000032	0.24	31.10	22.00	0.06
Tributary1	6565.697	2-Year	1.52	73.20	74.53		74.53	0.000004	0.07	20.90	18.26	0.02
Tributary1	6565.697	5-Year	2.50	73.20	74.66		74.66	0.000008	0.11	23.20	18.51	0.03
Tributary1	6565.697	10-Year	3.50	73.20	74.74		74.74	0.000013	0.14	24.74	18.68	0.04
Tributary1	6565.697	25-Year	5.06	73.20	74.85		74.85	0.000022	0.19	26.91	19.13	0.05
Tributary1	6565.697	50-Year	6.29	73.20	74.95		74.95	0.000029	0.22	28.80	19.99	0.06
Tributary1	6565.697	100-Year	7.65	73.20	75.02		75.02	0.000040	0.25	30.16	20.85	0.07
Tributary1	6565.697	Jul-79	7.44	73.20	75.05		75.05	0.000036	0.24	30.81	21.18	0.06
Tributary1	6547.102	2-Year	1.52	73.49	74.53		74.53	0.000017	0.12	12.36	13.88	0.04
Tributary1	6547.102	5-Year	2.50	73.49	74.65		74.66	0.000030	0.18	14.11	14.13	0.06
Tributary1	6547.102	10-Year	3.50	73.49	74.74		74.74	0.000046	0.23	15.27	14.29	0.07
Tributary1	6547.102	25-Year	5.06	73.49	74.85		74.85	0.000071	0.30	16.90	14.52	0.09
Tributary1	6547.102	50-Year	6.29	73.49	74.95		74.95	0.000086	0.34	18.31	14.71	0.10
Tributary1	6547.102	100-Year	7.65	73.49	75.01		75.02	0.000108	0.40	19.27	14.84	0.11
Tributary1	6547.102	Jul-79	7.44	73.49	75.04		75.05	0.000095	0.38	19.74	14.90	0.10
Tributary1	6518.839	2-Year	1.91	73.32	74.53		74.53	0.000015	0.13	14.74	14.22	0.04
Tributary1	6518.839	5-Year	3.12	73.32	74.65		74.65	0.000029	0.19	16.55	15.29	0.06
Tributary1	6518.839	10-Year	4.20	73.32	74.73		74.74	0.000041	0.24	17.84	16.21	0.07
Tributary1	6518.839	25-Year	5.91	73.32	74.85		74.85	0.000061	0.30	19.74	17.48	0.08
Tributary1	6518.839	50-Year	7.14	73.32	74.94		74.95	0.000070	0.34	21.48	18.66	0.09
Tributary1	6518.839	100-Year	8.48	73.32	75.01		75.02	0.000085	0.39	22.71	19.45	0.10
Tributary1	6518.839	Jul-79	8.64	73.32	75.04		75.05	0.000082	0.39	23.32	19.82	0.10
Tributary1	6483.158	2-Year	1.91	73.40	74.53		74.53	0.000056	0.21	9.25	12.83	0.07
Tributary1	6483.158	5-Year	3.12	73.40	74.65		74.65	0.000094	0.29	11.01	16.51	0.10
Tributary1	6483.158	10-Year	4.20	73.40	74.73		74.73	0.000128	0.36	12.50	21.88	0.11
Tributary1	6483.158	25-Year	5.91	73.40	74.84		74.85	0.000171	0.45	15.08	24.68	0.13
Tributary1	6483.158	50-Year	7.14	73.40	74.93		74.94	0.000182	0.49	17.60	29.16	0.14
Tributary1	6483.158	100-Year	8.48	73.40	75.00		75.01	0.000208	0.54	19.50	30.90	0.15
Tributary1	6483.158	Jul-79	8.64	73.40	75.03		75.04	0.000195	0.53	20.53	32.63	0.15
Tributary1	6410.477	2-Year	1.91	73.88	74.51		74.52	0.000464	0.40	6.72	27.23	0.19
Tributary1	6410.477	5-Year	3.12	73.88	74.63		74.64	0.000455	0.45	10.40	32.48	0.19
Tributary1	6410.477	10-Year	4.20	73.88	74.71		74.72	0.000468	0.48	12.99	33.95	0.19
Tributary1	6410.477	25-Year	5.91	73.88	74.82		74.83	0.000470	0.53	16.85	37.37	0.19
Tributary1	6410.477	50-Year	7.14	73.88	74.92		74.92	0.000419	0.53	20.73	60.65	0.19
Tributary1	6410.477	100-Year	8.48	73.88	74.98		74.99	0.000424	0.56	23.80	74.98	0.19
Tributary1	6410.477	Jul-79	8.64	73.88	75.01		75.02	0.000369	0.53	25.60	94.53	0.18
Tributary1	6337.265	2-Year	2.31	73.70	74.47	74.16	74.48	0.000637	0.33	8.97	28.98	0.17
Tributary1	6337.265	5-Year	3.73	73.70	74.59	74.24	74.60	0.000734	0.38	12.93	36.20	0.17
Tributary1	6337.265	10-Year	4.89	73.70	74.67	74.29	74.67	0.000785	0.41	15.74	38.04	0.17
Tributary1	6337.265	25-Year	6.77	73.70	74.77	74.34	74.78	0.000819	0.45	20.05	41.29	0.17
Tributary1	6337.265	50-Year	8.00	73.70	74.88	74.38	74.89	0.000679	0.44	24.50	44.83	0.16
Tributary1	6337.265	100-Year	9.30	73.70	74.94	74.39	74.95	0.000685	0.45	27.35	47.05	0.16
Tributary1	6337.265	Jul-79	9.84	73.70	74.98	74.42	74.99	0.000651	0.45	29.15	49.47	0.15
Tributary1	6258.598	2-Year	2.31	73.79	74.40		74.40	0.001555	0.47	9.56	35.38	0.22
Tributary1	6258.598	5-Year	3.73	73.79	74.51		74.52	0.001501	0.53	13.62	40.05	0.22
Tributary1	6258.598	10-Year	4.89	73.79	74.58		74.59	0.001455	0.57	16.65	42.41	0.23
Tributary1	6258.598	25-Year	6.77	73.79	74.69		74.70	0.001362	0.61	21.51	45.67	0.22
Tributary1	6258.598	50-Year	8.00	73.79	74.82		74.82	0.000938	0.56	27.23	47.10	0.19
Tributary1	6258.598	100-Year	9.30	73.79	74.88		74.89	0.000932	0.58	30.20	47.99	0.19
Tributary1	6258.598	Jul-79	9.84	73.79	74.92		74.93	0.000866	0.58	32.17	48.75	0.19
Tributary1	6190.743	2-Year	2.31	73.54	74.05	74.05	74.16	0.013232	1.45	1.59	7.58	1.01

HEC-RAS Plan: 2015-01-30 River: Shirley Reach: Tributary1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary1	4690.586	10-Year	10.79	68.95	70.11	69.92	70.24	0.015827	1.69	7.19	13.44	0.61
Tributary1	4690.586	25-Year	14.10	68.95	70.20	70.05	70.37	0.017689	1.93	8.46	14.07	0.65
Tributary1	4690.586	50-Year	16.90	68.95	70.27		70.47	0.018527	2.08	9.53	14.50	0.68
Tributary1	4690.586	100-Year	18.50	68.95	70.32		70.53	0.018756	2.16	10.15	14.77	0.69
Tributary1	4690.586	Jul-79	21.00	68.95	70.40		70.62	0.017932	2.22	11.35	15.33	0.68
Tributary1	4635.215	2-Year	5.90	68.60	69.20	69.19	69.35	0.016653	1.72	3.57	13.13	0.94
Tributary1	4635.215	5-Year	8.30	68.60	69.38		69.49	0.010047	1.52	6.12	15.01	0.67
Tributary1	4635.215	10-Year	10.79	68.60	69.52		69.63	0.007979	1.50	8.33	15.97	0.59
Tributary1	4635.215	25-Year	14.10	68.60	69.70		69.80	0.006380	1.50	11.18	16.85	0.52
Tributary1	4635.215	50-Year	16.90	68.60	69.84		69.94	0.005358	1.49	13.66	17.47	0.48
Tributary1	4635.215	100-Year	18.50	68.60	69.94		70.04	0.004604	1.46	15.45	17.92	0.45
Tributary1	4635.215	Jul-79	21.00	68.60	70.10		70.19	0.003740	1.41	18.30	18.65	0.41
Tributary1	4564.609	2-Year	5.90	67.90	68.99	68.46	69.03	0.001814	0.79	7.45	10.48	0.30
Tributary1	4564.609	5-Year	8.30	67.90	69.16	68.59	69.20	0.002004	0.89	9.30	11.43	0.32
Tributary1	4564.609	10-Year	10.79	67.90	69.31	68.69	69.36	0.002104	0.98	10.99	11.91	0.33
Tributary1	4564.609	25-Year	14.10	67.90	69.49	68.82	69.55	0.002090	1.06	13.26	12.43	0.33
Tributary1	4564.609	50-Year	16.90	67.90	69.66	68.92	69.72	0.001982	1.10	15.31	12.82	0.32
Tributary1	4564.609	100-Year	18.50	67.90	69.78	68.96	69.84	0.001804	1.10	16.88	13.18	0.31
Tributary1	4564.609	Jul-79	21.00	67.90	69.96	69.03	70.02	0.001496	1.08	19.39	13.86	0.29
Tributary1	4535.882	2-Year	5.90	67.90	68.96		68.99	0.001141	0.79	9.18	18.40	0.27
Tributary1	4535.882	5-Year	8.30	67.90	69.13		69.16	0.001040	0.85	12.66	20.52	0.27
Tributary1	4535.882	10-Year	10.79	67.90	69.28		69.31	0.000972	0.90	15.78	21.04	0.26
Tributary1	4535.882	25-Year	14.10	67.90	69.47		69.51	0.000864	0.94	19.92	21.66	0.25
Tributary1	4535.882	50-Year	16.90	67.90	69.64		69.68	0.000766	0.95	23.62	22.33	0.24
Tributary1	4535.882	100-Year	18.50	67.90	69.77		69.80	0.000666	0.94	26.47	23.06	0.23
Tributary1	4535.882	Jul-79	21.00	67.90	69.96		69.99	0.000569	0.93	32.50	44.36	0.22
Tributary1	4525.185	2-Year	5.90	67.58	68.96	67.96	68.98	0.000166	0.53	11.06	16.81	0.14
Tributary1	4525.185	5-Year	8.30	67.58	69.13	68.06	69.15	0.000224	0.67	12.41	19.17	0.17
Tributary1	4525.185	10-Year	10.79	67.58	69.28	68.15	69.31	0.000281	0.80	13.57	20.62	0.19
Tributary1	4525.185	25-Year	14.10	67.58	69.46	68.26	69.50	0.000342	0.94	15.02	23.32	0.22
Tributary1	4525.185	50-Year	16.90	67.58	69.62	68.35	69.67	0.000376	1.04	16.28	24.99	0.23
Tributary1	4525.185	100-Year	18.50	67.58	69.73	68.40	69.79	0.000372	1.07	17.24	25.95	0.23
Tributary1	4525.185	Jul-79	21.00	67.58	69.92	68.47	69.98	0.000365	1.12	18.71	33.20	0.23
Tributary1	4507.086		Culvert									
Tributary1	4486.599	2-Year	5.90	67.53	68.95	67.91	68.96	0.000153	0.52	11.33	12.67	0.14
Tributary1	4486.599	5-Year	8.30	67.53	69.11	68.01	69.13	0.000212	0.66	12.61	14.62	0.17
Tributary1	4486.599	10-Year	10.79	67.53	69.24	68.10	69.28	0.000273	0.79	13.68	15.84	0.19
Tributary1	4486.599	25-Year	14.10	67.53	69.41	68.21	69.45	0.000343	0.94	15.00	23.15	0.22
Tributary1	4486.599	50-Year	16.90	67.53	69.55	68.30	69.61	0.000387	1.05	16.13	26.14	0.24
Tributary1	4486.599	100-Year	18.50	67.53	69.66	68.35	69.72	0.000388	1.09	17.01	31.12	0.24
Tributary1	4486.599	Jul-79	21.00	67.53	69.83	68.42	69.89	0.000391	1.15	18.32	34.44	0.24
Tributary1	4462.663	2-Year	5.90	67.70	68.92		68.95	0.001142	0.84	7.04	7.40	0.27
Tributary1	4462.663	5-Year	8.30	67.70	69.07		69.12	0.001574	1.02	8.17	7.84	0.32
Tributary1	4462.663	10-Year	10.79	67.70	69.19		69.26	0.002044	1.18	9.14	12.67	0.36
Tributary1	4462.663	25-Year	14.10	67.70	69.34		69.43	0.002610	1.35	10.45	16.87	0.40
Tributary1	4462.663	50-Year	16.90	67.70	69.48		69.58	0.003119	1.44	11.75	27.99	0.43
Tributary1	4462.663	100-Year	18.50	67.70	69.60		69.70	0.002851	1.42	13.72	35.59	0.41
Tributary1	4462.663	Jul-79	21.00	67.70	69.81		69.87	0.001723	1.22	23.21	48.64	0.33
Tributary1	4432.086	2-Year	5.90	67.70	68.87		68.91	0.001772	0.90	6.57	20.82	0.33
Tributary1	4432.086	5-Year	8.30	67.70	69.02		69.07	0.001845	1.00	9.76	23.62	0.34
Tributary1	4432.086	10-Year	10.79	67.70	69.14		69.20	0.001719	1.06	12.92	26.34	0.33
Tributary1	4432.086	25-Year	14.10	67.70	69.31		69.36	0.001424	1.07	17.73	29.92	0.31
Tributary1	4432.086	50-Year	16.90	67.70	69.47		69.51	0.001137	1.03	22.40	34.93	0.28
Tributary1	4432.086	100-Year	18.50	67.70	69.60		69.63	0.000866	0.96	26.70	41.20	0.25
Tributary1	4432.086	Jul-79	21.00	67.70	69.81		69.83	0.000587	0.86	35.31	53.61	0.21
Tributary1	4334.765	2-Year	5.90	67.60	68.74		68.76	0.001246	0.66	8.96	14.41	0.25
Tributary1	4334.765	5-Year	8.30	67.60	68.88		68.91	0.001308	0.76	11.74	24.92	0.26
Tributary1	4334.765	10-Year	10.79	67.60	69.02		69.05	0.001220	0.81	15.39	27.84	0.26
Tributary1	4334.765	25-Year	14.10	67.60	69.21		69.24	0.001001	0.83	21.12	34.80	0.24
Tributary1	4334.765	50-Year	16.90	67.60	69.39		69.42	0.000776	0.80	27.69	39.44	0.22
Tributary1	4334.765	100-Year	18.50	67.60	69.54		69.56	0.000596	0.75	34.67	51.12	0.19
Tributary1	4334.765	Jul-79	21.00	67.60	69.77		69.79	0.000362	0.64	47.04	54.76	0.16
Tributary1	4236.688	2-Year	5.90	67.60	68.67		68.68	0.000522	0.57	13.11	28.94	0.21
Tributary1	4236.688	5-Year	8.30	67.60	68.81		68.83	0.000529	0.62	17.41	30.97	0.21
Tributary1	4236.688	10-Year	10.79	67.60	68.96		68.97	0.000497	0.65	21.99	32.50	0.20
Tributary1	4236.688	25-Year	14.10	67.60	69.16		69.18	0.000415	0.65	28.83	34.19	0.19
Tributary1	4236.688	50-Year	16.90	67.60	69.35		69.36	0.000341	0.64	35.64	40.66	0.17

HEC-RAS Plan: 2015-01-30 River: Shirley Reach: Tributary1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary1	4236.688	100-Year	18.50	67.60	69.51		69.52	0.000268	0.60	41.98	55.75	0.15
Tributary1	4236.688	Jul-79	21.00	67.60	69.75		69.76	0.000190	0.55	56.23	64.93	0.13
Tributary1	4167.088	2-Year	5.90	67.60	68.57		68.61	0.003196	0.89	7.78	30.46	0.35
Tributary1	4167.088	5-Year	8.30	67.60	68.73		68.76	0.002103	0.83	13.08	33.42	0.29
Tributary1	4167.088	10-Year	10.79	67.60	68.90		68.92	0.001442	0.78	18.95	38.48	0.25
Tributary1	4167.088	25-Year	14.10	67.60	69.12		69.14	0.000851	0.69	28.12	42.19	0.20
Tributary1	4167.088	50-Year	16.90	67.60	69.32		69.33	0.000583	0.63	36.86	56.67	0.17
Tributary1	4167.088	100-Year	18.50	67.60	69.49		69.50	0.000402	0.56	47.91	70.37	0.14
Tributary1	4167.088	Jul-79	21.00	67.60	69.74		69.75	0.000240	0.48	65.82	72.64	0.11
Tributary1	4112.813	2-Year	5.90	67.60	68.37	68.16	68.44	0.002982	1.13	5.21	11.93	0.55
Tributary1	4112.813	5-Year	8.30	67.60	68.59	68.27	68.65	0.002106	1.02	8.68	18.67	0.41
Tributary1	4112.813	10-Year	10.79	67.60	68.79	68.37	68.83	0.001592	0.96	14.12	35.35	0.34
Tributary1	4112.813	25-Year	14.10	67.60	69.06	68.47	69.09	0.000955	0.84	25.15	46.89	0.26
Tributary1	4112.813	50-Year	16.90	67.60	69.28	68.54	69.30	0.000671	0.76	37.63	83.76	0.21
Tributary1	4112.813	100-Year	18.50	67.60	69.46	68.58	69.48	0.000389	0.62	56.63	98.59	0.16
Tributary1	4112.813	Jul-79	21.00	67.60	69.73	68.63	69.73	0.000197	0.48	83.00	101.74	0.12
Tributary1	4110.796	2-Year	5.90	67.56	68.34	68.04	68.43	0.002218	1.33	4.44	10.99	0.48
Tributary1	4110.796	5-Year	8.30	67.56	68.52	68.16	68.64	0.002203	1.52	5.46	16.64	0.50
Tributary1	4110.796	10-Year	10.79	67.56	68.67	68.27	68.82	0.002256	1.70	6.34	23.07	0.51
Tributary1	4110.796	25-Year	14.10	67.56	68.90	68.41	69.07	0.002090	1.85	7.62	42.79	0.51
Tributary1	4110.796	50-Year	16.90	67.56	69.09	68.52	69.28	0.001926	1.94	8.71	59.77	0.50
Tributary1	4110.796	100-Year	18.50	67.56	69.28	68.58	69.46	0.001565	1.89	9.79	157.84	0.46
Tributary1	4110.796	Jul-79	21.00	67.56	69.54	68.67	69.72	0.001254	1.86	11.28	171.53	0.42
Tributary1	4090.206		Culvert									
Tributary1	4079.661	2-Year	5.95	67.30	68.28	67.85	68.35	0.001349	1.14	5.20	30.68	0.38
Tributary1	4079.661	5-Year	8.57	67.30	68.43	67.98	68.53	0.001662	1.41	6.08	55.89	0.44
Tributary1	4079.661	10-Year	10.96	67.30	68.53	68.09	68.67	0.002023	1.65	6.64	57.57	0.49
Tributary1	4079.661	25-Year	14.20	67.30	68.62	68.23	68.82	0.002650	1.98	7.16	65.84	0.57
Tributary1	4079.661	50-Year	17.10	67.30	68.66	68.34	68.93	0.003472	2.32	7.38	73.41	0.65
Tributary1	4079.661	100-Year	18.90	67.30	68.67	68.40	69.00	0.004102	2.54	7.45	74.89	0.71
Tributary1	4079.661	Jul-79	21.40	67.30	68.68	68.49	69.10	0.005187	2.86	7.48	75.49	0.80
Tributary1	4045.686	2-Year	5.95	67.00	68.25		68.27	0.002246	0.63	9.83	29.82	0.23
Tributary1	4045.686	5-Year	8.57	67.00	68.42		68.45	0.002242	0.72	13.36	37.64	0.24
Tributary1	4045.686	10-Year	10.96	67.00	68.53		68.56	0.002339	0.79	16.90	47.18	0.25
Tributary1	4045.686	25-Year	14.20	67.00	68.65		68.69	0.002436	0.87	21.30	52.48	0.26
Tributary1	4045.686	50-Year	17.10	67.00	68.72		68.76	0.002704	0.95	24.12	55.54	0.27
Tributary1	4045.686	100-Year	18.90	67.00	68.76		68.80	0.002885	1.00	25.65	57.18	0.28
Tributary1	4045.686	Jul-79	21.40	67.00	68.80		68.85	0.003119	1.07	27.79	70.61	0.30
Tributary1	3964.183	2-Year	5.95	66.90	68.02		68.05	0.003394	0.79	7.54	18.68	0.30
Tributary1	3964.183	5-Year	8.57	66.90	68.15		68.20	0.004338	0.95	9.14	23.76	0.34
Tributary1	3964.183	10-Year	10.96	66.90	68.23		68.29	0.005162	1.10	10.73	43.48	0.37
Tributary1	3964.183	25-Year	14.20	66.90	68.30	67.84	68.38	0.006229	1.28	14.23	128.53	0.42
Tributary1	3964.183	50-Year	17.10	66.90	68.35	67.93	68.43	0.006381	1.34	20.90	146.46	0.42
Tributary1	3964.183	100-Year	18.90	66.90	68.38	67.98	68.46	0.006552	1.38	24.04	151.32	0.43
Tributary1	3964.183	Jul-79	21.40	66.90	68.41	68.05	68.49	0.006789	1.43	28.40	179.09	0.44
Tributary1	3910.996	2-Year	5.95	66.80	67.87		67.89	0.002558	0.61	11.24	35.45	0.24
Tributary1	3910.996	5-Year	8.57	66.80	67.98		68.00	0.002826	0.70	16.28	70.68	0.25
Tributary1	3910.996	10-Year	10.96	66.80	68.05		68.07	0.002996	0.76	22.28	120.46	0.27
Tributary1	3910.996	25-Year	14.20	66.80	68.11		68.14	0.003071	0.81	30.89	164.88	0.27
Tributary1	3910.996	50-Year	17.10	66.80	68.16		68.18	0.003218	0.86	38.30	178.73	0.28
Tributary1	3910.996	100-Year	18.90	66.80	68.18		68.20	0.003171	0.86	42.47	182.65	0.28
Tributary1	3910.996	Jul-79	21.40	66.80	68.21		68.23	0.003038	0.87	48.87	204.08	0.28
Tributary1	3852.352	2-Year	5.95	66.70	67.67		67.70	0.004319	0.76	8.94	39.37	0.31
Tributary1	3852.352	5-Year	8.57	66.70	67.74		67.78	0.005761	0.92	12.35	75.87	0.36
Tributary1	3852.352	10-Year	10.96	66.70	67.78		67.82	0.006383	0.99	15.48	82.03	0.38
Tributary1	3852.352	25-Year	14.20	66.70	67.83		67.88	0.006983	1.07	19.83	106.09	0.40
Tributary1	3852.352	50-Year	17.10	66.70	67.87		67.92	0.007012	1.09	23.99	122.08	0.40
Tributary1	3852.352	100-Year	18.90	66.70	67.90		67.94	0.006950	1.10	26.65	129.45	0.40
Tributary1	3852.352	Jul-79	21.40	66.70	67.93		67.97	0.007241	1.15	31.83	169.95	0.41
Tributary1	3787.461	2-Year	5.95	66.62	67.54	67.28	67.54	0.001409	0.43	21.63	119.91	0.18
Tributary1	3787.461	5-Year	8.57	66.62	67.61		67.61	0.001322	0.42	30.28	133.13	0.17
Tributary1	3787.461	10-Year	10.96	66.62	67.66		67.66	0.001223	0.41	37.08	137.13	0.17
Tributary1	3787.461	25-Year	14.20	66.62	67.71		67.72	0.001152	0.42	45.10	166.12	0.16
Tributary1	3787.461	50-Year	17.10	66.62	67.75		67.76	0.001128	0.43	52.34	177.13	0.16
Tributary1	3787.461	100-Year	18.90	66.62	67.78		67.79	0.001107	0.44	56.82	180.67	0.16
Tributary1	3787.461	Jul-79	21.40	66.62	67.81		67.82	0.001078	0.44	63.33	197.72	0.16

Reach	River Sta	Profile	Q Total (m³/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m²)	Top Width (m)	Froude # Chl
Tributary1	3713.495	2-Year	5.95	66.40	67.30		67.35	0.006286	0.99	7.56	51.17	0.41
Tributary1	3713.495	5-Year	8.57	66.40	67.41		67.44	0.004824	0.97	13.54	72.72	0.37
Tributary1	3713.495	10-Year	10.96	66.40	67.48		67.51	0.004025	0.95	19.49	85.30	0.34
Tributary1	3713.495	25-Year	14.20	66.40	67.56		67.58	0.003287	0.91	26.84	96.78	0.32
Tributary1	3713.495	50-Year	17.10	66.40	67.61		67.63	0.003053	0.91	31.69	101.76	0.31
Tributary1	3713.495	100-Year	18.90	66.40	67.64		67.66	0.002847	0.90	35.07	105.15	0.30
Tributary1	3713.495	Jul-79	21.40	66.40	67.68		67.70	0.002704	0.90	39.21	107.56	0.29
Tributary1	3653.05	2-Year	5.95	66.30	67.25		67.25	0.000597	0.39	23.90	90.77	0.15
Tributary1	3653.05	5-Year	8.57	66.30	67.38		67.38	0.000374	0.35	35.82	97.59	0.12
Tributary1	3653.05	10-Year	10.96	66.30	67.45		67.45	0.000348	0.35	43.41	105.68	0.12
Tributary1	3653.05	25-Year	14.20	66.30	67.53		67.53	0.000352	0.37	51.87	116.02	0.12
Tributary1	3653.05	50-Year	17.10	66.30	67.57		67.58	0.000389	0.41	57.25	119.75	0.13
Tributary1	3653.05	100-Year	18.90	66.30	67.60		67.61	0.000409	0.42	61.01	127.38	0.13
Tributary1	3653.05	Jul-79	21.40	66.30	67.64		67.65	0.000430	0.44	65.82	131.31	0.13
Tributary1	3615.362	2-Year	5.95	66.24	67.23		67.23	0.000487	0.30	29.77	122.89	0.12
Tributary1	3615.362	5-Year	8.57	66.24	67.37		67.37	0.000276	0.23	47.13	134.69	0.09
Tributary1	3615.362	10-Year	10.96	66.24	67.44		67.44	0.000250	0.23	57.52	138.55	0.08
Tributary1	3615.362	25-Year	14.20	66.24	67.52		67.52	0.000259	0.24	68.48	154.38	0.08
Tributary1	3615.362	50-Year	17.10	66.24	67.56		67.57	0.000282	0.25	75.50	159.02	0.09
Tributary1	3615.362	100-Year	18.90	66.24	67.59		67.60	0.000288	0.26	80.38	160.79	0.09
Tributary1	3615.362	Jul-79	21.40	66.24	67.63		67.63	0.000303	0.28	86.70	175.23	0.09
Tributary1	3539.195	2-Year	5.95	66.20	67.19		67.20	0.000448	0.34	26.66	111.27	0.14
Tributary1	3539.195	5-Year	8.57	66.20	67.35		67.35	0.000219	0.27	44.58	128.15	0.10
Tributary1	3539.195	10-Year	10.96	66.20	67.42		67.43	0.000202	0.28	55.34	149.65	0.10
Tributary1	3539.195	25-Year	14.20	66.20	67.50		67.50	0.000201	0.29	67.15	158.66	0.10
Tributary1	3539.195	50-Year	17.10	66.20	67.54		67.55	0.000224	0.32	74.26	166.10	0.11
Tributary1	3539.195	100-Year	18.90	66.20	67.57		67.58	0.000228	0.33	79.27	166.82	0.11
Tributary1	3539.195	Jul-79	21.40	66.20	67.61		67.61	0.000248	0.35	85.18	172.21	0.11
Tributary1	3459.393	2-Year	5.95	65.95	67.12		67.13	0.001694	0.55	16.67	94.80	0.22
Tributary1	3459.393	5-Year	8.57	65.95	67.32		67.32	0.000676	0.37	38.70	135.05	0.13
Tributary1	3459.393	10-Year	10.96	65.95	67.40		67.40	0.000539	0.35	49.87	138.78	0.12
Tributary1	3459.393	25-Year	14.20	65.95	67.48		67.48	0.000513	0.36	60.76	141.67	0.12
Tributary1	3459.393	50-Year	17.10	65.95	67.52		67.52	0.000566	0.39	66.48	141.67	0.13
Tributary1	3459.393	100-Year	18.90	65.95	67.55		67.55	0.000573	0.40	70.68	141.67	0.13
Tributary1	3459.393	Jul-79	21.40	65.95	67.58		67.58	0.000602	0.42	75.38	141.67	0.13
Tributary1	3361.237	2-Year	5.95	65.90	66.84		66.92	0.003083	1.35	6.52	36.58	0.48
Tributary1	3361.237	5-Year	8.57	65.90	67.25		67.26	0.000543	0.75	32.20	132.86	0.22
Tributary1	3361.237	10-Year	10.96	65.90	67.35		67.36	0.000469	0.73	44.98	137.83	0.20
Tributary1	3361.237	25-Year	14.20	65.90	67.42		67.43	0.000494	0.78	55.75	140.95	0.21
Tributary1	3361.237	50-Year	17.10	65.90	67.46		67.47	0.000589	0.86	60.35	140.95	0.23
Tributary1	3361.237	100-Year	18.90	65.90	67.48		67.50	0.000610	0.89	64.35	140.95	0.24
Tributary1	3361.237	Jul-79	21.40	65.90	67.51		67.53	0.000665	0.94	68.49	140.95	0.25
Tributary1	3330.8	2-Year	5.95	65.79	66.86	66.29	66.87	0.000442	0.54	12.47	77.31	0.18
Tributary1	3330.8	5-Year	8.57	65.79	67.26	66.38	67.26	0.000018	0.13	88.80	159.35	0.04
Tributary1	3330.8	10-Year	10.96	65.79	67.35	66.44	67.35	0.000021	0.15	112.71	159.40	0.04
Tributary1	3330.8	25-Year	14.20	65.79	67.43	66.52	67.43	0.000028	0.18	124.88	159.40	0.05
Tributary1	3330.8	50-Year	17.10	65.79	67.46	66.59	67.46	0.000037	0.21	130.15	159.40	0.06
Tributary1	3330.8	100-Year	18.90	65.79	67.49	66.62	67.49	0.000042	0.23	134.65	159.40	0.06
Tributary1	3330.8	Jul-79	21.40	65.79	67.52	66.68	67.52	0.000049	0.25	139.35	159.40	0.06
Tributary1	3320.636	2-Year	5.95	65.52	66.57	66.43	66.83	0.808791	2.28	2.62	10.45	0.78
Tributary1	3320.636	5-Year	8.57	65.52	67.25	66.64	67.26	0.004025	0.21	23.77	137.79	0.06
Tributary1	3320.636	10-Year	10.96	65.52	67.35	66.80	67.35	0.001351	0.13	49.22	145.83	0.04
Tributary1	3320.636	25-Year	14.20	65.52	67.42	67.01	67.43	0.001158	0.13	60.47	151.25	0.04
Tributary1	3320.636	50-Year	17.10	65.52	67.45	67.20	67.46	0.001302	0.14	65.34	152.86	0.04
Tributary1	3320.636	100-Year	18.90	65.52	67.48	67.20	67.49	0.001300	0.14	69.64	154.88	0.04
Tributary1	3320.636	Jul-79	21.40	65.52	67.51	67.20	67.52	0.001377	0.15	74.15	157.27	0.04
Tributary1	3308.937		Culvert									
Tributary1	3301.163	2-Year	5.71	65.35	66.62	66.18	66.66	0.001652	0.80	7.16	10.76	0.27
Tributary1	3301.163	5-Year	8.38	65.35	66.87	66.34	66.91	0.001971	0.90	10.22	43.43	0.28
Tributary1	3301.163	10-Year	10.80	65.35	66.90	66.34	66.97	0.002985	1.13	11.11	87.36	0.34
Tributary1	3301.163	25-Year	14.00	65.35	66.96	66.36	67.05	0.003930	1.34	14.48	105.74	0.40
Tributary1	3301.163	50-Year	16.70	65.35	66.93	66.46	67.07	0.006417	1.68	12.59	94.79	0.50
Tributary1	3301.163	100-Year	17.90	65.35	66.94	66.50	67.09	0.006954	1.76	13.39	101.81	0.53
Tributary1	3301.163	Jul-79	20.00	65.35	66.97	66.57	67.14	0.007683	1.88	15.08	107.82	0.56
Tributary1	3292.083	2-Year	5.71	65.20	66.63	65.72	66.64	0.000612	0.39	17.30	70.68	0.12
Tributary1	3292.083	5-Year	8.38	65.20	66.89	65.83	66.90	0.000469	0.40	26.46	121.98	0.11
Tributary1	3292.083	10-Year	10.80	65.20	66.93	65.91	66.94	0.000680	0.49	27.89	143.38	0.13

HEC-RAS Plan: 2015-01-30 River: Shirley Reach: Tributary1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary1	3292.083	25-Year	14.00	65.20	67.01	66.00	67.01	0.000426	0.40	52.34	175.27	0.11
Tributary1	3292.083	50-Year	16.70	65.20	67.01	66.08	67.01	0.000606	0.48	52.38	175.32	0.13
Tributary1	3292.083	100-Year	17.90	65.20	67.03	66.11	67.04	0.000622	0.49	54.57	176.36	0.13
Tributary1	3292.083	Jul-79	20.00	65.20	67.07	66.16	67.07	0.000637	0.50	58.47	177.45	0.13
Tributary1	3262.229	2-Year	5.71	65.19	66.60	65.91	66.62	0.001051	0.61	9.35	29.00	0.22
Tributary1	3262.229	5-Year	8.38	65.19	66.85	66.06	66.88	0.000904	0.68	12.62	128.02	0.21
Tributary1	3262.229	10-Year	10.80	65.19	66.87	66.17	66.91	0.001425	0.86	12.85	131.55	0.26
Tributary1	3262.229	25-Year	14.00	65.19	66.99	66.27	67.00	0.000434	0.51	48.94	156.48	0.15
Tributary1	3262.229	50-Year	16.70	65.19	66.98	66.36	66.99	0.000650	0.62	48.03	155.97	0.18
Tributary1	3262.229	100-Year	17.90	65.19	67.00	66.39	67.01	0.000653	0.63	50.53	178.26	0.18
Tributary1	3262.229	Jul-79	20.00	65.19	67.04	66.45	67.05	0.000646	0.64	55.03	183.40	0.18
Tributary1	3211.613	2-Year	5.71	65.10	66.52	65.81	66.55	0.001383	0.77	7.42	45.34	0.25
Tributary1	3211.613	5-Year	8.38	65.10	66.77	65.96	66.81	0.001798	0.87	10.24	90.05	0.28
Tributary1	3211.613	10-Year	10.80	65.10	66.83	66.08	66.84	0.000937	0.64	29.95	114.81	0.21
Tributary1	3211.613	25-Year	14.00	65.10	66.96	66.22	66.97	0.000575	0.55	45.86	126.92	0.16
Tributary1	3211.613	50-Year	16.70	65.10	66.94	66.32	66.95	0.000961	0.70	43.05	125.99	0.21
Tributary1	3211.613	100-Year	17.90	65.10	66.96	66.36	66.98	0.000956	0.70	45.55	126.82	0.21
Tributary1	3211.613	Jul-79	20.00	65.10	67.00	66.44	67.01	0.000928	0.71	50.15	129.01	0.21
Tributary1	3182.32	2-Year	5.71	65.00	66.49	65.71	66.52	0.001092	0.69	8.30	8.70	0.22
Tributary1	3182.32	5-Year	8.38	65.00	66.75	65.86	66.77	0.000939	0.70	16.09	58.28	0.21
Tributary1	3182.32	10-Year	10.80	65.00	66.77	65.97	66.81	0.001360	0.85	17.38	60.01	0.26
Tributary1	3182.32	25-Year	14.00	65.00	66.92	66.10	66.95	0.001019	0.80	28.97	85.63	0.23
Tributary1	3182.32	50-Year	16.70	65.00	66.86	66.20	66.91	0.002114	1.12	21.56	70.63	0.32
Tributary1	3182.32	100-Year	17.90	65.00	66.88	66.24	66.93	0.002234	1.16	22.40	72.38	0.33
Tributary1	3182.32	Jul-79	20.00	65.00	66.92	66.32	66.97	0.002141	1.16	28.51	85.43	0.33
Tributary1	3157.212	2-Year	5.71	65.00	66.48	65.66	66.49	0.000642	0.52	11.60	21.03	0.17
Tributary1	3157.212	5-Year	8.38	65.00	66.74	65.79	66.75	0.000513	0.55	18.75	74.07	0.16
Tributary1	3157.212	10-Year	10.80	65.00	66.76	65.89	66.78	0.000792	0.69	19.50	76.13	0.20
Tributary1	3157.212	25-Year	14.00	65.00	66.91	66.00	66.93	0.000600	0.65	36.17	94.63	0.18
Tributary1	3157.212	50-Year	16.70	65.00	66.82	66.09	66.86	0.001432	0.96	24.36	86.46	0.27
Tributary1	3157.212	100-Year	17.90	65.00	66.84	66.12	66.88	0.001563	1.01	25.13	88.04	0.28
Tributary1	3157.212	Jul-79	20.00	65.00	66.89	66.18	66.93	0.001369	0.97	34.02	91.19	0.27
Tributary1	3112.739	2-Year	5.71	64.90	66.46	65.52	66.47	0.000465	0.45	12.67	25.87	0.14
Tributary1	3112.739	5-Year	8.38	64.90	66.72	65.63	66.73	0.000353	0.45	23.98	176.79	0.13
Tributary1	3112.739	10-Year	10.80	64.90	66.73	65.72	66.75	0.000559	0.57	24.56	178.32	0.16
Tributary1	3112.739	25-Year	14.00	64.90	66.90	65.83	66.91	0.000235	0.41	71.17	244.89	0.11
Tributary1	3112.739	50-Year	16.70	64.90	66.78	65.92	66.81	0.001110	0.83	26.94	185.24	0.23
Tributary1	3112.739	100-Year	17.90	64.90	66.81	65.95	66.83	0.000759	0.70	49.40	222.17	0.19
Tributary1	3112.739	Jul-79	20.00	64.90	66.87	66.01	66.88	0.000627	0.65	62.19	232.93	0.18
Tributary1	3106.096	2-Year	5.71	64.67	66.37	65.52	66.45	0.000951	1.29	4.42	8.71	0.33
Tributary1	3106.096	5-Year	8.38	64.67	66.57	65.74	66.71	0.001393	1.69	4.96	69.93	0.40
Tributary1	3106.096	10-Year	10.80	64.67	66.43	65.93	66.71	0.003011	2.36	4.58	12.91	0.58
Tributary1	3106.096	25-Year	14.00	64.67	66.14	66.14	66.84	0.009456	3.68	3.80	7.66	1.00
Tributary1	3106.096	50-Year	16.70	64.67	66.77	66.32	66.80	0.000975	0.85	43.27	191.54	0.23
Tributary1	3106.096	100-Year	17.90	64.67	66.80	66.39	66.82	0.000903	0.83	48.51	205.61	0.23
Tributary1	3106.096	Jul-79	20.00	64.67	66.86	66.52	66.88	0.000702	0.75	60.80	210.11	0.20
Tributary1	3100.236		Culvert									
Tributary1	3094.45	2-Year	5.71	64.34	66.31	65.27	66.37	0.000631	1.15	4.95	9.64	0.27
Tributary1	3094.45	5-Year	8.38	64.34	66.50	65.49	66.53	0.000605	0.75	14.28	85.16	0.20
Tributary1	3094.45	10-Year	10.80	64.34	66.58	65.67	66.61	0.000687	0.83	22.18	109.34	0.22
Tributary1	3094.45	25-Year	14.00	64.34	66.69	65.89	66.71	0.000610	0.82	37.62	160.79	0.21
Tributary1	3094.45	50-Year	16.70	64.34	66.77	66.06	66.79	0.000499	0.76	52.81	192.74	0.19
Tributary1	3094.45	100-Year	17.90	64.34	66.80	66.14	66.81	0.000477	0.75	58.04	195.15	0.18
Tributary1	3094.45	Jul-79	20.00	64.34	66.85	66.26	66.87	0.000410	0.72	69.91	212.18	0.17
Tributary1	3086.02	2-Year	5.71	64.80	66.32	65.56	66.36	0.001183	0.80	7.25	19.46	0.25
Tributary1	3086.02	5-Year	8.38	64.80	66.47	65.72	66.52	0.001559	1.00	9.97	59.32	0.29
Tributary1	3086.02	10-Year	10.80	64.80	66.53	65.85	66.60	0.002012	1.18	11.96	107.90	0.33
Tributary1	3086.02	25-Year	14.00	64.80	66.62	66.01	66.70	0.002314	1.32	14.87	180.69	0.36
Tributary1	3086.02	50-Year	16.70	64.80	66.69	66.11	66.77	0.002483	1.42	17.11	185.49	0.38
Tributary1	3086.02	100-Year	17.90	64.80	66.71	66.16	66.80	0.002635	1.47	17.75	195.40	0.39
Tributary1	3086.02	Jul-79	20.00	64.80	66.76	66.23	66.85	0.002685	1.52	19.45	204.16	0.39
Tributary1	3065.567	2-Year	5.71	64.80	66.29	65.55	66.33	0.001454	0.84	6.81	7.19	0.27
Tributary1	3065.567	5-Year	8.38	64.80	66.43	65.73	66.48	0.001973	1.06	9.01	60.86	0.32
Tributary1	3065.567	10-Year	10.80	64.80	66.47	65.86	66.55	0.002760	1.29	10.17	66.84	0.38
Tributary1	3065.567	25-Year	14.00	64.80	66.53	66.02	66.64	0.003583	1.52	11.89	112.66	0.44
Tributary1	3065.567	50-Year	16.70	64.80	66.58	66.13	66.70	0.004201	1.69	13.18	144.41	0.48
Tributary1	3065.567	100-Year	17.90	64.80	66.57	66.18	66.72	0.004993	1.83	12.95	138.31	0.52

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary1	1869.72	25-Year	14.00	63.50	64.75	64.33	64.76	0.000677	0.46	41.25	119.12	0.16
Tributary1	1869.72	50-Year	16.70	63.50	64.82	64.36	64.83	0.000685	0.48	46.81	124.61	0.16
Tributary1	1869.72	100-Year	17.90	63.50	64.79	64.38	64.80	0.000888	0.54	44.74	121.72	0.18
Tributary1	1869.72	Jul-79	20.00	63.50	64.82	64.40	64.83	0.000964	0.57	47.13	124.96	0.19
Tributary1	1754.4	2-Year	5.82	63.70	64.36	64.26	64.37	0.002057	0.88	14.69	69.52	0.42
Tributary1	1754.4	5-Year	8.84	63.70	64.47	64.30	64.48	0.001564	0.86	22.01	82.08	0.36
Tributary1	1754.4	10-Year	11.40	63.70	64.55	64.34	64.56	0.001378	0.87	27.67	90.08	0.34
Tributary1	1754.4	25-Year	14.70	63.70	64.64	64.37	64.66	0.001217	0.88	34.45	102.25	0.33
Tributary1	1754.4	50-Year	17.60	63.70	64.71	64.41	64.73	0.001131	0.89	39.79	115.17	0.32
Tributary1	1754.4	100-Year	18.60	63.70	64.62	64.41	64.65	0.002194	1.16	33.13	99.79	0.44
Tributary1	1754.4	Jul-79	20.10	63.70	64.65	64.43	64.67	0.002192	1.18	34.88	102.76	0.44
Tributary1	1600.626	2-Year	5.82	63.00	63.94	63.76	63.99	0.003085	1.03	5.89	41.59	0.49
Tributary1	1600.626	5-Year	8.84	63.00	64.03	63.87	64.11	0.004200	1.27	7.47	52.46	0.55
Tributary1	1600.626	10-Year	11.40	63.00	64.10	63.94	64.20	0.004981	1.44	8.64	56.56	0.59
Tributary1	1600.626	25-Year	14.70	63.00	64.18	64.02	64.30	0.005724	1.62	10.09	63.65	0.62
Tributary1	1600.626	50-Year	17.60	63.00	64.24	64.09	64.39	0.006125	1.74	11.38	70.58	0.64
Tributary1	1600.626	100-Year	18.60	63.00	64.31	64.11	64.34	0.001989	1.03	28.10	90.70	0.36
Tributary1	1600.626	Jul-79	20.10	63.00	64.34	64.14	64.38	0.001846	1.02	31.22	99.22	0.35
Tributary1	1476.175	2-Year	5.82	63.20	63.79	63.63	63.80	0.000833	0.62	19.31	66.44	0.27
Tributary1	1476.175	5-Year	8.84	63.20	63.92	63.67	63.92	0.000667	0.63	27.74	70.77	0.25
Tributary1	1476.175	10-Year	11.40	63.20	64.00	63.70	64.01	0.000609	0.65	33.82	73.88	0.24
Tributary1	1476.175	25-Year	14.70	63.20	64.10	63.73	64.11	0.000541	0.67	42.48	96.79	0.23
Tributary1	1476.175	50-Year	17.60	63.20	64.19	63.76	64.20	0.000482	0.67	51.58	116.40	0.22
Tributary1	1476.175	100-Year	18.60	63.20	64.22	63.77	64.23	0.000464	0.67	54.97	122.43	0.22
Tributary1	1476.175	Jul-79	20.10	63.20	64.26	63.78	64.27	0.000436	0.67	60.39	132.02	0.21
Tributary1	1299.13	2-Year	5.82	62.78	63.47	63.30	63.54	0.003208	1.16	5.80	32.61	0.51
Tributary1	1299.13	5-Year	8.84	62.78	63.65	63.43	63.71	0.002623	1.21	9.84	58.38	0.47
Tributary1	1299.13	10-Year	11.40	62.78	63.76	63.52	63.82	0.002162	1.20	13.66	63.87	0.43
Tributary1	1299.13	25-Year	14.70	62.78	63.89	63.60	63.95	0.001813	1.19	17.95	69.34	0.39
Tributary1	1299.13	50-Year	17.60	62.78	64.00	63.71	64.05	0.001601	1.20	21.46	88.75	0.37
Tributary1	1299.13	100-Year	18.60	62.78	64.04	63.72	64.09	0.001546	1.20	22.60	91.67	0.37
Tributary1	1299.13	Jul-79	20.10	62.78	64.09	63.75	64.14	0.001469	1.20	24.30	97.06	0.36
Tributary1	1287.573	2-Year	5.82	62.58	63.46	63.15	63.51	0.001697	0.97	5.99	11.82	0.40
Tributary1	1287.573	5-Year	8.84	62.58	63.61	63.29	63.68	0.002043	1.17	7.53	13.94	0.43
Tributary1	1287.573	10-Year	11.40	62.58	63.70	63.37	63.79	0.002509	1.37	8.35	24.32	0.48
Tributary1	1287.573	25-Year	14.70	62.58	63.79	63.47	63.91	0.003080	1.59	9.24	41.32	0.53
Tributary1	1287.573	50-Year	17.60	62.58	63.86	63.54	64.02	0.003508	1.77	9.97	53.33	0.56
Tributary1	1287.573	100-Year	18.60	62.58	63.88	63.57	64.05	0.003655	1.82	10.20	57.11	0.58
Tributary1	1287.573	Jul-79	20.10	62.58	63.92	63.61	64.10	0.003856	1.91	10.55	68.28	0.59
Tributary1	1276.827		Bridge									
Tributary1	1263.755	2-Year	5.82	62.47	63.42	63.02	63.47	0.001350	0.96	6.29	38.10	0.37
Tributary1	1263.755	5-Year	8.84	62.47	63.57	63.21	63.64	0.001782	1.19	7.70	56.87	0.42
Tributary1	1263.755	10-Year	11.40	62.47	63.63	63.30	63.73	0.002364	1.42	8.34	64.71	0.48
Tributary1	1263.755	25-Year	14.70	62.47	63.69	63.40	63.84	0.003214	1.71	8.94	68.29	0.56
Tributary1	1263.755	50-Year	17.60	62.47	63.73	63.49	63.92	0.004023	1.96	9.37	69.81	0.63
Tributary1	1263.755	100-Year	18.60	62.47	63.74	63.51	63.95	0.004368	2.05	9.46	70.01	0.65
Tributary1	1263.755	Jul-79	20.10	62.47	63.76	63.55	63.99	0.004883	2.19	9.60	70.35	0.69
Tributary1	1247.371	2-Year	5.82	62.50	63.34	63.18	63.43	0.004805	1.31	4.63	18.22	0.60
Tributary1	1247.371	5-Year	8.84	62.50	63.52	63.34	63.60	0.003578	1.28	9.49	63.52	0.50
Tributary1	1247.371	10-Year	11.40	62.50	63.60	63.47	63.68	0.003525	1.34	12.26	66.08	0.50
Tributary1	1247.371	25-Year	14.70	62.50	63.68	63.57	63.76	0.003620	1.43	15.05	69.14	0.50
Tributary1	1247.371	50-Year	17.60	62.50	63.75	63.61	63.83	0.003626	1.49	17.33	79.48	0.50
Tributary1	1247.371	100-Year	18.60	62.50	63.76	63.63	63.85	0.003717	1.52	17.90	80.85	0.51
Tributary1	1247.371	Jul-79	20.10	62.50	63.79	63.65	63.88	0.003775	1.56	18.86	82.50	0.51
Tributary1	1133.542	2-Year	5.82	61.90	62.78	62.61	62.90	0.004434	1.55	4.14	10.26	0.60
Tributary1	1133.542	5-Year	8.84	61.90	62.95	62.77	63.11	0.004973	1.85	5.69	20.46	0.64
Tributary1	1133.542	10-Year	11.40	61.90	63.05	62.88	63.21	0.004737	1.92	9.19	30.56	0.63
Tributary1	1133.542	25-Year	14.70	61.90	63.16	63.10	63.31	0.004330	1.95	13.02	38.85	0.60
Tributary1	1133.542	50-Year	17.60	61.90	63.23	63.18	63.38	0.004324	2.03	15.93	45.90	0.61
Tributary1	1133.542	100-Year	18.60	61.90	63.26	63.20	63.40	0.004183	2.02	17.17	47.41	0.60
Tributary1	1133.542	Jul-79	20.10	61.90	63.29	63.24	63.43	0.004144	2.04	18.66	49.11	0.60
Tributary1	954.9156	2-Year	5.82	61.20	62.43	61.98	62.45	0.001493	0.69	11.17	33.75	0.23
Tributary1	954.9156	5-Year	8.84	61.20	62.58	62.13	62.61	0.001653	0.80	17.69	47.99	0.25
Tributary1	954.9156	10-Year	11.40	61.20	62.65	62.20	62.68	0.001876	0.89	21.15	67.08	0.27
Tributary1	954.9156	25-Year	14.70	61.20	62.73	62.27	62.76	0.002174	1.00	25.54	79.39	0.29
Tributary1	954.9156	50-Year	17.60	61.20	62.79	62.32	62.82	0.002249	1.06	29.34	83.84	0.30
Tributary1	954.9156	100-Year	18.60	61.20	62.81	62.36	62.84	0.002317	1.08	30.76	91.68	0.31

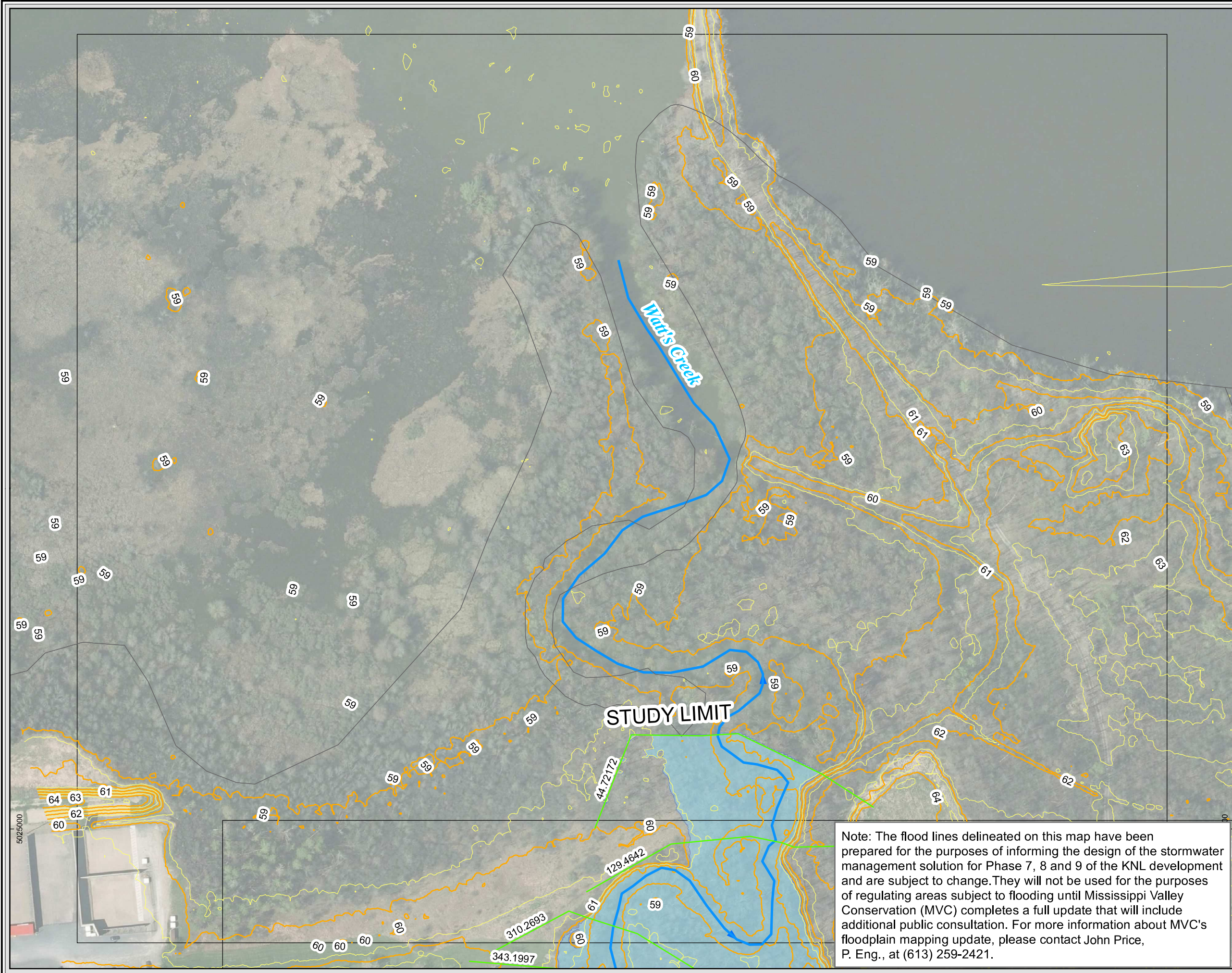
HEC-RAS Plan: 2015-01-30 River: Shirley Reach: Tributary1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary1	954.9156	Jul-79	20.10	61.20	62.84	62.41	62.87	0.002343	1.11	32.89	96.52	0.31
Tributary1	846.8483	2-Year	5.82	60.93	62.16		62.22	0.003479	1.06	5.99	19.06	0.40
Tributary1	846.8483	5-Year	8.84	60.93	62.33		62.38	0.002689	1.08	14.61	77.54	0.37
Tributary1	846.8483	10-Year	11.40	60.93	62.44		62.47	0.001995	1.00	23.59	92.56	0.32
Tributary1	846.8483	25-Year	14.70	60.93	62.55		62.57	0.001456	0.92	34.13	97.80	0.28
Tributary1	846.8483	50-Year	17.60	60.93	62.62		62.64	0.001270	0.90	41.51	104.26	0.26
Tributary1	846.8483	100-Year	18.60	60.93	62.65		62.67	0.001230	0.89	43.82	106.05	0.26
Tributary1	846.8483	Jul-79	20.10	60.93	62.68		62.70	0.001166	0.89	47.38	108.20	0.25
Tributary1	747.0098	2-Year	5.82	60.80	61.81	61.55	61.89	0.003092	1.21	4.80	9.69	0.55
Tributary1	747.0098	5-Year	8.84	60.80	61.98	61.72	62.07	0.003426	1.37	6.65	12.65	0.53
Tributary1	747.0098	10-Year	11.40	60.80	62.09	61.83	62.20	0.003700	1.50	8.27	31.98	0.54
Tributary1	747.0098	25-Year	14.70	60.80	62.20	61.94	62.34	0.003986	1.65	10.63	54.34	0.56
Tributary1	747.0098	50-Year	17.60	60.80	62.29	62.04	62.42	0.003968	1.72	13.21	59.09	0.55
Tributary1	747.0098	100-Year	18.60	60.80	62.31	62.08	62.45	0.003961	1.74	14.06	61.69	0.55
Tributary1	747.0098	Jul-79	20.10	60.80	62.35	62.12	62.49	0.003952	1.76	15.33	64.08	0.55
Tributary1	632.3096	2-Year	5.82	60.70	61.48	61.26	61.55	0.002747	1.21	5.08	14.19	0.52
Tributary1	632.3096	5-Year	8.84	60.70	61.64	61.41	61.73	0.002656	1.32	8.09	21.58	0.50
Tributary1	632.3096	10-Year	11.40	60.70	61.75	61.53	61.84	0.002615	1.40	10.48	23.19	0.50
Tributary1	632.3096	25-Year	14.70	60.70	61.86	61.64	61.96	0.002663	1.51	13.18	26.59	0.50
Tributary1	632.3096	50-Year	17.60	60.70	61.94	61.72	62.05	0.002689	1.59	15.52	29.23	0.51
Tributary1	632.3096	100-Year	18.60	60.70	61.96	61.74	62.07	0.002708	1.61	16.26	29.40	0.51
Tributary1	632.3096	Jul-79	20.10	60.70	62.00	61.77	62.11	0.002708	1.65	17.40	29.67	0.51
Tributary1	492.7144	2-Year	5.82	60.00	61.06	60.54	61.10	0.003653	0.93	6.43	13.22	0.35
Tributary1	492.7144	5-Year	8.84	60.00	61.20	60.71	61.26	0.004231	1.13	8.98	21.22	0.38
Tributary1	492.7144	10-Year	11.40	60.00	61.30	60.84	61.37	0.004456	1.24	11.38	28.29	0.40
Tributary1	492.7144	25-Year	14.70	60.00	61.40	60.98	61.47	0.004542	1.34	14.48	32.81	0.41
Tributary1	492.7144	50-Year	17.60	60.00	61.47	61.19	61.55	0.004725	1.42	16.98	35.94	0.42
Tributary1	492.7144	100-Year	18.60	60.00	61.49	61.21	61.58	0.004762	1.45	17.78	36.32	0.43
Tributary1	492.7144	Jul-79	20.10	60.00	61.52	61.25	61.61	0.004846	1.49	19.01	37.86	0.43
Tributary1	414.3949	2-Year	5.82	59.75	60.90	60.30	60.92	0.001526	0.71	10.92	33.82	0.24
Tributary1	414.3949	5-Year	8.84	59.75	60.99	60.47	61.03	0.002102	0.89	14.63	40.63	0.29
Tributary1	414.3949	10-Year	11.40	59.75	61.08	60.58	61.11	0.002291	0.98	18.22	45.21	0.30
Tributary1	414.3949	25-Year	14.70	59.75	61.17	60.79	61.21	0.002455	1.07	22.70	51.77	0.32
Tributary1	414.3949	50-Year	17.60	59.75	61.23	60.89	61.27	0.002593	1.14	25.94	53.84	0.33
Tributary1	414.3949	100-Year	18.60	59.75	61.24	60.93	61.29	0.002744	1.18	26.55	54.20	0.34
Tributary1	414.3949	Jul-79	20.10	59.75	61.27	60.96	61.32	0.002810	1.21	28.09	55.31	0.34
Tributary1	334.7006	2-Year	5.82	59.60	60.78	60.14	60.79	0.001745	0.53	15.60	57.69	0.20
Tributary1	334.7006	5-Year	8.84	59.60	60.77	60.31	60.80	0.004325	0.82	15.04	57.15	0.31
Tributary1	334.7006	10-Year	11.40	59.60	60.86	60.45	60.89	0.003754	0.83	20.52	61.92	0.30
Tributary1	334.7006	25-Year	14.70	59.60	60.95	60.60	60.98	0.003612	0.88	26.41	69.60	0.30
Tributary1	334.7006	50-Year	17.60	59.60	61.00	60.68	61.03	0.003844	0.94	29.91	71.77	0.31
Tributary1	334.7006	100-Year	18.60	59.60	60.94	60.75	60.99	0.006082	1.13	25.84	69.15	0.39
Tributary1	334.7006	Jul-79	20.10	59.60	60.96	60.77	61.01	0.006356	1.17	27.11	70.15	0.40
Tributary1	246.4345	2-Year	5.82	59.80	60.35	60.35	60.48	0.008756	1.65	4.03	89.49	0.91
Tributary1	246.4345	5-Year	8.84	59.80	60.41	60.41	60.45	0.003673	1.13	15.50	98.83	0.57
Tributary1	246.4345	10-Year	11.40	59.80	60.41	60.41	60.47	0.006108	1.46	15.50	98.83	0.73
Tributary1	246.4345	25-Year	14.70	59.80	60.43	60.43	60.51	0.008547	1.74	16.58	99.68	0.86
Tributary1	246.4345	50-Year	17.60	59.80	60.46	60.45	60.55	0.008681	1.81	18.90	101.45	0.86
Tributary1	246.4345	100-Year	18.60	59.80	60.47	60.46	60.51	0.004983	1.38	27.87	102.39	0.65
Tributary1	246.4345	Jul-79	20.10	59.80	60.49	60.46	60.53	0.004839	1.38	29.75	102.66	0.64
Tributary1	185.9653	2-Year	5.82	59.30	60.06	59.87	60.11	0.002072	1.02	8.23	64.01	0.43
Tributary1	185.9653	5-Year	8.84	59.30	60.12	59.99	60.15	0.001810	1.00	16.47	66.79	0.40
Tributary1	185.9653	10-Year	11.40	59.30	60.18	60.07	60.21	0.001879	1.07	20.06	77.49	0.41
Tributary1	185.9653	25-Year	14.70	59.30	60.26	60.10	60.29	0.001532	1.02	30.29	111.00	0.37
Tributary1	185.9653	50-Year	17.60	59.30	60.29	60.13	60.32	0.001688	1.10	33.87	111.90	0.39
Tributary1	185.9653	100-Year	18.60	59.30	60.30	60.14	60.34	0.001744	1.12	35.02	119.49	0.40
Tributary1	185.9653	Jul-79	20.10	59.30	60.32	60.16	60.35	0.001801	1.15	36.91	119.86	0.40
Tributary1	78.72429	2-Year	5.82	59.09	59.85	59.65	59.91	0.002490	1.12	6.87	75.15	0.48
Tributary1	78.72429	5-Year	8.84	59.09	59.97	59.80	60.00	0.001336	0.90	23.46	110.37	0.35
Tributary1	78.72429	10-Year	11.40	59.09	60.07	59.92	60.08	0.000905	0.79	34.16	113.12	0.29
Tributary1	78.72429	25-Year	14.70	59.09	59.95	59.95	60.04	0.004569	1.64	21.24	109.93	0.65
Tributary1	78.72429	50-Year	17.60	59.09	60.00	59.98	60.07	0.004169	1.61	26.08	110.85	0.62
Tributary1	78.72429	100-Year	18.60	59.09	60.01	59.99	60.09	0.003980	1.59	27.91	111.72	0.60
Tributary1	78.72429	Jul-79	20.10	59.09	60.03	60.00	60.10	0.003832	1.59	30.23	112.26	0.59
Tributary1	29.9602	2-Year	5.82	58.97	59.52	59.52	59.68	0.009812	1.78	3.27	31.61	1.00
Tributary1	29.9602	5-Year	8.84	58.97	59.63	59.63	59.84	0.010709	2.03	4.45	94.41	0.98
Tributary1	29.9602	10-Year	11.40	58.97	59.70	59.70	59.95	0.011780	2.25	5.27	110.86	1.01

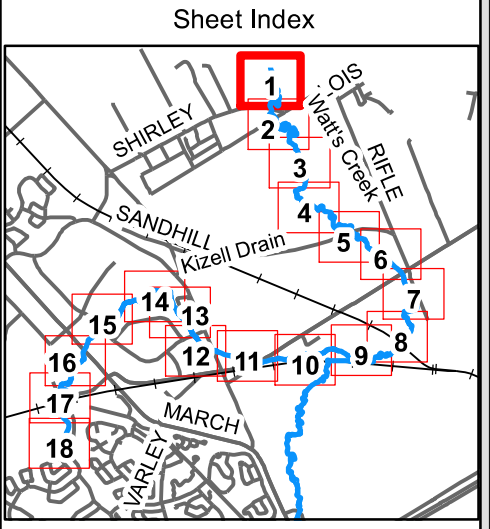
HEC-RAS Plan: 2015-01-30 River: Shirley Reach: Tributary1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary1	29.9602	25-Year	14.70	58.97	59.78	59.78	59.83	0.003533	1.31	27.87	137.03	0.55
Tributary1	29.9602	50-Year	17.60	58.97	59.78	59.78	59.85	0.005065	1.57	27.87	137.03	0.66
Tributary1	29.9602	100-Year	18.60	58.97	59.78	59.78	59.86	0.005657	1.66	27.87	137.03	0.69
Tributary1	29.9602	Jul-79	20.10	58.97	59.79	59.79	59.87	0.006118	1.74	28.81	137.50	0.72

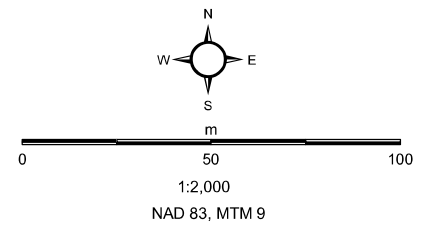
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- Legend**
- Watt's Creek & Kizell Drain
 - HEC-RAS Cross Section Location & ID
 - Hydraulic Structure Location & ID
 - Extent of 100-Year Flood Line
 - Match Lines
 - 1.0 m Contour Interval
 - 0.5 m Contour Interval
 - Parcel Fabric
 - Spill Location



Topographic information and digital orthophotography provided by the City of Ottawa



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Note: The flood lines delineated on this map have been prepared for the purposes of informing the design of the stormwater management solution for Phase 7, 8 and 9 of the KNL development and are subject to change. They will not be used for the purposes of regulating areas subject to flooding until Mississippi Valley Conservation (MVC) completes a full update that will include additional public consultation. For more information about MVC's floodplain mapping update, please contact John Price, P. Eng., at (613) 259-2421.

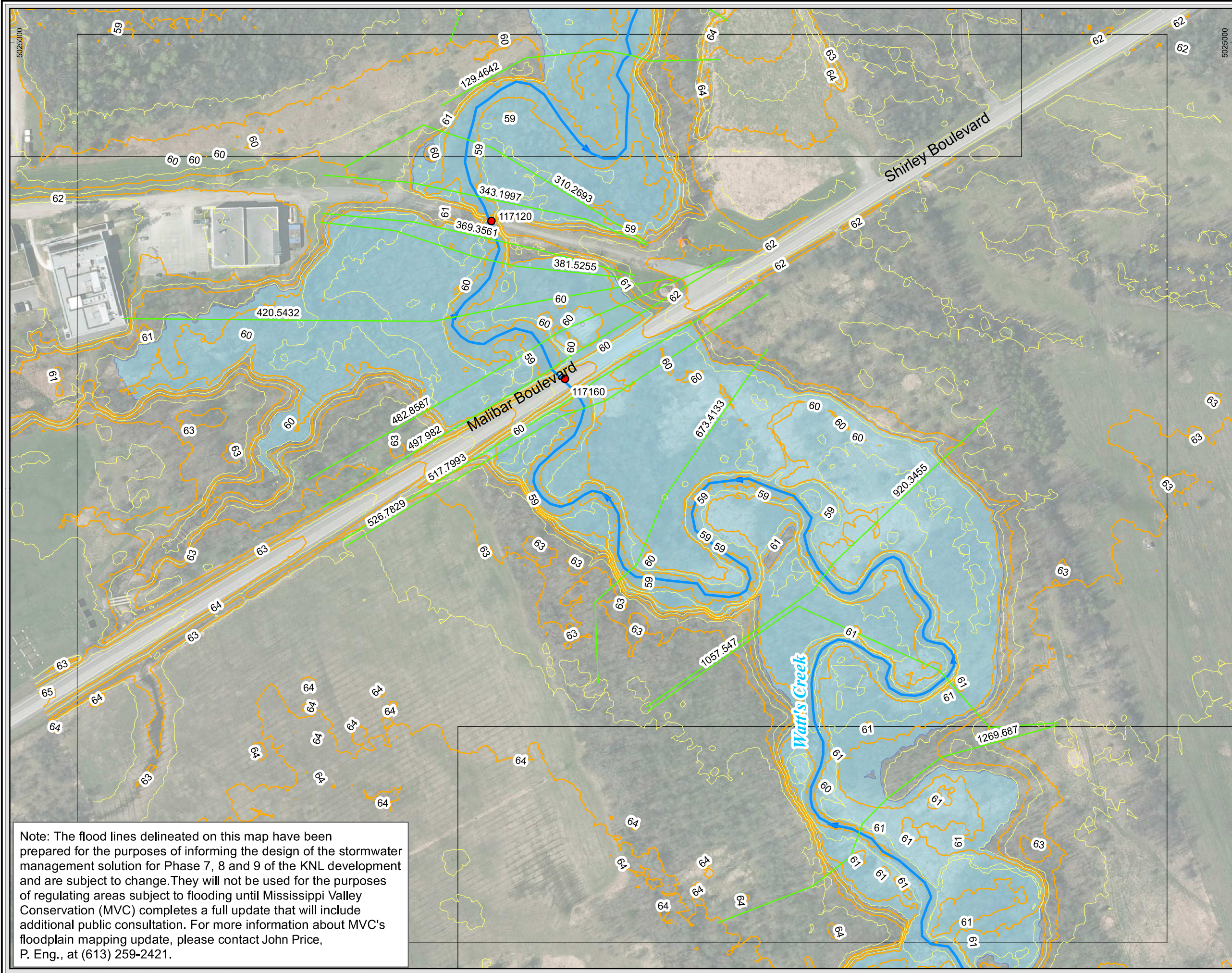
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Watt's Creek & Kizell Drain
Flood Line Delineation**

February 2015
60264539

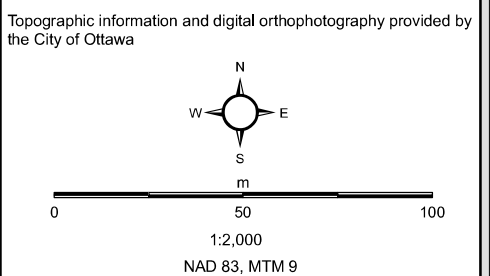
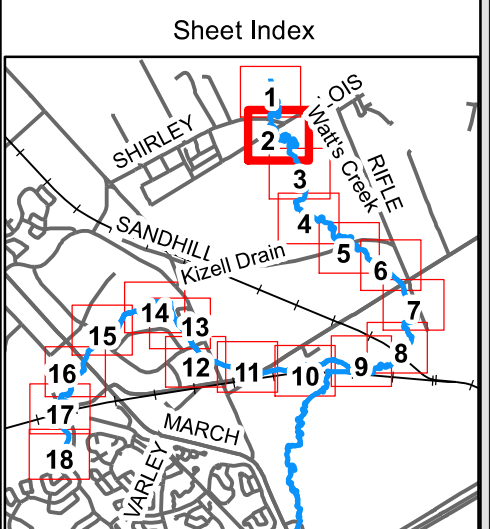
AECOM Sheet No. 1 of 18

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Legend

- Watt's Creek & Kizell Drain
- HEC-RAS Cross Section Location & ID
- Hydraulic Structure Location & ID
- Extent of 100-Year Flood Line
- Match Lines
- 1.0 m Contour Interval
- 0.5 m Contour Interval
- Parcel Fabric
- Spill Location



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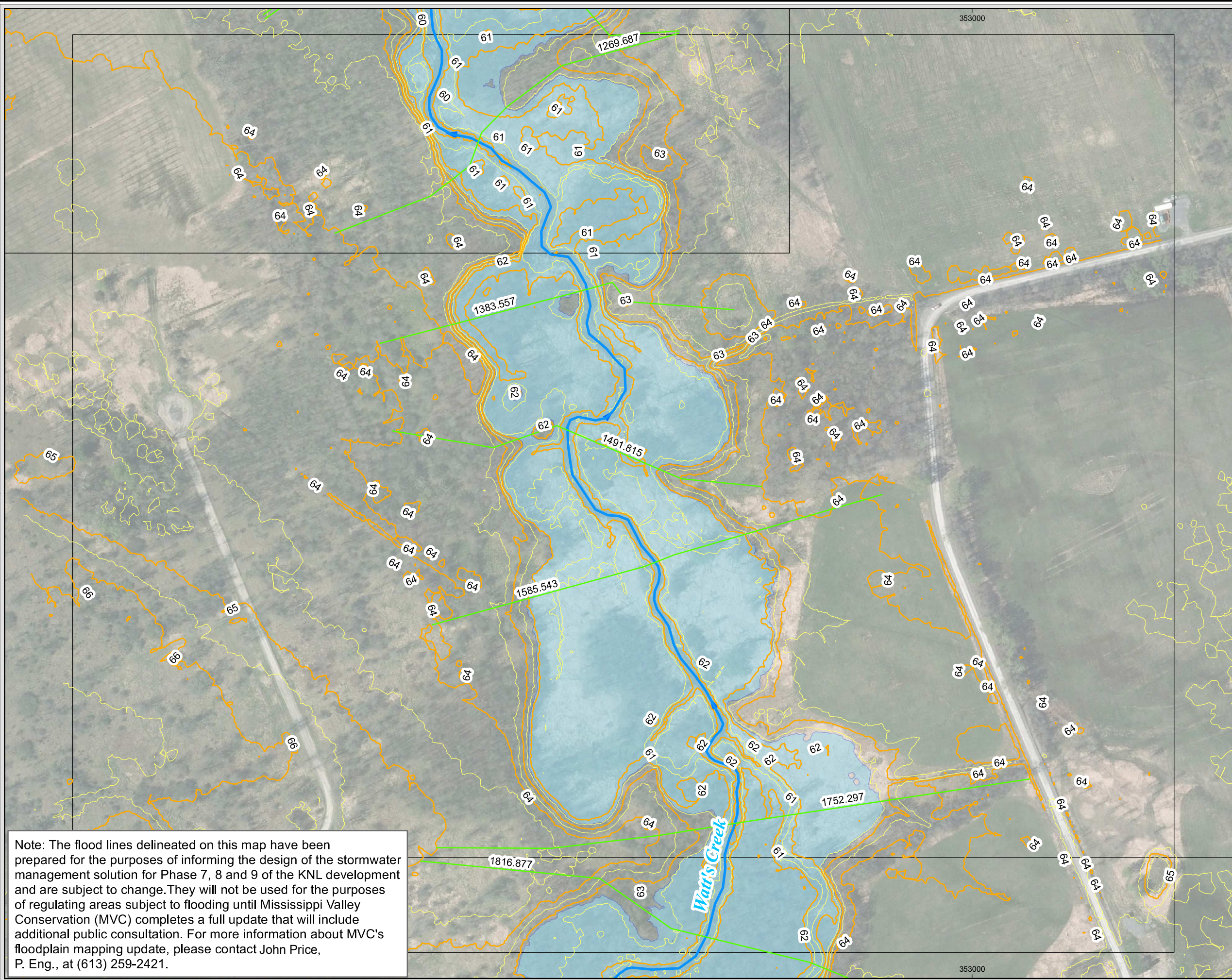
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Watt's Creek & Kizell Drain
Flood Line Delineation**

February 2015
60264539

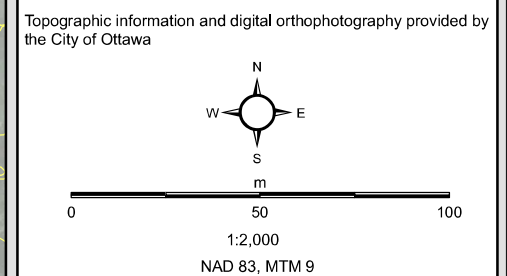
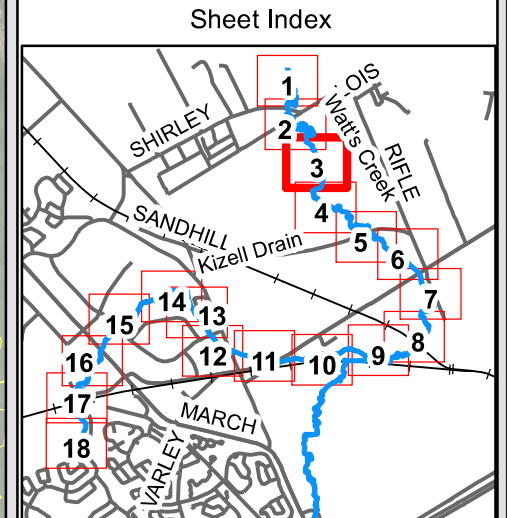
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Legend

- Watt's Creek & Kizell Drain
- HEC-RAS Cross Section Location & ID
- Hydraulic Structure Location & ID
- Extent of 100-Year Flood Line
- Match Lines
- 1.0 m Contour Interval
- 0.5 m Contour Interval
- Parcel Fabric
- Spill Location



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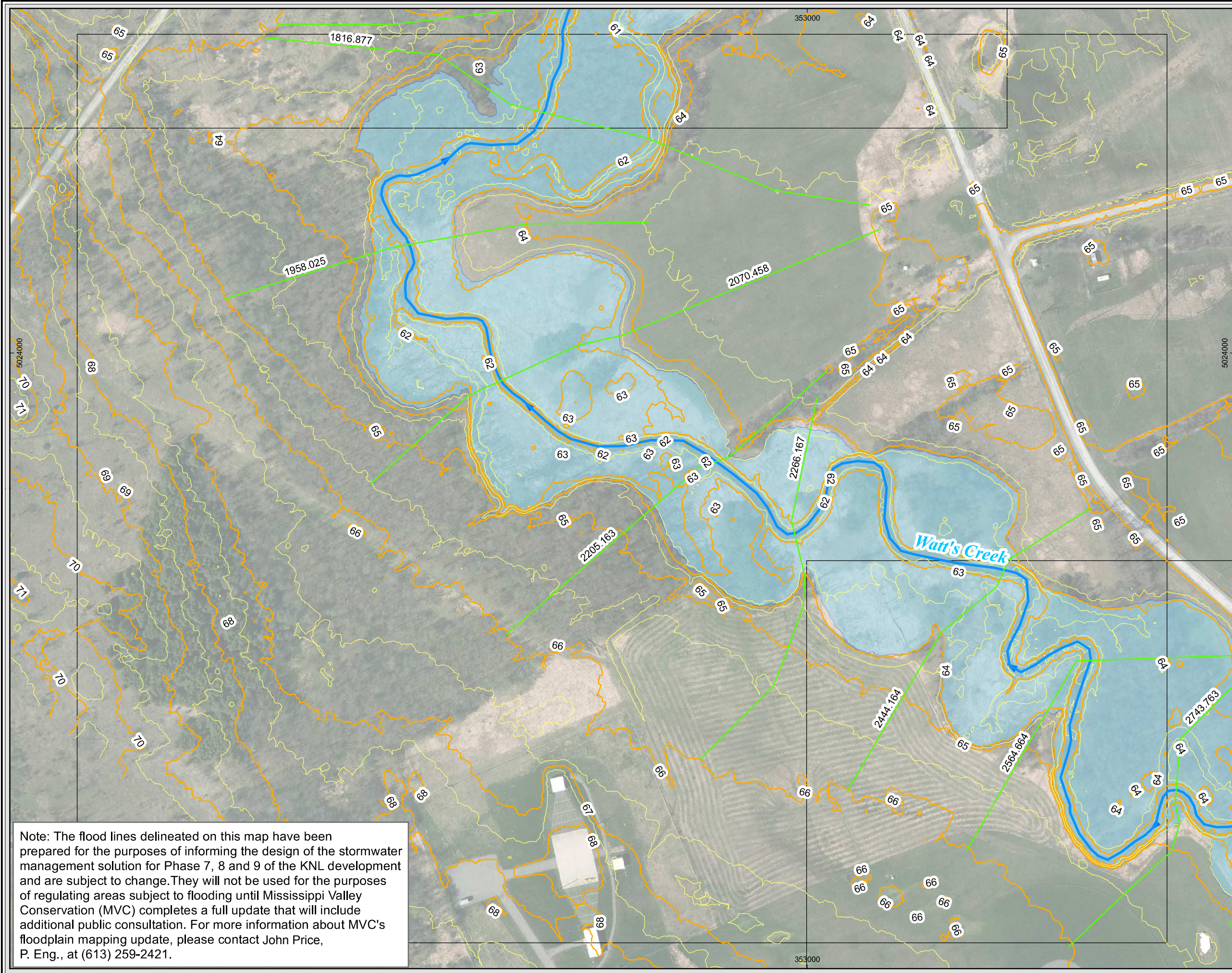
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Watt's Creek & Kizell Drain
Flood Line Delineation**

February 2015
60264539

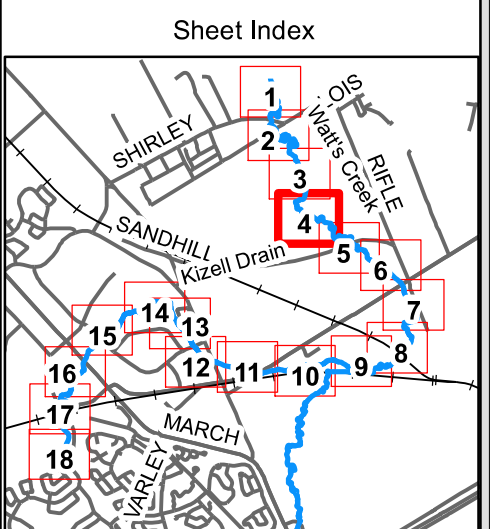
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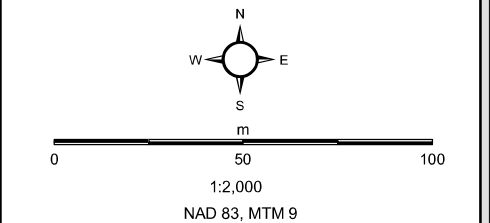


Legend

- Watt's Creek & Kizell Drain
- HEC-RAS Cross Section Location & ID
- Hydraulic Structure Location & ID
- Extent of 100-Year Flood Line
- Match Lines
- 1.0 m Contour Interval
- 0.5 m Contour Interval
- Parcel Fabric
- Spill Location



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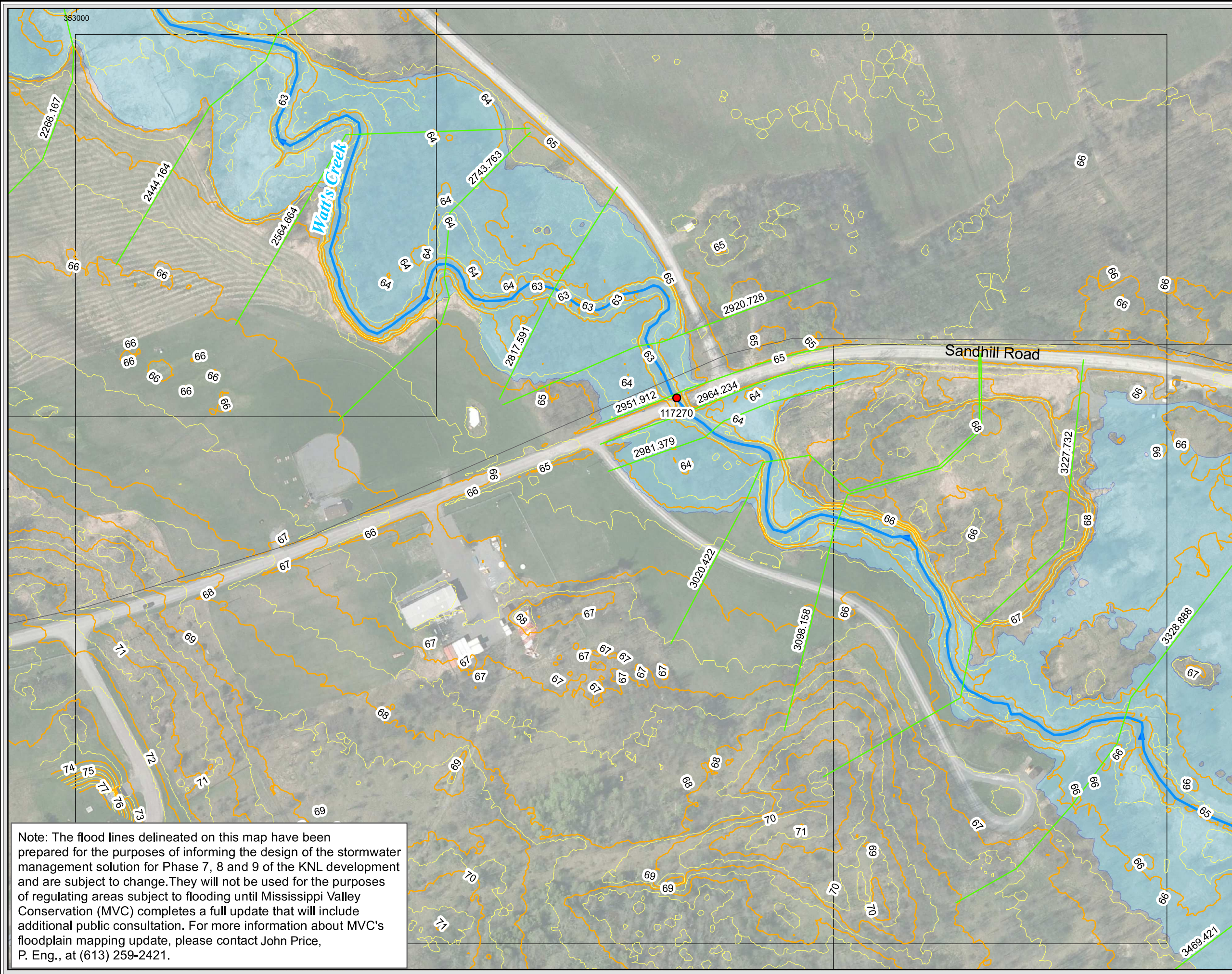
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Watt's Creek & Kizell Drain
Flood Line Delineation**

February 2015
60264539

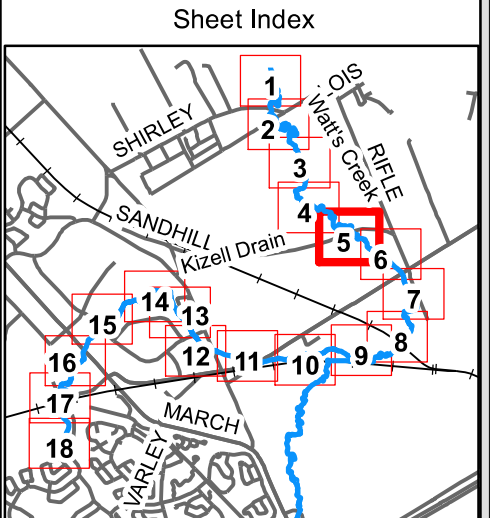
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Legend

- Watt's Creek & Kizell Drain
- HEC-RAS Cross Section Location & ID
- Hydraulic Structure Location & ID
- Extent of 100-Year Flood Line
- Match Lines
- 1.0 m Contour Interval
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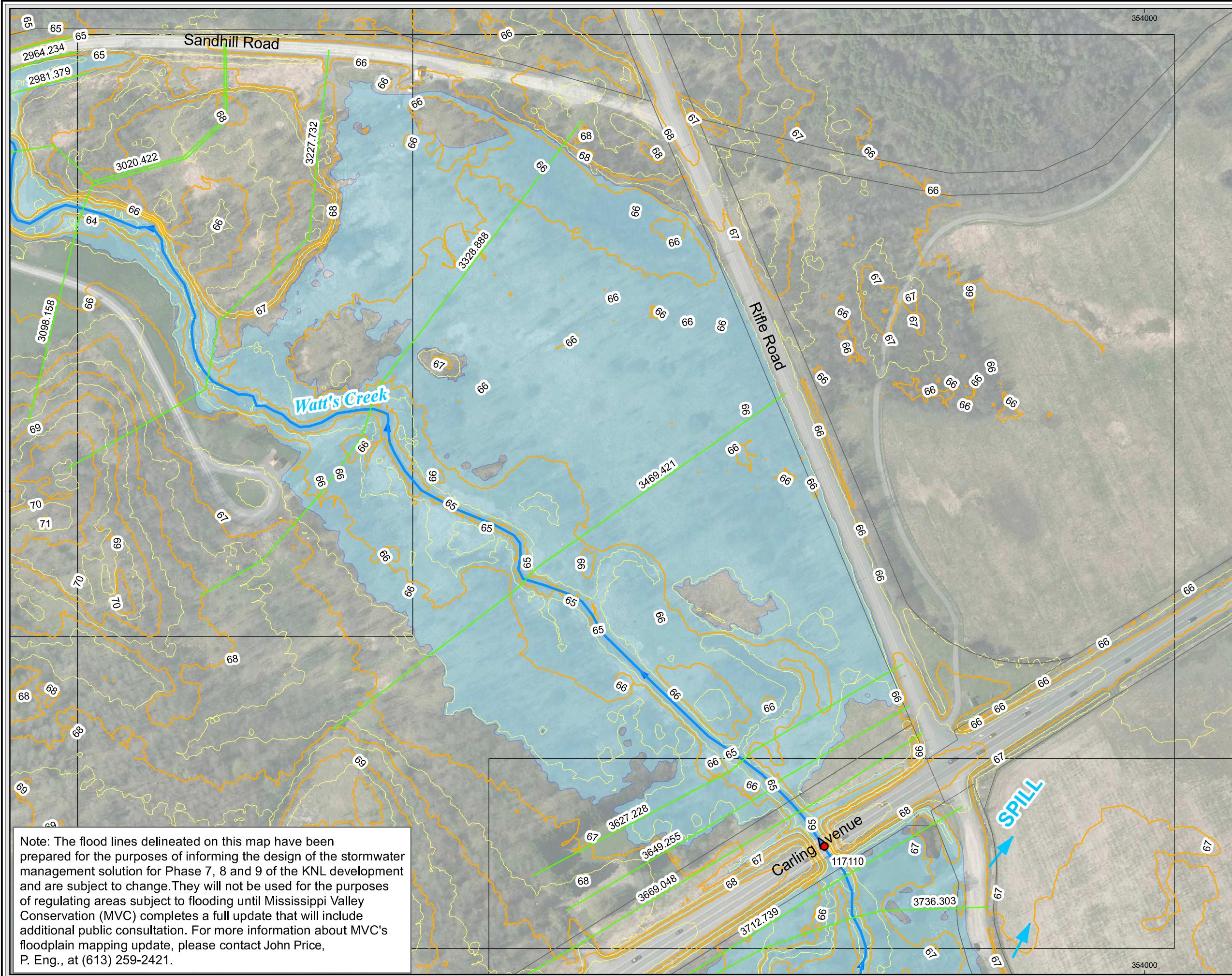
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Watt's Creek & Kizell Drain
Flood Line Delineation**

February 2015
60264539

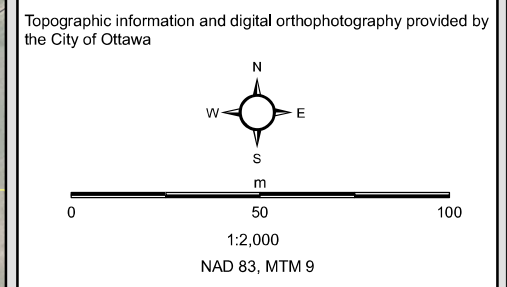
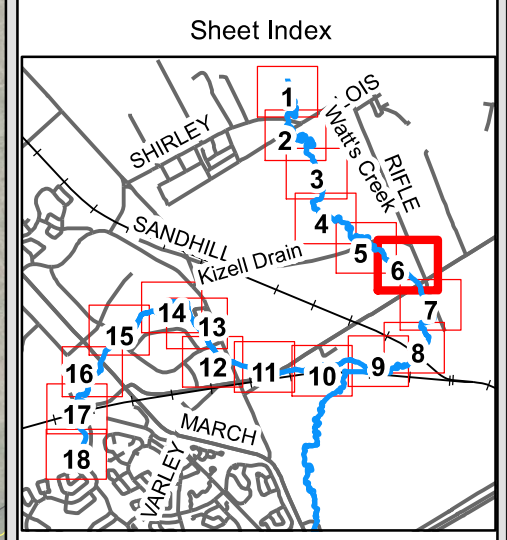
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Legend

- Watt's Creek & Kizell Drain
- HEC-RAS Cross Section Location & ID
- Hydraulic Structure Location & ID
- Extent of 100-Year Flood Line
- Match Lines
- 1.0 m Contour Interval
- 0.5 m Contour Interval
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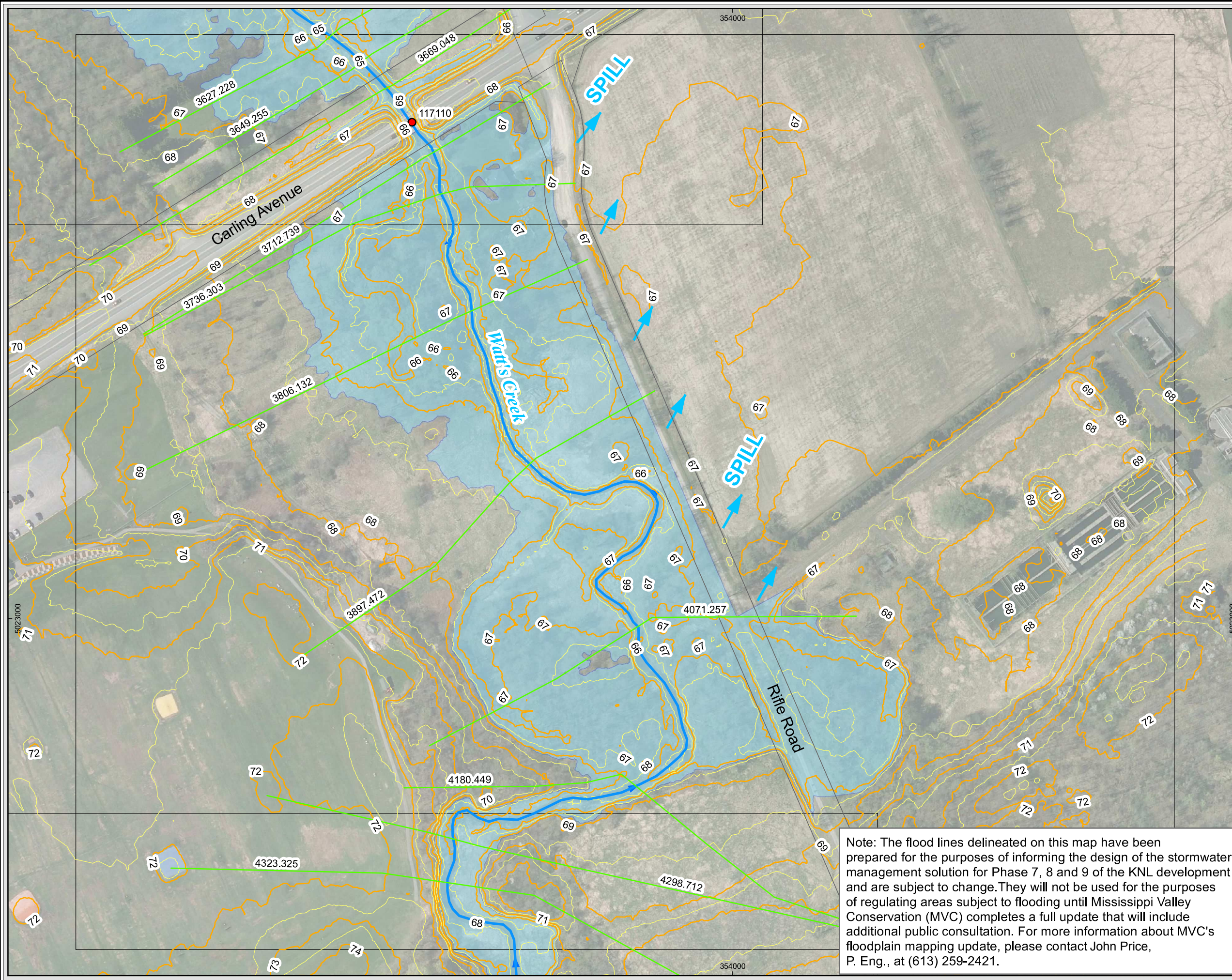
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Watt's Creek & Kizell Drain
Flood Line Delineation**

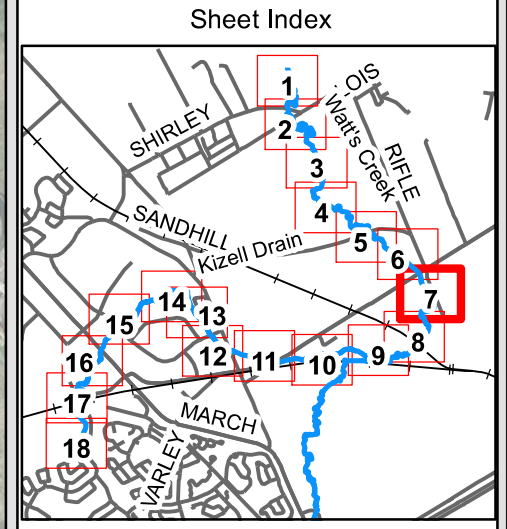
February 2015
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Sheet No. 6 of 18

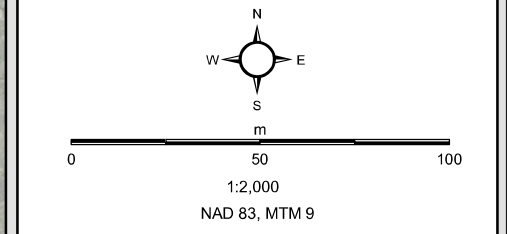
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- Legend**
- Watt's Creek & Kizell Drain
 - HEC-RAS Cross Section Location & ID
 - Hydraulic Structure Location & ID
 - Extent of 100-Year Flood Line
 - Match Lines
 - 1.0 m Contour Interval
 - 0.5 m Contour Interval
 - Parcel Fabric
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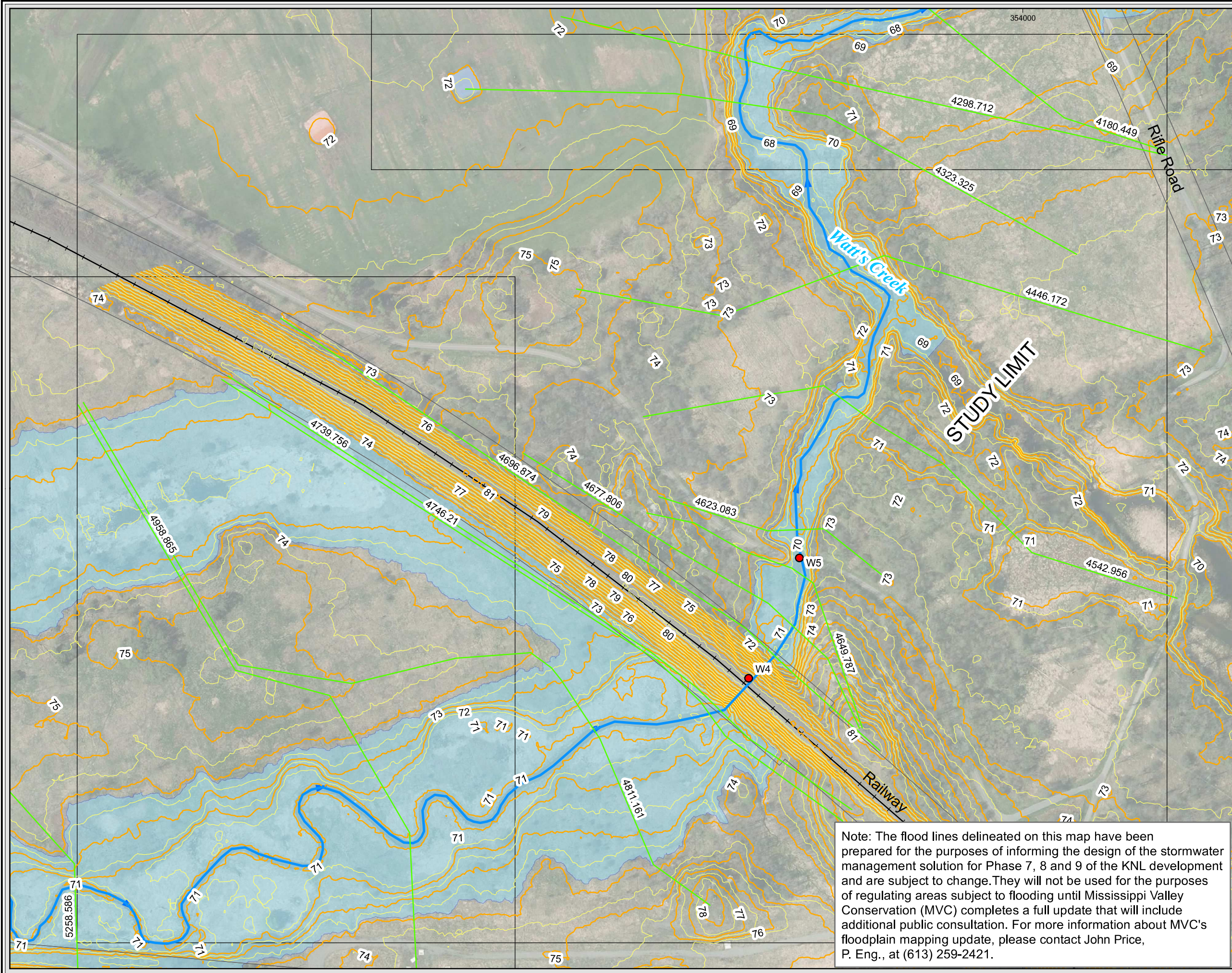
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Watt's Creek & Kizell Drain
Flood Line Delineation**

February 2015
60264539

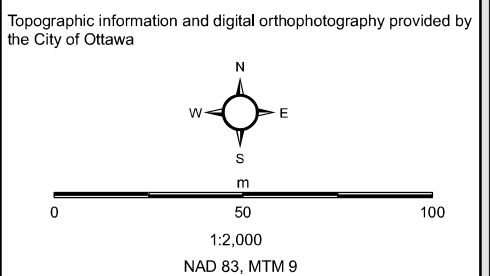
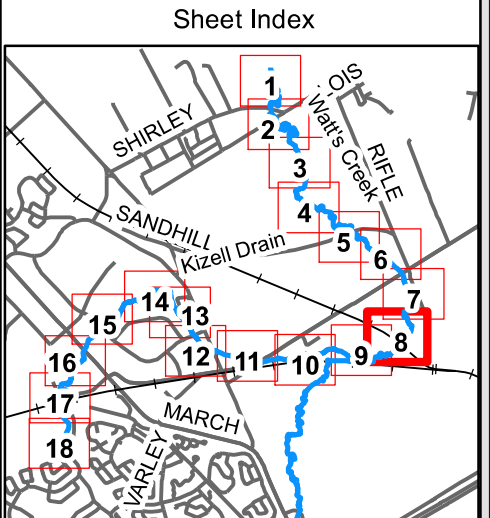
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Legend

- Watt's Creek & Kizell Drain
- HEC-RAS Cross Section Location & ID
- Hydraulic Structure Location & ID
- Extent of 100-Year Flood Line
- Match Lines
- 1.0 m Contour Interval
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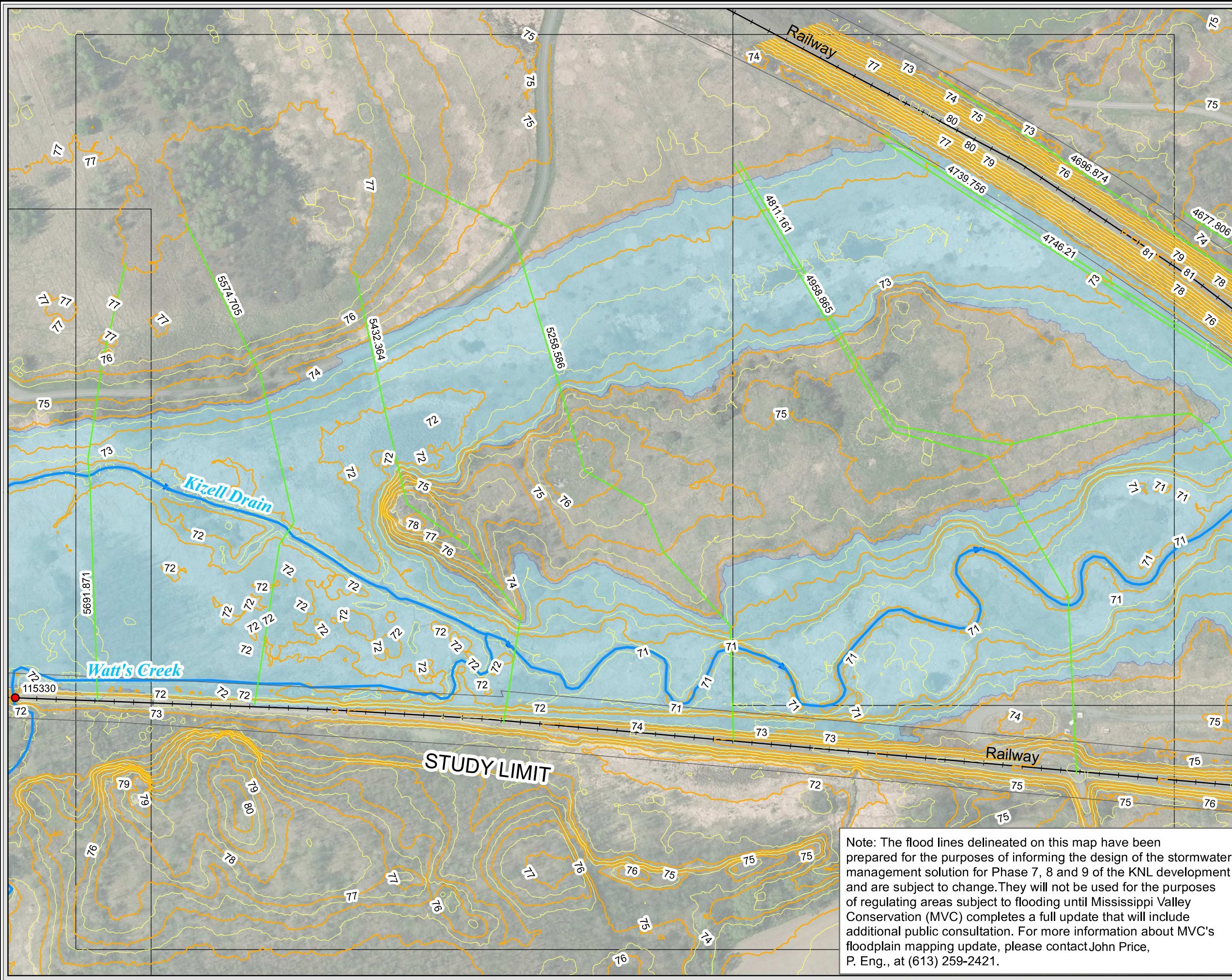
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Watt's Creek & Kizell Drain
Flood Line Delineation**

February 2015
60264539

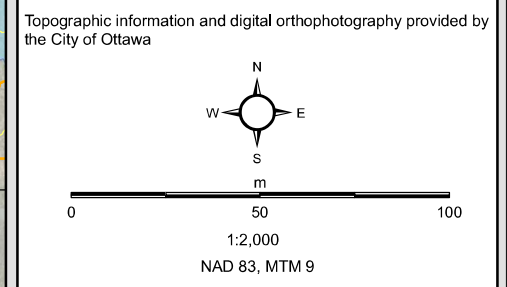
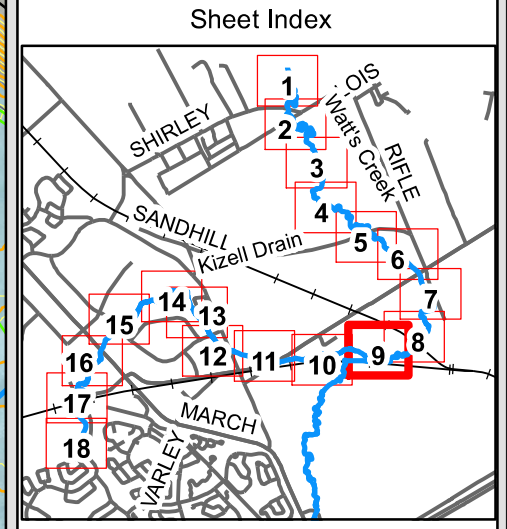
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Legend

- Watt's Creek & Kizell Drain
- HEC-RAS Cross Section Location & ID
- Hydraulic Structure Location & ID
- Extent of 100-Year Flood Line
- Match Lines
- 1.0 m Contour Interval
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- Parcel Fabric
- Spill Location



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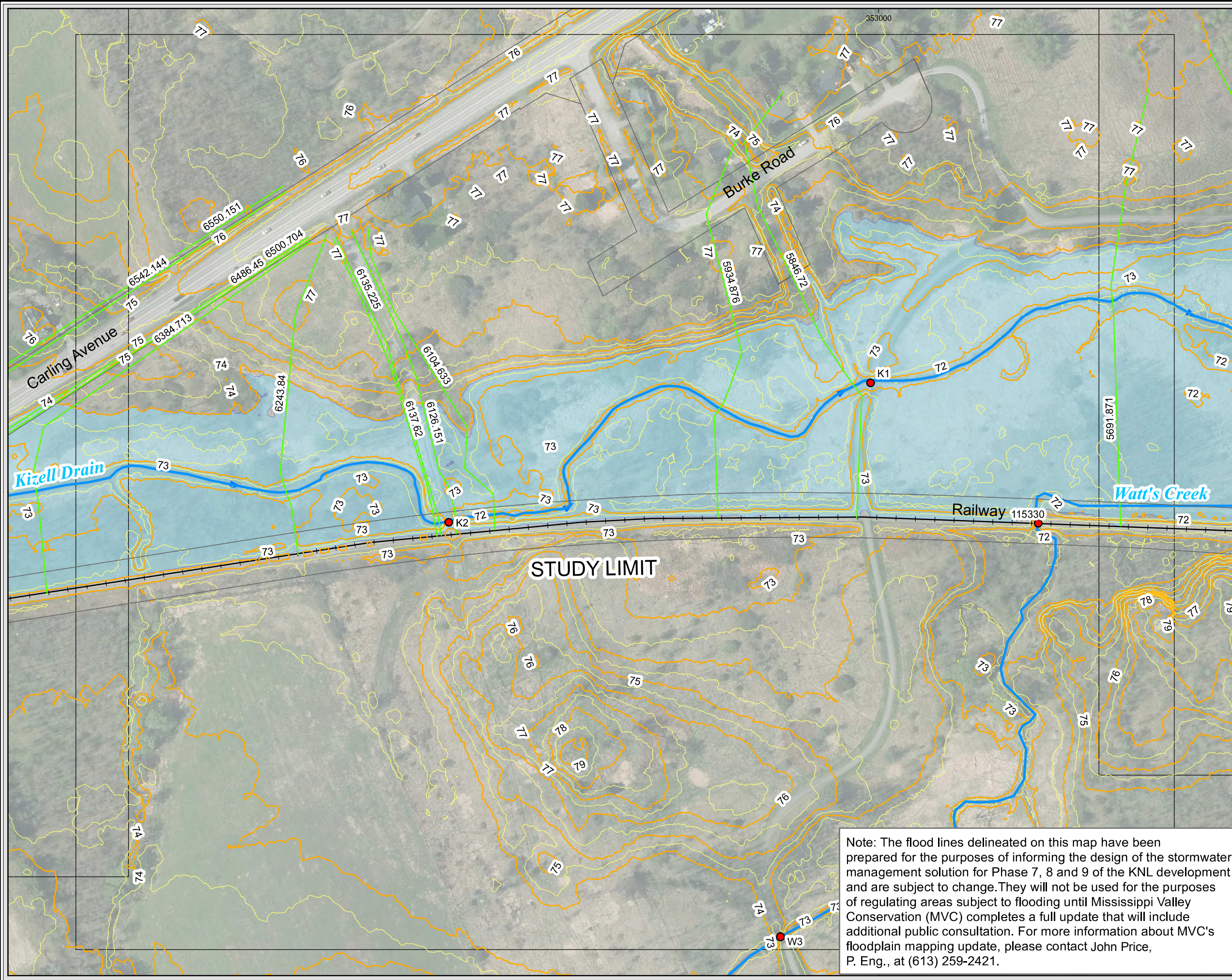
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Watt's Creek & Kizell Drain
Flood Line Delineation**

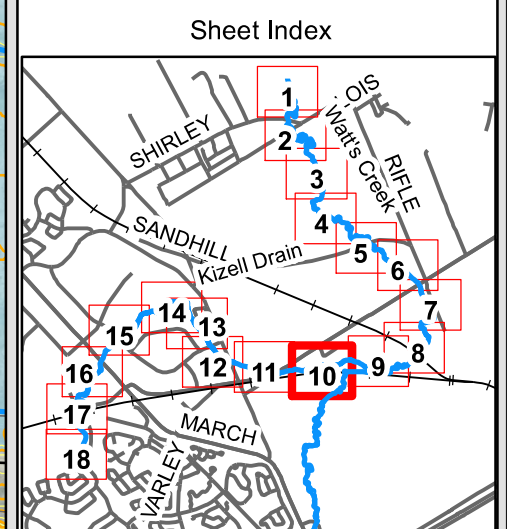
February 2015
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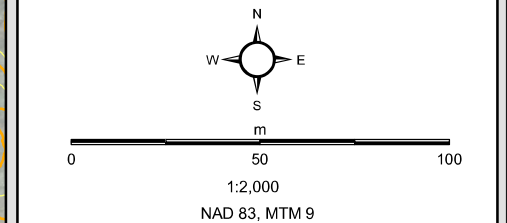
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- Legend**
- Watt's Creek & Kizell Drain
 - HEC-RAS Cross Section Location & ID
 - Hydraulic Structure Location & ID
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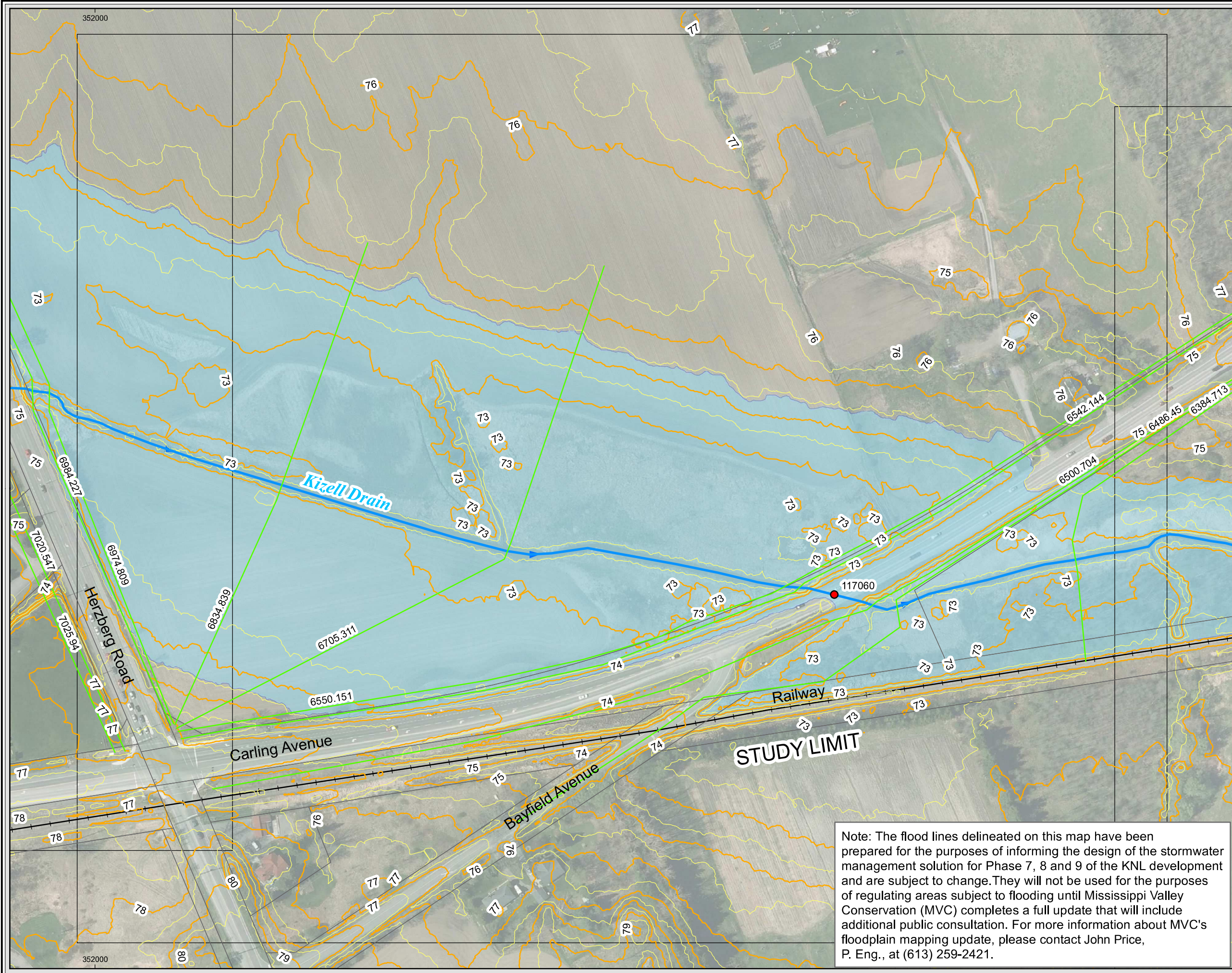
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Watt's Creek & Kizell Drain
Flood Line Delineation**

February 2015
60264539

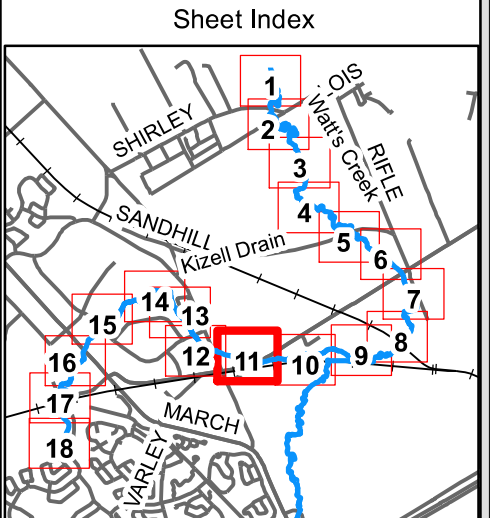
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Legend

- Watt's Creek & Kizell Drain
- HEC-RAS Cross Section Location & ID
- Hydraulic Structure Location & ID
- Extent of 100-Year Flood Line
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- 1.0 m Contour Interval
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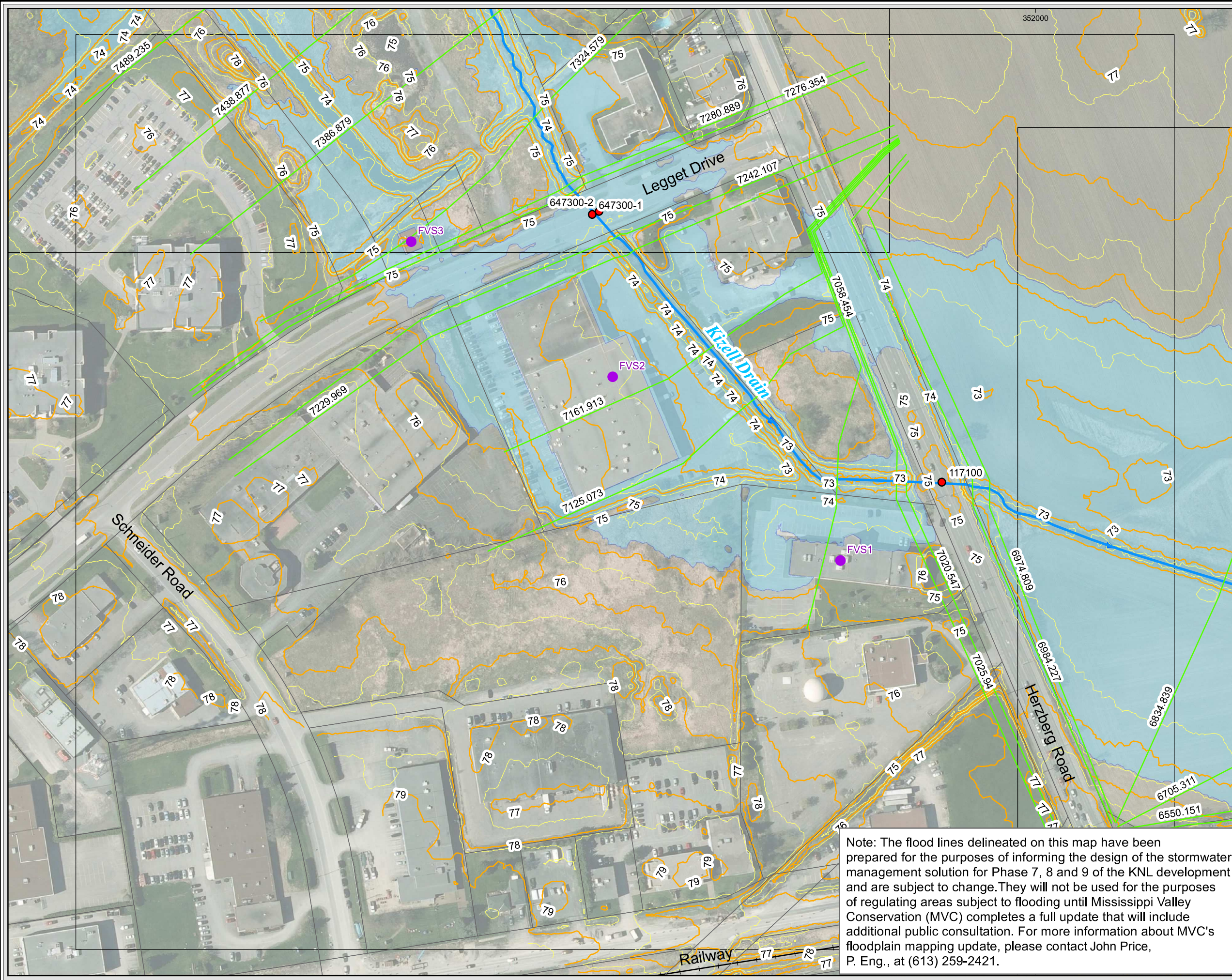
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Watt's Creek & Kizell Drain
Flood Line Delineation**

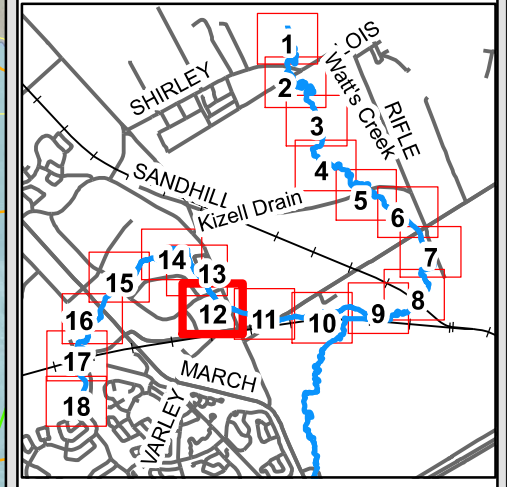
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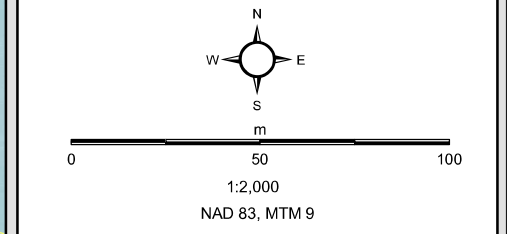
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- Legend**
- Watt's Creek & Kizell Drain
 - HEC-RAS Cross Section Location & ID
 - Hydraulic Structure Location & ID
 - Extent of 100-Year Flood Line
 - Match Lines
 - 1.0 m Contour Interval
 - 0.5 m Contour Interval
 - Parcel Fabric
 - Spill Location
 - Flood Vulnerable Structure Location & ID



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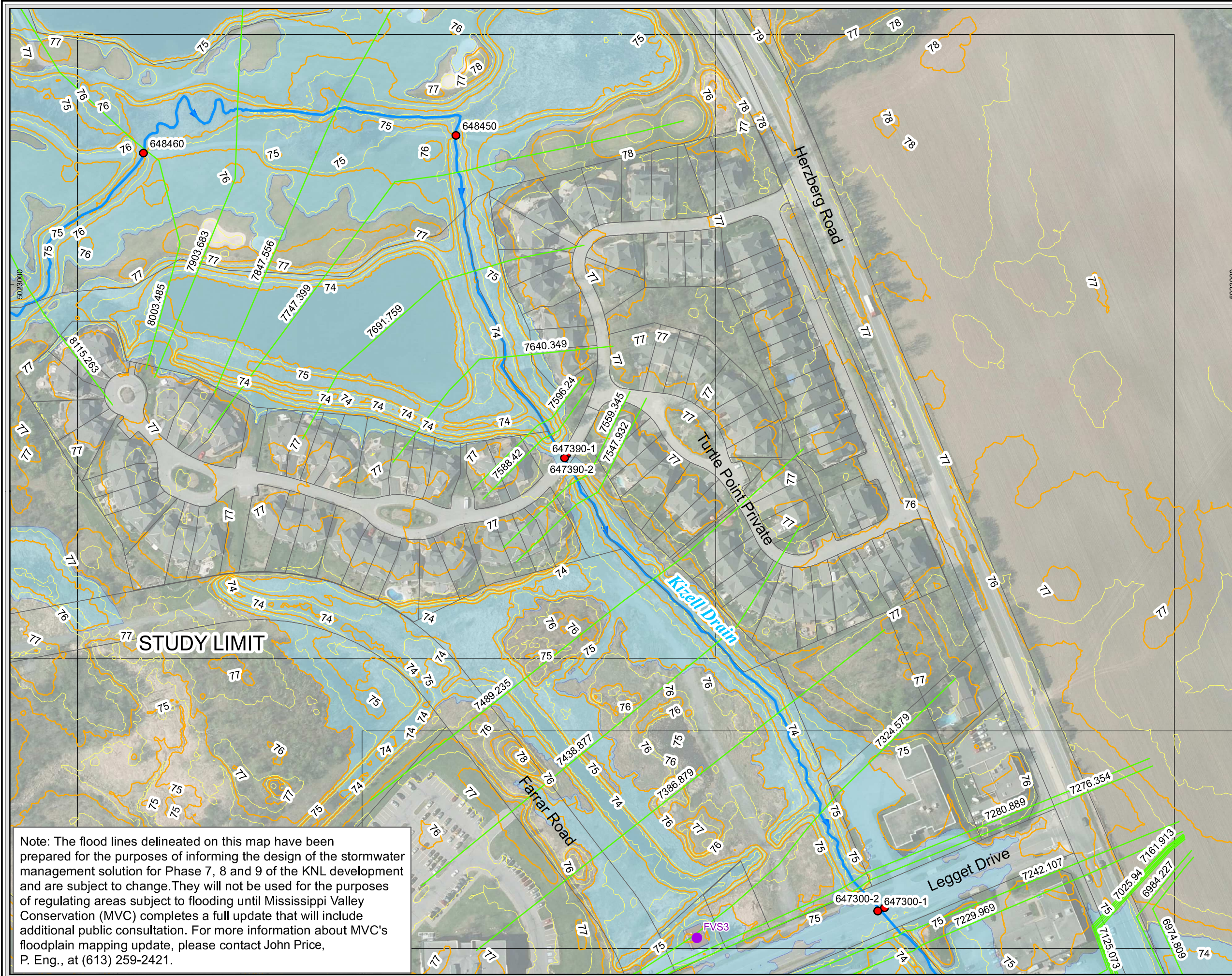


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Shirley's Brook & Watt's Creek Phase 2 SWM Study
**Watt's Creek & Kizell Drain
 Flood Line Delineation**
 February 2015
 60264539
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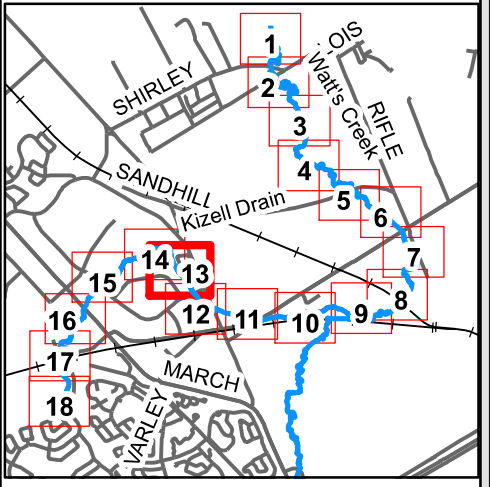


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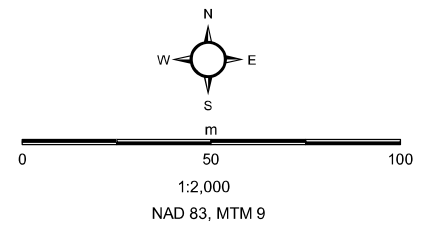
Legend

- Watt's Creek & Kizell Drain
- HEC-RAS Cross Section Location & ID
- Hydraulic Structure Location & ID
- Extent of 100-Year Flood Line
- Match Lines
- 1.0 m Contour Interval
- 0.5 m Contour Interval
- Parcel Fabric
- Spill Location
- Flood Vulnerable Structure Location & ID

Sheet Index



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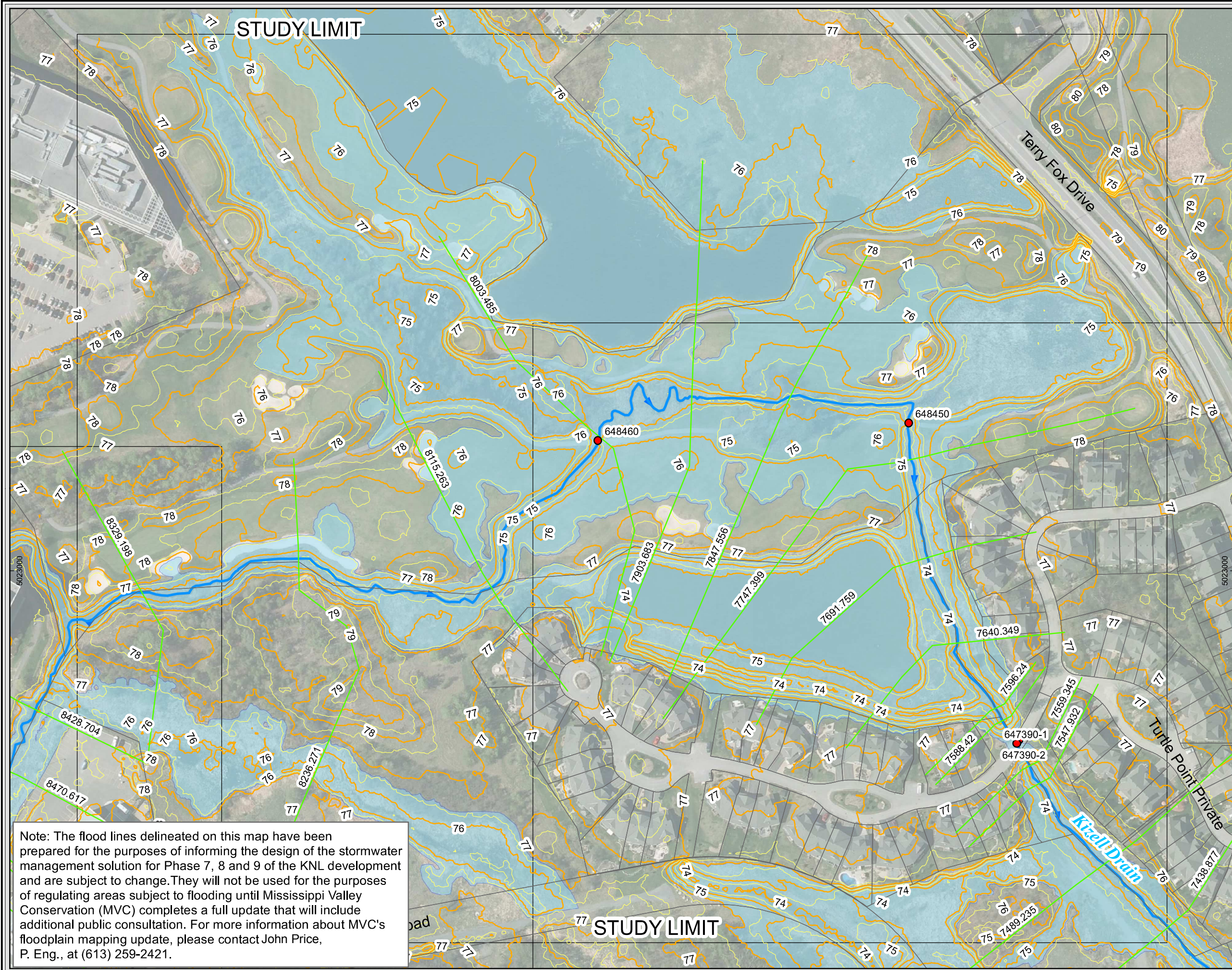
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Watt's Creek & Kizell Drain
Flood Line Delineation**

February 2015
60264539

Sheet No. 13 of 18

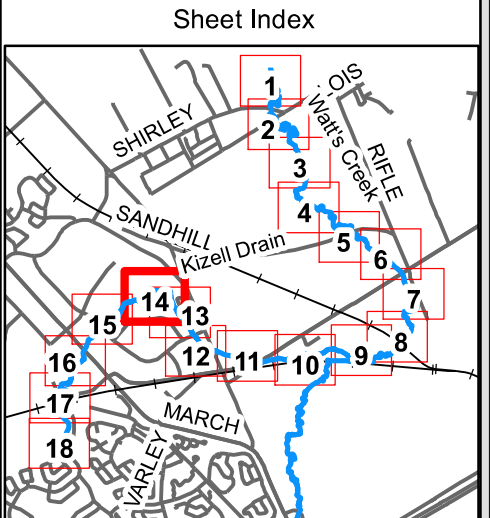
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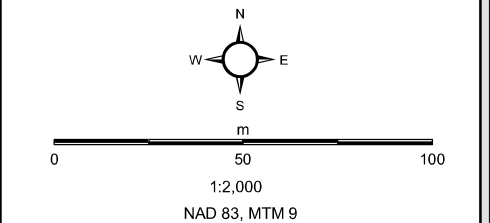
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Legend

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- Extent of 100-Year Flood Line
- Match Lines
- 1.0 m Contour Interval
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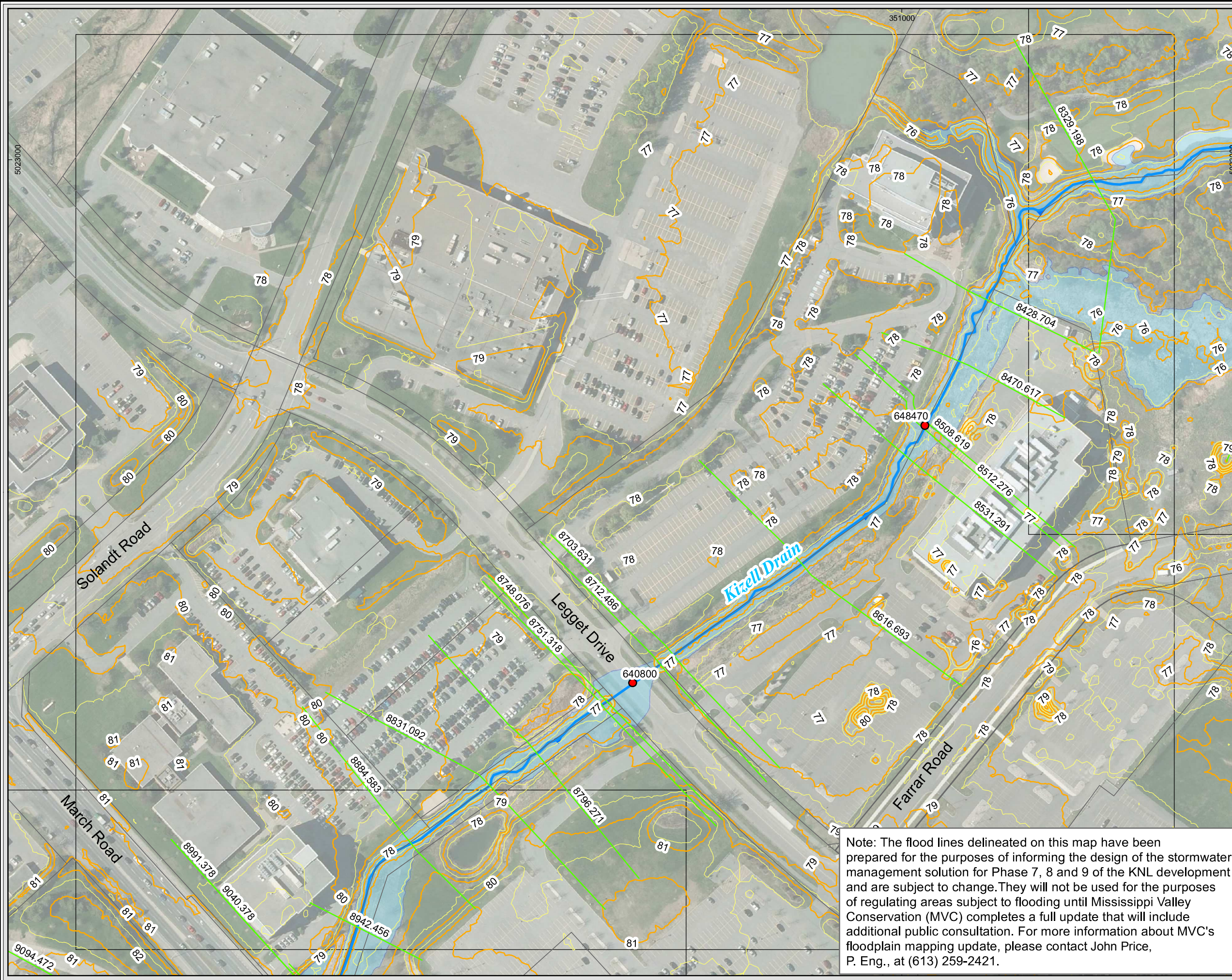


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Shirley's Brook & Watt's Creek Phase 2 SWM Study
**Watt's Creek & Kizell Drain
 Flood Line Delineation**
 February 2015
 60264539

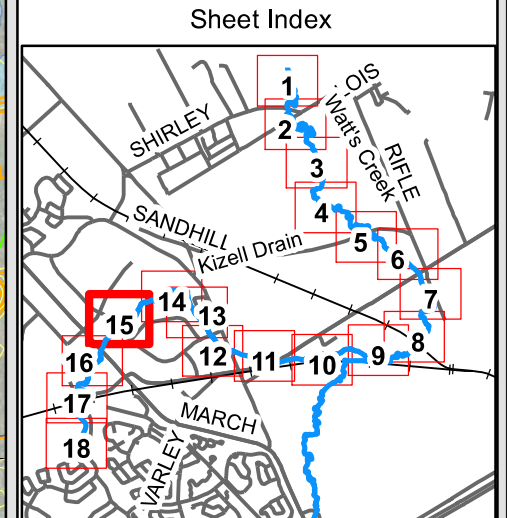
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Legend

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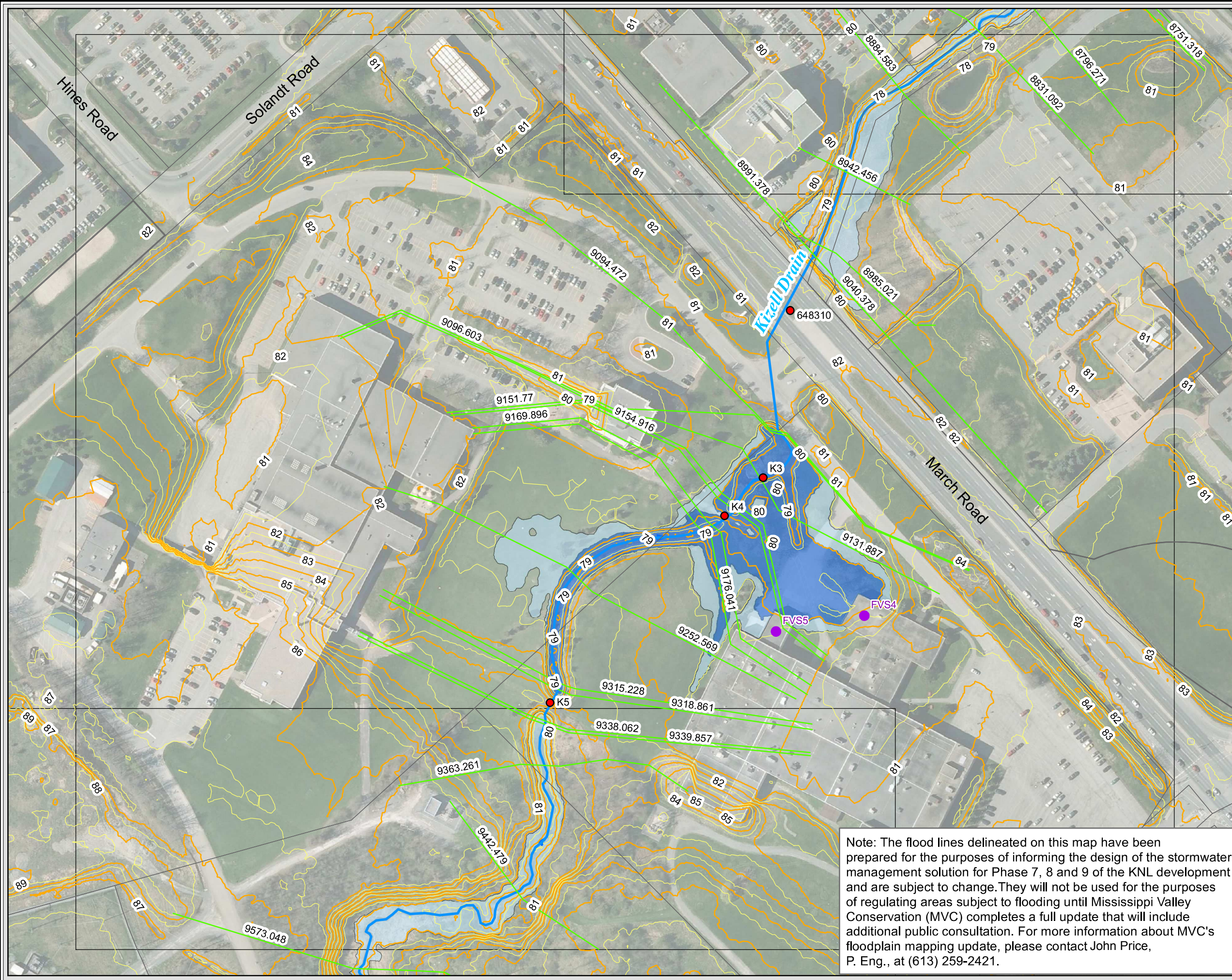
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Watt's Creek & Kizell Drain
 Flood Line Delineation**

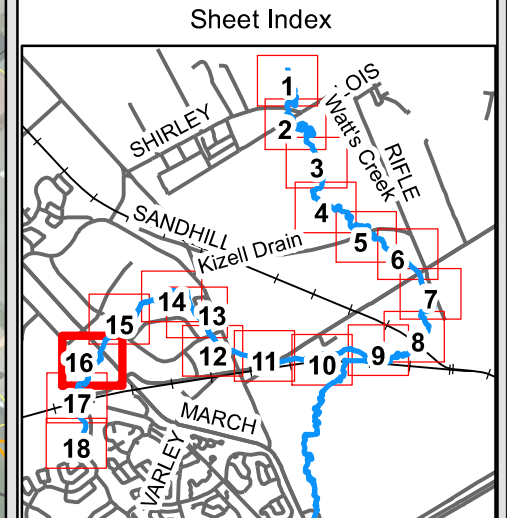
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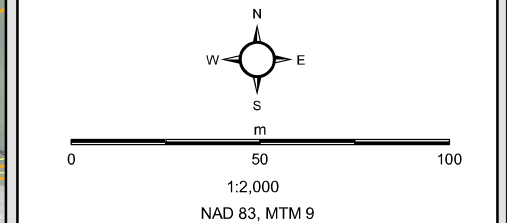
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- ### Legend
- Watt's Creek & Kizell Drain
 - HEC-RAS Cross Section Location & ID
 - Hydraulic Structure Location & ID
 - Extent of 100-Year Flood Line
 - Extent of 100-Year Flood Line (Routed Water Level)
 - Match Lines
 - 1.0 m Contour Interval
 - 0.5 m Contour Interval
 - Parcel Fabric
 - Spill Location
 - Flood Vulnerable Structure Location & ID



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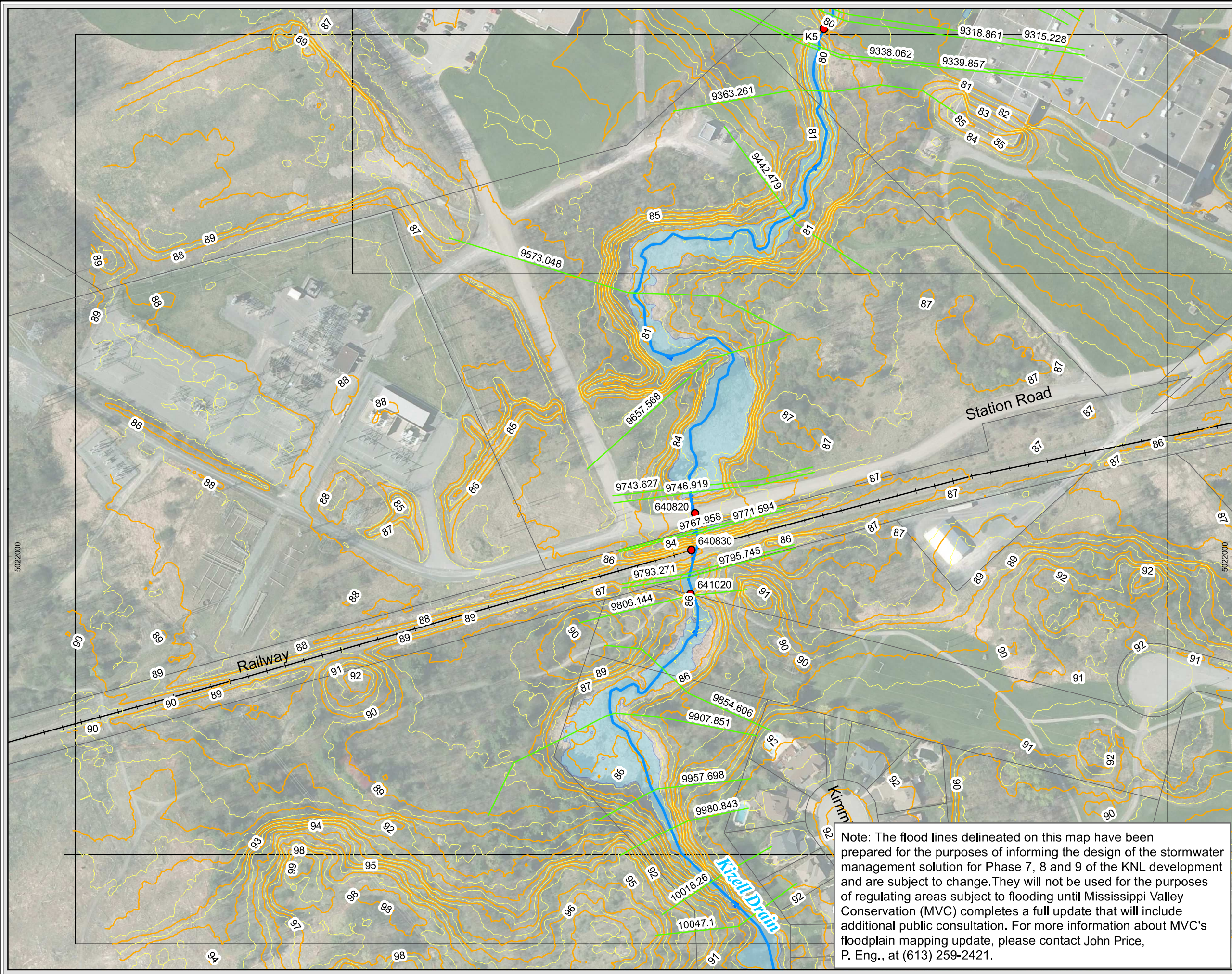
Shirley's Brook & Watt's Creek Phase 2 SWM Study

Watt's Creek & Kizell Drain Flood Line Delineation

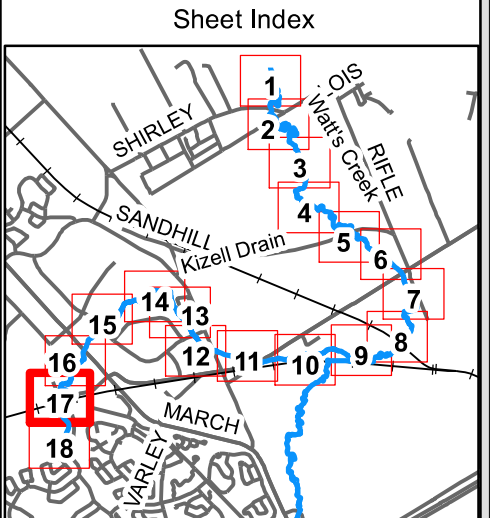
February 2015
60264539

Sheet No. 16 of 18

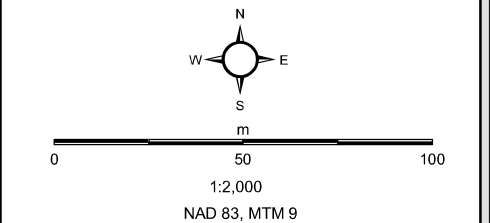
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- Legend**
- Watt's Creek & Kizell Drain
 - HEC-RAS Cross Section Location & ID
 - Hydraulic Structure Location & ID
 - Extent of 100-Year Flood Line
 - Match Lines
 - 1.0 m Contour Interval
 - 0.5 m Contour Interval
 - Parcel Fabric
 - Spill Location



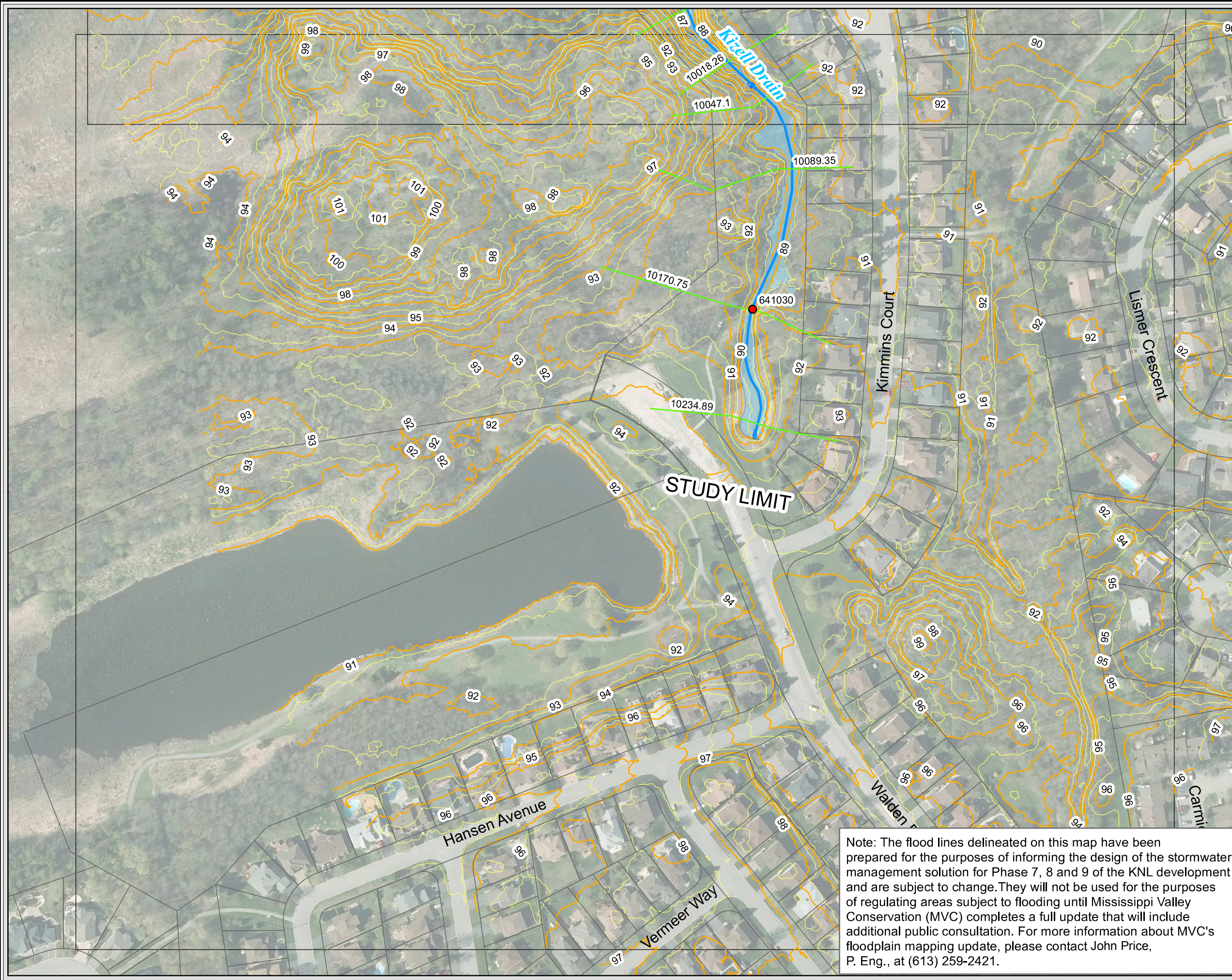
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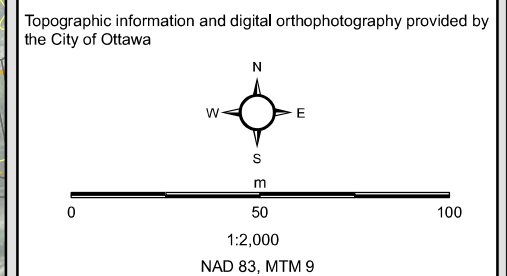
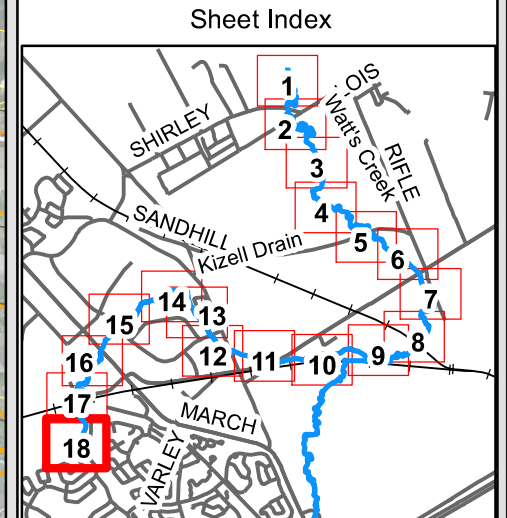
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Legend

- Watt's Creek & Kizell Drain
- HEC-RAS Cross Section Location & ID
- Hydraulic Structure Location & ID
- Extent of 100-Year Flood Line
- Match Lines
- 1.0 m Contour Interval
- 0.5 m Contour Interval
- Parcel Fabric
- Spill Location



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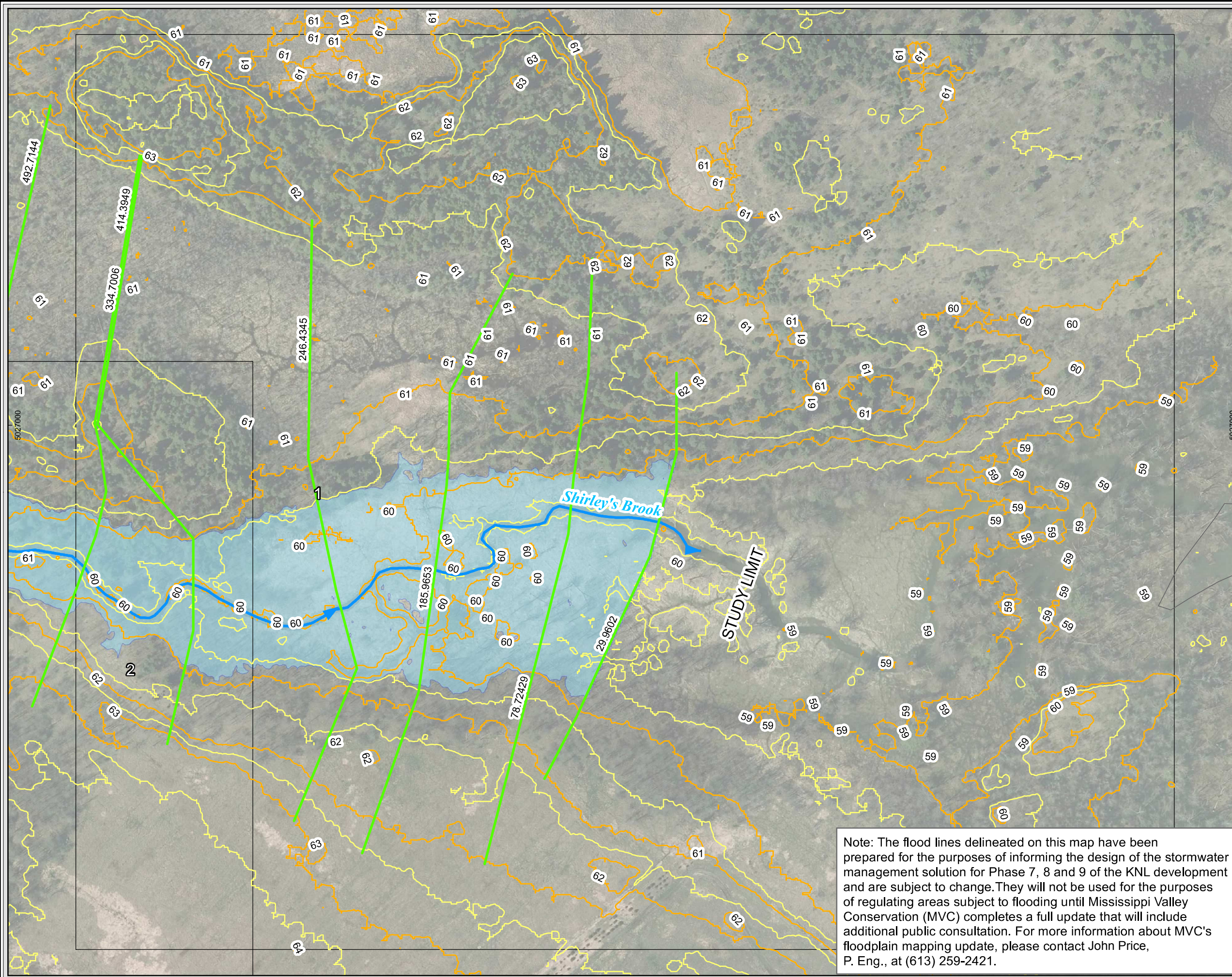
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Watt's Creek & Kizell Drain
Flood Line Delineation**

February 2015
60264539

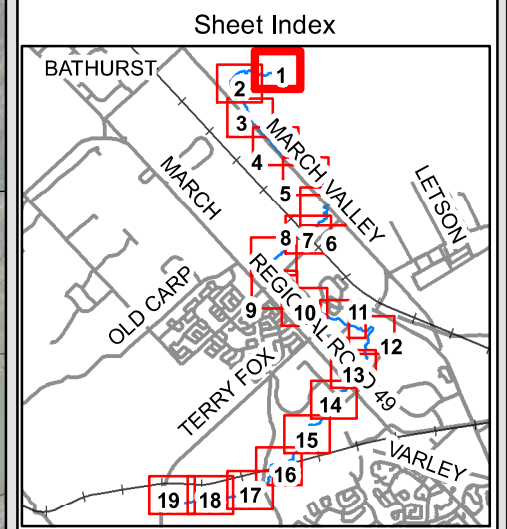
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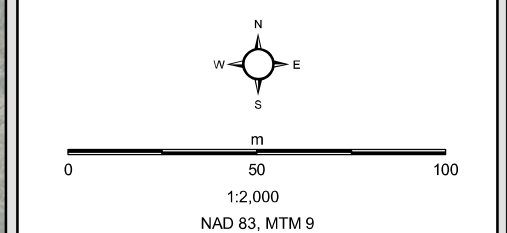


Legend

- Shirley's Brook
- HEC-RAS Cross Sections**
- X-Sections (LiDAR)
- X-Sections (Design Information)
- X-Sections (Contours)
- Hydraulic Structure Location & ID
- Extent of 100-Year Flood Line
- Match Lines
- 1.0 m Contour Interval
- 0.5 m Contour Interval
- Parcel Fabric
- Spill Location



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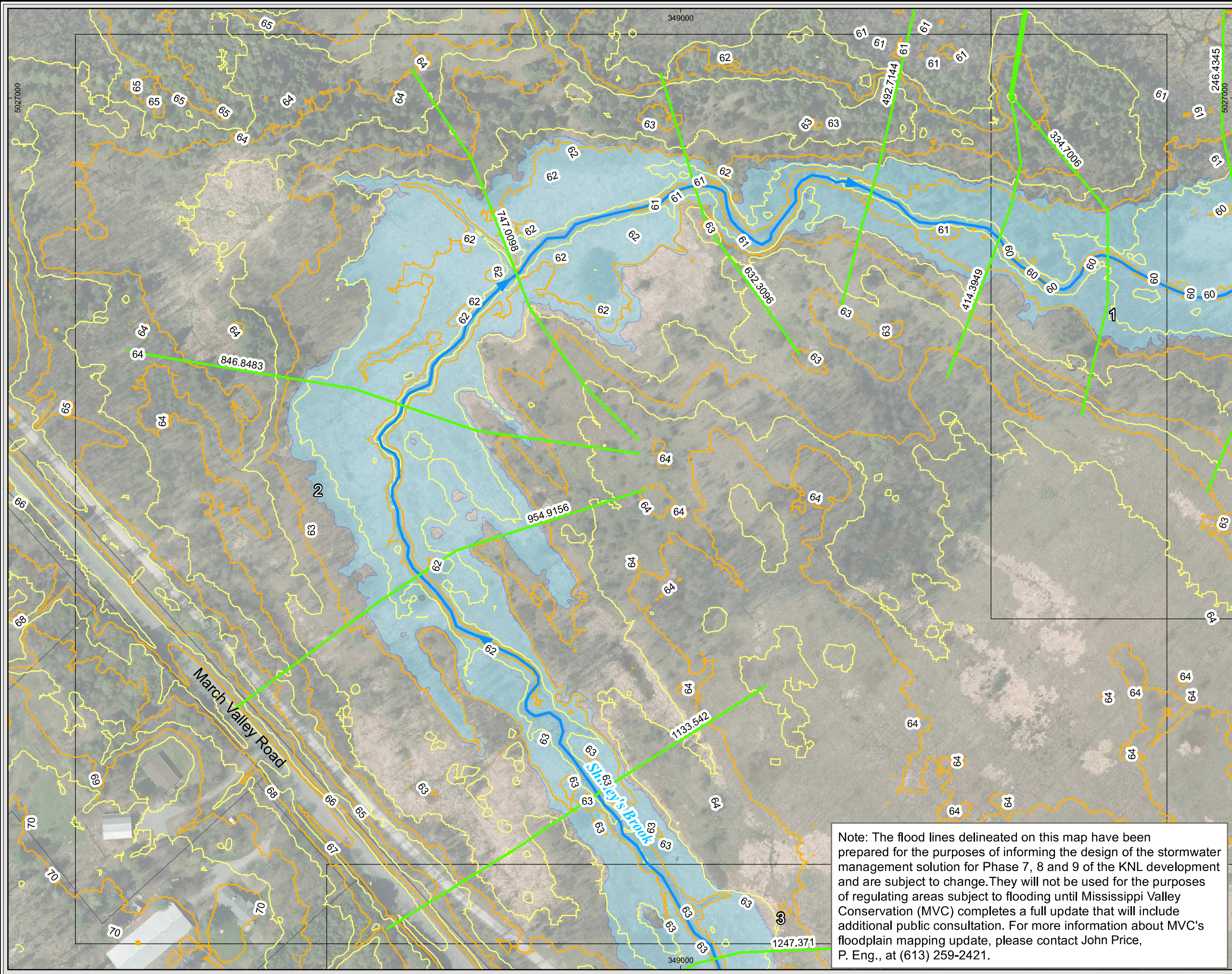
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Shirley's Brook
Flood Line Delineation**

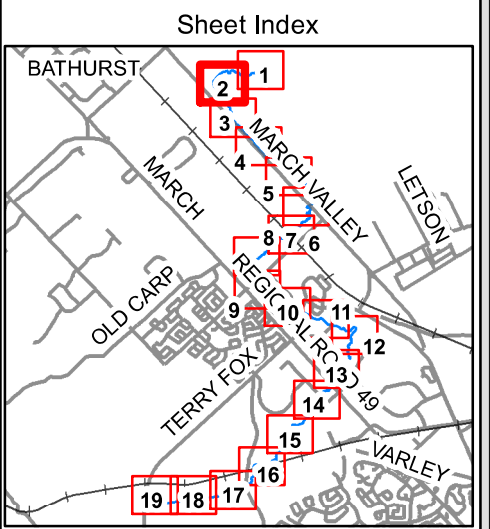
February 2015
60264539

Sheet No. 1 of 19

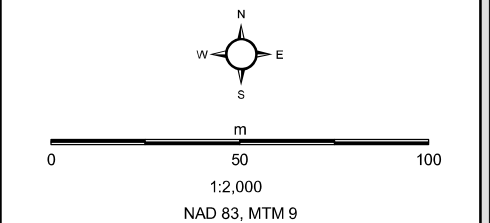
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- Legend**
- Shirley's Brook
 - HEC-RAS Cross Sections**
 - X-Sections (LiDAR)
 - X-Sections (Design Information)
 - X-Sections (Contours)
 - Hydraulic Structure Location & ID
 - Extent of 100-Year Flood Line
 - Match Lines
 - 1.0 m Contour Interval
 - 0.5 m Contour Interval
 - Parcel Fabric
 - Spill Location



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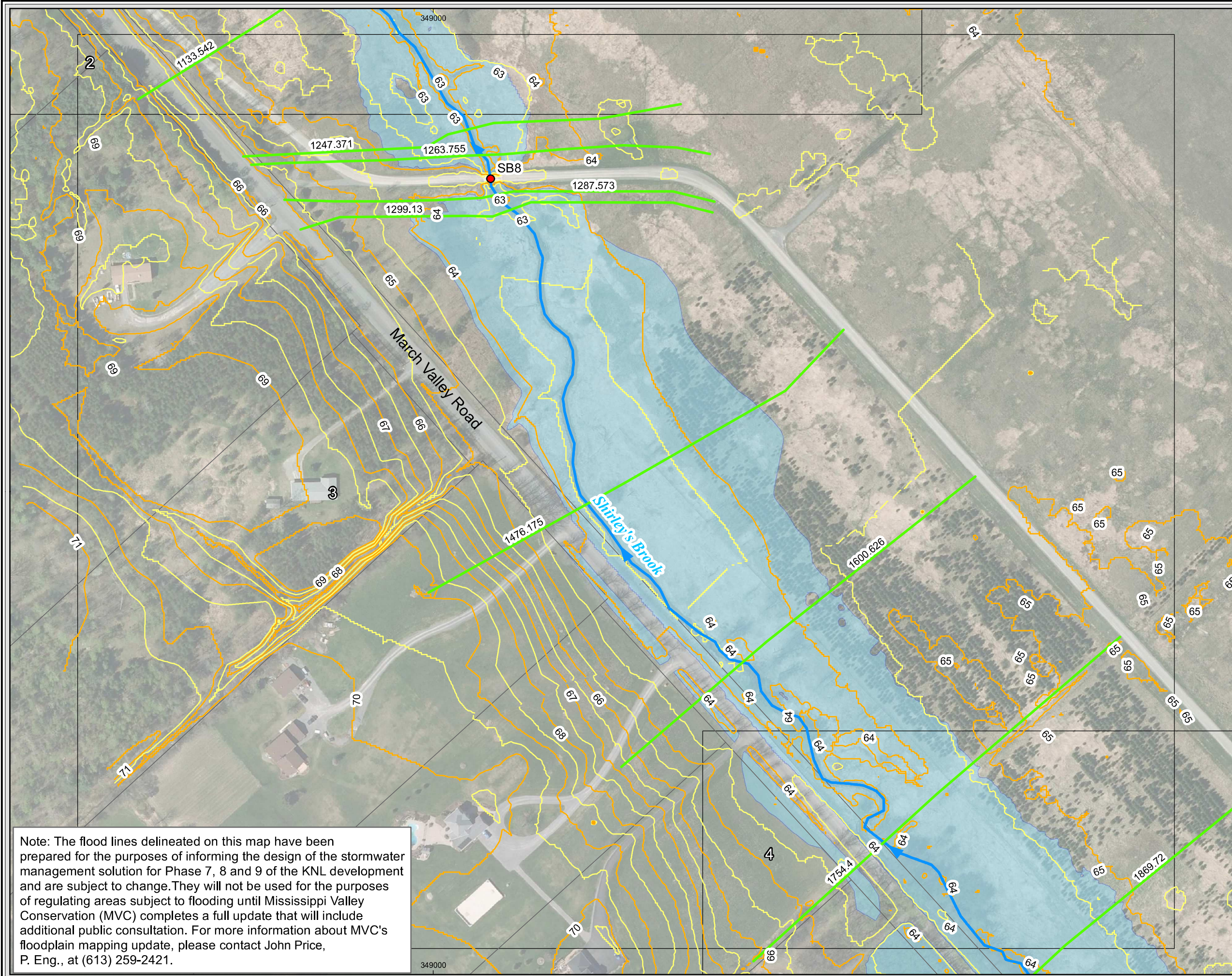
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Shirley's Brook
Flood Line Delineation**

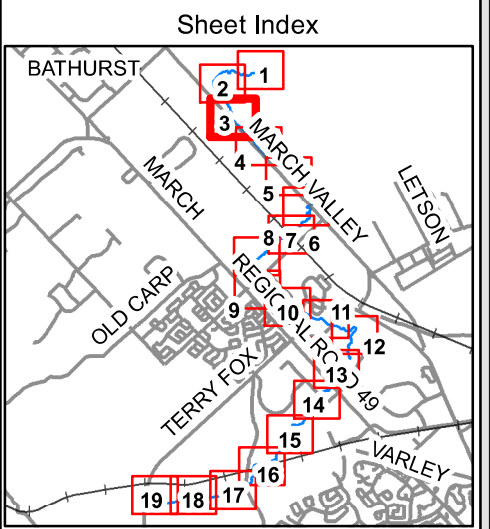
February 2015
60264539

AECOM Sheet No. 2 of 19

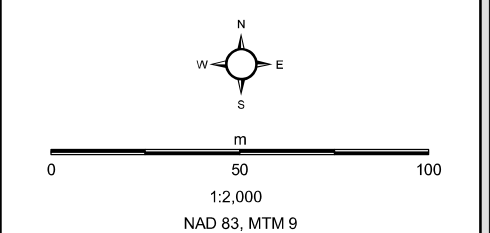
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- Legend**
- Shirley's Brook
 - HEC-RAS Cross Sections**
 - X-Sections (LiDAR)
 - X-Sections (Design Information)
 - X-Sections (Contours)
 - Hydraulic Structure Location & ID
 - Extent of 100-Year Flood Line
 - Match Lines
 - 1.0 m Contour Interval
 - 0.5 m Contour Interval
 - Parcel Fabric
 - Spill Location



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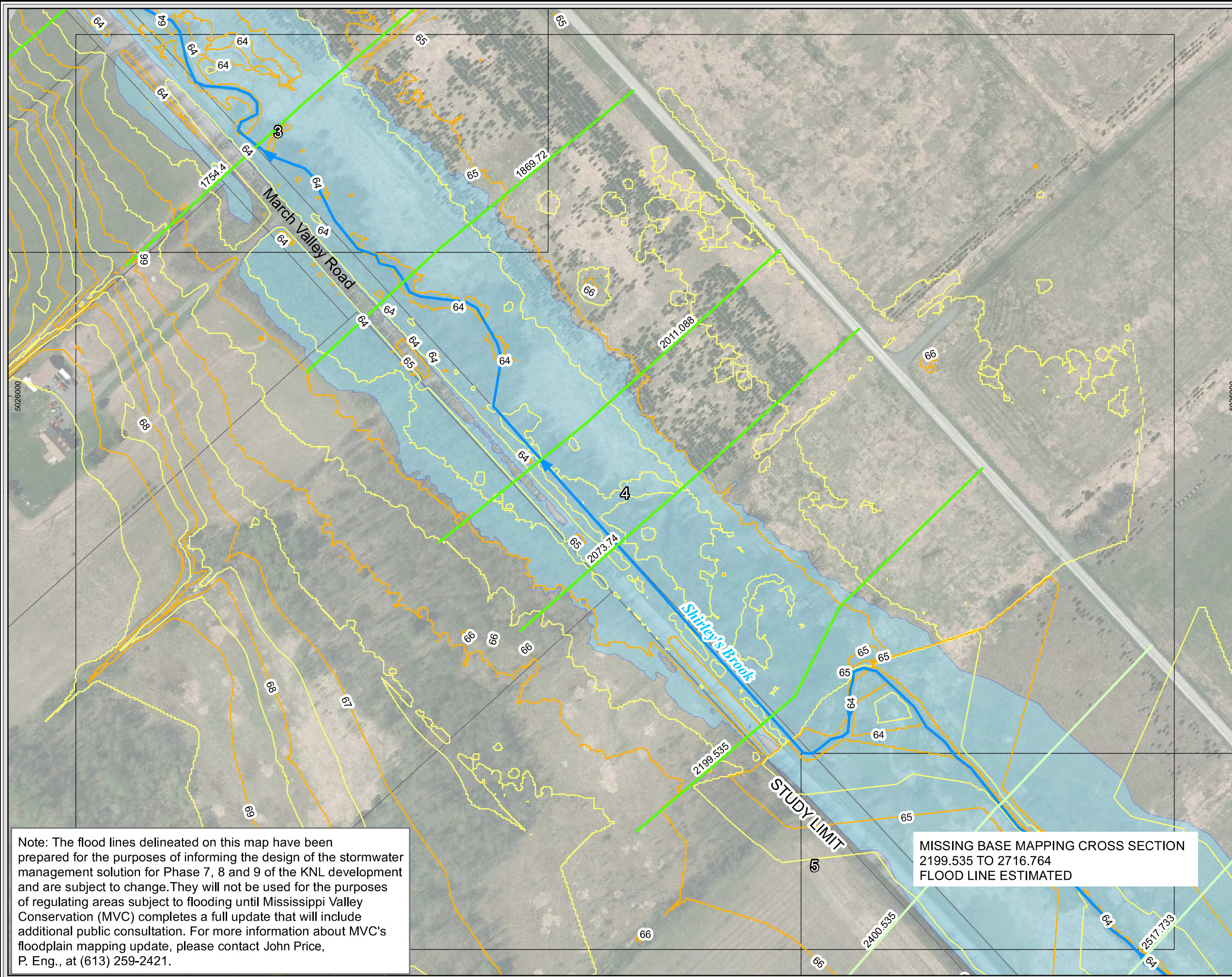
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Shirley's Brook
Flood Line Delineation**

February 2015
60264539

AECOM Sheet No. 3 of 19

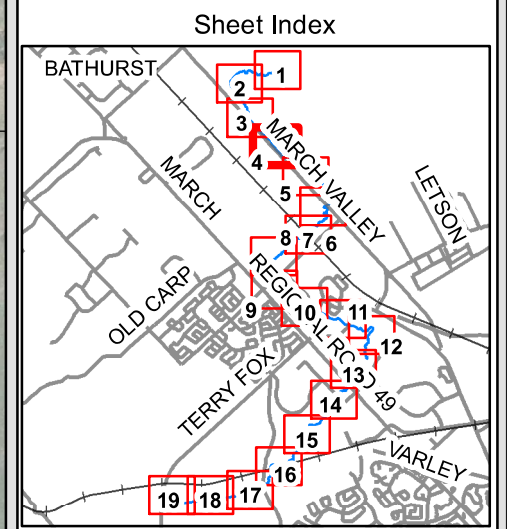
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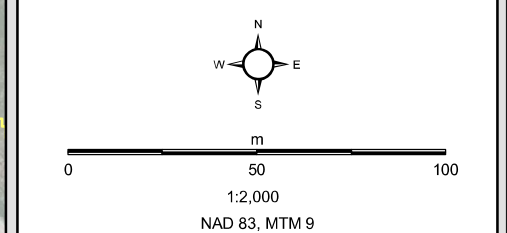
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MISSING BASE MAPPING CROSS SECTION
 2199.535 TO 2716.764
 FLOOD LINE ESTIMATED

- Legend**
- Shirley's Brook
 - HEC-RAS Cross Sections**
 - X-Sections (LiDAR)
 - X-Sections (Design Information)
 - X-Sections (Contours)
 - Hydraulic Structure Location & ID
 - Extent of 100-Year Flood Line
 - Match Lines
 - 1.0 m Contour Interval
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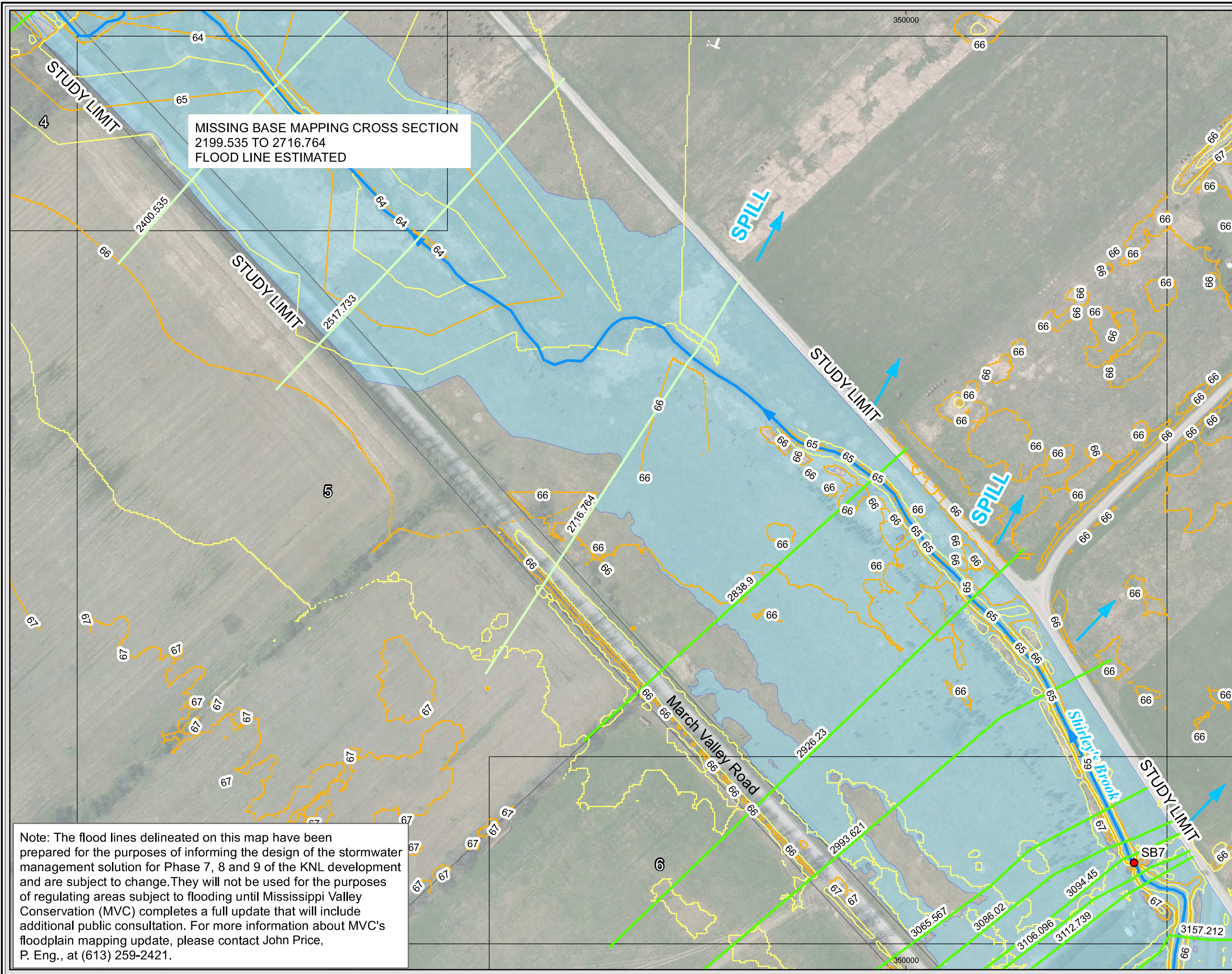
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Shirley's Brook
 Flood Line Delineation**

February 2015
 60264539

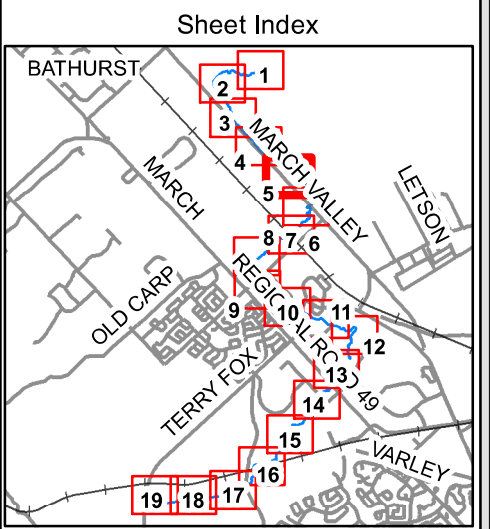
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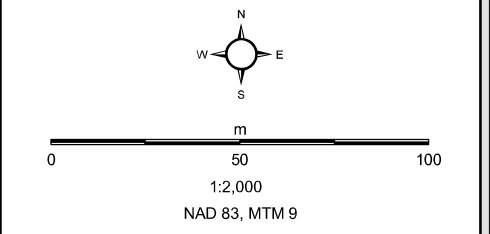


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- Legend**
- Shirley's Brook
 - HEC-RAS Cross Sections**
 - X-Sections (LiDAR)
 - X-Sections (Design Information)
 - X-Sections (Contours)
 - Hydraulic Structure Location & ID
 - Extent of 100-Year Flood Line
 - Match Lines
 - 1.0 m Contour Interval
 - 0.5 m Contour Interval
 - Parcel Fabric
 - Spill Location



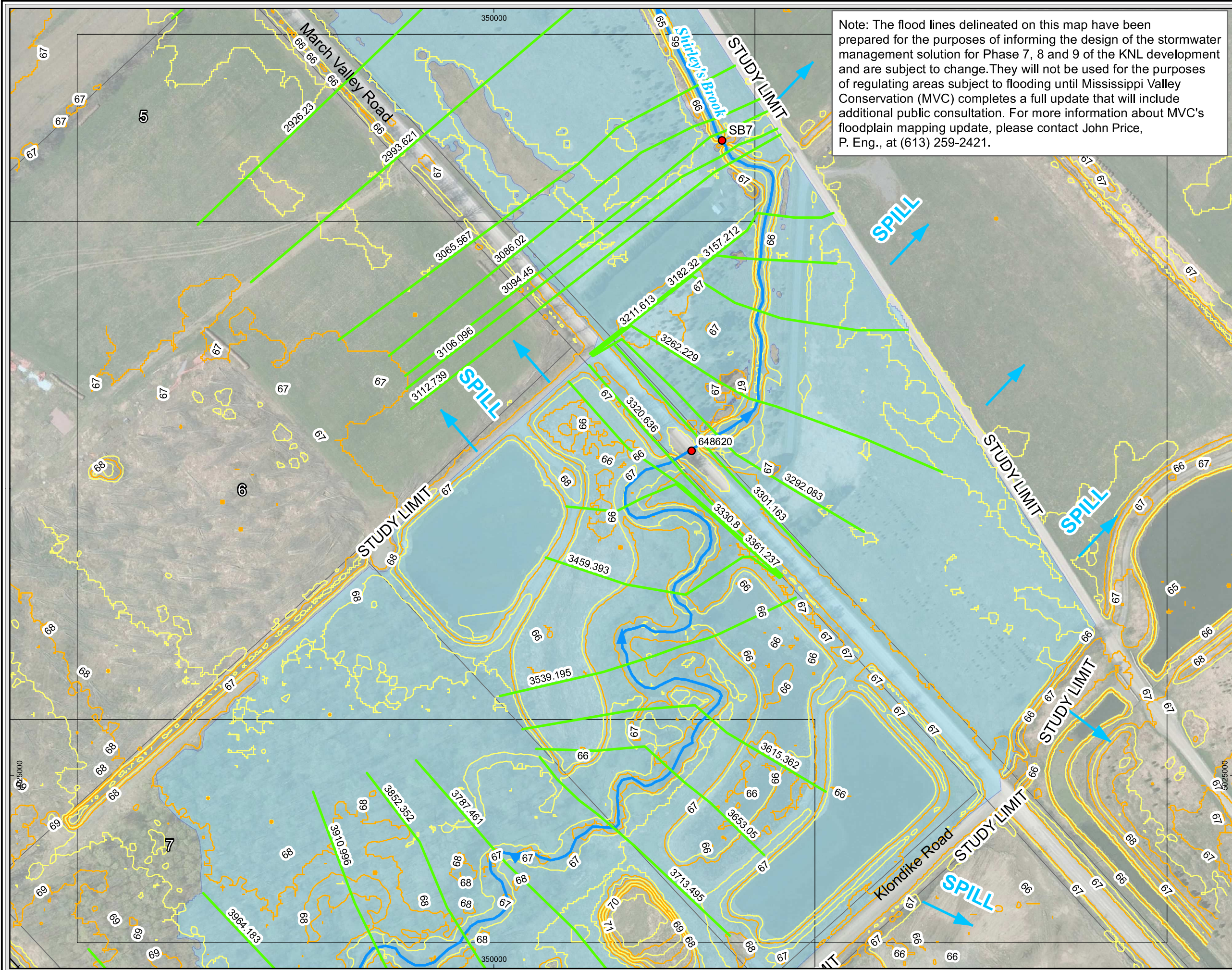
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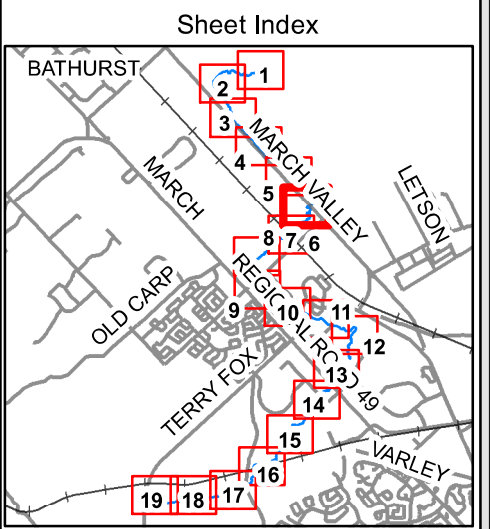
Shirley's Brook & Watt's Creek Phase 2 SWM Study
**Shirley's Brook
Flood Line Delineation**
February 2015
60264539

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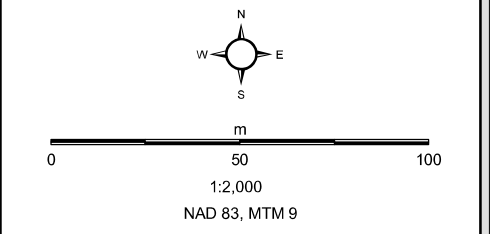


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- Legend**
- Shirley's Brook
 - HEC-RAS Cross Sections**
 - X-Sections (LiDAR)
 - X-Sections (Design Information)
 - X-Sections (Contours)
 - Hydraulic Structure Location & ID
 - Extent of 100-Year Flood Line
 - Match Lines
 - 1.0 m Contour Interval
 - 0.5 m Contour Interval
 - Parcel Fabric
 - Spill Location



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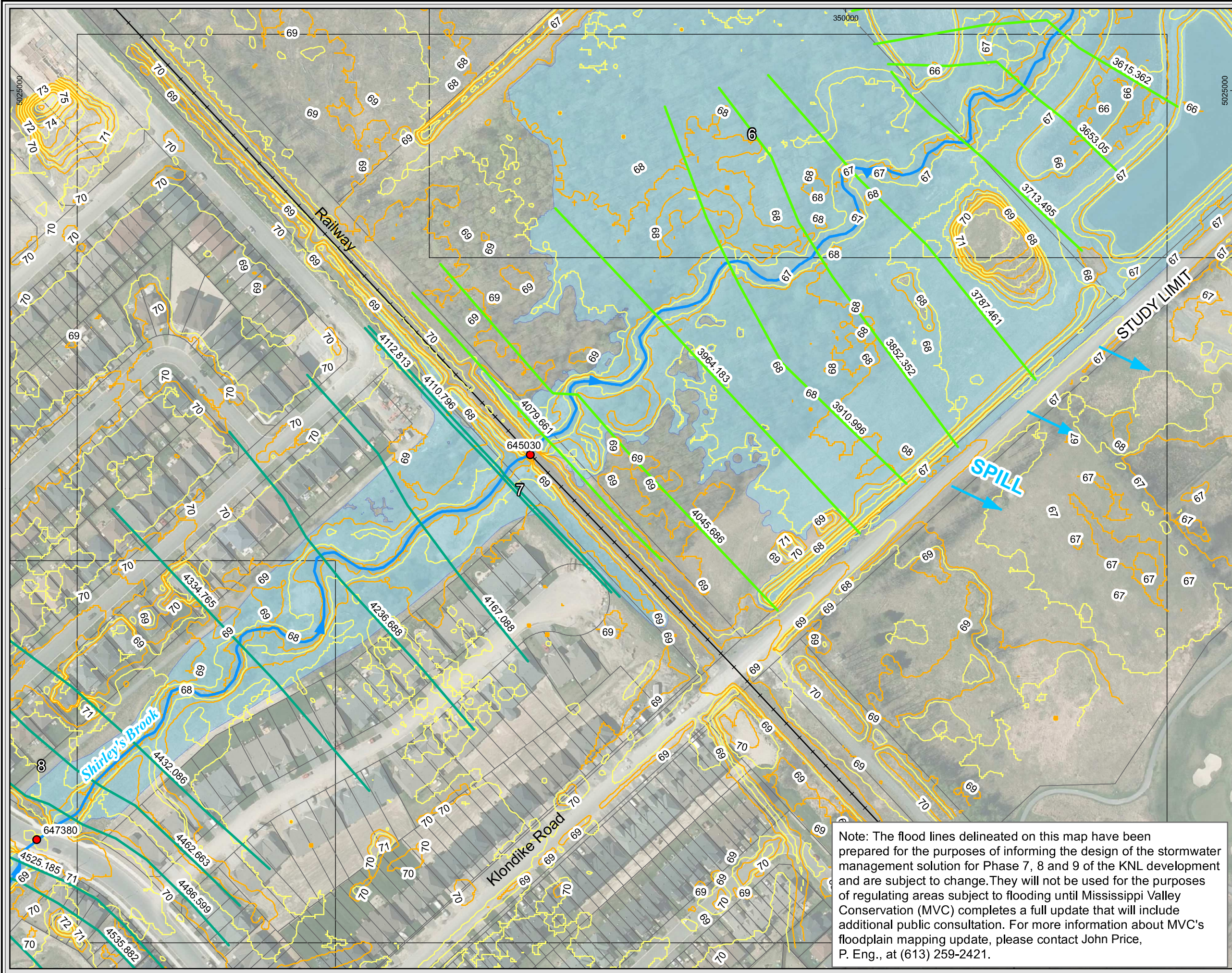
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Shirley's Brook
Flood Line Delineation**

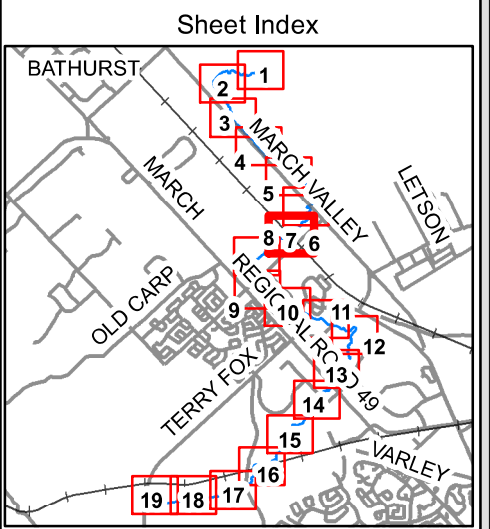
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AECOM Sheet No. 6 of 19

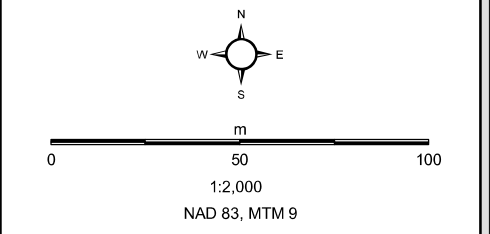
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- Legend**
- Shirley's Brook
 - HEC-RAS Cross Sections**
 - X-Sections (LiDAR)
 - X-Sections (Design Information)
 - X-Sections (Contours)
 - Hydraulic Structure Location & ID
 - Extent of 100-Year Flood Line
 - Match Lines
 - 1.0 m Contour Interval
 - 0.5 m Contour Interval
 - Parcel Fabric
 - Spill Location



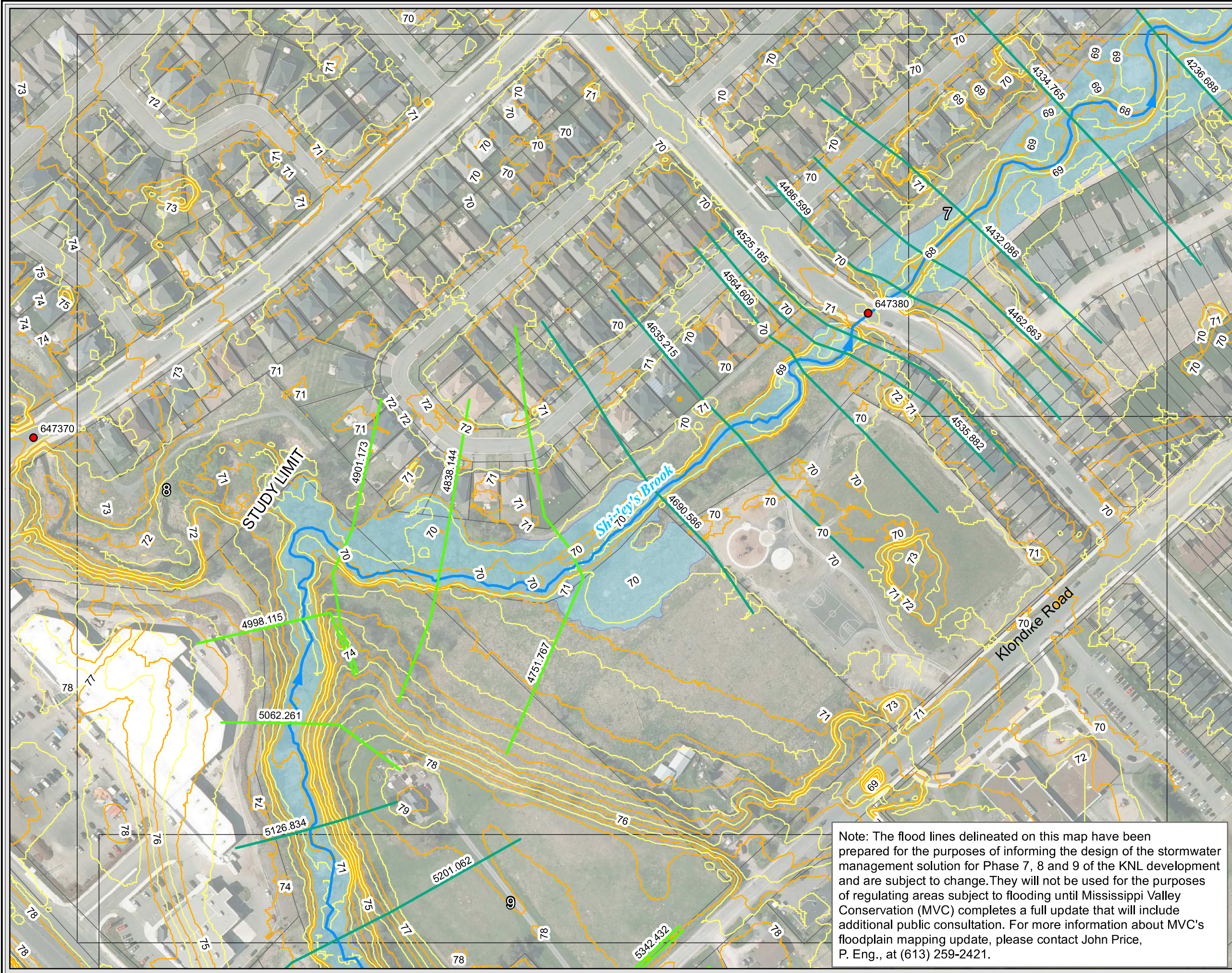
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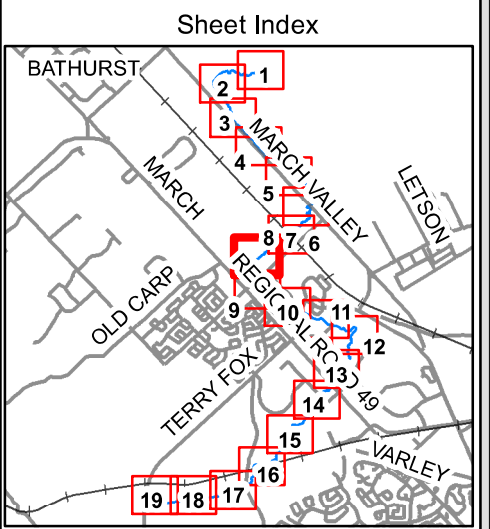
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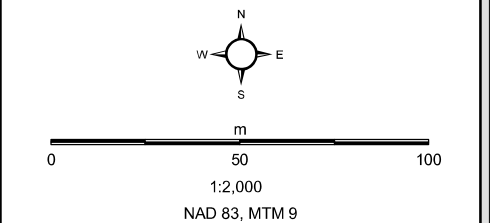


Legend

- Shirley's Brook
- HEC-RAS Cross Sections**
- X-Sections (LiDAR)
- X-Sections (Design Information)
- X-Sections (Contours)
- Hydraulic Structure Location & ID
- Extent of 100-Year Flood Line
- Match Lines
- 1.0 m Contour Interval
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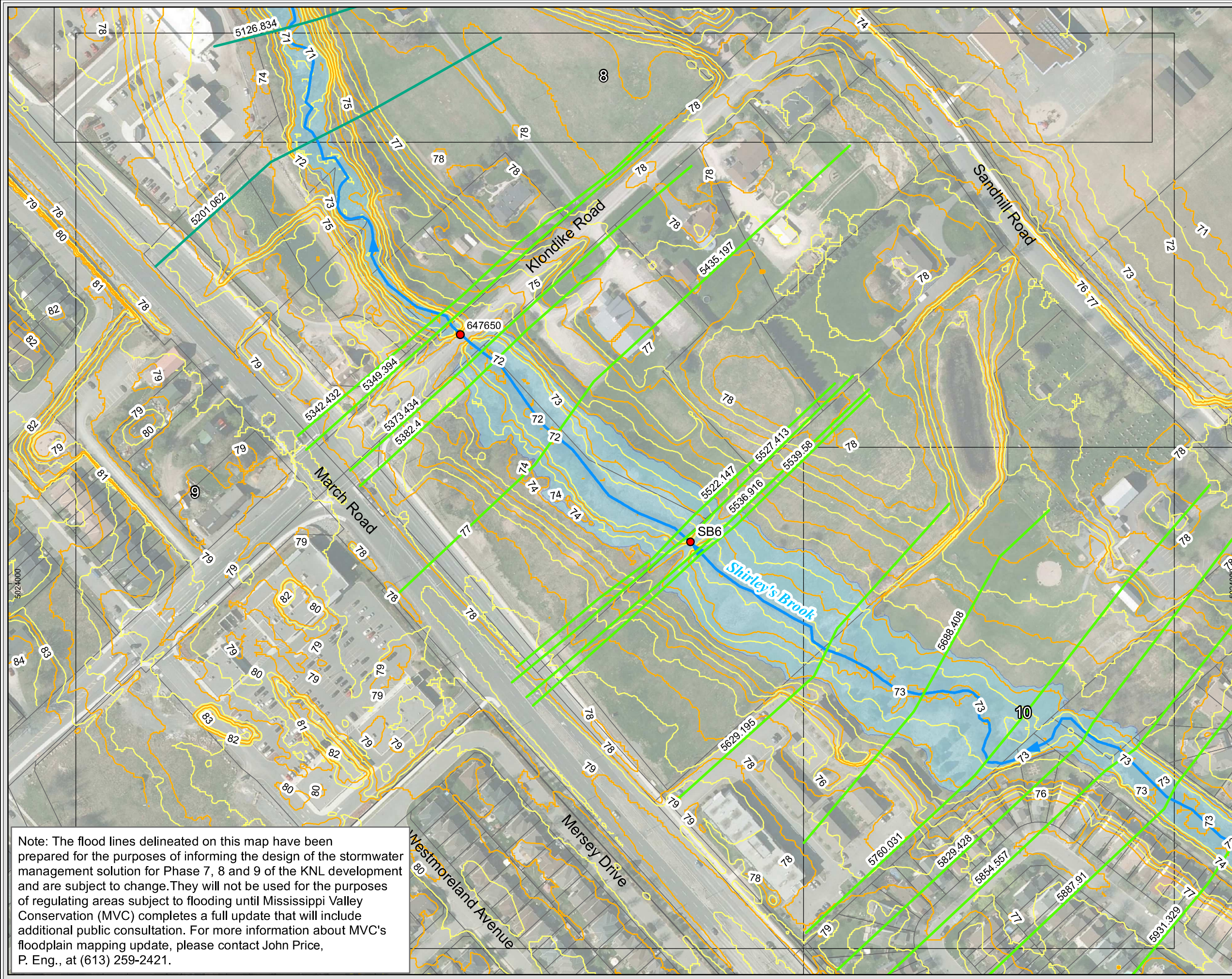
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Shirley's Brook
Flood Line Delineation**

February 2015
60264539

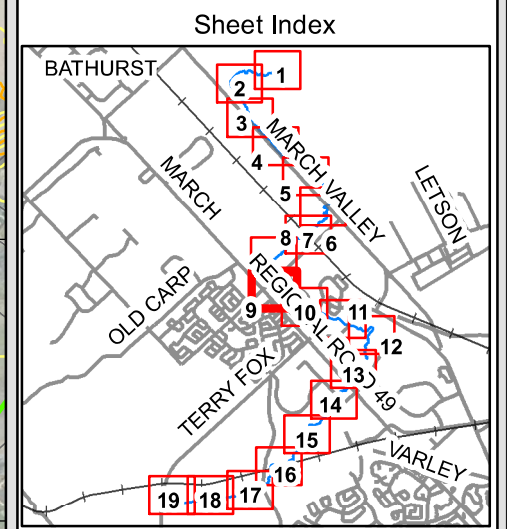
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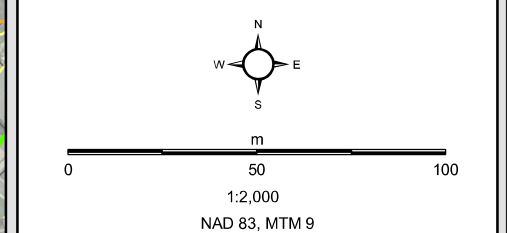


Legend

- Shirley's Brook
- HEC-RAS Cross Sections**
- X-Sections (LiDAR)
- X-Sections (Design Information)
- X-Sections (Contours)
- Hydraulic Structure Location & ID
- Extent of 100-Year Flood Line
- Match Lines
- 1.0 m Contour Interval
- 0.5 m Contour Interval
- Parcel Fabric
- Spill Location



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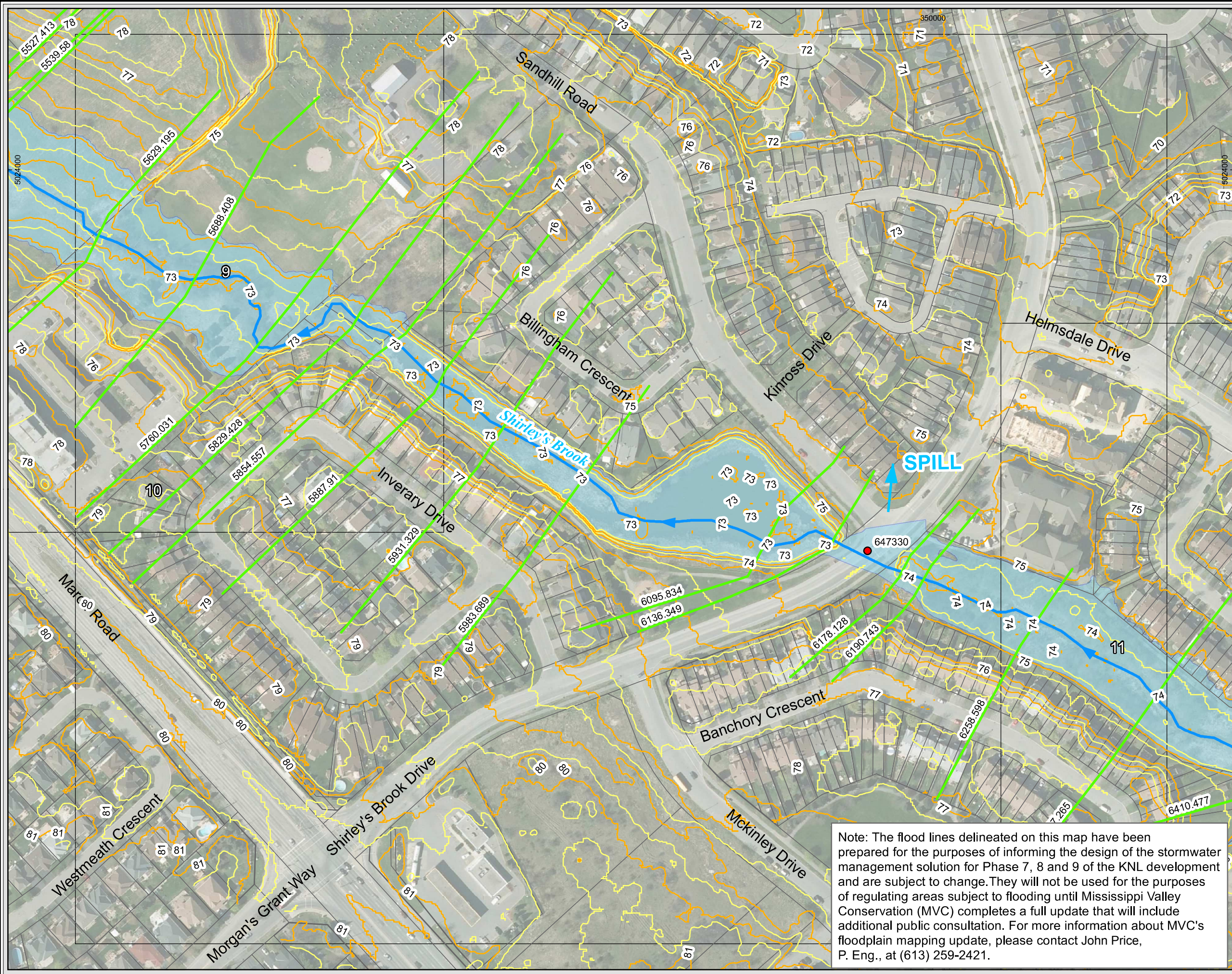
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Shirley's Brook
Flood Line Delineation**

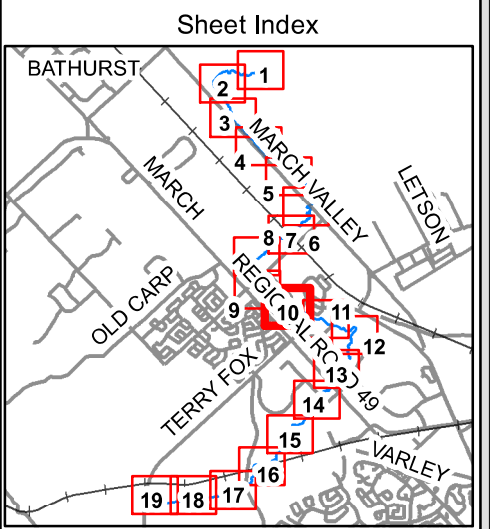
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60264539

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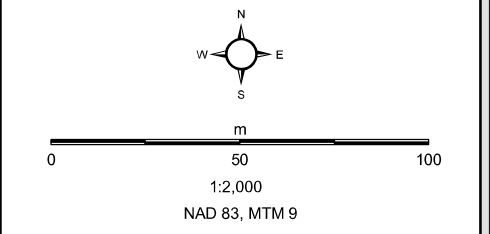
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 Time: 2/13/19 PM Date: 2/9/2016



- Legend**
- Shirley's Brook
 - HEC-RAS Cross Sections**
 - X-Sections (LiDAR)
 - X-Sections (Design Information)
 - X-Sections (Contours)
 - Hydraulic Structure Location & ID
 - Extent of 100-Year Flood Line
 - Match Lines
 - 1.0 m Contour Interval
 - 0.5 m Contour Interval
 - Parcel Fabric
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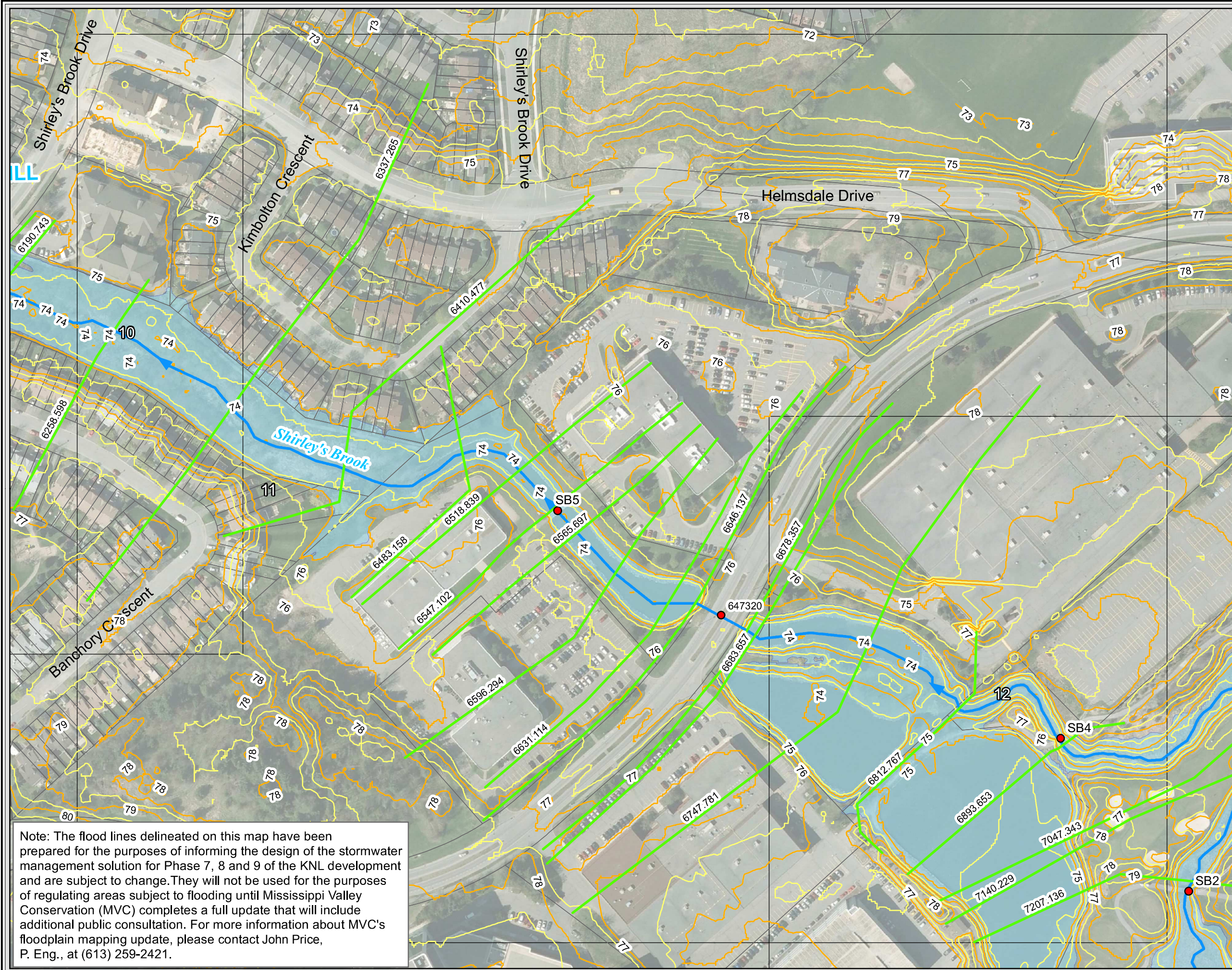
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Shirley's Brook
Flood Line Delineation**

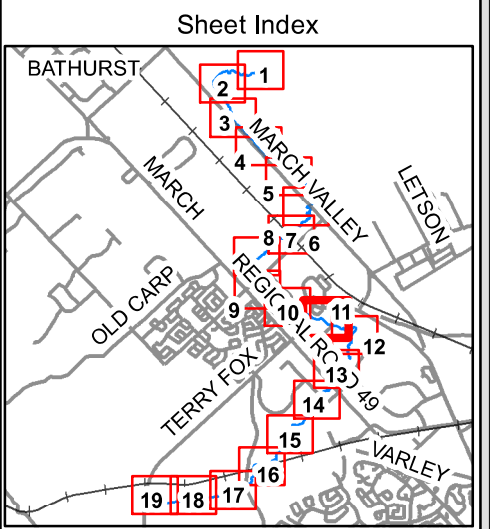
February 2015
60264539

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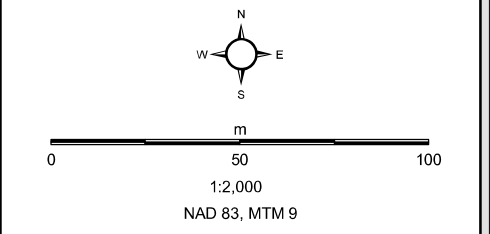
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- Legend**
- Shirley's Brook
 - HEC-RAS Cross Sections**
 - X-Sections (LiDAR)
 - X-Sections (Design Information)
 - X-Sections (Contours)
 - Hydraulic Structure Location & ID
 - Extent of 100-Year Flood Line
 - Match Lines
 - 1.0 m Contour Interval
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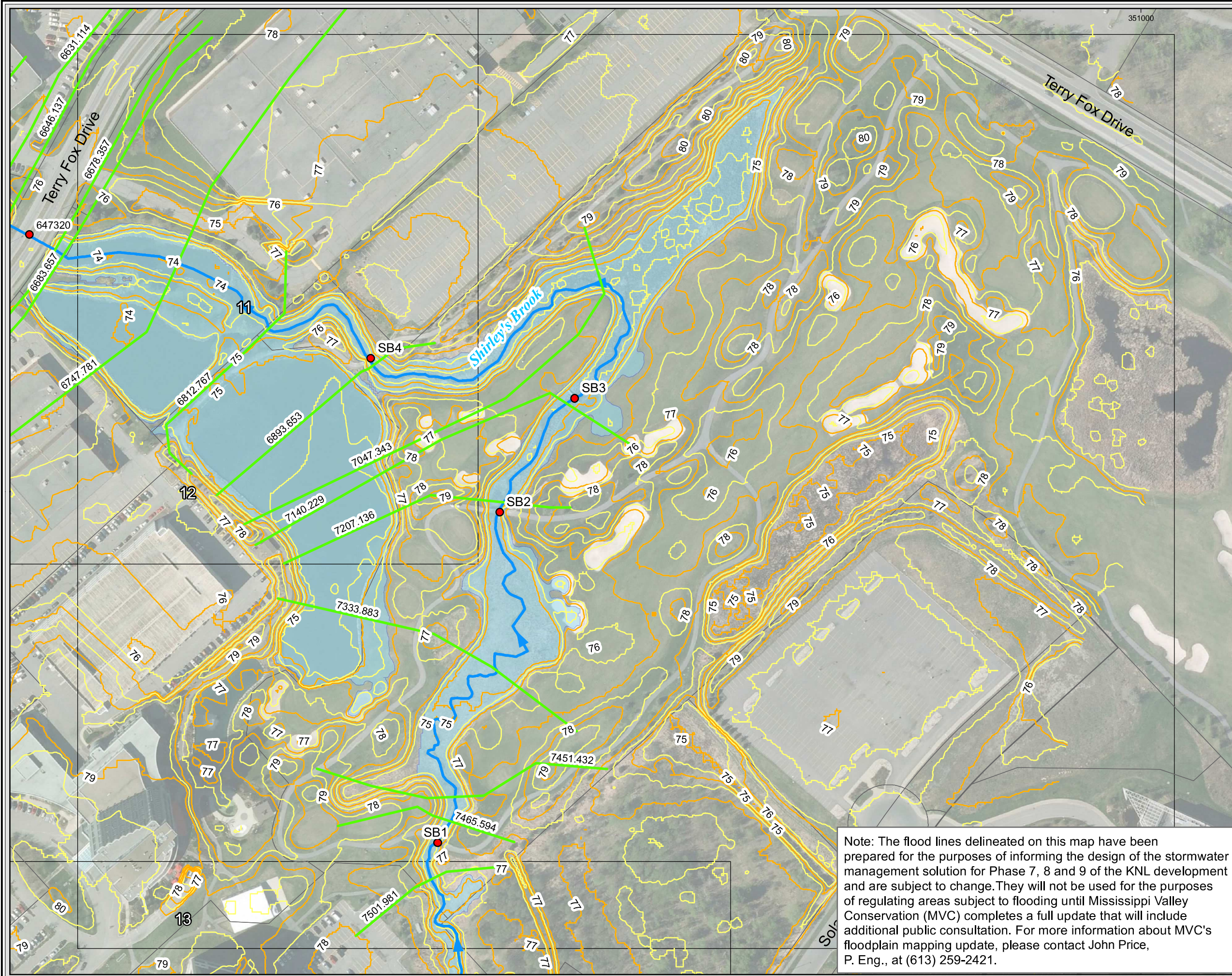
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Shirley's Brook
Flood Line Delineation**

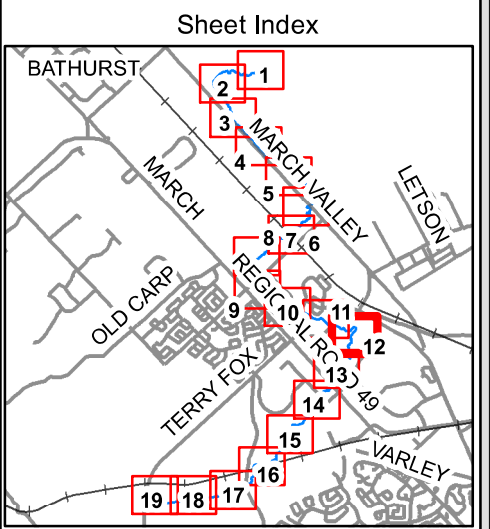
February 2015
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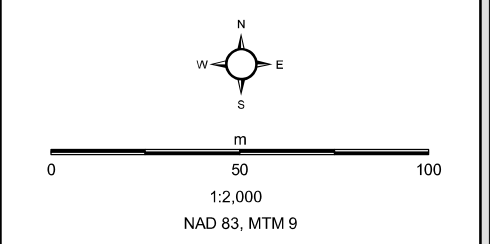
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- Legend**
- Shirley's Brook
 - HEC-RAS Cross Sections**
 - X-Sections (LiDAR)
 - X-Sections (Design Information)
 - X-Sections (Contours)
 - Hydraulic Structure Location & ID
 - Extent of 100-Year Flood Line
 - Match Lines
 - 1.0 m Contour Interval
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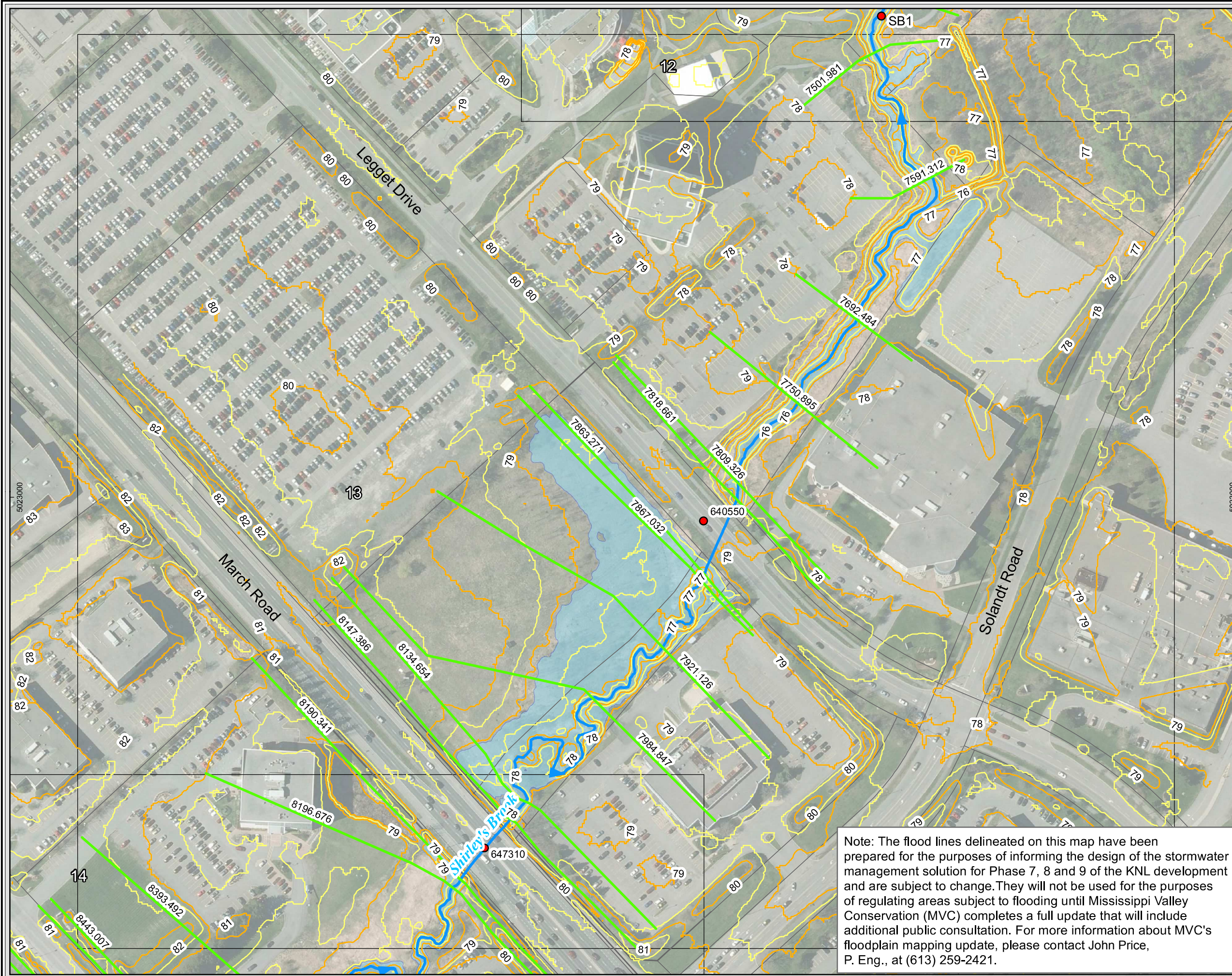
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Shirley's Brook
Flood Line Delineation**

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60264539

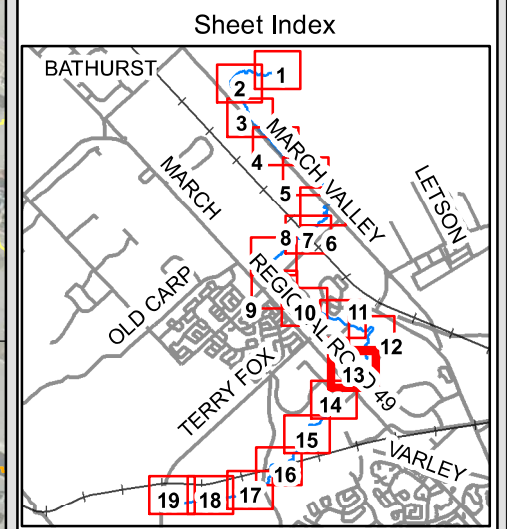
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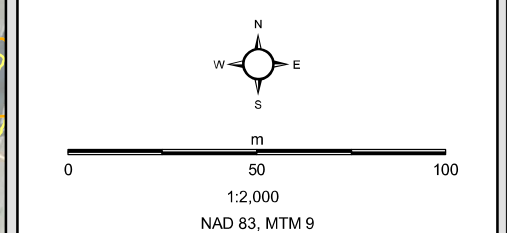


Legend

- Shirley's Brook
- HEC-RAS Cross Sections**
- X-Sections (LiDAR)
- X-Sections (Design Information)
- X-Sections (Contours)
- Hydraulic Structure Location & ID
- Extent of 100-Year Flood Line
- Match Lines
- 1.0 m Contour Interval
- 0.5 m Contour Interval
- Parcel Fabric
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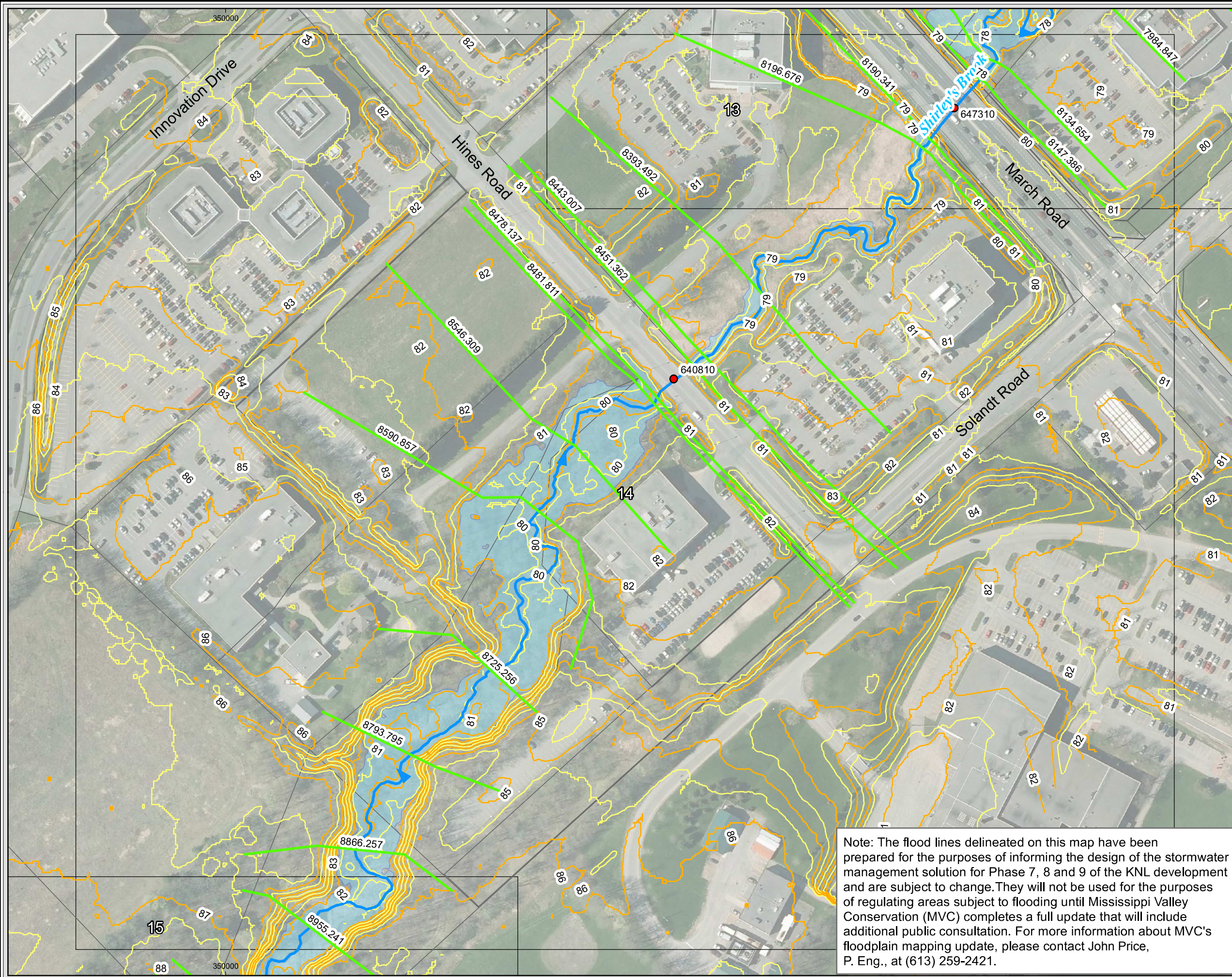
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Shirley's Brook
Flood Line Delineation**

February 2015
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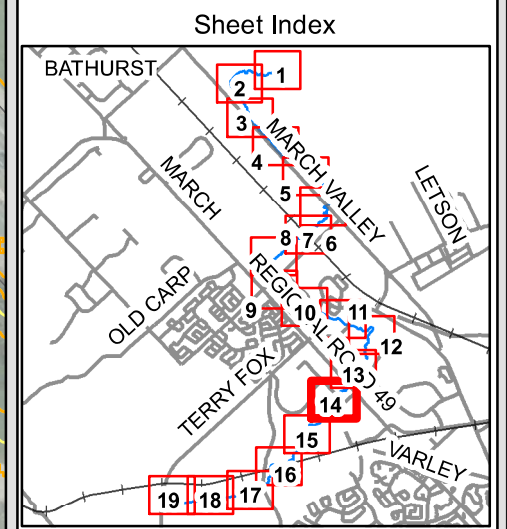
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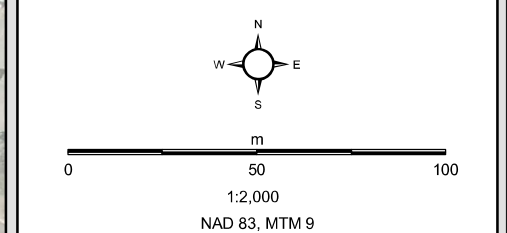


Legend

- Shirley's Brook
- HEC-RAS Cross Sections**
- X-Sections (LiDAR)
- X-Sections (Design Information)
- X-Sections (Contours)
- Hydraulic Structure Location & ID
- Extent of 100-Year Flood Line
- Match Lines
- 1.0 m Contour Interval
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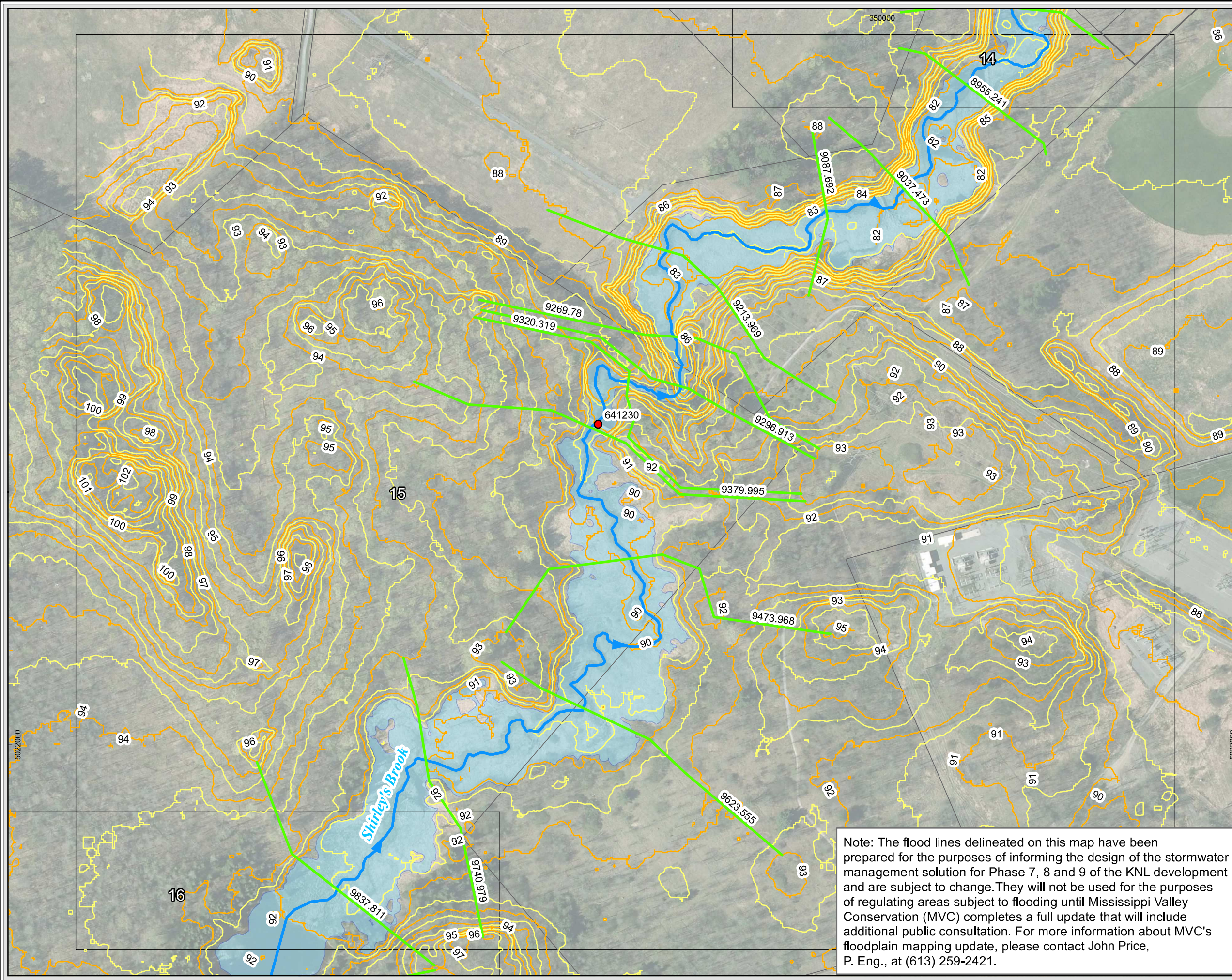
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Shirley's Brook
Flood Line Delineation**

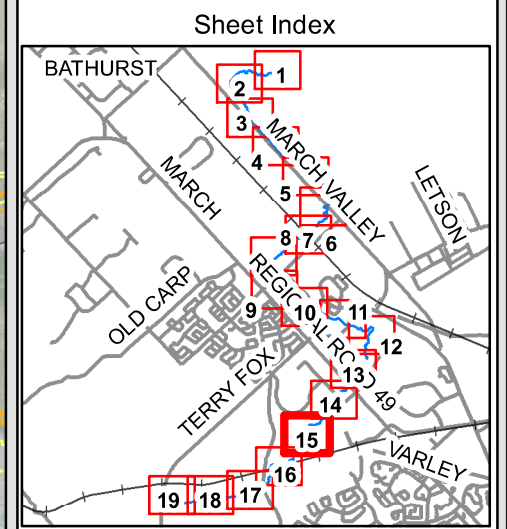
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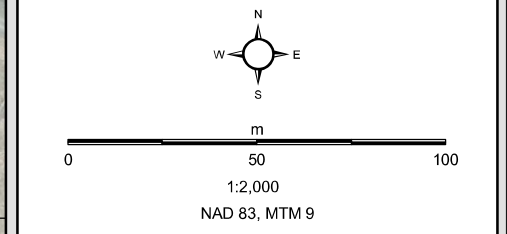
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- Legend**
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 - HEC-RAS Cross Sections**
 - X-Sections (LiDAR)
 - X-Sections (Design Information)
 - X-Sections (Contours)
 - Hydraulic Structure Location & ID
 - Extent of 100-Year Flood Line
 - Match Lines
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 - Parcel Fabric
 - Spill Location



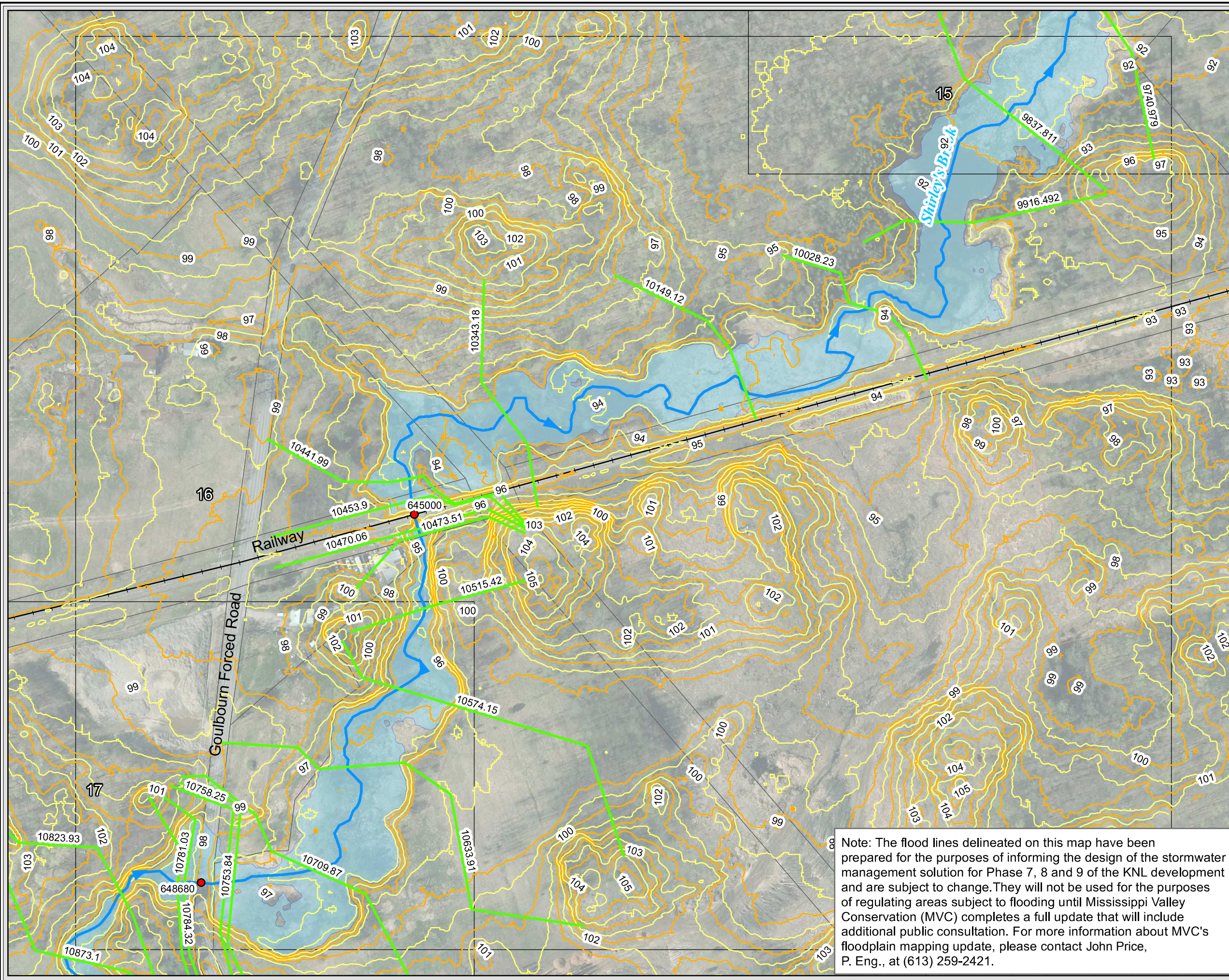
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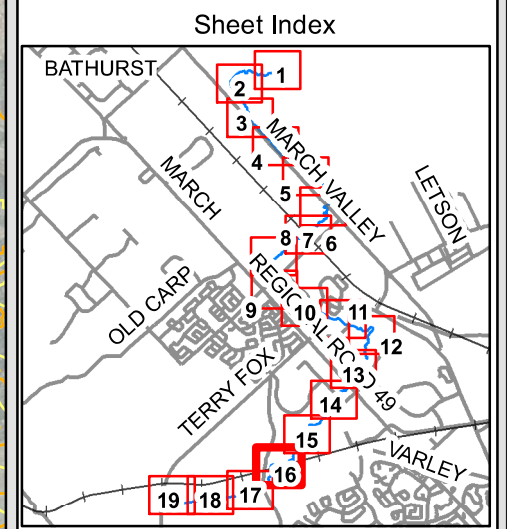
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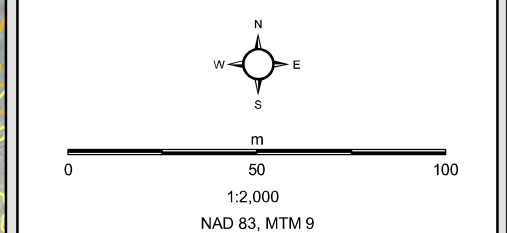
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- Legend**
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 - HEC-RAS Cross Sections**
 - X-Sections (LiDAR)
 - X-Sections (Design Information)
 - X-Sections (Contours)
 - Hydraulic Structure Location & ID
 - Extent of 100-Year Flood Line
 - Match Lines
 - 1.0 m Contour Interval
 - 0.5 m Contour Interval
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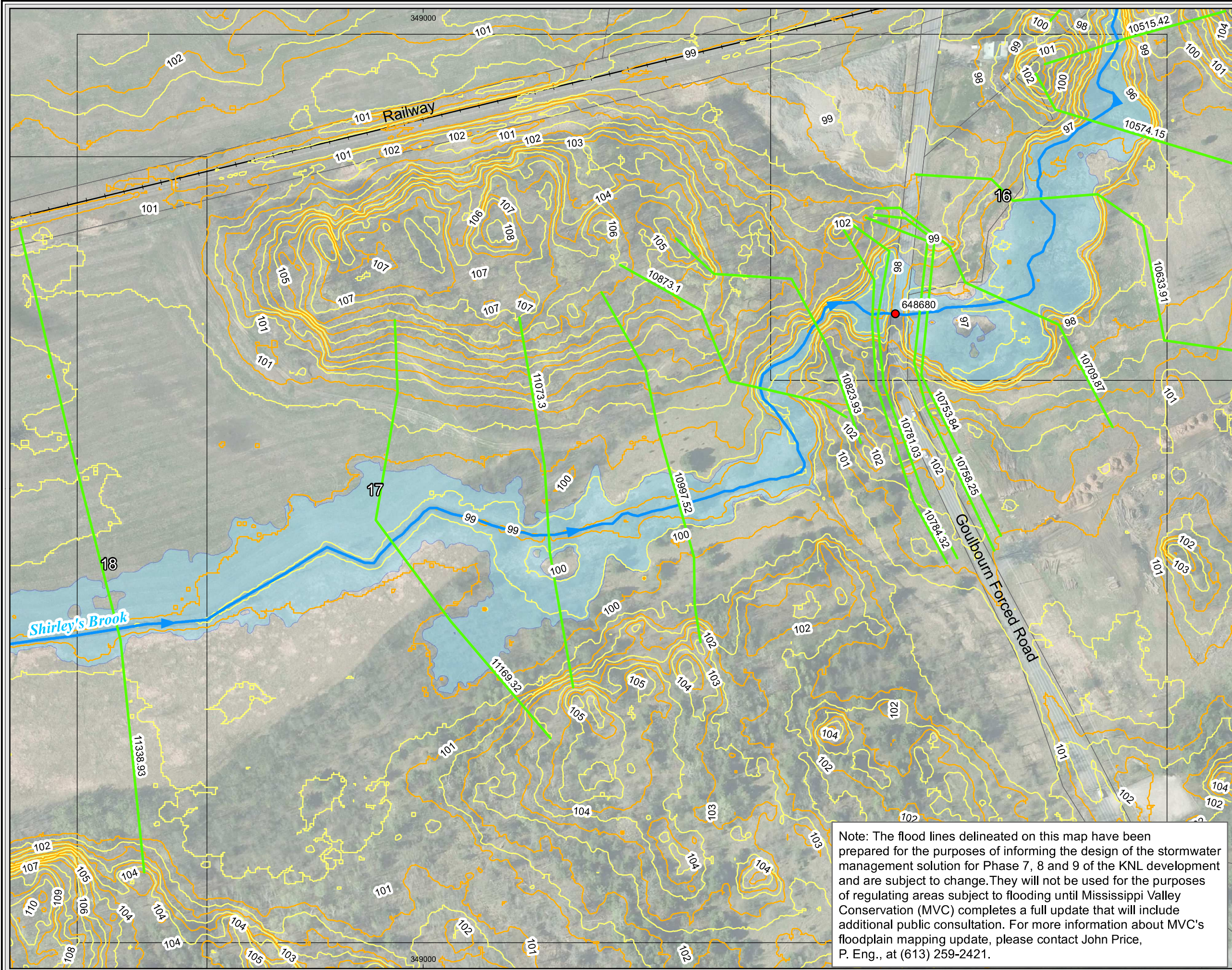
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Shirley's Brook
Flood Line Delineation**

February 2015
60264539

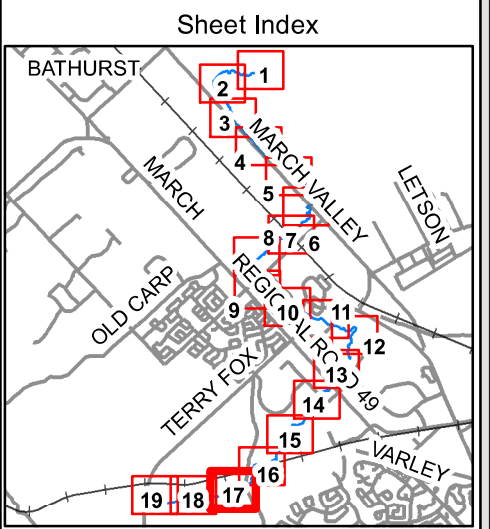
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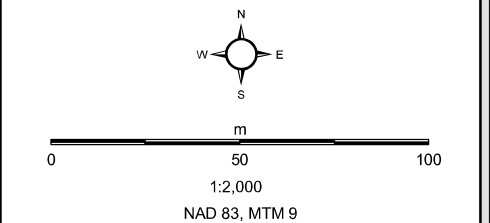


Legend

- Shirley's Brook
- HEC-RAS Cross Sections**
- X-Sections (LiDAR)
- X-Sections (Design Information)
- X-Sections (Contours)
- Hydraulic Structure Location & ID
- Extent of 100-Year Flood Line
- Match Lines
- 1.0 m Contour Interval
- 0.5 m Contour Interval
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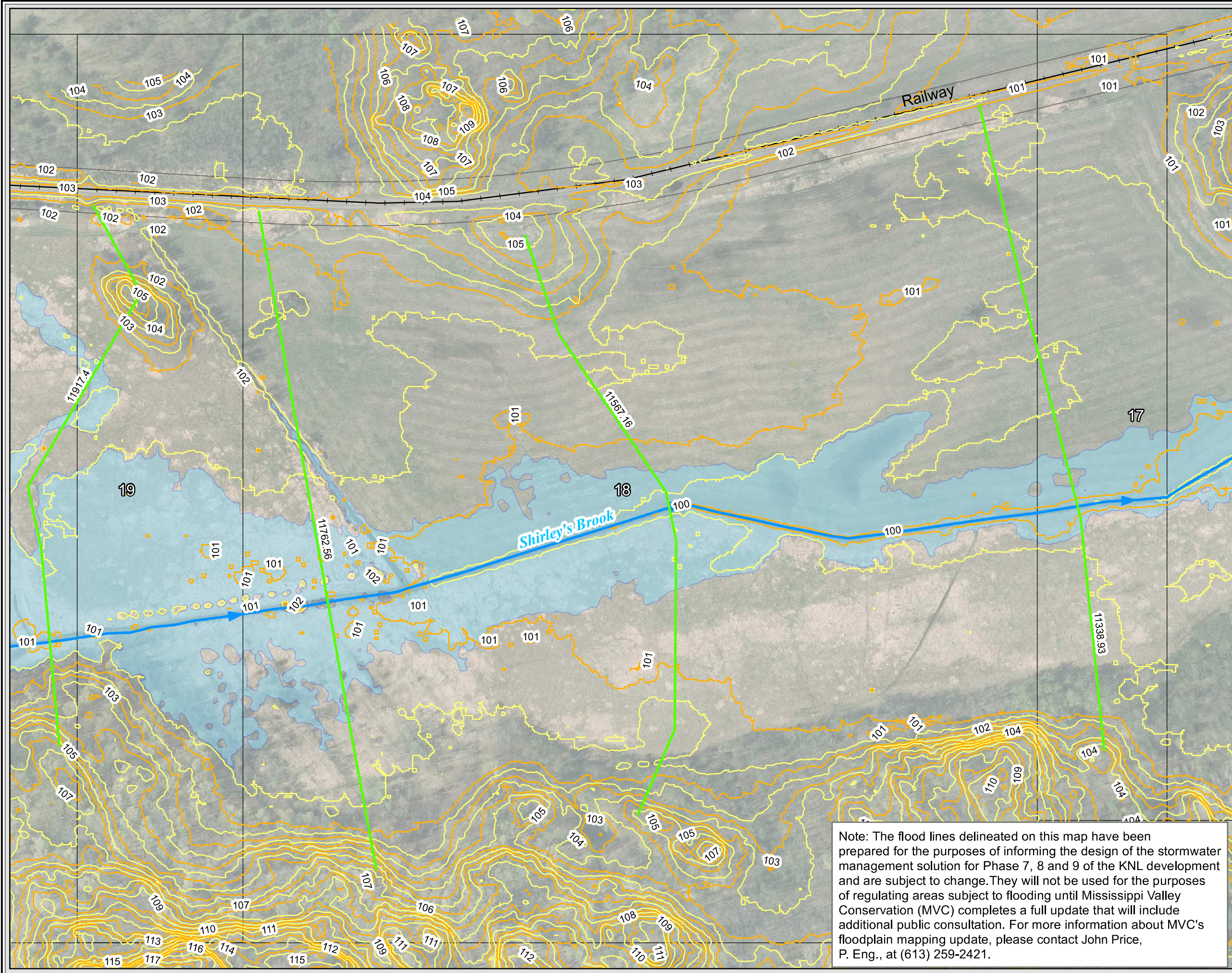
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Shirley's Brook
Flood Line Delineation**

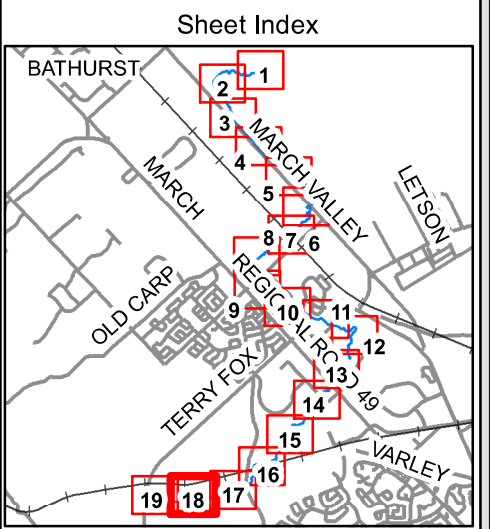
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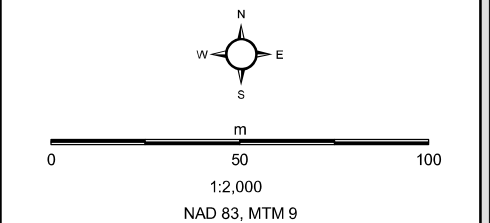
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- Legend**
- Shirley's Brook
 - HEC-RAS Cross Sections**
 - X-Sections (LiDAR)
 - X-Sections (Design Information)
 - X-Sections (Contours)
 - Hydraulic Structure Location & ID
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 - 1.0 m Contour Interval
 - 0.5 m Contour Interval
 - Parcel Fabric
 - Spill Location



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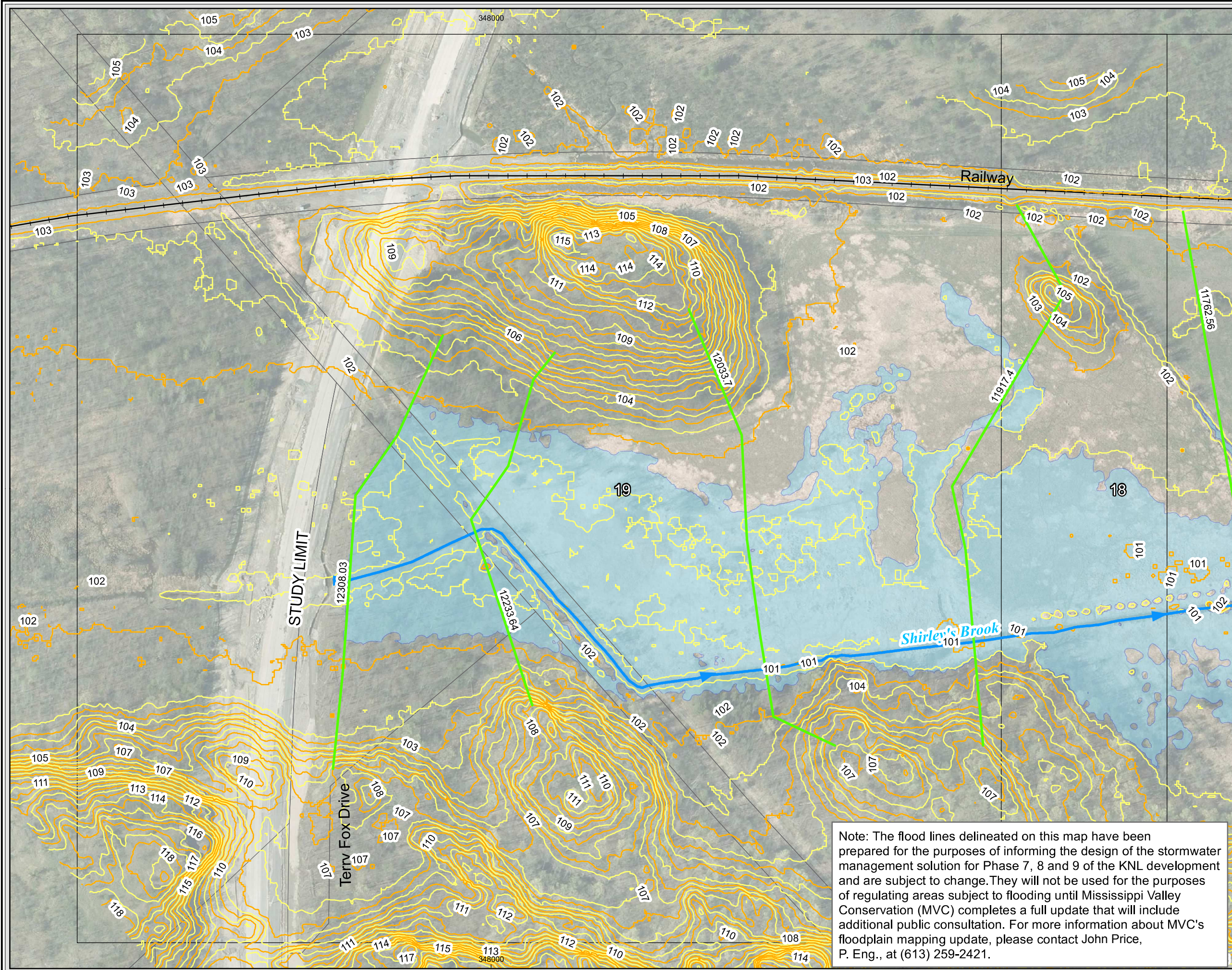
Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Shirley's Brook
Flood Line Delineation**

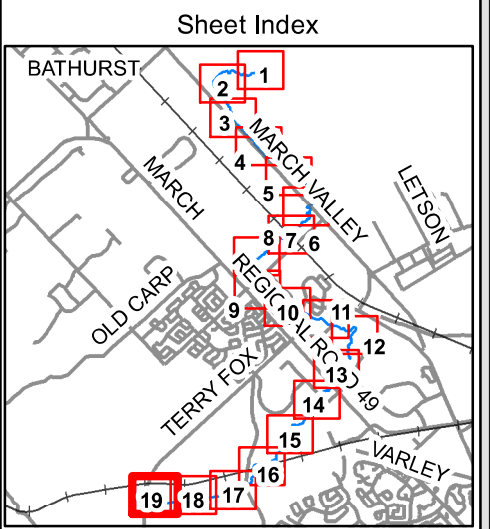
February 2015
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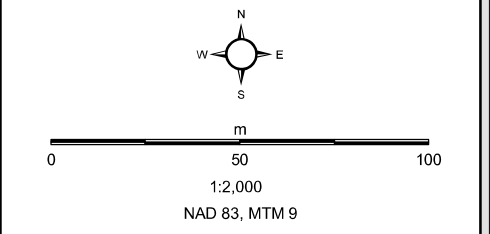
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- Legend**
- Shirley's Brook
 - HEC-RAS Cross Sections**
 - X-Sections (LiDAR)
 - X-Sections (Design Information)
 - X-Sections (Contours)
 - Hydraulic Structure Location & ID
 - Extent of 100-Year Flood Line
 - Match Lines
 - 1.0 m Contour Interval
 - 0.5 m Contour Interval
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Shirley's Brook & Watt's Creek Phase 2 SWM Study

**Shirley's Brook
Flood Line Delineation**

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