

APPENDIX G - COST ESTIMATES

Summary of Alternatives
River System EE/CA
TVA Kingston Ash Recovery Project

08/03/2012

ITEM		Alternative 1	Alternative 2A	Alternative 2B	Alternative 3A	Alternative 3B
WBS	ITEM DESCRIPTION	MONITORED NATURAL RECOVERY	IN-SITU CAPPING	TARGETED CAPPING	DREDGING	TARGETED DREDGING
1.0	INFRASTRUCTURE/SITE PREPARATION	-	177,300	177,300	6,665,900	6,665,900
1.1	Staging/operating area	-	177,300	177,300	-	-
1.2	Dewatering facility	-	-	-	4,929,800	4,929,800
1.3	Demolish dewatering facility	-	-	-	1,736,100	1,736,100
2.0	SUBAQUEOUS CAP PLACEMENT	-	18,522,200	14,885,400	-	-
2.1	Mobilization/demobilization	-	338,400	338,400	-	-
2.2	Purchase capping material	-	4,083,800	3,267,000	-	-
2.3	Place cap material	-	14,100,000	11,280,000	-	-
3.0	DREDGING	-	-	-	10,504,300	4,268,700
3.1	Mobilization/Demobilization	-	-	-	705,500	705,500
3.2	Hydraulic Dredging	-	-	-	9,798,800	3,563,200
4.0	DEWATERING	-	-	-	6,787,300	2,468,100
4.1	Operate CSBs & pump to Stilling Pond	-	-	-	1,446,300	525,900
4.2	Remove material from ponds and windrow	-	-	-	4,204,300	1,528,900
4.3	Load dewatered materials for transport	-	-	-	1,136,700	413,300
5.0	TRANSPORTATION	-	-	-	6,483,400	2,194,200
5.1	Truck transport to Subtitle D Landfill	-	-	-	2,782,000	642,000
5.2	Truck transport to Bulk Survey For Release facility	-	-	-	3,701,400	1,552,200
6.0	DISPOSAL	-	-	-	101,292,100	41,615,100
6.1	Disposal at Subtitle D Landfill	-	-	-	4,572,100	1,055,100
6.2	Bulk Survey For Release analysis & disposal	-	-	-	96,720,000	40,560,000
7.0	MONITORING OF OPERATIONS	-	1,538,800	1,259,000	1,782,000	648,000
7.1	Routine air monitoring	-	-	-	264,000	96,000
7.2	Routine surface water monitoring	-	1,518,000	1,242,000	1,518,000	552,000
7.3	Routine imported material sampling	-	20,800	17,000	-	-
8.0	SAMPLING/ANALYSIS	-	3,015,100	2,504,500	2,319,200	1,173,800
8.1	Vibracore sampling (to delineate area)	-	462,300	462,300	462,300	462,300
8.2	As-built bathymetry	-	1,600,000	1,280,000	1,040,000	400,000
8.3	Sampling (to confirm as-built cap/ash thickness)	-	952,800	762,200	619,300	238,200
8.4	Ash/sediment analysis precharacterization	-	-	-	68,300	26,300
8.5	Routine waste sampling for disposal	-	-	-	129,300	47,000
9.0	INSITUTIONAL CONTROLS	-	20,000	20,000	20,000	20,000
9.1	Legal Fees, Administration, Documentation	-	20,000	20,000	20,000	20,000
10.0	PROJECT MANAGEMENT/SUPPORT	-	3,318,300	2,715,000	5,288,800	2,327,200
10.1	Project Manager	-	503,400	411,800	572,000	251,700
10.2	Field Engineer	-	402,700	329,500	915,200	402,700
10.3	Health & Safety	-	375,600	307,300	426,800	187,800
10.4	Quality Engineer	-	371,700	304,100	422,400	185,900
10.5	Project Controls Engineer	-	356,200	291,500	404,800	178,100
10.6	Procurement	-	69,700	57,000	79,200	34,800
10.7	Construction Engineer	-	484,000	396,000	1,100,000	484,000
10.8	Transport Specialist	-	-	-	112,200	49,400
10.9	Waste Packaging Specialist	-	-	-	112,200	49,400
10.10	TVA oversight and management	-	755,000	617,800	1,144,000	503,400
	Subtotal	-	26,591,700	21,561,200	141,143,000	61,381,000
	Contingency (20%)	-	5,318,300	4,312,200	28,228,600	12,276,200
		-	1,063,700	862,400	5,645,700	2,455,200
	** CAPITAL COST TOTAL **	-	31,910,000	25,873,400	169,371,600	73,657,200

APPENDIX G - COST ESTIMATES

Summary of Alternatives
River System EE/CA
TVA Kingston Ash Recovery Project

08/03/2012

ITEM		Alternative 1	Alternative 2A	Alternative 2B	Alternative 3A	Alternative 3B
WBS	ITEM DESCRIPTION	MONITORED NATURAL RECOVERY	IN-SITU CAPPING	TARGETED CAPPING	DREDGING	TARGETED DREDGING
11.0	SEDIMENT MONITORING	41,900	41,900	41,900	41,900	41,900
11.1	Collect 3 samples @ each of 7 locations	22,400	22,400	22,400	22,400	22,400
11.2	Analyze for % ash, arsenic/selenium	7,000	7,000	7,000	7,000	7,000
11.3	Validate and archive data	12,500	12,500	12,500	12,500	12,500
12.0	BIOTA MONITORING	159,700	159,700	159,700	159,700	159,700
12.1	Collect 3 adult mayflies @ each of 7 locations	68,300	68,300	68,300	68,300	68,300
12.2	Collect 3 larval mayflies @ each of 7 locations	68,300	68,300	68,300	68,300	68,300
12.3	Analyze for arsenic/selenium	10,200	10,200	10,200	10,200	10,200
12.4	Validate and archive data	12,900	12,900	12,900	12,900	12,900
13.0	EFFECTS MONITORING	116,600	116,600	116,600	116,600	116,600
13.1	Benthic comm. survey sampling (7 transects)	58,300	58,300	58,300	58,300	58,300
13.2	Species identification	58,300	58,300	58,300	58,300	58,300
14.0	SEDIMENT TRANSPORT MODELING	19,600	19,600	19,600	19,600	19,600
14.1	Survey bathymetry @ each of 6 transects	9,600	9,600	9,600	9,600	9,600
14.2	Update transport model	10,000	10,000	10,000	10,000	10,000
15.0	REPAIRS	-	185,400	185,400	-	-
15.1	Maintain cap (repair scour)	-	185,400	185,400	-	-
16.0	REPORTING	30,800	30,800	30,800	30,800	30,800
16.1	Annual data evaluation and reports	16,000	16,000	16,000	16,000	16,000
16.2	5-yr review reports	14,800	14,800	14,800	14,800	14,800
17.0	PROJECT MANAGEMENT/SUPPORT	124,900	124,900	124,900	124,900	124,900
17.1	Project Manager	22,900	22,900	22,900	22,900	22,900
17.2	Health & Safety	17,100	17,100	17,100	17,100	17,100
17.3	Quality Engineer	16,900	16,900	16,900	16,900	16,900
17.4	Project Controls Engineer	16,200	16,200	16,200	16,200	16,200
17.5	Procurement	3,200	3,200	3,200	3,200	3,200
17.6	TVA oversight and management	48,600	48,600	48,600	48,600	48,600
	Subtotal	\$ 493,500	\$ 678,900	\$ 678,900	\$ 493,500	\$ 493,500
	Contingency (10%)	\$ 49,400	\$ 67,900	\$ 67,900	\$ 49,400	\$ 49,400
	** ANNUAL O&M COST TOTAL **	\$ 542,900	\$ 746,800	\$ 746,800	\$ 542,900	\$ 542,900
18.0	OTHER MONITORING	338,700	290,300	290,300	290,300	290,300
18.1	Fish bioaccumulation evaluation	232,000	232,000	232,000	232,000	232,000
18.2	Fish community survey	58,300	58,300	58,300	58,300	58,300
18.3	Sediment toxicity testing	48,400	-	-	-	-
	** ANNUAL MISC MONITORING COST TOTAL **	\$ 338,700	\$ 290,300	\$ 290,300	\$ 290,300	\$ 290,300
	Assumed O&M Period (Monitoring)	30 years	30 years	30 years	30 years	30 years
	Assumed O&M Period (Misc. Monitoring)	5 years	5 years	5 years	5 years	5 years
	Assumed O&M Period (Cap Maintenance)		30 years	30 years		
	** PRESENT WORTH **	\$ 10,000,000	\$ 44,800,000	\$ 38,700,000	\$ 179,100,000	\$ 83,400,000

APPENDIX G - COST ESTIMATES

Alternative 1 - Monitored Natural Recovery
River System EE/CA
TVA Kingston Ash Recovery Project

08/03/2012

ITEM					
WBS	ITEM DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL (\$)
1.0	INFRASTRUCTURE/SITE PREPARATION				-
1.1	Staging/operating area	-		-	-
1.2	Dewatering facility	-		-	-
1.3	Demolish dewatering facility	-		-	-
2.0	SUBAQUEOUS CAP PLACEMENT				-
2.1	Mobilization/demobilization	-		-	-
2.2	Purchase capping material	-		-	-
2.3	Place cap material	-		-	-
3.0	DREDGING				-
3.1	Mobilization/Demobilization	-		-	-
3.2	Hydraulic Dredging	-		-	-
4.0	DEWATERING				-
4.1	Operate CSBs & pump to Stilling Pond	-		-	-
4.2	Remove material from ponds and windrow	-		-	-
4.3	Load dewatered materials for transport	-		-	-
5.0	TRANSPORTATION				-
5.1	Truck transport to Subtitle D Landfill	-		-	-
5.2	Truck transport to Bulk Survey For Release facility	-		-	-
6.0	DISPOSAL				-
6.1	Disposal at Subtitle D Landfill	-		-	-
6.2	Bulk Survey For Release analysis & disposal	-		-	-
7.0	MONITORING OF OPERATIONS				-
7.1	Routine air monitoring	-		-	-
7.2	Routine surface water monitoring	-		-	-
7.3	Routine imported material sampling	-		-	-
8.0	SAMPLING/ANALYSIS				-
8.1	Vibracore sampling (to delineate area)	-		-	-
8.2	As-built bathymetry	-		-	-
8.3	Sampling (to confirm as-built cap/ash thickness)	-		-	-
8.4	Ash/sediment analysis precharacterization	-		-	-
8.5	Routine waste sampling for disposal	-		-	-
9.0	INSITUTIONAL CONTROLS				-
9.1	Legal Fees, Administration, Documentation	-		-	-
10.0	PROJECT MANAGEMENT/SUPPORT	-		-	-
10.1	Project Manager	-		-	-
10.2	Field Engineer	-		-	-
10.3	Health & Safety	-		-	-
10.4	Quality Engineer	-		-	-
10.5	Project Controls Engineer	-		-	-
10.6	Procurement	-		-	-
10.7	Construction Engineer	-		-	-
10.8	Transport Specialist	-		-	-
10.9	Waste Packaging Specialist	-		-	-
10.10	TVA oversight and management	-		-	-
	Subtotal				-
	Contingency (20%)				-
	** CAPITAL COST TOTAL **				-

APPENDIX G - COST ESTIMATES

Alternative 1 - Monitored Natural Recovery
River System EE/CA
TVA Kingston Ash Recovery Project

08/03/2012

ITEM					
WBS	ITEM DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL (\$)
11.0	SEDIMENT MONITORING				41,900
11.1	Collect 3 samples @ each of 7 locations	21	samples	1,066	22,400
11.2	Analyze for % ash, arsenic/selenium	21	samples	334	7,000
11.3	Validate and archive data	21	samples	597	12,500
12.0	BIOTA MONITORING				159,700
12.1	Collect 3 adult mayflies @ each of 7 locations	21	samples	3,250	68,300
12.2	Collect 3 larval mayflies @ each of 7 locations	21	samples	3,250	68,300
12.3	Analyze for arsenic/selenium	42	samples	244	10,200
12.4	Validate and archive data	42	samples	306	12,900
13.0	EFFECTS MONITORING				116,600
13.1	Benthic comm. survey sampling (7 transects)	7	transects	8,333	58,300
13.2	Species identification	7	transects	8,333	58,300
14.0	SEDIMENT TRANSPORT MODELING				19,600
14.1	Survey bathymetry @ each of 6 transects	6	transects	1,600	9,600
14.2	Update transport model	1	each	10,000	10,000
15.0	REPAIRS				-
15.1	Maintain cap (repair scour)	-	-	-	-
16.0	REPORTING				30,800
16.1	Annual data evaluation and reports	1	each	16,000	16,000
16.2	5-yr review reports	1	each	14,800	14,800
17.0	PROJECT MANAGEMENT/SUPPORT				124,900
17.1	Project Manager	1	months	22,880	22,900
17.2	Health & Safety	1	months	17,072	17,100
17.3	Quality Engineer	1	months	16,896	16,900
17.4	Project Controls Engineer	1	months	16,192	16,200
17.5	Procurement	1	months	3,168	3,200
17.6	TVA oversight and management	1	months	48,620	48,600
	Subtotal				\$ 493,500
	Contingency (10%)				\$ 49,400
	** ANNUAL O&M COST TOTAL **				\$ 542,900
18.0	OTHER MONITORING				338,700
18.1	Fish bioaccumulation evaluation	72	samples	3,222	232,000
18.2	Fish community survey	7	transects	8,333	58,300
18.3	Sediment toxicity testing	36	months	1,344	48,400
	** ANNUAL MISC MONITORING COST TOTAL **				\$ 338,700
	Assumed O&M Period (Monitoring)				30 years
	Assumed O&M Period (Misc. Monitoring)				5 years
	Assumed O&M Period (Cap Maintenance)				
	** PRESENT WORTH **				\$ 10,000,000

APPENDIX G - COST ESTIMATES

Alternative 2A - In-Situ Capping with MNR
River System EE/CA
TVA Kingston Ash Recovery Project

08/03/2012

ITEM WBS	ITEM DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL (\$)
1.0	INFRASTRUCTURE/SITE PREPARATION				177,300
1.1	Staging/operating area	2	acres	88,650	177,300
1.2	Dewatering facility	-		-	-
1.3	Demolish dewatering facility	-		-	-
2.0	SUBAQUEOUS CAP PLACEMENT				18,522,200
2.1	Mobilization/demobilization	1	each	338,400	338,400
2.2	Purchase capping material	272,250	tons	15.00	4,083,800
2.3	Place cap material	200	acres	70,500	14,100,000
3.0	DREDGING				-
3.1	Mobilization/Demobilization	-		-	-
3.2	Hydraulic Dredging	-		-	-
4.0	DEWATERING				-
4.1	Operate CSBs & pump to Stilling Pond	-		-	-
4.2	Remove material from ponds and windrow	-		-	-
4.3	Load dewatered materials for transport	-		-	-
5.0	TRANSPORTATION				-
5.1	Truck transport to Subtitle D Landfill	-		-	-
5.2	Truck transport to Bulk Survey For Release facility	-		-	-
6.0	DISPOSAL				-
6.1	Disposal at Subtitle D Landfill	-		-	-
6.2	Bulk Survey For Release analysis & disposal	-		-	-
7.0	MONITORING OF OPERATIONS				1,538,800
7.1	Routine air monitoring	-	months	-	-
7.2	Routine surface water monitoring	22	months	69,000	1,518,000
7.3	Routine imported material sampling	22	months	944	20,800
8.0	SAMPLING/ANALYSIS				3,015,100
8.1	Vibracore sampling (to delineate area)	300	samples	1,541	462,300
8.2	As-built bathymetry	200	acres	8,000	1,600,000
8.3	Sampling (to confirm as-built cap/ash thickness)	800	samples	1,191	952,800
8.4	Ash/sediment analysis precharacterization	-		-	-
8.5	Routine waste sampling for disposal	-		-	-
9.0	INSITUTIONAL CONTROLS				20,000
9.1	Legal Fees, Administration, Documentation	1	each	20,000	20,000
10.0	PROJECT MANAGEMENT/SUPPORT				3,318,300
10.1	Project Manager	22	months	22,880	503,400
10.2	Field Engineer	22	months	18,304	402,700
10.3	Health & Safety	22	months	17,072	375,600
10.4	Quality Engineer	22	months	16,896	371,700
10.5	Project Controls Engineer	22	months	16,192	356,200
10.6	Procurement	22	months	3,168	69,700
10.7	Construction Engineer	22	months	22,000	484,000
10.8	Transport Specialist	-	months	-	-
10.9	Waste Packaging Specialist	-	months	-	-
10.10	TVA oversight and management	22	months	34,320	755,000
	Subtotal				26,591,700
	Contingency (20%)				5,318,300
	** CAPITAL COST TOTAL **				31,910,000

APPENDIX G - COST ESTIMATES

Alternative 2A - In-Situ Capping with MNR
River System EE/CA
TVA Kingston Ash Recovery Project

08/03/2012

ITEM WBS	ITEM DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL (\$)
11.0	SEDIMENT MONITORING				41,900
11.1	Collect 3 samples @ each of 7 locations	21	samples	1,066	22,400
11.2	Analyze for % ash, arsenic/selenium	21	samples	334	7,000
11.3	Validate and archive data	21	samples	597	12,500
12.0	BIOTA MONITORING				159,700
12.1	Collect 3 adult mayflies @ each of 7 locations	21	samples	3,250	68,300
12.2	Collect 3 larval mayflies @ each of 7 locations	21	samples	3,250	68,300
12.3	Analyze for arsenic/selenium	42	samples	244	10,200
12.4	Validate and archive data	42	samples	306	12,900
13.0	EFFECTS MONITORING				116,600
13.1	Benthic comm. survey sampling (7 transects)	7	transects	8,333	58,300
13.2	Species identification	7	transects	8,333	58,300
14.0	SEDIMENT TRANSPORT MODELING				19,600
14.1	Survey bathymetry @ each of 6 transects	6	transects	1,600	9,600
14.2	Update transport model	1	EA	10,000	10,000
15.0	REPAIRS				185,400
15.1	Maintain cap (repair scour)	2	acres	92,682	185,400
16.0	REPORTING				30,800
16.1	Annual data evaluation and reports	1	EA	16,000	16,000
16.2	5-yr review reports	1	EA	14,800	14,800
17.0	PROJECT MANAGEMENT/SUPPORT				124,900
17.1	Project Manager	1	months	22,880	22,900
17.2	Health & Safety	1	months	17,072	17,100
17.3	Quality Engineer	1	months	16,896	16,900
17.4	Project Controls Engineer	1	months	16,192	16,200
17.5	Procurement	1	months	3,168	3,200
17.6	TVA oversight and management	1	months	48,620	48,600
	Subtotal				\$ 678,900
	Contingency (10%)				\$ 67,900
	** ANNUAL O&M COST TOTAL **				\$ 746,800
18.0	OTHER MONITORING				290,300
18.1	Fish bioaccumulation evaluation	72	samples	3,222	232,000
18.2	Fish community survey	7	transects	8,333	58,300
18.3	Sediment toxicity testing	-	months	-	-
	** ANNUAL MISC MONITORING COST TOTAL **				\$ 290,300
	Assumed O&M Period (Monitoring)				30 years
	Assumed O&M Period (Misc. Monitoring)				5 years
	Assumed O&M Period (Cap Maintenance)				30 years
	** PRESENT WORTH **				\$ 44,800,000

APPENDIX G - COST ESTIMATES

Alternative 2B - Targeted Capping with MNR
Rivory System EE/CA
TVA Kingston Ash Recovery Project

08/03/2012

ITEM WBS	ITEM DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL (\$)
1.0	INFRASTRUCTURE/SITE PREPARATION				177,300
1.1	Staging/operating area	2	acres	88,650	177,300
1.2	Dewatering facility	-		-	-
1.3	Demolish dewatering facility	-		-	-
2.0	SUBAQUEOUS CAP PLACEMENT				14,885,400
2.1	Mobilization/demobilization	1	each	338,400	338,400
2.2	Purchase capping material	217,800	tons	15.00	3,267,000
2.3	Place cap material	160	acres	70,500	11,280,000
3.0	DREDGING				-
3.1	Mobilization/Demobilization	-		-	-
3.2	Hydraulic Dredging	-		-	-
4.0	DEWATERING				-
4.1	Operate CSBs & pump to Stilling Pond	-		-	-
4.2	Remove material from ponds and windrow	-		-	-
4.3	Load dewatered materials for transport	-		-	-
5.0	TRANSPORTATION				-
5.1	Truck transport to Subtitle D Landfill	-		-	-
5.2	Truck transport to Bulk Survey For Release facility	-		-	-
6.0	DISPOSAL				-
6.1	Disposal at Subtitle D Landfill	-		-	-
6.2	Bulk Survey For Release analysis & disposal	-		-	-
7.0	MONITORING OF OPERATIONS				1,259,000
7.1	Routine air monitoring	-	months	-	-
7.2	Routine surface water monitoring	18	months	69,000	1,242,000
7.3	Routine imported material sampling	18	months	944	17,000
8.0	SAMPLING/ANALYSIS				2,504,500
8.1	Vibracore sampling (to delineate area)	300	samples	1,541	462,300
8.2	As-built bathymetry	160	acres	8,000	1,280,000
8.3	Sampling (to confirm as-built cap/ash thickness)	640	samples	1,191	762,200
8.4	Ash/sediment analysis precharacterization	-		-	-
8.5	Routine waste sampling for disposal	-		-	-
9.0	INSITUTIONAL CONTROLS				20,000
9.1	Legal Fees, Administration, Documentation	1	each	20,000	20,000
10.0	PROJECT MANAGEMENT/SUPPORT				2,715,000
10.1	Project Manager	18	months	22,880	411,800
10.2	Field Engineer	18	months	18,304	329,500
10.3	Health & Safety	18	months	17,072	307,300
10.4	Quality Engineer	18	months	16,896	304,100
10.5	Project Controls Engineer	18	months	16,192	291,500
10.6	Procurement	18	months	3,168	57,000
10.7	Construction Engineer	18	months	22,000	396,000
10.8	Transport Specialist	-	months	-	-
10.9	Waste Packaging Specialist	-	months	-	-
10.10	TVA oversight and management	18	months	34,320	617,800
	Subtotal				21,561,200
	Contingency (20%)				4,312,200
	** CAPITAL COST TOTAL **				25,873,400

APPENDIX G - COST ESTIMATES

Alternative 2B - Targeted Capping with MNR
Rivory System EE/CA
TVA Kingston Ash Recovery Project

08/03/2012

11.0	SEDIMENT MONITORING				41,900
11.1	Collect 3 samples @ each of 7 locations	21	samples	1,066	22,400
11.2	Analyze for % ash, arsenic/selenium	21	samples	334	7,000
11.3	Validate and archive data	21	samples	597	12,500
12.0	BIOTA MONITORING				159,700
12.1	Collect 3 adult mayflies @ each of 7 locations	21	samples	3,250	68,300
12.2	Collect 3 larval mayflies @ each of 7 locations	21	samples	3,250	68,300
12.3	Analyze for arsenic/selenium	42	samples	244	10,200
12.4	Validate and archive data	42	samples	306	12,900
13.0	EFFECTS MONITORING				116,600
13.1	Benthic comm. survey sampling (7 transects)	7	transects	8,333	58,300
13.2	Species identification	7	transects	8,333	58,300
14.0	SEDIMENT TRANSPORT MODELING				19,600
14.1	Survey bathymetry @ each of 6 transects	6	transects	1,600	9,600
14.2	Update transport model	1	EA	10,000	10,000
15.0	REPAIRS				185,400
15.1	Maintain cap (repair scour)	2	acres	92,682	185,400
16.0	REPORTING				30,800
16.1	Annual data evaluation and reports	1	EA	16,000	16,000
16.2	5-yr review reports	1	EA	14,800	14,800
17.0	PROJECT MANAGEMENT/SUPPORT				124,900
17.1	Project Manager	1	months	22,880	22,900
17.2	Health & Safety	1	months	17,072	17,100
17.3	Quality Engineer	1	months	16,896	16,900
17.4	Project Controls Engineer	1	months	16,192	16,200
17.5	Procurement	1	months	3,168	3,200
17.6	TVA oversight and management	1	months	48,620	48,600
	Subtotal				\$ 678,900
	Contingency (10%)				\$ 67,900
	** ANNUAL O&M COST TOTAL **				\$ 746,800
18.0	OTHER MONITORING				290,300
18.1	Fish bioaccumulation evaluation	72	samples	3,222	232,000
18.2	Fish community survey	7	transects	8,333	58,300
18.3	Sediment toxicity testing	-	months	-	-
	** ANNUAL MISC MONITORING COST TOTAL **				\$ 290,300
	Assumed O&M Period (Monitoring)				30 years
	Assumed O&M Period (Misc. Monitoring)				5 years
	Assumed O&M Period (Cap Maintenance)				30 years
	** PRESENT WORTH **				\$ 38,700,000

APPENDIX G - COST ESTIMATES

Alternative 3A - Dredging with MNR
River System EE/CA
TVA Kingston Ash Recovery Project

08/03/2012

ITEM WBS	ITEM DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL (\$)
1.0	INFRASTRUCTURE/SITE PREPARATION				6,665,900
1.1	Staging/operating area	-		-	-
1.2	Dewatering facility	15	acres	328,651	4,929,800
1.3	Demolish dewatering facility	15	acres	115,741	1,736,100
2.0	SUBAQUEOUS CAP PLACEMENT				-
2.1	Mobilization/demobilization	-	-	-	-
2.2	Purchase capping material	-	-	-	-
2.3	Place cap material	-	-	-	-
3.0	DREDGING				10,504,300
3.1	Mobilization/Demobilization	1	each	705,500	705,500
3.2	Hydraulic Dredging	440,000	cy	22.27	9,798,800
4.0	DEWATERING				6,787,300
4.1	Operate CSBs & pump to Stilling Pond	22	months	65,739	1,446,300
4.2	Remove material from ponds and windrow	22	months	191,107	4,204,300
4.3	Load dewatered materials for transport	22	months	51,666	1,136,700
5.0	TRANSPORTATION				6,483,400
5.1	Truck transport to Subtitle D Landfill	130,000	cy	21.40	2,782,000
5.2	Truck transport to Bulk Survey For Release facility	310,000	cy	11.94	3,701,400
6.0	DISPOSAL				101,292,100
6.1	Disposal at Subtitle D Landfill	130,000	cy	35.17	4,572,100
6.2	Bulk Survey For Release analysis & disposal	310,000	cy	312	96,720,000
7.0	MONITORING OF OPERATIONS				1,782,000
7.1	Routine air monitoring	22	months	12,000	264,000
7.2	Routine surface water monitoring	22	months	69,000	1,518,000
7.3	Routine imported material sampling	-		-	-
8.0	SAMPLING/ANALYSIS				2,319,200
8.1	Vibracore sampling (to delineate area)	300	samples	1,541	462,300
8.2	As-built bathymetry	130	acres	8,000	1,040,000
8.3	Sampling (to confirm as-built cap/ash thickness)	520	samples	1,191	619,300
8.4	Ash/sediment analysis precharacterization	130	samples	525	68,300
8.5	Routine waste sampling for disposal	88	samples	1,469	129,300
9.0	INSITUTIONAL CONTROLS				20,000
9.1	Legal Fees, Administration, Documentation	1	each	20,000	20,000
10.0	PROJECT MANAGEMENT/SUPPORT				5,288,800
10.1	Project Manager	25	months	22,880	572,000
10.2	Field Engineer	25	months	36,608	915,200
10.3	Health & Safety	25	months	17,072	426,800
10.4	Quality Engineer	25	months	16,896	422,400
10.5	Project Controls Engineer	25	months	16,192	404,800
10.6	Procurement	25	months	3,168	79,200
10.7	Construction Engineer	25	months	44,000	1,100,000
10.8	Transport Specialist	25	months	4,488	112,200
10.9	Waste Packaging Specialist	25	months	4,488	112,200
10.10	TVA oversight and management	25	months	45,760	1,144,000
	Subtotal				141,143,000
	Contingency (20%)				28,228,600
	** CAPITAL COST TOTAL **				169,371,600

APPENDIX G - COST ESTIMATES

Alternative 3A - Dredging with MNR
River System EE/CA
TVA Kingston Ash Recovery Project

08/03/2012

ITEM WBS	ITEM DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL (\$)
11.0	SEDIMENT MONITORING				41,900
11.1	Collect 3 samples @ each of 7 locations	21	samples	1,066	22,400
11.2	Analyze for % ash, arsenic/selenium	21	samples	334	7,000
11.3	Validate and archive data	21	samples	597	12,500
12.0	BIOTA MONITORING				159,700
12.1	Collect 3 adult mayflies @ each of 7 locations	21	samples	3,250	68,300
12.2	Collect 3 larval mayflies @ each of 7 locations	21	samples	3,250	68,300
12.3	Analyze for arsenic/selenium	42	samples	244	10,200
12.4	Validate and archive data	42	samples	306	12,900
13.0	EFFECTS MONITORING				116,600
13.1	Benthic comm. survey sampling (7 transects)	7	transects	8,333	58,300
13.2	Species identification	7	transects	8,333	58,300
14.0	SEDIMENT TRANSPORT MODELING				19,600
14.1	Survey bathymetry @ each of 6 transects	6	transects	1,600	9,600
14.2	Update transport model	1	each	10,000	10,000
15.0	REPAIRS				-
15.1	Maintain cap (repair scour)	-		-	-
16.0	REPORTING				30,800
16.1	Annual data evaluation and reports	1	each	16,000	16,000
16.2	5-yr review reports	1	each	14,800	14,800
17.0	PROJECT MANAGEMENT/SUPPORT				124,900
17.1	Project Manager	1	months	22,880	22,900
17.2	Health & Safety	1	months	17,072	17,100
17.3	Quality Engineer	1	months	16,896	16,900
17.4	Project Controls Engineer	1	months	16,192	16,200
17.5	Procurement	1	months	3,168	3,200
17.6	TVA oversight and management	1	months	48,620	48,600
	Subtotal				\$ 493,500
	Contingency (10%)				\$ 49,400
	** ANNUAL O&M COST TOTAL **				\$ 542,900
18.0	OTHER MONITORING				290,300
18.1	Fish bioaccumulation evaluation	72	samples	3,222	232,000
18.2	Fish community survey	7	transects	8,333	58,300
18.3	Sediment toxicity testing	-	months	-	-
	** ANNUAL MISC MONITORING COST TOTAL **				\$ 290,300
	Assumed O&M Period (Monitoring)				30 years
	Assumed O&M Period (Misc. Monitoring)				5 years
	Assumed O&M Period (Cap Maintenance)				
	** PRESENT WORTH **				\$ 179,100,000

APPENDIX G - COST ESTIMATES

Alternative 3B - Targeted Dredging with MNR
River System EE/CA
Kingston Ash Recovery Project

08/03/2012

ITEM WBS	ITEM DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL (\$)
1.0	INFRASTRUCTURE/SITE PREPARATION				6,665,900
1.1	Staging/operating area	-		-	-
1.2	Dewatering facility	15	acres	328,651	4,929,800
1.3	Demolish dewatering facility	15	acres	115,741	1,736,100
2.0	SUBAQUEOUS CAP PLACEMENT				-
2.1	Mobilization/demobilization	-	-	-	-
2.2	Purchase capping material	-	-	-	-
2.3	Place cap material	-	-	-	-
3.0	DREDGING				4,268,700
3.1	Mobilization/Demobilization	1	each	705,500	705,500
3.2	Hydraulic Dredging	160,000	cy	22.27	3,563,200
4.0	DEWATERING				2,468,100
4.1	Operate CSBs & pump to Stilling Pond	8	months	65,739	525,900
4.2	Remove material from ponds and windrow	8	months	191,107	1,528,900
4.3	Load dewatered materials for transport	8	months	51,666	413,300
5.0	TRANSPORTATION				2,194,200
5.1	Truck transport to Subtitle D Landfill	30,000	cy	21.40	642,000
5.2	Truck transport to Bulk Survey For Release facility	130,000	cy	11.94	1,552,200
6.0	DISPOSAL				41,615,100
6.1	Disposal at Subtitle D Landfill	30,000	cy	35.17	1,055,100
6.2	Bulk Survey For Release analysis & disposal	130,000	cy	312	40,560,000
7.0	MONITORING OF OPERATIONS				648,000
7.1	Routine air monitoring	8	months	12,000	96,000
7.2	Routine surface water monitoring	8	months	69,000	552,000
7.3	Routine imported material sampling	-		-	-
8.0	SAMPLING/ANALYSIS				1,173,800
8.1	Vibracore sampling (to delineate area)	300	samples	1,541	462,300
8.2	As-built bathymetry	50	acres	8,000	400,000
8.3	Sampling (to confirm as-built cap/ash thickness)	200	samples	1,191	238,200
8.4	Ash/sediment analysis precharacterization	50	samples	525	26,300
8.5	Routine waste sampling for disposal	32	samples	1,469	47,000
9.0	INSITUTIONAL CONTROLS				20,000
9.1	Legal Fees, Administration, Documentation	1	each	20,000	20,000
10.0	PROJECT MANAGEMENT/SUPPORT				2,327,200
10.1	Project Manager	11	months	22,880	251,700
10.2	Field Engineer	11	months	36,608	402,700
10.3	Health & Safety	11	months	17,072	187,800
10.4	Quality Engineer	11	months	16,896	185,900
10.5	Project Controls Engineer	11	months	16,192	178,100
10.6	Procurement	11	months	3,168	34,800
10.7	Construction Engineer	11	months	44,000	484,000
10.8	Transport Specialist	11	months	4,488	49,400
10.9	Waste Packaging Specialist	11	months	4,488	49,400
10.10	TVA oversight and management	11	months	45,760	503,400
	Subtotal				61,381,000
	Contingency (20%)				12,276,200
	** CAPITAL COST TOTAL **				73,657,200

APPENDIX G - COST ESTIMATES

Alternative 3B - Targeted Dredging with MNR
River System EE/CA
Kingston Ash Recovery Project

08/03/2012

ITEM WBS	ITEM DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL (\$)
11.0	SEDIMENT MONITORING				41,900
11.1	Collect 3 samples @ each of 7 locations	21	samples	1,066	22,400
11.2	Analyze for % ash, arsenic/selenium	21	samples	334	7,000
11.3	Validate and archive data	21	samples	597	12,500
12.0	BIOTA MONITORING				159,700
12.1	Collect 3 adult mayflies @ each of 7 locations	21	samples	3,250	68,300
12.2	Collect 3 larval mayflies @ each of 7 locations	21	samples	3,250	68,300
12.3	Analyze for arsenic/selenium	42	samples	244	10,200
12.4	Validate and archive data	42	samples	306	12,900
13.0	EFFECTS MONITORING				116,600
13.1	Benthic comm. survey sampling (7 transects)	7	transects	8,333	58,300
13.2	Species identification	7	transects	8,333	58,300
14.0	SEDIMENT TRANSPORT MODELING				19,600
14.1	Survey bathymetry @ each of 6 transects	6	transects	1,600	9,600
14.2	Update transport model	1	each	10,000	10,000
15.0	REPAIRS				-
15.1	Maintain cap (repair scour)	-		-	-
16.0	REPORTING				30,800
16.1	Annual data evaluation and reports	1	each	16,000	16,000
16.2	5-yr review reports	1	each	14,800	14,800
17.0	PROJECT MANAGEMENT/SUPPORT				124,900
17.1	Project Manager	1	months	22,880	22,900
17.2	Health & Safety	1	months	17,072	17,100
17.3	Quality Engineer	1	months	16,896	16,900
17.4	Project Controls Engineer	1	months	16,192	16,200
17.5	Procurement	1	months	3,168	3,200
17.6	TVA oversight and management	1	months	48,620	48,600
	Subtotal				\$ 493,500
	Contingency (10%)				\$ 49,400
	** ANNUAL O&M COST TOTAL **				\$ 542,900
18.0	OTHER MONITORING				290,300
18.1	Fish bioaccumulation evaluation	72	samples	3,222	232,000
18.2	Fish community survey	7	transects	8,333	58,300
18.3	Sediment toxicity testing	-	months	-	-
	** ANNUAL MISC MONITORING COST TOTAL **				\$ 290,300
	Assumed O&M Period (Monitoring)				30 years
	Assumed O&M Period (Misc. Monitoring)				5 years
	Assumed O&M Period (Cap Maintenance)				
	** PRESENT WORTH **				\$ 83,400,000