# KINGSTON FOSSIL PLANT
## OPTION 7 - WET ASH IN POND & GYPSUM IN POND
## (WITH BUFFER OPTION)

| | |
|---|---|
| **Project name** | KIF/05093O7/FLY&BOTTM ASH |
| **Engineer** | DAN SMITH |
| **Estimator** | C. L. Toney |
| **Labor rate table** | KIF 40 2004 |
| **Equipment rate table** | TVA Equipment |
| **Project** | Ash |
| **Plant** | KIF |
| **Estimate #** | 05093O7 |
| **PCN #** | KIF530 |
| **Requesting Engr** | Dan Smith |
| **Option** | 7 |
| **Revision** | 0 |
| **Phase** | 2 |
| **Estimate Type** | Preliminary |
| **Estimate Accuracy** | +/- 20% |
| **Est. Issue Date** | 12/20/2004 |
| **Funding Type** | Capital |
| **Unit** | N |

**Notes**

(Wet ash in dredge cell/Phase 1. Wet gypsum in Phase 2. Phase 3 is dry stack ash)

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

(1) Closure costs not included.

(2) Bottom ash colums are subject to change with final design.

(3) Engineering (Incl TVA oversight, subcontracts, and geotechnical investigation) - Assumes 10% of construction cost.

(4) Assuming a disposal rate of 475,600 cy annually (including bottom and fly ash) & gypsum/ash generating 327,380 cy annually.

(5) Single phase power is assumed for pump installed for dredge cell seepage retrofit. 3-phase power is assumed not to be required.

| | |
|---|---|
| **Report format** | Sorted by 'Location/Activity'<br>'Detail' summary |

| Location | Activity | Description | Takeoff Quantity | Labor Productivity | Labor Quantity | Labor Amount | Material Amount | Sub Amount | Equip Amount | Other Amount | Total Cost/Unit | Total Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | | | | | | | | | | | | |
| | Erosion Controls/S P | | | | | | | | | | | |
| | | Erect Silt Fence | 1,000.00 lf | 0.069 | 68.57 mh | 1,994 | 502 | - | 317 | - | 2.81 | 2,813 |
| | | Geotextile (Nonwoven) Erosion Protection Channel | 4,300.00 sy | 0.016 | 68.80 mh | 1,963 | 5,772 | - | 175 | - | 1.84 | 7,911 |
| | | D50 9" Riprap | 5,215.00 tn | 0.320 | 1,668.80 mh | 49,667 | 53,037 | - | 26,865 | - | 24.85 | 129,568 |
| | | 3" Stone, 1' Thick To Prevent Erosion (Assume 105 pcf) | 2,004.00 tn | 0.096 | 192.38 mh | 6,056 | 18,190 | - | 3,066 | - | 13.63 | 27,312 |
| | | Stg 1-6 CMP Mtl Spillway (1/2 of 48" Dia Riser Stand Pipe @ 128 Ft/Ea) | 4.00 ea | 166.084 | 664.33 mh | 20,450 | 20,198 | - | 2,795 | - | 10,860.84 | 43,443 |
| | | Cut (Excavation For Placement Of 48" Dia Half-Round Pipe) 43 bcy | 52.00 cy | 0.400 | 20.80 mh | 599 | - | - | 177 | - | 14.91 | 776 |
| | | Fill With 1032 CompactedCrushed Stone | 93.00 tn | 0.400 | 37.20 mh | 1,107 | 804 | - | 599 | - | 26.99 | 2,510 |
| | | 30" Diameter CMP Culvert | 1,000.00 lf | 0.600 | 600.00 mh | 17,487 | 26,442 | - | 3,682 | - | 47.61 | 47,611 |
| | | Bedding For 30" CMP, 6" Thick | 135.00 tn | 0.500 | 67.50 mh | 1,943 | 1,284 | - | 230 | - | 25.61 | 3,457 |
| | | 30" Diameter CMP Stand Pipe (4Pipes @ 6 Stages w/30' Per Stage) | 720.00 lf | 0.750 | 540.00 mh | 16,623 | 19,038 | - | 2,279 | - | 52.70 | 37,940 |
| | | D50 9" Riprap Outlet For Metal Spillway | 53.00 tn | 0.320 | 16.96 mh | 505 | 539 | - | 273 | - | 24.85 | 1,317 |
| | | Galvanized Corrugated Metal Anti-Seep Collar | 16.00 ea | 16.000 | 256.00 mh | 7,461 | 4,882 | - | 1,571 | - | 869.59 | 13,914 |
| | | **Erosion Controls/S P** | | | **4,201.35 hrs** | **125,853** | **150,687** | | **42,029** | | | **318,569** |
| | | ***01*** | | | ***4,201.35 hrs*** | ***125,853*** | ***150,687*** | | ***42,029*** | | | ***318,569*** |
| 02 | | | | | | | | | | | | |
| | Seed/Mulch | | | | | | | | | | | |
| | | See/Mulch Disturbed Areas | 26.00 ac | | - | - | - | 64,619 | - | - | 2,485.34 | 64,619 |
| | | **Seed/Mulch** | | | **hrs** | | | **64,619** | | | | **64,619** |
| | | ***02*** | | | ***hrs*** | | | ***64,619*** | | | | ***64,619*** |
| 03 | | | | | | | | | | | | |
| | South Access Road | | | | | | | | | | | |
| | | 1032 Crushed Stone Base, 6" Depth | 3,520.00 tn | 0.120 | 422.40 mh | 13,739 | 31,950 | - | 4,147 | - | 14.16 | 49,836 |
| | | **South Access Road** | | | **422.40 hrs** | **13,739** | **31,950** | | **4,147** | | | **49,836** |
| | | ***03*** | | | ***422.40 hrs*** | ***13,739*** | ***31,950*** | | ***4,147*** | | | ***49,836*** |
| 04 | | | | | | | | | | | | |
| | Perimeter Road | | | | | | | | | | | |
| | | 1032 Roller Compacted Crushed Stone Base, 6" Depth | 6,885.00 tn | 0.120 | 826.20 mh | 26,872 | 62,493 | - | 8,112 | - | 14.16 | 97,478 |
| | | **Perimeter Road** | | | **826.20 hrs** | **26,872** | **62,493** | | **8,112** | | | **97,478** |
| | | ***04*** | | | ***826.20 hrs*** | ***26,872*** | ***62,493*** | | ***8,112*** | | | ***97,478*** |
| 05 | | | | | | | | | | | | |
| | Instl Drns/Swan Pond | | | | | | | | | | | |
| | | 6" Dia Pipe Bollards | 24.00 ea | 1.500 | 36.00 mh | 1,036 | 4,882 | - | 245 | - | 256.78 | 6,163 |
| | | PVC Monitoring Wells | 6.00 ea | | - | - | - | 12,324 | - | - | 2,054.00 | 12,324 |
| | | 6" Dia Non-Perf HDPE Corrugated Tubing Lateral Outlet Pipes (EL. 772) | 474.00 lf | 0.200 | 94.80 mh | 2,587 | 785 | - | 403 | - | 7.96 | 3,774 |
| | | Crushed Stone, Bedding 6" Depth | 16.00 tn | 0.500 | 8.00 mh | 230 | 152 | - | 27 | - | 25.61 | 410 |
| | | 6" Dia Non-Perf HDPE Corrugated Tubing Lateral Outlet Pipes (EL. 780) | 520.00 lf | 0.200 | 104.00 mh | 2,838 | 861 | - | 442 | - | 7.96 | 4,141 |
| | | Crushed Stone, Bedding 6" Depth | 18.00 tn | 0.500 | 9.00 mh | 259 | 171 | - | 31 | - | 25.61 | 461 |
| | | 6" Dia Non-Perf HDPE Corrugated Tubing Lateral Outlet Pipes (EL. 792) | 491.00 lf | 0.200 | 98.20 mh | 2,680 | 813 | - | 417 | - | 7.96 | 3,910 |
| | | Crushed Stone, Bedding 6" Depth | 17.00 tn | 0.500 | 8.50 mh | 245 | 162 | - | 29 | - | 25.61 | 435 |
| | | 6" Dia Non-Perf HDPE Corrugated Tubing Lateral Outlet Pipes (EL. 810) | 1,282.00 lf | 0.200 | 256.40 mh | 6,998 | 2,122 | - | 1,089 | - | 7.96 | 10,208 |
| | | Crushed Stone, Bedding 6" Depth | 43.00 tn | 0.500 | 21.50 mh | 619 | 409 | - | 73 | - | 25.61 | 1,101 |
| | | 6" Dia Non-Perf HDPE Corrugated Tubing Lateral Outlet Pipes (EL. 817) | 1,218.00 lf | 0.200 | 243.60 mh | 6,648 | 2,016 | - | 1,034 | - | 7.96 | 9,699 |
| | | Crushed Stone, Bedding 6" Depth | 41.00 tn | 0.500 | 20.50 mh | 590 | 390 | - | 70 | - | 25.61 | 1,050 |
| | | 6" Dia Non-Perf HDPE Corrugated Tubing Lateral Outlet Pipes (EL. 825) | 1,180.00 lf | 0.200 | 236.00 mh | 6,441 | 1,953 | - | 1,002 | - | 7.96 | 9,396 |
| | | Crushed Stone, Bedding 6" Depth | 40.00 tn | 0.500 | 20.00 mh | 576 | 380 | - | 68 | - | 25.61 | 1,024 |
| | | 6" Dia Non-Perf HDPE Corrugated Tubing Lateral Outlet Pipes (EL. 832) | 1,160.00 lf | 0.200 | 232.00 mh | 6,332 | 1,920 | - | 985 | - | 7.96 | 9,237 |
| | | Crushed Stone, Bedding 6" Depth | 39.00 tn | 0.500 | 19.50 mh | 561 | 371 | - | 66 | - | 25.61 | 999 |
| | | Cut For 6" Dia Non-Perforated HDPE (17,658 bcy) | 21,190.00 cy | 0.200 | 4,238.00 mh | 121,995 | - | - | 36,025 | - | 7.46 | 158,020 |
| | | Backfill For 6" Dia Non-Perforated HDPE (12,361 bcy) | 14,833.00 cy | 0.250 | 3,708.25 mh | 106,746 | - | - | 44,481 | - | 10.20 | 151,227 |
| | | Cut For 6" Dia Perforated HDPE (18,186 bcy) | 21,824.00 cy | 0.200 | 4,364.80 mh | 125,646 | - | - | 37,103 | - | 7.46 | 162,748 |
| | | Backfill For 6" Dia Perforated HDPE (12,730 bcy) | 15,276.00 cy | 0.250 | 3,819.00 mh | 109,934 | - | - | 45,810 | - | 10.20 | 155,744 |
| | | 6" Dia Perforated HDPE Perimeter Underdrain (EL. 763) | 2,000.00 lf | 0.200 | 400.00 mh | 10,917 | 3,310 | - | 1,698 | - | 7.96 | 15,926 |
| | | 1081 Crushed Stone | 378.00 tn | 0.150 | 56.70 mh | 1,632 | 3,431 | - | 482 | - | 14.67 | 5,545 |
| | | Geotextile Woven Monofilament | 1,556.00 sy | 0.021 | 32.01 mh | 913 | 3,151 | - | 109 | - | 2.68 | 4,173 |
| | | 6" Dia Perforated HDPE Perimeter Underdrain (EL. 772) | 3,790.00 lf | 0.200 | 758.00 mh | 20,688 | 6,273 | - | 3,218 | - | 7.96 | 30,179 |
| | | 1081 Crushed Stone | 716.00 tn | 0.150 | 107.40 mh | 3,092 | 6,499 | - | 913 | - | 14.67 | 10,503 |
| | | Geotextile Woven Monofilament | 2,948.00 sy | 0.021 | 60.64 mh | 1,730 | 5,969 | - | 206 | - | 2.68 | 7,905 |
| | | 6" Dia Perforated HDPE Perimeter Underdrain (EL. 780) | 4,160.00 lf | 0.200 | 832.00 mh | 22,707 | 6,886 | - | 3,532 | - | 7.96 | 33,125 |
| | | 1081 Crushed Stone | 786.00 tn | 0.150 | 117.90 mh | 3,394 | 7,134 | - | 1,002 | - | 14.67 | 11,530 |
| | | Geotextile Woven Monofilament | 3,236.00 sy | 0.021 | 66.56 mh | 1,899 | 6,552 | - | 226 | - | 2.68 | 8,678 |
| | | 6" Dia Perforated HDPE Perimeter Underdrain (EL. 792) | 3,925.00 lf | 0.200 | 785.00 mh | 21,425 | 6,497 | - | 3,333 | - | 7.96 | 31,254 |
| | | 1081 Crushed Stone | 742.00 tn | 0.150 | 111.30 mh | 3,204 | 6,735 | - | 946 | - | 14.67 | 10,885 |
| | | Geotextile Woven Monofilament | 3,053.00 sy | 0.021 | 62.80 mh | 1,792 | 6,182 | - | 214 | - | 2.68 | 8,187 |
| | | 6" Dia Perforated HDPE Perimeter Underdrain (EL. 810) | 6,410.00 lf | 0.200 | 1,282.00 mh | 34,989 | 10,610 | - | 5,443 | - | 7.96 | 51,042 |
| | | 1081 Crushed Stone | 1,211.00 tn | 0.150 | 181.65 mh | 5,229 | 10,992 | - | 1,544 | - | 14.67 | 17,765 |
| | | Geotextile Woven Monofilament | 4,986.00 sy | 0.021 | 102.56 mh | 2,926 | 10,096 | - | 349 | - | 2.68 | 13,371 |
| | | 6" Dia Perforated HDPE Perimeter Underdrain (EL. 817) | 6,090.00 lf | 0.200 | 1,218.00 mh | 33,242 | 10,080 | - | 5,171 | - | 7.96 | 48,494 |
| | | 1081 Crushed Stone | 1,151.00 tn | 0.150 | 172.65 mh | 4,970 | 10,447 | - | 1,468 | - | 14.67 | 16,885 |
| | | Geotextile Woven Monofilament | 4,737.00 sy | 0.021 | 97.44 mh | 2,780 | 9,592 | - | 331 | - | 2.68 | 12,703 |
| | | 6" Dia Perforated HDPE Perimeter Underdrain (EL. 825) | 5,900.00 lf | 0.200 | 1,180.00 mh | 32,205 | 9,765 | - | 5,010 | - | 7.96 | 46,981 |

| Location | Activity | Description | Takeoff Quantity | Labor Productivity | Labor Quantity | Labor Amount | Material Amount | Sub Amount | Equip Amount | Other Amount | Total Cost/Unit | Total Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Instl Drns/Swan Pond | | | | | | | | | | | |
| | | 1081 Crushed Stone | 1,115.00 tn | 0.150 | 167.25 mh | 4,814 | 10,121 | - | 1,422 | - | 14.67 | 16,357 |
| | | Geotextile Woven Monofilament | 4,589.00 sy | 0.021 | 94.40 mh | 2,693 | 9,292 | - | 321 | - | 2.68 | 12,306 |
| | | 6" Dia Perforated HDPE Perimeter Underdrain (EL. 832) | 5,800.00 lf | 0.200 | 1,160.00 mh | 31,659 | 9,600 | - | 4,925 | - | 7.96 | 46,185 |
| | | 1081 Crushed Stone | 1,096.00 tn | 0.150 | 164.40 mh | 4,732 | 9,948 | - | 1,397 | - | 14.67 | 16,078 |
| | | Geotextile Woven Monofilament | 4,511.00 sy | 0.021 | 92.79 mh | 2,647 | 9,134 | - | 316 | - | 2.68 | 12,097 |
| | | 12" Dia Force Main HDPE Perimeter Underdrain (EL. 763) | 2,580.00 lf | 0.250 | 645.00 mh | 17,604 | 13,087 | - | 2,741 | - | 12.96 | 33,432 |
| | | 1081 Crushed Stone | 575.00 tn | 0.150 | 86.25 mh | 2,483 | 5,219 | - | 733 | - | 14.67 | 8,435 |
| | | Submersible Pumping Station Equipment Package | 1.00 ls | 56.000 | 56.00 mh | 2,266 | 5,085 | - | 209 | - | 7,560.57 | 7,561 |
| | | 60" Diameter Catch Basin (Precast) | 1.00 ea | 60.000 | 60.00 mh | 1,810 | 3,051 | - | 478 | - | 5,338.36 | 5,338 |
| | | Geotextile Woven Monofilament | 2,293.00 sy | 0.021 | 47.17 mh | 1,346 | 4,643 | - | 160 | - | 2.66 | 6,149 |
| | | Grout Seal Storm Drain - 24" Diameter (Pump & Plug) | 54.00 cy | 1.000 | 54.00 mh | 1,515 | 2,856 | - | 499 | - | 90.19 | 4,870 |
| | | Seal Weld 1/4" Thick A-36 Steel Plate | 2.00 ea | 4.000 | 8.00 mh | 304 | 102 | - | 80 | - | 243.02 | 486 |
| | | Grout Seal Storm Drain - 24" Diameter (Pump & Plug) | 53.00 cy | 1.000 | 53.00 mh | 1,487 | 2,803 | - | 490 | - | 90.19 | 4,780 |
| | | Seal Weld 1/4" Thick A-36 Steel Plate | 2.00 ea | 4.000 | 8.00 mh | 304 | 102 | - | 80 | - | 243.02 | 486 |
| | | Grout Seal Storm Drain - 24" Diameter (Pump & Plug) | 23.00 cy | 1.000 | 23.00 mh | 645 | 1,216 | - | 212 | - | 90.19 | 2,074 |
| | | Seal Weld 1/4" Thick A-36 Steel Plate | 2.00 ea | 4.000 | 8.00 mh | 304 | 102 | - | 80 | - | 243.02 | 486 |
| | | 24" CMP Storm Drain | 38.00 lf | 0.480 | 18.24 mh | 498 | 773 | - | 68 | - | 35.24 | 1,339 |
| | | Excavation For 24" Dia Pipe (25 bcy) | 30.00 cy | 0.200 | 6.00 mh | 173 | - | - | 77 | - | 8.31 | 249 |
| | | Backfill For 24" Diameter CMP ( 17 bcy) | 21.00 cy | 0.320 | 6.72 mh | 193 | - | - | 166 | - | 17.13 | 360 |
| | | Bedding For 24" Culvert | 4.00 tn | 0.500 | 2.00 mh | 58 | 38 | - | 7 | - | 25.61 | 102 |
| | | 36" CMP Storm Drain | 72.00 lf | 0.600 | 43.20 mh | 1,259 | 2,709 | - | 265 | - | 58.80 | 4,233 |
| | | Excavation For 36" Dia Pipe ( 67 bcy) | 81.00 cy | 0.200 | 16.20 mh | 466 | - | - | 207 | - | 8.31 | 673 |
| | | Backfill For 36" Diameter CMP (47 bcy) | 57.00 cy | 0.320 | 18.24 mh | 525 | - | - | 451 | - | 17.13 | 976 |
| | | Bedding For 36" Culvert | 9.00 tn | 0.500 | 4.50 mh | 130 | 86 | - | 15 | - | 25.61 | 230 |
| | | Anchor Trench - Excavate Into Borrow Area (8,650 bcy) | 10,380.00 cy | 0.200 | 2,076.00 mh | 59,760 | - | - | 26,469 | - | 8.31 | 86,229 |
| | | Upper & Lower LLDPE Geomembrane | 110,688.00 sy | 0.050 | 5,534.40 mh | 157,865 | 247,653 | - | 14,113 | - | 3.79 | 419,651 |
| | | Sediment Trap (3,630 bcy) | 4,356.00 cy | 0.040 | 174.24 mh | 5,807 | - | - | 4,582 | - | 2.39 | 10,389 |
| | | Instl Drns/Swan Pond | | | 35,789.66 hrs | 1,016,066 | 495,205 | 12,324 | 265,158 | | | 1,788,753 |
| | | *05* | | | *35,789.66 hrs* | *1,016,066* | *495,205* | *12,324* | *265,158* | | | *1,788,753* |
| *06* | | | | | | | | | | | | |
| | Drg Cell/P1 Opr Cost | | | | | | | | | | | |
| | | ***Elv. 810 To Elv. 844*** | ***1.00 lot*** | | - | - | - | - | - | - | ***0.00*** | ***0*** |
| | | Bottom Ash Dike Fill | 622,416.00 cy | 1,300.000 | 478.78 cd | 1,159,419 | - | - | 966,986 | - | 3.42 | 2,126,405 |
| | | Dredge | 4,853,654.00 cy | | - | - | - | 7,631,580 | - | - | 1.57 | 7,631,580 |
| | | Wet Dip And Stack | 678,848.00 cy | 375.000 | 1,810.26 cd | 531,659 | - | - | 1,264,903 | - | 2.65 | 1,796,563 |
| | | ***Disposal Life (Assume Dike & Dredge Ash)*** | ***12.90 yr*** | | - | - | - | - | - | - | ***0.00*** | ***0*** |
| | | Drg Cell/P1 Opr Cost | | | 48,954.36 hrs | 1,691,078 | | 7,631,580 | 2,231,890 | | | 11,554,547 |
| | | *06* | | | *48,954.36 hrs* | *1,691,078* | | *7,631,580* | *2,231,890* | | | *11,554,547* |
| *07* | | | | | | | | | | | | |
| | Ph 2&Ph 3 Base Const | | | | | | | | | | | |
| | | ***Base Layers*** | ***1.00 lot*** | | - | - | - | - | - | - | ***0.00*** | ***0*** |
| | | Cut For Dredge Cell (268,500 bcy) | 322,200.00 cy | 0.040 | 12,888.00 mh | 429,505 | - | - | 338,937 | - | 2.39 | 768,442 |
| | | Compacted Fly Ash Base (Fill) | 910,558.00 cy | 1,300.000 | 700.43 cd | 1,696,157 | - | - | 1,414,641 | - | 3.42 | 3,110,798 |
| | | Proofroll Subgrade | 281,111.00 sy | 28,111.100 | 10.00 cd | 8,497 | - | - | 4,080 | - | 0.05 | 12,577 |
| | | 2.5' Thick Bottom Ash Layer | 242,407.00 cy | 1,300.000 | 186.47 cd | 451,549 | - | - | 376,604 | - | 3.42 | 828,153 |
| | | 0.5' Thick Fly Ash Filter Layer | 48,481.00 cy | 1,300.000 | 37.29 cd | 90,309 | - | - | 75,320 | - | 3.42 | 165,629 |
| | | 18" Dia Coarse Bottom Ash Drain Columns (haul 2 miles, 1,100 bcy) | 16,920.00 lf | | - | - | - | 347,537 | - | - | 20.54 | 347,537 |
| | | Roto Till Fly Ash Layer | 281,111.00 sy | 1,400.000 | 200.79 cd | 117,943 | - | - | 32,770 | - | 0.54 | 150,712 |
| | | Bottom Ash Dike Fill | 163,614.00 cy | 1,300.000 | 125.86 cd | 304,775 | - | - | 254,191 | - | 3.42 | 558,966 |
| | | 1.0' Layer Of Bottom Ash | 96,963.00 cy | 1,300.000 | 74.59 cd | 180,620 | - | - | 150,642 | - | 3.42 | 331,262 |
| | | Geosynthetic Clay Liner | 290,889.00 sy | 0.026 | 7,563.11 mh | 215,760 | 698,908 | - | 19,286 | - | 3.21 | 933,954 |
| | | 4" Diameter Perforated PVC Pipe (Underdrains) SDR 17.5 | 41,400.00 lf | 0.070 | 2,898.00 mh | 79,094 | 64,987 | - | 12,320 | - | 3.78 | 156,401 |
| | | Trenching For The Drain System (4" Dia Underdrains), 1,533 bcy | 1,840.00 cy | 0.200 | 368.00 mh | 10,593 | - | - | 3,128 | - | 7.46 | 13,721 |
| | | Strip Existing 1' Soil Cover (Phase 1 Expansion), 19,133 bcy | 22,960.00 cy | 800.000 | 28.70 cd | 14,128 | - | - | 14,930 | - | 1.27 | 29,058 |
| | | Anchor Trench Cut | 2,073.00 cy | 0.200 | 414.60 mh | 11,935 | - | - | 5,286 | - | 8.31 | 17,221 |
| | | Anchor Trench Fill & Compact | 1,971.00 cy | 0.320 | 630.72 mh | 18,156 | - | - | 15,607 | - | 17.13 | 33,763 |
| | | 2.0' Thick Bottom Ash Blanket Drain | 39,111.00 cy | 1,300.000 | 30.09 cd | 72,855 | - | - | 60,763 | - | 3.42 | 133,618 |
| | | 1.0' Thick Filter Drain Ash Layer | 19,556.00 cy | 1,300.000 | 15.04 cd | 36,428 | - | - | 30,382 | - | 3.42 | 66,811 |
| | | Geomembrane | 58,667.00 sy | 0.050 | 2,933.35 mh | 83,682 | 131,262 | - | 7,480 | - | 3.79 | 222,424 |
| | | Perforated Pipe ADS Drain Tube, 6" Diameter | 7,850.00 lf | 0.200 | 1,570.00 mh | 42,849 | 12,993 | - | 6,666 | - | 7.96 | 62,508 |
| | | Geotextile For Underdrain | 6,542.00 sy | 0.021 | 134.57 mh | 3,839 | 13,247 | - | 458 | - | 2.68 | 17,543 |
| | | #57 Stone For Outlet pipe Bedding (135 pcf) | 1,590.00 tn | 0.150 | 238.50 mh | 6,865 | 14,432 | - | 2,027 | - | 14.67 | 23,325 |
| | | Solid Outlet Pipe ADS Drain 6" Diameter | 1,963.00 lf | 0.200 | 392.60 mh | 10,715 | 3,249 | - | 1,667 | - | 7.96 | 15,631 |
| | | #57 Stone For Outlet pipe Bedding (135 pcf) | 397.00 tn | 0.150 | 59.55 mh | 1,714 | 3,803 | - | 506 | - | 14.67 | 5,824 |
| | | 6" Dia Non-Perf HDPE Corrugated Tubing Lateral Outlet Pipes (EL. 760) | 480.00 lf | 0.200 | 96.00 mh | 2,620 | 794 | - | 408 | - | 7.96 | 3,822 |
| | | 1081Crushed Stone, Bedding 6" Depth | 16.00 tn | 0.500 | 8.00 mh | 230 | 152 | - | 27 | - | 25.61 | 410 |
| | | 6" Dia Perforated HDPE Drain (EL. 760) | 2,400.00 lf | 0.200 | 480.00 mh | 13,100 | 3,972 | - | 2,038 | - | 7.96 | 19,111 |
| | | 1081Crushed Stone | 454.00 tn | 0.500 | 227.00 mh | 6,534 | 4,317 | - | 773 | - | 25.61 | 11,625 |
| | | Geotextile Woven Monofilament | 1,867.00 sy | 0.021 | 38.40 mh | 1,096 | 3,780 | - | 131 | - | 2.68 | 5,007 |
| | | Cut For Underdrain System | 356.00 cy | 0.200 | 71.20 mh | 2,050 | - | - | 605 | - | 7.46 | 2,655 |
| | | Backfill For Underdrain System | 267.00 cy | 0.250 | 66.75 mh | 1,921 | - | - | 801 | - | 10.20 | 2,722 |
| | | Certification | 1.00 ls | | - | - | - | - | - | 50,000 | 50,000.00 | 50,000 |

| Location | Activity | Description | Takeoff Quantity | Labor Productivity | Labor Quantity | Labor Amount | Material Amount | Sub Amount | Equip Amount | Other Amount | Total Cost/Unit | Total Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ph 2&Ph 3 Base Const | | | | | | | | | | | |
| | | QA/QC For Construction Of Diposal Facility | 1.00 ls | | - | - | - | 746,424 | - | - | 746,423.60 | 746,424 |
| | | Ph 2&Ph 3 Base Const | | | 119,212.97 hrs | 3,915,521 | 955,697 | 1,093,960 | 2,832,473 | 50,000 | | 8,847,653 |
| | | *07* | | | *119,212.97 hrs* | *3,915,521* | *955,697* | *1,093,960* | *2,832,473* | *50,000* | | *8,847,653* |
| *08* | | | | | | | | | | | | |
| | Temp Slope Protect | | | | | | | | | | | |
| | | Cut For Ditch (5,815 bcy) | 6,978.00 cy | 1,200.000 | 5.82 cd | 10,981 | - | - | 12,041 | - | 3.30 | 23,022 |
| | | D50 9" Riprap | 4,239.00 tn | 0.320 | 1,356.48 mh | 40,371 | 43,111 | - | 21,837 | - | 24.85 | 105,319 |
| | | Seed Ditch | 6,978.00 sy | | - | - | - | 3,583 | - | - | 0.51 | 3,583 |
| | | Jute Matting | 6,978.00 sy | 0.012 | 83.74 mh | 2,389 | 5,464 | - | 427 | - | 1.19 | 8,280 |
| | | Temp Slope Protect | | | 1,765.86 hrs | 53,741 | 48,575 | 3,583 | 34,304 | | | 140,204 |
| | | *08* | | | *1,765.86 hrs* | *53,741* | *48,575* | *3,583* | *34,304* | | | *140,204* |
| *09* | | | | | | | | | | | | |
| | Riprap Stilling Basn | | | | | | | | | | | |
| | | Riprap D50 Size 9" | 2,344.00 tn | 0.320 | 750.08 mh | 22,824 | 23,838 | - | 12,075 | - | 24.85 | 58,237 |
| | | Cut For Basin (3,582 bcy) | 4,300.00 cy | 1,200.000 | 3.58 cd | 6,767 | - | - | 7,420 | - | 3.30 | 14,186 |
| | | Riprap Stilling Basn | | | 950.75 hrs | 29,091 | 23,838 | | 19,495 | | | 72,424 |
| | | *09* | | | *950.75 hrs* | *29,091* | *23,838* | | *19,495* | | | *72,424* |
| *10* | | | | | | | | | | | | |
| | Ph 2 Initial Constr | | | | | | | | | | | |
| | | ***Wet Sluice Sedimented Gypsum Quantities*** | ***451,295.00 cy*** | | - | - | - | - | - | - | *0.00* | *0* |
| | | ***Initial Disposal Life*** | ***1.40 yrs*** | | - | - | - | - | - | - | *0.00* | *0* |
| | | Perforated Pipe ADS Drain Tube, 6" Diameter | 7,370.00 lf | 0.200 | 1,474.00 mh | 40,229 | 12,199 | - | 6,258 | - | 7.96 | 58,686 |
| | | Geotextile For Underdrain | 6,142.00 sy | 0.021 | 126.34 mh | 3,604 | 12,437 | - | 430 | - | 2.68 | 16,471 |
| | | #57 Stone For Outlet pipe Bedding (135 pcf) | 1,492.00 tn | 0.150 | 223.80 mh | 6,442 | 13,542 | - | 1,902 | - | 14.67 | 21,887 |
| | | Solid Outlet Pipe ADS Drain 6" Diameter | 1,658.00 lf | 0.200 | 331.60 mh | 9,050 | 2,744 | - | 1,408 | - | 7.96 | 13,202 |
| | | #57 Stone For Outlet pipe Bedding (135 pcf) | 336.00 tn | 0.150 | 50.40 mh | 1,451 | 3,050 | - | 428 | - | 14.67 | 4,929 |
| | | Ph 2 Initial Constr | | | 2,206.14 hrs | 60,777 | 43,972 | | 10,427 | | | 115,175 |
| | | *10* | | | *2,206.14 hrs* | *60,777* | *43,972* | | *10,427* | | | *115,175* |
| *11* | | | | | | | | | | | | |
| | Rim Ditches | | | | | | | | | | | |
| | | Cut (111,899 bcy) | 134,279.00 cy | 375.000 | 358.08 cd | 105,164 | - | - | 250,203 | - | 2.65 | 355,368 |
| | | Rim Ditches | | | 2,864.62 hrs | 105,164 | | | 250,203 | | | 355,368 |
| | | *11* | | | *2,864.62 hrs* | *105,164* | | | *250,203* | | | *355,368* |
| *12* | | | | | | | | | | | | |
| | Ph 2 Operationl Cost | | | | | | | | | | | |
| | | ***Stage 1 (3 To 1 Side Slopes)*** | ***1.00 lot*** | | - | - | - | - | - | - | *0.00* | *0* |
| | | Wet Cast Gypsum Dike Fill | 255,189.00 cy | 375.000 | 680.50 cd | 199,859 | - | - | 475,496 | - | 2.65 | 675,354 |
| | | ***Wet Sluice Gypsum Quantities*** | ***1,334,496.00 cy*** | | - | - | - | - | - | - | *0.00* | *0* |
| | | ***Stage 1 Disposal Life (Assumes Dikes & Sluice Gypsum)*** | ***4.90 yrs*** | | - | - | - | - | - | - | *0.00* | *0* |
| | | Perforated Pipe ADS Drain Tube, 6" Diameter | 11,495.00 lf | 0.200 | 2,299.00 mh | 62,746 | 19,026 | - | 9,761 | - | 7.96 | 91,533 |
| | | Geotextile For Underdrain | 9,579.00 sy | 0.021 | 197.04 mh | 5,621 | 19,396 | - | 670 | - | 2.68 | 25,687 |
| | | #57 Stone For Outlet pipe Bedding (135 pcf) | 2,328.00 tn | 0.150 | 349.20 mh | 10,052 | 21,131 | - | 2,968 | - | 14.67 | 34,151 |
| | | Solid Outlet Pipe ADS Drain 6" Diameter | 2,586.00 lf | 0.200 | 517.20 mh | 14,116 | 4,280 | - | 2,196 | - | 7.96 | 20,592 |
| | | #57 Stone For Outlet pipe Bedding (135 pcf) | 524.00 tn | 0.150 | 78.60 mh | 2,263 | 4,756 | - | 668 | - | 14.67 | 7,687 |
| | | Ph 2 Operationl Cost | | | 8,885.07 hrs | 294,656 | 68,589 | | 491,759 | | | 855,005 |
| | | *12* | | | *8,885.07 hrs* | *294,656* | *68,589* | | *491,759* | | | *855,005* |
| *13* | | | | | | | | | | | | |
| | Ph 2 Operationl Cost | | | | | | | | | | | |
| | | ***Stage 2 (3 To 1 Side Slopes)*** | ***1.00 lot*** | | - | - | - | - | - | - | *0.00* | *0* |
| | | Wet Cast Gypsum Dike Fill | 263,403.00 cy | 375.000 | 702.41 cd | 206,292 | - | - | 490,801 | - | 2.65 | 697,093 |
| | | ***Wet Sluice Gypsum Quantities*** | ***1,509,673.00 cy*** | | - | - | - | - | - | - | *0.00* | *0* |
| | | ***Stage 2 Disposal Life (Assume Dike & Sluice Gypsum)*** | ***5.40 yrs*** | | - | - | - | - | - | - | *0.00* | *0* |
| | | Perforated Pipe ADS Drain Tube, 6" Diameter | 11,865.00 lf | 0.200 | 2,373.00 mh | 64,765 | 19,639 | - | 10,075 | - | 7.96 | 94,479 |
| | | Geotextile For Underdrain | 9,888.00 sy | 0.021 | 203.40 mh | 5,802 | 20,022 | - | 692 | - | 2.68 | 26,516 |
| | | #57 Stone For Outlet pipe Bedding (135 pcf) | 2,403.00 tn | 0.150 | 360.45 mh | 10,376 | 21,811 | - | 3,064 | - | 14.67 | 35,251 |
| | | Solid Outlet Pipe ADS Drain 6" Diameter | 2,670.00 lf | 0.200 | 534.00 mh | 14,574 | 4,419 | - | 2,267 | - | 7.96 | 21,261 |
| | | #57 Stone For Outlet pipe Bedding (135 pcf) | 541.00 tn | 0.150 | 81.15 mh | 2,336 | 4,911 | - | 690 | - | 14.67 | 7,936 |
| | | Ph 2 Operationl Cost | | | 9,171.26 hrs | 304,146 | 70,801 | | 507,589 | | | 882,536 |
| | | *13* | | | *9,171.26 hrs* | *304,146* | *70,801* | | *507,589* | | | *882,536* |
| *14* | | | | | | | | | | | | |
| | Ph 3 Initial Constr | | | | | | | | | | | |
| | | Dry Ash Stack | 569,783.00 cy | 1,100.000 | 517.98 cd | 1,134,475 | - | - | 760,816 | - | 3.33 | 1,895,291 |
| | | ***Disposal Life (Assumes Dry Stack Ash)*** | ***1.20 yrs*** | | - | - | - | - | - | - | *0.00* | *0* |
| | | Ph 3 Initial Constr | | | 37,294.89 hrs | 1,134,475 | | | 760,816 | | | 1,895,291 |

| Location | Activity | Description | Takeoff Quantity | Labor Productivity | Labor Quantity | Labor Amount | Material Amount | Sub Amount | Equip Amount | Other Amount | Total Cost/Unit | Total Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *14* | | | *37,294.89 hrs* | *1,134,475* | | | *760,816* | | | *1,895,291* |
| *15* | | | | | | | | | | | | |
| | Ph 3 Operationl Cost | | | | | | | | | | | |
| | | *Stage 1 (3 To 1 Side Slopes)* | *1.00 lot* | | - | - | - | - | - | - | *0.00* | *0* |
| | | Dry Stack Ash Quantities | 1,349,180.00 cy | 1,100.000 | 1,226.53 cd | 2,686,305 | - | - | 1,801,523 | - | 3.33 | 4,487,828 |
| | | *Stage 1 Disposal Life (Assume Dike Stack)* | *2.80 yrs* | | - | - | - | - | - | - | *0.00* | *0* |
| | | Ph 3 Operationl Cost | | | 88,309.96 hrs | 2,686,305 | | | 1,801,523 | | | 4,487,828 |
| | | *15* | | | *88,309.96 hrs* | *2,686,305* | | | *1,801,523* | | | *4,487,828* |
| *16* | | | | | | | | | | | | |
| | Ph 3 Operationl Cost | | | | | | | | | | | |
| | | *Stage 2 (3 To 1 Side Slopes)* | *1.00 lot* | | - | - | - | - | - | - | *0.00* | *0* |
| | | Dry Stack Ash Quantities | 1,504,825.00 cy | 1,100.000 | 1,368.02 cd | 2,996,204 | - | - | 2,009,352 | - | 3.33 | 5,005,556 |
| | | *Stage 2 Disposal Life (Assume Dry Stack)* | *3.20 yrs* | | - | - | - | - | - | - | *0.00* | *0* |
| | | Ph 3 Operationl Cost | | | 98,497.64 hrs | 2,996,204 | | | 2,009,352 | | | 5,005,556 |
| | | *16* | | | *98,497.64 hrs* | *2,996,204* | | | *2,009,352* | | | *5,005,556* |
| *17* | | | | | | | | | | | | |
| | Ph 3 Operationl Cost | | | | | | | | | | | |
| | | Dry Stack Ash Quantities | 1,334,189.00 cy | 1,100.000 | 1,212.90 cd | 2,656,457 | - | - | 1,781,506 | - | 3.33 | 4,437,963 |
| | | *Stage 3 Disposal Life (Assume Dry Stack)* | *2.80 yrs* | | - | - | - | - | - | - | *0.00* | *0* |
| | | Ph 3 Operationl Cost | | | 87,328.74 hrs | 2,656,457 | | | 1,781,506 | | | 4,437,963 |
| | | *17* | | | *87,328.74 hrs* | *2,656,457* | | | *1,781,506* | | | *4,437,963* |
| *18* | | | | | | | | | | | | |
| | Ph 2 Operationl Cost | | | | | | | | | | | |
| | | *Stage 3 (3 To 1 Side Slopes)* | *1.00 lot* | | - | - | - | - | - | - | *0.00* | *0* |
| | | Wet Cast Gypsum Dike Fill | 227,106.00 cy | 375.000 | 605.62 cd | 177,865 | - | - | 423,169 | - | 2.65 | 601,033 |
| | | *Wet Sluice Gypsum Quantities* | *1,344,916.00 cy* | | - | - | - | - | - | - | *0.00* | *0* |
| | | *Stage 3 Disposal Life (Assume Dike & Sluice Ash & Gypsum)* | *4.80 yrs* | | - | - | - | - | - | - | *0.00* | *0* |
| | | Perforated Pipe ADS Drain Tube, 6" Diameter | 10,230.00 lf | 0.200 | 2,046.00 mh | 55,841 | 16,932 | - | 8,687 | - | 7.96 | 81,460 |
| | | Geotextile For Underdrain | 8,525.00 sy | 0.021 | 175.36 mh | 5,003 | 17,262 | - | 597 | - | 2.68 | 22,861 |
| | | #57 Stone For Outlet pipe Bedding (135 pcf) | 2,072.00 tn | 0.150 | 310.80 mh | 8,947 | 18,807 | - | 2,642 | - | 14.67 | 30,395 |
| | | Solid Outlet Pipe ADS Drain 6" Diameter | 2,302.00 lf | 0.200 | 460.40 mh | 12,566 | 3,810 | - | 1,955 | - | 7.96 | 18,330 |
| | | #57 Stone For Outlet pipe Bedding (135 pcf) | 466.00 tn | 0.150 | 69.90 mh | 2,012 | 4,230 | - | 594 | - | 14.67 | 6,836 |
| | | Ph 2 Operationl Cost | | | 7,907.39 hrs | 262,232 | 61,041 | | 437,643 | | | 760,916 |
| | | *18* | | | *7,907.39 hrs* | *262,232* | *61,041* | | *437,643* | | | *760,916* |
| *19* | | | | | | | | | | | | |
| | Ph 2 Operationl Cost | | | | | | | | | | | |
| | | *Stage 4 (3 To 1 Side Slopes)* | *1.00 lot* | | - | - | - | - | - | - | *0.00* | *0* |
| | | Wet Cast Gypsum Dike Fill | 158,831.00 cy | 375.000 | 450.22 cd | 132,225 | - | - | 314,584 | - | 2.65 | 446,809 |
| | | *Wet Sluice Gypsum & Ash Quantities* | *702,654.00 cy* | | - | - | - | - | - | - | *0.00* | *0* |
| | | *Stage 4 Disposal Life (Assume Dike & Sluice Ash)* | *2.70 yrs* | | - | - | - | - | - | - | *0.00* | *0* |
| | | Perforated Pipe ADS Drain Tube, 6" Diameter | 7,605.00 lf | 0.200 | 1,521.00 mh | 41,512 | 12,588 | - | 6,456 | - | 7.96 | 60,557 |
| | | Geotextile For Underdrain | 6,338.00 sy | 0.021 | 130.37 mh | 3,719 | 12,833 | - | 443 | - | 2.68 | 16,996 |
| | | #57 Stone For Outlet pipe Bedding (135 pcf) | 1,540.00 tn | 0.150 | 231.00 mh | 6,650 | 13,978 | - | 1,964 | - | 14.67 | 22,591 |
| | | Solid Outlet Pipe ADS Drain 6" Diameter | 1,711.00 lf | 0.200 | 342.20 mh | 9,340 | 2,832 | - | 1,453 | - | 7.96 | 13,624 |
| | | #57 Stone For Outlet pipe Bedding (135 pcf) | 347.00 tn | 0.150 | 52.05 mh | 1,498 | 3,150 | - | 442 | - | 14.67 | 5,090 |
| | | Ph 2 Operationl Cost | | | 5,878.35 hrs | 194,944 | 45,381 | | 325,344 | | | 565,669 |
| | | *19* | | | *5,878.35 hrs* | *194,944* | *45,381* | | *325,344* | | | *565,669* |
| *20* | | | | | | | | | | | | |
| | Ph 3 Operationl Cost | | | | | | | | | | | |
| | | *Stage 4 (3 To 1 Side Slopes)* | *1.00 lot* | | - | - | - | - | - | - | *0.00* | *0* |
| | | Dry Stack Ash Quantities | 577,613.00 cy | 1,100.000 | 525.10 cd | 1,150,265 | - | - | 771,271 | - | 3.33 | 1,921,536 |
| | | *Stage 4 Disposal Life (Dry Stack Ash)* | *1.20 yrs* | | - | - | - | - | - | - | *0.00* | *0* |
| | | Ph 3 Operationl Cost | | | 37,807.40 hrs | 1,150,265 | | | 771,271 | | | 1,921,536 |
| | | *20* | | | *37,807.40 hrs* | *1,150,265* | | | *771,271* | | | *1,921,536* |
| *25* | | | | | | | | | | | | |
| | Dry Fly Ash Conver | | | | | | | | | | | |
| | | Dry Fly Ash Conversion Capital Cost | 1.00 ls | | - | - | - | 21,977,800 | - | - | 21,977,800.00 | 21,977,800 |
| | | Dry Fly Ash Conver | | | hrs | | | 21,977,800 | | | | 21,977,800 |
| | | *25* | | | *hrs* | | | *21,977,800* | | | | *21,977,800* |
| *xCONST FACILITY* | | | | | | | | | | | | |
| | Construct Facilities | | | | | | | | | | | |
| | | Mobilize, Drug Test, Misc Other, & Demobilize | 1.00 ls | 11,824.864 | 11,824.86 mh | *370,000* | - | - | *200,000* | 0 | 570,000.00 | 570,000 |
| | | Construct Facilities | | | 11,824.86 hrs | 370,000 | | | 200,000 | | | 570,000 |

| Location | Activity | Description | Takeoff Quantity | Labor Productivity | Labor Quantity | Labor Amount | Material Amount | Sub Amount | Equip Amount | Other Amount | Total Cost/Unit | Total Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *xCONST FACILITY* | | | *11,824.86 hrs* | *370,000* | | | *200,000* | | | *570,000* |
| *zNON MANUAL* | | | | | | | | | | | | |
| | Non-Manual | | | | | | | | | | | |
| | | Non Manual | 1.00 ls | 21,885.500 | 21,885.50 mh | *1,094,275* | - | - | - | - | 1,094,275.00 | 1,094,275 |
| | | Non-Manual | | | 21,885.50 hrs | 1,094,275 | | | | | | 1,094,275 |
| | | *zNON MANUAL* | | | *21,885.50 hrs* | *1,094,275* | | | | | | *1,094,275* |

## Estimate Totals

| | | | | | | |
|---|---|---|---|---|---|---|
| Labor | 20,181,860 | | 631,985.357 | hrs | | |
| Material | 2,058,231 | | | | | |
| Subcontract | 30,783,866 | | | | | |
| Equipment | 14,785,042 | | 433,741.161 | hrs | | |
| Other | 50,000 | | | | | |
| | 67,858,999 | 67,858,999 | | | | |
| Engineered Materials - Ph 2 | | | 100.000 | % | | C |
| Adjustment - Engr Materials | | | (100.000) | % | | C |
| | | 67,858,999 | | | | |
| Environmental Costs | | | 100.000 | % | | C |
| Adjustment Environmental | | | (100.000) | % | | C |
| | | 67,858,999 | | | | |
| FPG Mech Engr - Phase 2 | 7,002 | | 0.026 | % @ | 42.00 A | 167 |
| FPG Elec Engr - Phase 2 | 7,002 | | 0.026 | % @ | 42.00 A | 167 |
| FPG Civil Engr - Phase 2 | 16,003 | | 0.060 | % @ | 42.00 A | 381 |
| Non-TVA Engr - Phase 2 | 281,003 | | 0.818 | % @ | 72.00 A | 3,903 |
| FPG Proj Cntrl Cost - Phase 2 | 1,001 | | 0.004 | % @ | 42.00 A | 24 |
| FPG Proj Cntrl Sched - Phase 2 | 2,969 | | 0.011 | % @ | 42.00 A | 71 |
| FPG Cost Estimating - Phase 2 | 1,001 | | 0.004 | % @ | 42.00 A | 24 |
| FPG Engr Records - Phase 2 | 1,001 | | 0.004 | % @ | 42.00 A | 24 |
| | 317,002 | 68,176,001 | | | | |
| Rounding | | | | | | L |
| | | 68,176,001 | | | | |
| | ***Total*** | ***68,176,001*** | | | | |