

Spreadsheet Report

KIF0509304R1\FLY&BOT ASH

KINGSTON FOSSIL PLANT
OPTION 4 - DRY ASH IN POND & GYPSUM IN POND
(WITHOUT BUFFER OPTION)

Project name KIF0509304R1\FLY&BOT ASH

Engineer DAN SMITH
Estimator C. L. Toney
Labor rate table KIF 40 2004

Equipment rate table TVA Equipment

Project Ash
Plant KIF
Estimate # 0509304R1
PCN # KIF530
Requesting Engr Dan Smith
Option 4
Revision 1
Phase 2
Estimate Type Preliminary
Estimate Accuracy +/- 20%
Est. Issue Date 01/21/2005
Funding Type Capital
Unit N

All cost are based in 2005 dollars. Additional notes are as follow:

- (1) Closure costs not included.
- (2) Liner is not required for this option.
- (3) Bottom ash columns are subject to change with final design.
- (4) Engineering (incl TVA oversight, subcontracts, and geotechnical investigation) - Assumes 10% of construction cost.
- (5) Assuming a disposal rate of 475,600 cy annually (including bottom and fly ash) & gypsum/ash generating 327,360 cy annually.
- (6) Single phase power is assumed for pumps installed for dredge cut seepage retrofit. 3-phase power is assumed not to be required.

Report format Sorted by Location/Activity/Outage Seq
Detail summary

Spreadsheet Report
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Estimate Company

Location	Activity	Outage Seq	Description	Takeoff Quantity	Labor Productivity	Labor Quantity	Labor Amount	Material Amount	Sub Amount	Equip Amount	Other Amount	Total Cost/Unit	Total Amount		
04	Ash / Gypsum in Pond	Capital	Erect Silt Fence	1,000.00 lf	0.098	68.57 mh	1,994	592	317				2,813		
			Geotextile (Nonwoven) Erosion Protection Channel	4,300.00 sy	0.016	68.80 mh	1,983	572	175					7,911	
			D50 9' Riprap	5,216.00 in	0.330	1,585.80 mh	49,667	26,063	24,856					20,568	
			3" Stone, 1" Thick To Prevent Erosion (Assume 105 pd)	2,004.00 sq	0.096	192.38 mh	6,056	18,190	13,653					13,653	
			Sig 1.5 CMP Mill Spallway (1/2 of 48" Dia Rise Stand Pipe @ 128 FFEs)	4.00 ea	166.064	864.33 mh	20,450	27,935	10,860.64					43,443	
			Cut (Excavation For Placement Of 48" Dia Half-Round Pipe) (43 boy)	52.00 sy	0.400	20.80 mh	599	177	14.91						177
			Fill With 1032 Compacted Crushed Stone	93.00 in	0.400	37.20 mh	804	230	25.10						230
			30" Diameter Chlor-Cement	1,000.00 lf	0.600	600.00 mh	17,487	3,682	47.61						47.61
			Bedding For 30" Chlor-Cement	135.00 in	0.500	67.50 mh	1,943	1,284	3,457						3,457
			30" Diameter Chlor Stand Pipe (Riprap @ 6 Stages w/30" Per Stage)	720.00 lf	0.750	540.00 mh	16,623	2,279	52.70						52.70
05	Miscellaneous	Capital	D50 9' Riprap Outlet For Midas Slurry	53.00 in	0.320	16.96 mh	539	273					1,317		
			Galvanized Corrugated Metal Anti-Slip Collar	255.00 mh	16,000	4,082	1,571	65,519						65,519	
			See Much Crushed Areas	28.00 ea			7,461	2,485.34						2,485.34	
			1032 Crushed Stone Base, 6" Depth	3,520.00 in	0.120	422.40 mh	13,739	31,930	14.16					14.16	
			1032 Roller Compacted Crushed Stone Base, 6" Depth	6,885.00 in	0.120	826.20 mh	28,872	69,478	14.16					14.16	
			Base Layers	1.00 lot					0.00					0.00	0
			Compacted Fly Ash Base (Fill)	910,556.00 sy	1,300,000	700.45 cd	1,696.157	1,414.641	3,42					3,42	
			Prodrol Subgrade	281,111.00 sy	28,111,000	10.00 cd	8,097	4,000	12,377						12,377
			2.5" Thick Bottom Ash Layer	242,407.00 sy	1,300,000	166.47 cd	45,149	376,804	3,42						3,42
			0.5" Thick Fly Ash Filter Layer	48,481.00 sy	1,300,000	37.29 cd	90,399	75,320	20.54						20.54
06	Dig Call/Pi Opr Cost	O & M	18" Dia Coarse Bottom Ash Drain Columns (haul 2 miles, 1, 100 boy)	16,920.00 lf	1,400,000	200.79 cd	117,943								
			Bottom Ash Ash Fill	281,111.00 sy	1,300,000	125.86 cd	394,775								
			4" Diameter Perforated PVC Pipe (Underdrains) SDR 17.5	41,400.00 lf	0.070	2,896.00 mh	79,084	61,997	13,320					13,320	
			Trenching For The Drain System (4" Dia Underdrains), 1,533 boy	1,846.00 sy	0.200	368.00 mh	1,033	1,830	1,427					1,427	
			Slip Existing 1" Soil Cover (Phase 1 Expansion), 19,133 boy	22,960.00 sy	800,000	28.70 cd	14,128	5,285	13,721					13,721	
			Anchor Trench Cut	2,073.00 sy	0.200	416.60 mh	1,333	1,713	17,221					17,221	
			Another Trench Cut	1,971.00 sy	0.320	630.72 mh	1,938	1,607	33,763					33,763	
			2.0" Thick Bottom Ash Blanket Drain	39,111.00 sy	1,300,000	30.06 cd	18,158	60,763	17,13					17,13	
			1.0" Thick Filter Drain Ash Layer	19,556.00 sy	1,300,000	15.04 cd	36,428	30,382	3,42					3,42	
			Geomembrane	56,667.90 sy	0.050	2,833.35 mh	83,066	17,543	7,95					7,95	
07	Miscellaneous	Capital	Geotextile For Underdrain	7,850.00 lf	0.200	1,570.00 mh	42,849	12,993							
			Geotextile For Underdrain	6,542.00 lf	0.200	1,308.40 mh	32,671	9,432							
			#57 Stone For Outlet Pipe Bedding (135 pct)	1,963.00 lf	0.200	392.60 mh	1,174	3,893	1,96						
			#57 Stone For Outlet Pipe Bedding (135 pct)	397.00 in	0.150	59.55 mh	174	784	16.67						
			6" Dia Non-Par HDPE Corrugated Lining Lateral Outlet Pipes (EL. 760)	480.00 in	0.200	96.00 mh	292	468	16.67						
			6" Dia Non-Par HDPE Corrugated Lining Lateral Outlet Pipes (EL. 760)	16.00 in	0.500	8.00 mh	29	152	26.81						
			108" Crushed Stone, Bedding 6" Depth	2,400.00 lf	0.200	480.00 mh	1,310	2,093	18.11						
			108" Crushed Stone, Bedding 6" Depth	454.00 lf	0.500	227.00 mh	773	1,261	11,925						
			Geotextile Woven Manufacturement	1,867.00 sy	0.021	39.40 mh	1,096	3,780	5,007						
			Cut For Underdrain System	356.00 sy	0.200	71.20 mh	2,050	2,655	2,655						
08	Miscellaneous	Capital	Backfill For Underdrain System	297.00 lf	0.250	66.75 mh	1,921								
			Compaction	1.00 ls											
			Cut For Outlet (5,815 boy)	6,978.00 sy	1,200,000	5.82 cd	10,981	12,041	50,000						
			60" x 9' Riprap	4,239.00 sy	0.320	1,356.48 mh	40,371	43,111	3,39						
			Site Grading	6,978.00 sy	0.012	83.74 mh	2,388	5,664	2,682						
			Riprap 50# Size 6"	2,344.00 in	0.320	750.08 mh	22,324	23,638	2,682						
			Cut For Basin (3,382 boy)	1.00 ls											
			Contingency @ 10%												
			Ash / Gypsum in Pond												
			09	Miscellaneous	Capital	Dry Fly Ash Conversion Capital Cost	1.00 ls								
Non-Manual	1.00 ls														
Mobiliz, Dng Test, Misc Other, & Demobiliz	1.00 ls														
Contingency @ 10%	1.00 ls														
Miscellaneous	1.00 ls														
Capital	1.00 ls														
Miscellaneous	1.00 ls														
05															
Dig Call/Pi Opr Cost															
10	Miscellaneous	Capital				Dry Fly Ash Conversion Capital Cost	1.00 lot								
			Dry Ash Stack	5,476,070.00 sy	1,100,000	4,978.25 cd	10,903.210								
			Wet Dip And Stack Bottom Ash Only	676,848.00 sy	236,000	2,888.71 cd	848.392								
			Disposal Life (Assume Dike & Dredge Ash)	12.90 yr											
			Haul Distance (Round Trip)	0.50 mile											
			0												
			0												
			0												
			0												
			0												

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Estimate Company

Location	Activity	Outage Seq	Description	Takeoff Quantity	Lebor Productivity	Lebor Quantity	Lebor Amount	Material Amount	Sub Amount	Equip Amount	Other Amount	Total Cost/Unit	Total Amount
07	Ph 2 Base Construct	O & M	0.06 0.07 0.07	381,543.39 hrs 381,543.39 hrs 381,543.39 hrs	11,751,602 11,751,602 11,751,602	9,330,510 9,330,510 9,330,510	746,424 746,424 746,424	0 0 0	0 0 0	0 0 0	0 0 0	21,092,112 21,092,112 21,092,112	
10	Ph 2 Initial Constr.	O & M	1.00 1.40	1.00 1.40	0.00 0.00	0.00 0.00	0 0	0 0	0 0	0 0	0 0	0 0	
11	Rim Ditches	O & M	1.00 1.40	1.00 1.40	0.00 0.00	0.00 0.00	0 0	0 0	0 0	0 0	0 0	0 0	
12	Ph 2 Operational Cost	O & M	1.00 1.40	1.00 1.40	0.00 0.00	0.00 0.00	0 0	0 0	0 0	0 0	0 0	0 0	
13	Ph 2 Operational Cost	O & M	1.00 1.40	1.00 1.40	0.00 0.00	0.00 0.00	0 0	0 0	0 0	0 0	0 0	0 0	
14	Ph 3 Initial Constr	O & M	1.00 1.40	1.00 1.40	0.00 0.00	0.00 0.00	0 0	0 0	0 0	0 0	0 0	0 0	
15	Ph 3 Operational Cost	O & M	1.00 1.40	1.00 1.40	0.00 0.00	0.00 0.00	0 0	0 0	0 0	0 0	0 0	0 0	

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Estimate Company

Location	Activity	Outage Seq	Description	Takeoff Quantity	Labor Productivity	Labor Quantity	Labor Amount	Material Amount	Sub Amount	Equip Amount	Other Amount	Total Cost/Unit	Total Amount	
16	O & M Ph 3 Operation Cost		Stage 1 (3 To 1 Side Slopes)	1.00 lot	1,100.000	1,226.53 cd	2,686.305	-	-	-	1,801,523	0.00	0	
			Dry Stack Ash Quantities	1,349,180.00 cy	1,100.000	-	-	-	-	-	-	-	-	4,487,828
			Stage 1 Disposal Life (Assume Dry Stack Area)	2.60 yrs	-	-	-	-	-	-	-	-	-	0
			Haul Distance (Round Trip)	0.50 mile	-	-	-	-	-	-	-	-	-	0
			O & M	88,309.96 hrs	-	-	-	-	-	-	-	-	-	4,487,828
			Ph 3 Operation Cost	88,309.96 hrs	-	-	-	-	-	-	-	-	-	4,487,828
			15	88,309.96 hrs	-	-	-	-	-	-	-	-	-	4,487,828
			Ph 3 Operation Cost	88,309.96 hrs	-	-	-	-	-	-	-	-	-	4,487,828
			16	88,309.96 hrs	-	-	-	-	-	-	-	-	-	4,487,828
			Ph 3 Operation Cost	88,309.96 hrs	-	-	-	-	-	-	-	-	-	4,487,828
			17	88,309.96 hrs	-	-	-	-	-	-	-	-	-	4,487,828
			Ph 3 Operation Cost	88,309.96 hrs	-	-	-	-	-	-	-	-	-	4,487,828
			18	88,309.96 hrs	-	-	-	-	-	-	-	-	-	4,487,828
			Ph 3 Operation Cost	88,309.96 hrs	-	-	-	-	-	-	-	-	-	4,487,828
			19	88,309.96 hrs	-	-	-	-	-	-	-	-	-	4,487,828
			Ph 3 Operation Cost	88,309.96 hrs	-	-	-	-	-	-	-	-	-	4,487,828
17	O & M Ph 2 Operation Cost		Wet Cast Gypsum Dike Fill	227,106.00 cy	235.000	956.41 cd	283,826	-	-	-	675,289	4.22	959,195	
			Wet Sluice Gypsum Quantities	1,344,916.00 cy	235.000	-	-	-	-	-	-	-	-	0
			Stage 3 Disposal Life (Assume Dike & Sluice Gypsum)	4.80 yrs	-	-	-	-	-	-	-	-	-	0
			Perforated Pipe ADS Drain Tube 6" Diameter	10,230.00 lf	0.200	2,046.00 mm	55,841	15,132	81,600	-	-	-	-	81,600
			Geotextile For Underdrain	6,525.00 sq	0.021	175.35 mm	3,003	17,897	22,881	-	-	-	-	22,881
			#57 Stone For Outlet Pipe Bedding (135 pcf)	2,072.00 tn	0.150	310.80 mm	8,947	19,807	30,390	-	-	-	-	30,390
			Solid Outlet Pipe ADS Drain 6" Diameter	2,302.00 lf	0.200	480.40 mm	12,956	26,424	39,378	-	-	-	-	39,378
			#57 Stone For Outlet Pipe Bedding (135 pcf)	465.00 tn	0.150	69.90 mm	2,012	594	8,638	-	-	-	-	8,638
			O & M	10,793.73 hrs	-	-	-	-	-	-	-	-	-	1,118,978
			Ph 2 Operation Cost	10,793.73 hrs	-	-	-	-	-	-	-	-	-	1,118,978
			17	10,793.73 hrs	-	-	-	-	-	-	-	-	-	1,118,978
			Ph 2 Operation Cost	10,793.73 hrs	-	-	-	-	-	-	-	-	-	1,118,978
			18	10,793.73 hrs	-	-	-	-	-	-	-	-	-	1,118,978
			Ph 2 Operation Cost	10,793.73 hrs	-	-	-	-	-	-	-	-	-	1,118,978
			19	10,793.73 hrs	-	-	-	-	-	-	-	-	-	1,118,978
			Ph 2 Operation Cost	10,793.73 hrs	-	-	-	-	-	-	-	-	-	1,118,978
18	O & M Ph 3 Operation Cost		Stage 3 (3 To 1 Side Slopes)	1.00 lot	1,100.000	1,212.90 cd	2,656.457	-	-	-	1,781,506	0.00	0	
			Dry Stack Ash Quantities	1,334,189.00 cy	1,100.000	-	-	-	-	-	-	-	-	4,437,963
			Stage 3 Disposal Life (Assume Dry Stack Area)	2.80 yrs	-	-	-	-	-	-	-	-	-	0
			Haul Distance (Round Trip)	0.50 mile	-	-	-	-	-	-	-	-	-	0
			O & M	87,328.74 hrs	-	-	-	-	-	-	-	-	-	4,437,963
			Ph 3 Operation Cost	87,328.74 hrs	-	-	-	-	-	-	-	-	-	4,437,963
			18	87,328.74 hrs	-	-	-	-	-	-	-	-	-	4,437,963
			Ph 3 Operation Cost	87,328.74 hrs	-	-	-	-	-	-	-	-	-	4,437,963
			19	87,328.74 hrs	-	-	-	-	-	-	-	-	-	4,437,963
			Ph 3 Operation Cost	87,328.74 hrs	-	-	-	-	-	-	-	-	-	4,437,963
			20	87,328.74 hrs	-	-	-	-	-	-	-	-	-	4,437,963
			Ph 3 Operation Cost	87,328.74 hrs	-	-	-	-	-	-	-	-	-	4,437,963
			21	87,328.74 hrs	-	-	-	-	-	-	-	-	-	4,437,963
			Ph 3 Operation Cost	87,328.74 hrs	-	-	-	-	-	-	-	-	-	4,437,963
			22	87,328.74 hrs	-	-	-	-	-	-	-	-	-	4,437,963
			Ph 3 Operation Cost	87,328.74 hrs	-	-	-	-	-	-	-	-	-	4,437,963
19	O & M Ph 2 Operation Cost		Stage 4 (3 To 1 Side Slopes)	1.00 lot	235.000	718.43 cd	210,987	-	-	-	501,996	0.00	0	
			Wet Cast Gypsum Dike Fill	168,831.00 cy	235.000	-	-	-	-	-	-	-	-	712,993
			Wet Sluice Gypsum Quantities	702,654.00 cy	235.000	-	-	-	-	-	-	-	-	0
			Stage 4 Disposal Life (Assume Dike & Sluice Ash & Gypsum)	2.70 yrs	-	-	-	-	-	-	-	-	-	0
			Perforated Pipe ADS Drain Tube 6" Diameter	7,605.00 lf	0.200	1,521.00 mm	41,512	12,398	60,557	-	-	-	-	60,557
			Geotextile For Underdrain	5,383.00 sq	0.021	130.37 mm	3,719	12,833	16,996	-	-	-	-	16,996
			#57 Stone For Outlet Pipe Bedding (135 pcf)	1,540.00 tn	0.150	231.00 mm	6,650	13,978	22,591	-	-	-	-	22,591
			Solid Outlet Pipe ADS Drain 6" Diameter	1,711.00 lf	0.200	342.20 mm	9,340	2,832	13,624	-	-	-	-	13,624
			#57 Stone For Outlet Pipe Bedding (135 pcf)	347.00 tn	0.150	52.05 mm	1,498	3,150	5,090	-	-	-	-	5,090
			O & M	8,024.06 hrs	-	-	-	-	-	-	-	-	-	831,853
			Ph 2 Operation Cost	8,024.06 hrs	-	-	-	-	-	-	-	-	-	831,853
			19	8,024.06 hrs	-	-	-	-	-	-	-	-	-	831,853
			Ph 2 Operation Cost	8,024.06 hrs	-	-	-	-	-	-	-	-	-	831,853
			20	8,024.06 hrs	-	-	-	-	-	-	-	-	-	831,853
			Ph 2 Operation Cost	8,024.06 hrs	-	-	-	-	-	-	-	-	-	831,853
			21	8,024.06 hrs	-	-	-	-	-	-	-	-	-	831,853
Ph 2 Operation Cost	8,024.06 hrs	-	-	-	-	-	-	-	-	-	831,853			
20	O & M Ph 3 Operation Cost		Stage 4 (3 To 1 Side Slopes)	1.00 lot	1,100.000	525.10 cd	1,150,065	-	-	-	771,271	0.00	0	
			Dry Stack Ash Quantities	577,613.00 cy	1,100.000	-	-	-	-	-	-	-	-	1,921,336
			Stage 4 Disposal Life (Assume Dike & Dry Stack Ash)	1.20 yrs	-	-	-	-	-	-	-	-	-	0
			Haul Distance (Round Trip)	0.50 mile	-	-	-	-	-	-	-	-	-	0
			O & M	37,807.40 hrs	-	-	-	-	-	-	-	-	-	1,921,336
			Ph 3 Operation Cost	37,807.40 hrs	-	-	-	-	-	-	-	-	-	1,921,336
			20	37,807.40 hrs	-	-	-	-	-	-	-	-	-	1,921,336
			Ph 3 Operation Cost	37,807.40 hrs	-	-	-	-	-	-	-	-	-	1,921,336
			21	37,807.40 hrs	-	-	-	-	-	-	-	-	-	1,921,336
			Ph 3 Operation Cost	37,807.40 hrs	-	-	-	-	-	-	-	-	-	1,921,336
			22	37,807.40 hrs	-	-	-	-	-	-	-	-	-	1,921,336
			Ph 3 Operation Cost	37,807.40 hrs	-	-	-	-	-	-	-	-	-	1,921,336
			23	37,807.40 hrs	-	-	-	-	-	-	-	-	-	1,921,336
			Ph 3 Operation Cost	37,807.40 hrs	-	-	-	-	-	-	-	-	-	1,921,336
			24	37,807.40 hrs	-	-	-	-	-	-	-	-	-	1,921,336
			Ph 3 Operation Cost	37,807.40 hrs	-	-	-	-	-	-	-	-	-	1,921,336

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Estimate Totals

Labor	28,561,509								
Material	864,118								
Subcontract	26,837,162								
Equipment	22,346,088								
Other	3,403,611								
	<u>82,012,488</u>	82,012,488							
Engineered Materials - Ph 2			100.000 %						C
Adjustment - Engr Materials		82,012,488	(100.000) %						C
Environmental Costs									
Adjustment Environmental		82,012,488	100.000 %						C
FFG Mech Engr - Phase 2	17,000		0.044 % @	42.00 A					405
FFG Elec Engr - Phase 2	17,000		0.044 % @	42.00 A					405
FFG Civil Engr - Phase 2	16,001		0.042 % @	42.00 A					381
Non-TVA Engr - Phase 2	260,993		0.398 % @	72.00 A					3,625
FFG Proj Civil Cost - Phase 2	1,002		0.003 % @	42.00 A					24
FFG Proj Civil Sched - Phase 2	3,000		0.008 % @	42.00 A					71
FFG Cost Estimating - Phase 2	1,002		0.003 % @	42.00 A					24
FFG Engr Records - Phase 2	1,002		0.003 % @	42.00 A					24
Engr Contingency@10%-Phase 2	31,700		0.083 % @	42.00 A					755
	<u>346,700</u>	82,361,188							
Rounding									L
		<u>812</u>							
		<u>82,362,000</u>							
Total		82,362,000							