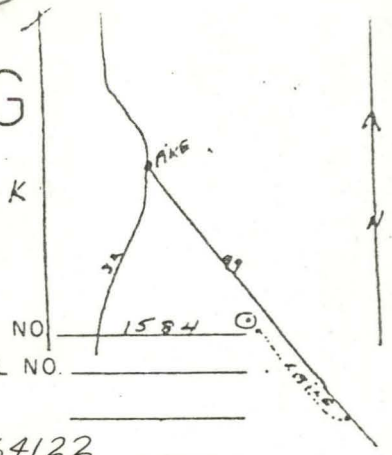


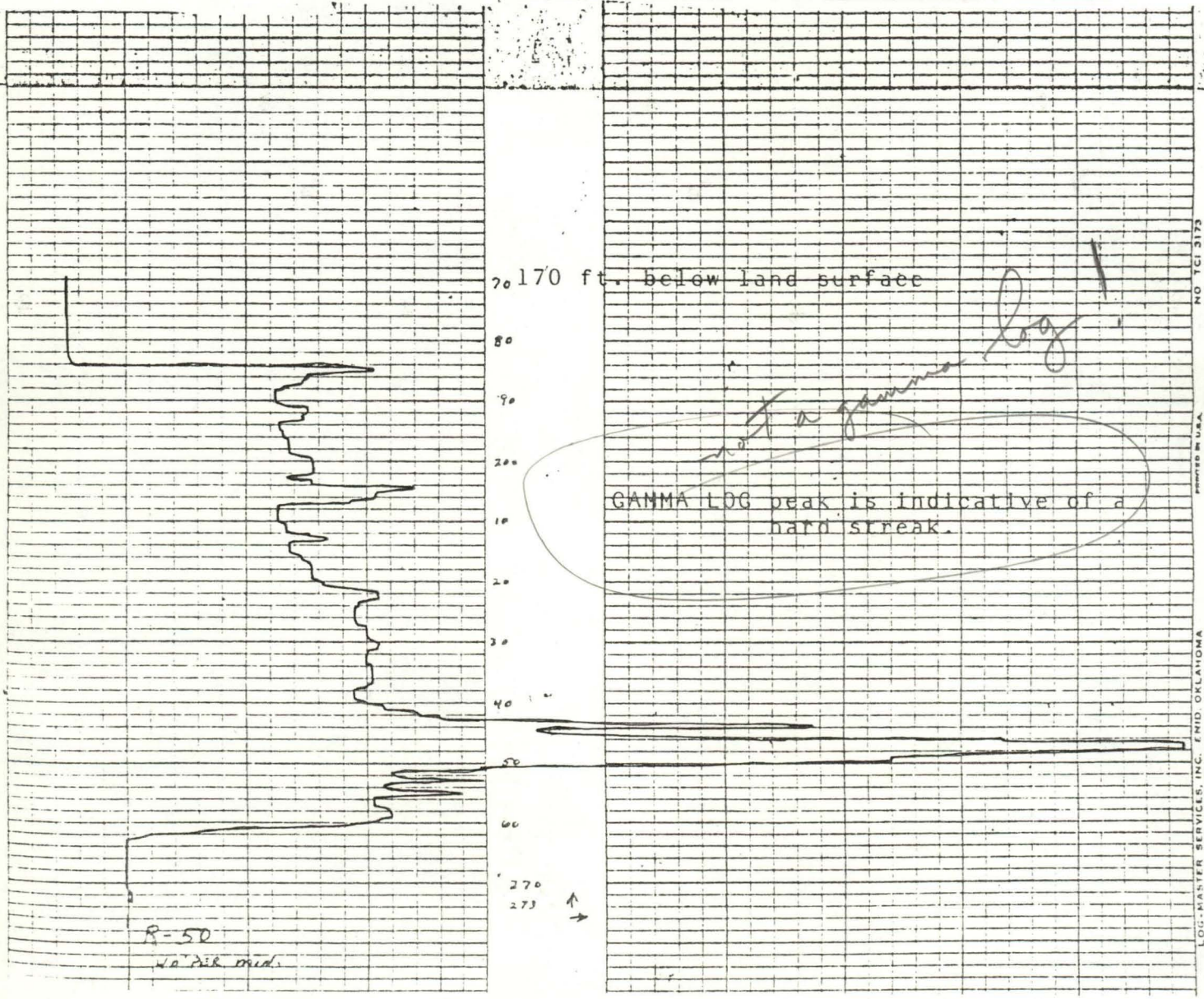
WAS-T-1-83

GEOPHYSICAL LOG

NORTH CAROLINA
DIVISION OF GROUND WATER
DEPARTMENT OF WATER AND AIR RESOURCES



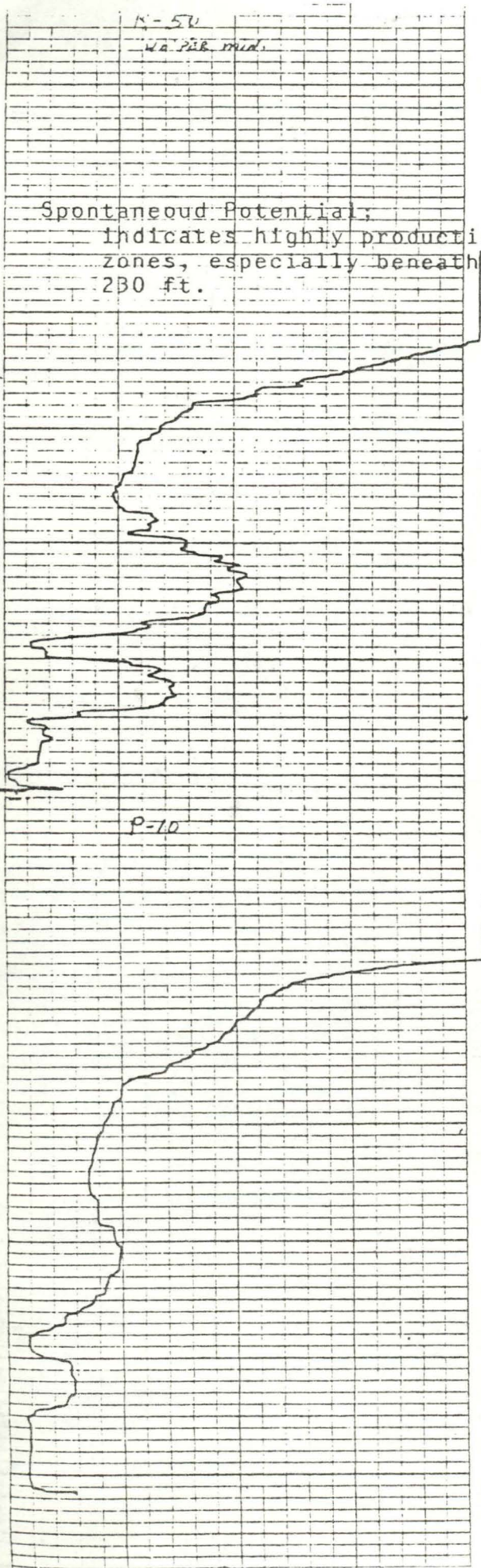
LOG BY: OSCAR HOWARD DATE: 12-16-83 LOG NO. 1584 WELL NO. _____
 LOCATION: DANNENBURG PROPERTIES INC. COUNTY: WASHINGTON
4 MILES S.E. OF PIKE, ON RIGHT OR W. SIDE OF 99 354505 / 764122
 OWNER: DANNENBURG PROPERTIES INC. DRILLER: CRAVEN WELL DRILLING DATE DRILLED: 12-15-83
 DEPTH: 273 ft. DIA: 4 in CASING: 180 ft. ELEV: _____ rsl MSL
 POTENTIAL: 10-25 mv/10 div. RESISTIVITY: 50-100 ohms/10 div.
 MR/HR: CS 1 + 2
 LOGGING RATE: PR 40 ft/min. GAMMA 16 ft/min. T. C.: 2



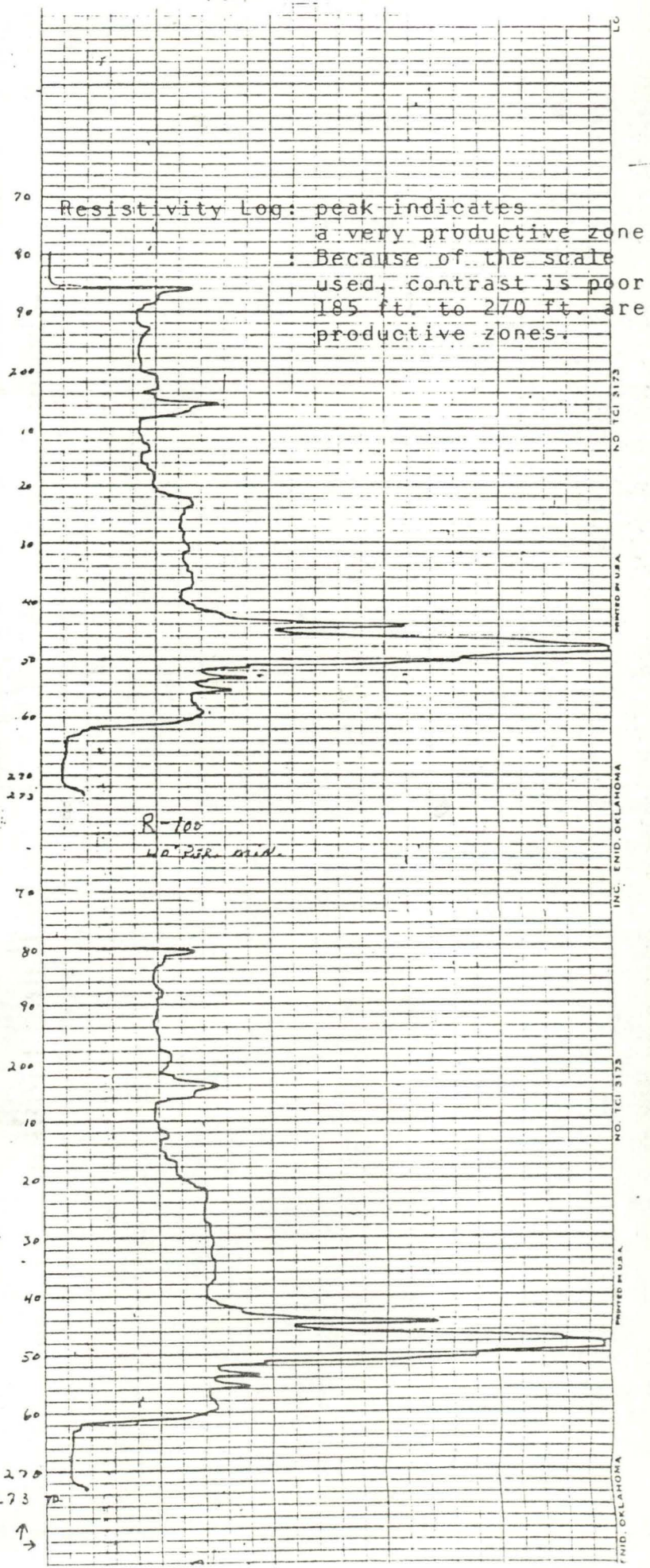
NO. TCI 3175
 PRINTED IN U.S.A.
 LOG-MASTER SERVICES, INC. ENID, OKLAHOMA

N-50
No. 218 mid.

Spontaneous Potential;
indicates highly productive
zones, especially beneath
230 ft.



P-10



Resistivity Log: peak indicates
a very productive zone
: Because of the scale
used, contrast is poor
185 ft. to 270 ft. are
productive zones.

R-100
No. 218 mid.

270
273
↑
→

NO. TCI 3173
PRINTED IN U.S.A.
INC. ENID, OKLAHOMA
NO. TCI 3173
PRINTED IN U.S.A.
ENID, OKLAHOMA

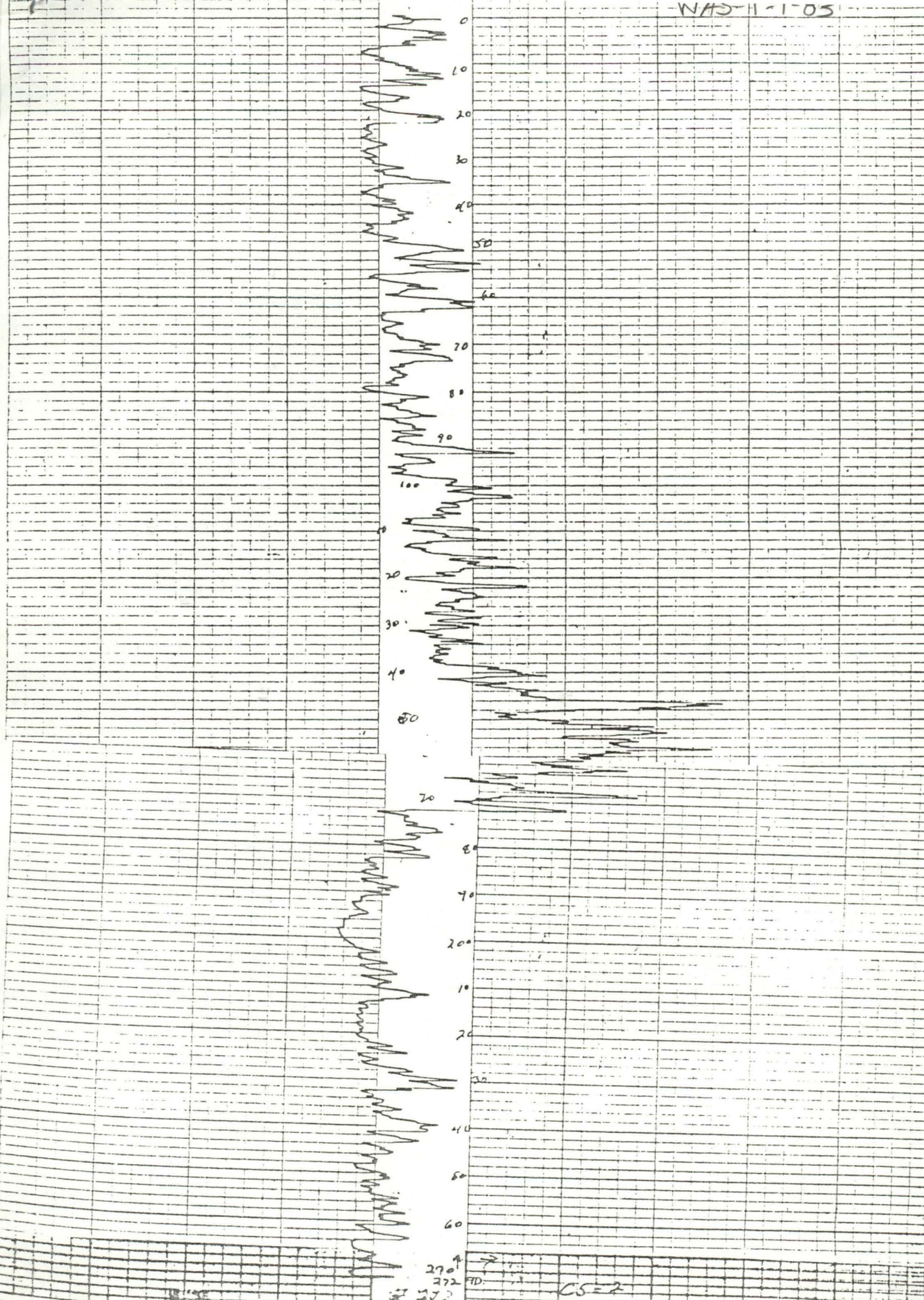
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LOG-MASTER SERVICES, INC. ENID, OKLAHOMA

NO. ICI 3173

PRINTED IN USA

LOG-MASTER SERVICES, INC. ENID, OKLAHOMA



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CS=2
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W E L L R E C O R D

FOR

IRRIGATION WELL # 1

DANNENBERG PROPERTIES

Washington County, NC

January, 1984

Contractor: Craven Well Service, Inc.
P.O. Box 248
Bridgeton, North Carolina 28519
(919) 637-2045 / 638-1702
Owner: Raymond Benton

Geologist: Edwin E. Andrews, III
P.O. Box 33634
Raleigh, North Carolina 27606
(919) 851-6145

RKA

Hydrogeology
Geology
Environmental Sciences
Soils

RUSSNOW, KANE & ANDREWS

Post Office Box 33634
Raleigh, North Carolina 27606
(919) 851-6145

WH-T-1-84

Offices:
Raleigh, North Carolina
Newport News, Virginia

January 14, 1984

Mr. Uli Bennewitz, President
AgResource, Ltd.
P.O. Box 158
Engelhard, North Carolina 27824

Dear Mr. Bennewitz:

Enclosed are all of the well records that are needed for future reference. Four sets are submitted to your office as well as a set to Craven Well Drilling and one to the North Carolina Department of Natural Resources and Community Development.

Because of the high yield, it is possible to install a pump capable of delivering 2200 gallons per minute. The top of the pump bowls should be set at least 80 feet below the top of the casing. Based on pumping for 70 continuous days, during a drought the pump should deliver at free discharge from a pumping level of 60 feet below land surface.

At these high rates of pumping, it is possible that sand may be pumped after the first season. If the sand content becomes excessive, it will be necessary to add the screen at that time (described in the Specifications). The water quality at this time appears to be hard as expected from the domestic wells in the area. After the well has been pumped this summer, a chemical analysis of the water should be performed.

It has been a pleasure to work with you on this project, and I hope whichever irrigation system you select will prove highly profitable.

Very truly yours,

RUSSNOW, KANE & ANDREWS

E. E. Andrews, III
Consulting Geologist

EEA;sba
Enclosure

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES & COMMUNITY DEVELOPMENT

WELL RECORD

DIVISION OF ENVIRONMENTAL MANAGEMENT, GROUNDWATER SECTION

P.O. BOX 27687 - RALEIGH, N.C. 27611

93-0064 WC.0028

DRILLING CONTRACTOR Craven Well

REG. NO.

WELL CONSTRUCTION PERMIT NO.

1. WELL LOCATION: (Show sketch of the location below)

Nearest Town: Plymouth County: Washington
Route 99
(Road, Community or Subdivision and Lot No.)

2. OWNER: Dannenberg Properties, Inc.

DRILLING LOG

3. ADDRESS: P.O. Box 158, Engelhard, NC 27824

DEPTH FROM TO

FORMATION DESCRIPTION

4. TOPOGRAPHY: draw, valley, slope, hilltop, flat (circle one)

5. USE OF WELL: Irrigation DATE: 1-12-84

6. DOES THIS WELL REPLACE AN EXISTING WELL? No

7. TOTAL DEPTH: 320 RIG TYPE OR METHOD: Reverse

8. FORMATION SAMPLES COLLECTED: YES X NO

9. CASING: Depth Inside Wall thick. type
Dia. or weight/ft.

From 2' to 185 ft 16" .375 A-53 B;k

10. GROUT: Depth Material Method

From 0 to 185 ft Type I Tremie

If additional space is needed, use back of form

11. SCREEN: Depth Dia. Type & Opening

From to ft n/a

LOCATION SKETCH
(Show distance to numbered roads, or other map reference points)

12. GRAVEL: Depth Size Material

From to ft n/a

13. WATER ZONES (depth): 285-320 ft.

14. STATIC WATER LEVEL: 13 ft. above top of casing
below

Casing is 2 ft. above land surface ELEV:

15. YIELD (gpm): 1500 METHOD OF TESTING: Time Dd.

16. PUMPING WATER LEVEL: 40 ft.

after 24 hours at 1500 gpm.

17. CHLORINATION: Type HTH Amount 15#

18. WATER QUALITY: TEMPERATURE (°F)

19. PERMANENT PUMP: Date Installed

Type Turbine Capacity 2000 (gpm) HP 50

Make Intake Depth 80'

Airline Depth Access Port

20. HAS THE OWNER BEEN PROVIDED A COPY OF THIS RECORD AND INFORMED OF THE DEPARTMENTS REQUIREMENTS AND RECOMMENDATIONS? Yes

21. REMARKS

I do hereby certify that this well was constructed in accordance with N.C. Well Construction Regulations and Standards and that this well record is true and exact.

SIGNATURE OF CONTRACTOR OR AGENT DATE

WELL DESCRIPTION

Dannenberg Farm - Well # 1

Well Construction:

Total Depth: 320 feet below land surface
 Casing Depth: 185 feet below land surface
 Casing Diameter: 16 inch diameter
 Casing Spec.: Wall Thickness - 0.375, welded,
 ASTM A-53
 Production Hole: Nominal 14 inch diameter (drilled
 reverse circulation)
 from 185 to 320 feet
 Grout: 185 feet to surface,
 Neat cement with Bentonite
 Hole Diameter
 for Outer Casing: 32 inch, drilled by conventional
 mud rotary

Hydrology:

Static Water Level: 13' 8" Top of Casing (TOC)

Test Pumping Rate: 1525 GPM

Pumping Level
 (after 24 hrs.): 41 feet below TOC

Specific Capacity: 55.8 GPM per ft. of drawdown

Transmissivity: 100,000 GPD/ft.

$$\frac{264 \times 1525}{5} = 80,520 \text{ GPD/ft}$$

Estimated Pumping Level at 2200 GPM \approx 55 feet. below land surface.

Estimated Pumping Level after 70 continuous days at 2200 GPM \approx
 60 feet below land surface.

Efficiency is greater than 95% because screen and drilling mud
 were not used in the production zone.

SEDIMENT ANALYSIS

Dannenberg Farms

Well # 1

Depth (ft.)	Lithologies
0-10	Black organic silty sand (0-2 ft) Grey-blue silty sand with clay (2-10 ft.)
10-20	Beige-brown fine-medium well sorted sand
20-30	Beige-green-grey fine silty sand
30-40	Beige-fine to medium very well sorted subrounded sand with thin streaks of clay
40-50	Grey-black-beige medium very well sorted subrounded sand; little glauconite
Vkt 50-60	Green black fine medium sand; well sorted with glauconite
60-70	Grey green medium quartzitic sand with glauconite and very few shells
70-80	Grey green medium quartzitic sand with fine glauconite and medium coarse shell hash
80-90	Grey green medium quartzitic sand with fine glauconite and coarse shell hash
90-100	Green grey medium quartzitic sand and medium shell hash with fine glauconite
100-110	Black-green-white coarse shell hash with medium sand
110-120	Green grey fine-medium sand with medium shell hash

SEDIMENT ANALYSIS

Dannenberg Farms

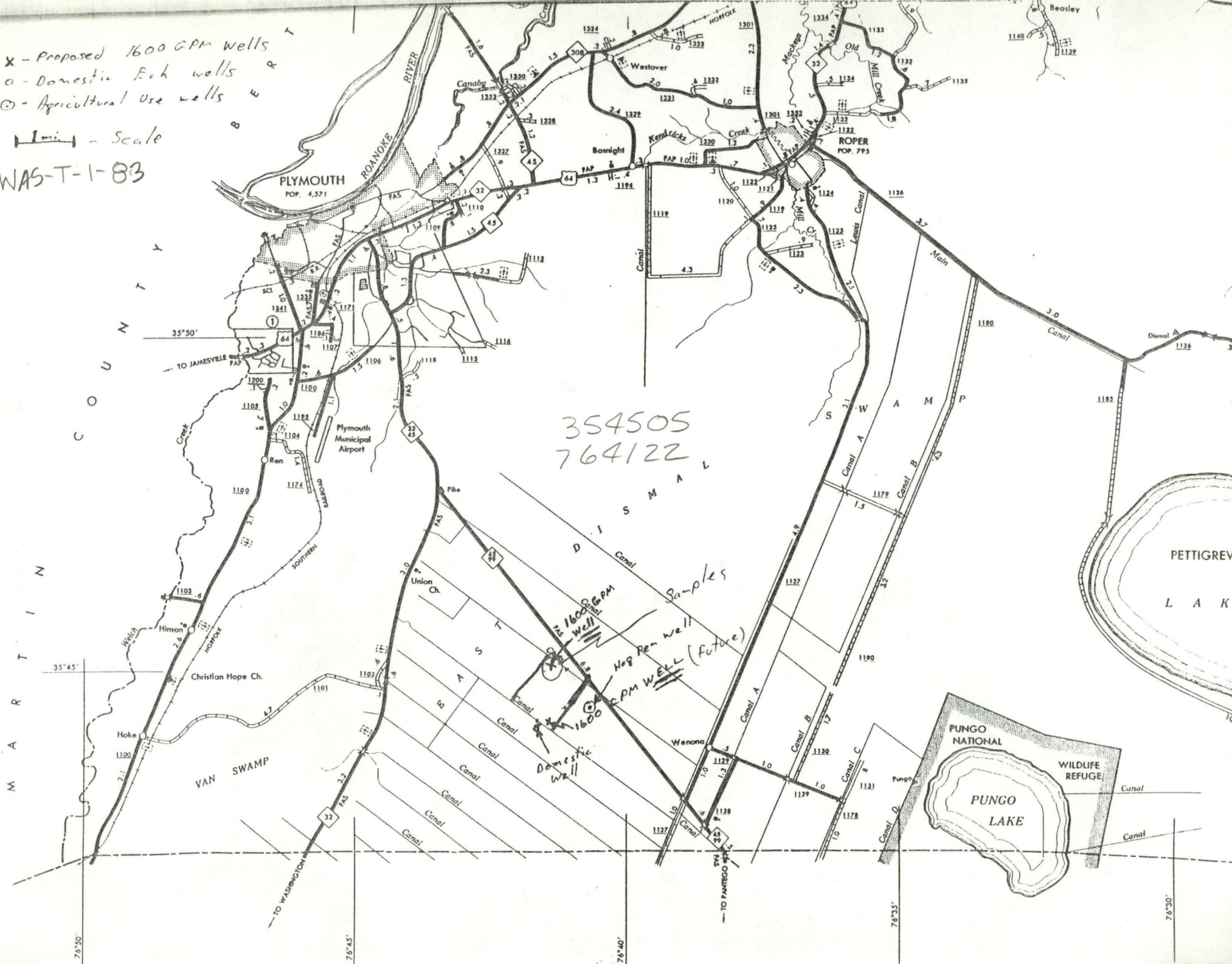
Well # 1

Depth (ft.)	Lithologies
120-130	Grey medium coarse shell hash with little quartzitic sand and glauconite
<u>VK</u> 130-140	Grey clay with coarse shells and silt
<u>PR</u> 140-150	Grey clay
150-160	Grey beige clay
160-170	Grey clay
<u>CH</u> 170-180	Grey clay with limestone
180-190	Grey-beige limestone - Castle Hayne
190-220	Beige-grey Castle Hayne limestone
220-240	Green grey limestone - Castle Hayne
240-250	Very hard drilling - grey coarse limestone
250-260	Grey hard limestone - Castle Hayne
260-270	Green grey limestone
270-280	Green grey limestone (Soft)

- X - Proposed 1600 GPM Wells
- o - Domestic Ech wells
- ⊙ - Agricultural Use wells

1 mi - Scale

WAS-T-1-83



354505
764122

1600 GPM Well
Domestic Well
Hog Pen well (future)

PUNGO NATIONAL WILDLIFE REFUGE
PUNGO LAKE

PETTIGREW LAKE