Carsen Johnson
85-05 4/11/12

Duke Power
Belews Creek Steam Station
Stokes County, N.C.

Flue Gas Desulfurization (FGD) Residue
Landfill Permit Application
Site Suitability Information

Received
APR 2005
Solid Waste Section

March 28, 2005

Volume 1

15A NCAC 13B
.0503(1) and .0504(1) Requirements and Responses

APPROVED
DIVISION OF WASTE MANAGEMENT
SOLID WASTE SECTION
DATE 6/29/2006 BY TAO
PERMIT # 85-05
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NCDENR

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

April 21, 2005

Allen Stowe, Scientist
Environmental Support
Duke Power
526 S Church St
EC10A / PO Box 1006
Charlotte NC 28201-1006

Re: Craig Road FGD Landfill Permit Application
Duke Power Belews Creek Power Station
Site Suitability Report Comments
Stokes County, North Carolina

Dear Mr. Stowe:

Solid Waste Section (SWS) staff completed a partial review of the above referenced application dated March 28, 2005, and offers the following comments regarding the requirements of Solid Waste Rules 15A NCAC 13B .0503 and .0504(1). Comments regarding the geologic and hydrologic study of the site required under Rule .0504(1)(c), and groundwater monitoring under Rule .0504(1)(g)(iv) will be provided separately.

Section 2.0 Project Description

1. Please correct the facility location in the first sentence to southeast Stokes County. Also, should the Belews Creek arm referenced in paragraph 3 be located to the east of the proposed site?

Section 3.0 Description of FGD System

2. Statement is made on page 2 that material will be periodically removed from the clarifier stage of the waste water treatment plant and placed in the landfill. Please describe the wastewater treatment process and provide analyticals on the material. Please describe the quantity of the material, how the clarifier material will be dewatered and what types of operational problems, if any, the material may present.

3. For future reference and if the application is successful, all disposed material in the proposed FGD landfill should be analyzed in accordance with approved waste determination procedures.

Section 5.0 Siting and Design Requirements

4. For future reference: Endangered species letters required under Section .0503(1)(b) from USF&WS, ACOE and NCDENR are to be forwarded by Duke Power upon their receipt. (page 6)

5. Attachment 5 lists Public Water Supply Wells located ENE and within 2 miles of the proposed site. According to the list, the supply wells service populations between 50 and 290. The accompanying small scale map is difficult to use for cross-referencing to the list. Please provide locations of the wells [Section .0504(1)(b)] on Figure 4 or an explanation as to why the wells need not be located.

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PROCUREMENT, CONSTRUCTION AND EH&S

Duke Power
EC11E / P.O. Box 1006
Charlotte, NC 28201-1006

March 30, 2005

North Carolina Department of
Environment and Natural Resources
Division of Waste Management
Solid Waste Section
401 Oberlin Road, Suite 150
Raleigh, NC 27605

Attention: Mr. Jim Barber
Branch Head, Solid Waste Section

Subject: Duke Power – Belews Creek Steam Station
Proposed Flue Gas Desulfurization (FGD) Residue Landfill
Site Suitability Package

Dear Mr. Barber:

Please reference the attached site suitability packages for the proposed FGD residue landfill at Belews Creek Steam Station. If additional information is required to ensure a timely response, please contact me at (704) 382-4309.

Sincerely,

Allen Stowe

Allen Stowe, Scientist
Environmental Support

Attachments

Duke Power

Belews Creek Steam Station

Stokes County, N.C.

Flue Gas Desulfurization (FGD) Residue

Landfill Permit Application

Site Suitability Information

March 28, 2005

15A NCAC 13B

.0503(1) and .0504(1) Requirements and Responses

Volume 1

Table of Contents

1.0 Introduction 1
2.0 Description of Plant and Landfill Site 1
3.0 Description of FGD System 1
4.0 Description of FGD Residue Landfill 3
5.0 .0503 SITING AND DESIGN REQUIREMENTS FOR DISPOSAL SITES 4
Requirement .0503(1)(a) 5
Requirement .0503(1)(b) (i) and (ii) 6
Requirement 0503(1)(b)(iii) 7
Requirement 0503(1)(b)(iv) 8
Requirement 0503(1)(c) 9
Requirement 0503(1)(d) 10
6.0 .0504 APPLICATION REQUIREMENTS FOR SANITARY LANDFILLS 11
Requirement .0504(1)(a) 12
Requirement .0504(1)(b) 13
Requirement .0504(1)(c) 14
Requirement .0504(1)(d) 16
Requirement .0504(1)(e) 17
Requirement .0504(1)(f) 18
Requirement .0504(1)(g) 19
Requirement .0504(1)(h) 20

Figures

Attachments

Drawings

List of Figures

Figure 1	Location Map with Footprint
Figure 2	Flood Hazard Area Map – 100 Year Flood
Figure 3	¼ Mile Radius Map
Figure 4	2 Mile Radius Map

Attachments

Attachment 1	Duke Letter to USFWS
Attachment 2	USFWS Letter to Duke
Attachment 3	Duke letter to SHPO
Attachment 4	SHPO letter to Duke
Attachment 5	EDR Report - November 30, 2004
Attachment 6	EDR Report – September 28, 2004
Attachment 7	Letter from Stokes County Planning and Community Development Department dated November 9, 2004

Drawings

Drawing C-1	Conceptual Grading Plan
Drawing C-2	Conceptual Closure Plan
Sheet-1	Belews Creek Steam Station Scrubber Landfill Property
Sheet-2	Belews Creek Steam Station Scrubber Landfill Property

1.0 INTRODUCTION

The Clean Smokestacks Act passed in 2002 requires significant reductions in emissions from coal-fired power plants operating in North Carolina. NC utilities must reduce the actual emissions of nitrous oxides (NO_X) by 77% by the year 2009 and must reduce actual sulfur dioxide (SO_2) emissions by 49% by the year 2009 and by 73% by 2013. As part of Duke Power's effort to meet the SO_2 reduction requirements, a Flue Gas Desulfurization (FGD) system will be installed at the Belews Creek Steam Station. Duke will also install similar FGD systems at other power plants located in NC. Duke's intent is that a large portion of the residue from this process will be utilized in beneficial products and the remainder will be placed in the proposed FGD residue landfill.

2.0 DESCRIPTION OF PLANT AND LANDFILL SITE

Belews Creek Steam Station is located in south-western Stokes County, on Pine Hall Road. Belews Creek Steam Station is a coal-fired electric generating facility located on Belews Lake near Walnut Cove, North Carolina. The station has two units, each of which can generate 1,200megawatts of electricity.

The plant is located in the Piedmont physiographic region. Figure 1 shows the location of the plant and the location of the proposed FGD landfill. The footprint for the landfill (actual waste footprint) contains an area of approximately 23.9 acres. The adjacent stormwater pond contains an area of approximately 2.4 acres.

The FGD landfill will be located on Duke Power property, south of the Belews Creek plant. The landfill site is located on land between two arms of the Belews Creek Lake. The West Belews Creek arm is located west of the landfill site and the Belews Creek arm is located west of the site. Craig Road is located to the west of the landfill.

3.0 DESCRIPTION OF FGD SYSTEM

The FGD system contracted for installation at Belews Creek is a Wet Scrubber system. In a Wet Scrubber system the SO_2 component of the flue gas produced from the coal combustion process is removed by reaction with a limestone-water slurry.

The particular system to be used at Belews Creek will collect the flue gas after it passes through the electrostatic precipitator and route the gas into the lower end of a vertical tank. As the gas rises through the tank to the outlet at the top, the gas passes through a spray header. An atomized slurry of water and limestone droplets is continually sprayed through this header into the stream of flue gas. The SO_2 in the flue gas reacts with the calcium in the limestone and produces SO_3. The SO_3 slurry falls to the bottom of the tank where a stream of air is injected to oxidize the slurry to form gypsum ($CaSO_4 \cdot H_2O$). The gypsum slurry is then drawn off to a hydroclone and subsequently routed to a vacuum belt filter. The liquid waste from this process will be treated as wastewater.

Duke is presently investigating beneficial uses for the FGD residue (gypsum). If these options are determined to be viable, the FGD residue meeting the material requirements for the beneficial uses will not be disposed in the landfill.

The typical parameters for this material produced by the system to be used at Belews Creek are:

Typical FGD Residue Parameters

Gypsum	93% to 95%
Sulfite	0.35%
CO_3	1.3%
CaF_2	0.2%
Inerts	2.5% to 3.5%
Fly ash Content	0.5% to 0.8%
pH	6.0 to 8.3
Unit Weight	76 lb/ft^3 to 97 lb/ft^3
Specific Gravity	2.35
Moisture	10% to 12%

FGD residue material that is not suitable for beneficial use will be placed in the landfill. In addition to this material, material will periodically be removed from the clarifier stage of the waste-water treatment system and placed in the landfill.

Synthetic Precipitation Leaching Procedure (SPLP EPA Method 1312) leaching has been performed on samples of FGD residue material provided by the equipment vendor. These results will be presented in subsequent submittals to NCDENR. Duke will also provide results of geotechnical tests performed on the FGD residue in subsequent submittals.

4.0 DESCRIPTION OF FGD RESIDUE LANDFILL

The FGD landfill will be located on Duke Power property, south of the Belews Creek plant. The landfill footprint contains approximately 23.9 acres.

The surface drainage at the site is described below:

Direction	Description of Surface Drainage Features
North	Low gradient drainage feature draining to Belews Lake
East	Drains overland approx. ¼ mile to Belews Creek arm of Belews Lake
South	Low Gradient drainage feature draining to West Belews Creek arm of Belews Lake
West	Due to the location of Craig Rd, surface water flow drains to the North.

As described in the Geologic and Hydrologic Siting Report, the subsurface conditions in the landfill area consist of residual soils, saprolite, partially weathered rock, and bedrock. The residual soil, saprolite, partially weathered rock have been formed by the in-place weathering of the parent rock. As is typical in the groundwater systems located in the Piedmont region, groundwater at the landfill site occurs within the residuum, saprolite, partially weathered rock, and shallow fractured bedrock under unconfined aquifer conditions. The predominant groundwater discharge areas are expected to be the drainage feature to the north of the landfill, the drainage feature to the south of the landfill, and to Belews Lake, located to the east and the west of the landfill.

The FGD residue will be conveyed to the landfill site by truck, where the material will be spread and compacted. The landfill will begin receiving FGD residue in October 2007. The volumetric capacity of the landfill is 1,900,000 yd^3.

The FGD residue landfill at Belews Creek will receive FGD residue generated at Belews Creek.

5.0 .0503 SITING AND DESIGN REQUIREMENTS FOR DISPOSAL SITES

Disposal sites shall comply with the following requirements in order for a permit to be issued:
(1) A site shall meet the following siting requirements:

Response:
The specific requirements of .0503 (1) are addressed on the following pages.

Requirement .0503(1)(a)
A site located in a floodplain shall not restrict the flow of the 100-year flood, reduce the temporary water storage capacity of the floodplain or result in washout of solid waste so as to pose a hazard to human life, wildlife or land or water resources.

Response
The proposed landfill site for the Belews Creek Steam Station FGD Residue Landfill is not located in the 100-year floodplain. Therefore, the proposed landfill will not restrict the flow of a 100-year flood, nor will the proposed landfill reduce the temporary water storage capacity of the floodplain or result in washout of solid waste so as to pose a hazard to human life, wildlife or land or water resources.

Figure 2 is the National Flood Insurance Program Flood Insurance Rate Map, prepared by FEMA, for the area adjacent to Belews Creek Steam Station.

The location of the proposed landfill relative to the 100-year floodplain is shown on Figure 2.

Requirement .0503(1)(b) (i) and (ii)

A site shall be located in consideration of the following:

(i) a site shall not cause or contribute to the taking of any endangered or threatened species of plants, fish or wildlife;

(ii) a site shall not result in the destruction or adverse modification of the critical habitat of endangered or threatened species as identified in 50 C.F.R. Part 17 which is hereby incorporated by reference including any subsequent amendments and editions. This information is available for inspection at the Department of Environment, Health, and Natural Resources, Division of Solid Waste Management, 401 Oberlin Road, Raleigh, North Carolina 27605 where copies can be obtained at no cost;

Response

Site surveys were performed to investigate the presence of endangered or threatened species of plants, fish or wildlife or critical habitat of endangered or threatened species that included evaluation for wetlands and Waters of the U.S. The Duke Power letters to the United States Fish and Wildlife Service (USFWS), the Army Corps of Engineers (ACOE) and the North Carolina Department of Environment and Natural Resources (NCDENR) providing the results of the site survey are dated March 17, 2005 (Attachments 1 and 2). Copies of the agency responses will be forwarded upon receipt.

Requirement 0503(1)(b)(iii)
A site shall not damage or destroy an archaeological or historical site.

Response
The North Carolina Department of Cultural Resources, State Historic Preservation Office (SHPO) was consulted to determine if an archaeological or historic site was listed at the proposed site. The response provided by the SHPO is dated May 5, 2003. The response stated that:

> *"We have conducted a review of the proposed undertaking and are aware of no historic resources which would be affected by the project."*

The letter to the SHPO providing the location of the landfill is included in Attachment 3.

The response from the SHPO is found in Attachment 4.

Requirement 0503(1)(b)(iv)
A site shall not cause an adverse impact on a state park, recreation or scenic area, or any other lands included in the state nature and historic preserve.

Response
The proposed landfill will not adversely impact a state park, recreation or scenic area or nature or historic preserves. There are no state parks, recreation or scenic areas, or any other lands included in the state nature and historic preserve within ten (10) kilometers (6.2 miles) of the proposed landfill site.

The Pine Hall and Piney Bluff boating access areas are located within ten (10) kilometers (6.2 miles) of the proposed landfill site. These access areas are owned by Duke Power. As operation of the current facility adjacent to the proposed landfill has not adversely impacted the access areas, there will be no impact resulting from the proposed landfill.

Requirement 0503(1)(c)
A new site disposing of putrescible wastes shall not be located within 10,000 feet of an airport runway used by turbojet aircraft or within 5,000 feet of an airport runway used by piston-type aircraft;

Response
The proposed landfill will not receive putrescible wastes.

Requirement 0503(1)(d)
A site shall have available adequate suitable soils for cover either on-site or from off-site.

Response
The proposed landfill site has adequate suitable soils available on-site. Drawing C-1 Conceptual Grading Plan shows the grading plan for the proposed landfill. This drawing shows contours for the planned excavation.

The planned excavation within the proposed landfill footprint is 700,000 cubic yards. The planned fill (for roads, ponds, etc.) required for the landfill is 115,000 cubic yards. The soil volume required for operational and the final cover system is 370,000 cubic yards. This leaves an excess of 215,000 cubic yards of soil. Therefore, there are adequate suitable soils on site.

The excess soil will be stored in an adjacent stockpile area.

6.0 .0504 APPLICATION REQUIREMENTS FOR SANITARY LANDFILLS

A permit for a sanitary landfill shall be based upon a particular stream of identified waste, as set forth in Rule .0504 (g)(i) and (ii) of this Section. Any substantial change in the population or area to be served, or in the type, quantity or source of waste shall require a new permit and operation plan, including waste determination procedures where appropriate. Five sets of plans shall be required with each application.

(1) The following information shall be required for reviewing a site application for a proposed sanitary landfill:

Requirement .0504(1)(a)

An aerial photograph on a scale of at least 1 inch equals 400 feet and a blueprint of the photograph accurately showing the area within one-fourth mile of the proposed site's boundaries with the following specifically identified:

(i) Entire property owned or leased by the person proposing the disposal site;

(ii) Land use and zoning;

(iii) Location of all homes, industrial buildings, public or private utilities, and roads;

(iv) Location of wells, watercourses, dry runs, and other applicable details regarding the general topography; and

(v) Floodplains.

Response

The information listed above is identified on Figure 3. An electronic version of an aerial photograph of the site is used as the background for Figure 3.

A survey plat showing the property associated with the landfill is provided as Sheets 1 and 2 Belews Creek Steam Station Scrubber Landfill Property.

Requirement .0504(1)(b)

A map on a scale of at least 1 inch equals 1000 feet showing the area within two miles of the proposed site's boundaries with the following specifically identified:

(i) Significant ground-water users;

(ii) Potential or existing sources of ground-water and surface water pollution;

(iii) Water intakes;

(iv) Airport and runways; and

(v) Subdivisions.

Response

As shown on Figure 4, there are no significant ground-water users, water intakes, airports and runways, or subdivisions within two miles of the proposed site's boundaries.

The Environmental Data Resources report, dated November 30, 2004 (Inquiry Number 01316566.1r) provides information on significant groundwater users and was used as a source of information for items (i) and (iii). A copy of this report is found in Attachment 5.

The Environmental Data Resources report, dated September 28, 2004 (Inquiry Number 01277555.1r) provides information on potential or existing sources of groundwater contamination and was used as a source for of information for items (ii). A copy of this report is found in Attachment 6.

Requirement .0504(1)(c)

A geological and hydrological study of the site which provides:

(i) Soil borings for which the numbers and depths have been confirmed by the Division and lab testing of selected soil samples that provide:

(A) standard penetration - resistance;

(B) particle size analysis;

(C) soil classification - USCS;

(D) geologic considerations (slopes, solution features, etc.);

(E) undisturbed representative geologic samples of the unconfined or confined or semiconfined hydrological units within a depth of 50 feet that provide the following information for each major lithologic units:

(I) saturated hydraulic conductivity (or by in-situ);

(II) volume percent water; and

(III) porosity;

(F) remolded sample of cover soils that provide:

(I) saturated hydraulic conductivity,

(II) total porosity,

(III) atterberg limits;

(G) stratagraphic cross-sections identifying hydrogeological units including lithology;

(H) tabulation of water table elevations at time of boring, 24 hours, and seven days (The number of cased borings to provide this information shall be confirmed by the Division.); and

(I) boring logs;

(ii) A boundary plat locating soil borings with accurate horizontal and vertical control which are tied to a permanent onsite bench mark;

(iii) A potentiometric map of the surfical aquifer based on stabilized water table elevations; and

(iv) A report summarizing the geological and hydrological evaluation.

Response

A geological and hydrological study of the site is submitted. Prior to the start of the site investigation, a meeting was conducted with the Division to discuss the numbers, the locations, and the depths of the soil borings. The title of this report is:

Geologic and Hydrologic Siting Report
FGD Scrubber Residue Disposal Site
Belews Creek Steam Station
3195 Pine Hall Road
Belews Creek, North Carolina
S&ME Project No: 1054-04-955
February 2005

This report is included as Volume 2. A survey plat showing the accurate horizontal and vertical location of the soil borings and wells and the property associated with the landfill is provided as Sheets 1 and 2 Belews Creek Steam Station Scrubber Landfill Property.

Information on the depths of the borings and wells is found in the hydrogeologic study.

Requirement .0504(1)(d)
A conceptual design plan presenting special engineering features or considerations which must be included or maintained in site construction, operation, maintenance and closure.

Response
The conceptual design for the proposed FGD Residue landfill is shown on drawings C-1 and C-2.

There is one special engineering feature or consideration which must be included or maintained in site construction, operation, maintenance and closure. This engineering feature or consideration is the placement of an engineered cover system to minimize infiltration.

Placement of an Engineered Cover System to Minimize Infiltration
The proposed landfill will be a monofill composed of FGD residue from the wet scrubbers installed at Belews Creek. Laboratory analysis of the FGD residue leachate has been performed. This leachate was generated by subjecting the residue to SPLP testing (EPA Method 1312). The residue tested was provided by the FGD equipment vendor and is similar in type to the residue that will be produced at the Belews Creek Plant (similar processes)

This analytical information and infiltration modeling, developed by using the HELP model, was used in a groundwater fate and transport model to determine compliance with T15A NCAC 2L Groundwater Standards. The results of this modeling show that a landfill design, utilizing an engineered cap system to minimize infiltration into the landfill, will allow the landfill to met 2L standards. This demonstration will be submitted in a separate submittal.

The engineered cap will consist of a 40 mil textured linear low density polyethylene (LLDPE) geomembrane beneath a geocomposite drainage net. The cap will be topped with two feet of soil for vegetative growth. The geomembrane is a barrier layer that prevents rainwater from entering the waste cell of the landfill. The geocomposite drainage net allows water that percolates through the vegetative layer to drain laterally to a collection system.

The vegetative layer protects the geomembrane and geocomposite from ultraviolet degradation, desiccation, freeze-thaw, wind, and vectors. The vegetative layer shall be stabilized and seeded appropriately to prevent erosion. Native material cut from open areas within the landfill will be used for the vegetative layer. Debris will be removed, and the soil will be amended as needed.

Other Engineering Features or Considerations
Other than the engineered cap described above, there are no special engineering features or considerations that must be included or maintained in site construction, operation, maintenance and closure.

Requirement .0504(1)(e)
Local government approvals:

> (i) If the site is located within an incorporated city or town, or within the extra-territorial jurisdiction of an incorporated city or town, the approval of the governing board of the city or town shall be required. Otherwise, the approval of the Board of Commissioners of the county in which the site is located shall be required. Approval may be in the form of either a resolution or a vote on a motion. A copy of the resolution, or the minutes of the meeting where the vote was taken, shall be forwarded to the Division.
>
> (ii) A letter from the unit of government having zoning jurisdiction over the site which states that the proposal meets all of the requirements of the local zoning ordinance, or that the site is not zoned.

Response
Requirement .0504(1)(e)(i) is not applicable.

A zoning approval letter from Stokes County, as stipulated by .0504(1)(e)(ii), is included as Attachment 7.

Requirement .0504(1)(f)
A discussion of compliance with siting standards in Rule .0503(1) of this Subchapter.

Response:
The .0503 (1) requirements and the Duke response are included with this site suitability package. The proposed design will ensure that the siting requirements specified in Rule .0503 (1) are met.

Requirement .0504(1)(g)

A report indicating the following:

(i) population and area to be served;

(ii) type, quantity and source of waste;

(iii) the equipment that will be used for operating the site;

(iv) a proposed groundwater monitoring plan including well location and schematics showing proposed screened interval, depth and construction.

Response

(i) The FGD residue landfill at Belews Creek will receive FGD residue generated at Belews Creek.

(ii) The FGD residue will primarily be gypsum. The quantity of waste placed in the landfill will not exceed 1,900,000 yd^3. Source of the waste will be FGD equipment located at Belews Creek.

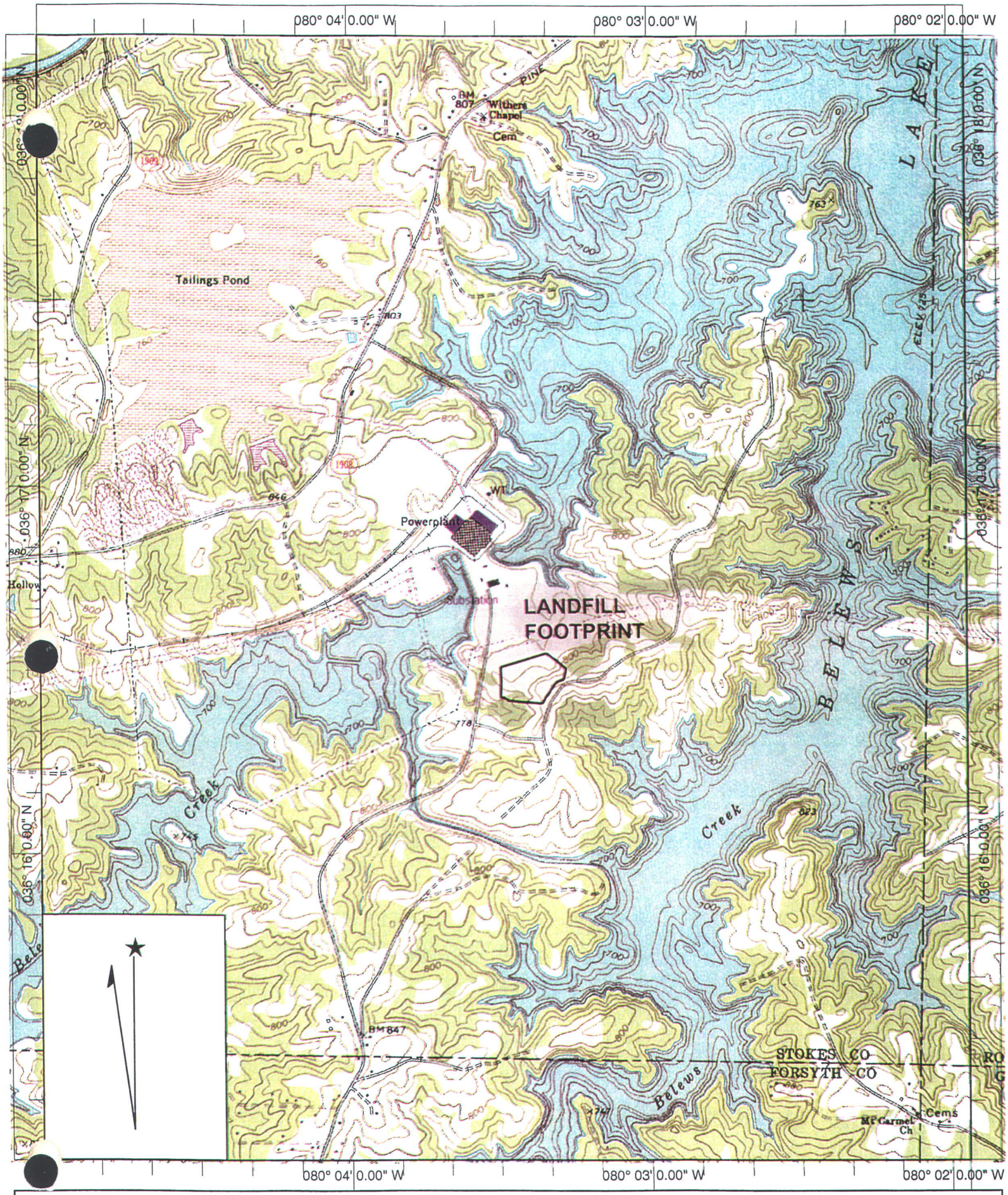
(iii) The equipment used to operate the landfill includes but is not limited to: backhoes, bulldozers, front end loaders, trucks to haul the material, excavators, watering and maintenance trucks.

(iv) Attachment 8 contains the proposed groundwater monitoring plan including well locations, screened intervals, depths, and construction details.

Requirement .0504(1)(h)
Any other information pertinent to the suitability of the proposed site.

Response
The review performed by Duke and by its consultants has not identified any concerns with the suitability of the proposed site.

Duke is not aware of additional information pertinent to the suitability of the proposed site.

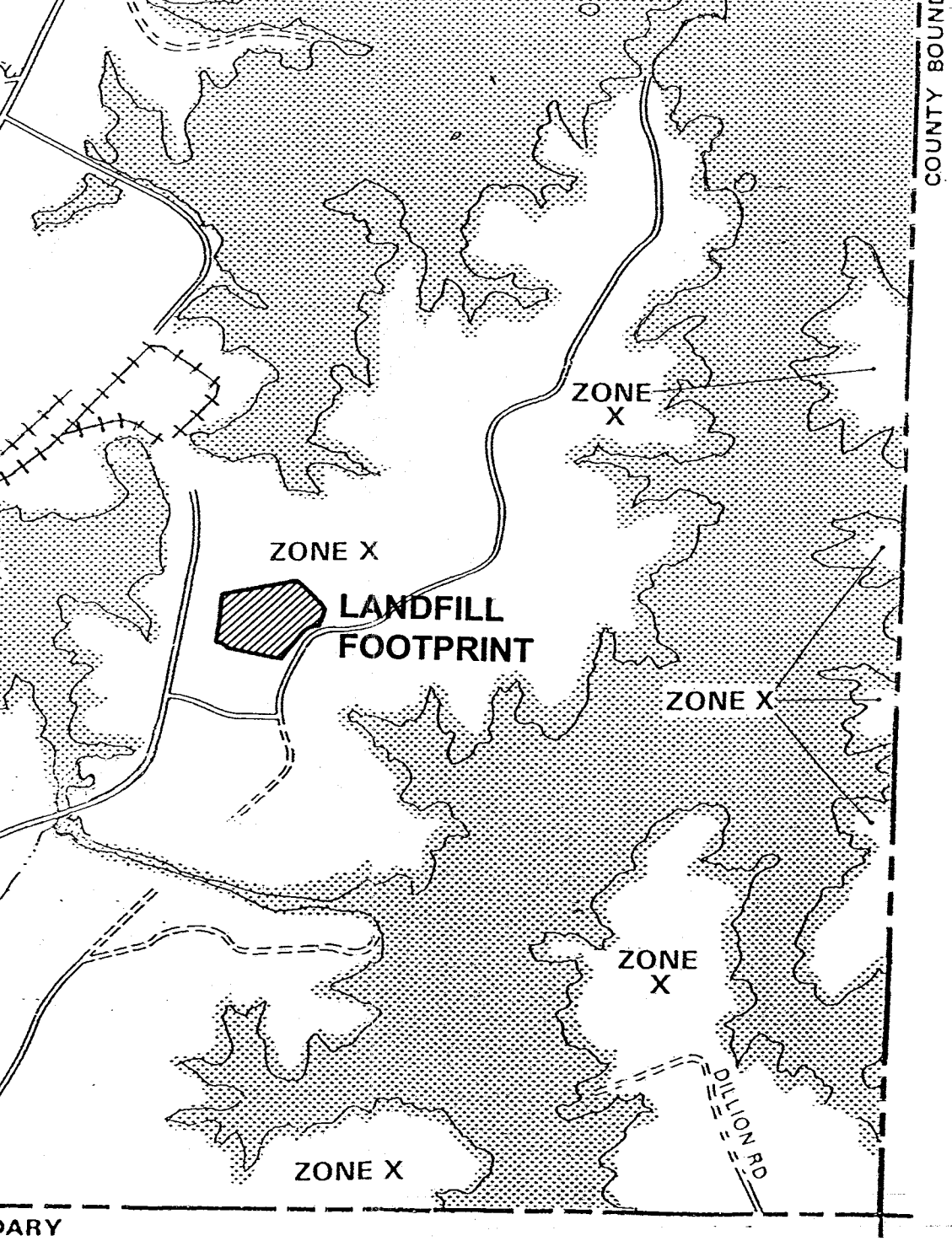


Name: BELEWS LAKE
Date: 9/1/2004
Scale: 1 inch equals 2000 feet

Location: 036° 16' 41.8" N 080° 03' 29.3" W
Caption: Duke Power
Belews Creek Station
FGD Landfill Site

Figure 1

Copyright (C) 1997, Maptech, Inc.



ZONE A99 To be protected from 100-year flood by Federal flood protection system under construction; no base elevations determined.

ZONE V Coastal flood with velocity hazard (wave action); no base flood elevations determined.

ZONE VE Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

ZONE X Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

ZONE X Areas determined to be outside 500-year flood plain.

ZONE D Areas in which flood hazards are undetermined.

Flood Boundary

Floodway Boundary

Zone D Boundary

Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

513 Base Flood Elevation Line; Elevation in Feet*

D — D Cross Section Line

(EL 987) Base Flood Elevation in Feet Where Uniform Within Zone*

$RM7_X$ Elevation Reference Mark

•M1.5 River Mile

*Referenced to the National Geodetic Vertical Datum of 1929

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas.

Certain areas not in the Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Refer to Floodway Data Table where floodway width is shown at 1/20 inch.

Coastal base flood elevations apply only landward of the shoreline.

Elevation reference marks are described in the Flood Insurance Study Report.

Corporate limits shown are current as of the date of this map. The user should contact appropriate community officials to determine if corporate limits have changed subsequent to the issuance of this map.

For adjoining panels, see separately printed Map Index.

MAP REPOSITORY

Planning Department, County Courthouse, Danbury, North Carolina (Maps available for reference only, not for distribution.)

INITIAL IDENTIFICATION:
MARCH 17, 1978

FLOOD HAZARD BOUNDARY MAP REVISIONS:

FLOOD INSURANCE RATE MAP EFFECTIVE:
SEPTEMBER 30, 1988

FLOOD INSURANCE RATE MAP REVISIONS:

Figure 2

Belews Creek Scrubber Residue Landfill

Drawings Under Seperate Cover

Attachments

Attachment 1

Duke Letter to USFWS

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PROCUREMENT, CONSTRUCTION AND EH&S

Duke Power
EC11E / P.O. Box 1006
Charlotte, NC 28201-1006

March 17, 2005

Mr. Mark Cantrell
U.S. Fish and Wildlife Service
160 Zillicoa Street
Asheville, NC 28801

Subject : Belews Creek Steam Station - Flue Gas Desulfurization System

Dear Mr. Cantrell:

Duke Power contacted your office in a letter of April 30, 2003 (USFWS Log Number 4-2-03-275) regarding a rare, threatened, and endangered species inventory of a site proposed for the fill of gypsum, a by-product of Flue Gas Desulfurization System, which will be installed to enhance air emission controls to comply with the new North Carolina clean air legislation at Duke Power's Belews Creek Steam Station in southeastern Stokes County, North Carolina. In addition to the permitted fill site, additional facilities are necessary to complete the system. Duke Power is in the process of engineering and environmental planning for additional facilities. As part of the planning, Duke Power contracted to conduct a biological inventory, including rare, threatened and endangered species inventory, of a study area where additional facilities may be necessary. A copy of the biological inventory is attached.

The study area drains to Belews Lake, a cooling reservoir built for Belews Creek Steam Station, in the Dan River drainage. Additional new facilities are regulated through a NPDES permit administered by North Carolina Department of Environment and Natural Resources (NCDENR). Any new facilities will be associated with using limestone to enhance air emission, as necessary to comply with the new North Carolina Clean Smokestacks legislation.

The permitting of the landfill is under the jurisdiction of the NCDENR, Division of Waste Management, Solid Waste Section. The landfill permit application siting regulation NCAC 15A .0503 (1) requires that:

(b) A site shall be located in consideration of the following:

(i) a site shall not cause or contribute to the taking of any endangered or threatened species of plants, fish or wildlife;

(ii) a site shall not result in the destruction or adverse modification of the critical habitat of endangered or threatened species as identified in 50 C.F.R. Part 17 which is hereby incorporated by reference including any subsequent amendments and editions.

I request your concurrence with the attached investigation and request that you respond within 30 days so we can include your review with our permit application. Should you have questions or need additional information, please contact me at (980) 373-5710.

Sincerely,

Ron Lewis

Ron Lewis, Senior Scientist
Environmental Support

DUKE POWER
CHARLOTTE, NORTH CAROLINA

BIOLOGICAL INVENTORY OF BELEWS CREEK STEAM STATION LANDS ASSOCIATED WITH INSTALLATION OF A FLUE GAS DESULFURIZATION SYSTEM

March 2005

Prepared by:

Environmental Resources of the Carolinas
7550 Forest Oak Drive
Denver, NC
(704) 483-0972

INTRODUCTION

Duke Power is planning for facility expansions associated with the installation of a Flue Gas Desulfurization System at Belews Creek Steam Station in Stokes County, NC. The system is necessary to meet the air emission standards for the new NC Clean Smokestacks legislation. As part of this planning process, they contracted for a biological inventory of a study area that would emcompass feasible areas for required future facilities. The inventory included a characterization of potential waters and wetland and a description of plant communities and animal habitats, with a special emphasis on protected plant and animal species. This report summarizes the rare species component of the investigation.

The study area (Figure 1) was inventoried over a period of September 2004 to March 2005, with information included from previous inventories in October and December 2002. The vegetation communities of the study area were characterized and areas where potential rare plant or animal habitats may occur were thoroughly searched for rare species. Species list, community characteristics, and photographs of representative communities are provided in the report.

OVERVIEW

The study area for potential facility expansions included a variety of habitats from old fields to relatively mature oak-hickory forests. Some of the area has been disturbed from construction of the plant and associated transmission lines in the late 1960-early 1970's. Construction yards established during initial construction have been reused as recently as 2002.

Vegetation communities of the study area are relatively undisturbed oak-hickory stands, natural pine stands that succeeded from past farm fields, pine plantations, and early succession openings such as right-of-ways and recent clearing. No unique habitats were found and no rare species were observed.

VEGETATION

A biological inventory was conducted in a study area (Figure 1) at Belews Creek Steam Station to assist in planning for facility expansions necessary for installation of a Flue Gas Desulfurization System in order to comply with North Carolina's new Clean Smokestacks legislation. The inventory focused on identifying any rare or special vegetation or aquatic communities with special emphasis placed on identifying any protected species.

The US Fish & Wildlife Service and the NC Department of Environment and Natural Resources have identified that the following protected species occur in Stokes County:

Orangefin madtom	*Noturus gilberti*	FSC[1]
Rustyside sucker	*Thoburnia hamiltoni*	FSC
Diana fritillary butterfly	*Speyeria diana*	FSC
Green floater	*Lasmigonia subviridis*	FSC
James spinymussel	*Pleurobema collina*	Endangered
Small-anthered bittercress	*Cardamine micranthera*	Endangered
Schweinitz's sunflower	*Helianthus schweiniitzii*	Endangered
Butternut	*Juglans cinerea*	FSC

[1]FCS-Federal candidate for listing under the Endangered Species Act

A biological inventory of the study area (Figures 1 and 2) was conducted on October 23, 2002, September 10 and 14, 2004, December 14, 2004, March 4 and 10, 2005. The area includes five general vegetation community types: "pine plantations", "natural pine stands", "oak-hickory forests", "early succession old fields and logging operations", a farm pond, and "early succession wetlands".

Some surface waters in the study area are associated with a network of blocked, intermittent drainages resulting from the placement of fill for past construction yards, access roads, and associated sediment control ponds. In Figure 3 seven intermittent or ephemeral stream channels (S-2, 5, 5a, 6, 7, 8 and 9) and five man-made ditch complexes (S-1, 3, 3a, 4, and 4a) occur in the study area that all consist of negligible or no discharge at the time of the inventory, despite substantial rainfall associated with Hurricane Francis that passed through the area on September 8, 2004, as well as runoff and seepage from snowmelt of a winter storm in March 2005. Wetland habitats were primarily ephemeral, but potential wetlands W-2, W-5, W-6, and W-7 and farm pond, W-9, (Figures 4 and 5) contain perennial habitat for amphibians and reptiles. These perennial waters offer some habitat for shorebirds but none were observed using them. Habitat for the orangefin madtom, rustyside sucker, green floater, and James spinymussell does not exist in the study area.

The "pine plantation" vegetation type (Figures 6 through 9) includes areas that have been logged less than 10-years ago and planted with loblolly pine (*Pinus taeda*), as well as several stands where the loblolly pines are approximately 20-40 years old. Of the younger stands, one contains

numerous wildlife openings/and trails that have been planted with sericea lespedeza (*Lespedeza cuneata*) and bicolor lespedeza (*Lespedeza bicolor*) (Figure 6). This type also includes Virginia pine (*Pinus virginiana*), short-leaf pine (*P. echinata*), persimmon (*Diospyros virginiana*), tulip poplar (*Liriodendron tulipifera*), red maple (*Acer rubrum*), white oak (*Quercus alba*) and scarlet oak (*Q. coccinea*) among other species; the trees in this area are generally less than 20-feet tall (Figure 6). A sparsely planted loblolly pine stand exists in another area of the study area and here the plantation includes a mixture of mixed hardwoods and natural pines (similar to stands described above) that form a dense thicket of saplings (Figure 7). Habitat for protected species in the young pines exists only in openings, along roads and an associated power line right-of way (Figure 8); while this type and associated roadside areas contains habitat for Schweinitz's sunflower, none were found, despite a thorough search for the species.

The older pine plantations (Figure 9) are dominated by loblolly pines and have a relatively open understory and few other species. One of these plantations includes areas of saturated soils from altered drainages associated with construction yards, roads, and sediment basins and occurs on lands that have been cut and filled during construction of Belews Creek Steam Station in the 1970's. In addition to loblolly pines, this site contains wetland vegetation such as bulrush (*Scirpus cyperinus*), sedge (*Cyperus strigosus*), Vietnam grass (*Microstegium virmineum*), and beggar ticks (*Bidens aristosa*) and upland species such as thoroughwort (*Eupatorium hyssopifolium*), Indian woodoats (*Chasmanthium latifolium*), muscadine (*Vitis rotundifolia*), and beggar lice (*Desmodium paniculatum*). Habitat for protected species does not occur in this vegetation type.

"Natural pine stands" are a major vegetation type of the study area (Figure 1) and some adjacent lands. These appeared to have succeeded from previously farmed fields and contain relatively dense stands of Virginia and shortleaf pine (Figure 10). Berms in the stands suggest that contour farming occurred in the area. These stands contain a few herbaceous species, such as pipsissewa (*Chimaphila umbellate*), and scattered deciduous sub-canopy and under-story trees, primarily sourwood, dogwood, and red maple. Habitat for listed or candidate species does not exist in this community.

The "oak-hickory" community includes several separate stands and buffers along the drainages of previously logged tracts. In the hardwood buffers, young hardwoods including American beech (*Fagus grandifolia*), hickory (*Carya* spp.), tulip popular, chestnut oak (*Q. prinus*), sourwood (*Oxydendrum arboreum*), white oak, and black gum (*Nyssa sylvatica*) are found with sparse, larger white oaks, scarlet oaks, and tulip poplars (Figure 11). A diverse, but by no means

rich, assemblage of herbaceous vegetation exists along some of the intermittent drainages, including wild ginger (*Hexastylis* spp., probably *Hexastylis virginica*), Christmas fern (*Polystichum acrostichoides*), bellwort (*Uvularia pudica*), ebony spleenwort (*Asplenium platyneuron*), Southern grape fern (*Botrychium biternatum)*, New York fern (*Thelypteris noveboracensis*), and pipsissewa.

Mature and early succession oak-hickory stands occur in the study area (Figures 12 and 13). These stands contain white oak, black oak (*Q. velutina*), post oak (*Q. stellata*), pignut hickory (*Carya glabra*), mockernut hickory (*C. tomentosa*), bitternut hickory (*C. cordiformis*), tulip poplar, American beech, red maple (*Acer rubrum*), sourwood, and dogwood (*Cornus florida*). The shrub layer includes blueberry (*Vaccinium* spp.) and mountain laurel (*Kalmia latifolia*) or rosebay (*Rhododendron maximum*) along some of the intermittent drainages. Herbaceous species are generally sparse here and include Indian woodoats (*Chasmanthium latifolium*), Christmas fern, downy rattlesnake plantain (*Goodyera pubescens*), wild ginger, bellwort (*Uvularia pudica*) Southern lady fern (*Athyrium asplenioides*), sedge (*Carex* spp.), New York fern, elephant's foot (*Elephantopus carolinianus*), and black cohosh (*Cimicifuga racemosa*). This community contains potentially low-grade habitat for sweet pinesap, a Federal candidate species, but because of the time of the survey and the difficulty in locating specimens, the occurrence of this species was not determined. The basic soils usually necessary for butternut appear not to occur in the area.

"Early succession old fields" occur in electric transmission line corridors and cut and fill sites from past construction (Figure 14), and forest openings. These sites contain Indian grass (*Sorghastrum nutans*), little bluestem (*Andropogon scoparius*), beard grass (*Erianthus contortus*), sericea lespedeza, thoroughwort (*Eupatorium hyssopifolium, E. serotinium*), gamma grass (*Tripsacum dactyloides*), partridge pea (*Cassia fasciculate*), coreopsis (*Coreopsis major*), and senecio (*Senecio smalli*), including other early succession species. Some of the construction yards are covered in gravel. This vegetation type occurs in habitat that is suitable for Schweinitz's sunflower, but none were found, despite a thorough search for the species.

"Early succession wetlands" (Figure 15) occur associated with past construction practices where water has been diverted off and around construction yards and to sediment basins. In some cases the soils contain gravel from roads and construction yards. Some areas are inundated because of blocked drainages. Dominant species include alder (*Alnus serrulata*), bulrush, barnyard grass (*Echinochloa crusgalli*), rushes (*Juncus canadensis, J. acuminatus*), beak rush (*Rhynchospora glomerata*), umbrella grass (*Fuirena squarrosa*), boneset (*Eupatorium perfoliatum*), gerardia

(*Agalinis purpurea*), seedbox (*Ludwigia alternifolia*), and nodding ladies' tresses (*Spiranthes cernua*). No protected species or their habitats occur in the "early succession wetlands". Potential habitat for the bog turtle exists in some of these sites but none were found.

The intermittent drainages in the study area do not consistently support aquatic life and contain water primarily during rainfall events. The slopes along these drainages, while canopy covered, had the highest potential for small-anthered bittercress, a winter annual species. While no small-anthered bittercress were found in the area, potential low-grade habitat exists.

The study area for facility expansions contains a diversity of plant habitats from recently disturbed lands to relatively mature oak-hickory forests. No unique plant communities or habitats exist in the study area. The drainage courses of the type found at the site are common in the area. While potential habitat exists for small-anthered bittercress (adjacent slopes of intermittent drainages) and Schweinitz's sunflower (old fields, transmission rights-of-way, roadsides), no plants were found. The study area for the proposed facility expansions necessary to meet the requirements for the new Clean Smokestacks legislation has little or no potential to impact listed species or critical habitat for listed species.

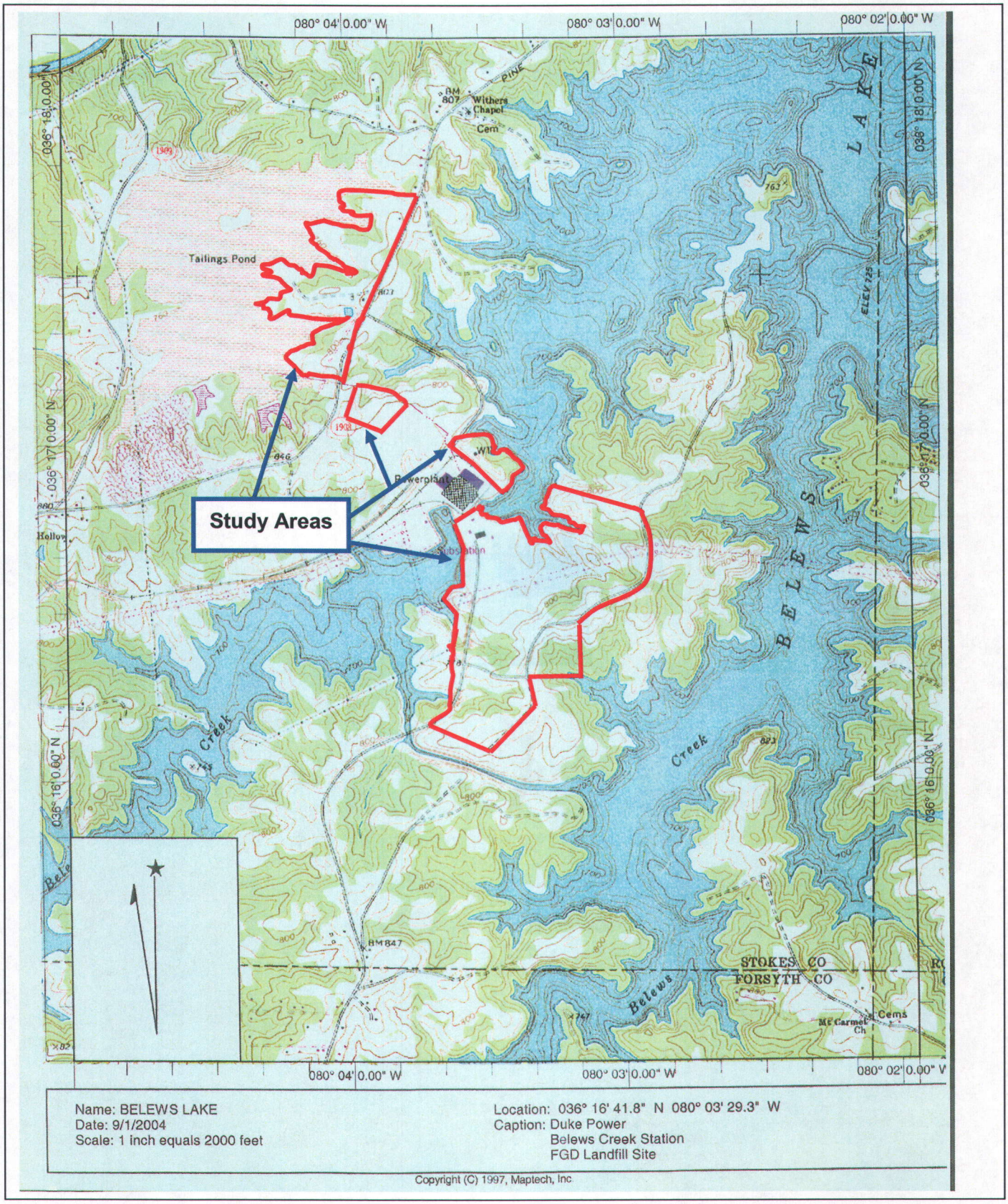


Figure 1. Portion of the Belews Lake USGS 7.5 minute map, showing the approximate boundary of the study area for facility expansions associated with the installation of a Flue Gas Desulfurization System at Belews Creek Steam Station in Stokes County, NC.

Figure 2. Aerial photograph of Belews Creek Steam Station taken in 2003 with the rough boundary of the study area for a Flue Gas Desulfurization identified.

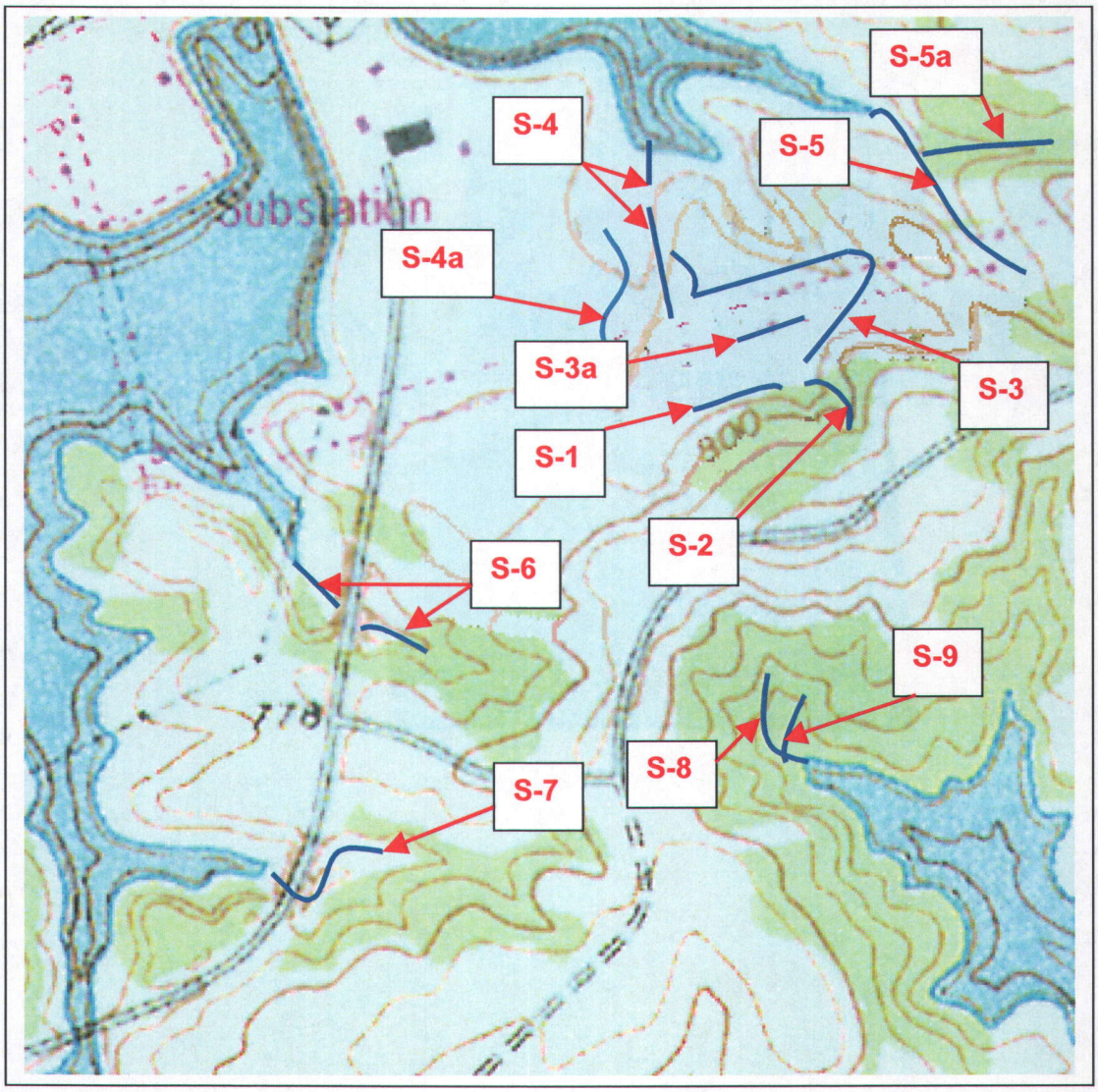


Figure 3. Approximate locations of stream channels investigated in the study area for facility expansion associated with the installation of a Flue Gas Desulfurization System at Belews Creek Steam Station.

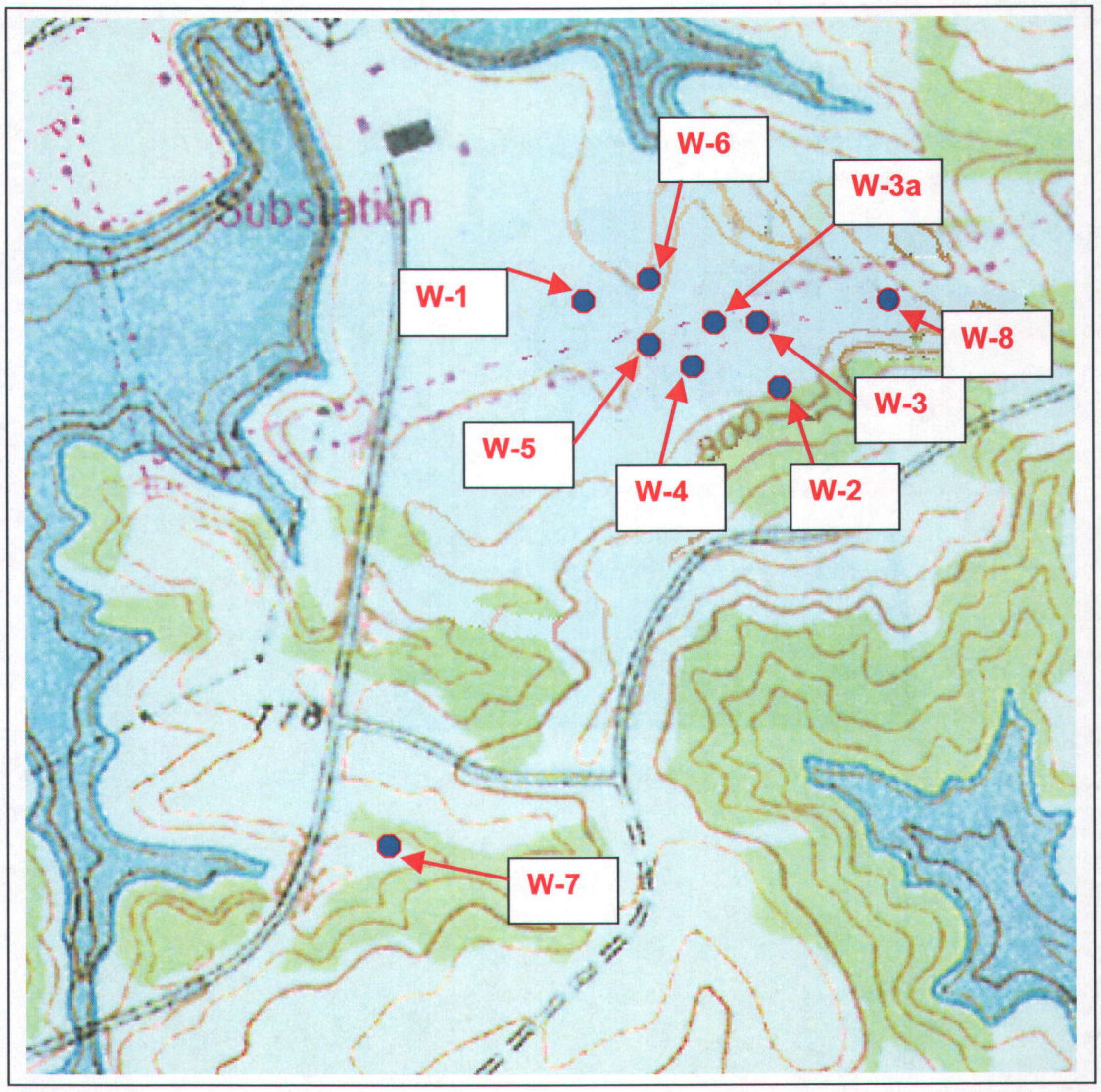


Figure 4. Approximate locations of areas investigated for wetland in the study area for facility expansion associated with the installation of a Flue Gas Desulfurization System at Belews Creek Steam Station.

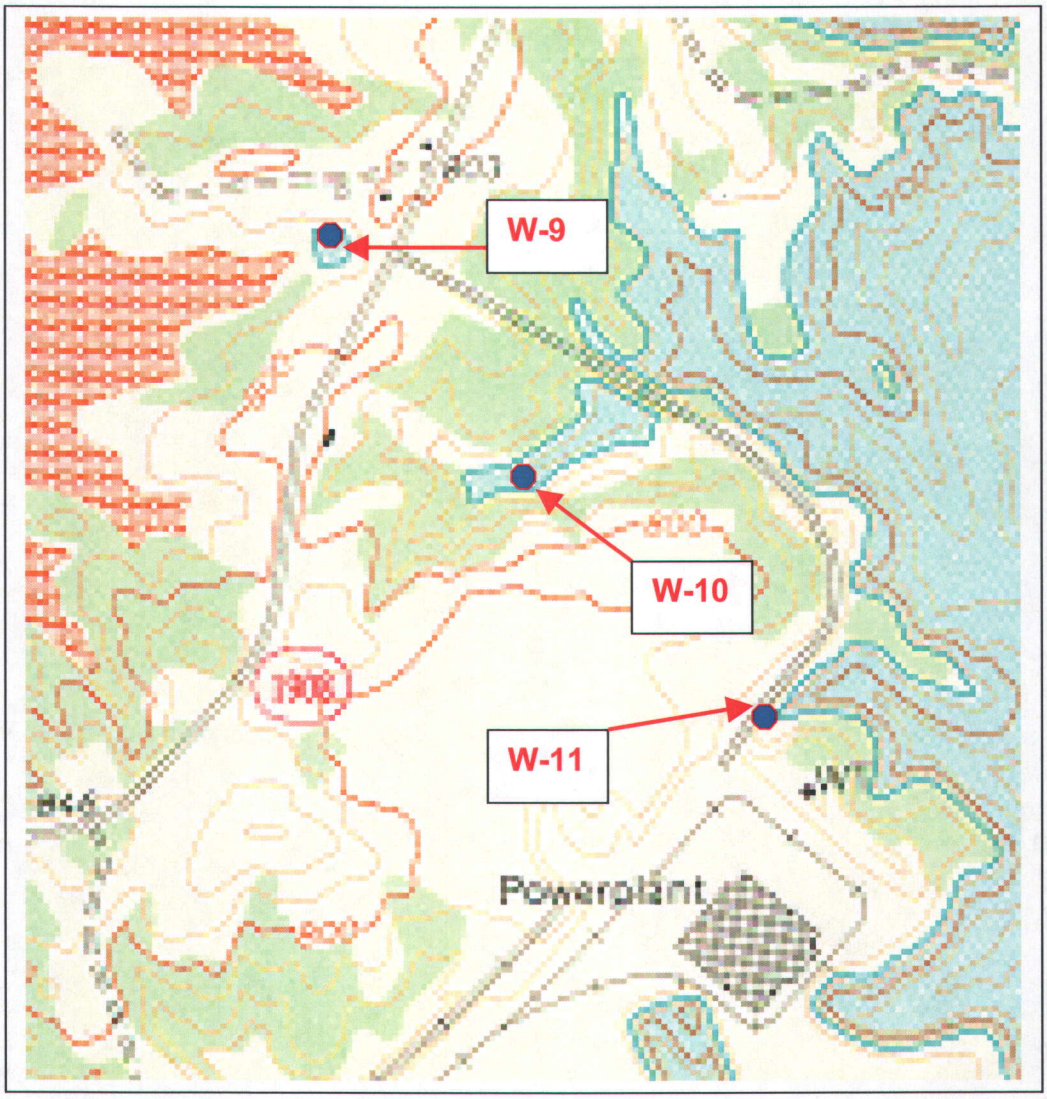


Figure 5. Additional areas investigated for wetlands in the study area for facility expansion associated with the installation of a Flue Gas Desulfurization System at Belews Creek Steam Station.

Figure 6. A pine plantation, in the study area for facility expansion at Belews Creek Steam Station, that was sparsely planted with loblolly pines and also planted with sericea and bicolor lespedeza, as observed on October 23, 2002.

Figure 7. A pine plantation, in the study area for facility expansion at Belews Creek Steam Station, that was sparsely planted with loblolly pines, but contains both natural pines and hardwood sprouts, as observed on September 14, 2004.

Figure 8. Roadside areas within the study area for facility expansion at Belews Creek Steam Station, as observed on September 14, 2004.

Figure 9. Pine plantation, in the study area for facility expansion at Belews Creek Steam Station, as observed on March 10, 2005.

Figure 10. Natural pine stand within the study area for facility expansion at Belews Creek Steam Station, as observed on September 10, 2004.

Figure 11. Oak-hickory forest that is a buffer along intermittent stream channels in the study area for facility expansion at Belews Creek Steam Station, as observed on October 23, 2002.

Figure 12. Young oak-hickory forest within the study area for facility expansion at Belews Creek Steam Station, as observed on September 10, 2004.

Figure 13. Relatively mature oak-hickory forest within the study area for facility expansion at Belews Creek Steam Station, as observed on March 10, 2005.

Figure 14. Early succession habitat in electric transmission corridors and construction yards within the study area for facility expansion at Belews Creek Steam Station, as observed on September 10, 2004.

Figure 15. Early succession wetlands in the right side of the photo and located under the transmission structure, in the study area for facility expansions at Belews Creek Steam Station, as observed on September 14, 2004.

Attachment 2

Duke Letter to US Army Corps of Engineers

Duke Power®
A Duke Energy Company

PROCUREMENT, CONSTRUCTION AND EH&S

Duke Power
EC11E / P.O. Box 1006
Charlotte, NC 28201-1006

March 17, 2005

Ms. Andrea Wade
United States Army Corps of Engineers
Raleigh Regional Field Office
6508 Falls of Neuse Road
Suite 120
Raleigh, NC 27615

Subject: Request for a Jurisdictional Review at Belews Creek Steam Station

Dear Ms. Wade:

Duke Power is in the process of planning for the installation of a Flue Gas Desulfurization System, which will be installed to comply with the new North Carolina Clean Smokestacks legislation at Duke Power's Belews Creek Steam Station in southeastern Stokes County, North Carolina. Several facilities will need to be upgraded or added to the plant. Duke Power is in the process of engineering and environmental planning for additional facilities. As part of the planning, Duke Power contracted to conduct a biological inventory, including waters, wetlands, and a rare, threatened and endangered species inventory, of a study area where additional facilities may be necessary. A copy of the waters and wetlands inventory is attached. The area is located in the Belews Lake/Dan River Drainage (Belews Lake, NC USGS 7.5 minute map).

I would like to schedule a review of the jurisdictional status of potential stream channels and wetlands as soon as your schedule permits. I will coordinate your visit with appropriate personnel from NC Department of Environment and Natural Resources. If you have questions, please call me at (980) 373-5710.

Sincerely,

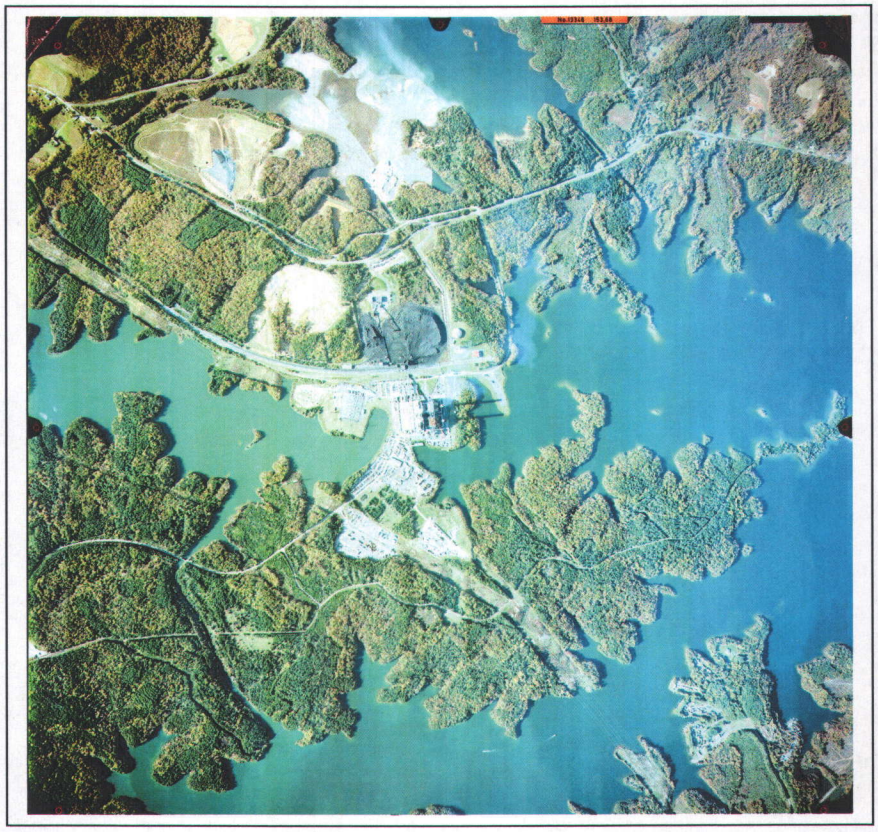
Ron Lewis

Ron Lewis, Senior Scientist
Environmental Support

Attachments

cc: Mr. John Dorney
NC DENR/Division of Water Quality,
Wetlands Unit,
1650 Mail Service Center,
Raleigh, NC 27699-1650

DUKE POWER
CHARLOTTE, NORTH CAROLINA



BIOLOGICAL INVENTORY OF BELEWS CREEK STEAM STATION LANDS ASSOCIATED WITH INSTALLATION OF A FLUE GAS DESULFURIZATION SYSTEM

March 2005

Prepared by:

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7550 Forest Oak Drive
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INTRODUCTION

Duke Power is planning for facility expansions associated with the installation of a Flue Gas Desulfurization System at Belews Creek Steam Station in Stokes County, NC. The system is necessary to meet the air emission standards for the new NC Clean Smokestacks legislation. As part of this planning process, they contracted for a biological inventory of a study area that would emcompass feasible areas for required future facilities. The inventory included a characterization of potential waters and wetland and a description of plant communities and animal habitats, with a special emphasis on protected plant and animal species.

The study area (Figures 1 and 2) was inventoried over a period of September 2004 to March 2005, with information included from previous inventories in October and December 2002. During the field inventory, potential wetlands within the study areas (Figures 3 through 6) were evaluated using the 1987 US Army Corps of Engineers "Routine On-Site Determination Method" (Environmental Laboratory 1987). Wetlands were considered present when observations of vegetation, hydrology, and soils indicated that the three-parameter criteria for wetland identification were met, but because of past disturbances in the study area, consideration was given to past land uses (see Figures 3 and 7). Wetlands found in the area were characterized using Data 1 Forms and boundaries were marked, where appropriate, with survey ribbon and photographed. Stream channels were evaluated using the US Army Corp of Engineers' "Intermittent Channel Evaluation Form" and photographed. Data and key photographs are included in this report.

The vegetation communities of the study area were characterized and areas where potential rare plant or animal habitats may occur were thoroughly searched for rare species. Species list, community characteristics, and photographs of representative communities are provided in the report.

OVERVIEW

The study area for potential facility expansions included a variety of habitats from old fields to relatively mature oak-hickory forests. Much of the area has been disturbed from construction of the plant and associated transmission lines in the late 1960-early 1970's. Construction yards established during initial construction have been reused as recently as 2002.

The topography and hydrology of the study area are such that no perennial streams are present, and wetlands would not be expected to occur here. Land disturbances from initial construction required substantial grading (Figures 6 and 7) and these disturbances resulted in diversion, and in

some cases ponding, of ephemeral or intermittent channels to route water around construction yards. In some cases these activities blocked drainages, which inhibited natural flows; in many cases soils are extremely compacted and hold surface water. After a period of 35 years, some areas, primarily in places where it was necessary to alter water courses around construction activities and laydown yards, hydric soils, hydrophytic vegetation, and wetlands hydrology have developed. These areas, because of their proximity to construction yards and the station, offer opportunities for facility expansion. This is the case for potential wetlands W-1, W-2, W-3, W-3a, W-4, W-5, and W-6 (Table 1 and Figures 4, 5, and 8 through 29) and associated intermittent channels or diversion ditches (Table 2 and Figures 30 through 60). Similarily, W-7 results from substantial instream erosion (probably from activities associated with excavation of the connecting canal between the Belews Lake basins), W-8 from grading associated with the clearing of the right-of-way for a transmission line, and W-11 from a stormwater drain to Belews Lake from the main access road. These circumstances lead to difficult agency jurisdictional determinations.

Certain areas within the drainage area of the Station's ash basin wastewater treatment system were not evaluated for wetlands as soil were primarily ash, hydrology from the impounded basin. Additionally, they were connected to the NPDES permitted basin.

Vegetation communities of the study area are relatively undisturbed oak-hickory stands, natural pine stands that succeeded from past farm fields, pine plantations, and early succession openings such as right-of-ways and recent clearing. No unique habitats were found and no rare species were observed.

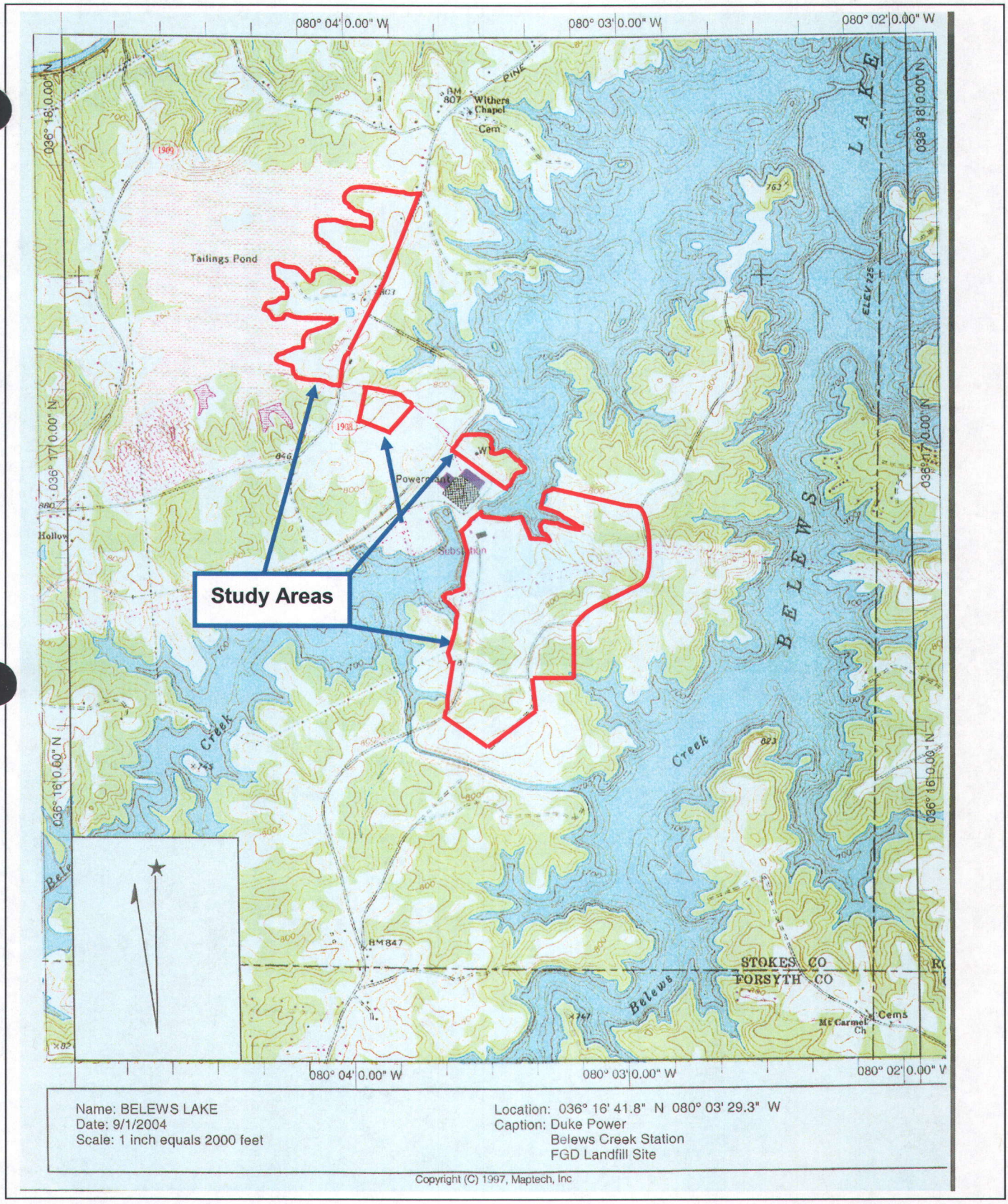

Figure 1. Portion of the Belews Lake USGS 7.5 minute map, showing the approximate boundary of the study area for facility expansions associated with the installation of a Flue Gas Desulfurization System at Belews Creek Steam Station in Stokes County, NC.

Figure 2. Aerial photograph of Belews Creek Steam Station taken in 2003 with the rough boundary of the study area for a Flue Gas Desulfurization identified.

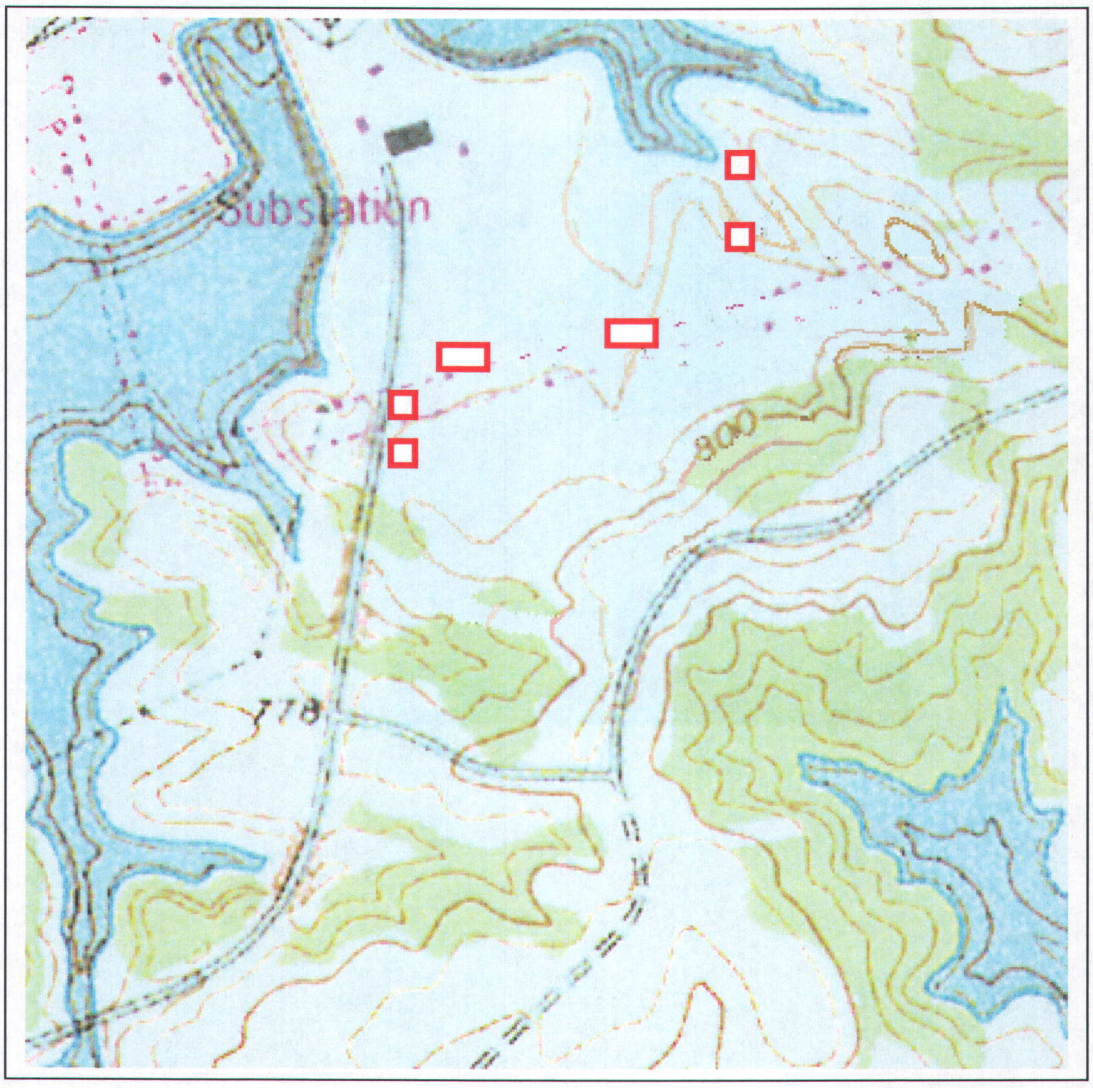

Figure 3. Approximate location of past and current sediment basins, excluding those used during initial construction of Belews Creek Steam Station.

WETLANDS

Table 1. Summary characteristics of areas investigated for jurisdictional wetlands.

Plot Number	Associated Water	Vegetation	Soils	Hydrology	Jurisdictional Wetland
W-1	Ditch/Blocked Drainage	Yes	Yes	No	No[1]
W-2	Sediment Basin / Ditch-Diversion / Ephemeral Channel	Yes	Yes	Yes	No[1]
W-3	Ditch-Diversion/Blocked Drainage	Yes	No	Yes	No[1]
W-3a	Ditch-Diversion/Blocked Drainage	Yes	Yes	?	Not-Probable[1]
W-4	Ditch-Diversion/Blocked Drainage	Yes	Yes	Yes	Not-Probable[1]
W-5	Ditch-Diversion/Blocked Drainage	Yes	Yes	Yes	Not-Probable[1]
W-6	Ditch-Diversion/Blocked Drainage	Yes	Yes	Yes	No[1]
W-7	Unimportant Channel	Yes	Yes	Yes	Yes[2]
W-8	Ephemeral Channel	Yes	Yes	?	Probable[2]
W-9	Upland Farm Pond	Yes	?	Yes	No
W-10	Coal Storage	Yes	No	Yes	No[3]
W-12	Stormwater Drain to Lake	Yes	Yes	Yes	No[4]

[1]Previous cut and fill and used as a construction yard.
[2]Isolated wetland
[3]NPDES permitted discharge
[4]Hydrology from storm drain from road

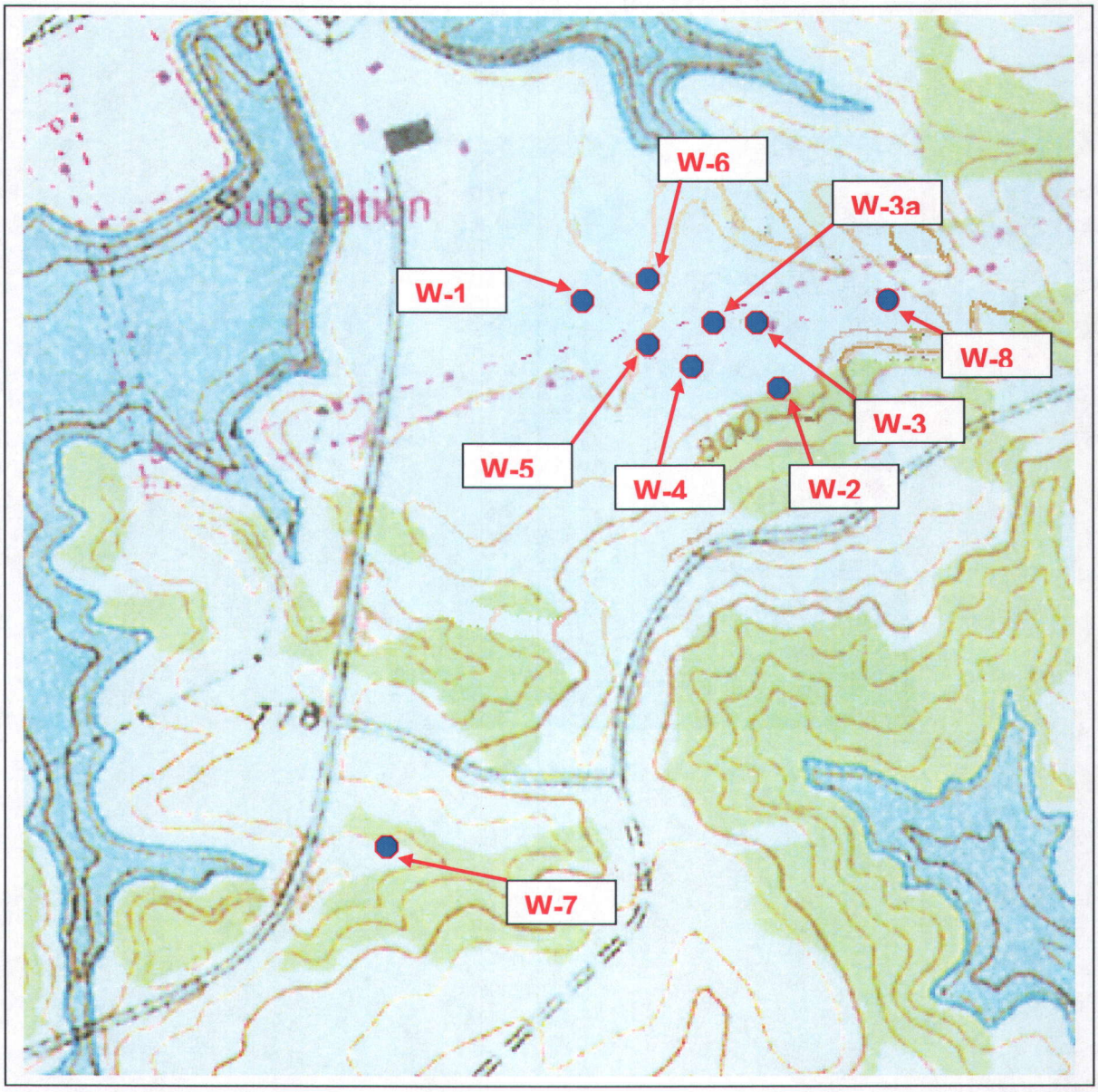

Figure 4. Approximate locations of areas investigated for wetland in the study area for facility expansion associated with the installation of a Flue Gas Desulfurization System at Belews Creek Steam Station.

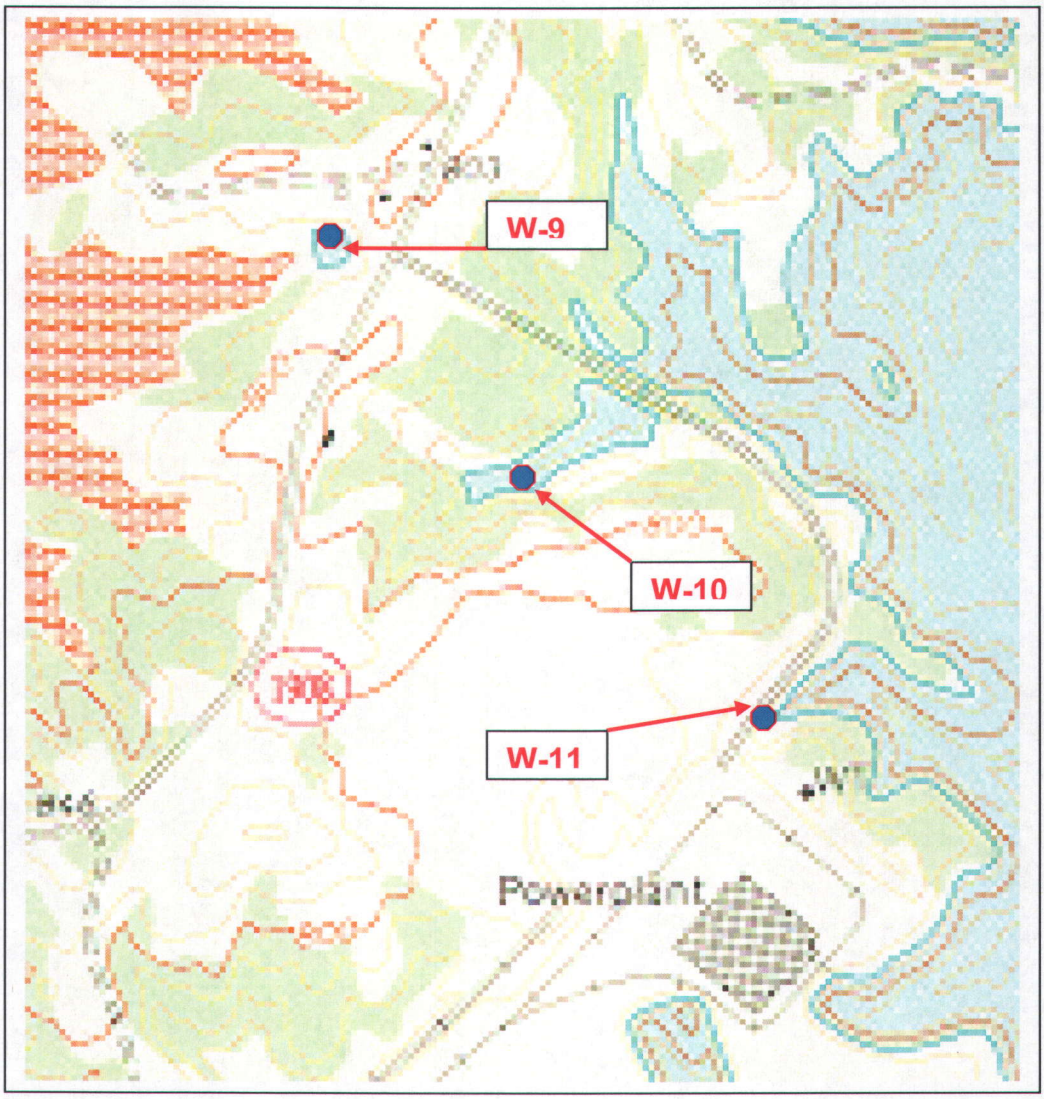

Figure 5. Additional areas investigated for wetlands in the study area for facility expansion associated with the installation of a Flue Gas Desulfurization System at Belews Creek Steam Station.

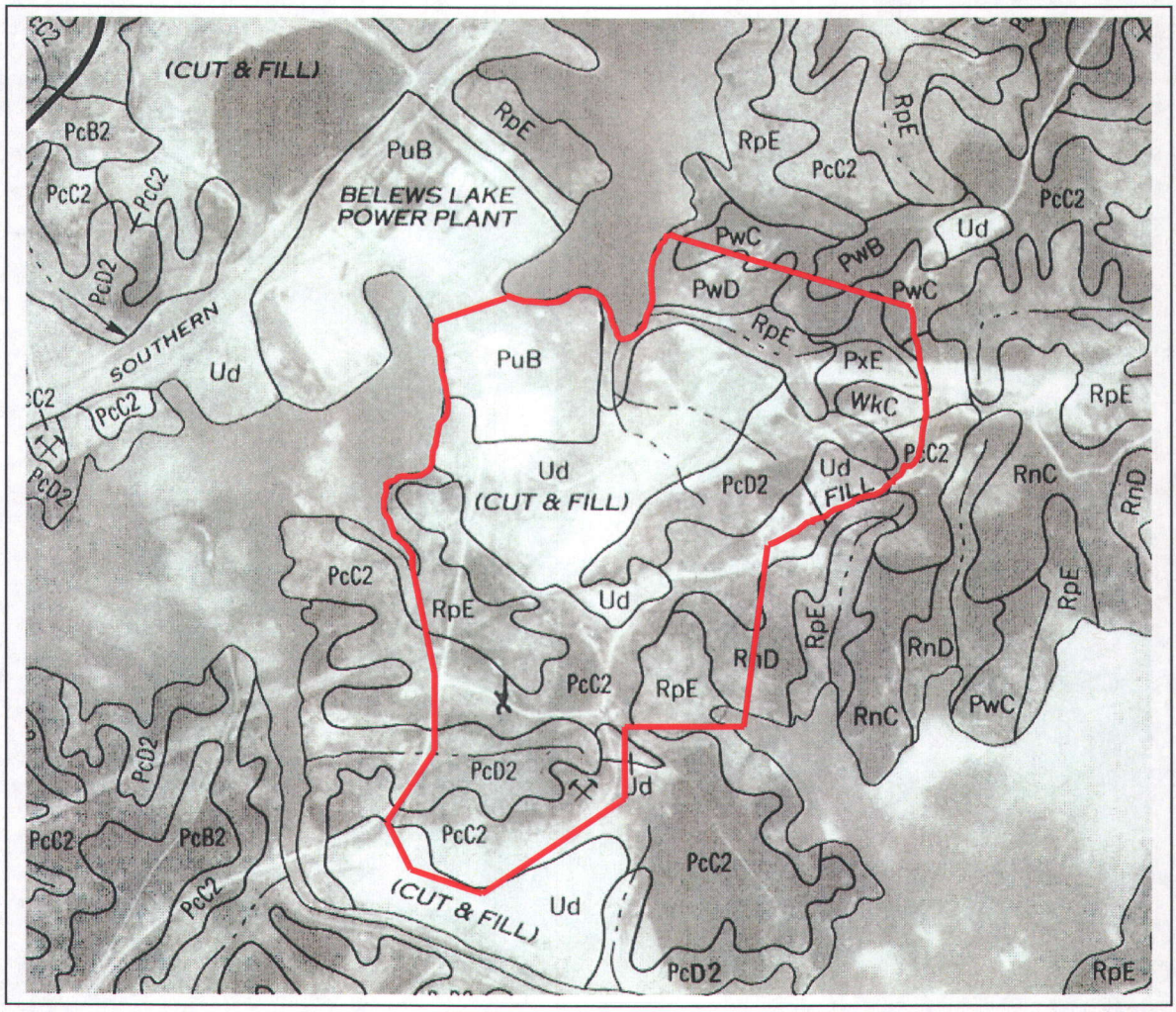

Figure 6. Soil map showing the approximate area where the majority of potential wetlands were found in the study area for facility expansion, associated with a Flue Gas Desulfurization System for Belews Creek Steam Station in Stokes County, NC.

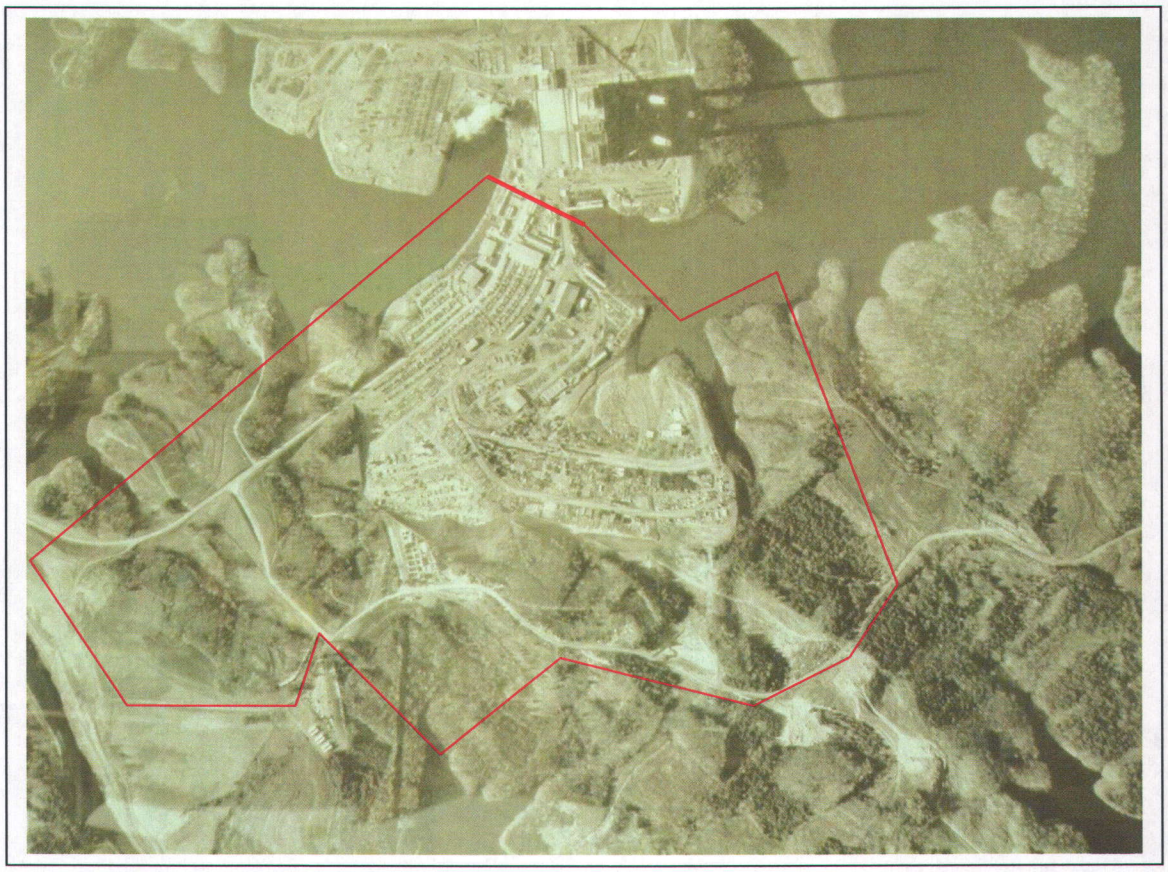

Figure 7. Aerial photograph from December 1973 during construction of Belews Creek Steam Station, showing land disturbances during construction.

DATA FORM 1
WETLAND DETERMINATION

Applicant Name: Duke Power
Project Name: Belews Creek Steam Station, Flue Gas Desulfurization System
State: NC . County: Stokes . Date: 9/10/04. Section: Belews Lake, USGS 7.5-minute map
Transect and Plot No.: W-1 (Figures 4, 8, and 9).

Vegetation

Species	Indicator status	Species	Indicator status
Trees		**Herbs**	
Pinus taeda	FAC	*Microstegium vimineum*	FAC+
Saplings/shrubs		*Scirpus cyperinus*	OBL
Liquidambar styraciflua	FAC+	*Bidens aristosa*	FACW
Liriodendron tulipifera	FAC	*Lespedeza cuneata*	NI
Platanus occidentalis	FACW-	**Woody vines**	
		Vitis rotundifolia	FAC

% of species that are OBL, FACW, and/or FAC: 100% .Other indicators:
Hydrophytic vegetation: Yes: X .No: .Basis: % of FAC and wetter,

Soil
Series and phase: Mapped- Ud-Udorthents, loamy (Cut and Fill) .
Mottled: Yes: X No: .
Mottled color: 10YR5/6 @12 inches ; Matrix color: 10YR7/2 @ 12 inches.
Gleyed: Yes: . No: X . Other indicators: None.
Hydric soils: Yes: X . No: . Basis: Chroma <2 .

Hydrology
Inundated: Yes: . No: X .
Depth of standing water: Isolated pockets in ditch (S-4a) .
Saturated soils: Yes: No: X , except in channel .
Depth to saturated soil: None.
Other indicators: None .
Wetland hydrology: Yes: No: X . Basis: No saturated or inundated soils.
Atypical situation: Yes: X No: .
Normal Circumstances? Yes: No: X .

Wetland Determination: Wetland: Non-wetland: X .
Comment: Area is isolated and not considered a water of the US. Not considered water of the state because hydrology, when present, is the result of blocked drainages from construction yards, man-made ditches, and an associated sediment basin. Soils are variable due to past cut and fill.

Determined by: Robert Siler
Environmental Resources of the Carolinas
7550 Forest Oak Drive,
Denver, NC 28037
(704) 483-0972

Figure 8. Vegetation at wetland sampling station W-1, as observed on September 10, 2004.

Figure 9. Soils at 8-14 inches deep at wetlands sampling station W-1, as observed on September 10, 2004. Soil matrix was classified as 10YR7/2 and mottles were 10YR5/6. Soil profiles are variable from previous cut and fill.

DATA FORM 1
WETLAND DETERMINATION

Applicant Name: Duke Power
Project Name: Belews Creek Steam Station, Flue Gas Desulfurization System
State: NC . County: Stokes . Date: 9/10/04. Section: Belews Lake, USGS 7.5-minute map
Transect and Plot No.: W-2 (Figures 4, 10, and 11).

Vegetation
Vegetation: Algae ; % of species that are OBL, FACW, and/or FAC: 100% .
Other indicators: No emergent vegetation; algae is the primary vegetation.
Hydrophytic vegetation: Yes: X .No: .Basis: % of FAC and wetter,

Soil
Series and phase: Mapped- Pacolet sandy clay loam .
Mottled: Yes: X No: .
Mottled color: ; Matrix color: 2.5Y5/3 @ 6"+; 2.5Y3/1 at 0-6".
Gleyed: Yes: . No: X . Other indicators: None.
Hydric soils: Yes: X . No: . Basis: Chroma <2 .

Hydrology
Inundated: Yes: X . No: .
Depth of standing water: Greater than 8 inches .
Saturated soils: Yes: X No: .
Depth to saturated soil: 12 in. .
Other indicators: None .
Wetland hydrology: Yes: X No: . Basis: Inundated soils.
Atypical situation: Yes: X No: .
Normal Circumstances? Yes: No: X .

Wetland Determination: Wetland: Non-wetland: X .
Comment: Area is a constructed basin during early construction of the plant that receives water from two manmade diversion ditches and an ephemeral channel. Not considered water of the US.

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Denver, NC 28037
(704) 483-0972

Figure 10. Inundated area, W-2, that is the result of past use as a collection basin, as observed on September 10, 2004. Area receives water from two ditch systems (S-1 and 3) that divert water from construction yards and from an ephemeral stream channel (S-2).

Figure 11. Soils at 0-8 inches deep at wetlands sampling station W-2, as observed on March 4, 2005. Soil matrix was classified as 2.5Y3/1 at 0-6" and 2.5Y5/3 at 6".

DATA FORM 1
WETLAND DETERMINATION

Applicant Name: Duke Power
Project Name: Belews Creek Steam Station, Flue Gas Desulfurization System
State: NC . County: Stokes . Date: 9/10/04. Section: Belews Lake, USGS 7.5-minute map
Transect and Plot No.: W-3 (Figures 4, 12, and 13).

Vegetation

Species	Indicator status	Species	Indicator status
Trees		**Herbs**	
None		*Scirpus cyperinus*	OBL
		Ludwigia alternifolia	OBL
Saplings/shrubs		*Juncus effusus*	FACW+
Salix nigra	OBL	*Eupatorium hyssopifolium*	U
		Woody vines	
		None	

% of species that are OBL, FACW, and/or FAC: 80% .Other indicators:
Hydrophytic vegetation: Yes: X .No: .Basis: % of FAC and wetter,

Soil
Series and phase: Mapped- Ud Udorthents, loamy (Cut and Fill) .
Mottled: Yes: No: X .
Mottled color: ; Matrix color: 10YR6/4 @ 3 in..
Gleyed: Yes: . No: X . Other indicators: Soil compacted from vehicle traffic; soils heavily graveled from stone placement.
Hydric soils: Yes: . No: X . Basis: Chroma >2 .

Hydrology
Inundated: Yes: X . No: .
Depth of standing water: 2 inches .
Saturated soils: Yes: X (at surface) No: .
Depth to saturated soil: Heavy gravel prevented digging of pit.
Other indicators: None .
Wetland hydrology: Yes: X No: . Basis: Saturated and inundated soils.
Atypical situation: Yes: X No: .
Normal Circumstances? Yes: No: X .

Wetland Determination: Wetland: Non-wetland: X .
Comment: Area is isolated and not considered a water of the US. Area appears to be past construction access road and construction yard as hydrology appears to occurs as result of vehicle traffic and resulting compacted soil. Area contains heavily graveled soil, apparently placed for an access road or construction yard. Area has been cut and filled during past construction. Hydrology apparently enhanced by Hurricane Francis, which passed through the area on September 8, 2004.

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7550 Forest Oak Drive, Denver, NC 28037, (704) 483-0972

Figure 12. Area W-3 that is apparently the result of vehicle traffic on a graveled area, as observed on September 10, 2004. Area is part of access for past, adjacent construction yards and part of construction yard.

Figure 13. Soils at 3 inches deep at wetlands sampling station W-3, as observed on September 10, 2004. Soil matrix was classified as 10YR4/6 and was heavily graveled.

DATA FORM 1
WETLAND DETERMINATION

Applicant Name: Duke Power
Project Name: Belews Creek Steam Station, Flue Gas Desulfurization System
State: NC . County: Stokes . Date: 9/10/04. Section: Belews Lake, USGS 7.5-minute map
Transect and Plot No.: W-3a (Figures 4, 14, and 15).

Vegetation

Species	Indicator status	Species	Indicator status
Trees		**Herbs**	
None		*Panicum* spp.	FAC
		Juncus effusus	FACW+
Saplings/shrubs		*Eupatorium hyssopifolium*	U
Alnus serrulata	FACW+	*Asclepias incarnata*	OBL
Diospyros virginiana	FAC	**Woody vines**	
		Lonicera japonica	FAC-

% of species that are OBL, FACW, and/or FAC: 83% .Other indicators:
Hydrophytic vegetation: Yes: X .No: .Basis: % of FAC and wetter,

Soil
Series and phase: Mapped- Ud Udorthents, loamy (Cut and Fill) .
Mottled: Yes: No: X .
Mottled color: ; Matrix color: 10YR7/2 @ 8 inches; 10YR7/4 @ 6 inches.
Gleyed: Yes: . No: X . Other indicators: .
Hydric soils: Yes: X . No: . Basis: Chroma = or <2 .

Hydrology
Inundated: Yes: . No: X .
Depth of standing water: None . .
Saturated soils: Yes: X No: .
Depth to saturated soil: 0-4 in/ not below/ soils compacted .
Other indicators: None .
Wetland hydrology: Yes: No: X . Basis: No deep saturation; previous heavy rainfall.
Atypical situation: Yes: X No: .
Normal Circumstances? Yes: No: X .

Wetland Determination: Wetland: Non-wetland: X .
Comment: Area is isolated and not considered a water of the US. Hydrology apparently enhanced by Hurricane Francis which passed through the area on September 8, 2004; uncertain if hydrology is met during the growing season. Drainage from the area is blocked by construction access road. Area is part of cut and fill associated with construction activities; soils compacted. Little development of hydric soils.

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Figure 14. Area W-3a that is the result of blocked drainage from a construction access road, as observed on September 10, 2004. Hydrology is likely associated with rainfall from Hurricane Francis, which passed through the area on September 8, 2004. Soils compacted from past construction activities.

Figure 15. Soils at 0-6 inches deep at wetlands sampling station W-3a, as observed on September 10, 2004. Soil matrix was classified as 10YR7/4 at 6 in. and 10YR7/2 at 8 inches.

DATA FORM 1
WETLAND DETERMINATION

Applicant Name: Duke Power
Project Name: Belews Creek Steam Station, Flue Gas Desulfurization System
State: NC . County: Stokes . Date: 9/10/04. Section: Belews Lake, USGS 7.5-minute map
Transect and Plot No.: W-4 (Figures 4, 16, and 17).

Vegetation

Species	Indicator status	Species	Indicator status
Trees		**Herbs**	
None		*Scirpus cyperinus.*	OBL
		Typha latifolia	OBL
Saplings/shrubs		*Cyperus strigosus*	FACW
Alnus serrulata	FACW+	*Asclepias incarnata*	OBL
Salix nigra	OBL	**Woody vines**	
		Lonicera japonica	FAC-

% of species that are OBL, FACW, and/or FAC: 86% .Other indicators:
Hydrophytic vegetation: Yes: X .No: .Basis: % of FAC and wetter,

Soil
Series and phase: Mapped- Ud Udorthents, loamy (Cut and Fill) .
Mottled: Yes: No: X .
Mottled color: ; Matrix color: 5BG6/1.
Gleyed: Yes: X . No: . Other indicators: .
Hydric soils: Yes: X . No: . Basis: Gleyed soils .

Hydrology
Inundated: Yes: X . No: .
Depth of standing water: >8 inches .
Saturated soils: Yes: X No: .
Depth to saturated soil: 12 in. .
Other indicators: None .
Wetland hydrology: Yes: X No: . Basis: Inundated and saturated soils.
Atypical situation: Yes: X No: .
Normal Circumstances? Yes: No: X .

Wetland Determination: Wetland: Non-wetland: ? .
Comment: Area is isolated and not considered a water of the US. Area meets all wetland criteria. Hydrology results from a blocked drainage from a construction access road and part of network of ditches to a past sediment basin. Major portion of wetland is under a electric transmission structure.

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Figure 16. Area W-4 that is the result of blocked drainage from a construction access road (on right side of tower), as observed on September 10, 2004.

Figure 17. Soils at 0-6 inches deep at wetlands sampling station W-4, as observed on September 10, 2004. Soil matrix was classified as 5BG6/1.

DATA FORM 1
WETLAND DETERMINATION

Applicant Name: Duke Power
Project Name: Belews Creek Steam Station, Flue Gas Desulfurization System
State: NC . County: Stokes . Date: 9/14/04. Section: Belews Lake, USGS 7.5-minute map
Transect and Plot No.: W-5 (Figures 4, 18, and 19).

Vegetation

Species	Indicator status	Species	Indicator status
Trees		**Herbs**	
Pinus taeda	FAC	*Juncus canadensis*	OBL
		Agalinis purpurea	FAC
Saplings/shrubs		*Fuirena squarrosa*	OBL
Alnus serrulata	FACW+	*Bidens aristosa*	FACW
		Woody vines	
		None	

% of species that are OBL, FACW, and/or FAC: 100% .Other indicators:
Hydrophytic vegetation: Yes: X .No: .Basis: % of FAC and wetter,

Soil
Series and phase: Mapped- Ud Udorthents, loamy (Cut and Fill) .
Mottled: Yes: No: X .
Mottled color: ; Matrix color: Variable profile (See Figure 19) 5GY6/1 at 10 inches.
Gleyed: Yes: X . No: . Other indicators: Oxidized root channels at 6 inches .
Hydric soils: Yes: X . No: . Basis: Gleyed soils .

Hydrology
Inundated: Yes: X . No: .
Depth of standing water: 2 inches .
Saturated soils: Yes: X (mainly at surface) No: .
Depth to saturated soil: Mainly at surface due to compacted soils .
Other indicators: None .
Wetland hydrology: Yes: X No: . Basis: Inundated and saturated soils.
Atypical situation: Yes: X No: .
Normal Circumstances? Yes: No: X .

Wetland Determination: Wetland: Non-wetland: ? .
Comment: Area is isolated and not considered a water of the US. Area meets all wetland criteria. Hydrology appears enhanced due to Hurricane Francis. Major portion of wetland is around an electric transmission structure; hydrology is from blocked drainage through and over a transmission access road fill.

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Figure 18. Area W-5 that is the result of blocked drainage from a diversion to a sediment basin, as observed on September 14, 2004.

Figure 19. Soils at 0-6 inches deep at wetlands sampling station W-5, as observed on September 14, 2004. Soil profile was variable. Soil matrix was classified as 2.5Y5/1 at 6 inches and 5GY6/1 at 10 inches with inlayed sand and clay.

DATA FORM 1
WETLAND DETERMINATION

Applicant Name: Duke Power
Project Name: Belews Creek Steam Station, Flue Gas Desulfurization System
State: NC . County: Stokes . Date: 9/14/04. Section: Belews Lake, USGS 7.5-minute map
Transect and Plot No.: W-6 (Figures 4, 20, and 21).

Vegetation

Species	Indicator status	Species	Indicator status
Trees		**Herbs**	
Pinus taeda	FAC	*Juncus canadensis*	OBL
		Typha latifolia	OBL
Saplings/shrubs		*Fuirena squarrosa*	OBL
Alnus serrulata	FACW+	*Bidens aristosa*	FACW
		Woody vines	
		None	

% of species that are OBL, FACW, and/or FAC: 100% .Other indicators:
Hydrophytic vegetation: Yes: X .No: .Basis: % of FAC and wetter,

Soil
Series and phase: Mapped- Ud Udorthents, loamy (Cut and Fill) .
Mottled: Yes: No: X .
Mottled color: ; Matrix color: Variable profile (See Figure 21) 5GY6/1 at 10 inches.
Gleyed: Yes: X . No: . Other indicators: Oxidized root channels at 6 inches .
Hydric soils: Yes: X . No: . Basis: Gleyed soils .

Hydrology
Inundated: Yes: X . No: .
Depth of standing water: 2 inches .
Saturated soils: Yes: X (mainly at surface) No: .
Depth to saturated soil: Mainly in top 3 inches except in basin .
Other indicators: None .
Wetland hydrology: Yes: X No: . Basis: Inundated and saturated soils.
Atypical situation: Yes: X No: .
Normal Circumstances? Yes: No: X .

Wetland Determination: Wetland: Non-wetland: ? .
Comment: Area is isolated and not considered a water of the US. Area meets all wetland criteria. Hydrology results from diversion of water from adjacent construction yards and upslope sediment basin (now removed). Hydrology appears more prevalent due to Hurricane Francis.

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Figure 20. Area W-6 that is the result of upslope sediment basin and blocked drainages during construction, as observed on September 14, 2004.

Figure 21. Soils at 0-6 inches deep at wetlands sampling station W-6, as observed on September 14, 2004. Soil profile was variable. Soil matrix was classified as 10YR6/1 at 3 inches and 7.5YR5/6 at 5 inches.

DATA FORM 1
WETLAND DETERMINATION

Applicant Name: Duke Power
Project Name: Belews Creek Steam Station, Flue Gas Desulfurization System
State: NC . County: Stokes . Date: 12/19/02. Section: Belews Lake, USGS 7.5-minute map
Transect and Plot No.: W-7 (Figures 4 and 22).

Vegetation

Species	Indicator status	Species	Indicator status
Trees		**Herbs**	
Acer rubrum	FAC	*Boehmeria cylindrica*	FACW+
Salix nigra	OBL	*Carex* spp.	FAC
Betula nigra	FACW+	*Microstegium vimineum*	FAC+
Saplings/shrubs		**Woody vines**	
Fraxinus pennsylvanica	FACW	*Lonicera japonica*	FAC-
Carpinus caroliniana	FAC		
Alnus serrulata	FACW		

% of species that are OBL, FACW, and/or FAC: 90% .Other indicators:
Hydrophytic vegetation: Yes: X .No: .Basis: % of FAC and wetter,

Soil
Series and phase: Mapped- Pacolet sandy clay loam-Adjacent Upland 10YR5/2; Wetlands: 5G4/1 to 5G7/1 .
Mottled: Yes: No: X .
Mottled color: ; Matrix color: .
Gleyed: Yes: X . No: . Other indicators: Oxidized root channels.
Hydric soils: Yes: X . No: . Basis: Gleyed soils 5G4/1 to 5G7/1 .

Hydrology
Inundated: Yes: X . No: .
Depth of standing water: 2 feet-variable .
Saturated soils: Yes: X No: .
Depth to saturated soil: 12 inches .
Other indicators: .
Wetland hydrology: Yes: X No: . Basis: Inundated.
Atypical situation: Yes: X No: .
Normal Circumstances? Yes: No: X .

Wetland Determination: Wetland: X Non-wetland: .
Comment: Unimportant channel blocked by sediment deposition, likely from previous changes in drainage and from fill during construction of channel connecting basins, as indicated by upstream erosion. Area of inundation variable based on annual rainfall. Hydric soils well developed: vegetation less developed due to variable hydrology and scouring. Boundary and channel reviewed by Todd Tugwell, USACOE.

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Figure 22. Area W-7 located within the channel of an unimportant channel (S-7) to Belews Lake, as observed on December 18, 2002.

DATA FORM 1
WETLAND DETERMINATION

Applicant Name: Duke Power
Project Name: Belews Creek Steam Station, Flue Gas Desulfurization System
State: NC . County: Stokes . Date: 3/4/2005. Section: Belews Lake, USGS 7.5-minute map
Transect and Plot No.: W-8 (Figures 4, 23, and 24).

Vegetation

Species	Indicator status	Species	Indicator status
Trees		**Herbs**	
Salix nigra	OBL	*Boehmeria cylindrica*	FACW+
Salix spp.	OBL	*Carex* spp.	FAC
		Microstegium vimineum	FAC+
Saplings/shrubs		*Polygonum sagittatum*	OBL
Alnus serrulata	FACW		
		Woody vines	
		Lonicera japonica	FAC-

% of species that are OBL, FACW, and/or FAC: 88% .Other indicators:
Hydrophytic vegetation: Yes: X .No: .Basis: % of FAC and wetter,

Soil
Series and phase: Mapped- Pacolet sandy clay loam.
Mottled: Yes: No: X .
Mottled color: ; Matrix color: 2.5Y5/2@ 0-5 inches; 2.5Y6/3 at 5+ inches.
Gleyed: Yes: . No: X . Other indicators: Oxidized root channels.
Hydric soils: Yes: X . No: . Basis: Chroma = or <2 .

Hydrology
Inundated: Yes: X . No: .
Depth of standing water: 1 inch .
Saturated soils: Yes: X No: .
Depth to saturated soil: 12 inches .
Other indicators: .
Wetland hydrology: Yes: X No: . Basis: Inundated and saturated soil.
Atypical situation: Yes: X No: .
Normal Circumstances? Yes: No: X .

Wetland Determination: Wetland: ? Non-wetland: .
Comment: Wetland located at head of a swale that leads across a transmission r/w. Drainage has been altered from construction of the line and grubbing of the r/w in the 1970's, allowing retention of water in the r/w. Fill placed in swale during early construction. Hydrology enhanced by recent snowmelt .

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Figure 23. Area W-8 located within a transmission right-of-way and at the head of a swale that drains to a diversion ditch (S-3) around a past construction yard, as observed on March 4, 2005. Hydrology enhanced due to recent snowmelt.

Figure 24. Soils at 0-6 inches deep at wetlands sampling station W-8, as observed on March 4, 2005. Soil matrix was classified as 2.5Y5/2 @ 0-5 inches and 2.5Y6/3 at 5 + inches.

DATA FORM 1
WETLAND DETERMINATION

Applicant Name: Duke Power
Project Name: Belews Creek Steam Station, Flue Gas Desulfurization System
State: NC . County: Stokes . Date: 3/10/2005. Section: Belews Lake, USGS 7.5-minute map Transect and Plot No.: W-9 (Figures 5, 25, and 26).

Vegetation

Species	Indicator status	Species	Indicator status
Trees		**Herbs**	
Betula nigra	FACW	*Carex* spp.	FAC
Acer rubrum	FAC		
Saplings/shrubs			
		Woody vines	

% of species that are OBL, FACW, and/or FAC: 100% .Other indicators:
Hydrophytic vegetation: Yes: X .No: .Basis: % of FAC and wetter,

Soil
Series and phase: Mapped- Pacolet sandy clay loam.
Mottled: Yes: No: X .
Mottled color: ; Matrix color: 2.5Y5/3 at 6 inches.
Gleyed: Yes: . No: X . Other indicators: Oxidized root channels.
Hydric soils: Yes: . No: X . Basis: Chroma >2 .

Hydrology
Inundated: Yes: X . No: .
Depth of standing water: >1 foot .
Saturated soils: Yes: X No: .
Depth to saturated soil: 12 inches .
Other indicators: .
Wetland hydrology: Yes: X No: . Basis: Inundated and saturated soil.
Atypical situation: Yes: X No: .
Normal Circumstances? Yes: No: X .

Wetland Determination: Wetland: Non-wetland: X .
Comment: Farm pond with no channel in or out of pond. .

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Figure 25. Farm pond (W-9) investigated as water of US, as observed on March 10, 2005. No channel is apparent into or out of the pond.

Figure 26. Soils at 0-6 inches deep at wetlands sampling station W-9, as observed on March 10, 2005. Soil matrix was classified 2.5Y5/3 @ 6 inches with oxidized root channels.

DATA FORM 1
WETLAND DETERMINATION

Applicant Name: Duke Power
Project Name: Belews Creek Steam Station, Flue Gas Desulfurization System
State: NC . County: Stokes . Date: 3/10/2005. Section: Belews Lake, USGS 7.5-minute map Transect and Plot No.: W-10 (Figures 5 and 27).

Vegetation

Species	Indicator status	Species	Indicator status
Trees		**Herbs**	
Pinus taeda	FAC	*Carex* spp.	FAC
Pinus virginiana	Upland	*Scirpus cyperinus.*	OBL
Liriodendron tulipifera	FAC	*Rubus* spp.	FAC
Saplings/shrubs			
Liquidambar styraciflua	FAC+		
Salix nigra	OBL	**Woody vines**	
		Lonicera japonica	FAC-

% of species that are OBL, FACW, and/or FAC: 78% .Other indicators:
Hydrophytic vegetation: Yes: X .No: .Basis: % of FAC and wetter,

Soil
Series and phase: Mapped- Ud Udorthents, loamy (Cut and Fill.
Mottled: Yes: No: X .
Mottled color: ; Matrix color: Surface soils are coal residue.
Gleyed: Yes: . No: X . Other indicators: None.
Hydric soils: Yes: . No: X . Basis: Lack of soils .

Hydrology
Inundated: Yes: X . No: .
Depth of standing water: <6 inches .
Saturated soils: Yes: X No: .
Depth to saturated soil: 12 inches .
Other indicators: .
Wetland hydrology: Yes: X No: . Basis: Inundated and saturated soil.
Atypical situation: Yes: X No: .
Normal Circumstances? Yes: No: X .

Wetland Determination: Wetland: Non-wetland: X .
Comment: Area is basin for collection and routing of water from coal storage. Area is a permitted NPDES discharge .

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Figure 27. Area W-10 is located within the area of coal storage for Belews Creek Steam Station, as observed on December 14, 2004. Discharge for coal storage is part of plant NPDES discharge permit. Soils are primarily coal residue.

DATA FORM 1
WETLAND DETERMINATION

Applicant Name: Duke Power
Project Name: Belews Creek Steam Station, Flue Gas Desulfurization System
State: NC . County: Stokes . Date: 3/10/2005. Section: Belews Lake, USGS 7.5-minute map Transect and Plot No.: W-11 (Figures 5, 28, and 29).

Vegetation

Species	Indicator status	Species	Indicator status
Trees		**Herbs**	
Acer rubrum	FAC	*Festuca* spp.	FAC-
Liriodendron tulipifera	FAC	*Solidago* spp.	FAC
		Rubus spp.	FAC
Saplings/shrubs			
Alnus serrulata	FACW+		
		Woody vines	
		Lonicera japonica	FAC-

% of species that are OBL, FACW, and/or FAC: 71% .Other indicators:
Hydrophytic vegetation: Yes: X .No: .Basis: % of FAC and wetter,

Soil
Series and phase: Mapped- Ud Udorthents, loamy (Cut and Fill.
Mottled: Yes: No: X .
Mottled color: ; Matrix color: 2.5Y2/0 at 0-6 inches.
Gleyed: Yes: . No: X . Other indicators: None.
Hydric soils: Yes: X . No: . Basis: chroma <2 .

Hydrology
Inundated: Yes: X . No: .
Depth of standing water: <2 inches .
Saturated soils: Yes: X No: .
Depth to saturated soil: 12 inches .
Other indicators: .
Wetland hydrology: Yes: X No: . Basis: Inundated and saturated soil.
Atypical situation: Yes: X No: .
Normal Circumstances? Yes: No: X .

Wetland Determination: Wetland: Non-wetland: ? .
Comment: Area is the confluence of a storm drain from the adjacent road and Belews Lake. Areas above the full pool elevation of Belews Lake was not considered a water of the US because drainage is from storm drain.

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Figure 28. Area W-11 is located at the confluence of a storm drain through a road fill and Belews Lake, as observed on March 10, 2005.

Figure 29. Soils at 0-6 inches deep at wetlands sampling station W-11, as observed on March 10, 2005. Soil matrix was classified 2.5Y2/0 @ 0-8 inches.

INTERMITTENT CHANNELS

Table 2. Summary characteristics of channels investigated for jurisdictional status.

Waters	Status	Jurisdictional Distance	Predominant Substrate
S-1	Ditch through uplands	NA	Leaves, sand, silt, clay
S-2	Ephemeral Channel	NA	Leaves, cobble, sand
S-3	Ditch through cut and fill	NA	Vegetation, silt, clay, sand
S-3a	Ditch through cut and fill	NA	Leaves, silt, clay, sand
S-4	Ditch through cut and fill	NA	Clay, stone, silt, sand
S-4a	Ditch through cut and fill	NA	Clay, pine needles, silt
S-5	Unimportant Channel	919 feet	Bedrock, cobble, leaves, sticks, silt, sand, gravel
S-5a	Ephemeral Channel	NA	Leaves, sticks, silt, roots
S-6	Unimportant Channel	325 feet	Leaves, roots, sand, gravel
S-7	Unimportant Channel	256 feet	Leaves, gravel, sand
S-8	Unimportant Channel	217 feet	Sand, gravel, cobble
S-9	Unimportant Channel	180 feet	Sand, gravel, cobble

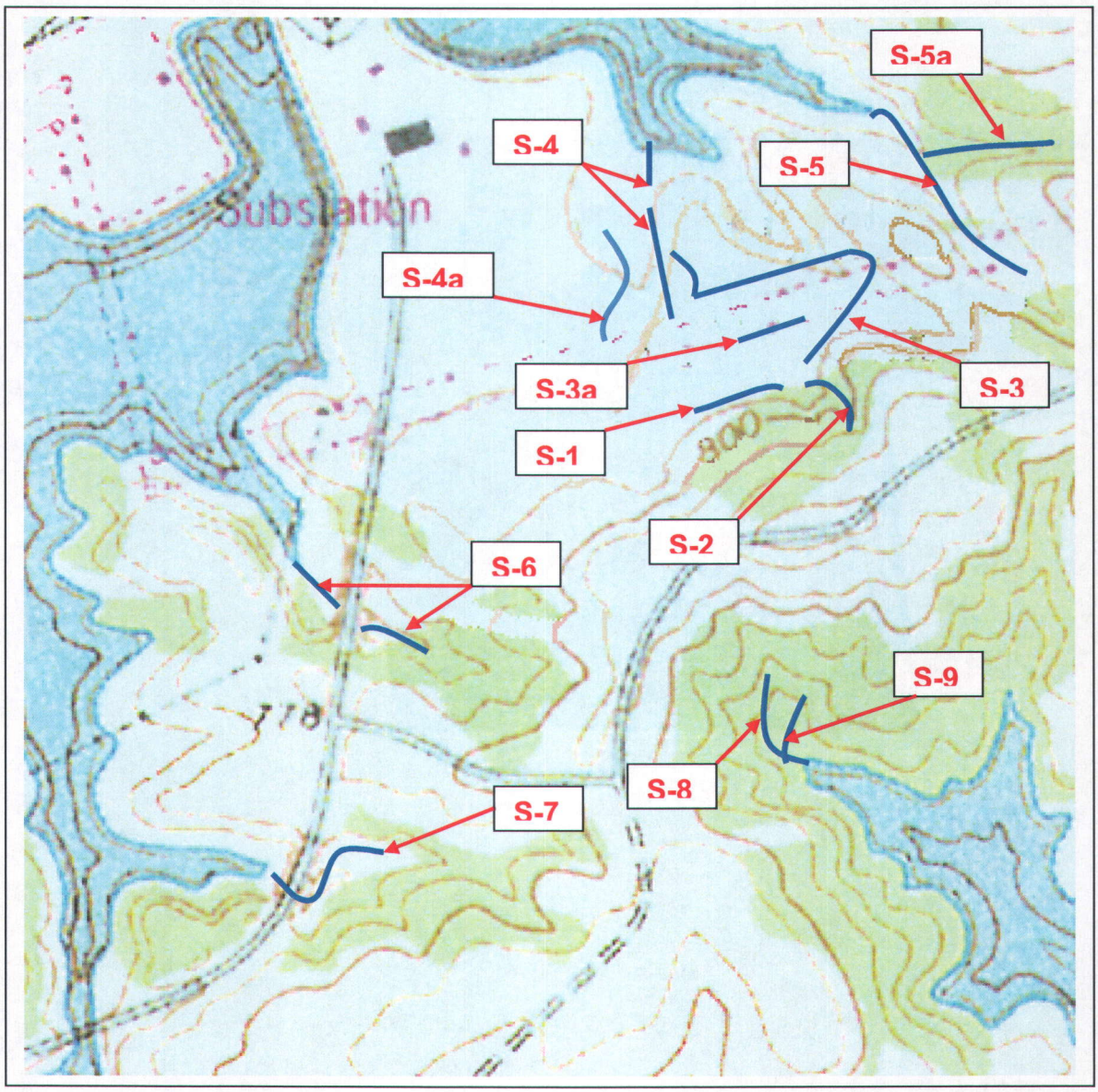


Figure 30. Approximate locations of channels investigated in the study area for facility expansion associated with the installation of a Flue Gas Desulfurization System at Belews Creek Steam Station.

INTERMITTENT CHANNEL EVALUATION FORM

ACTION ID S-1 (Figures 30, 31, and 32). APPLICANT NAME Duke Power .
DATE 9/10/04 . PROPOSED CHANNEL WORK Flue Gas Desulfurization System.
WATERBODY/RIVER BASIN Belews Lake .COUNTY/CITY Stokes County .
RECENT WEATHER CONDITIONS Substantial rainfall from Hurricane Francis on 9/8/04.

P	SP	NP	OBSERVATION	COMMENTS OR DESCRIPTION
		X	Fish/Shellfish/Crustaceans Present	
X			Benthic Macro Invertebrates	Dipteran larvae, oligochaetes
X			Amphibians Present/Breeding	
		X	Algae and/or Fungus (water quality function)	Iron Flocculent dominant
		X	Wildlife Channel Use (i.e. tracks, feces, shell, other)	
		X	Federally Protected Species Present (Discontinue)	
		X	Riffle/Pool/Structure	
		X	Stable Streambanks	Side-cast material on banks
		X	Channel Substrate(i.e. gravel, cobble, rock, coarse sand)	Leaves, silt, clay, sand
X			Riparian Canopy Present (SP>/=50% Closure)	Alder, Virginia pine, sourwood, red maple
		X	Undercut Banks/Instream Habitat Structure	
		X	Flow in Channel	
		X	Wetlands Adjacent to /Contiguous with Channel (Discontinue)	
X			Persistent Pools/Saturated Bottom (June-September)	
		X	Seeps/Groundwater Discharge (June-September)	
		X	Adjacent Floodplain Present	
		X	Wrack material or Drift Lines	
	X		Hydrophytic Vegetation in/adjacent to Channel	Southern lady fern, cinnamon fern, royal fern, netted chain fern

Important To Domestic Water Supply? Y/N N .
Does Channel Appear On A Quad or Soils Map? Y/N N .
Approx. Drainage Area: roughly 15 acres .

Determination:
Perennial Channel ____. Important Channel: _____. Project Manager Initials:___.
Intermittent Channel ____. Unimportant Channel: ____.
Ephemeral Channel: _____. (non-jurisdictional)
Ditch Through Upland: X . (non-jurisdictional)

Evaluator's Signature: J Robert Sabo .

P=Present SP=Strongly Present NP=Not Present

Figure 31. Ditch, S-1, constructed to route water around construction yard, as observed on September 10, 2004.

Figure 32. Ditch, S-1, as observed on March 4, 2005 and influenced by recent snowmelt.

INTERMITTENT CHANNEL EVALUATION FORM

ACTION ID S-2 (Figures 30, 33, and 34). APPLICANT NAME Duke Power .
DATE 9/10/04 . PROPOSED CHANNEL WORK Flue Gas Desulfurization System.
WATERBODY/RIVER BASIN Belews Lake .COUNTY/CITY Stokes County .
RECENT WEATHER CONDITIONS Substantial rainfall from Hurricane Francis on 9/8/04.

P	SP	NP	OBSERVATION	COMMENTS OR DESCRIPTION
		X	Fish/Shellfish/Crustaceans Present	
		X	Benthic Macro Invertebrates	
		X	Amphibians Present/Breeding	
		X	Algae and/or Fungus (water quality function)	Iron Flocculent dominant
		X	Wildlife Channel Use (i.e. tracks, feces, shell, other)	
		X	Federally Protected Species Present (Discontinue)	
		X	Riffle/Pool/Structure	Primarily dry
		X	Stable Streambanks	Eroded banks present, especially at head
X			Channel Substrate(i.e. gravel, cobble, rock, coarse sand)	Leaves, cobble, sand
		X	Riparian Canopy Present (SP>/=50% Closure)	Riparian vegetation similar to surrounding upland forests
		X	Undercut Banks/Instream Habitat Structure	
		X	Flow in Channel	Mainly wet channel, but some ephemeral pools
		X	Wetlands Adjacent to /Contiguous with Channel (Discontinue)	
		X	Persistent Pools/Saturated Bottom (June-September)	Some ephemeral pools <3 inched deep
		X	Seeps/Groundwater Discharge (June-September)	
		X	Adjacent Floodplain Present	
		X	Wrack material or Drift Lines	
		X	Hydrophytic Vegetation in/adjacent to Channel	

Important To Domestic Water Supply? Y/N N .
Does Channel Appear On A Quad or Soils Map? Y/N N .
Approx. Drainage Area: roughly 10 acres; distance 79 feet .

Determination:
Perennial Channel ___. Important Channel: _____. Project Manager Initials:___.
Intermittent Channel ___.Unimportant Channel: _____.
Ephemeral Channel: X . (non-jurisdictional)
Ditch Through Upland:___. (non-jurisdictional)

Evaluator's Signature: J Robert Shelton .

P=Present SP=Strongly Present NP=Not Present

Figure 33. Ephemeral channel, S-2, as observed on September 10, 2004 following Hurricane Francis.

Figure 34. Ephemeral channel, S-2, as observed on March 4, 2005, following a period of snowmelt.

INTERMITTENT CHANNEL EVALUATION FORM

ACTION ID S-3 (Figures 30, 35, 36, 37). APPLICANT NAME Duke Power .
DATE 9/10/04 . PROPOSED CHANNEL WORK Flue Gas Desulfurization System.
WATERBODY/RIVER BASIN Belews Lake .COUNTY/CITY Stokes County .
RECENT WEATHER CONDITIONS Substantial rainfall from Hurricane Francis on 9/8/04.

P	SP	NP	OBSERVATION	COMMENTS OR DESCRIPTION
		X	Fish/Shellfish/Crustaceans Present	
X			Benthic Macro Invertebrates	Oligochaetes, dipteran larvae
X			Amphibians Present/Breeding	
X			Algae and/or Fungus (water quality function)	Iron Flocculent dominant; some algae in channel
		X	Wildlife Channel Use (i.e. tracks, feces, shell, other)	
		X	Federally Protected Species Present (Discontinue)	
		X	Riffle/Pool/Structure	
		X	Stable Streambanks	Ditch/diversion around construction yard
		X	Channel Substrate(i.e. gravel, cobble, rock, coarse sand)	Vegetation, silt, gravel, sand
		X	Riparian Canopy Present (SP>/=50% Closure)	Alder in some areas of electric transmission corridor
		X	Undercut Banks/Instream Habitat Structure	
		X	Flow in Channel	Culvert block some flow from channel
		X	Wetlands Adjacent to /Contiguous with Channel (Discontinue)	
X			Persistent Pools/Saturated Bottom (June-September)	Culverts and vegetation block drainage
		X	Seeps/Groundwater Discharge (June-September)	
		X	Adjacent Floodplain Present	
		X	Wrack material or Drift Lines	
	X		Hydrophytic Vegetation in/adjacent to Channel	Bulrush, cattail, alder, soft rush

Important To Domestic Water Supply? Y/N N .
Does Channel Appear On A Quad or Soils Map? Y/N N .
Approx. Drainage Area: roughly 20 acres .

Determination:
Perennial Channel ___. Important Channel: _____. Project Manager Initials:___.
Intermittent Channel ___. Unimportant Channel: ___.
Ephemeral Channel: ____. (non-jurisdictional)
Ditch Through Upland: X . (non-jurisdictional)

Evaluator's Signature: J Robert Sabo .

P=Present SP=Strongly Present NP=Not Present

Figure 35. Ditch, S-3, constructed to route water around construction yard, as observed on September 10, 2004.

Figure 36. Culvert that drains from ditch S-3 to W-2, as observed on September 10, 2004.

Figure 37. Ditch, S-3, constructed to route water around construction yard, as observed on March 4, 2005 and during a period of snowmelt.

INTERMITTENT CHANNEL EVALUATION FORM

ACTION ID S-3a (Figures 30 and 38). APPLICANT NAME Duke Power .
DATE 3/4/05 . PROPOSED CHANNEL WORK Flue Gas Desulfurization System.
WATERBODY/RIVER BASIN Belews Lake .COUNTY/CITY Stokes County .
RECENT WEATHER CONDITIONS Surface runoff and seepage from snowmelt.

P	SP	NP	OBSERVATION	COMMENTS OR DESCRIPTION
		X	Fish/Shellfish/Crustaceans Present	
X			Benthic Macro Invertebrates	
X			Amphibians Present/Breeding	
		X	Algae and/or Fungus (water quality function)	Iron Flocculent dominant
		X	Wildlife Channel Use (i.e. tracks, feces, shell, other)	
		X	Federally Protected Species Present (Discontinue)	
		X	Riffle/Pool/Structure	
		X	Stable Streambanks	Ditch in past construction yard
		X	Channel Substrate(i.e. gravel, cobble, rock, coarse sand)	Leaves, silt, clay, sand
		X	Riparian Canopy Present (SP>/=50% Closure)	In electric transmission corridor with herbaceous vegetation
		X	Undercut Banks/Instream Habitat Structure	
		X	Flow in Channel	Primarily standing water
		X	Wetlands Adjacent to /Contiguous with Channel (Discontinue)	
X			Persistent Pools/Saturated Bottom (June-September)	
		X	Seeps/Groundwater Discharge (June-September)	
		X	Adjacent Floodplain Present	
		X	Wrack material or Drift Lines	
	X		Hydrophytic Vegetation in/adjacent to Channel	Alder, herbaceous vegetation

Important To Domestic Water Supply? Y/N N .
Does Channel Appear On A Quad or Soils Map? Y/N N .
Approx. Drainage Area: roughly 5 acres .

Determination:
Perennial Channel ___. Important Channel: _____. Project Manager Initials:___.
Intermittent Channel ___. Unimportant Channel: ___.
Ephemeral Channel: _____. (non-jurisdictional)
Ditch Through Upland: X . (non-jurisdictional)

Evaluator's Signature: J Robert Sabo .

P=Present SP=Strongly Present NP=Not Present

Figure 38. Ditch, S-3a, appears to be an erosion channel through a past construction yard, as observed on March 4, 2005.

INTERMITTENT CHANNEL EVALUATION FORM

ACTION ID S-4 (Figures 30, 39, 40, and 41). APPLICANT NAME Duke Power .
DATE 3/4/ 2005 . PROPOSED CHANNEL WORK Flue Gas Desulfurization System.
WATERBODY/RIVER BASIN Belews Lake .COUNTY/CITY Stokes County .
RECENT WEATHER CONDITIONS: Surface runoff and seepage from snowmelt.

P	SP	NP	OBSERVATION	COMMENTS OR DESCRIPTION
		X	Fish/Shellfish/Crustaceans Present	
X			Benthic Macro Invertebrates	Oligochaetes
X			Amphibians Present/Breeding	
		X	Algae and/or Fungus (water quality function)	Iron Flocculent
		X	Wildlife Channel Use (i.e. tracks, feces, shell, other)	
		X	Federally Protected Species Present (Discontinue)	
		X	Riffle/Pool/Structure	
		X	Stable Streambanks	Ditch around construction yard and to sediment basin
		X	Channel Substrate(i.e. gravel, cobble, rock, coarse sand)	Clay, placed stone, silt, sand
		X	Riparian Canopy Present (SP>/=50% Closure)	Only herbaceous vegetation present
		X	Undercut Banks/Instream Habitat Structure	
		X	Flow in Channel	
		X	Wetlands Adjacent to /Contiguous with Channel (Discontinue)	
X			Persistent Pools/Saturated Bottom (June-September)	
		X	Seeps/Groundwater Discharge (June-September)	
		X	Adjacent Floodplain Present	
		X	Wrack material or Drift Lines	
X			Hydrophytic Vegetation in/adjacent to Channel	Soft rush

Important To Domestic Water Supply? Y/N N .
Does Channel Appear On A Quad or Soils Map? Y/N N .
Approx. Drainage Area: roughly 20 acres .

Determination:
Perennial Channel ____. Important Channel: _____. Project Manager Initials:___.
Intermittent Channel ____. Unimportant Channel: ____.
Ephemeral Channel: ____. (non-jurisdictional)
Ditch Through Upland: X . (non-jurisdictional)

Evaluator's Signature: J Robert Sabo .

P=Present SP=Strongly Present NP=Not Present

Figure 39. Ditch, S-4, constructed to route water around construction yard through a sediment basin to Belews Lake, as observed on March 4, 2005.

Figure 40. Ditch, S-4, constructed to route water around construction yard, as observed on December 14, 2004.

Figure 41. Ditch, S-4 just upstream from its confluence with Belews Lake, as observed on December 14, 2004.

INTERMITTENT CHANNEL EVALUATION FORM

ACTION ID S-4a (Figures 30 and 42). APPLICANT NAME Duke Power .
DATE 3/4/05 . PROPOSED CHANNEL WORK Flue Gas Desulfurization System.
WATERBODY/RIVER BASIN Belews Lake .COUNTY/CITY Stokes County .
RECENT WEATHER CONDITIONS Surface runoff and seepage from snowmelt.

P	SP	NP	OBSERVATION	COMMENTS OR DESCRIPTION
		X	Fish/Shellfish/Crustaceans Present	
X			Benthic Macro Invertebrates	Oligocheates, dipteran larvae
		X	Amphibians Present/Breeding	
		X	Algae and/or Fungus (water quality function)	Iron Flocculent dominant
		X	Wildlife Channel Use (i.e. tracks, feces, shell, other)	
		X	Federally Protected Species Present (Discontinue)	
		X	Riffle/Pool/Structure	
		X	Stable Streambanks	Apparent erosion ditch through past const. yard
		X	Channel Substrate(i.e. gravel, cobble, rock, coarse sand)	clay, pine needles, silt
		X	Riparian Canopy Present (SP>/=50% Closure)	Same as adjacent lands; Loblolly pine plantation
		X	Undercut Banks/Instream Habitat Structure	
		X	Flow in Channel	Channel discontinuous downstream and not connected to other channels
		X	Wetlands Adjacent to /Contiguous with Channel (Discontinue)	
X			Persistent Pools/Saturated Bottom (June-September)	
		X	Seeps/Groundwater Discharge (June-September)	
		X	Adjacent Floodplain Present	
		X	Wrack material or Drift Lines	
		X	Hydrophytic Vegetation in/adjacent to Channel	Loblolly pine plantation

Important To Domestic Water Supply? Y/N N .
Does Channel Appear On A Quad or Soils Map? Y/N N .
Approx. Drainage Area: roughly 15 acres .

Determination:
Perennial Channel ___. Important Channel: _____. Project Manager Initials:___.
Intermittent Channel ___. Unimportant Channel: ___.
Ephemeral Channel: ____. (non-jurisdictional)
Ditch Through Upland: X . (non-jurisdictional)

Evaluator's Signature: J Robert Sabo .

P=Present SP=Strongly Present NP=Not Present

Figure 42. Ditch, S-4a where it terminates, as observed on March 4, 2005 following a period of snowmelt.

INTERMITTENT CHANNEL EVALUATION FORM

ACTION ID S-5 (Figures 30, 43, 44, 45, 46, 47, and 48). APPLICANT NAME Duke Power .
DATE 3/10/05 . PROPOSED CHANNEL WORK Flue Gas Desulfurization System.
WATERBODY/RIVER BASIN Belews Lake .COUNTY/CITY Stokes County .
RECENT WEATHER CONDITIONS Surface runoff and seepage from snowmelt.

P	SP	NP	OBSERVATION	COMMENTS OR DESCRIPTION
		X	Fish/Shellfish/Crustaceans Present	
X			Benthic Macro Invertebrates	Dipteran larvae, caddis larvae, oligochaetes, beetle larvae near confluence with Belews Lake
X			Amphibians Present/Breeding	In upper section
		X	Algae and/or Fungus (water quality function)	Iron Flocculent dominant throughout channel
		X	Wildlife Channel Use (i.e. tracks, feces, shell, other)	Deer
		X	Federally Protected Species Present (Discontinue)	
X			Riffle/Pool/Structure	Bedrock shelves on lower section
X			Stable Streambanks	Incised channel on lower section; braided channel in upstream section
X			Channel Substrate(i.e. gravel, cobble, rock, coarse sand)	Bedrock cobble downstream; leaves, sticks, gravel, silt, sand upstream
		X	Riparian Canopy Present (SP>/=50% Closure)	Alders in some upstream section; same as surrounding forest below
		X	Undercut Banks/Instream Habitat Structure	
X			Flow in Channel	Most sections dry during fall, flow during observations in March, December
X			Wetlands Adjacent to /Contiguous with Channel (Discontinue)	Narrow adjacent wetlands in braided section that was grubbed during trans. line construction
X			Persistent Pools/Saturated Bottom (June-September)	Dry ephemeral channel below confluence of S-5 and S-5a
		X	Seeps/Groundwater Discharge (June-September)	
		X	Adjacent Floodplain Present	Only where channel previously disturbed
		X	Wrack material or Drift Lines	
X			Hydrophytic Vegetation in/adjacent to Channel	Alder, sedges, soft rush, red maple

Important To Domestic Water Supply? Y/N N .
Does Channel Appear On A Quad or Soils Map? Y/N N .
Approx. Drainage Area: roughly 30 acres; 919 feet in total length; 98 feet of bedrock just upstream of Belews Lake; 112 feet of dry channel.

Determination:
Perennial Channel ___. Important Channel: _____. Project Manager Initials:___.
Intermittent Channel X . Unimportant Channel: X .
Ephemeral Channel: ____. (non-jurisdictional)
Ditch Through Upland:___. (non-jurisdictional)

Evaluator's Signature: J Robert Shelton .

P=Present SP=Strongly Present NP=Not Present

Figure 43. Upper section of S-5 in an area that has been grubbed and reshaped during clearing of transmission line in 1970's, as observed on March 10, 2005 following a period of snowmelt.

Figure 44. Upper section of S-5 in an area that has been grubbed and reshaped during clearing of transmission line in 1970's and contains 2 channels, as observed on March 10, 2005.

Figure 45. Middle section of S-5 in an area that has been grubbed and reshaped during clearing of transmission line in 1970's and some recent logging, as observed on March 10, 2005. Channel is culverted just upstream.

Figure 46. Confluence of S-5 and S-5a, as observed on December 14, 2004.

Figure 47. Section of S-5 downstream of confluence of S-5 and S-5a where stream channel is dry, even during a period of runoff and seepage from snowmelt, as observed on March 10, 2005.

Figure 48. Section of S-5 just before its confluence with Belews Lake, showing bedrock and cobble, as observed on March 10, 2005.

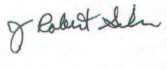
INTERMITTENT CHANNEL EVALUATION FORM

ACTION ID S-5a (Figures 30, 49, and 50). APPLICANT NAME Duke Power .
DATE 3/10/05 . PROPOSED CHANNEL WORK Flue Gas Desulfurization System.
WATERBODY/RIVER BASIN Belews Lake .COUNTY/CITY Stokes County .
RECENT WEATHER CONDITIONS Surface runoff and seepage from snowmelt.

P	SP	NP	OBSERVATION	COMMENTS OR DESCRIPTION
		X	Fish/Shellfish/Crustaceans Present	
		X	Benthic Macro Invertebrates	
		X	Amphibians Present/Breeding	
		X	Algae and/or Fungus (water quality function)	Iron Flocculent throughout
		X	Wildlife Channel Use (i.e. tracks, feces, shell, other)	
		X	Federally Protected Species Present (Discontinue)	
		X	Riffle/Pool/Structure	Pools from jams of leaves and sticks
		X	Stable Streambanks	Channel incised 2-8 feet,
		X	Channel Substrate(i.e. gravel, cobble, rock, coarse sand)	Leaves, sticks, silt, roots
		X	Riparian Canopy Present (SP>/=50% Closure)	Same as surrounding forest
		X	Undercut Banks/Instream Habitat Structure	
		X	Flow in Channel	Goes underground in several locations
		X	Wetlands Adjacent to /Contiguous with Channel (Discontinue)	
		X	Persistent Pools/Saturated Bottom (June-September)	
		X	Seeps/Groundwater Discharge (June-September)	
		X	Adjacent Floodplain Present	
		X	Wrack material or Drift Lines	
		X	Hydrophytic Vegetation in/adjacent to Channel	

Important To Domestic Water Supply? Y/N N .
Does Channel Appear On A Quad or Soils Map? Y/N N .
Approx. Drainage Area: roughly 15 acres , 289 feet in length .

Determination:
Perennial Channel ____. Important Channel: _____. Project Manager Initials:___.
Intermittent Channel ____. Unimportant Channel: ____.
Ephemeral Channel: X . (non-jurisdictional)
Ditch Through Upland:___. (non-jurisdictional)

Evaluator's Signature:  .

P=Present SP=Strongly Present NP=Not Present

Figure 49. Section of S-5a in the upstream section, showing eroded banks, as observed on March 10, 2005. Channel incised to 8 feet.

Figure 50. Section of S-5a just before its confluence with S-5, as observed on March 10, 2005, following period of snowmelt.

INTERMITTENT CHANNEL EVALUATION FORM

ACTION ID S-6 (Figures 30, 51, 52, and 53). APPLICANT NAME Duke Power .
DATE 3/10,2005 . PROPOSED CHANNEL WORK Flue Gas Desulfurization System .
WATERBODY/RIVER BASIN Belews Lake. COUNTY/CITY Stokes County .
RECENT WEATHER CONDITIONS Snowfall runoff and seepage occurring .

P	SP	NP	OBSERVATION	COMMENTS OR DESCRIPTION
		X	Fish/Shellfish/Crustaceans Present	
		X	Benthic Macro Invertebrates	
		X	Amphibians Present/Breeding	
		X	Algae and/or Fungus (water quality function)	Iron Flocculent dominant
		X	Wildlife Channel Use (i.e. tracks, feces, shell, other)	
		X	Federally Protected Species Present (Discontinue)	
		X	Riffle/Pool/Structure	Stick and Leaf jams
X			Stable Streambanks	Defined channel with moss covered banks
X			Channel Substrate(i.e. gravel, cobble, rock, coarse sand)	Leaves, roots, sand, gravel
		X	Riparian Canopy Present (SP>/=50% Closure)	Similar to surrounding forests
		X	Undercut Banks/Instream Habitat Structure	
		X	Flow in Channel	Leaf jams restrict flow
		X	Wetlands Adjacent to /Contiguous with Channel (Discontinue)	
		X	Persistent Pools/Saturated Bottom (June-September)	Present in periods of rainfall only
		X	Seeps/Groundwater Discharge (June-September)	
		X	Adjacent Floodplain Present	
		X	Wrack material or Drift Lines	
		X	Hydrophytic Vegetation in/adjacent to Channel	

Important To Domestic Water Supply? Y/N N .
Does Channel Appear On A Quad or Soils Map? Y/N N .
Approx. Drainage Area: Roughly 25 acres; 325 feet in total length; 69 feet below road .

Determination:
Perennial Channel ____. Important Channel: ____. Project Manager Initials:_____.
Intermittent Channel X . Unimportant Channel: X .
Ephemeral Channel: ____. (non-jurisdictional)
Ditch Through Upland:___. (non-jurisdictional)

Evaluator's Signature: J Robert Sabin .

P=Present SP=Strongly Present NP=Not Present

Figure 51. Section of S-6 just upstream of culvert at paved road, as observed on October 23, 2002.

Figure 52. Section of S-6 just upstream of culvert at paved road, as observed on March 10, 2005, following a period of snowmelt.

Figure 53. Section of S-6 downstream of paved road and just upstream of confluence with Belews Lake, as observed on March 4, 2005, following period of runoff from snowmelt.

INTERMITTENT CHANNEL EVALUATION FORM

ACTION ID S-7 (Figures 30, 54, and 55). APPLICANT NAME Duke Power .
DATE 12/19/2002. PROPOSED CHANNEL WORK Flue Gas Desulfurization System .
WATERBODY/RIVER BASIN Belews Lake .COUNTY/CITY Stokes County .
RECENT WEATHER CONDITIONS Minor snowfall in past week
.

P	SP	NP	OBSERVATION	COMMENTS OR DESCRIPTION
		X	Fish/Shellfish/Crustaceans Present	
		X	Benthic Macro Invertebrates	
X			Amphibians Present/Breeding	In section just below instream wetland W-7
		X	Algae and/or Fungus (water quality function)	Iron Flocculent dominant
		X	Wildlife Channel Use (i.e. tracks, feces, shell, other)	
		X	Federally Protected Species Present (Discontinue)	
		X	Riffle/Pool/Structure	
X			Stable Streambanks	Distinct u-shaped channel, vegetated banks
X			Channel Substrate(i.e. gravel, cobble, rock, coarse sand)	Leaves, gravel, sand
X			Riparian Canopy Present (SP>/=50% Closure)	Same as surrounding forests, except below wetland area where alder present
		X	Undercut Banks/Instream Habitat Structure	
		X	Flow in Channel	
X			Wetlands Adjacent to /Contiguous with Channel (Discontinue)	Isolated wetland in mid-channel upstream of jurisdiction channel-W-7
		X	Persistent Pools/Saturated Bottom (June-September)	
		X	Seeps/Groundwater Discharge (June-September)	
		X	Adjacent Floodplain Present	
		X	Wrack material or Drift Lines	
X			Hydrophytic Vegetation in/adjacent to Channel	Alder just below W-7

Important To Domestic Water Supply? Y/N N .
Does Channel Appear On A Quad or Soils Map? Y/N N .
Approx. Drainage Area: Roughly 20 acres; 256 feet in length .

Determination:
Perennial Channel ___. Important Channel: ____. Project Manager Initials:_____.
Intermittent Channel X . Unimportant Channel: X .
Ephemeral Channel: ____. (non-jurisdictional)
Ditch Through Upland:___. (non-jurisdictional)

Evaluator's Signature:__ J Robert Hahn .

P=Present SP=Strongly Present NP=Not Present

Figure 54. Section of S-7 just upstream of culvert at paved road, as observed on December 19, 2002.

Figure 55. Section of S-7 just upstream of culvert at paved road, as observed on December 14, 2004.

INTERMITTENT CHANNEL EVALUATION FORM

ACTION ID S-8 (Figures 30, 56, 57, and 58). APPLICANT NAME Duke Power .
DATE 9/10/04 . PROPOSED CHANNEL WORK Flue Gas Desulfurization System.
WATERBODY/RIVER BASIN Belews Lake .COUNTY/CITY Stokes County .
RECENT WEATHER CONDITIONS Substantial rainfall from Hurricane Francis on 9/8/04.

P	SP	NP	OBSERVATION	COMMENTS OR DESCRIPTION
		X	Fish/Shellfish/Crustaceans Present	
X			Benthic Macro Invertebrates	Some oligochaetes
		X	Amphibians Present/Breeding	
		X	Algae and/or Fungus (water quality function)	Iron Flocculent dominant
		X	Wildlife Channel Use (i.e. tracks, feces, shell, other)	
		X	Federally Protected Species Present (Discontinue)	
X			Riffle/Pool/Structure	Some pools separated by dry cobble
X			Stable Streambanks	Some defined channel, Eroded banks present
X			Channel Substrate(i.e. gravel, cobble, rock, coarse sand)	Sand, gravel, cobble
X			Riparian Canopy Present (SP>/=50% Closure)	Riparian vegetation similar to surrounding upland forests, except rhododendron on slopes
		X	Undercut Banks/Instream Habitat Structure	
		X	Flow in Channel	Channel mainly dry with intermittent pools; flow during periods of runoff
		X	Wetlands Adjacent to /Contiguous with Channel (Discontinue)	
X			Persistent Pools/Saturated Bottom (June-September)	Some saturated channel with intermittent pools <4 inched deep
		X	Seeps/Groundwater Discharge (June-September)	
		X	Adjacent Floodplain Present	
		X	Wrack material or Drift Lines	
X			Hydrophytic Vegetation in/adjacent to Channel	Rhododendron, Southern lady fern, cinnamon fern on slopes of channel bank

Important To Domestic Water Supply? Y/N N .
Does Channel Appear On A Quad or Soils Map? Y/N N .
Approx. Drainage Area: roughly 15 acres; 217 feet of channel, some ephemeral.

Determination:
Perennial Channel ____. Important Channel: _____. Project Manager Initials:___.
Intermittent Channel ____.Unimportant Channel: X .
Ephemeral Channel: _____. (non-jurisdictional)
Ditch Through Upland:___. (non-jurisdictional)

Evaluator's Signature: J Robert Helm .

P=Present SP=Strongly Present NP=Not Present

Figure 56. Unimportant channel, S-8. which has a section that appears to be an ephemeral channel between 2 sections of unimportant channel, as observed on September 10, 2004.

Figure 57. Unimportant channel, S-8, as observed on March 10, 2005.

Figure 58. Ephemeral section of S-8, as observed on March 10, 2005.

INTERMITTENT CHANNEL EVALUATION FORM

ACTION ID S-9 (Figures 30, 59, and 60). APPLICANT NAME Duke Power .
DATE 9/10/04 . PROPOSED CHANNEL WORK Flue Gas Desulfurization System.
WATERBODY/RIVER BASIN Belews Lake .COUNTY/CITY Stokes County .
RECENT WEATHER CONDITIONS Substantial rainfall from Hurricane Francis on 9/8/04.

P	SP	NP	OBSERVATION	COMMENTS OR DESCRIPTION
		X	Fish/Shellfish/Crustaceans Present	
X			Benthic Macro Invertebrates	Some oligochaetes
		X	Amphibians Present/Breeding	
		X	Algae and/or Fungus (water quality function)	Iron Flocculent dominant
		X	Wildlife Channel Use (i.e. tracks, feces, shell, other)	
		X	Federally Protected Species Present (Discontinue)	
X			Riffle/Pool/Structure	Riffles, primarily dry
		X	Stable Streambanks	Eroded banks present, some defined channel
X			Channel Substrate(i.e. gravel, cobble, rock, coarse sand)	Leaves, sand, gravel, cobble
X			Riparian Canopy Present (SP>/=50% Closure)	Riparian vegetation similar to surrounding upland forests, except rhododendron
		X	Undercut Banks/Instream Habitat Structure	
X			Flow in Channel	Mainly within 60 feet from Lake
		X	Wetlands Adjacent to /Contiguous with Channel (Discontinue)	
X			Persistent Pools/Saturated Bottom (June-September)	Some saturated channel constrictions <2 inched deep
		X	Seeps/Groundwater Discharge (June-September)	
		X	Adjacent Floodplain Present	
		X	Wrack material or Drift Lines	
X			Hydrophytic Vegetation in/adjacent to Channel	Rhododendron, Mountain Laurel, Christmas Fern

Important To Domestic Water Supply? Y/N N .
Does Channel Appear On A Quad or Soils Map? Y/N N .
Approx. Drainage Area: roughly 10 acres ; 180 feet in length .

Determination:
Perennial Channel ___. Important Channel: _____. Project Manager Initials:___.
Intermittent Channel ___.Unimportant Channel: X (Approximately 200 feet long).
Ephemeral Channel: _____. (non-jurisdictional)
Ditch Through Upland:___. (non-jurisdictional)

Evaluator's Signature: J Robert Sabin .

P=Present SP=Strongly Present NP=Not Present

Figure 59. Unimportant channel, S-9, as observed on March 10, 2005.

Figure 60. Unimportant channel, S-9, as observed on September 10, 2004.

Attachment 3

Duke letter to SHPO

Duke Power®
A Duke Energy Company

Duke Power
526 South Church Street
P.O. Box 1006
Charlotte, NC 28201-1006
Mail Code EC12Y

October 7, 2004

Ms. Renee Gledhill-Earley
North Carolina Department of Cultural Resources
4617 Mail Service Center
Raleigh, NC 27699-4617

Subject: Proposed Landfill at Belews Creek Steam Station
Stokes County

Dear Ms. Gledhill-Earley:

Duke Power is in the process of siting a new landfill for its Belews Creek Steam Station. The landfill will be filled with gypsum, a by-product of a new Flue Gas Desulfurization System. The new system is being installed to comply with North Carolina's new clean air regulations.

A total of 50 acres will be disturbed during construction of the landfill; the proposed landfill itself will encompass 22 acres (see enclosed map). The site consists of loblolly pine plantations, natural pine stands that succeeded from previously farmed fields, some hardwoods that have been logged, and electric transmission line corridors. The loblolly pine stands are located in areas that were utilized as borrow and fill areas during the construction of the Belews Creek Steam Station.

Duke Power is not aware of any known cultural resources in the proposed landfill area. However, there is an old tobacco barn located within the footprint (see enclosed photos).

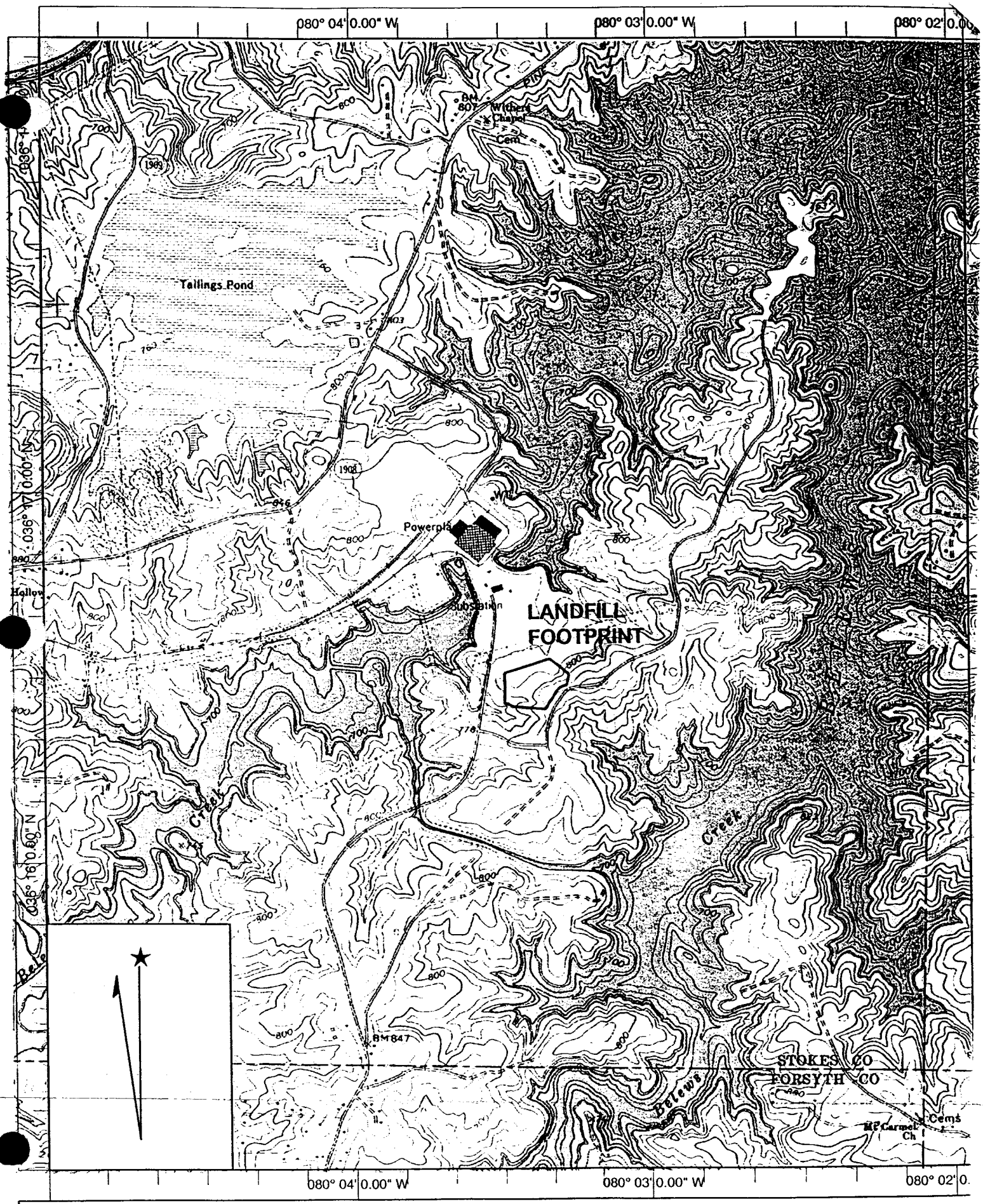
Please let us know by November 12, 2004, if we need to take any additional actions to ensure that we are appropriately considering archaeological and historic sites. Please do not hesitate to contact me at 980.373.4392 should we need to discuss this issue further.

Sincerely:

Jennifer Huff
Sr. Environmental Resource Manager

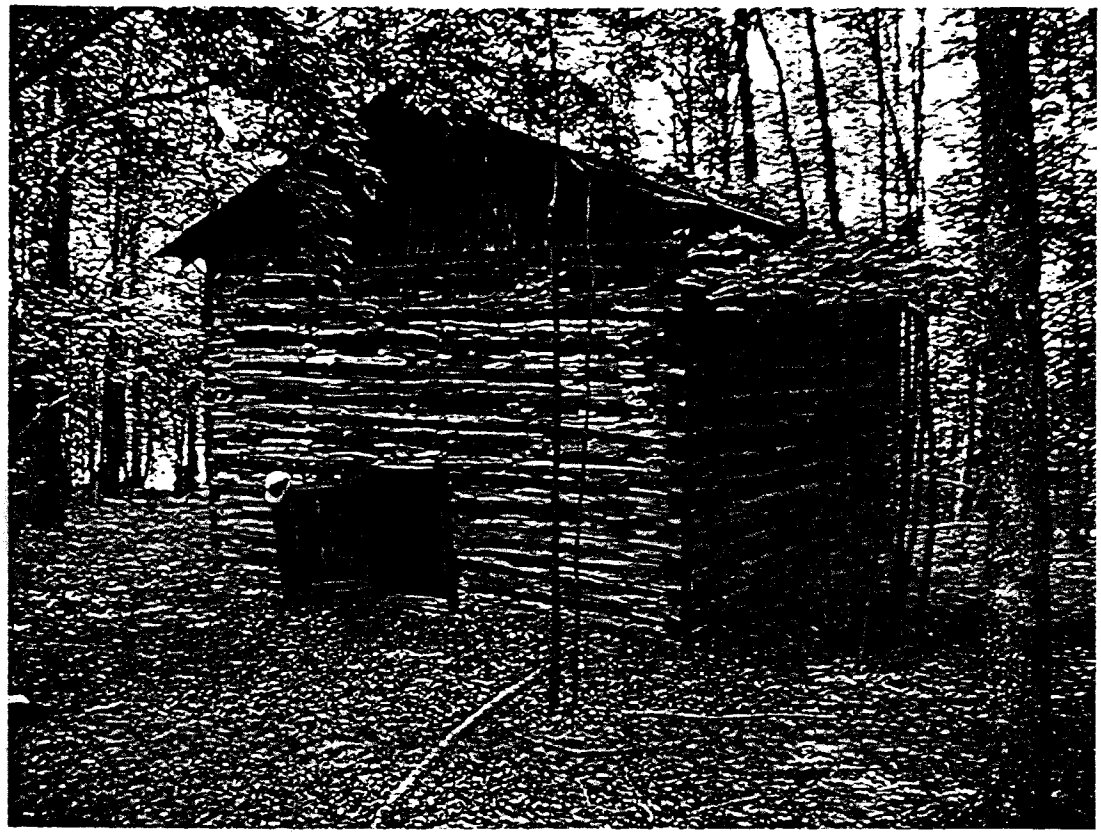
Enclosure

cc w/o enclosure: W.M. Miller



Name: BELEWS LAKE
Date: 9/1/2004
Scale: 1 inch equals 2000 feet

Location: 036° 16' 41.8" N 080° 03' 29.3" W
Caption: Duke Power
Belews Creek Station
FGD Landfill Site



Belews Creek Steam Station Landfill Site: Tobacco Barn

Attachment 4

SHPO letter to Duke

North Carolina Department of Cultural Resources

State Historic Preservation Office

Peter B. Sandbeck, Administrator

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

November 3, 2004

Jennifer Huff
Senior Environmental Resource Manager
Duke Power
PO Box 1006
Charlotte, NC 28201-1006

Re: Proposed Landfill at Belews Creek Steam Station, Stokes County, ER 04-2651

Dear Ms. Huff:

Thank you for your letter of October 7, 2004, concerning the above project.

We have conducted a review of the proposed undertaking and are aware of no historic resources which would be affected by the project. Therefore, we have no comment on the undertaking as proposed.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

Peter B. Sandbeck

	Location	Mailing Address	Telephone/Fax
ADMINISTRATION	507 N. Blount Street, Raleigh NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919)733-4763/733-8653
RESTORATION	515 N. Blount Street, Raleigh NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919)733-6547/715-4801
SURVEY & PLANNING	515 N. Blount Street, Raleigh, NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919)733-6545/715-4801

Attachment 5

EDR Report - November 30, 2004

The EDR GeoCheck® Report

Belews Creek
3195 Pine Hall Road
Belews Creek, NC 27052

Inquiry Number: 01316566.1r

November 30, 2004

EDR™ Environmental Data Resources Inc

The Standard in Environmental Risk Management Information

440 Wheelers Farms Road
Milford, Connecticut 06460

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

FORM-ERN

TABLE OF CONTENTS

SECTION **PAGE**

GEOCHECK ADDENDUM

Physical Setting Source Addendum **A-1**

Physical Setting Source Summary **A-2**

Physical Setting Source Map **A-8**

Physical Setting Source Map Findings **A-9**

Physical Setting Source Records Searched **A-21**

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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GEOCHECK® - PHYSICAL SETTING SOURCE REPORT

TARGET PROPERTY ADDRESS

BELEWS CREEK
3195 PINE HALL ROAD
BELEWS CREEK, NC 27052

TARGET PROPERTY COORDINATES

Latitude (North):	36.275002 - 36° 16' 30.0"
Longitude (West):	80.056900 - 80° 3' 24.8"
Universal Tranverse Mercator:	Zone 17
UTM X (Meters):	584706.4
UTM Y (Meters):	4014662.0
Elevation:	790 ft. above sea level

EDR's GeoCheck Report has been developed to assist the environmental professional with the collection of physical setting source information in accordance with ASTM 1527-00, Section 7.2.3. Section 7.2.3 requires that a current USGS 7.5 Minute Topographic Map (or equivalent, such as the USGS Digital Elevation Model) be reviewed. It also requires that one or more additional physical setting sources be sought when (1) conditions have been identified in which hazardous substances or petroleum products are likely to migrate to or from the property, and (2) more information than is provided in the current USGS 7.5 Minute Topographic Map (or equivalent) is generally obtained, pursuant to local good commercial or customary practice, to assess the impact of migration of recognized environmental conditions in connection with the property. Such additional physical setting sources generally include information about the topographic, hydrologic, hydrogeologic, and geologic characteristics of a site, and wells in the area.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata. EDR's GeoCheck Report is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

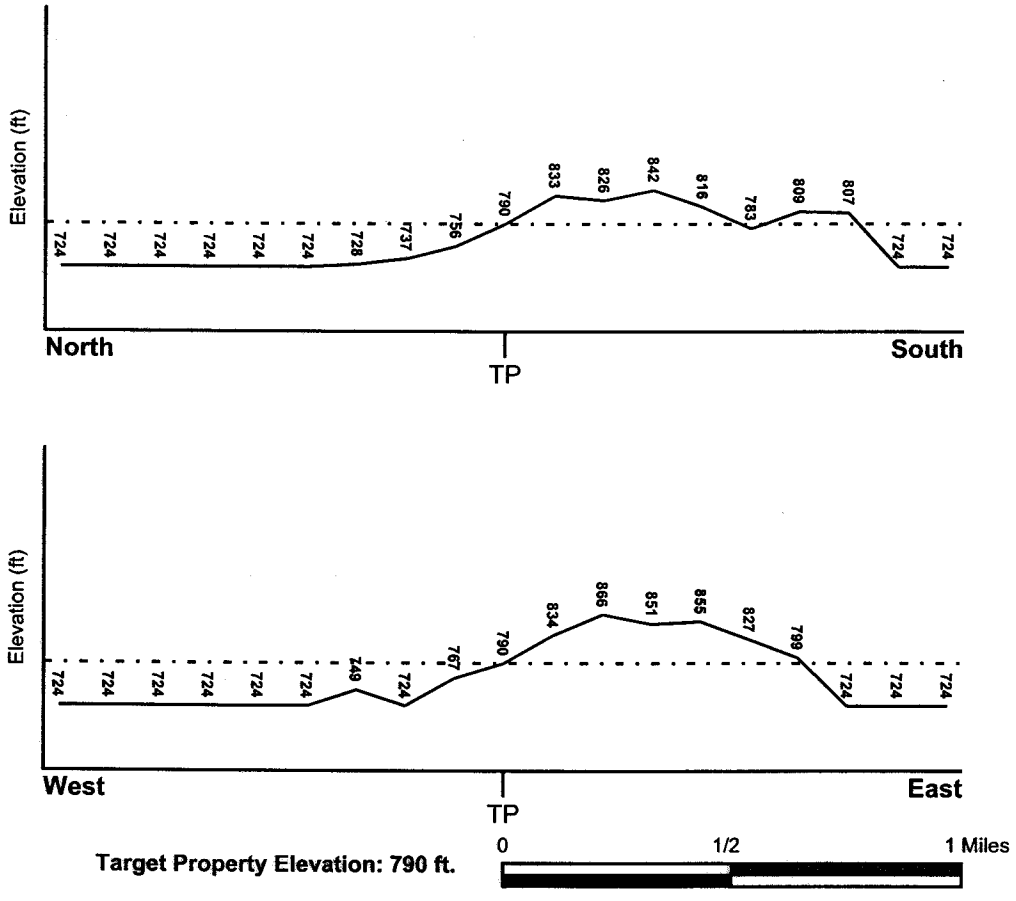
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

USGS Topographic Map:	36080-C1 BELEWS LAKE, NC
General Topographic Gradient:	General WNW
Source:	USGS 7.5 min quad index

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
STOKES, NC	Not Available

Flood Plain Panel at Target Property: Not Reported

Additional Panels in search area:
37067C0090H
37067C0095H
37067C0180H
37067C0185H
3701110005B

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
BELEWS LAKE	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT **GEOLOGIC AGE IDENTIFICATION**

Era:	Paleozoic	Category:	Metamorphic Rocks
System:	Pennsylvanian		
Series:	Felsic paragneiss and schist		
Code:	mm1 *(decoded above as Era, System & Series)*		

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps. The following information is based on Soil Conservation Service STATSGO data.

Soil Component Name:	PACOLET
Soil Surface Texture:	fine sandy loam
Hydrologic Group:	Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.
Soil Drainage Class:	Well drained. Soils have intermediate water holding capacity. Depth to water table is more than 6 feet.

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel: HIGH

Depth to Bedrock Min: > 60 inches

Depth to Bedrock Max: > 60 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification			
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil	Permeability Rate (in/hr)	Soil Reaction (pH)
1	0 inches	3 inches	fine sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 6.00 Min: 2.00	Max: 6.50 Min: 4.50
2	3 inches	29 inches	sandy clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 2.00 Min: 0.60	Max: 6.00 Min: 4.50
3	29 inches	52 inches	clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 2.00 Min: 0.60	Max: 6.00 Min: 4.50
4	52 inches	70 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 2.00 Min: 0.60	Max: 6.00 Min: 4.50

OTHER SOIL TYPES IN AREA

Based on Soil Conservation Service STATSGO data, the following additional subordinant soil types may appear within the general area of target property.

Soil Surface Textures: clay loam
gravelly - sandy loam
sandy loam
loam

Surficial Soil Types: clay loam
gravelly - sandy loam
sandy loam
loam

Shallow Soil Types: clay
sandy clay loam
silt loam
clay loam
silty clay loam

Deeper Soil Types: fine sandy loam
weathered bedrock

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

ADDITIONAL ENVIRONMENTAL RECORD SOURCES

According to ASTM E 1527-00, Section 7.2.2, "one or more additional state or local sources of environmental records may be checked, in the discretion of the environmental professional, to enhance and supplement federal and state sources... Factors to consider in determining which local or additional state records, if any, should be checked include (1) whether they are reasonably ascertainable, (2) whether they are sufficiently useful, accurate, and complete in light of the objective of the records review (see 7.1.1), and (3) whether they are obtained, pursuant to local, good commercial or customary practice." One of the record sources listed in Section 7.2.2 is water well information. Water well information can be used to assist the environmental professional in assessing sources that may impact groundwater flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	2.000
Federal FRDS PWS	2.000
State Database	2.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A3	NC0285495	1/8 - 1/4 Mile WNW
D10	NC0279169	1 - 2 Miles ENE
D11	NC0279169	1 - 2 Miles ENE
D12	NC0279169	1 - 2 Miles ENE
E14	NC0279750	1 - 2 Miles East
D15	NC0279695	1 - 2 Miles ENE
E17	NC0279695	1 - 2 Miles ENE
F18	NC0285423	1 - 2 Miles West

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A1	NCWS005098	0 - 1/8 Mile West
A2	NCWS005097	1/8 - 1/4 Mile WSW
B4	NCWS004908	1 - 2 Miles ENE
B5	NCWS004907	1 - 2 Miles ENE
C6	NCWS004909	1 - 2 Miles ENE
C7	NCWS004906	1 - 2 Miles ENE
C8	NCWS004994	1 - 2 Miles ENE

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
9	NCWS004161	1 - 2 Miles South
D13	NCWS004986	1 - 2 Miles ENE
D16	NCWS004987	1 - 2 Miles ENE
19	NCWS005047	1 - 2 Miles North
F20	NCWS005091	1 - 2 Miles West
F21	NCWS005108	1 - 2 Miles WSW

OTHER STATE DATABASE INFORMATION

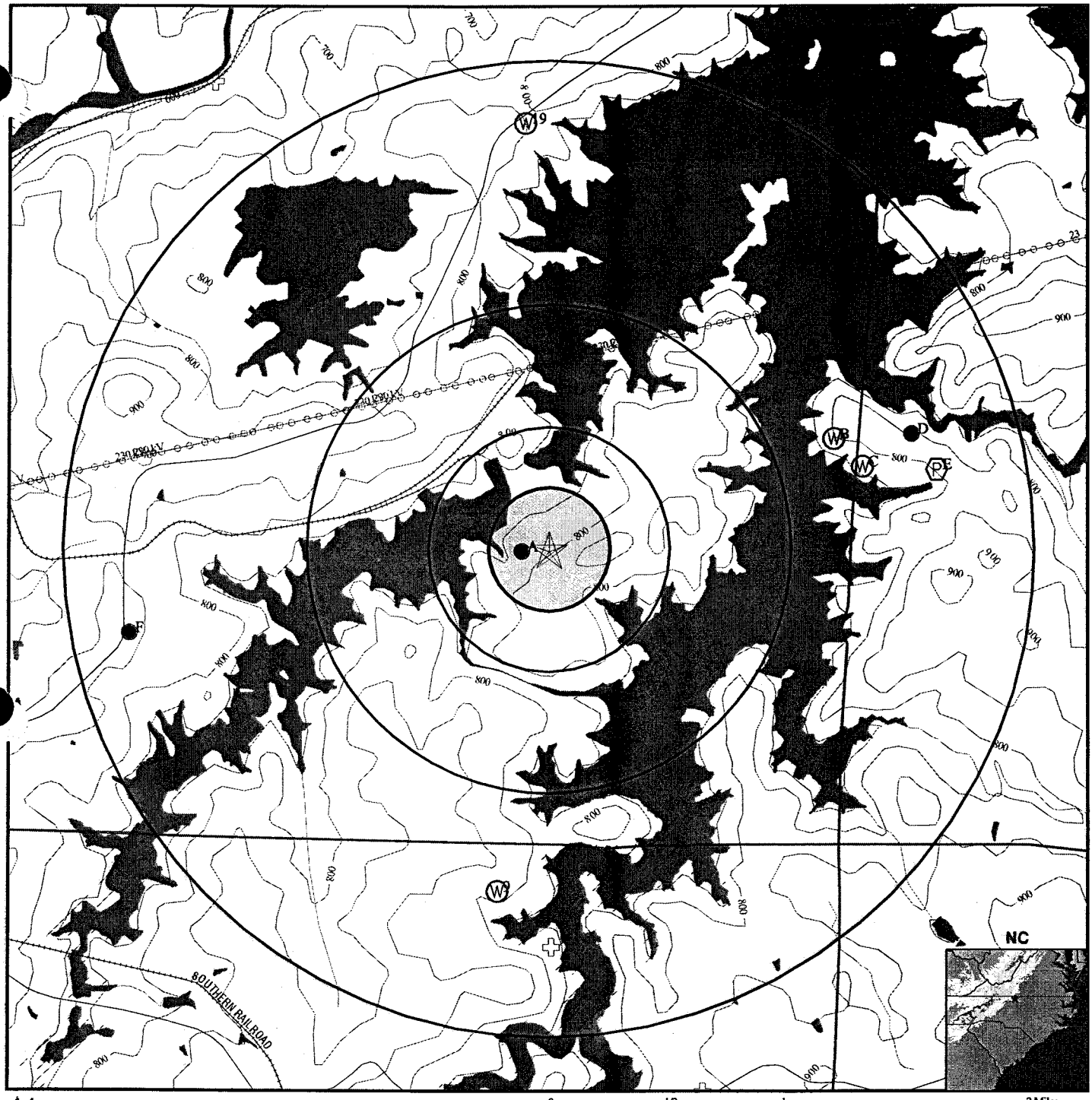
NORTH CAROLINA NATURAL HERITAGE ELEMENT OCCURRENCES

ID	Class
NC50003670	Animal
NC50006460	Animal
NC50009996	Plants
NC50012795	Plants

NORTH CAROLINA SIGNIFICANT NATURAL HERITAGE AREAS DATABASE:

ID	Name
NC10000155	TOWN FORK CREEK BOTTOMLANDS
NC10003359	DAN RIVER (STOKES) AQUATIC HABITAT

PHYSICAL SETTING SOURCE MAP - 01316566.1r



- County Boundary
- Major Roads
- Contour Lines
- Power transmission lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- Indeterminate Groundwater Flow at Location
- Groundwater Flow Varies at Location
- 100-year flood zone
- 500-year flood zone
- Wetlands
- Wildlife Areas
- Natural Areas
- Rare & Endangered Species

TARGET PROPERTY:	Belews Creek	CUSTOMER:	Duke Power Company
ADDRESS:	3195 Pine Hall Road	CONTACT:	William Miller
CITY/STATE/ZIP:	Belews Creek NC 27052	INQUIRY #:	01316566.1r
LAT/LONG:	36.2750 / 80.0569	DATE:	November 30, 2004 3:54 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

	Database	EDR ID Number
A1 **West** **0 - 1/8 Mile** **Lower**	**NC WELLS**	**NCWS005098**

Site Name:	WELL #2		
PWS ID:	0285495	Source code:	RW2
City:	WALNUT COVE		
County:	Stokes		
Latitude:	361630.21	Longitude:	800330.967
Availability:	Permanent		
Type:	Ground	Depth:	400
Owner:	DUKE ENERGY CORPORATION		

A2 **WSW** **1/8 - 1/4 Mile** **Lower**	**NC WELLS**	**NCWS005097**

Site Name:	WELL #1		
PWS ID:	0285495	Source code:	RW1
City:	WALNUT COVE		
County:	Stokes		
Latitude:	361627.03	Longitude:	800332.4
Availability:	Permanent		
Type:	Ground	Depth:	900
Owner:	DUKE ENERGY CORPORATION		

A3 **WNW** **1/8 - 1/4 Mile** **Lower**	**FRDS PWS**	**NC0285495**

PWS ID:	NC0285495	PWS Status:	Active
Date Initiated:	7706	Date Deactivated:	Not Reported
PWS Name:	DUKE POWER-BELEWS CREEK STEAM WALNUT COVE, NC 27052		
Addressee / Facility:	System Owner/Responsible Party JIM BURNETTE OR MANAGER NOW PO BOX 557 WALNUT COVE, NC 27052		
Addressee / Facility:	System Owner/Responsible Party DUKE POWER COMPANY 13339 HAGERS FERRY RD HUNTERSVILLE, NC 28078		
Facility Latitude:	36 16 31	Facility Longitude:	080 03 34
City Served:	WALNUT COVE		
Treatment Class:	Treated	Population:	00000181

PWS currently has or had major violation(s) or enforcement: Yes

VIOLATIONS INFORMATION:

Violation ID:	9400419	Source ID:	000	PWS Phone:	Not Reported
Vio. beginning Date:	10/01/93	Vio. end Date:	10/31/93	Vio. Period:	001 Months
Num required Samples:	Not Reported	Number of Samples Taken:		Not Reported	
Analysis Result:	Not Reported	Maximum Contaminant Level:		Not Reported	
Analysis Method:	Not Reported				
Violation Type:	Monitoring, Routine Major (TCR)				
Contaminant:	COLIFORM (TCR)				
Vio. Awareness Date:	111593				

Violation ID:	9408781	Source ID:	Not Reported	PWS Phone:	Not Reported
Vio. beginning Date:	10/01/93	Vio. end Date:	12/31/93	Vio. Period:	003 Months
Num required Samples:	000	Number of Samples Taken:		000	
Analysis Result:	Not Reported	Maximum Contaminant Level:		Not Reported	
Analysis Method:	Not Reported				
Violation Type:	Monitoring, Regular				
Contaminant:	NITRATE				
Vio. Awareness Date:	061594				

ENFORCEMENT INFORMATION:

System Name:	DUKE POWER-BELEWS CREEK ST		
Violation Type:	Monitoring, Routine Major (TCR)		
Contaminant:	COLIFORM (TCR)		
Compliance Period:	1999-10-01 - 1999-12-31	Analytical Value:	0000000.000000000
Violation ID:	0004090	Enforcement ID:	0007581
Enforcement Date:	2000-02-04	Enf. Action:	State Formal NOV Issued

System Name:	DUKE POWER-BELEWS CREEK ST		
Violation Type:	Monitoring, Routine Major (TCR)		
Contaminant:	COLIFORM (TCR)		
Compliance Period:	1999-10-01 - 1999-12-31	Analytical Value:	0000000.000000000
Violation ID:	0004090	Enforcement ID:	0007582
Enforcement Date:	2000-02-04	Enf. Action:	State Public Notif Requested

---

B4
ENE
1 - 2 Miles
Higher

NC WELLS **NCWS004908**

Site Name:	WELL #2		
PWS ID:	0279169	Source code:	200
City:	STOKESDALE		
County:	Rockingham		
Latitude:	361654.29	Longitude:	800210.35
Availability:	Permanent		
Type:	Ground	Depth:	0
Owner:	SYLVIA MIDDLETON		

B5
ENE
1 - 2 Miles
Higher

NC WELLS **NCWS004907**

Site Name:	WELL #1		
PWS ID:	0279169	Source code:	100
City:	STOKESDALE		
County:	Rockingham		
Latitude:	361652.84	Longitude:	800207.69
Availability:	Emergency		
Type:	Ground	Depth:	0
Owner:	SYLVIA MIDDLETON		

C6
ENE **NC WELLS** **NCWS004909**
1 - 2 Miles
Lower

Site Name:	WELL #3		
PWS ID:	0279169	Source code:	300
City:	STOKESDALE		
County:	Rockingham		
Latitude:	361648.551	Longitude:	800202.084
Availability:	Permanent		
Type:	Ground	Depth:	0
Owner:	SYLVIA MIDDLETON		

C7
ENE **NC WELLS** **NCWS004906**
1 - 2 Miles
Lower

Site Name:	WELL #1		
PWS ID:	0279168	Source code:	100
City:	STOKESDALE		
County:	Rockingham		
Latitude:	361648.54	Longitude:	800201.95
Availability:	Permanent		
Type:	Ground	Depth:	0
Owner:	SYLVIA MIDDLETON		

C8
ENE **NC WELLS** **NCWS004994**
1 - 2 Miles
Lower

Site Name:	WELL #1		
PWS ID:	0279750	Source code:	100
City:	STOKESDALE		
County:	Rockingham		
Latitude:	361645.78	Longitude:	800159.966
Availability:	Permanent		
Type:	Ground	Depth:	0
Owner:	HUMPHREY'S GRILL		

9
South **NC WELLS** **NCWS004161**
1 - 2 Miles
Higher

Site Name:	WELL #1		
PWS ID:	0234198	Source code:	SR1
City:	BELEWS CREEK		
County:	Forsyth		
Latitude:	361516.8	Longitude:	800338.54
Availability:	Permanent		
Type:	Ground	Depth:	0
Owner:	HYDRAULICS LTD		

D10
ENE
1 - 2 Miles
Higher

FRDS PWS NC0279169

PWS ID:	NC0279169	PWS Status:	Active
Date Initiated:	9106	Date Deactivated:	Not Reported
PWS Name:	HUMPHREY'S RIDGE #3 STOKESDALE, NC 27357		

Addressee / Facility: System Owner/Responsible Party
SYLVIA MIDDLETON OR MANAGER
435 HUMPHREY'S RIDGE DR
STOKESDALE, NC 27357

Addressee / Facility: System Owner/Responsible Party
SYLVIA MIDDLETON
435 HUMPHREY'S RIDGE DR
STOKESDALE, NC 27357

Facility Latitude:	36 16 55	Facility Longitude	080 01 50
Facility Latitude:	36 16 53	Facility Longitude	080 01 52
Facility Latitude:	36 16 52	Facility Longitude	080 01 50
City Served:	STOKESDALE		
Treatment Class:	Treated	Population:	00000075

PWS currently has or had major violation(s) or enforcement: Yes

VIOLATIONS INFORMATION:

Violation ID:	9401530	Source ID:	Not Reported	PWS Phone:	Not Reported
Vio. beginning Date:	10/01/93	Vio. end Date:	12/31/93	Vio. Period:	003 Months
Num required Samples:	000	Number of Samples Taken:		000	
Analysis Result:	Not Reported	Maximum Contaminant Level:		Not Reported	
Analysis Method:	Not Reported				
Violation Type:	Monitoring, Regular				
Contaminant:	TTHM				
Vio. Awareness Date:	020994				

Violation ID:	9400409	Source ID:	000	PWS Phone:	Not Reported
Vio. beginning Date:	10/01/93	Vio. end Date:	10/31/93	Vio. Period:	001 Months
Num required Samples:	Not Reported	Number of Samples Taken:		Not Reported	
Analysis Result:	Not Reported	Maximum Contaminant Level:		Not Reported	
Analysis Method:	Not Reported				
Violation Type:	Monitoring, Routine Major (TCR)				
Contaminant:	COLIFORM (TCR)				
Vio. Awareness Date:	111593				

Violation ID:	9408684	Source ID:	Not Reported	PWS Phone:	Not Reported
Vio. beginning Date:	01/01/90	Vio. end Date:	12/31/93	Vio. Period:	048 Months
Num required Samples:	000	Number of Samples Taken:		000	
Analysis Result:	Not Reported	Maximum Contaminant Level:		Not Reported	
Analysis Method:	Not Reported				
Violation Type:	Monitoring, Regular				
Contaminant:	GROSS ALPHA, EXCL. RADON & U				
Vio. Awareness Date:	060194				

D11
ENE
1 - 2 Miles
Higher

FRDS PWS **NC0279169**

PWS ID:	NC0279169	PWS Status:	Active
Date Initiated:	9106	Date Deactivated:	Not Reported
PWS Name:	HUMPHREY'S RIDGE #3 STOKESDALE, NC 27357		
Addressee / Facility:	System Owner/Responsible Party SYLVIA MIDDLETON OR MANAGER 435 HUMPHREY'S RIDGE DR STOKESDALE, NC 27357		
Addressee / Facility:	System Owner/Responsible Party SYLVIA MIDDLETON 435 HUMPHREY'S RIDGE DR STOKESDALE, NC 27357		

Facility Latitude:	36 16 55	Facility Longitude	080 01 50
Facility Latitude:	36 16 53	Facility Longitude	080 01 52
Facility Latitude:	36 16 52	Facility Longitude	080 01 50
City Served:	STOKESDALE		
Treatment Class:	Treated	Population:	00000075

PWS currently has or had major violation(s) or enforcement: Yes

VIOLATIONS INFORMATION:

Violation ID:	9401530	Source ID:	Not Reported	PWS Phone:	Not Reported
Vio. beginning Date:	10/01/93	Vio. end Date:	12/31/93	Vio. Period:	003 Months
Num required Samples:	000	Number of Samples Taken:		000	
Analysis Result:	Not Reported	Maximum Contaminant Level:		Not Reported	
Analysis Method:	Not Reported				
Violation Type:	Monitoring, Regular				
Contaminant:	TTHM				
Vio. Awareness Date:	020994				

Violation ID:	9400409	Source ID:	000	PWS Phone:	Not Reported
Vio. beginning Date:	10/01/93	Vio. end Date:	10/31/93	Vio. Period:	001 Months
Num required Samples:	Not Reported	Number of Samples Taken:		Not Reported	
Analysis Result:	Not Reported	Maximum Contaminant Level:		Not Reported	
Analysis Method:	Not Reported				
Violation Type:	Monitoring, Routine Major (TCR)				
Contaminant:	COLIFORM (TCR)				
Vio. Awareness Date:	111593				

Violation ID:	9408684	Source ID:	Not Reported	PWS Phone:	Not Reported
Vio. beginning Date:	01/01/90	Vio. end Date:	12/31/93	Vio. Period:	048 Months
Num required Samples:	000	Number of Samples Taken:		000	
Analysis Result:	Not Reported	Maximum Contaminant Level:		Not Reported	
Analysis Method:	Not Reported				
Violation Type:	Monitoring, Regular				
Contaminant:	GROSS ALPHA, EXCL. RADON & U				
Vio. Awareness Date:	060194				

D12
ENE
1 - 2 Miles
Lower

FRDS PWS **NC0279169**

PWS ID:	NC0279169	PWS Status:	Active
Date Initiated:	9106	Date Deactivated:	Not Reported
PWS Name:	HUMPHREY'S RIDGE #3 STOKESDALE, NC 27357		
Addressee / Facility:	System Owner/Responsible Party SYLVIA MIDDLETON OR MANAGER 435 HUMPHREY'S RIDGE DR STOKESDALE, NC 27357		
Addressee / Facility:	System Owner/Responsible Party SYLVIA MIDDLETON 435 HUMPHREY'S RIDGE DR STOKESDALE, NC 27357		
Facility Latitude:	36 16 55	Facility Longitude:	080 01 50
Facility Latitude:	36 16 53	Facility Longitude:	080 01 52
Facility Latitude:	36 16 52	Facility Longitude:	080 01 50
City Served:	STOKESDALE		
Treatment Class:	Treated	Population:	00000075

PWS currently has or had major violation(s) or enforcement: Yes

VIOLATIONS INFORMATION:

Violation ID:	9401530	Source ID:	Not Reported	PWS Phone:	Not Reported
Vio. beginning Date:	10/01/93	Vio. end Date:	12/31/93	Vio. Period:	003 Months
Num required Samples:	000	Number of Samples Taken:		000	
Analysis Result:	Not Reported	Maximum Contaminant Level:		Not Reported	
Analysis Method:	Not Reported				
Violation Type:	Monitoring, Regular				
Contaminant:	TTHM				
Vio. Awareness Date:	020994				

Violation ID:	9400409	Source ID:	000	PWS Phone:	Not Reported
Vio. beginning Date:	10/01/93	Vio. end Date:	10/31/93	Vio. Period:	001 Months
Num required Samples:	Not Reported	Number of Samples Taken:		Not Reported	
Analysis Result:	Not Reported	Maximum Contaminant Level:		Not Reported	
Analysis Method:	Not Reported				
Violation Type:	Monitoring, Routine Major (TCR)				
Contaminant:	COLIFORM (TCR)				
Vio. Awareness Date:	111593				

Violation ID:	9408684	Source ID:	Not Reported	PWS Phone:	Not Reported
Vio. beginning Date:	01/01/90	Vio. end Date:	12/31/93	Vio. Period:	048 Months
Num required Samples:	000	Number of Samples Taken:		000	
Analysis Result:	Not Reported	Maximum Contaminant Level:		Not Reported	
Analysis Method:	Not Reported				
Violation Type:	Monitoring, Regular				
Contaminant:	GROSS ALPHA, EXCL. RADON & U				
Vio. Awareness Date:	060194				

D13
ENE
1 - 2 Miles
Lower

NC WELLS **NCWS004986**

Site Name:	WELL #1		
PWS ID:	0279695	Source code:	100
City:	STOKESDALE		
County:	Rockingham		
Latitude:	361658.41	Longitude:	800149.64
Availability:	Permanent		
Type:	Ground	Depth:	0
Owner:	SYLVIA MIDDLETON		

E14
East
1 - 2 Miles
Lower

FRDS PWS **NC0279750**

PWS ID:	NC0279750	PWS Status:	Active
Date Initiated:	9105	Date Deactivated:	Not Reported
PWS Name:	HUMPHREY'S GRILL STOKESDALE, NC 27357		
Addressee / Facility:	System Owner/Responsible Party SYLVIA MIDDLETON OR MANAGER RT 1 BOX 50-C STOKESDALE, NC 27357		
Addressee / Facility:	System Owner/Responsible Party SYLVIA MIDDLETON RT 1 BOX 50-C STOKESDALE, NC 27357		
Facility Latitude:	36 16 45	Facility Longitude:	080 01 45
City Served:	STOKESDALE		
Treatment Class:	Treated	Population:	00000050

PWS currently has or had major violation(s) or enforcement: No

---

D15
ENE
1 - 2 Miles
Higher

FRDS PWS **NC0279695**

PWS ID:	NC0279695	PWS Status:	Active
Date Initiated:	7706	Date Deactivated	Not Reported
PWS Name:	HUMPHREY'S RIDGE #1 STOKESDALE, NC 27357		
Addressee / Facility:	System Owner/Responsible Party MS SILVIA MIDDLETON OR DIR RT 1 BOX 50-C STOKESDALE, NC 27357		
Addressee / Facility:	System Owner/Responsible Party SYLVIA MIDDLETON RT 1 BOX 50-C STOKESDALE, NC 27357		
Facility Latitude:	36 16 48	Facility Longitude	080 01 40
Facility Latitude:	36 16 50	Facility Longitude	080 01 45
City Served:	STOKESDALE		
Treatment Class:	Treated	Population:	00000290

PWS currently has or had major violation(s) or enforcement: Yes

VIOLATIONS INFORMATION:

Violation ID:	9401531	Source ID:	Not Reported	PWS Phone:	Not Reported
Vio. beginning Date:	10/01/93	Vio. end Date:	10/31/93	Vio. Period:	001 Months
Num required Samples:	000	Number of Samples Taken:		000	
Analysis Result:	Not Reported	Maximum Contaminant Level:		Not Reported	
Analysis Method:	Not Reported				
Violation Type:	Monitoring, Regular				
Contaminant:	TTHM				
Vio. Awareness Date:	020994				

Violation ID:	9400412	Source ID:	000	PWS Phone:	Not Reported
Vio. beginning Date:	10/01/93	Vio. end Date:	10/31/93	Vio. Period:	001 Months
Num required Samples:	Not Reported	Number of Samples Taken:		Not Reported	
Analysis Result:	Not Reported	Maximum Contaminant Level:		Not Reported	
Analysis Method:	Not Reported				
Violation Type:	Monitoring, Routine Major (TCR)				
Contaminant:	COLIFORM (TCR)				
Vio. Awareness Date:	111593				

D16
ENE
1 - 2 Miles
Higher

NC WELLS **NCWS004987**

Site Name:	WELL #2		
PWS ID:	0279695	Source code:	200
City:	STOKESDALE		
County:	Rockingham		
Latitude:	361657.56	Longitude:	800146.701
Availability:	Permanent		
Type:	Ground	Depth:	0
Owner:	SYLVIA MIDDLETON		

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

E17
ENE
1 - 2 Miles
Higher | **FRDS PWS** | **NC0279695**

PWS ID: NC0279695 PWS Status: Active
Date Initiated: 7706 Date Deactivated: Not Reported
PWS Name: HUMPHREY'S RIDGE #1
STOKESDALE, NC 27357

Addressee / Facility: System Owner/Responsible Party
MS SILVIA MIDDLETON OR DIR
RT 1 BOX 50-C
STOKESDALE, NC 27357

Addressee / Facility: System Owner/Responsible Party
SYLVIA MIDDLETON
RT 1 BOX 50-C
STOKESDALE, NC 27357

Facility Latitude: 36 16 48 Facility Longitude: 080 01 40
Facility Latitude: 36 16 50 Facility Longitude: 080 01 45
City Served: STOKESDALE
Treatment Class: Treated Population: 00000290

PWS currently has or had major violation(s) or enforcement: Yes

VIOLATIONS INFORMATION:

Violation ID: 9401531 Source ID: Not Reported PWS Phone: Not Reported
Vio. beginning Date: 10/01/93 Vio. end Date: 10/31/93 Vio. Period: 001 Months
Num required Samples: 000 Number of Samples Taken: 000
Analysis Result: Not Reported Maximum Contaminant Level: Not Reported
Analysis Method: Not Reported
Violation Type: Monitoring, Regular
Contaminant: TTHM
Vio. Awareness Date: 020994

Violation ID: 9400412 Source ID: 000 PWS Phone: Not Reported
Vio. beginning Date: 10/01/93 Vio. end Date: 10/31/93 Vio. Period: 001 Months
Num required Samples: Not Reported Number of Samples Taken: Not Reported
Analysis Result: Not Reported Maximum Contaminant Level: Not Reported
Analysis Method: Not Reported
Violation Type: Monitoring, Routine Major (TCR)
Contaminant: COLIFORM (TCR)
Vio. Awareness Date: 111593

F18
West
1 - 2 Miles
Higher | **FRDS PWS** | **NC0285423**

PWS ID: NC0285423 PWS Status: Active
Date Initiated: 7706 Date Deactivated: Not Reported
PWS Name: FOREST CHAPEL METHODIST CHURCH
WALNUT COVE, NC 27052

Addressee / Facility: System Owner/Responsible Party
BYRON SHELTON OR PASTOR
RT 2
WALNUT COVE, NC 27052

Addressee / Facility: System Owner/Responsible Party
FOREST CHAPEL METH CHURCH
RT 2
WALNUT COVE, NC 27052

Facility Latitude: 36 16 15
Facility Longitude: 080 05 15
City Served: WALNUT COVE
Treatment Class: Untreated
Population: 00000070

PWS currently has or had major violation(s) or enforcement: No

---

19
North
1 - 2 Miles
Higher

NC WELLS **NCWS005047**

Site Name: WELL #1
PWS ID: 0285432
Source code: W01
City: PINE HALL
County: Stokes
Latitude: 361801.093
Longitude: 800331.502
Availability: Permanent
Type: Ground
Depth: 0
Owner: WITHERS CHAPEL UMC

F20
West
1 - 2 Miles
Higher

NC WELLS **NCWS005091**

Site Name: WELL #1
PWS ID: 0285483
Source code: 1
City: WALNUT COVE
County: Stokes
Latitude: 361612.5
Longitude: 800516.3
Availability: Permanent
Type: Ground
Depth: 0
Owner: ELSIE STULTZ OR RAY CALHOUNE

F21
WSW
1 - 2 Miles
Higher

NC WELLS **NCWS005108**

Site Name: WELL #1
PWS ID: 0285515
Source code: W01
City: WALNUT COVE
County: Stokes
Latitude: 361608.264
Longitude: 800518.304
Availability: Permanent
Type: Ground
Depth: 103
Owner: SAM BRAY

Direction Distance		Database	EDR ID Number
		NC_NHEO	NC50003670
GIS ID:	92548		
Classification by Type:	Animal		
Occurrence Status:	Extant		
		NC_NHEO	NC50006460
GIS ID:	212410		
Classification by Type:	Animal		
Occurrence Status:	Extant		
		NC_NHEO	NC50009996
GIS ID:	62438		
Classification by Type:	Plants		
Occurrence Status:	Historic, no evidence of destruction		
		NC_NHEO	NC50012795
GIS ID:	42592		
Classification by Type:	Plants		
Occurrence Status:	X		
		NC_SNHA	NC10000155
Site Name:	TOWN FORK CREEK BOTTOMLANDS		
Quality:	Not Reported		
Acres per Polygon:	102.56		
		NC_SNHA	NC10003359
Site Name:	DAN RIVER (STOKES) AQUATIC HABITAT		
Quality:	Not Reported		
Acres per Polygon:	567.8		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: NC Radon

Radon Test Results

County	Result Type	Total Sites	Avg pCi/L	Range pCi/L
STOKES	Statistical	12	1.43	0.20-3.60
STOKES	Non-Statistical	120	2.69	0.00-15.30

Federal EPA Radon Zone for STOKES County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 27052

Number of sites tested: 2

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.400 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002. 7.5-Minute DEMs correspond to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 from the U.S. Fish and Wildlife Service.

HYDROGEOLOGIC INFORMATION

AQUIFLOW[R] Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

ADDITIONAL ENVIRONMENTAL RECORD SOURCES

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

STATE RECORDS

NC Natural Areas: Significant Natural Heritage Areas
Source: Center for Geographic Information and Analysis
Telephone: 919-733-2090
A polygon converage identifying sites (terrestrial or aquatic that have particular biodiversity significance. A site's significance may be due to the presenceof rare species, rare or hight quality natural communities, or other important ecological features.

NC Game Lands: Wildlife Resources Commission Game Lands
Source: Center for Geographic Information and Analysis
Telephone: 919-733-2090
All publicly owned game lands managed by the North Carolina Wildlife Resources Commission and as listed in Hunting and Fishing Maps.

NC Natural Heritage Sites: Natural Heritage Element Occurrence Sites
Source: Center for Geographic Information and Analysis
Telephone: 919-733-2090
A point coverage identifying locations of rare and endangered species, occurrences of exemplary or unique natural ecosystems (terrestrial or aquatic), and special animal habitats (e.g., colonial waterbird nesting sites).

North Carolina Public Water Supply Wells
Source: Department of Environmental Health
Telephone: 919-715-3243

RADON

State Database: NC Radon
Source: Department of Environment & Natural Resources
Telephone: 919-733-4984
Radon Statistical and Non Statiscal Data

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

Attachment 6

EDR Report – September 28, 2004

EDR™ Environmental
Data Resources Inc

The EDR Radius Map
with GeoCheck®

Belews Creek
3195 Pine Hall Rd
Belews Creek, NC 27052

Inquiry Number: 01277555.1r

September 28, 2004

The Standard in Environmental Risk Management Information

440 Wheelers Farms Road
Milford, Connecticut 06460

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

FORM-ERN

TABLE OF CONTENTS

SECTION	PAGE
Executive Summary	ES1
Overview Map	2
Detail Map	3
Map Findings Summary	4
Map Findings	6
Orphan Summary	12
Government Records Searched/Data Currency Tracking	GR-1

GEOCHECK ADDENDUM

Physical Setting Source Addendum	A-1
Physical Setting Source Summary	A-2
Physical Setting Source Map	A-7
Physical Setting Source Map Findings	A-8
Physical Setting Source Records Searched	A-12

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc. (EDR). The report meets the government records search requirements of ASTM Standard Practice for Environmental Site Assessments, E 1527-00. Search distances are per ASTM standard or custom distances requested by the user.

TARGET PROPERTY INFORMATION

ADDRESS

3195 PINE HALL RD
BELEWS CREEK, NC 27052

COORDINATES

Latitude (North):	36.275000 - 36° 16' 30.0"
Longitude (West):	80.056900 - 80° 3' 24.8"
Universal Tranverse Mercator:	Zone 17
UTM X (Meters):	584706.4
UTM Y (Meters):	4014662.0
Elevation:	790 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property:	36080-C1 BELEWS LAKE, NC
Source:	USGS 7.5 min quad index

TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following government records. For more information on this property see page 6 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
DUKE POWER/WALNUT COVE POWER HOUSE ROAD WALNUT COVE, NC	SHWS	N/A
DUKE POWER - WALNUT COVE- SOUTHERN 3195 PINE HALL ROAD WALNUT COVE, NC 27052	IMD LUST	N/A
DUKE POWER - BELEWS CREEK SR 1904 WALNUT COVE, NC 27052	LUST	N/A
DUKE POWER/BELEWS CREEK ST PLT SR 1908 STOKES, NC	SWF/LF	N/A

EXECUTIVE SUMMARY

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the ASTM E 1527-00 search radius around the target property for the following databases:

FEDERAL ASTM STANDARD

NPL ..... National Priority List
Proposed NPL ..... Proposed National Priority List Sites
CERCLIS ..... Comprehensive Environmental Response, Compensation, and Liability Information System
CERC-NFRAP ..... CERCLIS No Further Remedial Action Planned
CORRACTS ..... Corrective Action Report
RCRIS-TSD ..... Resource Conservation and Recovery Information System
RCRIS-LQG ..... Resource Conservation and Recovery Information System
RCRIS-SQG ..... Resource Conservation and Recovery Information System
ERNS ..... Emergency Response Notification System

STATE ASTM STANDARD

UST ..... Petroleum Underground Storage Tank Database
OLI ..... Old Landfill Inventory
INDIAN UST ..... Underground Storage Tanks on Indian Land
VCP ..... Responsible Party Voluntary Action Sites

FEDERAL ASTM SUPPLEMENTAL

CONSENT ..... Superfund (CERCLA) Consent Decrees
ROD ..... Records Of Decision
Delisted NPL ..... National Priority List Deletions
FINDS ..... Facility Index System/Facility Identification Initiative Program Summary Report
HMIRS ..... Hazardous Materials Information Reporting System
MLTS ..... Material Licensing Tracking System
MINES ..... Mines Master Index File
NPL Liens ..... Federal Superfund Liens
PADS ..... PCB Activity Database System
ODI ..... Open Dump Inventory
UMTRA ..... Uranium Mill Tailings Sites
FUDS ..... Formerly Used Defense Sites
INDIAN RESERV ..... Indian Reservations
US BROWNFIELDS ..... A Listing of Brownfields Sites
DOD ..... Department of Defense Sites
RAATS ..... RCRA Administrative Action Tracking System
TRIS ..... Toxic Chemical Release Inventory System
TSCA ..... Toxic Substances Control Act
SSTS ..... Section 7 Tracking Systems
FTTS INSP ..... FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

STATE OR LOCAL ASTM SUPPLEMENTAL

NC HSDS ..... Hazardous Substance Disposal Site

EXECUTIVE SUMMARY

AST..... AST Database
LUST TRUST..... State Trust Fund Database
DRYCLEANERS..... Drycleaning Sites

EDR PROPRIETARY HISTORICAL DATABASES

Coal Gas..... Former Manufactured Gas (Coal Gas) Sites

BROWNFIELDS DATABASES

US BROWNFIELDS..... A Listing of Brownfields Sites
Brownfields..... Brownfields Projects Inventory
INST CONTROL..... No Further Action Sites With Land Use Restrictions Monitoring
VCP..... Responsible Party Voluntary Action Sites

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were not identified.

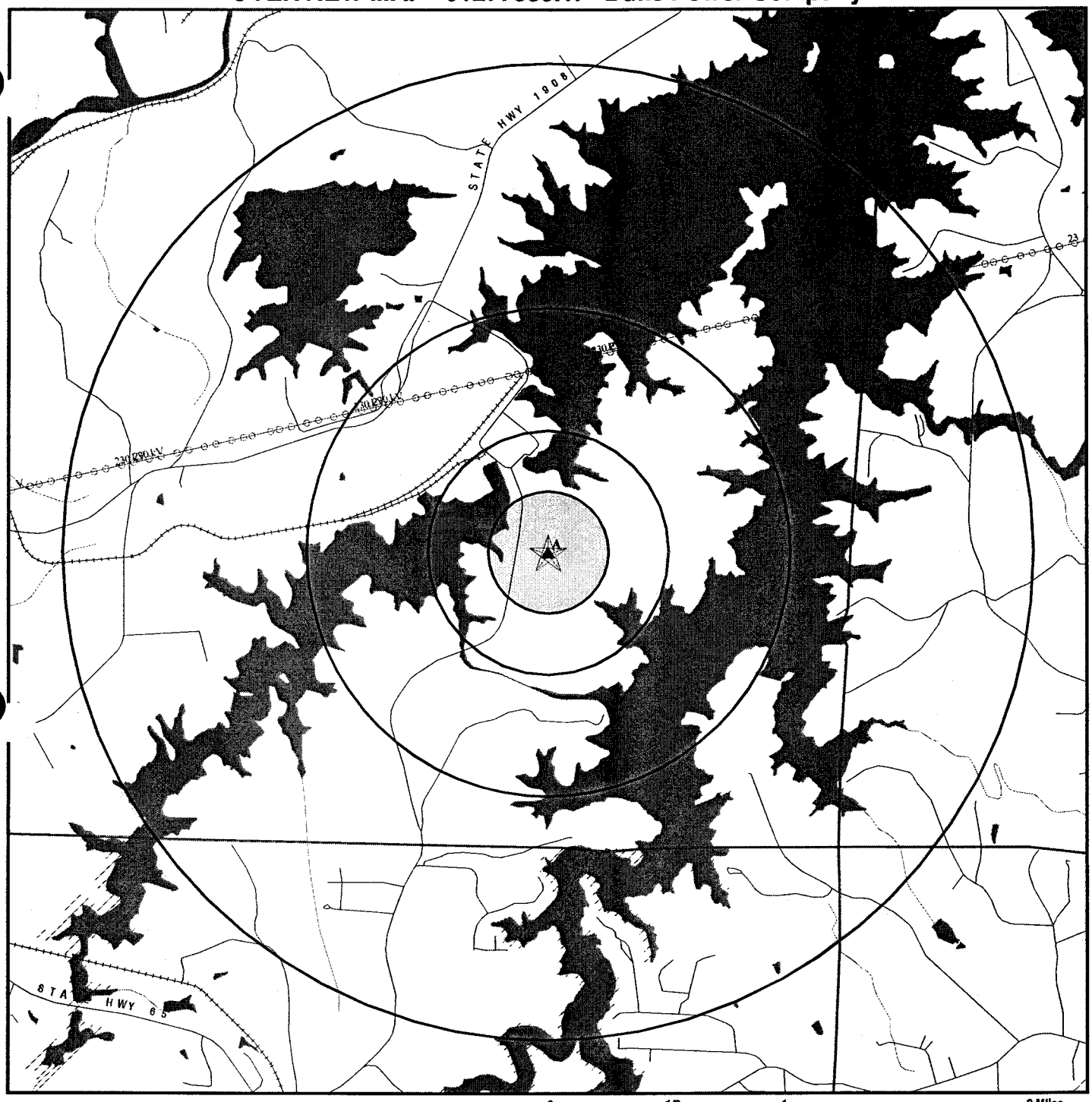
Unmappable (orphan) sites are not considered in the foregoing analysis.

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped:

Site Name	Database(s)
PRIVATE FARM	SHWS
PRIVATE FARM	CERC-NFRAP
THOMAS STANLEY GRADING AND HAULING	SWF/LF
CARL WHITE GROCERY	LUST
STOKES COUNTY - NORTH STOKES HIGH	LUST
J.B. DALTON'S STORE	LUST
TIMES TURN AROUND - STOKESDALE	IMD, LUST
LAWSON PROPERTY, MITCHELL	LUST
TUCKERS GROCERY	LUST
TUCKER GROCERY - STOKESDALE	LUST
VULCAN - STOKESDALE QUARRY	LUST
ROCKINGHAM BANDAG CORP.	LUST
WOODS COUNTRY STORE	LUST, UST
BREWER'S STORE	LUST
KOUNTRY KORNER - WALNUT COVE	IMD, LUST
FRIENDLY FOOD MART 6	LUST, UST
BONNIE'S	LUST
NCDOT - WALNUT COVE FACILITY - B	LUST
NCDOT - WALNUT COVE FACILITY	LUST
BETTY'S COUNTRY GROCERY	LUST
MEADOWBROOK FIELD	LUST
WHITE'S GROCERY (CARL & NADIA)	LUST
DEHART PROPERTY, V.L.	IMD, LUST
WHITE'S GROCERY	LUST TRUST
WALNUT COVE TIRE SHOP	LUST TRUST
A.V. CHAPMAN	UST
SPENCER'S GROCERY	UST
VINCENT B. SANDY	UST
WALNUT COVE TIRE CTR INC	UST
CROSS CREEK APPAREL	UST
NC DOR. DIV. OF HWY	UST
COUNTRY GROCERY	UST
BONNIES	UST
MRS V L DEHART	UST
NCDOT-WALNUT COVE	IMD
NCDOT-WALNUT COVE-B	IMD

OVERVIEW MAP - 01277555.1r - Duke Power Company



- ★ Target Property
- ▲ Sites at elevations higher than or equal to the target property
- ◆ Sites at elevations lower than the target property
- Coal Gasification Sites
- National Priority List Sites
- Landfill Sites
- Dept. Defense Sites
- Indian Reservations BIA
- County Boundary
- Power transmission lines
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- Federal Wetlands
- Hazardous Substance Disposal Sites

TARGET PROPERTY:	Belews Creek	CUSTOMER:	Duke Power Company
ADDRESS:	3195 Pine Hall Rd	CONTACT:	Ralph Roberts
CITY/STATE/ZIP:	Belews Creek NC 27052	INQUIRY #:	01277555.1r
LAT/LONG:	36.2750 / 80.0569	DATE:	September 28, 2004 2:57 pm

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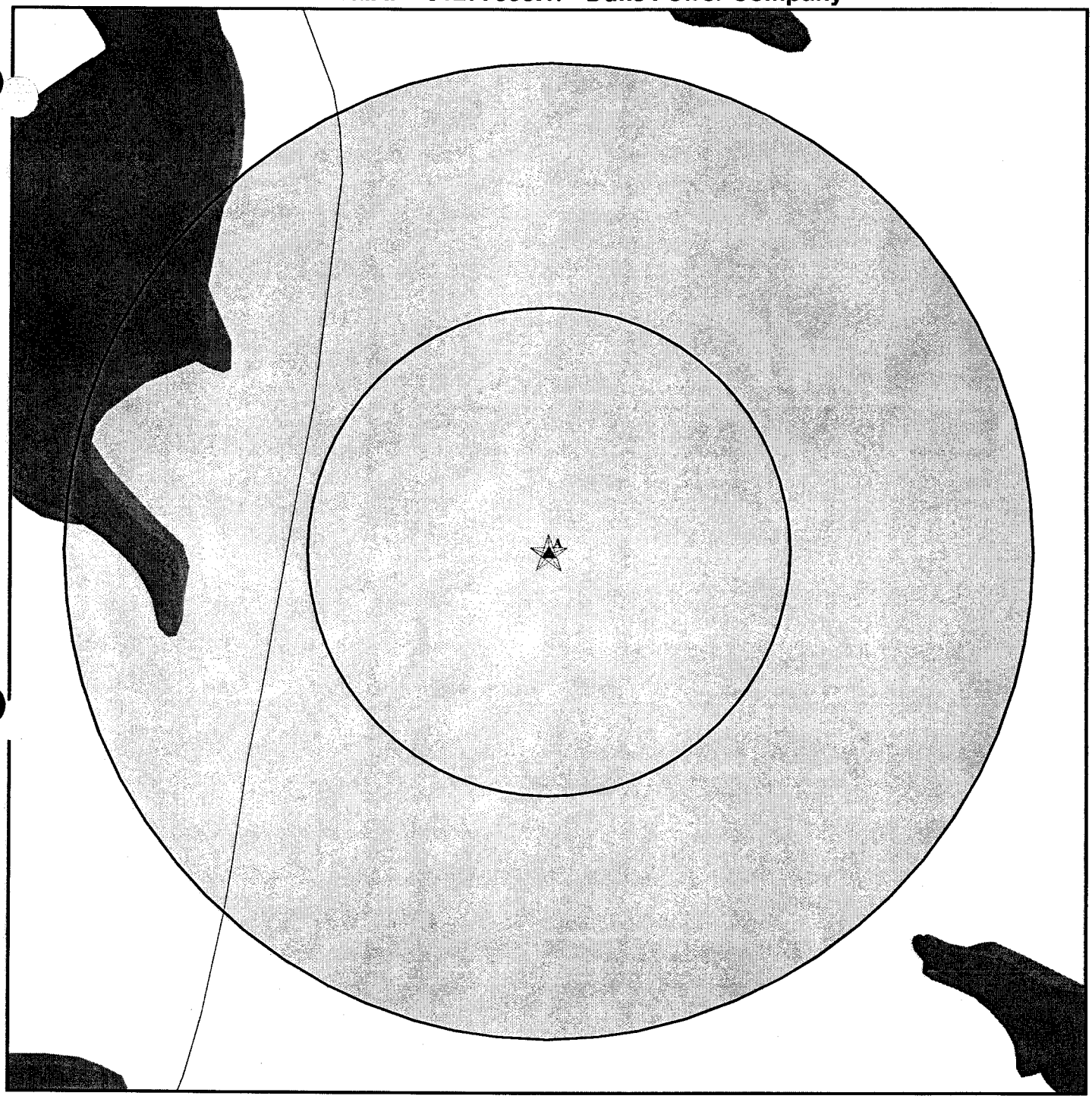
DETAIL MAP - 01277555.1r - Duke Power Company



★ Target Property

▲ Sites at elevations higher than or equal to the target property

◆ Sites at elevations lower than the target property

Coal Gasification Sites

Sensitive Receptors

National Priority List Sites

Landfill Sites

Dept. Defense Sites

0 1/16 1/8 1/4 Miles

Indian Reservations BIA

County Boundary

Oil & Gas pipelines

Federal Wetlands

Hazardous Substance Disposal Sites

TARGET PROPERTY:	Belews Creek	CUSTOMER:	Duke Power Company
ADDRESS:	3195 Pine Hall Rd	CONTACT:	Ralph Roberts
CITY/STATE/ZIP:	Belews Creek NC 27052	INQUIRY #:	01277555.1r
LAT/LONG:	36.2750 / 80.0569	DATE:	September 28, 2004 2:57 pm

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MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FEDERAL ASTM STANDARD								
NPL		2.000	0	0	0	0	0	0
Proposed NPL		2.000	0	0	0	0	0	0
CERCLIS		2.000	0	0	0	0	0	0
CERC-NFRAP		2.000	0	0	0	0	0	0
CORRACTS		2.000	0	0	0	0	0	0
RCRIS-TSD		2.000	0	0	0	0	0	0
RCRIS Lg. Quan. Gen.		0.750	0	0	0	0	NR	0
RCRIS Sm. Quan. Gen.		0.750	0	0	0	0	NR	0
ERNS		0.500	0	0	0	NR	NR	0
STATE ASTM STANDARD								
State Haz. Waste	X	2.000	0	0	0	0	0	0
State Landfill	X	2.000	0	0	0	0	0	0
LUST	X	2.000	0	0	0	0	0	0
UST		0.750	0	0	0	0	NR	0
OLI		1.000	0	0	0	0	NR	0
INDIAN UST		0.750	0	0	0	0	NR	0
VCP		2.000	0	0	0	0	0	0
FEDERAL ASTM SUPPLEMENTAL								
CONSENT		1.500	0	0	0	0	0	0
ROD		1.500	0	0	0	0	0	0
Delisted NPL		1.500	0	0	0	0	0	0
FINDS		0.500	0	0	0	NR	NR	0
HMIRS		0.500	0	0	0	NR	NR	0
MLTS		0.500	0	0	0	NR	NR	0
MINES		0.250	0	0	NR	NR	NR	0
NPL Liens		0.500	0	0	0	NR	NR	0
PADS		0.500	0	0	0	NR	NR	0
ODI		2.000	0	0	0	0	0	0
UMTRA		1.000	0	0	0	0	NR	0
FUDS		1.500	0	0	0	0	0	0
INDIAN RESERV		1.500	0	0	0	0	0	0
US BROWNFIELDS		1.000	0	0	0	0	NR	0
DOD		1.500	0	0	0	0	0	0
RAATS		TP	NR	NR	NR	NR	NR	0
TRIS		0.500	0	0	0	NR	NR	0
TSCA		0.500	0	0	0	NR	NR	0
SSTS		TP	NR	NR	NR	NR	NR	0
FTTS		0.500	0	0	0	NR	NR	0
STATE OR LOCAL ASTM SUPPLEMENTAL								
NC HSDS		1.500	0	0	0	0	0	0

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
AST		0.500	0	0	0	NR	NR	0
LUST TRUST		2.000	0	0	0	0	0	0
DRYCLEANERS		0.750	0	0	0	0	NR	0
IMD	X	1.000	0	0	0	0	NR	0
EDR PROPRIETARY HISTORICAL DATABASES								
Coal Gas		1.500	0	0	0	0	0	0
BROWNFIELDS DATABASES								
US BROWNFIELDS		1.000	0	0	0	0	NR	0
Brownfields		0.500	0	0	0	NR	NR	0
INST CONTROL		0.500	0	0	0	NR	NR	0
VCP		2.000	0	0	0	0	0	0

NOTES:

AQUIFLOW - see EDR Physical Setting Source Addendum

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

Coal Gas Site Search: No site was found in a search of Real Property Scan's ENVIROHAZ database.

A1 **DUKE POWER/WALNUT COVE** **SHWS** **S104918893**
Target **POWER HOUSE ROAD** **N/A**
Property **WALNUT COVE, NC**

Site 1 of 4 in cluster A

Actual:
791 ft.

SHWS:
Facility ID: NONCD0000091
Facility Status: Not reported

A2 **DUKE POWER - WALNUT COVE- SOUTHERN** **IMD** **S104914460**
Target **3195 PINE HALL ROAD** **LUST** **N/A**
Property **WALNUT COVE, NC 27052**

Site 2 of 4 in cluster A

Actual:
791 ft.

LUST:

Incident Number:	22402		
Date Occurred:	07/17/00		
5 Min Quad:	Not reported		
Lat/Long:	0000000000 / 0000000000		
Source Type:	3		
Facility ID:	Not reported	GPS Confirmed:	No
Operation:	Industrial		
UST Number :	WS-6088	Testlat :	0000000000
Regional Officer Project Mgr :	SYW		
Region :	Winston-Salem		
Responsible Party	DUKE POWER (LAND OWNER)	Contact Person :	TRACY BEER
RP Address :	P O BOX 1006		
	CHARLOTTE, NC 28201 - 1006		
RP County :	MECKLENBURG	Product Type :	Petroleum
Date Reported :	07/17/00		
Comm / Non-comm UST Site :	Non commercial		
Tank Regulated Status :	Non Regulated		
NORR Issued Date :	01/05/01		
NOV Issued Date	/ /	Phase Of LSA Req	1
Risk Classification	H		
Risk Classification Based On Review :	L		
Site Risk Reason :	Not reported	Land Use :	Residential
Corrective Action Plan Type:	Not reported		
Level Of Soil Cleanup Achieved :	soil to GW levels		
Closure Request Date :	10/25/01		
NFA Letter Date :	10/31/01		
Contamination Type :	SL		
MTBE :	0	# Of Supply Wells :	0
Comments :	Contaminted soil must be addressed to lowest level. Potential future use is making it a HIGH risk. Contaminated soil got ot remediated to lowest level.		
Telephone :	Not reported	Flag :	0
Error Flag :	0	LUR Filed :	/ /
MTBE1 :	Unknown	Flag1 :	No
Cleanup :	09/30/01	Current Status :	File Located in House
RBCA GW :	Not reported	PETOPT :	4
CD Num :	0	Reel Num :	0
RPOW :	False	RPOP :	False
RPL :	False		
Type :	5		

DUKE POWER - WALNUT COVE- SOUTHERN (Continued) **S104914460**

Date Occurred: Not reported
Date Reported : Not reported
Incident Description : Not reported
Ownership: Not reported Location: Not reported
Site Priority: Not reported
Type : Not reported Priority Update : Not reported
Wells Affected: Not reported Num Affected: Not reported
7.5 Min Quad: Not reported 5 Min Quad: Not reported
Release Code: Not reported Source Type: Not reported
Error Type : Not reported
UST Number : Not reported
Operation Type : Not reported
Last Modified: 12/06/01
Incident Phase: Closed Out
NOV Issued: / / NORR Issued: / /
45 Day Report: / / SOC Sighned: / /
Public Meeting Held: / /
Close-out Report: 10/31/01 RS Designation: / /
Corrective Action Planned: / /
Reclassification Report: / /
Closure Request Date: / /

Incident Number: 23034
Date Occurred: 07/20/00
5 Min Quad: Not reported
Lat/Long: 0000000000 / 0000000000
Source Type: 3
Facility ID: Not reported GPS Confirmed: No
Operation: Industrial
UST Number : WS-6179 Testlat : 0000000000
Regional Officer Project Mgr : SYW
Region : Winston-Salem
Responsible Party DUKE POWER (LAND OWNER) Contact Person : TRACY BEER
RP Address : PO BOX 1006
CHARLOTTE, NC 28201 - 1006
RP County : Not reported Product Type : Petroleum
Date Reported : 07/25/00
Comm / Non-comm UST Site : Non commercial
Tank Regulated Status : Non Regulated
NORR Issued Date : 01/05/01
NOV Issued Date / / Phase Of LSA Req 1
Risk Classification H
Risk Classification Based On Review : L
Site Risk Reason : Not reported Land Use : Residential
Corrective Action Plan Type: Not reported
Level Of Soil Cleanup Achieved : soil to GW levels
Closure Request Date : 12/04/01
NFA Letter Date : 12/13/01
Contamination Type : SL
MTBE : 0 # Of Supply Wells : 0
Comments : Contaminted soil must be addressed to lowest level.
Potential future use is making it a HIGH risk. Contaminated soil got ot remediated to lowest level.
Telephone : Not reported Flag : 0
Error Flag : 0 LUR Filed : / /
MTBE1 : Unknown Flag1 : No
Cleanup : 09/30/01 Current Status : File Located in House

DUKE POWER - WALNUT COVE- SOUTHERN (Continued) **S104914460**

RBCA GW :	Not reported	PETOPT :	4
CD Num :	0	Reel Num :	0
RPOW :	False	RPOP :	False
RPL :	False		
Type :	5		
Date Occurred:	Not reported		
Date Reported :	Not reported		
Incident Description :	Not reported		
Ownership:	Not reported	Location:	Not reported
Site Priority:	Not reported		
Type :	Not reported	Priority Update :	Not reported
Wells Affected:	Not reported	Num Affected:	Not reported
7.5 Min Quad:	Not reported	5 Min Quad:	Not reported
Release Code:	Not reported	Source Type:	Not reported
Error Type :	Not reported		
UST Number :	Not reported		
Operation Type :	Not reported		
Last Modified:	01/25/02		
Incident Phase:	Closed Out		
NOV Issued:	/ /	NORR Issued:	/ /
45 Day Report:	/ /	SOC Sighned:	/ /
Public Meeting Held:	/ /		
Close-out Report:	12/13/01	RS Designation:	/ /
Corrective Action Planned:	/ /		
Reclassification Report:	/ /		
Closure Request Date:	/ /		

IMD:

Incident Number:	22402
Region:	WS
Date Occurred:	07/17/00
Submit Date:	10/12/00
GW Contam:	Not reported
Soil Contam:	Yes
Operator:	TRACY BEER P.O. BOX 1006 CHARLOTTE, NC 28201 IREDE County
Contact Phone:	704 373-7890
Priority Code:	Not reported
Priority Update:	10/12/00
Site Priority:	U
Dem Contact:	Not reported
Wells Affected:	No
Num Affected:	0
Sampled By:	Samples Include:
7.5 Min Quad:	Not reported
5 Min Quad:	Not reported
Incident Desc:	SOIL CONTAMINATION DISCOVERED UPON UST REMOVAL
Ownership:	Private
Operation:	Industrial
Material:	Not reported
Qty Lost:	Not reported
Qty Recovered:	Not reported
Source:	Leak-underground
Type:	Heating Oil
Location:	Residence
Setting:	Rural
Wells Contam:	Not reported

DUKE POWER - WALNUT COVE- SOUTHERN (Continued) **S104914460**

Sampled By: Not reported
Samples Include: Not reported
Owner Company: DUKE POWER
Lat/Long: 361810 / 800126
Risk Site Not reported
Lat/Long Decimal: 36.30278 / 80.02389
Lat/Long Number 361810 / 800126
GPS: EST
Agency : DWM
Last Modified: 12/06/01
Incident Phase: CO
NOV Issued: / /
45 Day Report: / /
SOC Sighned: / /
Public Meeting Held: / /
Corrective Action Planned: / /
Reclassification Report: / /
Close-out Report: 10/31/01
RS Designation: / /
Closure Request Date: / /

Incident Number: 23034
Region: WS
Date Occurred: 07/20/00
Submit Date: 03/21/01
GW Contam: Not reported
Soil Contam: Yes
Operator: Not reported
Not reported
Not reported
Contact Phone: Not reported
Priority Code: Not reported
Priority Update: 03/21/01
Site Priority: U
Dem Contact: Not reported
Wells Affected: No
Num Affected: 0
Sampled By: Samples Include:
7.5 Min Quad: Not reported
5 Min Quad: Not reported
Incident Desc: SOIL CONTAMINATION DISCOVERED DURING UST CLOSURE
Ownership: Private
Operation: Residential
Material: Not reported
Qty Lost: Not reported
Qty Recovered: Not reported
Source: Leak-underground
Type: Heating Oil
Location: Residence
Setting: Rural
Wells Contam: Not reported
Sampled By: Not reported
Samples Include: Not reported
Owner Company: Not reported
Lat/Long: 361810 / 800126
Risk Site Not reported
Lat/Long Decimal: 36.30278 / 80.02389
Lat/Long Number 361810 / 800126
GPS: EST
Agency : DWM
Last Modified: 01/25/02
Incident Phase: CO
NOV Issued: / /

DUKE POWER - BELEWS CREEK (Continued) **S105766452**

7.5 Min Quad:	Not reported	5 Min Quad:	Not reported
Release Code:	Not reported	Source Type:	Not reported
Error Type :	Not reported		
UST Number :	Not reported		
Operation Type :	Not reported		
Last Modified:	05/13/91		
Incident Phase:	Follow Up		
NOV Issued:	/ /	NORR Issued:	/ /
45 Day Report:	/ /	SOC Sighned:	/ /
Public Meeting Held:	/ /		
Close-out Report:	/ /	RS Designation:	/ /
Corrective Action Planned:	/ /		
Reclassification Report:	/ /		
Closure Request Date:	/ /		

A4 **DUKE POWER/BELEWS CREEK ST PLT** **SWF/LF** **S103240134**
Target **SR 1908** **N/A**
Property **STOKES, NC**

Site 4 of 4 in cluster A

Actual:
791 ft.

LF:

Facility Id:	P0135
Facility Telephone:	(336) 445-0324
Facility Fax:	(336) 445-0423
Contact:	RANDY PRICE
Waste Mgmt Specialist:	Hugh Jernigan
Contact Address:	DUKE ENERGY 3195 PINE HALL ROAD BELEWS CREEK, NC 27009
Public/Private:	PRIVATE
Facility Status:	OPEN
Lined:	False
Facility Type 1:	Industrail Solid Waste

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
BELEWES CREEK	S105521161	WHITE'S GROCERY	7296 HWY 65	27009	LUST TRUST
BELEWS CREEK	S106204984	CARL WHITE GROCERY	ROUTE 1 HWY 65	27009	LUST
DANBURY	S105766955	STOKES COUNTY - NORTH STOKES HIGH	ROUTE 1, BOX 346	27052	LUST
GERMANTON	U001191575	A.V. CHAPMAN	N.C. HIGHWAY 8	27052	UST
STOKESDALE	1003868320	PRIVATE FARM	RTE #1	27357	CERC-NFRAP
STOKESDALE	S104919075	PRIVATE FARM	ROUTE 1	27357	SHWS
STOKESDALE	S105766940	J.B. DALTON'S STORE	RT 1 BOX 52	27357	LUST
STOKESDALE	S101166341	TIMES TURN AROUND - STOKESDALE	7915 HWY 68	27357	IMD, LUST
STOKESDALE	S105766471	LAWSON PROPERTY, MITCHELL	HWY 68	27357	LUST
STOKESDALE	S105897682	TUCKERS GROCERY	7911 HWY 68 N	27357	LUST
STOKESDALE	S105897683	TUCKER GROCERY - STOKESDALE	HWY 68 / US 158	27357	LUST
STOKESDALE	S105766603	VULCAN - STOKESDALE QUARRY	SR 6826	27357	LUST
STOKESDALE	S105805034	THOMAS STANLEY GRADING AND HAULING	NC HWY 68	27357	SWF/LF
STOKESDALE	S105898034	ROCKINGHAM BANDAG CORP.	400 LEMONS/SR 1104	27357	LUST
WALNUT COVE	U001204279	WOODS COUNTRY STORE	HWY #8 @PINEY MT ROAD	27052	LUST, UST
WALNUT COVE	U001190960	SPENCER'S GROCERY	RT 1 BOX 311	27052	UST
WALNUT COVE	U001199838	VINCENT B. SANDY	RT 1 BOX 112-1	27052	UST
WALNUT COVE	S106406768	BREWER'S STORE	ROUTE 1, BOX 177	27052	LUST
WALNUT COVE	U001204188	WALNUT COVE TIRE CTR INC	RT 2 BOX 17	27052	UST
WALNUT COVE	S103040598	KOUNTRY KORNER - WALNUT COVE	ROUTE 2, BOX 194-A	27052	IMD, LUST
WALNUT COVE	S105219199	WALNUT COVE TIRE SHOP	ROUTE 2, BOX 17	27052	LUST TRUST
WALNUT COVE	U003143629	FRIENDLY FOOD MART 6	ROUTE 2, BOX 733	27052	LUST, UST
WALNUT COVE	U003562330	CROSS CREEK APPAREL	RT. 3 HWY 89	27052	UST
WALNUT COVE	S104547247	NCDOT-WALNUT COVE	ROUTE 3 BOX 97	27052	IMD
WALNUT COVE	U003563074	NC DOR. DIV. OF HWY	RT. 3	27052	UST
WALNUT COVE	S102554561	NCDOT-WALNUT COVE-B	RT 3, BOX 97	27052	IMD
WALNUT COVE	S105766634	BONNIE'S	ROUTE 3, BOX 185	27052	LUST
WALNUT COVE	S105766824	NCDOT - WALNUT COVE FACILITY - B	ROUTE 3, BOX 97	27052	LUST
WALNUT COVE	S105766952	NCDOT - WALNUT COVE FACILITY	ROUTE 3, BOX 95	27052	LUST
WALNUT COVE	S106205003	BETTY'S COUNTRY GROCERY	ROUTE 3, BOX 58	27052	LUST
WALNUT COVE	U001187980	COUNTRY GROCERY	ROUTE 3, BOX 58	27052	UST
WALNUT COVE	U001191121	BONNIES	ROUTE 3, BOX 185	27052	UST
WALNUT COVE	S106204887	MEADOWBROOK FIELD	ROUTE 4	27052	LUST
WALNUT COVE	U003179296	MRS V L DEHART	NC 65 @ PINE HALL ROAD	27052	UST
WALNUT COVE	S105766951	WHITE'S GROCERY (CARL & NADIA)	NC HIGHWAY 65 @ PINE HALL RD.	27052	LUST
WALNUT COVE	S102868538	DEHART PROPERTY, V.L.	7294 E. HWY 65 @PINEHAL	27052	IMD, LUST

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Elapsed ASTM days: Provides confirmation that this EDR report meets or exceeds the 90-day updating requirement of the ASTM standard.

FEDERAL ASTM STANDARD RECORDS

NPL: National Priority List
Source: EPA
Telephone: N/A
National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 07/30/04
Date Made Active at EDR: 09/09/04
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 08/03/04
Elapsed ASTM days: 37
Date of Last EDR Contact: 08/03/04

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 8
Telephone: 303-312-6774

EPA Region 4
Telephone 404-562-8033

Proposed NPL: Proposed National Priority List Sites
Source: EPA
Telephone: N/A

Date of Government Version: 07/22/04
Date Made Active at EDR: 09/09/04
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 08/03/04
Elapsed ASTM days: 37
Date of Last EDR Contact: 08/03/04

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System
Source: EPA
Telephone: 703-413-0223
CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 05/17/04
Date Made Active at EDR: 08/10/04
Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 06/23/04
Elapsed ASTM days: 48
Date of Last EDR Contact: 06/23/04

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned
Source: EPA
Telephone: 703-413-0223
As of February 1995, CERCLIS sites designated "No Further Remedial Action Planned" (NFRAP) have been removed from CERCLIS. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund action or NPL consideration. EPA has removed approximately 25,000 NFRAP sites to lift the unintended barriers to the redevelopment of these properties and has archived them as historical records so EPA does not needlessly repeat the investigations in the future. This policy change is part of the EPA's Brownfields Redevelopment Program to help cities, states, private investors and affected citizens to promote economic redevelopment of unproductive urban sites.

Date of Government Version: 05/17/04
Date Made Active at EDR: 08/10/04
Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 06/23/04
Elapsed ASTM days: 48
Date of Last EDR Contact: 06/23/04

CORRACTS: Corrective Action Report
Source: EPA
Telephone: 800-424-9346
CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 06/15/04
Date Made Active at EDR: 08/10/04
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 06/25/04
Elapsed ASTM days: 46
Date of Last EDR Contact: 06/07/04

RCRIS: Resource Conservation and Recovery Information System
Source: EPA
Telephone: 800-424-9346
Resource Conservation and Recovery Information System. RCRIS includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs): generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs): generate between 100 kg and 1,000 kg of hazardous waste per month. Large quantity generators (LQGs): generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. Transporters are individuals or entities that move hazardous waste from the generator off-site to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 06/15/04
Date Made Active at EDR: 07/20/04
Database Release Frequency: Varies

Date of Data Arrival at EDR: 06/23/04
Elapsed ASTM days: 27
Date of Last EDR Contact: 08/24/04

ERNS: Emergency Response Notification System
Source: National Response Center, United States Coast Guard
Telephone: 202-260-2342
Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/03
Date Made Active at EDR: 03/12/04
Database Release Frequency: Annually

Date of Data Arrival at EDR: 01/26/04
Elapsed ASTM days: 46
Date of Last EDR Contact: 07/26/04

FEDERAL ASTM SUPPLEMENTAL RECORDS

BRS: Biennial Reporting System
Source: EPA/NTIS
Telephone: 800-424-9346
The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/01/01
Database Release Frequency: Biennially

Date of Last EDR Contact: 06/22/04
Date of Next Scheduled EDR Contact: 09/13/04

CONSENT: Superfund (CERCLA) Consent Decrees
Source: Department of Justice, Consent Decree Library
Telephone: Varies
Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 03/05/04
Database Release Frequency: Varies

Date of Last EDR Contact: 07/30/04
Date of Next Scheduled EDR Contact: 10/25/04

ROD: Records Of Decision
Source: EPA
Telephone: 703-416-0223
Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 06/07/04
Database Release Frequency: Annually
Date of Last EDR Contact: 07/07/04
Date of Next Scheduled EDR Contact: 10/04/04

DELISTED NPL: National Priority List Deletions
Source: EPA
Telephone: N/A
The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 07/30/04
Database Release Frequency: Quarterly
Date of Last EDR Contact: 08/03/04
Date of Next Scheduled EDR Contact: 11/01/04

FINDS: Facility Index System/Facility Identification Initiative Program Summary Report
Source: EPA
Telephone: N/A
Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 04/08/04
Database Release Frequency: Quarterly
Date of Last EDR Contact: 07/06/04
Date of Next Scheduled EDR Contact: 10/04/04

HMIRS: Hazardous Materials Information Reporting System
Source: U.S. Department of Transportation
Telephone: 202-366-4555
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 02/17/04
Database Release Frequency: Annually
Date of Last EDR Contact: 04/20/04
Date of Next Scheduled EDR Contact: 07/19/04

MLTS: Material Licensing Tracking System
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 07/15/04
Database Release Frequency: Quarterly
Date of Last EDR Contact: 07/06/04
Date of Next Scheduled EDR Contact: 10/04/04

MINES: Mines Master Index File
Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959

Date of Government Version: 06/04/04
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 06/30/04
Date of Next Scheduled EDR Contact: 09/27/04

NPL LIENS: Federal Superfund Liens
Source: EPA
Telephone: 202-564-4267
Federal Superfund Liens. Under the authority granted the USEPA by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner receives notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/91
Database Release Frequency: No Update Planned
Date of Last EDR Contact: 08/23/04
Date of Next Scheduled EDR Contact: 11/22/04

PADS: PCB Activity Database System
Source: EPA
Telephone: 202-564-3887
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 06/29/04
Database Release Frequency: Annually
Date of Last EDR Contact: 08/10/04
Date of Next Scheduled EDR Contact: 11/08/04

DOD: Department of Defense Sites
Source: USGS
Telephone: 703-692-8801
This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 10/01/03
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 08/12/04
Date of Next Scheduled EDR Contact: 11/08/04

STORMWATER: Storm Water General Permits
Source: Environmental Protection Agency
Telephone: 202-564-0746
A listing of all facilities with Storm Water General Permits.

Date of Government Version: 02/04/04
Database Release Frequency: Quarterly
Date of Last EDR Contact: 07/06/04
Date of Next Scheduled EDR Contact: 10/04/04

INDIAN RESERV: Indian Reservations
Source: USGS
Telephone: 202-208-3710
This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 10/01/03
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 08/12/04
Date of Next Scheduled EDR Contact: 11/08/04

US BROWNFIELDS: A Listing of Brownfields Sites
Source: Environmental Protection Agency
Telephone: 202-566-2777
Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities--especially those without EPA Brownfields Assessment Demonstration Pilots--minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients-States, political subdivisions, territories, and Indian tribes become BCRLF cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

Date of Government Version: 07/06/04
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 06/14/04
Date of Next Scheduled EDR Contact: 09/13/04

RMP: Risk Management Plans
Source: Environmental Protection Agency
Telephone: 202-564-8600
When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 05/27/04
Database Release Frequency: Varies

Date of Last EDR Contact: 08/23/04
Date of Next Scheduled EDR Contact: 11/22/04

FUDS: Formerly Used Defense Sites
Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/03
Database Release Frequency: Varies

Date of Last EDR Contact: 07/06/04
Date of Next Scheduled EDR Contact: 10/04/04

ODI: Open Dump Inventory
Source: Environmental Protection Agency
Telephone: 800-424-9346
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/85
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 05/23/95
Date of Next Scheduled EDR Contact: N/A

UMTRA: Uranium Mill Tailings Sites
Source: Department of Energy
Telephone: 505-845-0011
Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized. In 1978, 24 inactive uranium mill tailings sites in Oregon, Idaho, Wyoming, Utah, Colorado, New Mexico, Texas, North Dakota, South Dakota, Pennsylvania, and on Navajo and Hopi tribal lands, were targeted for cleanup by the Department of Energy.

Date of Government Version: 04/22/04
Database Release Frequency: Varies

Date of Last EDR Contact: 06/21/04
Date of Next Scheduled EDR Contact: 09/20/04

RAATS: RCRA Administrative Action Tracking System
Source: EPA
Telephone: 202-564-4104
RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/95
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 06/07/04
Date of Next Scheduled EDR Contact: 09/06/04

TRIS: Toxic Chemical Release Inventory System
Source: EPA
Telephone: 202-566-0250
Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/02
Database Release Frequency: Annually

Date of Last EDR Contact: 06/22/04
Date of Next Scheduled EDR Contact: 09/20/04

TSCA: Toxic Substances Control Act
Source: EPA
Telephone: 202-260-5521
Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/02
Database Release Frequency: Every 4 Years

Date of Last EDR Contact: 06/07/04
Date of Next Scheduled EDR Contact: 09/06/04

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
Source: EPA
Telephone: 202-564-2501

Date of Government Version: 04/13/04
Database Release Frequency: Quarterly

Date of Last EDR Contact: 06/21/04
Date of Next Scheduled EDR Contact: 09/20/04

SSTS: Section 7 Tracking Systems
Source: EPA
Telephone: 202-564-5008
Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/01
Database Release Frequency: Annually

Date of Last EDR Contact: 07/20/04
Date of Next Scheduled EDR Contact: 10/18/04

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-564-2501
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/13/04
Database Release Frequency: Quarterly

Date of Last EDR Contact: 06/21/04
Date of Next Scheduled EDR Contact: 09/20/04

STATE OF NORTH CAROLINA ASTM STANDARD RECORDS

SHWS: Inactive Hazardous Sites Inventory
Source: Department of Environment, Health and Natural Resources
Telephone: 919-733-2801
State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: 04/15/04
Date Made Active at EDR: 05/26/04
Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 04/15/04
Elapsed ASTM days: 41
Date of Last EDR Contact: 07/12/04

SWF/LF: List of Solid Waste Facilities
Source: Department of Environment and Natural Resources
Telephone: 919-733-0692
Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 07/27/04
Date Made Active at EDR: 08/31/04
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 07/27/04
Elapsed ASTM days: 35
Date of Last EDR Contact: 07/26/04

LUST: Incidents Management Database
Source: Department of Environment and Natural Resources
Telephone: 919-733-1315
Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 06/04/04
Date Made Active at EDR: 07/09/04
Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 06/08/04
Elapsed ASTM days: 31
Date of Last EDR Contact: 06/08/04

UST: Petroleum Underground Storage Tank Database
Source: Department of Environment and Natural Resources
Telephone: 919-733-1308
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 06/21/04
Date Made Active at EDR: 07/12/04
Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 06/23/04
Elapsed ASTM days: 19
Date of Last EDR Contact: 06/11/04

OLI: Old Landfill Inventory
Source: Department of Environment & Natural Resources
Telephone: 919-733-4996

Date of Government Version: 04/05/04
Date Made Active at EDR: 05/26/04
Database Release Frequency: Varies

Date of Data Arrival at EDR: 04/28/04
Elapsed ASTM days: 28
Date of Last EDR Contact: 08/25/04

VCP: Responsible Party Voluntary Action Sites
Source: Department of Environment and Natural Resources
Telephone: 919-733-4996

Date of Government Version: 07/14/04
Date Made Active at EDR: 08/16/04
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 07/15/04
Elapsed ASTM days: 32
Date of Last EDR Contact: 07/12/04

INDIAN UST: Underground Storage Tanks on Indian Land
Source: EPA Region 4
Telephone: 404-562-9424

Date of Government Version: 10/22/03
Date Made Active at EDR: 01/09/04
Database Release Frequency: Varies

Date of Data Arrival at EDR: 12/19/03
Elapsed ASTM days: 21
Date of Last EDR Contact: 08/23/04

STATE OF NORTH CAROLINA ASTM SUPPLEMENTAL RECORDS

HSDS: Hazardous Substance Disposal Site
Source: North Carolina Center for Geographic Information and Analysis
Telephone: 919-733-2090
Locations of uncontrolled and unregulated hazardous waste sites. The file includes sites on the National Priority List as well as those on the state priority list.

Date of Government Version: 06/21/95
Database Release Frequency: Biennially

Date of Last EDR Contact: 08/30/04
Date of Next Scheduled EDR Contact: 11/29/04

AST: AST Database
Source: Department of Environment and Natural Resources
Telephone: 919-715-6170
Facilities with aboveground storage tanks that have a capacity greater than 21,000 gallons.

Date of Government Version: 01/09/04
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 07/19/04
Date of Next Scheduled EDR Contact: 10/18/04

LUST TRUST: State Trust Fund Database
Source: Department of Environment and Natural Resources
Telephone: 919-733-1315
This database contains information about claims against the State Trust Funds for reimbursements for expenses incurred while remediating Leaking USTs.

Date of Government Version: 08/06/04
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 08/10/04
Date of Next Scheduled EDR Contact: 11/08/04

DRYCLEANERS: Drycleaning Sites
Source: Department of Environment & Natural Resources
Telephone: 919-733-2801
Potential and known drycleaning sites, active and abandoned, that the Drycleaning Solvent Cleanup Program has knowledge of and entered into this database.

Date of Government Version: 05/19/04
Database Release Frequency: Varies

Date of Last EDR Contact: 07/19/04
Date of Next Scheduled EDR Contact: 10/18/04

IMD: Incident Management Database
Source: Department of Environment and Natural Resources
Telephone: 919-733-1315
Groundwater and/or soil contamination incidents

Date of Government Version: 06/15/04
Database Release Frequency: Quarterly

Date of Last EDR Contact: 07/27/04
Date of Next Scheduled EDR Contact: 10/25/04

EDR PROPRIETARY HISTORICAL DATABASES

Former Manufactured Gas (Coal Gas) Sites: The existence and location of Coal Gas sites is provided exclusively to EDR by Real Property Scan, Inc. ©Copyright 1993 Real Property Scan, Inc. For a technical description of the types of hazards which may be found at such sites, contact your EDR customer service representative.

Disclaimer Provided by Real Property Scan, Inc.

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BROWNFIELDS DATABASES

Brownfields: Brownfields Projects Inventory
Source: Department of Environment and Natural Resources
Telephone: 919-733-4996
A brownfield site is an abandoned, idled, or underused property where the threat of environmental contamination has hindered its redevelopment. All of the sites in the inventory are working toward a brownfield agreement for cleanup and liabitliy control.

Date of Government Version: 03/31/04
Database Release Frequency: Varies

Date of Last EDR Contact: 08/03/04
Date of Next Scheduled EDR Contact: 11/01/04

VCP: Responsible Party Voluntary Action Sites
Source: Department of Environment and Natural Resources
Telephone: 919-733-4996

Date of Government Version: 07/14/04
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 07/12/04
Date of Next Scheduled EDR Contact: 10/11/04

INST CONTROL: No Further Action Sites With Land Use Restrictions Monitoring
Source: Department of Environment, Health and Natural Resources
Telephone: 919-733-2801

Date of Government Version: 07/14/04
Database Release Frequency: Quarterly

Date of Last EDR Contact: 07/12/04
Date of Next Scheduled EDR Contact: 10/11/04

US BROWNFIELDS: A Listing of Brownfields Sites
Source: Environmental Protection Agency
Telephone: 202-566-2777
Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities--especially those without EPA Brownfields Assessment Demonstration Pilots--minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients-States, political subdivisions, territories, and Indian tribes become BCRLF cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

Date of Government Version: N/A
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: N/A
Date of Next Scheduled EDR Contact: N/A

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data
Source: PennWell Corporation
Telephone: (800) 823-6277
This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.
Daycare Centers: Child Care Facility List
Source: Department of Health & Human Services
Telephone: 919-662-4499

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 from the U.S. Fish and Wildlife Service.

STREET AND ADDRESS INFORMATION

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GEOCHECK®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

BELEWS CREEK
3195 PINE HALL RD
BELEWS CREEK, NC 27052

TARGET PROPERTY COORDINATES

Latitude (North):	36.275002 - 36° 16' 30.0"
Longitude (West):	80.056900 - 80° 3' 24.8"
Universal Tranverse Mercator:	Zone 17
UTM X (Meters):	584706.4
UTM Y (Meters):	4014662.0
Elevation:	790 ft. above sea level

EDR's GeoCheck Physical Setting Source Addendum has been developed to assist the environmental professional with the collection of physical setting source information in accordance with ASTM 1527-00, Section 7.2.3. Section 7.2.3 requires that a current USGS 7.5 Minute Topographic Map (or equivalent, such as the USGS Digital Elevation Model) be reviewed. It also requires that one or more additional physical setting sources be sought when (1) conditions have been identified in which hazardous substances or petroleum products are likely to migrate to or from the property, and (2) more information than is provided in the current USGS 7.5 Minute Topographic Map (or equivalent) is generally obtained, pursuant to local good commercial or customary practice, to assess the impact of migration of recognized environmental conditions in connection with the property. Such additional physical setting sources generally include information about the topographic, hydrologic, hydrogeologic, and geologic characteristics of a site, and wells in the area.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata. EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

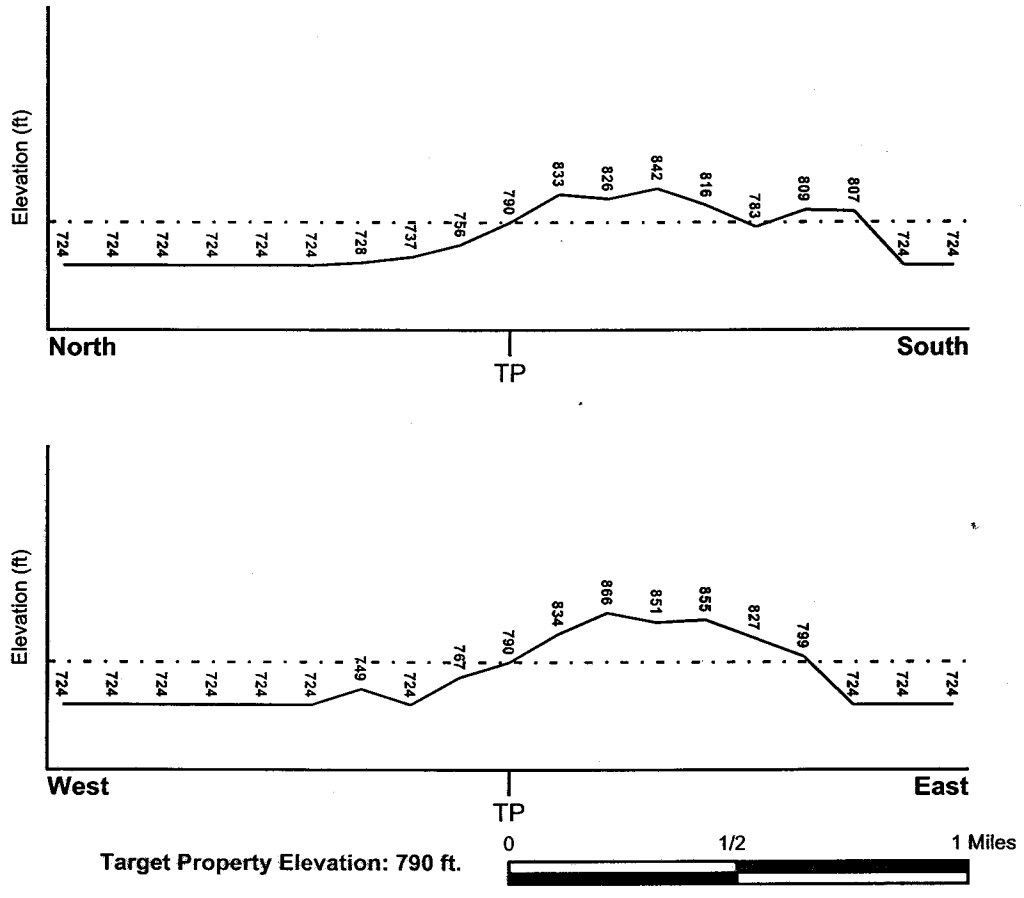
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

USGS Topographic Map:	36080-C1 BELEWS LAKE, NC
General Topographic Gradient:	General WNW
Source:	USGS 7.5 min quad index

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
STOKES, NC	Not Available

Flood Plain Panel at Target Property: Not Reported

Additional Panels in search area: Not Reported

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
BELEWS LAKE	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

Era:	Paleozoic
System:	Pennsylvanian
Series:	Felsic paragneiss and schist
Code:	mm1 *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Metamorphic Rocks

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps. The following information is based on Soil Conservation Service STATSGO data.

Soil Component Name:	PACOLET
Soil Surface Texture:	fine sandy loam
Hydrologic Group:	Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.
Soil Drainage Class:	Well drained. Soils have intermediate water holding capacity. Depth to water table is more than 6 feet.

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel: HIGH

Depth to Bedrock Min: > 60 inches

Depth to Bedrock Max: > 60 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification			
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil	Permeability Rate (in/hr)	Soil Reaction (pH)
1	0 inches	3 inches	fine sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 6.00 Min: 2.00	Max: 6.50 Min: 4.50
2	3 inches	29 inches	sandy clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 2.00 Min: 0.60	Max: 6.00 Min: 4.50
3	29 inches	52 inches	clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 2.00 Min: 0.60	Max: 6.00 Min: 4.50
4	52 inches	70 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 2.00 Min: 0.60	Max: 6.00 Min: 4.50

OTHER SOIL TYPES IN AREA

Based on Soil Conservation Service STATSGO data, the following additional subordinant soil types may appear within the general area of target property.

Soil Surface Textures: clay loam
gravelly - sandy loam
sandy loam
loam

Surficial Soil Types: clay loam
gravelly - sandy loam
sandy loam
loam

Shallow Soil Types: clay
sandy clay loam
silt loam
clay loam
silty clay loam

Deeper Soil Types: fine sandy loam
weathered bedrock

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

ADDITIONAL ENVIRONMENTAL RECORD SOURCES

According to ASTM E 1527-00, Section 7.2.2, "one or more additional state or local sources of environmental records may be checked, in the discretion of the environmental professional, to enhance and supplement federal and state sources... Factors to consider in determining which local or additional state records, if any, should be checked include (1) whether they are reasonably ascertainable, (2) whether they are sufficiently useful, accurate, and complete in light of the objective of the records review (see 7.1.1), and (3) whether they are obtained, pursuant to local, good commercial or customary practice." One of the record sources listed in Section 7.2.2 is water well information. Water well information can be used to assist the environmental professional in assessing sources that may impact groundwater flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A3	NC0285495	1/8 - 1/4 Mile WNW

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

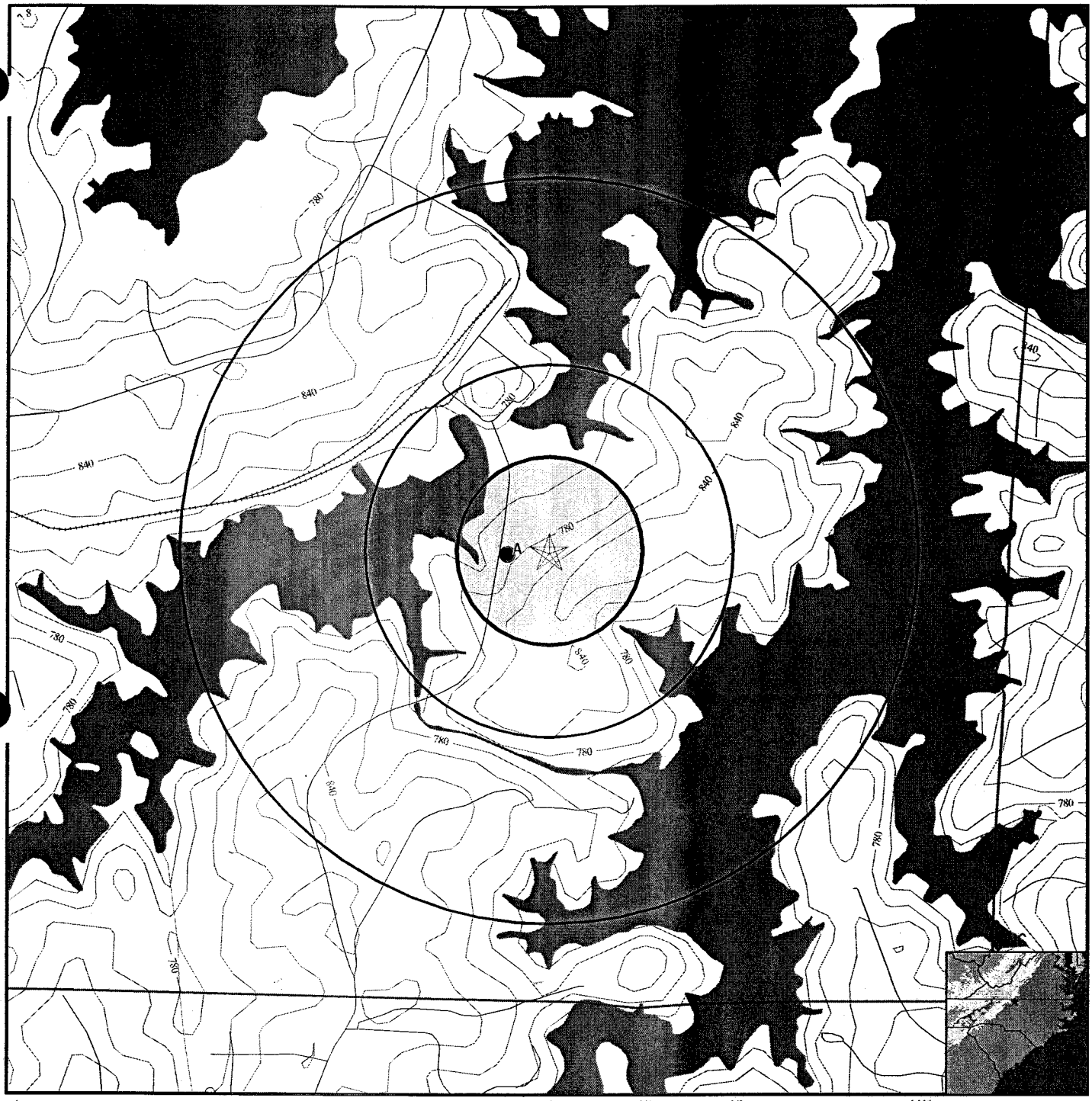
MAP ID	WELL ID	LOCATION FROM TP
A1	NCWS005098	0 - 1/8 Mile West
A2	NCWS005097	1/8 - 1/4 Mile WSW

OTHER STATE DATABASE INFORMATION

NORTH CAROLINA NATURAL HERITAGE ELEMENT OCCURRENCES

ID	Class
NC50006460	Animal

PHYSICAL SETTING SOURCE MAP - 01277555.1r



- County Boundary
- Major Roads
- Contour Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public-Water Supply Wells
- Cluster of Multiple Icons

- Groundwater Flow Direction
- Indeterminate Groundwater Flow at Location
- Groundwater Flow Varies at Location
- Wildlife Areas
- Natural Areas
- Rare & Endangered Species

TARGET PROPERTY:	Belews Creek	CUSTOMER:	Duke Power Company
ADDRESS:	3195 Pine Hall Rd	CONTACT:	Ralph Roberts
CITY/STATE/ZIP:	Belews Creek NC 27052	INQUIRY #:	01277555.1r
LAT/LONG:	36.2750 / 80.0569	DATE:	September 28, 2004 2:57 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

	Database	EDR ID Number
A1 **West** **0 - 1/8 Mile** **Lower**	**NC WELLS**	**NCWS005098**

Site Name:	WELL #2		
PWS ID:	0285495	Source code:	RW2
City:	WALNUT COVE		
County:	Stokes		
Latitude:	361630.21	Longitude:	800330.967
Availability:	Permanent		
Type:	Ground	Depth:	400
Owner:	DUKE ENERGY CORPORATION		

A2 **WSW** **1/8 - 1/4 Mile** **Lower**		**NC WELLS**	**NCWS005097**
Site Name:	WELL #1		
PWS ID:	0285495	Source code:	RW1
City:	WALNUT COVE		
County:	Stokes		
Latitude:	361627.03	Longitude:	800332.4
Availability:	Permanent		
Type:	Ground	Depth:	900
Owner:	DUKE ENERGY CORPORATION		

A3 **WNW** **1/8 - 1/4 Mile** **Lower**		**FRDS PWS**	**NC0285495**
PWS ID:	NC0285495	PWS Status:	Active
Date Initiated:	7706	Date Deactivated:	Not Reported
PWS Name:	DUKE POWER-BELEWS CREEK STEAM WALNUT COVE, NC 27052		
Addressee / Facility:	System Owner/Responsible Party JIM BURNETTE OR MANAGER NOW PO BOX 557 WALNUT COVE, NC 27052		
Addressee / Facility:	System Owner/Responsible Party DUKE POWER COMPANY 13339 HAGERS FERRY RD HUNTERSVILLE, NC 28078		
Facility Latitude:	36 16 31	Facility Longitude:	080 03 34
City Served:	WALNUT COVE		
Treatment Class:	Treated	Population:	00000181
PWS currently has or had major violation(s) or enforcement:		Yes	

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

VIOLATIONS INFORMATION:

Violation ID:	9400419	Source ID:	000	PWS Phone:	Not Reported
Vio. beginning Date:	10/01/93	Vio. end Date:	10/31/93	Vio. Period:	001 Months
Num required Samples:	Not Reported	Number of Samples Taken:		Not Reported	
Analysis Result:	Not Reported	Maximum Contaminant Level:		Not Reported	
Analysis Method:	Not Reported				
Violation Type:	Monitoring, Routine Major (TCR)				
Contaminant:	COLIFORM (TCR)				
Vio. Awareness Date:	111593				

Violation ID:	9408781	Source ID:	Not Reported	PWS Phone:	Not Reported
Vio. beginning Date:	10/01/93	Vio. end Date:	12/31/93	Vio. Period:	003 Months
Num required Samples:	000	Number of Samples Taken:		000	
Analysis Result:	Not Reported	Maximum Contaminant Level:		Not Reported	
Analysis Method:	Not Reported				
Violation Type:	Monitoring, Regular				
Contaminant:	NITRATE				
Vio. Awareness Date:	061594				

ENFORCEMENT INFORMATION:

System Name:	DUKE POWER-BELEWS CREEK ST		
Violation Type:	Monitoring, Routine Major (TCR)		
Contaminant:	COLIFORM (TCR)		
Compliance Period:	1999-10-01 - 1999-12-31	Analytical Value:	0000000.000000000
Violation ID:	0004090	Enforcement ID:	0007581
Enforcement Date:	2000-02-04	Enf. Action:	State Formal NOV Issued

System Name:	DUKE POWER-BELEWS CREEK ST		
Violation Type:	Monitoring, Routine Major (TCR)		
Contaminant:	COLIFORM (TCR)		
Compliance Period:	1999-10-01 - 1999-12-31	Analytical Value:	0000000.000000000
Violation ID:	0004090	Enforcement ID:	0007582
Enforcement Date:	2000-02-04	Enf. Action:	State Public Notif Requested

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Direction Distance		Database	EDR ID Number
		NC_NHEO	**NC50006460**

GIS ID: 212410
Classification by Type: Animal
Occurrence Status: Extant

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: NC Radon

Radon Test Results

County	Result Type	Total Sites	Avg pCi/L	Range pCi/L
STOKES	Statistical	12	1.43	0.20-3.60
STOKES	Non-Statistical	120	2.69	0.00-15.30

Federal EPA Radon Zone for STOKES County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 27052

Number of sites tested: 2

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.400 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002. 7.5-Minute DEMs correspond to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 from the U.S. Fish and Wildlife Service.

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

ADDITIONAL ENVIRONMENTAL RECORD SOURCES

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

STATE RECORDS

NC Natural Areas: Significant Natural Heritage Areas
Source: Center for Geographic Information and Analysis
Telephone: 919-733-2090
A polygon converage identifying sites (terrestrial or aquatic that have particular biodiversity significance. A site's significance may be due to the presenceof rare species, rare or hight quality natural communities, or other important ecological features.

NC Game Lands: Wildlife Resources Commission Game Lands
Source: Center for Geographic Information and Analysis
Telephone: 919-733-2090
All publicly owned game lands managed by the North Carolina Wildlife Resources Commission and as listed in Hunting and Fishing Maps.

NC Natural Heritage Sites: Natural Heritage Element Occurrence Sites
Source: Center for Geographic Information and Analysis
Telephone: 919-733-2090
A point coverage identifying locations of rare and endangered species, occurrences of exemplary or unique natural ecosystems (terrestrial or aquatic), and special animal habitats (e.g., colonial waterbird nesting sites).

North Carolina Public Water Supply Wells
Source: Department of Environmental Health
Telephone: 919-715-3243

RADON

State Database: NC Radon
Source: Department of Environment & Natural Resources
Telephone: 919-733-4984
Radon Statistical and Non Statiscal Data

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

7

Attachment 7

Letter from Stokes County Planning and Community Development Department dated November 9, 2004

PLANNING AND COMMUNITY
DEVELOPMENT DEPARTMENT
P.O. Box 20 • Danbury, NC 27016 • (910) 593-2811 • fax (910) 593-5434

Mr. Allen Stowe
Duke Power Company
526 South Church St.
Interoffice – EC11E
Charlotte, NC 28202

November 9, 2004

Dear Mr. Stowe:

This letter is to inform you that the property owned by Duke Power on which the Belews Creek Steam Station is located is zoned M-1 (Light Manufacturing). This is the proper zoning classification for the power plant and its related facilities. After reviewing NCGS 130A-294 (bl) and NCAC 15A 13B .0504 (1) (e) (ii), it is determined that the proposed FGD landfill on Duke Power's property located off of Craig Rd. will meet the applicable requirements of the Stokes County Zoning Ordinance as a related use and facility in the production of electrical power by the Belews Creek Steam Station. This letter will serve as determination of consistency with the Stokes County Zoning Ordinance for this proposed site.

Should you have any questions please do not hesitate to contact me at (336)-593-2408.

Sincerely,

David N. Sudderth

David N. Sudderth
Director of Planning & Community Dev.

RECEIVED
NOV 15 2004
EH & S

Attachment 8

Proposed Groundwater Sampling and Analysis Plan

DUKE POWER
BELEWS CREEKSTEAM STATION
STOKES COUNTY, NC

FLUE GAS DESULFURIZATION (FGD) RESIDUE LANDFILL

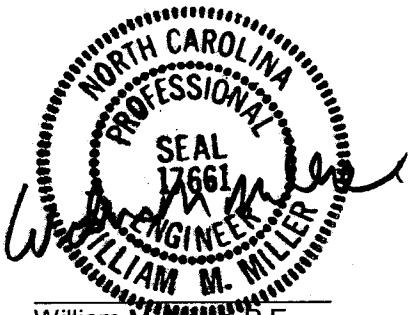
PROPOSED

GROUND WATER MONITORING PROGRAM
SAMPLING AND ANALYSIS PLAN

Revision 0

March 8, 2005

Prepared By:



William M. Miller, P.E.

Duke Power
PO Box 1006
Charlotte, NC 28201-1006

Description of Revisions

Revision	Page(s)		Description of Revision
0	all		Original Issue

1.0 PROGRAM DESCRIPTION

1.1 SCOPE OF WORK

This Ground-Water Monitoring Program is designed to monitor the effects of the Flue Gas Desulfurization (FGD) Residue Landfill at Belews Creek Steam Station (BCS) on the groundwater in the area. This plan has been prepared according to the guidelines set forth by the North Carolina Water Quality Guidance Document for Solid Waste Facilities (SW-1001-87), and by the EPA in "Interim Guidelines and Specifications for Preparing Quality Assurance Plans" (QAMS-500/80), and documents the methodologies of field sampling, record-keeping protocols, data quality objectives, and data validation procedures that will be used in this program.

1.2 BACKGROUND AND SITE HYDROGEOLOGICAL DESCRIPTION

Belews Creek Steam Station is located in south-western Stokes County, on Pine Hall Road. Belews Creek Steam Station is a coal-fired electric generating facility located on Belews Lake near Walnut Cove, North Carolina. The station has two units, each of which can generate 1,200megawatts of electricity.

The plant is located in the Piedmont physiographic region. Figure 1 shows the location of the plant and the location of the proposed FGD landfill. The footprint for the landfill (actual waste footprint) contains an area of approximately 23.9 acres. The adjacent stormwater pond contains an area of approximately 2.4 acres.

The FGD landfill will be located on Duke Power property, south of the Belews Creek plant. The landfill site is located on land between two arms of the Belews Creek Lake. The West Belews Creek arm is located west of the landfill site and the Belews Creek arm is located west of the site. Craig Road is located to the west of the landfill.

The FGD residue will be conveyed to the landfill site by truck, where the material will be spread and compacted. The landfill will begin receiving FGD residue in November 2006. The volumetric capacity of the landfill is 1,753,000 yd^3.

The surface drainage at the site is described below:

Direction	Description of Surface Drainage Features
North	Low gradient drainage feature draining to Belews Lake
East	Drains overland approx. ¼ mile to Belews Creek arm of Belews Lake
South	Low Gradient drainage feature draining to West Belews Creek arm of Belews Lake
West	Due to the location of Craig Rd, surface water flow drains to the North.

As described in the Geologic and Hydrologic Siting Report[1], the subsurface conditions in the landfill area consist of residual soils, saprolite, partially weathered rock, and bedrock. The residual soil, saprolite, partially weathered rock have been formed by the in-place weathering of the parent rock. As is typical in the groundwater systems located in the Piedmont region, groundwater at the landfill site occurs within the residuum, saprolite, partially weathered rock, and shallow fractured bedrock under unconfined aquifer conditions. The predominant groundwater discharge areas are expected to be the drainage feature to the north of the landfill, the drainage feature to the south of the landfill, and to Belews Lake, located to the east and the west of the landfill.

[1] Geologic and Hydrologic Siting Report FGD Scrubber Residue Disposal Site, Belews Creek Steam Station, 3195 Pine Hall Road, Belews Creek, North Carolina, S&ME Project No: 1054-04-955, February 2005

The subsurface conditions at the landfill can be described by the following conditions (paraphrased from the S&ME hydro-geo report):

- Residuum: Residium material consists of highly weathered, unconsolidated material that retains none to very little of the physical characteristics of the parent bedrock. This material is generally comprised of silt with variable amounts of clay and sand. These materials were found at depths ranging from 3 to 10.5 feet below ground surface.

- Saprolite: Saprolite is the product of weathered bedrock and usually retains some to much of the observable structure of the parent bedrock. This material is generally composed of sandy silt and silty sand, transitioning to larger size sand grains and even larger gravel size particles with depth. Saprolite material was found from depths from the ground surface to 23.5 feet below ground surface.

- Partially Weathered Rock: This material is defined as a transitional material ranging between very dense soil and soft weathered rock, exhibiting SPT resistances in excess of 100 blows per foot. This material was sampled as silty sand to coarse sand with varying gravel content and varied in thickness from a few feet to approximately 29 feet.

- Bedrock: Bedrock is the consolidated parent material of soil in the Piedmont Geologic Province, exhibiting little to no weathering. Bedrock was encountered at depths ranging form 10.5 feet to 89.6 feet below ground surface.

1.3 WELL LOCATIONS AND INSTALLATION

The landfill will be monitored through a series of nine monitoring wells and one surface water sampling location. Monitoring well information is detailed in Table 1. The location of these wells is shown on Figure 2. Monitoring well BC-25 will be used as the background well.

These wells will be constructed of two-inch diameter PVC well screen and casing. Each well will intercept the aquifer with section of PVC well screen with a slot size of 0.010 inch. The screen lengths are shown in Table 1.

The wells have been/will be installed by a North Carolina registered well driller in accordance with applicable NCDENR regulations. The location of the well and the elevation of the top of the casing will be surveyed under the direction of a Professional Surveyor, licensed in North Carolina.

Figure 3 shows a typical construction diagram for the wells. All wells will be equipped with dedicated bladder type pump systems. Well construction records for the existing wells are included in Appendix B.

1.4 SURFACE WATER SAMPLING

There are no plans to perform surface water sampling to monitor for impacts from the landfill.

1.5 MONITORING FREQUENCY

The wells will be sampled semi-annually (with the actual sampling periods determined later). Sampling results will be submitted to the State within 90 days of sampling. The monitoring wells will be sampled prior to placement of waste in the landfill expansion.

1.6 PARAMETERS

Proposed parameters, units of measure, methods, and detection limits are presented in Table 2.

1.6 DATA QUALITY OBJECTIVES

The overall Quality Assurance (QA) objective is to ensure that reliable data of known and acceptable quality are provided. All measurements will be documented to yield results that are representative of the groundwater. Data will be calculated and reported in units consistent with those of other agencies and organizations to allow comparability of data.

The QA objectives for precision, accuracy, and completeness have been established by the laboratory(s) in accordance with EPA or other accepted agencies for each measurement variable (where possible). The objectives are outlined in the Duke Power Company Laboratory Services Procedures Manual, and are available upon request.

Detection limits for the water analyses presented in Table 2 are generally specified by the analytical methods. As stated above, appropriate methods have been selected to meet applicable standards for groundwater quality. Instances may occur, however, in which the condition of the sample will not allow detection of the desired limits for various parameters either because of matrix interference or high analyte concentrations requiring sample dilution. The laboratory(s) will provide sufficient documentation with each data package to notify reviewers of the data to any analytical problems.

2.0 SAMPLING PROCEDURES

2.1 SAMPLING EQUIPMENT

Development, purging and sampling equipment are selected to ensure all materials are compatible with the sample parameters and comply with state and federal regulatory requirements for sampling. Positive-gas-displacement fluorocarbon resin bladder pumps are installed in each monitoring well as dedicated purging and sampling systems.

2.1.1 Equipment Cleaning Procedures

Dedicated sampling equipment will be installed in each monitoring well. However, in the event non-dedicated equipment is used, reusable water level meters, development pumps, purging and sampling equipment are cleaned between wells in accordance with standard EPA approved cleaning procedures for field equipment. This standard is outlined in "Standard Operating Procedures and Quality Assurance Manual", Engineering Support Branch, EPA Region IV, February 1, 1991.

2.2 GROUND-WATER SAMPLING

2.2.1 Development of Wells

After installation of new wells, and prior to initial sampling, the monitoring wells are developed. Development removes silt that has settled into the bottom of the well following installation, and removes fine silt and clay particles from the well screen and sandpack surrounding the screen. Well development is necessary to eliminate potential clogging and enhance well performance. Development involves removing an estimated ten or more well volumes from the well using a positive-gas-displacement fluorocarbon resin bladder pump with an up-and-down agitation to loosen particles from the well screen. After development of a well, a true well depth is recorded.

2.2.2 Ground-Water Level and Total Depth Measurements

Water-level measurements are performed to determine the ground-water flow elevations and to calculate the volume of standing water in the well. All monitoring wells have been surveyed by a registered surveyor to determine the elevation of the top of each well casing. All depth and water-level measurements are referenced to the top of the well casing and recorded to the nearest one-hundredth of a foot.

Water level measurements are made with an electronic measuring device consisting of a spool of dual conductor wire, a probe attached to the end, and an indicator. When the probe comes in contact with water, the circuit is closed and a meter light and/or buzzer attached to the spool signal the contact. The probe is lowered further until it rests on the bottom of the well to determine the depth of the well. The depth and water level are used to determine that the well has not filled with silt and to calculate the volume of standing well water. The volume of well water (in gallons) is calculated using the following equation:

$$V = h \times \pi r^2 \times (7.48052 \text{ gal/ft}^3)$$

where V = volume of standing water (gallons)
h = height of standing water (feet) = casing depth - water level
r = radius of well casing (feet)

In dedicated sampling systems, an accurate well depth is determined, as indicated above, after development of the well and prior to installation of the dedicated bladder pump. The well depth, water level measurement, and calculated well volume are recorded on the Groundwater Monitoring Data Sheet (Figure 4).

2.2.3 Well Purging and Sampling

A Hydrolab® Multi-parameter Water Quality Monitoring Instrument is used to measure indicator parameters for establishing representative groundwater. These instruments are calibrated with

reference standards prior to and after each sampling day as described in Procedure 3210.1.[2] The pH subsystem is calibrated with two different pH standards (pH 7.0 and 4.0) which usually bracket the expected groundwater pH. The conductivity subsystem is calibrated to a standard nearest the expected groundwater conductivity. Calibration results are recorded on the Field Sampling Calibration Data Form (Figure 5).

Wells will be purged and sampled by conventional sampling methods in accordance to Procedure 3500.1.[3] Conventional sampling entails removing one equivalent well volume and measuring the indicator parameters temperature, pH, conductivity and turbidity. When indicator parameters have stabilized within ±0.2 pH units and ±10% for temperature, conductivity and turbidity over 3 to 5 consecutive well volumes, representative groundwater has been determined and sample collection may begin. Removed well volumes, indicator parameters, and pertinent notations are documented on the Groundwater Monitoring Data Sheet.

In the case of low groundwater levels, an alternative to conventional well purging and sample collection is the use of low flow sampling technology. This technique is particularly suited for low yielding wells where conventional purging and sampling evacuate a well to dryness. This method will not normally be employed, but is a viable option for obtaining samples under low groundwater conditions.

Low flow well purging and sampling allows the well to be purged in a shorter period of time, with less purge water generated while maintaining the same level of accuracy and reproducibility. Low flow technology involves using dedicated bladder pumps, a flow through cell, and water quality monitor continually measuring pH, turbidity, specific conductance, temperature, oxidation-reduction potential, and dissolved oxygen. Water is purged from the screened interval of the well at low flow rates ($\leq$100 ml/min) through a flow cell connected to a water quality instrument. The pumping rate will be maintained in an attempt to match the natural groundwater flow velocity in order to minimize drawdown in the well. Indicator parameters are electronically logged until stabilization is achieved and samples are collected.

2.2.4 Sample Collection

After representative groundwater has been determined by purging and stablilizing the indicator parameters, sampling may begin. Sampling personnel wear clean, disposable, non-powdered latex gloves during sample collection for each well. Samples are collected in the order of the volatilization sensitivity of the parameters:

- Metals
- Sulfate and chloride
- Nitrate
- TDS

If groundwater samples for metal analysis have a turbidity $\geq$10 NTU, the sample is collected and preserved. An additional sample should be collected using an in line flow through filter suitable for groundwater sampling. This filtered sample should be preserved accordingly with the analytical results used as information only.

2.2.5 Sample Containers, Volume, Preservative, and Holding Time

All sample containers supplied for the collection of groundwater samples by the laboratory are new, precleaned as approved by EPA procedures appropriate for the parameters of interest. Table 3 summarizes the sample containers, sample volume, preservation procedures and holding

[2] Procedure found in Duke Power Company Environmental Chemistry Operating Procedure For The Hydrolab Water Quality Analyzers.

[3] Procedure found in Groundwater Investigation, Groundwater Monitoring, Sample Collection And Aquifer Investigations At Duke Energy Corporation Locations.

times required for each type of sample and parameter. Sample containers are kept closed until used. All sample containers are provided by Duke Energy or vendor laboratories.

3.0 SAMPLE TRACKING

The chain of custody program allows for tracing the possession and handling of individual samples from the time of field collection through laboratory analysis and report preparation. Samples are pre-logged prior to sample collection. This process assigns a unique tracking number for each sample and generates corresponding labels.

3.1 SAMPLE LABELING

Sample containers are labeled and organized prior to field activities as part of the pre-sampling staging process. As samples are actually collected, the sampling personnel write the following information directly on the label: sampling date and time, and initials of sample collector. This information is also recorded on the Groundwater Monitoring Data Form and the Chain of Custody Record (Figure 6).

3.2 FIELD DOCUMENTATION

Field documentation form each sampling event is recorded on the Groundwater Monitoring Data Sheets, the Field Sampling Calibration Form, and the Chain-of-Custody Record. These loose-leaf sheets are arranged in sequential order and filed by project and date. All recorded entries are made in indelible ink. Errors are corrected by drawing a line through the error, initialing and dating the correction, and starting a new entry on the next line (if necessary). Additionally, a Groundwater Sampling Site Checklist (Figure 7) is completed indicating information of the monitoring well such as proper ID tag, condition of protective casing and pad. Field notations are made during the course of the field work to document the following information:

- Identification of well
- Well depth
- Static water level depth and measurement technique
- Presence of immiscible layers and detection method
- Well yield - high or low
- Purge volume or pumping rate
- Sample identification numbers
- Well evacuation procedure/equipment
- Sample withdrawal procedure/equipment
- Date and time of collection
- Types of sample containers used
- Identification of replicates or blind samples
- Preservative(s) used
- Parameters requested for analysis
- Field analysis data and methods
- Sample distribution and transporter
- Field observations on sampling event
- Name of collector(s)
- Climatic conditions including estimate of air temperature

3.3 CHAIN-OF-CUSTODY RECORD (COC)

The COC Record (Figure 6) accompanies the sample(s), traces sample possession from time of collection to delivery to the laboratory(s), and clearly identifies which sample containers have been designated for each requested parameter. The record includes the following types of information:

- Sample identification number
- Signature of collector
- Date and time of collection
- Sample type (e.g., groundwater, immiscible layer)
- Identification of well
- Number of containers
- Parameters requested for analysis
- Preservative used
- Signature of persons involved in the chain of possession
- Inclusive dates of possession

3.4 SAMPLE CUSTODY, SHIPMENT AND LABORATORY RECEIPT

For the purpose of these procedures, a sample is considered in custody if it is:

- In actual possession of the responsible person;
- In view, after being in physical possession;
- Locked so that no one can tamper with it, after having been in physical custody; or in a secured area, restricted to authorized personnel. All samples are maintained in the custody of the sampling crew during the sampling event. At the end of each sampling day and prior to the transfer of the samples off-site, chain-of-custody entries are completed on the COC for all samples. Upon transfer of custody, the chain-of-custody form is signed by a sampling crew member, including the date and time. If outside vendor laboratories are utilized, samples are delivered to these facilities by Duke Energy personnel or courier.

All chain-of-custody forms received by the laboratory(s) are signed and dated by the respective Supervising Scientist(s) or their designee (at the Duke Energy lab), or the laboratory sample custodian (at vendor labs) immediately following receipt by the laboratory.

The analysts at the laboratory(s) maintain a sample-tracking record that will follow each sample through all stages of laboratory processing. The sample tracking records show the date of sample extraction or preparation, and analysis. These records are used to determine compliance with holding time limits during lab audits and data validation.

Custody procedures followed by Duke Energy laboratory personnel are described in detail in the Duke Energy Laboratory Services Procedures Manual.

4.0 ANALYTICAL PROCEDURES

The main analytical laboratory used in this program is the Duke Energy Laboratory Services Laboratory: N.C. Drinking Water (NC37804) and Wastewater (#248) Certifications. The organizational structure and staff qualifications of the laboratory are discussed in its generic Quality Assurance Program (QAP). The QAP and Laboratory Services Procedures Manual are available for review upon request.

Vendor laboratories that meet EPA and North Carolina certification requirements may be used for analyses which cannot be performed in-house.

The analytical procedures used for this Groundwater Monitoring Program are listed in Table 2. Indicator parameters are measured in the field according to Duke Energy Scientific Services Section Quality Assurance Plan and Procedure 3210.1.

5.0 INTERNAL QUALITY CONTROL CHECKS

Internal laboratory control checks used by the laboratories are described in their generic QAP and procedures manual. The laboratories demonstrate the ability to produce acceptable results using the methods specified.

Internal quality control checks for sampling procedures and laboratory analyses will be conducted with each sampling event. These checks will consist of the preparation and submittal of field blanks, trip (travel) blanks, and/or field replicates for analysis of all parameters at frequencies described in the laboratory(s) procedures manuals. Equipment rinsate blanks for laboratory-cleaned equipment will be collected quarterly.

The above field QC blanks and replicates included as internal QC checks are described as follows:

- **Field Blanks**: A field blank consists of sample containers filled in the field with organic-free, deionized or distilled water prepared and preserved in the same manner as the samples. The field blank is transported to the laboratory with the samples and analyzed along with the field samples for the constituents of interest to check for contamination imparted to the samples by the sample container, preservative, or other exogenous sources.

- **Trip Blanks**: A trip (travel) blank is a sample container filled with organic-free water in the laboratory that travels unopened with the sample bottles. It is returned to the laboratory with the field samples, and analyzed along with the field samples for parameters of interest.

- **Field Replicates**: A field replicate is a duplicate sample prepared at the sampling locations from equal portions of all sample aliquots combined to make the sample. Both the field replicate and the sample are collected at the same time, in the same container type, preserved in the same way, and analyzed by the same laboratory as a measure of sampling and analytical precision.

6.0 VALIDATION OF FIELD DATA PACKAGE

The field data package includes all of the field records and measurements developed by the sampling team personnel. The field data package validation procedure consists of:

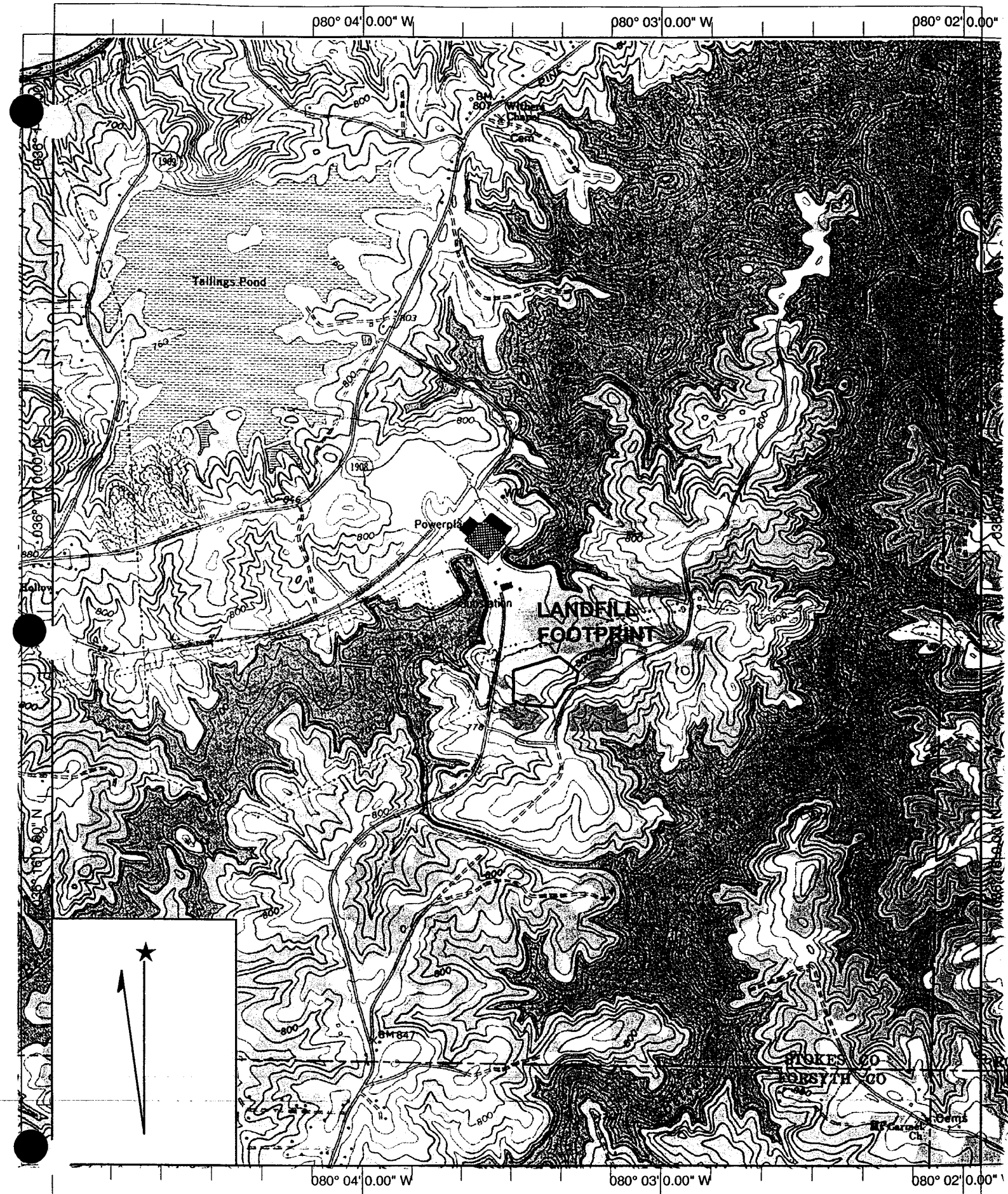
- A review of field data contained on the Groundwater Monitoring Data Sheets for completeness.
- Verification that equipment blanks, field blanks, and trip blanks were properly prepared, identified, and analyzed.
- A check of the Field Sampling Calibration Form for equipment calibration and instrument condition.
- A review of the Chain-Of-Custody Record for proper completion, signatures of field personnel and the laboratory sample custodian, and dates, and for verification that the correct analyses were specified.

7.0 REPORT SUBMITTAL

A summary table of the field and laboratory data and a cover letter describing trends will be submitted to the North Carolina Department of Environment and Natural Resources within 90 days of sampling. The State will be notified in the event that vendor lab analyses have not been completed within this time frame. All Groundwater Monitoring Data Sheets, Field Calibration Forms, Chain-of-Custody Record, Laboratory(s) QA data, and Data Validation Checklists are kept in fire-proof file cabinets or microfiche, and are available upon request.

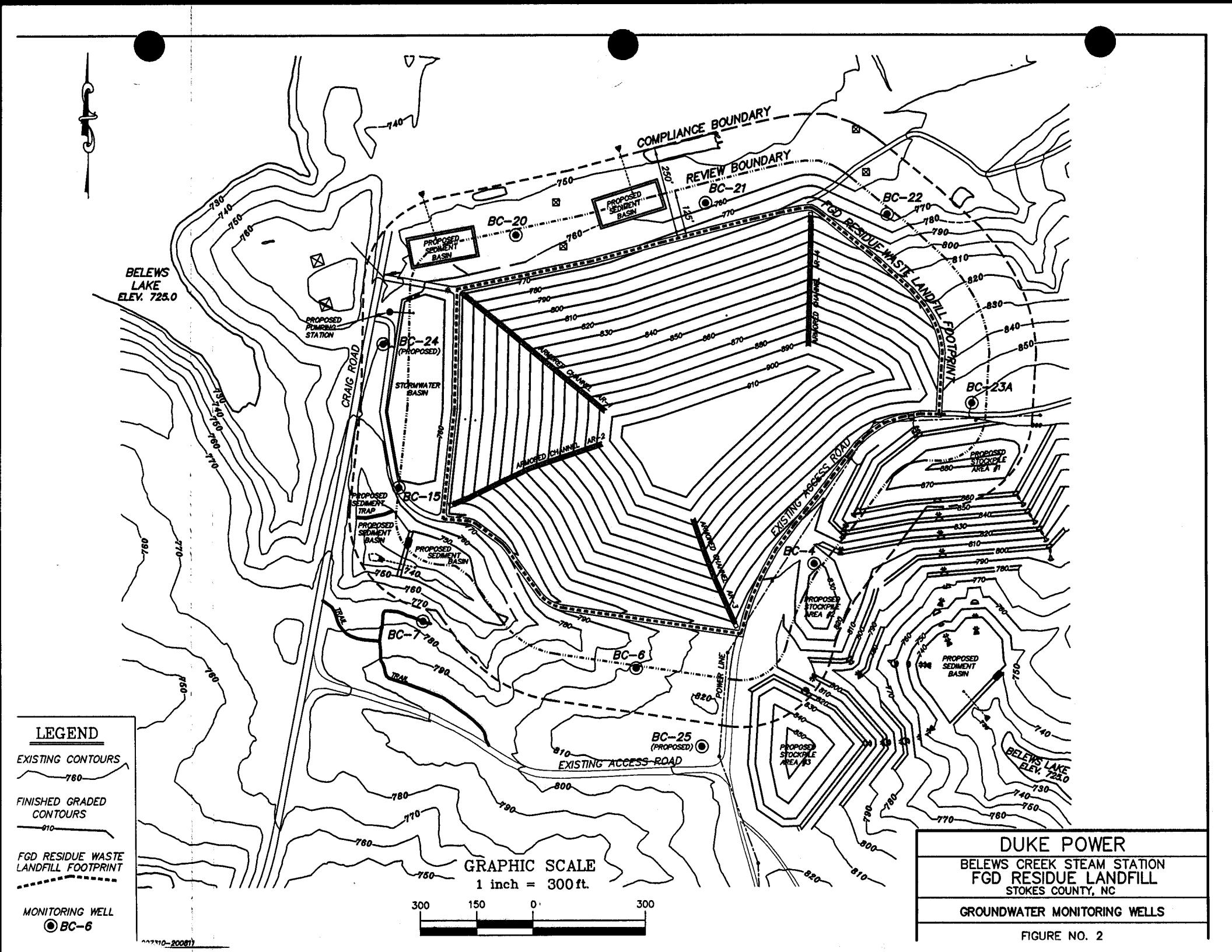
APPENDIX A

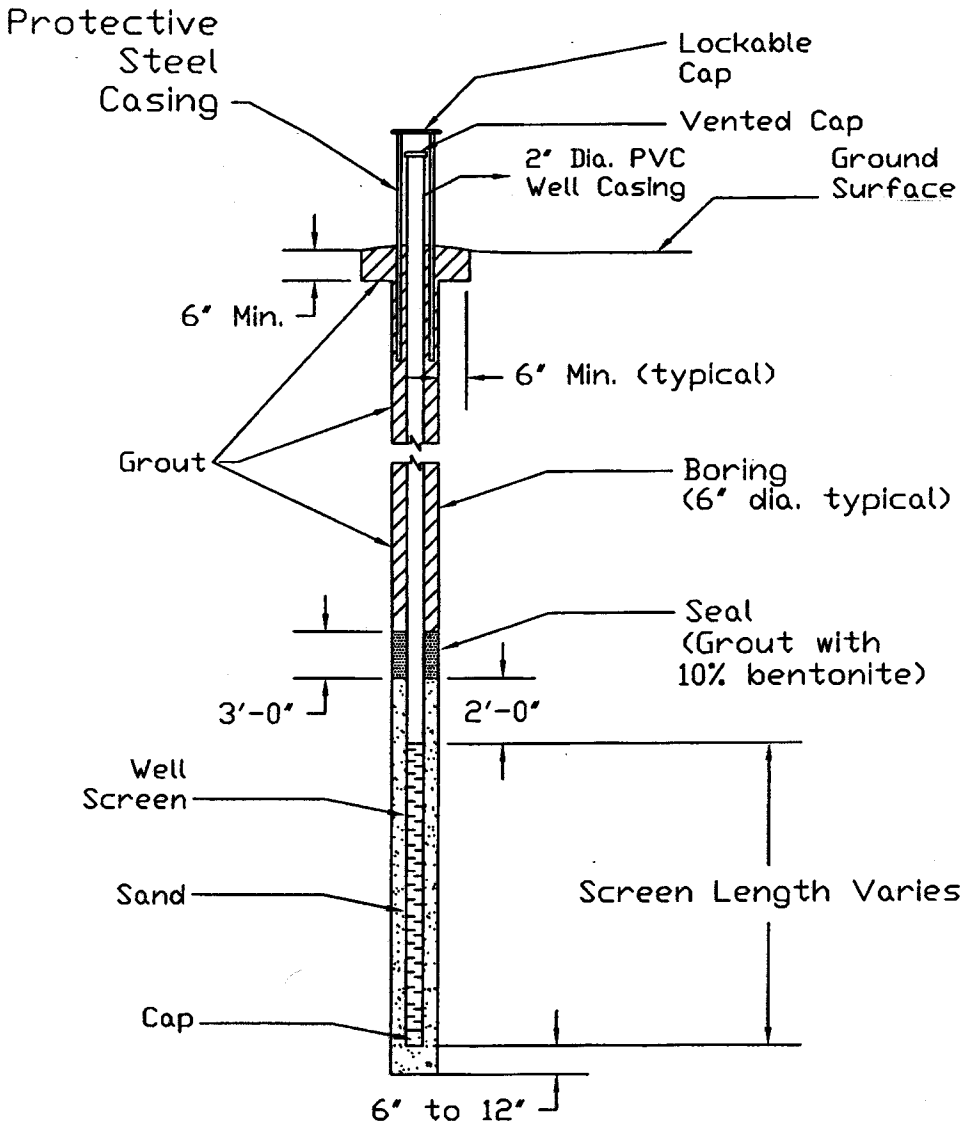
FIGURES & TABLES



Name: BELEWS LAKE
Date: 9/1/2004
Scale: 1 inch equals 2000 feet

Location: 036° 16' 41.8" N 080° 03' 29.3" W
Caption: Duke Power
Belews Creek Station
FGD Landfill Site


COMPLIANCE BOUNDARY
REVIEW BOUNDARY
250'
125'
BC-20
BC-21
BC-22
BC-23A
BC-24
(PROPOSED)
BC-15
BC-7
BC-6
BC-4
BC-25
(PROPOSED)
PROPOSED SEDIMENT BASIN
PROPOSED SEDIMENT TRAP
PROPOSED POWERING STATION
STORMWATER BASIN
CRAIG ROAD
ARMORED CHANNEL AR-1
ARMORED CHANNEL AR-2
ARMORED CHANNEL AR-3
ARMORED CHANNEL AR-4
FGD RESIDUE WASTE LANDFILL FOOTPRINT
EXISTING ACCESS ROAD
PROPOSED STOCKPILE AREA #1
PROPOSED STOCKPILE AREA #2
PROPOSED STOCKPILE AREA #3
POWER LINE
TRAIL
BELEWS LAKE ELEV. 725.0
LEGEND
EXISTING CONTOURS
760
FINISHED GRADED CONTOURS
810
FGD RESIDUE WASTE LANDFILL FOOTPRINT
MONITORING WELL
BC-6
GRAPHIC SCALE
1 inch = 300 ft.
300 150 0 300
DUKE POWER
BELEWS CREEK STEAM STATION
FGD RESIDUE LANDFILL
STOKES COUNTY, NC
GROUNDWATER MONITORING WELLS
FIGURE NO. 2



Notes:

- All well casing material shall be Sch 40 PVC.
- Well screen material shall be Sch 40 PVC.

Duke Power Company

Typical
Groundwater Monitoring Well
Construction Details
FIGURE 3

DUKE POWER COMPANY

GROUNDWATER MONITORING DATA SHEET

LOCATION:				
PROJECT NAME:				
PROCEDURE NUMBER:	3500.1			
SAMPLING DATE:			FIELD CREW:	

MONITORING WELL NUMBER: ____

WATER LEVEL METER SERIAL #: ____

PRODUCT LEVEL METER SERIAL #: ____

TIME SAMPLE COLLECTED: ____

WELL VOLUME CALCULATION:

WELL DIAMETER (in)	WELL DEPTH (ft)		DEPTH TO WATER (ft)		WATER COLUMN (ft)		CONVERSION FACTOR		WELL VOLUME (gal)
2"		-		=		X	0.1631	=	
4"		-		=		X	0.6530	=	
6"		-		=		X	1.4684	=	

METHOD (Pump/Bail):	
MICROPURGE (Yes/No):	
PID READING:	ppm

DEDICATED SAMPLING SYSTEMS ONLY		
REFERENCE PROBE DEPTH:		(ft)
SUBMERSION DEPTH:	-	(ft)
DEPTH TO WATER:	=	(ft)

DETECTED ODORS	FREE PRODUCT MEASUREMENT		
TYPE:	DEPTH TO WATER		(ft)
STRONG:	DEPTH TO PRODUCT	-	(ft)
MINOR:	PRODUCT THICKNESS	=	(ft)
NONE:	DON'T SAMPLE IF THICKNESS > OR = TO 0.1 ft !		

VOLUME (gal)	EVACUATED VOLUME (gal)	TEMP (deg C)	SPECIFIC CONDUCTANCE (umho/cm)	TURBIDITY (NTU)	pH (unit)	ORP (mV)	DISSOLVED OXYGEN (mg/l)		COMPLETE EVACUATION (Yes/No)

COMMENTS: WATER LEVEL, PRODUCT LEVEL AND WELL DEPTH REFERENCED TO THE TOP OF WELL CASING.

Figure 4

FIELD SAMPLING CALIBRATION DATA FORM

STUDY: _____

DATE: _____ **WEATHER CONDITIONS:** _____

COLLECTORS: _____ **SURFACE UNIT READER:** _____

HYDROLAB SERIAL #: _____ **COMPUTER:** _____

OTHER EQUIPMENT: _____ **SURVEYOR SERIAL #:** _____

Procedure Number 3210.1

Calibration Time		Time		Time		Time	
Barometric Pressure			mmHg		mmHg		mmHg
Parameter	Calib.	Instrument Value	Standard Value	Instrument Value	Standard Value	Instrument Value	Standard Value
Thermometer No.							
TEMP (deg C)		_____ --/--> _____		_____ --/--> _____		_____ --/--> _____	
		_____ --/--> _____		_____ --/--> _____		_____ --/--> _____	
DO (mg/l)	W		_____		_____		_____
	W		_____		_____		_____
	W		_____		_____		_____
	AW	_____ ---> _____		_____ ---> _____		_____ ---> _____	
pH (units)	B	_____ --->	7.00	_____ --->	7.00	_____ --->	7.00
	B	_____ --->	4.00	_____ --->	4.00	_____ --->	4.00
	B	_____ --->	10.00	_____ --->	10.00	_____ --->	10.00
SP COND (uS/cm)	SS	_____ --->	0.00	_____ --->	0.00	_____ --->	0.00
	SS	_____ --->	_____	_____ --->	_____	_____ --->	_____
	SS	_____ --->	_____	_____ --->	_____	_____ --->	_____
ORP (mV)	SS	_____ --->	_____	_____ --->	_____	_____ --->	_____
	SS	_____ --->	_____	_____ --->	_____	_____ --->	_____
TURBIDITY (ntu)	SS	_____ --->	0.00	_____ --->	0.00	_____ --->	0.00
	SS	_____ --->	_____	_____ --->	_____	_____ --->	_____

KEY: B = Buffer; SS = Standard Solution; ---> = Adjusted To; W = Winkler; AW = Average Winkler; --/--> = Not Adjusted To; NA = Not Applicable

Figure 5

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Duke EnergySM

For Detailed Instructions, see:
http://dewww/essenv/coc/

Analytical Laboratory Services
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd
Huntersville, N. C. 28078
(704) 875-5245
Fax: (704) 875-5038

Analytical Laboratory Use Only

LIMS # | Sample Class | Samples Originating From NC ___ SC ___

Logged By | Date & Time | SAMPLE PROGRAM: Ground Water ___ NPDES ___ Drinking Water ___ UST ___ RCRA Waste ___

Vendor | Cooler Temp (C)

PO # | [15]Preserv.: 1=HCl 2=H_2SO_4 3=HNO_3 4=Ice 5=None

MR #

[19]Page ____ of ____

DISTRIBUTION
ORIGINAL to LAB,
COPY to CLIENT

Customer must Complete

1)Project Name		2)Phone No:
3)Client		4)Fax No:
5)Business Unit:	6)Process:	7)Resp. To:
8)Project ID:	9)Activity ID:	10)Mail Code:

Customer to complete all appropriate NON-SHADED areas.

LAB USE ONLY [11]Lab ID	[12]Chem Desktop No.	[13]Sample Description or ID	[14]Collection Information Date	Time	Signature	[17]Comp.	[18]Grab	[16]Analyses Required	[20]Total # of Containers

Customer to complete appropriate columns to right

Customer to sign & date below

21)Relinquished By	Date/Time	Accepted By:	Date/Time
Relinquished By	Date/Time	Accepted By:	Date/Time
Relinquished By	Date/Time	Accepted By:	Date/Time
23)Seal/Locked By	Date/Time	Sealed/Lock Opened By	Date/Time
24)Comments			

Customer, important please indicate desired turnaround

[22]Requested Turnaround

14 Days _____

*7 Days _____

*48 Hr _____

*Other _____

* Add. Cost Will Apply

Figure 6

GROUNDWATER SAMPLING SITE CHECKLIST

Location _____ **Site** _____

Site Contact _____ **Field Crew** _____

Sample Date _____ **Weather** _____

YES	NO	SITE CONDITIONS DURING GROUNDWATER SAMPLING EVENT
____	____	Was Access to the wells clear & adequate ? _____
____	____	Were wells locked ? _____
____	____	Do locks need replacing ? _____

Do wells have proper identification tags attached including:

NC REQUIREMENTS

__ Drilling contractor name & registration number
__ Date well completed
__ Total well depth
__ Warning that the well is not for water supply & that the groundwater may contain hazardous materials
__ Depth to screen

SC REQUIREMENTS

__ Drilling contractor name & driller certification number
__ Date well completed
__ Total well depth
__ Casing depth (ft) and inside diam. (in)
__ Screen interval(s)
__ Yield in gpm or specific capacity in gpm per ft of drawdown (gpm/ft-dd)
__ Static water level and date measured

____	____	Were well PVC casings in good shape ? _____
____	____	Were concrete pads in good shape ? _____
____	____	Any ants, wasps, etc. in or around the casing ? _____
____	____	Were well protective casings in good shape _____

FLUSH MOUNT WELLS ONLY

____	____	Do well caps work properly ? _____
____	____	Are gaskets & bolts in good shape (keep out the rain) ? _____

Note any type activity that might impact the integrity of the monitoring wells (dumping, earthmoving, construction, or the use of pesticides/herbicides) _____

ANY OTHER COMMENTS: _____

Figure 7

Table 1. Monitoring Well Information

	BC-4	BC-6	BC-7	BC-15	BC-20	BC-21	BC-23A	BC-24	BC-25
	(Existing)	(Existing)	(Existing)	(Existing)	(Existing)	(Existing)	(Existing)	Proposed	Proposed
North (ft)	920,130.5	919,849.2	919,975.5	920,337.8	921,017.9	921,128.8	920,562.7	later	later
East (ft)	1,688,918.4	1,688,441.6	1,687,873.7	1,687,813.4	1,688,124.9	1,688,620.9	1,689,344.3	later	later
Top Of Casing Elevation (ft)	813.74	802.16	777.8	762.26	757.22	756.69	863.79	later	later
Well Diameter	2"	2"	2"	2"	2"	2"	2"	2"	2"
Well Stick-up (ft)	1.75	1.42	1.94	1.6	3.4	1.1	2	later	later
Type of Casing	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC
Screen Length (ft)	15	15.22	14.5	15	10	10	25	later	later
Screen Interval (ft below ground surface)	46.44 To 61.44	23.5 To 38.72	37.88 To 52.38	28.4 To 43.4	11.6 To 21.6	3.9 To 13.9	76.7 To 101.7	later	later
Lithologic Unit at Screen Interval	Bedrock	PWR/ Bedrock	Bedrock	Saprolite	PWR	Residuum/ Saprolite	PWR /Bedrock	later	later

Coordinates: NC State Plane Grid, NAD83
Elevations: NAVD 88

Table 2. Sample Parameters, Analytical Methods and Detection Limits

PARAMETER	UNITS	ANALYTICAL METHOD	DETECTION LIMITS
Insitu Parameters			
Field pH	pH Units	Hydrolab	NA
Specific Conductance	umhos/cm	Hydrolab	NA
Temperature	°C	Hydrolab	NA
Turbidity	NTU	HACH	NA
Water Level	ft	Water Level Meter	0.01 ft
Laboratory Analyses			
Nitrate	mg/l	EPA 353.2	0.05
Chloride	mg/l	EPA 300.0	0.1
Arsenic	ug/l	EPA 200.8	(Note 1) 2
Barium	mg/l	EPA 200.7	0.0050
Cadmium	ug/l	EPA 200.8	0.5
Chromium	ug/l	EPA 200.8	1
Copper	ug/l	EPA 200.8	2
Iron	mg/l	EPA 200.7	0.010
Lead	ug/l	EPA 200.8	2
Manganese	mg/l	EPA 200.7	0.0050
Mercury	ug/l	EPA 245.1	0.1
Nickel	ug/l	EPA 200.7	40
Selenium	ug/l	EPA 200.8	2
Silver	ug/l	EPA 200.8	0.5
Zinc	ug/l	EPA 200.7	0.02
Sulfate	mg/l	EPA 300.0	0.1
Fluoride	mg/l	EPA 300.0	0.10
TDS	mg/l	EPA 160.1	10

Note 1: The Division of Public Health has recommended that the Groundwater Quality Standard for Arsenic be lowered to 0.00002 mg/L. The Environmental Management Commission previously directed that NCDENR staff proceed with permanent rulemaking to change the Groundwater Quality Standard for Arsenic. The permanent rule published for hearing will propose a concentration level for Arsenic at the much lower concentration of 0.00002 milligrams per liter. Duke is evaluating methods to achieve detection at this lower concentration.

Table 3. Sample Containers, Preservatives and Holding Times.

PARAMETER	CONTAINERS	PRESERVATIVES	HOLDING TIMES
Insitu Parameters			
Field pH	Insitu	None	Analyze Immediately
Specific Conductance	Insitu	None	Analyze Immediately
Temperature	Insitu	None	Analyze Immediately
Turbidity	Insitu	None	Analyze Immediately
ORP	Insitu	None	Analyze Immediately
Laboratory Analyses			
Nitrate	500 ml HDPE	Cool 4°C	48 hrs
Chloride	500 ml HDPE	Cool 4°C	28 days
Arsenic	500 ml HDPE	pH<2 HNO_3	6 months
Barium	500 ml HDPE	pH<2 HNO_3	6 months
Cadmium	500 ml HDPE	pH<2 HNO_3	6 months
Chromium	500 ml HDPE	pH<2 HNO_3	6 months
Copper	500 ml HDPE	pH<2 HNO_3	6 months
Iron	500 ml HDPE	pH<2 HNO_3	6 months
Lead	500 ml HDPE	pH<2 HNO_3	6 months
Manganese	500 ml HDPE	pH<2 HNO_3	6 months
Nickel	500 ml HDPE	pH<2 HNO_3	6 months
Mercury	500 ml HDPE	pH<2 HNO_3	6 months
Selenium	500 ml HDPE	pH<2 HNO_3	6 months
Silver	500 ml HDPE	pH<2 HNO_3	6 months
Zinc	500 ml HDPE	pH<2 HNO_3	6 months
Sulfate	500 ml HDPE	Cool 4°C	28 days
Fluoride	500 ml HDPE	pH<2 HNO_3	6 months
Total Dissolved Solids	500 ml HDPE	Cool 4°C	7 days

APPENDIX B

Monitoring Well Construction Records

(Monitoring Well Construction Records for BC24 and BC-25 will be supplied upon construction of the wells)

WELL CONSTRUCTION RECORD

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print): Earl Mosely — CERTIFICATION #: 2252

WELL CONTRACTOR COMPANY NAME: S&ME, Inc. — PHONE #: 919-872-2660

STATE WELL CONSTRUCTION PERMIT# (if applicable): — ASSOCIATED WQ PERMIT# (if applicable):

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultral ☐
   Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use: _____
2. WELL LOCATION:
   earest Town: Walnut Cove — County: Stokes
   SR 1908 (Pine Hall Road) - Duke Power Belews Creek Steam Station
   (Street Name, Numbers, Community, Sudivision, Lot No.,Zip Code)

   Topographic/Land setting
   ☐ Ridge ☐ Slope ☒ Valley ☐ Flat
   (check appropriate box)
   Latitude/longitude of well location _____
   (degrees/minutes/seconds)
   Latitude/longitude scource: ☐GPS ☐Topographic Map
   (check box)
3. OWNER: Duke Power - Belews Creek Steam Station
   Address: 3195 Pine Hall Road
   (Street or Route No.)
   Belews Creek — NC — 27009
   City or Town — State — Zip Code
   336-427-0274
   Area code - Phone Number
4. DATE DRILLED: 11/15/2002
5. TOTAL DEPTH: 62
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 56.46 ft.
   (Use "+" if Above Top of Casing)
8. TOP OF CASING IS 1.75 FT. Above Land Surface*
   *Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): _____ METHOD OF TEST: _____
0. WATER ZONES (depth): _____

DEPTH From	DEPTH To	DRILLING LOG Formation Descrpition
0	50	Brown silt and sand
50	62	Gray quartz-feldspar gneiss

1. DISINFECTION: Type: NA — Amount: _____
2. CASING:

	Depth From	Depth To		Diameter		Wall Thickness or Weight/Ft.	Material
	0	46.44	Ft.	2	in.	Schedule 40	PVC
			Ft.				
			Ft.				

3. GROUT:

	Depth From	Depth To		Material	Method
	0	38.5	Ft.	Cement	Grout
	38.5	45	Ft.	Bentonite	Chips

4. SCREEN:

	Depth From	Depth To		Diameter		Slot Size		Material
	46.44	61.44	Ft.	2	in.	0.01	in.	PVC
			Ft.		in.		in.	

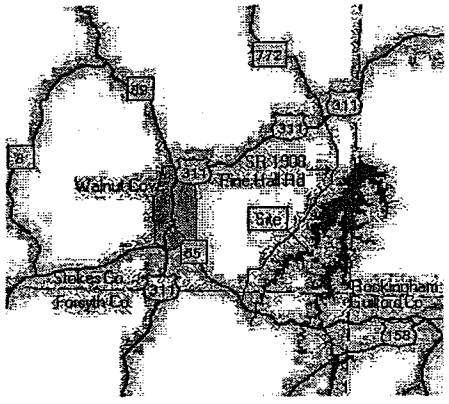
5. SAND/GRAVEL PACK:

	Depth From	Depth To		Size	Material
	45	62	Ft.		Filter Sand #2
			Ft.		

6. REMARKS: Monitor Well Number BC-4

LOCATION SKETCH

Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common names.



I DO HERE BY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

Earl Mosely — 4-9-03

SIGNATURE OF PERSON CONSTRUCTING THE WELL — DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

BORING LOG BC-4

PROJECT:	**Duke Power-Belews Creek**	DRILLING CONTRACTOR:	**S&ME, Inc.**
LOCATION:	**Belews Creek, NC**	DRILLING METHOD:	**4¼" H.S.A.**
PROJECT NO.:	**1264-02-576**	DRILL RIG:	**CME-45**
LOGGED BY:	**J. Drummond**	TOP OF CASING ELEVATION (ft):	**813.74**
DATE DRILLED:	**11/15/2002**	WATER LEVEL TOB (ft bgs):	
BORING DEPTH (ft):	**62**	WATER LEVEL 24 HRS (ft bgs):	**54.71**

Depth (feet)	Sample Number	Sample Interval (feet)	Blow Counts per 6 Inches	Recovery (inches)	Rock RQD (%)	Symbol	Description & Remarks	Well Construction Details	Well Construction Graphic	Elevation (feet)
	S-1	0.0-10.0	--				Orange brown micaceous SILT and fine to coarse SAND, slightly moist.	Protective Casing Dia: 4.0 in. Type: Stick-Up Interval: 1.75 ft.		810
	SS-1	1.0-2.5	6-6-7	18						
	SS-2	3.5-5.0	4-7-8	18			Orange brown to light yellowish brown very micaceous SILT and fine to coarse SAND, dry, crumbly.			
5								Riser Casing Dia: 2.0 in. Type: Sch 40 PVC Interval: 0.0 - 46.44 ft.		805
	SS-3	6.0-7.5	4-6-7	18			Orange brown micaceous SILT and fine to coarse SAND w/rock fragments, trace wood fibers, dry, crumbly.			
	SS-4	8.5-10.0	10-11-12	18			Orange brown and light yellowish brown micaceous SILT and coarse SAND w/rock fragments (saprolite), dry, crumbly.	Grout Type: Portland Cement Interval: 0.0 - 38.5 ft.		
10	S-2	10.0-20.0	--				Light orange brown and light yellowish brown micaceous SILT and fine to coarse SAND w/rock fragments (saprolite), dry, crumbly.			800
	SS-5	13.5-15.0	5-9-10	18				Seal Type: Bentonite Chips Interval: 38.5 - 45.0 ft.		
15							Light to medium orange brown micaceous SILT and fine to coarse SAND w/rock fragments (saprolite), dry, crumbly.	Filterpack Type: Filter Sand #2 Interval: 45.0 - 62.0 ft.		795
	SS-6	18.5-18.5	50/.1--	0						
20	S-3	20.0-30.0	--					Screen Dia: 2.0 in. Type: Sch 40 PVC Interval: 46.44 - 61.44 ft.		790
	SS-7	23.5-25.0	14-15-12	18						
25							Light yellowish brown micaceous SILT and fine to coarse SAND (gneissic saprolite), dry, crumbly.			785
	SS-8	28.5-30.0	32-35-35	18						
30	S-4	30.0-40.0	--				Medium gray, light orange, and light yellowish brown micaceous SILT and fine to coarse SAND w/rock fragments (gneissic saprolite), dry, crumbly.			780
	SS-9	33.5-34.0	50/6--	6						

NOTES

SS = Split Spoon Sample
ST = Shelby Tube Sample
S = Bulk Sample
R = Core Run
RS = Rock Sample
REC = Rock Core Recovery
RQD = Rock Quality Designation

1. ▽ = Water Level At Termination of Boring
2. ▼ = Water Level After 24 Hours

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BORING LOG BC-4

PROJECT:	Duke Power-Belews Creek	DRILLING CONTRACTOR:	S&ME, Inc.
LOCATION:	Belews Creek, NC	DRILLING METHOD:	4¼" H.S.A.
PROJECT NO.:	1264-02-576	DRILL RIG:	CME-45
LOGGED BY:	J. Drummond	TOP OF CASING ELEVATION (ft):	813.74
DATE DRILLED:	11/15/2002	WATER LEVEL TOB (ft bgs):	
BORING DEPTH (ft):	62	WATER LEVEL 24 HRS (ft bgs):	54.71

Depth (feet)	Sample Number	Sample Interval (feet)	Blow Counts per 6 Inches	Recovery (Inches)	Rock RQD (%)	Description & Remarks
	SS-10	38.8-38.8	50/0.2"	0.2		Light yellowish brown and light to medium gray micaceous HARD WEATHERED ROCK samples as SILT and fine to coarse SAND w/rock fragments, dry, crumbly. Auger refusal at 50.0 ft.
40	S-5	40.0-50.0	–			
	SS-11	43.5-43.5	50/1"	1		
45						
	SS-12	48.5-49.0	50/6"	6		
50	R-1	50.0-54.5	–	54	44	Medium gray, black, and white layered medium to coarse grained quartz-feldspar GNEISS, very weathered, highly fractured with large fracture at 40 (degrees) 53 ft., blockage and quartzite at 58 ft. REC = 38% RQD = 44% Fracture at 58.5' : 56
55						
60						Boring terminated at 62.0 ft. in weathered GNEISS.

Well Construction Details

Protective Casing
Dia: 4.0 in.
Type: Stick-Up
Interval: 1.75 ft.

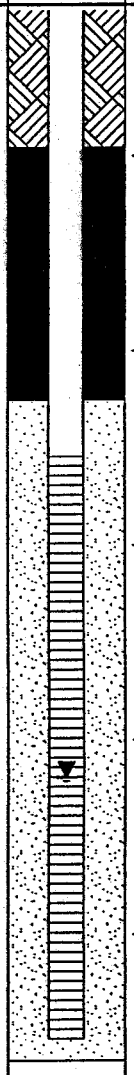
Riser Casing
Dia: 2.0 in.
Type: Sch 40 PVC
Interval: 0.0 - 46.44 ft.

Grout
Type: Portland Cement
Interval: 0.0 - 38.5 ft.

Seal
Type: Bentonite Chips
Interval: 38.5 - 45.0 ft.

Filterpack
Type: Filter Sand #2
Interval: 45.0 - 62.0 ft.

Screen
Dia: 2.0 in.
Type: Sch 40 PVC
Interval: 46.44 - 61.44 ft.



NOTES

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WELL CONSTRUCTION RECORD

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print): Micheal Mosely — CERTIFICATION #: 3210

WELL CONTRACTOR COMPANY NAME: S&ME, Inc. — PHONE #: 919-872-2660

STATE WELL CONSTRUCTION PERMIT# (if applicable): — ASSOCIATED WQ PERMIT# (if applicable):

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultral ☐
   Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use:

2. WELL LOCATION:
   Nearest Town: Walnut Cove County: Stokes
   SR 1908 (Pine Hall Road) - Duke Power Belews Creek Steam Station
   (Street Name, Numbers, Community, Sudivision, Lot No.,Zip Code)

   Topographic/Land setting
   ☐ Ridge ☐ Slope ☒ Valley ☐ Flat
   (check appropriate box)
   Latitude/longitude of well location
   (degrees/minutes/seconds)
   Latitude/longitude scource: ☐GPS ☐Topographic Map
   (check box)

3. OWNER: Duke Power - Belews Creek Steam Station
   Address: 3195 Pine Hall Road
   (Street or Route No.)
   Belews Creek | NC | 27009
   City or Town | State | Zip Code
   336-427-0274
   Area code - Phone Number

4. DATE DRILLED: 11/7/02
5. TOTAL DEPTH: 38.72
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 39.21 ft.
   (Use "+" if Above Top of Casing)
8. TOP OF CASING IS 1.42 FT. Above Land Surface*
   *Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): ____ METHOD OF TEST: ____
10. WATER ZONES (depth): ____

DEPTH From	DEPTH To	DRILLING LOG Formation Descrpition
0	13.5	brown to orange sandy silt
13.5	28.5	brown to yellow sandy silt
		with thin layer of weathered
		rock (quartz crystals).
28.5	38.5	Gray granitic gneiss

11. DISINFECTION: Type: NA Amount: ____
12. CASING:

	Depth From	To		Diameter		Wall Thickness or Weight/Ft.	Material
	0	23.5	Ft.	2	in.	Schedule 40	PVC
			Ft.				
			Ft.				

13. GROUT:

	Depth From	To		Material	Method
	0	18.8	Ft.	Cement	Grout
	18.8	23.5	Ft.	Bentonite	Chips

14. SCREEN:

	Depth From	To		Diameter		Slot Size		Material
	23.5	38.72	Ft.	2	in.	0.01	in.	PVC
			Ft.		in.		in.	

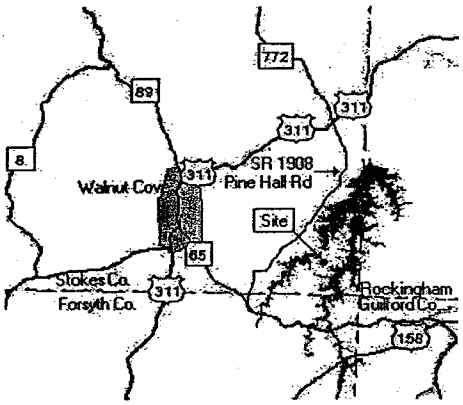
15. SAND/GRAVEL PACK:

	Depth From	To		Size	Material
	23.5	38.72	Ft.		Filter Sand #2
			Ft.		

16. REMARKS: Monitor Well Number BC-6

LOCATION SKETCH

Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common names.



I DO HERE BY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

Micheal Mosely — 4-7-03

SIGNATURE OF PERSON CONSTRUCTING THE WELL — DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

BORING LOG BC-6

PROJECT:	**Duke Power-Belews Creek**	DRILLING CONTRACTOR:	**S&ME, Inc.**
LOCATION:	**Belews Creek, NC**	DRILLING METHOD:	**4¼" H.S.A.**
PROJECT NO.:	**1264-02-576**	DRILL RIG:	**Mobile B-57**
LOGGED BY:	**S. Watts**	TOP OF CASING ELEVATION (ft):	**802.16**
DATE DRILLED:	**11/7/2002**	WATER LEVEL TOB (ft bgs):	
BORING DEPTH (ft):	**38.72**	WATER LEVEL 24 HRS (ft bgs):	**37.79**

Depth (feet)	Sample Number	Sample Interval (feet)	Blow Counts per 6 Inches	Recovery (Inches)	Rock RQD (%)	Description & Remarks
	SS-1	0.5-2.0	3-3-5	12		Moderate reddish brown SILT (MH), slightly plastic, slightly moist.
	ST-1	3.0-5.0	--			
	SS-2	3.5-5.0	3-4-6	10		
5						Moderate reddish brown slightly micaceous very fine sandy SILT (MH) w/pale yellowish orange streaks, slightly moist.
	SS-3	8.5-10.0	9-11-12	15		
10	S-1	0.0-10.0	--			Dark yellowish orange to grayish orange slightly micaceous very fine sandy SILT (MH).
	SS-4	13.5-15.0	8-12-13	16		
15						Light brown to pale yellowish orange micaceous very fine silty SAND (SM), relict layer structures visible (saprolite), dusky brown to pinkish gray streaks, few quartz crystals.
	ST-2	18.0-20.0	--			
	SS-5	18.5-20.0	5-3-5	7		
20	S-2	10.0-20.0	--			Dusky yellow green quartzite (SOFT WEATHERED ROCK). Light brown to pale yellowish orange micaceous very fine silty SAND (SM).
	SS-6	23.5-25.0	7-10-14	9		Light brown to moderate reddish brown very fine sandy SILT (MH/SM).
25						Slightly moist along a layer of SOFT WEATHERED ROCK (about 1 inch thick). Light brown to moderate reddish brown very fine sandy SILT (MH/SM). Auger refusal at 28.5 feet on rock.
	S-3	20.0-28.5	--			
	R-1	28.5-33.5	--	54	53	Medium gray to light gray granitic and augen GNEISS. REC = 90% RQD = 53% Fracture at 32.0' : 41
30						
	R-2	33.5-38.5	--	60.5	97	

Well Construction Details

Protective Casing
Dia: 4.0 in.
Type: Stick-Up
Interval: 1.42 ft.

Riser Casing
Dia: 2.0 in.
Type: Sch 40 PVC
Interval: 0.0 - 23.72 ft.

Grout
Type: Portland Cement
Interval: 0.0 - 18.8 ft.

Seal
Type: Bentonite Chips
Interval: 18.8 - 23.5 ft.

Filterpack
Type: Filter Sand #2
Interval: 23.5 - 38.72 ft.

Screen
Dia: 2.0 in.
Type: Sch 40 PVC
Interval: 23.72 - 38.72 ft.

Well Construction Graphic

Elevation (feet): 800, 795, 790, 785, 780, 775, 770

NOTES
SS = Split Spoon Sample
ST = Shelby Tube Sample
S = Bulk Sample
R = Core Run
RS = Rock Sample
REC = Rock Core Recovery
RQD = Rock Quality Designation

1. ▽ = Water Level At Termination of Boring
2. ▼ = Water Level After 24 Hours

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Raleigh, NC 27616

BORING LOG BC-6

PROJECT:	**Duke Power-Belews Creek**	DRILLING CONTRACTOR:	**S&ME, Inc.**
LOCATION:	**Belews Creek, NC**	DRILLING METHOD:	**4¼" H.S.A.**
PROJECT NO.:	**1264-02-576**	DRILL RIG:	**Mobile B-57**
LOGGED BY:	**S. Watts**	TOP OF CASING ELEVATION (ft):	**802.16**
DATE DRILLED:	**11/7/2002**	WATER LEVEL TOB (ft bgs):	
BORING DEPTH (ft):	**38.72**	WATER LEVEL 24 HRS (ft bgs):	**37.79**

Sample Information						Symbol	Description & Remarks	Well Construction Details	Well Construction Graphic	Elevation (feet)
Depth (feet)	Sample Number	Sample Interval (feet)	Blow Counts per 6 Inches	Recovery (inches)	Rock RQD (%)					
							Medium gray to light gray granitic and augen GNEISS. REC = 100% RQD = 97% Fractures at 37.0' : 40 38.5' : 40 *(continued)*	**Protective Casing** Dia: 4.0 in. Type: Stick-Up Interval: 1.42 ft.		765
							Boring terminated at 38.72 ft.	**Riser Casing** Dia: 2.0 in. Type: Sch 40 PVC Interval: 0.0 - 23.72 ft.		
								Grout Type: Portland Cement Interval: 0.0 - 18.8 ft.		
								Seal Type: Bentonite Chips Interval: 18.8 - 23.5 ft.		
								Filterpack Type: Filter Sand #2 Interval: 23.5 - 38.72 ft.		
								Screen Dia: 2.0 in. Type: Sch 40 PVC Interval: 23.72 - 38.72 ft.		

NOTES

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ENVIRONMENTAL SERVICES
ENGINEERING - TESTING
3118 Spring Forest Road
Raleigh, NC 27616

WELL CONSTRUCTION RECORD

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print): Earl Mosely — CERTIFICATION #: 2252

WELL CONTRACTOR COMPANY NAME: S&ME, Inc. — PHONE #: 919-872-2660

STATE WELL CONSTRUCTION PERMIT# (if applicable): — ASSOCIATED WQ PERMIT# (if applicable):

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultral ☐
   Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use
2. WELL LOCATION:
   earest Town: Walnut Cove — County: Stokes
   SR 1908 (Pine Hall Road) - Duke Power Belews Creek Steam Station
   (Street Name, Numbers, Community, Sudivision, Lot No.,Zip Code)

   Topographic/Land setting
   ☐ Ridge ☐ Slope ☒ Valley ☐ Flat
   (check appropriate box)
   Latitude/longitude of well location
   (degrees/minutes/seconds)
   Latitude/longitude scource: ☐GPS ☐Topographic Map
   (check box)
3. OWNER: Duke Power - Belews Creek Steam Station
   Address: 3195 Pine Hall Road
   (Street or Route No.)
   Belews Creek — NC — 27009
   City or Town — State — Zip Code
   336-427-0274
   Area code - Phone Number
4. DATE DRILLED: 11/21/2002
5. TOTAL DEPTH: 52.38
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 43.51 ft.
   (Use "+" if Above Top of Casing)
8. TOP OF CASING IS 1.94 FT. Above Land Surface*
   *Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): — METHOD OF TEST:
0. WATER ZONES (depth):

DEPTH From	DEPTH To	DRILLING LOG Formation Description
	0 – 3.5	red clayey silt w/some gravel
	3.5 – 36.3	brown to yellow sandy silt
		with thin layer of weathered
		rock (quartz crystals).
	36.3 – 52.3	gray weathered qtz. gneiss

1. DISINFECTION: Type: NA — Amount:
2. CASING:

	Depth		Diameter		Wall Thickness or Weight/Ft.	Material
From 0	To 37.38	Ft.	2	in.	Schedule 40	PVC
From	To	Ft.				
From	To	Ft.				

3. GROUT:

	Depth		Material	Method
From 0	To 31.5	Ft.	Cement	Grout
From 31.5	To 36	Ft.	Bentonite	Chips

4. SCREEN:

	Depth		Diameter		Slot Size		Material
From 37.38	To 52.38	Ft.	2	in.	0.01	in.	PVC
From	To	Ft.		in.		in.	

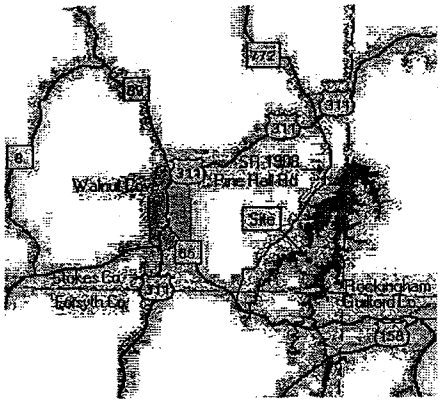
5. SAND/GRAVEL PACK:

	Depth		Size	Material
From 36	To 52.38	Ft.		Filter Sand #2
From	To	Ft.		

6. REMARKS: Monitor Well Number BC-7

LOCATION SKETCH

Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common names.



I DO HERE BY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Earl M Sely — 4-9-03

SIGNATURE OF PERSON CONSTRUCTING THE WELL — DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

BORING LOG BC-7

PROJECT:	Duke Power-Belews Creek	DRILLING CONTRACTOR:	S&ME, Inc.
LOCATION:	Belews Creek, NC	DRILLING METHOD:	4¼" H.S.A.
PROJECT NO.:	1264-02-576	DRILL RIG:	Mobile B-57
LOGGED BY:	S. Watts	TOP OF CASING ELEVATION (ft):	777.80
DATE DRILLED:	11/21/2002	WATER LEVEL TOB (ft bgs):	
BORING DEPTH (ft):	52.38	WATER LEVEL 24 HRS (ft bgs):	41.57

Depth (feet)	Sample Number	Sample Interval (feet)	Blow Counts per 6 inches	Recovery (inches)	Rock RQD (%)	Description & Remarks
	S-1	1.0-10.0	–			Light red to orange red clayey SILT w/few small gravel (ML/CL), medium plastic, slightly moist.
	SS-1	1.0-2.5	5-8-10	16		
	SS-2	3.5-5.0	6-6-7	14		
	ST-1	4.0-6.0	–			Light brown to dark yellowish orange SILT (ML).
5						
	SS-3	8.5-10.0	6-7-8	16		Pale yellow orange slightly micaceous fine sandy SILT (ML) w/few biotite/muscovite crystals.
10	S-2	10.0-20.0	–			
	SS-4	13.5-15.0	6-8-11	15		Grayish orange to pale yellowish orange slightly micaceous fine sandy SILT w/few weathered rock fragments (SM/SP), (hard layer encountered at 16.5 ft.).
	ST-2	14.0-16.0	–			
15						
	SS-5	18.5-20.0	11-24-45	15		Light olive brown to moderate yellow brown fine sandy SILT w/layering visible (SM), soft, loose.
20	S-3	20.0-30.0	–			Gray orange to pale yellowish orange silty SAND w/weathered rock fragments (SM/SP), hard and crumbly.
	SS-6	23.5-25.0	21-34-23	16		Grayish orange slightly micaceous sandy SILT w/white streaks (SM), soft and loose.
25						
	SS-7	28.5-28.9	50/3–	3		Grayish orange to pale yellow orange micaceous sandy SILT w/light to medium gray streaks (SM).
30						Gray to yellow orange sandy SILT (SM).
	SS-8	33.5-35.0	50/1.5–	3		Grayish to yellow orange sandy SILT w/weathered rock fragments (SM/SP).

Well Construction Details

Protective Casing
Dia: 4.0 in.
Type: Stick-Up
Interval: 1.94 ft.

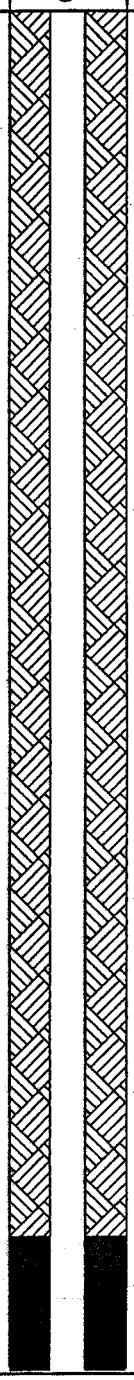
Riser Casing
Dia: 2.0 in.
Type: Sch 40 PVC
Interval: 0.0 - 37.38 ft.

Grout
Type: Portland Cement
Interval: 0.0 - 31.5 ft.

Seal
Type: Bentonite Chips
Interval: 31.5 - 36.0 ft.

Filterpack
Type: Filter Sand #2
Interval: 36.0 - 52.38 ft.

Screen
Dia: 2.0 in.
Type: Sch 40 PVC
Interval: 37.38 - 52.38 ft.



Elevation (feet): 775, 770, 765, 760, 755, 750, 745

NOTES

SS = Split Spoon Sample
ST = Shelby Tube Sample
S = Bulk Sample
R = Core Run
RS = Rock Sample
REC = Rock Core Recovery
RQD = Rock Quality Designation

1. ▽ = Water Level At Termination of Boring
2. ▼ = Water Level After 24 Hours

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BORING LOG BC-7

PROJECT:	**Duke Power-Belews Creek**	DRILLING CONTRACTOR:	**S&ME, Inc.**
LOCATION:	**Belews Creek, NC**	DRILLING METHOD:	**4¼" H.S.A.**
PROJECT NO.:	**1264-02-576**	DRILL RIG:	**Mobile B-57**
LOGGED BY:	**S. Watts**	TOP OF CASING ELEVATION (ft):	**777.80**
DATE DRILLED:	**11/21/2002**	WATER LEVEL TOB (ft bgs):	
BORING DEPTH (ft):	**52.38**	WATER LEVEL 24 HRS (ft bgs):	**41.57**

Depth (feet)	Sample Number	Sample Interval (feet)	Blow Counts per 6 Inches	Recovery (Inches)	Rock RQD (%)	Symbol	Description & Remarks	Well Construction Details	Elevation (feet)
							Auger refusal at 36.3 ft. on rock.	Protective Casing Dia: 4.0 in. Type: Stick-Up Interval: 1.94 ft.	740
	R-1	36.3-46.3	--	108			Light gray, white, light brown, black micaceous medium to coarse weathered Quartz GNEISS, moderately fractured, sandy silt layer encountered at 41.7 ft. REC = 90% RQD = 49% Fractures at 37.27' : 50 38.97' : 30 39.95' : 25 42.85' : 70	Riser Casing Dia: 2.0 in. Type: Sch 40 PVC Interval: 0.0 - 37.38 ft.	735
40								Grout Type: Portland Cement Interval: 0.0 - 31.5 ft.	
45	R-2	46.3-52.3	--	62			Light gray, white, black, micaceous medium to coarse weathered Quartz GNEISS, slightly to moderately fractured, low angle fractures,biotite enriched layer from 50 - 52 ft. REC = 87% RQD = 81%	Seal Type: Bentonite Chips Interval: 31.5 - 36.0 ft.	730
50							Boring terminated at 52.3 ft.	Filterpack Type: Filter Sand #2 Interval: 36.0 - 52.38 ft.	
								Screen Dia: 2.0 in. Type: Sch 40 PVC Interval: 37.38 - 52.38 ft.	

NOTES

SS = Split Spoon Sample
ST = Shelby Tube Sample
S = Bulk Sample
R = Core Run
RS = Rock Sample
REC = Rock Core Recovery
RQD = Rock Quality Designation

1. ▽ = Water Level At Termination of Boring
2. ▼ = Water Level After 24 Hours

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WELL CONSTRUCTION RECORD

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print): Seth D. Low — CERTIFICATION #: 2254

WELL CONTRACTOR COMPANY NAME: S&ME, Inc. — PHONE #: 919-872-2660

STATE WELL CONSTRUCTION PERMIT# (if applicable): — ASSOCIATED WQ PERMIT# (if applicable):

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultral ☐
   Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use: _____

2. WELL LOCATION:
   Nearest Town: Walnut Cove County: Stokes
   SR 1908 (Pine Hall Road) - Duke Power Belews Creek Steam Station
   (Street Name, Numbers, Community, Sudivision, Lot No.,Zip Code)

   Topographic/Land setting
   ☐ Ridge ☐ Slope ☐ Valley ☐ Flat ☒
   (check appropriate box)
   Latitude/longitude of well location _____
   (degrees/minutes/seconds)
   Latitude/longitude scource: ☐GPS ☐Topographic Map
   (check box)

3. OWNER: Duke Power - Belews Creek Steam Station
   Address: 3195 Pine Hall Road
   (Street or Route No.)
   Belews Creek | NC | 27009
   City or Town | State | Zip Code
   336-427-0274
   Area code - Phone Number

4. DATE DRILLED: 9/22/2004
5. TOTAL DEPTH: 43.4
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 26.14 ft.
   (Use "+" if Above Top of Casing)
8. TOP OF CASING IS 1.6 FT. Above Land Surface*
   ***Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.**
9. YIELD (gpm): _____ METHOD OF TEST: _____
10. WATER ZONES (depth): _____
11. DISINFECTION: Type: NA Amount: _____
12. CASING:

	Depth		Diameter		Wall Thickness or Weight/Ft.	Material
From 0	To 28.4	Ft.	2	in.	Schedule	PVC
From _____	To _____	Ft.	_____		_____	_____
From _____	To _____	Ft.	_____		_____	_____

13. GROUT:

	Depth		Material	Method
From 0	To 24	Ft.	Cement	Grout
From 24	To 26	Ft.	Bentonite	Chips

14. SCREEN:

	Depth		Diameter		Slot Size		Material
From 28.4	To 43.4	Ft.	2	in.	0.01	in.	PVC
From _____	To _____	Ft.	_____	in.	_____	in.	_____

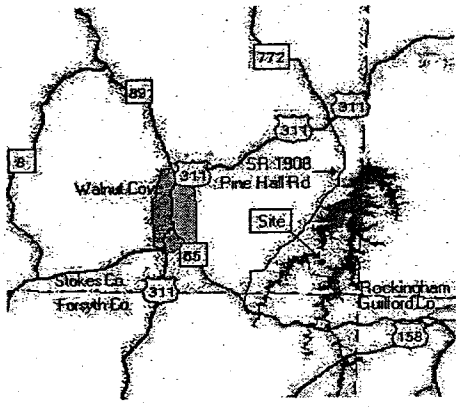
15. SAND/GRAVEL PACK:

	Depth		Size	Material
From 26	To 43.4	Ft.	_____	Filter Sand #2
From _____	To _____	Ft.	_____	_____

DEPTH From	DEPTH To	DRILLING LOG Formation Descrpition
0	13.5	Orange/brown sandy SILT
13.5	48.9	Brown silty sand Saprolite
48.9	56.8	Quartz Gneiss
56.8	61.8	Gray mica Schist

LOCATION SKETCH

Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common names.



16. REMARKS: Monitoring Well BC-15

I DO HERE BY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

Seth D. Low — 10-04-04

SIGNATURE OF PERSON CONSTRUCTING THE WELL — DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

BORING LOG BC-15

PROJECT: **Duke Power-Belews Creek**
LOCATION: **Belews Creek, NC**
PROJECT NO.: **1054-04-955**
LOGGED BY: **L. Ennis**
DATE DRILLED: **9/22/2004**
BORING DEPTH (ft): **61.8**

DRILLING CONTRACTOR: **S&ME, Inc.**
DRILLING METHOD: **4¼" H.S.A.**
DRILL RIG: **CME-550X**
TOP OF CASING ELEVATION (ft): **762.26**
WATER LEVEL TOB (ft bgs):
WATER LEVEL 24 HRS (ft bgs): **26.14**

Depth (feet)	Sample Number	Sample Interval (feet)	Blow Counts per 6 inches	Recovery (inches)	Rock RQD (%)	Description & Remarks
	S-1	0-5	–			TOPSOIL
	SS-1	3.5-5	3-3-5	11		Tan silty SAND, damp
	SS-2	8.5-10	3-3-3	12		Light brown sandy SILT, micaceous, damp
	SS-3	23.5-25	3-3-7	13		Light brown sandy Silt with alternating lenses of weathered k-feldspar, SAPROLITE, damp
	SS-4	13.5-15	4-4-5	12		Tan brown sandy SILT with alternating leness of weathered k-feldspar, SAPROLITE, damp
	SS-5	43.5-45	4-3-4	16		Orange brown silty Sand SAPROLITE, with black oxidized interlayers, moist, layers not easily visible
	SS-6	28.5-30	7-8-11	13		Light brown silty sand SAPROLITE with black and orange oxidation layers, micaceous, K-feldspar visible in sections, moist
	SS-7	33.5-35	5-10-11	13		

Well Construction Details

Protective Casing
Dia:
Type: N/A
Interval:

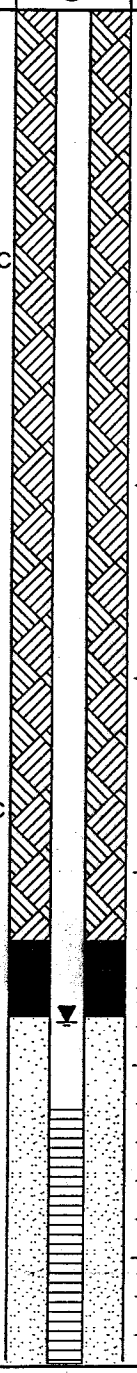
Riser Casing
Dia: 2.0 in.
Type: Schedule 40 PVC
Interval: 0.0 - 28.4

Grout
Type: Portland Cement
Interval: 0.0 - 24.0

Seal
Type: Bentonite
Interval: 24.0 - 26.0

Filterpack
Type: Sand
Interval: 26.0 - 43.4

Screen
Dia: 2"
Type: Schedule 40 PVC
Interval: 28.4 - 43.4



NOTES
SS = Split Spoon Sample
ST = Shelby Tube Sample
S = Bulk Sample
R = Core Run
RS = Rock Sample
REC = Rock Core Recovery
RQD = Rock Quality Designation

1. ▽ = Water Level At Termination of Boring
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BORING LOG BC-15

PROJECT:	Duke Power-Belews Creek	DRILLING CONTRACTOR:	S&ME, Inc.
LOCATION:	Belews Creek, NC	DRILLING METHOD:	4¼" H.S.A.
PROJECT NO.:	1054-04-955	DRILL RIG:	CME-550X
LOGGED BY:	L. Ennis	TOP OF CASING ELEVATION (ft):	762.26
DATE DRILLED:	9/22/2004	WATER LEVEL TOB (ft bgs):	
BORING DEPTH (ft):	61.8	WATER LEVEL 24 HRS (ft bgs):	26.14

Depth (feet)	Sample Number	Sample Interval (feet)	Blow Counts per 6 inches	Recovery (inches)	Rock RQD (%)	Description & Remarks
						Light brown silty sand SAPROLITE with black and orange oxidation layers, micaceous, K-feldspar visible in sections, moist *(continued)*
	SS-8	38.5-40	17-23-40	13		Olive gray silty Sand SAPROLITE with very visible micaceous layers, wet
40						Orange light brown silty Sand SAPROLITE, layering visible, wet
	SS-9	18.5-20	35-19-18	12		White tan and orange tan layered silty Sand SAPROLITE, wet
45						Orange brown silty Sand SAPROLITE, micaceous, Wet
	R-1	48.9-51.8	--	25	43	Medium gray Quartz Gneiss
50						
	R-2	51.8-56.8	--	60	22	
55						
	R-3	56.8-61.8	--	58	50	Gray mica SCHIST
60						
						Boring Terminated at 61.8 fts

Well Construction Details

Protective Casing
Dia:
Type: N/A
Interval:

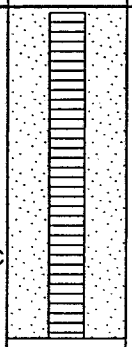
Riser Casing
Dia: 2.0 in.
Type: Schedule 40 PVC
Interval: 0.0 - 28.4

Grout
Type: Portland Cement
Interval: 0.0 - 24.0

Seal
Type: Bentonite
Interval: 24.0 - 26.0

Filterpack
Type: Sand
Interval: 26.0 - 43.4

Screen
Dia: 2"
Type: Schedule 40 PVC
Interval: 28.4 - 43.4



Elevation (feet): 725, 720, 715, 710, 705

NOTES

SS = Split Spoon Sample
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S = Bulk Sample
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1. ▽ = Water Level At Termination of Boring
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WELL CONSTRUCTION RECORD

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print): Michael Mosely — CERTIFICATION #: 3210

WELL CONTRACTOR COMPANY NAME: S&ME, Inc. — PHONE #: 919-872-2660

STATE WELL CONSTRUCTION PERMIT# (if applicable): _____ — ASSOCIATED WQ PERMIT# (if applicable): _____

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultral ☐
   Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use _____

2. WELL LOCATION:
   Nearest Town: Walnut Cove County Stokes
   SR 1908 (Pine Hall Road) - Duke Power Belews Creek Steam Station
   (Street Name, Numbers, Community, Subdivision, Lot No.,Zip Code)

   Topographic/Land setting
   ☐ Ridge ☐ Slope ☐ Valley ☐ Flat ☒
   (check appropriate box)

   Latitude/longitude of well location _____
   (degrees/minutes/seconds)
   Latitude/longitude source: ☐GPS ☐Topographic Map
   (check box)

3. OWNER: Duke Power - Belews Creek Steam Station
   Address: 3195 Pine Hall Road
   (Street or Route No.)
   Belews Creek | NC | 27009
   City or Town | State | Zip Code
   336-427-0274
   Area code - Phone Number

4. DATE DRILLED 8/31/2004
5. TOTAL DEPTH 21.6
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 14.6 ft.
   (Use "+" if Above Top of Casing)
8. TOP OF CASING IS 3.4 FT. Above Land Surface*
   ***Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.**
9. YIELD (gpm) _____ METHOD OF TEST _____
10. WATER ZONES (depth): _____
11. DISINFECTION: Type NA Amount _____
12. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 11.6 Ft.		2 in.	Schedule 40	PVC
From	To Ft.				
From	To Ft.				

13. GROUT:

	Depth		Material	Method
From 0	To 7.3 Ft.		Cement	Grout
From 7.3	To 9.6 Ft.		Bentonite	Chips

14. SCREEN:

	Depth		Diameter	Slot Size	Material
From 11.6	To 21.6 Ft.		2 in.	0.01 in.	PVC
From	To Ft.		in.	in.	

15. SAND/GRAVEL PACK:

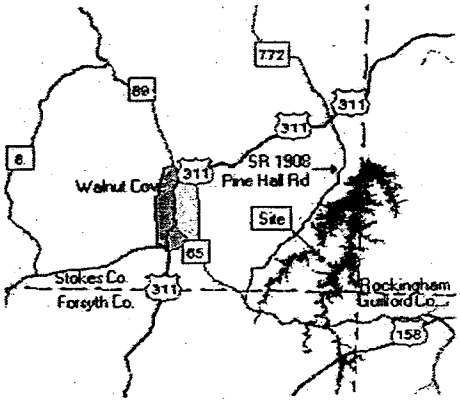
	Depth		Size	Material
From 9.6	To 21.6 Ft.			Filter Sand #2
From	To Ft.			

16. REMARKS: Monitor Well Number BC-20

DEPTH From	DEPTH To	DRILLING LOG Formation Description
0	13.5	orange/brn sandy silt
13.5	21.9	PWR: sampled as silty sand
		and sandy silt
21.9	34.4	quartz gneiss

LOCATION SKETCH

Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common names.



I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Michael A Mosely — 9-17-04

SIGNATURE OF PERSON CONSTRUCTING THE WELL — DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

BORING LOG BC-20

PROJECT:	**Duke Power-Belews Creek**	DRILLING CONTRACTOR:	**S&ME, Inc.**
LOCATION:	**Belews Creek, NC**	DRILLING METHOD:	**4¼" H.S.A.**
PROJECT NO.:	**1054-04-955**	DRILL RIG:	**Mobile B-57**
LOGGED BY:	**A. Smith**	TOP OF CASING ELEVATION (ft):	**757.22**
DATE DRILLED:	**8/31/2004**	WATER LEVEL TOB (ft bgs):	
BORING DEPTH (ft):	**34.4**	WATER LEVEL 24 HRS (ft bgs):	**11.2**

Depth (feet)	Sample Number	Sample Interval (feet)	Blow Counts per 6 inches	Recovery (inches)	Rock RQD (%)	Description & Remarks
						ABC Stone and Fabric
	S-1	1-6	–			Tan/brown fine silty SAND, moist with mica fragments
	SS-1	3.5-5	14-22-19			
5						
	SS-2	8.5-9.0	15-11-15			Orange and brown fine sandy SILT, moist, with some quartz and mica rock fragments
10						
	SS-3	13.5-15	50/0.5–			Gray brown fine sandy Silt PWR moist with mica fragments
15						
	SS-4	18.5-18.6	50/0.1–			Tan silty very fine Sand PWR with trace rock fragments
20						
	R-1	22.9-25.6	–	24	0	Brown tan highly fractured GNEISS with Quartz veins
25						
	R-2	25.6-30.6	–	26	28	Brown tan medium to highly fractured GNEISS with Quartz veins
30						
	R-3	30.6-34.4	–	40	0	Brown tan highly fractured GNEISS with Quartz veins

Well Construction Details

Protective Casing
Dia:
Type: N/A
Interval:

Riser Casing
Dia: 2.0 in.
Type: Schedule 40 PVC
Interval: 0 - 11.6

Grout
Type: Portland Cement
Interval: 0.0 - 11.3

Seal
Type: Bentonite
Interval: 7.3 - 9.6

Filterpack
Type: Sand
Interval: 9.6 - 21.6

Screen
Dia: 2"
Type: Schedule 40 PVC
Interval: 11.6 - 21.6

Well Construction Graphic

Elevation (feet): 755, 750, 745, 740, 735, 730, 725

NOTES

SS = Split Spoon Sample
ST = Shelby Tube Sample
S = Bulk Sample
R = Core Run
RS = Rock Sample
REC = Rock Core Recovery
RQD = Rock Quality Designation

1. ▽ = Water Level At Termination of Boring
2. ▼ = Water Level After 24 Hours

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3118 Spring Forest Road
Raleigh, NC 27616

WELL CONSTRUCTION RECORD

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Michael Mosely **CERTIFICATION #** 3210

WELL CONTRACTOR COMPANY NAME S&ME, Inc. **PHONE #** 919-872-2660

STATE WELL CONSTRUCTION PERMIT# (if applicable) _____ **ASSOCIATED WQ PERMIT#** (if applicable) _____

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultral ☐
   Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use _____
2. WELL LOCATION:
   Nearest Town: Walnut Cove County Stokes
   SR 1908 (Pine Hall Road) - Duke Power Belews Creek Steam Station
   (Street Name, Numbers, Community, Sudivision, Lot No.,Zip Code)

   Topographic/Land setting
   ☐ Ridge ☐ Slope ☐ Valley ☐ Flat ☒ (check appropriate box)

   Latitude/longitude of well location _____ (degrees/minutes/seconds)

   Latitude/longitude scource: ☐GPS ☐Topographic Map (check box)
3. OWNER: Duke Power - Belews Creek Steam Station
   Address 3195 Pine Hall Road (Street or Route No.)
   Belews Creek (City or Town) NC (State) 27009 (Zip Code)
   336-427-0274 (Area code - Phone Number)
4. DATE DRILLED 9/1/2004
5. TOTAL DEPTH 13.9
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 8.8 ft. (Use "+" if Above Top of Casing)
8. TOP OF CASING IS 1.1 FT. Above Land Surface*
   ***Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.**
9. YIELD (gpm) _____ METHOD OF TEST _____
10. WATER ZONES (depth): _____
11. DISINFECTION: Type NA Amount _____
12. CASING:

	Depth		Diameter		Wall Thickness or Weight/Ft.	Material
From 0	To 3.9	Ft.	2	in.	Schedule	PVC
From _____	To _____	Ft.				
From _____	To _____	Ft.				

13. GROUT:

	Depth		Material	Method
From 0	To 1.3	Ft.	Cement	Grout
From 1.3	To 3	Ft.	Bentonite	Chips

14. SCREEN:

	Depth		Diameter		Slot Size		Material
From 3.9	To 13.9	Ft.	2	in.	0.01	in.	PVC
From _____	To _____	Ft.	_____	in.	_____	in.	_____

15. SAND/GRAVEL PACK:

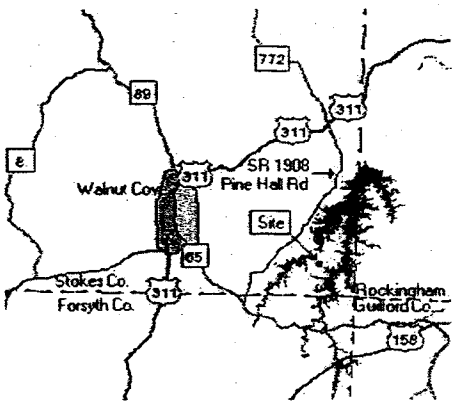
	Depth		Size	Material
From 3	To 13.9	Ft.	_____	Filter Sand #2
From _____	To _____	Ft.	_____	_____

16. REMARKS: Monitor Well Number BC-21

DEPTH From	DEPTH To	DRILLING LOG Formation Descrpition
0	13.7	tan/oragne silty sand
13.7	35.2	PWR: sampled as silty sand
35.2	44.6	quartz gneiss (crystalline rock)

LOCATION SKETCH

Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common names.



I DO HERE BY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

Michael A Mosely 9-17-04

SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days. GW-1 REV. 07/2001

BORING LOG BC-21

PROJECT: **Duke Power-Belews Creek**
LOCATION: **Belews Creek, NC**
PROJECT NO.: **1054-04-955**
LOGGED BY: **A. Smith**
DATE DRILLED: **9/1/2004**
BORING DEPTH (ft): **44.6**

DRILLING CONTRACTOR: **S&ME, Inc.**
DRILLING METHOD: **4¼" H.S.A.**
DRILL RIG: **Mobile B-57**
TOP OF CASING ELEVATION (ft): **756.69**
WATER LEVEL TOB (ft bgs):
WATER LEVEL 24 HRS (ft bgs): **7.7**

Depth (feet)	Sample Number	Sample Interval (feet)	Blow Counts per 6 inches	Recovery (inches)	Rock RQD (%)	Symbol	Description & Remarks	Well Construction Details	Well Construction Graphic	Elevation (feet)
							ABC Stone and fabric	Protective Casing Dia: Type: N/A Interval:		755
							Tan orange silty clayey SAND, moist to wet at 6			
	SS-1	3.7-5.2	6-7-6							
5								Riser Casing Dia: 2.0 in. Type: Schedule 40 PVC Interval: 0 - 3.9		750
	SS-2	8.7-10.2	9-10-12				Tan orange clayey silty very fine SAND, wet			
10								Grout Type: Portland Cement Interval: 0.0 - 1.3		745
	SS-3	13.7-14.3	50/0.2--					Seal Type: Bentonite Interval: 1.3 - 3.0		
15										740
								Filterpack Type: Sand Interval: 3.0 - 13.9		
	SS-4	18.7-18.9	50/0.4--				Tan orange fine silty SAND with trace quartz lenses, wet			
20								Screen Dia: 2" Type: Schedule 40 PVC Interval: 3.9 - 13.9		735
	SS-5	23.7-24	50/0.3--							
25										730
	SS-6	28.7-28.9	50/0.2--							
30										725
		34.6-39.6	--	50	56					

NOTES
SS = Split Spoon Sample
ST = Shelby Tube Sample
S = Bulk Sample
R = Core Run
RS = Rock Sample
REC = Rock Core Recovery
RQD = Rock Quality Designation

1. ▽ = Water Level At Termination of Boring
2. ▼ = Water Level After 24 Hours

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Raleigh, NC 27616

BORING LOG BC-21

PROJECT:	**Duke Power-Belews Creek**	DRILLING CONTRACTOR:	**S&ME, Inc.**
LOCATION:	**Belews Creek, NC**	DRILLING METHOD:	**4¼" H.S.A.**
PROJECT NO.:	**1054-04-955**	DRILL RIG:	**Mobile B-57**
LOGGED BY:	**A. Smith**	TOP OF CASING ELEVATION (ft):	**756.69**
DATE DRILLED:	**9/1/2004**	WATER LEVEL TOB (ft bgs):	
BORING DEPTH (ft):	**44.6**	WATER LEVEL 24 HRS (ft bgs):	**7.7**

Sample Information						Symbol	Description & Remarks	Well Construction Details	Well Construction Graphic	Elevation (feet)
Depth (feet)	Sample Number	Sample Interval (feet)	Blow Counts per 6 inches	Recovery (inches)	Rock RQD (%)					
							Tan-gray and whit moderately fractured quartz GNEISS *(continued)*	Protective Casing Dia: Type: N/A Interval:		720
40		39.6-44.6	–	48	8		Tan-gray and white highly fractured quartz GNEISS	Riser Casing Dia: 2.0 in. Type: Schedule 40 PVC Interval: 0 - 3.9		715
							Boring Terminated at 44.6	Grout Type: Portland Cement Interval: 0.0 - 1.3 Seal Type: Bentonite Interval: 1.3 - 3.0 Filterpack Type: Sand Interval: 3.0 - 13.9 Screen Dia: 2" Type: Schedule 40 PVC Interval: 3.9 - 13.9		

NOTES

SS = Split Spoon Sample
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S&ME
ENVIRONMENTAL SERVICES
ENGINEERING · TESTING
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Raleigh, NC 27616

WELL CONSTRUCTION RECORD

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print): Seth D. Low — CERTIFICATION #: 2254

WELL CONTRACTOR COMPANY NAME: S&ME, Inc. — PHONE #: 919-872-2660

STATE WELL CONSTRUCTION PERMIT# (if applicable): — ASSOCIATED WQ PERMIT# (if applicable):

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultral ☐
   Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use: _____

2. WELL LOCATION:
   Nearest Town: Walnut Cove — County: Stokes
   SR 1908 (Pine Hall Road) - Duke Power Belews Creek Steam Station
   (Street Name, Numbers, Community, Sudivision, Lot No.,Zip Code)

   Topographic/Land setting
   ☒ Ridge ☐ Slope ☐ Valley ☐ Flat q
   (check appropriate box)
   Latitude/longitude of well location
   _____
   (degrees/minutes/seconds)
   Latitude/longitude scource: ☐GPS ☐Topographic Map
   (check box)

3. OWNER: Duke Power - Belews Creek Steam Station
   Address: 3195 Pine Hall Road
   (Street or Route No.)
   Belews Creek — NC — 27009
   City or Town — State — Zip Code
   336-427-0274
   Area code - Phone Number

4. DATE DRILLED: 9/2/2004
5. TOTAL DEPTH: 101.7
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 81.42 ft.
   (Use "+" if Above Top of Casing)
8. TOP OF CASING IS 2 FT. Above Land Surface*
   ***Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.**
9. YIELD (gpm): _____ METHOD OF TEST: _____
10. WATER ZONES (depth): _____
11. DISINFECTION: Type: NA — Amount: _____
12. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 76.7	Ft.	2 in.	Schedule	PVC
From	To	Ft.			
From	To	Ft.			

13. GROUT:

	Depth		Material		Method
From 0	To 72.1	Ft.	Cement		Grout
From 72.1	To 74	Ft.	Bentonite		Chips

14. SCREEN:

	Depth		Diameter	Slot Size	Material
From 76.7	To 101.7	Ft.	2 in.	0.01 in.	PVC
From	To	Ft.	in.	in.	

15. SAND/GRAVEL PACK:

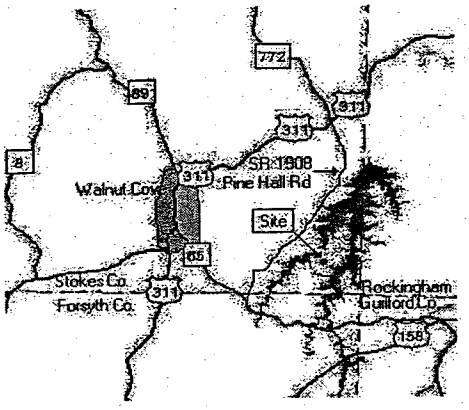
	Depth		Size	Material
From 74	To 101.7	Ft.		Filter Sand #2
From	To	Ft.		

DEPTH / DRILLING LOG

From	To	Formation Descrpition
0	23.5	Tan/orange sandy Silt
23.5	39	Brown fine sandy Saprolite
39	49	Pink/Red brown PWR
49	63.5	Olive gray silt Saprolite
63.5	84.6	Brown silty sand PWR
84.6	102.7	Quartz Gneiss (Crystaline rock)

LOCATION SKETCH

Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common names.



16. REMARKS: Monitoring Well Number BC-23A

I DO HERE BY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

Seth D. Low — 10-04-04

SIGNATURE OF PERSON CONSTRUCTING THE WELL — DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

BORING LOG BC-23A

PROJECT:	**Duke Power-Belews Creek**	DRILLING CONTRACTOR:	**S&ME, Inc.**
LOCATION:	**Belews Creek, NC**	DRILLING METHOD:	**4¼" H.S.A.**
PROJECT NO.:	**1054-04-955**	DRILL RIG:	**CME-550X**
LOGGED BY:	**L. Ennis**	TOP OF CASING ELEVATION (ft):	**863.79**
DATE DRILLED:	**9/2/2004**	WATER LEVEL TOB (ft bgs):	
BORING DEPTH (ft):	**102.7**	WATER LEVEL 24 HRS (ft bgs):	**81.42**

Depth (feet)	Sample Number	Sample Interval (feet)	Blow Counts per 6 inches	Recovery (inches)	Rock RQD (%)	Symbol	Description & Remarks	Well Construction Details	Well Construction Graphic	Elevation (feet)
							(Lithology taken from BC-23) TOPSOIL Orange/Yellow brown silty SAND, dry	Protective Casing Dia: Type: N/A Interval:		860
5							Light tan/ yellow orange silty clayey SAND with rock fragments, micaceous, moist at 13.5	Riser Casing Dia: 2.0 in. Type: Schedule 40 PVC Interval: 0.0 - 76.7		855
10								Grout Type: Portland Cement Interval: 0.0 - 72.1		850
15							Light red brown sandy silt SAPROLITE, with visible micaceous layering, moist	Seal Type: Bentonite Interval: 72.1 - 74.0 Filterpack Type: Sand Interval: 74.0 - 101.7		845
20								Screen Dia: 2" Type: Schedule 40 PVC Interval: 76.7 - 101.7		840
25										835
30							Pink and light tan/white silt SAPROLITE, with micaceous layering, moist			830

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BORING LOG BC-23A

PROJECT:	**Duke Power-Belews Creek**	DRILLING CONTRACTOR:	**S&ME, Inc.**
LOCATION:	**Belews Creek, NC**	DRILLING METHOD:	**4¼" H.S.A.**
PROJECT NO.:	**1054-04-955**	DRILL RIG:	**CME-550X**
LOGGED BY:	**L. Ennis**	TOP OF CASING ELEVATION (ft):	**863.79**
DATE DRILLED:	**9/2/2004**	WATER LEVEL TOB (ft bgs):	
BORING DEPTH (ft):	**102.7**	WATER LEVEL 24 HRS (ft bgs):	**81.42**

Sample Information: Depth (feet) | Sample Number | Sample Interval (feet) | Blow Counts per 6 inches | Recovery (inches) | Rock RQD (%)

Symbol | Description & Remarks | Well Construction Details | Well Construction Graphic | Elevation (feet)

Medium red brown fine sandy silt SAPROLITE, with micaceous layering, moist *(continued)*

Pink/red and gray sandy silt PWR, with micaceous layering, moist

Olive gray micaceous sandy silt SAPROLITE with visible layering, moist

Tan brown micaceous clayey Sand PWR, moist

Protective Casing
Dia:
Type: N/A
Interval:

Riser Casing
Dia: 2.0 in.
Type: Schedule 40 PVC
Interval: 0.0 - 76.7

Grout
Type: Portland Cement
Interval: 0.0 - 72.1

Seal
Type: Bentonite
Interval: 72.1 - 74.0

Filterpack
Type: Sand
Interval: 74.0 - 101.7

Screen
Dia: 2"
Type: Schedule 40 PVC
Interval: 76.7 - 101.7

40 — 45 — 50 — 55 — 60 — 65 —

825 — 820 — 815 — 810 — 805 — 800 — 795

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BORING LOG BC-23A

PROJECT: **Duke Power-Belews Creek**
LOCATION: **Belews Creek, NC**
PROJECT NO.: **1054-04-955**
LOGGED BY: **L. Ennis**
DATE DRILLED: **9/2/2004**
BORING DEPTH (ft): **102.7**

DRILLING CONTRACTOR: **S&ME, Inc.**
DRILLING METHOD: **4¼" H.S.A.**
DRILL RIG: **CME-550X**
TOP OF CASING ELEVATION (ft): **863.79**
WATER LEVEL TOB (ft bgs):
WATER LEVEL 24 HRS (ft bgs): **81.42**

Depth (feet)	Sample Number	Sample Interval (feet)	Blow Counts per 6 inches	Recovery (inches)	Rock RQD (%)	Description & Remarks	Well Construction Details
						Tan brown micaceous clayey Sand PWR, moist *(continued)*	Protective Casing Dia: Type: N/A Interval:
75						Yellow orange silty sand PWR, no layering, dry	Riser Casing Dia: 2.0 in. Type: Schedule 40 PVC Interval: 0.0 - 76.7
80							Grout Type: Portland Cement Interval: 0.0 - 72.1
85	R-1	84.6-87.7	–	46	21	Light gray/white Quartz GNEISS, highly fractured	Seal Type: Bentonite Interval: 72.1 - 74.0
	R-2	87.7-92.7	–	26	6		Filterpack Type: Sand Interval: 74.0 - 101.7
90							Screen Dia: 2" Type: Schedule 40 PVC Interval: 76.7 - 101.7
	R-3	92.7-97.7	–	36	13	Gray slightly fractured Quartz GNEISS	
95							
	R-4	97.7-102.7	–	60	21		
100						Boring Terminated at 102.7	

Well Construction Graphic

Elevation (feet): 790, 785, 780, 775, 770, 765

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Drawings under Seperate Cover