



Fac/Perm/Co ID #	Date	Doc ID#
Carmen	5/4/10	DIN

August 8, 2006

North Carolina Department of Environment and Natural Resources  
 Division of Waste Management  
 Attn: Mr. Edward F. Mussler, III  
 1646 Mail Service Center  
 Raleigh, NC 27699-1646

Fac/Perm/Co ID #	Date	Doc ID#
CCB003	/ /	6140

**Subject:** Carolina Power & Light Co. d/b/a Progress Energy Carolinas, Inc.  
 Roxboro Plant Flue Gas Desulphurization (Gypsum) Storage Pad  
 Coal Combustion By-Products  
 Notification for Structural Fill – August 2006 Update

Dear Mr. Mussler:

In accordance with 15A NCAC 13B .1703, the enclosed information describes the incorporation of coal ash as structural fill to build a gypsum storage pad on the Roxboro Plant property. Your Division approved the use of ash as structural fill in a letter dated December 16, 2005 but this letter did not contain an approval for the storage of gypsum. The Company subsequently re-designed the gypsum storage pad to incorporate a liner system beneath the gypsum and above the ash fill. The gypsum storage pad decreased in size from 20 acres to 11 acres. As such, this submittal supersedes our prior submittal dated November 1, 2005. Please contact Mr. Steven B. Conner at (336) 597-6292 or Mr. William E. Milam, Jr. at (336) 597-6284 if there are any questions concerning the information submitted.

Sincerely,

*Cecil E. Rowland*  
 Cecil E. Rowland  
 Plant Manager

Attachments  
 JRT/jt



cc/att: Mr. Timothy A. Jewett  
 Western Area Engineer  
 585 Waughtown Street  
 Winston-Salem, NC 27107-2241

Mr. John E. Murray, P.E.  
 Environmental Engineer  
 610 East Center Avenue, Suite 301  
 Mooresville, NC 28115

## Roxboro Plant Gypsum Storage Pad

### Project Description

Carolina Power & Light Company d/b/a Progress Energy Carolinas, Inc. is constructing flue gas desulphurization (FGD) systems for each of the four units at our Roxboro Plant. The first unit will be operational in Spring 2007 with the final unit operational in Fall 2008. The output from the FGD systems will be wall board specification gypsum. The Company has a contract to supply the gypsum to BPB, Inc. who is constructing a wall board plant adjacent to the Roxboro Plant. The contractual agreement requires Progress Energy to supply BPB, Inc. with gypsum such that they can operate uninterrupted, 24 hours a day, seven days a week.

Therefore, the Company will construct a storage pad for the gypsum to operate as a surge pile. Gypsum will be removed from the storage pad when the generation of gypsum (i.e. a unit off-line for maintenance) does not meet the wall board plant's consumption. An 11-acre storage pad is under construction to store 300,000 tons of gypsum. The Company plans to use approximately 95,000 cubic yards of coal ash as structural fill under select portions of the storage pad.

Runoff from the storage pad will be directed to the Unit 3 cooling pond which discharges to the Heated Water Discharge Canal (see figure in Attachment 1). The stormwater runoff from this storage pad will be added to a permit application that is to be submitted by October 2006 during a scheduled permit renewal. This approval has not been granted as mistakenly noted in our November 1, 2005 submittal.

Note, however, that the Division of Water Quality has approved the discharge from the gypsum settling basins into our NPDES permit (permit No. NC 0003425). Runoff from the storage pad will be similar to the discharge from the gypsum settling basins and we anticipate that the stormwater runoff from the storage pad will be approved later this year.

The storage pad will be constructed per 15A NCAC 13B .1705 and will be recorded per 15A NCAC 13B .1707. Within 30 days after construction of the storage pad ceases, a report will be submitted to the Department per 15A NCAC 13B .1706. The following questions and responses are included per 15A NCAC 13B .1703 and .1704.

### .1703 Notification for Structural Fill Facilities

*.1703(a)(1) A description of the nature, purpose and location of the project, including the name of the United States Geological Survey seven and one-half minute map on which the project is located and a Department of Transportation map or an eight and one-half by 11 inch topographic map showing the project.*

Mr. Edward F. Mussler, III  
Gypsum Storage Pad  
August 2006

The Roxboro Plant plans to use coal ash as structural fill to build a gypsum storage pad. The storage pad will be constructed on Plant property. Attachment 2 is a portion of the United States Geological Survey seven and one-half minute map of the Olive Hill Quadrangle showing the proposed location of the storage pad.

*.1703(a)(2) The estimated start and completion dates for the project.*

Construction began on April 24, 2006 and completion is anticipated in April 2007. A portion of the storage pad area is presently occupied by a concrete batch plant. This batch plant can not be moved until Spring 2007. The majority of the storage pad will be lined by Fall 2006. However, the entire storage pad will not be lined until the batch plant is moved and therefore completion is not anticipated until April 2007.

*.1703(a)(3) An estimate of the volume of coal combustion by-products to be used for the project.*

The gypsum storage pad will incorporate approximately 95,000 cubic yards of coal ash as structural fill in select areas beneath the storage pad.

*.1703(a)(4) A Toxicity Characteristic Leaching Procedure (TCLP) analysis from a representative sample of each different coal combustion by-product source to be used in the project. The TCLP analysis shall be conducted and certified by the generator to be representative of each coal combustion by-product source used in the project. A TCLP analysis shall be conducted at least annually. A minimum analysis shall include: arsenic, barium, cadmium, lead, chromium, mercury, selenium and silver.*

The gypsum storage pad will only utilize coal ash generated at the Roxboro Plant. Attachment 3 includes the results of a TCLP analyses completed on the Roxboro Plant coal ash.

*.1703(a)(5) A signed and dated statement by the owner(s) of the land on which the structural fill is to be placed, acknowledging and consenting to the use of coal combustion by-products as structural fill and agreeing to record the fill in accordance with Rule .1707 of this Section.*

The gypsum storage pad will be located on Company property. The Company stipulates to the recordation requirements of Rule .1707.

*.1703(a)(6)(A) The notification shall include the name of coal combustion by-products generator.*

Carolina Power & Light Company d/b/a Progress Energy Carolinas, Inc.  
Roxboro Plant  
1700 Dunnaway Road  
Semora, NC 27343

Mr. Edward F. Mussler, III  
Gypsum Storage Pad  
August 2006

*.1703(a)(6)(B) Physical location of the generating facility.*

Carolina Power & Light Company d/b/a Progress Energy Carolinas, Inc.  
Roxboro Plant  
1700 Dunnaway Road  
Semora, NC 27343

*.1703(a)(6)(C) Address of generator.*

Carolina Power & Light Company d/b/a Progress Energy Carolinas, Inc.  
Roxboro Plant  
1700 Dunnaway Road  
Semora, NC 27343

*.1703(a)(6)(D) Name of contact for generator.*

Mr. Steven B. Conner	(336) 597-6292
Mr. William E. Milam, Jr.	(336) 597-6284
Mr. John A. Moreci	(919) 546-6564
Mr. John R. Edelen	(919) 546-6765

*.1703(a)(6)(E) Telephone number of generator.*

Mr. Steven B. Conner	(336) 597-6292
Mr. William E. Milam, Jr.	(336) 597-6284
Mr. John A. Moreci	(919) 546-6564
Mr. John R. Edelen	(919) 546-6765

*.1703(b) In addition to the notification requirements under Paragraph (a) of this Rule, at least 30 days before using coal combustion by-products as a structural fill in projects with a volume of more than 10,000 cubic yards, the person proposing the use shall submit a written notice to the Division containing construction plans for the structural fill facility, including a stability analysis when necessary, which shall be prepared, signed and sealed by a registered professional engineer in accordance with sound engineering practices. The Department of Transportation is not required to submit construction plans with the written notice. The Department of Transportation shall maintain a complete set of construction plans and shall notify the Division where the construction plans are located.*

Please see the engineering plans prepared under seal of a Professional Engineer in Attachment 4.

.1704 Siting for Structural Fill Facilities

*.1704(a) Coal combustion by-products used as structural fill shall not be placed: (1) within 50 horizontal feet of a jurisdictional wetland unless after consideration of the chemical and physical impact on the wetland, the United States Corps of Engineers issues a permit or waiver for the fill.*

The Company has received a permit from the Division of Water Quality and Corps of Engineers (DWQ Project #05-0792 & Corps of Engineers Action #200520383) to fill the majority of the wetlands in and around the storage pad. No ash will be placed within 50 feet of the wetlands that will remain unfilled (see engineering plans in Attachment 4).

*.1704(a) Coal combustion by-products used as structural fill shall not be placed: (2) within 50 horizontal feet of the top of the bank of a perennial stream or other surface water body.*

No ash will be placed within 50 feet of a water body or perennial stream.

*.1704(a) Coal combustion by-products used as structural fill shall not be placed: (3) within 2 feet of the seasonal high ground water table.*

Eleven soil borings (G-4 through G-14) were completed in and around the location of the proposed storage pad. Groundwater was not encountered in borings G-5, G-6, G-7, G-8, G-11 and G-12. All of these borings were drilled to at least 22 feet below ground surface. Groundwater was encountered at borings G-4, G-9, G-10, G-13 and G-14. At these locations, groundwater was at least 15 feet below ground surface.

The project calls for the removal of 6 to 12 inches of topsoil and then placement of ash. Therefore, ash will not be placed within 2 feet of groundwater. Please see the boring logs and boring locations in Attachment 5. Also, a soil boring was completed on July 26, 2006 at location N6000, E12750 in the area recommended by Brian Wootton (DENR) during an on-site inspection on May 23, 2006. The soil boring was completed to four feet below ground surface and groundwater was not encountered.

*.1704(a) Coal combustion by-products used as structural fill shall not be placed: (4) within 100 feet of any source of drinking water, such as a well, spring or other groundwater source of drinking water.*

Ash will not be placed within 100 feet of a water supply well, or within 100 feet of Hycro Lake which supplies drinking water to the Roxboro Plant.

Mr. Edward F. Mussler, III  
Gypsum Storage Pad  
August 2006

*.1704(a) Coal combustion by-products used as structural fill shall not be placed: (5) within an area subject to a one hundred year flood, unless it can be demonstrated to the Division that the facility will be protected from inundation and washout, and the flow of water is not restricted and the storage volume of the flood plain will not be significantly reduced.*

Ash will not be placed within the 100 year flood plain.

*.1704(a) Coal combustion by-products used as structural fill shall not be placed: (6) within 25 feet of any property boundary.*

Ash will not be placed within 25 feet of a property boundary.

*.1704(a) Coal combustion by-products used as structural fill shall not be placed: (7) within 25 feet of a bedrock outcrop.*

Ash will not be placed within 25 feet of an outcrop. A few areas of the storage pad will require cuts and no ash will be used as fill in these areas. If bedrock is encountered in the areas where cuts are completed, no ash will be placed within 25 feet of the discovered bedrock.

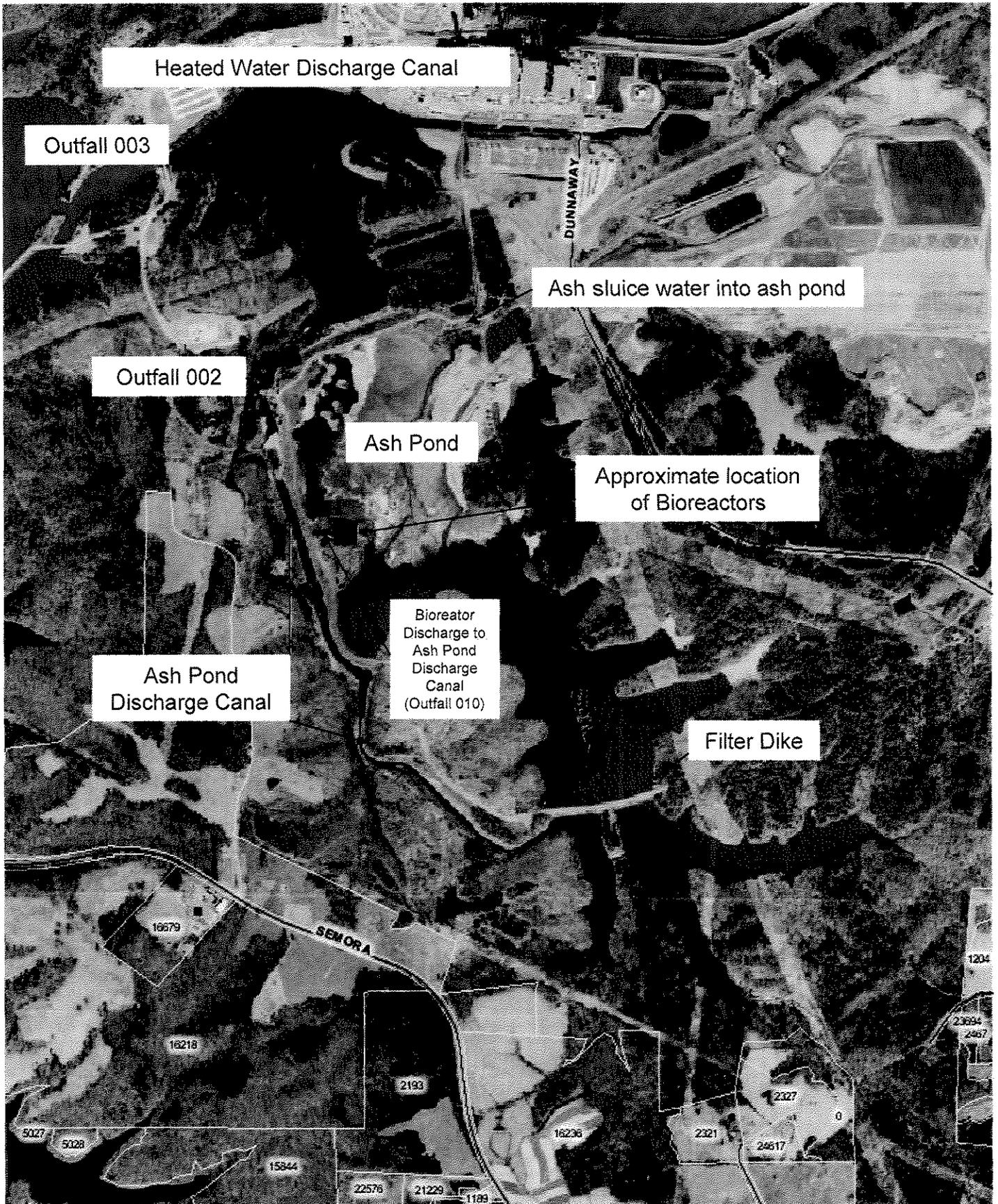
#### *Gypsum Storage Pad Liner*

The liner will consist of a geosynthetic clay liner (GCL) with a plastic laminated geomembrane. The GCL will be overlapped a minimum of six inches. The GCL will be placed laminate side up directly over a six inch layer of fly ash. The GCL will be covered by a six inch layer of fly ash, 12 inches of fill soil and then covered by six inches of topsoil. The topsoil will be seeded, fertilized and mulched. See Attachment 6 for more detail on the liner. The Company believes this liner system will adequately address the Division's concerns for recovered material as identified in your November 20, 2002 letter (also in Attachment 6).

Ground breaking for the wall board plant will begin in October 2006 with the plant scheduled to come on-line in October 2007. The wall board plant will consume 600,000 tons of gypsum per year with the capability to consume 730,000 tons if there is sufficient demand. The gypsum storage pad is capable to store 300,000 tons of gypsum. Once the pad is full, additional gypsum will be diverted to the on-site landfill for disposal. The table below provides the expected gypsum generation by unit for Roxboro Plant and the Mayo Plant through 2010. If Roxboro Plant can not generate enough gypsum to supply the wall board plant, gypsum from Mayo Plant will be transported to the storage pad. If Roxboro Plant can sufficiently supply the wall board plant, Mayo gypsum will go elsewhere. The generation figures in the table below are based upon the April 2006 Generation and Fuel Forecast (GFF).

**ATTACHMENT 1**

Stormwater Figure for NPDES Permit No. NC 0003425

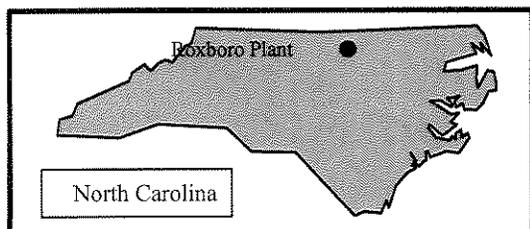


Outfall 002 is the ash pond discharge to the heated water discharge canal (internal outfall)  
Outfall 003 is the heated water discharge canal discharge to Hyco Lake



**ATTACHMENT 2**

Olive Hill, NC Quadrangle Map



N

Attachment 2 Olive Hill, NC Quadrangle  
 Scale Approximately 1:24 000

Carolina Power & Light Company  
 d/b/a Progress Energy Carolinas, Inc.  
 Roxboro Plant  
 Semora, NC

**ATTACHMENT 3**

TCLP Results

Progress Energy Laboratory Report

Sample No. 05-4533

Steven Conner

Date Sampled: 9/13/05

Date Received: 9/19/05

Date Completed: 10/10/05

ROXBORO

PH: 8-754-6292

  
Lab Supervisor or Designee

ROX REGULATORY  
ROXBORO PLANT FLYASH

SEE ATTACHED TRITEST REPORT.

Location:

Station:

Sample Analysis Results

Test Name	Results	Analyst
Arsenic, TCLP	COMMENT mg/l	TRIT
Barium, TCLP	COMMENT mg/l	TRIT
Cadmium, TCLP	COMMENT mg/l	TRIT
Chromium, TCLP	COMMENT mg/l	TRIT
Lead, TCLP	COMMENT mg/l	TRIT
Mercury, TCLP	COMMENT mg/l	TRIT
Selenium, TCLP	COMMENT mg/l	TRIT
Silver, TCLP	COMMENT mg/l	TRIT

# TRITEST

6701 Conference Drive  
Raleigh, NC 27607

Page 1 of 1

Telephone: (919) 834-4984  
Fax: (919) 834-6497

NC/MW Cert. #: 067  
NC/DW Cert. #: 37731

## Laboratory Report

--- Prepared for ---

Greg Barley  
Progress Energy - HEEC  
P.O. Box 327  
New Hill, NC 27562

Report Date: 10/5/2005  
Date Received: 9/19/2005  
Work Order #: 0509-01068

Project No.: 01  
Project ID: 05-4533 (TCLP METALS)

Cust. Code: CP3305  
Cust. P.O.#: XTA7000050

No.	Sample ID	Date Sampled	Time Sampled	Matrix	Sample Type	Condition
001	05-4533 FLY ASH - ROXBORO	9/13/2005	15:30	OT	Grab	4 +/- 2 deg C

Test Performed	Method	Results	Analyzed		Qualifier
			Date	Time	
Metals TCLP Package			10/3/05	9:29	
TCLP Arsenic	EPA 200.8	<0.5# mg/L	10/3/05	9:29	
TCLP Barium	EPA 200.8	<5.0# mg/L	10/3/05	9:29	
TCLP Cadmium	EPA 200.8	<0.1# mg/L	10/3/05	9:29	
TCLP Chromium	EPA 200.8	<0.2# mg/L	10/3/05	9:29	
TCLP Lead	EPA 200.8	<0.5# mg/L	10/3/05	9:29	
TCLP Selenium	EPA 200.8	<0.8# mg/L	10/3/05	9:29	
TCLP Silver	EPA 200.8	<0.5# mg/L	10/3/05	9:29	
TCLP Mercury Analysis	EPA 245.1	<0.002# mg/L	10/3/05	9:29	
Metals/SVOA TCLP Extraction	EPA 1311	-	10/3/05	9:29	
Metals Digest. of TCLP Ext.	EPA 200.8	-	10/3/05	9:29	

#ANALYZED BY SUMMITENVIRONMENTAL TECHNOLOGIES, INC., AKRON, OHIO.

Reviewed by:



for Tritest, Inc.



January 13, 2006

NCDENR – Division of Waste Management  
Attn: Mr. Edward F. Mussler III  
Permitting Branch Supervisor  
1646 Mail Service Center  
Raleigh, NC 27699-1646

Re: Carolina Power & Light Company d/b/a Progress Energy Carolinas, Inc.  
Roxboro Plant Gypsum Storage Pad  
Coal Combustion By-Products Notification for Structural Fill  
Revised Coal Ash TCLP Test Results

Dear Mr. Mussler:

Attached are the results from the revised TCLP test for a sample of the Roxboro Coal Ash you requested in your acknowledgement letter dated December 16, 2005. This revised TCLP test was completed for the typical eight RCRA metals along with manganese, iron and sulfate. The test was also completed to lower detection limits to compare leachate results to groundwater standards. If you have any questions on the analytical results, please contact me at 919-546-7863.

Sincerely,

A handwritten signature in black ink, appearing to read "John R. Toepfer".

John R. Toepfer, P.E.  
Senior Environmental  
Technical Specialist



6701 Conference Drive  
Raleigh, NC 27607

Page 1 of 1

Telephone: (919) 834-4984  
Fax: (919) 834-6497

NC/WW Cert. #: 067  
NC/DW Cert. #: 37731

Laboratory Report

--- Prepared for ---

Robert Howard  
Progress Energy - Roxboro (WW)  
1700 Dunnaway Road  
Semora, NC 27343

Report Date: 12/29/2005  
Date Received: 12/8/2005  
Work Order #: 0512-00402

Project No.: 01  
Project ID: DRY FLY ASH

Cust. Code: CP6148  
Cust. P.O.#: 5900

No.	Sample ID	Date Sampled	Time Sampled	Matrix	Sample Type	Condition
001	DRY FLY ASH	12/6/2005	8:50	OT	Composite	4 +/- 2 deg C

Test Performed	Method	Results	Analyzed Date Time	Qualifier
Metals TCLP Package			12/20/05 8:41	
TCLP Arsenic	EPA 200.8	<0.050 mg/L	12/20/05 8:41	
TCLP Barium	EPA 200.8	<1.0 mg/L	12/20/05 8:41	
TCLP Cadmium	EPA 200.8	<0.010 mg/L	12/20/05 8:41	
TCLP Chromium	EPA 200.8	0.069 mg/L	12/20/05 8:41	
TCLP Lead	EPA 200.8	<0.050 mg/L	12/20/05 8:41	
TCLP Selenium	EPA 200.8	0.197 mg/L	12/20/05 8:41	
TCLP Silver	EPA 200.8	<0.010 mg/L	12/21/05 16:31	
TCLP Mercury Analysis	EPA 245.1	1.180 ug/L	12/20/05 10:32	
Metals/SVOA TCLP Extraction	EPA 1311	DONE	12/21/05 16:31	
Metals Digest, of TCLP Ext.	EPA 200.8	DONE	12/21/05 16:31	
Manganese	EPA 200.8	0.199 mg/L	12/20/05 8:41	
Iron	EPA 200.8	0.629 mg/L	12/20/05 8:41	
Sulfate	Hach 8051	4200 mg/L	12/28/05 12:00	
Percent Dry Weight	SM 2540B	82.0 %	12/13/05 12:40	

Reviewed by:

*Maryanne Smith*  
for Tritest, Inc.

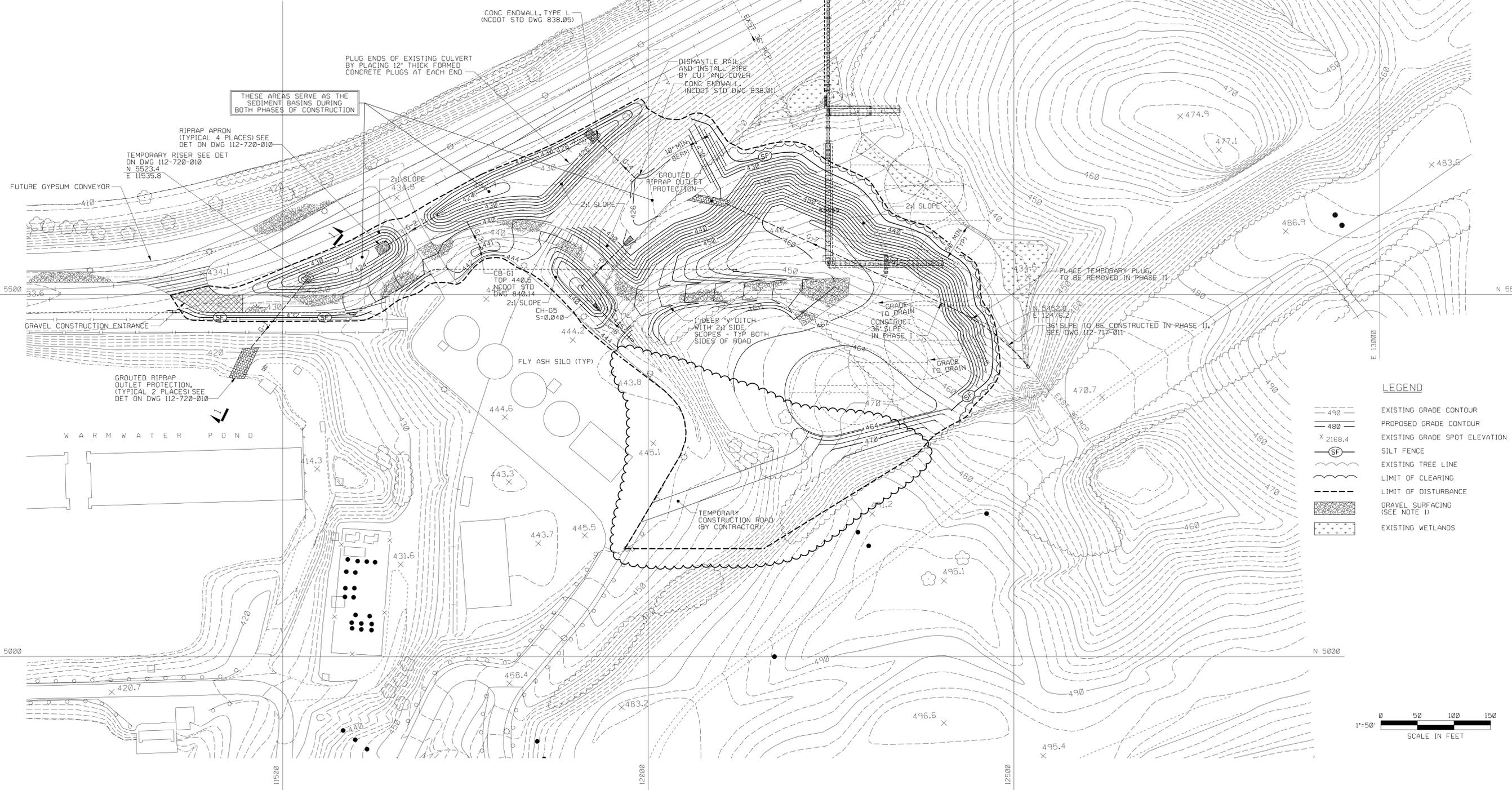
## **ATTACHMENT 4**

### Engineering Plans

ROXO-0-DW-112-717-009, Rev. 1  
ROXO-0-DW-112-717-011, Rev. 6  
ROXO-0-DW-112-717-012, Rev. 0  
ROXO-0-DW-112-717-013, Rev. 3  
ROXO-0-DW-112-720-010, Rev. 3  
ROXO-0-DW-112-720-011, Rev. 2

CULVERT	SIZE	UPSTREAM NODE		DOWNSTREAM NODE			LENGTH	SLOPE FT/FT	MATERIAL	
		COORDINATE		INVERT IN	COORDINATE					INVERT OUT
		NORTH	EAST		NORTH	EAST				
G-1	48"	5519.3	11532.5	422.00	5426.3	11456.7	421.27	120'	0.0061	SLPE
G-2	48"	5610.3	11712.5	423.25	5568.9	11644.1	422.66	80'	0.0074	SLPE
G-3	12"	5563.6	11771.3	437.00	5600.9	11752.0	436.00	42'	0.0238	SLPE
G-4	48"	5660.0	11983.0	425.53	5714.5	11930.0	424.93	76'	0.0079	RCP
G-5	15"	5510.6	11908.4	433.00	5570.3	11968.9	428.00	85'	0.0588	SLPE
G-6	15"	5438.6	11976.5	438.00	5480.2	11931.9	434.50	61'	0.0574	SLPE
* G-7	36"	±5400.8	±12519.2	439.67	5626.6	12105.2	434.92	475' **	0.0100	SLPE

SLPE = SMOOTH LINED POLYETHYLENE  
RCP = REINFORCED CONCRETE PIPE  
\* CONNECT TO EXST 36" RCP IN PHASE II, SEE DETAIL "A" ON DWG 112-720-010. PIPE HAS RADIUS, SEE PLAN FOR LOCATION  
\*\* TOTAL LENGTH FOR PHASES I AND II



NOTES:  
1. FOR GRAVEL SURFACING LIMITS SEE DRAWING ROXO-0-DW-113-717-003.  
2. SEE DRAWING 112-717-013 FOR FLY ASH PLACEMENT LOCATIONS.

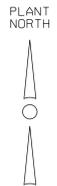
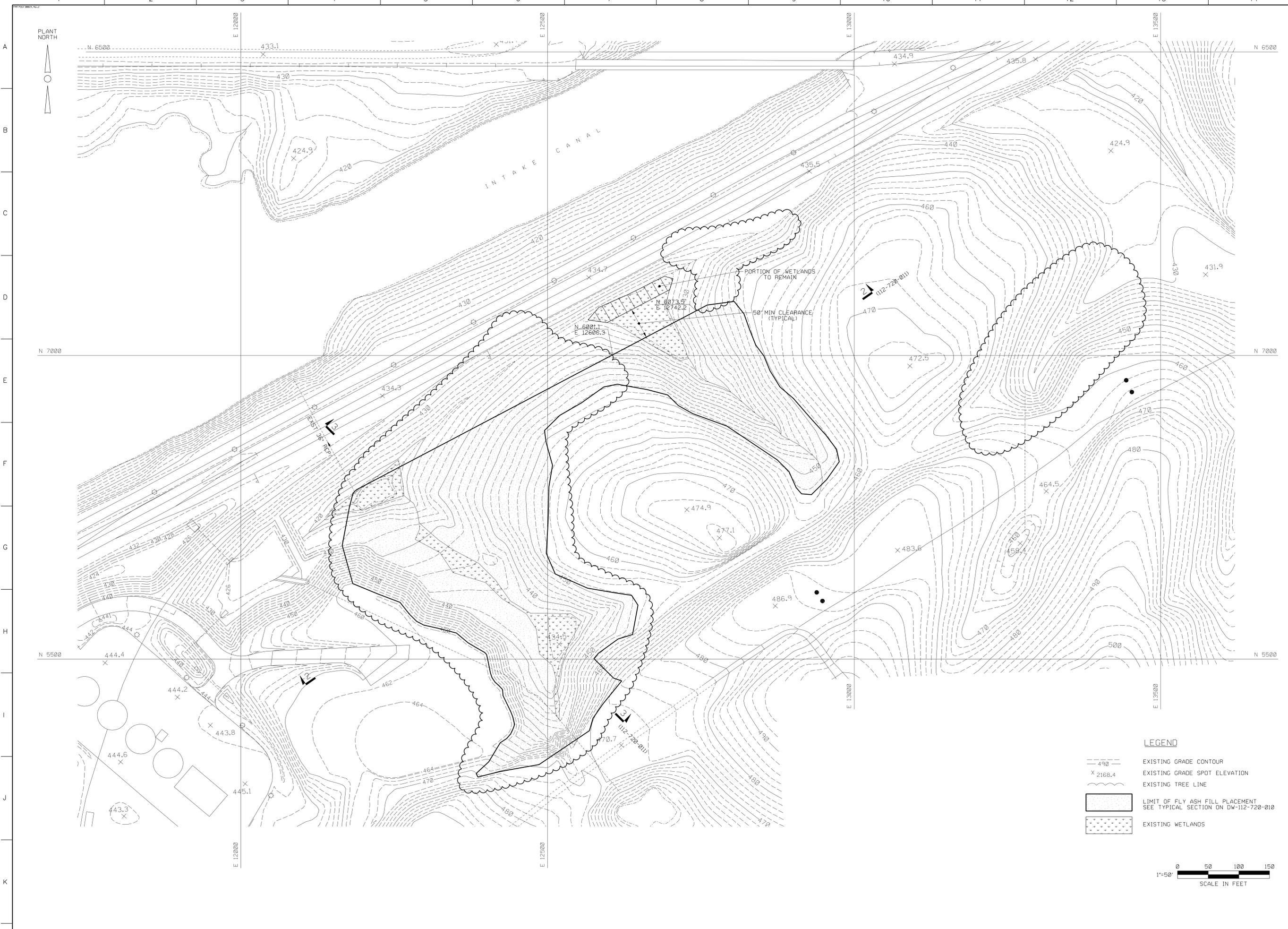
DWG NO.	REV.	TITLE	REV.	DESCRIPTION	DRAWN	CHKD	APPROV	DATE
DW-113-717-083	0	ROAD LOCATION & SURFACING PLAN						
DW-112-720-010	0	SECTIONS AND DETAILS						
DW-112-717-013	0	FLY ASH PLACEMENT - PLAN						
DW-112-717-011	0	PHASE II GRADING/E&S PLAN	1	REV LIMIT OF DISTURBANCE (1-7) FOR TEMP RD	KJF	JAW	JAW	04/29/05
	0		0	ISSUED FOR CONSTRUCTION	GJL	ALM	JAW	02/17/05

CONTRACTOR/VENDOR INFORMATION  
**PARSONS E&C**  
2675 MORGANTOWN ROAD  
READING, PA 19607  
610-855-2000

PROGRESS ENERGY CAROLINAS, INC.  
POWER OPERATIONS GROUP

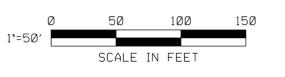
PROJECT NO. ROX 000 5743  
EC NO. 20037154 54227 N/A  
SCALE 1"=50'  
SHEET 1 OF 1  
DATE 02/17/05  
PROJECT 112-717-001  
SHEET NO. 001  
DWG NO. ROXO-0-DW-112-717-009  
REV. 1

PE&C-DWG-112-717-009-05



**LEGEND**

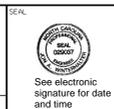
	EXISTING GRADE CONTOUR
	EXISTING GRADE SPOT ELEVATION
	EXISTING TREE LINE
	LIMIT OF FLY ASH FILL PLACEMENT SEE TYPICAL SECTION ON DW-112-720-010
	EXISTING WETLANDS



**NOTES:**  
1. WORK THIS DRAWING WITH PHASE II GRADING PLAN.

DRAWING REFERENCES		DRAWING REVISIONS	
DWG NO.	REV.	REV.	DESCRIPTION
DW-112-720-011	1	3	REVISED LIMITS OF FLYASH PLACEMENT
DW-112-720-010	3	2	ADDED SECT MARKS 2-2, 3-3 & REF TO 720-011
DW-112-717-011	6	1	REVISED LIMIT OF FLYASH PLACEMENT (D7)
		0	ISSUED FOR CONSTRUCTION

**CONTRACTOR/VENDOR INFORMATION**  
**PARSONS E&C**  
2675 MORGANTOWN ROAD  
READING, PA 19607  
610-855-2000



<b>PROGRESS ENERGY CAROLINAS, INC.</b>		
<b>POWER OPERATIONS GROUP</b>		
FACILITY NO.	UNITS	STREETS
20037154	000	7043
EC NO.	NO. OF	
54227	N/A	
SCALE:	PROJECT:	
ANSI-E	1"=50'	

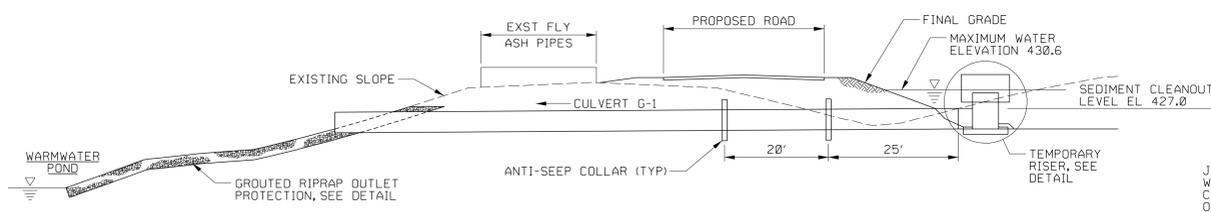
**Progress Energy**

TITLE: **FGD PROJECT  
GYPSUM STORAGE AREA  
FLY ASH PLACEMENT - PLAN**

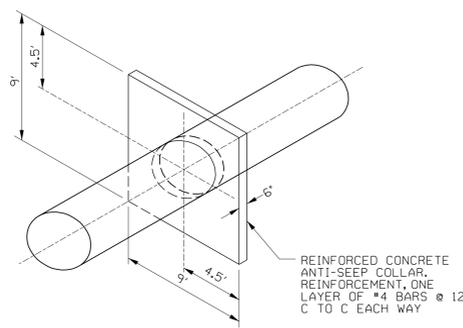
DWG NO: **ROX0-0-DW-112-717-013**

SHEET OF: **001**

DWG-FILE: rpx-co-0-dw-112-717-013.dwg 08/17  
DWG-DAT: 23-Mar-06 08:47

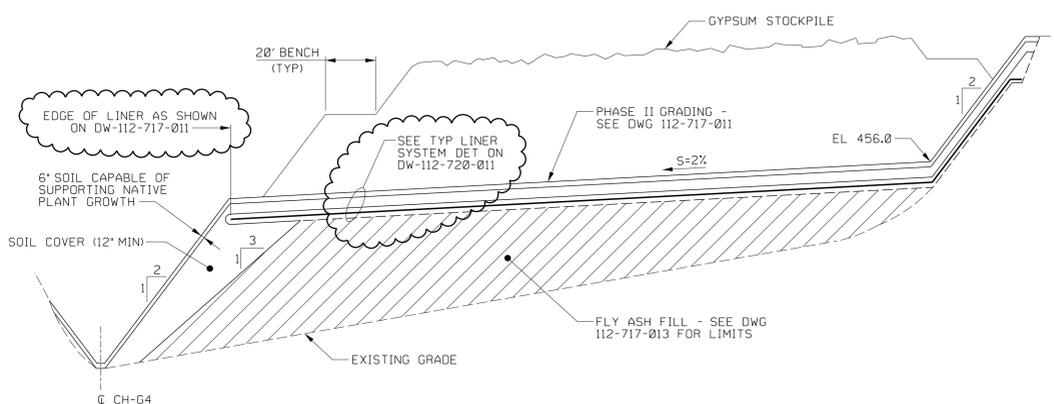


SECTION 1-1  
PROFILE ALONG SEDIMENT BASIN OUTLET PIPE  
(112-717-009)



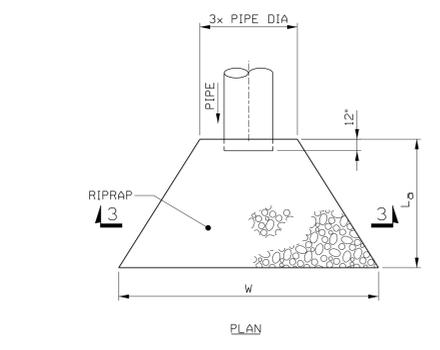
CONCRETE ANTI-SEEP COLLAR

NOTE:  
JOINT TO BE CAULKED WITH BITUMINOUS MASTIC AT TIME OF INSTALLATION.



- NOTES:
- EARTHWORK SHALL BE DONE IN ACCORDANCE WITH DOCUMENT PGNC-0-TS-02200, "EARTHWORK".
  - FLY ASH SHALL BE PLACED WITH A MAXIMUM SLOPE OF 3:1.
  - FLY ASH SHALL BE COVERED WITH A MINIMUM OF 12" OF SOIL AND 6" OF "SOIL CAPABLE OF SUPPORTING NATIVE PLANT GROWTH".

TYPICAL SECTION - FLY ASH FILL PLACEMENT  
(112-717-013)

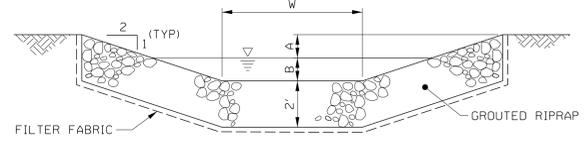


RIPRAP APRON DETAIL  
(112-717-009 & 011)

RIPRAP APRON SCHEDULE				
OUTFALL	W	L <sub>a</sub>	D	STONE SIZE d50
G2	12'	18'	9"	4'
* G4	12'	18'	9"	4'
G5	6.5'	13'	18"	8"
G6	5.3'	10'	18"	8"

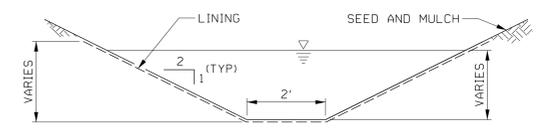
\* SEE PLAN FOR ORIENTATION

RIPRAP OUTLET PROTECTION SCHEDULE				
OUTFALL	W	A	B	STONE SIZE d50
G1	12'	1'	.75'	10'
G7	6'	.85'	1.15'	10'

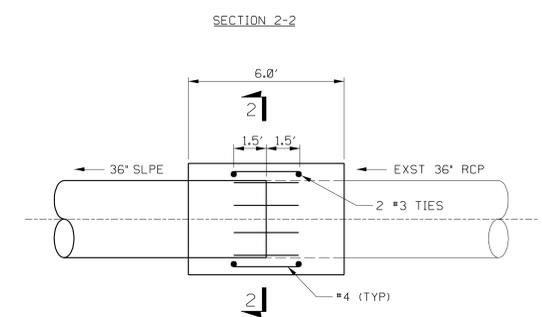


GROUTED RIPRAP OUTLET PROTECTION DETAIL  
(112-717-009)

VEGETATED CHANNEL SCHEDULE		
CHANNEL	PERMANENT LINING	TEMPORARY LINING
CH-G4	TALL FESCUE	STRAW WITH NET
CH-G5	TALL FESCUE	STRAW WITH NET



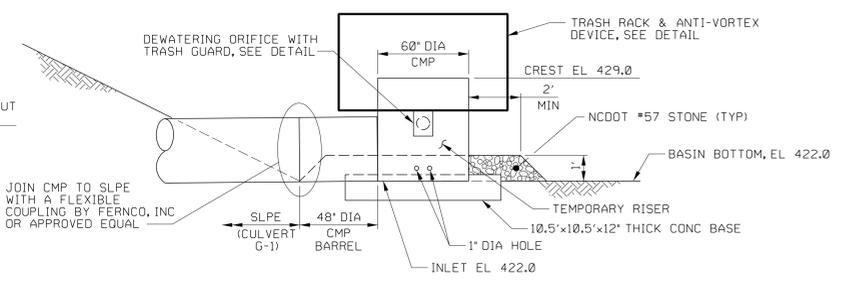
VEGETATED CHANNEL DETAIL  
(112-717-009 & 112-717-011)



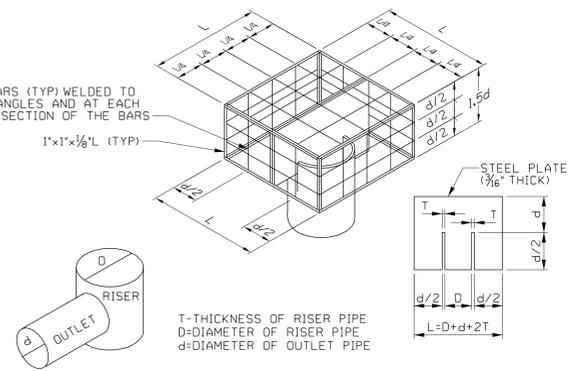
SECTION 2-2

- NOTES:
- TRIM RCP AS NECESSARY TO ENSURE CONTINUOUS CONTACT WITH SLPE.
  - CLEAN EXTERIOR OF PIPE TO ENSURE GOOD CONTACT BETWEEN PIPE AND CONCRETE.
  - CONCRETE SHALL HAVE MINIMUM STRENGTH OF 4000 PSI.
  - WORKMANSHIP SHALL BE IN ACCORDANCE WITH NC DOT STANDARD SPECIFICATIONS FOR ROAD AND STRUCTURES.
  - REBAR SHALL BE PLACED WITH A MINIMUM OF 3" COVER ON ALL SIDES.

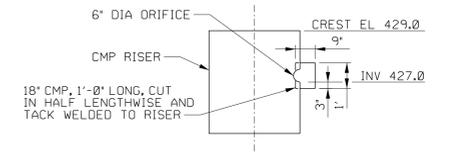
DETAIL "A"  
SLPE/RCP INTERFACE  
(112-717-011)



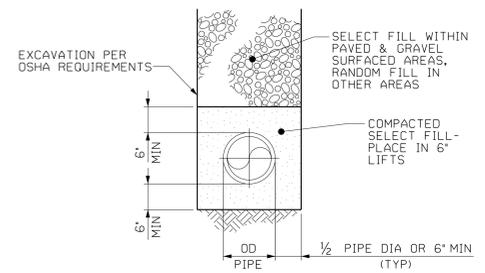
SEDIMENT BASIN TEMPORARY RISER



TRASH RACK AND ANTI-VORTEX DEVICE



DEWATERING ORIFICE WITH TRASH GUARD



STORM DRAIN PIPE TRENCH DETAIL

NOTES:

DWG NO.	REV.	TITLE
DW-112-720-011	1	SECTIONS & DETAILS
DW-112-717-013	3	FLY ASH PLACEMENT - PLAN
DW-112-717-011	6	PHASE II GRADING/E&S PLAN
DW-112-717-009	1	PHASE I GRADING/E&S PLAN

REV.	DESCRIPTION	DRAWN	CHKD	APPROV	DATE
3	RMD G8 FROM RIPRAP DET; REV FLY ASH SECT	K,J,F	V,J,B	JAW	03/23/06
2	ADDED G8 TO RIPRAP APRON DETAIL	K,J,F	ALM	JAW	12/05/05
1	REVISED TYP SECT - FLY ASH PLACEMENT	K,J,F	ALM	JAW	10/19/05
0	ISSUED FOR CONSTRUCTION	J,K,F	ALM	JAW	02/17/05

CONTRACTOR/VENDOR INFORMATION

**PARSONS E&C**  
2675 MORGANTOWN ROAD  
READING, PA 19607  
610-855-2000

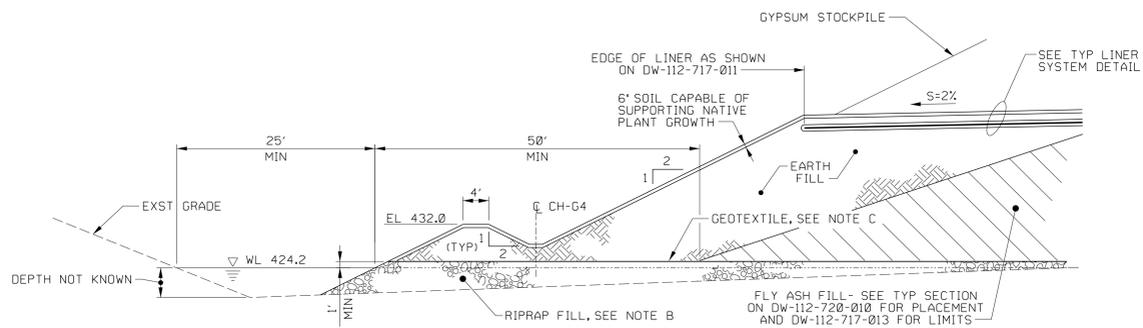
PROGRESS ENERGY CAROLINAS, INC.  
POWER OPERATIONS GROUP

PROJECT NO.	UNITS	SHEET
20037154	000	7043
EC NO.	REV.	DATE
54227	N/A	
SCALE	FRAC.	
ANSI-E	1"=50'	

**Progress Energy**

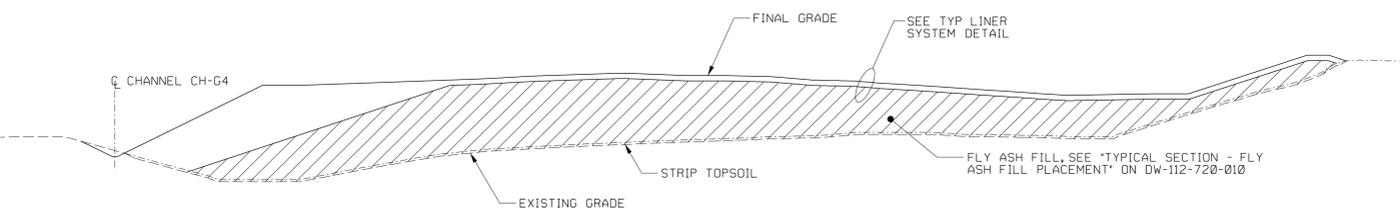
FGD PROJECT  
GYPSUM STORAGE AREA  
SECTIONS & DETAILS

001 OF 001

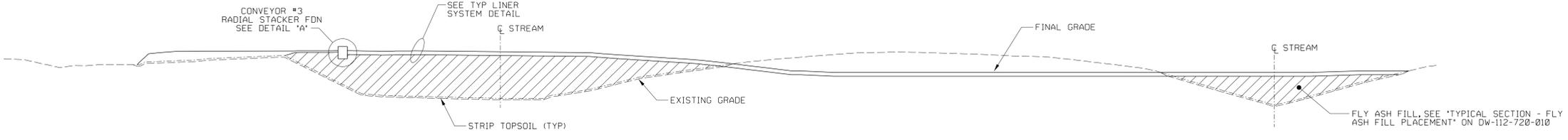


NOTES:  
 A. EARTHWORK SHALL BE DONE IN ACCORDANCE WITH DOCUMENT PGNC-0-TS-02200, 'EARTHWORK'.  
 B. RIPRAP SHALL BE CLASS A, B OR 1 PER SECTION 1042 OF NCDOT STANDARD SPECIFICATIONS.  
 C. GEOTEXTILE SHALL BE TYPE 2 PER SECTION 1056 OF NCDOT STANDARD SPECIFICATIONS.

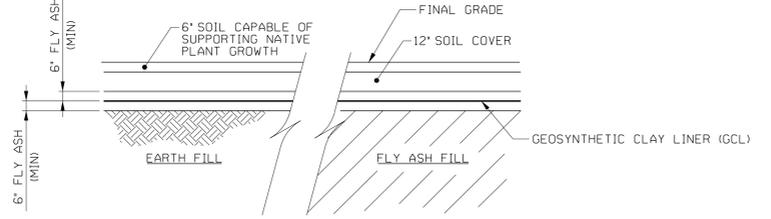
SECTION 1-1  
(112-717-011)



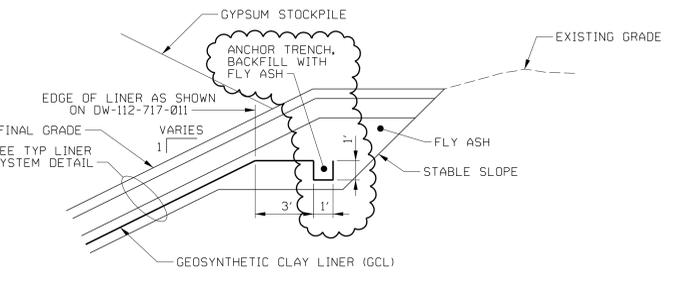
SECTION 3-3  
(112-717-011 & 112-717-013)



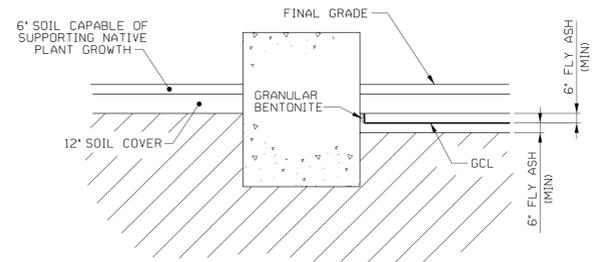
SECTION 2-2  
(112-717-011 & 112-717-013)



TYPICAL LINER SYSTEM DETAIL



TYPICAL LINER TERMINATION  
DETAIL ON SIDE SLOPES 3:1 OR GREATER



DETAIL "A"

NOTES:  
 1. SEE DRAWING 112-717-013 FOR FLY ASH PLACEMENT LOCATIONS.

DRAWING REFERENCES		DRAWING REVISIONS	
DWG NO.	REV.	REV.	DESCRIPTION
DW-112-720-010	3	2	REVISED TYPICAL LINER TERMINATION DETAIL
DW-112-717-013	3	1	REMOVED MH-GI DET; ADDED LINER DETAILS
DW-112-717-011	6	0	ISSUED FOR CONSTRUCTION

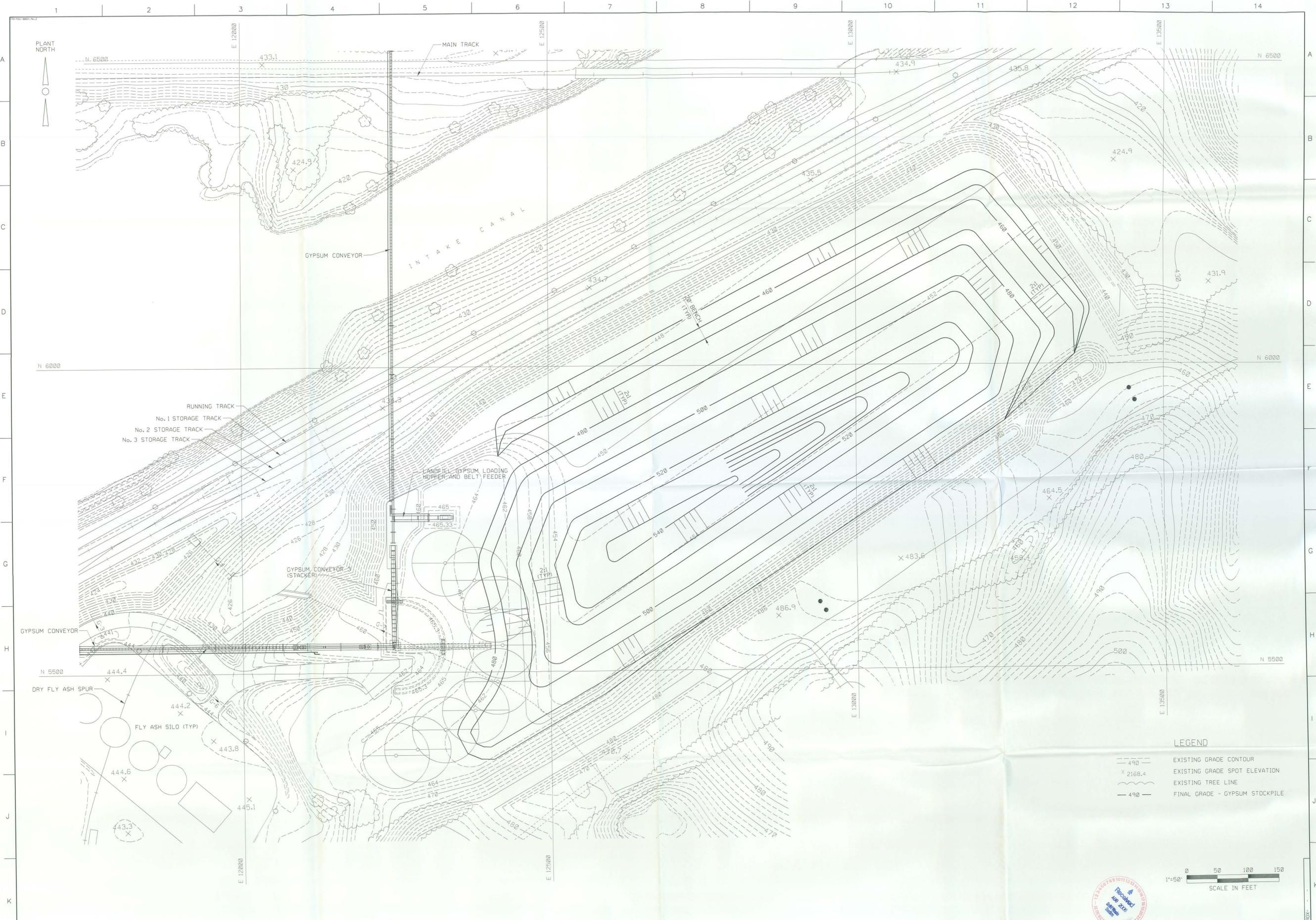
CONTRACTOR/VENDOR INFORMATION  
**PARSONS E&C**  
 2675 MORGANTOWN ROAD  
 READING, PA 19607  
 610-855-2000

PROGRESS ENERGY CAROLINAS, INC.  
 POWER OPERATIONS GROUP  
 PROJECT NO: 20037154  
 EC NO: 54227  
 SHEET: ANSI-E

UNIT: 000  
 STATION: 7043  
 DATE: N/A  
 SCALE: 1"=30'

**Progress Energy**  
 FGD PROJECT  
 GYPSUM STORAGE AREA  
 SECTIONS & DETAILS  
 DWG NO: R0X0-0-DW-112-720-011  
 SHEET: 001 OF 001

DWG-DATE: 08-May-06



- LEGEND**
- 490 — EXISTING GRADE CONTOUR
  - X 2168.4 EXISTING GRADE SPOT ELEVATION
  - - - - - EXISTING TREE LINE
  - 490 — FINAL GRADE - GYPSUM STOCKPILE



NOTES:

DWG NO.	REV.	TITLE
DW-112-728-010	0	SECTIONS AND DETAILS
DW-112-717-011	0	PHASE III GRADING/E&S PLAN
DW-112-717-009	0	PHASE I GRADING/E&S PLAN

REV.	DESCRIPTION	DATE	BY	CHKD	APPROV
0	ISSUED FOR CONSTRUCTION	02/17/05	JKF	ALM	JAW

CONTRACTOR/VENDOR INFORMATION  
**PARSONS E&C**  
 2675 MORGANTOWN ROAD  
 READING, PA 19607  
 610-855-2000

PROFESSIONAL ENGINEER SEAL  
 See electronic signature for date and time

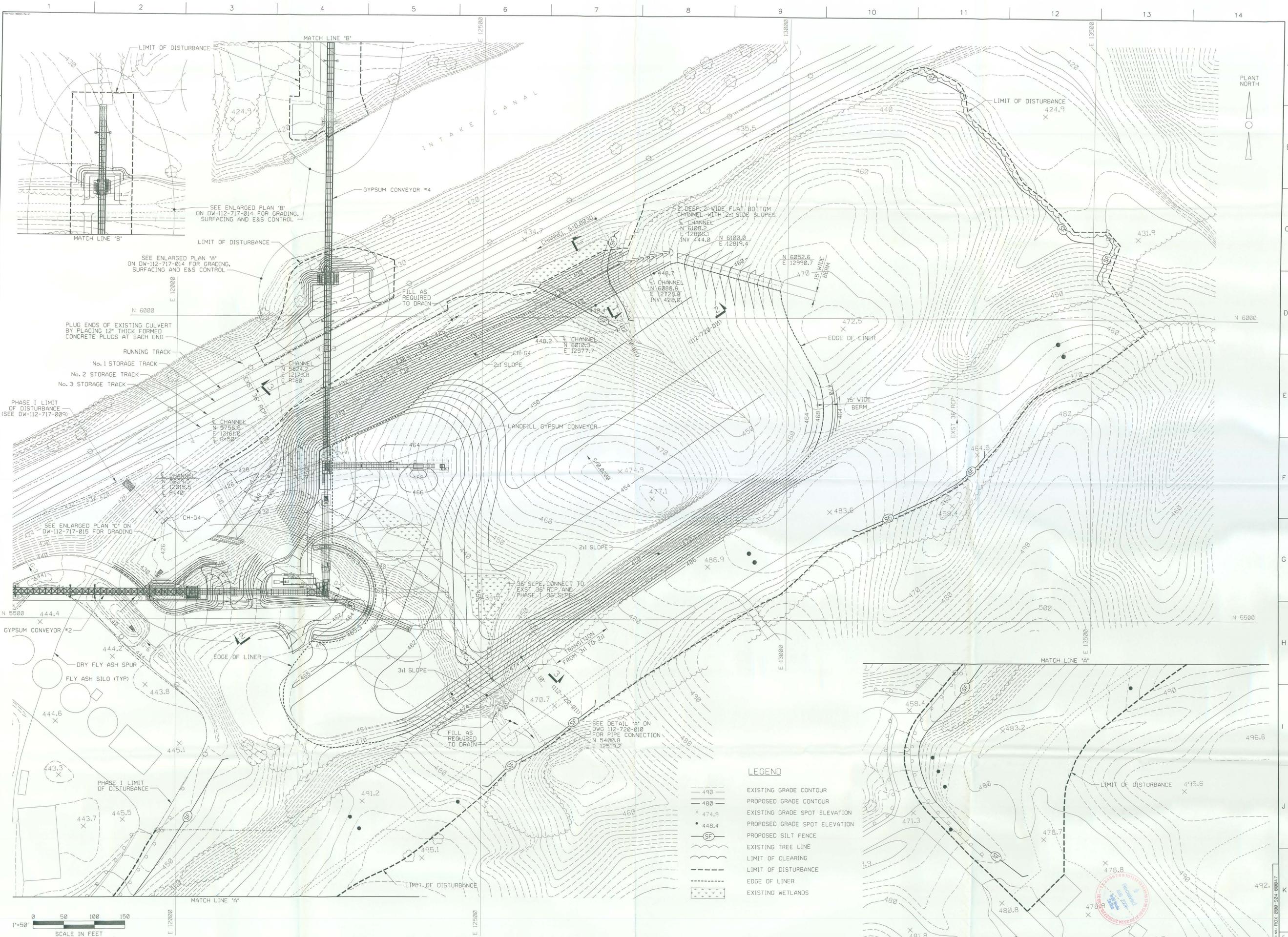
PROGRESS ENERGY CAROLINAS, INC.		
POWER OPERATIONS GROUP		
FACILITY: ROX	UNIT: 000	SYSTEM: 7043
PROJECT NO: 20037154	ECL NO: 54227	REVISION: N/A
SIZE: ANSI-E	SCALE: 1"=50'	PLT: 1"=50'

**Progress Energy**

FGD PROJECT  
 GYPSUM STORAGE AREA  
 GYPSUM STOCKPILE - PLAN

PROJ NO: ROX-0-DW-112-717-012  
 DWG NO: 001

PE&C-FILE:proj-04-112-717-012.dwg  
 PE&C-DATE:17-Feb-05



**LEGEND**

- 490 — EXISTING GRADE CONTOUR
- 480 — PROPOSED GRADE CONTOUR
- × 474.9 EXISTING GRADE SPOT ELEVATION
- 448.4 PROPOSED GRADE SPOT ELEVATION
- SF — PROPOSED SILT FENCE
- — — EXISTING TREE LINE
- — — LIMIT OF CLEARING
- — — LIMIT OF DISTURBANCE
- — — EDGE OF LINER
- — — EXISTING WETLANDS

**NOTES:**  
 1. SEE DRAWING 112-717-013 FOR FLY ASH PLACEMENT LOCATIONS.

DWG. NO.	REV.	TITLE
DW-112-717-015	0	ENLARGED PLAN "C"
DW-112-717-014	0	ENLARGED PLAN "A" & "B"
DW-112-720-011	1	SECTIONS & DETAILS
DW-112-720-010	3	SECTIONS & DETAILS
DW-112-717-013	3	FLY ASH PLACEMENT - PLAN
DW-112-717-009	1	PHASE I GRADING/E&S PLAN

NO.	DESCRIPTION	BY	CHKD	APPROV	DATE
6	REMOVED HOLD; REDUCED SIZE OF STORAGE	KJF	VJB	JAW	03/23/06
5	ADDED REF TO 112-717-015	KJF	ALM	JAW	03/08/06
4	ADDED MATCH LINE "B" & REF TO 112-717-014	KJF	ALM	JAW	01/06/06
3	REV GRADING AND LOD, ADDED SILT FENCE	KJF	ALM	JAW	12/05/05
2	ADDED SECT MARKS 2-2, 3-3 & REF TO 720-011	KJF	ALM	JAW	10/19/05
1	REV GRADING (07); ADDED SECT 1-1 & HOLD LIST	KJF	ALM	JAW	08/31/05
0	ISSUED FOR CONSTRUCTION	GJU	ALM	JAW	02/17/05

**CONTRACTOR/VENDOR INFORMATION**

**PARSONS E&C**  
 2875 MORGANTOWN ROAD  
 READING, PA 19607  
 610-855-2000

SEAL: See electronic signature for date and time.

**PROGRESS ENERGY CAROLINAS, INC.**

**POWER OPERATIONS GROUP**

PROJECT NO: 20037154  
 DE NO: 54227  
 SCALE: 1"=50'

**Progress Energy**

FGD PROJECT  
 GYPSUM STORAGE AREA  
 PHASE II GRADING/E&S PLAN

001 ROX0-0-DW-112-717-011 6

DWG-FILE: c:\p03\2003\504\12-717-011.dwg  
 DWG-DAT: 23-Mar-06 08:38

**ATTACHMENT 5**

Soil Boring Logs





3301 Atlantic Avenue  
Raleigh, NC 27604

GEOTECHNICAL BORING LOG  
SHEET 1 OF 1

SEE ATTACHED CORE BORING REPORT FOR CORING DETAILS

MACTEC PROJECT NO. 6468-03-0304.10		PROJECT ID: Roxboro		COUNTY Person		GEOLOGIST S. Clark								
PROJECT NAME Roxboro FGD							WATER LEVEL (ft)							
BORING NO. G-5							0 HR.							
GROUND ELEV. 435.1 ft (NAVD 88)		NORTHING 5,911.46 (PLANT GRID)		EASTING 12,243.83 (PLANT GRID)		24 HR.								
TOTAL DEPTH 41.0 ft		DRILL MACHINE D-50		DRILL METHOD Wash		HAMMER TYPE 140-lb. Man								
DATE STARTED 3/4/04		COMPLETED 3/4/04		SURFACE WATER DEPTH N/A										
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100	
435.1	0.0				Ground							435.1	0.00	
430.1	5.0				Gravel rail road bedding							430.1	5.0	
427.6	7.5	16	11	11	Firm to very firm, moist, brown, SILTY GRAVEL (GP-GM).							425.1	10.0	
425.1	10.0	11	10	9	Firm to very firm, moist, brown, fine sandy SILT (ML) with rock fragments.							406.1	29.0	
422.6	12.5	10	9	13	Residual - Hard, moist, tan green and brown, fine sandy SILT (ML) with rock fragments.							401.6	33.5	
420.1	15.0	17	13	19	PWR- Sampled as very dense damp tan brown silty fine SAND (SM).							397.1	38.0	
420.1	15.0	15	14	15	Hard Rock: Dark gray and white, slightly weathered, moderately to slightly fractured, hard, biotite hornblende GNEISS							394.1	41.0	
417.6	17.5	15	12	16	Fractures: 15° to 45° Fracture Spacing: 0.1 to 0.8 ft Boring and coring terminated at 41.0 ft in Hard Rock: GNEISS									
415.1	20.0	9	10	15										
411.6	23.5	12	15	18										
406.6	28.5	6	9	30										
401.6	33.5	50/0.3												
360.3	74.8													

CP&L ROXBORO 6468-03-0304.GPJ NC DOT.GDT 4/16/04







MACTEC PROJECT NO. 6468-03-0304.10			PROJECT ID: Roxboro			COUNTY Person			GEOLOGIST S. Clark			
PROJECT NAME Roxboro FGD								WATER LEVEL (ft)				
BORING NO. G-9								0 HR. 32.0				
GROUND ELEV. 432.6 ft (NAVD 88)			NORTHING 5,574.15 (PLANT GRID)			EASTING 11,325.09 (PLANT GRID)			24 HR.			
TOTAL DEPTH 50.1 ft			DRILL MACHINE CME-550			DRILL METHOD HSA-2.25" I.D./Core			HAMMER TYPE 140-lb. Man			
DATE STARTED 2/17/04			COMPLETED 2/17/04			SURFACE WATER DEPTH N/A						
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80			
432.6	0.0				Ground							432.6 0.00
430.1	2.5				Offset 7' towards center of 2nd fill.							430.1 2.5
427.6	5.0	8	8	11	19							427.6 5.00
425.1	7.5	6	8	12	20							425.1 7.50
422.6	10.0	7	10	10	20							422.6 10.00
420.1	12.5	10	10	10	20							420.1 12.50
417.6	15.0	10	10	16	28							417.6 15.00
415.1	17.5	14	15	16	31							415.1 17.50
412.6	20.0	28	30	39	39							412.6 20.00
407.6	25.0	9	16	20	36							407.6 25.00
402.6	30.0	14	20	13	33							402.6 30.00
397.6	35.0	16	12	16	28							397.6 35.00
392.6	40.0	19	16	19	35							392.6 40.00
387.6	45.0	37	30	59	89							387.6 45.00
382.6	50.0	50/1										382.6 50.00
357.8	74.8	50/1										357.8 74.80

CP&L ROXBORO 6468-03-0304.GPJ NC DOT.GDT 4/16/04



3301 Atlantic Avenue  
Raleigh, NC 27604

GEOTECHNICAL BORING LOG

SHEET 1 OF 1

MACTEC PROJECT NO. 6468-03-0304.10		PROJECT ID: Roxboro		COUNTY Person		GEOLOGIST S. Clark								
PROJECT NAME Roxboro FGD							WATER LEVEL (ft)							
BORING NO. G-10							0 HR. 33.0							
GROUND ELEV. 438.6 ft (NAVD 88)		NORTHING 5,530.40 (PLANT GRID)		EASTING 10,936.60 (PLANT GRID)		24 HR.								
TOTAL DEPTH 51.5 ft		DRILL MACHINE CME-550		DRILL METHOD HSA-2.25" I.D./Core		HAMMER TYPE 140-lb. Man								
DATE STARTED 2/17/04		COMPLETED 2/17/04		SURFACE WATER DEPTH N/A										
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100	
438.6	0.0				Ground							438.6 0.00		
436.1	2.5												436.1 2.5	Fill- Hard, moist, brown slightly fine sandy SILT (ML).
433.6	5.0	8	9	13									433.6 5.0	Fill- Hard, moist, brown slightly fine sandy SILT (ML) with rock fragments.
431.1	7.5	7	10	14									431.1 7.5	Fill- Dense, moist, brown silty, fine to coarse SAND (SM).
428.6	10.0	15	16	15									428.6 10.0	
426.1	12.5	13	14	14									426.1 12.5	Fill- Hard, moist, brown, fine sandy SILT (ML).
423.6	15.0	18	14	23									423.6 15.0	Fill- Very dense, moist, gray, brown silty fine to coarse SAND (SM) with rock fragments.
421.1	17.5	15	23	19									421.1 17.5	
418.6	20.0	34	39	36									418.6 20.0	Fill- Dense, moist, brown and tan, silty fine to coarse SAND (SM).
413.6	25.0	15	13	25									413.6 25.0	Fill- Dense, moist, brown and tan, silty fine to coarse SAND (SM) with rock fragments.
408.6	30.0	25	24	28									408.6 30.0	
403.6	35.0	13	19	21									403.6 35.0	PWR: Gneiss; Sampled as very stiff, moist, tan-brown, fine sandy SILT (ML)
398.6	40.0	50/0,4											398.6 40.0	Residual- Stiff to very stiff, moist, tan-brown, fine sandy SILT (ML). Hard drilling noted by driller between 33 and 38 ft (likely PWR). Hard drilling noted by driller at 47 ft.
393.6	45.0	6	6	7									393.6 45.0	
388.6	50.0	4	5	5									388.6 50.0	
387.1	51.5	7	10	11									387.1 51.5	Boring terminated at 51.5 ft
363.8	74.8													

CP&I ROXBORO 6468-03-0304.GPJ NC\_DOT.GDT 4/16/04

ELEV. (ft)		DEPTH (ft)			BLOW COUNT					BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100								
488.1		0.0			Ground											488.1	0.00	
485.6		2.5			4	5	6									485.6	2.5	Fill- Moist, brown, very silty fine to coarse SAND (SM) with rock fragments and organic traces.
483.1		5.0			8	5	6									480.6	7.5	
480.6		7.5			6	9	10									477.1	11.0	PWR: Gneiss; Sampled as hard, dry, brown, yellow fine sandy SILT (ML).
478.1		10.0			15	20	50/0.4									472.1	16.0	
475.6		12.5			19	20	45									470.6	17.5	PWR: Gneiss; Sampled as dense, dry tan, brown silty fine SAND (SM).
473.1		15.0			30	50/0.3									468.1	20.0		
470.6		17.5			50/0.4													Auger refusal at 22.0 ft
468.1		20.0			50/0.4													
413.3		74.8																Boring terminated at 22.0 ft

CP&L ROXBORO 6468-03-0304.GPJ NC DOT.GDT 4/16/04

MACTEC PROJECT NO. 6468-03-0304.10		PROJECT ID: Roxboro		COUNTY Person		GEOLOGIST S. Clark											
PROJECT NAME Roxboro FGD							WATER LEVEL (ft)										
BORING NO. G-12							0 HR.										
GROUND ELEV. 476.4 ft (NAVD 88)		NORTHING 5,800.17 (PLANT GRID)		EASTING 13,150.25 (PLANT GRID)			24 HR.										
TOTAL DEPTH 25.3 ft		DRILL MACHINE CME-550		DRILL METHOD HSA-2.25" I.D./Core		HAMMER TYPE 140-lb. Man											
DATE STARTED 2/20/04		COMPLETED 2/20/04		SURFACE WATER DEPTH N/A													
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION					
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100				
476.4	0.0				Ground							476.4	0.00				
473.9	2.5	8	9	12								473.9	2.5	Top soil, rootmat moist to wet, slightly fine sandy CLAY (CL). Moist silty fine SAND (SM).			
471.4	5.0	11	11	19								468.9	7.5	PWR: Gneiss; Sampled as very dense, dry, brown, sandy SILT (ML) with rock fragments			
468.9	7.5											466.4	10.0	PWR: Gneiss; Sampled as very dense, dry, brown, slightly clayey, fine sandy SILT (ML) with rock fragments			
466.4	10.0											463.9	12.5				
463.9	12.5											481.4	15.0				
481.4	15.0											458.9	17.5				
458.9	17.5											456.4	20.0				
456.4	20.0											451.4	25.0				
451.4	25.0														451.1	25.3	Boring terminated at 25.3 ft
401.6	74.8																

CP&L ROXBORO 6468-03-0304.GPJ NC DOT GDT 4/16/04

SEE ATTACHED CORE BORING REPORT FOR CORING DETAILS

MACTEC PROJECT NO. 6468-03-0304.15		PROJECT ID: Roxboro		COUNTY Person		GEOLOGIST N/A							
PROJECT NAME Roxboro FGD							WATER LEVEL (ft)						
BORING NO. G-13							0 HR. dry						
GROUND ELEV. 426.8 ft (NAVD 88)		NORTHING 6,004.30 (PLANT GRID)		EASTING 12,498.90 (PLANT GRID)		24 HR. 15.6							
TOTAL DEPTH 19.5 ft		DRILL MACHINE Mobile D-50		DRILL METHOD HSA-2.25"		HAMMER TYPE 140-lb.							
DATE STARTED 11/3/04.		COMPLETED 11/3/04		SURFACE WATER DEPTH N/A									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT				SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
		0.5ft	0.5ft	0.5ft	0	20	40	60				80	100
426.8	0.0				Ground						426.8 0.00		
425.8	1.0	2	4	4						1		425.8 1.00	Topsoil Firm, brown, slightly fine sandy, silty CLAY (CL) moist Very stiff, light orange brown fine sandy SILT (ML) grading to dense silty fine SAND (SM), damp
424.3	2.5	7	11	12						2			
422.3	4.5	20	32	42						3		421.8 5.00	Partially Weathered Rock sampled as gray to light brown very silty, very fine sand, damp.
420.3	6.5	50/4'								4			
417.8	9.0	50/3'								5			
413.1	13.7	60/2'								6			
408.3	18.5	50/1'								7			
396.9	29.9												Boring Terminated at 19.5' on Auger Refusal

CP&L ROXBORO 0104.L OPJ NC DOT.GDT 12/15/04

SEE ATTACHED CORE BORING REPORT FOR CORING DETAILS

MACTEC PROJECT NO. 6468-03-0304.15		PROJECT ID: Roxboro		COUNTY Person		GEOLOGIST: N/A								
PROJECT NAME Roxboro FGD							WATER LEVEL (ft)							
BORING NO. G-14							0 HR.	19.0						
GROUND ELEV. 433.9 ft (NAVD 88)		NORTHING 6,242.20 (PLANT GRID)		EASTING 12,867.40 (PLANT GRID)		24 HR.	15.0							
TOTAL DEPTH 19.0 ft		DRILL MACHINE Mobile D-50		DRILL METHOD HSA-2.25"		HAMMER TYPE 140-lb.								
DATE STARTED 11/4/04		COMPLETED 11/4/04		SURFACE WATER DEPTH N/A										
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80					100
433.9	0.0				Ground								433.9 0.00	
432.9	1.0	2	8	10						1			433.5 0.3	Ditch Sediment Firm, brown, silty SAND (SM) with rootlets, moist
431.4	2.5	40	50/3'							2			431.9 2.0	Partially weathered rock sampled as brown to gray and brown very silty, very fine sand with occasional fragments of biotite hornblende gneiss
430.2	3.7	50/3'								3				
427.9	6.0	50/1'								4				
425.3	8.6	50/3'								5				
420.3	13.6	50/3'								6				
415.4	18.5	50/1'								7			414.9 19.0	Boring Terminated at 19.0' on Auger Refusal
404.0	29.9													

CP&L ROXBORO 0304.1.GPJ NC DOT.GDT 12/15/04

PROJECT: <u>FGD</u>	PROJECT NO. <u>6472-05-1092</u>	S	M	T	W	T	F	S
CLIENT: <u>Fluor</u>	DATE: <u>7-26-06</u>	SUNNY		CLOUDY		RAINY		
		<32	32-40	50s	60s	70s		
		80s	90s	100s	110s	+		

MACTEC REPRESENTATIVE: Mark R. Blechley PAGE 1 OF 1

ARRIVE: \_\_\_\_\_ am/pm DEPART: \_\_\_\_\_ am/pm STANDBY: \_\_\_\_\_ hrs. REASON: \_\_\_\_\_

PERSONNEL / CREW	REG HRS	OT HRS	TOT HR	MILES

ACTIVITIES: As per RFI 0851, a rep. of Mactec observed the excavation of a hole located at N6000/E12750. A truck mounted drill was used to auger a 24" shaft through the fly ash fill and 4' into existing soils. The fly ash depth was measured to a depth of 17'. Soil, consisting of a gray brown clayey silt w/ small roots was augered 4' to -21' of surface. The bottom of the hole was checked and no groundwater was observed. The excavation was refilled.

CLIENT'S REP: J. Brown 7/26/06

This report reflects the views of the author only and is subject to revision after review. Mark R. Blechley

<h2 style="margin:0;">RECORD OF DAILY ACTIVITIES</h2>	<p style="margin:0;"><b>MACTEC</b> Mactec Engineering and Consulting, Inc. 3301 Atlantic Avenue Raleigh, NC 27604</p>
---	---

SEE ATTACHED CORE BORING REPORT FOR CORING DETAILS

MACTEC PROJECT NO. 6468-03-0304.10		PROJECT ID: Roxboro		COUNTY Person		GEOLOGIST S. Clark								
PROJECT NAME Roxboro FGD							WATER LEVEL (ft)							
BORING NO. G-4							0 HR.	32.0						
GROUND ELEV. 433.0 ft (NAVD 88)		NORTHING 6,019.15 (PLANT GRID)		EASTING 12,246.50 (PLANT GRID)		24 HR.								
TOTAL DEPTH 48.0 ft		DRILL MACHINE CME-550		DRILL METHOD HSA-2.25" I.D./Core		HAMMER TYPE 140-lb. Man								
DATE STARTED 2/18/04		COMPLETED 2/18/04		SURFACE WATER DEPTH N/A										
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100	
433.0	0.0				Ground							433.0	0.00	
430.5	2.5											430.5	2.5	Topsoil and rootmat identified in field
428.0	5.0	29	14	14								428.0	5.0	Very stiff, moist, brown, SILTY GRAVEL (GP-GM) with organic traces.
425.5	7.5	50/0.4										425.5	7.5	Very dense, moist, brown silty fine to coarse SAND (SM).
423.0	10.0	18	15	22								423.0	10.0	Hard, moist, brown, fine sandy SILT (ML) with rock fragments.
420.5	12.5	14	18	20										
418.0	15.0	11	14	22										
415.5	17.5	22	10	14										
413.0	20.0	18	22	30										
		11	13	13										
408.0	25.0	12	12	12								408.0	25.0	Residual -very stiff, wet, black and brown fine sandy SILT (ML) with rock fragments.
403.0	30.0	10	14	16										
398.0	35.0	2	3	3								398.0	35.0	Soft, wet, brown fine sandy SILT (ML).
393.0	40.0	50/0.4										393.0	40.0	PWR- Gneiss; Sampled as dense damp tan brown silty fine SAND (SM).
390.0	43.0	50/0.1										390.0	43.0	Hard Rock: Dark gray and white, slightly weathered, moderately fractured to sound, hard, biotite hornblende GNEISS
												385.0	48.0	Fractures: 0° to 45° Fracture Spacing: 0.2 to 1.5 ft Boring and coring terminated at 48.0 ft in Hard Rock: GNEISS
358.2	74.8													

CP&L ROXBORO 6468-03-0304.GPJ NC DOT.GDT 4/16/04

**ATTACHMENT 6**

Gypsum Storage Pad Liner Details

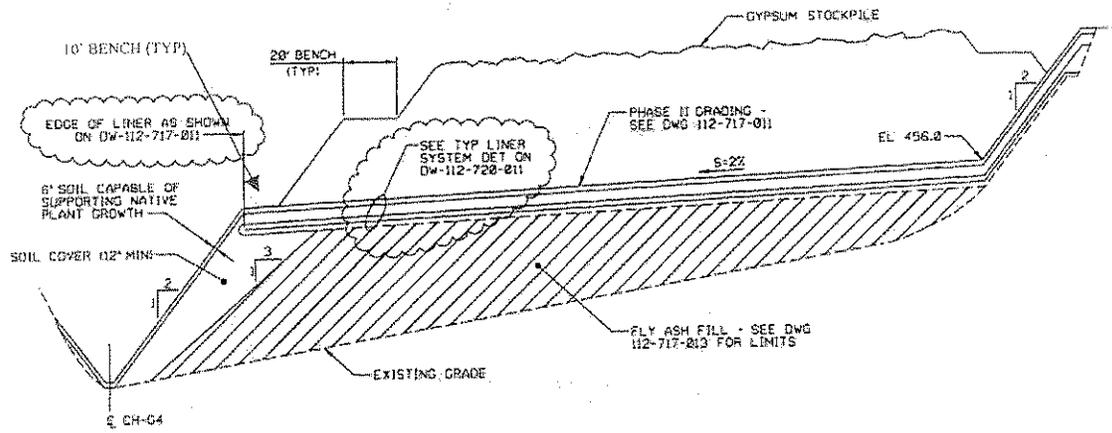
## Gypsum Storage Pad Work Plan

### Liner construction considerations:

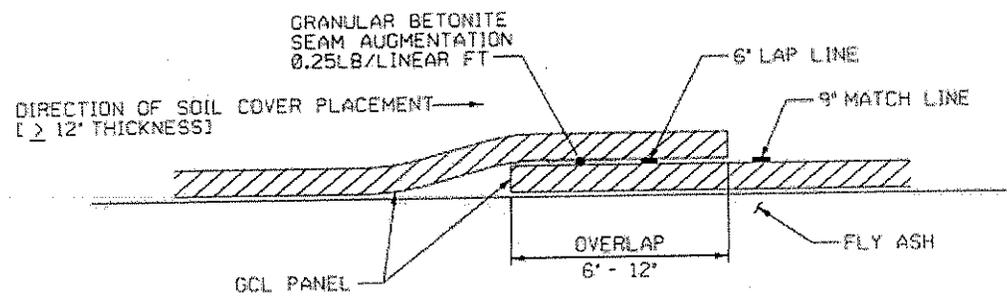
- 1) The GCL shall be Bentomat CLF or equal. This product consists of a plastic-laminated geomembrane to reduce hydraulic conductivity with geotextiles on both sides.
- 2) Place fly ash above and below the GCL (per typical liner system detail) to provide cushioning and reduce permeability adjacent to the gypsum leachate. [We have already determined that fly ash (from the Roxboro plant) is compatible with the GCL in a previous test.]
- 3) Place the plastic laminate side up to the gypsum to limit the exposure of the bentonite to the gypsum leachate. Allow hydration of the GCL from below by compacting the fly ash at a wet-of-optimum moisture content. Immediately place the GCL liner upon placement of the flyash base fill. Once the GCL becomes hydrated, it can be exposed to potentially incompatible leachate without affecting its performance. This is because the hydration water is captured in the clay. Only the surface of the clay layer will be in contact with runoff.
- 4) The way the GCL is joined is by overlapping at least 6 inches. This effectively presents a 6-inch thick layer of bentonite to the leachate at the seams.
- 5) Carefully Place 6" of ash, 12" of fill, and 6" of topsoil above the liner to provide a cap for the flyash. This will help control dust and add additional protection above the liner.

### Gypsum Stockpile Management:

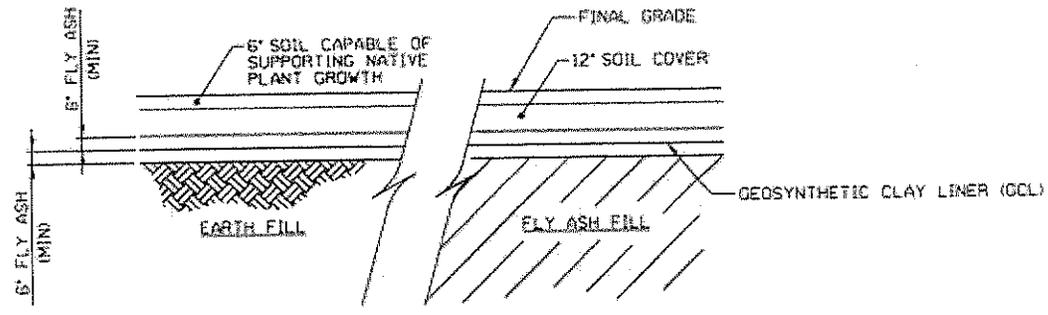
- 1) As gypsum is sent to the stockpile, gently spread a two foot base layer of the gypsum above the top of pad, gradually pushing out to the east.
- 2) Maintain a ten (10) foot minimum edged distance between sloped pad embankment and gypsum stockpile to ensure adequate liner coverage under the gypsum stockpile.
- 3) Upon placement of the two foot base layer; stockpiling of the gypsum may begin expanding upwards and to the east with the bulk of the pile as close to the reclaim feeders as possible.
- 4) Once the stockpile has reached the design capacity of 300,000 Tons, the remaining gypsum must be either sold or sent to the landfill.
- 5) Reclaimed gypsum shall be replaced in a sufficient amount of time to maintain the contracted design capacity.



TYPICAL CROSS-SECTION



BENTONITE ENHANCED SEAM DETAIL



TYPICAL LINER SYSTEM DETAIL

North Carolina  
Department of Environment and Natural Resources

RECEIVED  
NOV 26 2002



Division of Waste Management

Michael F. Easley, Governor  
William G. Ross Jr., Secretary  
Dexter R. Matthews, Interim Director

November 20, 2002

Mr. George T. Everett, Ph.D  
Vice President, Environmental Affairs  
Duke Power  
P.O. Box 1006  
Charlotte, North Carolina 28201-1006

Subject: Landfill permitting and structural fill applications.

Dear Mr. Everett:

The Division of Waste Management (Division) concurs with your letter dated 3 October 2002, outlining the process that Duke Power will undertake in managing the flue gas desulfurization residuals (FGDR) generated by Duke Power facilities. The issue of managing the FGDR for re-use in the manufacturing of wallboard does not require a solid waste permit, at this time, as long as the recovered material is managed consistent with the following criteria:

- 1) The recovered material or the by-products of the operation of the flue gas desulfurization process shall not be discharged, deposited, injected, dumped, spilled, leaked, or placed into or upon any land or water so that the products or by-products or any constituent thereof may enter other lands or be emitted into the air or discharged into any waters including groundwater, or otherwise enter the environment or pose a threat to the public health and safety. Storage of the FGDR, that can be utilized for wallboard production based on purity of the calcium sulfate, at Duke Power facilities or at the wallboard manufacturing facility can take place without a solid waste permit as long as the above conditions are do not occur;
- (2) The recovered material shall not be a hazardous waste or have been recovered from a hazardous waste;
- (3) Surface water shall be diverted from the FGDR storage area. Any water which comes in contact with recovered materials, shall be contained on-site or properly treated prior to discharge;

1646 Mail Service Center, Raleigh, North Carolina 27699-1646

Phone: 919-733-0692 \ FAX: 919-733-4810 \ Internet: [www.enr.state.nc.us/](http://www.enr.state.nc.us/)

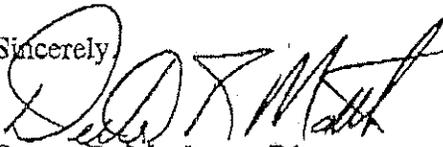
AN EQUAL OPPORTUNITY \ AFFIRMATIVE ACTION EMPLOYER - 50% RECYCLED / 10% POST CONSUMER PAPER

Mr. Everett  
Page 2  
November 20, 2002

Furthermore, the Solid Waste Section has meet with representatives of Duke Power, on 15 October 2002, to discuss the requirements for submitting a site suitability application for various Duke Power facility landfills (see letter enclosed) and discussed in general terms the requirements for applications on structural fills. At this time, Solid Waste Section personnel have a meeting scheduled with Duke representatives for 25 November 2002 to discuss specific information on possible sites for structural fills using FGDR.

If you have any questions regarding the progress of future Duke Power applications or if you have any questions about information requested of Duke Power, based on reviews of current applications, please contact Jim Barber at (919) 733-0692 ext: 255.

Sincerely



Dexter R. Matthews, Director  
Division of Waste Management

(Enclosure)

cc: Dan Oakley  
James C. Coffey  
Jim Barber  
Ellen Lorscheider  
Bill Hocutt



NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

Dexter R. Matthews, Director

Division of Waste Management

Michael F. Easley, Governor  
William G. Ross Jr., Secretary

December 16, 2005

John R. Toepfer, P.E.  
Progress Energy Service Company, LLC  
Environmental Services Section  
410 South Wilmington Street, PEB4  
Raleigh, NC 27601

Subject: Notification – Coal ash structural fill –  
for Roxboro Plant Gypsum Storage Pad  
Carolina Power & Light Company d/b/a Progress Energy Carolinas  
1700 Dunnaway Road, Semora, NC 27343

Reference: Letter/documentation dated November 1, 2005, including site plans sealed by Jon  
A. Winterhalter on October 19, 2005, received by the Solid Waste Section on  
November 7, 2005

Dear Mr. Toepfer,

This letter acknowledges receipt of the above referenced documentation which satisfies the notification requirements specified in Section .1700 of the North Carolina Solid Waste Management 15A NCAC 13B Rules. This notification included the following information as required by Rule .1703:

1. **Nature, Purpose and location of the project:** This project is proposal of placement of 80,000 cubic yards of coal ash from the Roxboro Plant as structural fill underneath select portions of a proposed 20 acre storage pad.  
**Quad sheet:** Olive Hill, NC Quadrangle
2. **Estimated start:** December 15, 2005  
**Estimated completion:** March 15, 2006
3. **Estimated volume:** 80,000 cubic yards
4. **TCLP analysis from coal ash:** included; also a revised TCLP with lower detection limits is to be submitted to the Solid Waste Section. If revised TCLP results from the coal ash are above groundwater standards, ground-water monitoring wells may be required to be installed at various locations and a sampling schedule implemented.

1646 Mail Service Center, Raleigh, North Carolina 27699-1646  
Phone 919-508-8400 \ FAX 919-733-4810 \ Internet <http://wastenotnc.org>

Mr. John Toepfer, P.E.  
Notification Coal Ash Structural Fill  
Progress Energy Roxboro Pland  
December 16, 2005  
Page 2

5. **Signed statement from the owner:** The Company stipulates to the recordation requirements per Progress Energy's letter dated November 1, 2005 to the Division of Waste Management.

6. **CCB generator:** CP&L, Roxboro plant

**Location of generating plant:** 1700 Dunnaway Road, Semora NC

**Mailing address:** 410 South Wilmington Street, PEB4  
Raleigh, NC 27601

**Contacts:** Steven B. Conner, William B. Milam, Jr.

**Telephone numbers:** (336) 597-6292, (336)597-6284

**Statement that notification will be given to DWM if changes are to occur.**

Construction can now begin on this project, however, the storage of 600,000 tons of flue gas desulfurization (FGD) residue on a proposed pad is pending approval at this time.

If you have any questions or comments, please contact myself or Brian Wootton at (919)-508-8495 or (919)-508-8524 respectively.

Sincerely,



Edward F. Mussler III  
CN = Edward F. Mussler III, C = US, O = Division  
of Waste Management, OU = Solid Waste Section  
I am the author of this document  
2005.12.16 14:21:17 -0500

Edward F. Mussler III  
Permitting Branch Supervisor  
Solid Waste Section  
Division of Waste Management

CC:	Ben Barnes	Solid Waste Section
	Brian Wootton	Solid Waste Section
	Cecil E. Rowland	Progress Energy
	Steven B. Conner	Progress Energy
	William B. Milam, Jr.	Progress Energy
	Central File	