PIEZOMETER ABANDONMENT
DESIGN HYDROGEOLOGIC INVESTIGATION
PIEDMONT LANDFILL AND RECYCLING CENTER

KERNERSVILLE, NORTH CAROLINA

Carmen Johnson

Fac/Perm/Co ID#	Date	Doc ID#
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JUNE 8, 1994

RUST ENVIRONMENT & INFRASTRUCTURE
GREENVILLE, SOUTH CAROLINA
PROJECT NUMBER 87221.900

RUST ENVIRONMENT & INFRASTRUCTURE

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June 8, 1994

North Carolina Department of Environment, Health, and Natural Resources
Post Office Box 27687
Raleigh, North Carolina 27611-7687

Attention: Mr. Bobby Lutfy
Hydrogeologist - Solid Waste Section

Subject: Piezometer Abandonment
Design Hydrogeologic Investigation
Piedmont Landfill and Recycling Center
Kernersville, North Carolina

Gentlemen:

The purpose of this letter is to notify the Department that the permanent abandonment of the temporary piezometers installed at the Piedmont Landfill and Recycling Center during the Design Hydrogeologic Investigation near Kernersville, North Carolina has been completed. Permission for abandonment was granted by Mr. Bobby Lutfy on April 22 after the seasonal high water table elevations at the site had been established and agreed upon by Mr. Lutfy and myself.

The temporary piezometers were abandoned in accordance with the requirements of Section T15A:02C.0113 of the North Carolina Administrative Code. Prior to abandonment, each well was sounded to its entire depth to verify that downhole obstructions that might interfere with sealing operations were not present. The piezometer casings were removed from the boreholes by either pulling out after over-reaming the casing using hollow stem auger or by using an air hammer equipped with a tri-cone roller bit. Casing fragments were removed from the borehole by the augers for the former method and by air pressure for the latter method. Over-reaming/drilling continued either to the bottom of the piezometer within soils or to at least five feet into rock. The boreholes were subsequently filled with a cement-bentonite grout by pumping the mixture through a tremie pipe from the bottom of the hole up. Details concerning abandonment of each of the piezometers are included in the attached piezometer abandonment reports. The locations of the abandoned piezometer are shown on the attached Figure 1.

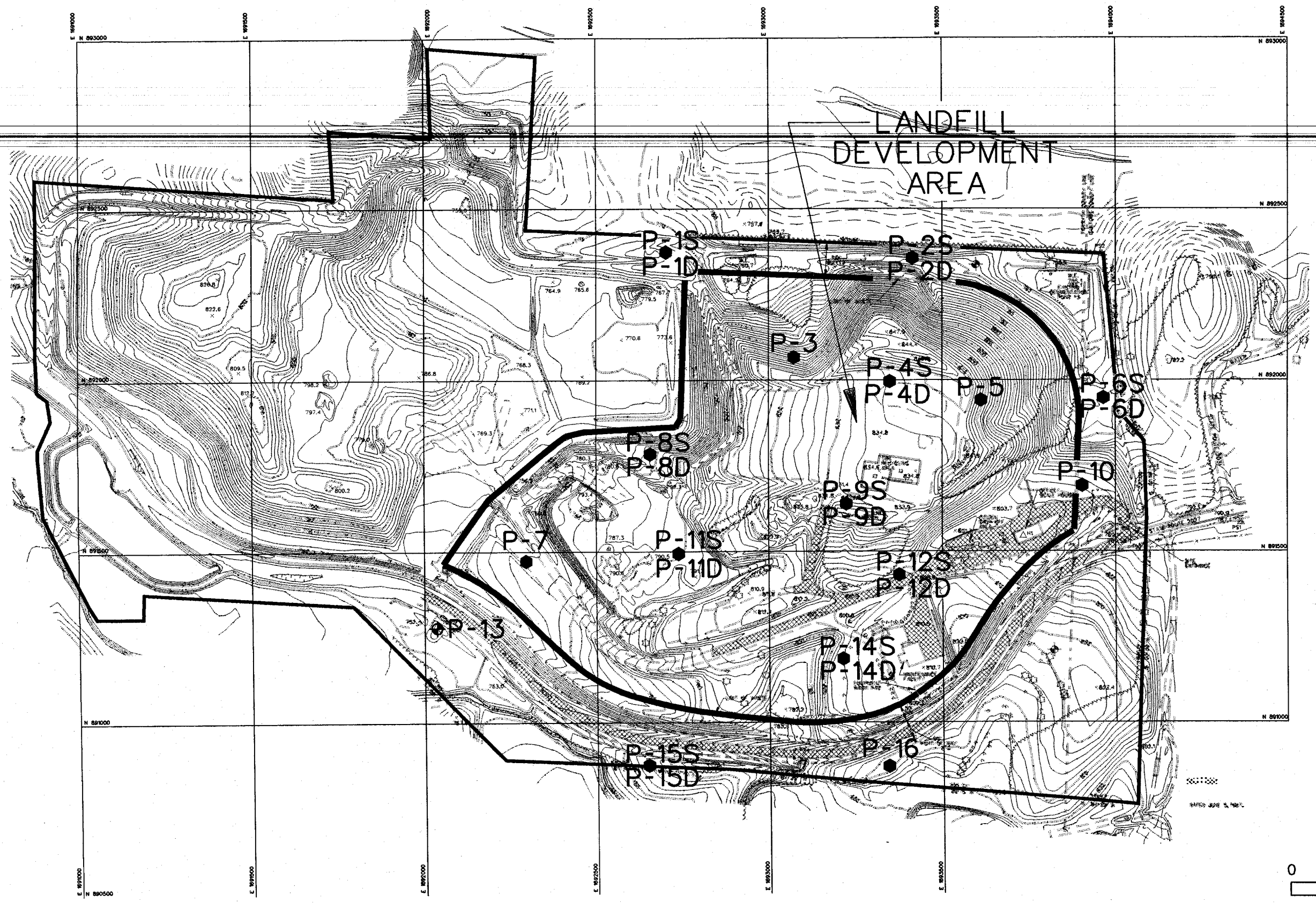
A total of 26 piezometers were installed during the Design Hydrogeologic Investigation at the site. Of these piezometers, 25 have been abandoned. The remaining piezometer, P-13, was constructed such that it may be converted into a monitoring well if it is considered appropriate. This piezometer will not be abandoned until such a decision has been made..

Thank you for assisting us with this matter. If you have any questions regarding the piezometer abandonment, please do not hesitate to contact us.

Sincerely,

RUST ENVIRONMENT & INFRASTRUCTURE

Peter J. Walls, P.G., P.E.
Senior Geological Engineer



LEGEND:

- ABANDONED PIEZOMETER
- PIEZOMETER NOT ABANDONED
- P-8S — SHALLOW PIEZOMETER SCREENED IN UN-CONSOLIDATED MATERIALS
- P-8D — DEEP PIEZOMETER SCREENED IN BEDROCK

0 300 600 900

SCALE IN FEET

RUST ENVIRONMENT & INFRASTRUCTURE

FIGURE 1
PIEZOMETER ABANDONMENT

Design Hydrogeologic Investigation
Piedmont Landfill and Recycling Center
Forsyth County, North Carolina

Project No. 87221.900

N:/87221/7221BRNG.DGN

RUST ENVIRONMENT & INFRASTRUCTURE

PIEZOMETER ABANDONMENT REPORT

GENERAL INFORMATION

Site Name: PIEDMONT LANDFILL

Piezometer Number: P-1-D

Location: KERNERSVILLE, NC

Project Name: DESIGN HYDROGEOLOGIC - PIEZOMETER ABANDONMENT

Latitude: _____ Longitude: _____

Location Description: SEE LOCATION PLAN

County: FORSYTH

Installation Contractor: ECS

Date Installed: 2-21-94

Abandonment Contractor: ECS

Driller: _____

Oversight Contractor: RUST

Oversight: JASON FLIPPO

Piezometer Abandonment: Date Started: 5-4-94 Date Completed: 5-4-94

PRE-ABANDONMENT MEASUREMENT

Height of Piezometer or top of well above ground surface: 3.79 (ft)

Depth of Piezometer below ground surface: 84.7 (ft)

Measured depth from ground surface to bottom of piezometer: 84.7 (ft)

Depth from ground surface to static water level: 29.04 (ft)

Total drilled depth of abandonment borehole: 63 (ft) Diameter: 9 (in)

Ground surface elevation (mean sea level): 775.8 (ft)

Reason for well abandonment: TEMPORARY PIEZOMETER

LANDFILL DEVELOPMENT

PIEZOMETER ABANDONMENT

General abandonment method(s) used (check where applicable):

- ____ Pumping of grout through tremie pipe to fill inside of well screen and casing.
- ____ Pressurized injection of grout into filter pack, screen and casing; pressure maintained until grout sets.
- ____ Cutting of casing and pressurized injection of grout into permeable zones; pressure maintained until grout sets.
- ____ Over-reaming of well casing and screen, pulling casing and screen from hole.
- ____ Milling out of casing and screen.
- X Drilling out well casing, screen and grout to original borehole diameter, removal of materials by flushing.
- X Pumping of grout through tremie pipe to fill borehole.
- ____ Other (describe) _____

PIEZOMETER ABANDONMENT (cont'd)

Footage actually abandoned (From/To): 0 -63

Abandonment problems or deviations from abandonment specifications:

Drilled 5' into rock which was encountered at 58'

Grout mix used: 4 94 lb. bags cement to approximately 30 gallons of water + 5% bentonite

GROUT PUMPED:

Number of Cubic Yards	Weight as Pumped	Date Pumped
0.46		5-4-94

SITE CLEANUP PIEZOMETER

Disposal of Piezometer pad, posts and other materials: On Site

Disposal of Piezometer well screens(s) and casing: On Site

Disposal of drilling mud: N/A

Disposal of excess grout: On Site

Date site cleanup completed: 5-10-94

Site inspected by: Jason Flippo Date: 5-10-94

Report prepared by: Jason Flippo Date: 5-12-94

Data accuracy verified by: Peter J. Walls Date: 5-13-94

PIEZOMETER ABANDONMENT COMMENTS

RUST ENVIRONMENT & INFRASTRUCTURE

PIEZOMETER ABANDONMENT REPORT

GENERAL INFORMATION

Site Name: PIEDMONT LANDFILL

Piezometer Number: P-1-S

Location: KERNERSVILLE, NC

Project Name: DESIGN HYDROGEOLOGIC - PIEZOMETER ABANDONMENT

Latitude: _____ Longitude: _____

Location Description: SEE LOCATION PLAN

County: FORSYTH

Installation Contractor: ECS

Date Installed: 2-21-94

Abandonment Contractor: ECS

Driller: _____

Oversight Contractor: RUST

Oversight: JASON FLIPPO

Piezometer Abandonment: Date Started: 5-4-94 Date Completed: 5-4-94

PRE-ABANDONMENT MEASUREMENT

Height of Piezometer or top of well above ground surface: 3.01 (ft)

Depth of Piezometer below ground surface: 40.7 (ft)

Measured depth from ground surface to bottom of piezometer: 40.7 (ft)

Depth from ground surface to static water level: 30.23 (ft)

Total drilled depth of abandonment borehole: 42 (ft) Diameter: 6 (in)

Ground surface elevation (mean sea level): 777.2 (ft)

Reason for well abandonment: TEMPORARY PIEZOMETER LANDFILL DEVELOPMENT

PIEZOMETER ABANDONMENT

General abandonment method(s) used (check where applicable):

- ____ Pumping of grout through tremie pipe to fill inside of well screen and casing.
- ____ Pressurized injection of grout into filter pack, screen and casing; pressure maintained until grout sets.
- ____ Cutting of casing and pressurized injection of grout into permeable zones; pressure maintained until grout sets.
- ____ Over-reaming of well casing and screen, pulling casing and screen from hole.
- ____ Milling out of casing and screen.
- X Drilling out well casing, screen and grout to original borehole diameter, removal of materials by flushing.
- X Pumping of grout through tremie pipe to fill borehole.
- ____ Other (describe) _____

PIEZOMETER ABANDONMENT (cont'd)

Footage actually abandoned (From/To): 0 - 42

Abandonment problems or deviations from abandonment specifications: _____

Grout mix used: 4 94 lb. bags cement to approximately 30 gallons of water + 5% bentonite

GROUT PUMPED:

Number of Cubic Yards	Weight as Pumped	Date Pumped
0.30		5-4-94

SITE CLEANUP PIEZOMETER

Disposal of Piezometer pad, posts and other materials: On Site

Disposal of Piezometer well screens(s) and casing: On Site

Disposal of drilling mud: N/A

Disposal of excess grout: On Site

Date site cleanup completed: 5-10-94

Site inspected by: Jason Flippo Date: 5-10-94

Report prepared by: Jason Flippo Date: 5-12-94

Data accuracy verified by: Peter J. Walls Date: 5-13-94

PIEZOMETER ABANDONMENT COMMENTS

RUST ENVIRONMENT & INFRASTRUCTURE

PIEZOMETER ABANDONMENT REPORT

GENERAL INFORMATION

Site Name: PIEDMONT LANDFILL

Piezometer Number: P-2-D

Location: KERNERSVILLE, NC

Project Name: DESIGN HYDROGEOLOGIC - PIEZOMETER ABANDONMENT

Latitude: _____ Longitude: _____

Location Description: SEE LOCATION PLAN

County: FORSYTH

Installation Contractor: ECS Date Installed: 3-4-94

Abandonment Contractor: ECS Driller: _____

Oversight Contractor: RUST Oversight: JASON FLIPPO

Piezometer Abandonment: Date Started: 5-9-94 Date Completed: 5-9-94

PRE-ABANDONMENT MEASUREMENT

Height of Piezometer or top of well above ground surface: 2.83 (ft)

Depth of Piezometer below ground surface: 57.0 (ft)

Measured depth from ground surface to bottom of piezometer: 57.0 (ft)

Depth from ground surface to static water level: 19.02 (ft)

Total drilled depth of abandonment borehole: 58 (ft) Diameter: 6 (in)

Ground surface elevation (mean sea level): 769.2 (ft)

Reason for well abandonment: TEMPORARY PIEZOMETER LANDFILL DEVELOPMENT

PIEZOMETER ABANDONMENT

General abandonment method(s) used (check where applicable):

- ____ Pumping of grout through tremie pipe to fill inside of well screen and casing.
- ____ Pressurized injection of grout into filter pack, screen and casing; pressure maintained until grout sets.
- ____ Cutting of casing and pressurized injection of grout into permeable zones; pressure maintained until grout sets.
- ____ Over-reaming of well casing and screen, pulling casing and screen from hole.
- ____ Milling out of casing and screen.
- X Drilling out well casing, screen and grout to original borehole diameter, removal of materials by flushing.
- X Pumping of grout through tremie pipe to fill borehole.
- ____ Other (describe) _____

PIEZOMETER ABANDONMENT (cont'd)

Footage actually abandoned (From/To): 0 - 58

Abandonment problems or deviations from abandonment specifications: _____

Grout mix used: 4 94 lb. bags cement to approximately 30 gallons of water + 5% bentonite

GROUT PUMPED:

Number of Cubic Yards	Weight as Pumped	Date Pumped
0.41		5-9-94

SITE CLEANUP PIEZOMETER

Disposal of Piezometer pad, posts and other materials: On Site

Disposal of Piezometer well screens(s) and casing: On Site

Disposal of drilling mud: N/A

Disposal of excess grout: On Site

Date site cleanup completed: 5-10-94

Site inspected by: Jason Flippo Date: 5-10-94

Report prepared by: Jason Flippo Date: 5-12-94

Data accuracy verified by: Peter J. Walls Date: 5-13-94

PIEZOMETER ABANDONMENT COMMENTS

RUST ENVIRONMENT & INFRASTRUCTURE

PIEZOMETER ABANDONMENT REPORT

GENERAL INFORMATION

Site Name: PIEDMONT LANDFILL

Piezometer Number: P-2-S

Location: KERNERSVILLE, NC

Project Name: DESIGN HYDROGEOLOGIC - PIEZOMETER ABANDONMENT

Latitude: _____ Longitude: _____

Location Description: SEE LOCATION PLAN

County: FORSYTH

Installation Contractor: ECS

Date Installed: 3-4-94

Abandonment Contractor: ECS

Driller: _____

Oversight Contractor: RUST

Oversight: JASON FLIPPO

Piezometer Abandonment: Date Started: 5-9-94 Date Completed: 5-9-94

PRE-ABANDONMENT MEASUREMENT

Height of Piezometer or top of well above ground surface: 2.73 (ft)

Depth of Piezometer below ground surface: 26.0 (ft)

Measured depth from ground surface to bottom of piezometer: 26.0 (ft)

Depth from ground surface to static water level: 18.43 (ft)

Total drilled depth of abandonment borehole: 27 (ft) Diameter: 6 (in)

Ground surface elevation (mean sea level): 768.8 (ft)

Reason for well abandonment: TEMPORARY PIEZOMETER LANDFILL DEVELOPMENT

PIEZOMETER ABANDONMENT

General abandonment method(s) used (check where applicable):

- ____ Pumping of grout through tremie pipe to fill inside of well screen and casing.
- ____ Pressurized injection of grout into filter pack, screen and casing; pressure maintained until grout sets.
- ____ Cutting of casing and pressurized injection of grout into permeable zones; pressure maintained until grout sets.
- ____ Over-reaming of well casing and screen, pulling casing and screen from hole.
- ____ Milling out of casing and screen.
- X Drilling out well casing, screen and grout to original borehole diameter, removal of materials by flushing.
- X Pumping of grout through tremie pipe to fill borehole.
- ____ Other (describe) _____

PIEZOMETER ABANDONMENT (cont'd)

Footage actually abandoned (From/To): 0 - 27

Abandonment problems or deviations from abandonment specifications: _____

Grout mix used: 4 94 lb. bags cement to approximately 30 gallons of water + 5% bentonite

GROUT PUMPED:

Number of Cubic Yards	Weight as Pumped	Date Pumped
0.19		5-9-94

SITE CLEANUP PIEZOMETER

Disposal of Piezometer pad, posts and other materials: On Site

Disposal of Piezometer well screens(s) and casing: On Site

Disposal of drilling mud: N/A

Disposal of excess grout: On Site

Date site cleanup completed: 5-10-94

Site inspected by: Jason Flippo Date: 5-10-94

Report prepared by: Jason Flippo Date: 5-12-94

Data accuracy verified by: Peter J. Walls Date: 5-13-94

PIEZOMETER ABANDONMENT COMMENTS

RUST ENVIRONMENT & INFRASTRUCTURE

PIEZOMETER ABANDONMENT REPORT

GENERAL INFORMATION

Site Name: PIEDMONT LANDFILL

Piezometer Number: P-3 Location: KERNERSVILLE, NC

Project Name: DESIGN HYDROGEOLOGIC - PIEZOMETER ABANDONMENT

Latitude: Longitude:

Location Description: SEE LOCATION PLAN

County: FORSYTH

Installation Contractor: ECS Date Installed: 3-5-94

Abandonment Contractor: ECS Driller:

Oversight Contractor: RUST Oversight: JASON FLIPPO

Piezometer Abandonment: Date Started: 5-2-94 Date Completed: 5-2-94

PRE-ABANDONMENT MEASUREMENT

Height of Piezometer or top of well above ground surface: N/A (ft)

Depth of Piezometer below ground surface: 45.36 (ft)

Measured depth from ground surface to bottom of piezometer: 45.36 (ft)

Depth from ground surface to static water level: 29.19 (ft)

Total drilled depth of abandonment borehole: 47 (ft) Diameter: 9 (in)

Ground surface elevation (mean sea level): 807.9 (prior to excavation) (ft)

Reason for well abandonment: TEMPORARY PIEZOMETER LANDFILL DEVELOPMENT

PIEZOMETER ABANDONMENT

General abandonment method(s) used (check where applicable):

- ____ Pumping of grout through tremie pipe to fill inside of well screen and casing.
- ____ Pressurized injection of grout into filter pack, screen and casing; pressure maintained until grout sets.
- ____ Cutting of casing and pressurized injection of grout into permeable zones; pressure maintained until grout sets.
- X Over-reaming of well casing and screen, pulling casing and screen from hole.
- ____ Milling out of casing and screen.
- ____ Drilling out well casing, screen and grout to original borehole diameter, removal of materials by flushing.
- X Pumping of grout through tremie pipe to fill borehole.
- ____ Other (describe)

PIEZOMETER ABANDONMENT (cont'd)

Footage actually abandoned (From/To): 23 - 70

Abandonment problems or deviations from abandonment specifications: The well had been cut down by excavation from being 68. 9 ft. in depth to 45.36 ft. in depth.

Grout mix used: 4 94 lb. bags cement to approximately 30 gallons of water + 5% bentonite

GROUT PUMPED:

Number of Cubic Yards	Weight as Pumped	Date Pumped
0.74		5-2-94

SITE CLEANUP PIEZOMETER

Disposal of Piezometer pad, posts and other materials: On Site

Disposal of Piezometer well screens(s) and casing: On Site

Disposal of drilling mud: N/A

Disposal of excess grout: On Site

Date site cleanup completed: 5-10-94

Site inspected by: Jason Flippo Date: 5-10-94

Report prepared by: Jason Flippo Date: 5-12-94

Data accuracy verified by: Peter J. Walls Date: 5-13-94

PIEZOMETER ABANDONMENT COMMENTS

RUST ENVIRONMENT & INFRASTRUCTURE

PIEZOMETER ABANDONMENT REPORT

GENERAL INFORMATION

Site Name: PIEDMONT LANDFILL

Piezometer Number: P-4-D

Location: KERNERSVILLE, NC

Project Name: DESIGN HYDROGEOLOGIC - PIEZOMETER ABANDONMENT

Latitude: _____ Longitude: _____

Location Description: SEE LOCATION PLAN

County: FORSYTH

Installation Contractor: ECS

Date Installed: 3-4-94

Abandonment Contractor: ECS

Driller: _____

Oversight Contractor: RUST

Oversight: JASON FLIPPO

Piezometer Abandonment: Date Started: 5-4-94 Date Completed: 5-4-94

PRE-ABANDONMENT MEASUREMENT

Height of Piezometer or top of well above ground surface: 4.08 (ft)

Depth of Piezometer below ground surface: 135 (ft)

Measured depth from ground surface to bottom of piezometer: 135 (ft)

Depth from ground surface to static water level: 80.32 (ft)

Total drilled depth of abandonment borehole: 135 (ft) Diameter: 9 (in)

Ground surface elevation (mean sea level): 836.4 (ft)

Reason for well abandonment: TEMPORARY PIEZOMETER LANDFILL DEVELOPMENT

PIEZOMETER ABANDONMENT

General abandonment method(s) used (check where applicable):

- ____ Pumping of grout through tremie pipe to fill inside of well screen and casing.
- ____ Pressurized injection of grout into filter pack, screen and casing; pressure maintained until grout sets.
- ____ Cutting of casing and pressurized injection of grout into permeable zones; pressure maintained until grout sets.
- ____ Over-reaming of well casing and screen, pulling casing and screen from hole.
- ____ Milling out of casing and screen.
- X Drilling out well casing, screen and grout to original borehole diameter, removal of materials by flushing.
- X Pumping of grout through tremie pipe to fill borehole.
- ____ Other (describe) _____

PIEZOMETER ABANDONMENT (cont'd)

Footage actually abandoned (From/To): 0 - 135

Abandonment problems or deviations from abandonment specifications: _____

Grout mix used: 4 94 lb. bags cement to approximately 30 gallons of water + 5% bentonite

GROUT PUMPED:

Number of Cubic Yards	Weight as Pumped	Date Pumped
2.21		5-4-94

SITE CLEANUP PIEZOMETER

Disposal of Piezometer pad, posts and other materials: On Site

Disposal of Piezometer well screens(s) and casing: On Site

Disposal of drilling mud: N/A

Disposal of excess grout: On Site

Date site cleanup completed: 5-10-94

Site inspected by: Jason Flippo Date: 5-10-94

Report prepared by: Jason Flippo Date: 5-12-94

Data accuracy verified by: Peter J. Walls Date: 5-13-94

PIEZOMETER ABANDONMENT COMMENTS

RUST ENVIRONMENT & INFRASTRUCTURE

PIEZOMETER ABANDONMENT REPORT

GENERAL INFORMATION

Site Name: PIEDMONT LANDFILL

Piezometer Number: P-4-S

Location: KERNERSVILLE, NC

Project Name: DESIGN HYDROGEOLOGIC - PIEZOMETER ABANDONMENT

Latitude: _____ Longitude: _____

Location Description: SEE LOCATION PLAN

County: FORSYTH

Installation Contractor: ECS

Date Installed: 3-1-94

Abandonment Contractor: ECS

Driller: _____

Oversight Contractor: RUST

Oversight: JASON FLIPPO

Piezometer Abandonment: Date Started: 5-5-94 Date Completed: 5-5-94

PRE-ABANDONMENT MEASUREMENT

Height of Piezometer or top of well above ground surface: 2.81 (ft)

Depth of Piezometer below ground surface: 111.1 (ft)

Measured depth from ground surface to bottom of piezometer: 111.1 (ft)

Depth from ground surface to static water level: 81.01 (ft)

Total drilled depth of abandonment borehole: 112 (ft) Diameter: 9 (in)

Ground surface elevation (mean sea level): 832.0 (ft)

Reason for well abandonment: TEMPORARY PIEZOMETER LANDFILL DEVELOPMENT

PIEZOMETER ABANDONMENT

General abandonment method(s) used (check where applicable):

- ____ Pumping of grout through tremie pipe to fill inside of well screen and casing.
- ____ Pressurized injection of grout into filter pack, screen and casing; pressure maintained until grout sets.
- ____ Cutting of casing and pressurized injection of grout into permeable zones; pressure maintained until grout sets.
- ____ Over-reaming of well casing and screen, pulling casing and screen from hole.
- ____ Milling out of casing and screen.
- X Drilling out well casing, screen and grout to original borehole diameter, removal of materials by flushing.
- X Pumping of grout through tremie pipe to fill borehole.
- ____ Other (describe) _____

PIEZOMETER ABANDONMENT (cont'd)

Footage actually abandoned (From/To): 0 - 112

Abandonment problems or deviations from abandonment specifications: _____

Grout mix used: 4 94 lb. bags cement to approximately 30 gallons of water + 5% bentonite

GROUT PUMPED:

Number of Cubic Yards	Weight as Pumped	Date Pumped
1.82		5-5-94

SITE CLEANUP PIEZOMETER

Disposal of Piezometer pad, posts and other materials: On Site

Disposal of Piezometer well screens(s) and casing: On Site

Disposal of drilling mud: N/A

Disposal of excess grout: On Site

Date site cleanup completed: 5-10-94

Site inspected by: Jason Flippo Date: 5-10-94

Report prepared by: Jason Flippo Date: 5-12-94

Data accuracy verified by: Peter J. Walls Date: 5-13-94

PIEZOMETER ABANDONMENT COMMENTS

RUST ENVIRONMENT & INFRASTRUCTURE

PIEZOMETER ABANDONMENT REPORT

GENERAL INFORMATION

Site Name: PIEDMONT LANDFILL

Piezometer Number: P-6-D

Location: KERNERSVILLE, NC

Project Name: DESIGN HYDROGEOLOGIC - PIEZOMETER ABANDONMENT

Latitude: _____ Longitude: _____

Location Description: SEE LOCATION PLAN

County: FORSYTH

Installation Contractor: ECS Date Installed: 2-20-94

Abandonment Contractor: ECS Driller: _____

Oversight Contractor: RUST Oversight: JASON FLIPPO

Piezometer Abandonment: Date Started: 5-3-94 Date Completed: 5-3-94

PRE-ABANDONMENT MEASUREMENT

Height of Piezometer or top of well above ground surface: 2.56 (ft)

Depth of Piezometer below ground surface: 60.0 (ft)

Measured depth from ground surface to bottom of piezometer: 60.0 (ft)

Depth from ground surface to static water level: 2.32 (ft)

Total drilled depth of abandonment borehole: 61 (ft) Diameter: 6 (in)

Ground surface elevation (mean sea level): 766.6 (ft)

Reason for well abandonment: TEMPORARY PIEZOMETER LANDFILL DEVELOPMENT

PIEZOMETER ABANDONMENT

General abandonment method(s) used (check where applicable):

- ____ Pumping of grout through tremie pipe to fill inside of well screen and casing.
- ____ Pressurized injection of grout into filter pack, screen and casing; pressure maintained until grout sets.
- ____ Cutting of casing and pressurized injection of grout into permeable zones; pressure maintained until grout sets.
- X Over-reaming of well casing and screen, pulling casing and screen from hole.
- ____ Milling out of casing and screen.
- ____ Drilling out well casing, screen and grout to original borehole diameter, removal of materials by flushing.
- X Pumping of grout through tremie pipe to fill borehole.
- ____ Other (describe) _____

PIEZOMETER ABANDONMENT (cont'd)

Footage actually abandoned (From/To): 0 - 61

Abandonment problems or deviations from abandonment specifications: _____

Grout mix used: 4 94 lb. bags cement to approximately 30 gallons of water + 5% bentonite

GROUT PUMPED:

Number of Cubic Yards	Weight as Pumped	Date Pumped
0.98		5-3-94

SITE CLEANUP PIEZOMETER

Disposal of Piezometer pad, posts and other materials: On Site

Disposal of Piezometer well screens(s) and casing: On Site

Disposal of drilling mud: N/A

Disposal of excess grout: On Site

Date site cleanup completed: 5-10-94

Site inspected by: Jason Flippo Date: 5-10-94

Report prepared by: Jason Flippo Date: 5-12-94

Data accuracy verified by: Peter J. Walls Date: 5-13-94

PIEZOMETER ABANDONMENT COMMENTS

RUST ENVIRONMENT & INFRASTRUCTURE

PIEZOMETER ABANDONMENT REPORT

GENERAL INFORMATION

Site Name: PIEDMONT LANDFILL

Piezometer Number: P-6-S Location: KERNERSVILLE, NC

Project Name: DESIGN HYDROGEOLOGIC - PIEZOMETER ABANDONMENT

Latitude: _____ Longitude: _____

Location Description: SEE LOCATION PLAN

County: FORSYTH

Installation Contractor: ECS Date Installed: 2-20-94

Abandonment Contractor: ECS Driller: _____

Oversight Contractor: RUST Oversight: JASON FLIPPO

Piezometer Abandonment: Date Started: 5-3-94 Date Completed: 5-3-94

PRE-ABANDONMENT MEASUREMENT

Height of Piezometer or top of well above ground surface: 3.20 (ft)

Depth of Piezometer below ground surface: 11.0 (ft)

Measured depth from ground surface to bottom of piezometer: 11.0 (ft)

Depth from ground surface to static water level: 2.29 (ft)

Total drilled depth of abandonment borehole: 15 (ft) Diameter: 6 (in)

Ground surface elevation (mean sea level): 767.5 (ft)

Reason for well abandonment: TEMPORARY PIEZOMETER LANDFILL DEVELOPMENT

PIEZOMETER ABANDONMENT

General abandonment method(s) used (check where applicable):

- ____ Pumping of grout through tremie pipe to fill inside of well screen and casing.
- ____ Pressurized injection of grout into filter pack, screen and casing; pressure maintained until grout sets.
- ____ Cutting of casing and pressurized injection of grout into permeable zones; pressure maintained until grout sets.
- X Over-reaming of well casing and screen, pulling casing and screen from hole.
- ____ Milling out of casing and screen.
- ____ Drilling out well casing, screen and grout to original borehole diameter, removal of materials by flushing.
- X Pumping of grout through tremie pipe to fill borehole.
- ____ Other (describe) _____

PIEZOMETER ABANDONMENT (cont'd)

Footage actually abandoned (From/To): 0 - 15

Abandonment problems or deviations from abandonment specifications: _____

Grout mix used: 4 94 lb. bags cement to approximately 30 gallons of water + 5% bentonite

GROUT PUMPED:

Number of Cubic Yards	Weight as Pumped	Date Pumped
0.24		5-3-94

SITE CLEANUP PIEZOMETER

Disposal of Piezometer pad, posts and other materials: On Site

Disposal of Piezometer well screens(s) and casing: On Site

Disposal of drilling mud: N/A

Disposal of excess grout: On Site

Date site cleanup completed: 5-10-94

Site inspected by: Jason Flippo Date: 5-10-94

Report prepared by: Jason Flippo Date: 5-12-94

Data accuracy verified by: Peter J. Walls Date: 5-13-94

PIEZOMETER ABANDONMENT COMMENTS

RUST ENVIRONMENT & INFRASTRUCTURE

PIEZOMETER ABANDONMENT REPORT

GENERAL INFORMATION

Site Name: PIEDMONT LANDFILL

Piezometer Number: P-7 Location: KERNERSVILLE, NC

Project Name: DESIGN HYDROGEOLOGIC - PIEZOMETER ABANDONMENT

Latitude: Longitude:

Location Description: SEE LOCATION PLAN

County: FORSYTH

Installation Contractor: ECS Date Installed: 2-17-94

Abandonment Contractor: ECS Driller:

Oversight Contractor: RUST Oversight: JASON FLIPPO

Piezometer Abandonment: Date Started: 5-6-94 Date Completed: 5-6-94

PRE-ABANDONMENT MEASUREMENT

Height of Piezometer or top of well above ground surface: 3.08 (ft)

Depth of Piezometer below ground surface: 27.0 (ft)

Measured depth from ground surface to bottom of piezometer: 27.0 (ft)

Depth from ground surface to static water level: 13.22 (ft)

Total drilled depth of abandonment borehole: 28 (ft) Diameter: 6 (in)

Ground surface elevation (mean sea level): 763.8 (ft)

Reason for well abandonment: TEMPORARY PIEZOMETER LANDFILL DEVELOPMENT

PIEZOMETER ABANDONMENT

General abandonment method(s) used (check where applicable):

- ____ Pumping of grout through tremie pipe to fill inside of well screen and casing.
- ____ Pressurized injection of grout into filter pack, screen and casing; pressure maintained until grout sets.
- ____ Cutting of casing and pressurized injection of grout into permeable zones; pressure maintained until grout sets.
- ____ Over-reaming of well casing and screen, pulling casing and screen from hole.
- ____ Milling out of casing and screen.
- X Drilling out well casing, screen and grout to original borehole diameter, removal of materials by flushing.
- X Pumping of grout through tremie pipe to fill borehole.
- ____ Other (describe)

PIEZOMETER ABANDONMENT (cont'd)

Footage actually abandoned (From/To): 0 - 28

Abandonment problems or deviations from abandonment specifications:

Grout mix used: 4 94 lb. bags cement to approximately 30 gallons of water + 5% bentonite

GROUT PUMPED:

Number of Cubic Yards	Weight as Pumped	Date Pumped
0.44		5-6-94

SITE CLEANUP PIEZOMETER

Disposal of Piezometer pad, posts and other materials: On Site

Disposal of Piezometer well screens(s) and casing: On Site

Disposal of drilling mud: N/A

Disposal of excess grout: On Site

Date site cleanup completed: 5-10-94

Site inspected by: Jason Flippo Date: 5-10-94

Report prepared by: Jason Flippo Date: 5-12-94

Data accuracy verified by: Peter J. Walls Date: 5-13-94

PIEZOMETER ABANDONMENT COMMENTS

RUST ENVIRONMENT & INFRASTRUCTURE

PIEZOMETER ABANDONMENT REPORT

GENERAL INFORMATION

Site Name: PIEDMONT LANDFILL

Piezometer Number: P-8-D

Location: KERNERSVILLE, NC

Project Name: DESIGN HYDROGEOLOGIC - PIEZOMETER ABANDONMENT

Latitude: _____ Longitude: _____

Location Description: SEE LOCATION PLAN

County: FORSYTH

Installation Contractor: ECS

Date Installed: 3-4-94

Abandonment Contractor: ECS

Driller: _____

Oversight Contractor: RUST

Oversight: JASON FLIPPO

Piezometer Abandonment: Date Started: 5-2-94 Date Completed: 5-2-94

PRE-ABANDONMENT MEASUREMENT

Height of Piezometer or top of well above ground surface: 2.89 (ft)

Depth of Piezometer below ground surface: 76.5 (ft)

Measured depth from ground surface to bottom of piezometer: 76.5 (ft)

Depth from ground surface to static water level: 21.06 (ft)

Total drilled depth of abandonment borehole: 77 (ft) Diameter: 9 (in)

Ground surface elevation (mean sea level): 777.9 (ft)

Reason for well abandonment: TEMPORARY PIEZOMETER LANDFILL DEVELOPMENT

PIEZOMETER ABANDONMENT

General abandonment method(s) used (check where applicable):

- ____ Pumping of grout through tremie pipe to fill inside of well screen and casing.
- ____ Pressurized injection of grout into filter pack, screen and casing; pressure maintained until grout sets.
- ____ Cutting of casing and pressurized injection of grout into permeable zones; pressure maintained until grout sets.
- X Over-reaming of well casing and screen, pulling casing and screen from hole.
- ____ Milling out of casing and screen.
- ____ Drilling out well casing, screen and grout to original borehole diameter, removal of materials by flushing.
- X Pumping of grout through tremie pipe to fill borehole.
- ____ Other (describe) _____

PIEZOMETER ABANDONMENT (cont'd)

Footage actually abandoned (From/To): 0 - 77

Abandonment problems or deviations from abandonment specifications: _____

Grout mix used: 4 94 lb. bags cement to approximately 30 gallons of water + 5% bentonite

GROUT PUMPED:

Number of Cubic Yards	Weight as Pumped	Date Pumped
1.25		5-2-94

SITE CLEANUP PIEZOMETER

Disposal of Piezometer pad, posts and other materials: On Site

Disposal of Piezometer well screens(s) and casing: On Site

Disposal of drilling mud: N/A

Disposal of excess grout: On Site

Date site cleanup completed: 5-10-94

Site inspected by: Jason Flippo Date: 5-10-94

Report prepared by: Jason Flippo Date: 5-12-94

Data accuracy verified by: Peter J. Walls Date: 5-13-94

PIEZOMETER ABANDONMENT COMMENTS

RUST ENVIRONMENT & INFRASTRUCTURE

PIEZOMETER ABANDONMENT REPORT

GENERAL INFORMATION

Site Name: PIEDMONT LANDFILL

Piezometer Number: P-8-S

Location: KERNERSVILLE, NC

Project Name: DESIGN HYDROGEOLOGIC - PIEZOMETER ABANDONMENT

Latitude: _____ Longitude: _____

Location Description: SEE LOCATION PLAN

County: FORSYTH

Installation Contractor: ECS

Date Installed: 2-22-94

Abandonment Contractor: ECS

Driller: _____

Oversight Contractor: RUST

Oversight: JASON FLIPPO

Piezometer Abandonment: Date Started: 5-3-94 Date Completed: 5-3-94

PRE-ABANDONMENT MEASUREMENT

Height of Piezometer or top of well above ground surface: 2.93 (ft)

Depth of Piezometer below ground surface: 32.0 (ft)

Measured depth from ground surface to bottom of piezometer: 32.0 (ft)

Depth from ground surface to static water level: 19.55 (ft)

Total drilled depth of abandonment borehole: 33 (ft) Diameter: 6 (in)

Ground surface elevation (mean sea level): 776.5 (ft)

Reason for well abandonment: TEMPORARY PIEZOMETER LANDFILL DEVELOPMENT

PIEZOMETER ABANDONMENT

General abandonment method(s) used (check where applicable):

- ____ Pumping of grout through tremie pipe to fill inside of well screen and casing.
- ____ Pressurized injection of grout into filter pack, screen and casing; pressure maintained until grout sets.
- ____ Cutting of casing and pressurized injection of grout into permeable zones; pressure maintained until grout sets.
- X Over-reaming of well casing and screen, pulling casing and screen from hole.
- ____ Milling out of casing and screen.
- ____ Drilling out well casing, screen and grout to original borehole diameter, removal of materials by flushing.
- X Pumping of grout through tremie pipe to fill borehole.
- ____ Other (describe) _____

PIEZOMETER ABANDONMENT (cont'd)

Footage actually abandoned (From/To): 0 - 33

Abandonment problems or deviations from abandonment specifications: _____

Grout mix used: 4 94 lb. bags cement to approximately 30 gallons of water - 5% bentonite

GROUT PUMPED:

Number of Cubic Yards	Weight as Pumped	Date Pumped
0.52		5-3-94

SITE CLEANUP PIEZOMETER

Disposal of Piezometer pad, posts and other materials: On Site

Disposal of Piezometer well screens(s) and casing: On Site

Disposal of drilling mud: N/A

Disposal of excess grout: On Site

Date site cleanup completed: 5-10-94

Site inspected by: Jason Flippo Date: 5-10-94

Report prepared by: Jason Flippo Date: 5-12-94

Data accuracy verified by: Peter J. Walls Date: 5-13-94

PIEZOMETER ABANDONMENT COMMENTS

RUST ENVIRONMENT & INFRASTRUCTURE

PIEZOMETER ABANDONMENT REPORT

GENERAL INFORMATION

Site Name: PIEDMONT LANDFILL

Piezometer Number: P-9-D Location: KERNERSVILLE, NC

Project Name: DESIGN HYDROGEOLOGIC - PIEZOMETER ABANDONMENT

Latitude: _____ Longitude: _____

Location Description: SEE LOCATION PLAN

County: FORSYTH

Installation Contractor: ECS Date Installed: 3-17-94

Abandonment Contractor: ECS Driller: _____

Oversight Contractor: RUST Oversight: JASON FLIPPO

Piezometer Abandonment: Date Started: 5-5-94 Date Completed: 5-5-94

PRE-ABANDONMENT MEASUREMENT

Height of Piezometer or top of well above ground surface: 3.25 (ft)

Depth of Piezometer below ground surface: 104.3 (ft)

Measured depth from ground surface to bottom of piezometer: 104.3 (ft)

Depth from ground surface to static water level: 69.51 (ft)

Total drilled depth of abandonment borehole: 55 (ft) Diameter: 9 (in)

Ground surface elevation (mean sea level): 828.0 (ft)

Reason for well abandonment: TEMPORARY PIEZOMETER LANDFILL DEVELOPMENT

PIEZOMETER ABANDONMENT

General abandonment method(s) used (check where applicable):

- ____ Pumping of grout through tremie pipe to fill inside of well screen and casing.
- ____ Pressurized injection of grout into filter pack, screen and casing; pressure maintained until grout sets.
- ____ Cutting of casing and pressurized injection of grout into permeable zones; pressure maintained until grout sets.
- ____ Over-reaming of well casing and screen, pulling casing and screen from hole.
- ____ Milling out of casing and screen.
- X Drilling out well casing, screen and grout to original borehole diameter, removal of materials by flushing.
- X Pumping of grout through tremie pipe to fill borehole.
- ____ Other (describe) _____

PIEZOMETER ABANDONMENT (cont'd)

Footage actually abandoned (From/To): 0 - 55

Abandonment problems or deviations from abandonment specifications:
Drilled 5 ft. into rock which was encountered at 50.0 ft.

Grout mix used: 4 94 lb. bags cement to approximately 30 gallons of water + 5% bentonite

GROUT PUMPED:

Number of Cubic Yards	Weight as Pumped	Date Pumped
0.90		5-5-94

SITE CLEANUP PIEZOMETER

Disposal of Piezometer pad, posts and other materials: On Site

Disposal of Piezometer well screens(s) and casing: On Site

Disposal of drilling mud: N/A

Disposal of excess grout: On Site

Date site cleanup completed: 5-10-94

Site inspected by: Jason Flippo Date: 5-10-94

Report prepared by: Jason Flippo Date: 5-12-94

Data accuracy verified by: Peter J. Walls Date: 5-13-94

PIEZOMETER ABANDONMENT COMMENTS

RUST ENVIRONMENT & INFRASTRUCTURE

PIEZOMETER ABANDONMENT REPORT

GENERAL INFORMATION

Site Name: PIEDMONT LANDFILL

Piezometer Number: P-9-S

Location: KERNERSVILLE, NC

Project Name: DESIGN HYDROGEOLOGIC - PIEZOMETER ABANDONMENT

Latitude: _____ Longitude: _____

Location Description: SEE LOCATION PLAN

County: FORSYTH

Installation Contractor: ECS

Date Installed: 3-17-94

Abandonment Contractor: ECS

Driller: _____

Oversight Contractor: RUST

Oversight: JASON FLIPPO

Piezometer Abandonment: Date Started: 5-5-94 Date Completed: 5-5-94

PRE-ABANDONMENT MEASUREMENT

Height of Piezometer or top of well above ground surface: 3.97 (ft)

Depth of Piezometer below ground surface: 76.0 (ft)

Measured depth from ground surface to bottom of piezometer: 76.0 (ft)

Depth from ground surface to static water level: 66.22 (ft)

Total drilled depth of abandonment borehole: 55 (ft) Diameter: 9 (in)

Ground surface elevation (mean sea level): 827.6 (ft)

Reason for well abandonment: TEMPORARY PIEZOMETER LANDFILL DEVELOPMENT

PIEZOMETER ABANDONMENT

General abandonment method(s) used (check where applicable):

- ____ Pumping of grout through tremie pipe to fill inside of well screen and casing.
- ____ Pressurized injection of grout into filter pack, screen and casing; pressure maintained until grout sets.
- ____ Cutting of casing and pressurized injection of grout into permeable zones; pressure maintained until grout sets.
- ____ Over-reaming of well casing and screen, pulling casing and screen from hole.
- ____ Milling out of casing and screen.
- X Drilling out well casing, screen and grout to original borehole diameter, removal of materials by flushing.
- X Pumping of grout through tremie pipe to fill borehole.
- ____ Other (describe) _____

PIEZOMETER ABANDONMENT (cont'd)

Footage actually abandoned (From/To): 0 - 55

Abandonment problems or deviations from abandonment specifications:
Drilled 5 ft. into rock which was encountered at 50.0 ft.

Grout mix used: 4 94 lb. bags cement to approximately 30 gallons of water + 5% bentonite

GROUT PUMPED:

Number of Cubic Yards	Weight as Pumped	Date Pumped
0.90		5-5-94

SITE CLEANUP PIEZOMETER

Disposal of Piezometer pad, posts and other materials: On Site

Disposal of Piezometer well screens(s) and casing: On Site

Disposal of drilling mud: N/A

Disposal of excess grout: On Site

Date site cleanup completed: 5-10-94

Site inspected by: Jason Flippo Date: 5-10-94

Report prepared by: Jason Flippo Date: 5-12-94

Data accuracy verified by: Peter J. Walls Date: 5-13-94

PIEZOMETER ABANDONMENT COMMENTS

RUST ENVIRONMENT & INFRASTRUCTURE

PIEZOMETER ABANDONMENT REPORT

GENERAL INFORMATION

Site Name: PIEDMONT LANDFILL

Piezometer Number: P-10 Location: KERNERSVILLE, NC

Project Name: DESIGN HYDROGEOLOGIC - PIEZOMETER ABANDONMENT

Latitude: Longitude:

Location Description: SEE LOCATION PLAN

County: FORSYTH

Installation Contractor: ECS Date Installed: 2-16-94

Abandonment Contractor: ECS Driller:

Oversight Contractor: RUST Oversight: JASON FLIPPO

Piezometer Abandonment: Date Started: 5-6-94 Date Completed: 5-6-94

PRE-ABANDONMENT MEASUREMENT

Height of Piezometer or top of well above ground surface: 2.80 (ft)

Depth of Piezometer below ground surface: 46.0 (ft)

Measured depth from ground surface to bottom of piezometer: 46.0 (ft)

Depth from ground surface to static water level: 24.30 (ft)

Total drilled depth of abandonment borehole: 47 (ft) Diameter: 6 (in)

Ground surface elevation (mean sea level): 797.5 (ft)

Reason for well abandonment: TEMPORARY PIEZOMETER LANDFILL DEVELOPMENT

PIEZOMETER ABANDONMENT

General abandonment method(s) used (check where applicable):

- ____ Pumping of grout through tremie pipe to fill inside of well screen and casing.
- ____ Pressurized injection of grout into filter pack, screen and casing; pressure maintained until grout sets.
- ____ Cutting of casing and pressurized injection of grout into permeable zones; pressure maintained until grout sets.
- ____ Over-reaming of well casing and screen, pulling casing and screen from hole.
- ____ Milling out of casing and screen.
- X Drilling out well casing, screen and grout to original borehole diameter, removal of materials by flushing.
- X Pumping of grout through tremie pipe to fill borehole.
- ____ Other (describe)

PIEZOMETER ABANDONMENT (cont'd)

Footage actually abandoned (From/To): 0 - 47

Abandonment problems or deviations from abandonment specifications:

Grout mix used: 4 94 lb. bags cement to approximately 30 gallons of water + 5% bentonite

GROUT PUMPED:

Number of Cubic Yards	Weight as Pumped	Date Pumped
0.75		5-6-94

SITE CLEANUP PIEZOMETER

Disposal of Piezometer pad, posts and other materials: On Site

Disposal of Piezometer well screens(s) and casing: On Site

Disposal of drilling mud: N/A

Disposal of excess grout: On Site

Date site cleanup completed: 5-10-94

Site inspected by: Jason Flippo Date: 5-10-94

Report prepared by: Jason Flippo Date: 5-12-94

Data accuracy verified by: Peter J. Walls Date: 5-13-94

PIEZOMETER ABANDONMENT COMMENTS

RUST ENVIRONMENT & INFRASTRUCTURE

PIEZOMETER ABANDONMENT REPORT

GENERAL INFORMATION

Site Name: PIEDMONT LANDFILL

Piezometer Number: P-11-D Location: KERNERSVILLE, NC

Project Name: DESIGN HYDROGEOLOGIC - PIEZOMETER ABANDONMENT

Latitude: _____ Longitude: _____

Location Description: SEE LOCATION PLAN

County: FORSYTH

Installation Contractor: ECS Date Installed: 2-22-94

Abandonment Contractor: ECS Driller: _____

Oversight Contractor: RUST Oversight: JASON FLIPPO

Piezometer Abandonment: Date Started: 5-3-94 Date Completed: 5-3-94

PRE-ABANDONMENT MEASUREMENT

Height of Piezometer or top of well above ground surface: 4.10 (ft)

Depth of Piezometer below ground surface: 96.0 (ft)

Measured depth from ground surface to bottom of piezometer: 96.0 (ft)

Depth from ground surface to static water level: 34.42 (ft)

Total drilled depth of abandonment borehole: 97 (ft) Diameter: 9 (in)

Ground surface elevation (mean sea level): 791.4 (ft)

Reason for well abandonment: TEMPORARY PIEZOMETER LANDFILL DEVELOPMENT

PIEZOMETER ABANDONMENT

General abandonment method(s) used (check where applicable):

- ____ Pumping of grout through tremie pipe to fill inside of well screen and casing.
- ____ Pressurized injection of grout into filter pack, screen and casing; pressure maintained until grout sets.
- ____ Cutting of casing and pressurized injection of grout into permeable zones; pressure maintained until grout sets.
- X Over-reaming of well casing and screen, pulling casing and screen from hole.
- ____ Milling out of casing and screen.
- ____ Drilling out well casing, screen and grout to original borehole diameter, removal of materials by flushing.
- X Pumping of grout through tremie pipe to fill borehole.
- ____ Other (describe) _____

PIEZOMETER ABANDONMENT (cont'd)

Footage actually abandoned (From/To): 0 - 97

Abandonment problems or deviations from abandonment specifications: _____

Grout mix used: 4 94 lb. bags cement to approximately 30 gallons of water + 5% bentonite

GROUT PUMPED:

Number of Cubic Yards	Weight as Pumped	Date Pumped
1.57		5-6-94

SITE CLEANUP PIEZOMETER

Disposal of Piezometer pad, posts and other materials: On Site

Disposal of Piezometer well screens(s) and casing: On Site

Disposal of drilling mud: N/A

Disposal of excess grout: On Site

Date site cleanup completed: 5-10-94

Site inspected by: Jason Flippo Date: 5-10-94

Report prepared by: Jason Flippo Date: 5-12-94

Data accuracy verified by: Peter J. Walls Date: 5-13-94

PIEZOMETER ABANDONMENT COMMENTS

RUST ENVIRONMENT & INFRASTRUCTURE

PIEZOMETER ABANDONMENT REPORT

GENERAL INFORMATION

Site Name: PIEDMONT LANDFILL

Piezometer Number: P-11-S

Location: KERNERSVILLE, NC

Project Name: DESIGN HYDROGEOLOGIC - PIEZOMETER ABANDONMENT

Latitude: _____ Longitude: _____

Location Description: SEE LOCATION PLAN

County: FORSYTH

Installation Contractor: ECS

Date Installed: 2-21-94

Abandonment Contractor: ECS

Driller: _____

Oversight Contractor: RUST

Oversight: JASON FLIPPO

Piezometer Abandonment: Date Started: 5-3-94 Date Completed: 5-3-94

PRE-ABANDONMENT MEASUREMENT

Height of Piezometer or top of well above ground surface: 2.94 (ft)

Depth of Piezometer below ground surface: 51.0 (ft)

Measured depth from ground surface to bottom of piezometer: 51.0 (ft)

Depth from ground surface to static water level: 34.32 (ft)

Total drilled depth of abandonment borehole: 52 (ft) Diameter: 6 (in)

Ground surface elevation (mean sea level): 791.5 (ft)

Reason for well abandonment: TEMPORARY PIEZOMETER LANDFILL DEVELOPMENT

PIEZOMETER ABANDONMENT

General abandonment method(s) used (check where applicable):

- ____ Pumping of grout through tremie pipe to fill inside of well screen and casing.
- ____ Pressurized injection of grout into filter pack, screen and casing; pressure maintained until grout sets.
- ____ Cutting of casing and pressurized injection of grout into permeable zones; pressure maintained until grout sets.
- X Over-reaming of well casing and screen, pulling casing and screen from hole.
- ____ Milling out of casing and screen.
- ____ Drilling out well casing, screen and grout to original borehole diameter, removal of materials by flushing.
- X Pumping of grout through tremie pipe to fill borehole.
- ____ Other (describe) _____

PIEZOMETER ABANDONMENT (cont'd)

Footage actually abandoned (From/To): 0 - 52

Abandonment problems or deviations from abandonment specifications: _____

Grout mix used: 4 94 lb. bags cement to approximately 30 gallons of water + 5% bentonite

GROUT PUMPED:

Number of Cubic Yards	Weight as Pumped	Date Pumped
0.83		5-3-94

SITE CLEANUP PIEZOMETER

Disposal of Piezometer pad, posts and other materials: On Site

Disposal of Piezometer well screens(s) and casing: On Site

Disposal of drilling mud: N/A

Disposal of excess grout: On Site

Date site cleanup completed: 5-10-94

Site inspected by: Jason Flippo Date: 5-10-94

Report prepared by: Jason Flippo Date: 5-12-94

Data accuracy verified by: Peter J. Walls Date: 5-13-94

PIEZOMETER ABANDONMENT COMMENTS

RUST ENVIRONMENT & INFRASTRUCTURE

PIEZOMETER ABANDONMENT REPORT

GENERAL INFORMATION

Site Name: PIEDMONT LANDFILL

Piezometer Number: P-12-D Location: KERNERSVILLE, NC

Project Name: DESIGN HYDROGEOLOGIC - PIEZOMETER ABANDONMENT

Latitude: _____ Longitude: _____

Location Description: SEE LOCATION PLAN

County: FORSYTH

Installation Contractor: ECS Date Installed: 2-19-94

Abandonment Contractor: ECS Driller: _____

Oversight Contractor: RUST Oversight: JASON FLIPPO

Piezometer Abandonment: Date Started: 5-5-94 Date Completed: 5-5-94

PRE-ABANDONMENT MEASUREMENT

Height of Piezometer or top of well above ground surface: 3.35 (ft)

Depth of Piezometer below ground surface: 76.0 (ft)

Measured depth from ground surface to bottom of piezometer: 76.0 (ft)

Depth from ground surface to static water level: 40.2 (ft)

Total drilled depth of abandonment borehole: 64 (ft) Diameter: 9 (in)

Ground surface elevation (mean sea level): 809.8 (ft)

Reason for well abandonment: TEMPORARY PIEZOMETER LANDFILL DEVELOPMENT

PIEZOMETER ABANDONMENT

General abandonment method(s) used (check where applicable):

- ____ Pumping of grout through tremie pipe to fill inside of well screen and casing.
- ____ Pressurized injection of grout into filter pack, screen and casing; pressure maintained until grout sets.
- ____ Cutting of casing and pressurized injection of grout into permeable zones; pressure maintained until grout sets.
- ____ Over-reaming of well casing and screen, pulling casing and screen from hole.
- ____ Milling out of casing and screen.
- X Drilling out well casing, screen and grout to original borehole diameter, removal of materials by flushing.
- X Pumping of grout through tremie pipe to fill borehole.
- ____ Other (describe) _____

PIEZOMETER ABANDONMENT (cont'd)

Footage actually abandoned (From/To): 0 - 64

Abandonment problems or deviations from abandonment specifications:
Drilled 5.0 ft. into rock which was encountered at 59.0 ft.

Grout mix used: 4 94 lb. bags cement to approximately 30 gallons of water + 5% bentonite

GROUT PUMPED:

Number of Cubic Yards	Weight as Pumped	Date Pumped
1.05		5-5-94

SITE CLEANUP PIEZOMETER

Disposal of Piezometer pad, posts and other materials: On Site

Disposal of Piezometer well screens(s) and casing: On Site

Disposal of drilling mud: N/A

Disposal of excess grout: On Site

Date site cleanup completed: 5-10-94

Site inspected by: Jason Flippo Date: 5-10-94

Report prepared by: Jason Flippo Date: 5-12-94

Data accuracy verified by: Peter J. Walls Date: 5-13-94

PIEZOMETER ABANDONMENT COMMENTS

RUST ENVIRONMENT & INFRASTRUCTURE

PIEZOMETER ABANDONMENT REPORT

GENERAL INFORMATION

Site Name: PIEDMONT LANDFILL

Piezometer Number: P-12-S

Location: KERNERSVILLE, NC

Project Name: DESIGN HYDROGEOLOGIC - PIEZOMETER ABANDONMENT

Latitude: _____ Longitude: _____

Location Description: SEE LOCATION PLAN

County: FORSYTH

Installation Contractor: ECS

Date Installed: 2-19-94

Abandonment Contractor: ECS

Driller: _____

Oversight Contractor: RUST

Oversight: JASON FLIPPO

Piezometer Abandonment: Date Started: 5-2-94 Date Completed: 5-2-94

PRE-ABANDONMENT MEASUREMENT

Height of Piezometer or top of well above ground surface: 3.17 (ft)

Depth of Piezometer below ground surface: 56.0 (ft)

Measured depth from ground surface to bottom of piezometer: 56.0 (ft)

Depth from ground surface to static water level: 41.26 (ft)

Total drilled depth of abandonment borehole: 57 (ft) Diameter: 6 (in)

Ground surface elevation (mean sea level): 811.1 (ft)

Reason for well abandonment: TEMPORARY PIEZOMETER LANDFILL DEVELOPMENT

PIEZOMETER ABANDONMENT

General abandonment method(s) used (check where applicable):

- ____ Pumping of grout through tremie pipe to fill inside of well screen and casing.
- ____ Pressurized injection of grout into filter pack, screen and casing; pressure maintained until grout sets.
- ____ Cutting of casing and pressurized injection of grout into permeable zones; pressure maintained until grout sets.
- X Over-reaming of well casing and screen, pulling casing and screen from hole.
- ____ Milling out of casing and screen.
- ____ Drilling out well casing, screen and grout to original borehole diameter, removal of materials by flushing.
- X Pumping of grout through tremie pipe to fill borehole.
- ____ Other (describe) _____

PIEZOMETER ABANDONMENT (cont'd)

Footage actually abandoned (From/To): 0 -57

Abandonment problems or deviations from abandonment specifications: _____

Grout mix used: 4 94 lb. bags cement to approximately 30 gallons of water + 5% bentonite

GROUT PUMPED:

Number of Cubic Yards	Weight as Pumped	Date Pumped
0.93		5-2-94

SITE CLEANUP PIEZOMETER

Disposal of Piezometer pad, posts and other materials: On Site

Disposal of Piezometer well screens(s) and casing: On Site

Disposal of drilling mud: N/A

Disposal of excess grout: On Site

Date site cleanup completed: 5-10-94

Site inspected by: Jason Flippo Date: 5-10-94

Report prepared by: Jason Flippo Date: 5-12-94

Data accuracy verified by: Peter J. Walls Date: 5-13-94

PIEZOMETER ABANDONMENT COMMENTS

_____

RUST ENVIRONMENT & INFRASTRUCTURE

PIEZOMETER ABANDONMENT REPORT

GENERAL INFORMATION

Site Name: PIEDMONT LANDFILL

Piezometer Number: P-14-D

Location: KERNERSVILLE, NC

Project Name: DESIGN HYDROGEOLOGIC - PIEZOMETER ABANDONMENT

Latitude: _____ Longitude: _____

Location Description: SEE LOCATION PLAN

County: FORSYTH

Installation Contractor: ECS

Date Installed: 2-18-94

Abandonment Contractor: ECS

Driller: _____

Oversight Contractor: RUST

Oversight: JASON FLIPPO

Piezometer Abandonment: Date Started: 5-6-94 Date Completed: 5-6-94

PRE-ABANDONMENT MEASUREMENT

Height of Piezometer or top of well above ground surface: 2.85 (ft)

Depth of Piezometer below ground surface: 80.4 (ft)

Measured depth from ground surface to bottom of piezometer: 80.4 (ft)

Depth from ground surface to static water level: 37.81 (ft)

Total drilled depth of abandonment borehole: 65 (ft) Diameter: 9 (in)

Ground surface elevation (mean sea level): 805.8 (ft)

Reason for well abandonment: TEMPORARY PIEZOMETER LANDFILL DEVELOPMENT

PIEZOMETER ABANDONMENT

General abandonment method(s) used (check where applicable):

- ____ Pumping of grout through tremie pipe to fill inside of well screen and casing.
- ____ Pressurized injection of grout into filter pack, screen and casing; pressure maintained until grout sets.
- ____ Cutting of casing and pressurized injection of grout into permeable zones; pressure maintained until grout sets.
- ____ Over-reaming of well casing and screen, pulling casing and screen from hole.
- ____ Milling out of casing and screen.
- X Drilling out well casing, screen and grout to original borehole diameter, removal of materials by flushing.
- X Pumping of grout through tremie pipe to fill borehole.
- ____ Other (describe) _____

PIEZOMETER ABANDONMENT (cont'd)

Footage actually abandoned (From/To): 0 - 65

Abandonment problems or deviations from abandonment specifications:

Drilled 5' into rock which was encountered at 60'

Grout mix used: 4 94 lb. bags cement to approximately 30 gallons of water + 5% bentonite

GROUT PUMPED:

Number of Cubic Yards	Weight as Pumped	Date Pumped
1.06		5-6-94

SITE CLEANUP PIEZOMETER

Disposal of Piezometer pad, posts and other materials: On Site

Disposal of Piezometer well screens(s) and casing: On Site

Disposal of drilling mud: N/A

Disposal of excess grout: On Site

Date site cleanup completed: 5-10-94

Site inspected by: Jason Flippo Date: 5-10-94

Report prepared by: Jason Flippo Date: 5-12-94

Data accuracy verified by: Peter J. Walls Date: 5-13-94

PIEZOMETER ABANDONMENT COMMENTS

RUST ENVIRONMENT & INFRASTRUCTURE

PIEZOMETER ABANDONMENT REPORT

GENERAL INFORMATION

Site Name: PIEDMONT LANDFILL

Piezometer Number: P-14-S

Location: KERNERSVILLE, NC

Project Name: DESIGN HYDROGEOLOGIC - PIEZOMETER ABANDONMENT

Latitude:

Longitude:

Location Description: SEE LOCATION PLAN

County: FORSYTH

Installation Contractor: ECS

Date Installed: 2-17-94

Abandonment Contractor: ECS

Driller:

Oversight Contractor: RUST

Oversight: JASON FLIPPO

Piezometer Abandonment: Date Started: 5-3-94

Date Completed: 5-3-94

PRE-ABANDONMENT MEASUREMENT

Height of Piezometer or top of well above ground surface: 2.63 (ft)

Depth of Piezometer below ground surface: 40.4 (ft)

Measured depth from ground surface to bottom of piezometer: 40.4 (ft)

Depth from ground surface to static water level: 37.8 (ft)

Total drilled depth of abandonment borehole: 41 (ft) Diameter: 6 (in)

Ground surface elevation (mean sea level): 805.8 (ft)

Reason for well abandonment: TEMPORARY PIEZOMETER

LANDFILL DEVELOPMENT

PIEZOMETER ABANDONMENT

General abandonment method(s) used (check where applicable):

- ____ Pumping of grout through tremie pipe to fill inside of well screen and casing.
- ____ Pressurized injection of grout into filter pack, screen and casing; pressure maintained until grout sets.
- ____ Cutting of casing and pressurized injection of grout into permeable zones; pressure maintained until grout sets.
- X Over-reaming of well casing and screen, pulling casing and screen from hole.
- ____ Milling out of casing and screen.
- ____ Drilling out well casing, screen and grout to original borehole diameter, removal of materials by flushing.
- X Pumping of grout through tremie pipe to fill borehole.
- ____ Other (describe)

PIEZOMETER ABANDONMENT (cont'd)

Footage actually abandoned (From/To): 0 - 41

Abandonment problems or deviations from abandonment specifications:

Grout mix used: 4 94 lb. bags cement to approximately 30 gallons of water + 5% bentonite

GROUT PUMPED:

Number of Cubic Yards	Weight as Pumped	Date Pumped
0.66		5-3-94

SITE CLEANUP PIEZOMETER

Disposal of Piezometer pad, posts and other materials: On Site

Disposal of Piezometer well screens(s) and casing: On Site

Disposal of drilling mud: N/A

Disposal of excess grout: On Site

Date site cleanup completed: 5-10-94

Site inspected by: Jason Flippo Date: 5-10-94

Report prepared by: Jason Flippo Date: 5-12-94

Data accuracy verified by: Peter J. Walls Date: 5-13-94

PIEZOMETER ABANDONMENT COMMENTS

RUST ENVIRONMENT & INFRASTRUCTURE

PIEZOMETER ABANDONMENT REPORT

GENERAL INFORMATION

Site Name: PIEDMONT LANDFILL

Piezometer Number: P-15-D

Location: KERNERSVILLE, NC

Project Name: DESIGN HYDROGEOLOGIC - PIEZOMETER ABANDONMENT

Latitude: _____ Longitude: _____

Location Description: SEE LOCATION PLAN

County: FORSYTH

Installation Contractor: ECS

Date Installed: 3-11-94

Abandonment Contractor: ECS

Driller: _____

Oversight Contractor: RUST

Oversight: JASON FLIPPO

Piezometer Abandonment: Date Started: 5-3-94 Date Completed: 5-3-94

PRE-ABANDONMENT MEASUREMENT

Height of Piezometer or top of well above ground surface: 2.03 (ft)

Depth of Piezometer below ground surface: 52.6 (ft)

Measured depth from ground surface to bottom of piezometer: 52.6 (ft)

Depth from ground surface to static water level: 14.26 (ft)

Total drilled depth of abandonment borehole: 37 (ft) Diameter: 9 (in)

Ground surface elevation (mean sea level): 766.2 (ft)

Reason for well abandonment: TEMPORARY PIEZOMETER LANDFILL DEVELOPMENT

PIEZOMETER ABANDONMENT

General abandonment method(s) used (check where applicable):

- ____ Pumping of grout through tremie pipe to fill inside of well screen and casing.
- ____ Pressurized injection of grout into filter pack, screen and casing; pressure maintained until grout sets.
- ____ Cutting of casing and pressurized injection of grout into permeable zones; pressure maintained until grout sets.
- ____ Over-reaming of well casing and screen, pulling casing and screen from hole.
- ____ Milling out of casing and screen.
- X Drilling out well casing, screen and grout to original borehole diameter, removal of materials by flushing.
- X Pumping of grout through tremie pipe to fill borehole.
- ____ Other (describe) _____

PIEZOMETER ABANDONMENT (cont'd)

Footage actually abandoned (From/To): 0 - 37

Abandonment problems or deviations from abandonment specifications:
Drilled 5' into rock which was encountered at 32'

Grout mix used: 4 94 lb. bags cement to approximately 30 gallons of water + 5% bentonite

GROUT PUMPED:

Number of Cubic Yards	Weight as Pumped	Date Pumped
0.60		5-6-94

SITE CLEANUP PIEZOMETER

Disposal of Piezometer pad, posts and other materials: On Site

Disposal of Piezometer well screens(s) and casing: On Site

Disposal of drilling mud: N/A

Disposal of excess grout: On Site

Date site cleanup completed: 5-10-94

Site inspected by: Jason Flippo Date: 5-10-94

Report prepared by: Jason Flippo Date: 5-12-94

Data accuracy verified by: Peter J. Walls Date: 5-13-94

PIEZOMETER ABANDONMENT COMMENTS

RUST ENVIRONMENT & INFRASTRUCTURE

PIEZOMETER ABANDONMENT REPORT

GENERAL INFORMATION

Site Name: PIEDMONT LANDFILL

Piezometer Number: P-15-S

Location: KERNERSVILLE, NC

Project Name: DESIGN HYDROGEOLOGIC - PIEZOMETER ABANDONMENT

Latitude: _____ Longitude: _____

Location Description: SEE LOCATION PLAN

County: FORSYTH

Installation Contractor: ECS Date Installed: 2-16-94

Abandonment Contractor: ECS Driller: _____

Oversight Contractor: RUST Oversight: JASON FLIPPO

Piezometer Abandonment: Date Started: 5-9-94 Date Completed: 5-9-94

PRE-ABANDONMENT MEASUREMENT

Height of Piezometer or top of well above ground surface: 2.87 (ft)

Depth of Piezometer below ground surface: 21.0 (ft)

Measured depth from ground surface to bottom of piezometer: 21.0 (ft)

Depth from ground surface to static water level: 14.14 (ft)

Total drilled depth of abandonment borehole: 21 (ft) Diameter: 6 (in)

Ground surface elevation (mean sea level): 766.9 (ft)

Reason for well abandonment: TEMPORARY PIEZOMETER LANDFILL DEVELOPMENT

PIEZOMETER ABANDONMENT

General abandonment method(s) used (check where applicable):

- ____ Pumping of grout through tremie pipe to fill inside of well screen and casing.
- ____ Pressurized injection of grout into filter pack, screen and casing; pressure maintained until grout sets.
- ____ Cutting of casing and pressurized injection of grout into permeable zones; pressure maintained until grout sets.
- ____ Over-reaming of well casing and screen, pulling casing and screen from hole.
- ____ Milling out of casing and screen.
- X Drilling out well casing, screen and grout to original borehole diameter, removal of materials by flushing.
- X Pumping of grout through tremie pipe to fill borehole.
- ____ Other (describe) _____

PIEZOMETER ABANDONMENT (cont'd)

Footage actually abandoned (From/To): 0 - 21

Abandonment problems or deviations from abandonment specifications: _____

Grout mix used: 4 94 lb. bags cement to approximately 30 gallons of water + 5% bentonite

GROUT PUMPED:

Number of Cubic Yards	Weight as Pumped	Date Pumped
0.34		5-9-94

SITE CLEANUP PIEZOMETER

Disposal of Piezometer pad, posts and other materials: On Site

Disposal of Piezometer well screens(s) and casing: On Site

Disposal of drilling mud: N/A

Disposal of excess grout: On Site

Date site cleanup completed: 5-10-94

Site inspected by: Jason Flippo Date: 5-10-94

Report prepared by: Jason Flippo Date: 5-12-94

Data accuracy verified by: Peter J. Walls Date: 5-13-94

PIEZOMETER ABANDONMENT COMMENTS

RUST ENVIRONMENT & INFRASTRUCTURE

PIEZOMETER ABANDONMENT REPORT

GENERAL INFORMATION

Site Name: PIEDMONT LANDFILL

Piezometer Number: P-16 Location: KERNERSVILLE, NC

Project Name: DESIGN HYDROGEOLOGIC - PIEZOMETER ABANDONMENT

Latitude: Longitude:

Location Description: SEE LOCATION PLAN

County: FORSYTH

Installation Contractor: ECS Date Installed: 3-12-94

Abandonment Contractor: ECS Driller: ECS

Oversight Contractor: RUST Oversight: JASON FLIPPO

Piezometer Abandonment: Date Started: 5-9-94 Date Completed: 5-9-94

PRE-ABANDONMENT MEASUREMENT

Height of Piezometer or top of well above ground surface: 3.05 (ft)

Depth of Piezometer below ground surface: 44.5 (ft)

Measured depth from ground surface to bottom of piezometer: 44.5 (ft)

Depth from ground surface to static water level: 32.52 (ft)

Total drilled depth of abandonment borehole: 22 (ft) Diameter: 9 (in)

Ground surface elevation (mean sea level): 811.2 (ft)

Reason for well abandonment: TEMPORARY PIEZOMETER

LANDFILL DEVELOPMENT

PIEZOMETER ABANDONMENT

General abandonment method(s) used (check where applicable):

- ____ Pumping of grout through tremie pipe to fill inside of well screen and casing.
- ____ Pressurized injection of grout into filter pack, screen and casing; pressure maintained until grout sets.
- ____ Cutting of casing and pressurized injection of grout into permeable zones; pressure maintained until grout sets.
- ____ Over-reaming of well casing and screen, pulling casing and screen from hole.
- ____ Milling out of casing and screen.
- X Drilling out well casing, screen and grout to original borehole diameter, removal of materials by flushing.
- X Pumping of grout through tremie pipe to fill borehole.
- ____ Other (describe)

PIEZOMETER ABANDONMENT (cont'd)

Footage actually abandoned (From/To): 0 - 22

Abandonment problems or deviations from abandonment specifications

Drilled 5' into rock which was encountered at 17'

Grout mix used: 4 94 lb. bags cement to approximately 30 gallons of water + 5% bentonite

GROUT PUMPED:

Number of Cubic Yards	Weight as Pumped	Date Pumped
0.36		5-9-94

SITE CLEANUP PIEZOMETER

Disposal of Piezometer pad, posts and other materials: On Site

Disposal of Piezometer well screens(s) and casing: On Site

Disposal of drilling mud: N/A

Disposal of excess grout: On Site

Date site cleanup completed: 5-10-94

Site inspected by: Jason Flippo Date: 5-10-94

Report prepared by: Jason Flippo Date: 5-12-94

Data accuracy verified by: Peter J. Walls Date: 5-13-94

PIEZOMETER ABANDONMENT COMMENTS