APPENDIX F
USACE Sediment Deposit Removal Investigation

Introduction:

This document will serve as an appendix to the Upper Joachim Creek Floodplain Management Plan. This investigation came to light due to concerns by local citizens of De Soto, Missouri, about several large sediment deposits within the Joachim Creek. Their concern was that large sediment deposits will act as obstructions within the creek and cause induced flood during high water events.

Scope of Investigation:

Our investigation will look at seven sediment deposits ranging in size from 2 feet to 6 feet in height and 30 feet to 70 feet in width. Location of the seven sediment deposits is between Route E and Highway 110. Additional sediment deposits were brought to our attention by local citizens, further upstream of Route E, but those upstream sediment deposits did not register as significant in size on our terrain data and were not used for this investigation.

Our hydraulic modeling will consistent first of computing existing water surface elevations with all sediment deposits in place. We will then remove all seven sediment deposits from our geometry and re-compute water surface elevations. This before and after comparison of water surface elevations will provide us if significant flood reduction will result from removal of the seven sediment deposits.

Hydraulic Model:

The hydraulic model utilized for this investigation is the same model used for FEMA's Flood Insurance Study, Revised June 20, 2019. This model was further calibrated by the USGS for the April 18, 2013 flood and additional USGS measurements up to January 2019. No further calibration was completed by USACE. One-dimensional modeling will be used for this analysis. Peak discharges utilized for this investigating were obtained from Flood Insurance Study, Revised June 20, 2019. See Table 1.0 - Summary of Discharges for details.

Results of Investigation:

The results indicate approximate 0.1 to 0.6 foot flood reduction for 10% ACE discharge and 0.1 to 0.5 foot flood reduction for 1% ACE discharge. The results did not have a significant difference in flood reduction between the two ACE discharges. See Table 1.0 – Summary of Discharges. Two of the seven areas computed induced flooding downstream due to sediment deposit removal. Removing the sediment deposit allowed more water to flow downstream, therefore, approximate 0.1 to 0.9 foot flood induction was computed downstream in the vicinity of the sediment deposit.

During removal of sediment deposits in hydraulic modeling geometry, very conservative assumptions were made. It was assumed entire sediment deposit would be removed. If less material is removed from sediment deposits in hydraulic modeling geometry, less flood reduction will be computed.

Sediment deposits are a natural way of the creek depositing material during low flow conditions. Removal of material from channel will not guarantee future sediment deposits from occurring in the same area, future maintenance may be needed in these areas.

Table 1.0 – Summary of Discharges

Flood Source	Location	Peak Discharge (cfs)	
		10% Annual Chance	1% Annual Chance
Joachim Creek	Just downstream of confluence of Ball Creek	13,850	33,650
Joachim Creek	At Missouri Pacific Railroad	12,930	30,700
Joachim Creek	At Kelley Street	11,930	27,660
Joachim Creek	Approximately 500 feet downstream of State Highway E	10,780	24,680

Figures:

Please note not entire HEC RAS cross section is captured in figure. Zoomed-in image was utilized to better emphasize sediment deposit removal from geometry. "Black line" represents sediment deposit removal from geometry and "pink line" represents existing condition with sediment deposit in place.

Figure 1.1 – Location of Sediment Deposit #1 and #2

Figure 1.2 – Location of Sediment Deposit #3 and #4

Figure 1.3 – Location of Sediment Deposit #5 and #6

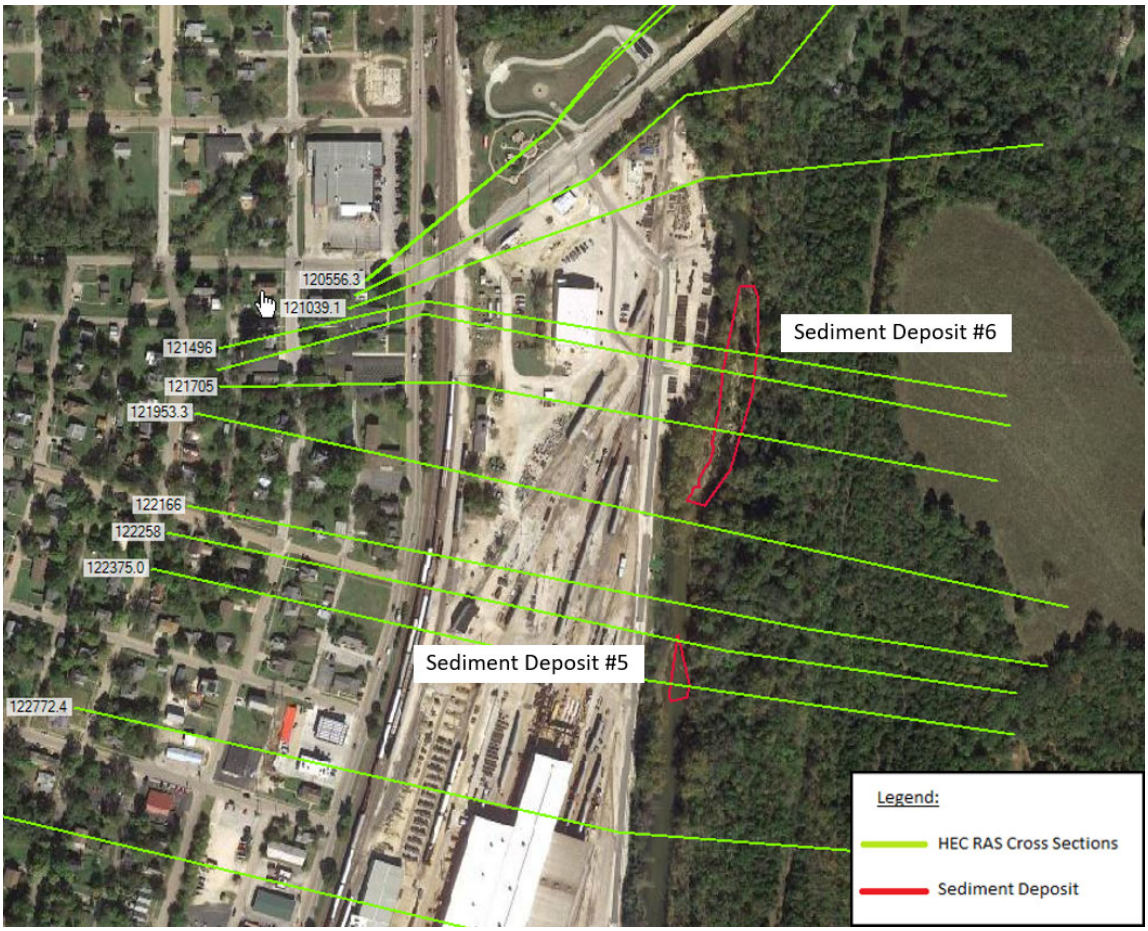


Figure 1.4 – Location of Sediment Deposit #7

Figure 1.5 – Sediment Deposit #1 – HEC RAS Cross Section 132,266

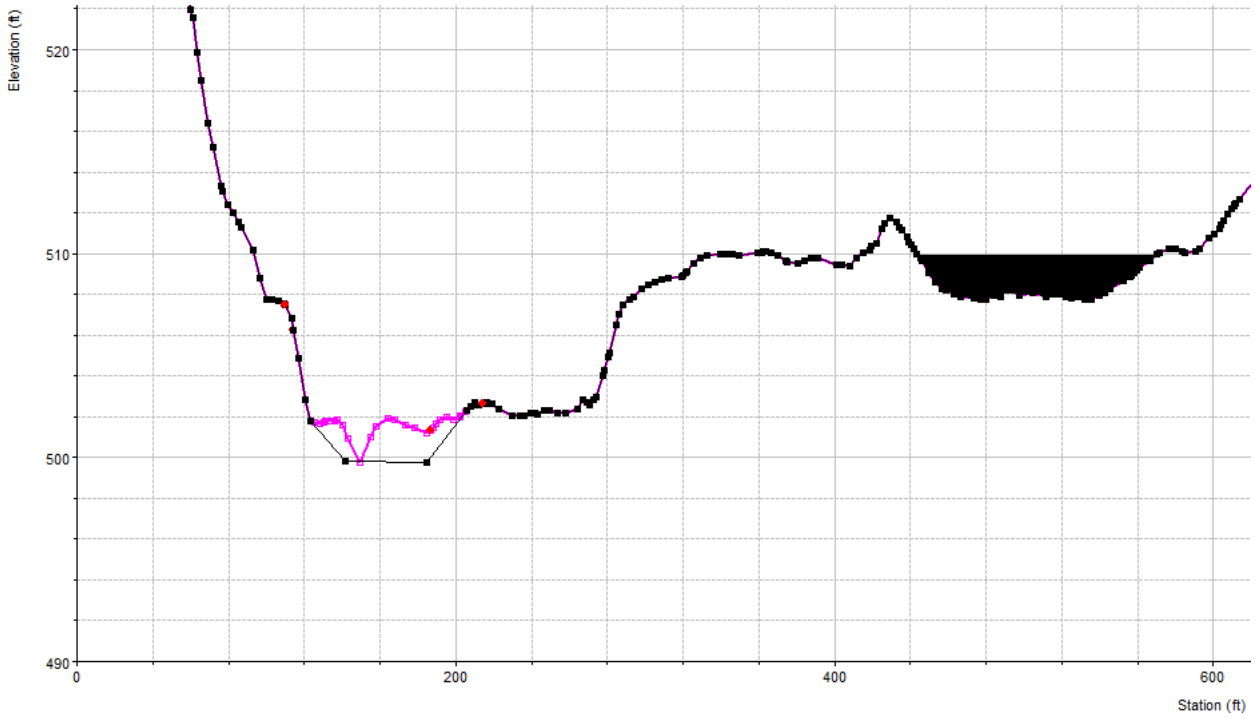


Figure 1.6 – Sediment Deposit #1 – HEC RAS Cross Section 132,170

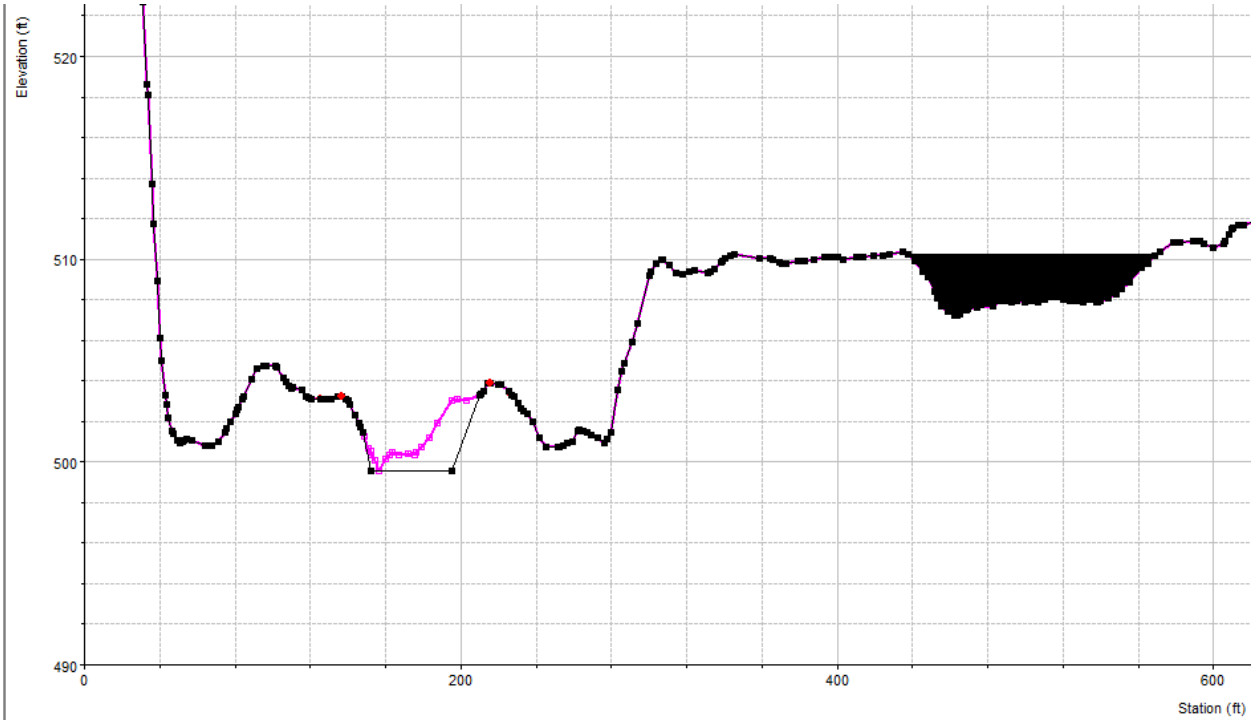


Figure 1.7 – Sediment Deposit #2 – HEC RAS Cross Section 130,989

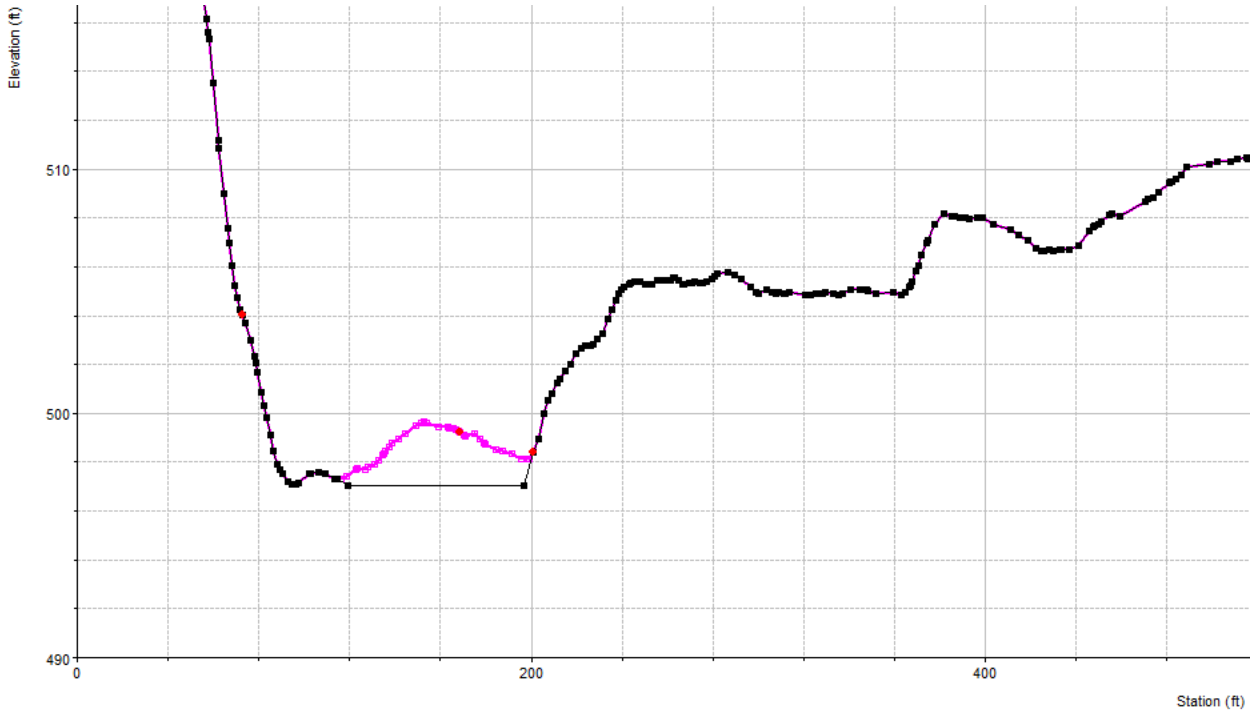


Figure 1.8 – Sediment Deposit #2 – HEC RAS Cross Section 130,861

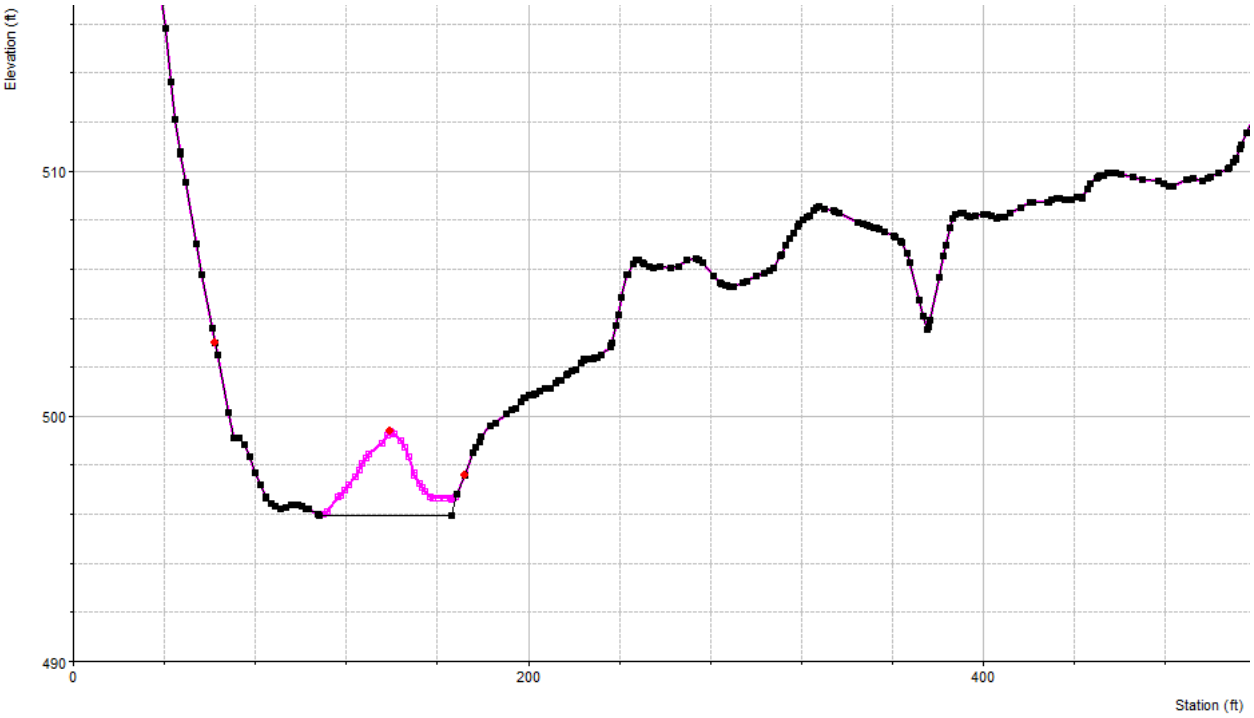


Figure 1.9 – Sediment Deposit #3 – HEC RAS Cross Section 128,204

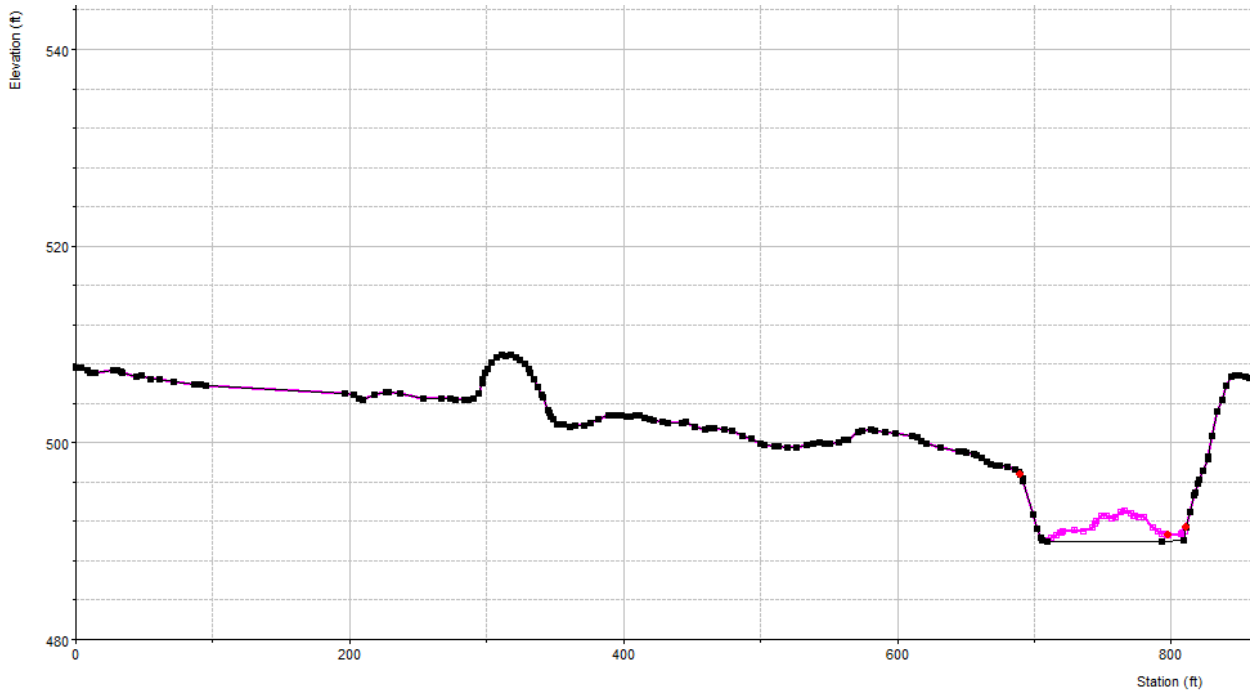


Figure 1.10 – Sediment Deposit #3 – HEC RAS Cross Section 128,114

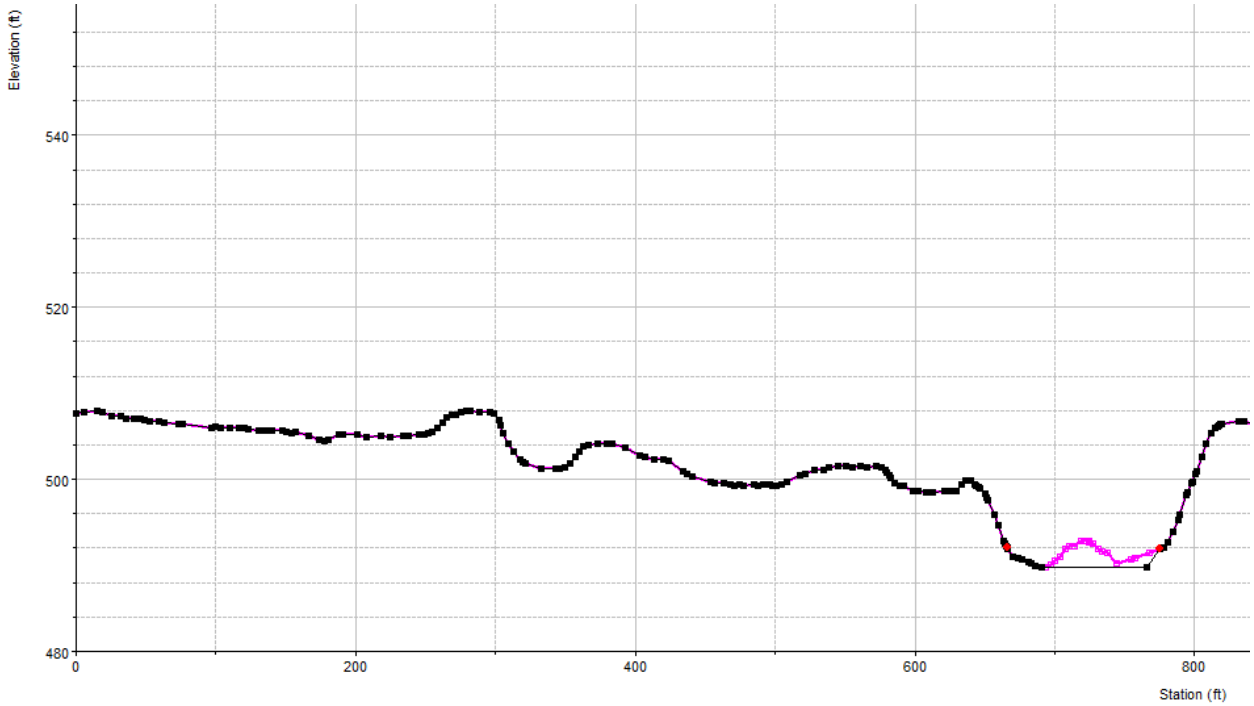


Figure 1.11 – Sediment Deposit #4 – HEC RAS Cross Section 125,886

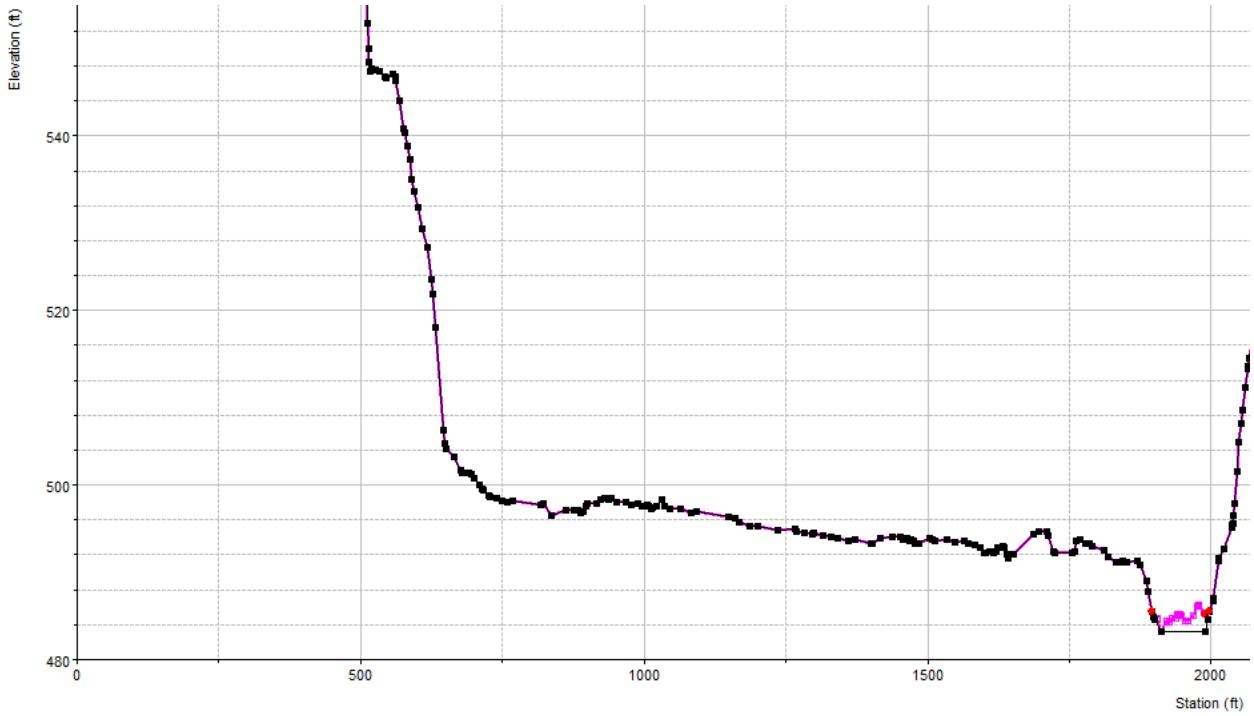


Figure 1.12 – Sediment Deposit #4 – HEC RAS Cross Section 125,749

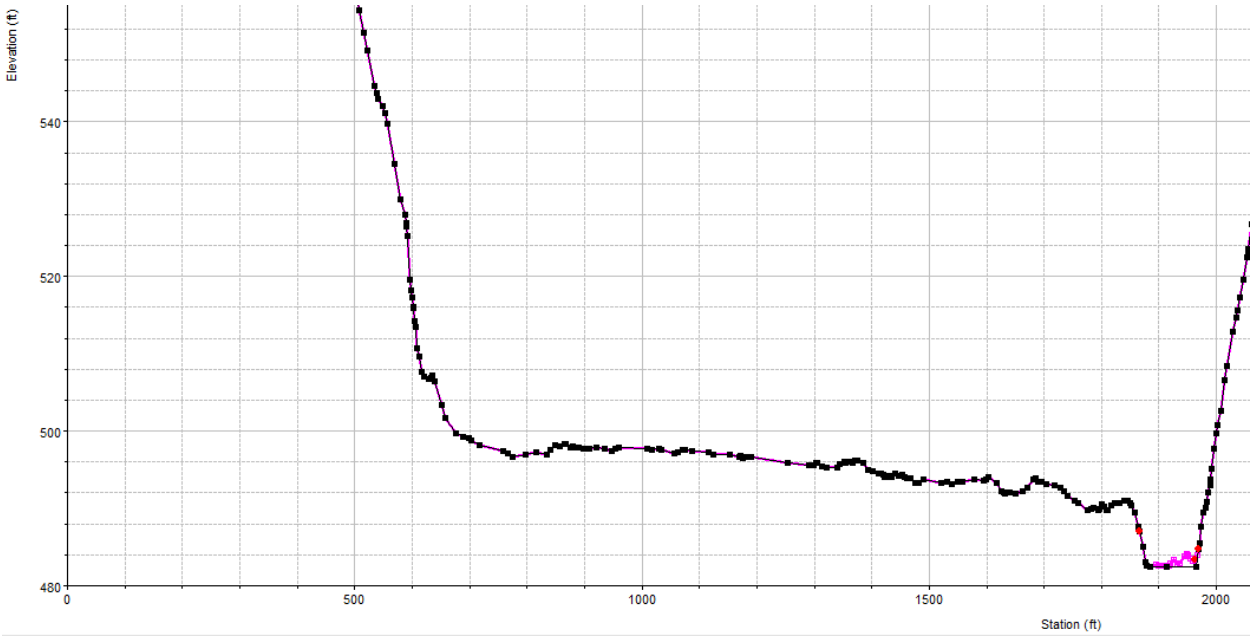


Figure 1.13 – Sediment Deposit #5 – HEC RAS Cross Section 122,375

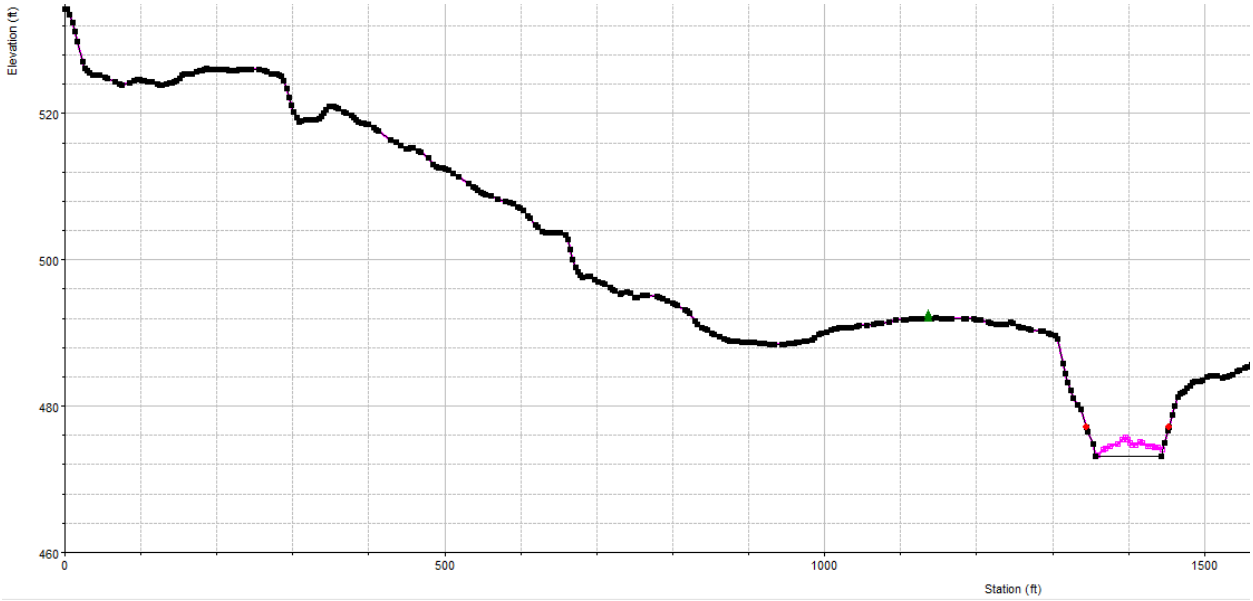


Figure 1.14 – Sediment Deposit #5 – HEC RAS Cross Section 122,258

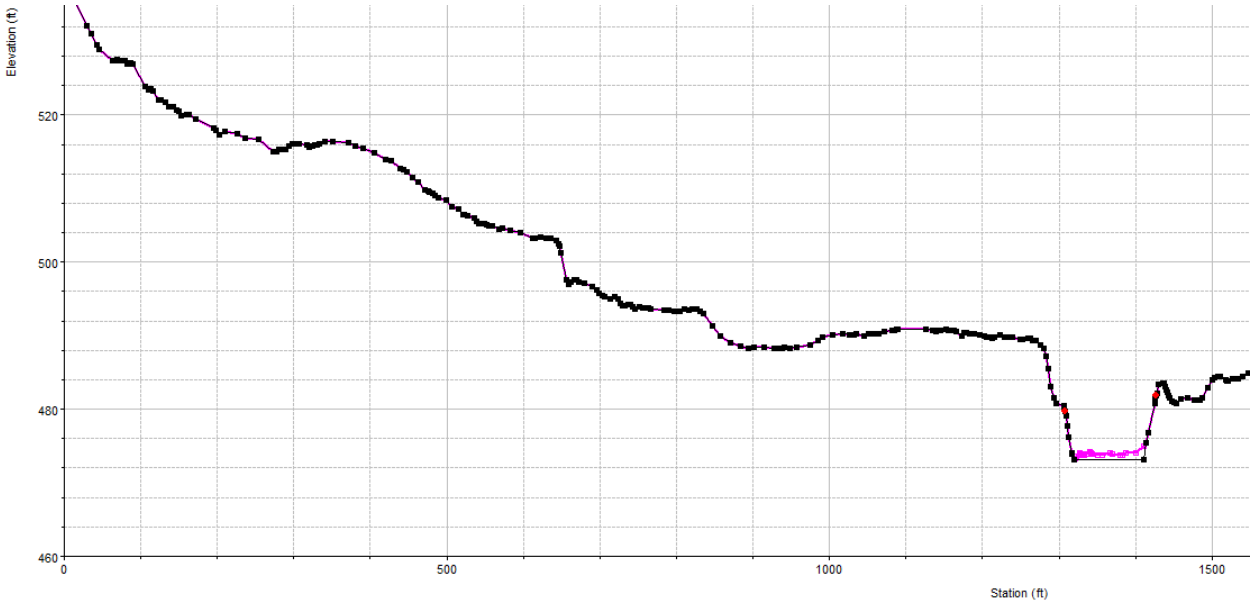


Figure 1.15 – Sediment Deposit #5 – HEC RAS Cross Section 122,166

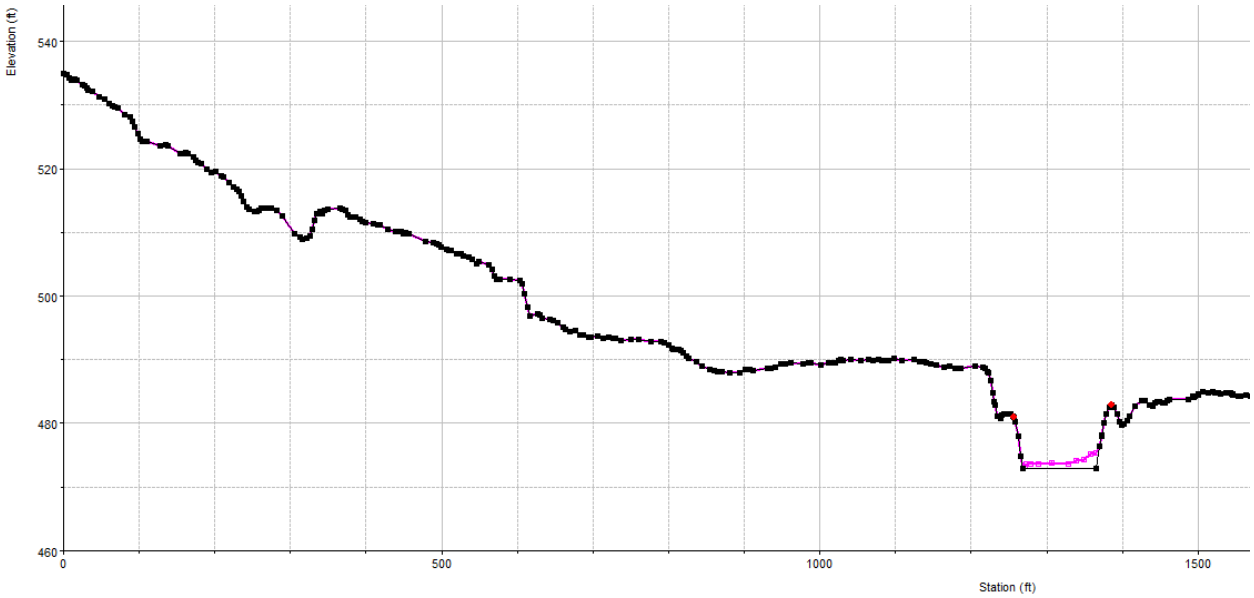


Figure 1.16 – Sediment Deposit #6 – HEC RAS Cross Section 121,705

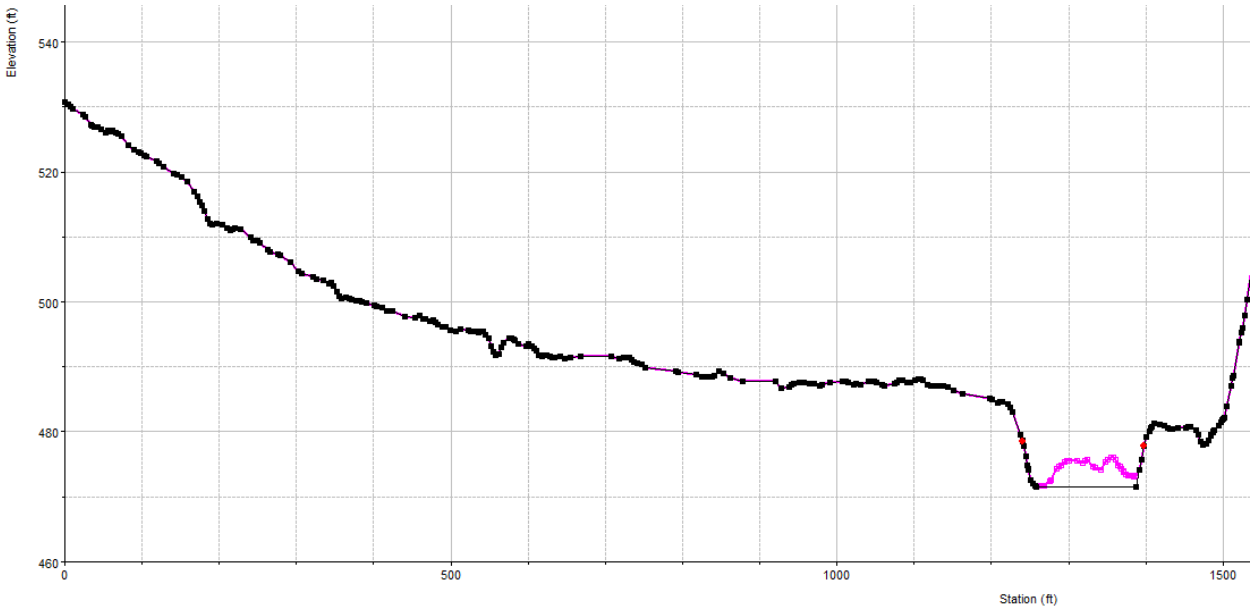


Figure 1.17 – Sediment Deposit #6 – HEC RAS Cross Section 121,550

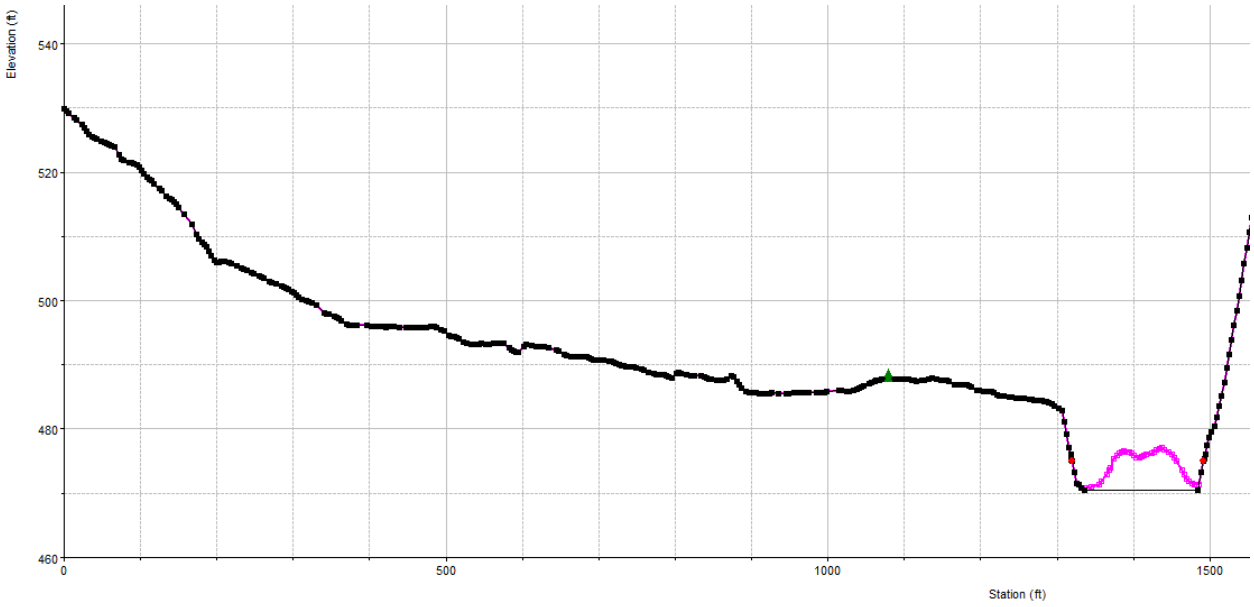


Figure 1.18 – Sediment Deposit #6 – HEC RAS Cross Section 121,496

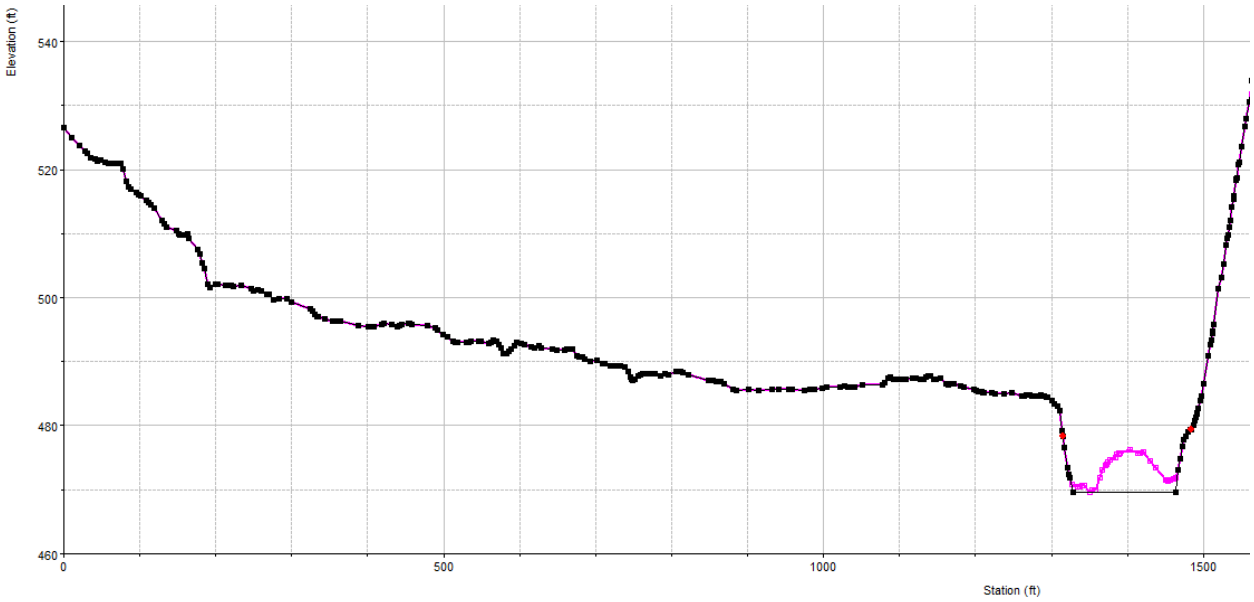


Figure 1.19 – Sediment Deposit #7 – HEC RAS Cross Section 118,932

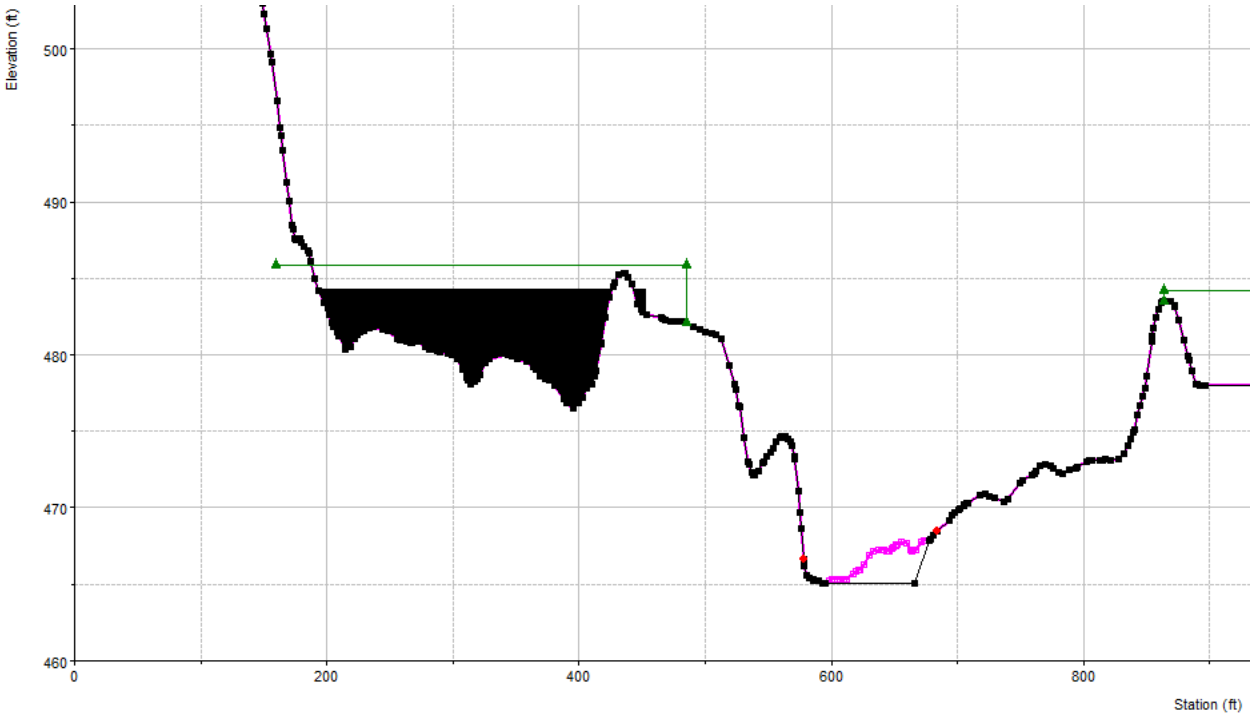


Figure 1.20 – Sediment Deposit #7 – HEC RAS Cross Section 118,854

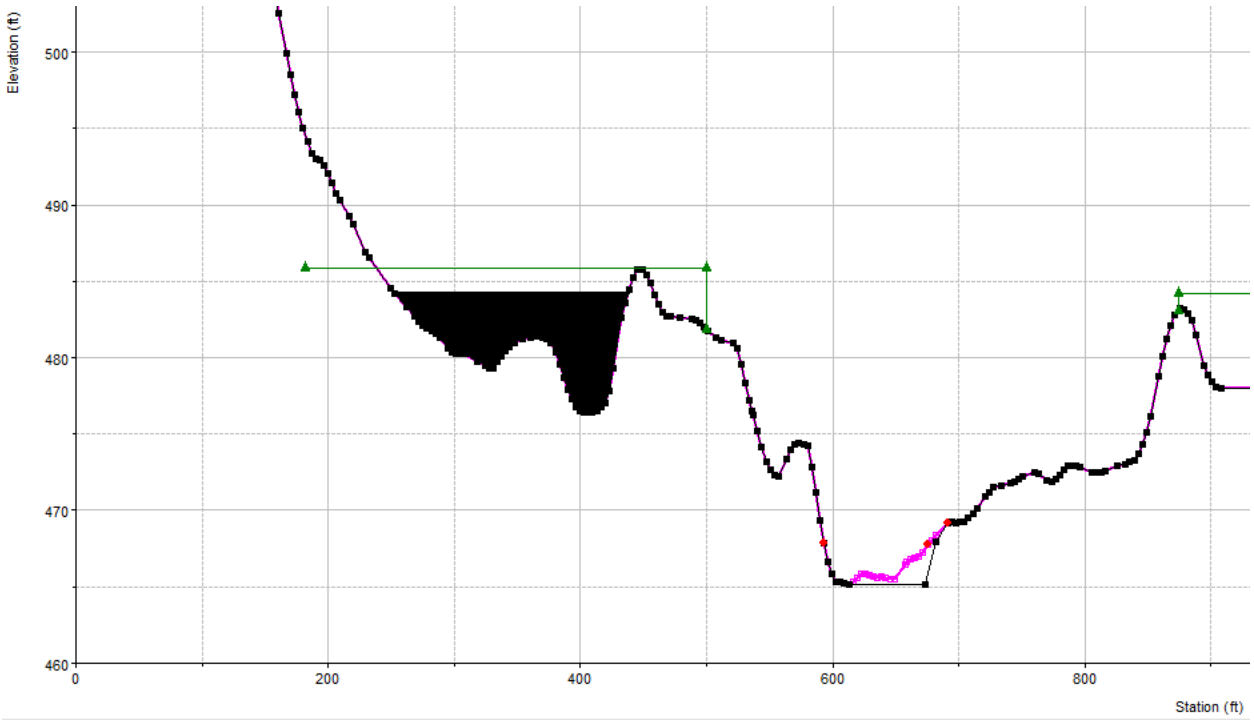
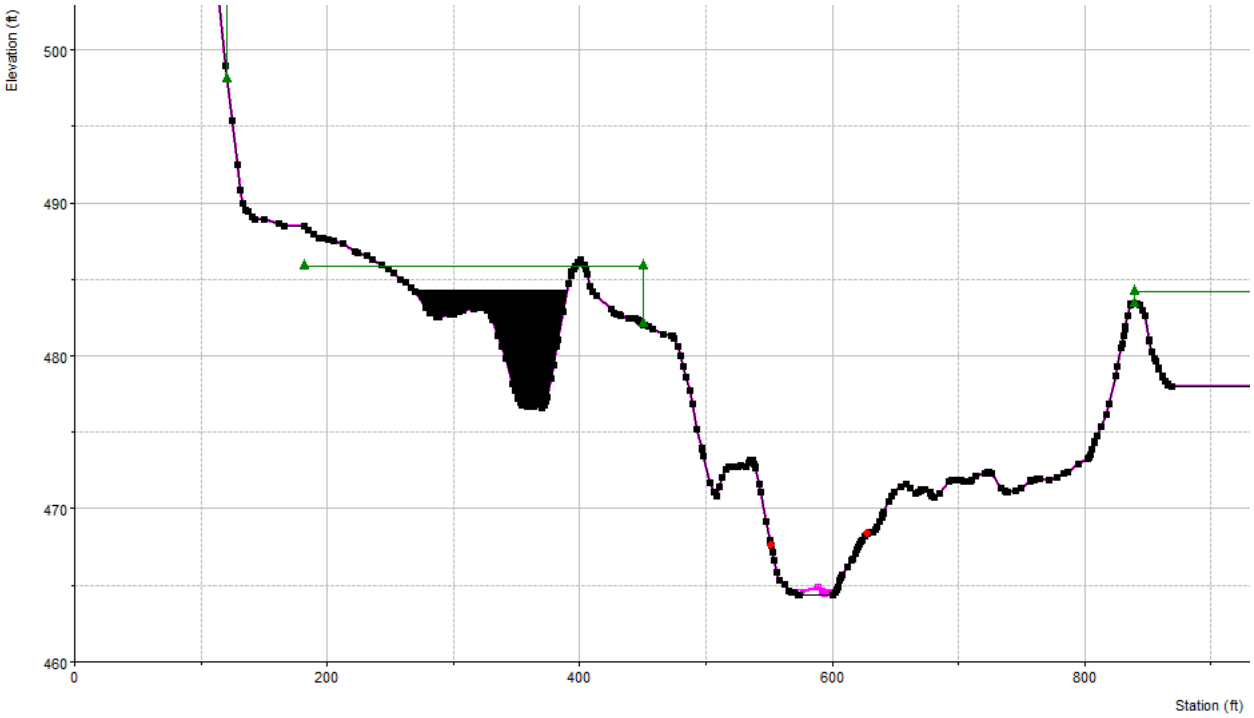


Figure 1.21 – Sediment Deposit #7 – HEC RAS Cross Section 118,787



1-percent Annual Chance of Exceedance (ACE) - with/without scenarios					
River Sta	Plan	Q Total (cfs)	W.S. Elev (ft)	Difference in W.S. Elev (ft)	Vel Chnl (ft/s)
142510	existing	24680	545.71		8.19
142510	without	24680	545.71	0	8.19
142394.2	existing	24680	545.56		7.7
142394.2	without	24680	545.56	0	7.7
142278.5	existing	24680	545.22		6.79
142278.5	without	24680	545.22	0	6.79
142162.7	existing	24680	544.45		9.93
142162.7	without	24680	544.45	0	9.93
142047	existing	24680	544.13		9.02
142047	without	24680	544.13	0	9.02
141905.3	existing	24680	542.28		12.54
141905.3	without	24680	542.28	0	12.54
141763.5	existing	24680	541.8		13.17
141763.5	without	24680	541.8	0	13.17
141621.7	existing	24680	541.45		11.32
141621.7	without	24680	541.45	0	11.32
141480	existing	24680	541.25		10.61
141480	without	24680	541.25	0	10.61
141150	existing	24680	539.48		13.24
141150	without	24680	539.48	0	13.24
140820	existing	24680	538.35		12.3
140820	without	24680	538.35	0	12.3
140225	existing	24680	537.66		6.34
140225	without	24680	537.66	0	6.34
140004	existing	24680	537.3		6.88
140004	without	24680	537.3	0	6.88
139783	existing	24680	537.08		6.86
139783	without	24680	537.08	0	6.86
139533	existing	24680	536.72		6.73
139533	without	24680	536.72	0	6.73

139283	existing	24680	535.33		11.32
139283	without	24680	535.33	0	11.32
138693	existing	24680	533.26		10.92
138693	without	24680	533.26	0	10.92
138141	existing	24680	531.4		10.52
138141	without	24680	531.4	0	10.52
137451	existing	24680	530.61		7.67
137451	without	24680	530.61	0	7.67
136889.8	existing	24680	530.02		6.53
136889.8	without	24680	530.02	0	6.53
136644.3	existing	24680	529.37		9.14
136644.3	without	24680	529.37	0	9.14
136413.4	existing	24680	529.09		9.81
136413.4	without	24680	529.09	0	9.81
136124.6	existing	24680	528.78		7.5
136124.6	without	24680	528.78	0	7.5
135806.1	existing	24680	527.87		9.72
135806.1	without	24680	527.87	0	9.72
135443.4	existing	24680	527.72		8.32
135443.4	without	24680	527.72	0	8.32
135158.1	existing	24680	527.59		6.79
135158.1	without	24680	527.59	0	6.79
135011.2	existing	24680	526.29		11.13
135011.2	without	24680	526.29	0	11.13
134900.2		Bridge			
134829.8	existing	24680	520.73		16.41
134829.8	without	24680	520.72	-0.01	16.43
134482.2	existing	24680	521.43		9.48
134482.2	without	24680	521.42	-0.01	9.5
134227.5	existing	24680	520.33		12.02
134227.5	without	24680	520.31	-0.02	12.05

133916.1	existing	24680	518.95		12.85
133916.1	without	24680	518.92	-0.03	12.91
133678.6	existing	24680	518.29		12.8
133678.6	without	24680	518.24	-0.05	12.86
133380.6	existing	24680	518.25		10.47
133380.6	without	24680	518.2	-0.05	10.53
132859	existing	24680	516.36		12.92
132859	without	24680	516.08	-0.28	13.41
132418.8	existing	24680	516.19		10.6
132418.8	without	24680	515.88	-0.31	11.02
132266	existing	24680	515.67		12.75
132266	without	24680	515.67	0	10.82
132170	existing	24680	515.85		9.99
132170	without	24680	515.68	-0.17	10.97
131905	existing	24680	515.5		9.98
131905	without	24680	515.4	-0.1	10.09
131778.5	existing	24680	515.64		7.86
131778.5	without	24680	515.54	-0.1	7.95
131651.9	existing	24680	515.49		8.2
131651.9	without	24680	515.38	-0.11	8.3
131516.6	existing	24680	515.4		8.59
131516.6	without	24680	515.29	-0.11	8.7
131381.2	existing	24680	515.13		9.24
131381.2	without	24680	515.02	-0.11	9.35
131124.3	existing	24680	514.51		10.3
131124.3	without	24680	514.37	-0.14	10.45
130989	existing	24680	514.24		10.73
130989	without	24680	514.36	0.12	8.93
130861	existing	24680	513.63		12.58
130861	without	24680	513.95	0.32	10.1
130723	existing	24680	513.18		12.03

130723	without	24680	513.18	0	12.03
130430.3	existing	24680	512.41		13.45
130430.3	without	24680	512.41	0	13.45
130168.4	existing	24680	512.23		12.06
130168.4	without	24680	512.22	-0.01	12.06
129891.6	existing	24680	511.6		13.13
129891.6	without	24680	511.6	0	13.13
129771	existing	24680	511.24		13.63
129771	without	24680	511.24	0	13.63
129698	existing	24680	511.24		10.71
129698	without	24680	511.23	-0.01	10.71
129658.1	existing	24680	509.67		13.87
129658.1	without	24680	509.67	0	13.87
129641.6		Bridge			
129624	existing	24680	510.15		12.13
129624	without	24680	510.15	0	12.13
129390.7	existing	24680	510.61		9.95
129390.7	without	24680	510.61	0	9.95
129067.7	existing	24680	510.72		8.55
129067.7	without	24680	510.72	0	8.55
128974.6	existing	24680	510.03		10.1
128974.6	without	24680	510.03	0	10.1
128929.1		Bridge			
128870.2	existing	24680	508.33		13.32
128870.2	without	24680	508.33	0	13.32
128711.5	existing	24680	508.46		12.82
128711.5	without	24680	508.46	0	12.82
128560	existing	24680	506.33		16.76
128560	without	24680	506.33	0	16.76
128204	existing	24680	504.93		13.97
128204	without	24680	505.86	0.93	10.92

128114	existing	24680	504.82		13.58
128114	without	24680	505.45	0.63	11.97
128032.3	existing	24680	505.04		12.15
128032.3	without	24680	504.69	-0.35	13.45
127791.7	existing	24680	504.91		11.36
127791.7	without	24680	504.91	0	11.36
127475.3	existing	24680	504.58		10.91
127475.3	without	24680	504.58	0	10.91
127261.3	existing	24680	504.42		11.43
127261.3	without	24680	504.42	0	11.43
127088	existing	24680	504.59		9.69
127088	without	24680	504.59	0	9.69
126963.9	existing	24680	504.3		10.72
126963.9	without	24680	504.3	0	10.72
126889.9		Bridge			
126804.6	existing	24680	502.8		14.79
126804.6	without	24680	502.8	0	14.79
126719.7	existing	24680	504.05		8.36
126719.7	without	24680	504.05	0	8.36
126634.8	existing	24680	503.07		11.29
126634.8	without	24680	503.07	0	11.29
126591.2	existing	24680	503.24		10.12
126591.2	without	24680	503.24	0	10.12
126549.2	existing	27660	501.73		14.59
126549.2	without	27660	501.73	0	14.59
126401.1	existing	27660	501.99		11.25
126401.1	without	27660	501.88	-0.11	11.44
126253	existing	27660	502.33		8.87
126253	without	27660	502.23	-0.1	9
126116.7	existing	27660	501.99		7.91
126116.7	without	27660	501.87	-0.12	8.07

125886	existing	27660	501.22		10
125886	without	27660	501.17	-0.05	9.46
125749	existing	27660	501.38		1.92
125749	without	27660	501.38	0	1.96
125649.2	existing	27660	500.26		9.59
125649.2	without	27660	500.24	-0.02	9.62
125340	existing	27660	499.84		8.64
125340	without	27660	499.81	-0.03	8.67
124537	existing	27660	498.63		8.54
124537	without	27660	498.57	-0.06	8.61
123917.3	existing	27660	497.49		9.38
123917.3	without	27660	497.39	-0.1	9.51
123458.7	existing	27660	497.05		8.21
123458.7	without	27660	496.93	-0.12	8.35
123106.1	existing	27660	495.54		11.04
123106.1	without	27660	495.34	-0.2	11.27
122772.4	existing	27660	493.63		13.14
122772.4	without	27660	493.13	-0.5	13.75
122375	existing	27660	493.09		10.87
122375	without	27660	492.78	-0.31	10.85
122258	existing	27660	493.25		8.9
122258	without	27660	492.94	-0.31	9.02
122166	existing	27660	493.18		8.34
122166	without	27660	492.89	-0.29	8.38
121953.3	existing	27660	492.93		8.32
121953.3	without	27660	492.61	-0.32	8.62
121705	existing	27660	492.73		6.89
121705	without	27660	492.49	-0.24	6.59
121550	existing	27660	492.51		6.91
121550	without	27660	492.38	-0.13	6.29
121496	existing	27660	492.46		6.82

121496	without	27660	492.36	-0.1	6.24
121039.1	existing	27660	489.88		12.97
121039.1	without	27660	489.89	0.01	12.95
120813.7	existing	27660	489.66		11.12
120813.7	without	27660	489.68	0.02	11.11
120661.2		Bridge			
120556.3	existing	27660	490.28		4.88
120556.3	without	27660	490.29	0.01	4.88
120534.2	existing	30700	489.63		9.06
120534.2	without	30700	489.65	0.02	9.04
120171.4	existing	30700	489.34		6.93
120171.4	without	30700	489.36	0.02	6.92
119837	existing	30700	489.01		6.97
119837	without	30700	489.03	0.02	6.96
119504.8	existing	30700	488.6		7.56
119504.8	without	30700	488.62	0.02	7.54
119182.9	existing	30700	488.49		5.75
119182.9	without	30700	488.52	0.03	5.74
118932	existing	30700	488.5		4.69
118932	without	30700	488.52	0.02	4.69
118854.1	existing	30700	488.1		7.69
118854.1	without	30700	488.03	-0.07	7.86
118787	existing	30700	488.28		5.04
118787	without	30700	488.28	0	5.04
118539.8	existing	30700	487.92		6.22
118539.8	without	30700	487.92	0	6.22
118133	existing	30700	486.97		8.55
118133	without	30700	486.97	0	8.55
117683.6	existing	30700	486.55		8.07
117683.6	without	30700	486.55	0	8.07
117407.1	existing	30700	485.29		11.29

117407.1	without	30700	485.29	0	11.29
117314.6		Bridge			
117193.3	existing	30700	483.66		12.57
117193.3	without	30700	483.66	0	12.57
117126.8	existing	30700	482.33		15.47
117126.8	without	30700	482.33	0	15.47
117101	existing	30700	482.71		13.78
117101	without	30700	482.71	0	13.78
117055.5		Bridge			
116985.7	existing	30700	478.64		16.39
116985.7	without	30700	478.64	0	16.39
116617.8	existing	33650	479.72		8.67
116617.8	without	33650	479.72	0	8.67
115938.7	existing	33650	478.47		9.96
115938.7	without	33650	478.47	0	9.96
115570.8	existing	33650	477.62		9.35
115570.8	without	33650	477.62	0	9.35
115275.2	existing	33650	477.58		6.86
115275.2	without	33650	477.58	0	6.86
114941	existing	33650	477.42		5.56
114941	without	33650	477.42	0	5.56
114511.1	existing	33650	477.19		4.9
114511.1	without	33650	477.19	0	4.9
114188.3	existing	33650	476.75		7.31
114188.3	without	33650	476.75	0	7.31
113266.8	existing	33650	476.3		5.95
113266.8	without	33650	476.3	0	5.95
112786.3	existing	33650	476.16		3.54
112786.3	without	33650	476.16	0	3.54
112522.2	existing	33650	476.05		3.99
112522.2	without	33650	476.05	0	3.99

112180.5	existing	33650	475.91		3.92
112180.5	without	33650	475.91	0	3.92
110213.5	existing	33650	475.22		4.01
110213.5	without	33650	475.22	0	4.01
109755	existing	33650	474.88		5.83
109755	without	33650	474.88	0	5.83
109203.9	existing	33650	474.8		4.25
109203.9	without	33650	474.8	0	4.25
108599	existing	33650	474.59		4.58
108599	without	33650	474.59	0	4.58
107998.4	existing	33650	472.89		10.77
107998.4	without	33650	472.89	0	10.77
107654.2	existing	33650	472.03		10.74
107654.2	without	33650	472.03	0	10.74
107258.6	existing	33650	470.98		10.81
107258.6	without	33650	470.98	0	10.81

10-percent Annual Chance of Exceedance (ACE) - with/without scenarios					
River Sta	Plan	Q Total (cfs)	W.S. Elev (ft)	Difference in W.S. Elev (ft)	Vel Chnl (ft/s)
142510	existing	10780	541.82		5.67
142510	without	10780	541.82	0	5.67
142394.2	existing	10780	541.62		5.8
142394.2	without	10780	541.62	0	5.8
142278.5	existing	10780	541.34		4.8
142278.5	without	10780	541.34	0	4.8
142162.7	existing	10780	540.59		8.13
142162.7	without	10780	540.59	0	8.13
142047	existing	10780	540.35		7.17
142047	without	10780	540.35	0	7.17
141905.3	existing	10780	539.51		8.11
141905.3	without	10780	539.51	0	8.11
141763.5	existing	10780	538.3		10.98
141763.5	without	10780	538.3	0	10.98
141621.7	existing	10780	538.02		8.73
141621.7	without	10780	538.02	0	8.73
141480	existing	10780	537.44		9.31
141480	without	10780	537.44	0	9.31
141150	existing	10780	536.72		8.65
141150	without	10780	536.72	0	8.65
140820	existing	10780	535.64		9.58
140820	without	10780	535.64	0	9.58
140225	existing	10780	533.83		7.4
140225	without	10780	533.83	0	7.4
140004	existing	10780	533.44		6.23
140004	without	10780	533.44	0	6.23
139783	existing	10780	533.16		6
139783	without	10780	533.16	0	6
139533	existing	10780	532.86		5.1
139533	without	10780	532.86	0	5.1

139283	existing	10780	531.86		8.35
139283	without	10780	531.86	0	8.35
138693	existing	10780	530.23		7.82
138693	without	10780	530.23	0	7.82
138141	existing	10780	528.18		8.77
138141	without	10780	528.18	0	8.77
137451	existing	10780	526.02		9.23
137451	without	10780	526.02	0	9.23
136889.8	existing	10780	524.66		7.46
136889.8	without	10780	524.66	0	7.46
136644.3	existing	10780	523.82		8.73
136644.3	without	10780	523.82	0	8.73
136413.4	existing	10780	523.35		9.53
136413.4	without	10780	523.35	0	9.53
136124.6	existing	10780	523.04		6.27
136124.6	without	10780	523.04	0	6.27
135806.1	existing	10780	521.95		8.46
135806.1	without	10780	521.95	0	8.46
135443.4	existing	10780	520.39		10.84
135443.4	without	10780	520.39	0	10.84
135158.1	existing	10780	519.42		10.42
135158.1	without	10780	519.42	0	10.42
135011.2	existing	10780	519.01		9.62
135011.2	without	10780	519.01	0	9.62
134900.2		Bridge			
134829.8	existing	10780	517.56		10.08
134829.8	without	10780	517.57	0.01	10.08
134482.2	existing	10780	517.07		7.88
134482.2	without	10780	517.07	0	7.88
134227.5	existing	10780	516.19		9.58
134227.5	without	10780	516.19	0	9.58

133916.1	existing	10780	514.38		11.1
133916.1	without	10780	514.4	0.02	11.06
133678.6	existing	10780	514.04		9.32
133678.6	without	10780	514.06	0.02	9.29
133380.6	existing	10780	513.83		7.97
133380.6	without	10780	513.86	0.03	7.94
132859	existing	10780	511.92		10.6
132859	without	10780	511.99	0.07	10.5
132418.8	existing	10780	510.77		10.75
132418.8	without	10780	510.25	-0.52	11.76
132266	existing	10780	510.05		12.74
132266	without	10780	510.43	0.38	9.54
132170	existing	10780	510.44		9.48
132170	without	10780	510.33	-0.11	9.92
131905	existing	10780	510.07		8.69
131905	without	10780	509.97	-0.1	8.82
131778.5	existing	10780	509.85		8.19
131778.5	without	10780	509.75	-0.1	8.29
131651.9	existing	10780	509.82		7.61
131651.9	without	10780	509.71	-0.11	7.74
131516.6	existing	10780	508.97		10.12
131516.6	without	10780	508.73	-0.24	10.54
131381.2	existing	10780	508.75		9.83
131381.2	without	10780	508.47	-0.28	10.28
131124.3	existing	10780	508.23		9.7
131124.3	without	10780	507.81	-0.42	10.31
130989	existing	10780	507.98		9.84
130989	without	10780	508.07	0.09	7.42
130861	existing	10780	507.28		11.38
130861	without	10780	507.79	0.51	8.09
130723	existing	10780	507.23		9.39

130723	without	10780	507.23	0	9.39
130430.3	existing	10780	506.47		10.57
130430.3	without	10780	506.47	0	10.57
130168.4	existing	10780	506.37		8.88
130168.4	without	10780	506.37	0	8.88
129891.6	existing	10780	505.43		10.61
129891.6	without	10780	505.43	0	10.61
129771	existing	10780	504.99		11.01
129771	without	10780	504.99	0	11
129698	existing	10780	504.72		8.99
129698	without	10780	504.73	0.01	8.98
129658.1	existing	10780	504.07		10.03
129658.1	without	10780	504.07	0	10.02
129641.6		Bridge			
129624	existing	10780	503.68		9.49
129624	without	10780	503.68	0	9.48
129390.7	existing	10780	503.6		9.19
129390.7	without	10780	503.61	0.01	9.19
129067.7	existing	10780	503.49		8.71
129067.7	without	10780	503.5	0.01	8.7
128974.6	existing	10780	503.13		8.59
128974.6	without	10780	503.14	0.01	8.59
128929.1		Bridge			
128870.2	existing	10780	502.55		10.07
128870.2	without	10780	502.56	0.01	10.06
128711.5	existing	10780	502.3		10.5
128711.5	without	10780	502.32	0.02	10.48
128560	existing	10780	500.36		14.29
128560	without	10780	499.73	-0.63	15.48
128204	existing	10780	500.38		11.02
128204	without	10780	500.92	0.54	8.25

128114	existing	10780	500.37		10.22
128114	without	10780	500.69	0.32	8.82
128032.3	existing	10780	500.58		8.71
128032.3	without	10780	500.38	-0.2	9.51
127791.7	existing	10780	500.43		8.11
127791.7	without	10780	500.38	-0.05	8.15
127475.3	existing	10780	500.23		7.4
127475.3	without	10780	500.17	-0.06	7.44
127261.3	existing	10780	500.09		7.77
127261.3	without	10780	500.03	-0.06	7.81
127088	existing	10780	500.04		7.25
127088	without	10780	499.97	-0.07	7.31
126963.9	existing	10780	499.55		8.83
126963.9	without	10780	499.47	-0.08	8.93
126889.9		Bridge			
126804.6	existing	10780	498.63		10.5
126804.6	without	10780	498.52	-0.11	10.61
126719.7	existing	10780	499.14		7.45
126719.7	without	10780	499.05	-0.09	7.54
126634.8	existing	10780	498.65		8.46
126634.8	without	10780	498.55	-0.1	8.53
126591.2	existing	10780	498.5		8.63
126591.2	without	10780	498.4	-0.1	8.74
126549.2	existing	11930	497.27		11.92
126549.2	without	11930	497.12	-0.15	12.09
126401.1	existing	11930	497.05		10.84
126401.1	without	11930	496.81	-0.24	11.2
126253	existing	11930	497.46		8.62
126253	without	11930	497.24	-0.22	8.95
126116.7	existing	11930	496.77		8.34
126116.7	without	11930	496.39	-0.38	8.97

125886	existing	11930	496.2		8.75
125886	without	11930	496.14	-0.06	7.73
125749	existing	11930	496.09		2.86
125749	without	11930	496.1	0.01	2.95
125649.2	existing	11930	494.77		8.45
125649.2	without	11930	494.72	-0.05	8.5
125340	existing	11930	494.23		7.49
125340	without	11930	494.17	-0.06	7.56
124537	existing	11930	492.54		7.73
124537	without	11930	492.42	-0.12	7.83
123917.3	existing	11930	490.79		8.97
123917.3	without	11930	490.57	-0.22	9.13
123458.7	existing	11930	489.59		9.17
123458.7	without	11930	489.25	-0.34	9.45
123106.1	existing	11930	488.75		8.83
123106.1	without	11930	488.3	-0.45	9.17
122772.4	existing	11930	488.05		8.52
122772.4	without	11930	487.48	-0.57	8.91
122375	existing	11930	487.22		8.03
122375	without	11930	486.8	-0.42	7.76
122258	existing	11930	487.06		7.42
122258	without	11930	486.63	-0.43	7.41
122166	existing	11930	486.91		7.17
122166	without	11930	486.51	-0.4	7.07
121953.3	existing	11930	486.53		7.31
121953.3	without	11930	485.99	-0.54	7.78
121705	existing	11930	486.28		5.82
121705	without	11930	485.96	-0.32	5.11
121550	existing	11930	486.09		5.58
121550	without	11930	485.91	-0.18	4.47
121496	existing	11930	485.99		5.67

121496	without	11930	485.85	-0.14	4.65
121039.1	existing	11930	484.45		8.79
121039.1	without	11930	484.43	-0.02	8.8
120813.7	existing	11930	484.1		7.91
120813.7	without	11930	484.07	-0.03	7.93
120661.2		Bridge			
120556.3	existing	11930	483.6		7.28
120556.3	without	11930	483.57	-0.03	7.3
120534.2	existing	12930	483.54		7.45
120534.2	without	12930	483.51	-0.03	7.48
120171.4	existing	12930	482.88		6.93
120171.4	without	12930	482.84	-0.04	6.97
119837	existing	12930	482.24		7.23
119837	without	12930	482.19	-0.05	7.28
119504.8	existing	12930	481.53		7.63
119504.8	without	12930	481.46	-0.07	7.7
119182.9	existing	12930	481.52		4.82
119182.9	without	12930	481.44	-0.08	4.85
118932	existing	12930	481.07		6.31
118932	without	12930	481.05	-0.02	6.05
118854.1	existing	12930	480.94		6.82
118854.1	without	12930	480.91	-0.03	6.5
118787	existing	12930	480.76		7.3
118787	without	12930	480.76	0	7.29
118539.8	existing	12930	480.43		5.89
118539.8	without	12930	480.43	0	5.89
118133	existing	12930	479.3		7.43
118133	without	12930	479.3	0	7.43
117683.6	existing	12930	478.67		7.03
117683.6	without	12930	478.67	0	7.03
117407.1	existing	12930	477.8		8.54

117407.1	without	12930	477.8	0	8.54
117314.6		Bridge			
117193.3	existing	12930	477.13		8.1
117193.3	without	12930	477.13	0	8.1
117126.8	existing	12930	476.6		9.6
117126.8	without	12930	476.6	0	9.6
117101	existing	12930	476.75		8.63
117101	without	12930	476.75	0	8.63
117055.5		Bridge			
116985.7	existing	12930	475.61		8.69
116985.7	without	12930	475.61	0	8.69
116617.8	existing	13850	473.65		11.18
116617.8	without	13850	473.65	0	11.18
115938.7	existing	13850	472.74		8
115938.7	without	13850	472.74	0	8
115570.8	existing	13850	472.28		5.92
115570.8	without	13850	472.28	0	5.92
115275.2	existing	13850	471.85		6.75
115275.2	without	13850	471.85	0	6.75
114941	existing	13850	471.73		4.52
114941	without	13850	471.73	0	4.52
114511.1	existing	13850	471.4		4.51
114511.1	without	13850	471.4	0	4.51
114188.3	existing	13850	471.16		4.94
114188.3	without	13850	471.16	0	4.94
113266.8	existing	13850	470.18		6.62
113266.8	without	13850	470.18	0	6.62
112786.3	existing	13850	470		3.72
112786.3	without	13850	470	0	3.72
112522.2	existing	13850	469.79		4.34
112522.2	without	13850	469.79	0	4.34

112180.5	existing	13850	469.5		4.41
112180.5	without	13850	469.5	0	4.41
110213.5	existing	13850	466.95		6.3
110213.5	without	13850	466.95	0	6.3
109755	existing	13850	466.13		6.85
109755	without	13850	466.13	0	6.85
109203.9	existing	13850	465.92		4.96
109203.9	without	13850	465.92	0	4.96
108599	existing	13850	465.36		5.55
108599	without	13850	465.36	0	5.55
107998.4	existing	13850	462.99		9.94
107998.4	without	13850	462.99	0	9.94
107654.2	existing	13850	461.93		9.34
107654.2	without	13850	461.93	0	9.34
107258.6	existing	13850	461.2		7.84
107258.6	without	13850	461.2	0	7.84