

# **Attachment 4**

## **Backwater and Secondary Channel Mitigation**

28<sup>th</sup> Meeting of the NECC  
January 11-12, 2000

Presented by

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Mississippi River - Backwater and Secondary Channel Mitigation

Pool	River Mile	Area	Selected Alternative	Initial Construction	Contingency (25%)	Total Construction	Engineering (10%)	S&A (10%)	Total Cost	Annual O&M Cost
5	752R	BW2	off shore revetment	\$215,250	\$53,813	\$269,063	\$26,906	\$26,906	\$322,875	\$10,763
									<b>\$350,000</b>	<b>\$11,000</b>
5	747L	BW4	off shore revetment	\$143,500	\$35,875	\$179,375	\$17,938	\$17,938	\$215,250	\$7,175
									<b>\$215,000</b>	<b>\$8,000</b>
5	746L	BW4	off shore revetment	\$129,150	\$32,288	\$161,438	\$16,144	\$16,144	\$193,725	\$6,458
									<b>\$200,000</b>	<b>\$7,000</b>
6	728R	BW1	drop structure, dredging	\$666,222	\$166,556	\$832,778	\$83,278	\$83,278	\$999,333	\$33,311
									<b>\$1,000,000</b>	<b>\$34,000</b>
6	727R	BW1	closure structure	\$17,220	\$4,305	\$21,525	\$2,153	\$2,153	\$25,830	\$861
									<b>\$25,000</b>	<b>\$1,000</b>
7	705R	SEC4	no project	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	696R	BW2	bank protection, closure structure	\$194,425	\$48,606	\$243,031	\$24,303	\$24,303	\$291,638	\$9,721
									<b>\$300,000</b>	<b>\$10,000</b>
9	671R	BW4	no project	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	670R	BW4	no project	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9	671L	SEC3	closure structure	\$86,100	\$21,525	\$107,625	\$10,763	\$10,763	\$129,150	\$4,305
									<b>\$130,000</b>	<b>\$4,500</b>
10	620R	BW10	dredging	\$1,222,222	\$305,556	\$1,527,778	\$152,778	\$152,778	\$1,833,333	\$61,111
									<b>\$1,835,000</b>	<b>\$62,000</b>
10	620R	BW10	closure structure	\$68,880	\$17,220	\$86,100	\$8,610	\$8,610	\$103,320	\$3,444
									<b>\$105,000</b>	<b>\$3,500</b>
11	614L	BW1	no project	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	610L	BW1	no project	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11	612R	BW3	barrier island, bank protection	\$187,867	\$46,967	\$234,834	\$23,483	\$23,483	\$281,801	\$9,393
									<b>\$285,000</b>	<b>\$10,000</b>
13	528L	BW11	no project	\$0	\$0	\$0	\$0	\$0	\$0	\$0
13	542R	SEC8	closure structure, dredging	\$1,167,773	\$291,943	\$1,459,716	\$145,972	\$145,972	\$1,751,660	\$58,389
									<b>\$1,755,000</b>	<b>\$59,000</b>
13	532R	SEC12	no project	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>TOTAL =</b>									<b>\$6,200,000</b>	<b>\$210,000</b>

Illinois River - Backwater and Secondary Channel Mitigation

Pool	River Mile	Area	Selected Alternative	Initial Construction	Contingency (25%)	Total Construction	Engineering (10%)	S&A (10%)	Total Cost	Annual O&M Cost
Dresden	280L	BW2	closure structure	\$118,080	\$29,520	\$147,600	\$14,760	\$14,760	\$177,120	\$5,904
									<b>\$180,000</b>	<b>\$6,000</b>
Marseilles	261R	SEC1	closure structure, bank protection	\$89,320	\$22,330	\$111,650	\$11,165	\$11,165	\$133,980	\$4,466
									<b>\$135,000</b>	<b>\$5,000</b>
Marseilles	256R	SEC-A	barrier island, bank protection, dredging	\$373,156	\$93,289	\$466,445	\$46,645	\$46,645	\$559,734	\$18,658
									<b>\$560,000</b>	<b>\$19,000</b>
Starved Rock	239L	SEC1	closure structure	\$137,760	\$34,440	\$172,200	\$17,220	\$17,220	\$206,640	\$6,888
									<b>\$210,000</b>	<b>\$7,000</b>
Starved Rock	236R	SEC2	dredging	\$1,111,111	\$277,778	\$1,388,889	\$138,889	\$138,889	\$1,666,667	\$55,556
									<b>\$1,670,000</b>	<b>\$56,000</b>
Peoria	201R	BW10	dredging	\$155,556	\$38,889	\$194,445	\$19,445	\$19,445	\$233,334	\$7,778
									<b>\$235,000</b>	<b>\$8,000</b>
Peoria	195R	SEC2	dredging, closure structure	\$2,895,200	\$723,800	\$3,619,000	\$361,900	\$361,900	\$4,342,800	\$144,760
									<b>\$4,345,000</b>	<b>\$145,000</b>
Peoria	208L	SEC-A	no project	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Peoria	204L	SEC-B	dredging, closure structure	\$767,609	\$191,902	\$959,511	\$95,951	\$95,951	\$1,151,414	\$38,380
									<b>\$1,155,000</b>	<b>\$39,000</b>
Peoria	203R	SEC-C	dredging, closure structure	\$723,164	\$180,791	\$903,955	\$90,396	\$90,396	\$1,084,746	\$36,158
									<b>\$1,085,000</b>	<b>\$36,000</b>
Lagrange	113L	BW4	dredging	\$333,333	\$83,333	\$416,666	\$41,667	\$41,667	\$500,000	\$16,667
									<b>\$500,000</b>	<b>\$17,000</b>
Lagrange	98L	BW5	no project	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Lagrange	96L	BW5	dredging	\$444,444	\$111,111	\$555,555	\$55,556	\$55,556	\$666,666	\$22,222
									<b>\$670,000</b>	<b>\$23,000</b>
Lagrange	92L	BW5	dredging	\$222,222	\$55,556	\$277,778	\$27,778	\$27,778	\$333,333	\$11,111
									<b>\$335,000</b>	<b>\$11,000</b>
Lagrange	95L	BW6	closure structure, dredging	\$1,078,720	\$269,680	\$1,348,400	\$134,840	\$134,840	\$1,618,080	\$53,936
									<b>\$1,620,000</b>	<b>\$54,000</b>
Lagrange	148R	SEC1	closure structure, dredging	\$631,733	\$157,933	\$789,666	\$78,967	\$78,967	\$947,600	\$31,587
									<b>\$950,000</b>	<b>\$32,000</b>
Lagrange	141L	SEC3	closure structure, dredging	\$831,733	\$207,933	\$1,039,666	\$103,967	\$103,967	\$1,247,600	\$41,587
									<b>\$1,250,000</b>	<b>\$42,000</b>
Alton	28R	BW2	closure structures	\$236,160	\$59,040	\$295,200	\$29,520	\$29,520	\$354,240	\$11,808
									<b>\$355,000</b>	<b>\$12,000</b>

Illinois River - Backwater and Secondary Channel Mitigation

Pool	River Mile	Area	Selected Alternative	Initial Construction	Contingency (25%)	Total Construction	Engineering (10%)	S&A (10%)	Total Cost	Annual O&M Cost
Alton	46R	SEC-B	closure structure, dredging	\$940,302	\$235,076	\$1,175,378	\$117,538	\$117,538	\$1,410,453	\$47,015
									<b>\$1,415,000</b>	<b>\$47,000</b>
Alton	39L	SEC-D	closure structure, dredging	\$1,236,818	\$309,205	\$1,546,023	\$154,602	\$154,602	\$1,855,227	\$61,841
									<b>\$1,860,000</b>	<b>\$62,000</b>
Alton	38R	SEC-E	closure structure	\$78,720	\$19,680	\$98,400	\$9,840	\$9,840	\$118,080	\$3,936
									<b>\$120,000</b>	<b>\$4,000</b>
Alton	31L	SEC-F	closure structure	\$98,400	\$24,600	\$123,000	\$12,300	\$12,300	\$147,600	\$4,920
									<b>\$150,000</b>	<b>\$5,000</b>
<b>TOTAL =</b>									<b>\$18,800,000</b>	<b>\$630,000</b>

## REVIEW OF NECC SUBMITTED UMRS BACKWATERS and SECONDARY CHANNELS

Mr. Bill Bertrand submitted the following. Results of review are in *italics*.

### Illinois River

#### Alton Pool

**RM 14-15.3 Helmbold Slough** – *this is BW3 in Alton Pool on the right side. Distance from sailing line to inlet is 150 m and depth at sailing line is 5.3 m and at inlet 1.0 m. Conditions and concentrations indicate that impacts from tow traffic are negligible.*

**RM 57.4-59 Big Blue Island Slough** – *SEC2 (secondary channel) in analysis of Alton Pool on the left side. Distance from sailing line to inlet is 160 m and depth at sailing line is 5.7 m and 1.6 m at inlet. Conditions beyond limits established for any potential impact from towboat traffic.*

#### Peoria Pool

**RM 179-181 East River complex** – *part of BW21 on the left side in the Peoria Pool. This is in the impounded portion of the pool and no computations can be made in those conditions in this analysis.*

**RM 189.5 Sparland unit of Marshal County Conservation Area** (downstream end of Goose Lake) – *This is part of BW14 on the right side in Peoria Pool. The inlet to the Sparland Unit is 80 m from the sailing line and 0.7 m deep. The navigation channel depth in this reach is 6.2 m. Based on the LaGrange Pool analysis, these conditions will produce negligible impacts from towboat traffic.*

**RM 198 Billsbach Lake** (location changed to RM 193.8 per telephone conversation with Mr. Bertrand) – *This is BW13 on the left side of the Peoria Pool. The distance from the sailing line to the inlet is 80 m and the inlet depth is 0.8 m. The navigation channel depth is 5.2 m. Again based on the LaGrange Pool analysis, these conditions will produce negligible impacts from towboat traffic.*

**RM 199 Senachwine Lake** – *this is BW10 on the right side in the Peoria Pool. This backwater was designated as having the potential for medium impacts in the sedimentation analysis and was colored YELLOW.*

**RM 211 Lake Depue** – *thus is BW6 on the right side in Peoria Pool. The distance from the sailing line to the inlet is 140 m and the depth at the sailing line is 4.6 m and at the inlet 0.8 m. This is a single-opening backwater, and the 140-m distance would create a low drawdown at the inlet; therefore, impacts would be negligible.*

- two additional ones in the LaGrange Pool are RM 122.3 Quiver Lake and RM 133.4-135.6 Senate Island – *Quiver Lake is BW1 on the left side in the LaGrange Pool. Results from sedimentation analysis indicated at 0.0103 acre-feet/year will move into the backwater, which will fill it at a rate of 0.00009 cm/year. These values are both below the designated levels of medium impacts from towboat traffic. Senate Island was listed in the GIS database as an isolated backwater and no computations could be made in this area since the bathymetry indicated no direct link to the main channel.*

### Mississippi River

**Pool 12**, RM 572.2 Menominee Slough – *part of BW6 on the left side in Pool 12. Distance from the sailing line to the inlet is 110 m and the depth of the inlet is 2.6 m. With these conditions and the sediment concentrations the results from the analysis indicated negligible potential for impacts from towboats.*

**Pool 18**, RM 423.3 Campbell Chute AND RM 422.5 opening into Burnt Pocket – *Campbell Chute and Burnt Pocket are parts (inlets) of BW 8 on the left side in Pool 18. Both inlets are 120 m from the sailing line to the inlets and the inlet depths are 3.5 m. Therefore, these inlets had values greater than those determined as being significant in the trend pools and the sediment concentrations from the towboat traffic were too low.*

**Pool 16**, RM 464 the backwaters at the lower end of Andalusia Island – *This area is an outlet to BW4 on the left side of Pool 16. In the backwater and secondary channel sediment study no computations were made in outlets due to the lack of data relative to the discharge coming out of such areas.*

**Pool 16**, RM 461.2 on Illinois side is an area called Dead Slough, site of the Andalusia Refuge HREP, and the lower end of Dead Slough where it connects to Drury Slough – *This area is part of BW5 on the left side in Pool 16. BW5 is an impounded backwater and no computations could be made on impounded backwaters in the backwater and secondary channel sedimentation study.*

Mr. Bernard Schonhoff submitted the following side channels as being potentially overlooked in the sediment study. According to Mr. Schonhoff, the river miles indicated are for the head of the island. It should be noted that based on this review, it was determined that Mr. Schonhoff considered the right and left side of the channel looking upstream, while in the backwater and secondary channel sediment study these areas were delineated looking downstream. Therefore, “right” on Mr. Schonhoff’s list would be “left” in the backwater and secondary channel sediment document provided to the NECC. Again, the results of this review are in *italics*.

## **Pool 16**

**472.9R Behind Tow head Island.** – *Assumed RM 471.9. Part of BW4 in Pool 16. Distance from sailing line to inlet is 170 m and inlet depth is about 3 m. Conditions and concentration indicate negligible potential for impacts from towboats.*

**469.6R Un-named island in the Andalusia complex** – *This area is part of BW4 on the left side in Pool 16. This particular island was not delineated in the GIS database, which indicates that this island has become attached to the adjacent land area. There is an inlet into BW4 at RM 468; however, the distance from the sailing line to that inlet is 240 m.*

**465.2R Un-named island in the Andalusia complex** – *This area is also part of BW4 on the left side in Pool 16. The distance from the sailing line to the inlet is 160 m and the depth of the inlet is about 5 m. Based on the trend pool calculation, these conditions create negligible impacts on resuspension of bed material from tows.*

**459.2L Un-named island** – *Part of impounded BW5 on the right side of Pool 16. No computations could be made on impounded backwaters in the backwater and secondary channel sedimentation study.*

## **Pool 17**

**452R Un-named island near head of Blanchard Island** – *This island was included in BW1 on the left side of Pool 17. There are inlets immediately upstream and downstream of this island. At the upstream inlet the distance from the sailing line to the inlet is 210 m and the depth of the inlet is 1 m, and at the downstream inlet the distance from the sailing line is 190 m and the inlet depth is 1 m. Therefore, conditions are such that this island will be subjected to negligible impacts from towboat traffic.*

**450.1R Un-named island near the middle of Blanchard Island** – *Also part of BW1 in Pool 17. In the GIS database the inlet to Blanchard Island is closed off; therefore, no computations were made. Based on some measurements made on the GIS maps, if the inlet was open it would be about 200 m from the sailing line. This indicates that there is a good chance that the potential impacts would be negligible.*

**447.7L Upper portion behind Kilpeck Island** – *Part of BW2 on the right side of Pool 17. The distance from the sailing line to the inlet is greater than 200 m; again indicating that the potential impacts from towboat resuspension of sediments is negligible.*

**438.0L Swift chute and un-named chute on Turkey Island** – *Part of BW4 on the right side in Pool 17. The distance of the inlet from the sailing line is 400 m; therefore, negligible impacts are projected.*

## **Pool 18**

**436.8L Chute between Keg and Otter Tail Islands** – *This chute is part of BW1 on the right side of Pool 18. There is 310 m between the sailing line and the inlet, and the inlet is greater than 6 m deep. These conditions and concentrations are such that the potential for impacts from tows resuspending bed material is negligible.*

**428.9L Chute between Blackhawk and un-named island** - *this entire area was shown to be growing on the aerial maps in the Cumulative Effects study. – This is part of BW4 on the right side of Pool 18. From the sailing line to the inlet is 340 m and the inlet is 3 m deep. These conditions and the concentrations are such that negligible impacts from tows are highly likely in this chute. While not intending to profess what the Cumulative Effects study was considering, a review of the Navigation Charts and GIS maps indicate that from about RM 419 to 425 the overall river width increases significantly*

*and then narrows back down around RM 419. Those conditions are indicative of areas of potential “Loss of Contiguous Backwater” delineated in the Cumulative Effects report.*

**423.8L Kingston Bar, Big Cody, Little Cody, and Beaver Chutes on Huron Island.** – *These chutes are part of BW7 on the right side of Pool 18. The distances from the sailing line to the inlets for these 4 inlets vary from 140 to 370 m (based on inlets at RM’s 425, 424, 423, and 422). The inlet depths vary from 1.4 to 6.7 m. Therefore, based on these conditions negligible impacts are projected for these 4 chutes or channels.*

## **Pool 19**

**408.8L Chute between Otter Island and un-named island** – *This chute is part of BW1 on the right side in Pool 19. The distance from the sailing line to the inlet is 120 m and the inlet depth is 3.9 m. These conditions are such that towboat traffic is projected to have negligible impacts on this chute.*

**406.1L Chute between Baby Rush and Big Rush Islands.** – *This chute is part of BW1 on the right side in Pool 19. No inlet was delineated specifically into this chute, but the backwater area was considered.*

**405.5L Chute between O’Connell Island and un-named island.** – *This chute is part of BW1 on the right side in Pool 19. In the backwater and secondary channel sediment study this chute was delineated as an outlet to BW1. Therefore, no computations were made on it. That outlet is approximately 200 m from the sailing line, so impacts are potentially negligible.*

**398.3R Chute through Burlington Island complex.** – *This chute is SEC1 on the left side of Pool 19. The distance from the sailing line to the chute inlet is 390 m and the depth of the inlet is greater than 1.5 m; therefore, potential impacts are negligible.*

**387.2L Lead Island Chute.** – *This chute was originally listed at RM 378.2. This chute is BW8 on the right side of Pool 19. The distance from the sailing line to the inlet is 780 m and the depth of the inlet is about 1.2 m. The distance to the inlet is too great to produce any impacts to the chute.*

**380.5L Rabbit Island Chute.** – *This chute is BW7 on the right side of Pool 19. The sailing line to inlet distance is 1,000 m; therefore, the tow-induced impacts are negligible.*