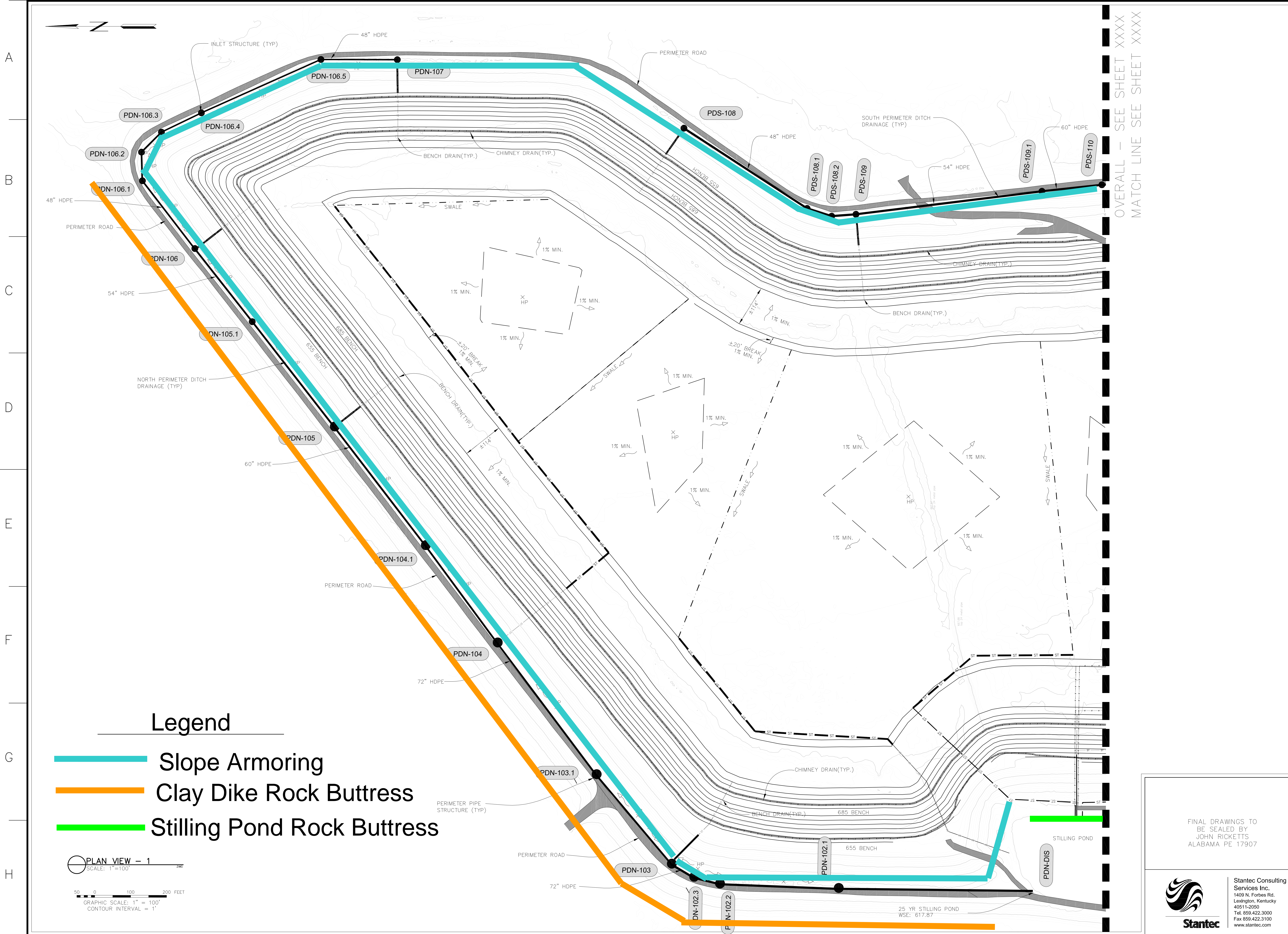
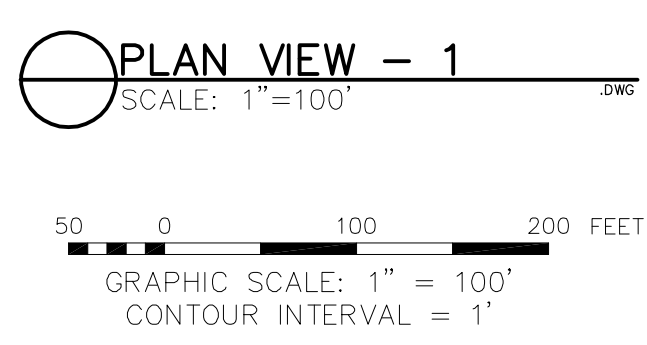


00-XXXXXX C 34



- Legend**
- Slope Armoring
 - Clay Dike Rock Buttress
 - Stilling Pond Rock Buttress



OVERALL - SEE SHEET XXXX
MATCH LINE SEE SHEET XXXX

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LEGEND

- PDN-103 PERIMETER DRAIN NORTH (TIES TO BENCH DOWN DRAIN 103)
 - INLET STRUCTURE
 - PERIMETER DITCH DRAINAGE PIPE
 - PARALLEL PERIMETER DITCH DRAINAGE PIPE
 - ST BENCH DRAIN PIPE
 - Section or Detail No.
 - Sheet Where Shown
- REFERENCE KEY**

FINAL DRAWINGS TO BE SEALED BY
JOHN RICKETTS
ALABAMA PE 17907

Stantec Consulting Services Inc.
1409 N. Forbes Rd.
Lexington, Kentucky 40511-2090
Tel: 859-422-2000
Fax: 859-422-3100
www.stantec.com

DESIGNED BY: -	DRAWN BY: -	CHECKED BY: R. FULLER	APPROVED BY: H. APARICIO	REVIEWED BY: J. MONTGOMERY	APPROVED BY: -	ISSUED BY: -
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**WIDOWS CREEK FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING**

AUTOCAD R 2008 DATE: 34 C **XXWXXX-00** R 0




PLOT FACTOR: XX
W_TVX C.A.D. DRAWING
DO NOT ALTER MANUALLY

00-XXXXXX C 34



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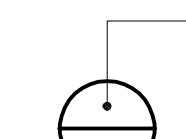

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Legend

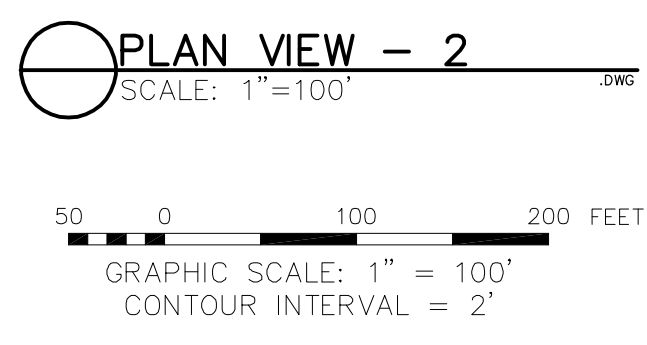
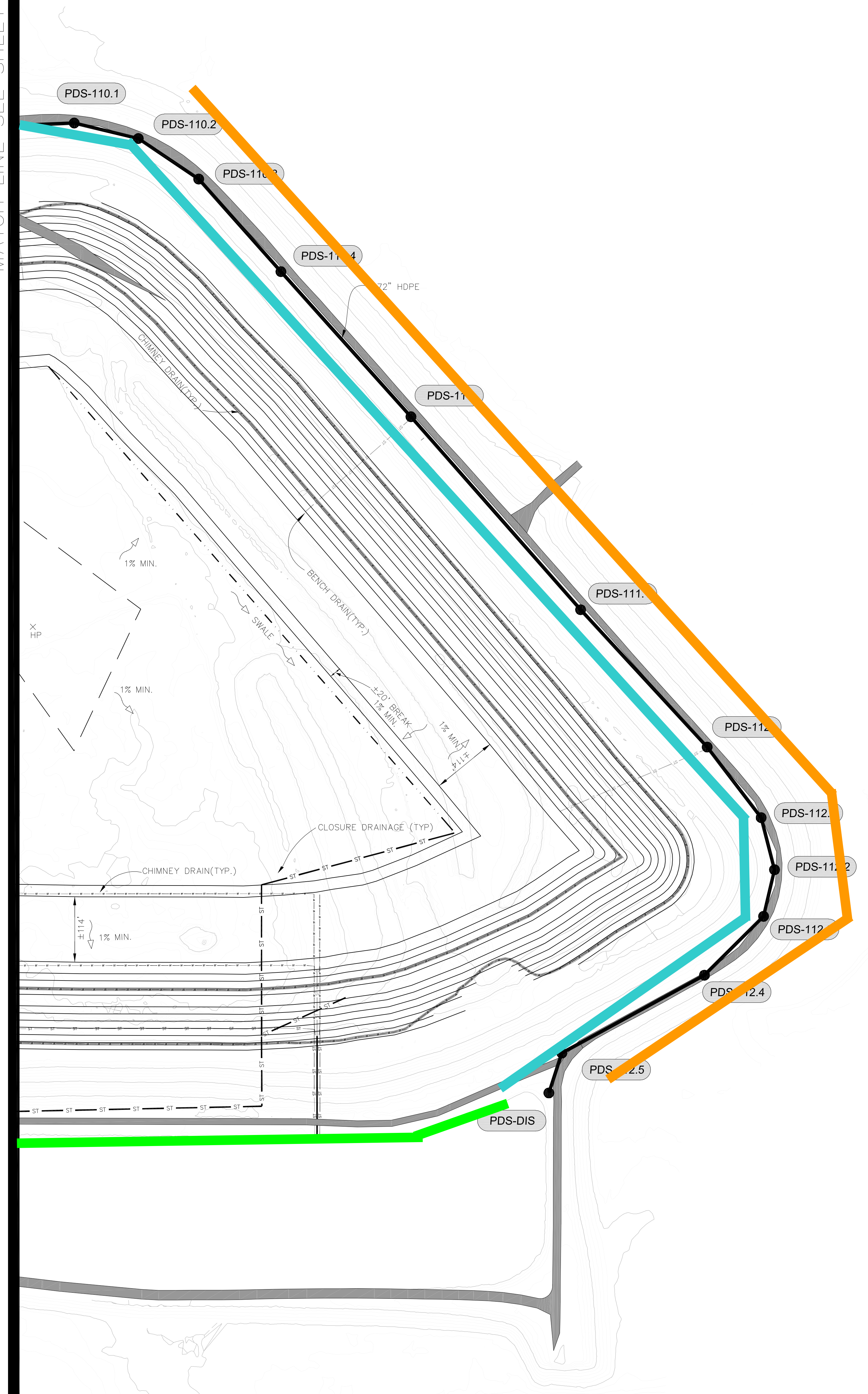
-  Slope Armoring
-  Clay Dike Rock Buttress
-  Stilling Pond Rock Buttress


**ISSUED FOR REVIEW
 NOT FOR CONSTRUCTION**

LEGEND
 Piezometer
 Slope Inclinometer

REFERENCE KEY
 Section or Detail No.
 Sheet Where Shown

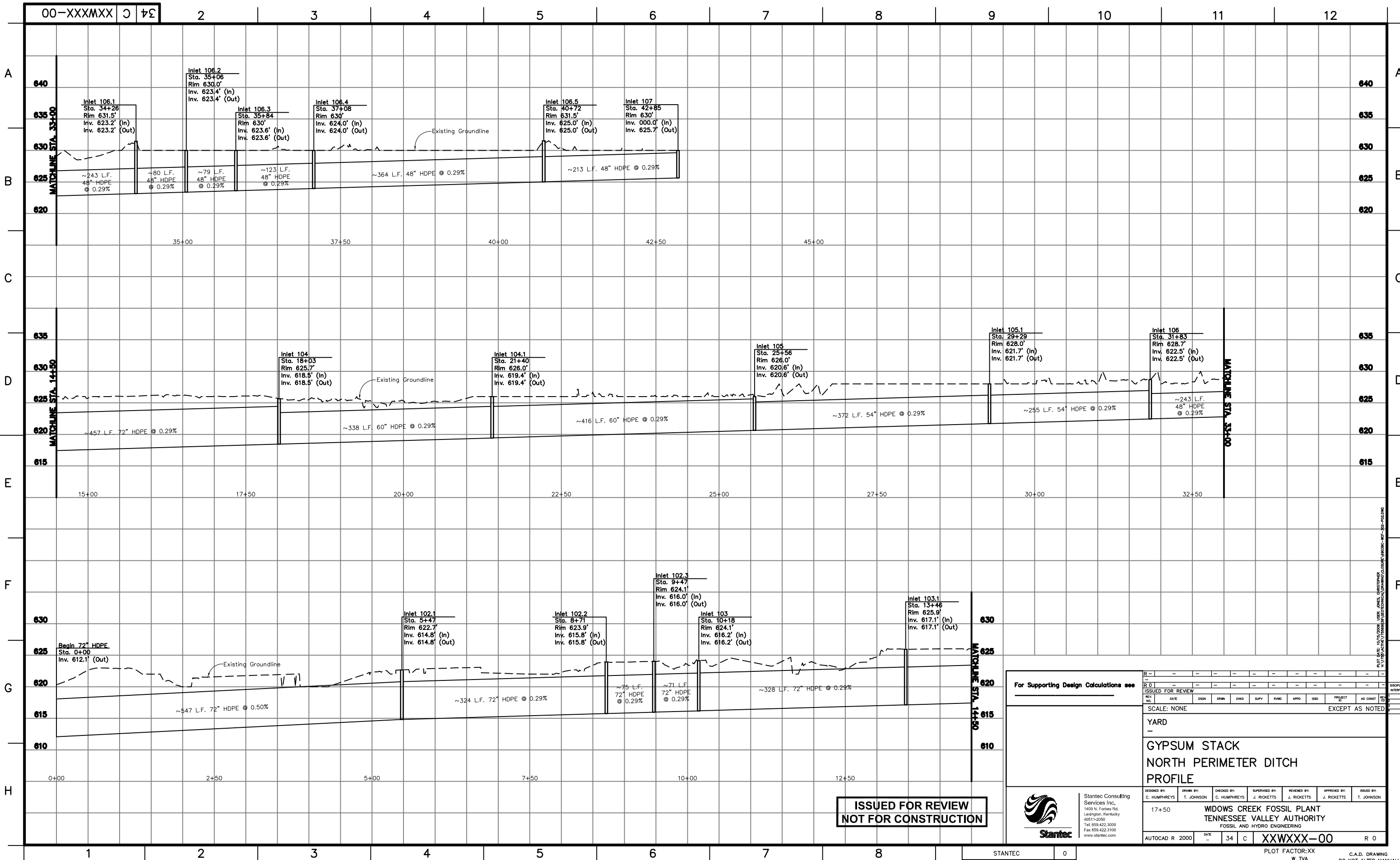
MATCH LINE SEE SHEET XXXX



FINAL DRAWINGS TO BE SEALED BY JOHN RICKETTS ALABAMA PE 17907		SCALE: 1"=100' EXCEPT AS NOTED	
YARD — PLAN VIEW - 2 —		DESIGNED BY: — DRAWN BY: — CHECKED BY: R. FULLER SUPERVISED BY: H. APARICIO REVIEWED BY: J. MONTGOMERY APPROVED BY: — ISSUED BY: —	
 Stantec Consulting Services Inc. 1409 N. Forbes Rd. Lexington, Kentucky 40511-2050 Tel: 859.422.3000 Fax: 859.422.3100 www.stantec.com		WIDOWS CREEK FOSSIL PLANT TENNESSEE VALLEY AUTHORITY FOSSIL AND HYDRO ENGINEERING	
AUTOCAD R 2008	DATE: 3/4	C	XXWXXX-00 R 0

TASK COMPLETED BY: — REV NO: —

PLOT FACTOR: XX W TVA C.A.D. DRAWING DO NOT ALTER MANUALLY



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For Supporting Design Calculations see

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RWD	APPR	ISSD	PROJECT	AS CONST

SCALE: NONE EXCEPT AS NOTED

YARD

**GYPHUM STACK
NORTH PERIMETER DITCH
PROFILE**

DESIGNED BY: C. HUMPHREYS	DRAWN BY: T. JOHNSON	CHECKED BY: C. HUMPHREYS	SUPERVISED BY: J. RICKETTS	REVIEWED BY: J. RICKETTS	APPROVED BY: J. RICKETTS	ISSUED BY: T. JOHNSON
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17+50

**WIDDOWS CREEK FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING**

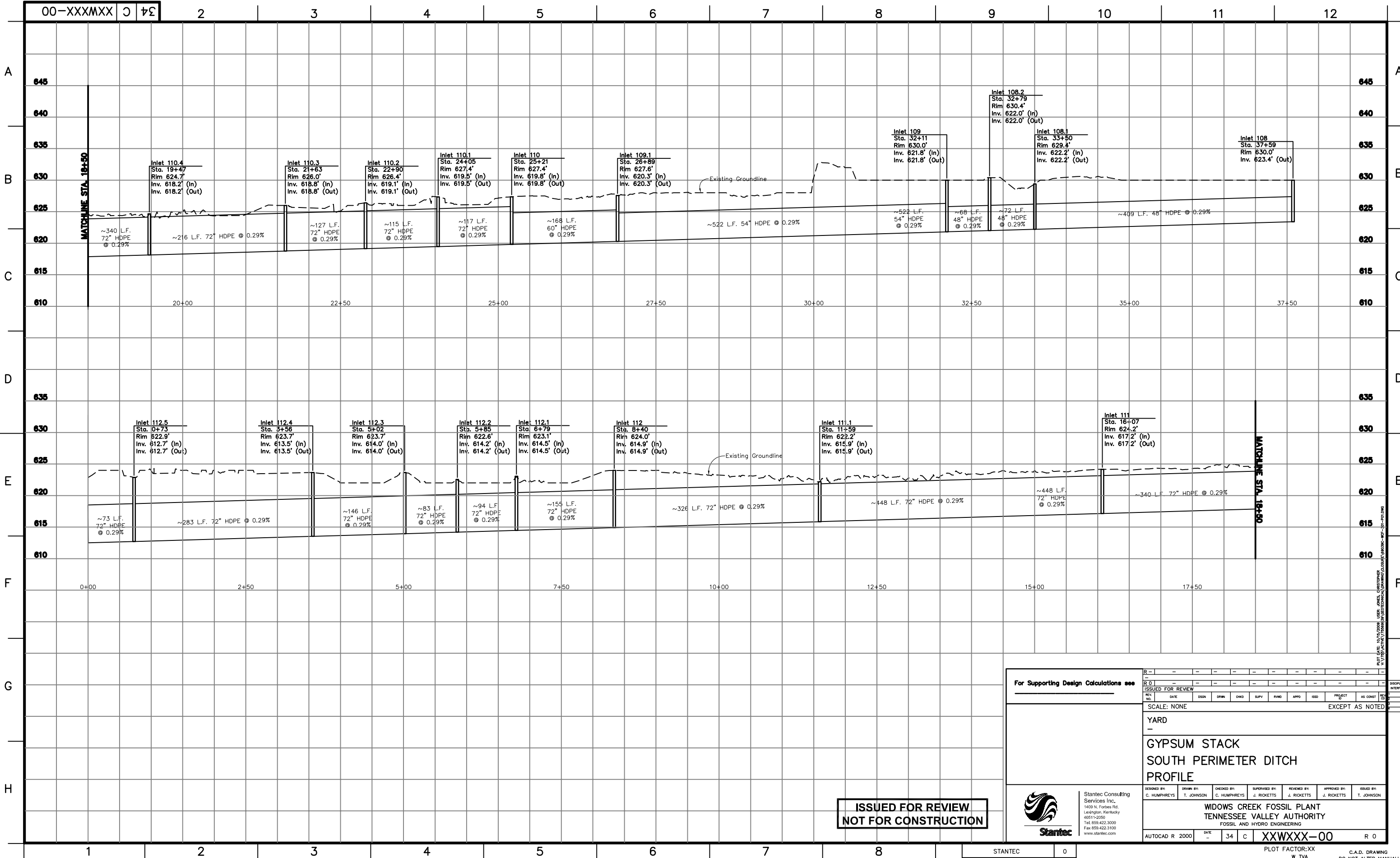
AUTOCAD R 2000 DATE: 3/4 C XXWXXX-00 R 0



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STANTEC 0
TASK COMPLETED BY: REV. NO.

PLOT FACTOR: XX
W_TVA C.A.D. DRAWING
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**ISSUED FOR REVIEW
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For Supporting Design Calculations see

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RWD	APPD	ISSD	PROJECT	AS CONST.

SCALE: NONE EXCEPT AS NOTED

YARD

**GYPHUM STACK
SOUTH PERIMETER DITCH
PROFILE**

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
C. HUMPHREYS	T. JOHNSON	C. HUMPHREYS	J. RICKETTS	J. RICKETTS	J. RICKETTS	T. JOHNSON

**WIDOWS CREEK FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING**

AUTOCAD R 2000 DATE: 34 C XXWXXX-00 R 0



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PLOT FACTOR: XX
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Work Plan 14 - Closure Plan
Widows Creek Fossil Plant, Stevenson, Alabama
Stantec Project No. 175569039

Feasibility Design Phase - Construction Cost Estimate

Project Title: Gypsum Stack, Widows Creek Fossil Plant
Project Name: Closure Plan
Proj. Location: Stevenson, Alabama
Estimate Date: 23-Oct-09

Work Plan 14
175569039
Construction

Prep. By: ZCM
Currency: USD

Item	Unit	Quantity	Unit Cost	Total Cost	Percentages	
Site Preparation						
(1) Mobilization/Demobilization	LS	1	\$100,000.00	\$100,000	0.6%	of TDC
(2) Clearing and Grubbing	AC	20	\$1,000.00	\$20,000	0.1%	of TDC
(3) BMP Silt Fence Installation	LF	32,000	\$2.50	\$80,000	0.5%	of TDC
Site Preparation Subtotal				200,000	1.2%	of TDC
Slope Stability						
Rock Buttress for Clay Dike						
(4) Sand	CY	21,000	\$12.10	\$254,100	1.5%	of TDC
(5) No. 89 Stone	CY	19,700	\$38.00	\$748,600	4.4%	of TDC
(6) Class 2 Channel Lining	CY	88,000	\$38.00	\$3,344,000	19.6%	of TDC
Slope Armoring for Stack						
(7) Sand	CY	27,700	\$12.10	\$335,170	2.0%	of TDC
(8) No. 89 Stone	CY	30,000	\$38.00	\$1,140,000	6.7%	of TDC
(9) Class 2 Channel Lining	CY	36,500	\$38.00	\$1,387,000	8.1%	of TDC
(10) Cast Gypsum Fill, w/ Foundation Benching on Slope	CY	107,600	\$4.00	\$430,400	2.5%	of TDC
(11) Sand for seepage collection in old perimeter ditch	CY	20,000	\$12.10	\$242,000	1.4%	of TDC
(12) 8" HDPE Perforated Pipe for seepage collection	LF	9,000	\$5.63	\$50,670	0.3%	of TDC
Stilling Pond Rock Buttress						
(13) Sand	CY	1,850	\$12.10	\$22,385	0.1%	of TDC
(14) No. 89 Stone	CY	1,670	\$38.00	\$63,460	0.4%	of TDC
(15) Class 2 Channel Lining	CY	6,300	\$38.00	\$239,400	1.4%	of TDC
(16) Temporary Water Diversion Pump System	LS	1	\$50,000.00	\$50,000	0.3%	of TDC
(17) 36" HDPE Pipe Extension (x2)	LF	70	\$45.00	\$3,150	0.0%	of TDC
(18) 30" HDPE Pipe Extension	LF	35	\$37.00	\$1,295	0.0%	of TDC
(19) 18" HDPE Pipe Extension (x2)	LF	70	\$17.00	\$1,190	0.0%	of TDC
(20) 8" HDPE Pipe Extension (x5)	LF	175	\$5.63	\$985	0.0%	of TDC
Slope Stability Subtotal				\$8,257,185	48.4%	of TDC
Perimeter Ditch						
Earthwork for North & South Pipe Installation						
(21) Trench Excavation	CY	22,055	\$2.50	\$55,138	0.3%	of TDC
(22) Sand Backfill	CY	10,729	\$12.10	\$129,821	0.8%	of TDC
(23) Roadway, crushed 1.5" stone, compacted, 6" deep	SY	27,000	\$10.00	\$270,000	1.6%	of TDC
Earthwork for Inlet Installation						
(24) Excavation	CY	5,100	\$2.50	\$12,750	0.1%	of TDC
(25) Stone Base	CY	143	\$38.00	\$5,434	0.0%	of TDC
(26) Sand Backfill	CY	4,454	\$12.10	\$53,893	0.3%	of TDC
North Pipe Installation						
(27) 48" diameter	LF	1,102	\$70.00	\$77,140	0.5%	of TDC
(28) 54" diameter	LF	627	\$104.00	\$65,208	0.4%	of TDC
(29) 60" diameter	LF	754	\$120.00	\$90,480	0.5%	of TDC
(30) 72" diameter	LF	1,802	\$150.00	\$270,300	1.6%	of TDC
South Pipe Installation						
(31) 48" diameter	LF	549	\$70.00	\$38,430	0.2%	of TDC
(32) 54" diameter	LF	522	\$104.00	\$54,288	0.3%	of TDC
(33) 60" diameter	LF	168	\$120.00	\$20,160	0.1%	of TDC
(34) 72" diameter	LF	2,523	\$150.00	\$378,450	2.2%	of TDC
Surface Drop Inlets						
(35) North	each	16	\$4,000.00	\$64,000	0.4%	of TDC
(36) South	each	18	\$4,000.00	\$72,000	0.4%	of TDC
Connections to Seepage Collection System						
(37) Inspection Wells Connection	each	20	\$3,500.00	\$70,000	0.4%	of TDC
Perimeter Ditch Subtotal				\$1,727,492	10.1%	of TDC

Work Plan 14 - Closure Plan
Widows Creek Fossil Plant, Stevenson, Alabama
Stantec Project No. 175569039

Feasibility Design Phase - Construction Cost Estimate

Project Title: Gypsum Stack, Widows Creek Fossil Plant
Project Name: Closure Plan
Proj. Location: Stevenson, Alabama
Estimate Date: 23-Oct-09

Work Plan 14
175569039
Construction

Prep. By: ZCM
Currency: USD

Item	Unit	Quantity	Unit Cost	Total Cost	Percentages	
Slope Drains						
655 Bench (Outlets 1,2,8,9)						
(38) 8" HDPE Perforated Slope Drain Pipe	LF	2,820	\$5.63	\$15,877	0.1%	of TDC
(39) Slope Drain Trench Excavation	CY	39,750	\$2.50	\$99,375	0.6%	of TDC
(40) Slope Drain Sand Backfill	CY	3,720	\$12.10	\$45,012	0.3%	of TDC
(41) Slope Drain Backfill	CY	37,600	\$12.00	\$451,200	2.6%	of TDC
(42) 8" HDPE Solid Lateral Pipe	LF	600	\$5.63	\$3,378	0.0%	of TDC
(43) Lateral Outlet Trench Excavation	CY	2,860	\$2.50	\$7,150	0.0%	of TDC
(44) Lateral Outlet Sand Backfill	CY	140	\$12.10	\$1,694	0.0%	of TDC
(45) Lateral Outlet Backfill	CY	2,720	\$12.00	\$32,640	0.2%	of TDC
685 Bench (Entire Perimeter)						
(46) 8" HDPE Perforated Slope Drain Pipe	LF	8,775	\$5.63	\$49,403	0.3%	of TDC
(47) Slope Drain Trench Excavation	CY	41,600	\$2.50	\$104,000	0.6%	of TDC
(48) Slope Drain Sand Backfill	CY	6,500	\$12.10	\$78,650	0.5%	of TDC
(49) Slope Drain Backfill	CY	35,100	\$12.00	\$421,200	2.5%	of TDC
(50) 8" HDPE Solid Lateral Pipe	LF	1,500	\$5.63	\$8,445	0.0%	of TDC
(51) Lateral Outlet Trench Excavation	CY	7,200	\$2.50	\$18,000	0.1%	of TDC
(52) Lateral Outlet Sand Backfill	CY	340	\$12.10	\$4,114	0.0%	of TDC
(53) Lateral Outlet Backfill	CY	6,860	\$12.00	\$82,320	0.5%	of TDC
Slope Drains Subtotal				\$1,422,458	8.3%	of TDC
Bench Drain System						
Earthwork for Surface Inlets						
(54) 18" Bench Drain	CY	3,410	\$11.00	\$37,510	0.2%	of TDC
(55) 30" Bench Drain	CY	888	\$11.00	\$9,768	0.1%	of TDC
(56) TDOT No. 89 Fill (per inlet)	CY	39	\$38.00	\$1,482	0.0%	of TDC
(57) Sand Backfill 18" Drain	CY	2,970	\$12.10	\$35,937	0.2%	of TDC
(58) Sand Backfill 30" Drain	CY	780	\$12.10	\$9,438	0.1%	of TDC
Surface Drop Inlets						
(59) 655 Bench Drain Inlet and Concrete Apron	each	13	\$5,000.00	\$65,000	0.4%	of TDC
(60) 685 Bench Drain Inlet and Concrete Apron	each	13	\$5,000.00	\$65,000	0.4%	of TDC
Earthwork Lateral Pipe						
(61) Excavation, Trench 15' deep	CY	15,273	\$3.00	\$45,819	0.3%	of TDC
(62) Sand Backfill	CY	913	\$12.00	\$10,956	0.1%	of TDC
(63) Cast Gypsum Fill	CY	14,207	\$4.00	\$56,828	0.3%	of TDC
Lateral Pipe						
(64) 18" diameter	LF	1,830	\$17.00	\$31,110	0.2%	of TDC
(65) 30" diameter	LF	910	\$37.00	\$33,670	0.2%	of TDC
Bench Re-grading						
(66) Ditch Regrade	CY	30,800	\$11.00	\$338,800	2.0%	of TDC
Vegetative Soil Cover						
(67) Topsoil placement and grading, 12" depth	AC	62	\$43,560.00	\$2,700,720	15.8%	of TDC
(68) Seeding, Hydro or air with mulch and fertilizer	AC	62	\$2,615.00	\$162,130	1.0%	of TDC
Bench Drain System Subtotal				\$3,604,168	21.1%	of TDC
Cap Drain System						
Earthwork						
(69) Excavation for Inlets	CY	2,886	\$11.00	\$31,746	0.2%	of TDC
(70) TDOT No. 89 Fill	CY	20	\$38.00	\$741	0.0%	of TDC
(71) Sand Backfill	CY	2,535	\$12.10	\$30,674	0.2%	of TDC
Surface Drop Inlets						
(72) Cap Drain Inlet with Concrete Apron	each	13	\$5,000.00	\$65,000	0.4%	of TDC
Earthwork Cap Drain Pipe						
(73) Excavation, 5 feet deep	CY	1,614	\$3.00	\$4,842	0.0%	of TDC
(74) Sand Backfill	CY	1,003	\$12.10	\$12,136	0.1%	of TDC
(75) Compacted Earth Backfill	CY	390	\$12.00	\$4,680	0.0%	of TDC
Cap Drain Pipe						
(76) 24" diameter	LF	1,250	\$24.00	\$30,000	0.2%	of TDC
(77) 30" diameter	LF	1,240	\$37.00	\$45,880	0.3%	of TDC
(78) 36" diameter	LF	1,650	\$45.00	\$74,250	0.4%	of TDC
Cap Drain Regrading						
(79) Regrade cap	CY	140,000	\$11.00	\$1,540,000	9.0%	of TDC
Vegetative Soil Cover						
(80) Topsoil placement and grading, 12" depth	AC	50	\$43,560.00	\$2,178,000	12.8%	of TDC
(81) Seeding, Hydro or air with mulch and fertilizer	AC	50	\$2,615.00	\$130,750	0.8%	of TDC
Cap Drain System Subtotal				\$1,839,949	10.8%	of TDC

Work Plan 14 - Closure Plan
Widows Creek Fossil Plant, Stevenson, Alabama
Stantec Project No. 175569039
Feasibility Design Phase - Construction Cost Estimate

Project Title: Gypsum Stack, Widows Creek Fossil Plant
Project Name: Closure Plan
Proj. Location: Stevenson, Alabama
Estimate Date: 23-Oct-09

Work Plan 14
175569039
Construction
Prep. By: ZCM
Currency: USD

Item	Unit	Quantity	Unit Cost	Total Cost	Percentages	
Total Direct Field Costs				\$17,051,251	100%	
				(TDC)		
Indirect Field Costs						
(82) Overtime Premium (5% TDL)				\$170,513	5.0%	of TDC
(83) Miscellaneous Material (5% of TDM)				\$511,538	5.0%	of TDM
(84) Freight (3% TDM)				\$306,923	3.0%	of TDM
(85) Sales Tax (6% TDM)				\$613,845	6.0%	of TDM
(86) Special Equipment Rental (2% TDM)				\$204,615	2.0%	of TDE
(87) Material Escalation (8% TDM)				\$818,460	8.0%	of TDM
(88) Labor Escalation				\$102,308	3.0%	of TDL
Other Costs				\$2,728,200	16.0%	of TDC
Total Field Costs				19,779,452	76.1%	of TIC
				(TFC)		
(89) Engineering Design				1,500,000	5.8%	of TIC
(90) Engineering & Construction Management				800,000	3.1%	of TIC
Total Non-Field Costs				2,300,000	8.9%	of TIC
(91) 15% Contingency				3,900,000	15.0%	of TIC
Project Total Cost				25,979,452	152.4%	of TDC (TIC)

Assumptions:

- 1) Unit costs include labor, material and equipment.
- 2) Excavated material is assumed to be non hazardous and doesn't require hazardous disposal.
- 3) Labor accounts for 20% of the total direct costs
- 4) Material accounts for 60% of the total direct costs
- 5) Equipment accounts for 20 % of the total direct costs
- 6) All quantities based on August 2009 conditions and proposed recommendations.
- 7) Unit prices based on 2009 RSMeans Heavy Construction Cost Data.