

#### **4.1.10 Transformer Storage Yard**

In 1950 to 1951, an on-site pit was used as a drainage receptor for oil from transformers. Sand was occasionally placed in the pit when oil was observed in the pit bottom. The total quantity of oil drained in this manner is unknown. From 1958 to 1977 this area was used for pesticide mixing and as a cleaning area for pesticide application equipment. The mixing area is reported to have been located in the southeast corner of the lot. In 1977, before pesticide mixing activities were moved to a different location, overland discharge from small spills, washout and excess disposal, was estimated at 350 gallons per week. Monitoring well 21GW1 was installed in 1984 to monitor groundwater quality in this vicinity.

#### **4.2 Soil Investigation**

In the fall of 1986 shallow soils at the HPIA were investigated by ESE using soil gas screening and laboratory analysis of soil boring samples.

##### **4.2.1 Soil Gas Survey**

The areas at the HPIA which were identified by the record search as potential sources of VOCs, were investigated during the Supplemental Characterization Study by using a soil gas technique. The results of the soil gas investigation were used to locate potential source locations and to determine the location of groundwater monitoring wells. Because of its high volatility, trichloroethylene (TCE) was used as the indicator compound to trace volatile plumes. TCE was detected in the following areas:

- Buildings 901, 902 and 903 - TCE was detected at a level of 1,497 parts per billion (ppb) in this area.
- Building 1100 - a single value of TCE was detected at a level of 152 ppb in this area.
- Buildings 1101, 1102, 1202, 1300, 1301, and 1302 - TCE was detected in the western and northwestern areas of building 1202; values ranged from 15 - 36,770 ppb. A single value of 295 ppb was detected on the eastern side of Building 1300.
- Buildings 1502, 1601 and 1602 - the area between Buildings 1601 and 1502 was found to contain high levels of TCE; the highest level was 703,000 ppb. The soil completely



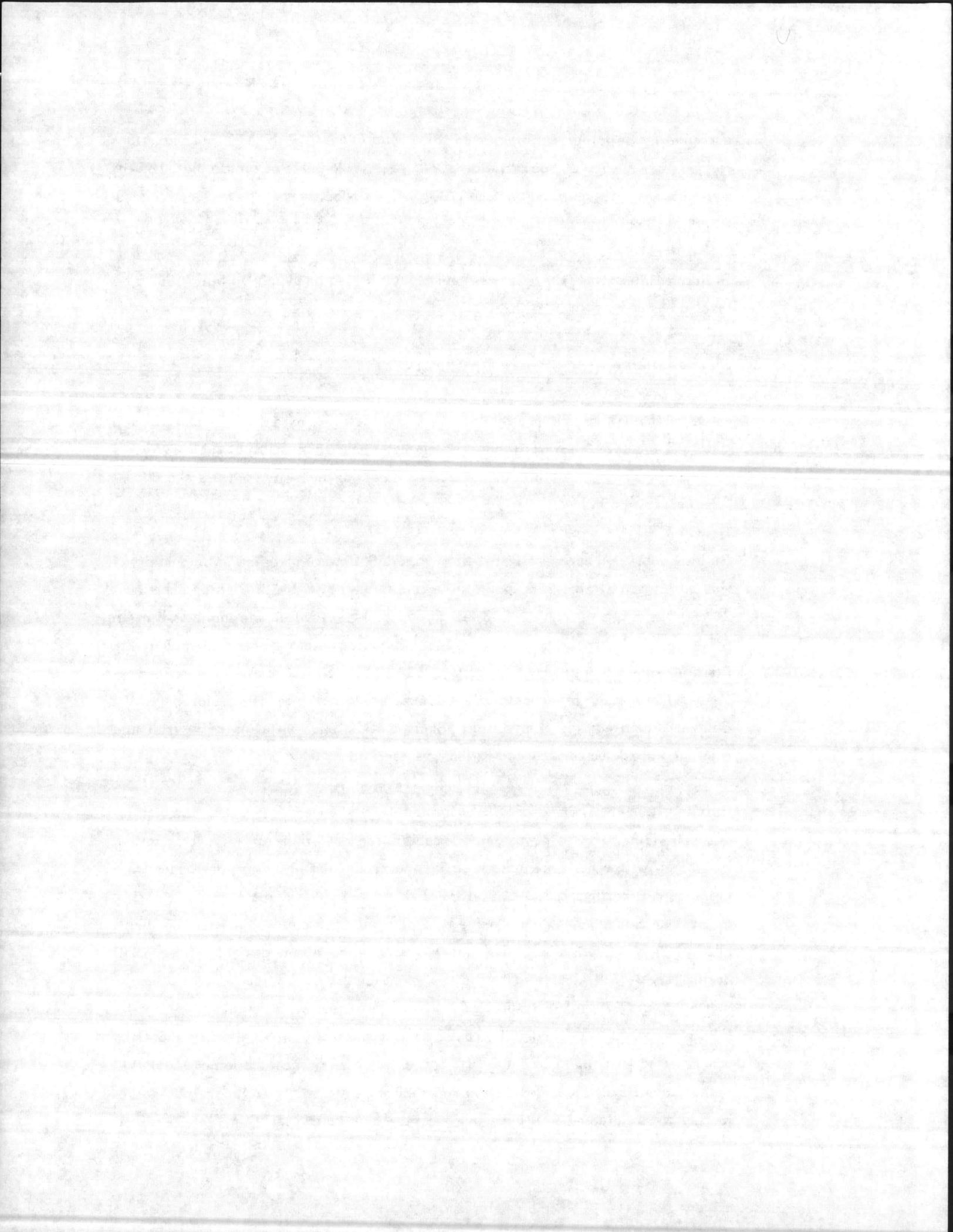
surrounding Building 1502 was found to be contaminated with TCE, concentrations ranged from 10 - 703,000 ppb. Building 1601 was also found to be contaminated on the southern (10 - 43 ppb) and eastern (79 - 703,000 ppb) sides. The western side of Building 1602 was found to be contaminated at levels ranging from 10 - 29 ppb.

- Buildings 1709 and 1710 - TCE was detected on the south side of Building 1709, at a level of 53,000 ppb.

#### **4.2.2 Soil Sampling**

The objective of the soil sampling program was to evaluate the extent of the shallow soil contamination (i.e., above the water table). Three major areas of concern at the HPIA were identified: Buildings 1601, 902 and 1202. A brief summary of the results of the soil analyses in these areas of concern follows.

- Building 902 - Soil borings HPSB-1 through HPSB-10 were installed in the vicinity of this building. HPSB-5 was found to be contaminated with 1,2-Dichloroethene at 2 - 4 feet at 55 µg/kg, and at 4 - 6 feet at 120 µg/kg. HPSB-6 was found to contain polyaromatic hydrocarbons at 0 - 2 feet, including phenanthrene at 500 µg/kg, fluoranthene at 690 µg/kg and pyrene at 530 µg/kg. Soil borings 1, 6 and 10 were analyzed for metals. Many metals were detected, but were in concentrations below the Contract-Required Detection Limit. Some metals, such as aluminum, iron and calcium, were detected at concentrations greater than 1000 mg/kg.
- Building 1202 - Soil borings HPSB-11 through HPSB-20 were installed in the vicinity of this building. HPSB-14 was found to contain concentrations of VOCs at a depth of 8 - 10 feet, with ethylbenzene at 62 µg/kg and xylene at 580 µg/kg. Pesticides were found in soil borings HPSB-11 and HPSB-15. Pesticides detected in soil boring HPSB-11 included heptachlor epoxide at 12 µg/kg at a depth of 2 - 4 feet, Endosulfan I at 16 µg/kg at a depth of 2 - 4 feet and DDT at 22 µg/kg at a depth of 2 - 4 feet. Soil boring HPSB-11 also contained Aroclor-1260 at depths of 0 - 2 feet and 4 - 6 feet at 290 µg/kg and 670 µg/kg, respectively. Three pesticides were found in soil boring HPSB-15 at 0 - 2 feet, Dieldrin was detected at a concentration of 38 µg/kg, 4,4'-DDE was detected at 97 µg/kg and 4,4'-DDT was detected at a concentration of 140 µg/kg. Soil borings HPSB-11, HPSB-15 and HPSB-20 were also analyzed for metals. Many metals were detected but were in concentrations below the Contract-Required



Detection Limit. Some metals, such as aluminum, iron and calcium, were detected at concentrations greater than 1000 mg/kg.

Building 1602 - Soil borings HPSB-21 through HPSB-30 were installed in the vicinity of this building. HPSB-23 exhibited detected levels of pesticides at 0 - 2 feet; these included Dieldrin at 92 µg/kg, 4,4'-DDE at 78 µg/kg and 4,4'-DDT at 40 µg/kg. Soil borings HPSB-21 and HPSB30 were analyzed for metals. Many metals were detected but were in concentrations below the Contract-Required Detection Limit. Some metals, such as aluminum, iron and calcium, were detected at concentrations greater than 1000 mg/kg.

#### **4.3 Surface Water and Sediment**

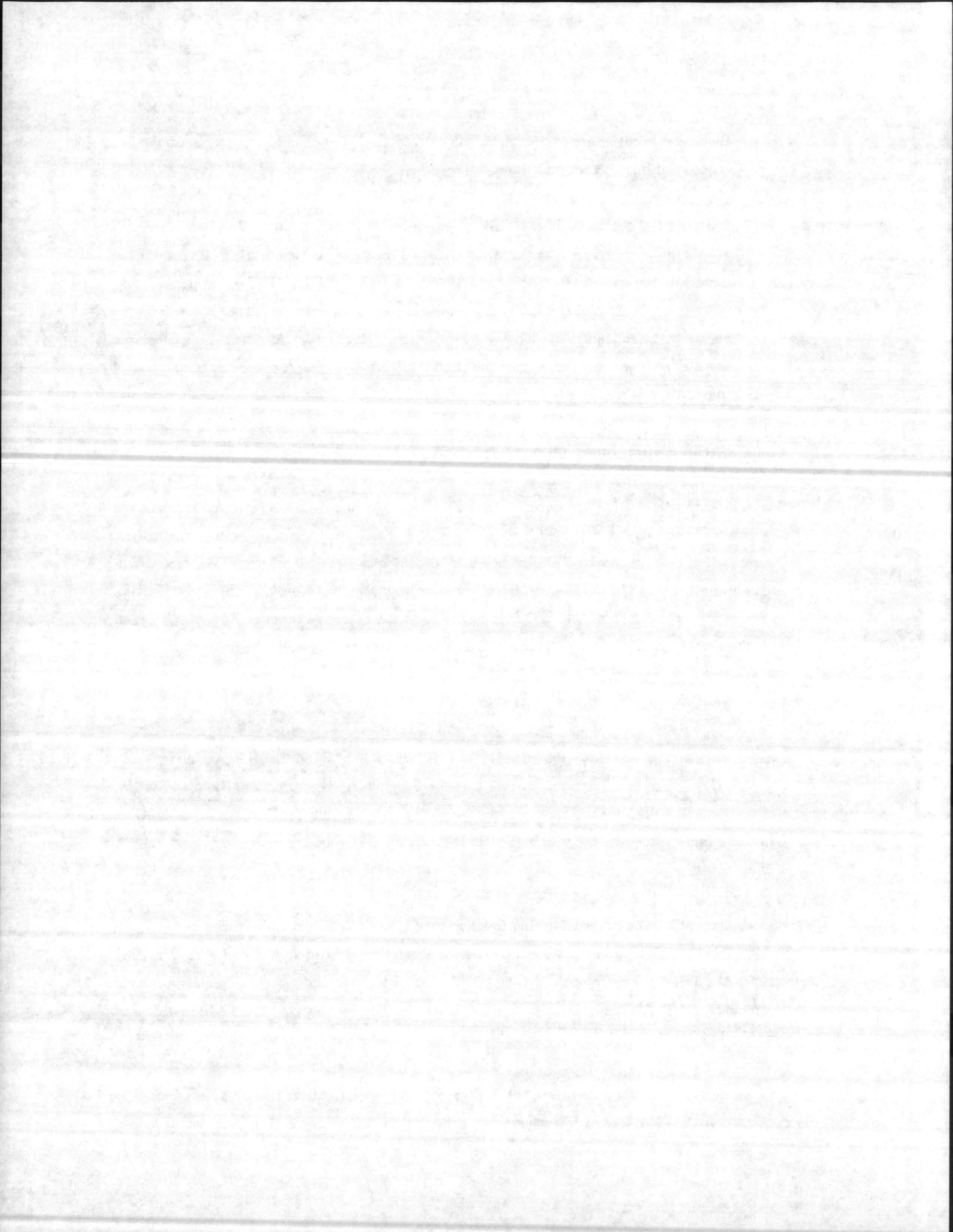
The aquifers at the HPIA flow toward the New River. Although the New River is less than one-quarter mile away from the Site, no surface water or sediment sampling was performed. A drainage ditch, located north of the Tank Farm, drains into Bear Head Creek, Wallace Creek and eventually into the New River. No information was provided from the ESE investigation on the quality of surface water and sediments within the drainage ditch or Bear Head Creek which flows into the New River. This is an issue that will be evaluated in the future.

#### **4.4 Shallow Aquifer Investigation**

Twenty nine (29) shallow monitoring wells were installed at HPIA during the Characterization phase (September 1986 through August 1987). Additionally, one shallow well also was installed at the Transformer Storage Yard during the Verification Investigation. Available shallow monitoring well logs and construction diagrams are included in Appendix A of this report.

ESE conducted groundwater sampling in a series of four sampling rounds (three in 1987 and one in January 1991). Samples were analyzed for VOCs, Total Lead and oil and grease in 1987 and for the full Target Compound List (TCL) parameters (including TCL volatile organic compounds, semivolatile organics, pesticides/PCBs and Target Analyte List (TAL) metals and cyanide) in 1991.

This section describes the results of the shallow aquifer investigation at each area of concern described in Section 4.1. Tables have been generated for each area to present detected



contaminant concentrations in groundwater. All tables in Section 4.0 were constructed from data included in Appendix I of the 1991 ESE report. Accuracy of the ESE summary tables must be assumed, as raw analytical data supplied by the laboratory was not provided.

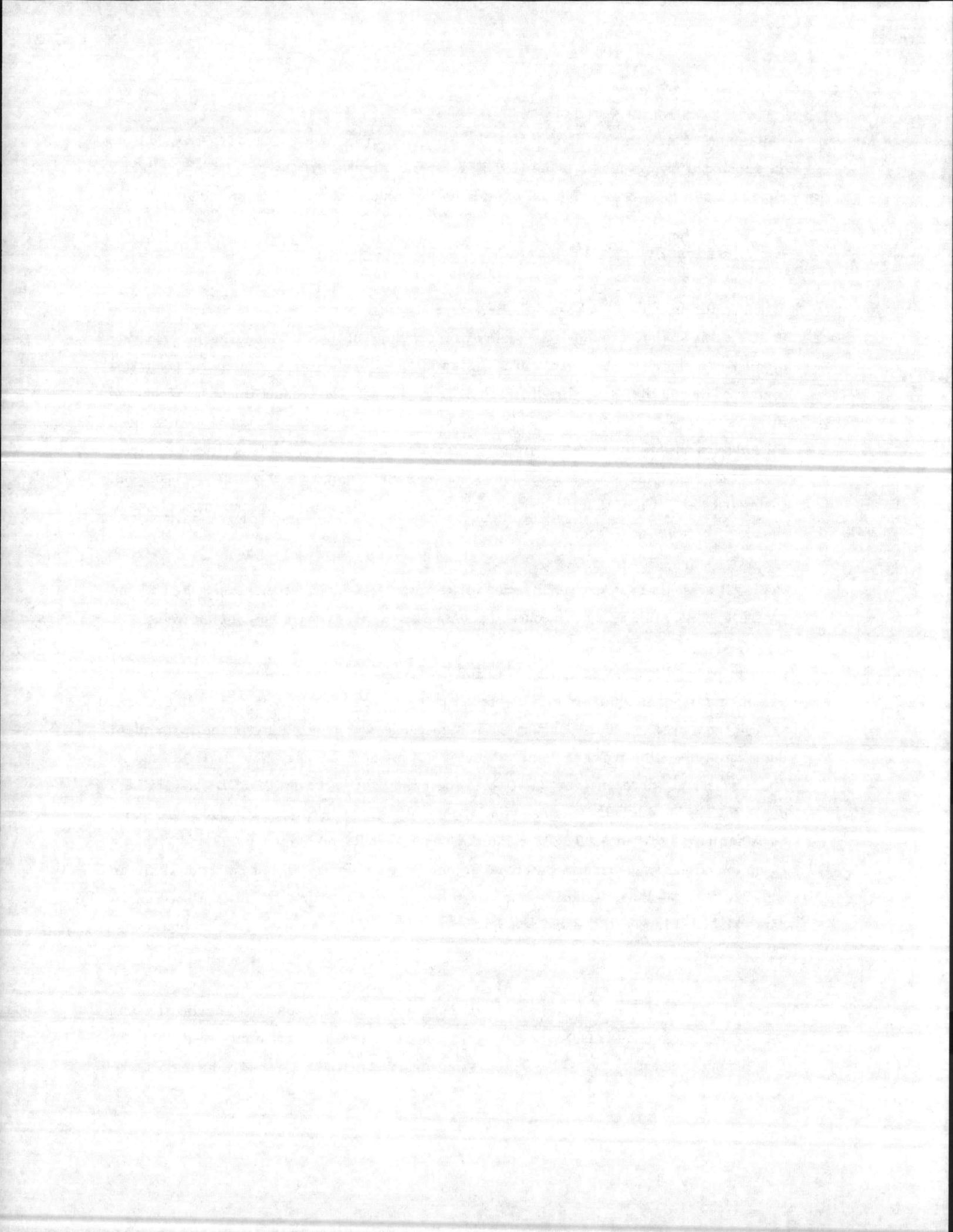
#### 4.4.1 Hadnot Point Fuel Tank Farm

Two monitoring wells (22GW1 and 22GW2) were installed during the Characterization phase to determine shallow groundwater quality in the vicinity of the Fuel Tank Farm. Floating product and the characterization of a contaminant plume(s) were among the activities conducted during the 1988 O'Brien and Gere investigation. The product thickness measured in wells ranged from 0.24 feet (MW-15) to 15.34 feet (MW-16); however, the measured thickness in the well may represent approximately four times the actual thickness of free-product on the groundwater surface due to the accumulation of product within the open well casing (Obrien & Gere, 1988). The study also characterized a benzene contaminant plume in the vicinity of the Tank Farm.

Table 4-1 presents a summary of detected volatile organics, semivolatile organics, and oil and grease, and inorganic parameter concentrations detected in the two shallow aquifer wells.

Monitoring well 22GW1 samples have exhibited BTEX (benzene, toluene, ethylbenzene, xylene) in all four sampling rounds. Benzene concentrations have decreased from 13,000 µg/L to 7900 µg/L over the four-year period. Ethylbenzene was detected above the instrument detection limit (IDL) in Set One and estimated in the Supplementary Round. In the second and third set, ethylbenzene was not detected above the IDL. However, the IDL was very high due to the need to dilute the sample in the laboratory. Xylene increased from 9000 µg/L in Set One (January 1987) to 9800 µg/L in the Supplementary Round (January 1991). With the exception of methylene chloride, all other organic parameters were below detection limits in well 22GW2. Methylene chloride is a known laboratory contaminant. However, without a data validation report, this cannot be verified (no data validation reports are included with ESE's report).

Oil and grease concentrations in well 22GW1 have remained fairly consistent during the first three sampling rounds (7,000 - 11,000 µg/l). Oil and grease was not analyzed during the Supplemental Investigation. Oil and grease were detected in well 22GW2 only during Set One (800 µg/L).



**TABLE 4-1  
CONSTITUENTS DETECTED IN GROUNDWATER  
TANK FARM AREA**

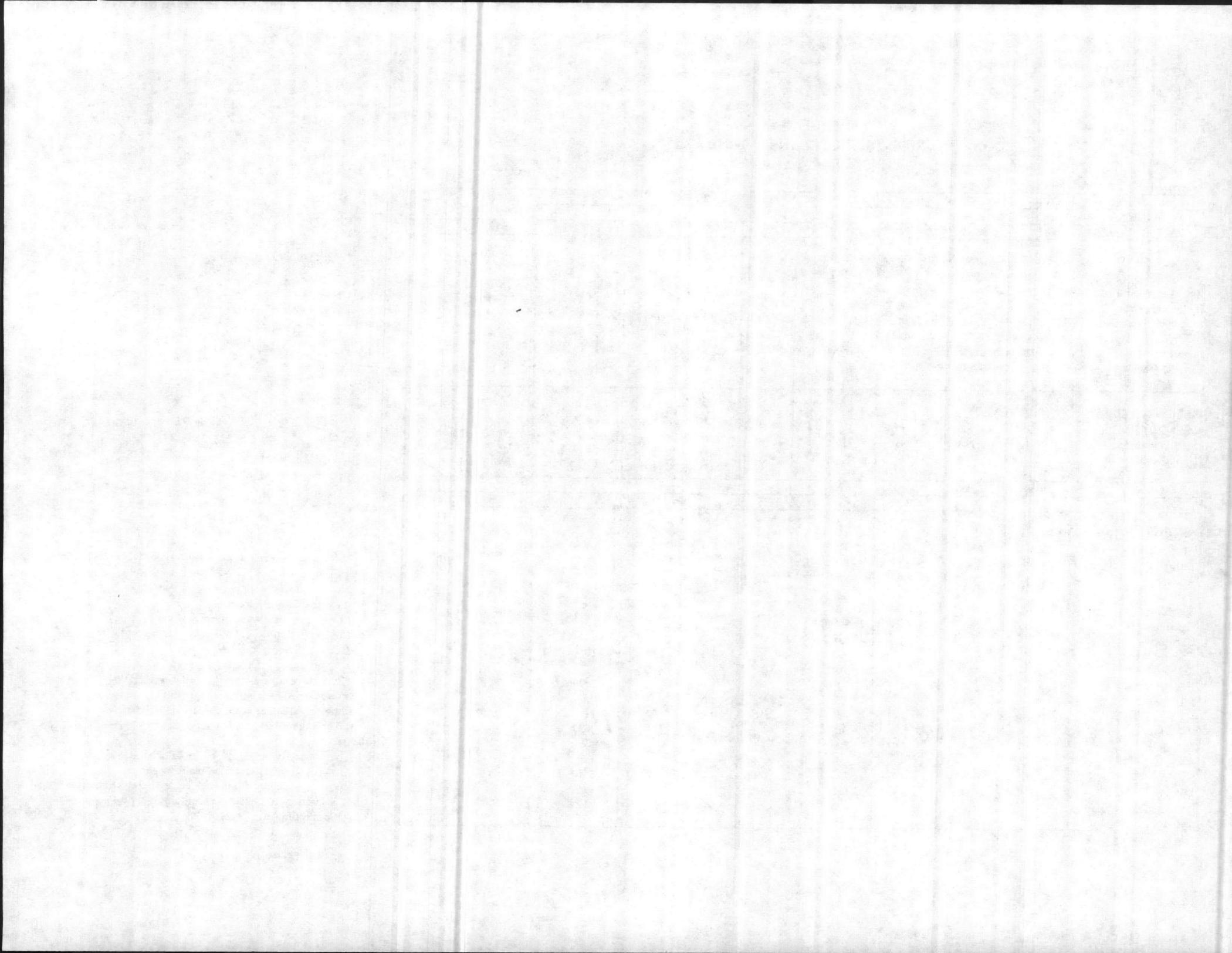
WELL NUMBER UNITS DATE SAMPLED	22GW1				22GW2				STANDARDS	
	ug/L				ug/L				NORTH CAROLINA*	PRIMARY MCLs
	1/9/87	3/8/87	5/27/87	1/18/91	1/9/8	3/8/8	5/27/87	1/18/91	ug/L	ug/L
<b>VOLATILES:</b>										
Benzene	12000	10000	13000	7900	< 1	< 1	< 1	< 5	1	5
Dichloroethane,1,2-	< 28	< 2800	< 2800	110 B	< 3	< 3	< 3	< 5	0.38	5
Ethyl benzene	1800	< 7200	< 7200	1900 J	< 7	< 7	< 7	< 5	29	700
Methylene chloride	< 28	< 2800	< 50000	5 U	7	< 3	< 50	< 5	5	5(1)
Trichloroethylene	< 30	< 1000	< 1000	5 J	< 1	< 3	< 1	< 5	2.8	5
Toluene	15000	18000	24000	16000	< 6	< 6	< 6	< 5	1000	1000
Xylene (total)	9000	< 12000	< 12000	9800	< 12	< 12	< 12	< 5	400	10000
<b>SEMIVOLATILES:</b>										
Methylnaphthalene,2-	NA	NA	NA	10 J	NA	NA	NA	< 10	-	-
Methylphenol,2-	NA	NA	NA	230	NA	NA	NA	< 10	-	-
Naphthalene	NA	NA	NA	28	NA	NA	NA	< 10	-	-
Oil & Grease	7000	11000	9000	NA	800	< 100	< 200	NA	-	-
Total Lead	33	29	78	307	28	< 27	< 49.2	16.2	50	15(2)
<b>INORGANICS:</b>										
Aluminum	NA	NA	NA	587000	NA	NA	NA	16900	-	-
Antimony				20.9 B				13.3 U	-	10/5(3)
Arsenic				50.3				11	50	50
Barium				804				67 B	1000	2000
Beryllium				5.8				0.5 U	-	1(1)
Calcium				33800				127000	-	-
Chromium				457				26.3	50	100
Cobalt				30.9 B				10.9 B	-	-
Copper				81.4				11.2 B	1000	1300(2)
Iron				101000				16200	300	-
Mercury				0.35				0.1 U	1.1	2
Nickel				186				17 B	150	100(1)
Potassium				24000				3030 B	-	-
Selenium				3.4 U				4.2 B	10	50
Silver				4.1 B				1.6 U	50	50(4)
Sodium				9560				8570	-	-
Vanadium				518				40.3 B	-	-
Zinc				295				91.8	5000	-
Cyanide				10 U				10 U	154	200(1)

**NOTES:**

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- NA - Not analyzed
- (-) - No standard set
- < - Less than detection limit
- 1 - Proposed maximum contaminant level (MCL)
- 2 - MCL is Action Level for Public Water Supply Systems, effective November 6, 1991.
- 3 - Two proposed MCLs
- 4 - Silver currently has an MCL of 50 ug/L; as of 7/30/92 silver will no longer have a primary MCL, its secondary MCL of 100 ug/L will become effective.

**QUALIFIERS:**

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- B - Analyte found in associated blank, organics
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The lead analyses represent total lead (unfiltered). Lead concentrations increased in well 22GW1 from 78 µg/L to 307 µg/L. Lead concentrations decreased from 28 µg/L to 16.2 µg/L in well 22GW2. Except for manganese and selenium, all inorganic parameters were present in higher concentrations in well 22GW1 than in well 22GW2.

#### **4.4.2 Buildings 1709 and 1710**

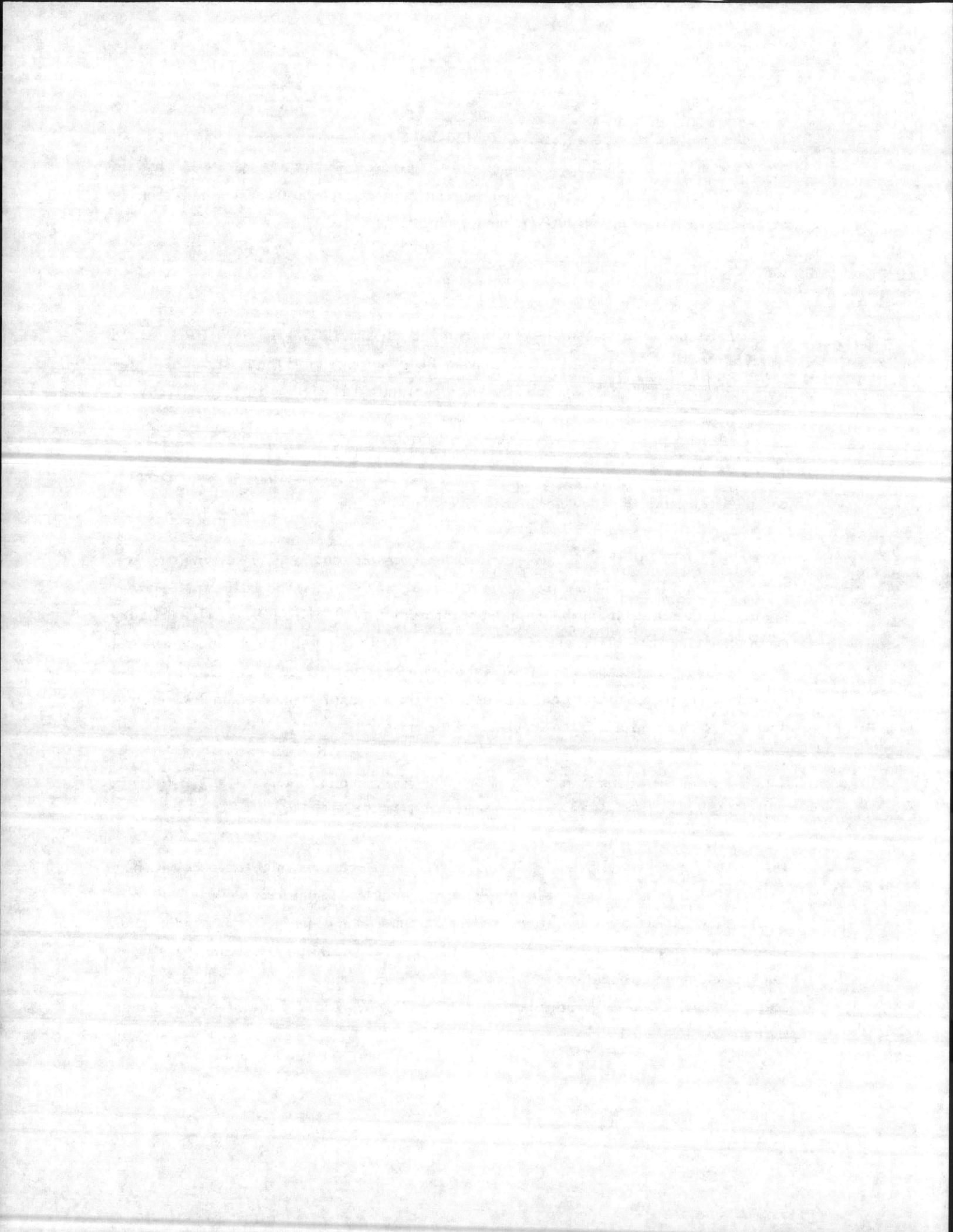
The four shallow wells situated in the vicinity of this site are HPGW1, HPGW2, HPGW3, and HPGW4. Based on the four sampling rounds HPGW2 appears to be the least contaminated well and HPGW4 appears to be the most contaminated well with respect to VOC contamination.

Table 4-2 presents a summary of detected volatile organics, oil and grease and inorganic parameter concentrations detected in the shallow aquifer wells.

All wells installed in this vicinity exhibited some organic contamination during the first sampling round (i.e., January 1987). However, only wells HPGW1 and HPGW4-1 showed organic contamination in the Supplemental Sampling Round (1991). The primary contaminants include BTEX, and oil and grease. Well HPGW4-1 also exhibited low levels of TCE and 1,2-DCE in addition to BTEX. Oil and grease were detected in the first and second rounds for all wells, but were not present in the third sampling round. Samples were not analyzed for oil and grease in the Supplemental Round.

Total lead concentrations increased over the four year sampling interval (1987 to 1991) in wells HPGW2 and HPGW4-1 and decreased in wells HPGW1 and HPGW3.

During the Supplemental Sampling Round, silver was detected in a higher concentration in well HPGW1 than the other wells in this vicinity. Arsenic and selenium in well HPGW2 were present above detected concentrations in the other associated wells. Antimony and cyanide were present in higher concentrations in well HPGW3. Aluminum, barium, beryllium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, sodium, vanadium and zinc were all detected in well HPGW4-1 in higher concentrations than the other wells.



**TABLE 4-2  
CONSTITUENTS DETECTED IN GROUNDWATER  
BUILDINGS 1709 AND 1710**

WELL NUMBER UNIT	HPGW1				HPGW2				HPGW3				STANDARDS	
	ug/L				ug/L				ug/L				NORTH CAROLINA*	Primary MCLs
	1/9/87	3/8/87	5/27/8	1/18/91	1/9/87	3/8/87	5/27/8	1/18/91	1/9/87	3/8/87	5/27/8	1/18/91	ug/L	ug/L
<b>VOLATILES:</b>														
Acetone	NA	NA	NA	10 J	NA	NA	NA	10 U	NA	NA	NA	10 U	-	-
Benzene	43	3.9	< 1	5 U	12	< 1	< 1	5 U	1.4	< 1	< 1	5 U	1	5
Chloromethane	< 4.3	< 4.3	< 4.3	10 U	5	< 4.3	< 4.3	10 U	< 4.3	< 4.3	< 4.3	10 U	-	-
Dichloroethylene, trans-1,2-	< 1.6	< 1.6	< 1.6	N/A	< 1.6	< 1.6	< 1.6	NA	< 1.6	< 1.6	< 1.6	NA	-	100
Dichloroethylene, (total),1,2-	NA	NA	NA	73	NA	NA	NA	5 U	NA	NA	NA	5 U	-	-
Ethyl benzene	12	< 7.2	< 7.2	5 U	< 7.2	< 7.2	< 7.2	5 U	8.2	9	< 7.2	5 U	29	700
Methylene chloride	< 2.8	< 2.8	< 50	5 U	< 2.8	< 2.8	< 50	5 U	< 2.8	< 2.8	< 50	5 U	5	5 (1)
Trichloroethylene	< 3	< 3	< 1	91	< 3	< 3	< 1	5 U	< 3	< 3	< 1	5 U	2.8	5
Toluene	100	12	< 6	5 U	38	< 6	< 6	5 U	< 6	< 6	< 6	5 U	1000	1000
Trichloroethane, 1,1,1-	< 3.8	< 3.8	< 3.8	5 U	< 3.8	< 3.8	< 3.8	5 U	< 3.8	13	< 3.8	5 U	200	200
Xylene (total)	62	< 12	< 12	5 U	28	< 12	< 12	5 U	< 12	< 12	< 12	5 U	400	10000
Oil & Grease	700	< 100	< 200	NA	700	< 100	< 200	NA	800	200	< 200	NA	-	-
Total Lead	27	< 27	< 49.2	16.6	< 27	< 27	< 49.2	29.4	40	< 27	< 49.2	11.4	50	15 (2)

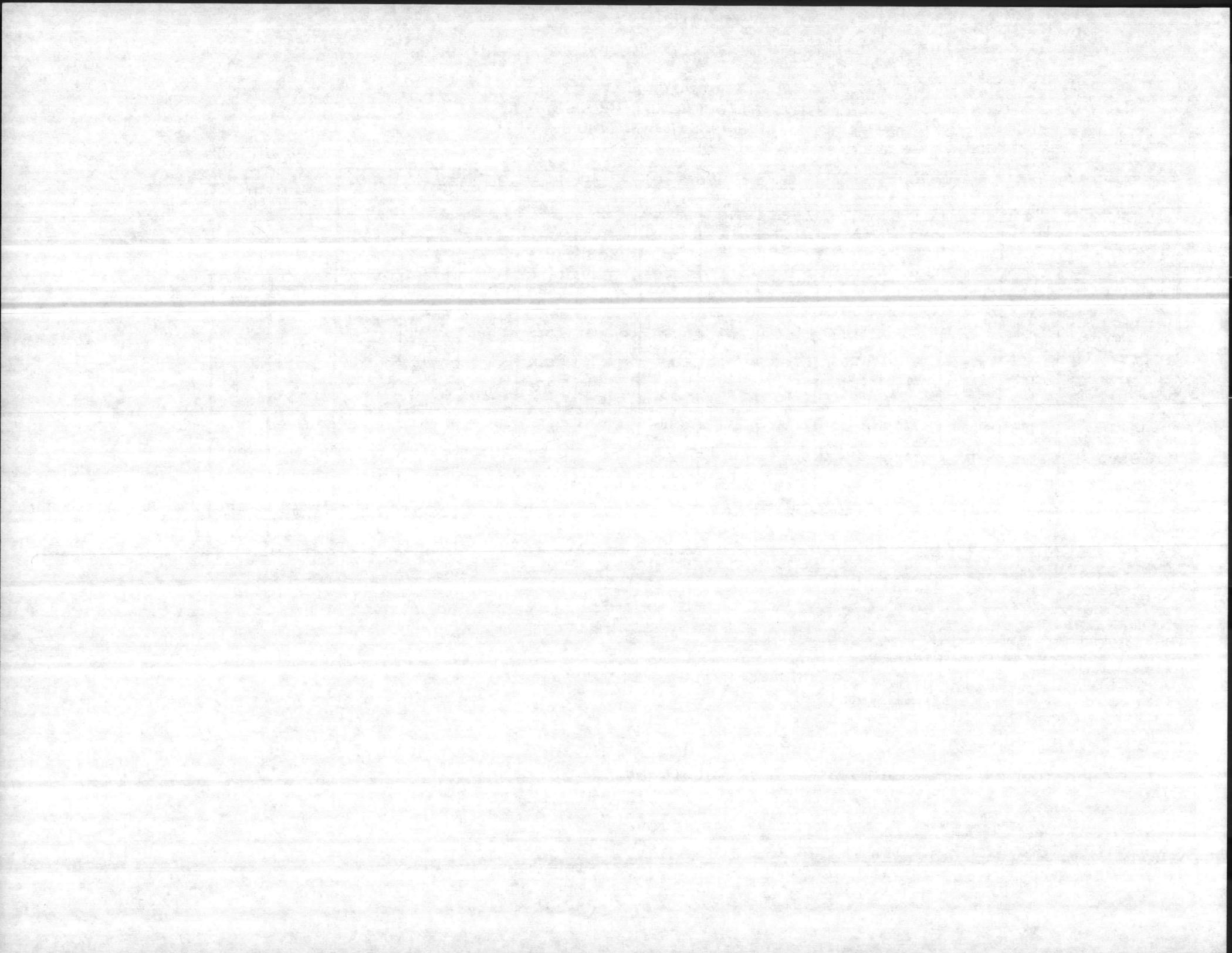
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continued



**TABLE 4-2 (cont)**  
**CONSTITUENTS DETECTED IN GROUNDWATER**  
**BUILDINGS 1709 AND 1710**

WELL NUMBER UNIT	HPGW1				HPGW2				HPGW3				STANDARDS	
	ug/L				ug/L				ug/L				NORTH CAROLINA*	Primary MCLs
	1/9/87	3/8/87	5/27/8	1/18/91	1/9/87	3/8/87	5/27/8	1/18/91	1/9/87	3/8/87	5/27/8	1/18/91	ug/L	ug/L
INORGANICS:														
Aluminum	NA	NA	NA	30600	NA	NA	NA	56000	NA	NA	NA	19300	-	-
Antimony				13.3 U				15.6 B				46.5 B	-	10/5(3)
Arsenic				8 B				24.1				15.6	50	50
Barium				166 B				84.4 B				55.5 B	1000	2000
Beryllium				6				1.7 B				1.2 B	-	1 (1)
Calcium				30100				46800				29800	-	-
Chromium				87				64.3				16.7	50	100
Cobalt				6 U				6.1 B				8 U	-	-
Copper				17.4 B				17.3 B				5.5 B	1000	1300(2)
Iron				64100				34800				10400	300	-
Lead				16.6				29.4				11.4	50	15(2)
Magnesium				5590				3980 B				2580 B	-	-
Manganese				168				77.7				53.9	50	-
Mercury				0.1 U				0.1 U				0.1 U	1.1	2
Nickel				31.3 B				16.9 B				12.1 B	150	100(1)
Potassium				3940 B				4820 B				2230 B	-	-
Selenium				3.4 U				3.6 B				3.4 U	10	50
Silver				4.7 B				1.6 U				1.6 U	50	50 (4)
Sodium				10900				3680 B				6390	-	-
Vanadium				92.1				160				35.9 B	-	-
Zinc				163				88.2				59.8	5000	-
Cyanide				10 U				11.2 U				11.2	154	200(1)

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continued

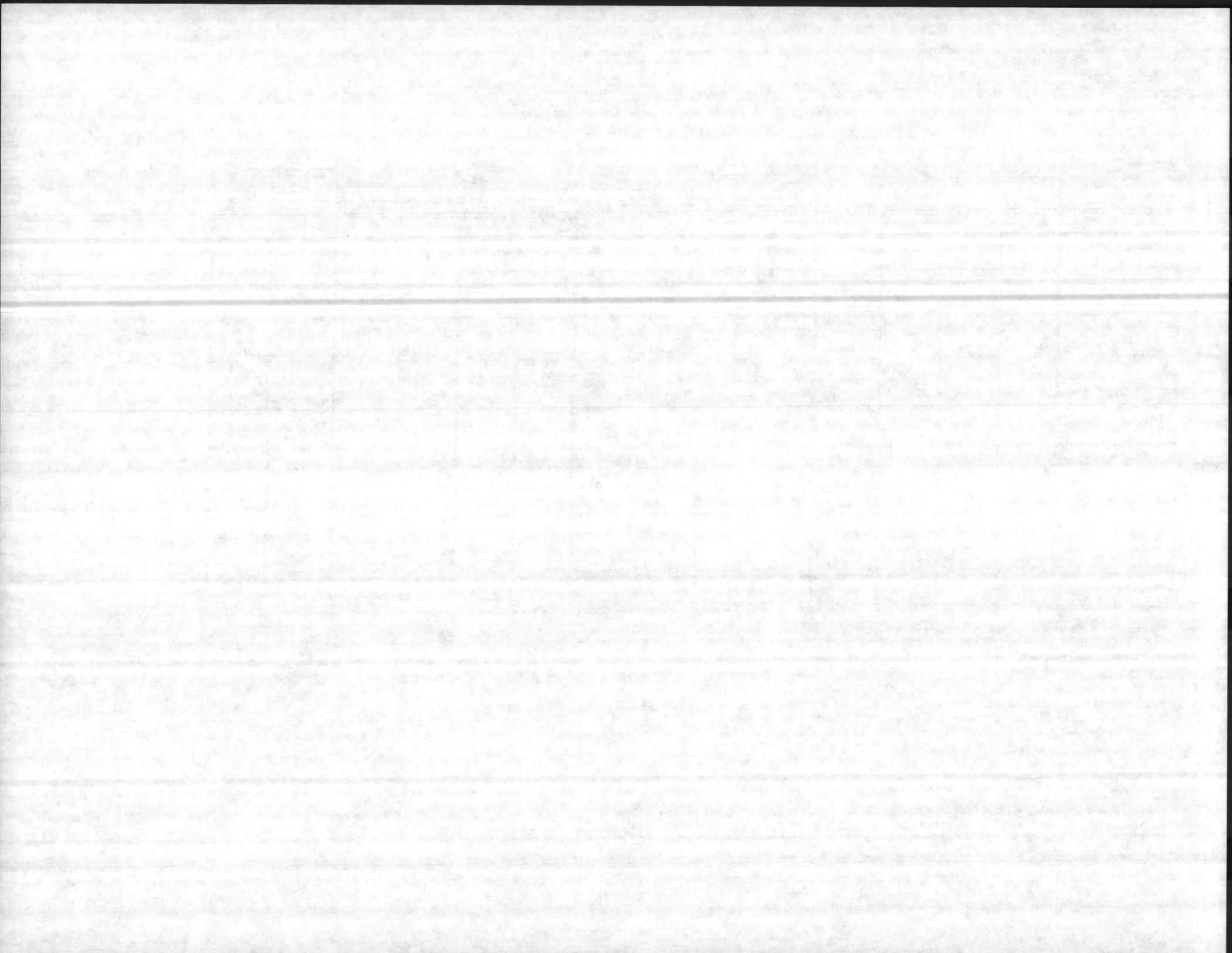


TABLE 4-2 (cont)  
 CONSTITUENTS DETECTED IN GROUNDWATER  
 BUILDINGS 1709 AND 1710

WELL NUMBER UNIT	HPGW4-1				HPGW4-1		STANDARDS	
	ug/L				ug/L		NORTH CAROLINA*	Primary MCLs
	1/12/8	3/8/87	5/27/8	1/18/91	1/18/91		ug/L	ug/L
<b>VOLATILES:</b>								
Acetone	NA	NA	NA	40	26	-	-	
Benzene	25	3.2	1.6	5 U	5 U	1	5	
Chloromethane	< 4.3	4.3	< 4.3	10 U	10 U	-	-	
Dichloroethylene, trans-1,2-	1.9	2.2	4.4	NA	NA	-	100	
Dichloroethylene, (total),1,2-	NA	NA	NA	5 U	0.6 J	-	-	
Ethyl benzene	< 7.2	7.2	< 7.2	5 U	5 U	29	700	
Methylene chloride	< 2.8	2.8	< 50	5 U	2 J	5	5 (1)	
Trichloroethylene	3.4	3	7.7	0.9 J	1 J	2.8	5	
Toluene	35	8.2	< 6	5 U	5 U	1000	1000	
Trichloroethane, 1,1,1-	< 3.8	3.8	< 3.8	5 U	5 U	200	200	
Xylene (total)	< 12	12	< 12	5 U	5 U	400	10000	
Oil & Grease	300	300	< 200	NA	-	-	-	
Total Lead	29	27	< 49.2	66.6	-	50	15 (2)	

NOTES:

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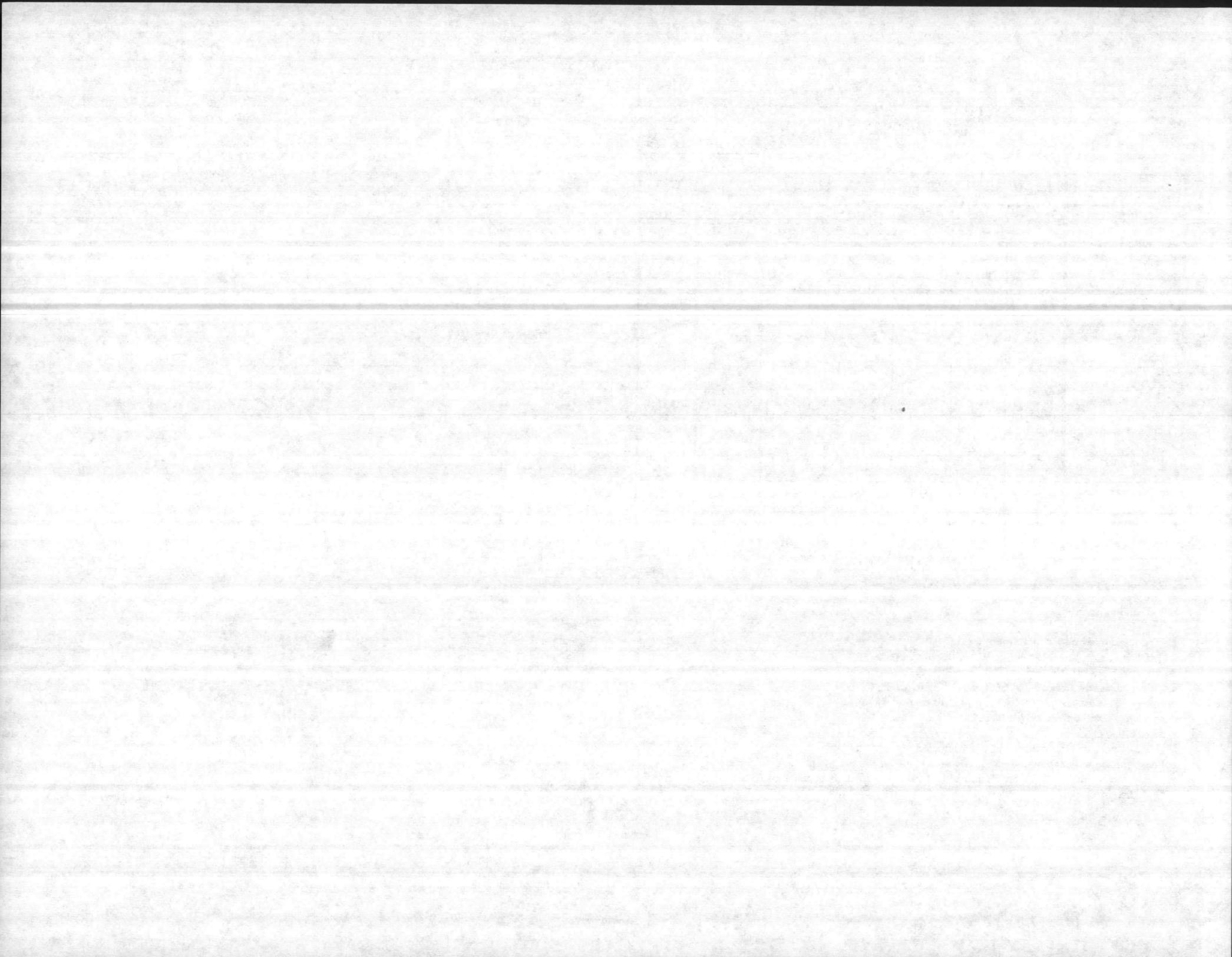
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**TABLE 4-2 (cont)  
CONSTITUENTS DETECTED IN GROUNDWATER  
BUILDINGS 1709 AND 1710**

WELL NUMBER UNIT DATE SAMPLED	HPGW4-1				HPGW4-1	STANDARDS	
	ug/L				ug/L	NORTH CAROLINA*	Primary MCLs
	1/12/8	3/8/87	5/27/8	1/18/91	1/18/91	ug/L	ug/L
INORGANICS:							
Aluminum	NA	NA	NA	97000	96800	-	-
Antimony				21.9 B	34.6 B	-	10/5(3)
Arsenic				15.5	19.4	50	50
Barium				268	273	1000	2000
Beryllium				6.7	6.4	-	1 (1)
Calcium				296000	310000	-	-
Chromium				187	195	50	100
Cobalt				14.4 B	18.2 B	-	-
Copper				35.4	39.2	1000	1300(2)
Iron				100000	106000	300	-
Lead				66.6	45.6	50	15(2)
Magnesium				12100	12500	-	-
Manganese				425	436	50	-
Mercury				0.1 U	0.1 U	1.1	2
Nickel				57	64.3	150	100(1)
Potassium				9710	9520	-	-
Selenium				3.4 U	3.4 U	10	50
Silver				1.6 U	2.4 B	50	50 (4)
Sodium				11400	11100	-	-
Vanadium				213	222	-	-
Zinc				228	272	5000	-
Cyanide				10 U	10 U	154	200(1)

**NOTES:**

\* - North Carolina water quality criteria for groundwater.

< - Less than detection limit

NA - Not analyzed

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1 - Proposed MCL

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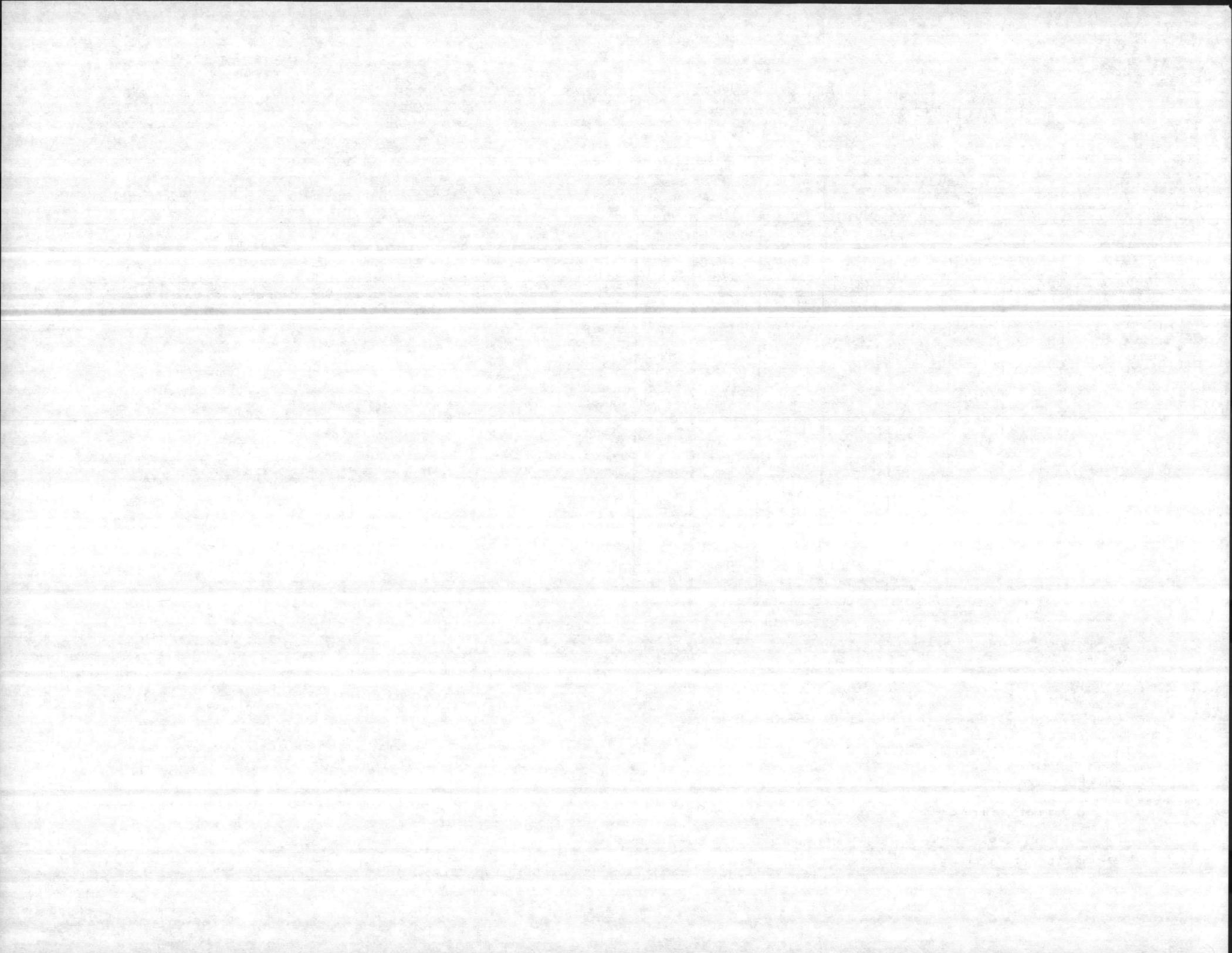
**QUALIFIERS:**

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J - Value is estimated



#### **4.4.3 Building 1613 (Exchange Service Station)**

The three shallow wells placed near this site are HPGW5, HPGW6, and HPGW7. Based on the lack of detected organic compounds, fuel leaks do not appear to have occurred in this vicinity. Oil and grease levels decreased over the first three sampling rounds. Total lead increased slightly above State and Federal standards.

Table 4-3 presents a summary of oil and grease compounds and inorganic parameter concentrations detected in the shallow aquifer wells. No organic compounds were detected above IDLs

#### **4.4.4 Buildings 1502, 1601, and 1602**

During the soil gas investigation, high levels of TCE were detected between Buildings 1502 and 1601, with lower levels detected between Buildings 1601 and 1602. As a result, four shallow monitoring wells (HPGW8 through HPGW11) were installed in the vicinity of Buildings 1502, 1601, and 1602 (the 1600 Area).

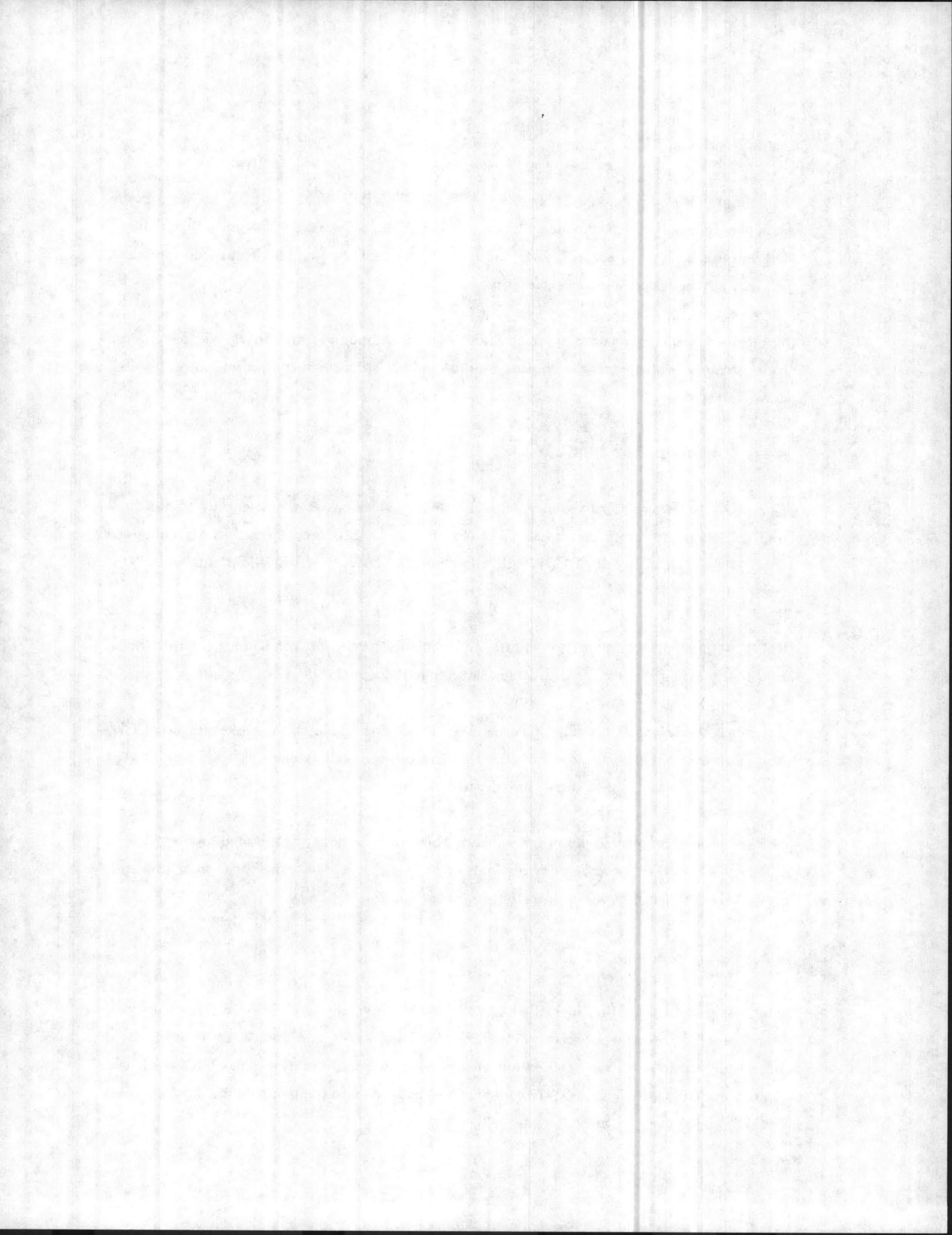
Table 4-4 presents a summary of volatile and semivolatile organic compounds, oil and grease and inorganic parameter concentrations detected in the four shallow aquifer wells.

Trichloroethene was detected in this area. Well HPGW9-1 exhibited the highest levels of TCE and also exhibited elevated levels of ethylbenzene, toluene, and xylene. The other wells were not contaminated with these fuel-related constituents.

Oil and grease concentrations decreased over time in all wells, but remained highest in well HPGW9-1. Total lead increased in all wells and ranged from a low concentration of 45.2 µg/L in well HPGW11 to a high concentration of 186 µg/L in well HPGW10.

#### **4.4.5 Building 1202**

The soil gas investigation identified the presence of high levels of TCE in the vicinity of Building 1202. Four wells (HPGW15, HPGW16, HPGW17-1, and HPGW18) were installed near this site to determine the extent of groundwater contamination associated with the contaminated soils. Well HPGW18 could not be located for sampling during the Supplemental Investigation (it may have been destroyed).



**TABLE 4-3  
CONSTITUENTS DETECTED IN GROUNDWATER  
BUILDING 1613**

WELL NUMBER UNITS	HPGW5				HPGW6				HPGW7				STANDARDS	
	ug/L				ug/L				ug/L				North Carolina*	Primary MCLs
	DATE SAMPLED	1/12/87	3/8/87	5/27/87	1/18/91	1/12/87	3/8/87	5/27/87	1/18/91	1/12/87	3/9/87	5/27/87	1/18/91	ug/L
Oil & Grease	900	< 100	< 200	NA	200	< 100	< 200	NA	3000	200	< 200	NA	-	-
Total Lead	< 27	< 27	< 49.2	13.6	< 27	< 27	< 49.2	60.7	< 27	29	< 49.2	112	50	15 (1)
INORGANICS:														
Aluminum	NA	NA	NA	3580	NA	NA	NA	1050000	NA	NA	NA	161000	-	-
Antimony				13.3 U				13.3 U				22 U	-	10/5(2)
Arsenic				1.5 U				31.5				18.3	50	50
Barium				13.6 B				1960				670	1000	2000
Beryllium				0.86 B				20				4.8 B	-	1 (3)
Calcium				80100				11200				10500	-	-
Chromium				3.6 B				1590				313	50	100
Cobalt				6 U				51.9				17.7 B	-	-
Copper				4.1 B				194				44.2	1000	1300(1)
Iron				3100				265000				65700	300	-
Lead				13.6				60.7				112	50	15 (1)
Magnesium				11100				49700				18200	-	-
Manganese				162				487				136	50	-
Mercury				0.1 U				1.4				0.25	1.1	2
Nickel				5.2 U				161				50.7	150	100(3)
Potassium				3930 B				55300				12000	-	-
Selenium				4.4 B				3.4 U				2.6 B	10	50
Silver				1.6 U				2.3 B				6.2 U	50	50 (4)
Sodium				22400				14800				11500	-	-
Vanadium				2.4 U				1610				285	-	-
Zinc				71.3				537				218	5000	-
Cyanide				10 U				10 U				10 U	154	200(3)

**NOTES:**

\* - These standards are water quality standards applicable to the groundwaters of North Carolina.

<X - Less than detection limit

NA - Not analyzed

(-) - No standard set

1 - Maximum contaminant level (MCL) is Action Level for Public Water Supply System.

2 - Two proposed MCLs

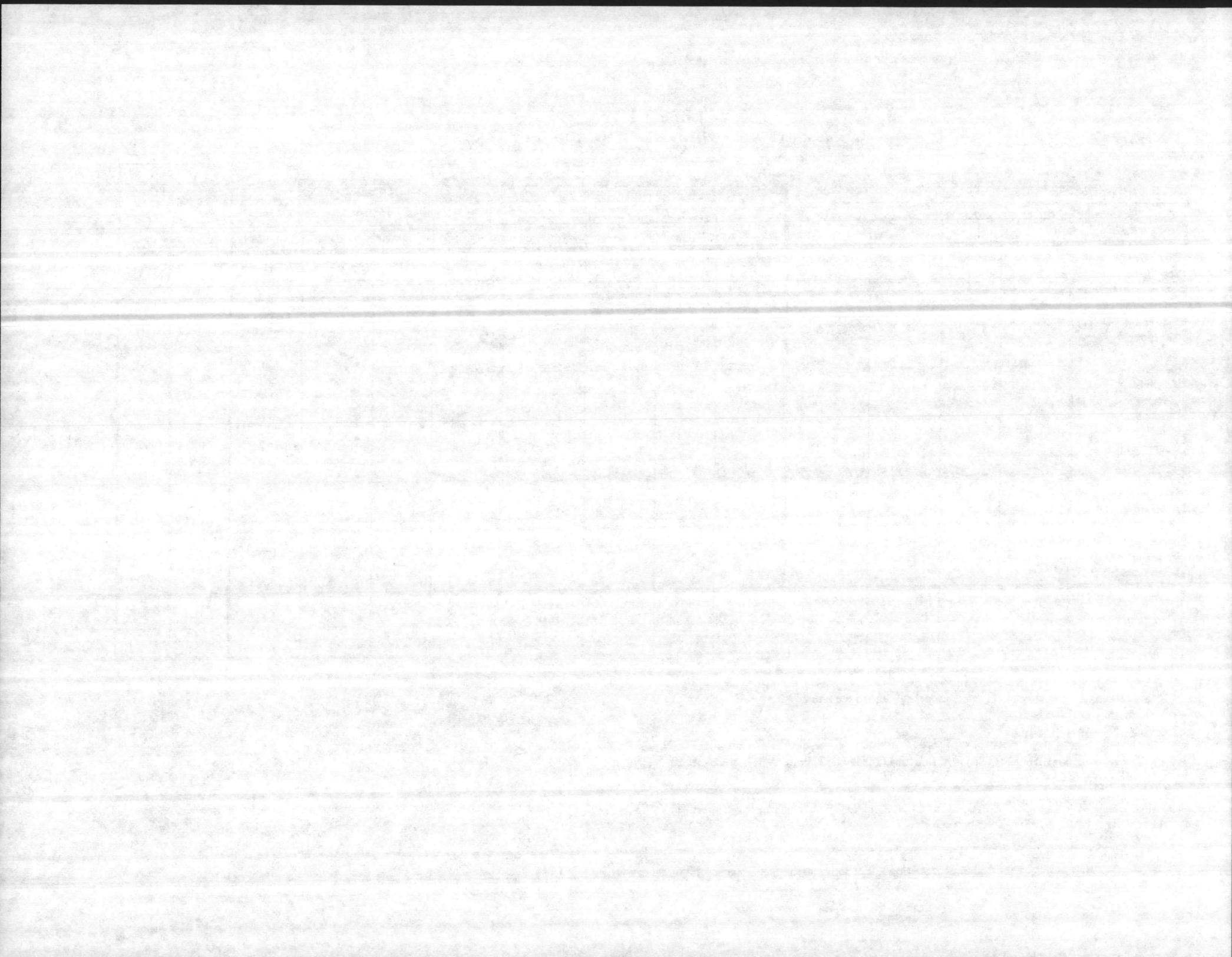
3 - Proposed MCL

4 - Silver currently has an MCL of 50 ug/L; as of 7/30/92 silver will no longer have a primary MCL, its secondary MCL of 100 ug/L will become effective.

**QUALIFIERS:**

U - Compound was analyzed, but not detected.

B - Reported value is < Contract Required Detection Limit, but > Instrument Detection Limit, inorganics



**TABLE 4-4  
CONSTITUENTS DETECTED IN GROUNDWATER  
BUILDINGS 1502, 1601 AND 1602**

WELL NUMBER UNIT DATE SAMPLED	HPGW8				HPGW9-1				STANDARDS		
	ug/L				ug/L				North Carolina*	Primary MCLs	
	3/13/87	3/9/87	5/28/87	1/18/91	1/14/87	3/9/87	5/28/87	1/18/91	ug/L	ug/L	
<b>VOLATILES:</b>											
Carbon Disulfide	NA	NA	NA	5 U	NA	NA	NA	13	-	-	
Chloroform	< 1.6	< 1.6	< 1.6	5 U	< 160	< 400	< 160	15	0.19	-	
Chloromethane	7.2	< 4.3	< 4.3	10 U	< 430	< 1100	< 430	10 U	-	-	
Dichloroethylene (total), 1,2-	< 2.8	< 2.8	< 2.8	5 U	< 280	< 700	< 280	1200	-	-	
Dichloroethylene, trans,1,2-	< 1.6	< 1.6	< 1.6	NA	740	< 400	2700	NA	70	100	
Ethyl Benzene	< 7.2	< 7.2	< 7.2	5 U	1100	< 1800	< 720	700	29	700	
Methylene Chloride	20	< 2.8	< 50	5 U	< 280	< 700	< 280	5 U	5	5(1)	
Toluene	< 6	< 6	< 6	5 U	< 600	< 1500	< 600	330 J	1000	1000	
Trichloroethene	< 3	< 3	< 1	2 J	5000	6100	< 100	14000	2.8	5	
Trichlorofluoromethane	14	96	< 3.2	NA	< 320	< 800	< 320	NA	-	-	
Xylene (total)	< 12	< 12	< 12	5 U	4500	< 3000	4000	3300	400	10000	
<b>SEMI-VOLATILES:</b>											
bis(2-Ethylhexyl)phthalate	NA	NA	NA	2 J	NA	NA	NA	10 U	-	-	
Methylnaphthalene, 2-	NA	NA	NA	10 U	NA	NA	NA	49	-	-	
Naphthalene	NA	NA	NA	10 U	NA	NA	NA	190	-	-	
Oil & Grease	100	< 100	< 200	NA	32000	11000	6000	NA	-	-	
Total Lead	< 27	< 27	< 49.2	54.1	130	92	70	128	50	15 (2)	

**NOTES:**

\* - North Carolina water quality standards for groundwater.

<X - Less than detection limit

NA - Not analyzed

(-) - No standard set

1 - Proposed MCL

2 - MCL is Action Level for Public Water Supply Systems, effective November 6, 1991.

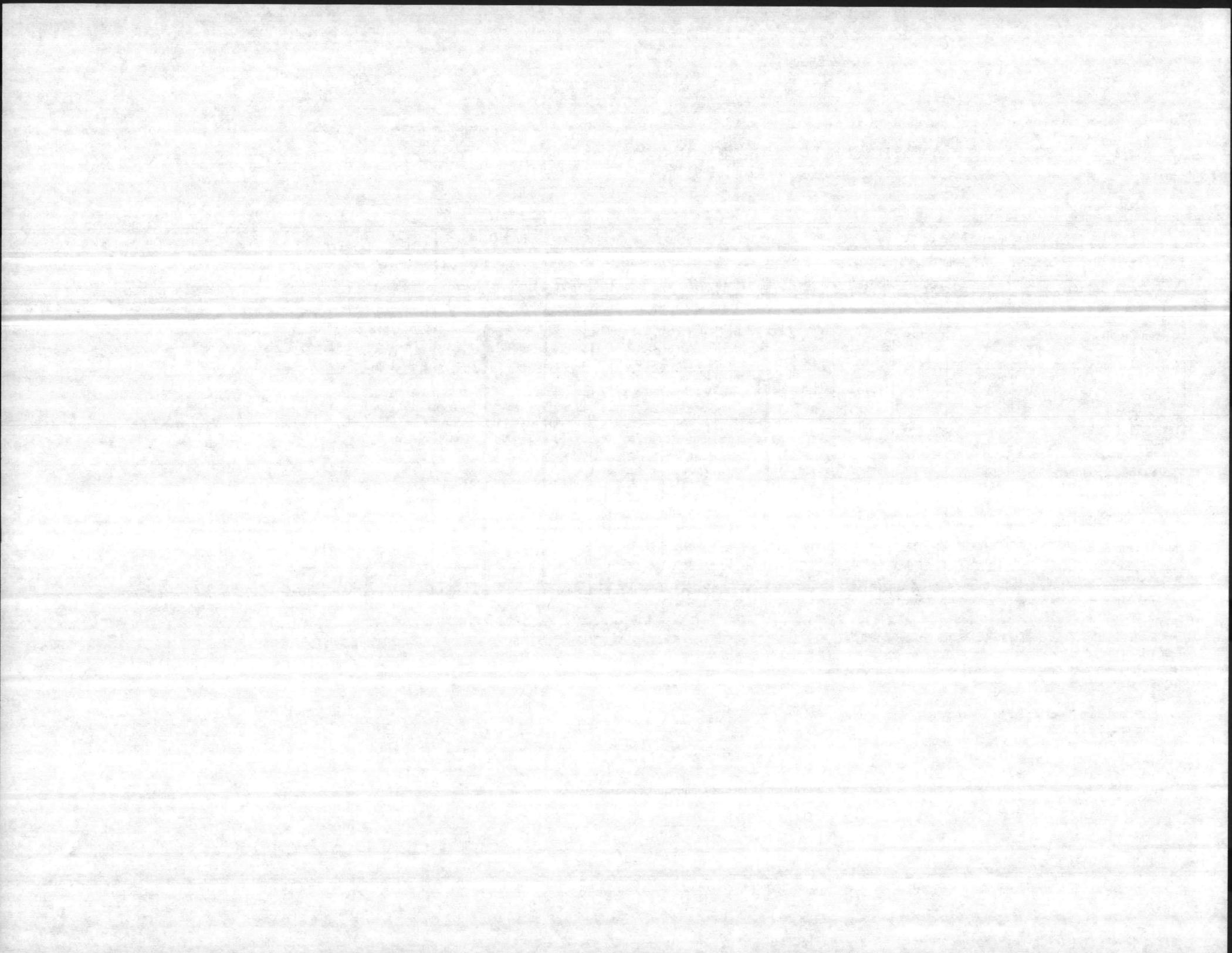
3 - Two proposed MCLs

**QUALIFIERS:**

U - Compound was analyzed, but not detected.

B - Analyte found in associated blank, organics

- Reported value is < Contract Required Detection Limit but > Instrument Detection Limit, inorganics



**TABLE 4-4 (cont)**  
**CONSTITUENTS DETECTED IN GROUNDWATER**  
**BUILDINGS 1502, 1601 AND 1602**

WELL NUMBER UNIT	HPGW8				HPGW9-1				STANDARDS		
	ug/L				ug/L				North Carolina*	Primary MCLs	
	DATE SAMPLED	3/13/87	3/9/87	5/28/87	1/18/91	1/14/87	3/9/87	5/28/87	1/18/91	ug/L	ug/L
INORGANICS:											
Aluminum	NA	NA	NA	91700	NA	NA	NA	59100	-	-	
Antimony				22 U				17.6 B	-	10/5 (3)	
Arsenic				28.4				3 B	50	50	
Barium				173 B				126 B	1000	2000	
Beryllium				2.1 U				0.79 B	-	1 (1)	
Calcium				10600				23500	-	-	
Chromium				91.8				66.4	50	100	
Cobalt				7.9 B				6 U	-	-	
Copper				19.5 B				27.1	1000	1300 (2)	
Iron				40900				19800	300	-	
Lead				54.1				128	50	15 (2)	
Magnesium				5780				11000	-	-	
Manganese				46.5				45	50	-	
Mercury				0.13 B				0.1 U	1.1	2	
Nickel				25.2 B				15.1 B	150	100(1)	
Potassium				5300				5370	-	-	
Selenium				3.6 B				3.6 B	10	50	
Sodium				8600				20400	-	-	
Vanadium				945				75.3	-	-	
Zinc				118				115	5000	-	
Cyanide				10 U				10 U	154	200(1)	

**NOTES:**

\* - North Carolina water quality standards for groundwater.

<X - Less than detection limit

NA - Not analyzed

(-) - No standard set

1 - Proposed maximum contaminant level (MCL)

2 - MCL is Action Level for Public Water Supply Systems.

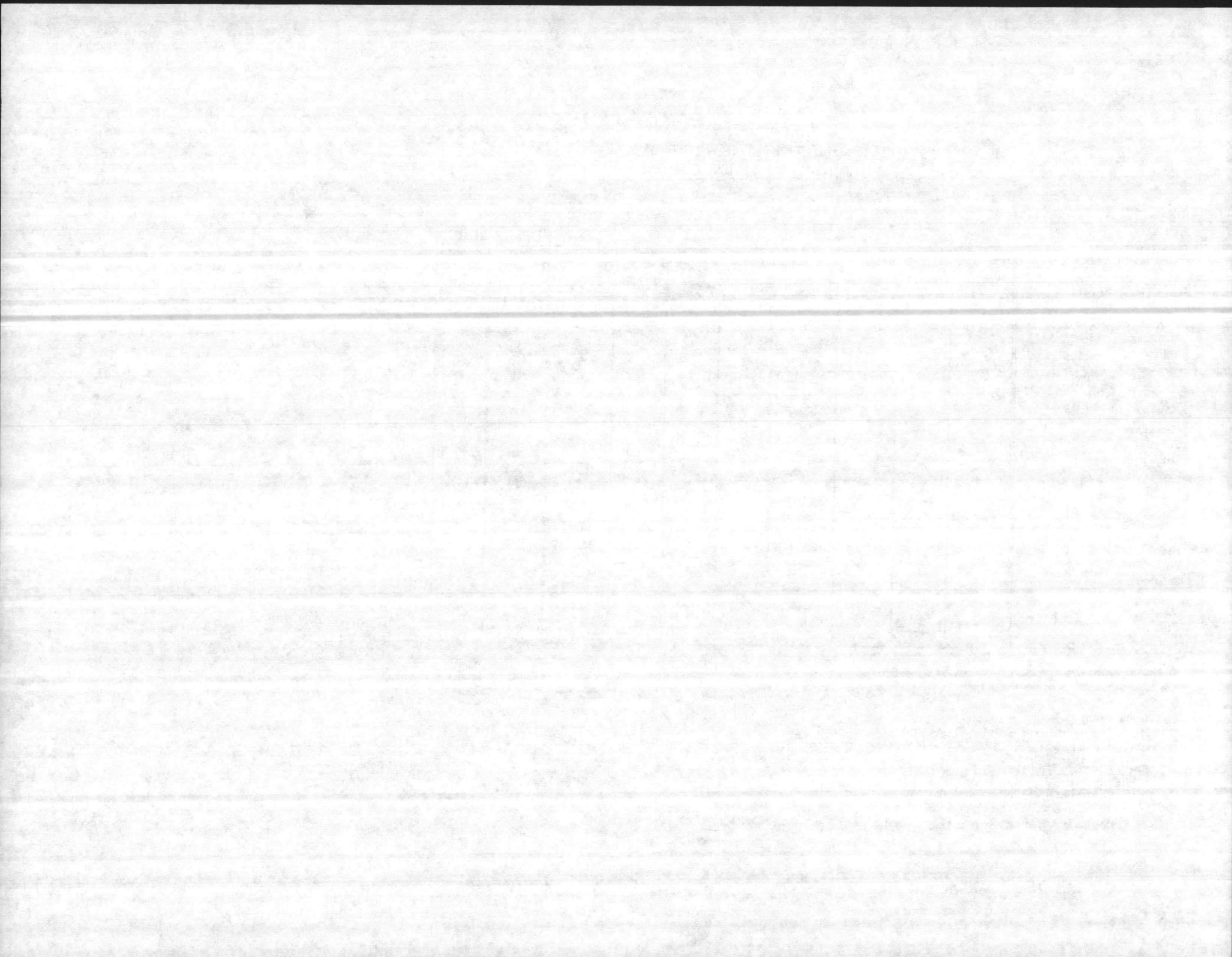
3 - Two proposed MCLs

**QUALIFIERS:**

U - Compound was analyzed, but not detected.

B - Analyte found in associated blank, organics

- Reported value is < Contract Required Detection Limit but > Instrument Detection Limit, inorganics



**TABLE 4-4 (cont)**  
**CONSTITUENTS DETECTED IN GROUNDWATER**  
**BUILDINGS 1502, 1601 AND 1602**

WELL NUMBER UNIT	HPGW10				HPGW11				STANDARDS		
	ug/L				ug/L				North Carolina*	Primary MCLs	
	DATE SAMPLED	1/14/87	3/9/87	5/28/87	1/18/91	1/14/87	3/9/87	5/28/87	1/18/91	ug/L	ug/L
<b>VOLATILES:</b>											
Carbon Disulfide	NA	NA	NA	5 U	NA	NA	NA	11		-	-
Chloroform	< 1.6	< 1.6	< 1.6	5 U	3.2	2.2	2.6	5 U	0.19	-	-
Chloromethane	< 4.3	< 4.3	< 4.3	10 U	< 4.3	< 4.3	< 4.3	10 U	-	-	-
Dichloroethylene (total), 1,2-	< 2.8	< 2.8	< 2.8	5 U	< 2.8	< 2.8	< 2.8	5 U	-	-	-
Dichloroethylene, trans,1,2-	< 1.6	< 1.6	< 1.6	NA	13	7.2	6	NA	70	100	
Ethyl Benzene	< 7.2	< 7.2	< 7.2	5 U	< 7.2	< 7.2	< 7.2	5 U	29	700	
Methylene Chloride	< 2.8	< 2.8	< 50	5 U	< 2.8	< 2.8	< 50	5 U	5	5(1)	
Toluene	< 6	< 6	< 6	5 U	< 6	< 6	< 6	5 U	1000	1000	
Trichloroethene	7.4	8.6	< 1	5 U	49	34	24	5 U	2.8	5	
Trichlorofluoromethane	< 3.2	< 3.2	< 3.2	NA	< 3.2	< 3.2	< 3.2	NA	-	-	-
Xylene (total)	< 12	< 12	< 12	5 U	< 12	< 12	< 12	5 U	400	10000	
<b>SEMI-VOLATILES:</b>											
bis(2-Ethylhexyl)phthalate	NA	NA	NA	10 U	NA	NA	NA	10 U	-	-	
Methylnaphthalene, 2-	NA	NA	NA	10 U	NA	NA	NA	10 U	-	-	
Naphthalene	NA	NA	NA	10 U	NA	NA	NA	10 U	-	-	
Oil & Grease	400	< 100	< 200	NA	300	600	< 200	NA	-	-	
Total Lead	29	< 27	< 49.2	186	< 27	< 27	< 49.2	45.2	50	15 (2)	

**NOTES:**

\* - North Carolina water quality standards for groundwater.

<X - Less than detection limit

NA - Not analyzed

(-) - No standard set

1 - Proposed MCL

2 - MCL is Action Level for Public Water Supply Systems, effective November 6, 1991.

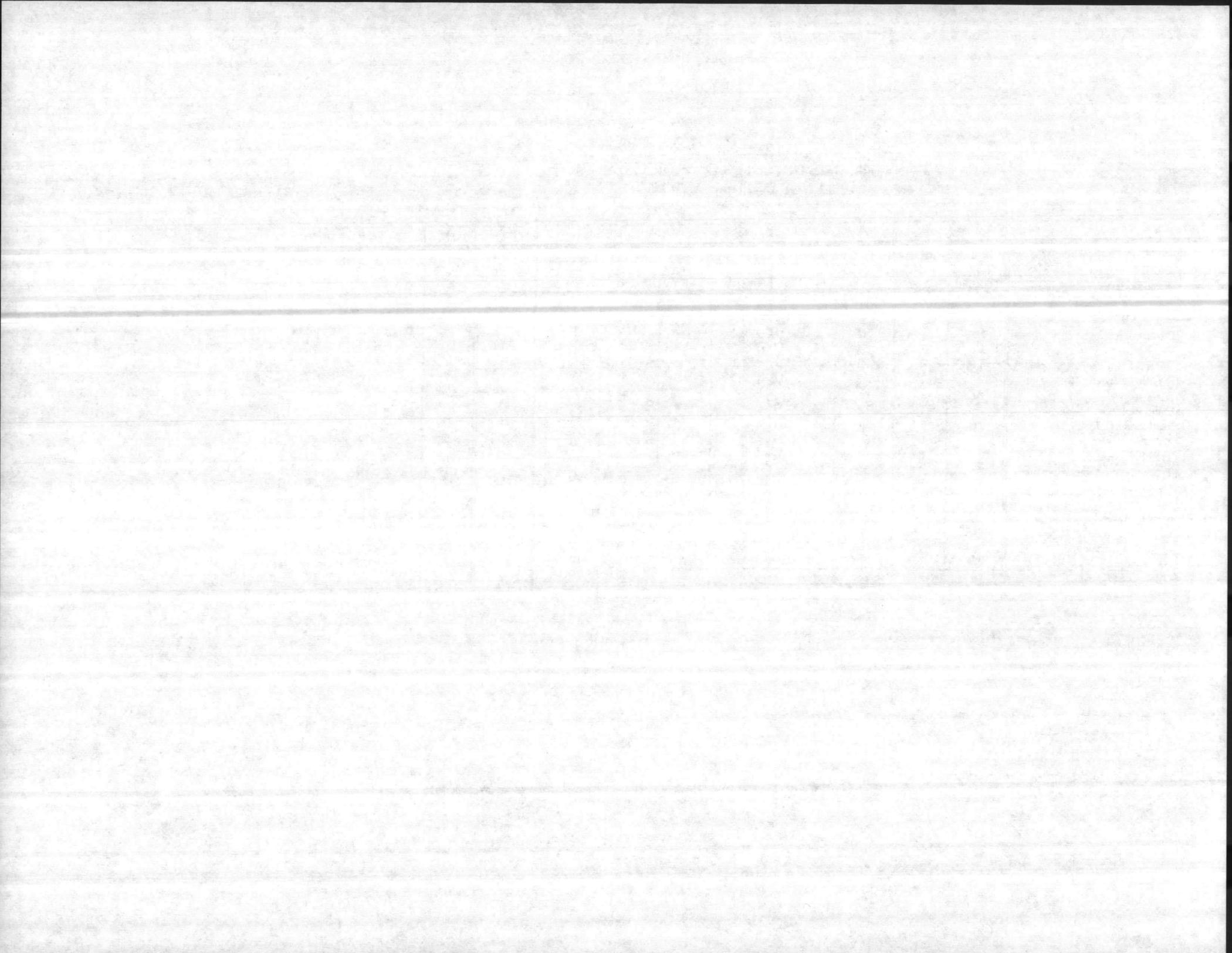
3 - Two proposed MCLs

**QUALIFIERS:**

U - Compound was analyzed, but not detected.

B - Analyte found in associated blank, organics

- Reported value is < Contract Required Detection Limit but > Instrument Detection Limit, inorganics



**TABLE 4-4 (cont)**  
**CONSTITUENTS DETECTED IN GROUNDWATER**  
**BUILDINGS 1502, 1601 AND 1602**

WELL NUMBER UNIT	HPGW10				HPGW11				STANDARDS		
	ug/L				ug/L				North Carolina*	Primary MCLs	
	DATE SAMPLED	1/14/87	3/9/87	5/28/87	1/18/91	1/14/87	3/9/87	5/28/87	1/18/91	ug/L	ug/L
<b>INORGANICS:</b>											
Aluminum	NA	NA	NA	348000	NA	NA	NA	95200	-	-	
Antimony				22 U				22 U	-	10/5 (3)	
Arsenic				39.9				9.1 B	50	50	
Barium				492				298	1000	2000	
Beryllium				5.6				2.1 U	-	1 (1)	
Calcium				56200				9730	-	-	
Chromium				310				140	50	100	
Cobalt				31.4 B				6.4 U	-	-	
Copper				72.2				30	1000	1300 (2)	
Iron				119000				31800	300	-	
Lead				186				45.2	50	15 (2)	
Magnesium				14900				11200	-	-	
Manganese				255				130	50	-	
Mercury				0.82				0.1 B	1.1	2	
Nickel				92.2				23.6 B	150	100(1)	
Potassium				17100				7320	-	-	
Selenium				1.6 U				3.7 B	10	50	
Sodium				3950 B				5410	-	-	
Vanadium				376				166	-	-	
Zinc				224				94	5000	-	
Cyanide				10 U				10 U	154	200(1)	

**NOTES:**

\* - North Carolina water quality standards for groundwater.

<X - Less than detection limit

NA - Not analyzed

(-) - No standard set

1 - Proposed maximum contaminant level (MCL)

2 - MCL is Action Level for Public Water Supply Systems.

3 - Two proposed MCLs

**QUALIFIERS:**

U - Compound was analyzed, but not detected.

B - Analyte found in associated blank, organics

- Reported value is < Contract Required Detection Limit but > Instrument Detection Limit, inorganics

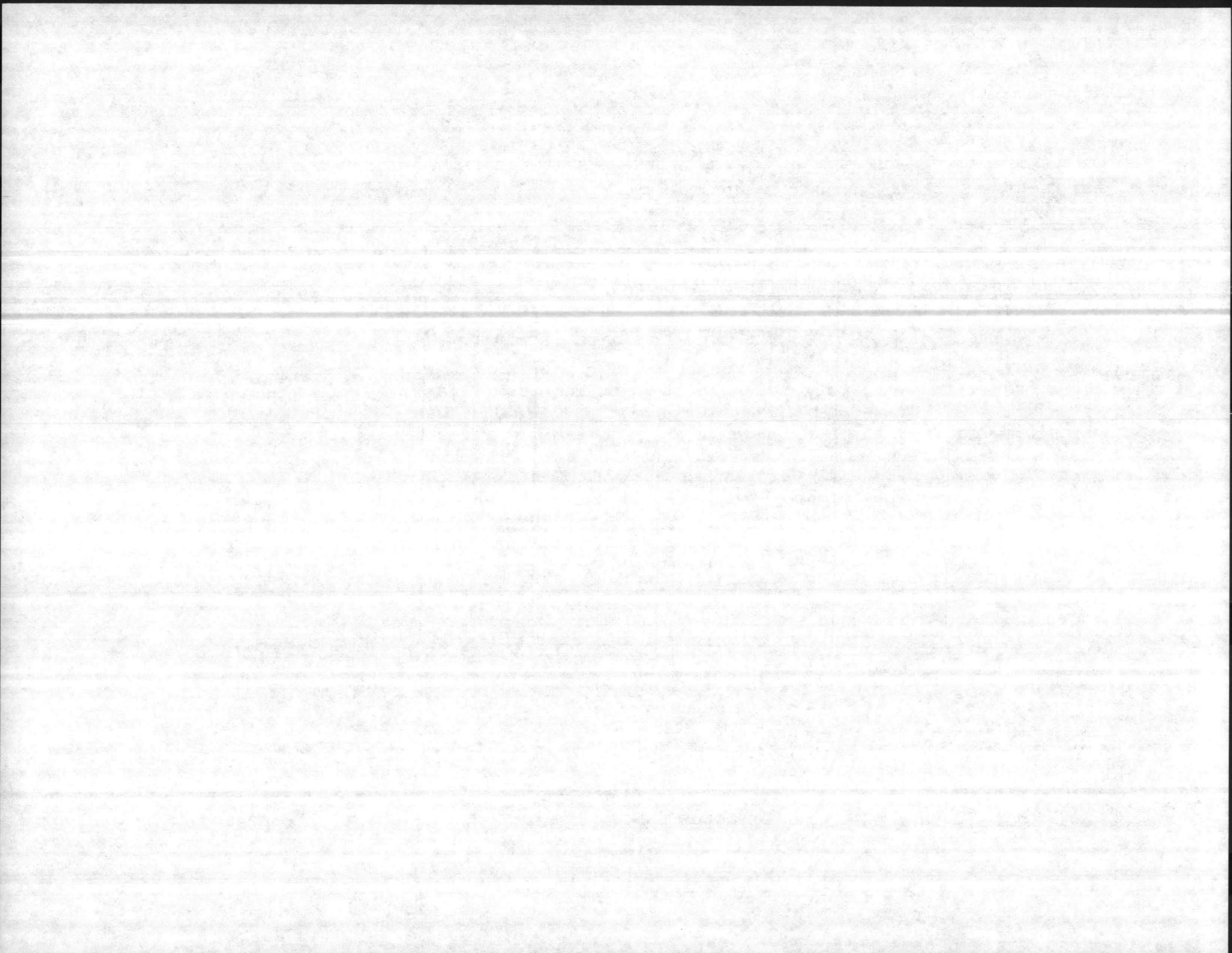


Table 4-5 presents a summary of volatile organic compounds, oil and grease, and inorganic parameter concentrations detected in the four shallow aquifer wells.

Only three volatile organic compounds (1,2-DCE (total), TCE, and trichlorofluoromethane) were detected in well HPGW15. Volatile organic compounds were not detected in the other wells in this area.

The highest oil and grease levels were reported during the second sampling round. Total lead concentrations decreased in well HPGW15, and increased in wells HPGW16 and HPGW17-1. Total lead was not detected in well HPGW18. All inorganic concentrations were greatest in well HPGW16, except for calcium (which was highest in well HPGW17-1) and sodium (exceeded in well HPGW15).

#### **4.4.6 Building 1100**

Monitoring well HPGW19 was installed in this location to verify TCE contamination identified in the soil gas survey.

Table 4-6 presents a summary of volatile organic compounds, oil and grease, and inorganic parameter concentrations detected in the shallow aquifer.

Trace concentrations of 1,2-DCE (total), tetrachloroethene (PCE), and TCE were detected in well HPGW19 in the Supplemental Round. Trans-1,2-DCE and PCE concentrations decreased over the four year sampling interval.

The oil and grease concentration increased from 200 µg/L in Set One to 2,000 µg/L in Set Two, but was not detected in the third Set. Oil and grease were not analyzed during the Supplemental Investigation.

Total lead increased from "not detected" in 1987 to 31.7 µg/L in 1991.

#### **4.4.7 Buildings 901, 902, 903**

The four shallow monitoring wells located near this area, which is referred to in this report as the "900 Area," are HPGW22, HPGW23, HPGW24-1, and HPGW25. Table 4-7 presents a



**TABLE 4-5  
CONSTITUENTS DETECTED IN GROUNDWATER  
BUILDING 1202**

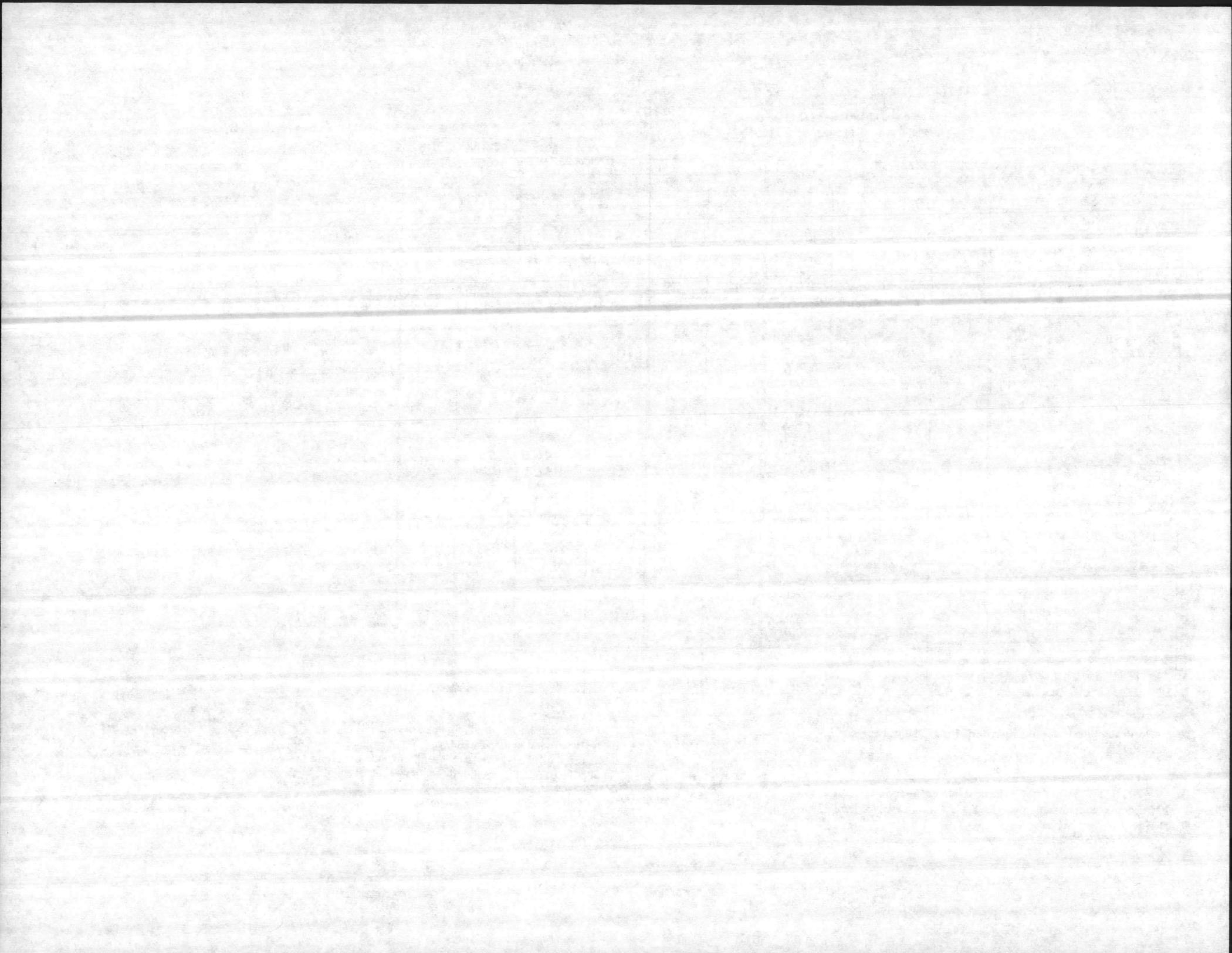
WELL NUMBER UNITS	HPGW15				HPGW16				STANDARDS		
	ug/L				ug/L				North Carolina*	Primary MCLs	
	DATE SAMPLED	1/15/87	3/9/87	5/28/87	1/18/91	1/15/87	3/10/87	5/28/87	1/18/91	ug/L	ug/L
<b>VOLATILES:</b>											
Dichloroethylene (total), 1,2-	< 2.8	2.8	2.8	7	< 2.8	< 2.8	< 2.8	5	U	-	-
Trichloroethene	< 3	3	1	4 J	< 3	< 3	< 1	5	U	2.8	5
Trichlorofluoromethane	< 3.2	3.2	7.1	N/A	< 3.2	< 3.2	< 3.2	N/A		-	-
Oil & Grease	< 100	100	200	N/A	200	3000	< 200	N/A		-	-
Total Lead	46	27	49.2	16.6	45	41	< 49.2	100		50	15 (2)
<b>INORGANICS:</b>											
Aluminum	NA	NA	NA	18500	NA	NA	NA	213000		-	-
Antimony				22 U				22 U		-	10/5(3)
Arsenic				1.8 U				17.3		50	50
Barium				119 B				276		1000	2000
Beryllium				2.1 U				5.3		-	1 (4)
Calcium				12000				33400		-	-
Chromium				21.4				209		-	100
Cobalt				6.4 U				18.7 B		-	-
Copper				12.2 B				44.6 B		1000	1300 (2)
Iron				4800				47200		300	-
Lead				16.6				100		50	15 (2)
Magnesium				5650				8110		-	-
Manganese				18.3				98.3		50	-
Mercury				0.1 U				0.13 B		1.1	2
Nickel				11 U				41		150	100(4)
Potassium				3390 B				12100		-	-
Sodium				6950				4960		-	-
Thallium				1.1 U				1.4 B		-	2/1(3)
Vanadium				24.9 B				225		-	-
Zinc				88.1				157		5000	-
<b>PESTICIDES:</b>											
Dieldrin				0.1 U				0.1 U		-	-

**NOTES:**

- \* - North Carolina water quality criteria for groundwater.
- NA - Not analyzed
- (-) - No standard set
- <X - Less than detection limit
- 1 - Well HPGW18 could not be located during the supplemental investigation.
- 2 - Maximum contaminant level (MCL) is Action Level for Public Water Supply Systems.
- 3 - Two proposed MCLs
- 4 - Proposed MCL

**QUALIFIERS:**

- U - Compound was analyzed, but not detected
- B - Analyte found in associated blank, organics
- Reported value is < Contract Required Detection Limit
- but > Instrument Detection Limit, inorganics
- J - Value is estimated



**TABLE 4-5 (cont)**  
**CONSTITUENTS FOUND IN GROUNDWATER**  
**BUILDING 1202**

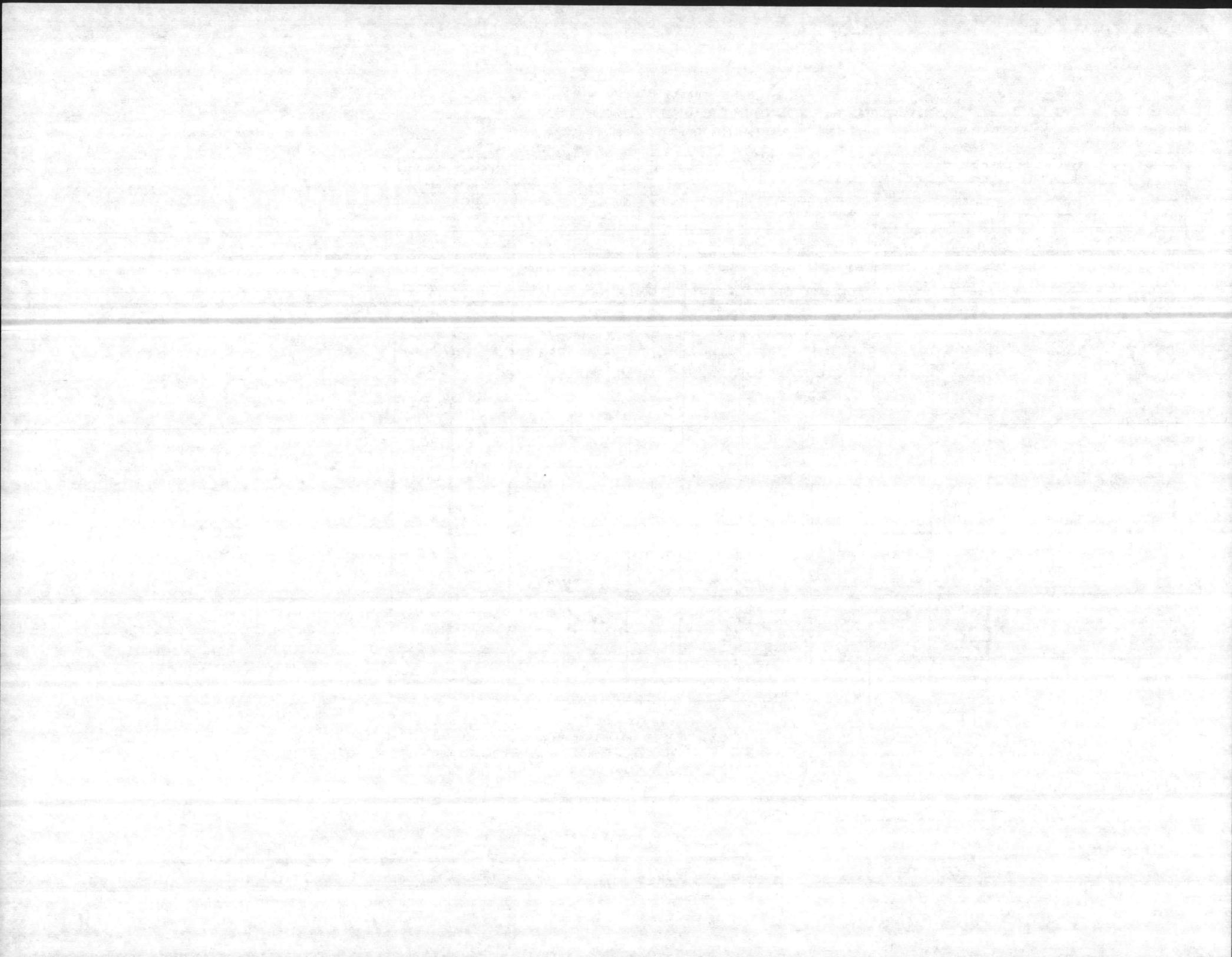
WELL NUMBER UNITS DATE SAMPLED	HPGW17 ug/L				HPGW18 (1) ug/L				STANDARDS	
	1/15/87	3/10/87	5/28/87	1/18/91	1/15/87	3/8/87	5/27/87	1/18/91	North Carolina*	Primary MCLs
									ug/L	ug/L
<b>VOLATILES:</b>										
Dichloroethylene (total), 1,2-	< 2.8	< 2.8	< 2.8	5 U	< 2.8	< 2.8	< 2.8	NA	-	-
Trichloroethene	< 3	< 3	< 1	5 U	< 1	< 3	< 1	NA	2.8	5
Trichlorofluoromethane	< 3.2	< 3.2	< 3.2	N/A	< 3.2	< 3.2	< 3.2	NA	-	-
Oil & Grease	< 100	3000	< 200	N/A	< 100	2000	< 200	NA	-	-
Total Lead	< 27	< 27	< 49.2	23.7	< 27	< 27	< 49.2	NA	50	15 (2)
<b>INORGANICS:</b>										
Aluminum	NA	NA	NA	29000	NA	NA	NA	NA	-	-
Antimony				22 U					-	10/5(3)
Arsenic				1.8 U					50	50
Barium				70.1 B					1000	2000
Beryllium				2.1 U					-	1 (4)
Calcium				60800					-	-
Chromium				37					-	100
Cobalt				6.4 U					-	-
Copper				20 B					1000	1300 (2)
Iron				10500					300	-
Lead				23.7					50	15 (2)
Magnesium				6790					-	-
Manganese				31.3					50	-
Mercury				0.1 U					1.1	2
Nickel				11.9 B					150	100(4)
Potassium				3530 B					-	-
Sodium				4480 B					-	-
Thallium				1.1 U					-	2/1(3)
Vanadium				52.1					-	-
Zinc				76.5					5000	-
<b>PESTICIDES:</b>										
Dieldrin				0.11					-	-

**NOTES:**

- \* - North Carolina water quality criteria for groundwater.
- NA - Not analyzed
- (-) - No standard set
- <X - Less than detection limit
- 1 - Well HPGW18 could not be located during the supplemental investigation.
- 2 - Maximum contaminant level (MCL) is Action Level for Public Water Supply Systems.
- 3 - Two proposed MCLs
- 4 - Proposed MCL

**QUALIFIERS:**

- U - Compound was analyzed, but not detected
- B - Analyte found in associated blank, organics
- Reported value is < Contract Required Detection Limit
- but > Instrument Detection Limit, inorganics
- J - Value is estimated



**TABLE 4-6  
CONSTITUENTS DETECTED IN GROUNDWATER  
BUILDING 1100**

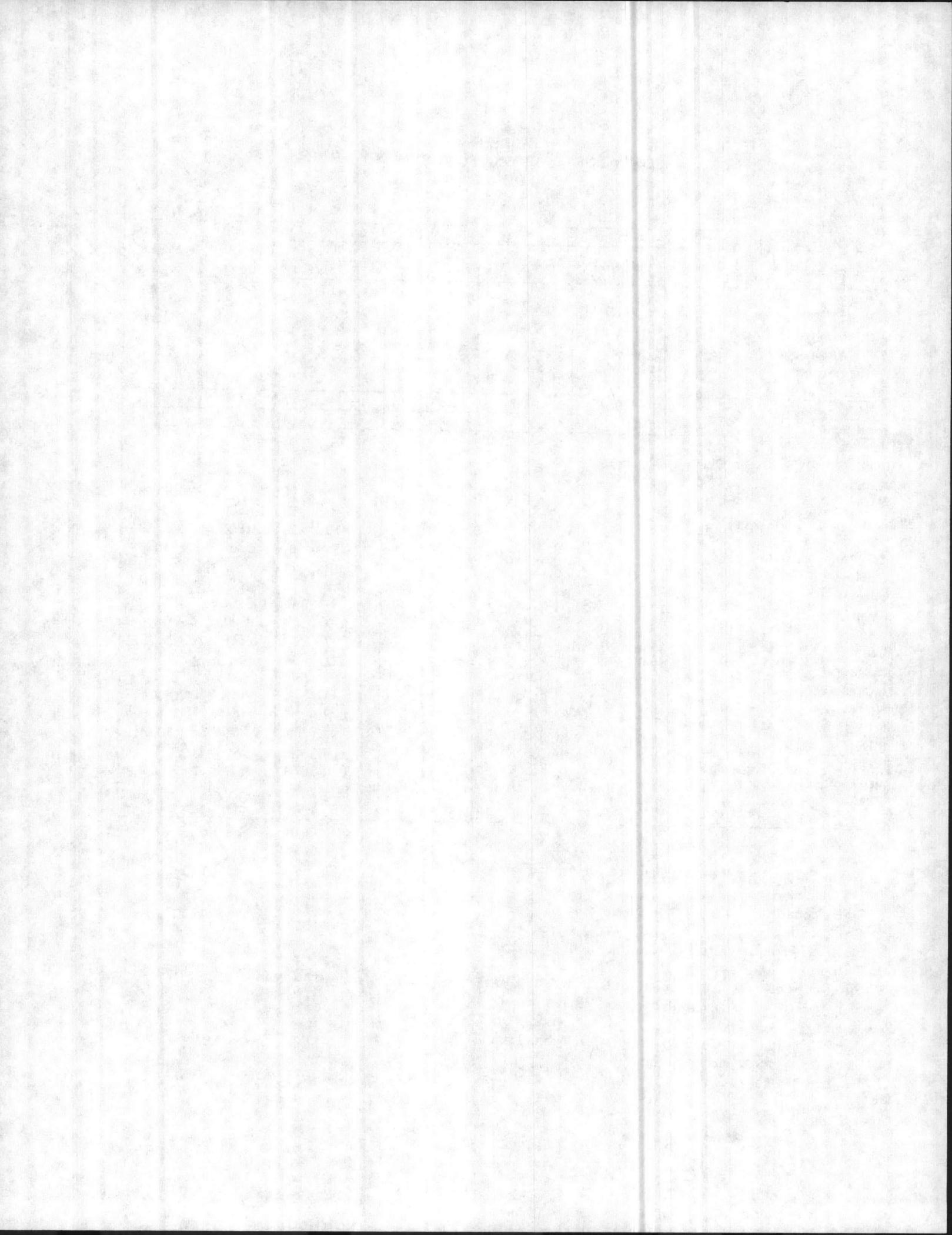
WELL NUMBER UNIT DATE SAMPLED	HPGW19 ug/L				STANDARDS	
	1/16/87	3/10/87	5/28/87	1/18/91	North Carolina*	Primary MCLs
					ug/L	ug/L
<b>VOLATILES:</b>						
Dichloroethylene (total),1,2-	NA	NA	NA	0.8 J	-	-
Dichloroethylene, trans,1,2-	2.5	< 1.6	< 1.6	NA	70	100
Tetrachloroethene	< 3	< 3	< 3	2 J	0.7	5
Trichloroethene	6	< 3	< 1	2 J	2.8	5
Oil & Grease	200	2000	< 200	NA	-	-
Total Lead	< 27	< 27	< 49.2	31.7	50	15 (1)
<b>INORGANICS:</b>						
Aluminum	NA	NA	NA	6840	-	-
Antimony				13.3 U	-	10/5 (2)
Arsenic				5 B	50	50
Barium				92.9 B	1000	2000
Beryllium				2.3 B	-	1 (1)
Calcium				3120 B	-	-
Chromium				13.8	50	100
Copper				8.6 B	1000	1300 (1)
Iron				36200	300	-
Lead				31.7	50	15 (1)
Magnesium				4200 B	-	-
Manganese				79	50	-
Nickel				7.3 B	150	100(1)
Potassium				2370 B	-	-
Silver				2.9 B	50	50 (4)
Sodium				23500	-	-
Vanadium				19.8 B	-	-
Zinc				81.1	5000	-

**NOTES:**

- \* - North Carolina water quality standards for groundwater.
- NA - Not analyzed
- (-) - No standard set
- 1 - Proposed MCL
- 2 - MCL is Action Level for Public Water Supply Systems.
- 3 - Two proposed MCLs
- 4 - Silver currently has an MCL of 50 ug/L; as of 7/30/92 silver's secondary MCL of 100 ug/L will become effective.

**QUALIFIERS:**

- B - Reported value is < Contract Required Detection Limit but > Instrument Detection Limit.
- J - Estimated value

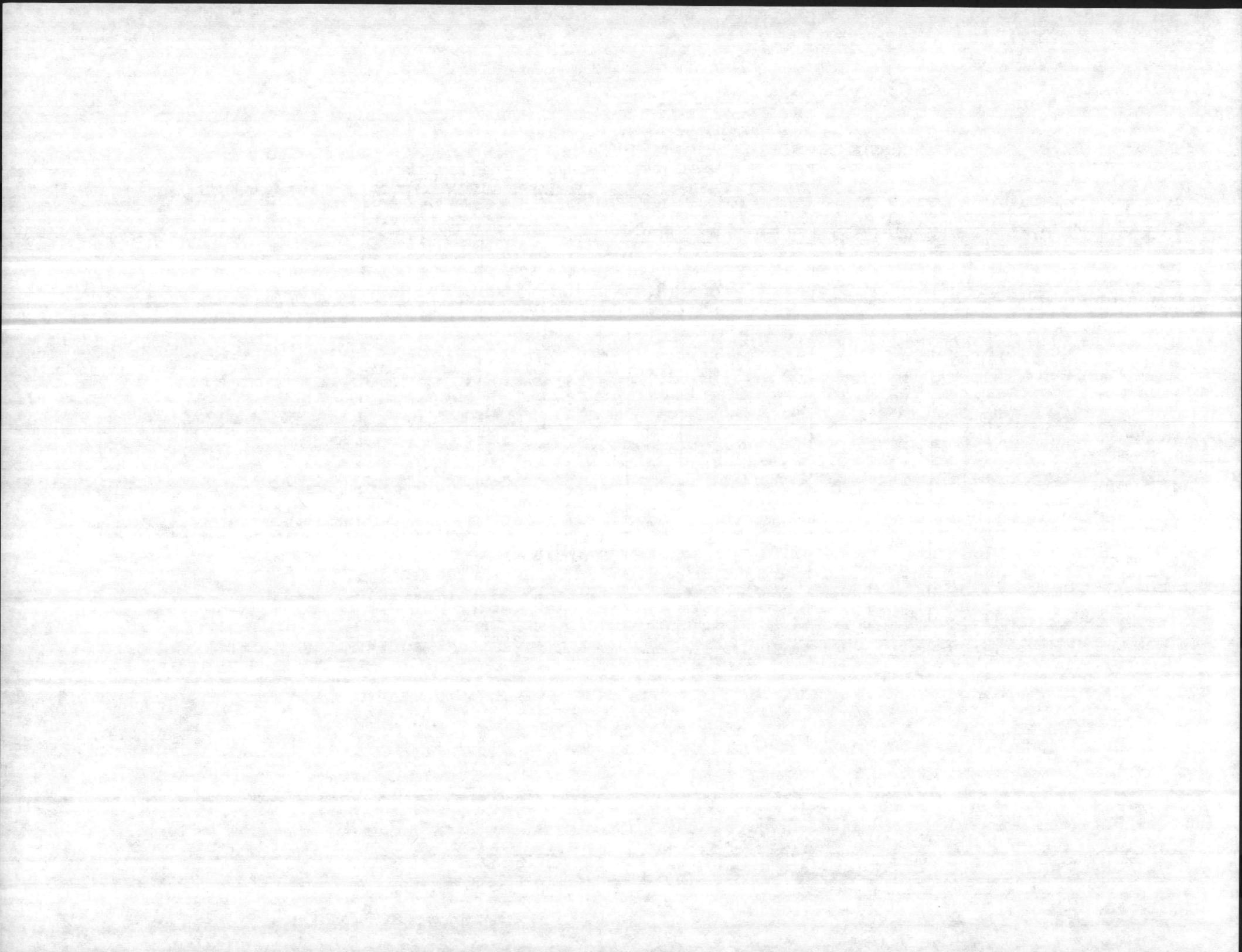


**TABLE 4-7**  
**CONSTITUENTS DETECTED IN GROUNDWATER**  
**BUILDINGS 901, 902, 903**

WELL NUMBER	HPGW22								STANDARDS	
	UNITS				UNITS				North	Primary
	ug/L				ug/L				Carolina*	MCLs
DATE SAMPLED	1/19/87	3/11/87	5/29/87	1/18/91	1/19/87	3/11/87	5/29/87	1/18/91	ug/L	ug/L
<b>VOLATILES:</b>										
Benzene	< 1	< 1	< 1	5 U	< 10	100	< 100	24	1	5
Carbon Disulfide	NA	NA	NA	5 U	NA	NA	NA	5	-	-
Dichloroethane,1,1-	< 4.7	< 4.7	< 4.7	5 U	< 47	470	< 470	5	U	-
Dichloroethane,1,2-	< 2.8	< 2.8	< 2.8	5 U	< 28	280	< 280	5	U	0.38
Dichloroethene,1,1-	NA	NA	NA	5 U	NA	NA	NA	5	U	7
Dichloroethylene (total), 1,2-	NA	NA	NA	5 U	NA	NA	NA	8900	-	-
Dichloroethylene, trans,1,2-	< 1.6	< 1.6	< 1.6	NA	830	6100	7100	NA	70	100
Ethyl Benzene	< 7.2	< 7.2	< 7.2	5 U	< 72	720	< 720	9	29	700
Methylene Chloride	< 2.8	< 2.8	< 50	9	< 28	300	< 5000	5	U	5 (1)
Tetrachloroethene	< 3	< 3	< 3	5 U	< 30	200	< 200	5	U	0.7
Toluene	< 6	< 6	< 6	5 U	< 60	600	< 600	13	1000	1000
Trichloroethene	< 3	< 1	< 1	5 U	830	13000	4300	3700	2.8	5
Trichloroethane, 1,1,2-	< 5	< 5	< 5	5 U	< 50	500	< 500	5	U	200
Vinyl Chloride	< 1	< 1	< 1	10 U	< 10	100	< 100	8	J	0.015
Xylene (total)	< 12	< 12	< 12	5 U	< 120	1200	< 1200	41	400	10000
<b>SEMI-VOLATILES:</b>										
Acenaphthene	NA	NA	NA	3 J	NA	NA	NA	10	-	-
Dibenzofuran				2 J				10	-	-
Fluorene				5 J				10	-	-
bis(2-ethylhexyl)Phthalate				10 U				3	-	-
Naphthalene				10 U				10	-	-
Methylnaphthalene, 2-				10 U				10	-	-
Oil & Grease	1000	2000	< 200	NA	600	3000	< 200	NA	-	-
Total Lead	27	< 27	< 49.2	39.4	38	27	< 49.2	45	50	15 (2)

4-24

continued



**TABLE 4-7 (cont)**  
**CONSTITUENTS DETECTED IN GROUNDWATER**  
**BUILDINGS 901, 902, 903**

WELL NUMBER	HPGW22				HPGW23				STANDARDS		
	ug/L				ug/L				North Carolina*	Primary MCLs	
	UNITS	DATE SAMPLED	1/19/87	3/11/87	5/29/87	1/18/91	1/19/87	3/11/87	5/29/87	1/18/91	ug/L
INORGANICS:											
Aluminum	NA	NA	NA	71800	NA	NA	NA	82500		-	-
Antimony				24.6 B				24.6 B	B	-	10/5(3)
Arsenic				7.2 B				6.6 B	B	50	50
Barium				102 B				196 B	B	1000	1000
Beryllium				0.6 B				1 B	B	-	1(1)
Calcium				96300				7890		-	-
Chromium				79.8				76.3		50	100
Cobalt				6 U				11.9 B	B	-	-
Copper				40				30.5		1000	1300(2)
Iron				24400				23300		300	-
Lead				39.4				45		50	15(2)
Magnesium				5210				6050		-	-
Manganese				94.1				68.8		50	-
Mercury				0.1 U				0.1 U	U	1.1	2
Nickel				23.2 B				33.2 B	B	150	100(1)
Potassium				6930				3880 B	B	-	-
Silver				2.5 B				6.6 B	B	50	50(4)
Sodium				5300				6260		-	-
Vanadium				100				77.6		-	-
Zinc				77.4				89.3		5000	-
Cyanide				10 U				10 U	U	154	200(1)

**NOTES:**

- \* - North Carolina water quality criteria for groundwater.
- NA - Not analyzed
- (-) - No standard set
- < - Less than detection limit
- 1 - Proposed maximum contaminant levels MCLs
- 2 - MCL is Action Level for Public Water Supply Systems.
- 3 - Two proposed MCLs
- 4 - Silver currently has an MCL of 50 ug/L; as of 7/30/92 silver will no longer have a primary MCL, its secondary MCL of 100 ug/L will become effective.

**QUALIFIERS:**

- U - Compound was analyzed but not detected
- B - Reported value is < Contract Required Detection Limit but > Instrument Detection Limit, inorganics
- J - estimated value
- D - Compound analyzed at a secondary dilution factor

continued

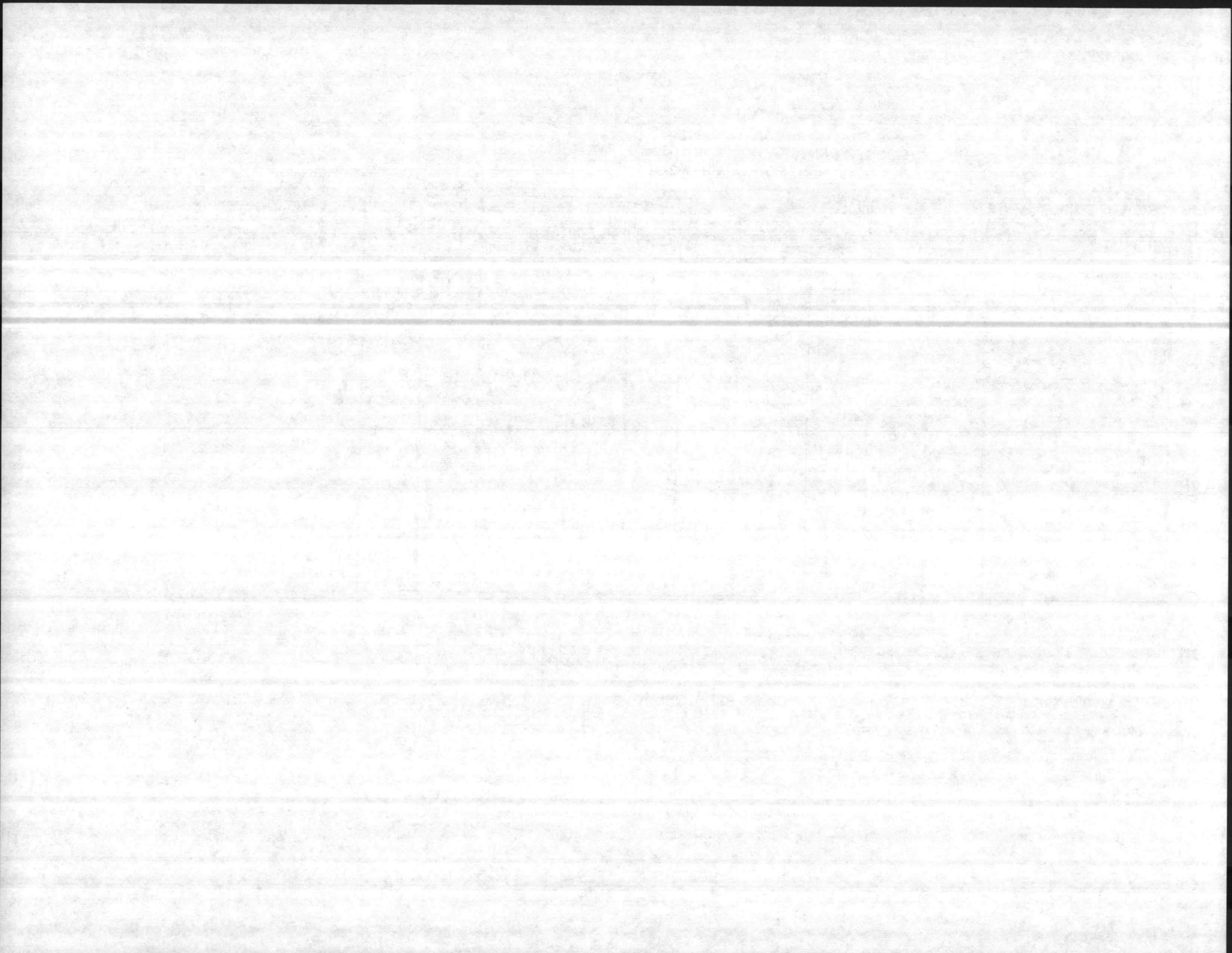
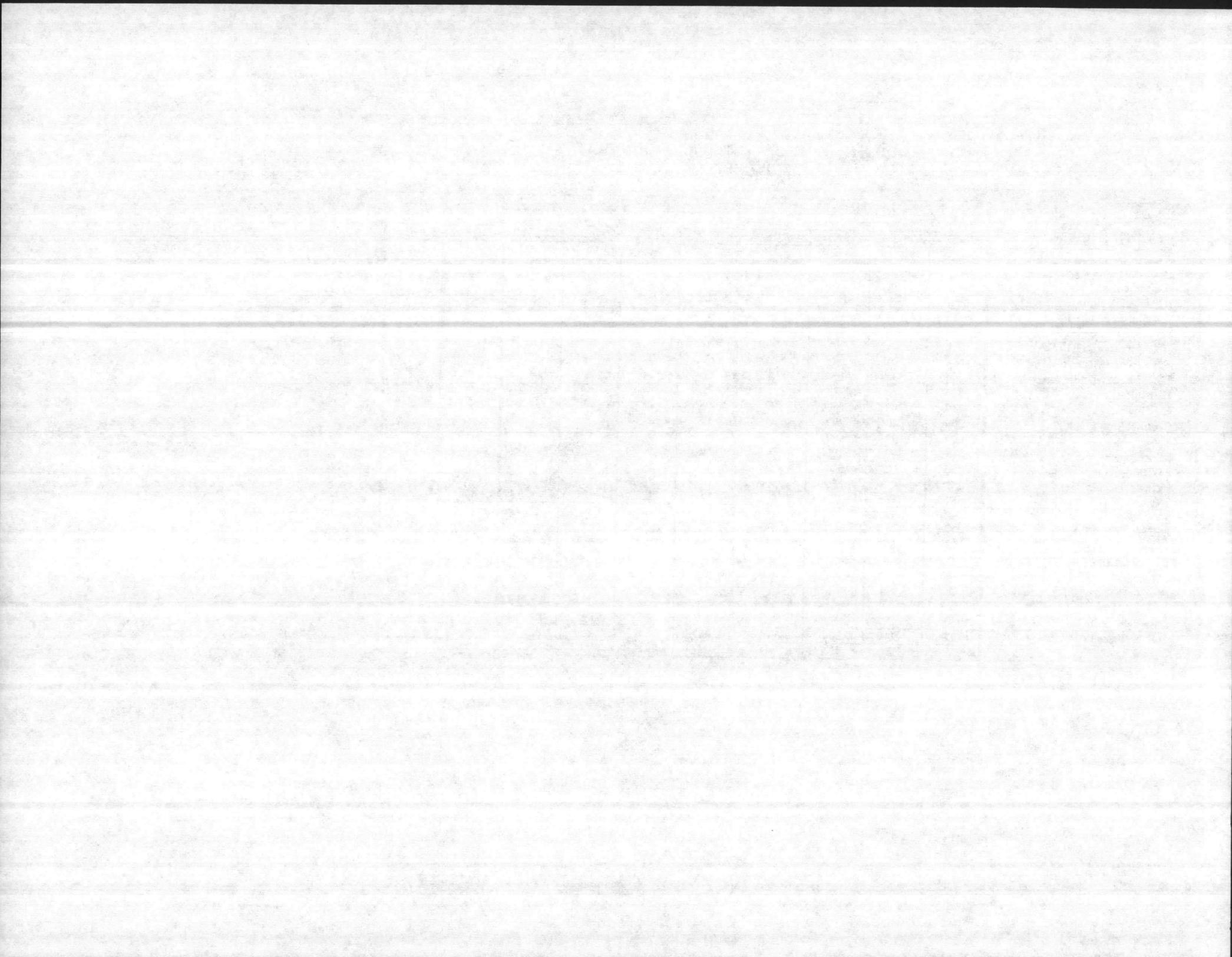


TABLE 4-7 (cont)  
 CONSTITUENTS DETECTED IN GROUNDWATER  
 BUILDINGS 901, 902, 903

WELL NUMBER UNITS	HPGW24				HPGW25				STANDARDS		
	ug/L				ug/L				North Carolina*	Primary MCLs	
	DATE SAMPLED	1/19/87	3/11/87	5/29/87	1/18/91	1/19/87	3/11/87	5/29/87	1/18/91	ug/L	ug/L
<b>VOLATILES:</b>											
Benzene	2	< 100	< 100	3 J	< 1	< 1	< 1	5 U		1	5
Carbon Disulfide	NA	NA	NA	7	NA	NA	NA	5 U		-	-
Dichloroethane,1,1-	12	< 470	< 470	5 U	< 4.7	< 4.7	< 4.7	5 U		-	-
Dichloroethane,1,2-	< 280	< 280	< 280	0.8 J	< 2.8	< 2.8	< 2.8	5 U		0.38	5
Dichloroethene,1,1-	NA	NA	NA	65	NA	NA	NA	5 U		7	7
Dichloroethylene (total), 1,2-	NA	NA	NA	42000 D	NA	NA	NA	5 U		-	-
Dichloroethylene, trans,1,2-	6400	4300	4000	NA	< 1.6	< 1.6	< 1.6	NA		70	100
Ethyl Benzene	< 720	< 720	< 720	3 J	< 7.2	< 7.2	< 7.2	5 U		29	700
Methylene Chloride	< 280	< 280	< 5000	5 U	< 2.8	2.9	< 50	5 U		5	5(1)
Tetrachloroethene	< 300	< 200	< 200	5 U	< 3	< 3	< 3	5 U		0.7	5
Toluene	< 600	< 600	< 600	13	< 6	< 6	< 6	5 U		1000	1000
Trichloroethene	57	< 100	< 100	180	< 3	< 1	< 1	5 U		2.8	5
Trichloroethane, 1,1,2-	< 500	< 500	< 500	3 J	< 5	< 5	< 5	5 U		-	200
Vinyl Chloride	190	< 100	250	25000 U	< 1	< 1	< 1	10 U		0.015	2
Xylene (total)	< 1200	< 1200	< 1200	10	< 12	< 12	< 12	5 U		400	10000
<b>SEMI-VOLATILES:</b>											
Acenaphthene	NA	NA	NA	6 J	NA	NA	NA	10 U		-	-
Dibenzofuran				10 U				10 U		-	-
Fluorene				10 U				10 U		-	-
bis(2-ethylhexyl)Phthalate				10 U				10 U		-	-
Naphthalene				130				10 U		-	-
Methylnaphthalene, 2-				3 J				10 U		-	-
Oil & Grease	100	2000	< 200	NA	200	300	< 200	NA		-	-
Total Lead	< 27	< 27	< 49.2	21.4	< 27	< 27	< 49.2	71.6		50	15(2)

4-26

continued



**TABLE 4-7 (cont)**  
**CONSTITUENTS DETECTED IN GROUNDWATER**  
**BUILDINGS 901, 902, 903**

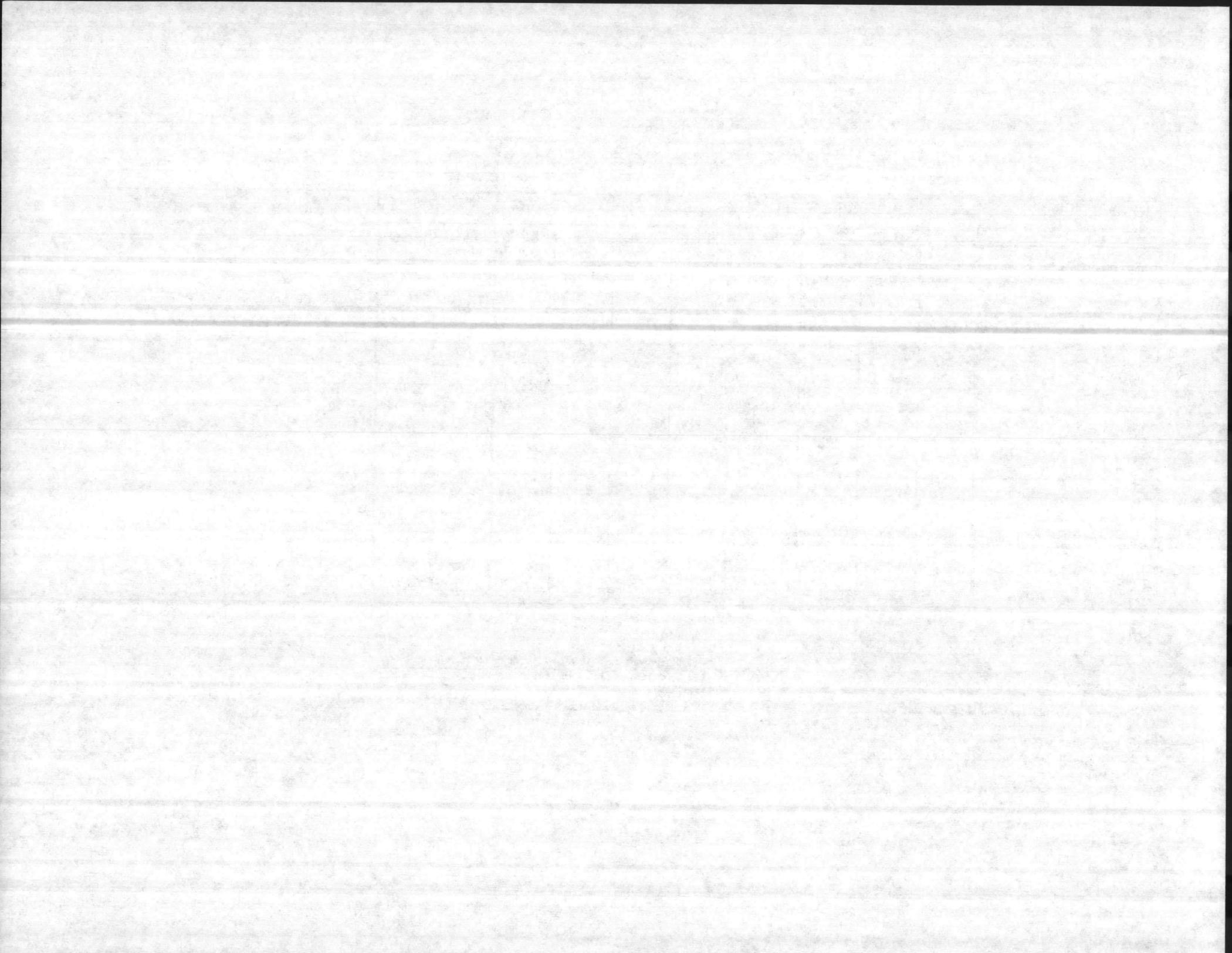
WELL NUMBER	HPGW24				HPGW25				STANDARDS		
	ug/L				ug/L				North Carolina*	Primary MCLs	
	DATE SAMPLED	1/19/87	3/11/87	5/29/87	1/18/91	1/19/87	3/11/87	5/29/87	1/18/91	ug/L	ug/L
INORGANICS:											
Aluminum	NA	NA	NA	15400	NA	NA	NA	218000	-	-	
Antimony				22 U				13.3 U	-	10/5(3)	
Arsenic				4.2 B				13.2	50	50	
Barium				60.1 B				289	1000	1000	
Beryllium				2.1 U				2.8 B	-	1(1)	
Calcium				16600				6270	-	-	
Chromium				26.3				205	50	100	
Cobalt				6.4 U				10.5 B	-	-	
Copper				11.5 B				57.7	1000	1300(2)	
Iron				19200				46600	300	-	
Lead				21.4				71.6	50	15(2)	
Magnesium				2430 B				10000	-	-	
Manganese				54.8				118	50	-	
Mercury				0.1 U				0.1 U	1.1	2	
Nickel				14 U				39.2 B	150	100(1)	
Potassium				3130 B				13100	-	-	
Silver				6.2 U				3.9 B	50	50(4)	
Sodium				11800				18200	-	-	
Vanadium				39.2 B				259	-	-	
Zinc				70.5				119	5000	-	
Cyanide				10 U				10 U	154	200(1)	

**NOTES:**

- \* - North Carolina water quality criteria for groundwater.
- NA - Not analyzed
- (-) - No standard set
- < - Less than detection limit
- 1 - Proposed maximum contaminant levels MCLs
- 2 - MCL is Action Level for Public Water Supply Systems.
- 3 - Two proposed MCLs
- 4 - Silver currently has an MCL of 50 ug/L; as of 7/30/92 silver will no longer have a primary MCL, its secondary MCL of 100 ug/L will become effective.

**QUALIFIERS:**

- U - Compound was analyzed but not detected
- B - Reported value is < Contract Required Detection Limit but > Instrument Detection Limit, inorganics
- J - estimated value
- D - Compound analyzed at a secondary dilution factor



summary of volatile and semivolatile organic compounds, oil and grease, and inorganic parameter concentrations detected in the four shallow aquifer wells.

In general, wells HPGW22 and HPGW25 do not appear to be contaminated with volatile organic constituents. Low concentrations of benzene, carbon disulfide, ethylbenzene, toluene, and xylene were found in wells HPGW23 and HPGW24. Concentrations of trans-1,2-DCE increased in well HPGW23 and decreased in well HPGW24. TCE concentrations exhibited a decreasing trend in well HPGW23 (from a high concentration of 13,000 µg/L in Set Two to 3,700 µg/L in the Supplemental Round). However, TCE increased in well HPGW24 from 57 µg/L in Set One to 180 µg/L in the Supplemental Round. Elevated concentrations for 1,2-DCE (total) were also detected in wells HPGW23 and HPGW24.

Naphthalene was detected in well HPGW24 only. Several semivolatile organic compounds were detected in trace concentrations in three of the four wells (except for well HPGW25).

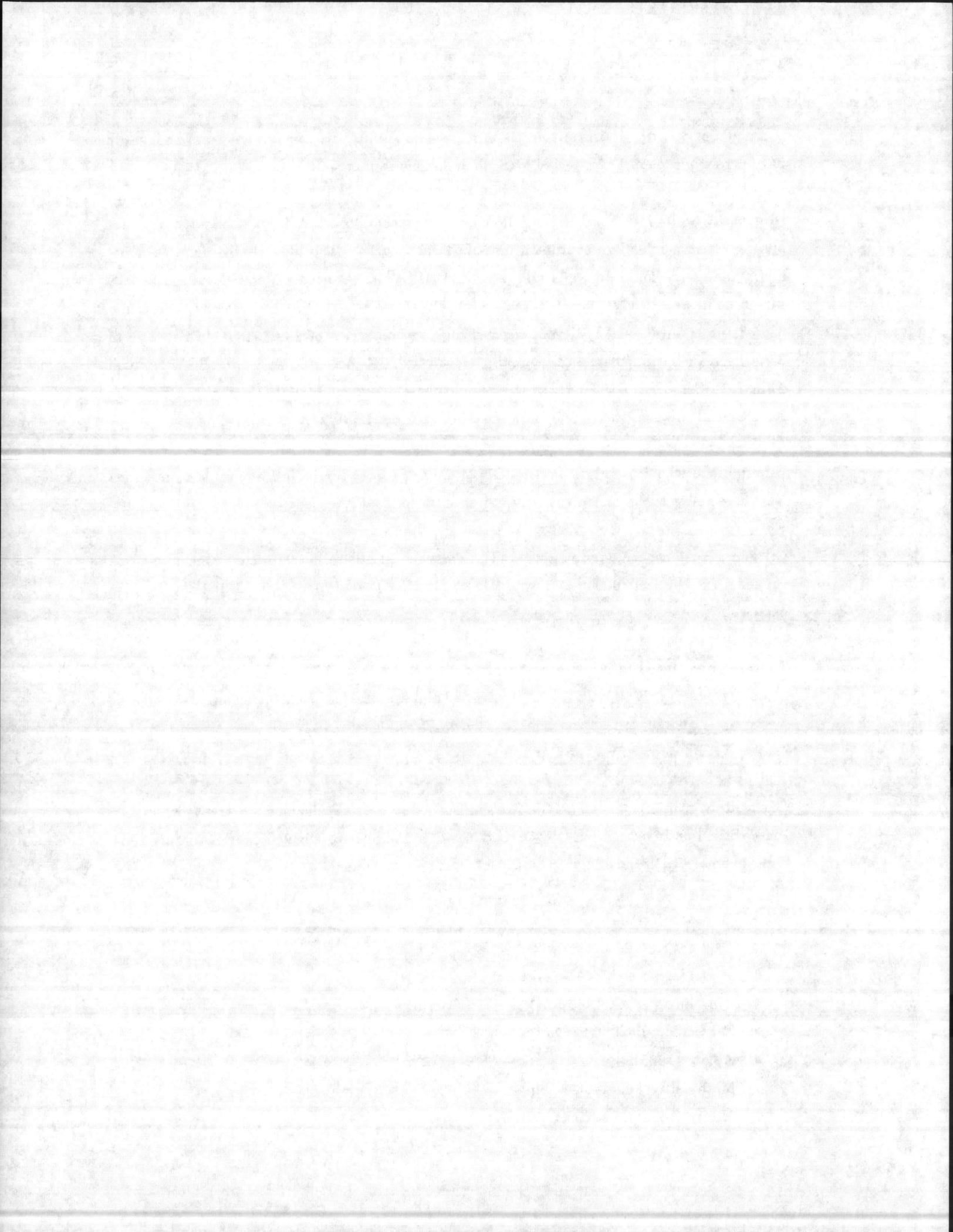
Oil and grease concentrations appeared to decrease in all wells. Detected concentrations ranged from a high of 3000 µg/L in well HPGW23 in Set Two to "not detected" in Set Three for each well.

Total lead appeared to have increased in each well in this vicinity during the four year sampling interval. Well HPGW25 exhibited the highest total lead concentration (71.6 µg/L).

#### **4.4.8 Transformer Storage Yard**

One shallow monitoring well (21GW1) was installed in the Transformer Storage Yard during the Verification Investigation (1984). Groundwater samples were collected in both July 1984 and November 1986 and analyzed for the following parameters:

- Organochlorine pesticides
- Organochlorine herbicides
- Polychlorinated biphenyls (PCBs)
- Volatile organics (1986 only)
- Tetrachlorodioxin (1986 only)
- Xylene (1986 only)
- Methylene ketone (1986 only)
- Methyl isobutyl ketone (1986 only)



- Ethylene dibromide (1986 only)
- Oil and grease (1986 only)

No target parameters were detected in the July 1984 groundwater sampling event. Two parameters, 2,4-D (an organochlorine herbicide detected at 1.17 µg/L) and oil and grease (400 µg/L) were detected in the November 1986 groundwater sampling event. The well was again sampled in 1991 during the Supplemental Investigation. No volatile or semivolatile parameters were present above instrument detection limits. All metals (except cadmium, mercury, selenium, silver, thallium, and cyanide) were detected in well 21GW1 (refer to Table 4-8).

#### **4.4.9 Monitoring Wells Paired to Water Supply Wells**

A shallow monitoring well was installed next to each of five closed water supply wells to determine whether contamination observed in the water supply well migrated from the shallow aquifer.

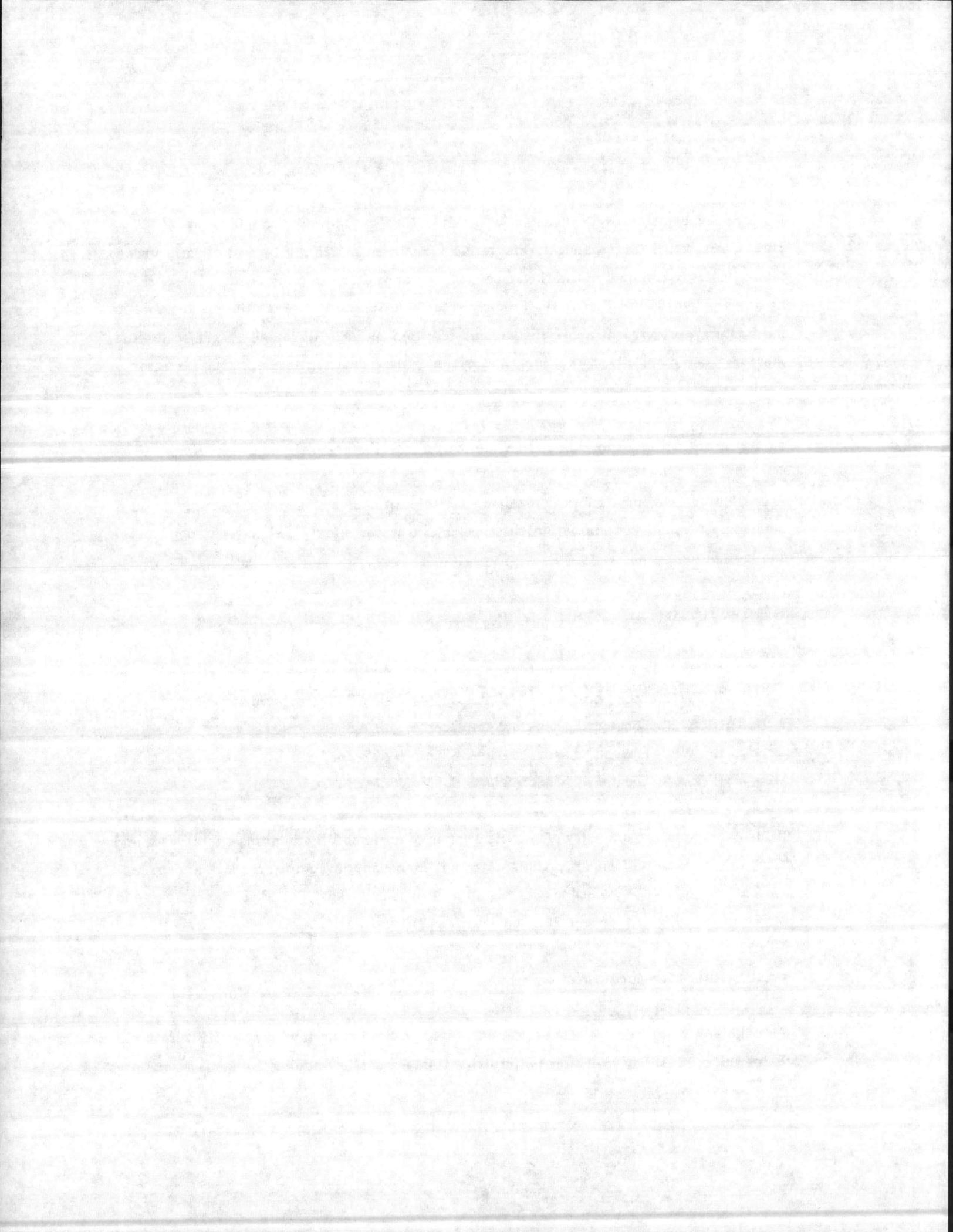
These wells include:

- HPGW2 - Located adjacent to Water Supply Well WS608
- HPGW13 - Located adjacent to Water Supply Well WS601 (replaced as WS660)
- HPGW20 - Located adjacent to Water Supply Well WS602
- HPGW25 - Located adjacent to Water Supply Well WS634
- HPGW26 - Located adjacent to Water Supply Well WS637

Table 4-9 presents a summary of volatile organic compounds, oil and grease, total lead, and inorganic parameter concentrations detected in the shallow aquifer. Oil and grease concentrations have decreased to non-detectable levels in all wells. Total lead has increased in each well. The highest concentration detected was 71.6 µg/L (HPGW25).

#### **4.4.10 Other Monitoring Wells**

Four shallow monitoring wells have been installed at other locations within the HPIA to aid in the definition of the overall flow pattern(s) within the shallow aquifer. Well locations are given as follows:



**TABLE 4-8  
CONSTITUENTS DETECTED IN GROUNDWATER  
TRANSFORMER STORAGE AREA**

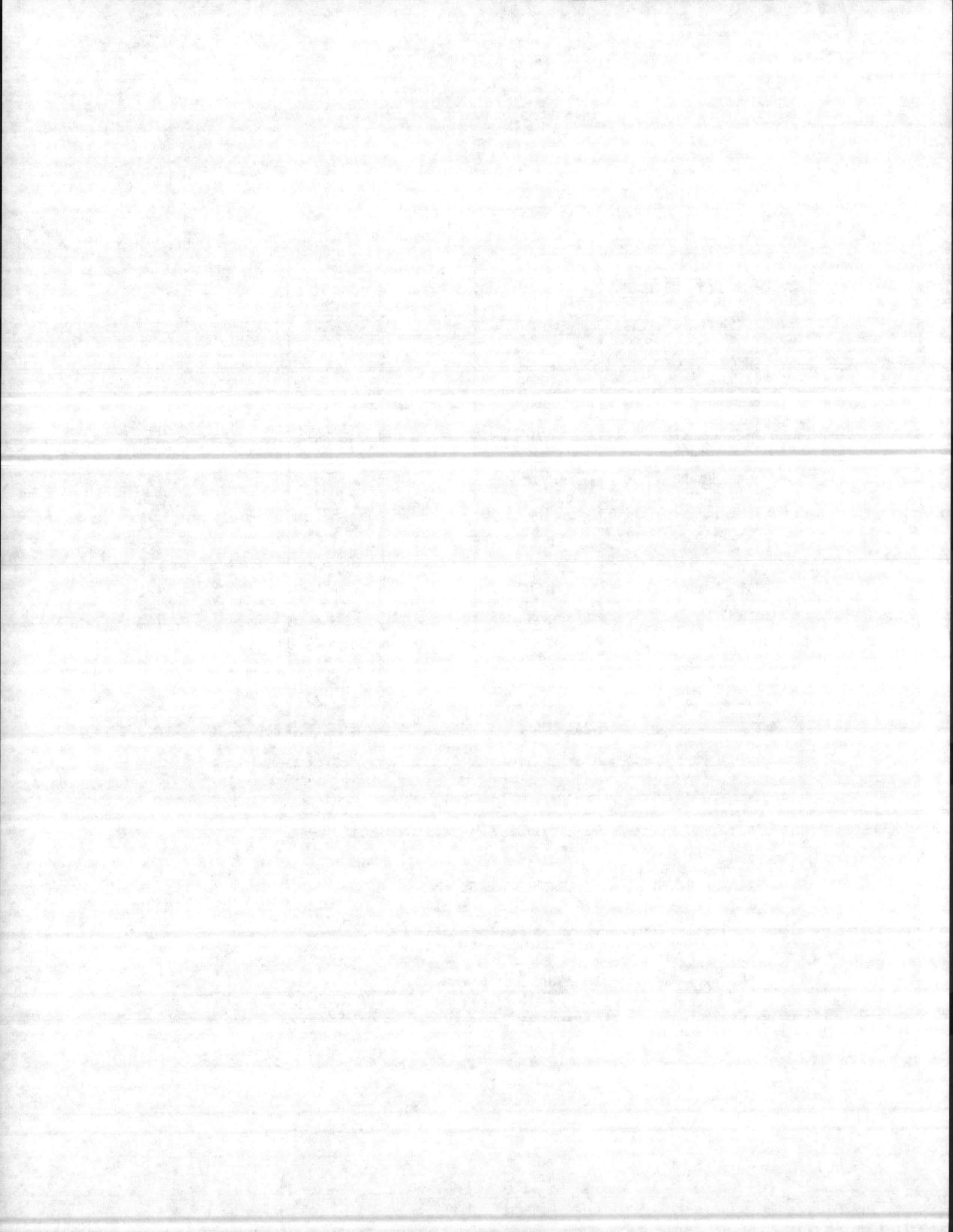
WELL NUMBER	21GW1	STANDARDS	
		North Carolina*	Primary MCLs
UNITS	ug/L		
DATE SAMPLED	1/18/91	ug/L	ug/L
<b>INORGANICS:</b>			
Aluminum	40400	-	-
Antimony	17 B	-	10/5(1)
Arsenic	41.4	50	50
Barium	71 B	1000	2000
Beryllium	1.1 B	-	1 (2)
Calcium	60400	-	-
Chromium	39	50	100
Cobalt	10.8 B	-	-
Copper	13.2 B	1000	1300(3)
Iron	54900	300	-
Lead	15.8	50	15 (3)
Magnesium	10300	-	-
Manganese	200	50	-
Mercury	0.35	1.1	2
Nickel	21.4 B	150	100(2)
Potassium	4400 B	-	-
Sodium	17400	-	-
Vanadium	138	-	-
Zinc	233	5000	-
Cyanide	10 U	154	200(2)

**NOTES:**

- \* - North Carolina water quality criteria for groundwater.
- 1 - Two proposed MCLs
- 2 - Proposed MCL
- 3 - MCL is Action Level for Public Water Supply Systems.
- 4 - Silver currently has an MCL of 50 ug/L; as of 7/30/92 silver will no longer have a primary MCL, its secondary MCL of 100 ug/L will become effective.

**QUALIFIERS:**

- U - Compound was analyzed for but not detected
- B - Reported value is < Contract Required Detection Limit but > Instrument Detection Limit, inorganics



**TABLE 4-9  
CONSTITUENTS DETECTED IN GROUNDWATER  
MONITORING WELLS PAIRED TO WATER SUPPLY WELLS**

WELL NUMBER SUPPLY WELL NUMBER UNITS DATE SAMPLED	HPGW2 Well 608				HPGW13 Well 601/660				HPGW20 Well 602				STANDARDS	
	ug/L				ug/L				ug/L				North Carolina*	Primary MCLs
	1/09/8	3/08/8	5/27/8	1/18/91	1/14/8	3/09/8	5/28/8	1/18/91	1/16/8	3/10/8	5/28/8	1/18/91	ug/L	ug/L
<b>ORGANICS:</b>														
Acetone	NA	NA	NA	10 U	NA	N/A	NA	10 U	NA	NA	NA	10 U	-	-
Benzene	12	< 1	< 1	5 U	< 1	< 1	< 1	5 U	< 1	< 1	< 1	5 U	1	5
Carbon disulfide	NA	NA	NA	5 U	NA	N/A	NA	5 U	NA	NA	NA	2 J	-	-
Chloromethane	5	< 4.3	< 4.3	10 U	< 4.3	< 4.3	< 4.3	10 U	< 4.3	< 4.3	< 4.3	10 U	-	-
Methylene chloride	< 2.8	< 2.8	< 50	5 U	< 2.8	< 2.8	< 50	1 J	< 2.8	3.4	< 50	0.9 J	5	5 (1)
Toluene	38	< 6	< 6	5 U	< 6	< 6	< 6	5 U	< 6	< 6	< 6	5 U	1000	1000
Xylene (total)	28	< 12	< 12	5 U	< 12	< 12	< 12	5 U	< 12	< 12	< 12	5 U	400	10000
Oil & Grease	700	< 100	< 200	NA	200	< 100	< 200	NA	< 100	3000	< 200	NA	-	-
Total Lead	< 27	< 27	< 49.2	29.4	< 27	< 27	< 49.2	9	46	33	< 49.2	20	50	15 (2)
<b>INORGANICS:</b>														
Aluminum	NA	NA	NA	56000	NA	NA	NA	13500	NA	NA	NA	289000	-	-
Antimony				15.6 B				13.3 U				21.9 B	-	10/5(3)
Arsenic				24.1				47				49.4	50	50
Barium				84.4 B				129 B				814	1000	2000
Beryllium				1.7 B				0.59 B				9.5	-	1 (1)
Calcium				46800				4100 B				6370	-	-
Chromium				64.3				48.9				424	50	100
Cobalt				6.1 B				9.3 B				80.8	-	-
Copper				17.3 B				17 B				97.7	1000	1300(2)
Iron				34800				33500				152000	300	-
Lead				29.4				9				20	50	15 (2)
Magnesium				3980 B				7700				18000	-	-
Manganese				77.7				30.3				217	50	-
Mercury				0.1 U				0.1 U				0.5	1.1	2
Nickel				16.9 B				21.1 B				168	150	100(1)
Potassium				4820 B				4520 B				16600	-	-
Selenium				3.6 B				3.4 U				3.4 U	10	50
Silver				1.6 U				2.1 B				4.3 B	50	50 (4)
Sodium				3680 B				18100				11000	-	-
Vanadium				160				40.5 B				419	-	-
Zinc				88.2				127				637	5000	-
Cyanide				11.2 U				10 U				10 U	154	200(1)

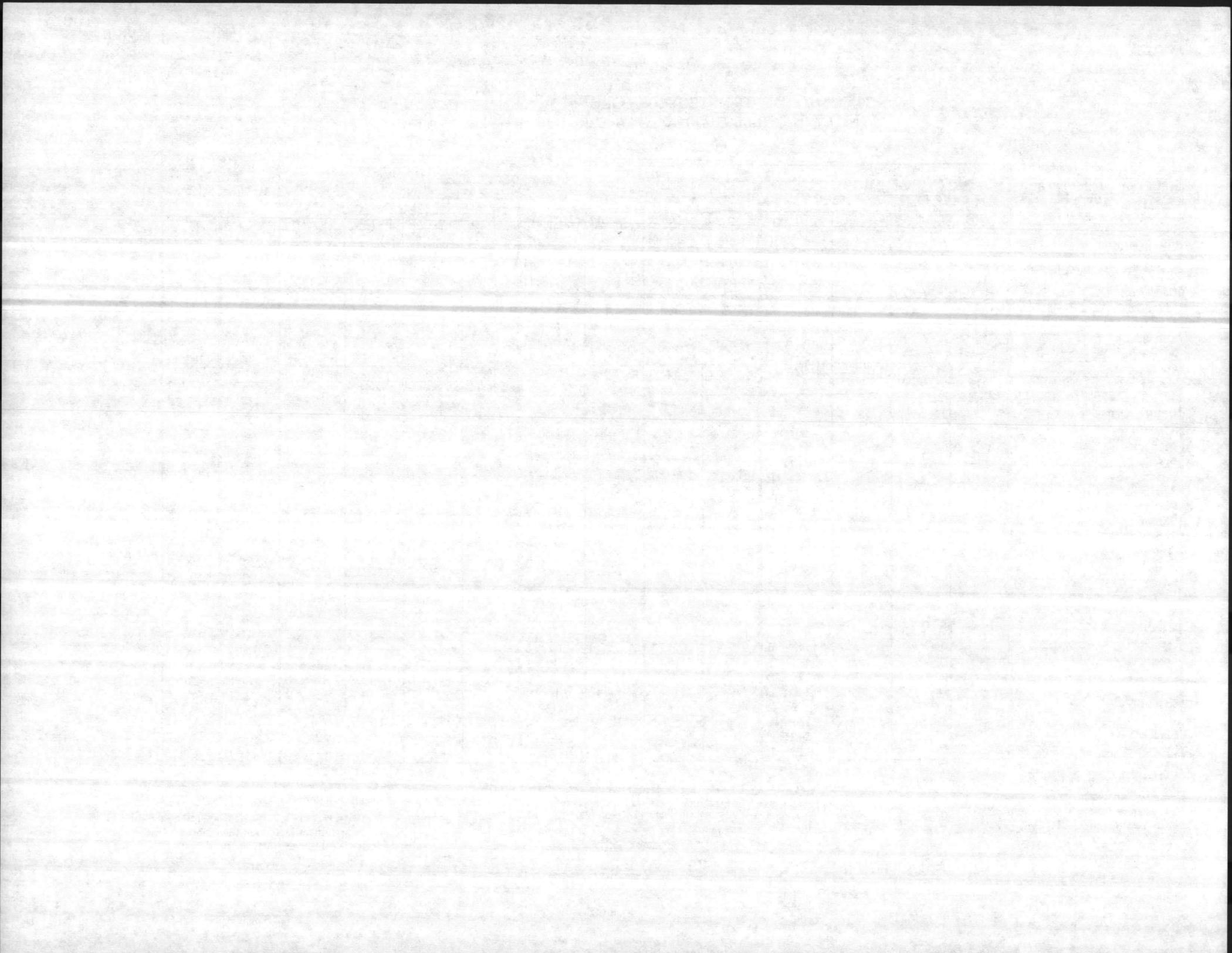
**NOTES:**

- \* - North Carolina water quality criteria for groundwater.
- NA - Not analyzed
- (-) - No standard set
- <X - Less than detection limit
- 1 - Proposed MCL

- 2 - MCL is Action Level for Public Water Supply Systems.
- 3 - Two proposed MCLs
- 4 - Silver currently has an MCL of 50 ug/L; as of 7/30/92 silver will no longer have a MCL, it's secondary MCL of 100 ug/L will become effective.

**QUALIFIERS:**

- U- Compound was analyzed for but not detected.
- B- Analyte found in associated blank, organics
- Reported value is <Contract Required Detection Limit - but > Instrument Detection Limit, inorganics
- J - Value is estimated



**TABLE 4-9 (cont)**  
**CONSTITUENTS DETECTED IN GROUNDWATER**  
**MONITORING WELLS PAIRED TO WATER SUPPLY WELLS**

WELL NUMBER SUPPLY WELL NUMBER UNITS	HPGW25 Well 634				HPGW26 Well 637				STANDARDS		
	ug/L				ug/L				North Carolina*	Primary MCLs	
	DATE SAMPLED	1/19/87	3/11/87	5/29/87	1/18/91	1/19/87	3/12/87	5/29/87	1/18/91	ug/L	ug/L
<b>ORGANICS:</b>											
Acetone	NA	NA	NA	10 U	NA	NA	NA	7 B	-	-	
Benzene	< 1	< 1	< 1	5 U	< 1	< 1	< 1	5 U	1	5	
Carbon disulfide	NA	NA	NA	5 U	NA	NA	NA	2 J	-	-	
Chloromethane	< 4.3	< 4.3	< 4.3	10 U	< 4.3	< 4.3	< 4.3	10 U	-	-	
Methylene chloride	< 2.8	2.9	< 50	5 U	< 2.8	6.5	< 50	3 J	5	5 (1)	
Toluene	< 6	< 6	< 6	5 U	< 6	< 6	< 6	5 U	1000	1000	
Xylene (total)	< 12	< 12	< 12	5 U	< 12	< 12	< 12	5 U	400	10000	
Oil & Grease	200	300	< 200	NA	200	2000	< 200	NA	-	-	
Total Lead	< 27	< 27	< 49.2	71.6	31	< 27	< 49.2	9	50	15 (2)	
<b>INORGANICS:</b>											
Aluminum	NA	NA	NA	218000	NA	NA	NA	10400	-	-	
Antimony				13.3 U				13.3 U	-	10/5(3)	
Arsenic				13.2				1.5 U	50	50	
Barium				289				72 B	1000	2000	
Beryllium				2.8 B				0.5 U	-	1 (1)	
Calcium				6270				2830 B	-	-	
Chromium				205				13	50	100	
Cobalt				10.5 B				6 U	-	-	
Copper				57.7				9.1 B	1000	1300(2)	
Iron				46600				19000	300	-	
Lead				71.6				9	50	15 (2)	
Magnesium				10000				1830 B	-	-	
Manganese				118				10.6 B	50	-	
Mercury				0.1 U				0.1 U	1.1	2	
Nickel				39.2 B				5.2 U	150	100(1)	
Potassium				13100				2230 B	-	-	
Selenium				3.4 U				3.4 U	10	50	
Silver				3.9 B				1.6 U	50	50 (4)	
Sodium				18200				5910	-	-	
Vanadium				259				149	-	-	
Zinc				119				68.1	5000	-	
Cyanide				10 U				10 U	154	200(1)	

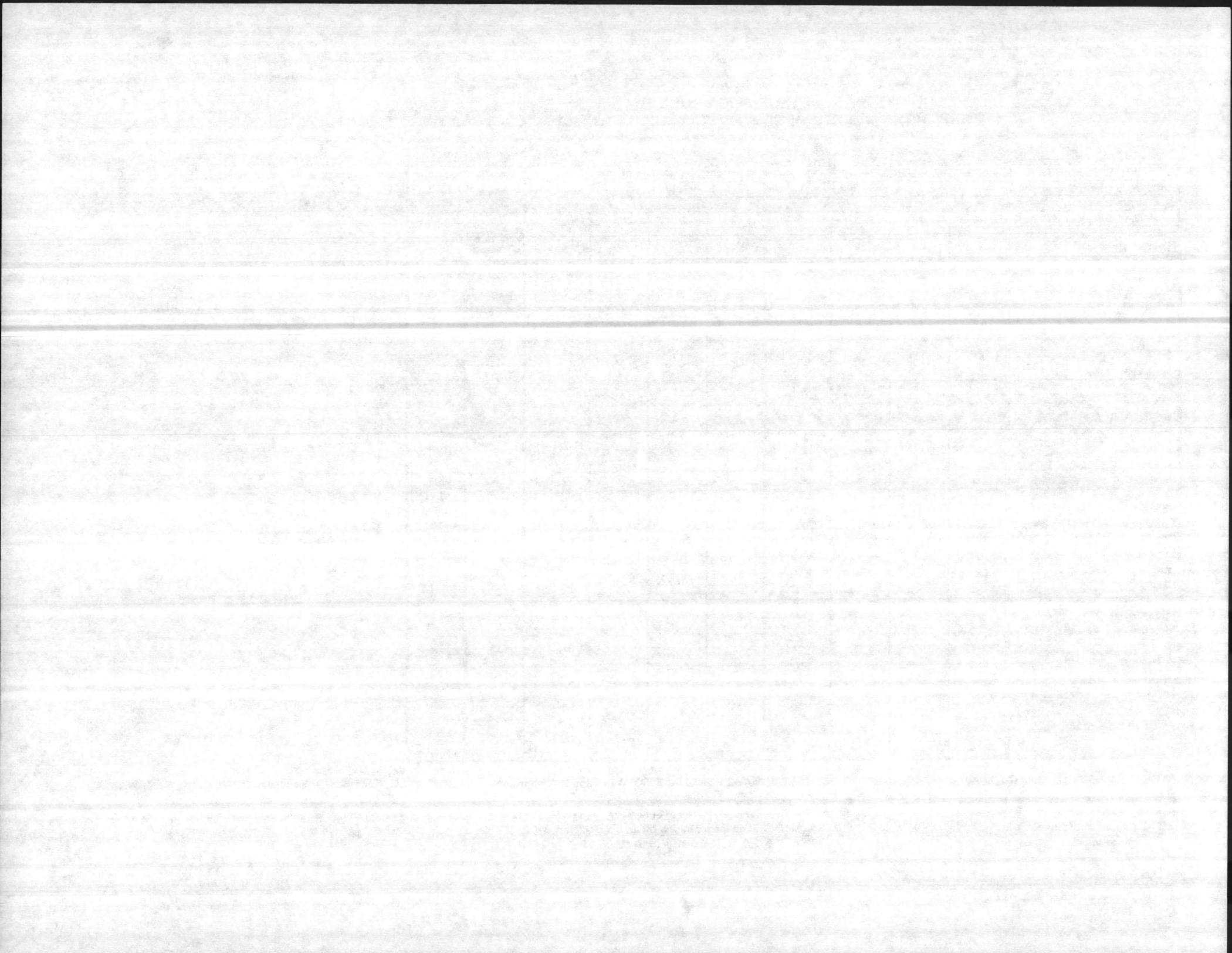
**NOTES:**

- \* - North Carolina water quality criteria for groundwater.
- NA - Not analyzed
- (-) - No standard set
- <X - Less than detection limit
- 1 - Proposed MCL

- 2 - MCL is Action Level for Public Water Supply Systems.
- 3 - Two proposed MCLs
- 4 - Silver currently has an MCL of 50 ug/L; as of 7/30/92 silver will no longer have a MCL, it's secondary MCL of 100 ug/L will become effective.

**QUALIFIERS:**

- U- Compound was analyzed for but not detected.
- B- Analyte found in associated blank, organics
- Reported value is <Contract Required Detection Limit
- but > Instrument Detection Limit, inorganics
- J - Value is estimated



- HPGW12: Located midway between Buildings 1202 and 1501
- HPGW14: Located midway between HPIA and Water Supply Well 601
- HPGW21: Located northwest of the Fuel Tank Farm
- HPGW29: Located adjacent to Building 1801

Table 4-10 presents a summary of volatile organic compounds, oil and grease, total lead, and inorganic parameter concentrations detected in these shallow aquifer wells.

Xylene was detected in well HPGW21 at a concentration of 5 µg/L. Other constituents, including TCE, were also present in this well in low concentrations.

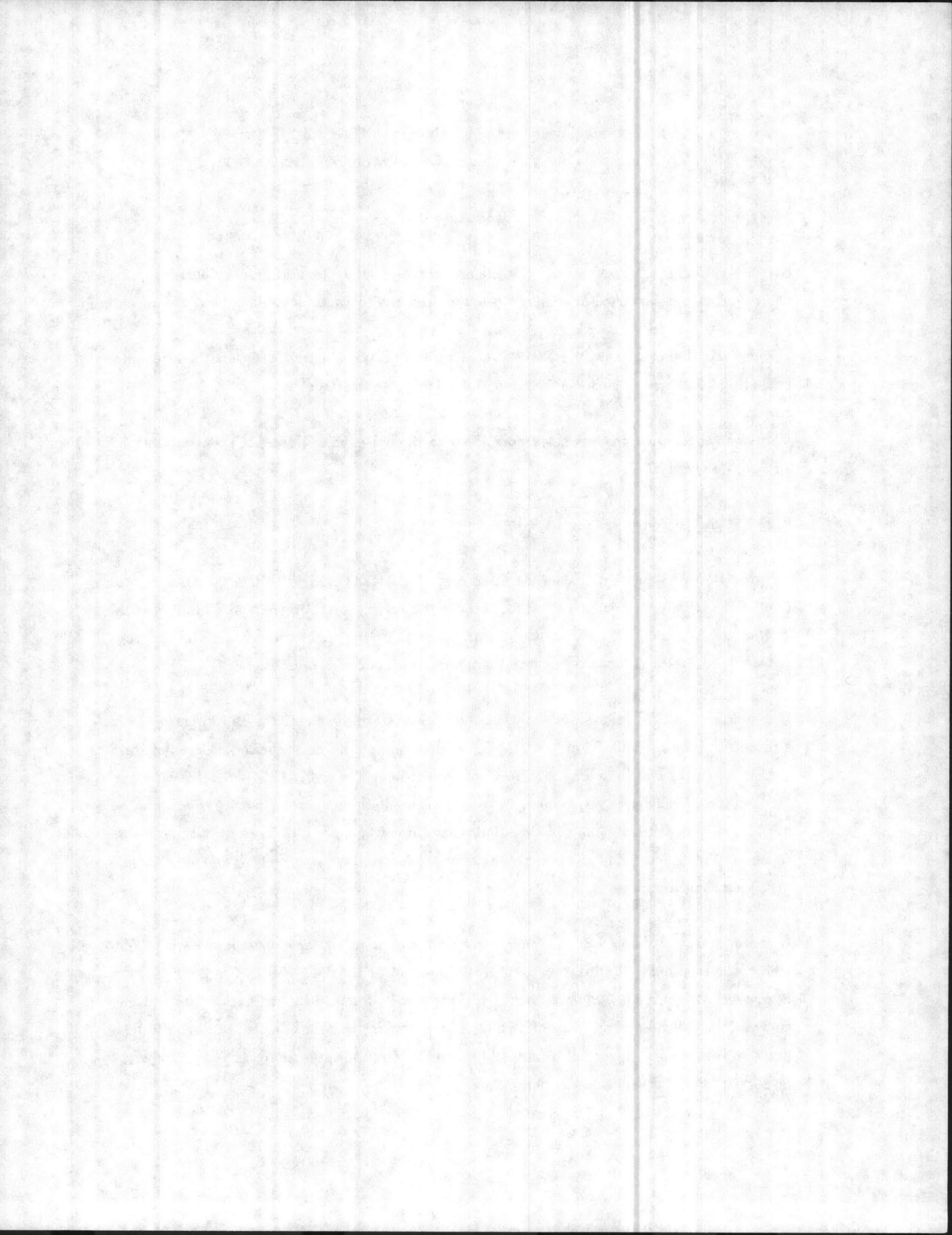
Total lead concentrations increased from non-detectable in each well to a high concentration of 66.5 µg/L in well HPGW14.

#### 4.5 Conclusions

Figures 4-1 to 4-4 present isoconcentration maps for BTEX, TCE, 1,2-DCE (total), and total lead, respectively. Concentrations from the most recent sampling round (Supplemental Round) were used to construct the maps. Based on the most recent sample analyses (January 18, 1991), two distinct contaminant plumes appear to be present.

One plume is located east of Cedar Street and extends from the vicinity of Buildings 901, 902 and 903 to the fuel tank farm. It is believed that this plume is comprised of two separate source areas, the 900 Area and Site 22. Contaminant levels in wells HPGW23, HPGW24, and HPGW25, which are located in the vicinity of the three buildings, are primarily contaminated with solvent constituents (e.g., TCE), but also exhibit low levels of BTEX. Contaminant levels in well GW22-1, located near the fuel tank farm, reflect high levels of BTEX and lower levels of solvent constituents.

A second plume, located west of Cedar Street, appears to be centered around Well HPGW9, which is associated with Buildings 1502, 1601, and 1602, the "1600 Area." The Confirmation Study records search documented heavy solvent and POL usage in this area. The soil gas survey data indicated high levels of TCE contamination in the soils adjacent to the buildings; these soils were also reported to be visibly stained. Groundwater analyses reflect elevated levels of TCE and other related constituents.



**TABLE 4-10  
CONSTITUENTS DETECTED IN GROUNDWATER  
OTHER MONITORING WELLS**

WELL NUMBER LOCATION DESCRIP UNITS	HPGW12 Midway between Bldgs. 1202 & 1501				HPGW14 Midway between HPIA & Well 601				STANDARDS		
	ug/L				ug/L				North Carolina*	Primary MCLs	
	DATE SAMPLED	1/14/87	3/08/87	5/27/87	1/18/91	1/14/87	3/09/87	5/28/87	1/18/91	ug/L	ug/L
<b>ORGANICS:</b>											
Acetone	NA	NA	NA	10 U	NA	N/A	NA	10 U	-	-	
Ethylbenzene	< 7.2	< 7.2	< 7.2	5 U	< 7.2	< 7.2	< 7.2	5 U	29	700	
Methylene chloride	< 2.8	< 2.8	< 50	5 U	< 2.8	< 2.8	< 50	5 U	5	5 (1)	
Tetrachloroethene	< 3	3.6	< 3	5 U	< 3	< 3	< 3	5 U	0.7	5	
Trichloroethene	< 3	< 3	< 1	5 U	< 3	< 3	< 1	5 J	2.8	5	
Xylene (total)	< 12	< 12	< 12	5 U	< 12	< 12	< 12	5 U	400	10000	
Oil & Grease	200	< 100	< 200	NA	200	< 100	< 300	NA	-	-	
Total Lead	< 27	< 27	< 49.2	15.7	< 27	< 27	< 49.2	66.5	50	15 (2)	
<b>INORGANICS:</b>											
Aluminum	NA	NA	NA	24000	NA	NA	NA	109000	-	-	
Antimony				22 U				13.3 U	-	10/5(3)	
Arsenic				1.8 U				45.6	50	50	
Barium				91.5 B				299	1000	2000	
Beryllium				2.1 U				2.7 B	-	1 (1)	
Calcium				34100				4340 B	-	-	
Chromium				25.5				127	50	100	
Cobalt				6.4 B				12.9 B	-	-	
Copper				5.9 B				34.8	1000	1300(2)	
Iron				5600				87200	300	-	
Lead				15.7				66.5	50	15 (2)	
Magnesium				7700				8770	-	-	
Manganese				18.3				80	50	-	
Mercury				0.1 U				0.26	1.1	2	
Nickel				11 U				41.6	150	100(1)	
Potassium				2600 B				6890	-	-	
Selenium				5.8				3.4 U	10	50	
Silver				6.2 U				2.5 B	50	50 (4)	
Sodium				9310				11500	-	-	
Vanadium				31.1				163	-	-	
Zinc				46.6				206	5000	-	
Cyanide				10 U				10 U	154	200(1)	

**NOTES:**

- \* - North Carolina water quality standards for groundwater.
  - <X - Less than detection limit
  - NA - Not analyzed
  - 1 - Proposed MCL
  - 2 - MCL is Action Level for Public Water Supply Systems.
  - 3 - Silver currently has an MCL of 50 ug/L; as of 7/30/92 silver will no longer have a primary MCL, its secondary MCL of 100 ug/L will become effective.
  - 4 - Two proposed MCLs
- QUALIFIERS:**
- U - Compound was analyzed for but not detected.
  - B - Analyte found in associated blank, organics Reported value is <Contract Required Detection Limit but >Instrument Detection Limit, inorganics
  - J - Value is estimated

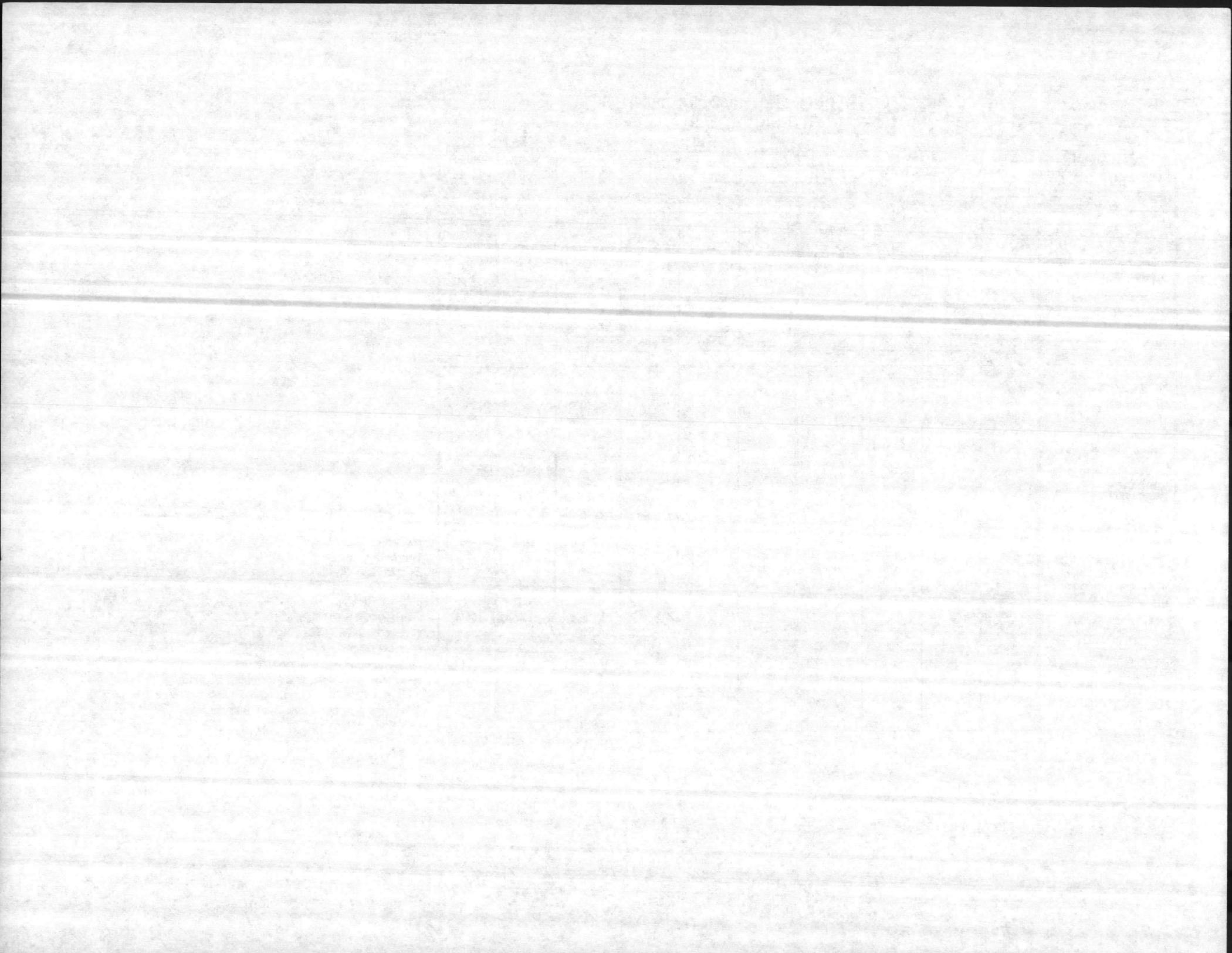


TABLE 4-10 (cont)  
 CONSTITUENTS DETECTED IN GROUNDWATER  
 OTHER MONITORING WELLS

WELL NUMBER LOCATION DESCRIP UNITS	HPGW21 NW of Fuel Tank Farm				HPGW29 Next to Building 1801				North Carolina*	Primary MCLs
	ug/L				ug/L					
	DATE SAMPLED	1/16/87	3/10/87	5/28/87	1/18/91	1/20/87	3/12/87	5/29/87		
ORGANICS:										
Acetone	NA	NA	NA	4 B	NA	NA	NA	10 U	-	-
Ethylbenzene	< 7.2	< 7.2	< 7.2	0.9 J	< 7.2	< 7.2	< 7.2	5 U	29	700
Methylene chloride	< 2.8	< 2.8	< 50	4 J	< 2.8	< 2.8	< 50	0.9 J	5	5 (1)
Tetrachloroethene	< 3	< 3	< 3	5 U	< 3	< 3	< 3	5 U	0.7	5
Trichloroethene	< 3	< 1	< 1	3 J	< 3	< 3	< 1	5 U	2.8	5
Xylene (total)	< 12	< 12	< 12	5	< 12	< 12	< 12	5 U	400	10000
Oil & Grease	200	2000	< 200	NA	200	< 100	< 200	NA	-	-
Total Lead	< 27	< 27	< 49.2	49.4	< 27	52	< 49.2	29.1	50	15 (2)
INORGANICS:										
Aluminum	NA	NA	NA	38500	NA	NA	NA	47800	-	-
Antimony				13.3 U				13.3 U	-	10/5(3)
Arsenic				12.1				25.6	50	50
Barium				114 B				633	1000	2000
Beryllium				3.7 B				8.7	-	1 (1)
Calcium				26100				59200	-	-
Chromium				45				179	50	100
Cobalt				17.6 B				17.8 B	-	-
Copper				28.3				39.9	1000	1300(2)
Iron				56600				76200	300	-
Lead				49.4				29.1	50	15 (2)
Magnesium				10200				15000	-	-
Manganese				136				236	50	-
Mercury				0.1 U				0.1 U	1.1	2
Nickel				30.8 B				93.5	150	100(1)
Potassium				5160				5900	-	-
Selenium				3.5 B				3.4 U	10	50
Silver				1.6 U				3.1 B	50	50 (4)
Sodium				11800				7850	-	-
Vanadium				178				108	-	-
Zinc				273				329	5000	-
Cyanide				10 U				10 U	154	200(1)

NOTES:

\* - North Carolina water quality standards for groundwater.

<X - Less than detection limit

NA - Not analyzed

1 - Proposed MCL

2 - MCL is Action Level for Public Water Supply Systems.

3 - Silver currently has an MCL of 50 ug/L; as of 7/30/92 silver will no longer have a primary MCL, its secondary MCL of 100 ug/L will become effective.

4 - Two proposed MCLs

QUALIFIERS:

U - Compound was analyzed for but not detected.

B - Analyte found in associated blank, organics

Reported value is < Contract Required Detection Limit but > Instrument Detection Limit, inorganics

J - Value is estimated



## 5.0 CONTAMINANT FATE AND TRANSPORT

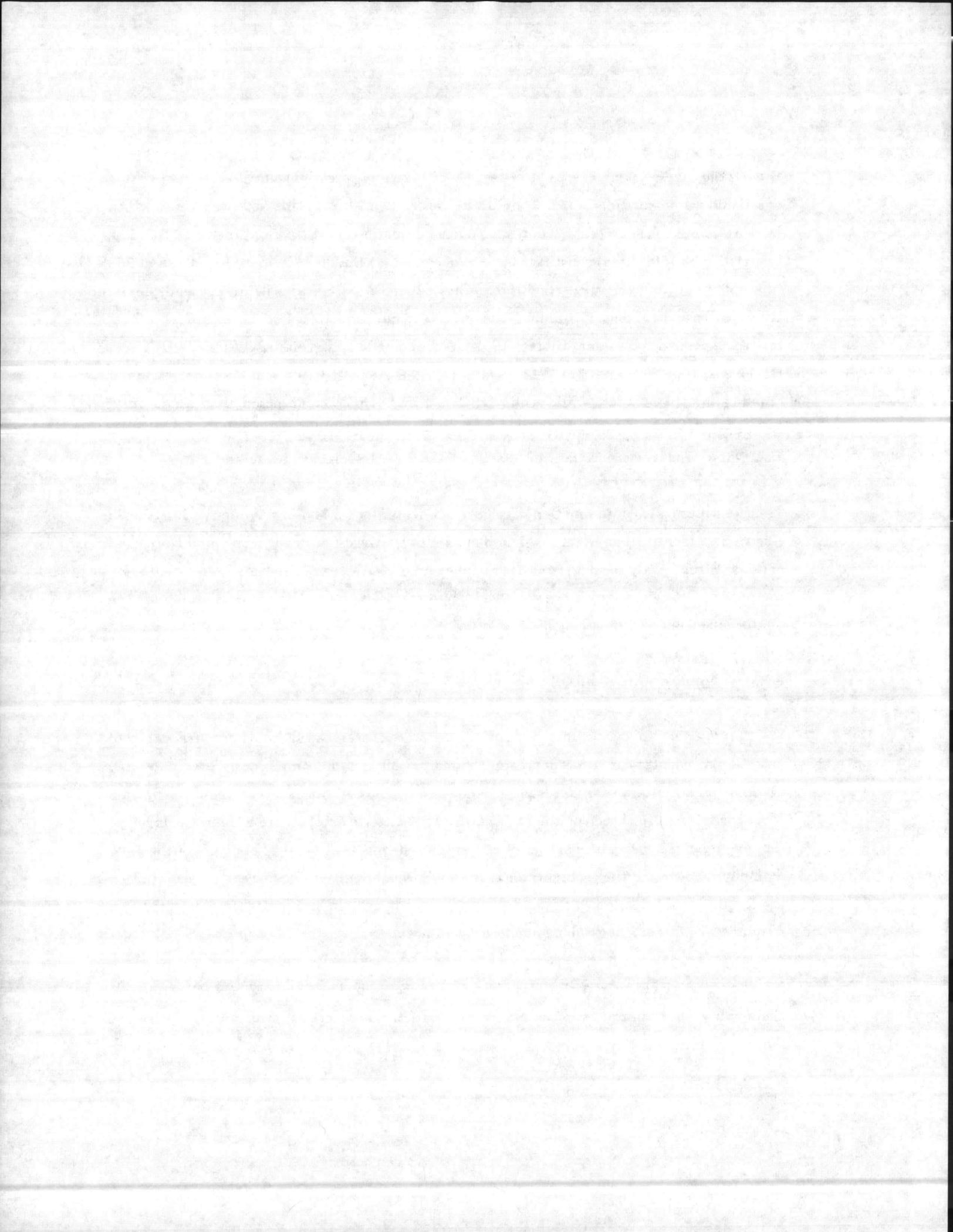
During the course of the investigations at the HPIA, many potential sources of contamination of soil and water were identified. The ESE RI Report (ESE, 1991) identified two plumes which were associated with three different areas of contamination: (1) Building Cluster 1601, 1602, and 1502 (the 1600 Area) constituted one plume; and, (2) Building Cluster 901, 902, and 903 (the 900 Area) and the HPIA tank farm (Site 22) were associated with the second plume. Historically and currently, Building Cluster 1601, 1602, and 1502 has been used as a Base maintenance shop. Building Cluster 1601, 1602 and 1502 is associated with wells HPGW8, HPGW9-1, HPGW10 and HPGW11. Wells HPGW9-1 and HPGW8 exhibited detections of organics and inorganics, while wells HPGW10 and HPGW11 detected inorganics only. Building Cluster 901, 902 and 903 is associated with wells HPGW22, HPGW23 and HPGW24-1. Organics and inorganics were detected in all the wells associated with this cluster.

Thus, two plumes of contamination have been delineated for the shallow aquifer within Site 78 (the HPIA), identified on Figures 4-1 through 4-4 as Southwest of Cedar Street and Northeast of Cedar Street. Only the data from the Supplemental Characterization were used to delineate the plumes. Previous data were reviewed for comparison only. Refer to Section 6.5 for the discussion on uncertainty analysis.

### 5.1 Choice of Chemicals of Concern

For the organic compounds, chemicals of concern were chosen based on toxicity, frequency of detection, concentration, exceedances of the federal Maximum Contaminant Levels (MCLs) and the North Carolina standards for groundwater (Tables 5-1 and 5-2). Inorganic chemicals of concern were also chosen on the basis of the above criteria except more weight was given to the toxicity of the inorganics in the selection of the chemicals. Chemical analyses of the 1991 data have shown that the groundwater in the shallow aquifer contains few chemicals in which the frequency of detection was greater than 50 percent, certain inorganics were detected at a frequency of 100 percent (iron, manganese, barium, and lead).

For the purposes of this report, the chemicals of concern have been categorized into groups of chemicals with similar physico-chemical and/or structural properties. The groups are: BTEX (benzene, toluene, ethylbenzene, and xylenes); solvents [vinyl chloride, chloroform,



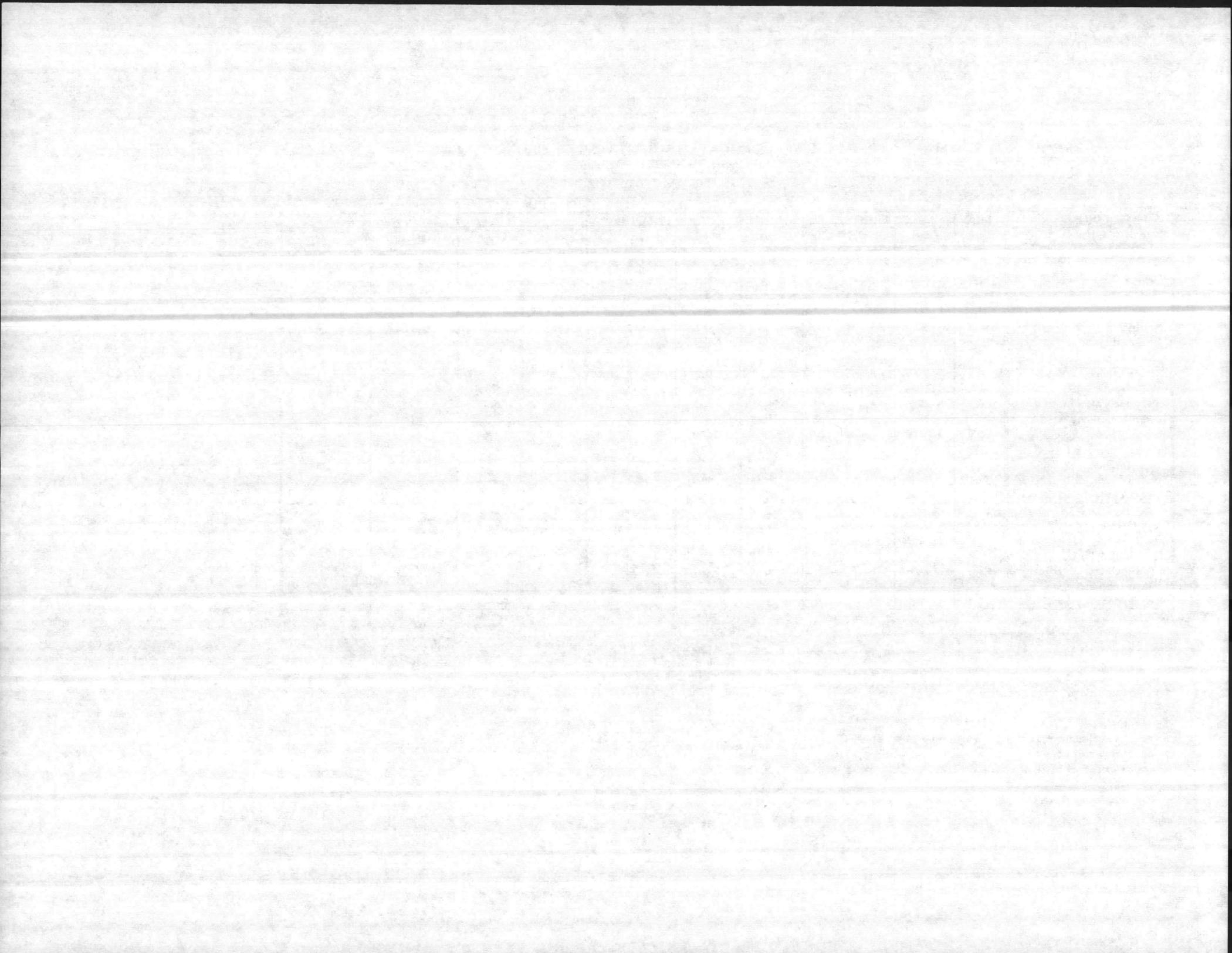
**TABLE 5-1  
FREQUENCY SUMMARY TABLE FOR WELLS LOCATED SOUTHWEST OF CEDAR STREET**

WELL NUMBER UNIT DATE SAMPLED	MIN ug/L 1/87	MAX ug/L 1/87	FREQUENCY OF DETECTS 1/87	MIN ug/L 3/87	MAX ug/L 3/87	FREQUENCY OF DETECTS 3/87	STANDARDS		NO. OF DETECTS GREATER THAN STANDARDS 1991 DATA ONLY	
							North Carolina*	Primary MCLs	North Carolina	Primary MCLs
							ug/L	ug/L		
Acetone	NA	NA	NA	NA	NA	NA	-	-	-	-
Benzene	1.40	43.0	4	3.2	3.9	2	1	5	-	-
Carbon Disulfide	NA	NA	NA	NA	NA	NA	-	-	-	-
Chloroform	ND	3.2	1	ND	2.2	1	0.19	-	1/1	-
Chloromethane	5.0	7.2	2	ND	ND	-	-	-	-	-
Dichloroethene (total),1,2-	NA	NA	NA	NA	NA	NA	-	-	-	-
Dichloroethene,trans-1,2-	1.9	740.0	3	2.2	7.2	2	70	100	-	-
Ethylbenzene	8.2	1100.0	3	ND	9.0	1	29	700	1/1	1/1
Methylene Chloride	ND	20.0	1	ND	ND	-	5	5(1)	-	-
Tetrachloroethene	ND	ND	-	ND	3.6	1	0.7	5	-	-
Toluene	35.0	100.0	3	8.2	12.0	2	1000	1000	-	-
Trichloroethane,1,1,1-	ND	ND	-	ND	13.0	1	200	200	-	-
Trichloroethene	3.4	5000.0	4	8.6	6100.0	3	2.8	5	3/5	2/5
Trichlorofluoromethane	ND	14.0	1	ND	96.0	1	-	-	-	-
Xylene (total)	28.0	4500.0	3	ND	ND	-	400	10000	1/1	-
Oil & Grease	100.0	3000.0	15	200.0	11000.0	5	-	-	-	-
SEMI-VOLATILES: bis(2-Ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA	-	-	-	-
Methylnaphthalene,2-							-	-	-	-
Naphthalene							-	-	-	-

**NOTES:**  
 \* - North Carolina water quality standards for groundwater.  
 NA - Not analyzed  
 NE - Not evaluated  
 <X - Less than detection limit  
 (-) - No standard set or no detects  
 1 - Proposed MCL  
 2 - Two proposed MCLs  
 3 - MCL is Action Level for Public Water Supply Systems.  
 4 - Silver currently has an MCL of 50 ug/L. As of 7/30/92, silver's secondary MCL of 100 ug/L will become effective.

**QUALIFIERS:**  
 B - analyte found in associated blank, organics  
 - Reported value is < Contract Required Detection Limit but > Instrument Detection Limit, inorganics  
 J - Value is estimated

5-2

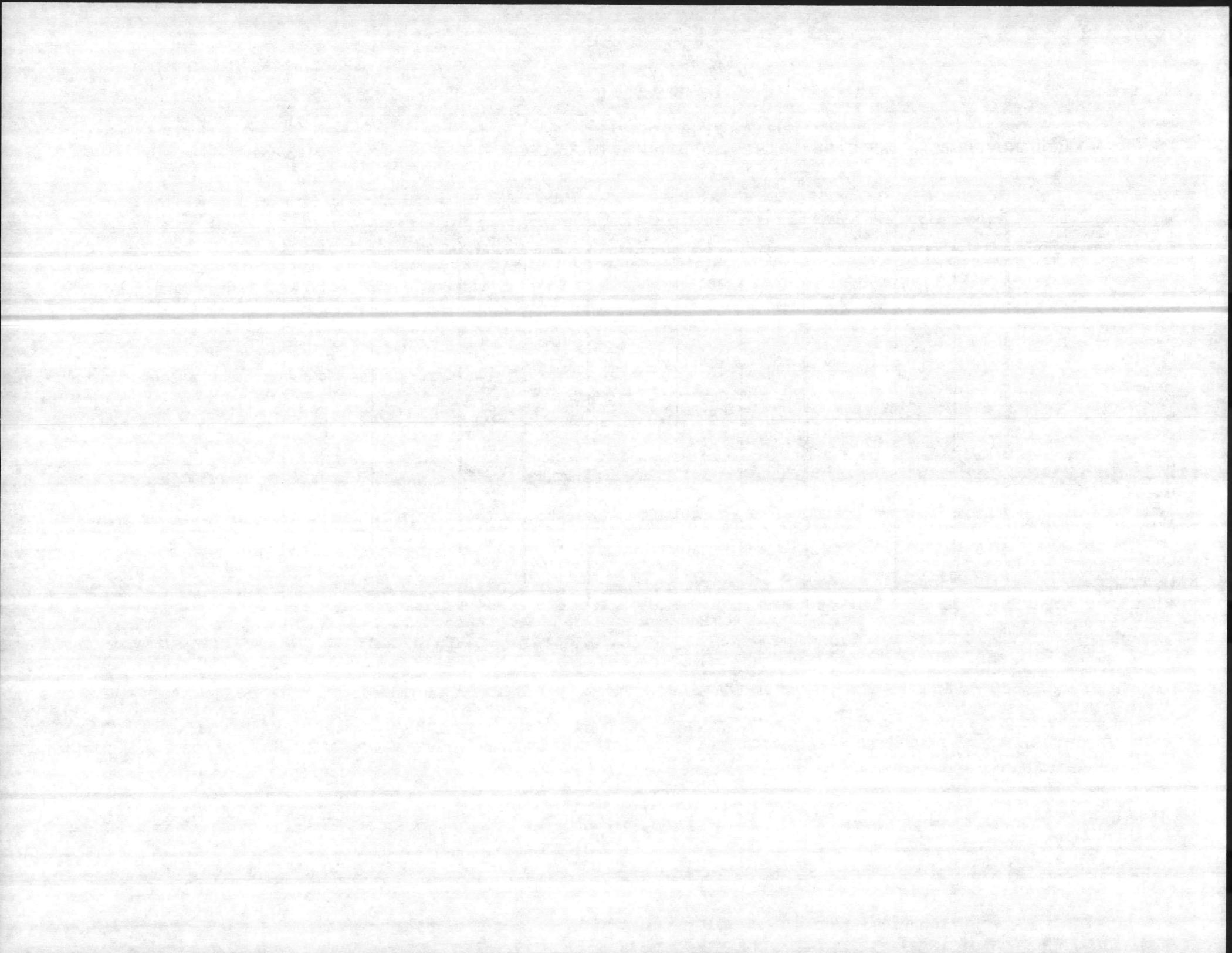


**TABLE 5-1 (cont)**  
**FREQUENCY SUMMARY TABLE FOR WELLS LOCATED SOUTHWEST OF CEDAR STREET**

WELL NUMBER UNIT DATE SAMPLED	MIN ug/L 1/87	MAX ug/L 1/87	FREQUENCY OF DETECTS 1/87	MIN ug/L 3/87	MAX ug/L 3/87	FREQUENCY OF DETECTS 3/87	STANDARDS		NO. OF DETECTS GREATER THAN STANDARDS 1991 DATA ONLY	
							North Carolina*	Primary MCLs	North Carolina	Primary MCLs
							ug/L	ug/L		
<b>INORGANICS:</b>										
Aluminum	NA	NA	NA	NA	NA	NA	-	-	-	-
Antimony							-	10/5(2)	-	4/4
Arsenic							50	50	-	-
Barium							1000	2000	1/16	1/16
Beryllium							-	1(1)	-	9/12
Calcium							-	-	-	-
Chromium							50	100	11/16	7/16
Cobalt							-	-	-	-
Copper							1000(4)	1300(3)	-	-
Iron							300	-	16/16	-
Lead							50	15(3)	7/16	13/16
Magnesium							-	-	-	-
Manganese							50	-	11/16	-
Mercury							1	2	1/16	-
Nickel							150	100(1)	1/12	1/12
Potassium							-	-	-	-
Selenium							10	50	-	-
Silver							50	50(4)	-	-
Sodium							-	-	-	-
Vanadium							-	-	-	-
Zinc							5000	-	-	-

**NOTES:**  
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 1 - Proposed MCL  
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**QUALIFIERS:**  
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 J - Value is estimated



**TABLE 5-1 (cont)**  
**FREQUENCY SUMMARY TABLE FOR WELLS LOCATED SOUTHWEST OF CEDAR STREET**

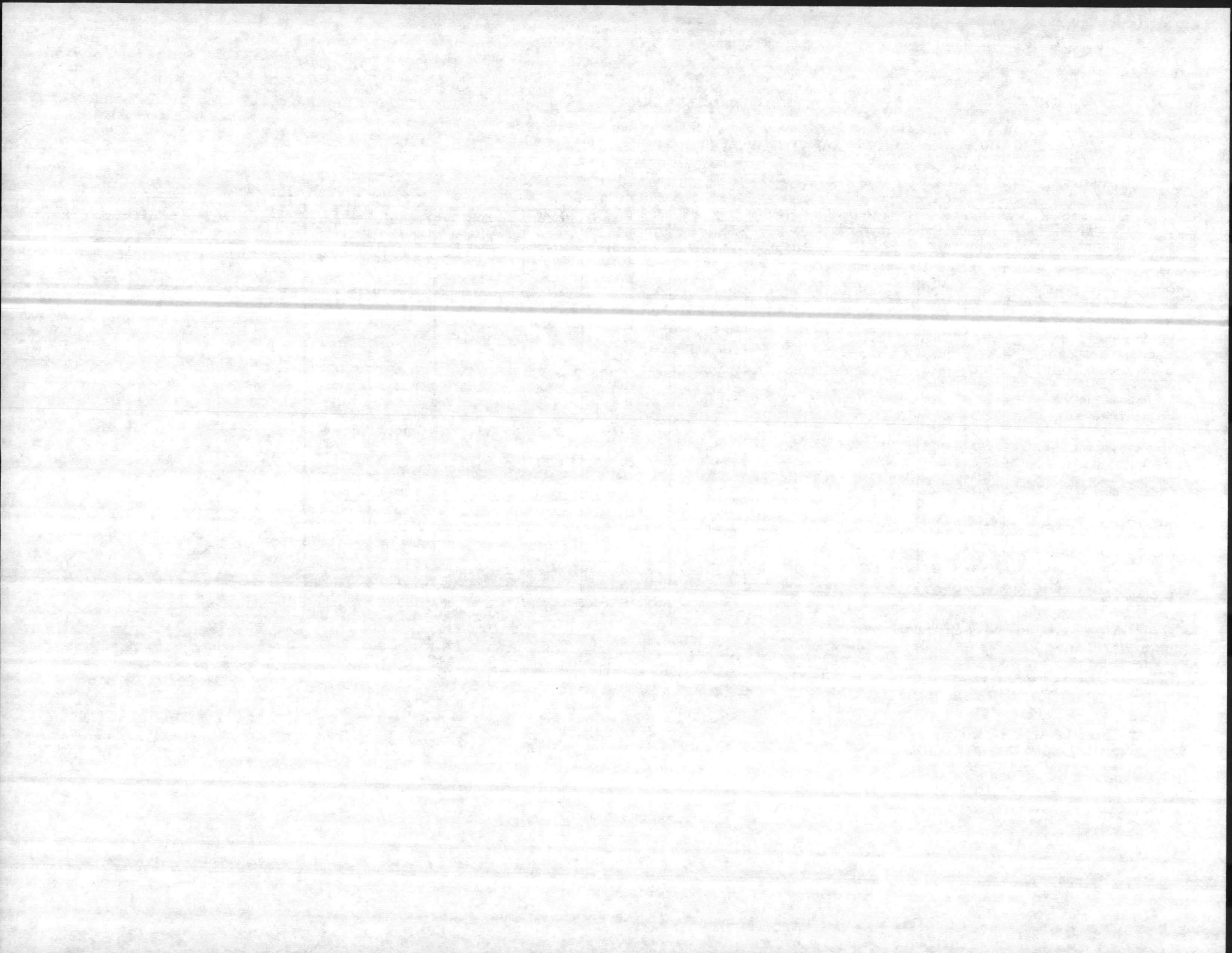
WELL NUMBER UNIT DATE SAMPLED	MIN ug/L 5/87	MAX ug/L 5/87	FREQUENCY OF DETECTS 5/87	MIN ug/L 1/18/91	MAX ug/L 1/18/91	FREQUENCY OF DETECTS 1/18/91	AVG ug/L 1/18/91	GEOMETRIC MEAN 1/18/91	STANDARDS		NO. OF DETECTS GREATER THAN STANDARDS 1991 DATA ONLY	
									North Carolina*	Primary MCLs	North Carolina	Primary MCLs
									ug/L	ug/L		
Acetone	NA	NA	NA	10.0 J	40.0	2/16	7.4	5.9	-	-	-	-
Benzene	ND	1.6	1	ND	ND	-	-	-	1	5	-	-
Carbon Disulfide	NA	NA	NA	11.0	13.0	2/16	3.6	3.0	-	-	-	-
Chloroform	ND	2.6	1	ND	15.0	1/16	3.2	2.8	0.19	-	1/1	-
Chloromethane	ND	ND	-	ND	ND	-	-	-	-	-	-	-
Dichloroethene (total),1,2-	NA	NA	NA	7.0 J	1200.0	3/16	77.1	4.6	-	-	-	-
Dichloroethene,trans-1,2-	4.4	2700.0	3	NA	NA	NA	NA	NA	70	100	-	-
Ethylbenzene	ND	ND	-	ND	700.0	1/16	43.5	3.6	29	700	1/1	1/1
Methylene Chloride	ND	ND	-	0.9 J	3.0 B	4/16	2.4	2.3	5	5(1)	-	-
Tetrachloroethene	ND	ND	-	ND	ND	-	-	-	0.7	5	-	-
Toluene	ND	ND	-	ND	330.0 J	1/16	21.8	3.4	1000	1000	-	-
Trichloroethane,1,1,1-	ND	ND	-	ND	ND	-	-	-	200	200	-	-
Trichloroethene	7.7	24.0	2	0.9 J	14000.0	5/16	831.0	5.1	2.8	5	3/5	2/5
Trichlorofluoromethane	ND	7.1	1	NA	NA	NA	NA	NA	-	-	-	-
Xylene (total)	ND	4000.0	1	ND	3300.0	1/16	196.5	3.9	400	10000	1/1	-
Oil & Grease	200.0	600.0	2	NA	NA	NA	NA	NA	-	-	-	-
SEMI-VOLATILES: bis(2-Ethylhexyl)phthalate	NA	NA	NA	ND	2 J	2/16	4.8	4.7	-	-	-	-
Methylnaphthalene,2-				ND	49	1/16	7.8	5.8	-	-	-	-
Naphthalene				ND	190	1/16	16.6	6.3	-	-	-	-

**NOTES:**

- \* - North Carolina water quality standards for groundwater.
- NA - Not analyzed
- NE - Not evaluated
- <X - Less than detection limit
- (-) - No standard set or no detects
- 1 - Proposed MCL
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- 3 - MCL is Action Level for Public Water Supply Systems.
- 4 - Silver currently has an MCL of 50 ug/L. As of 7/30/92, silver's secondary MCL of 100 ug/L will become effective.

**QUALIFIERS:**

- B - analyte found in associated blank, organics
- Reported value is < Contract Required Detection Limit but > Instrument Detection Limit, inorganics
- J - Value is estimated



**TABLE 5-1 (cont)**  
**FREQUENCY SUMMARY TABLE FOR WELLS LOCATED SOUTHWEST OF CEDAR STREET**

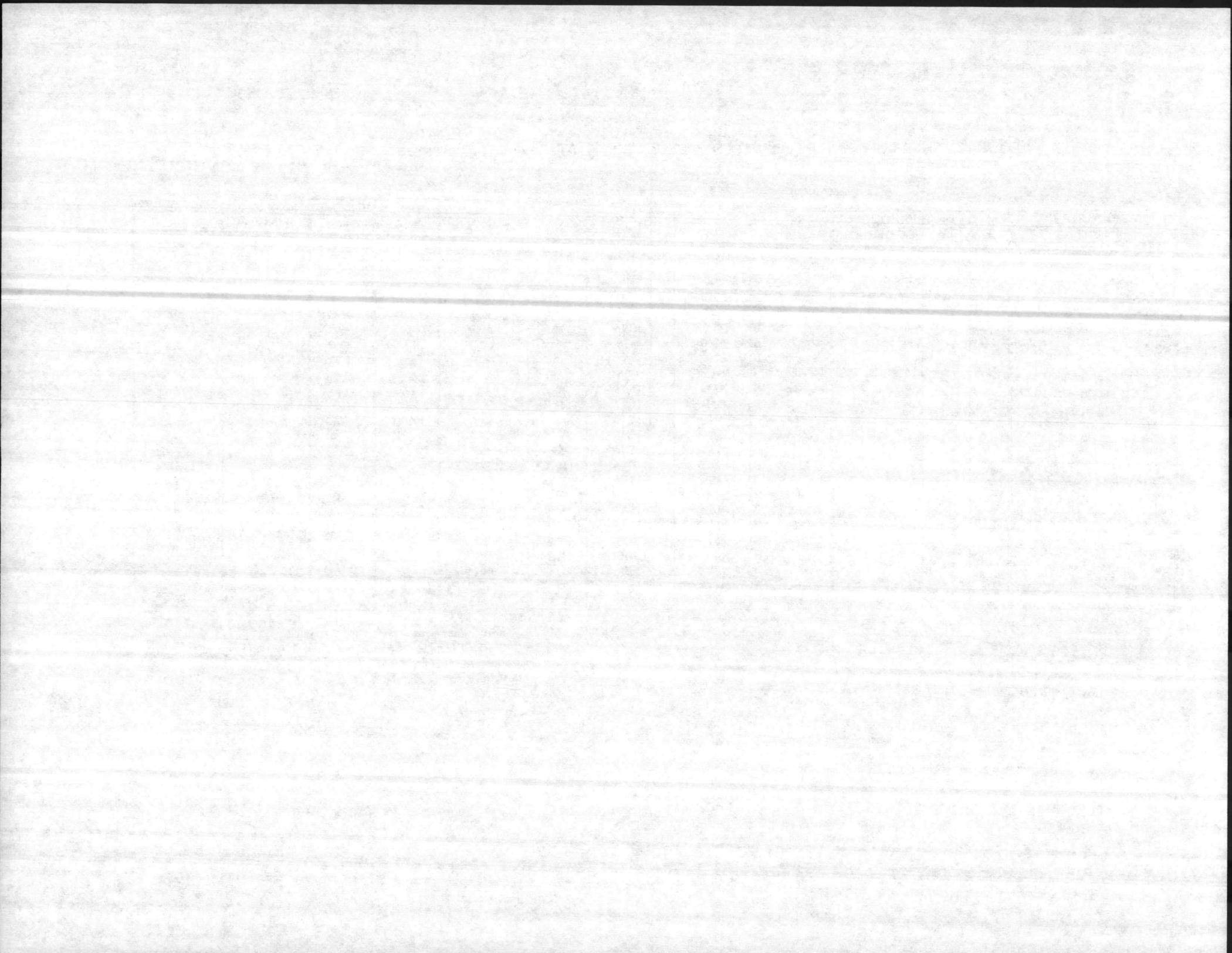
WELL NUMBER UNIT DATE SAMPLED	MIN ug/L 5/87	MAX ug/L 5/87	FREQUENCY OF DETECTS 5/87	MIN ug/L 1/18/91	MAX ug/L 1/18/91	FREQUENCY OF DETECTS 1/18/91	AVG ug/L 1/18/91	GEOMETRIC MEAN 1/18/91	STANDARDS		NO. OF DETECTS GREATER THAN STANDARDS 1991 DATA ONLY	
									North Carolina*	Primary MCLs	North Carolina	Primary MCLs
									ug/L	ug/L		
INORGANICS:												
Aluminum	NA	NA	NA	3580.0	1050000	16/16	139017.5	56533.4	-	-	-	-
Antimony				15.6 B	46.5 B	4/16	13	11.0	-	10/5(2)	-	4/4
Arsenic				3.0 B	47.0	13/16	19.6	10.7	50	50	-	-
Barium				13.6 B	1960	6/16	348.6	191.1	1000	2000	1/16	1/16
Beryllium				0.6 B	20	12/16	4	2.3	-	1(1)	-	9/12
Calcium				4100.0 B	91900	6/16	44891.9	23164.3	-	-	-	-
Chromium				3.6 B	1590	16/16	204.5	82.9	50	100	11/16	7/16
Cobalt				6.1 B	51.9	10/16	12.2	8.0	-	-	-	-
Copper				4.1 B	194	16/16	36	22.4	1000(4)	1300(3)	-	-
Iron				3100.0	265000	16/16	60118.8	33308.8	300	-	16/16	-
Lead				9.0	186	16/16	53.8	36.3	50	15(3)	7/16	13/16
Magnesium				2580.0 B	49700	16/16	11934.4	9323.5	-	-	-	-
Manganese				18.3	487	16/16	146.6	93.4	50	-	11/16	-
Mercury				0.1 B	1.4	6/16	0.2	0.1	1	2	1/16	-
Nickel				12.1 B	161	12/16	40.9	24.4	150	100(1)	1/12	1/12
Potassium				2230.0 B	55300	16/16	9395	6301.9	-	-	-	-
Selenium				2.6 B	5.8	7/16	2.6	2.2	10	50	-	-
Silver				2.1 B	4.7 B	5/16	2.3	2.0	50	50(4)	-	-
Sodium				3680.0 B	22400	16/16	10821.3	9501.9	-	-	-	-
Vanadium				24.9 B	1610	15/16	270.4	102.7	-	-	-	-
Zinc				46.6	4590	16/16	169.6	137.6	5000	-	-	-

**NOTES:**

- \* - North Carolina water quality standards for groundwater.
- NA - Not analyzed
- NE - Not evaluated
- <X - Less than detection limit
- (-) - No standard set or no detects
- 1 - Proposed MCL
- 2 - Two proposed MCLs
- 3 - MCL is Action Level for Public Water Supply Systems.
- 4 - Silver currently has an MCL of 50 ug/L. As of 7/30/92, silver's secondary MCL of 100 ug/L will become effective.

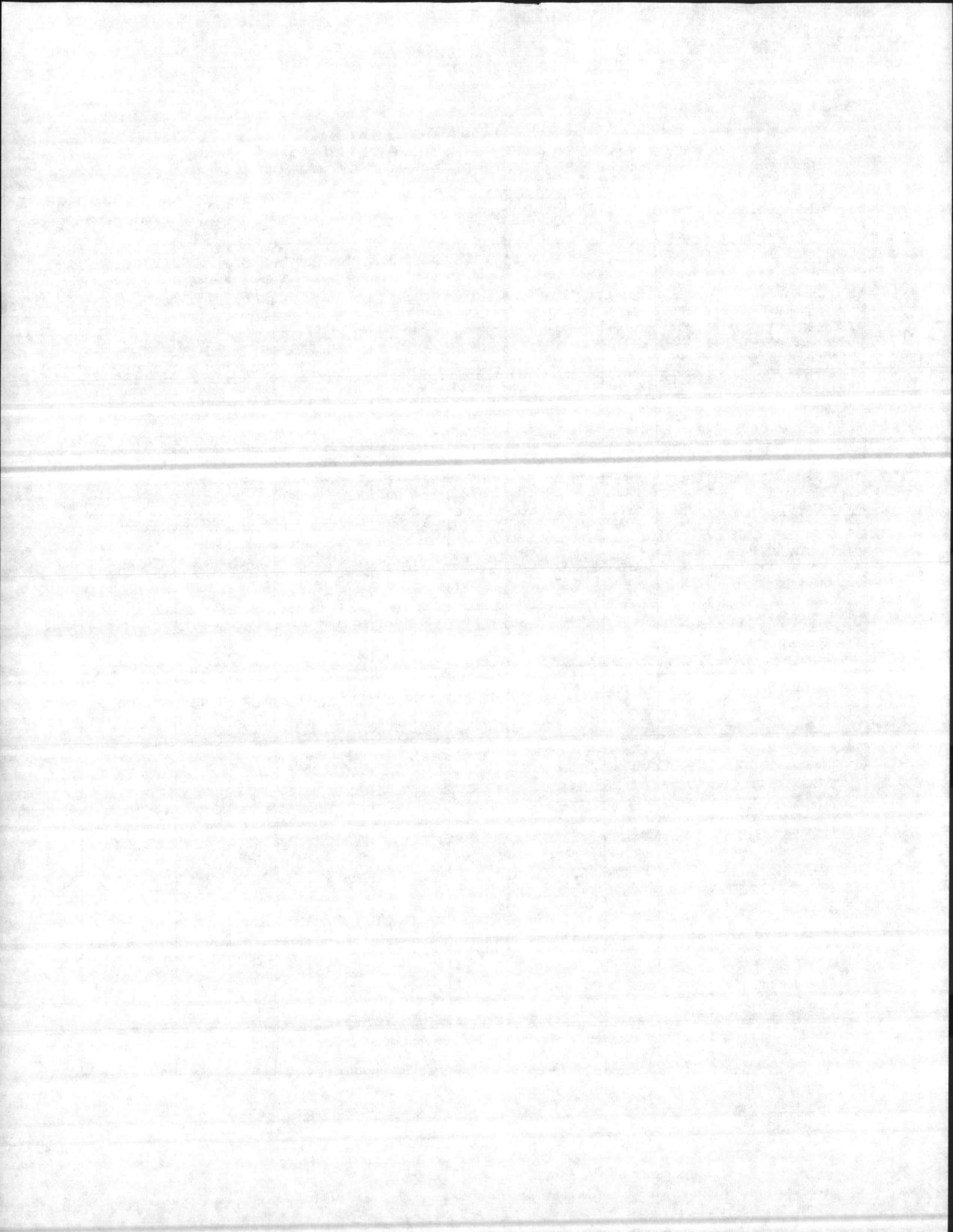
**QUALIFIERS:**

- B - analyte found in associated blank, organics
- Reported value is < Contract Required Detection Limit but > Instrument Detection Limit, inorganics
- J - Value is estimated



**TABLE 5-2  
DATA SUMMARY FOR WELLS NORTHEAST OF CEDAR STREET**

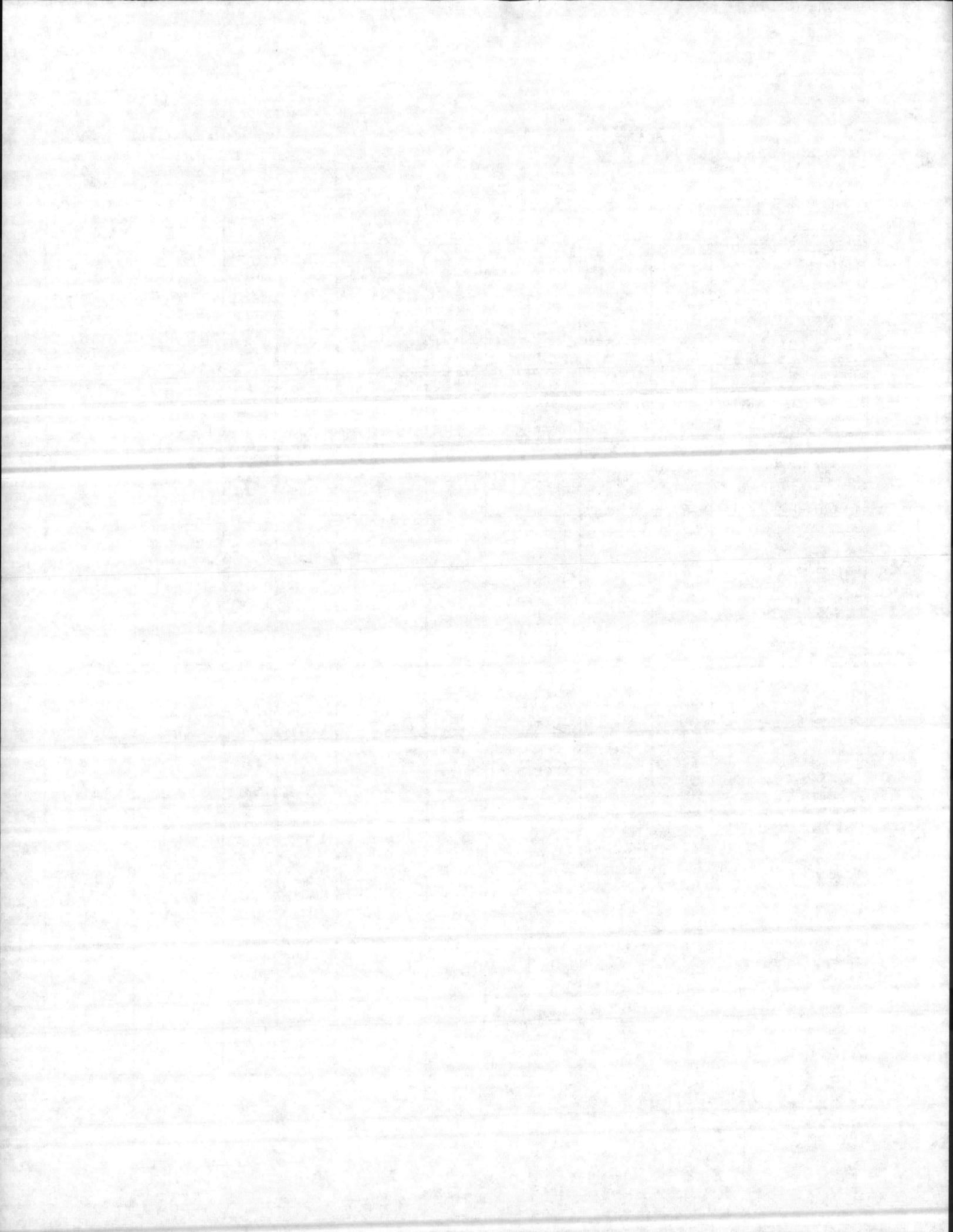
WELL NUMBER	MIN	MAX	FREQUENCY	MIN	MAX	FREQUENCY	MIN	MAX	FREQUENCY
UNIT	ug/L	ug/L	OF DETECTS	ug/L	ug/L	OF DETECTS	ug/L	ug/L	OF DETECTS
DATE SAMPLED	1/87	1/87	1/87	3/87	3/87	3/87	5/87	5/87	5/87
<b>ORGANICS:</b>									
Acetone	NA	NA	NA	NA	N/A	NA	NA	NA	NA
Benzene	2.0	12000.0	2.0	ND	10000.0	1.0	ND	13000.0	1.0
Carbon Disulfide	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichloroethane,1,1-	ND	12.0	1.0	ND	ND	None	ND	ND	-
Dichloroethane,1,2-	ND	ND	None	ND	ND	None	ND	ND	-
Dichloroethene,1,1-	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichloroethene (total),1,2-	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichloroethene,trans-1,2-	2.5	6400.0	3.0	4300.0	6100.0	2.0	4000.0	7100.0	2.0
Ethylbenzene	ND	1800.0	1.0	ND	ND	None	ND	ND	-
Methylene chloride	ND	7.3	1.0	2.9	2800.0	5.0	ND	ND	-
Tetrachloroethene	ND	ND	None	ND	ND	None	ND	ND	-
Toluene	ND	15000.0	1.0	ND	18000.0	1.0	ND	24000.0	1.0
Trichloroethane,1,1,2-	ND	ND	None	ND	ND	None	ND	ND	-
Trichloroethene	6	830.0	3.0	ND	13000.0	1.0	ND	4300.0	1.0
Vinyl chloride	ND	190.0	1.0	ND	ND	None	ND	250.0	1.0
Xylene (total)	ND	9000.0	1.0	ND	ND	None	ND	ND	-
Oil & Grease	200	7000.0	10.0	300.0	11000.0	12.0	ND	9000.0	1.0
<b>SEMI-VOLATILES:</b>									
Acenaphthene	NE	NE	NE	NE	NE	NE	NE	NE	NE
bis(2-Ethylhexyl)phthalate									
Dibenzofuran									
Fluorene									
2-Methylnaphthalene									
2-Methylphenol									
Naphthalene									
<b>INORGANICS:</b>									
Aluminum	NE	NE	NE	NE	NE	NE	NE	NE	NE
Antimony									
Arsenic									
Barium									
Beryllium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
<b>PESTICIDES:</b>									
Dieldrin	NE	NE	NE	NE	NE	NE	NE	NE	NE



**TABLE 5-2 (cont)**  
**DATA SUMMARY FOR WELLS NORTHEAST OF CEDAR STREET**

WELL NUMBER UNIT DATE SAMPLED	MIN ug/L 1/18/91	MAX ug/L 1/18/91	FREQUENCY OF DETECTS 1/18/91	AVG ug/L 1/18/91	GEOMETRIC MEAN 1/18/91	STANDARDS		NO. OF DETECTS GREATER THAN STANDARDS 1991 DATA ONLY	
						North Carolina*	Primary MCLs	North Carolina	Primary MCLs
						ug/L	ug/L		
<b>ORGANICS:</b>									
Acetone	4.0 B	7.0 B	2/12	5.1	5.0	-	-	-	-
Benzene	3.0 J	7900.0	3/12	662.5	6.0	1	5	3/3	2/3
Carbon Disulfide	2.0 J	7.0	4/12	3.0	2.8	-	-	-	-
Dichloroethane,1,1-	ND	ND	-	-	-	-	-	-	-
Dichloroethane,1,2-	0.8 J	110.0 B	2/12	11.3	3.1	0.38	5	2/2	1/2
Dichloroethene,1,1-	ND	65.0	1/12	7.7	3.3	7	7	1/1	1/1
Dichloroethene (total),1,2-	0.8 J	42000.0 D	3/12	4233.8	10.1	-	-	-	-
Dichloroethene,trans-1,2-	NA	N/A	N/A	N/A	N/A	70	100	-	-
Ethylbenzene	0.9 J	1900.0 J	4/12	161.4	4.5	29	700	1/4	1/4
Methylene chloride	0.9	9.0	4/12	3.1	2.7	5	5 (1)	1/4	1/4
Tetrachloroethene	ND	2.0 J	1/12	2.5	2.5	0.7	5	1/1	-
Toluene	13.0 J	16000.0	3/12	337.4	6.8	1000	1000	1/3	1/3
Trichloroethane,1,1,2-	ND	3.0 J	1/12	2.5	2.5	-	5	-	-
Trichloroethene	0.7 J	3700.0	5/12	326.0	7.8	2.8	5	4/5	3/5
Vinyl chloride	ND	8.0 J	1/12	1046.5	10.0	0.015	2	1/1	1/1
Xylene (total)	5.0	9800.0	4/12	823.0	7.5	400	10000	1/4	-
Oil & Grease	NA	NA	NA	NA	N/A	-	-	-	-
<b>SEMI-VOLATILES:</b>									
Acenaphthene	3 J	6 J	2/12	4.9	4.9	-	-	-	-
bis(2-Ethylhexyl)phthalate	ND	3 J	1/12	4.8	4.8	-	-	-	-
Dibenzofuran	ND	2 J	1/12	4.8	4.6	-	-	-	-
Fluorene	ND	5 J	1/12	5.0	5.0	-	-	-	-
2-Methylnaphthalene	3 J	28	2/12	6.8	5.4	-	-	-	-
2-Methylphenol	ND	10 J	1/12	5.4	5.3	-	-	-	-
Naphthalene	130	230	2/12	34.2	8.9	-	-	-	-
<b>INORGANICS:</b>									
Aluminum	6840	587000	12/12	105230.4	11646.3	-	-	-	-
Antimony	20.9 B	24.6 B	4/12	11.9	10.2	-	10/5(2)	-	4/12
Arsenic	4.2 B	50.3	10/12	12.0	4.9	50	50	1/10	1/10
Barium	60.1 B	814	12/12	198.8	86.5	1000	2000	-	-
Beryllium	0.6 B	9.5	8/12	2.3	1.1	-	1 (1)	-	6/8
Calcium	2830 B	127000	12/12	46618.7	24531.3	-	-	-	-
Chromium	13	457	12/12	107.7	27.7	50	100	6/12	4/12
Cobalt	10.5 B	80.8	7/12	13.7	7.3	-	-	-	-
Copper	8.6 B	97.7	12/12	36.5	23.4	1000	1300(3)	-	-
Iron	10500	152000	12/12	38528.0	24016.8	300	-	12/12	-
Lead	8.6 B	307	12/12	51.1	25.8	50	15 (3)	3/12	11/12
Magnesium	1830 B	21200	12/12	7412.0	5621.2	-	-	-	-
Manganese	10.6 B	763	12/12	144.2	84.4	50	-	10/12	-
Mercury	0.13 B	0.5	3/12	0.1	0.1	1.1	2	-	-
Nickel	7.3 B	186	10/12	38.3	15.3	150	100	2/10	2/10
Potassium	2230 B	24000	12/12	6739.3	4481.7	-	-	-	-
Selenium	3.5 B	4.2 B	2/12	1.8	1.6	10	50	-	-
Silver	2.5 B	6.6 B	6/12	2.6	2.0	50	50 (4)	-	-
Sodium	4480 B	23500	12/12	9865.3	8763.4	-	-	-	-
Thallium	ND	1.4 B	1/12	1.9	1.8	-	2/1 (1)	-	1/1
Vanadium	19.8 B	518	12/12	138.9	50.3	-	-	-	-
Zinc	68.1	637	12/12	450.7	143.2	5000	-	-	-
<b>PESTICIDES:</b>									
Dieldrin	ND	0.11	1/12	0.06	0.05	-	-	-	-

continued



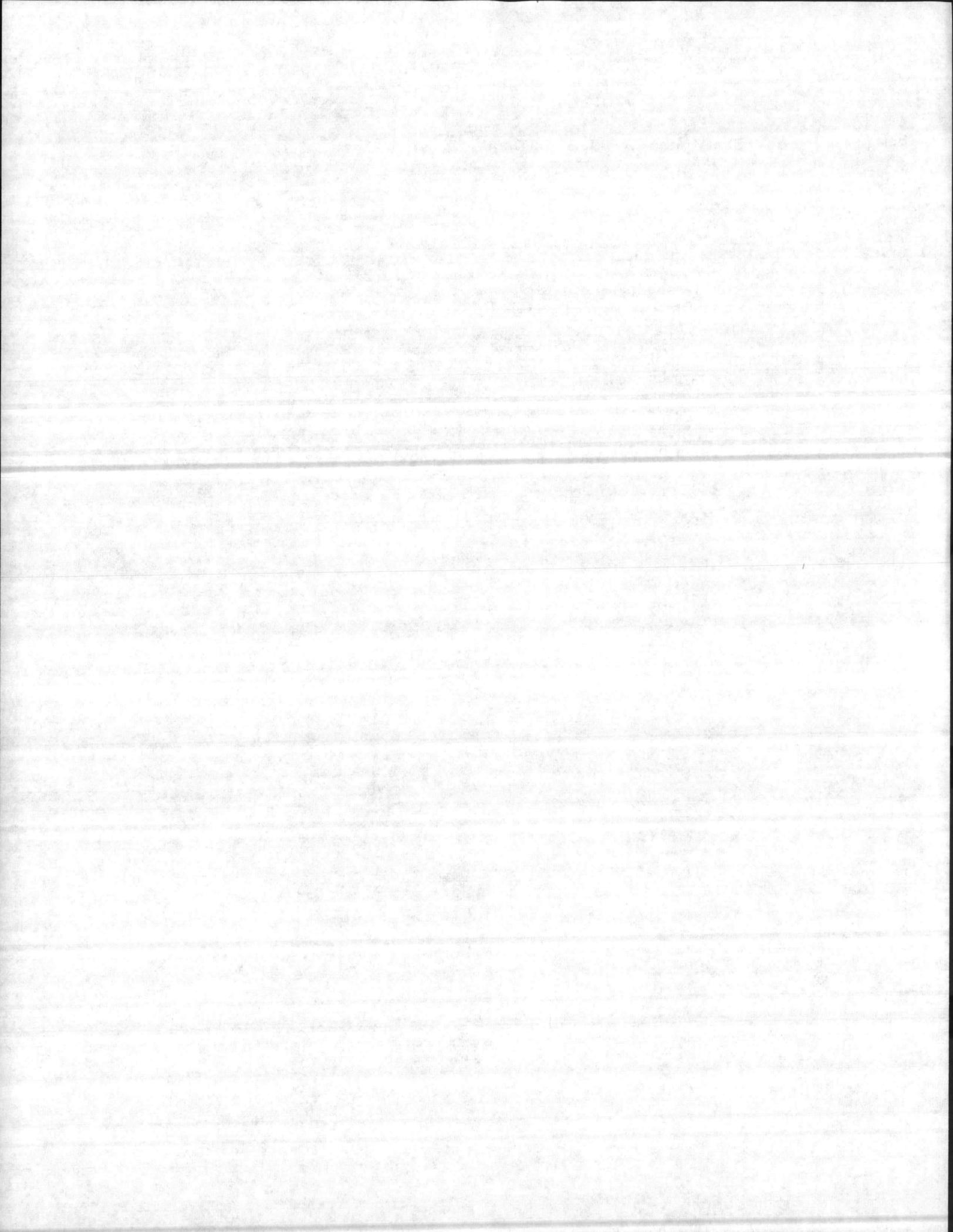
**TABLE 5-2 (cont)**  
**DATA SUMMARY FOR WELLS NORTHEAST OF CEDAR STREET**

**NOTES:**

- \* - North Carolina water quality criteria for groundwater.
- NA - Not analyzed
- ND - Not detected
- (-) - No standard set or no detects
- 1 - Proposed maximum contaminant level (MCL)
- 2 - Two proposed MCLs
- 3 - MCL is Action Level for Public Water Supply System.
- 4 - Silver currently has an MCL of 50 ug/L; as of 7/30/92 silver will no longer have a primary MCL, it's secondary MCL of 100 ug/L will become effective.

**QUALIFIERS:**

- B - Analyte found in associated blank, organics
  - Reported value is <Contract Required Detection Limit
  - but > Instrument Detection Limit, inorganics
- J - Value is estimated



trichloroethene, and 1,2-dichloroethene (total)]; the semivolatile organics, (naphthalene and 2-methylnaphthalene); and the inorganics (antimony, arsenic, beryllium, chromium, iron, lead, manganese, mercury, and nickel).

## **5.2 Chemicals of Concern Migration Patterns**

The migration patterns of the chemicals of concern are discussed in the following sections.

### **5.2.1 BTEX**

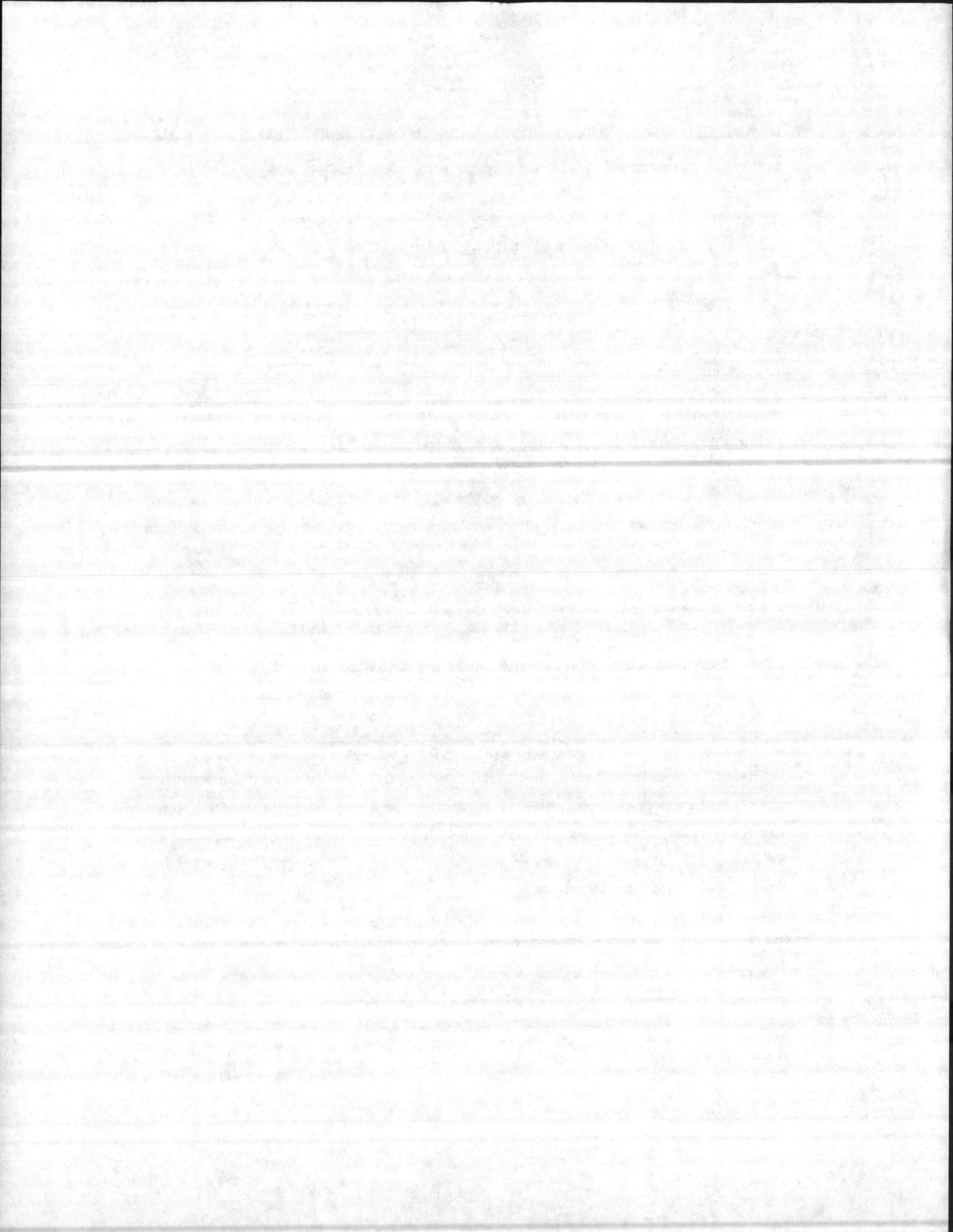
BTEX (benzene, toluene, ethylbenzene and xylenes) tend to be fairly mobile in soil/groundwater systems. Transport with infiltration water is high, especially in sandy soils and soils of low organic content. In both soil and surface waters, sorption onto particles is the primary removal method. BTEX are moderately sorbed onto particles in surficial soils, and tend to be in the soil-water phase in deeper soils. In general, sorption onto soil particles is expected to:

- Increase with increasing soil organic matter content.
- Increase slightly with decreasing temperature.
- Increase moderately with increasing salinity of the soil water.
- Decrease moderately with increasing dissolved organic matter content of the soil.

BTEX tend to be resistant to hydrolysis, but will biodegrade if the microbial populations are sufficiently numerous and active in the soils and oxygen is present in sufficient quantities. If biodegradation does not occur, these chemicals tend to be persistent in the environment for months to years; this is especially true with soils at depths where the microbial populations are low and the oxygen conditions are anaerobic. The rate of biodegradation is enhanced by the presence of other hydrocarbons.

The major transport process for BTEX from surficial soils is volatilization, with photochemical oxidation being the most likely fate process. In general, the important soil and environmental properties influencing the rate of volatilization include (IRP, 1989):

- Soil porosity
- Temperature
- Convection currents



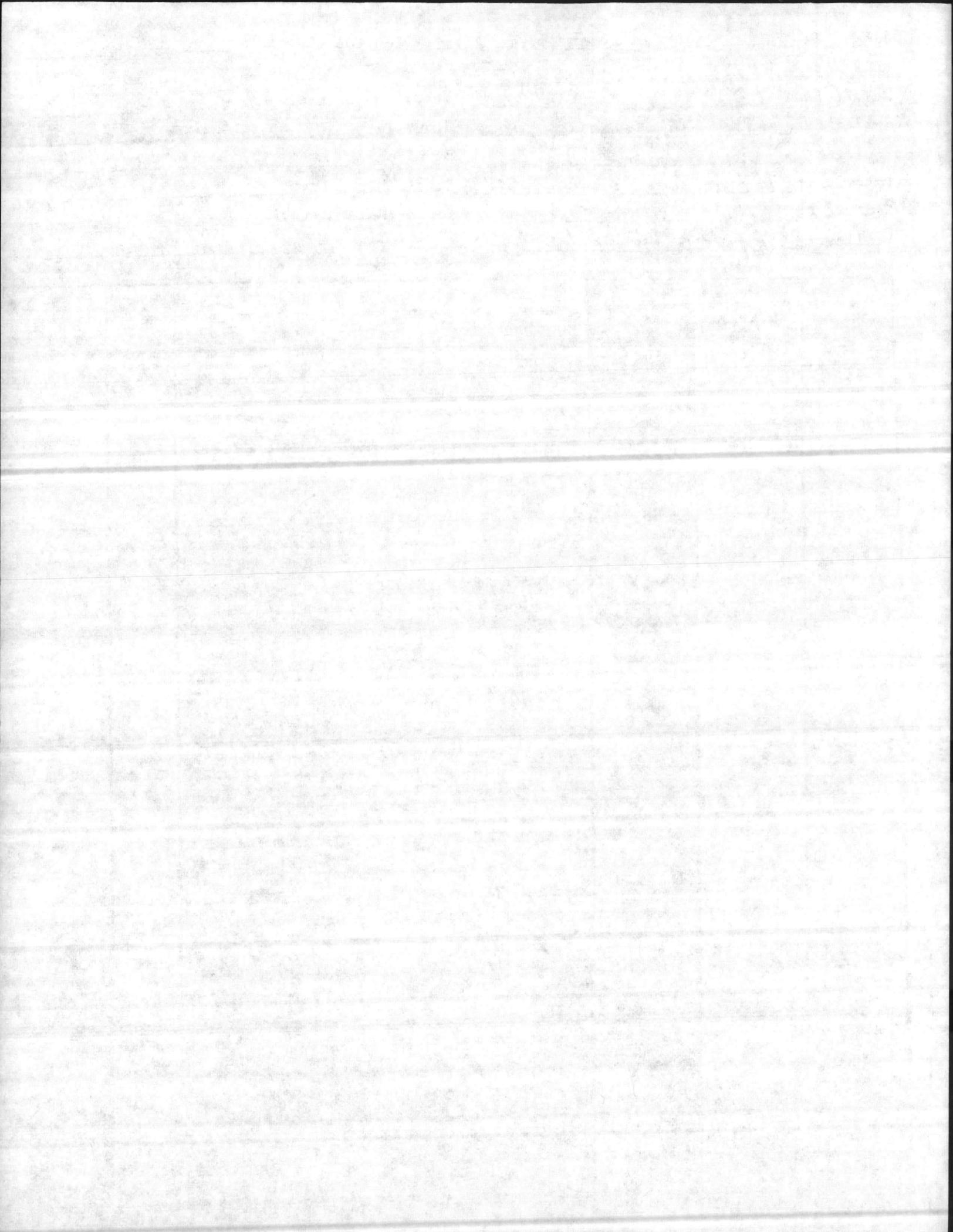
**APPENDIX A**

**ESE SHALLOW MONITORING WELL BORING LOGS**



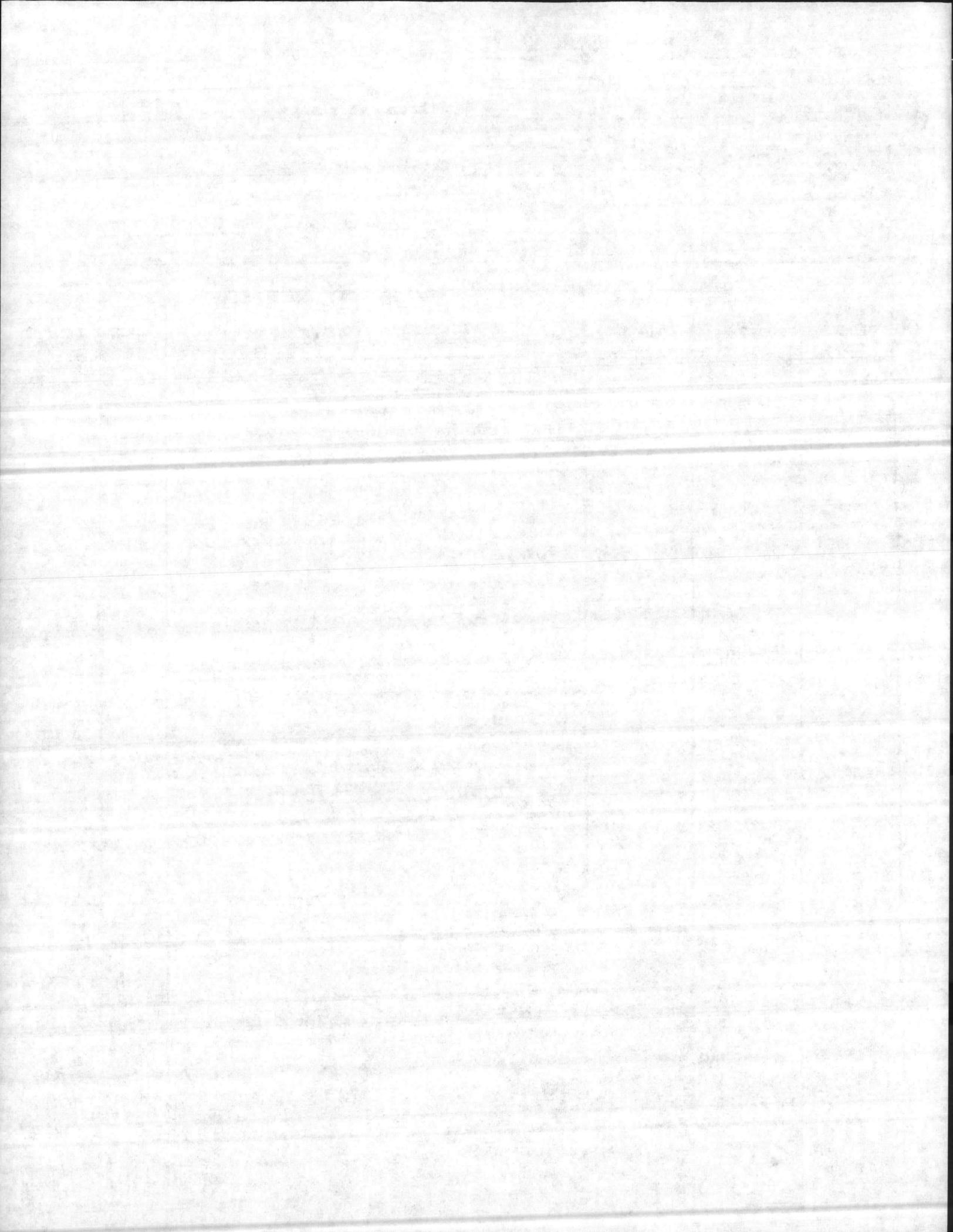
boring No HPGW 1 (vicinity of Bldg 1207) Location Coordinates N  
 Hole Size 6" Slot 0.010" E  
 Screen Size 2" Mat'l Sch. 40 PVC Filter Materials Silica Sand  
 casing Size 2" Mat'l PVC Grout Type 1' Bentonite Seal  
 Geologist Paul Conrad Development \_\_\_\_\_  
 Date Start 10/31/86 Finish 10/31/86 Static Water Level 20.54'  
 Contractor Davis Drilling Co Top of Well Elevation 23.104'  
 Driller Charles Smith Drill Type Hollow Stem Auger

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0-1.5			Peat, silt ~20%, dry, med. dense, non-plast., fibrous org. mtrl, color 10 YR 2/1 (black), sand ~5% upper 4" misc. grav. & sand from parking lot.	PT	6-4-6
1.5-3			same as above Peat	PT	4-5-6
3-4.5			at 3.75' the above grades to silty fine sand, silt 25-30%, clay 10-15%, v. slight plast, moist, med. dense, mottled color 10 YR 6/6 (brnsh yllw) and 10 YR 5/2 (grayish brn). Clayey zones are grayish brn.	ML	5-5-5
4.5-6			silty/clayey Fine Sand, silt 25-30%, clay 10-15%, moist, med. dense, v. slight plast, mottled color 10 YR 6/1 (gr) and 10 YR 6/6 (brnsh yllw)	ML	4-4-6



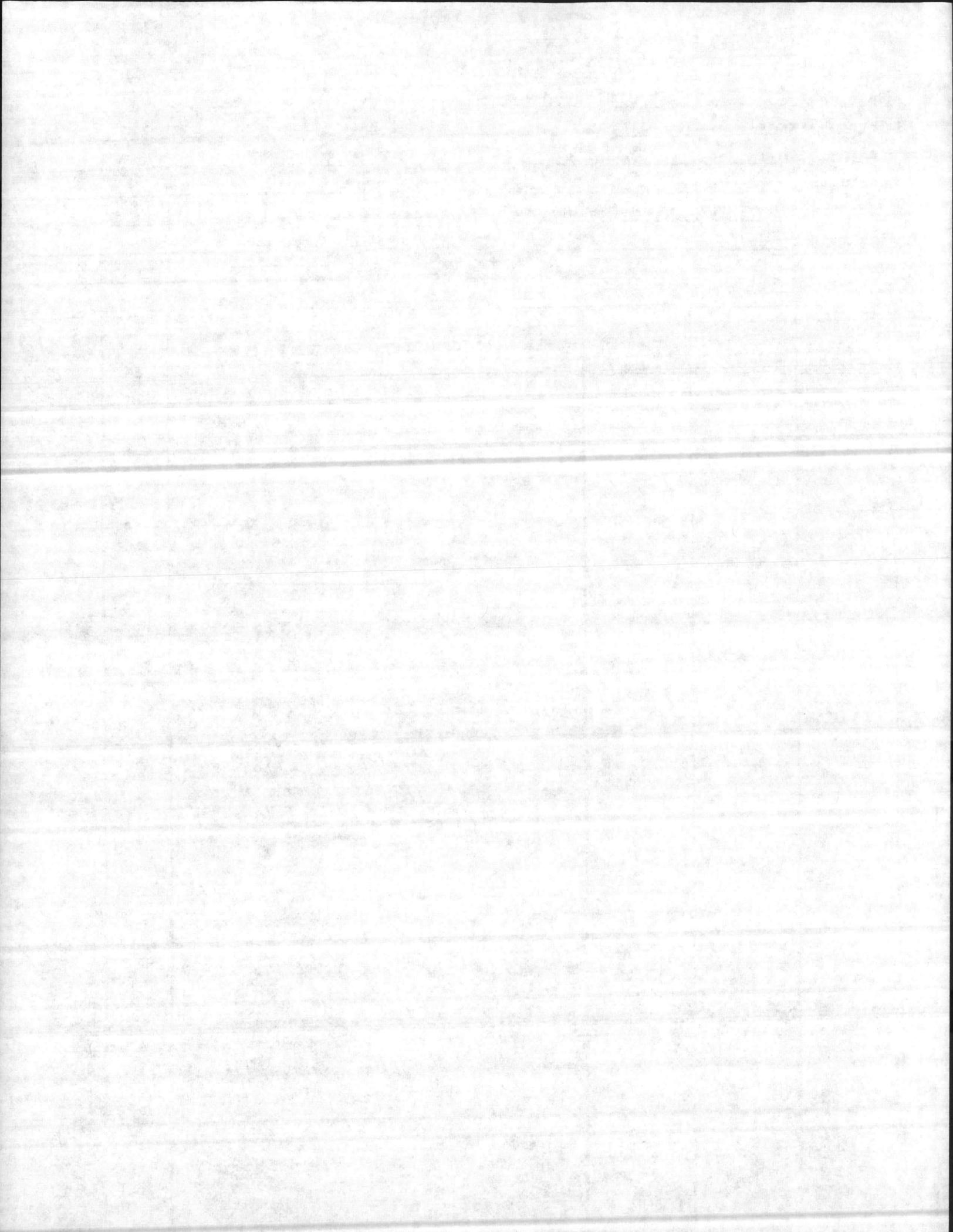
Boring No. HPGW1 Location Coordinates N 2074  
E  
 Hole Size \_\_\_\_\_ Slot \_\_\_\_\_  
 Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
 Casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
 Geologist Paul Conrad Development \_\_\_\_\_  
 Date Start 10/31/86 Finish 10/31/86 Static Water Level \_\_\_\_\_  
 Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
 Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology Color	USCS	SPT (BL/FT)
6-7.5			Silty Fine Sand, sift 15-20%, saturated, non-plast., med. dense, grains fairly uniform, color uniform 10YR 7/2 (light grey)	SM	6-6-12
7.5-9			Silty Fine Sand, same descr. as above	SM	8-6-4
9-10.5			Clay, v. fine sand ~5%, plastic, wet, fairly clean, v. soft, uniform color closest to N 5/0 (gr).	CH	3-1-1
14-15.5			Clay, clean, massive, high plasticity, soft, wet, uniform color 5Y 4/5 A (dk. grey)	CH	6-2-1



Boring No. HPGW1 Location Coordinates N  
 Hole Size \_\_\_\_\_ Slot \_\_\_\_\_ E \_\_\_\_\_  
 Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
 casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
 Geologist \_\_\_\_\_ Development \_\_\_\_\_  
 Date Start 10/31/86 Finish 10/31/86 Static Water Level \_\_\_\_\_  
 Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
 Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
19-20.5			<u>Clay</u> , same descript'n as above, 2-4% fine sand.	CH	0-2-
24-25.5			<u>Silty Fine Sand</u> , silt 20-25%, Clay ~ 8.5%, loose density, saturated, non-plast., mottled color 10 YR 6/2 (lgt brnsh gry) and 10 YR 5/6 (yllwish br'n)	SM	3-4-



6:50 am Arrived at Camp.  
Prepared for drilling.

7:50 Began drilling and sampling. Paul  
logging samples.

8:30 Last spoon taken. Casing assembled.  
All augers pulled out. Hole open  
(clay) and casing readily installed.  
Poured 8 bags silica sand (50 lb. ea)  
Bentonite placed.

8:40 Well complete. No unusual  
events.

Cleaning equip. & preping for  
next boring.

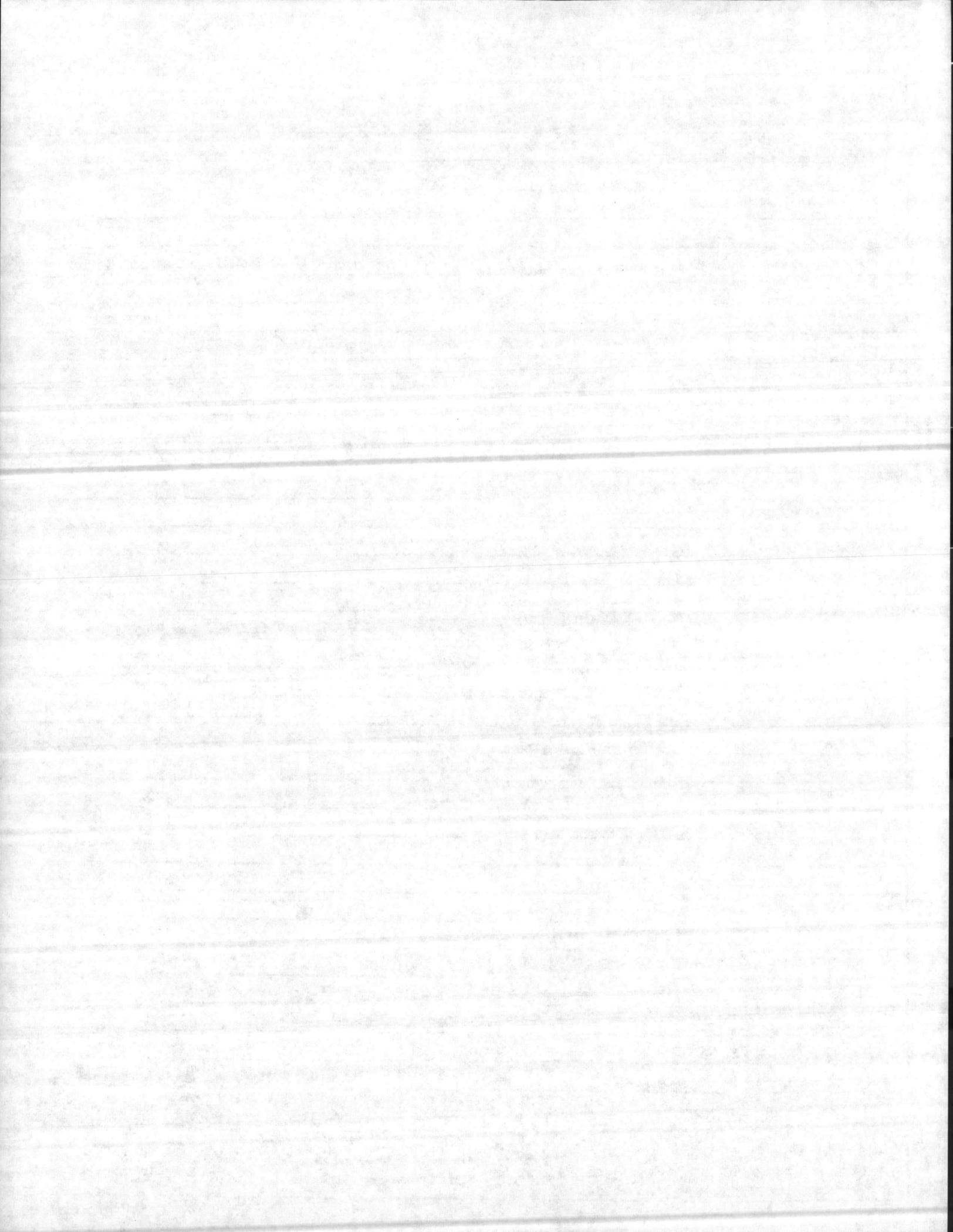
Standard construction. Hole 27' de

10/31/66

DATE

Paul D. Conrad

SIGNED



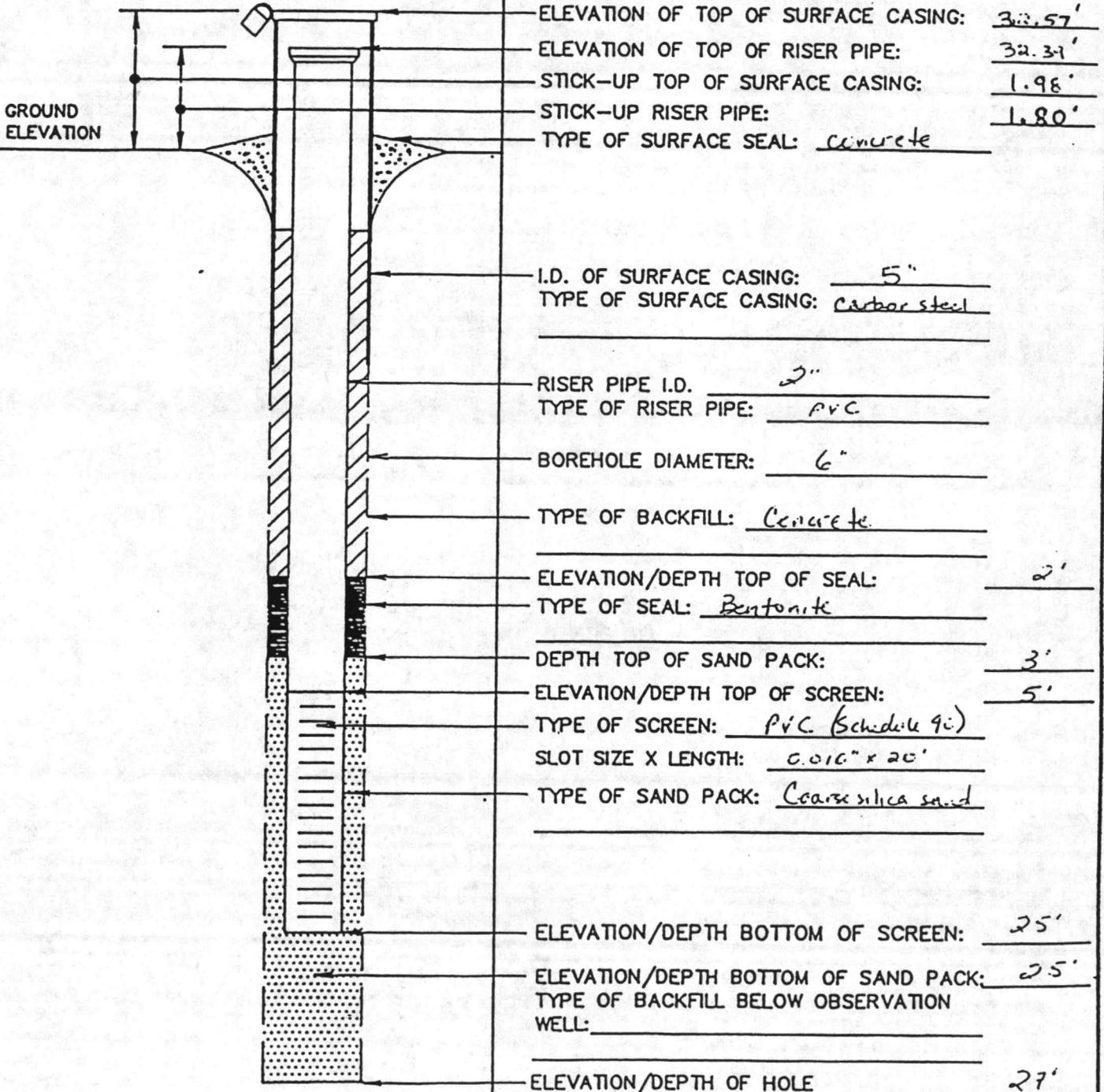
↑

## OVERBURDEN MONITORING WELL SHEET

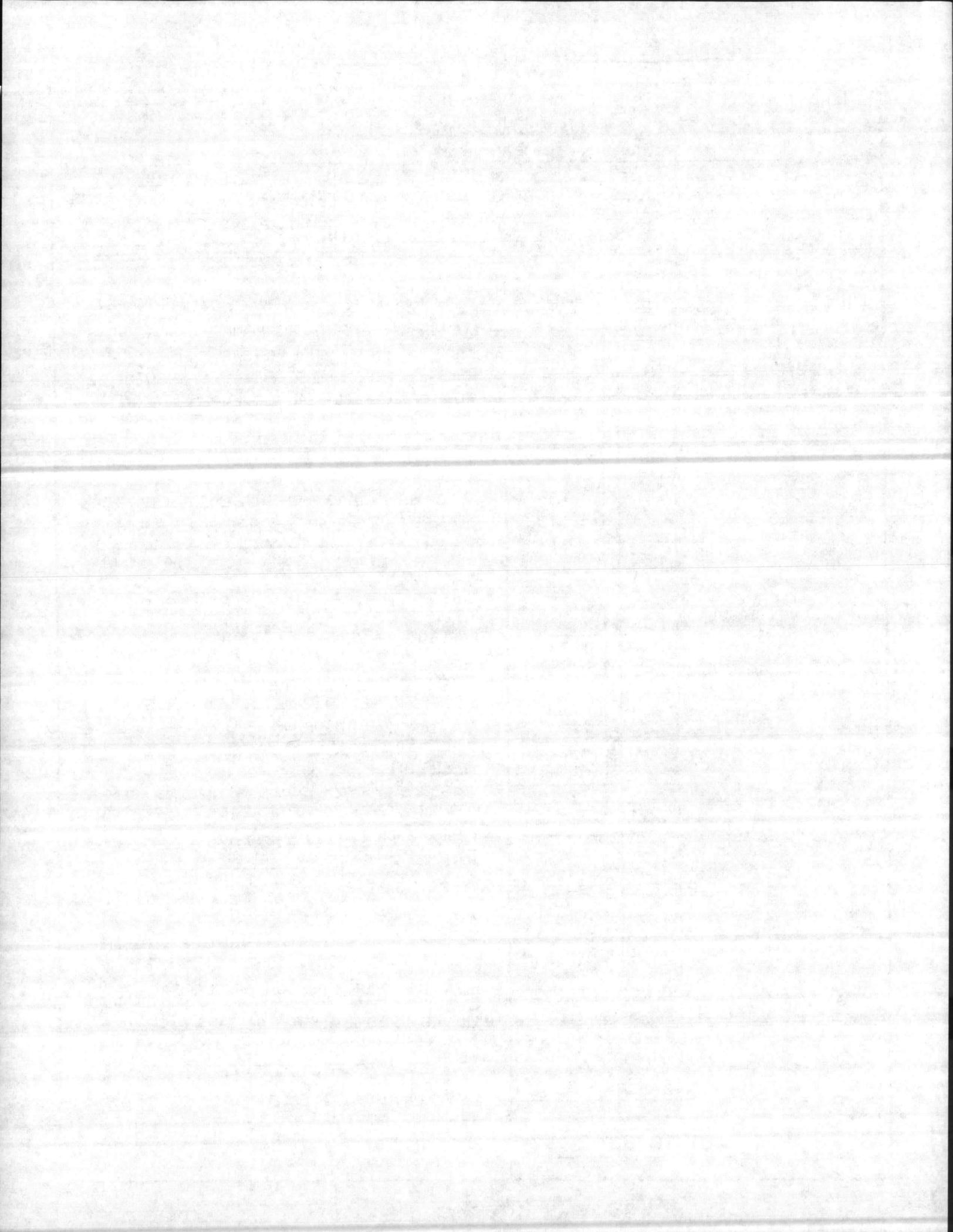
WELL NO. HP-GW1

PROJECT Camp Lejeune HP1A  
 PROJECT NO. 49-02000 BORING NO. HP-GW1  
 ELEVATION \_\_\_\_\_ DATE 10/31/86  
 FIELD GEOLOGIST Paul Conrad (ESE)

DRILLER Davis Drilling Co.  
 DRILLING METHOD Hollow Stem Auger  
 DEVELOPMENT METHOD \_\_\_\_\_



NOT TO SCALE



**FOR OFFICE USE ONLY**

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

GW 1

**WELL CONSTRUCTION RECORD**

DRILLING CONTRACTOR Davis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 66-0135-WM-0141

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

Nearest Town: Jacksonville, N.C.

County: Onslow

(Road, Community, or Subdivision and Lot No.)

2. OWNER U.S. Navy  
 ADDRESS Camp Lejeune, N.C.  
 (Street or Route No.) 28542  
 City or Town \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Depth	DRILLING LOG
From To	Formation Description
0.0 - 3.0	Sandy MUD
3.0 - 4.5	Silty Fine Sand
4.5 - 6.0	Silty Clayey Fine Sand
6.0 - 9.0	Silty Fine Sand
9.0 - 20.5	Clay
20.0 - 25.5	Silty Fine Sand

3. DATE DRILLED 10/31/86 USE OF WELL Monitor

4. TOTAL DEPTH 25' CUTTINGS COLLECTED  Yes  No

5. DOES WELL REPLACE EXISTING WELL?  Yes  No

6. STATIC WATER LEVEL: 20.54 FT.  above TOP OF CASING,  
 below TOP OF CASING IS 2.50' FT. ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_

WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	Depth	To	Diameter	Wall Thickness or Weight/Ft.	Material
From <u>2.5'</u>	Depth	To <u>5.0</u> Ft.	<u>2"</u>	<u>1/8"</u>	<u>PVC</u>
From _____	Depth	To _____	Ft.		
From _____	Depth	To _____	Ft.		

If additional space is needed use back of form.

**LOCATION SKETCH**

(Show direction and distance from at least two State Roads, or other map reference points)

See sketch attached to handout (2-5).

11. GROUT:

From	Depth	To	Material	Method
From <u>0.0</u>	Depth	To <u>2.0</u> Ft.	<u>Concrete</u>	
From <u>2.0</u>	Depth	To <u>3.0</u> Ft.	<u>Clay</u>	

12. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
From <u>5.0</u>	Depth	To <u>25.0</u> Ft.	<u>2"</u> in.	<u>201</u> in.	<u>PVC</u>
From _____	Depth	To _____	Ft.	in.	in.
From _____	Depth	To _____	Ft.	in.	in.

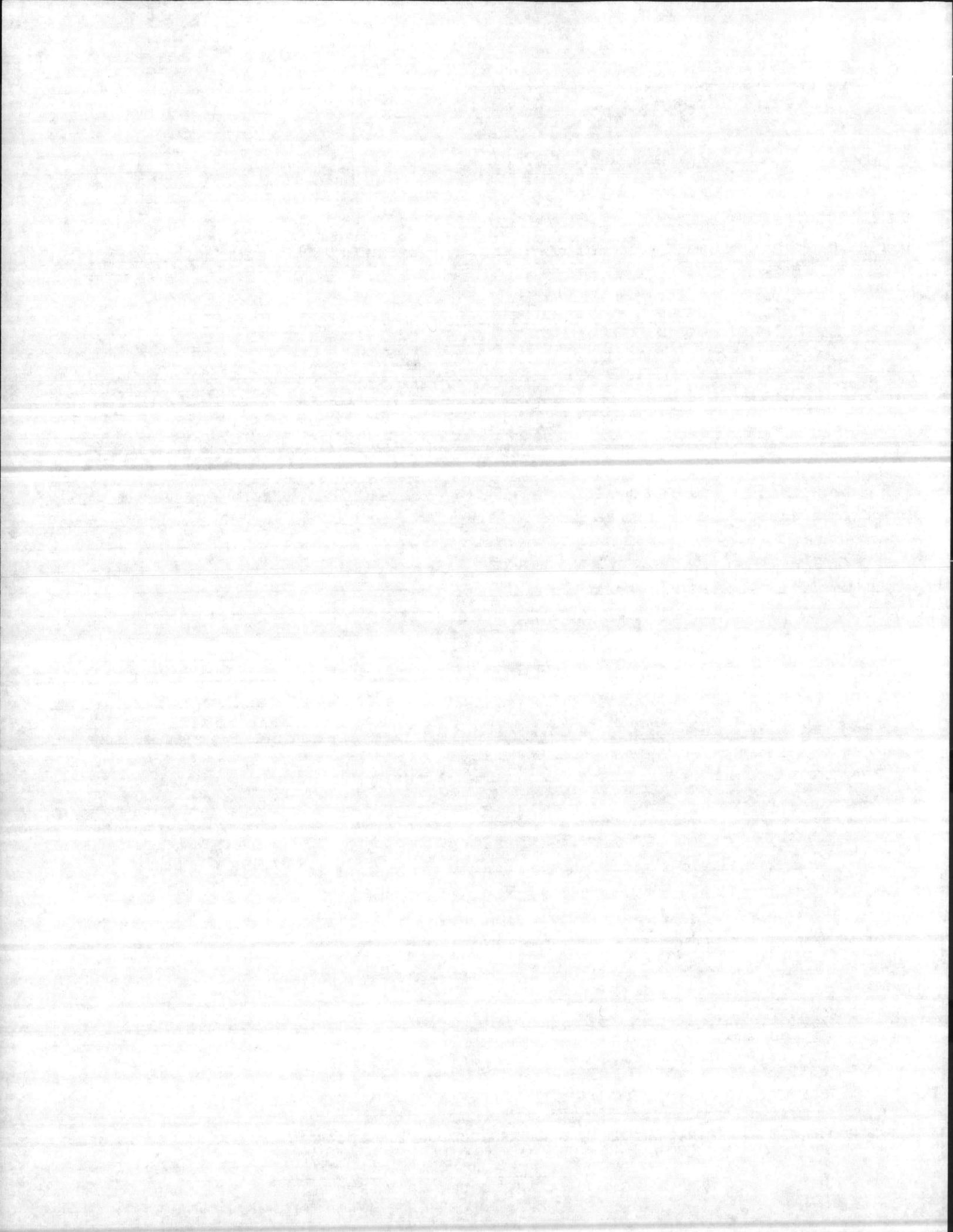
13. GRAVEL PACK:

From	Depth	To	Size	Material
From <u>3.0</u>	Depth	To <u>25'</u> Ft.	<u>Coarse</u>	<u>Sand</u>
From _____	Depth	To _____	Ft.	

REMARKS: \_\_\_\_\_

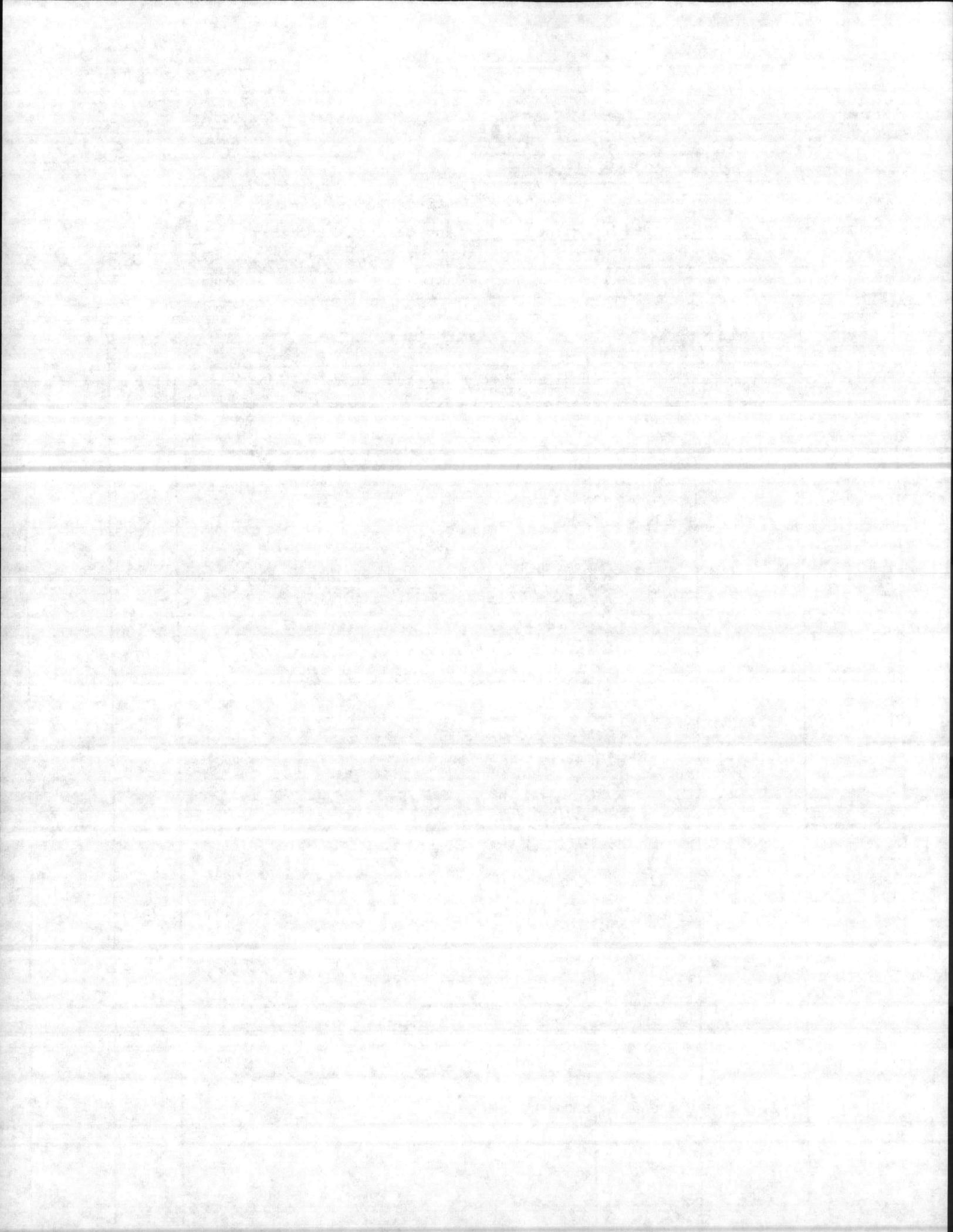
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Dennis H. Embury 2/9/87  
 SIGNATURE OF CONTRACTOR OR AGENT DATE



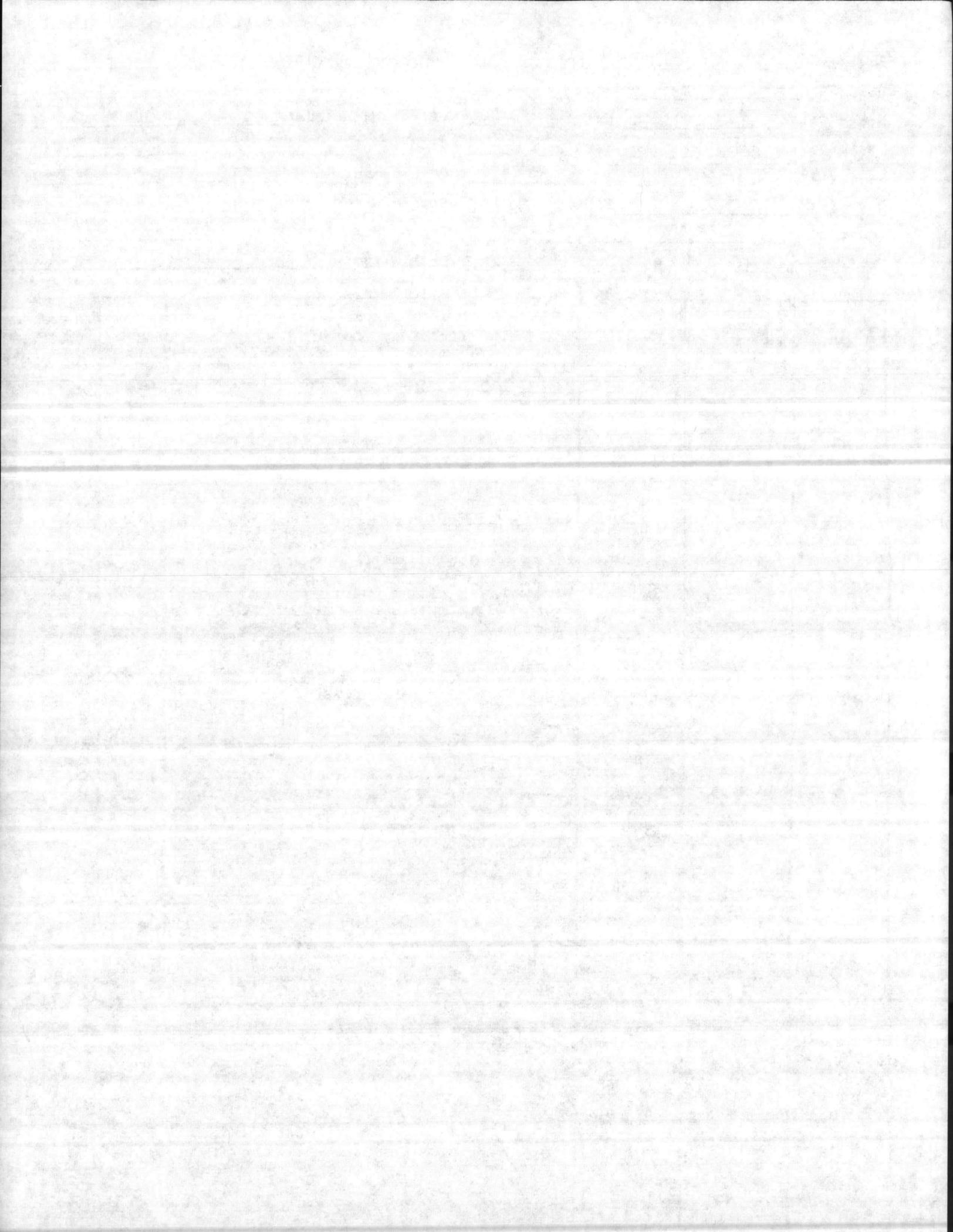
Boring No. HPGW2 (near Bldg 608) Location Coordinates N E  
 Hole Size 6" Slot E  
 Screen Size 2" Mat'l Schd. 40 PVC Filter Materials Silica Sand  
 Ring Size 2" Mat'l PVC Grout Type 1' Bentonite Seal  
 Geologist Paul Conrad Development \_\_\_\_\_  
 Date Start 11/4/86 Finish 11/4/86 Static Water Level 18.90'  
 Contractor Davis Drilling Co. Top of Well Elevation 21.40'  
 Driller Charles Smith Drill Type Hollow Stem Auger.

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0-1.5			<u>Fine Sandy Peat</u> , sand 5-10% non-plast, moist, organic debris at top, color 10YR 2/1 (black) stains hands (oily?), loose.	PT	3-2-3
1.5-3			<u>Silty fine sand</u> , silt 20-25%, non-plast, loose, moist, sand fairly uniform, color 10YR 7/2 (light gray) mottled w/ 10YR 7/8 (yellw)	SM	3-3-3
3-4.5			<u>Silty Fine Sand</u> , silt 20-25%, non-plast., med. dense, moist, color 10YR 6.5/6 (brnsh yellw) mottled w/ 10YR 7/2 (light gray).	SM	4-4-10
4.5-6			<u>Fine sand</u> , silt 10-12%, med. dense, moist, non-plast, some clay ~5%, color unif. 10YR 8/1 (White), gtz grains uniform.	SP	<del>5-7-3</del>



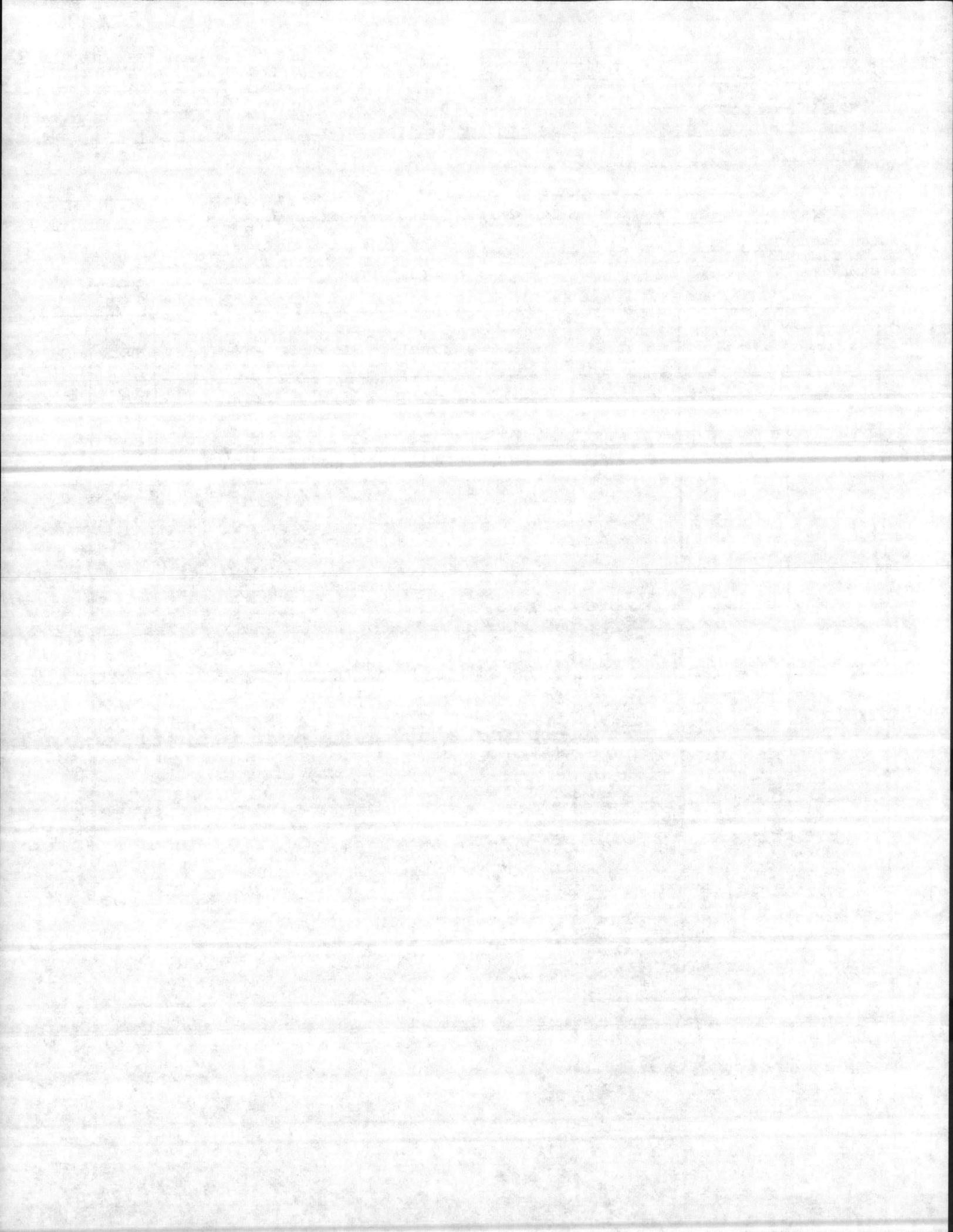
Boring No. HPGW2 Location Coordinates N  
 Hole Size Slot E  
 Screen Size Mat'l Filter Materials \_\_\_\_\_  
 using Size Mat'l Grout Type \_\_\_\_\_  
 Geologist \_\_\_\_\_ Development \_\_\_\_\_  
 Date Start \_\_\_\_\_ Finish 11/4/86 Static Water Level \_\_\_\_\_  
 Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
 Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
6-7.5			Silty fine sand, same as above	SP	5-7-5
7.5-9			silty fine sand, v. loose silty fine sand, same as above	SP	2-1-1
9-10.5			Clayey fine sand, v. loose saturated, clay 35-40%, slight plast., uniform color 2.5Y 4.5/0 (drk gray)	ML	0-3-1
14-15.5			Clayey fine sand, v. loose saturated, clay 35-40%, slight plast., uniform color 2.5Y 4.5/0 (drk gray)	ML	0-3-1



Boring No. HPGW2 Location Coordinates N Page 3 of 4  
 Hole Size \_\_\_\_\_ Slot \_\_\_\_\_ E \_\_\_\_\_  
 Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
 using Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
 Geologist \_\_\_\_\_ Development \_\_\_\_\_  
 Date Start \_\_\_\_\_ Finish 11/4/86 Static Water Level \_\_\_\_\_  
 Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
 Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/F)
19-20.5			<p>Clayey silty sand, silt 15-20%,            clayey ~ 5-10%, mottled            color sand 10YR 8/1 (white)            clay 10YR 7/1.5 (light grey)            silt 10YR 6/7 (light grey)            sand-loose, clay cemented            at 20.5', plast., soft.</p>	SP	3-5
24-25.5			<p>Silty fine sand, silt 12-15%,            wet, med dense, non-plast.            color fairly uniform 7.5 YR            6/8 (reddish yellow) at 25.5'            grades to mantle (color white).</p>	SP/ML	10-12



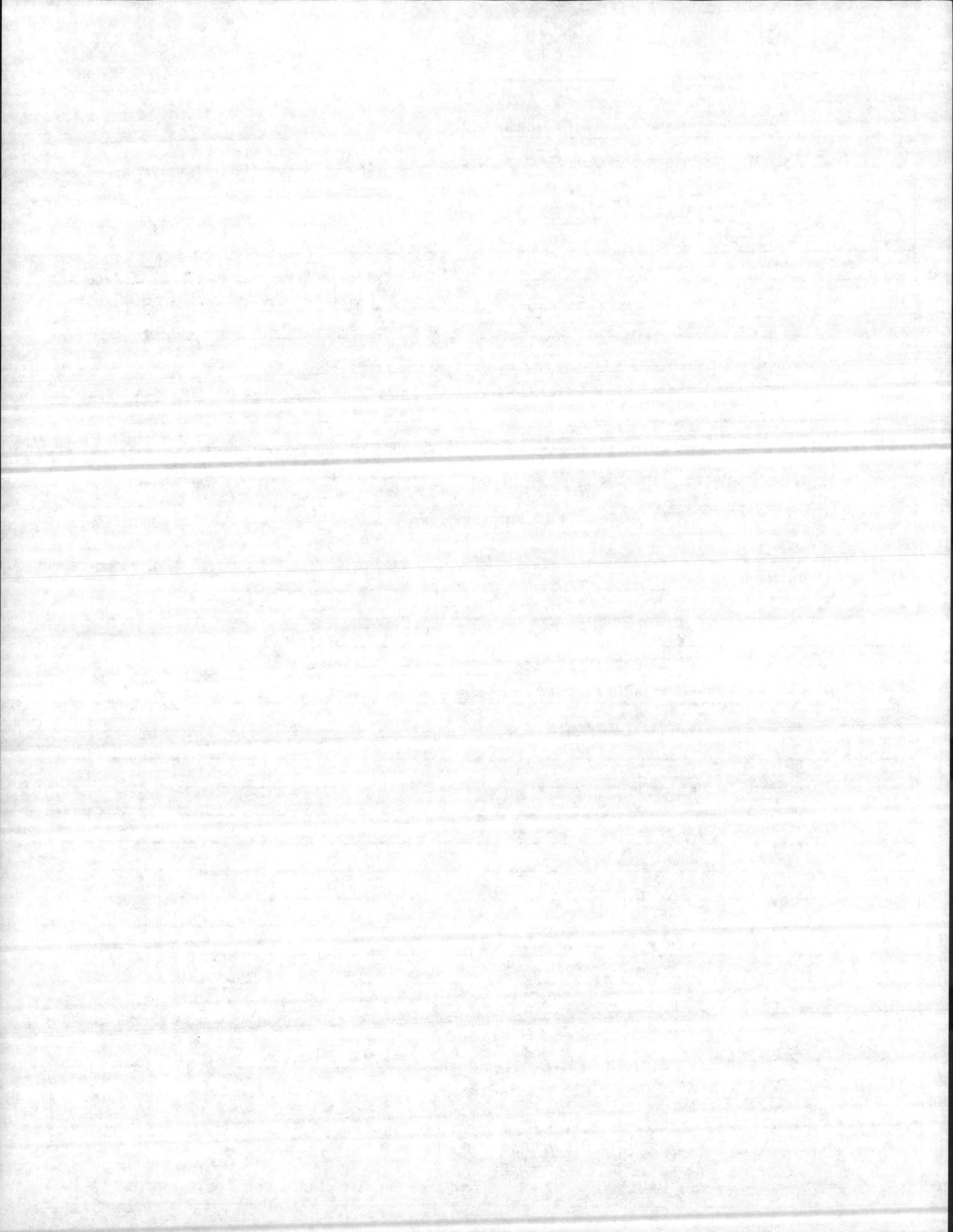
5 Finished washing rig

10:50 am. Began drilling & sampling.

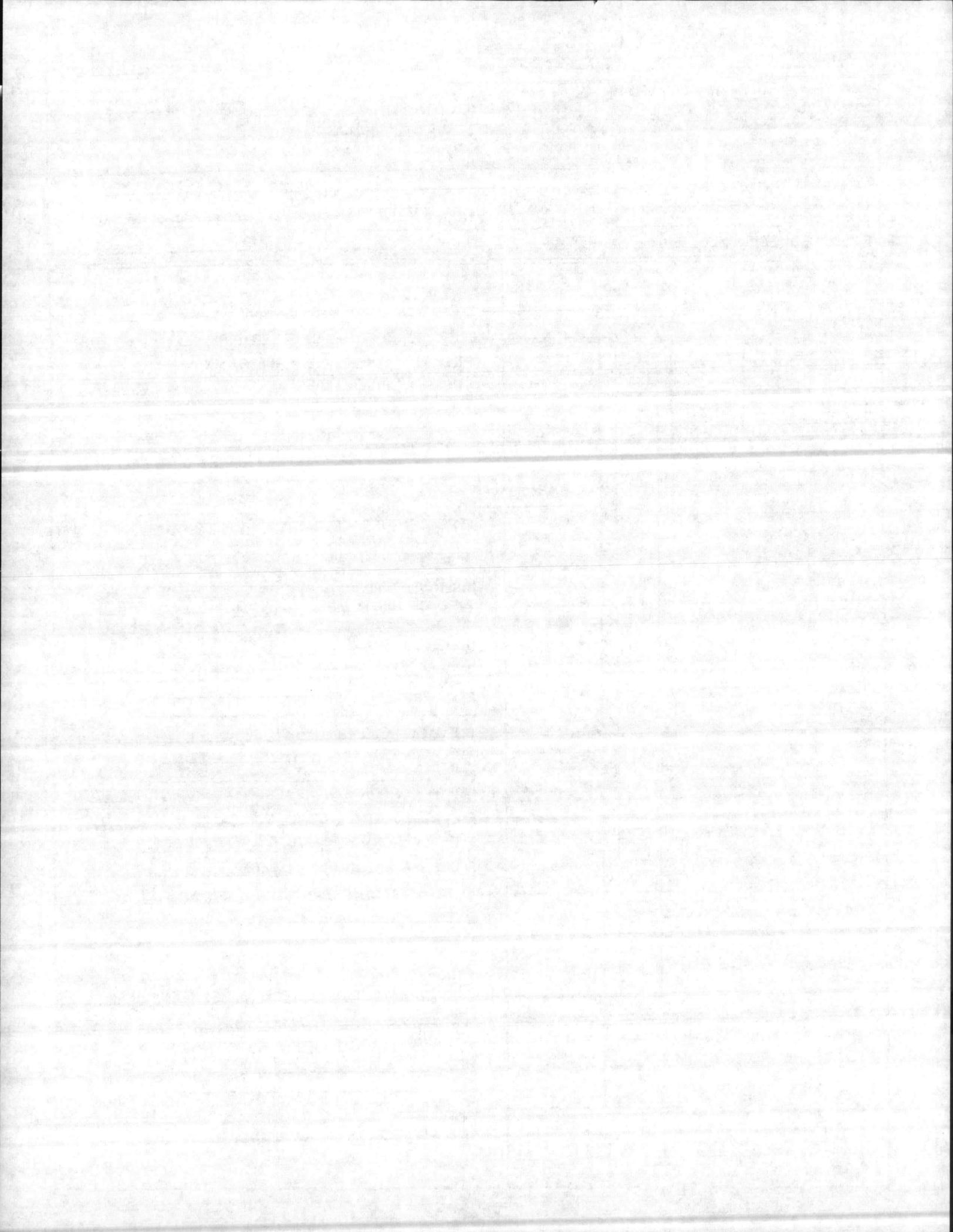
11:45 am Last spoon. Pulled augers → hole stayed open. Casing installed and silica sand pour. Five hundred lb. bags used. No unusual events.

12:00 Well complete. Began washing rig.

Standard well construction. Hole 27 feet.







FOR OFFICE USE ONLY	
Quad. No. _____	Serial No. _____
Lat. _____	Long. _____ Pc _____
Minor Basin _____	
Basin Code _____	
Header Ent. _____	GW-1 Ent. _____

**GW2 WELL CONSTRUCTION RECORD**

DRILLING CONTRACTOR Davis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 66-0135-WM-0141

1. WELL LOCATION: (Show sketch of the location below)  
 Nearest Town: Sacksonville, N.C.

County: Onslow

(Road, Community, or Subdivision and Lot No.)

2. OWNER U.S. Navy  
 ADDRESS Camp Lejeune  
 (Street or Route No.) 28542

Depth	DRILLING LOG
From To	Formation Description
0.0 - 1.5	Fine Silty Peat
1.5 - 4.5	Silty Fine Sand
4.5 - 6.0	Fine Sandy Silt
6.0 - 9.0	Silty Fine Sand
9.0 - 10.5	Clayey Fine Sand
14 - 15.5	Clay
19.0 - 20.5	Clayey Silty Sand
24 - 25.5	Silty Fine Sand

3. DATE DRILLED 11/4/86 USE OF WELL Monitor

4. TOTAL DEPTH 25 CUTTINGS COLLECTED  Yes  No

5. DOES WELL REPLACE EXISTING WELL?  Yes  No

6. STATIC WATER LEVEL: 18.90 FT.  above TOP OF CASING,  below  
 TOP OF CASING IS 2.50 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_

WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	To	Depth	Diameter	Wall Thickness or Weight/Ft.	Material
From <u>2.5</u>	To <u>-5.0</u>	Ft.	<u>2"</u>	<u>1/8"</u>	<u>PVC</u>
From _____	To _____	Ft.	_____	_____	_____
From _____	To _____	Ft.	_____	_____	_____

If additional space is needed use back of form.

**LOCATION SKETCH**

(Show direction and distance from at least two State Roads, or other map reference points)

See sketch attached to (Fig 2-5).

11. GROUT:

From	To	Depth	Material	Method
From <u>0.0</u>	To <u>-2.0</u>	Ft.	<u>Concrete</u>	_____
From <u>2.0</u>	To <u>-3.0</u>	Ft.	<u>Clay</u>	_____

12. SCREEN:

From	To	Depth	Diameter	Slot Size	Material
From <u>-5.0</u>	To <u>-20'</u>	Ft.	<u>2"</u>	<u>0.01 in.</u>	<u>PVC</u>
From _____	To _____	Ft.	_____	_____	_____
From _____	To _____	Ft.	_____	_____	_____

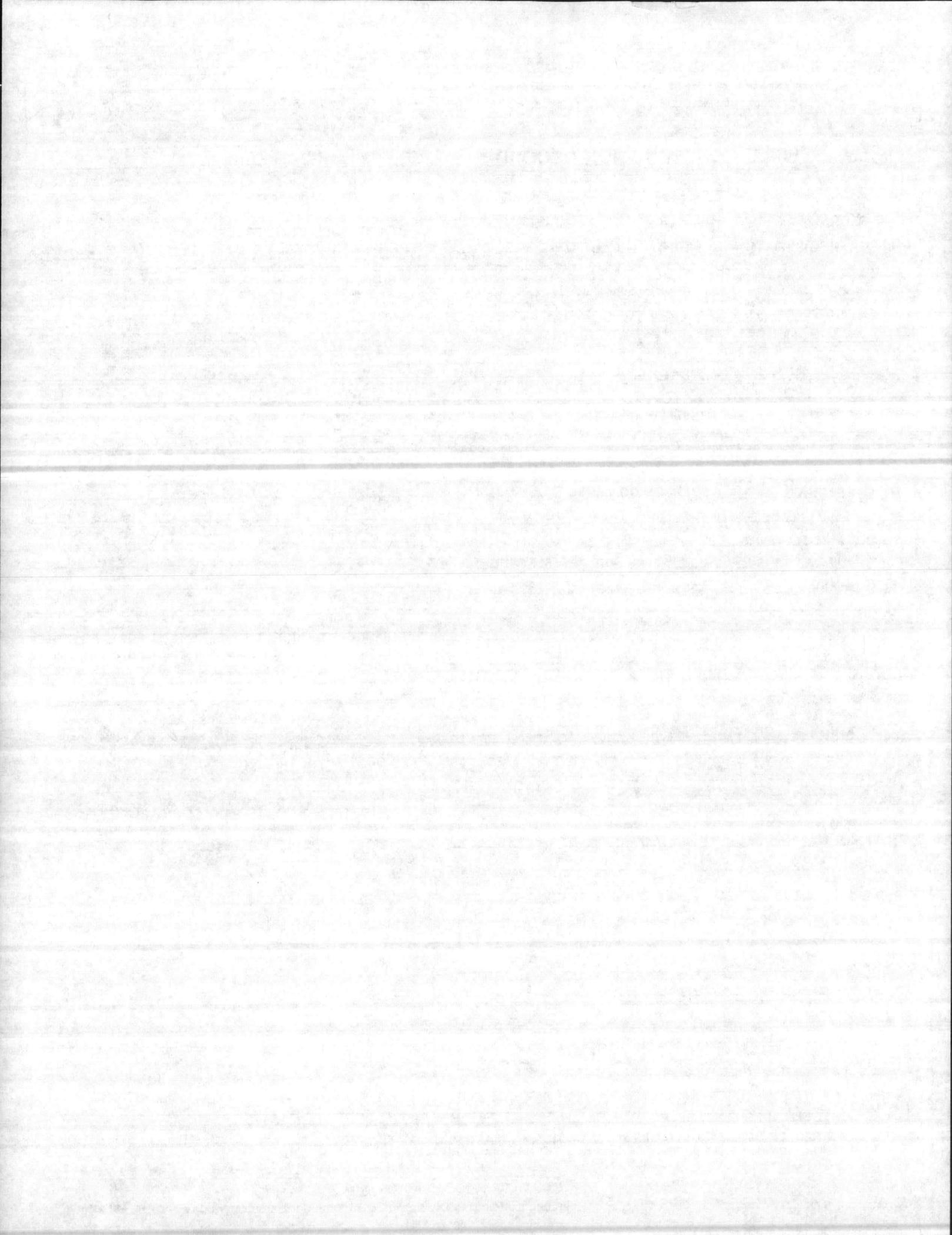
13. GRAVEL PACK:

From	To	Depth	Size	Material
From <u>-3.0</u>	To <u>-25'</u>	Ft.	<u>Coarse</u>	<u>Sand</u>
From _____	To _____	Ft.	_____	_____

REMARKS: \_\_\_\_\_

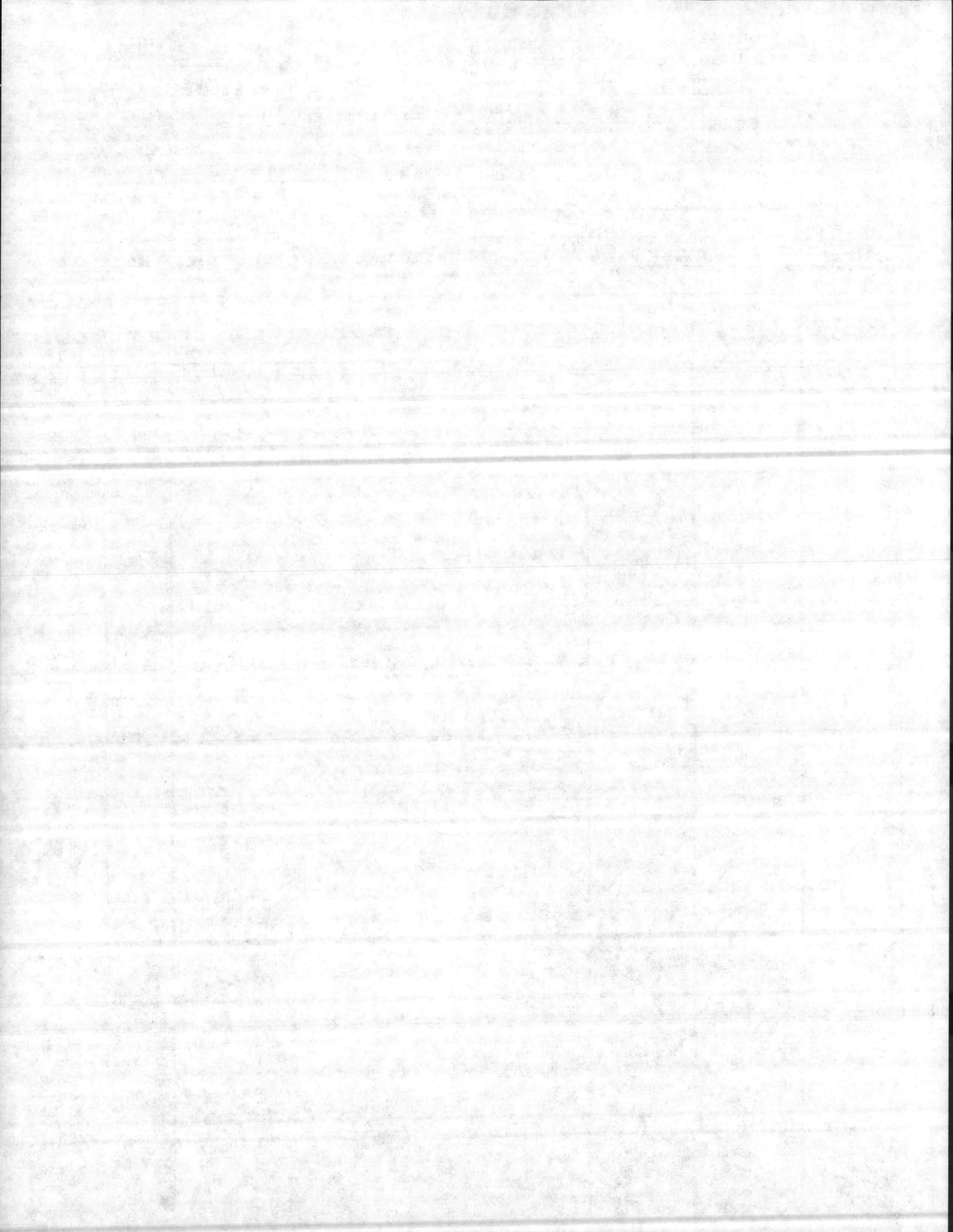
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT Paul H. Sullivan DATE 2/9/87



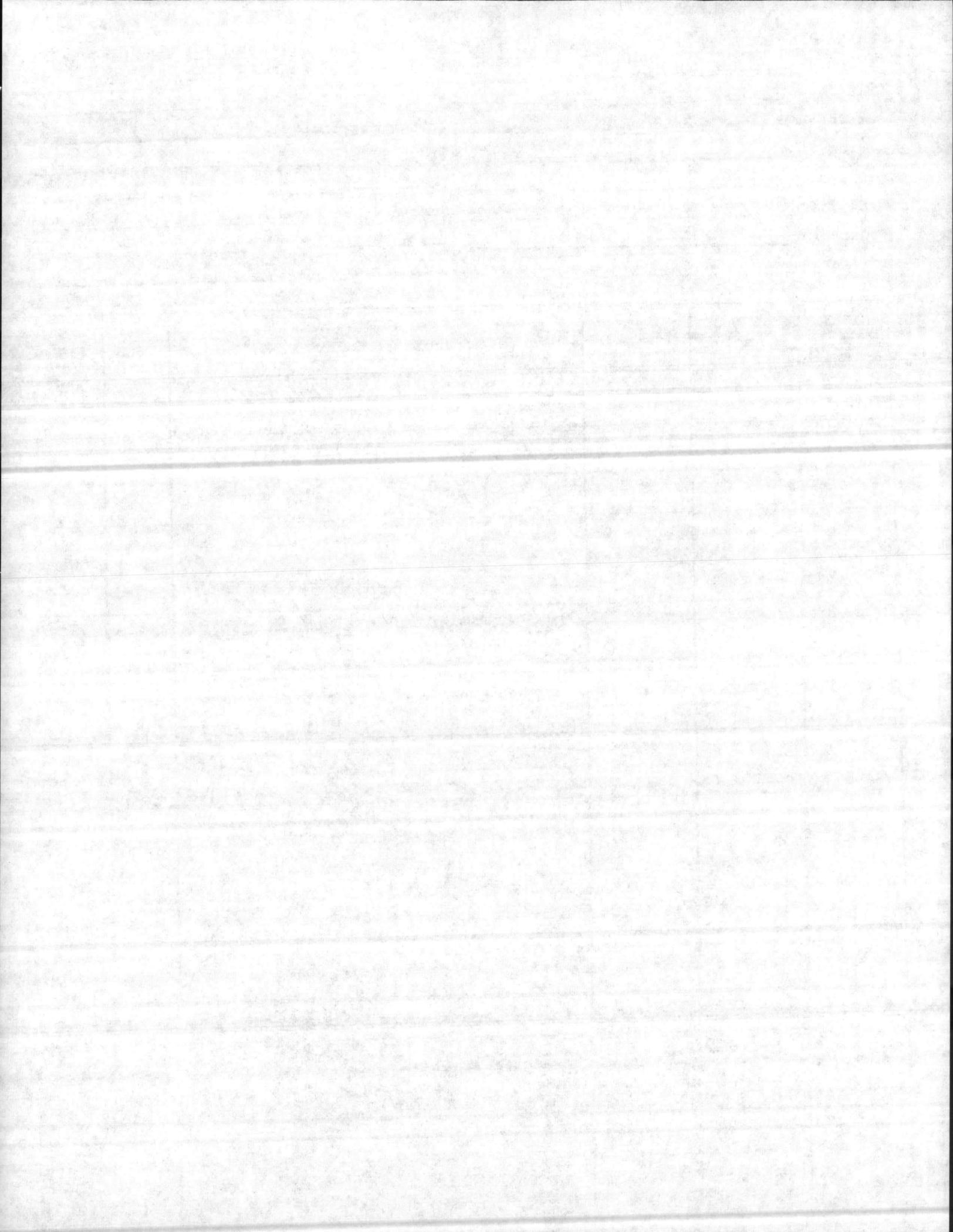
Boring No. HPGW3 776 (near Bldg. 1711) Location Coordinates N E Page 107  
 Hole Size 6" Slot 0.010"  
 Screen Size 2" Mat'l Sched. 40 PVC Filter Materials Silica Sand  
 casing Size 2" Mat'l PVC Grout Type 1' Bentonite Seal  
 Geologist Paul Conrad Development \_\_\_\_\_  
 Date Start 11/4/86 Finish 11/4/86 Static Water Level 19.17'  
 Contractor Davis Drilling Co. Top of Well Elevation 21.67'  
 Driller Charles Smith Drill Type Hollow Stem Auger

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0-1.5			Fine Sandy silt, sand 25-30%, organic debris & misc. gravel, appears oily or Peaty, color 10YR 3/1 (v. drk gry), moist, non-plast, loose.	ML Pt	2-3-3
1.5-3			Fine silty Peat, sand 5-10%, appears v. oily, stains hands, moist, non-plast, v. loose, color 7.5YR 2/1 (black), slight oil sheen when placed in water.	Pt	2-2-3
3-4.5			Silty fine sand, silt 30-35%, moist, loose, oily appearance, stains hands, non-plast, color 5Y 7.5/1 (Black).	SM	4-3-3
4.5-6			Silty fine sand, silt 30-35%, moist, v. loose non-plast, stains hands, color 5Y 7.5/1 (Black).	SM	2-2-1



Boring No. HP6W3 Location Coordinates N 2 of 4  
 Hole Size \_\_\_\_\_ Slot \_\_\_\_\_ E \_\_\_\_\_  
 Screen Size \_\_\_\_\_ Mac'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
 Ring Size \_\_\_\_\_ Mac'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
 Geologist \_\_\_\_\_ Development \_\_\_\_\_  
 Date Start 11/4/86 Finish 11/4/86 Static Water Level \_\_\_\_\_  
 Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
 Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
6-7.5			silty fine sand, silt 15-20%, sat'd, non-plast, fairly unif. sand, med. dense, color 10YR 5/2 (greyish brn), slight foul odor.	SM	5-8-f.
7.5-9			silty Fine Sand, silt 15-20%, foul odor (swamp gas?), color change to uniform 5GY 6/1 (greenish gr), non-plast, med. dense, sat'd.	SM	5-11-11
9-10.5			fine sandy clay, sand ~5%, plastic, sat'd, color unif. closest to N 4/10 (dark grey w/ greenish tint)	CH	2-1-2
14-15.5			Clay, clean, massive, high plast, wet, v. soft, unif. color 5GY 4.5/6 (dark greenish grey) no odor not evident	CH	0-1-C

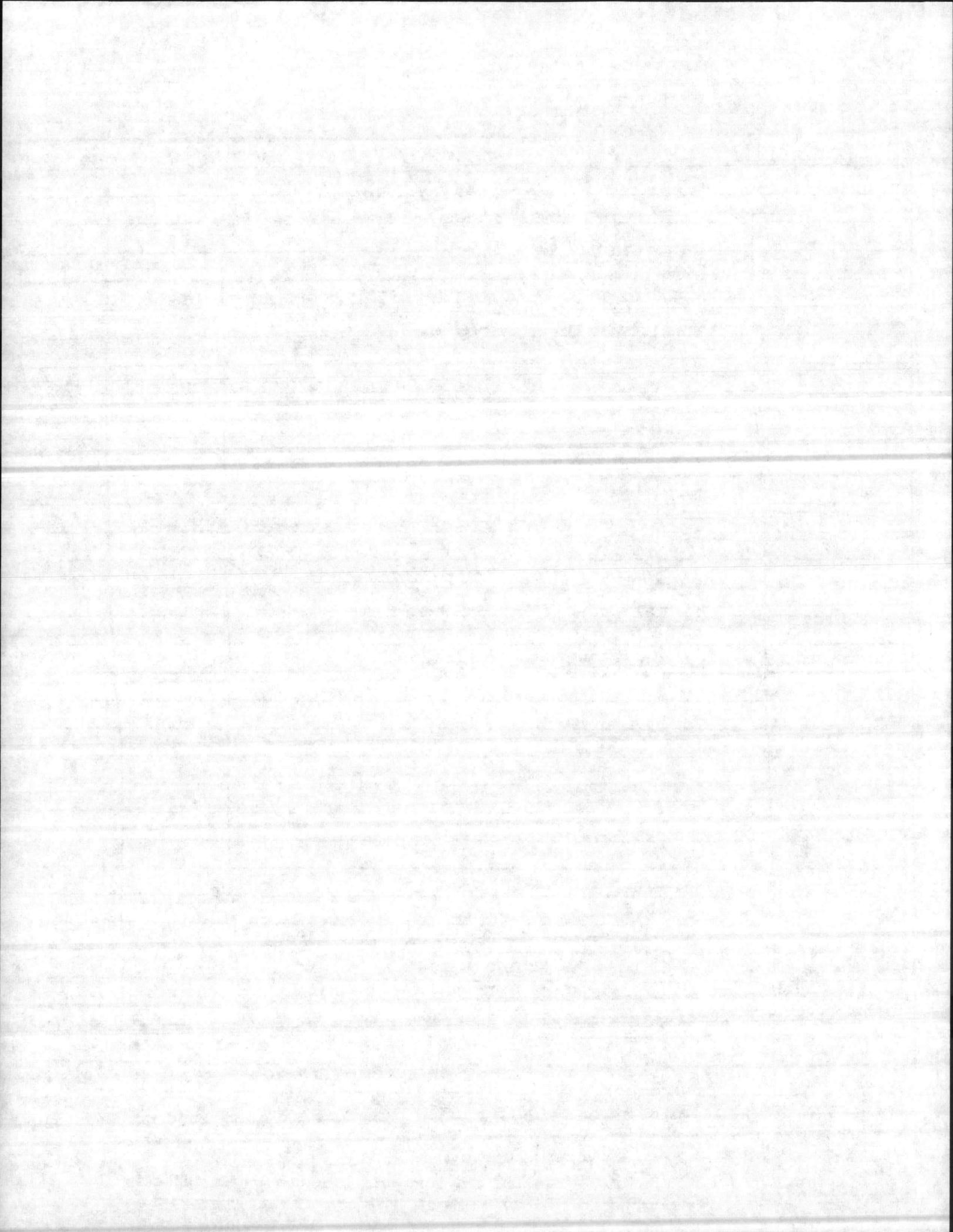


Depth (ft)	Lithology Color	USCS	SPT
19-20.5	19'-19.75': Fine Sandy Clay, sand 15-20%, wet, low plast., color closest to 5Y 5/1 (greenish gray), soft.	CL	2-3-
	19.75'-20.5': silty Fine Sand, silt 10-15%, non-plast., sat'd, color mottled 10YR 7/2 (light gray) and 10YR 6/8 (brnish yllw) - 25%. Trace clay.	SM	
24-25.5	Silty Fine Sand, calcareous cemented, silt ~10%, shell fragments ~20%, color 10YR 6/4 (light yllwish brn). V. moist, appears gravelly due to cementation.	SP	7-14-

7/14/86

DATE

SIGNED



4:30am Left for airport to take Mike Snar. (No Bkst. I)  
8:00am Arrived Camp Lejeune. Met drillers.  
8:45 Began Drilling & Sampling. No unusual event  
9:40 Well complete. \*Truck back to w.w.t. area for  
water.  
Washed rig. Began Well 17.

\*Augers pulled before silica sand poured. Hole  
stayed open.

Standard well construction. Hole depth 30'.

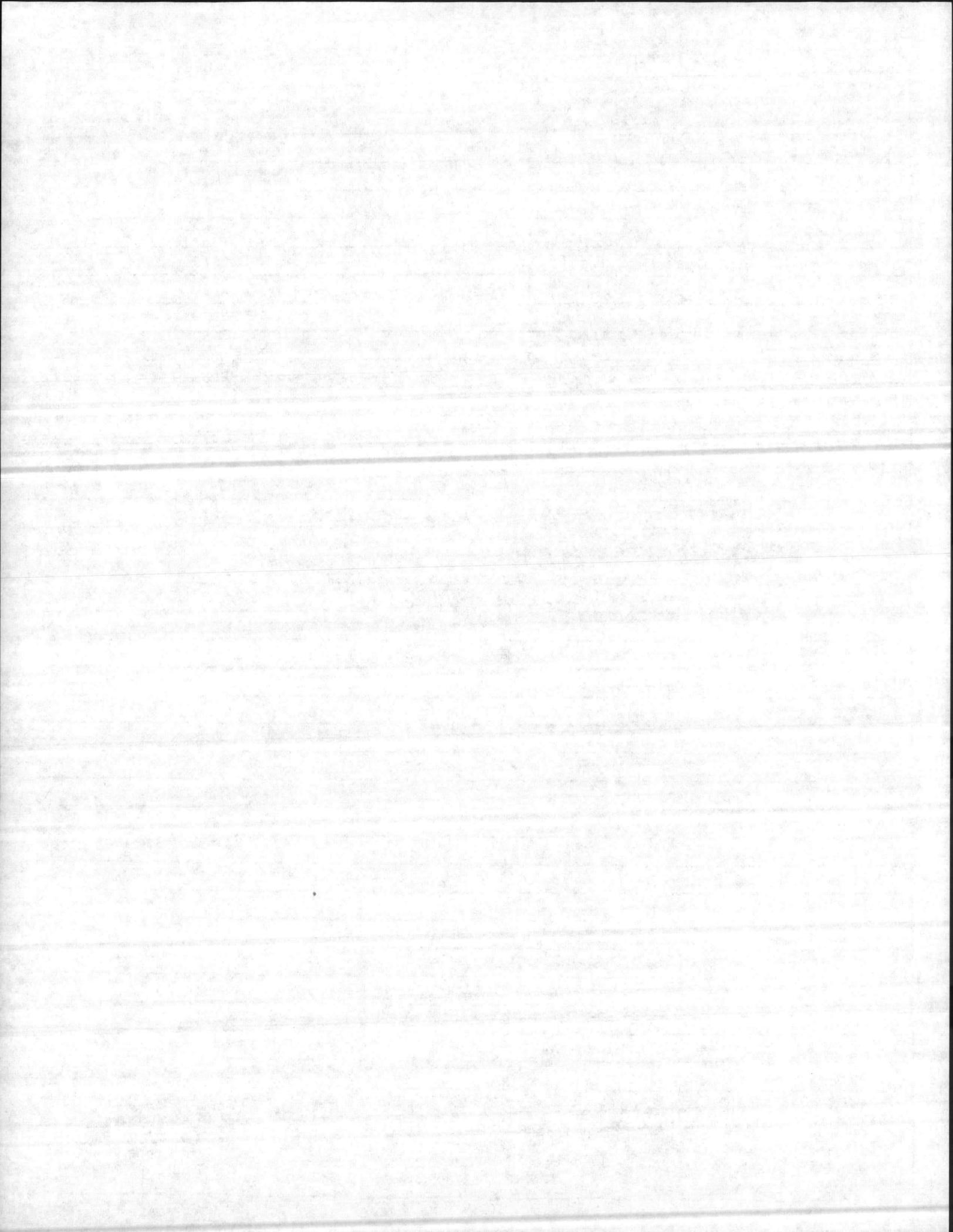
Note: At ~ 29' depth auger's bit picked up  
rock (driller reported hard drilling). Massive, hard  
silica/calc. (no acid) cementing large intact shell  
fragments (shells partially lithified). Possibly bedrock in  
float.

11/24/86

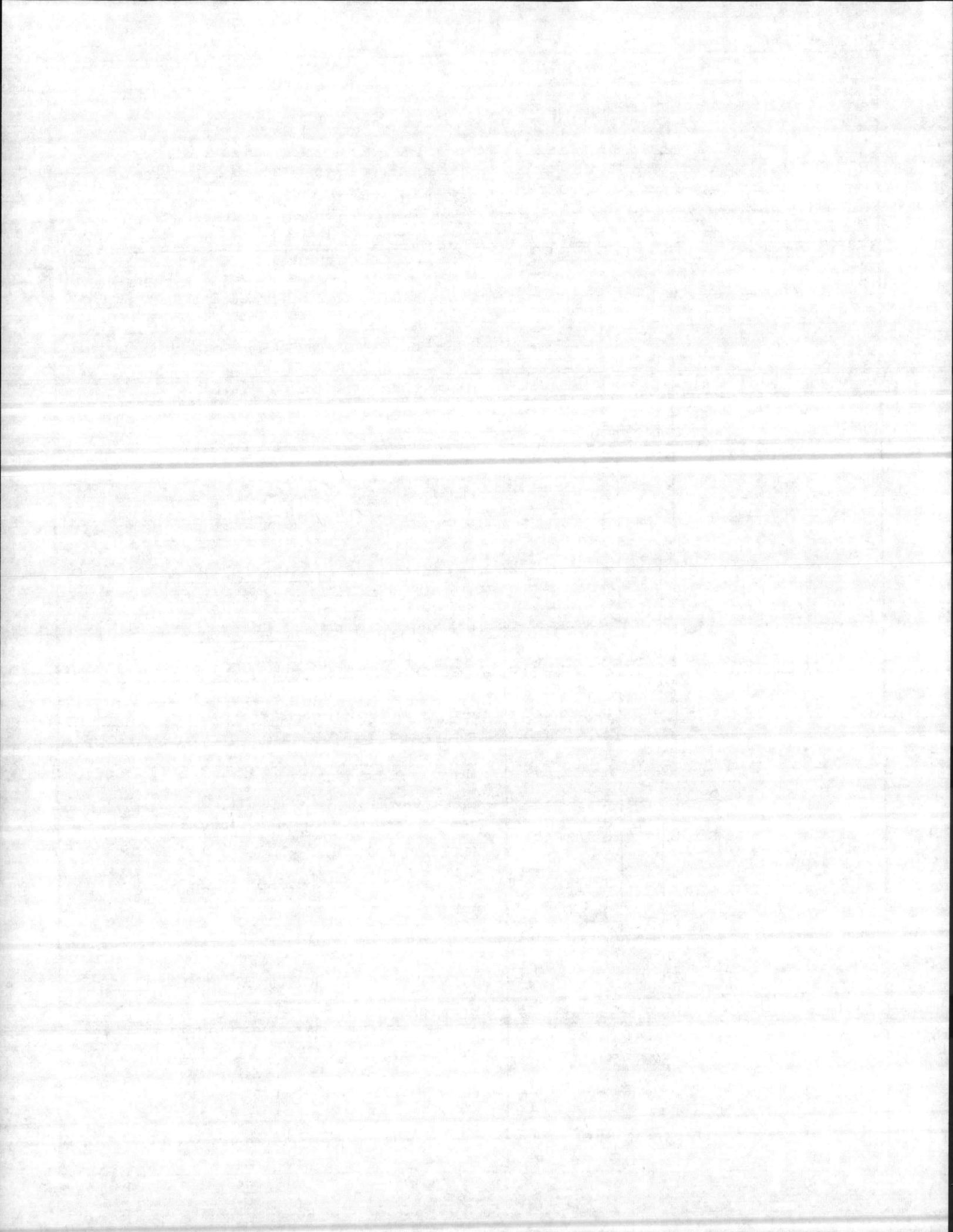
DATE

SIGNED

Paul D. Conrad







FOR OFFICE USE ONLY

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Davis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 66-0135-WM-0141

1. WELL LOCATION: (Show sketch of the location below)  
 Nearest Town: Jacksonville, N.C.

County: Onslow

(Road, Community, or Subdivision and Lot No.)

2. OWNER US Navy  
 ADDRESS Camp Lejeune N.C.  
 (Street or Route No.) 28542

Depth		DRILLING LOG
From	To	Formation Description
0.0	1.5	Fine Sandy Silt
1.5	3.0	Fine Sandy Peat
3.0	9.0	Silty Fine Sand
9.0	10.5	Fine Sandy Clay
10.5	14.0	Clay
14.0	19.0	Fine Sandy Clay and
19.0	20.5	Fine Silty Sand
20.5	25'	Silty Fine Sand

3. DATE DRILLED 11/4/86 USE OF WELL monitor

4. TOTAL DEPTH 25 CUTTINGS COLLECTED  Yes  No

5. DOES WELL REPLACE EXISTING WELL?  Yes  No

6. STATIC WATER LEVEL: 19.17 FT.  above  below TOP OF CASING.  
 TOP OF CASING IS \_\_\_\_\_ FT. ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_

8. WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	Depth	To	Diameter	Wall Thickness or Weight/Ft.	Material
From <u>2.5</u>	Depth	To <u>5.0</u>	Ft. <u>2"</u>	<u>1/8"</u>	<u>PUC</u>
From _____	To _____	Ft. _____	_____	_____	_____
From _____	To _____	Ft. _____	_____	_____	_____

11. GROUT:

From	Depth	To	Material	Method
From <u>0.0</u>	Depth	To <u>2.0</u>	Ft. <u>Concrete</u>	_____
From <u>2.0</u>	Depth	To <u>3.0</u>	Ft. <u>Clay</u>	_____

12. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
From <u>5.0</u>	Depth	To <u>25'</u>	Ft. <u>2"</u>	in. <u>0.01</u>	in. <u>PUC</u>
From _____	To _____	Ft. _____	in. _____	in. _____	_____
From _____	To _____	Ft. _____	in. _____	in. _____	_____

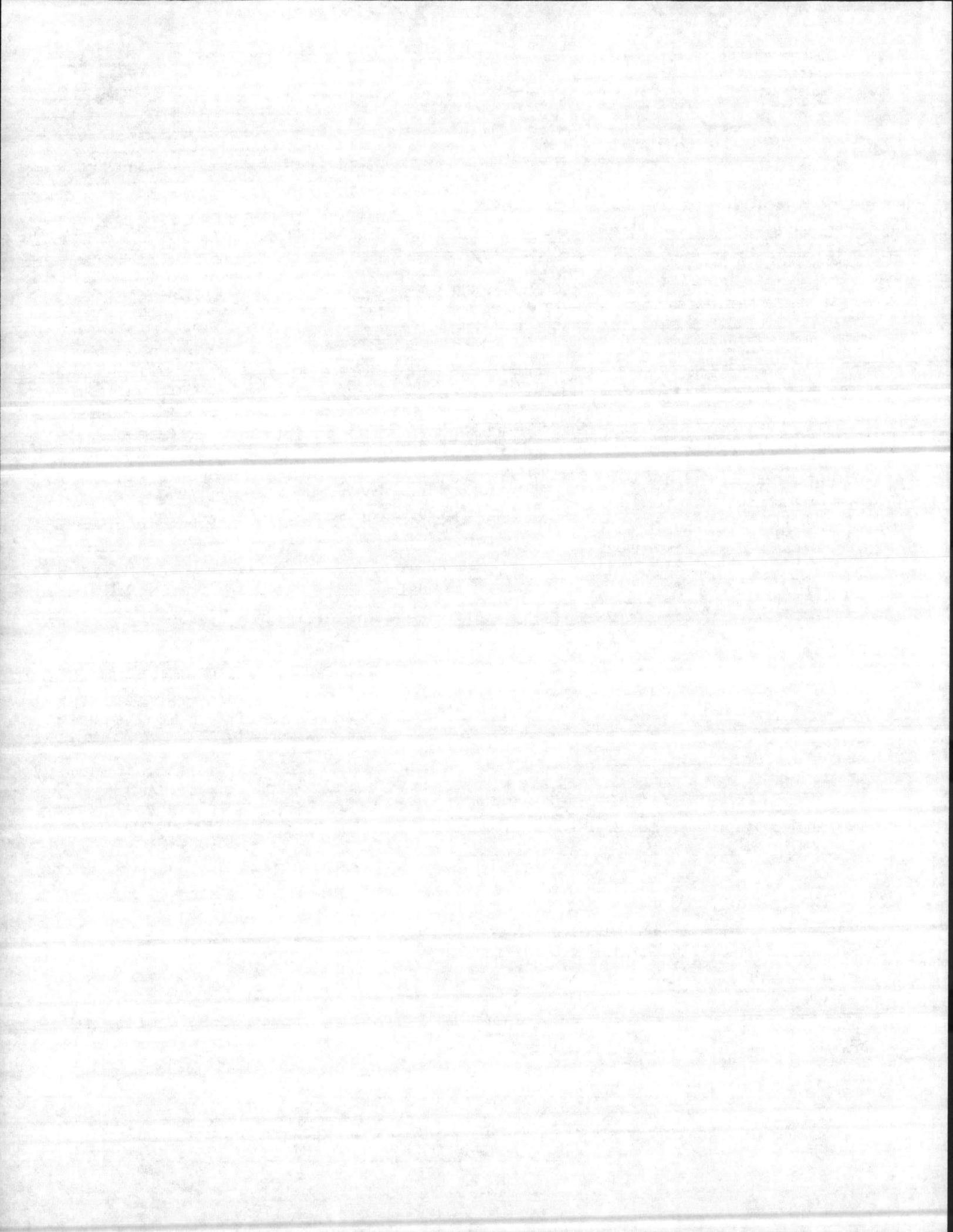
13. GRAVEL PACK:

From	Depth	To	Size	Material
From <u>3.0</u>	Depth	To <u>25'</u>	Ft. <u>Course</u>	<u>Sand</u>
From _____	To _____	Ft. _____	_____	_____

REMARKS: \_\_\_\_\_

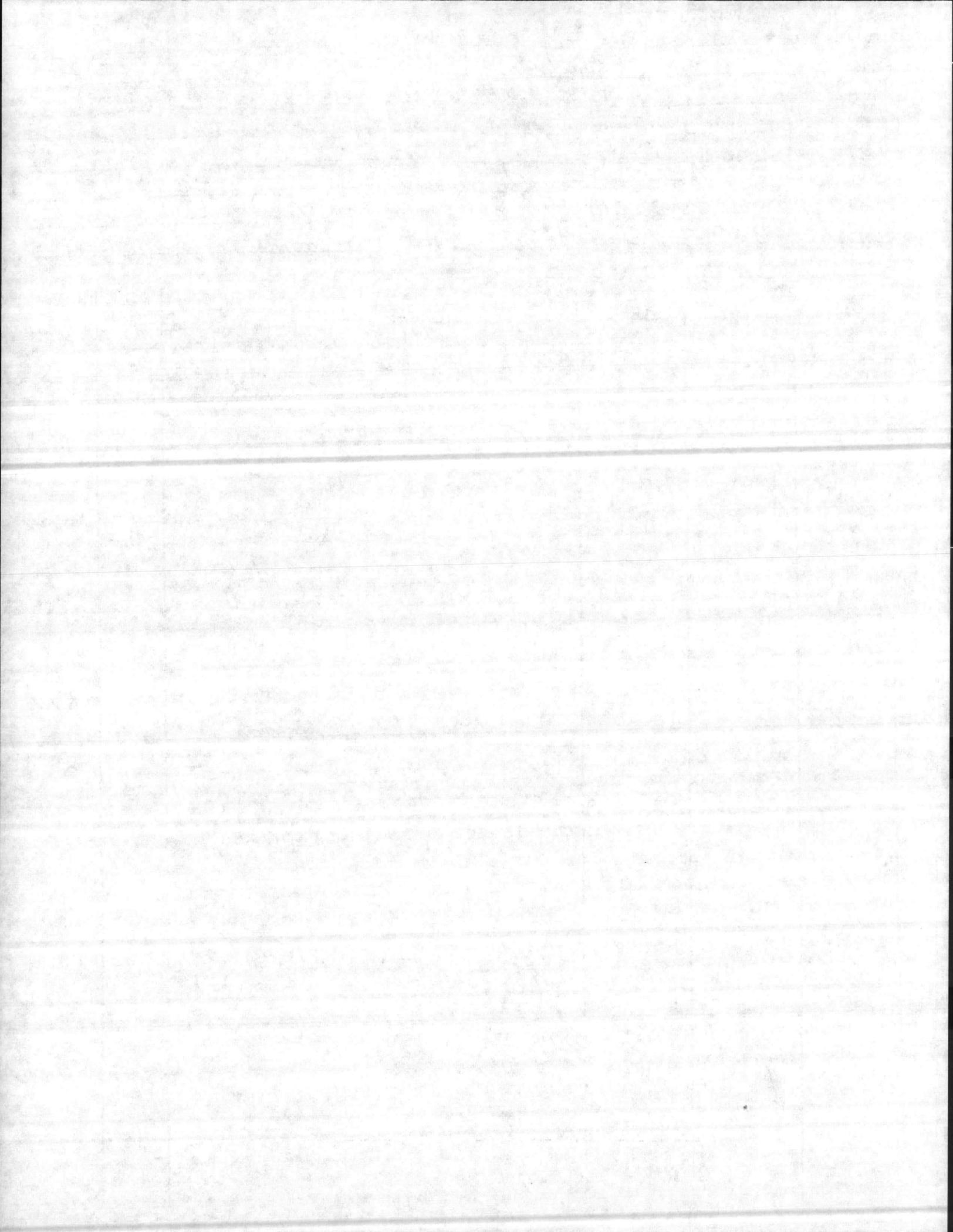
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NC AC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Charles A. Brubaker 2/9/87  
 SIGNATURE OF CONTRACTOR OR AGENT DATE



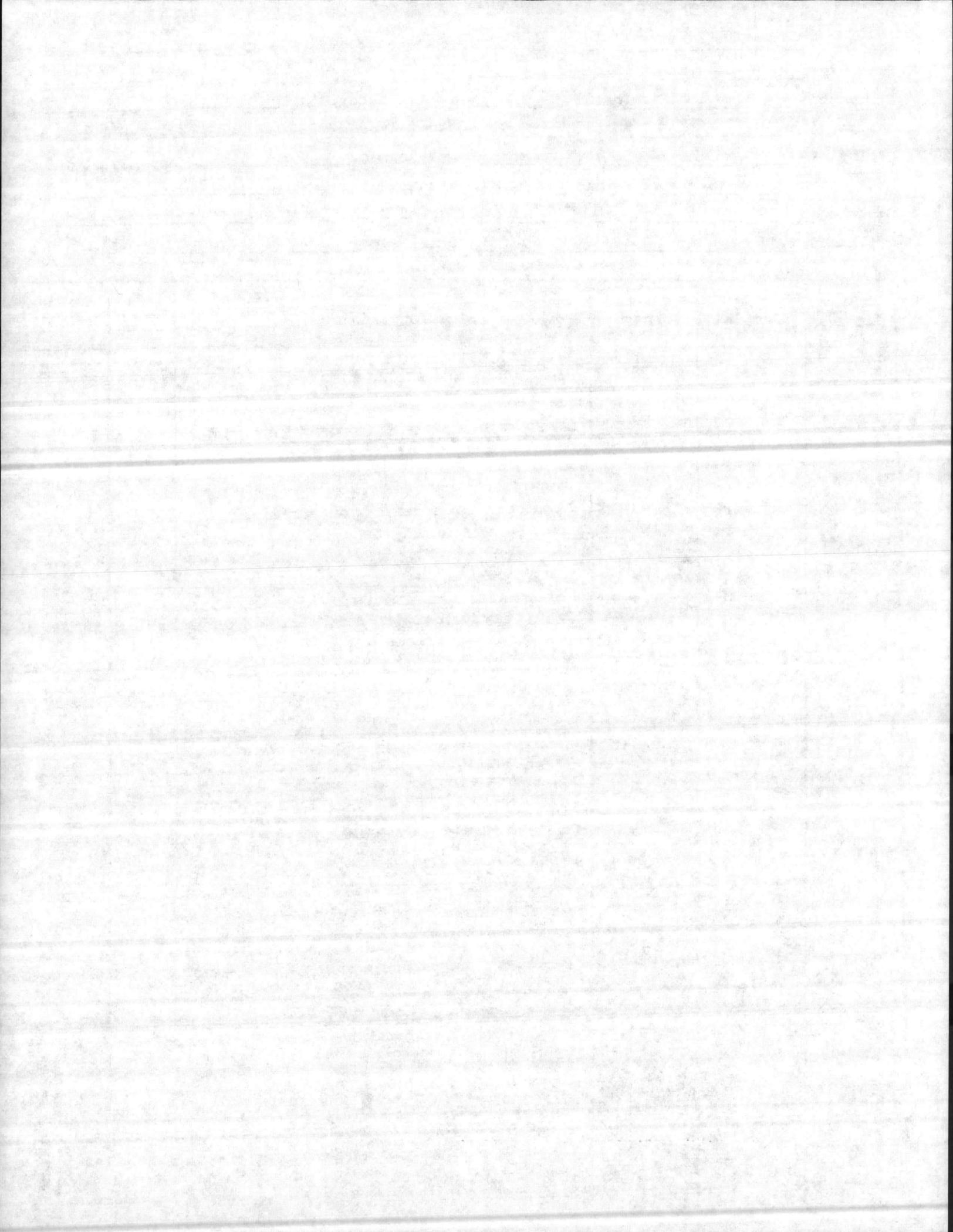
Boring No. HPGW 4 (near Bldg. 1703) Location Coordinates N Page 1077  
 Hole Size 6" Slot 0.010" E             
 Screen Size 2" Mat'l Schd. 40PK Filter Materials Silica Sand  
 using Size 2" Mat'l PVC Grout Type 1' Bentonite Seal  
 Geologist Paul Conrad Development             
 Date Start 11/4/86 Finish 11/4/86 Static Water Level 18.08'  
 Contractor Davis Drilling Co. Top of Well Elevation 20.58'  
 Driller Charles Smith Drill Type Hollow Stem Auger

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/F)
0-1.5			<u>Pent</u> , sand ~5%, non-plast., loose, s. moist, color 10YR 2/2 (v. drk. brown).	PT	2-3-
1.5-3			<u>Silty Fine Sand</u> , silt 30-35%, loose, s. moist, non-plast., color 10YR 4/2 (drk greyish brn) some lighter mottling.	ML	3-3-4
3-4.5			<u>Silty Fine Sand</u> , silt 15-20%, moist, med. dens 2, non-plast., color unif. 10YR 6/2.5 (lght. brnish gry), grains uniform.	SM	4-6-9
4.5-6			<u>Clayey Fine Sand</u> , clay ~5-10%, silt ~5%, med. dense; slight plast, unif color 10YR 7.5/1 (lght gry).	ML	7-7-6



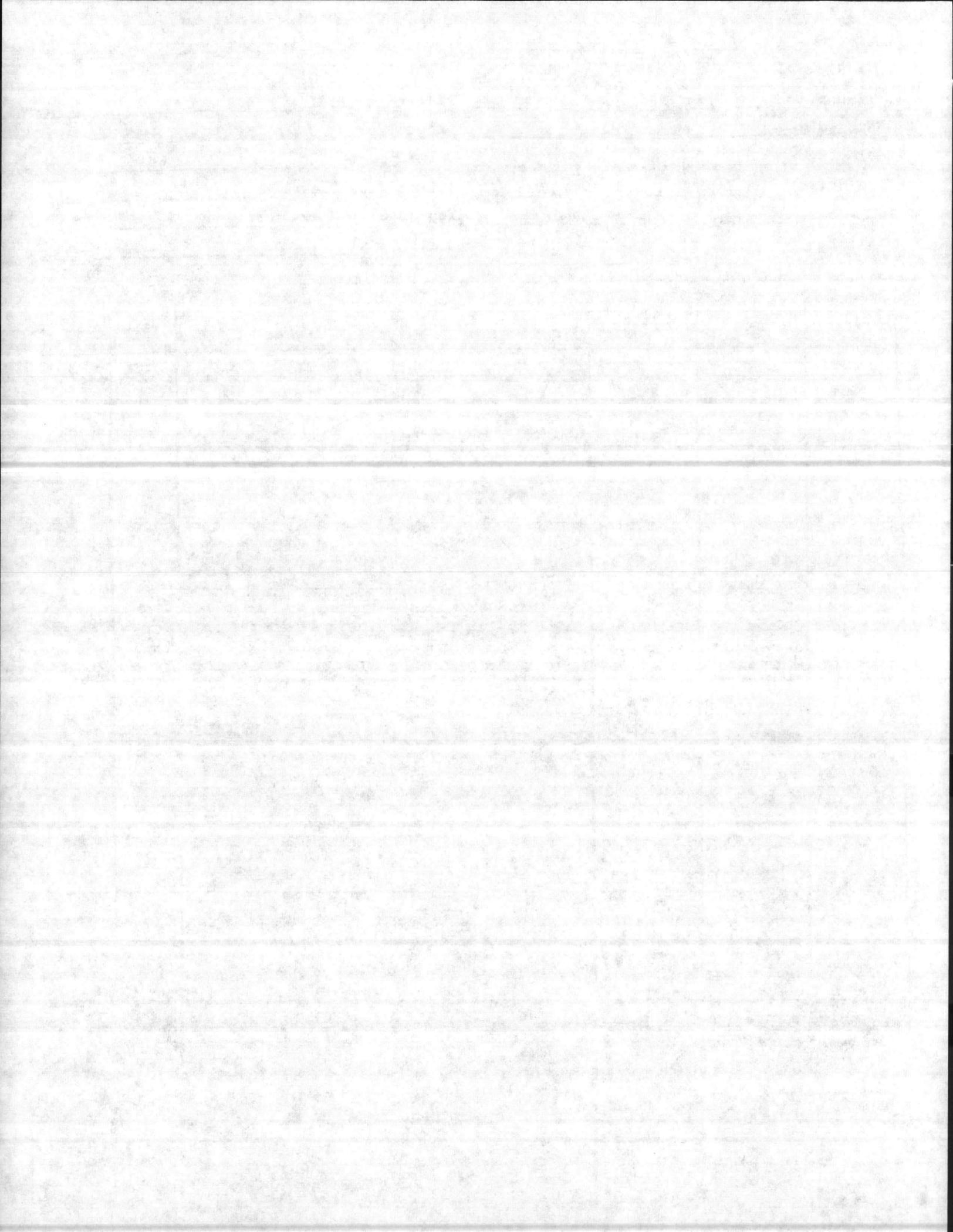
Boring No. 722 HPGW 4 Location Coordinates N                       
 Hole Size                      Slot                      E                       
 Screen Size                      Mat'l                      Filter Materials                       
 using Size                      Mat'l                      Grout Type                       
 Geologist                      Development                       
 Date Start                      Finish 11/4/86 Static Water Level                       
 Contractor                      Top of Well Elevation                       
 Driller                      Drill Type                     

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
6-7.5			fine sandy clay, sand 15-20% v. moist, v. soft, color unif. 5GY 5.5/1 (greenish gry).	ML	3-2-1
7.5-9			fine sandy clay, sand 10-15% sat'd, v. soft, color unif. 5GY 5.5/1 (greenish gry)	ML	1-0-1
9-10.5			silty, clayey fine sand silt 12%, clay 12%, soft, sat'd, sand uniform, color uniform 5GY 5.5/1 (greenish gry)	ML	1-2-2
14-15.5			clay, lean, v. soft, high plastic, color 5GY unif. (greenish gry)	ML	1-1-2



Boring No. TSZ HPGW4 Location Coordinates N 3 or 4  
 Hole Size \_\_\_\_\_ Slot \_\_\_\_\_ E \_\_\_\_\_  
 Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
 using Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
 Geologist \_\_\_\_\_ Development \_\_\_\_\_  
 Date Start \_\_\_\_\_ Finish 11/4/86 Static Water Level \_\_\_\_\_  
 Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
 Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
19-20.5			Marl, large shell fragments, one 30 mm x 20 mm rounded black gravel, overall color 10YR 6/8 (brnish yellow), silty ~ 20%, clayey ~ 10%, loose, sat'd.	Marl	2-3-4
24-25.5			Marl, same as above, more cemented, appears to be cherty cement, but because softness is probably calcitic. sat'd, high % shells, dense	Marl	26-26-2



20' Lunch Break.

1:15 pm

Began drilling & sampling.  
Location selected by Bob Alexander & Paul on 11/3/86. Too many utilities near 1704 (Bldg).

1:55 pm

Well complete. 5 100 lb bags of silica sand used. Casing installed directly in the hole. No heaving. 1' bentonite. No unusual events.

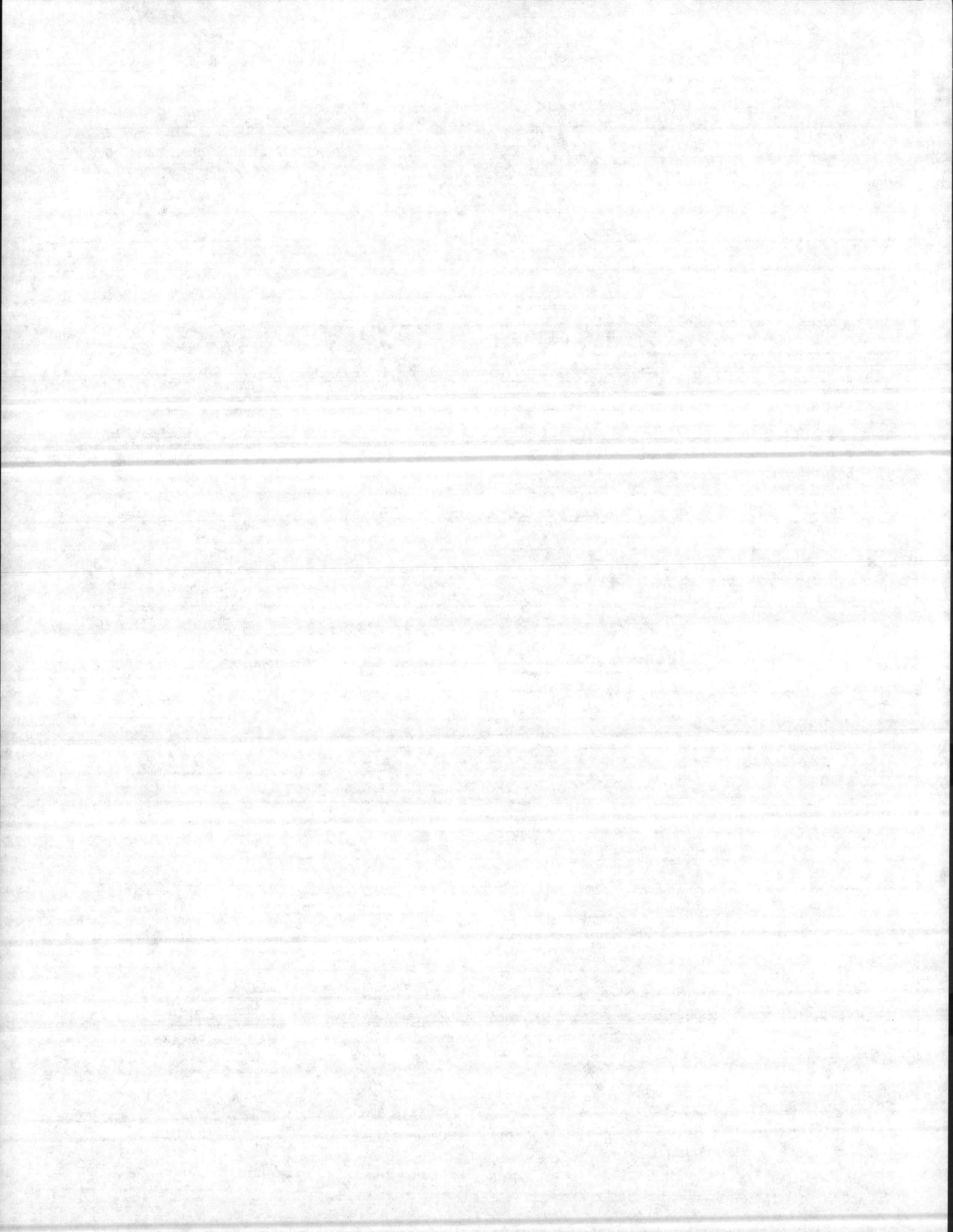
Construction: Stick up - 2.5'  
Bottom of casing at 24.5' (casing floated up, so 6" removed from top)  
Hole - 27' deep.

Standard construction otherwise.

2:30

Left Location.

11/4/86 Paul D. Conrad  
DATE SIGNED

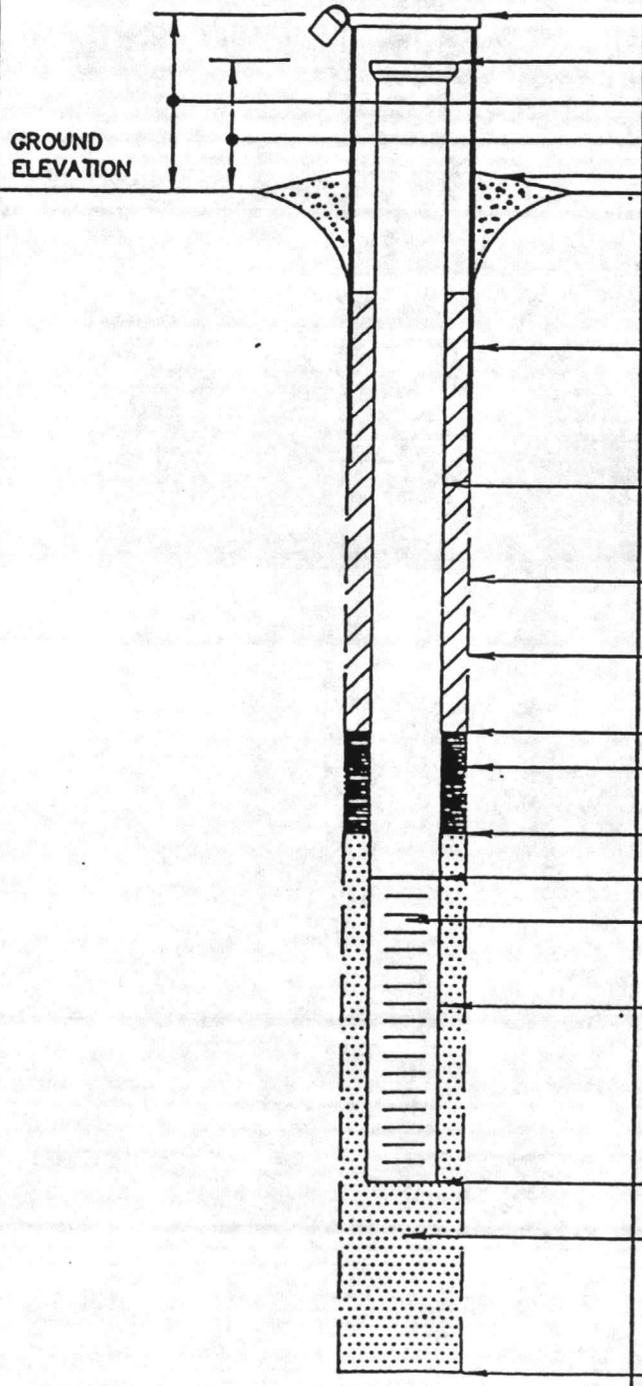


# OVERBURDEN MONITORING WELL SHEET

WELL NO. HP-6W4

PROJECT Camp Lejeune - HPIA  
 PROJECT NO. 49-02036 BORING NO. HP-6W4  
 ELEVATION \_\_\_\_\_ DATE 11/4/86  
 FIELD GEOLOGIST Paul Conrad (ESE)

DRILLER Davis Drilling Co  
 DRILLING METHOD Hollow Stem Auger  
 DEVELOPMENT METHOD \_\_\_\_\_



ELEVATION OF TOP OF SURFACE CASING: 31.80'  
 ELEVATION OF TOP OF RISER PIPE: 31.66'  
 STICK-UP TOP OF SURFACE CASING: 2.74'  
 STICK-UP RISER PIPE: 2.60'  
 TYPE OF SURFACE SEAL: concrete

I.D. OF SURFACE CASING: 5'  
 TYPE OF SURFACE CASING: carbon steel

RISER PIPE I.D.: 2"  
 TYPE OF RISER PIPE: Schedule 40 P.C.

BOREHOLE DIAMETER: 6"

TYPE OF BACKFILL: concrete

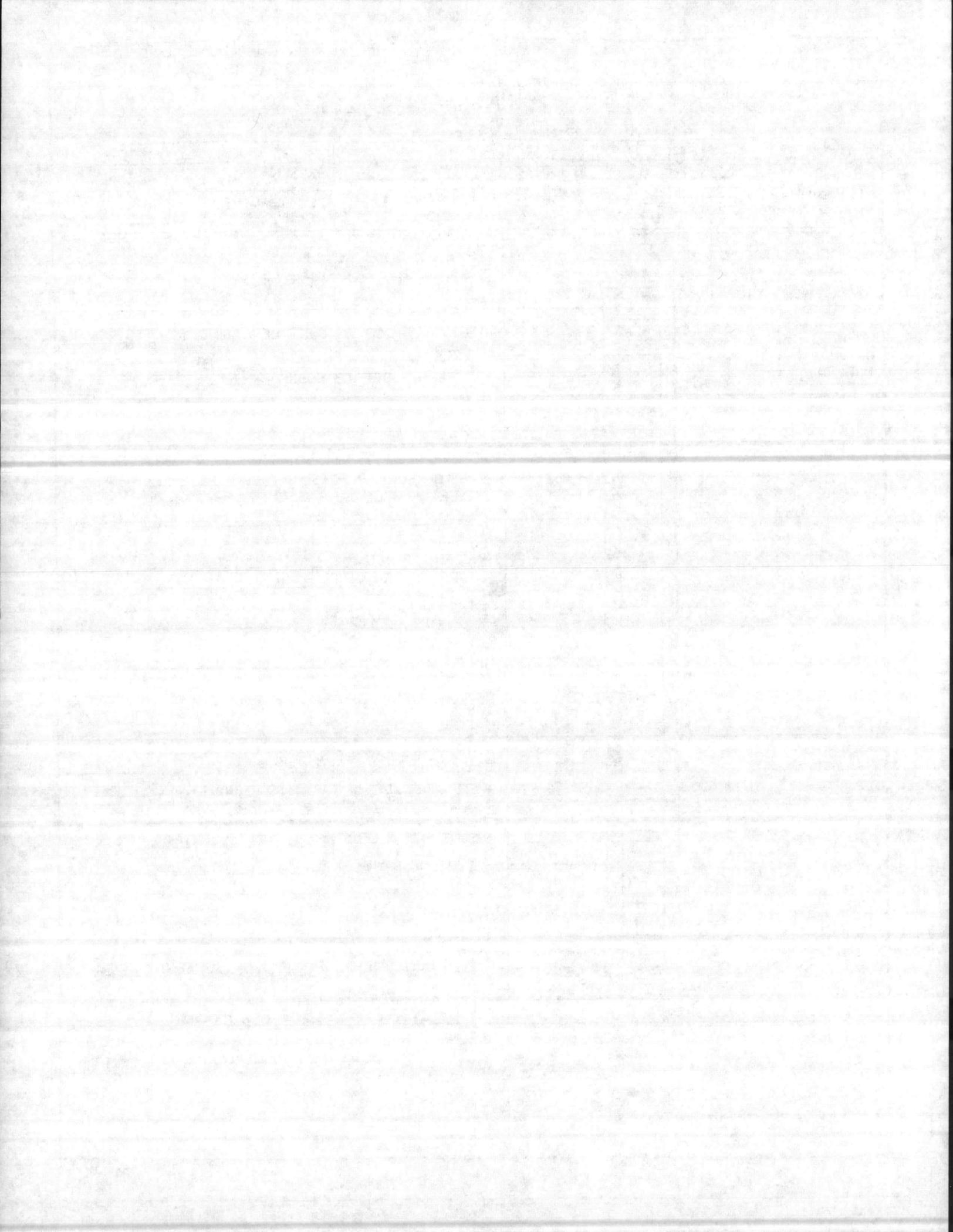
ELEVATION/DEPTH TOP OF SEAL: 2'  
 TYPE OF SEAL: benzocite

DEPTH TOP OF SAND PACK: 3'  
 ELEVATION/DEPTH TOP OF SCREEN: 4.5'  
 TYPE OF SCREEN: Schedule 40 P.C.  
 SLOT SIZE X LENGTH: 0.010" x 20'  
 TYPE OF SAND PACK: coarse silica sand

ELEVATION/DEPTH BOTTOM OF SCREEN: 29.5'  
 ELEVATION/DEPTH BOTTOM OF SAND PACK: \_\_\_\_\_  
 TYPE OF BACKFILL BELOW OBSERVATION WELL: \_\_\_\_\_

ELEVATION/DEPTH OF HOLE: 27'

NOT TO SCALE



**FOR OFFICE USE ONLY**

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

SW 4 WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Davis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 66-0135-WM-0141

1. WELL LOCATION: (Show sketch of the location below)  
 Nearest Town: Jacksonville, NC

County: Onslow

(Road, Community, or Subdivision and Lot No.)

2. OWNER US Navy  
 ADDRESS Camp Lejeune, N.C.  
(Street or Route No.) 28542  
City or Town State Zip Code

Depth		DRILLING LOG
From	To	Formation Description
0.0	1.5	Silty Peat
1.5	4.5	Silty Fine Sand
4.5	6.0	Clayey Fine Sand
6.0	9.0	Fine Sandy Clay
9.0	10.5	Silty Clayey Fine Sand
14.0	15.5	Clay
19.0	25.5	Marl

3. DATE DRILLED 11/4/86 USE OF WELL monitored

4. TOTAL DEPTH 25' CUTTINGS COLLECTED  Yes  No

5. DOES WELL REPLACE EXISTING WELL?  Yes  No

6. STATIC WATER LEVEL: 18.03 FT.  above TOP OF CASING,  
 below TOP OF CASING IS 25' FT. ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_

8. WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	To	Depth	Diameter	Wall Thickness or Weight/Ft.	Material
12.5	5.0	Ft.	2"	1/4"	PVC
From _____	To _____	Ft.			
From _____	To _____	Ft.			

If additional space is needed use back of form.

11. GROUT:

From	To	Depth	Material	Method
0.0	2.0	Ft.	Concrete	
2.0	3.0	Ft.	Clay	

LOCATION SKETCH

(Show direction and distance from at least two State Roads, or other map reference points)

see sketch attached to Fig (2.5).

12. SCREEN:

From	To	Depth	Diameter	Slot Size	Material
5.0	25	Ft.	2"	0.01 in.	PVC
From _____	To _____	Ft.			
From _____	To _____	Ft.			

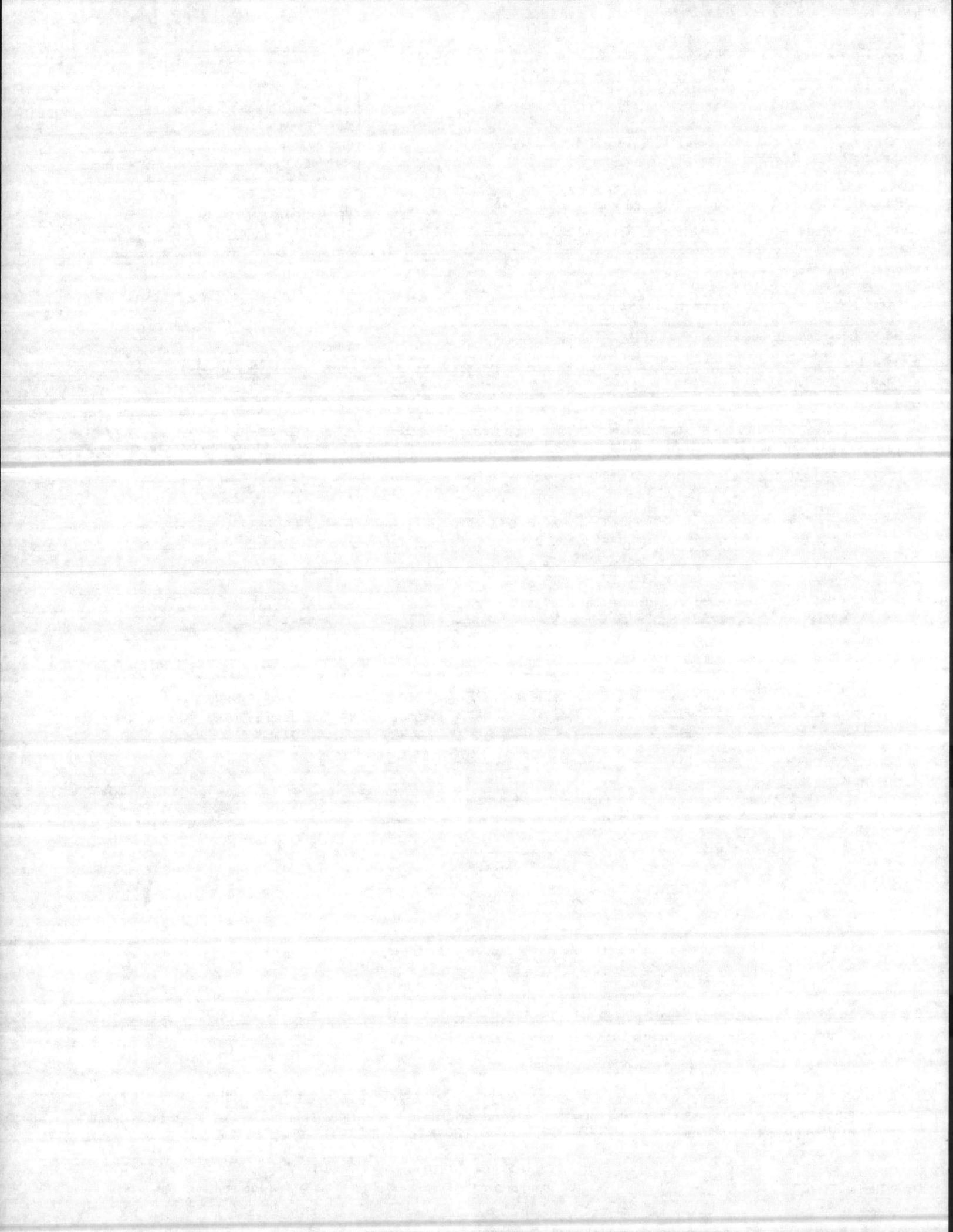
13. GRAVEL PACK:

From	To	Depth	Size	Material
3.0	25'	Ft.	coarse	Sand
From _____	To _____	Ft.		

REMARKS: \_\_\_\_\_

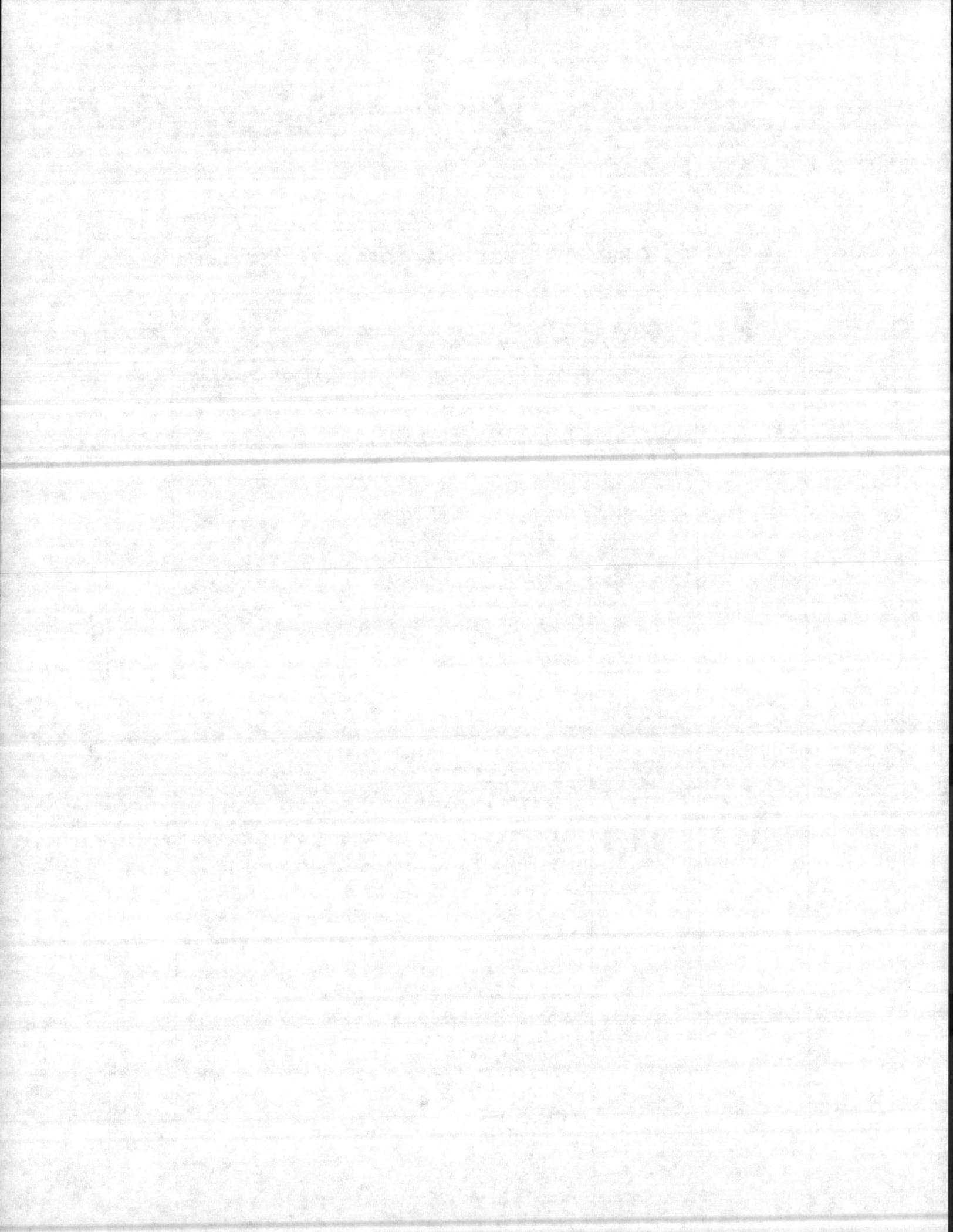
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

[Signature] 2/9/87  
 SIGNATURE OF CONTRACTOR OR AGENT DATE



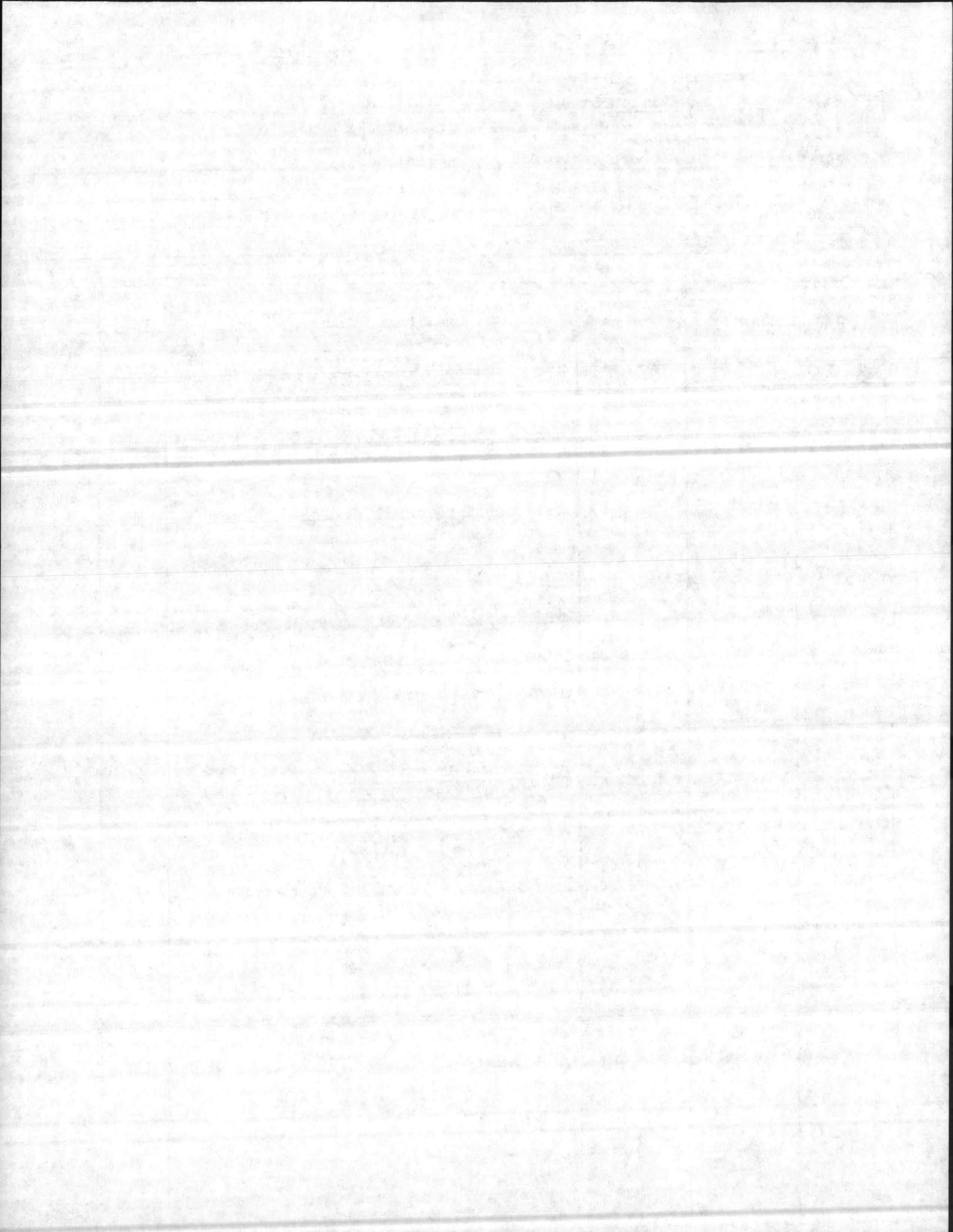
Boring No. HPGWS 2 (near Sta. 1606) Location Coordinates N Page 1 of 4  
 Hole Size 6" Slot 0.010" E  
 Screen Size 2" Mat'l Sch 40 PVC Filter Materials Silica Sand  
 Ring Size 2" Mat'l PVC Grout Type 1' Bentonite Seal  
 Geologist Paul Conrad Development  
 Date Start 11/4/86 Finish 11/4/86 Static Water Level 16.13'  
 Contractor Davis Drilling Co. Top of Well Elevation 18.63'  
 Driller Charles Smith Drill Type Hollow Stem Auger

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0-1.5			Peat, sand ~5%, moist, non-plast, loose, organics, roots, color 10YR 3/1 (v. drk. gry).	PT	2-3--
1.5-3			fine sandy silt, sand 15-20%, some roots, moist, non-plast, color 10YR 3/1 (v. drk gry); loose	ML	3-5-5
3-4.5			fine sandy silt, sand ~10%, moist, non-plast., color, med. dense, color 10YR 3/1 (v. drk gry) w/ thin bands of 10YR 5/3 (brown).	ML	3-5--
4.5-6			fine sandy silt, sand 10-15%, moist, loose, non-plast., color 10YR 7/2 (light gry), some mottling of 10YR 7/6 (yllw).	ML	2-3-3



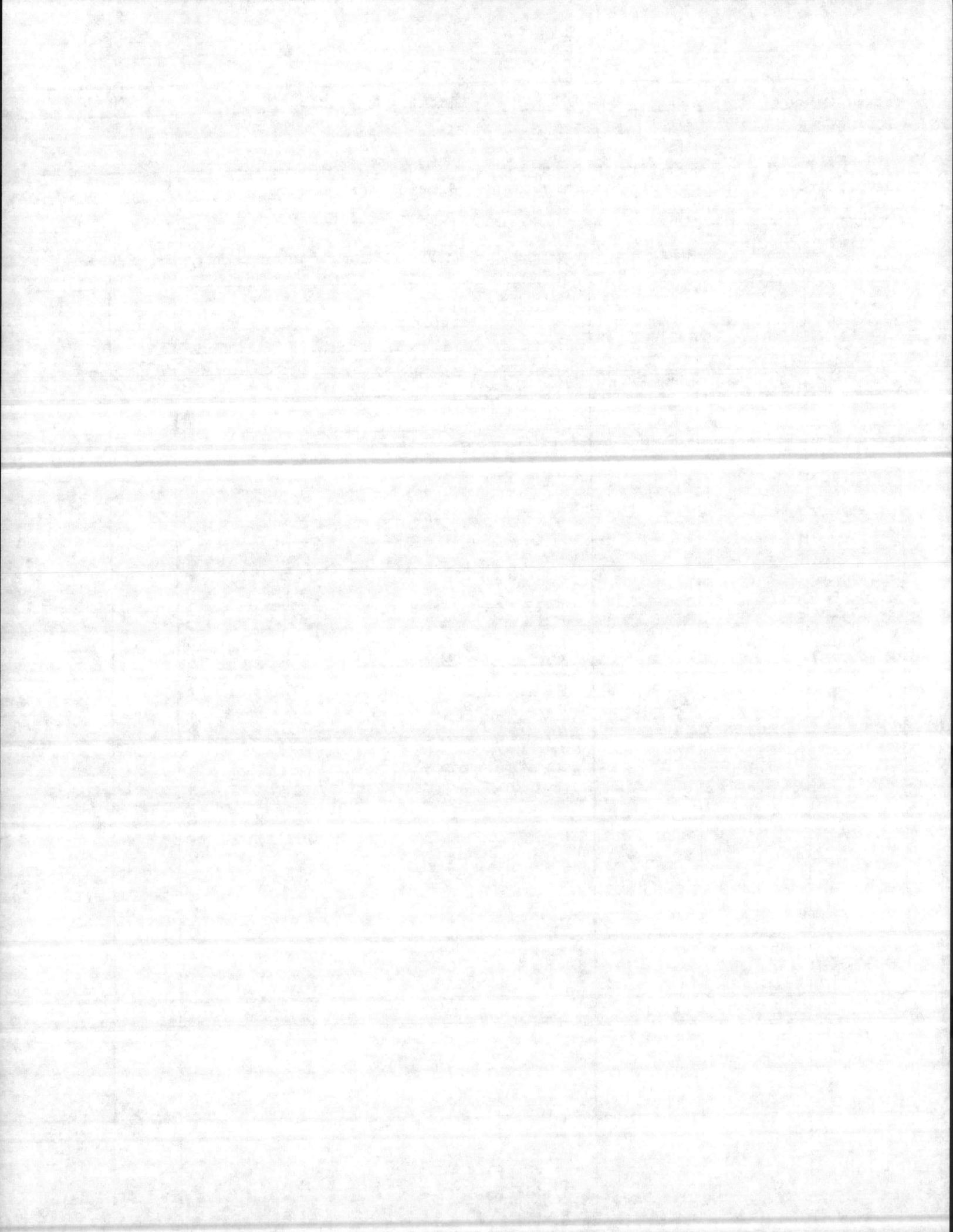
Boring No. X HPGW5 Location Coordinates N  
 Hole Size \_\_\_\_\_ Slot \_\_\_\_\_ E  
 Screen Size \_\_\_\_\_ Mac'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
 casing Size \_\_\_\_\_ Mac'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
 Geologist \_\_\_\_\_ Development \_\_\_\_\_  
 Date Start \_\_\_\_\_ Finish 11/4/36 Static Water Level \_\_\_\_\_  
 Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
 Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
6-7.5			fine sandy, silty clay, sand 5-10%, silt < 5%, slight plast., moist, color 5Y 6.5/1 (gray), 5% mottled w/ 10 YR 8/8 (yellow).	CL	1-2-1
7.5-9			fine sandy silty clay, sand 20-25%, silt ~ 15%, slight plast., v. moist, soft, color 10YR 7/2 (light gray), heavily mottled w/ 10YR 6/8 (brownish yellow).	CL	2-2-3
9-10.5			Silty fine sand, silt 12-15%, clay 5-10%, non-plast. (ex. spt clay), loose, moist, color 10YR 7/2 (light gray), mottled w/ 10YR 6/8 (brownish yellow).	SM	3-5-5
11-15.5			Clay, clean, massive, high plast, wet, color 5GY 5.5/1 (greenish gray), soft.	CH	6-2-3



Boring No. X HPGW5 Location Coordinates N 33° 7'  
 Hole Size \_\_\_\_\_ Slot \_\_\_\_\_ E \_\_\_\_\_  
 Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
 casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
 Geologist \_\_\_\_\_ Development \_\_\_\_\_  
 Date Start \_\_\_\_\_ Finish 11/4/36 Static Water Level \_\_\_\_\_  
 Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
 Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
19-20.5			same description as above, med. stiff.	CH	3-3-3
24-25.5			silty fine sand, silt 10-15% saturated, unif. sand grains, v. loose, color 2.5 Y 6/4 (light yellowish brn), mottled w/ 7.5 YR 5/6 (strong brn).	SM	2-2-2



? washing rig.

Began sampling & drilling.

3:35 pm Drilling finished. Pulled oil augers out.  
Hole open. Pouring silica sand.

3:40 pm Well complete. Four 100 lb bags  
silica sand used.

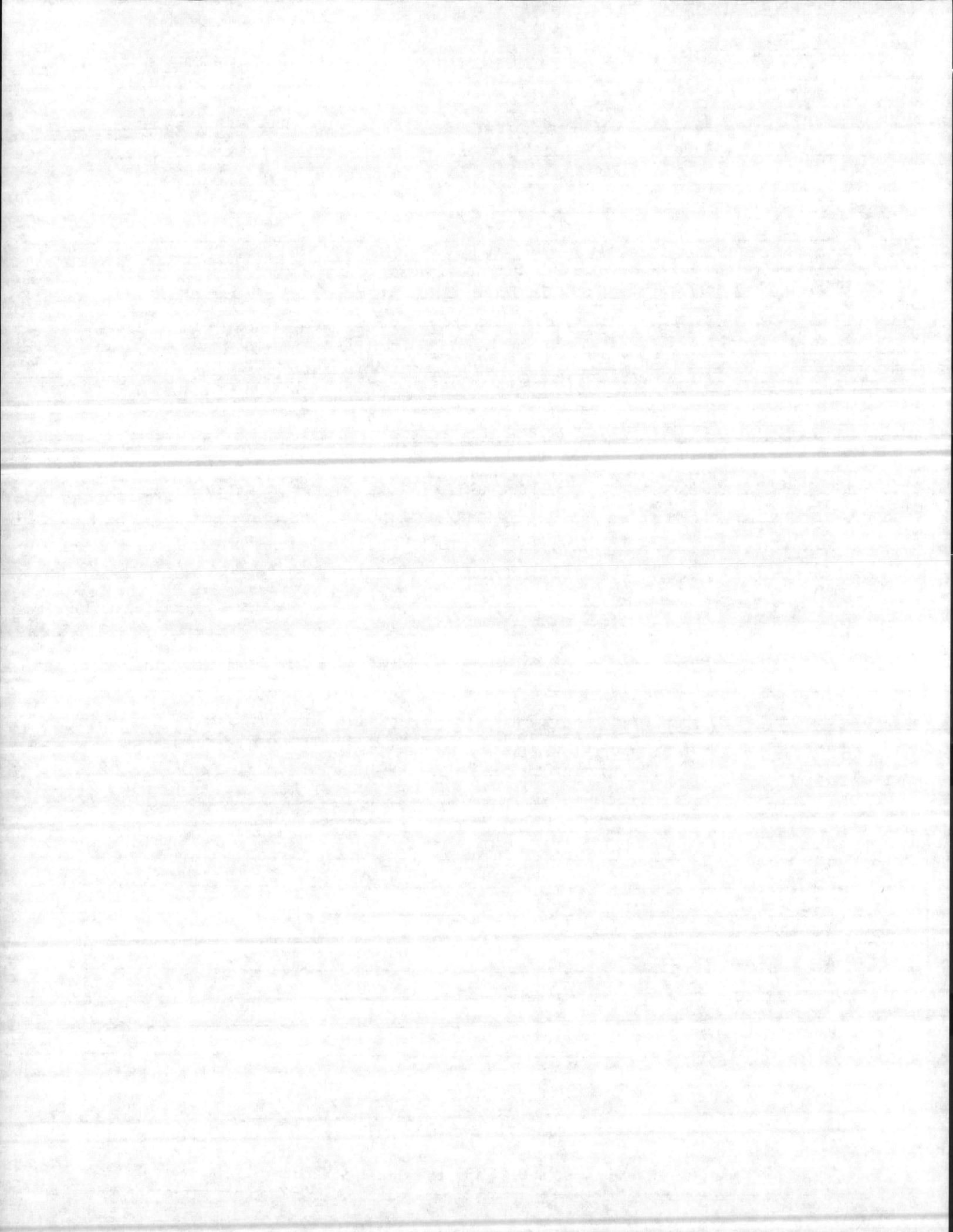
Standard construction configuration.  
Hole 27' deep.

Dismantling augers and cleaning up.

4:30 pm Left site.

11/4/86  
DATE

Paul D. Conrad  
SIGNED

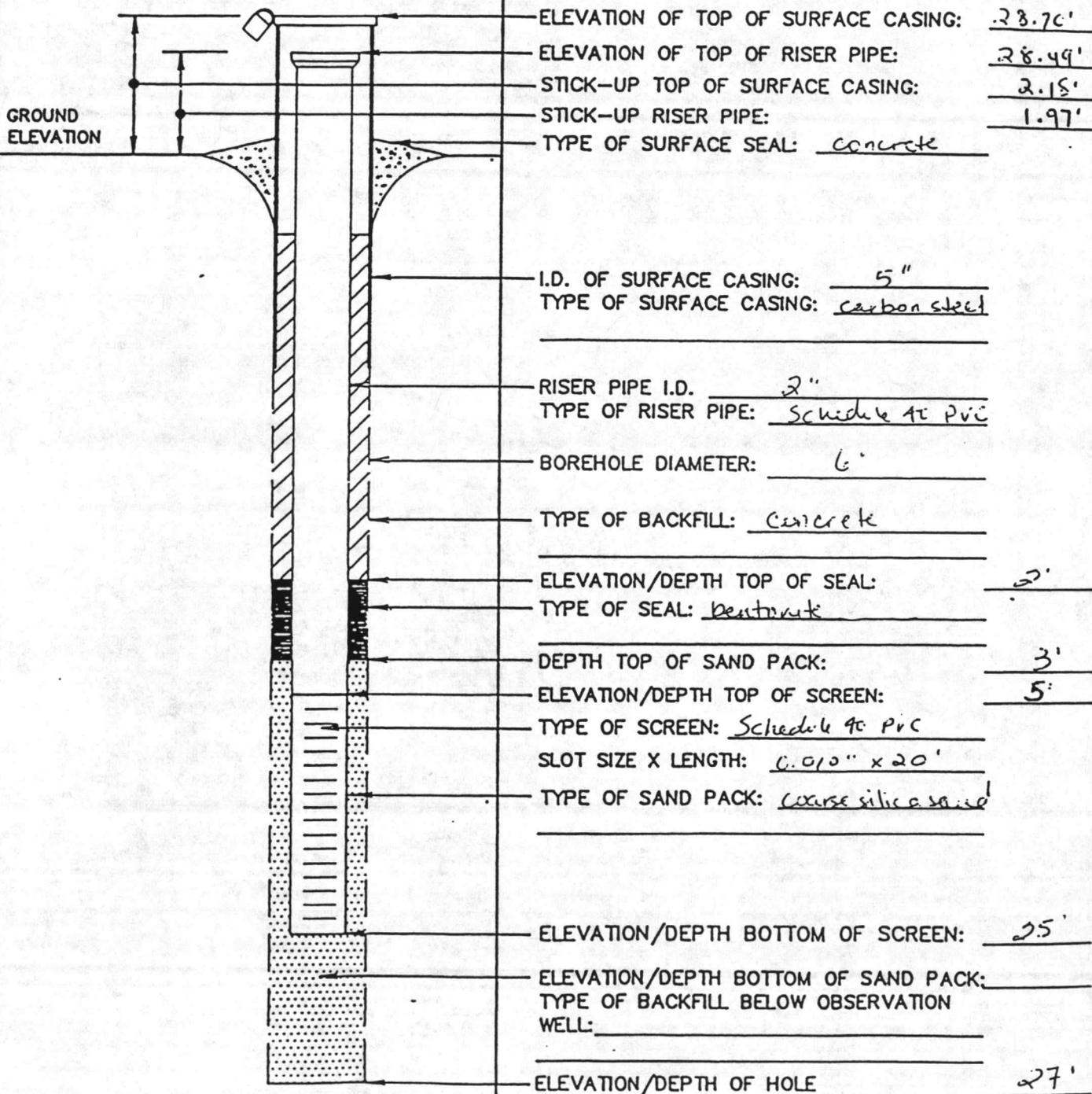


OVERBURDEN  
MONITORING WELL SHEET

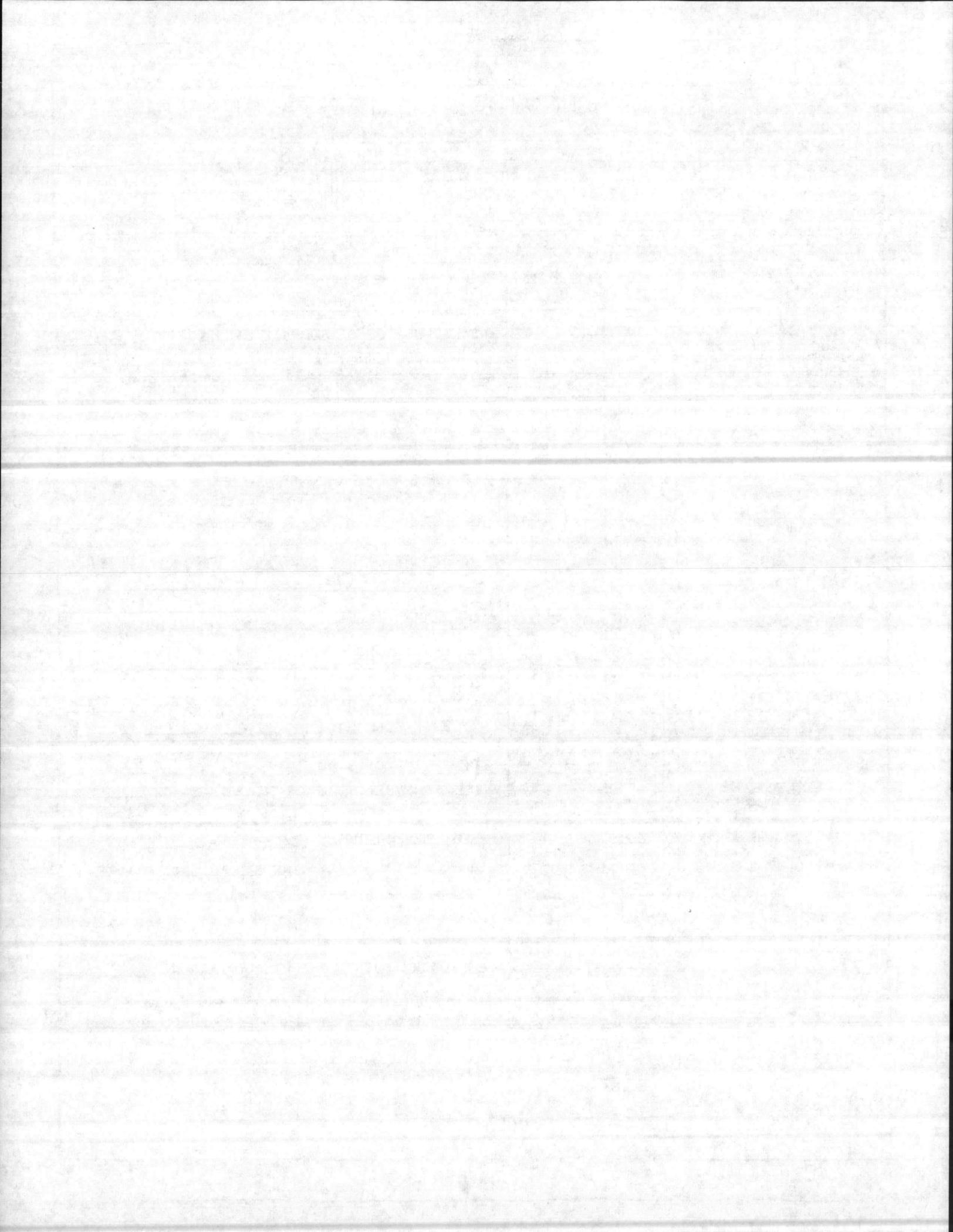
WELL NO. HP-GW-5

PROJECT Camp Lejeune HPIA  
 PROJECT NO. 49-c2c3c BORING NO. HP-GW-5  
 ELEVATION \_\_\_\_\_ DATE 11/4/86  
 FIELD GEOLOGIST Paul Conrad (ESE)

DRILLER Davis Drilling Co.  
 DRILLING METHOD Hollow Stem Auger  
 DEVELOPMENT METHOD \_\_\_\_\_



NOT TO SCALE



**FOR OFFICE USE ONLY**

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

**WELL CONSTRUCTION RECORD**

DRILLING CONTRACTOR Davis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 66-0135-WM-0141

1. WELL LOCATION: (Show sketch of the location below)  
 Nearest Town: Jacksonville, N.C.

County: Onslow

(Road, Community, or Subdivision and Lot No.)  
 2. OWNER US Navy  
 ADDRESS Camp Lejeune N.C. 28542  
(Street or Route No.)  
 City or Town State Zip Code

Depth		DRILLING LOG
From	To	Formation Description
0.0	1.5	Silt
1.5	6.0	Fine Sandy Silt
6.0	9.0	Fine Sandy Silty Clay
9.0	10.5	Silty Fine Sand
14.0	15.5	Clay
19.0	20.5	Clay
24.0	25.5	Fine Silty Sand

3. DATE DRILLED 11/4/86 USE OF WELL monitor  
 4. TOTAL DEPTH 25' CUTTINGS COLLECTED  Yes  No  
 5. DOES WELL REPLACE EXISTING WELL?  Yes  No  
 6. STATIC WATER LEVEL: 16.13 FT.  above TOP OF CASING,  
 below TOP OF CASING IS 21.5 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_  
 WATER ZONES (depth): \_\_\_\_\_  
 9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	Depth	To	Diameter	Wall Thickness or Weight/Ft.	Material
	<u>2.5</u>	<u>5.0</u>	<u>2"</u>	<u>1/8"</u>	<u>PVC</u>
From _____	To _____	Ft. _____	_____	_____	_____
From _____	To _____	Ft. _____	_____	_____	_____

If additional space is needed use back of form.

11. GROUT:

From	Depth	To	Material	Method
	<u>0.0</u>	<u>2.0</u>	<u>Concrete</u>	
	<u>2.0</u>	<u>3.0</u>	<u>Clay</u>	

LOCATION SKETCH  
 (Show direction and distance from at least two State Roads, or other map reference points)

see sketch attached to fig. (2-5).

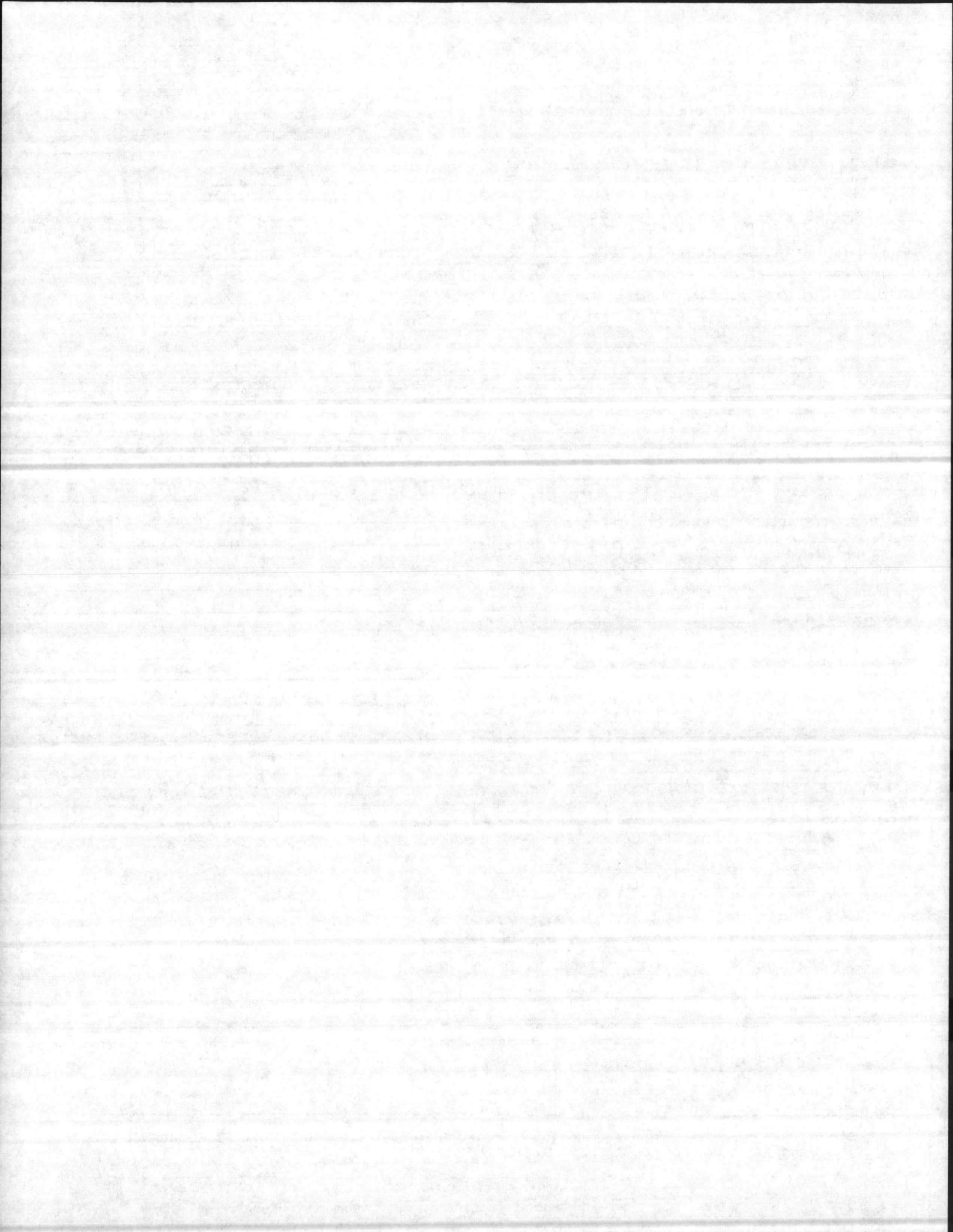
12. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
	<u>5.0</u>	<u>25</u>	<u>2"</u>	<u>0.01 in.</u>	<u>PVC</u>
From _____	To _____	Ft. _____	_____	_____	_____
From _____	To _____	Ft. _____	_____	_____	_____

13. GRAVEL PACK:

From	Depth	To	Size	Material
	<u>3.0</u>	<u>25'</u>	<u>Coarse</u>	<u>Sand</u>
From _____	To _____	Ft. _____	_____	_____

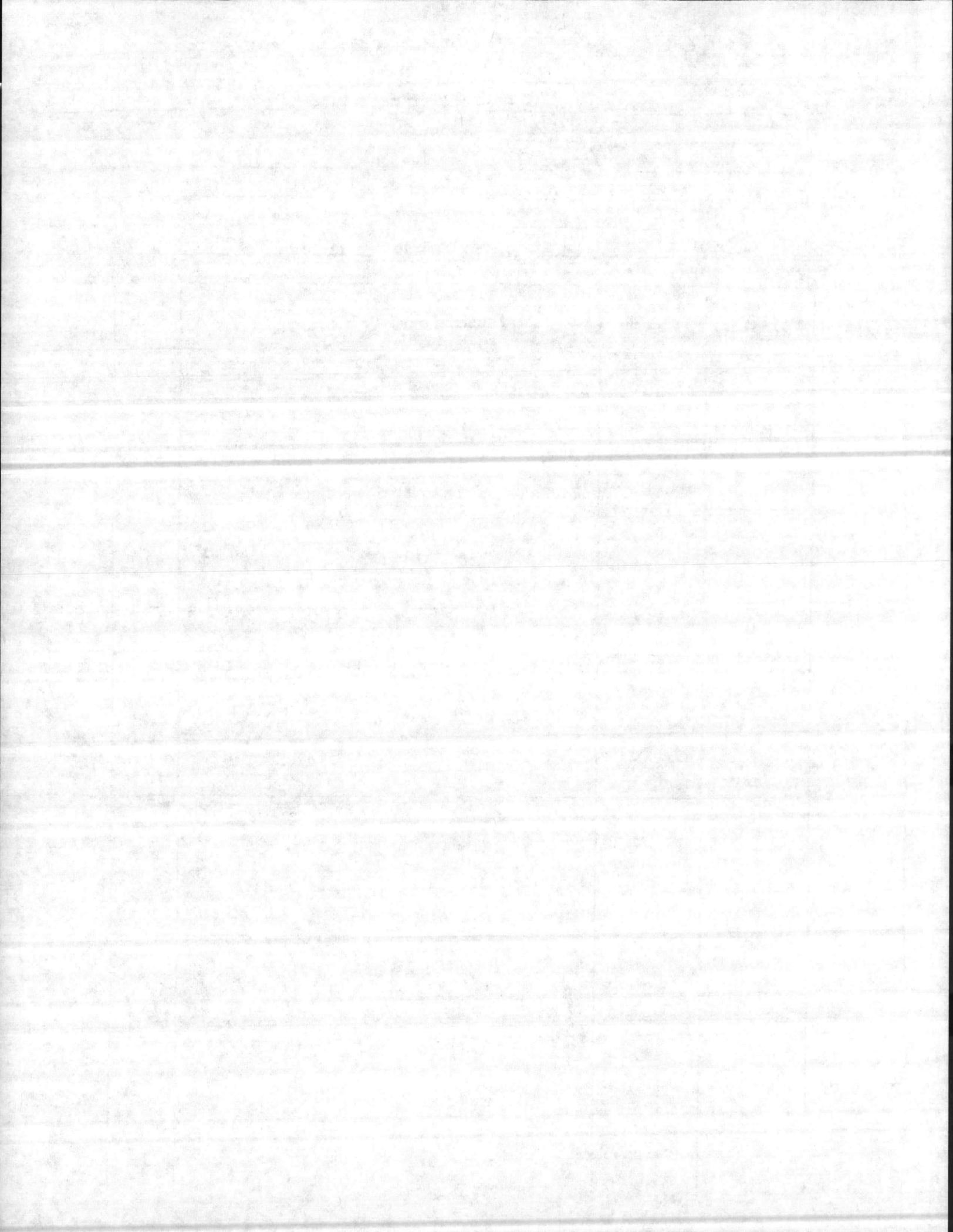
REMARKS: \_\_\_\_\_  
 I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 N.C.A.C. 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.  
 SIGNATURE OF CONTRACTOR OR AGENT [Signature] DATE 2/9/87  
 Submit original to Division of Environmental Management and copy to well owner.



Boring No. HP 6W 6  
 Hole Size 6" Slot 0.01  
 Screen Size 2" Mat'l PVC  
 casing Size 2" Mat'l PVC  
 Geologist David Brentlinger  
 Date Start 11/18/86 Finish 11/18  
 Contractor ESE  
 Driller Davis

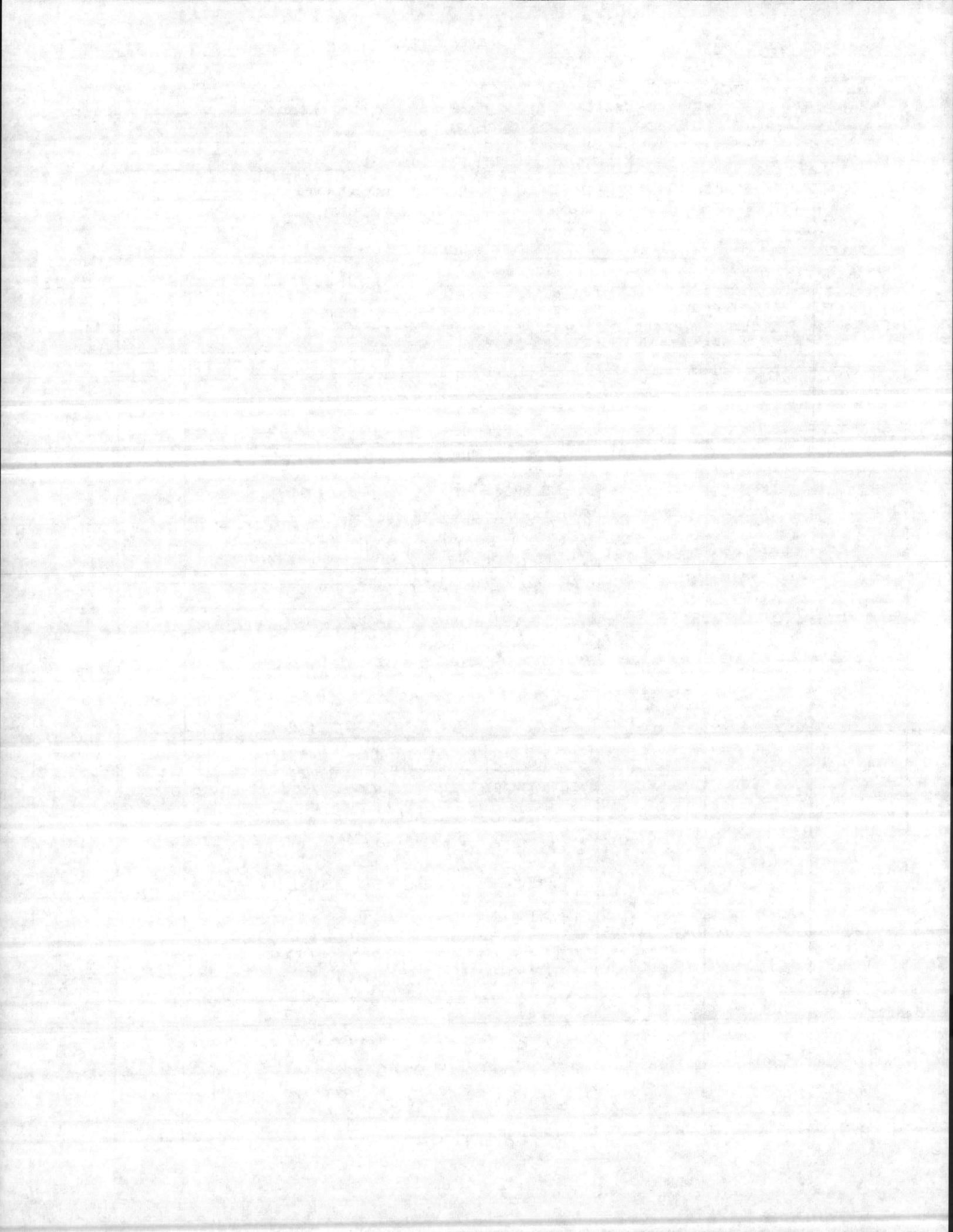
Location Coordinates N  
E  
 Filter Materials Silice Sand  
 Grout Type Bentonite Pellets  
 Development -  
 Static Water Level 16.25'  
 Top of Well Elevation 18.75'  
 Drill Type Hollow Stem Auger

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0.0-1.5			10YR 6.5/3 Pale-Very Pale Brown, Silty fine sand (silt 30%), organic matter top 3", loose, moist, non plastic	sm	3 4 7
1.5-3.0			2.5 Y 5.5/4 light olive Brown, Silty clayey fine sand, (silt + clay 45%), loose - slightly dense, moist, slightly plastic	SM SC	4 2 4
3.0-4.5			10YR 6/4 light yellow brown same as above (1.5-3.0)	SM SC	3 4 7
4.5-6.0			10YR 6/8, Brown yellow, Silty clayey fine sand (silt + clay 35%), non plastic, moist, slightly dense	sm	4 7 8
6.0-7.5			10YR 6.5/1 Grey-light grey with Red oxide streaks throughout, clean clay, firm, dense, plastic, moist	CL	2 2 3



Boring No. HP6WG Location Coordinates N  
 Hole Size \_\_\_\_\_ Slot \_\_\_\_\_ E \_\_\_\_\_  
 Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
 casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
 Logist \_\_\_\_\_ Development \_\_\_\_\_  
 Date Start \_\_\_\_\_ Finish \_\_\_\_\_ Static Water Level \_\_\_\_\_  
 Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
 Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
7.5-9.0			Same as above (6.0-7.5) Bottom 6" non plastic	CL	3 6 8
9.0-10.5			10YR 6.5/1 light grey, ultra fine - Fine Sand with 10% silt, loose, moist, non plastic	SW	5 9 12
14.0-15.5			10YR 6.5/3, Pale - very pale brown, silty fine sand, (silt 15-20%) moist - wet, slightly dense, non plastic	SM	7 11 13
19.0-20.5			10YR 7/4.5 very pale yellow - yellow, silty sandy clay (silt + sand 40%), sticky, plastic, wet, slightly dense	SC	12 13 8
24.0-25.5		24.0-24.80	10YR 7.5/1 light grey soft clean, very plastic clay, wet, slightly dense	CL SC	5 7 9
		24.8-25.5	10YR 7.5/2 light grey - very pale white brown, wet, sticky med. sandy clay sand 30%		



Boring No. HPGW 6

SHEET \_\_\_\_\_ OF \_\_\_\_\_

On site 730 am

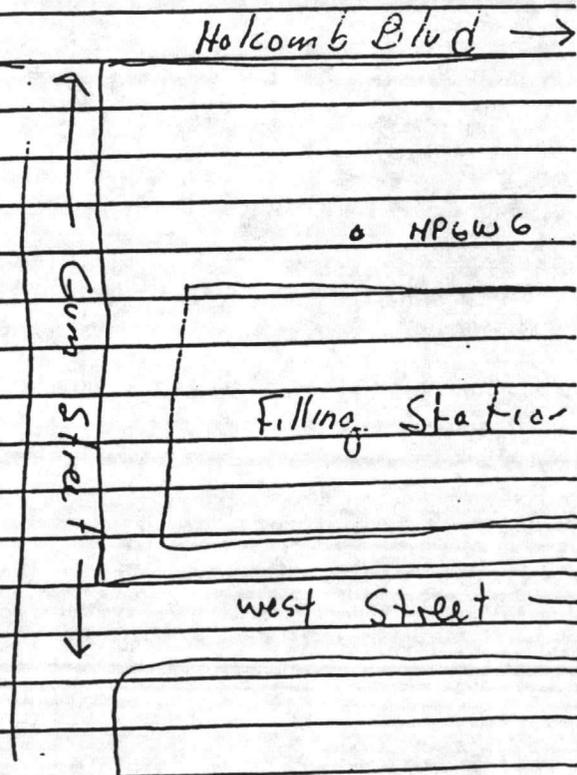
11/18/86

1st Spoon 735

1st Spoon 815

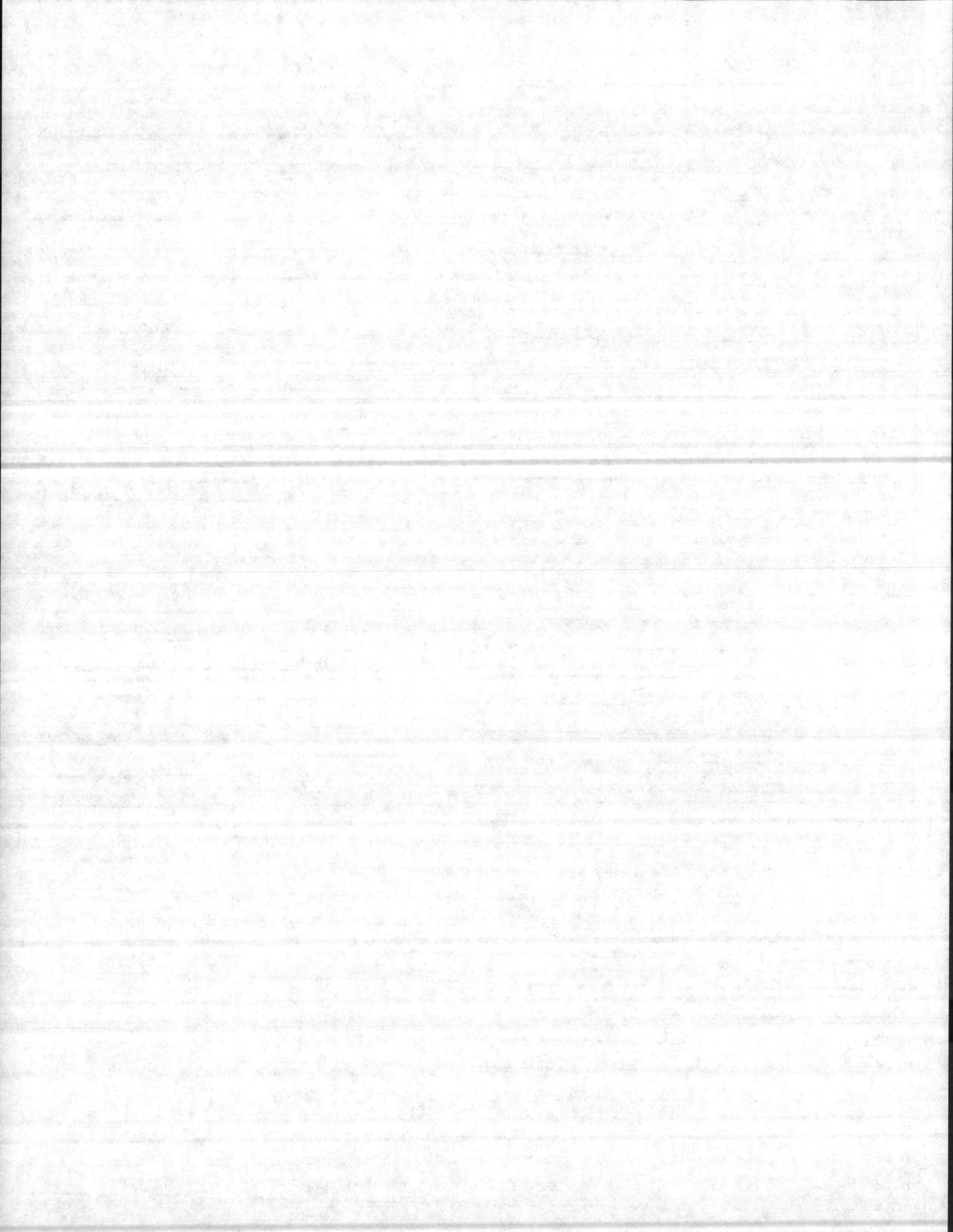
Well Complete 840

Standard Well Splice



DATE

SIGNED



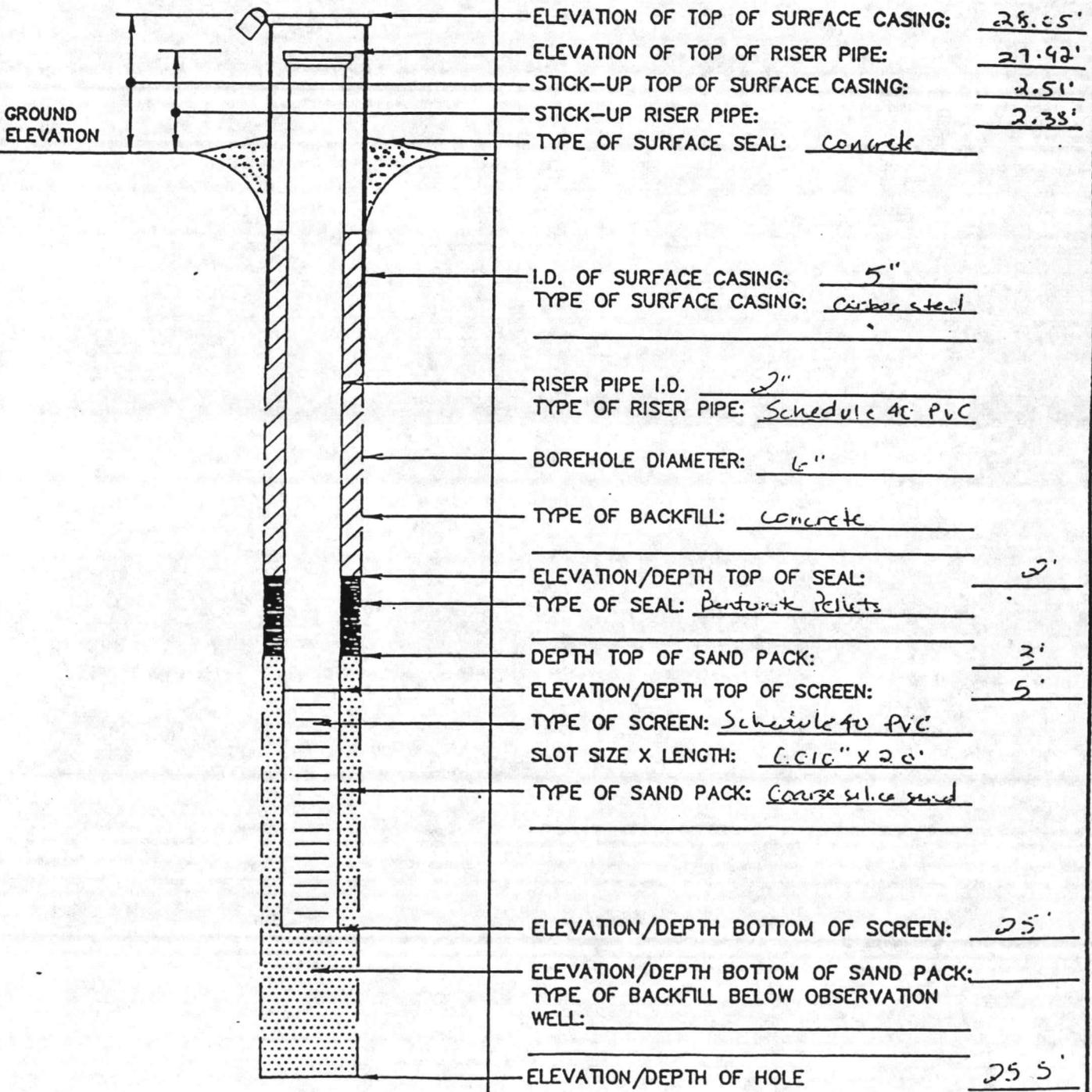
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## OVERBURDEN MONITORING WELL SHEET

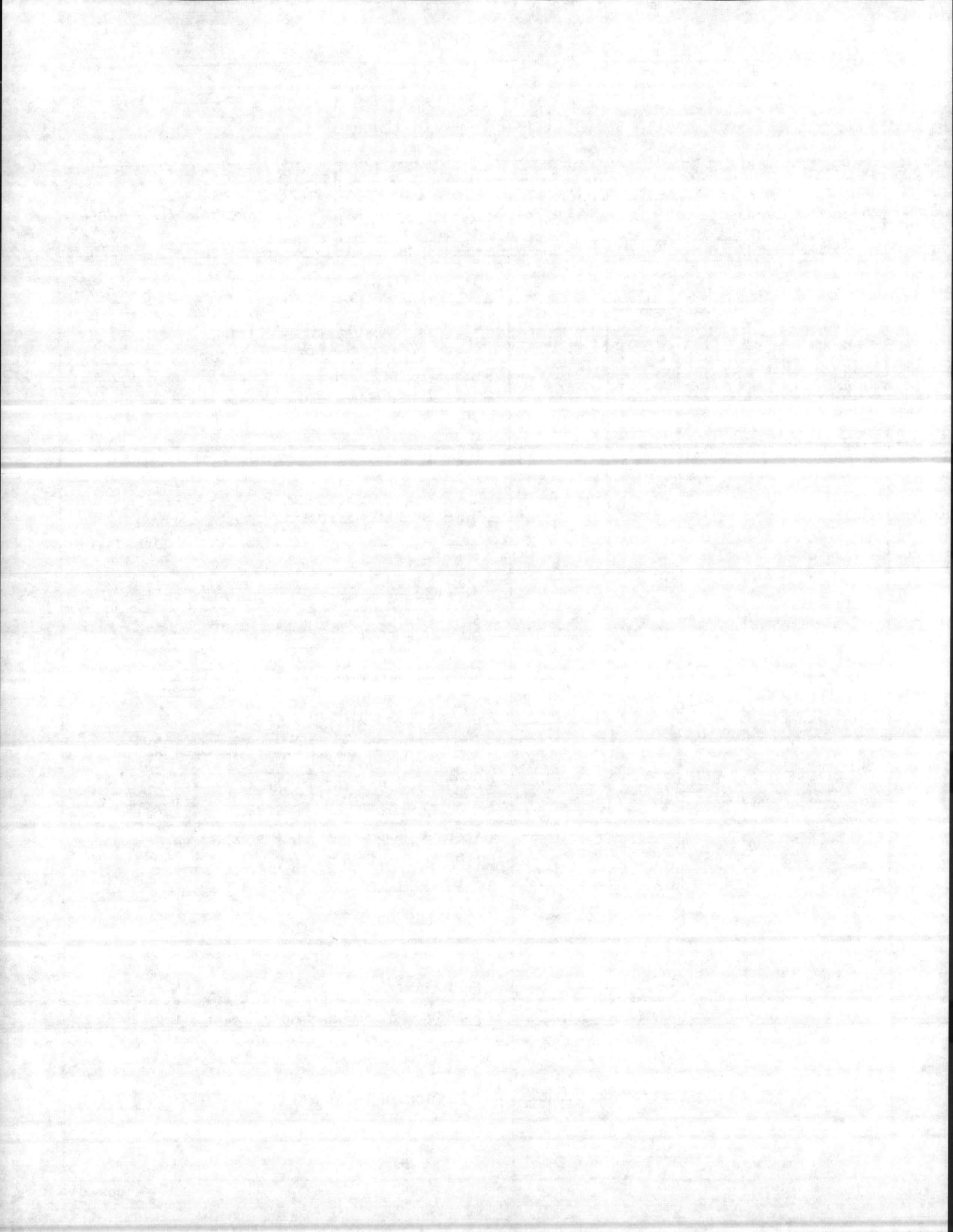
WELL NO. HP-GW6

PROJECT Camp Lejeune IIR 1A  
 PROJECT NO. 49-02030 BORING NO. HP-GW6  
 ELEVATION \_\_\_\_\_ DATE 11/12/86  
 FIELD GEOLOGIST David Brentlager (ESE)

DRILLER Davis Drilling Co  
 DRILLING METHOD Hollow stem Auger  
 DEVELOPMENT METHOD \_\_\_\_\_



NOT TO SCALE



FOR OFFICE USE ONLY

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

26W6

**WELL CONSTRUCTION RECORD**

DRILLING CONTRACTOR Davis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 66-0135-WM-0146

1. WELL LOCATION: (Show sketch of the location below)  
 Nearest Town: Jacksonville, N.C.

County: Onslow

(Road, Community, or Subdivision and Lot No.)

2. OWNER US Navy  
 ADDRESS Camp Lejeune, N.C.  
 (Street or Route No.) 28542

Depth	DRILLING LOG
From To	Formation Description
0.0 - 1.5	Silty Fine Sand
1.5 - 6.0	Silty Clayey Fine Sand
6.0 - 9.0	Clay
9.0 - 10.5	Ultra Fine Sand
14.0 - 15.5	Silty Fine Sand
19.0 - 20.5	Silty Sandy Clay
24.0 - 24.8	Clay
24.8 - 25.5	Sandy Clay

3. DATE DRILLED 11/18/86 USE OF WELL Monitor

4. TOTAL DEPTH 25' CUTTINGS COLLECTED  Yes  No

5. DOES WELL REPLACE EXISTING WELL?  Yes  No

6. STATIC WATER LEVEL: 16.25 FT.  above TOP OF CASING.  
 below TOP OF CASING IS 2.5 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_

WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	Depth	To	Diameter	Wall Thickness or Weight/Ft.	Material
<u>2.5</u>		<u>5.0</u>	<u>2"</u>	<u>1/8"</u>	<u>PVC</u>
From _____	Depth _____	To _____	Diameter _____	Wall Thickness or Weight/Ft. _____	Material _____
From _____	Depth _____	To _____	Diameter _____	Wall Thickness or Weight/Ft. _____	Material _____

If additional space is needed use back of form.

LOCATION SKETCH

(Show direction and distance from at least two State Roads or other map reference points)

See sketch attached to fig. (2-5).

11. GROUT:

From	Depth	To	Material	Method
<u>0.0</u>		<u>2.0</u>	<u>concrete</u>	
<u>2.0</u>		<u>3.0</u>	<u>clay</u>	

12. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
<u>5.0</u>		<u>25'</u>	<u>2"</u>	<u>0.06</u>	<u>PVC</u>
From _____	Depth _____	To _____	Diameter _____	Slot Size _____	Material _____
From _____	Depth _____	To _____	Diameter _____	Slot Size _____	Material _____

13. GRAVEL PACK:

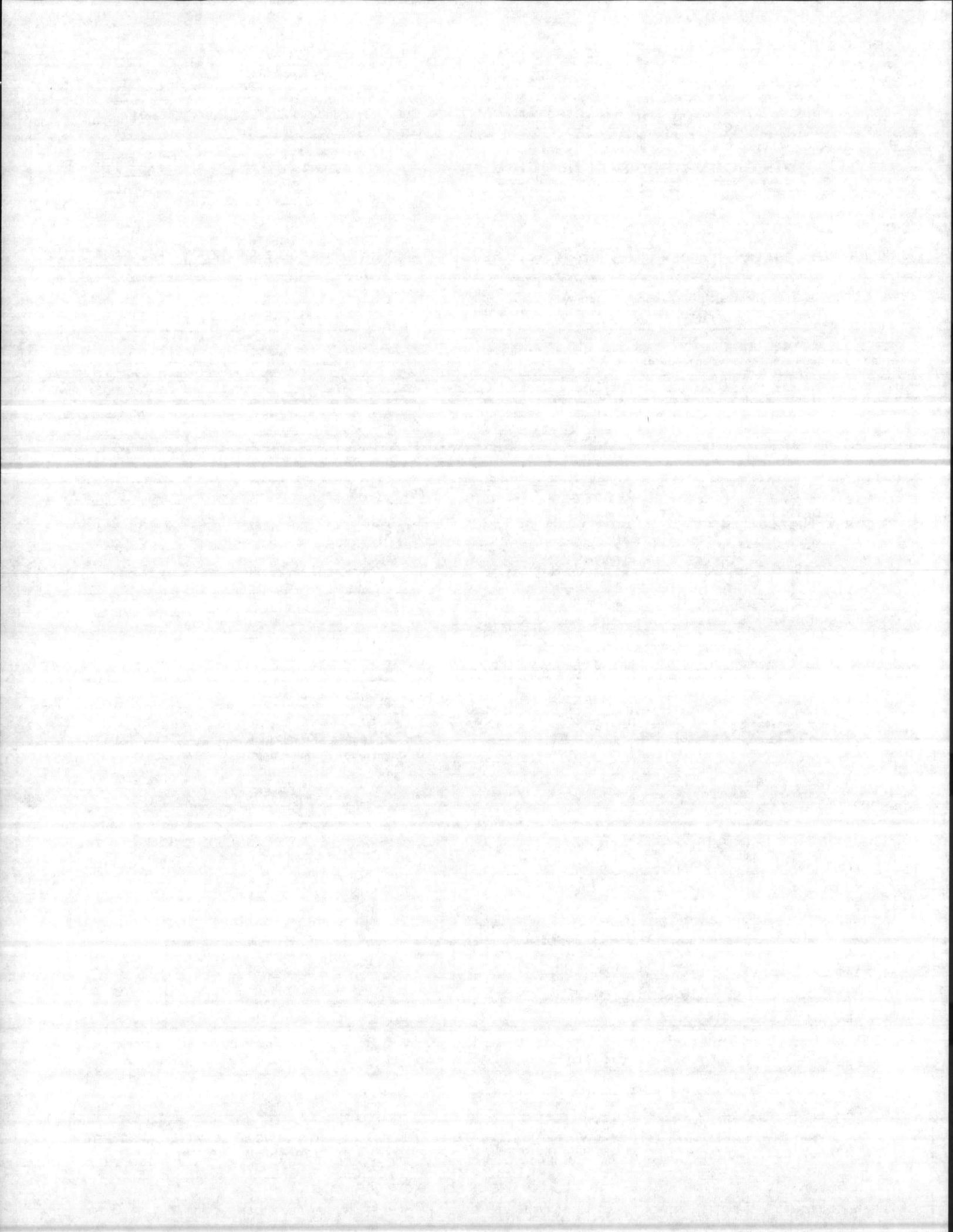
From	Depth	To	Size	Material
<u>3.0</u>		<u>25'</u>	<u>coarse</u>	<u>sand</u>
From _____	Depth _____	To _____	Size _____	Material _____

REMARKS: \_\_\_\_\_

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT

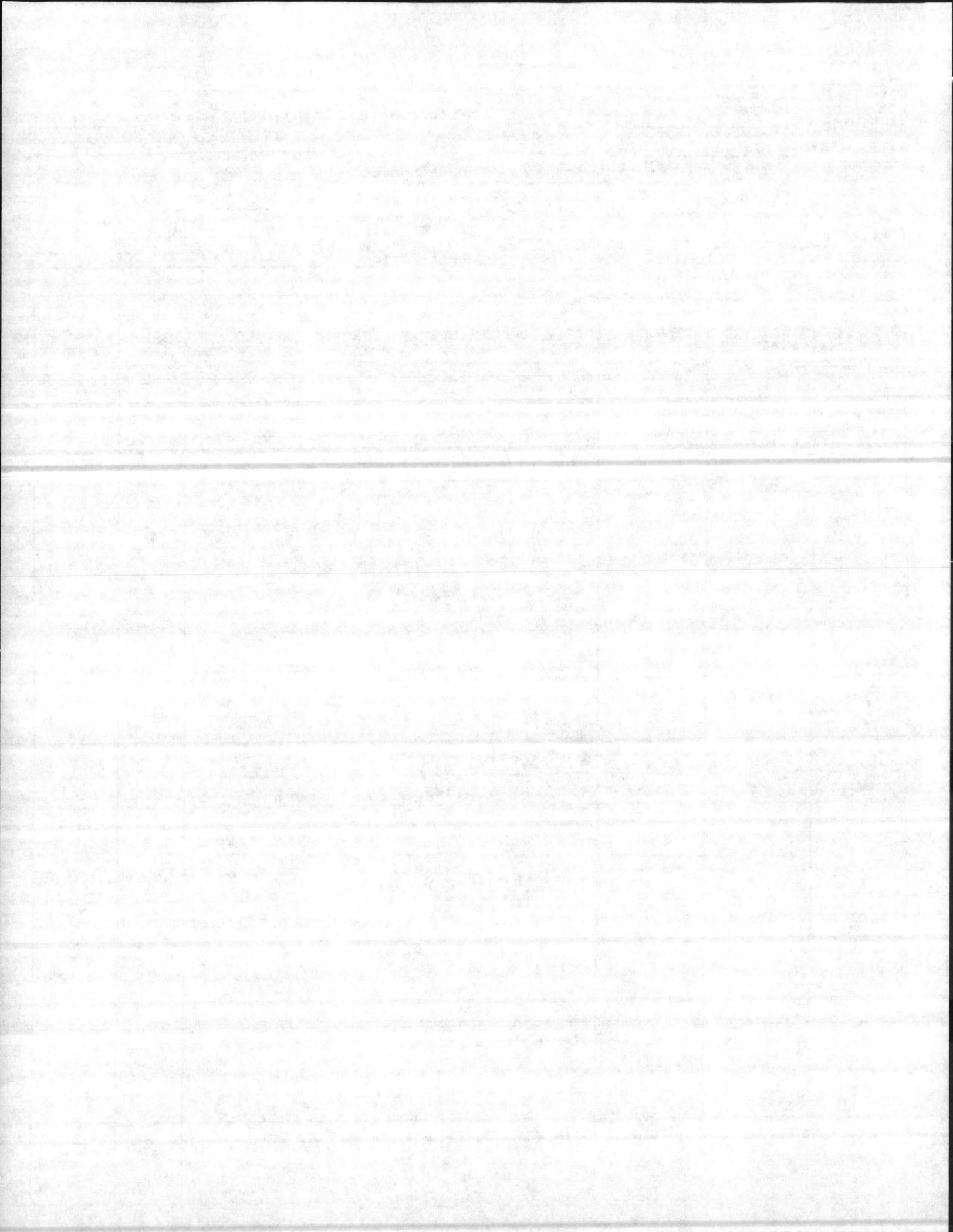
DATE



Boring No. HP 6W 7  
 Hole Size 6" Slot 0.01  
 Screen Size 2" Mat'l PVC  
 casing Size 2" Mat'l PVC  
 Geologist David Brent Einger  
 Date Start 11/18/86 Finish 11/18  
 Contractor ESE  
 Driller Davis

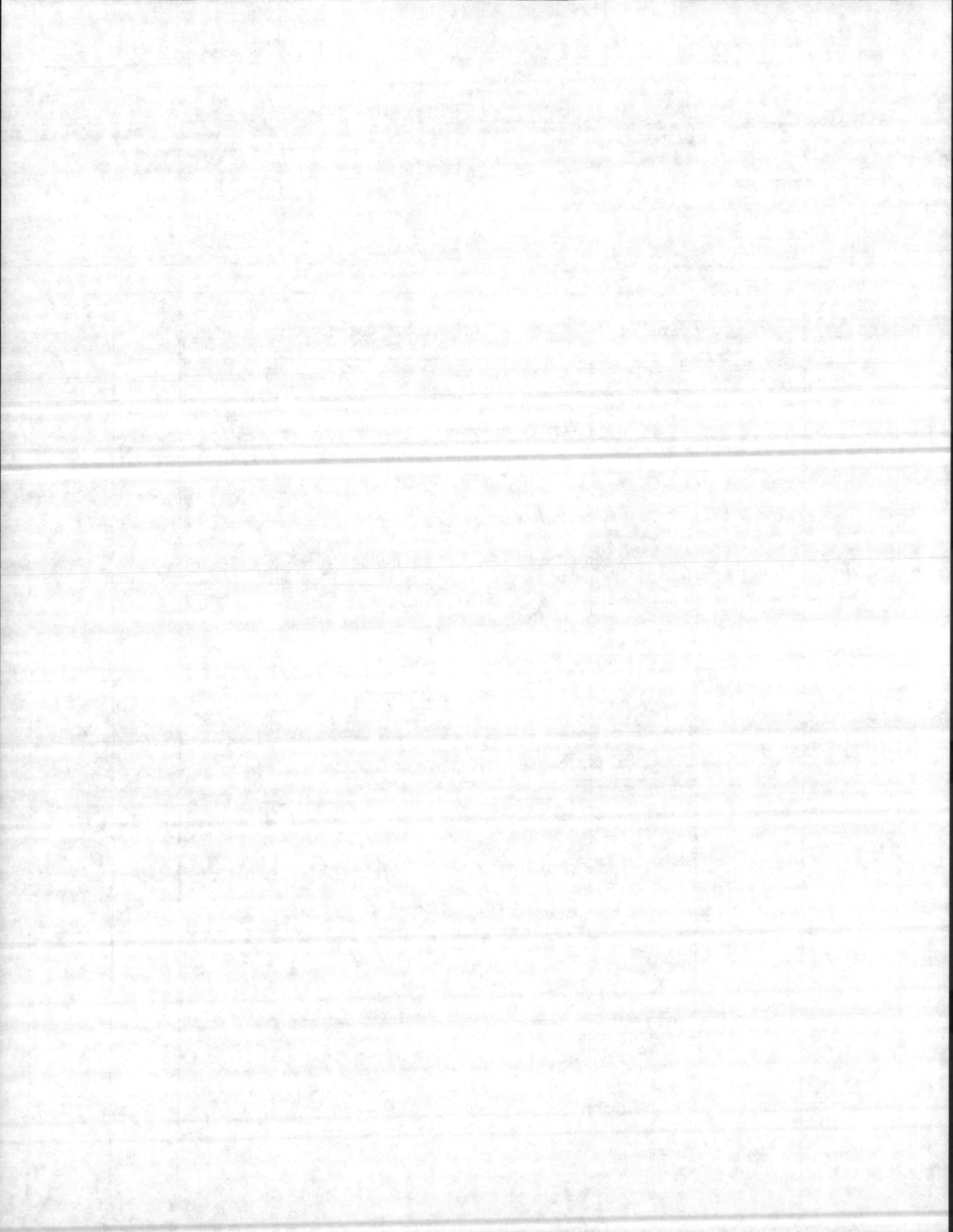
Location Coordinates N  
E  
 Filter Materials Silica Sand  
 Grout Type Bentonite Pellets  
 Development \_\_\_\_\_  
 Static Water Level 14.33'  
 Top of Well Elevation 16.83'  
 Drill Type Hollow Stem Auger

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0.0-1.5			10YR 6.5/3 Pale - Very Pale Brown, silty fine sand (silt 30%), loose, moist, non plastic, organic matter top 6"	SM	6 10 10
1.5-3.0			10YR 5.5/4 light yellow Brown, silty fine sandy clay (silt + sand 40%) moist, slightly plastic, med. dense	SC	3 5 5
3.0-4.5		3.0-3.9	Same as above (1.5-3.0)	SC SW	6 5 5
		3.9-4.5	10YR 8/1 white ultra fine - fine sand, loose, dry - moist, non plastic		
4.5-6.0		4.5-5.5	Same as above (3.9-4.5)	SW SM	8 10 8
		5.5-6.0	10YR 5.5/8 yellow brown - yellow, silty clayey fine sand (clay + silt 45%) slightly plastic, moist, mod. dense		
6.0-7.5			2.5Y 6.5/4 light yellow brown - pale yellow, silty clayey fine sand (silt + clay 30%), moist slightly dense, non plastic	SM	8 10 15



Boring No. HPGW 7 Location Coordinates N  
 Hole Size \_\_\_\_\_ Slot \_\_\_\_\_ E  
 Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
 casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
 Geologist \_\_\_\_\_ Development \_\_\_\_\_  
 Date Start \_\_\_\_\_ Finish \_\_\_\_\_ Static Water Level \_\_\_\_\_  
 Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
 Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
7.5-9.0			10yr 6.5/8 yellow brown - brown yellow, silty clayey fine sand (silt + clay 30%) must, non plastic, slightly dense	SM	5 6 6
9.0-10.5			10yr 7.8/8 yellow, very silty ultra fine sand, (silt 30-40%), loose, must non plastic	SM	8 7 6
14.0-15.5			10yr 6.5/4 very pale yellow brown, same as above (9.0-10.5) with more density	SM	9 12 15
19.0-20.5			2.5y 8/2 white - pale yellow, silty fine - med. sand (silt 10-15%), wet, slightly dense	SW	6 8 10
24.0-25.5			2.5y 7.5/2 light grey - pale yellow, silty clayey med. sand (silt + clay 40%), sticky and plastic in clay layers, wet, slightly dense	SM SC	3 3 3



Boring No.

HPGW7

SHEET

OF

On site 8:55 Am

11/18/86

1st Spoon 900

last Spoon 940

Well Complete 1040

Standard Well Specs

F

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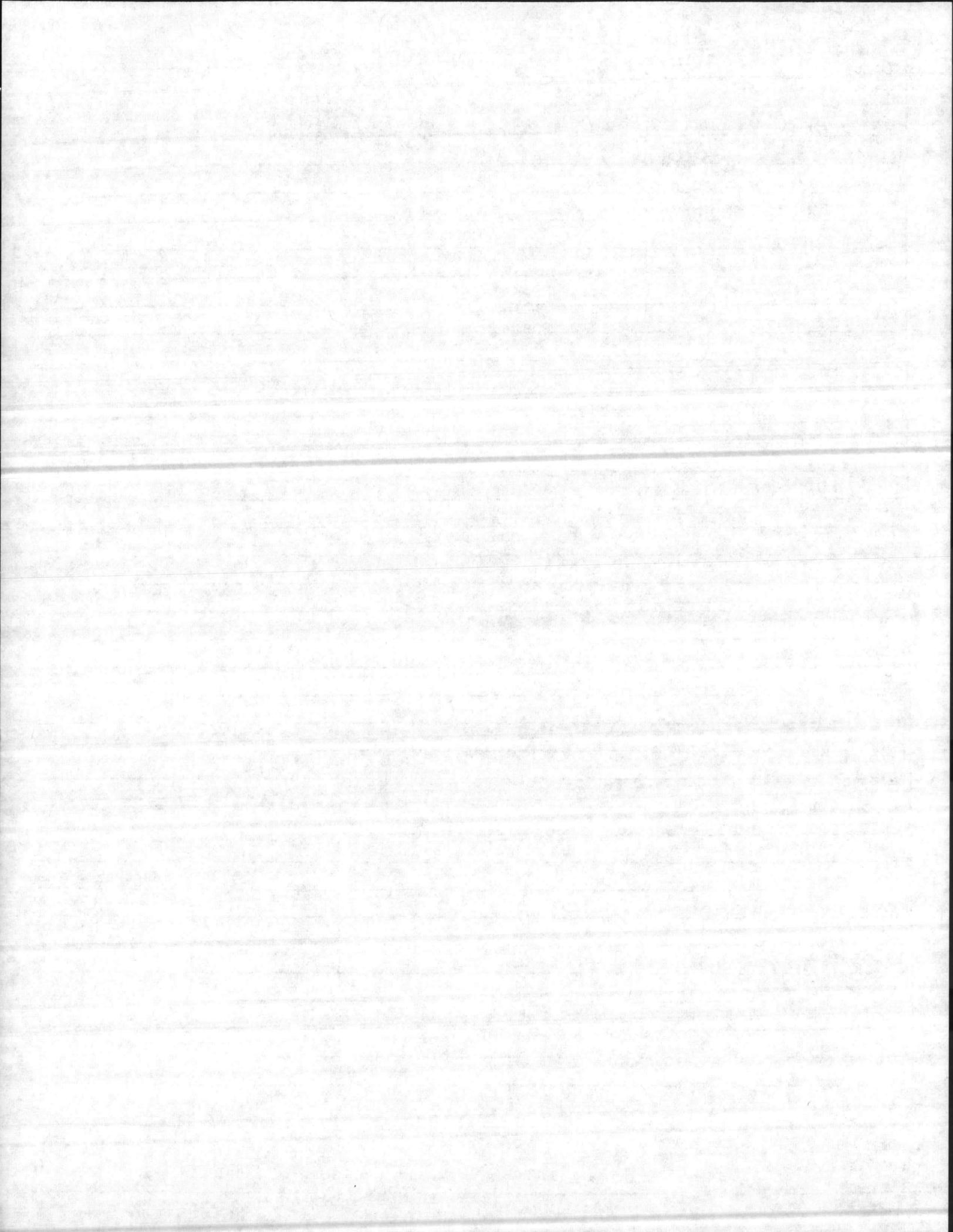
1500

HPGW7

Control Street

DATE

SIGNED



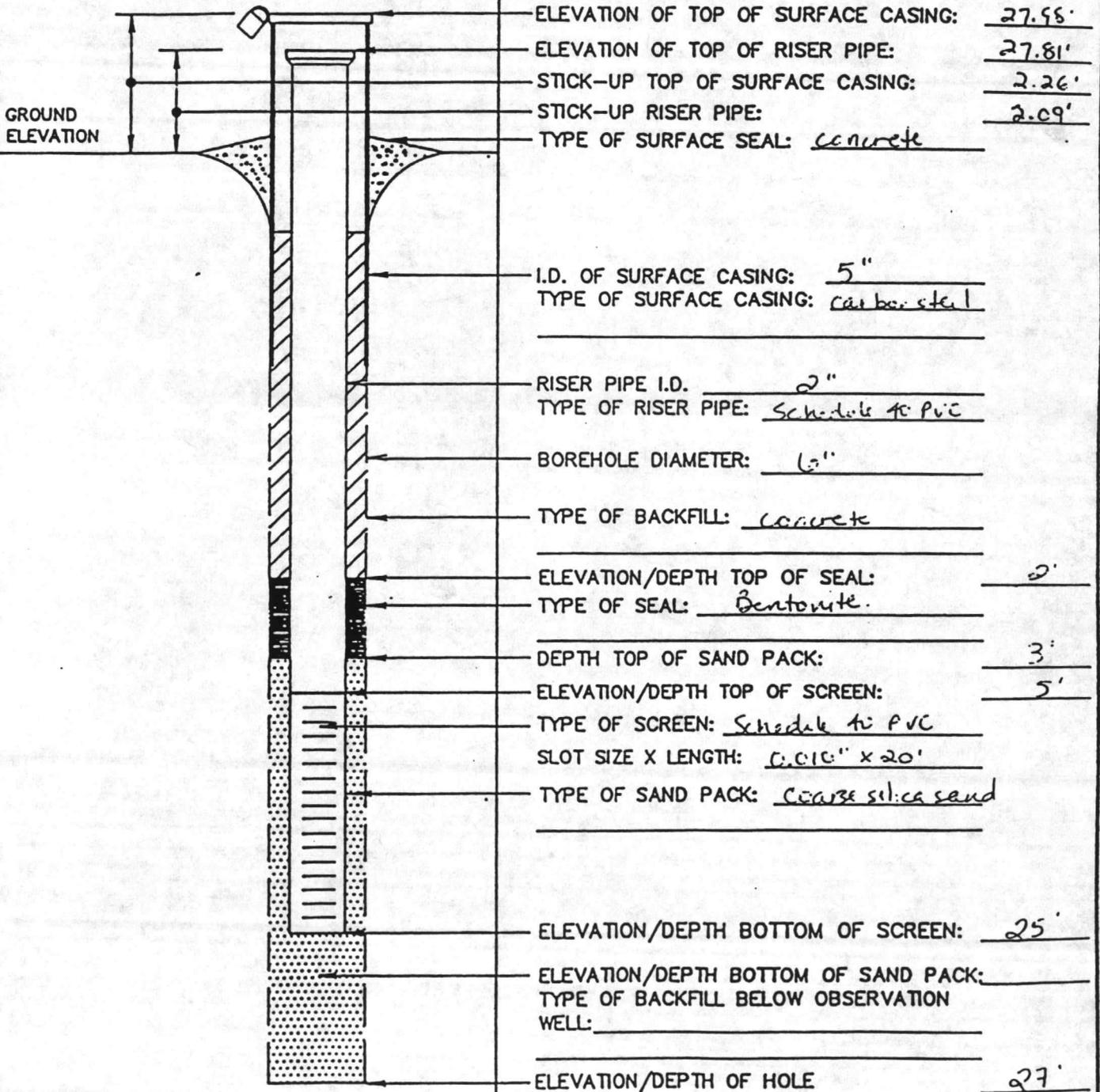
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OVERBURDEN  
MONITORING WELL SHEET

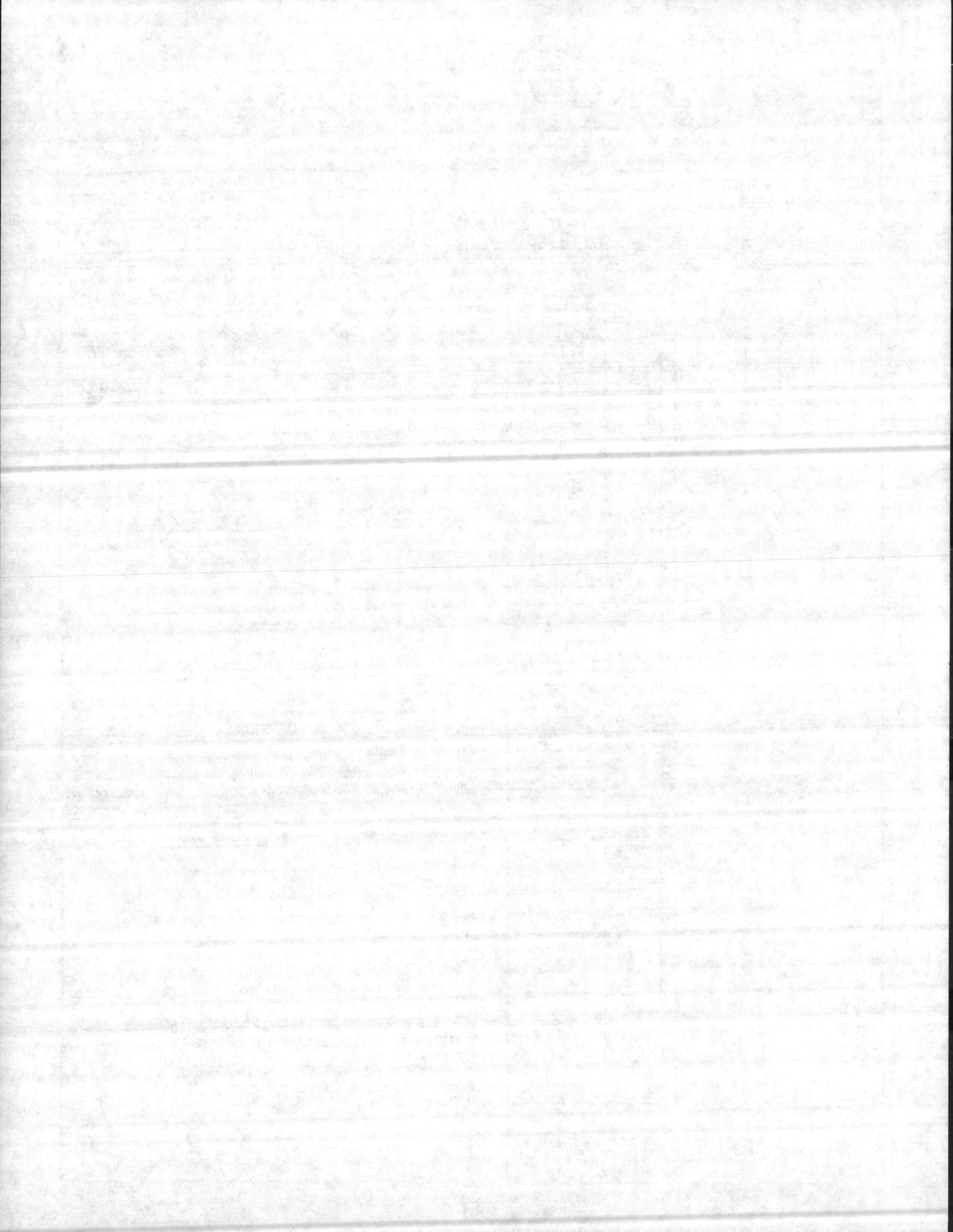
WELL NO. HP-GW7

PROJECT Camp Lejeune HP1A  
 PROJECT NO. 19-02036 BORING NO. HP-GW7  
 ELEVATION \_\_\_\_\_ DATE 11/6/86  
 FIELD GEOLOGIST Paul Conrad (ESE)

DRILLER Davis Drilling Co  
 DRILLING METHOD Hollow Stem Auger  
 DEVELOPMENT METHOD \_\_\_\_\_



NOT TO SCALE



**FOR OFFICE USE ONLY**

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

6W7

**WELL CONSTRUCTION RECORD**

DRILLING CONTRACTOR Devis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 66-0135-WM-0141

1. WELL LOCATION: (Show sketch of the location below)  
 Nearest Town: Jacksonville, N.C.

County: \_\_\_\_\_

(Road, Community, or Subdivision and Lot No.)

2. OWNER US Navy  
 ADDRESS Camp Lejeune, NC 28542  
(Street or Route No.)  
 City or Town \_\_\_\_\_ State \_\_\_\_\_ Zip code \_\_\_\_\_

Depth		DRILLING LOG
From	To	Formation Description
0.0	3.9	Silty fine sand
3.9	5.5	Ultra fine sand
5.5	9.0	Silty clayey fine sand
9.0	10.5	Very silty ultra fine sand
14.0	15.5	Very silty ultra fine sand
19.0	20.5	Silty fine-med. sand
24.0	25.5	Silty clayey med. sand

3. DATE DRILLED 11/18/86 USE OF WELL monitor

4. TOTAL DEPTH 25' CUTTINGS COLLECTED  Yes  No

5. DOES WELL REPLACE EXISTING WELL?  Yes  No

6. STATIC WATER LEVEL: 14.33 FT.  above  below TOP OF CASING.  
 TOP OF CASING IS 2.50 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_

WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	To	Depth	Diameter	Wall Thickness or Weight/Ft.	Material
0.0	2.5	2.5	2"	1/8"	PVC
2.5	5.0	5.0			
5.0					

If additional space is needed use back of form.

**LOCATION SKETCH**

(Show direction and distance from at least two State Roads, or other map reference points)

See fig. (2-5)

11. GROUT:

From	To	Depth	Material	Method
0.0	2.0	2.0	concrete	
2.0	3.0	3.0	clay	

12. SCREEN:

From	To	Depth	Diameter	Slot Size	Material
5.0	25.0	25.0	2"	0.01 in.	PVC

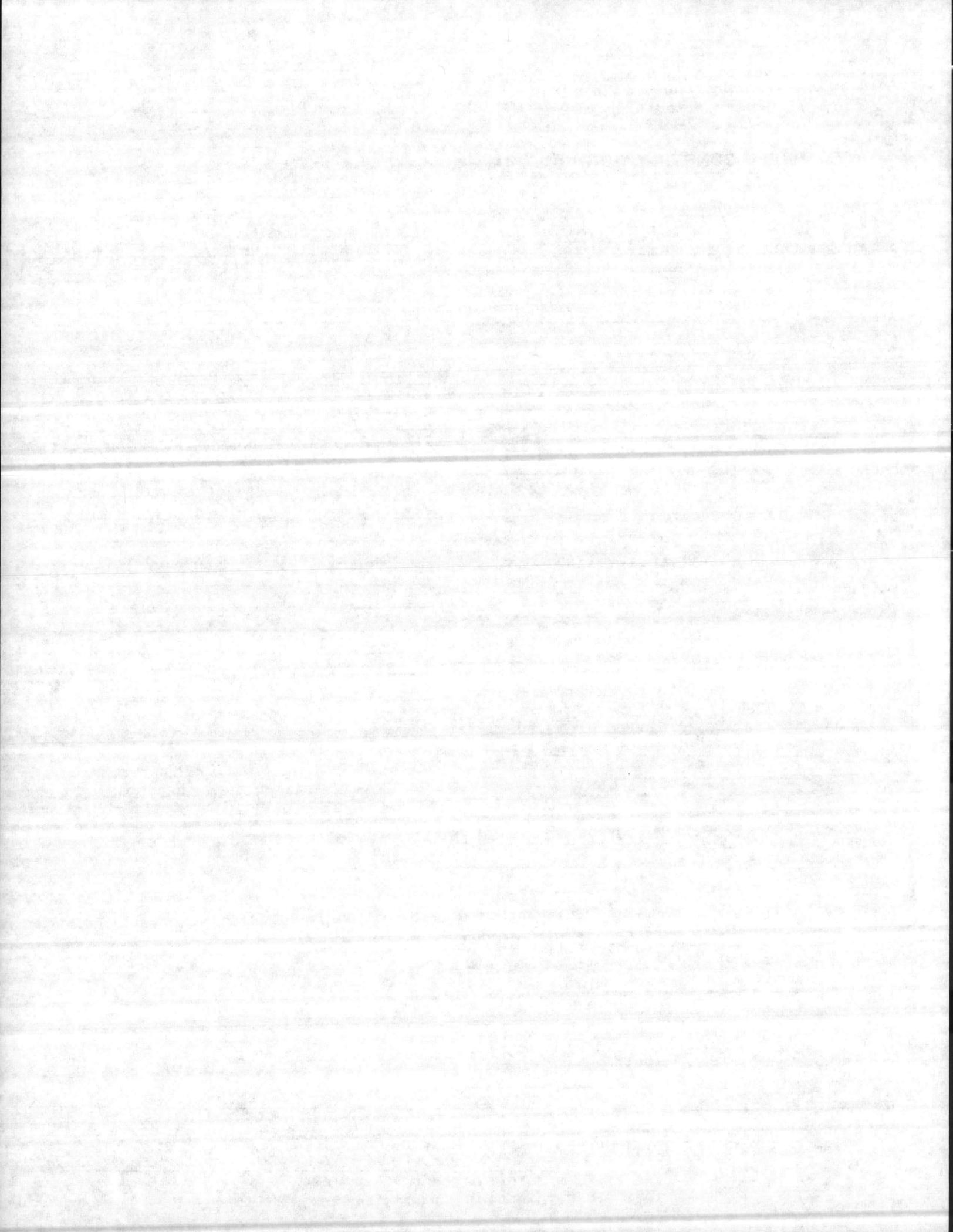
13. GRAVEL PACK:

From	To	Depth	Size	Material
3.0	25.0	25.0	coarse	sand

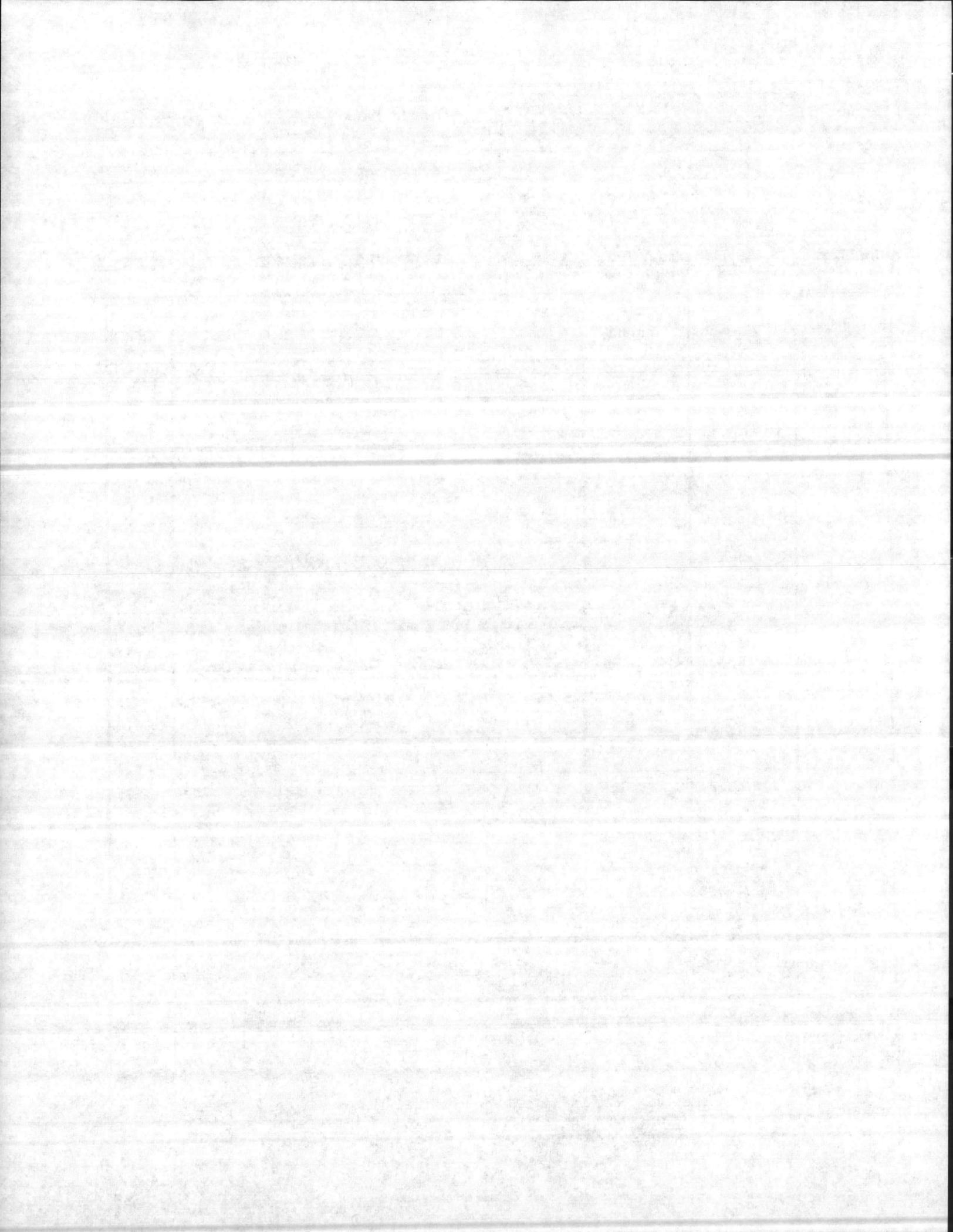
REMARKS: \_\_\_\_\_

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

[Signature] 2/10/87  
 SIGNATURE OF CONTRACTOR OR AGENT DATE

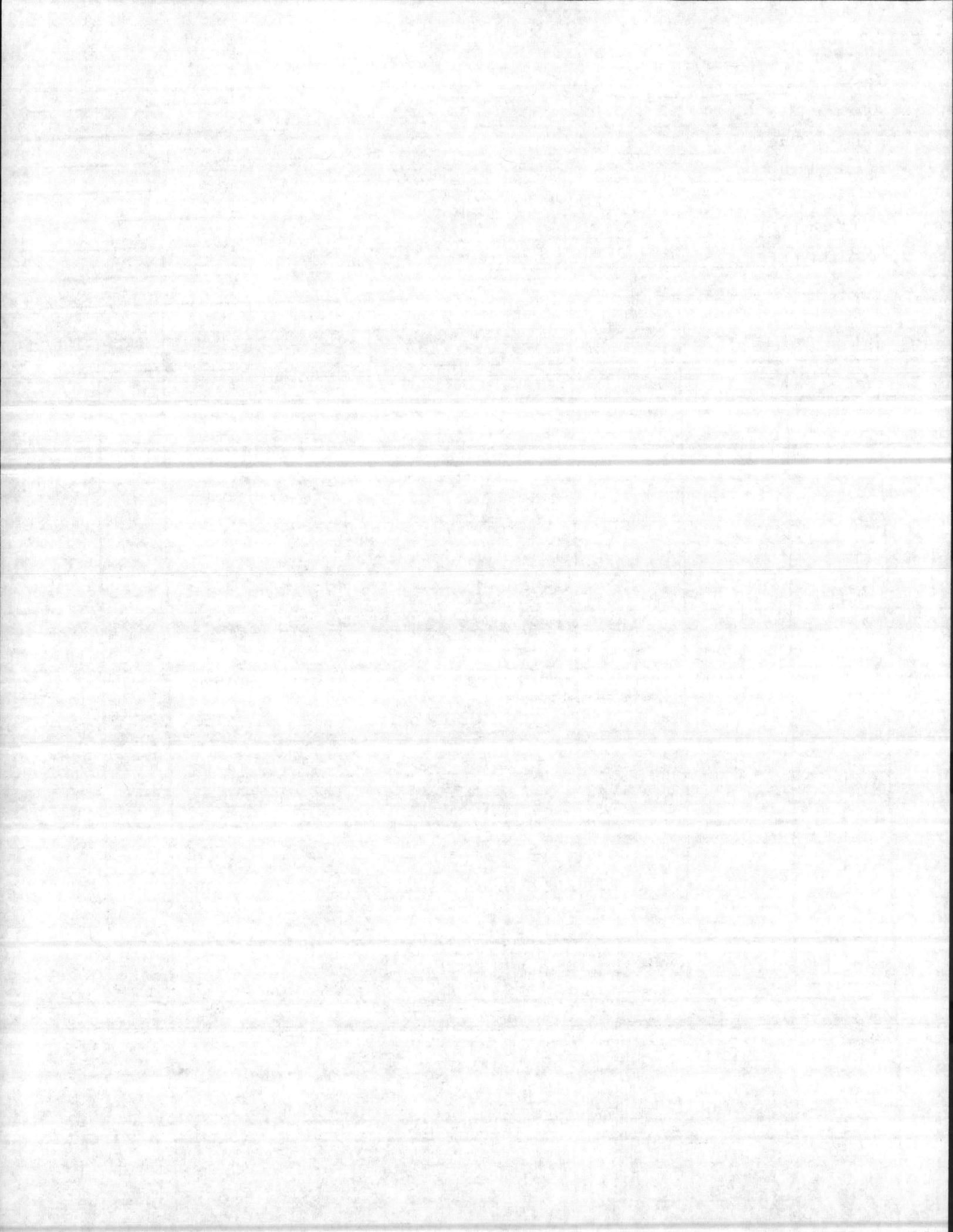






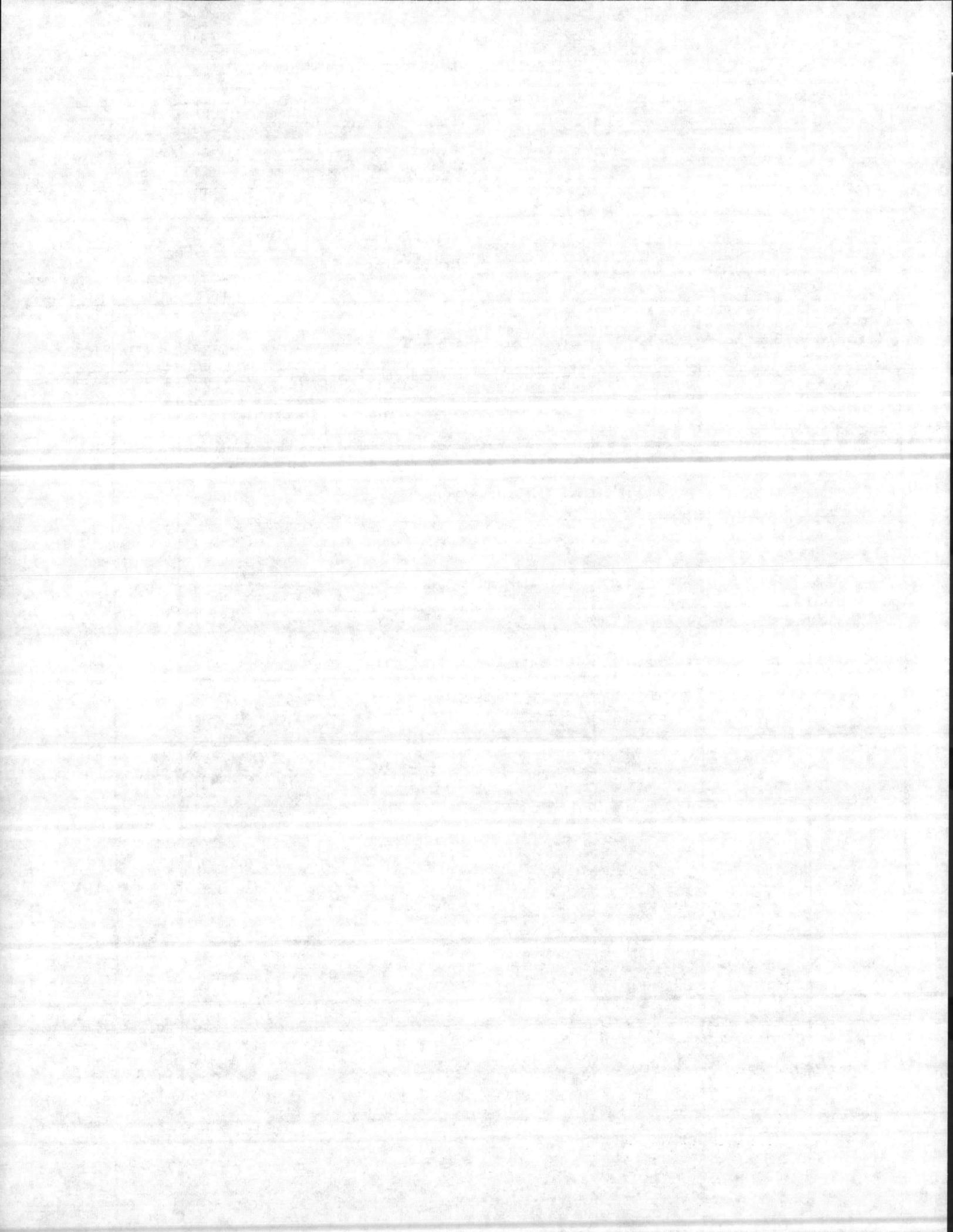
Boring No. H HPGW8 Location Coordinates N 207  
 Hole Size \_\_\_\_\_ Slot \_\_\_\_\_ E \_\_\_\_\_  
 Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
 Casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
 Geologist \_\_\_\_\_ Development \_\_\_\_\_  
 Date Start \_\_\_\_\_ Finish 10/6/86 Static Water Level \_\_\_\_\_  
 Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
 Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
6-7.5			Fine Sand, silt 5-10%, fairly clean, silty moist, non-plast, med. dense, mottled color <u>clean white</u> and 10YR 7/2 (light grey) silty zones are light grey.	SP	5-6-10
7.5-9			Fine Sand, silt 10-12% moist, non-plast, med. dense, color 2.5Y 7/2 (light grey), mottled with slightly lighter shade.	SP	5-7-1
9-10.5			Silty Clayey Fine Sand, silt 12-15%, clay ~5-10% moist, small soft clayey nodules (plast), silty sand, non-plast, med. dense, color mottled - 2.5Y 7/4 (pale yellow) ~80% 10YR 8/2 (white) ~5% 7.5YR 6/8 (reddish yellow) ~10%	ML	5-5-c
14-15.5			Plast. clayey fine sand, not cemented, fine sand 5-10% clay 10-15% moist, non-plast, med. dense, color 10YR 8/2 (white) ~5% 7.5YR 6/8 (reddish yellow) ~10%	PT	



Boring No. 4 HPGW8 Location Coordinates N 3 of 4  
 Hole Size \_\_\_\_\_ Slot \_\_\_\_\_ E \_\_\_\_\_  
 Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
 Casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
 Geologist \_\_\_\_\_ Development \_\_\_\_\_  
 Date Start \_\_\_\_\_ Finish \_\_\_\_\_ Static Water Level \_\_\_\_\_  
 Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
 Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
19-20.5			Silty Fine Sand, silt. 15-20%, clay ~ 5%, non-plast, small soft clayey zones slightly plast.; dense, sat'd., color unif. 5Y 6.5/2 (light olive gry).	SM	8-12-20
24-25.5			Fine Sand, silt. 5-8%, unif. gtz grains, non-plast, med. dense, sat'd., color 2.5Y 7/2 (light gry) uniform.	SP	5-8-10



Charlie drilling w/ helper hired yesterday (no exp)  
 7:30 am Arrived at Camp Lejeune.  
 Prepd. for drilling.

8:25 am Began drilling & sampling. Location moved from  
 near Bly. 1500 to 1461' to avoid buried utilities. App'd. by

9:15 am Last spoon. Assembled Casing. } Bob Alexon  
 2 5' auger sections pulled out,  
 pouring silica sand thru augers.

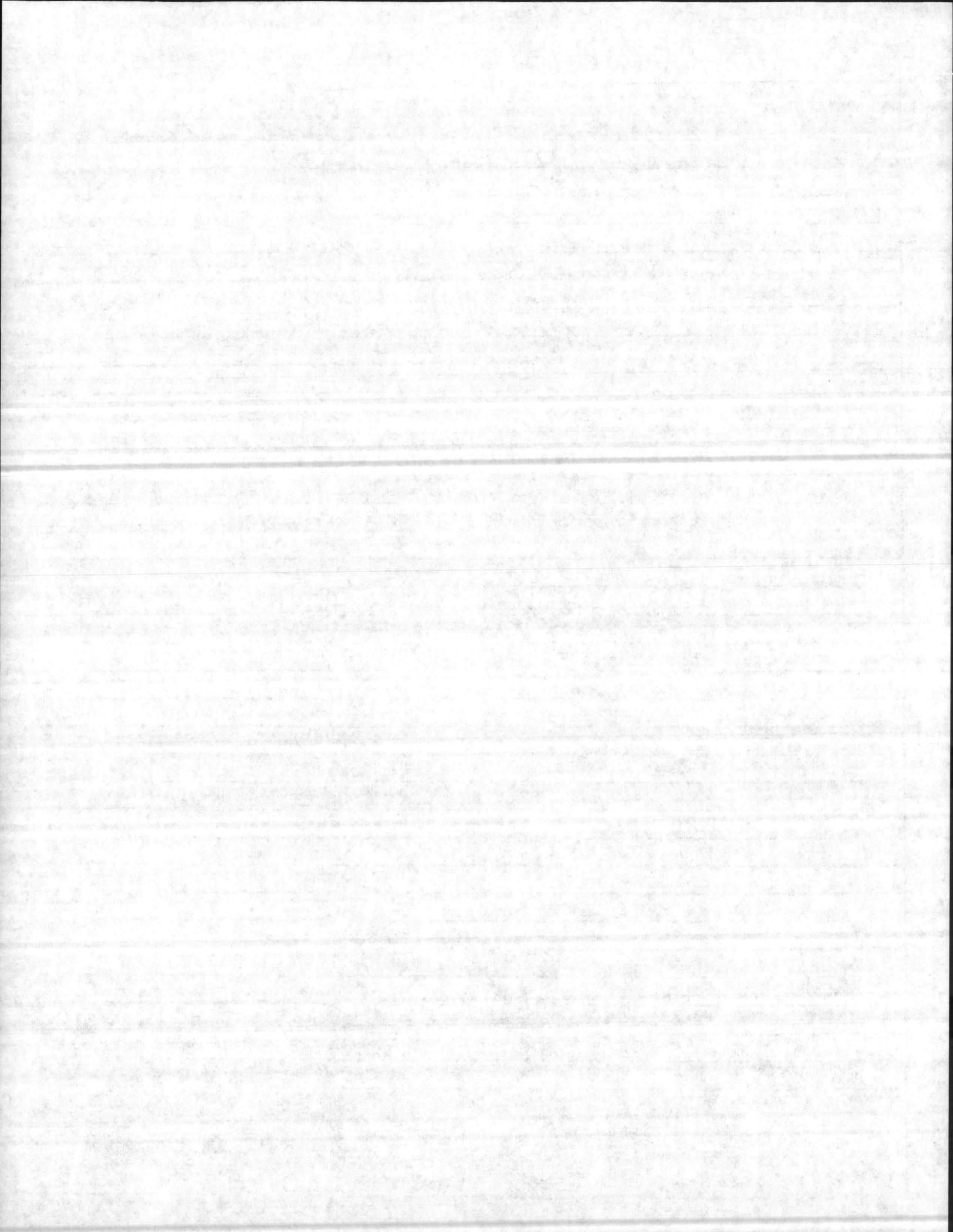
9:45 am Augers out. 1 1/2 bags silica sand in hole  
 Hole staying open.

10:00 am. Well complete. 4+ bags (100lb each) sil  
 sand used. 1' Bentonite seal. placed.

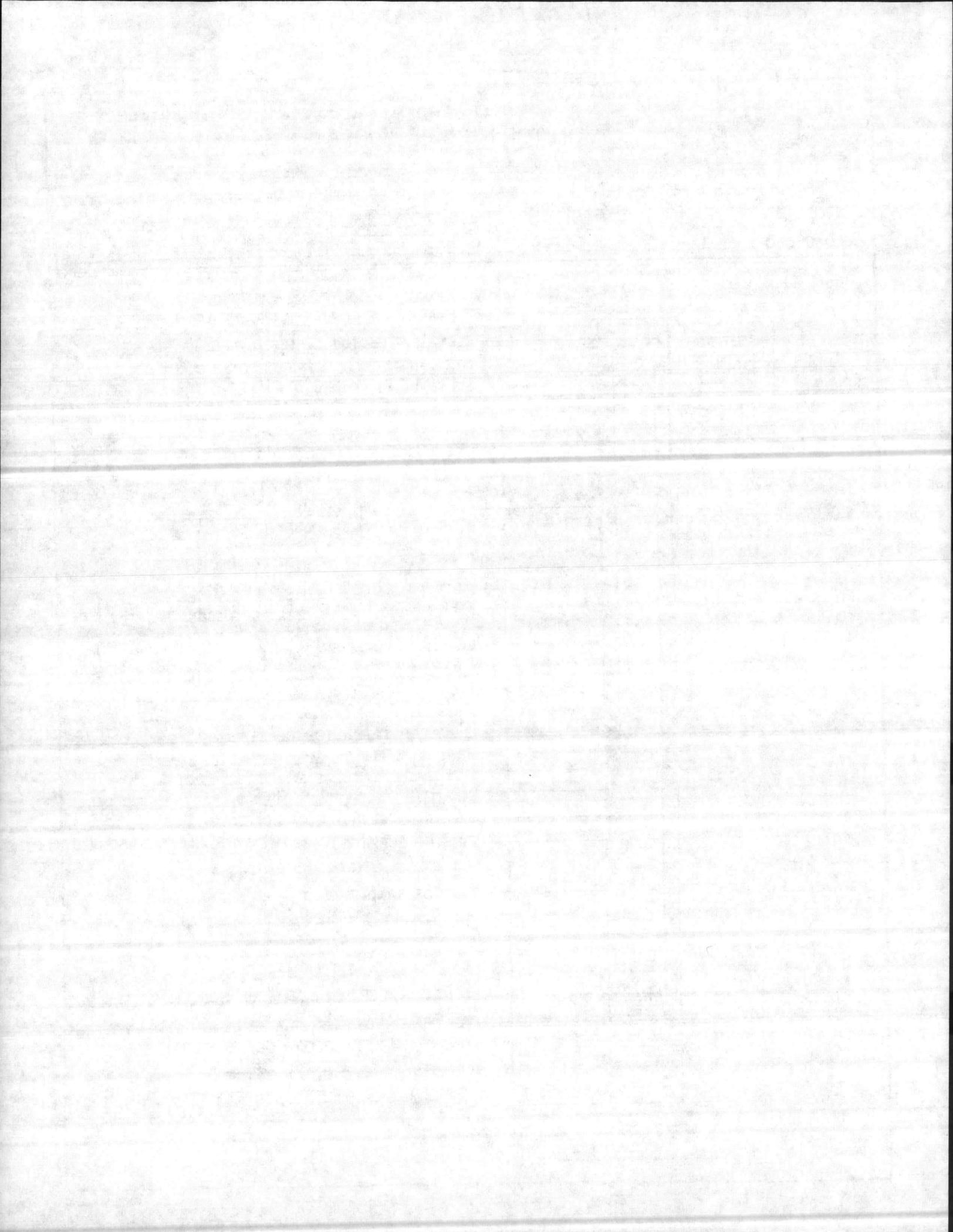
Standard construction (27' hole, 25' cas.  
 below ground, 2.5' stick up, 5" point at cas.  
 bottom, bottom 20 ft ss screen).

Washing rig. Preping for next hole.

1/2/00 M.D. Conrad  
 SOURCE: Environmental Science and Engineering, Inc.







FOR OFFICE USE ONLY

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

**WELL CONSTRUCTION RECORD**

DRILLING CONTRACTOR Davis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 06-035-WM-014

1. WELL LOCATION: (Show sketch of the location below)  
 Nearest Town: Jacksonville, N.C.

County: Onslow

(Road, Community, or Subdivision and Lot No.)

2. OWNER US Navy  
 ADDRESS Camp Lejeune  
 (Street or Route No.) 28542  
 City or Town \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Depth		DRILLING LOG
From	To	Formation Description
0.0	4.5	Silty fine sand
4.5	6.0	fine sandy clay
6.0	9.0	fine sand
9.0	10.5	Silty clayey fine sand
14.0	15.5	peat
19.0	20.5	Silty fine sand
24.0	25.5	fine sand

3. DATE DRILLED 11/6/86 USE OF WELL monitor

4. TOTAL DEPTH 25.5 CUTTINGS COLLECTED  Yes  No

5. DOES WELL REPLACE EXISTING WELL?  Yes  No

6. STATIC WATER LEVEL: 13.33 FT.  above TOP OF CASING,  below TOP OF CASING IS 2.5 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_

WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	Depth	To	Diameter	Wall Thickness	Material
			or Weight/Ft.		
From <u>2.5</u>	To <u>5.0</u>	Ft.	<u>2"</u>	<u>1/8"</u>	<u>PVC</u>
From _____	To _____	Ft.	_____	_____	_____
From _____	To _____	Ft.	_____	_____	_____

If additional space is needed use back of form.

**LOCATION SKETCH**

(Show direction and distance from at least two State Roads, or other map reference points)

11. GROUT:

From	Depth	To	Material	Method
From <u>0.0</u>	To <u>2.0</u>	Ft.	<u>concrete</u>	_____
From <u>2.0</u>	To <u>3.0</u>	Ft.	<u>clay</u>	_____

See Fig (2-5)

12. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
From <u>5.0</u>	To <u>25</u>	Ft.	<u>2"</u>	<u>0.01 in.</u>	<u>PVC</u>
From _____	To _____	Ft.	_____	_____	_____
From _____	To _____	Ft.	_____	_____	_____

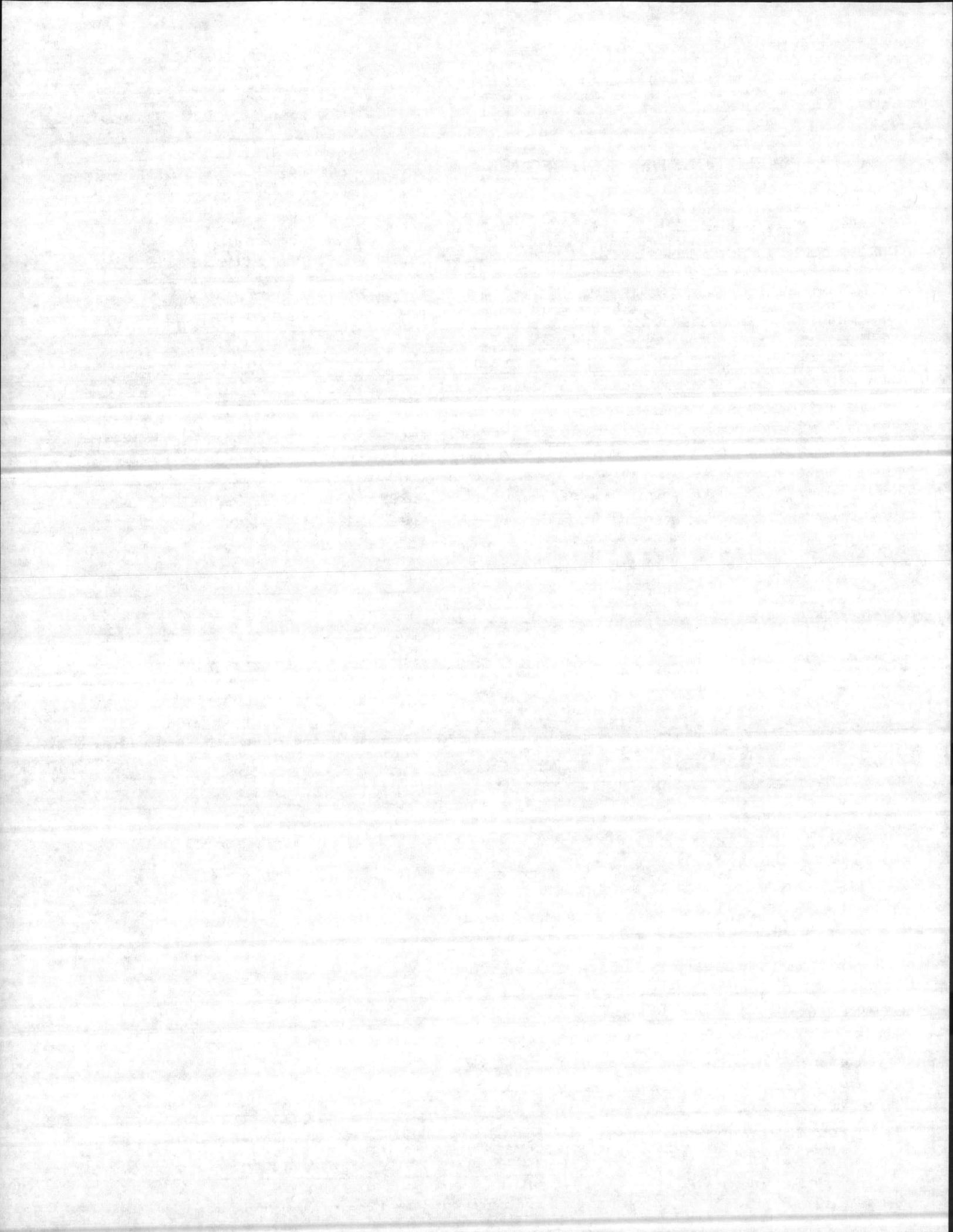
13. GRAVEL PACK:

From	Depth	To	Size	Material
From <u>-3.0</u>	To <u>-25</u>	Ft.	<u>course</u>	<u>sand</u>
From _____	To _____	Ft.	_____	_____

REMARKS: \_\_\_\_\_

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 75 NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT [Signature] DATE 2/10/87



Boring No HPGW9 409 (near Bld. 1601)

Location Coordinates N 7-10

Hole Size 6" Slot 0.010

E

Screen Size 2" Mat'l PVC

Filter Materials Silica Sand

Sealing Size 2" Mat'l PVC

Grout Type Bentonite Seal-1'

Geologist Paul Conrad

Development \_\_\_\_\_

Date Start 11/6/86 Finish \_\_\_\_\_

Static Water Level 15.63'

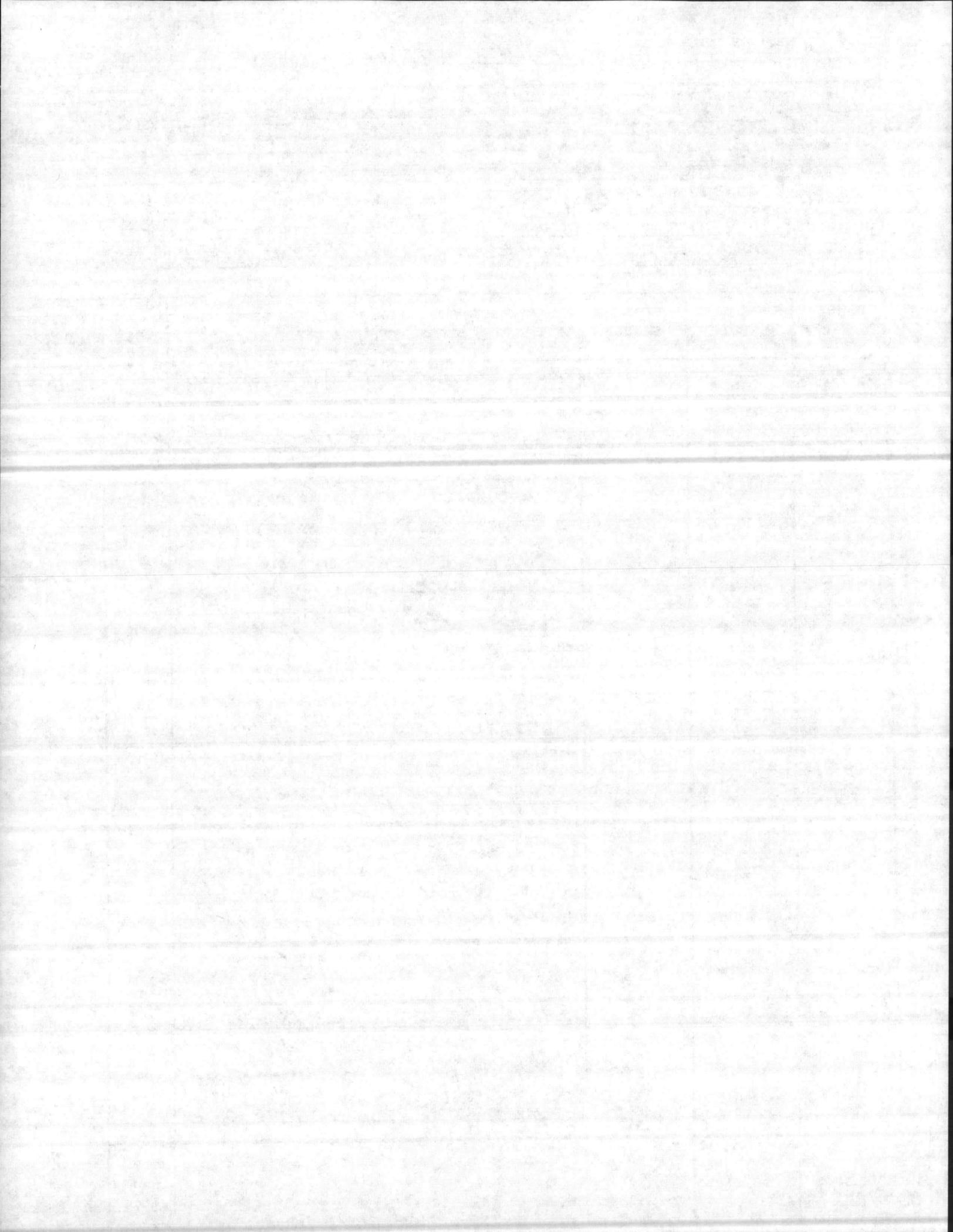
Contractor Davis Drilling

Top of Well Elevation 18.13'

Driller Charlie Smith

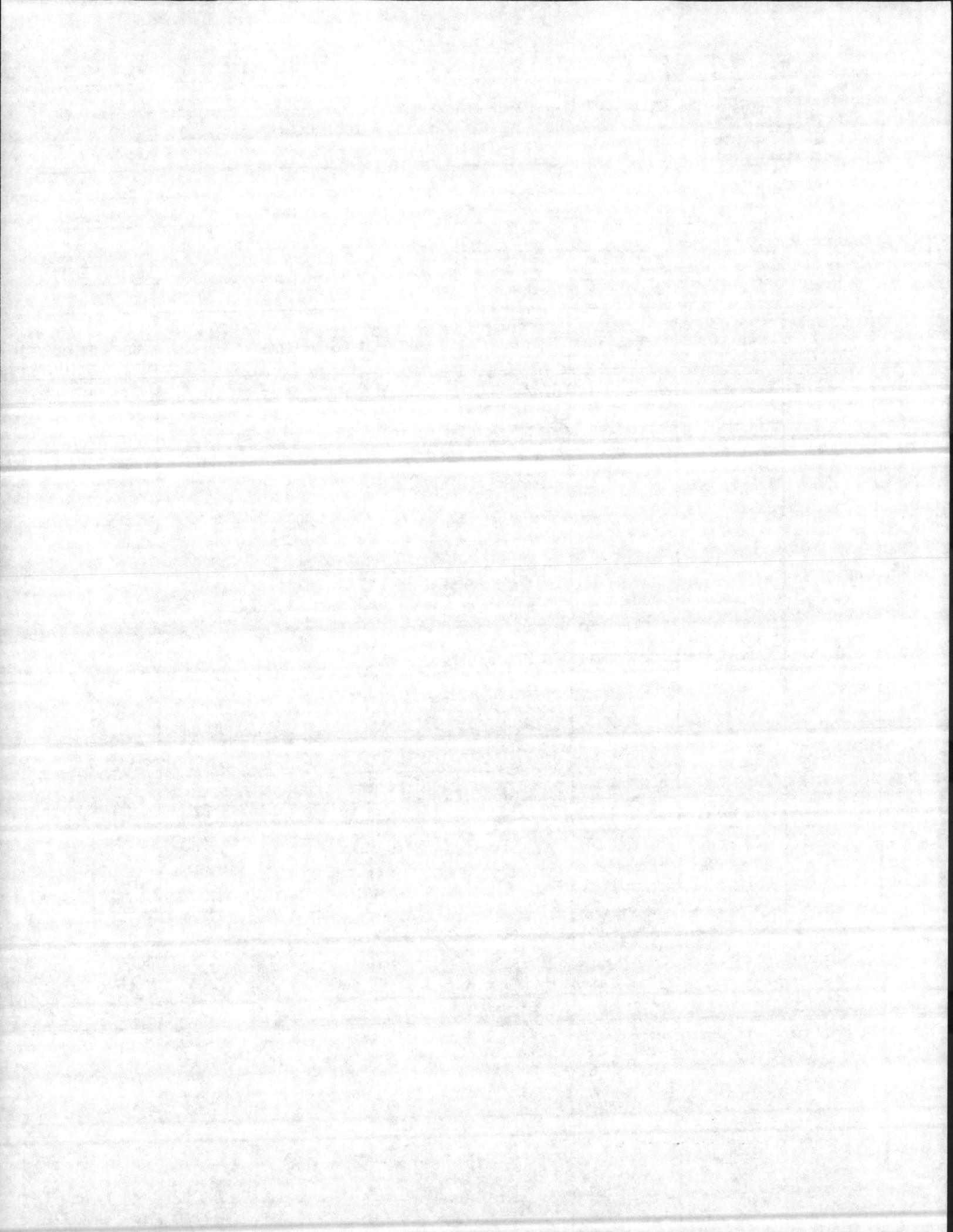
Drill Type Hollow Stem Auger-

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0-1.5			Top 8" mixture Peat, clay, silt, organic debris, roots, misc. gravel. <u>Silty Fine Sand, silt ~25%, non-plast, moist, color 10YR 5/3 (brown), trace mottling of 10YR 6/6 (brnsh yellow), loose.</u>	(SM)	3-4-1
1.5-3			<u>Silty Fine Sand, silt 20-25%, clay 3-5%, non-plast, s. moist, loose, color 10YR 5.5/4 (light yllwish brn). Trace mottling of 7.5YR 5/8 (strong brn), strong brown better cemented, several small frags. of baked clay (float from sewer install'n?).</u>	(SM)	3-4-4
3-4.5			<u>Silty Fine Sand, silt 20-25%, clay-trace, non-plast., v. loose, s. moist, color 10YR 6/4 uniform. (light yllwish brn), sand uniform.</u>	(SM)	1-2-2
4.5-6			<u>Silty Fine sand silt 20-25%, clay ~5%, s. moist, loose, sand uniform, non-plast. (except clayey zones), color 10YR 6/4 (light yllwish brn).</u>	(SM)	3-5-3



Boring No. H HPGW9 Location Coordinates N 20  
 Hole Size \_\_\_\_\_ Slot \_\_\_\_\_ E  
 Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
 casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
 Geologist \_\_\_\_\_ Development \_\_\_\_\_  
 Date Start \_\_\_\_\_ Finish \_\_\_\_\_ Static Water Level \_\_\_\_\_  
 Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
 Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/F)
6-7.5			Silty Fine Sand, ~50% fairly clean loose sand, ~50% silty fine sand (~3% clay), med. dense, moist, mottled color 10YR 8/2 (white) and 10YR 6/6 (brnish yellow), silt in silty sand ~20-25%.	SM	3-5
17.5-9			Silty Fine Sand, silt ~20%, moist, med. dense, color 10YR 6/6 (brnish yellow), s. lighter mottling.	SM	5-7.5
9-10.5			Silty Fine Sand, moist, non-plastic, med. dense, color 2.5Y 6/5 (light yellowish brn) mottled w/ light brnish gray and redish yellow, cluster of fine black fibres noted (fragile) - 10/100.	SM	5-6
14-15.5			Clayey Fine Sand, clay 5-10%, med. dense, color 2.5Y 6/5 (light yellowish brn) mottled w/ light brnish gray and redish yellow, cluster of fine black fibres noted (fragile) - 10/100.	SF	6-7



9-20.5

Fine Sand, ~5% fines, color 10YR 8/1 (white), saturated, v. foul odor (as above), uniform grain size, med. dense.

SP

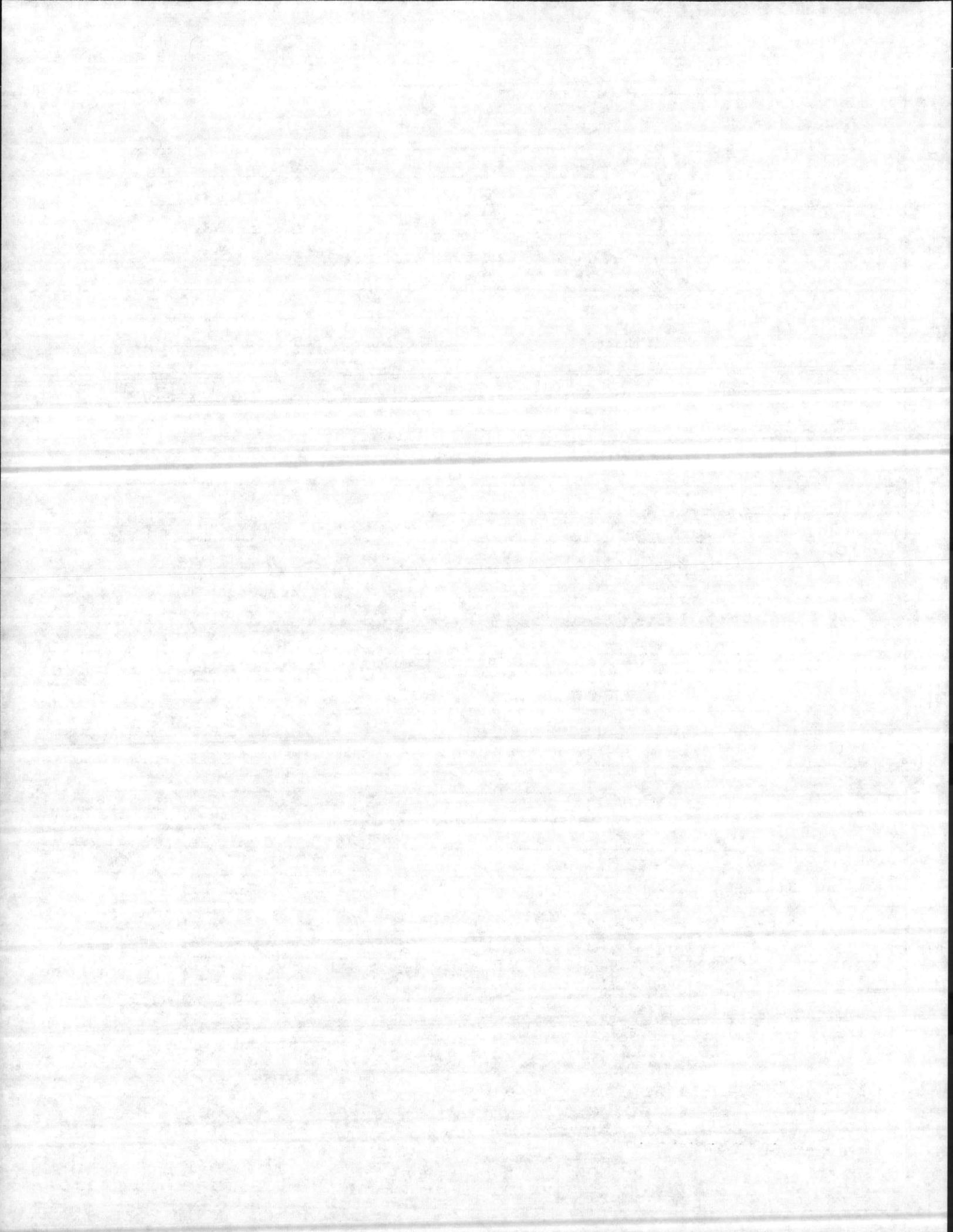
24-25.5

Clayey fine sand, clay ~5%, unif. grains, non-plast (slight in trace zones), v. foul odor (as above), med. dense, color 10YR 8/1 (white), uniform.

11/10/96

DATE

SIGNED



7:05 am Began drilling & sampling.

12:05 pm Last spoon. Began backing augers and pouring silica sand. Odor rising from hole. Casing installed. Odor resembles natural gas(?), solvent? \*

12:30. All augers out. Pouring sand. Hole open.

12:45 Bentonite in. Well complete.

Standard construction. Hole 27' deep. 4 bags silica sand used.

Driller back to w.w.t. plan to load up sand. Paul to Base Telephone to locate next site's cables. Also coordinate w/ other rig.

15 min. lunch Bk.

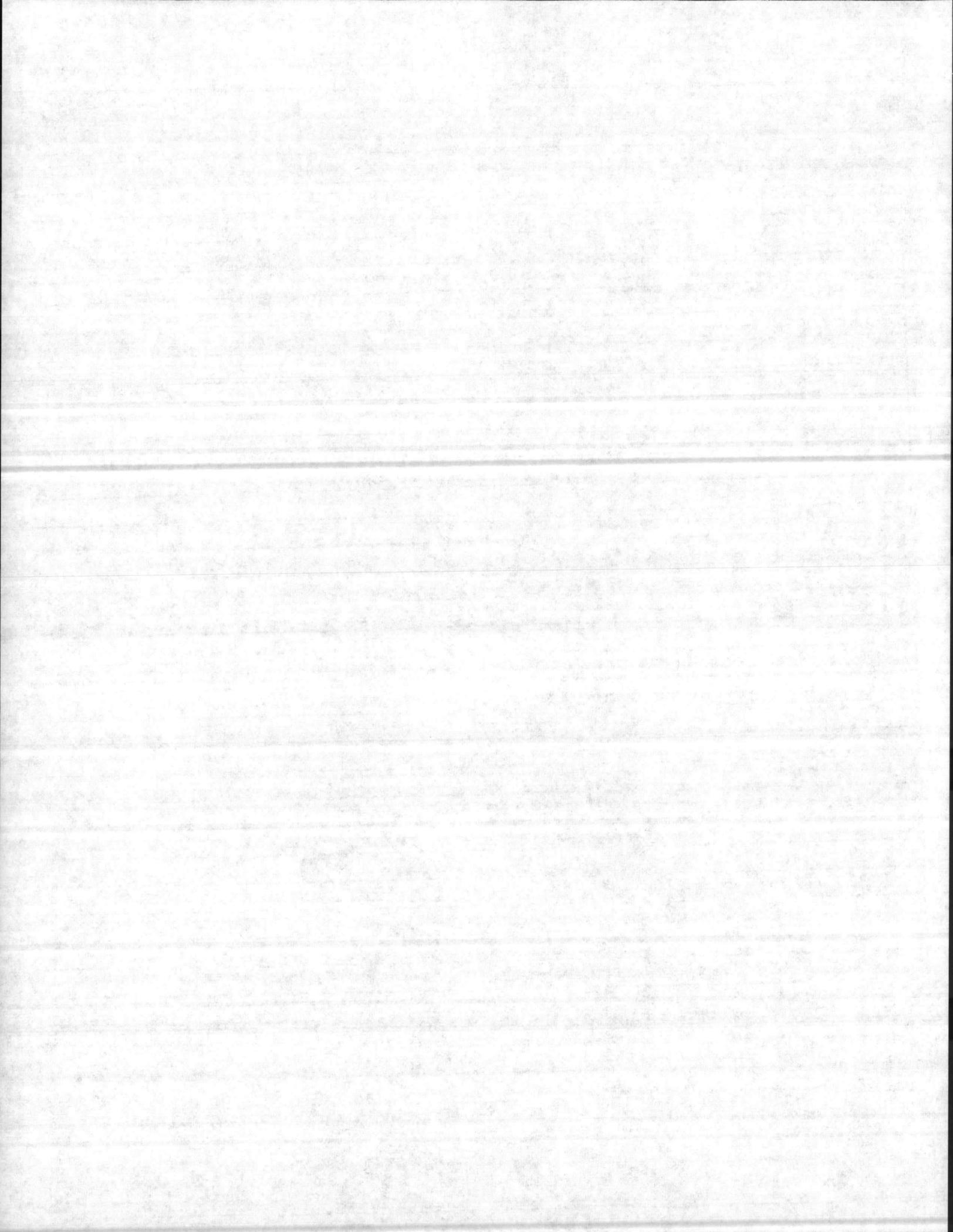
\* Driller did not notice any drilling difficulty. Geologist found no metal shavings or other indications of hitting pipeline. Propane tank ~30' away, but odor not exactly like propane. Observed no change in propane tank gauge.

Evidence from soil gas results that the odor is probably from solvents.

Because of near completion of well and the odor level judgement was made to quickly complete well.

DATE

SIGNED



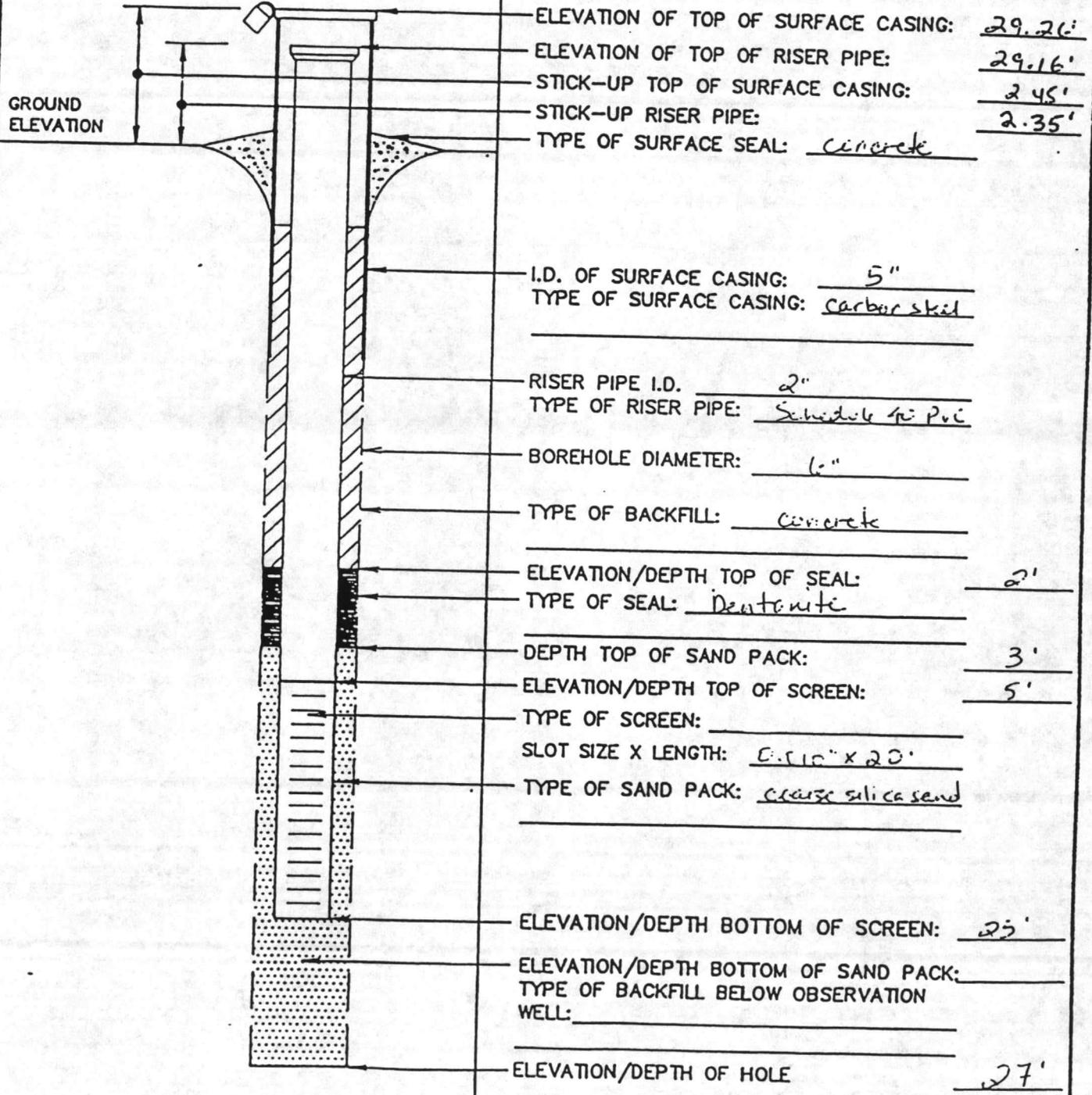
↑

## OVERBURDEN MONITORING WELL SHEET

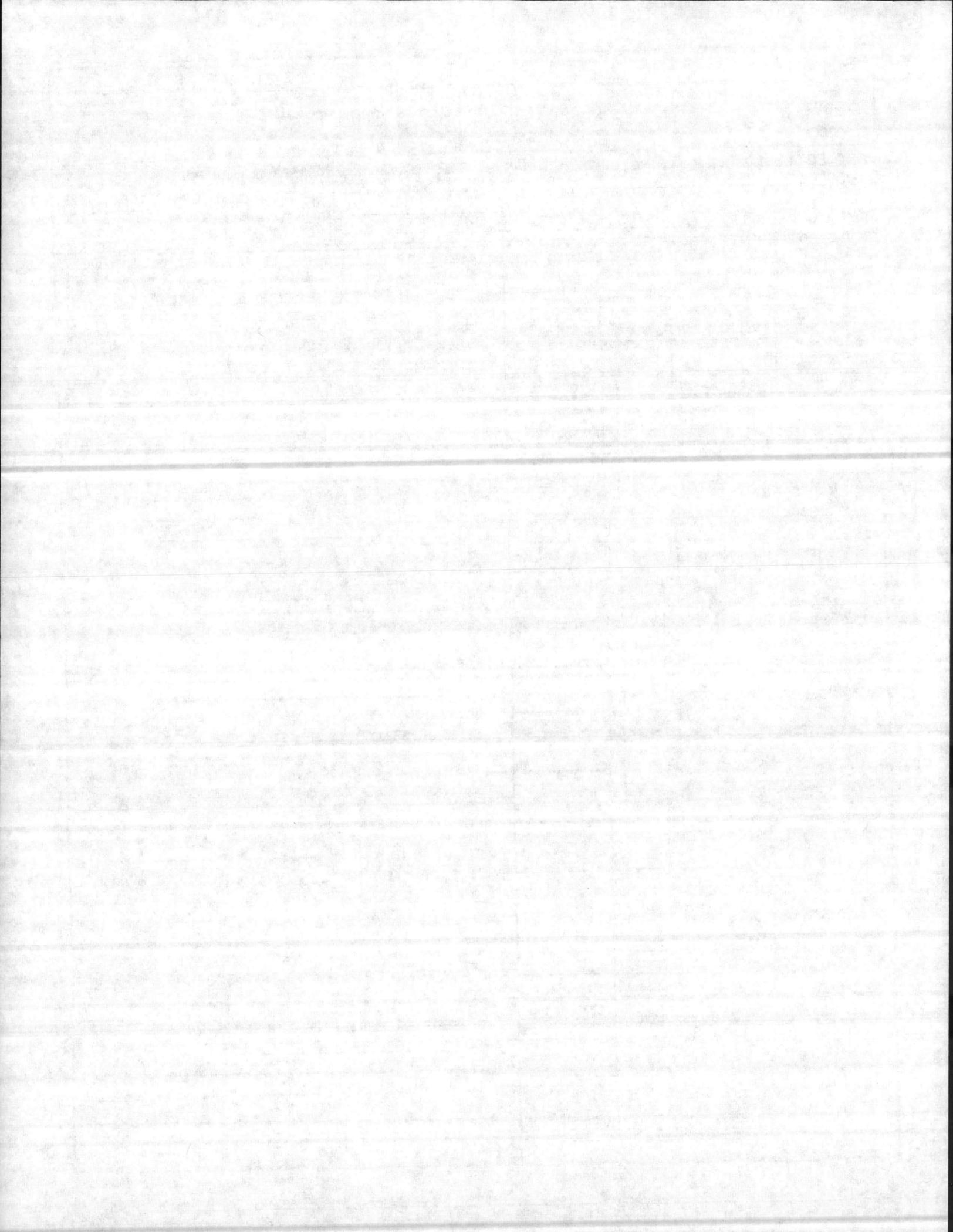
WELL NO. HP-GW9-1

PROJECT Camp Lejeune - HP1A  
 PROJECT NO. 49-C2C36 BORING NO. HP-GW9-1  
 ELEVATION \_\_\_\_\_ DATE 11/6/86  
 FIELD GEOLOGIST Paul Conrad (ESE)

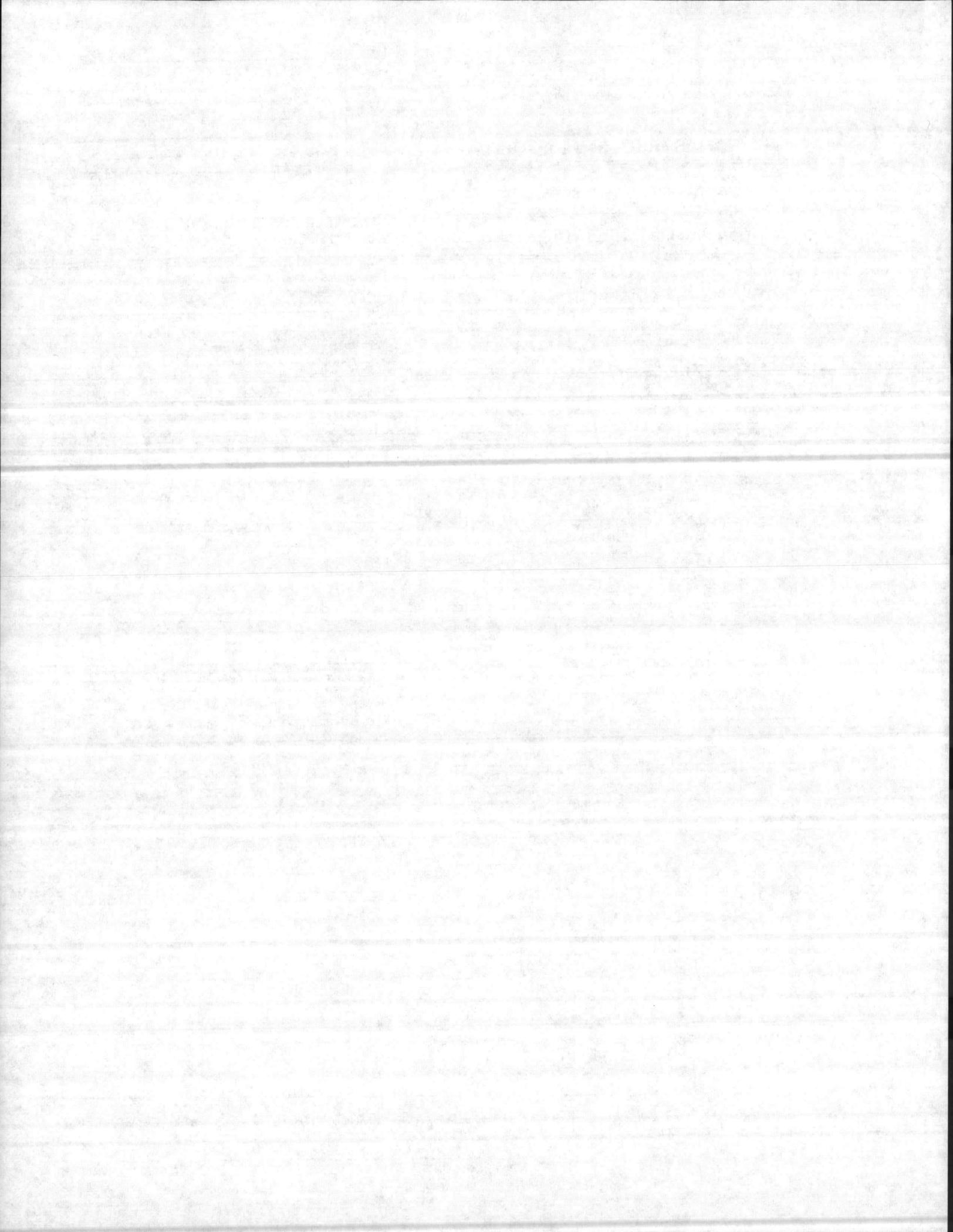
DRILLER Davis Drilling Co.  
 DRILLING METHOD Hollow Stem Auger  
 DEVELOPMENT METHOD \_\_\_\_\_



NOT TO SCALE







Geologist: Paul Conrad  
Date: 11/6/86

Driller: Charles Smith,  
Davis Drilling Co.

Well: #3 (near ...)

TOC - 1500'  
static - 12.50'

Sheet 1 of

HPGW 10

Lithology & Color

USCS

SPT  
(Ft)

3-1.5

Top six inches. Peat w/ fine sand 10-15% (Pt)

root: = ... color 10YR 2/1 (bluish)

Fine Sandy silt, sand 15-20%, high root (ML)

content, non-plast, loose, color 10YR

4/2 (dk. greyish brn), moist.

3-3-6

5-3

Silty Fine Sand, silt 10-15%, trace clay, (SM)

color 10YR 6/4, trace mottling of 10YR

6/8 (brnisk yllw) (light yllwish brn),

s. moist, non-plast. (except trace clayey

zones), med. dense.

6-9-6

5-5

Same as above

(SM)  
(CL)

3-3-2

2" fine sandy clay bed at 4', sand 25-30%,

low plast., moist, color 10YR 5.5/4 (light

yllwish brn), mottled w/ blk zones

4-4.5: silty fine sand, very light weight,

(sandy), color 10YR 3.5/1 (dk gry), loose.

5-6

Silty Clayey Fine Sand, silt 10-15%, clay (ML)

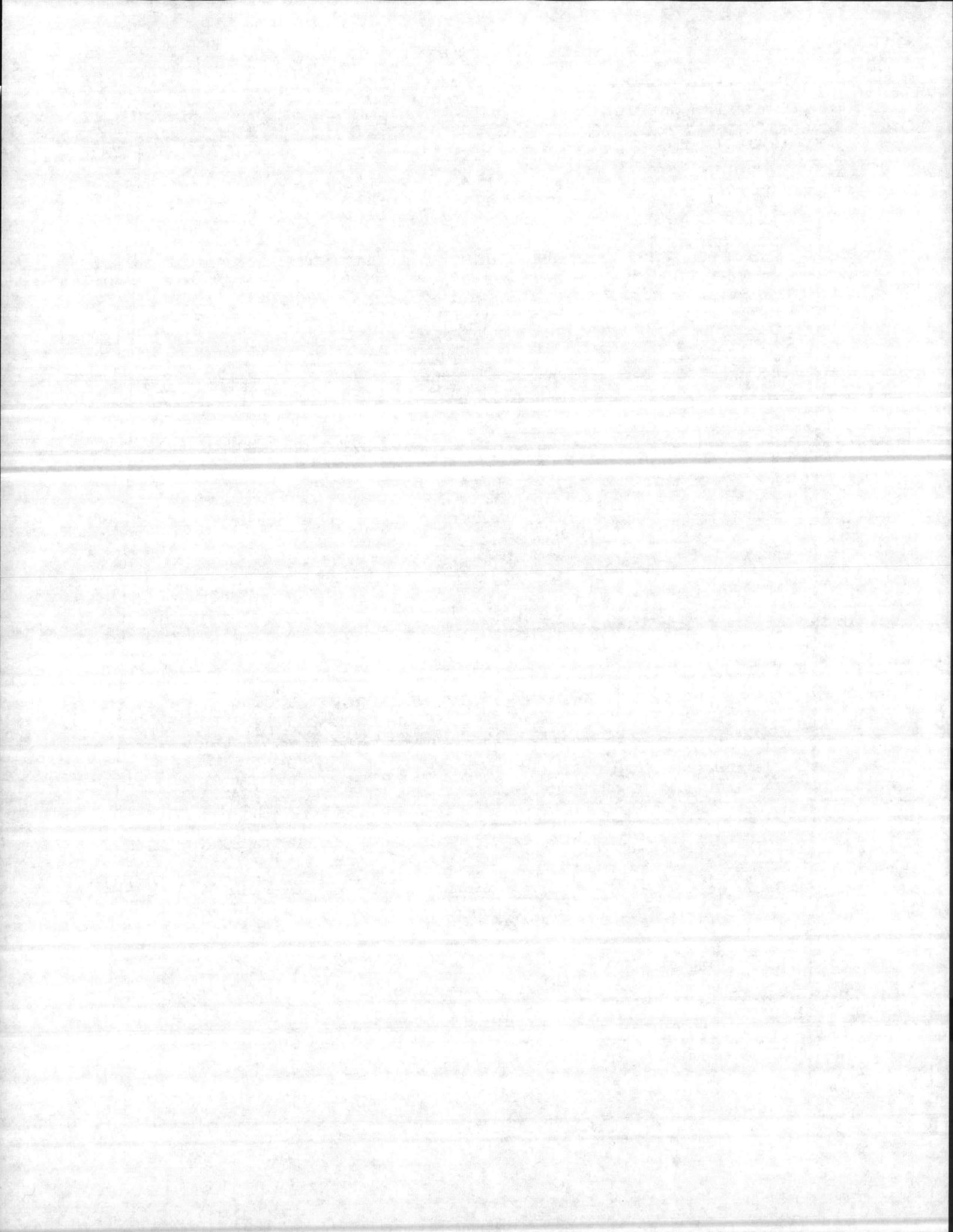
~10%, v. slight plast. in clayey zones,

otherwise non-plast., v. loose, moist,

color mottled 10YR 5/3 (brwn) and 10YR

7/8 (yllw)

1-1-1



~~HPGW10~~ HPGW10

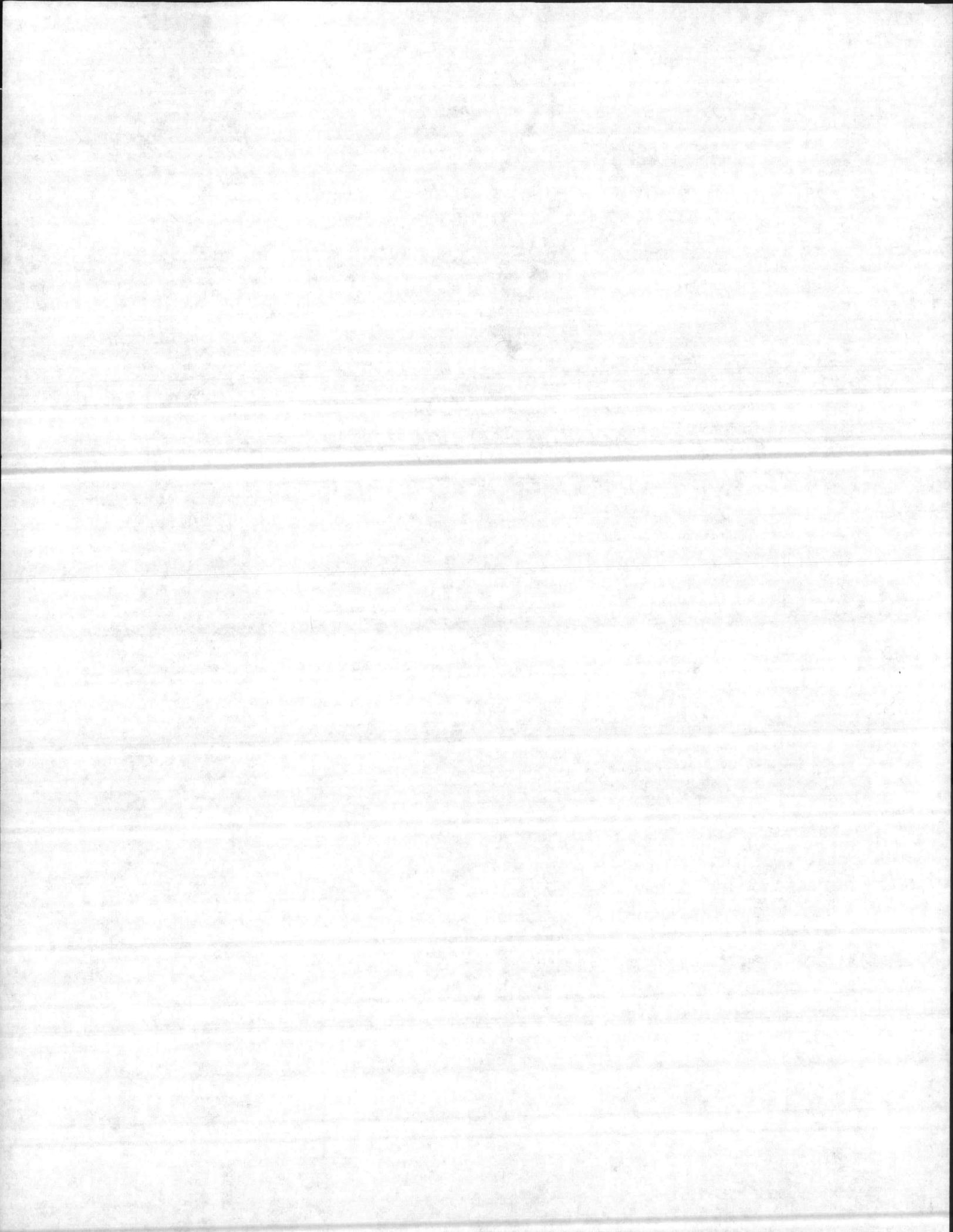
6'-7': Same as above.

7-7.5' Silty Fine Sand, silt ~12-15%, v. loose, (ML) (SM) 1-1-2  
non-plast., moist, mottled → clean  
white 10% : 5.5YR 6/3 (reddish yllw) ~15%,  
and 2.5Y 6/4 (light yllwish brn)

7.5-9' Silty Fine Sand, silt ~15%, trace (SM) 2-2-2  
clay, moist, mottled color, clean  
sand 10YR 8/1 (wht), silty sand 7.5YR  
5/8 (strong brn) to white, v. loose.

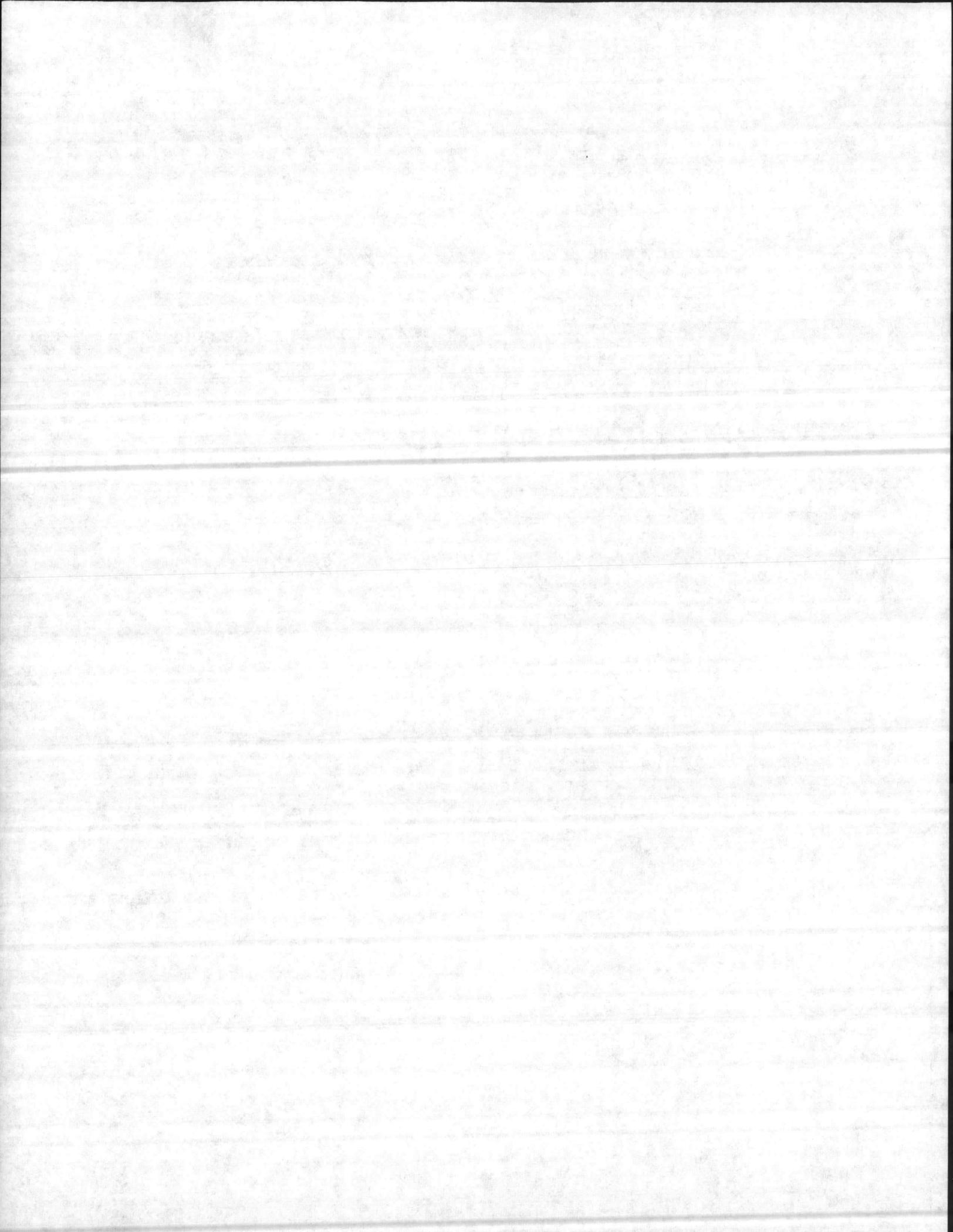
10.5' Silty Fine Sand, silt 15-20%, loose, (SM) 2-4-2  
same descript. as above except  
Strong brwn color dominant ~75%.

14-15.5' Peat, massive, v. soft, saturated, (PT) 3-2-2  
sand ~10%, color 10YR 2/1.5 (v.  
drk brn), stains hands, foul odor not  
evident, non-plast.



( ) 20.5 Silty Fine Sand, silt 15-20%, (SM) 6-7-77  
trace clay, sat'd, med. dense,  
grains uniform, unif. color 2.5Y  
7/2 (light gry); occ sprinkling of  
strong brown or v. thinly bedded  
reddish yllw silt., v. slight plast. to none.

( ) 24-25.5 Silty v. Fine Sand, silt 15-20%, (SM) 12-20--  
trace clay, sat'd., dense,  
grains uniform, color unif. 5Y 8/2  
(white); non-plast.



NELSON HPGW10

11/6/36

Log

5:50 pm. Began drilling & sampling.

3:05 Last Spoon. Backing out inner tri-cone string; and then augurs. Assembling and installing casing.

3:30 All augurs out. Hole open. No foul odor evident.

3:45 Well complete. 4 bags of silica sand used (100 lb. each). 1' bentonite placed.

Standard Construction. Hole 27' deep.

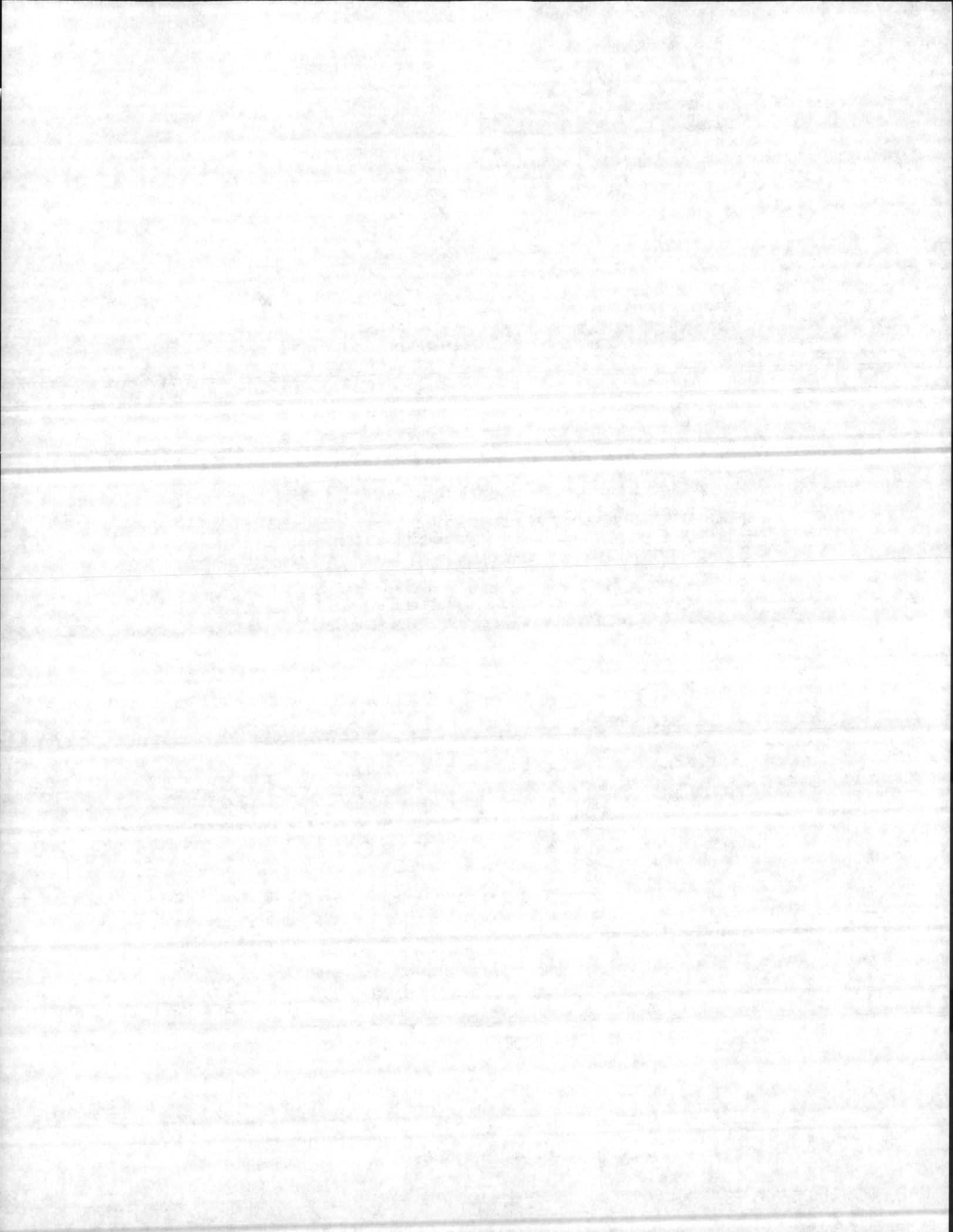
No unusual events.

11:15 Back at w.w.t. plant. Rig washed. Quit for day.

8:00 pm - 12:15 am. Constructed master maps of Industrial Area, which included all soil gas and locations of the ~18 characterization wells. Maps hung on Beach house wall for Bob Gregory's use in siting new wells, and general reference purposes.

1/2 hour spent coordinating ~~on~~ on well development.

7 0 0 1 1

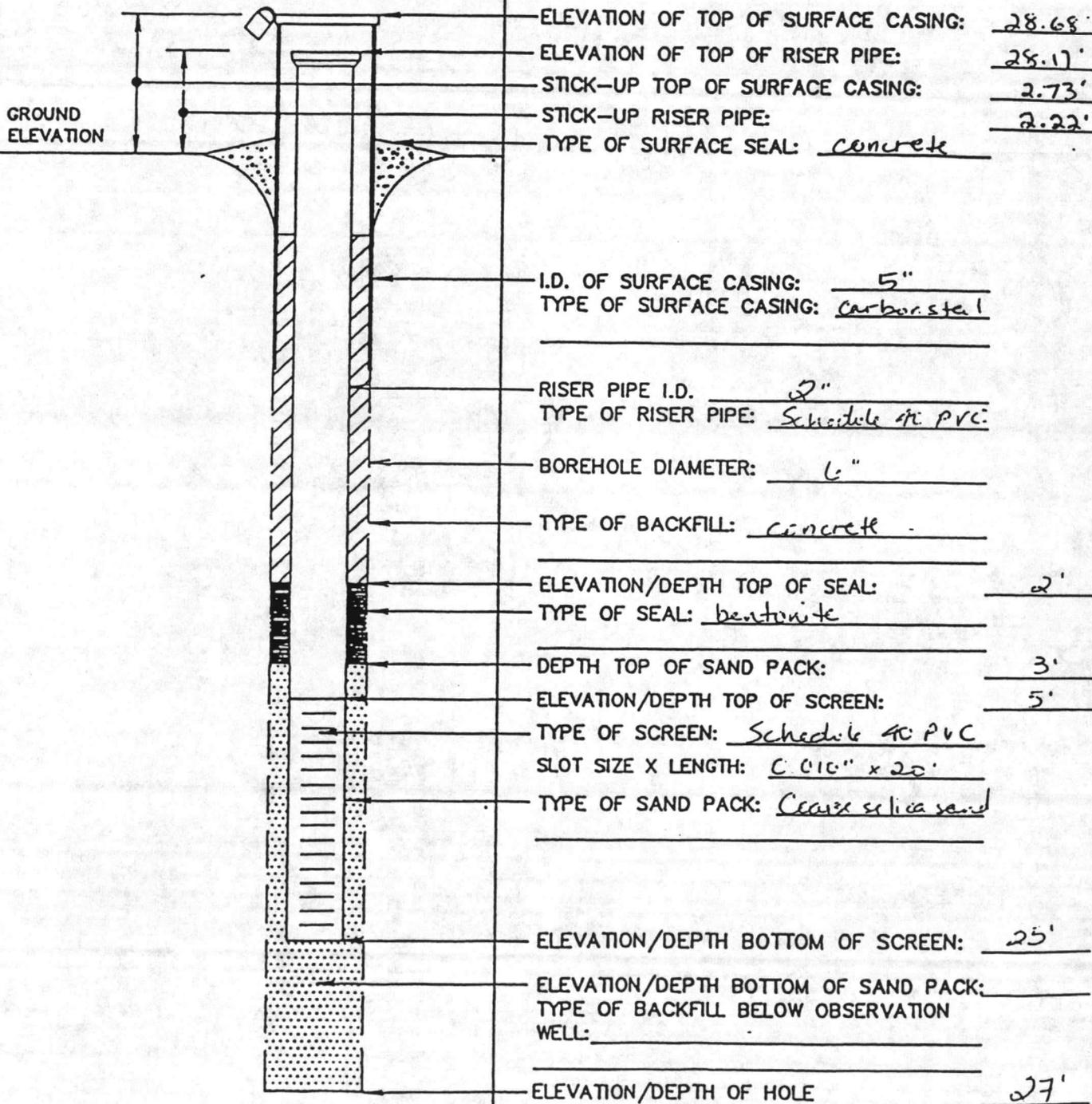


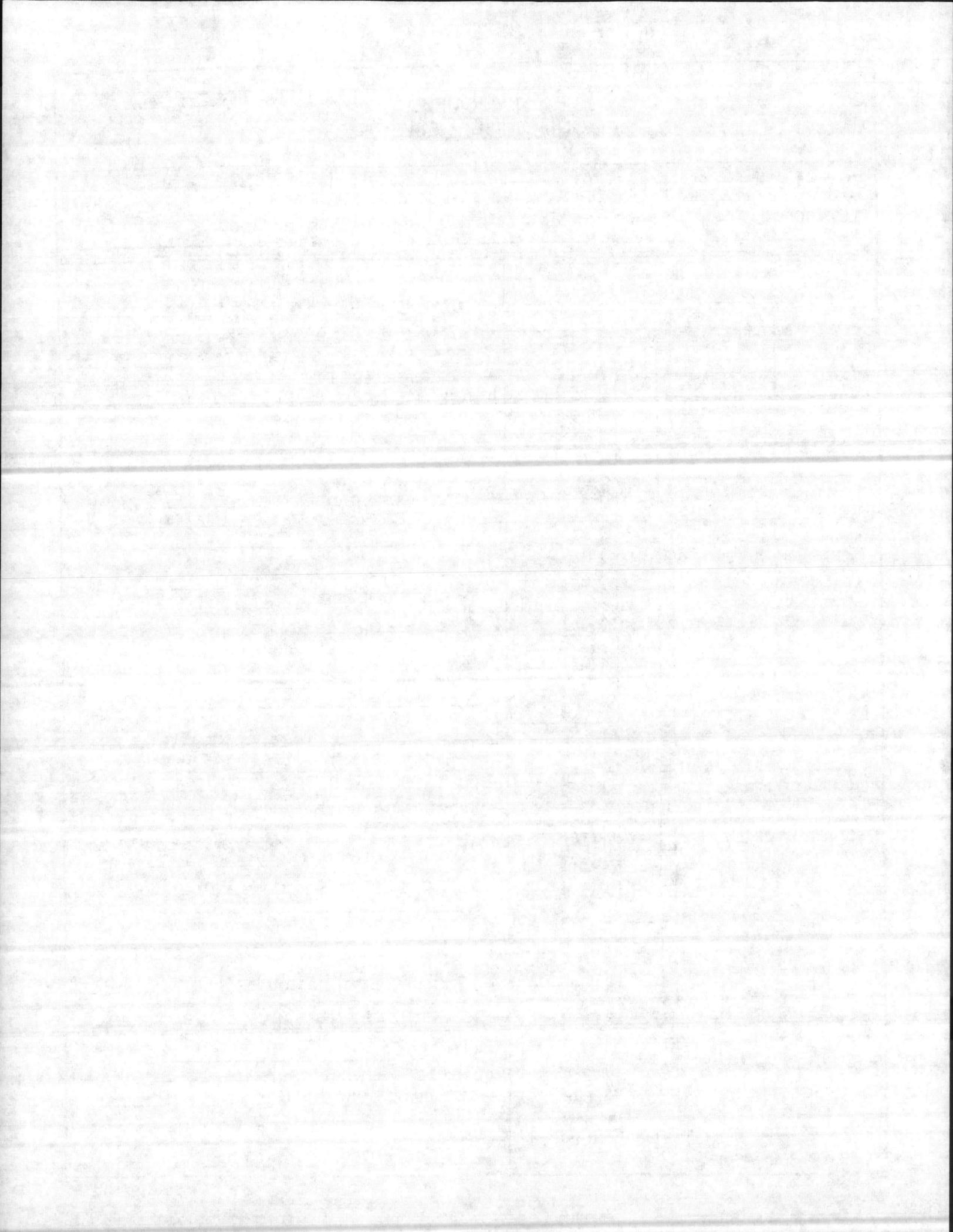
# OVERBURDEN MONITORING WELL SHEET

WELL NO. HP-GW10

PROJECT Camp Lejeune - HP1A  
 PROJECT NO. 17-02636 BORING NO. HP-GW10  
 ELEVATION \_\_\_\_\_ DATE 11/6/86  
 FIELD GEOLOGIST Paul Conrad (FSC)

DRILLER Davis Drilling Co  
 DRILLING METHOD Hollow Stem Auger  
 DEVELOPMENT METHOD \_\_\_\_\_





FOR OFFICE USE ONLY

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

**WELL CONSTRUCTION RECORD**

DRILLING CONTRACTOR Davis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 66-0135-WM-0141

1. WELL LOCATION: (Show sketch of the location below)  
 Nearest Town: Saxsonville, N.C.

County: Onslow

(Road, Community, or Subdivision and Lot No.)

2. OWNER US Navy  
 ADDRESS Camp Lejeune NC 28542  
(Street or Route No.)

Depth		DRILLING LOG
From	To	Formation Description
0.0	1.5	Silty Peat
1.5	3.0	Silty Fine Sand
3.0	4.5	Silty Fine Sand and Sandy Clay
4.5	6.0	Silty Clayey Fine Sand
6.0	10.5	Silty Fine Sand
14.0	15.5	Peat
19.0	20.5	Silty Fine Sand
24.0	25.5	Silty Very Fine Sand

3. DATE DRILLED 11/6/86 USE OF WELL monitor  
 4. TOTAL DEPTH 25.5' CUTTINGS COLLECTED  Yes  No  
 5. DOES WELL REPLACE EXISTING WELL?  Yes  No  
 6. STATIC WATER LEVEL: 12.50 FT.  above TOP OF CASING,  below TOP OF CASING IS 2.50 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_  
 WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	Depth	To	Diameter	Wall Thickness or Weight/Ft.	Material
<u>+2.5</u>		<u>-5.0</u>	<u>2"</u>	<u>1/8"</u>	<u>PVC</u>
From _____	To _____	Ft. _____	_____	_____	_____
From _____	To _____	Ft. _____	_____	_____	_____

11. GROUT:

From	Depth	To	Material	Method
<u>0.0</u>		<u>-2.0</u>	<u>Concrete</u>	_____
<u>-2.0</u>		<u>-3.0</u>	<u>Clay</u>	_____

12. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
<u>-5.0</u>		<u>-25'</u>	<u>2"</u>	<u>0.01 in.</u>	<u>PVC</u>
From _____	To _____	Ft. _____	in. _____	in. _____	_____
From _____	To _____	Ft. _____	in. _____	in. _____	_____

13. GRAVEL PACK:

From	Depth	To	Size	Material
<u>-3.0</u>		<u>-25'</u>	<u>Coarse</u>	<u>Sand</u>
From _____	To _____	Ft. _____	_____	_____

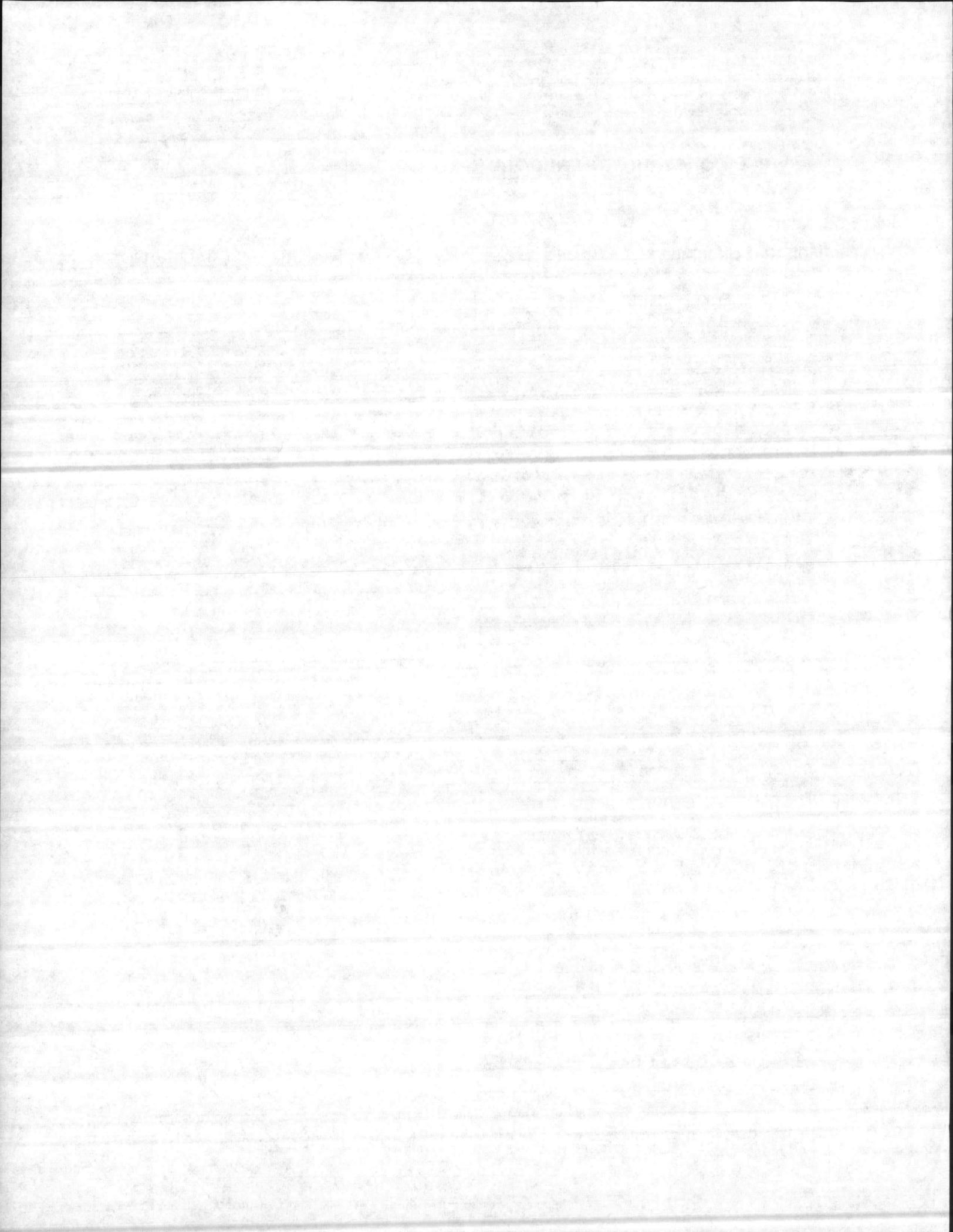
REMARKS: \_\_\_\_\_

See Fig. (2-5)

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Signature: [Signature] DATE: 2/11/88

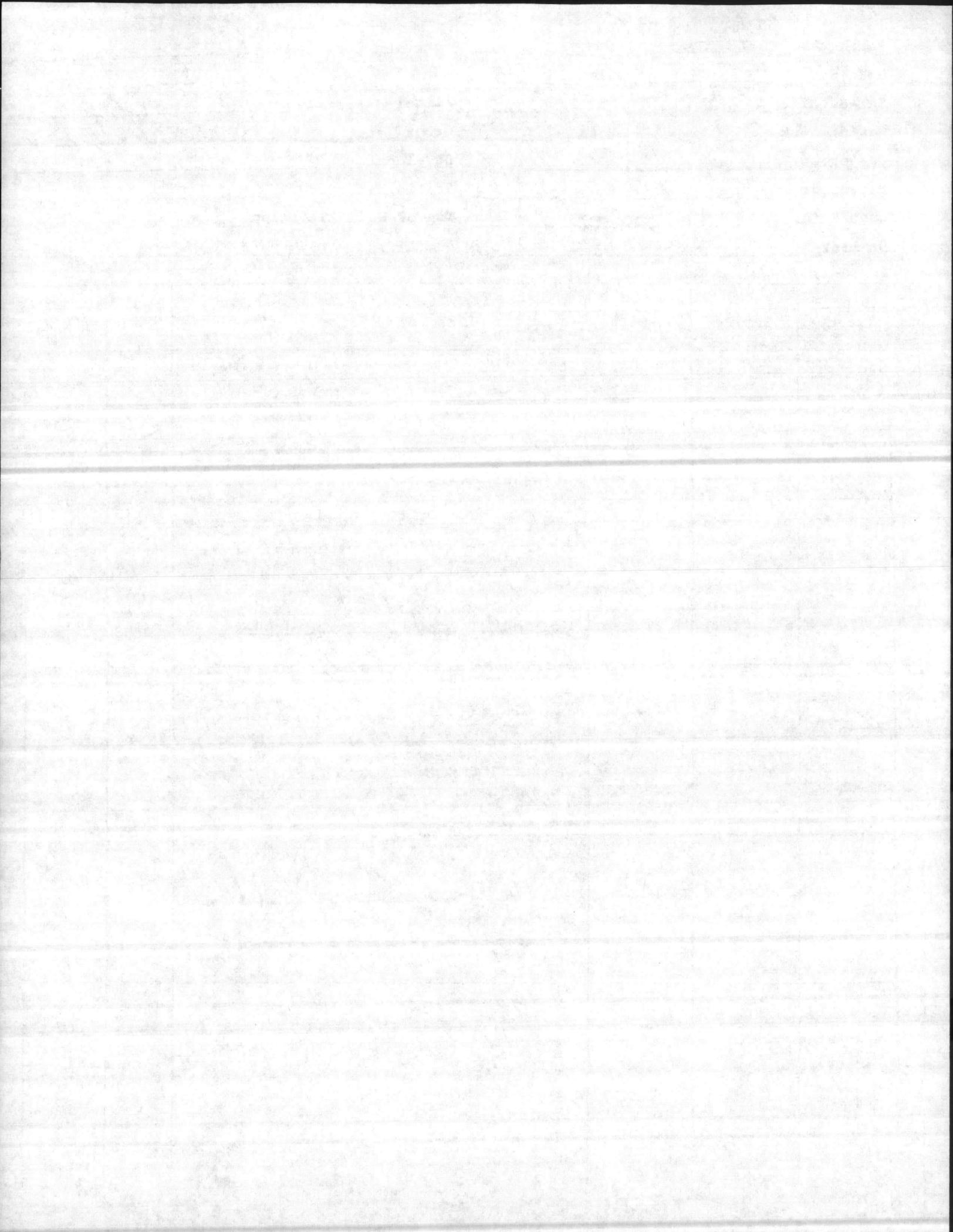
SIGNATURE OF CONTRACTOR OR AGENT DATE  
 Submit original to Division of Environmental Management and copy to well owner.



Boring No. HP6W 11  
 Hole Size 6" Slot 0.01  
 Screen Size 2" Mat'l PVC  
 casing Size 2" Mat'l PVC  
 Geologist David Brentlinger  
 Date Start 11/18/86 Finish 11/18  
 Contractor ESE  
 Driller Davis

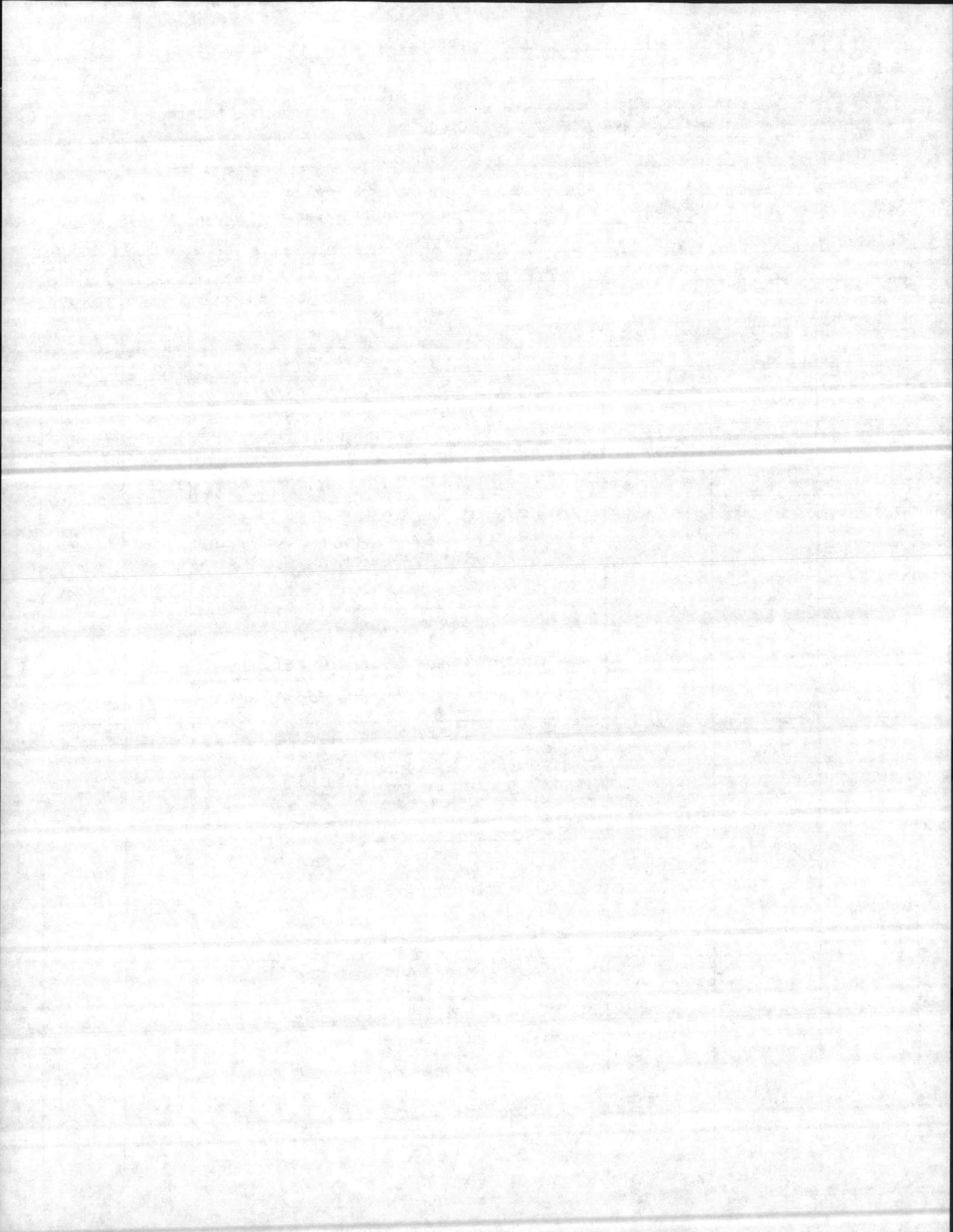
Location Coordinates N  
E  
 Filter Materials Silica Sand  
 Grout Type Bentonite Pellets  
 Development -  
 Static Water Level 13.57'  
 Top of Well Elevation 16.07'  
 Drill Type Hollow Stem Auger

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0.0-1.5			2.5 Y 6.5/6 yellow-olive yellow silty fine sand (silt 25%), organic matter top 2", loose, moist, non plastic	SM	W 5
1.5-3.0			104R 7.8/5.5 very pale brown yellow, silty fine sand (silt 10-15%), loose, moist, non plastic, Brown mottles throughout	SM	2 3 3
3.0-4.5			104R 5.25/8 Brown yellow-yellow Brown, silty clayey fine sand (silt + clay 35%), slightly dens, moist, non plastic	SM	3 3 6
4.5-6.0			104R 7.8/6, yellow, silty fine sand, (silt 30%) loose, moist, non plastic	SM	3 5 8
6.0-7.5			7.5 4R 7/8, Red yellow, silty fine sand (silt 30%) loose, moist, non plastic	SM	4 5 8



Boring No. HP 6W 11 Location Coordinates N  
 Hole Size \_\_\_\_\_ Slot \_\_\_\_\_ E \_\_\_\_\_  
 Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
 Casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
 Geologist \_\_\_\_\_ Development \_\_\_\_\_  
 Date Start \_\_\_\_\_ Finish \_\_\_\_\_ Static Water Level \_\_\_\_\_  
 Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
 Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

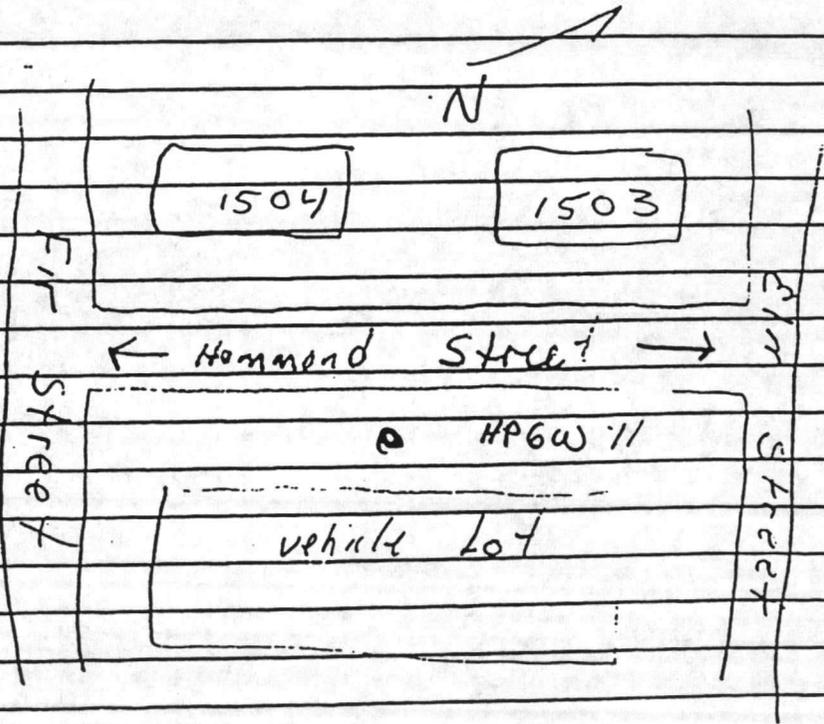
Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
7.5-9.0			7.5 YR 5.25/8 Strong Brown, silty fine sand with 10% clay mottles throughout (silt 25%), slightly dense-moist, non plastic	SM	3 6 8
9.0-10.5	9.0-9.75		10 YR 6.5/6 yellow Brown, silty clayey fine sand (silt + clay 40%), slightly dense, moist, non plastic	SC	15 8
	9.75-10.5		10 YR 7.5/1 light grey white, silty fine sand (silt 10-15%), loose, dry-moist, non plastic	SW	8
14.0-15.5			10 YR 5.25/3 pale brown-brown silty fine sand (silt 25%), slightly dense, moist, non plastic	SM	15 8 13
19.0-20.5			10 YR 5.5/4 Brown - light yellow Brown, same as about (14.0-15.5)	SM	14 8 8
24.0-25.5			10 YR 7.25/4, very pale brown, clayey fine-med. sand (clay 40%), sticky plastic clay layers throughout, wet, slightly dense, 10% coarse material	SC SW	3 4 4



11/18/86

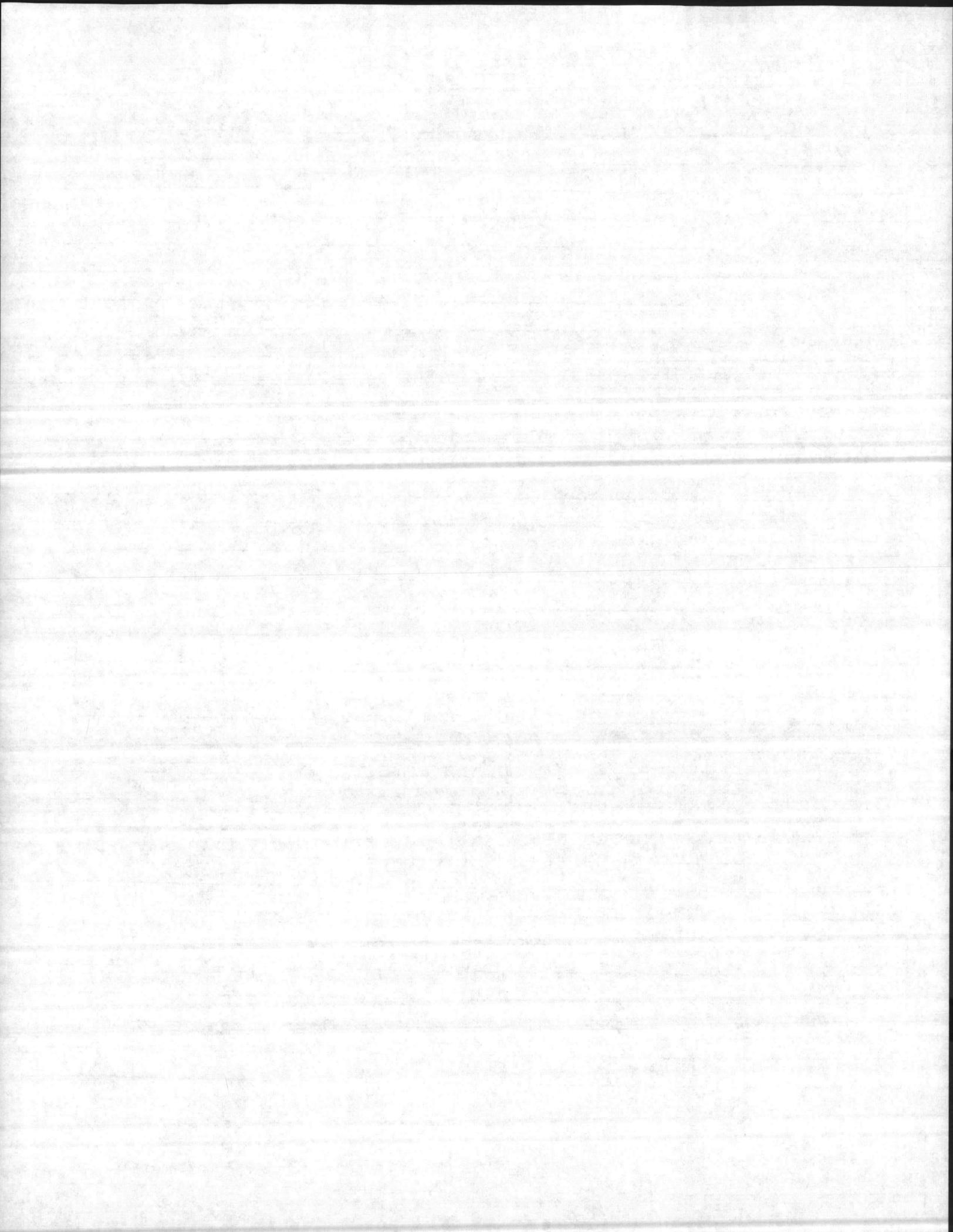
On Site 1110 am  
1st Spoon 1720  
last Spoon 1220  
Well Complete 110

Standard Well Specs



DATE

SIGNED



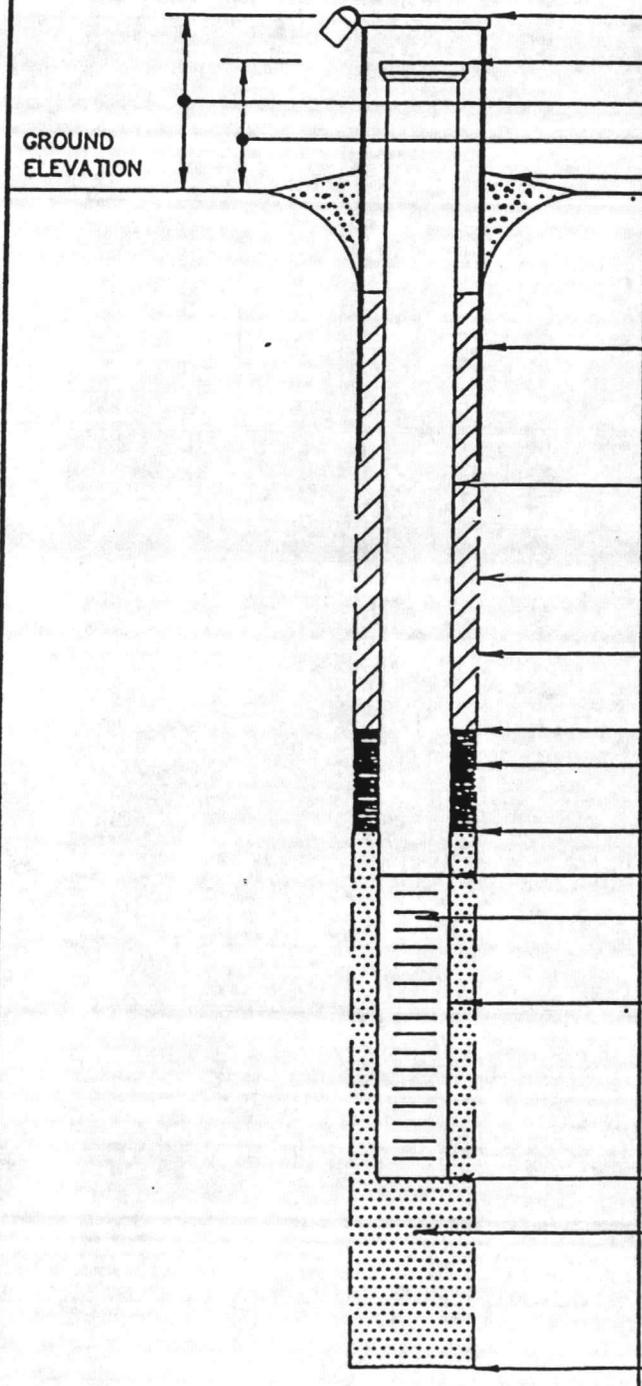
↑

OVERBURDEN  
MONITORING WELL SHEET

WELL NO. HP-GW-11

PROJECT Camp Lejeune - HP-1A  
 PROJECT NO. 44-CDC-30 BORING NO. HP-GW-11  
 ELEVATION \_\_\_\_\_ DATE 11/18/86  
 FIELD GEOLOGIST David Breittinger (ESE)

DRILLER Davis Drilling Co.  
 DRILLING METHOD Hollow Stem Auger  
 DEVELOPMENT METHOD \_\_\_\_\_



ELEVATION OF TOP OF SURFACE CASING: 28.25'  
 ELEVATION OF TOP OF RISER PIPE: 28.26'  
 STICK-UP TOP OF SURFACE CASING: 2.51'  
 STICK-UP RISER PIPE: 2.49'  
 TYPE OF SURFACE SEAL: Concrete

I.D. OF SURFACE CASING: 5"  
 TYPE OF SURFACE CASING: Carbon steel

RISER PIPE I.D. 2"  
 TYPE OF RISER PIPE: Schedule 40 PVC

BOREHOLE DIAMETER: 6"

TYPE OF BACKFILL: concrete

ELEVATION/DEPTH TOP OF SEAL: 2'  
 TYPE OF SEAL: Dentonite Pellets

DEPTH TOP OF SAND PACK: 3'  
 ELEVATION/DEPTH TOP OF SCREEN: 2'  
 TYPE OF SCREEN: Schedule 40 PVC  
 SLOT SIZE X LENGTH: 0.010' x 2.0'  
 TYPE OF SAND PACK: Coarse silica sand

ELEVATION/DEPTH BOTTOM OF SCREEN: 2.5'  
 ELEVATION/DEPTH BOTTOM OF SAND PACK: \_\_\_\_\_  
 TYPE OF BACKFILL BELOW OBSERVATION WELL: \_\_\_\_\_

ELEVATION/DEPTH OF HOLE 29.5'

NOT TO SCALE



FOR OFFICE USE ONLY

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

46W11

**WELL CONSTRUCTION RECORD**

DRILLING CONTRACTOR Davis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 66-0155-ww-0141

1. WELL LOCATION: (Show sketch of the location below)  
 Nearest Town: Jacksonville, N.C.

County: Onslow

(Road, Community, or Subdivision and Lot No.)

2. OWNER US Navy  
 ADDRESS Camp Lejeune N.C.  
 (Street or Route No.) 28542  
 City or Town \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Depth		DRILLING LOG
From	To	Formation Description
0.0	3.0	Silty Fine Sand
3.0	4.5	Silty Clayey Fine Sand
4.5	10.5	Silty Fine Sand
14.8	15.5	Silty Fine Sand
19.0	20.5	Silty Fine Sand
24.0	25.5	Clayey Fine-Med. Sand

3. DATE DRILLED 11/18/86 USE OF WELL monitor  
 4. TOTAL DEPTH 25.5' CUTTINGS COLLECTED  Yes  No  
 5. DOES WELL REPLACE EXISTING WELL?  Yes  No  
 6. STATIC WATER LEVEL: 13.57 FT.  above TOP OF CASING,  
 TOP OF CASING IS 2.50 FT.  below ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_  
 WATER ZONES (depth): \_\_\_\_\_  
 9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:  

From	Depth	To	Diameter	Wall Thickness or Weight/Ft.	Material
	<u>2.5</u>	<u>5.0</u>	<u>2"</u>	<u>18"</u>	<u>PVC</u>
From _____	To _____	Ft. _____	_____	_____	_____
From _____	To _____	Ft. _____	_____	_____	_____

If additional space is needed use back of form.  
**LOCATION SKETCH**  
 (Show direction and distance from at least two State Roads, or other map reference points)

11. GROUT:  

From	Depth	To	Material	Method
	<u>0.0</u>	<u>2.0</u>	<u>Concrete</u>	_____
	<u>2.0</u>	<u>3.0</u>	<u>Clay</u>	_____

See Fig (2-5)

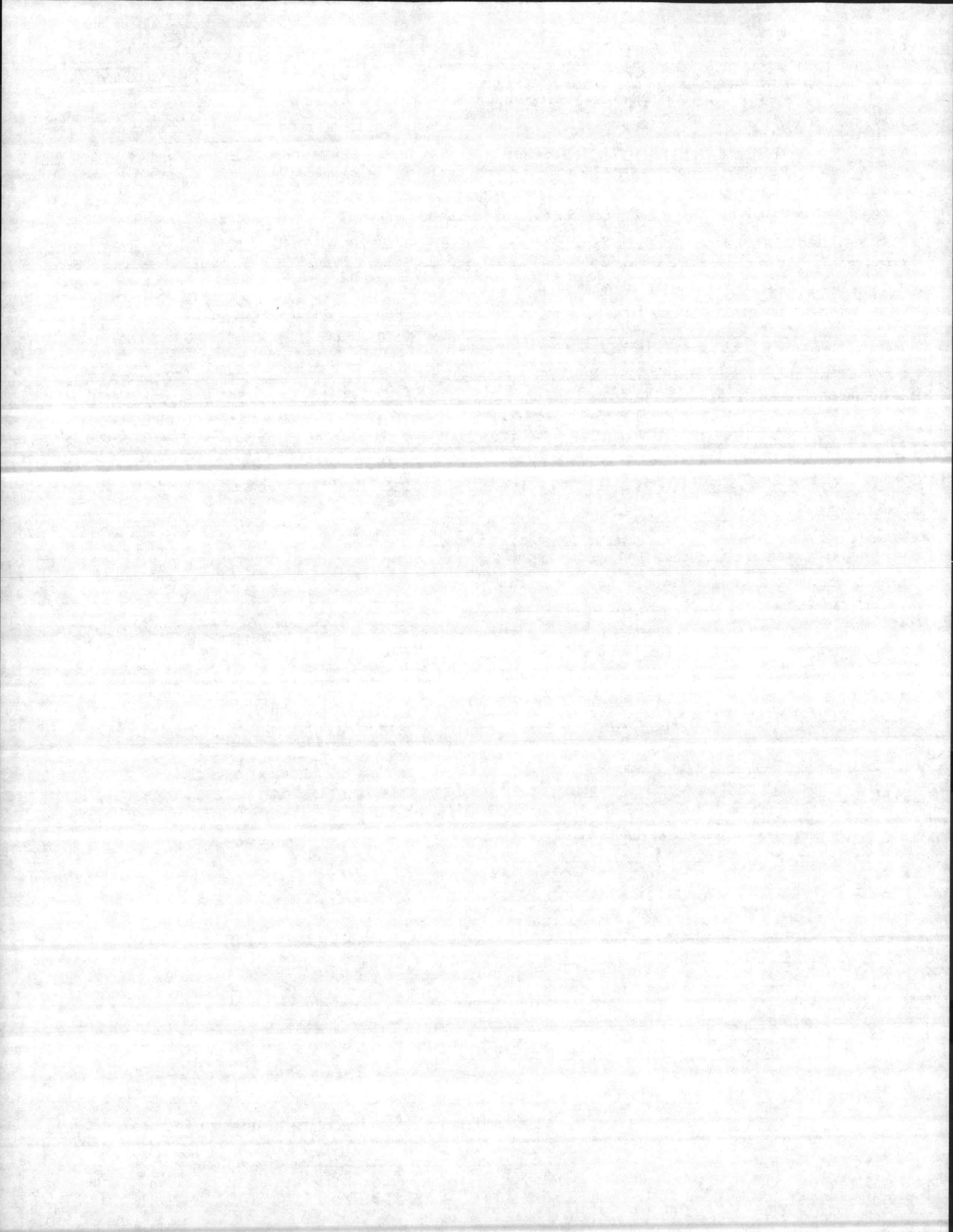
12. SCREEN:  

From	Depth	To	Diameter	Slot Size	Material
	<u>5.0</u>	<u>25.0</u>	<u>2"</u>	<u>0.01 in.</u>	<u>PVC</u>
From _____	To _____	Ft. _____	_____	_____	_____
From _____	To _____	Ft. _____	_____	_____	_____

13. GRAVEL PACK:  

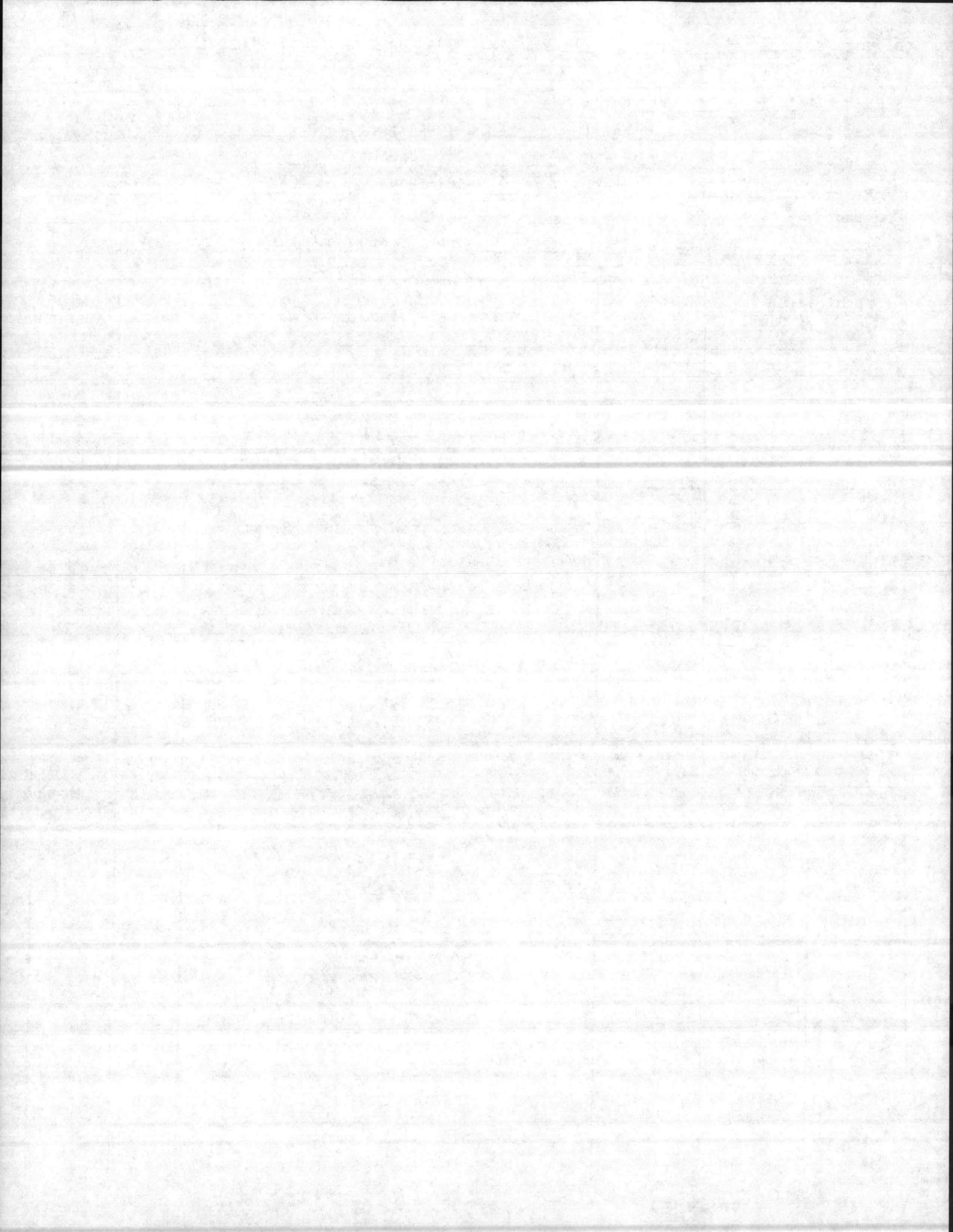
From	Depth	To	Size	Material
	<u>3.0</u>	<u>25'</u>	<u>Coarse</u>	<u>Sand</u>
From _____	To _____	Ft. _____	_____	_____

REMARKS: \_\_\_\_\_  
 I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 75 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.  
 SIGNATURE O: [Signature] DATE 2/11/87  
 Submit original to Division of Environmental Management and copy to well owner.



Boring No. HPGW 12 Location Coordinates N  
 Hole Size 6" Slot 0.01 E  
 Screen Size 2" Mat'l PVC Filter Materials Silica Sand  
 casing Size 2" Mat'l PVC Grout Type Bentonite Pellets  
 Geologist David Brentlinger Development -  
 Date Start 11/18/86 Finish 11/18 Static Water Level 11.70'  
 Contractor ESF Top of Well Elevation 19.20'  
 Driller Davis Drill Type Hollow Stem Auger

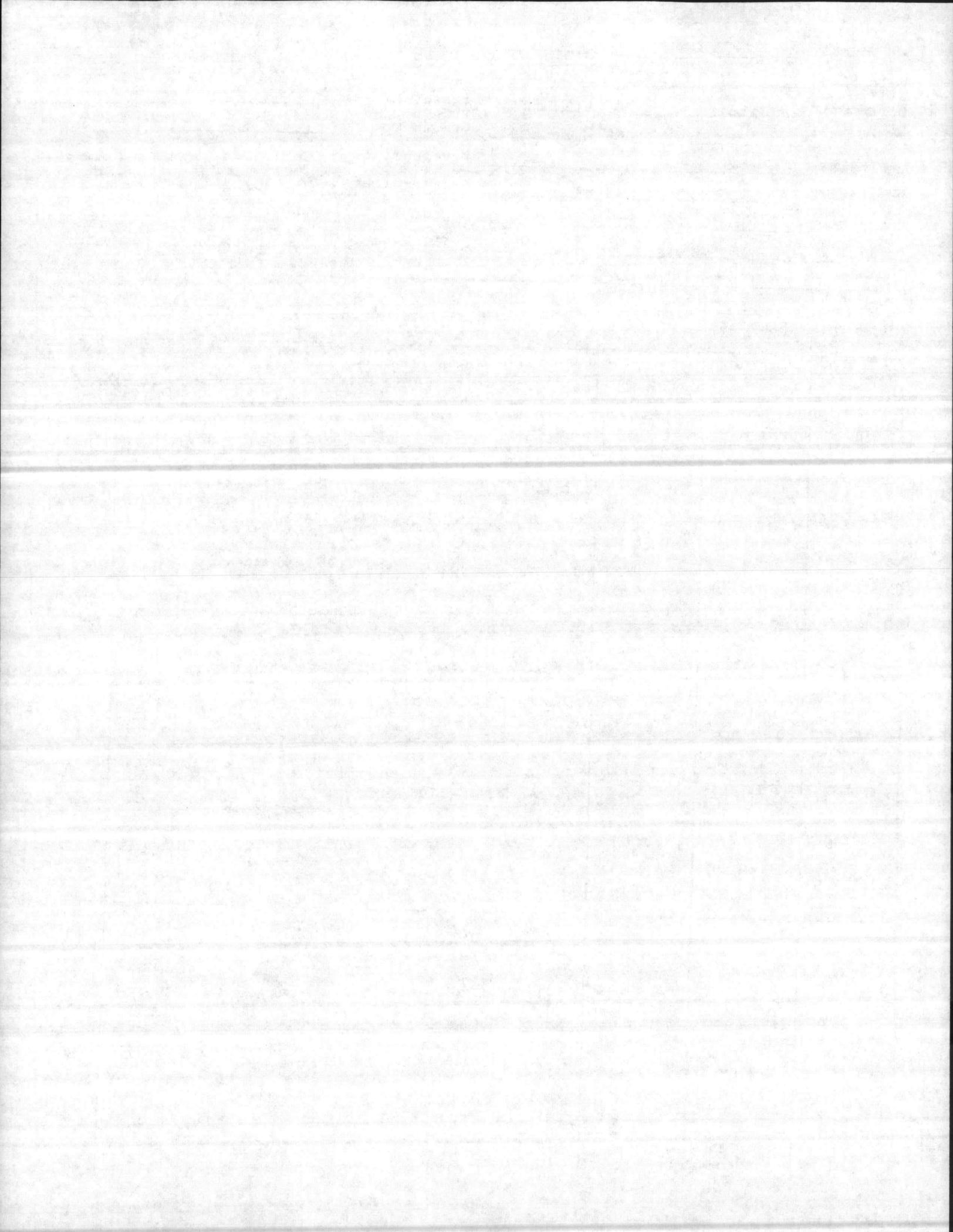
Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0.0-1.5			5Y 3.75/1, very dark grey, silty clayey fine sand, (silt + clay 40%), slightly dense moist, clay plastic	SM SC	3 3 6
1.5-3.0			2.5Y 4.5/4 Brown - light olive brown, silty fine sand with silty clay layers, (silt + clay 20-30%), slightly dense, clay is plastic, moist	SM	3 2 3
3.0-4.5			10YR 7.8/2, white - very pale brown, silty fine sand, (silt 20%), loose, moist, non plastic	SM	3 3 6
4.5-6.0			10YR 7/7.5 very pale brown - yellow, silty fine sand, (silt 20%), bright yellow brown mottles throughout, moist, slightly dense, non plastic	SM	6 8 10
6.0-7.5			10YR 6/8 Brown yellow, silty fine sand, (silt 35%), moist, slightly dense, non plastic	SM	7 7 9



Boring No. HA GW 12  
 Hole Size \_\_\_\_\_ Slot \_\_\_\_\_  
 Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_  
 Casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_  
 Logist \_\_\_\_\_  
 Date Start \_\_\_\_\_ Finish \_\_\_\_\_  
 Contractor \_\_\_\_\_  
 Driller \_\_\_\_\_

Location Coordinates N \_\_\_\_\_  
E \_\_\_\_\_  
 Filter Materials \_\_\_\_\_  
 Grout Type \_\_\_\_\_  
 Development \_\_\_\_\_  
 Static Water Level \_\_\_\_\_  
 Top of Well Elevation \_\_\_\_\_  
 Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
7.5-9.0			Same as above (6.0-7.5)	SM	9 6 7
9.0-10.5			10 YR 7.5/2, Very Pale Brown, Silty Clayey Sand, (silt + clay 45%) Slightly plastic, moist-wet, slight-mod. dense	SM SC	7 3 6
14.0-15.5			10 YR 8/2 white-very pale brown, silty fine-med. sand, (silt 10-15%), 10% iron s. - mottles, sand is wet, mod. dense, non plast.	SW	10 =
19.0-20.5			10 YR 7.25/8, yellow, med. sand with (10-15%) coarse material, loose, wet, non plastic	SW	11 10 6
24.0-24.5			10 YR 8/1 white silty clayey med. sand, (silt + clay layers 25%), 10% coarse sand, wet, clay plastic, mod. dense-dense	SC SW	5 16 7



On Site 135 pm

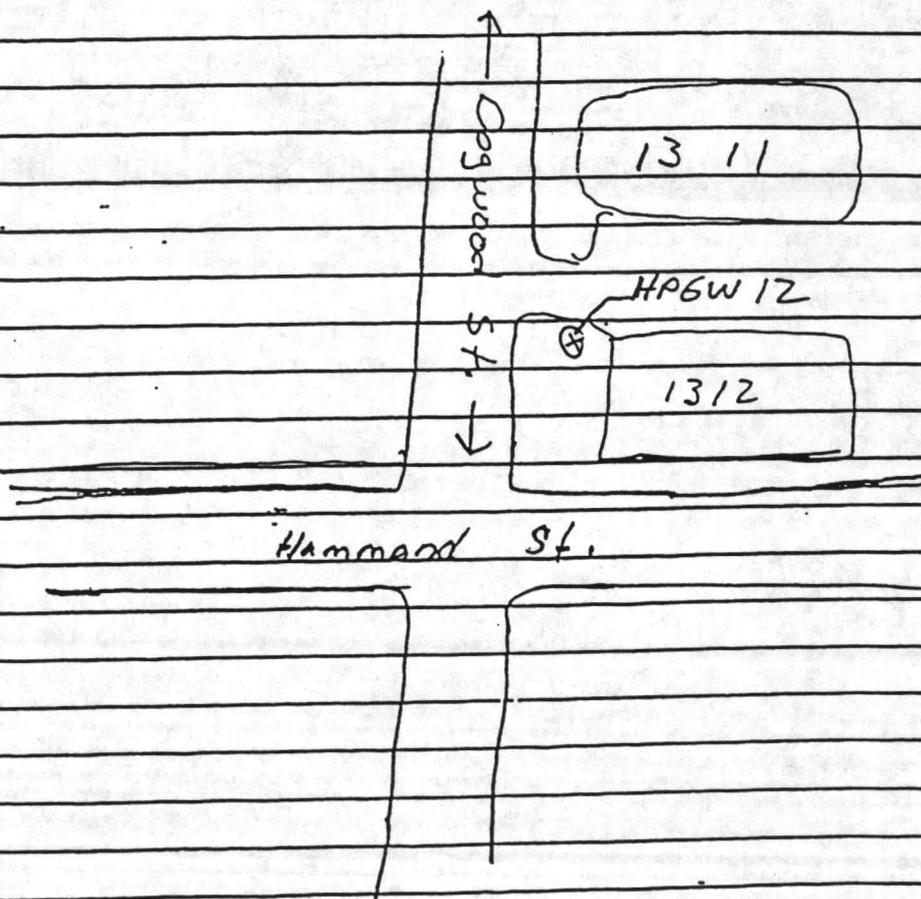
11/18

1st Spoon 140 pm

Last Spoon 230 pm

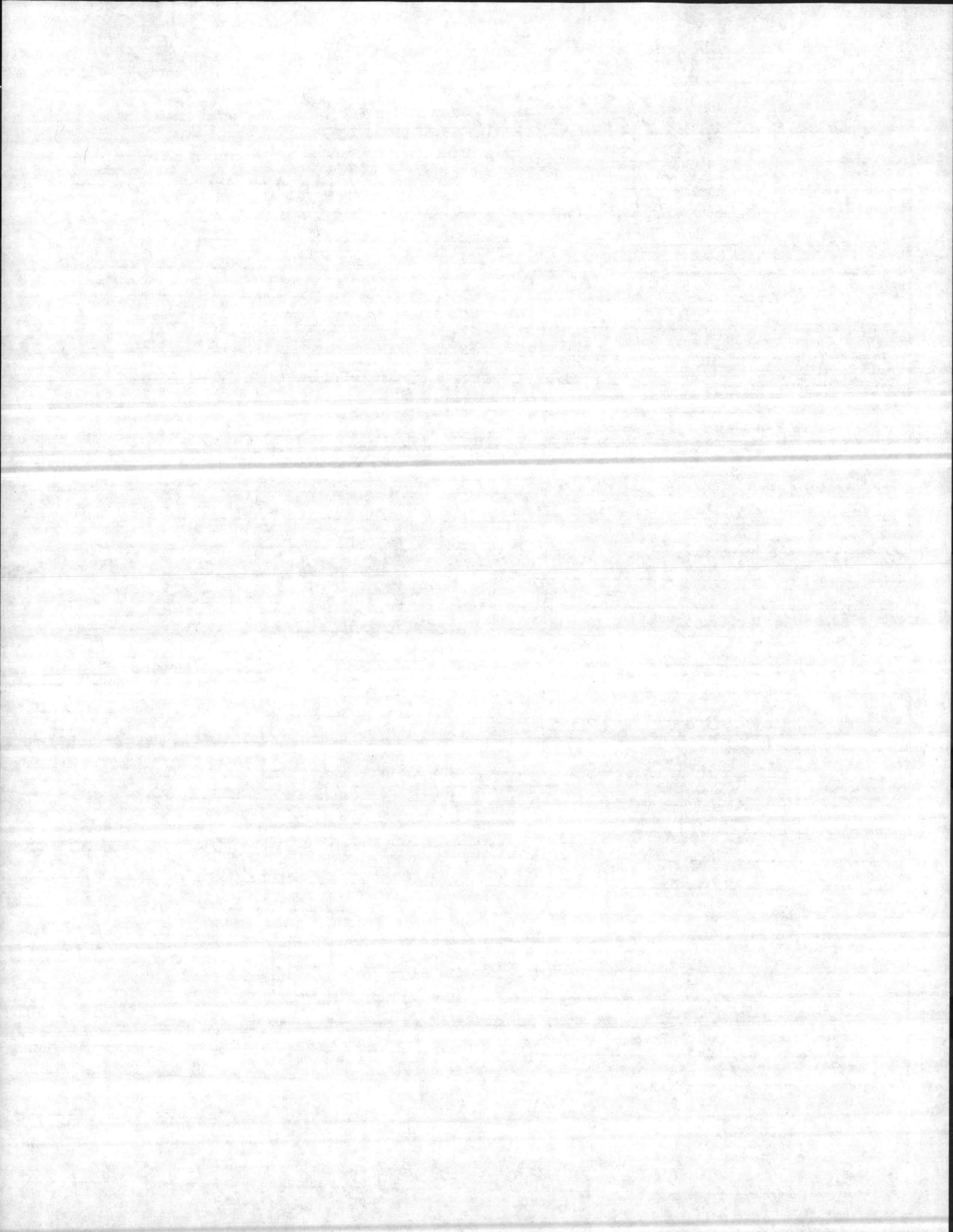
Well Complete 330 pm

Standard Well Specs

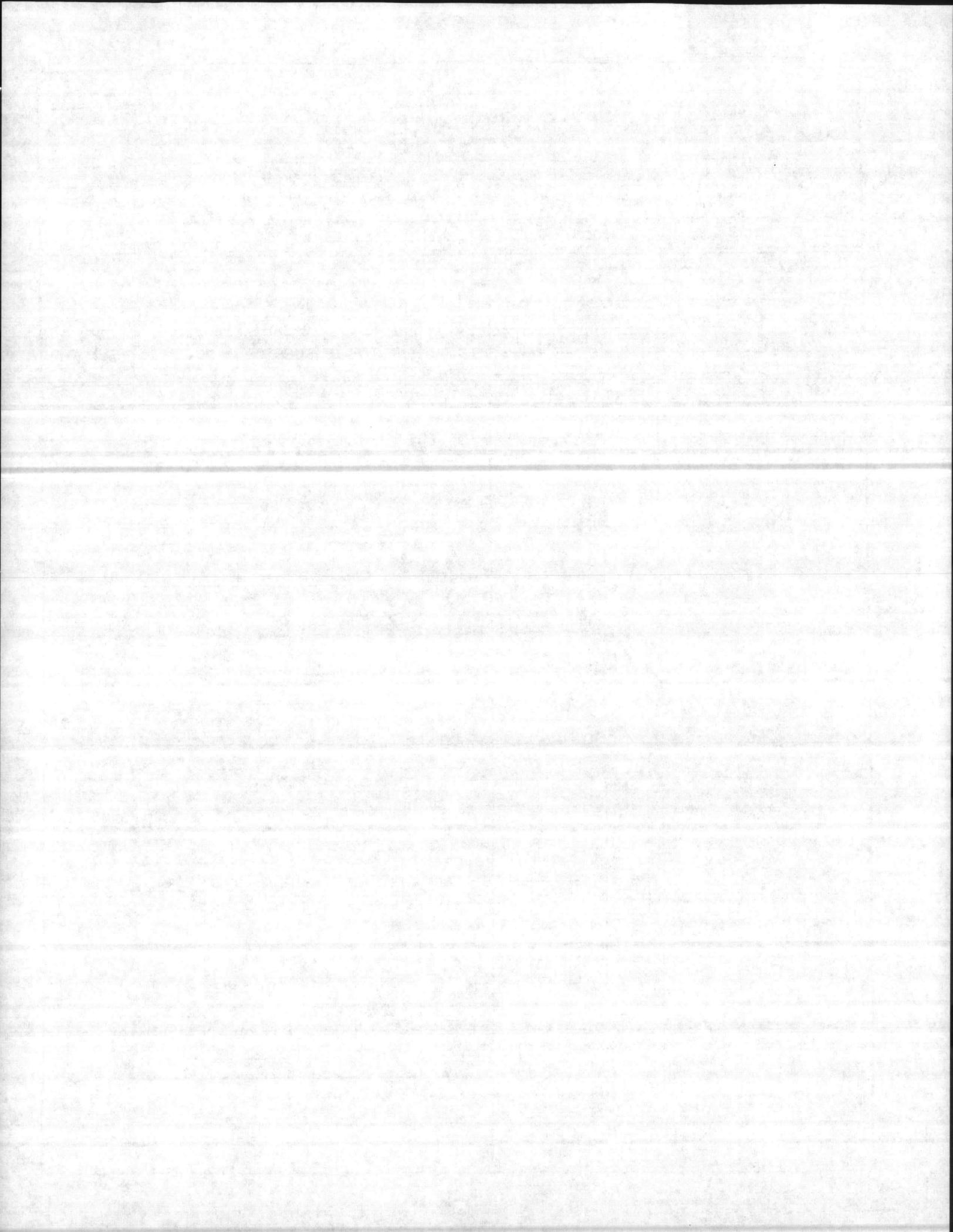


DATE \_\_\_\_\_

SIGNED \_\_\_\_\_







FOR OFFICE USE ONLY

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

**WELL CONSTRUCTION RECORD**

DRILLING CONTRACTOR Davis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 66-035-wm-0141

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

Nearest Town: Jacksonville, N.C. County: \_\_\_\_\_

(Road, Community, or Subdivision and Lot No.)

2. OWNER US Navy  
 ADDRESS Camp LeJeune, N.C.  
 (Street or Route No.) 28542

3. DATE DRILLED 11/18/86 City or Town \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_  
 USE OF WELL monitor

4. TOTAL DEPTH 25.5' CUTTINGS COLLECTED  Yes  No

5. DOES WELL REPLACE EXISTING WELL?  Yes  No

6. STATIC WATER LEVEL: 11.70 FT.  above  below TOP OF CASING.  
 TOP OF CASING IS 2.50 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_

8. WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	Depth	To	Diameter	Wall Thickness or Weight/Ft.	Material
<u>2.5</u>		<u>-5.0</u>	<u>2"</u>	<u>1/8"</u>	<u>PVC</u>
From _____	To _____	Ft. _____	_____	_____	_____
From _____	To _____	Ft. _____	_____	_____	_____

11. GROUT:

From	Depth	To	Material	Method
<u>0.0</u>		<u>-2.0</u>	<u>Concrete</u>	_____
<u>-2.0</u>		<u>-3.0</u>	<u>Clay</u>	_____

12. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
<u>-5.0</u>		<u>-25'</u>	<u>2"</u>	<u>0.01 in.</u>	<u>PVC</u>
From _____	To _____	Ft. _____	_____	_____	_____
From _____	To _____	Ft. _____	_____	_____	_____

13. GRAVEL PACK:

From	Depth	To	Size	Material
<u>-3.0</u>		<u>-25'</u>	<u>Course</u>	<u>Sand</u>
From _____	To _____	Ft. _____	_____	_____

REMARKS: \_\_\_\_\_

Depth	Formation Description
From <u>0.0</u> To <u>1.5</u>	<u>Silty Clayey Fine Sand</u>
<u>1.5</u> - <u>9.0</u>	<u>Silty Fine Sand</u>
<u>9.0</u> - <u>10.5</u>	<u>Silty Clayey Sand</u>
<u>14.0</u> - <u>15.5</u>	<u>Silty Fine-Med. Sand</u>
<u>19.0</u> - <u>20.5</u>	<u>Med-Coarsy Sand</u>
<u>24.0</u> - <u>25.5</u>	<u>Silty Clayey Med. Sand</u>

If additional space is needed use back of form.

LOCATION SKETCH

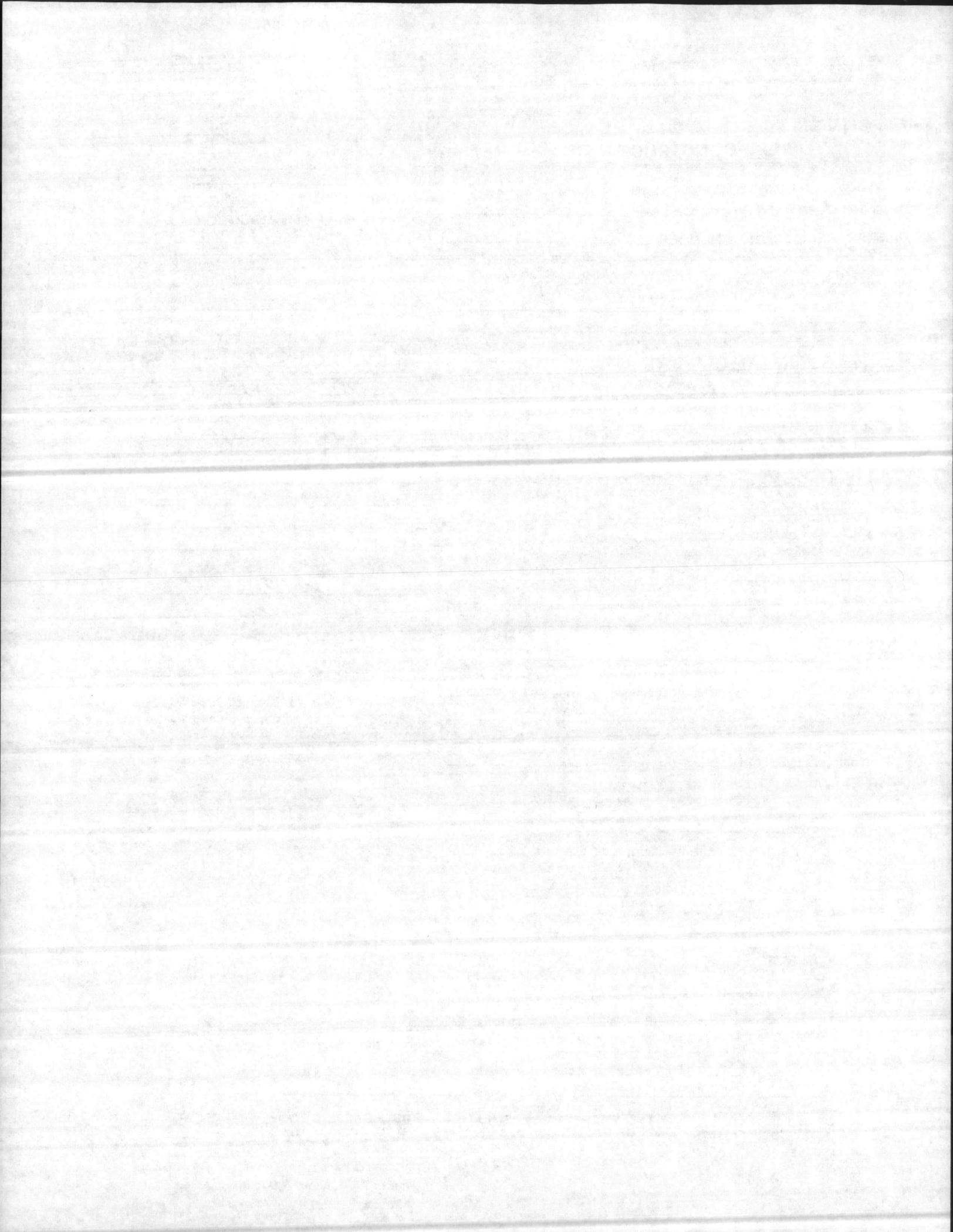
(Show direction and distance from at least two State Roads or other map reference points)

See Fig. (2-5)

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Charles H. Smith 2/11/87  
 SIGNATURE OF CONTRACTOR OR AGENT DATE

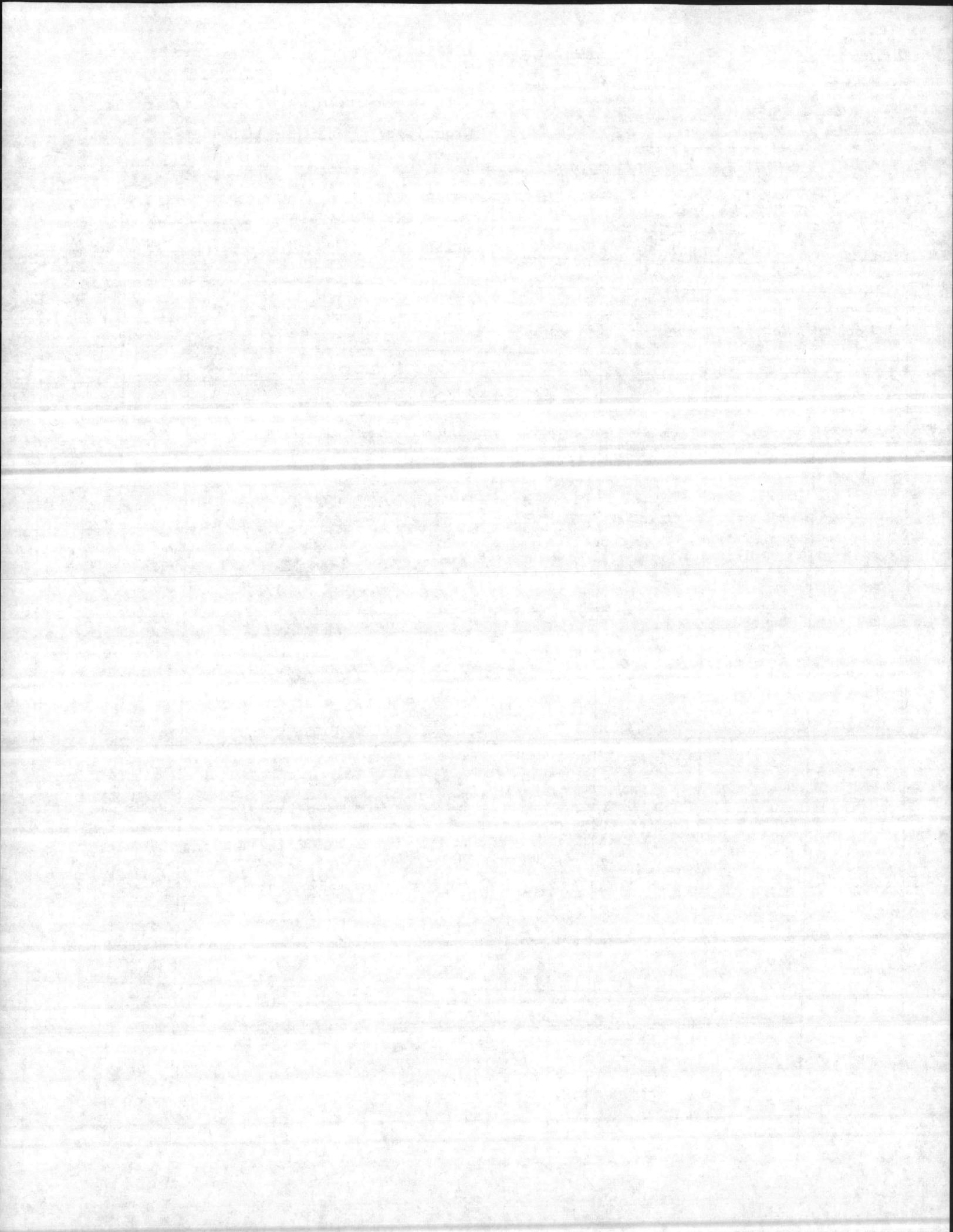
Submit original to Division of Environmental Management and copy to well owner.



Boring No. HPGW 13  
 Hole Size 6" Slot 0.01  
 Screen Size 2" Mat'l PVC  
 Ring Size 2" Mat'l PVC  
 Geologist David Brentlinger  
 Date Start 11/17/86 Finish 11/17  
 Contractor ES&  
 Driller Davis

Location Coordinates N \_\_\_\_\_  
E \_\_\_\_\_  
 Filter Materials Silica Sand  
 Grout Type Bentonite Pellets  
 Development \_\_\_\_\_  
 Static Water Level 12.00  
 Top of Well Elevation 14.50'  
 Drill Type Hollow Stem Auger

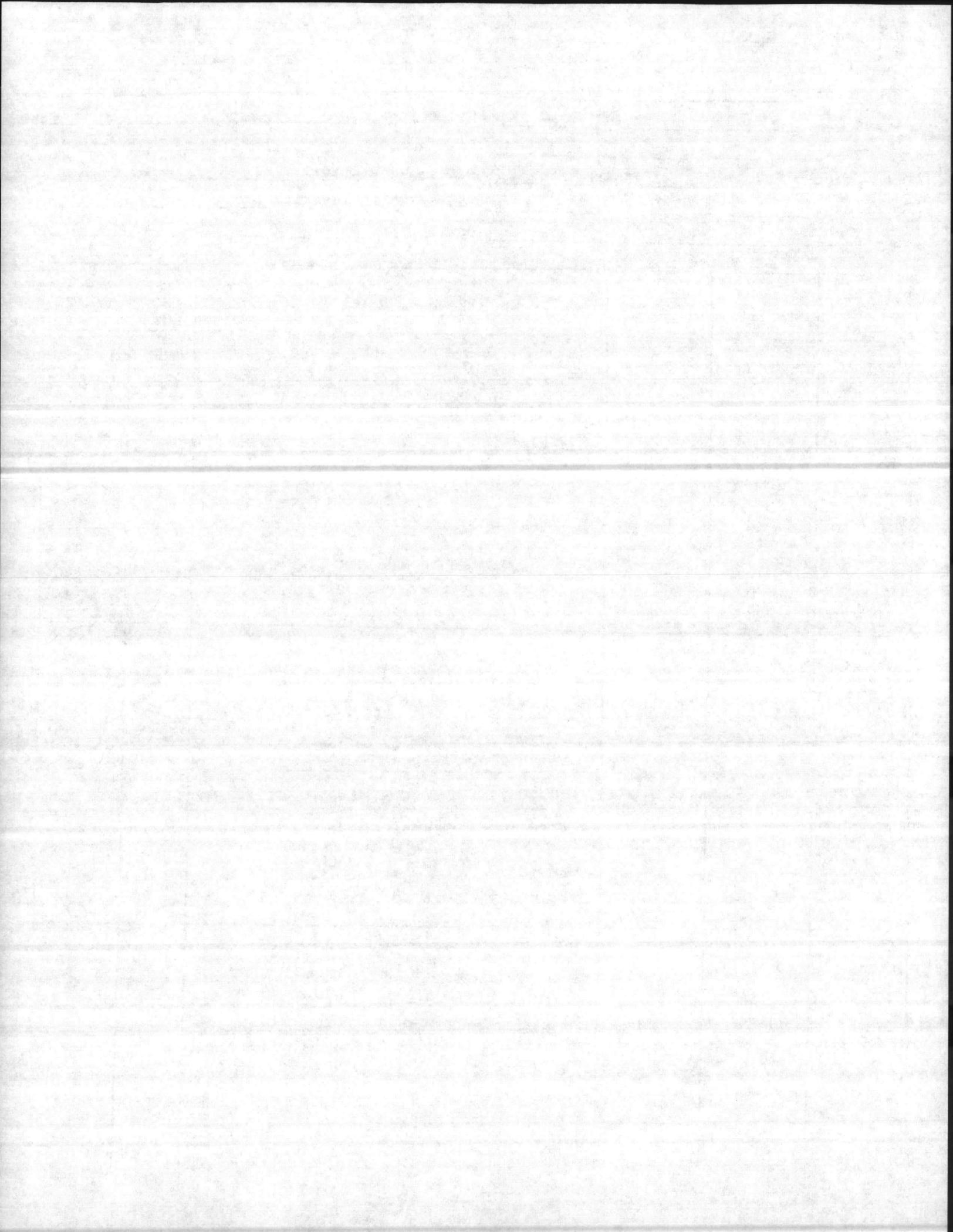
Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0.0-1.5			10YR 5.5/3 Brown-Pale Brown silty fine Sand (silt 30%), organic matter + Gravel fill throughout, 40%) mod. dense, moist, non plastic	SM	4 8 14
1.5-3.0			10YR 3.5/1 very dark grey, silty fine Sand with 10% grey mottles throughout slightly-dense, moist, non plastic	SM	6 4 6
3.0-4.5			5Y 5.5/2 light Olive Grey, silty fine Sandy Clay (silt + sand 45%) slightly plastic, slightly dense, moist	SC	6 3 3
4.5-6.0			2.5Y 5.6/4 light olive yellow Brown with oxide streaks throughout, silty sandy clay (silt + sand 40%) slightly plastic, firm, dense, moist	SC CL	2 3 6
6.0-7.5			2.5Y 5.6/4 light olive yellow Brown, silty Clay (silt 30%) firm + dense, moist, plastic	CL	4 8 6



Boring No. HP GW 13  
 Hole Size \_\_\_\_\_ Slot \_\_\_\_\_  
 Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_  
 Casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_  
 Logist \_\_\_\_\_  
 Date Start \_\_\_\_\_ Finish \_\_\_\_\_  
 Contractor \_\_\_\_\_  
 Driller \_\_\_\_\_

Location Coordinates N \_\_\_\_\_  
E \_\_\_\_\_  
 Filter Materials \_\_\_\_\_  
 Grout Type \_\_\_\_\_  
 Development \_\_\_\_\_  
 Static Water Level \_\_\_\_\_  
 Top of Well Elevation \_\_\_\_\_  
 Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
7.5-9.0			2.5Y 6.5/0, Grey Brown - light grey brown, silty clay same as above (6.0-7.5)	CL	3 3 5
9.0-10.5			2.5Y 6.5/4 pale Yellow - Light Yellow Brown, silty clay same as above (6.0-7.5), less dense	CL	2 2 2
14.0-15.5			10YR 8/3, Very Pale Brown, silty med. Sand, (silt 15-20%), wet, slightly dense, non plastic	SM SW	2 2 4
19.0-20.5			5Y 4.5/1, grey - olive grey (green tint), silty med. Sand, (silt 20%), wet, loose, non plastic	SM SW	2 2 0
24.0-25.5			2.5Y 4.5/0 grey clean medium Sand, wet, loose, non plastic	SW	2 1 4



Boring No. HP GW 13

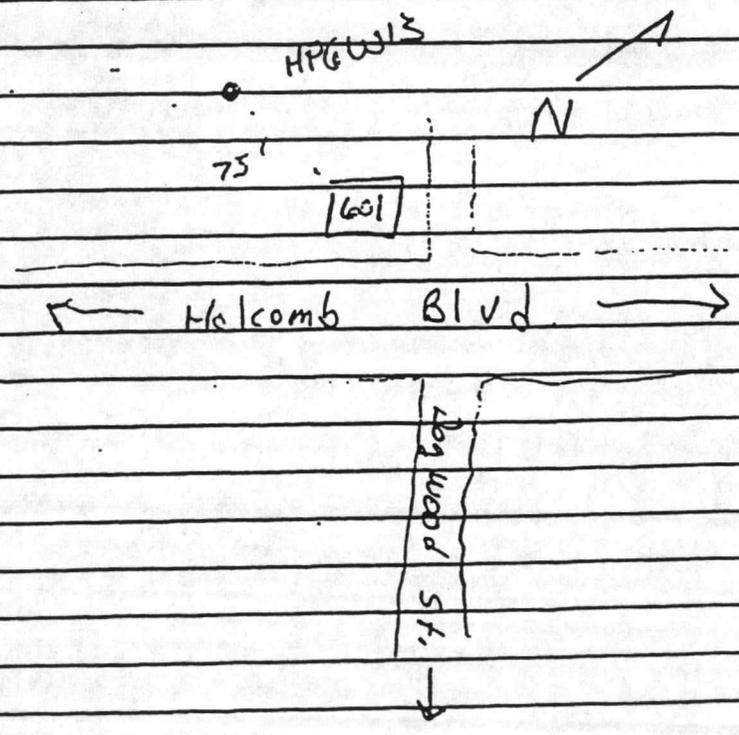
SHEET \_\_\_\_\_ OF \_\_\_\_\_

insite 120 PM

11/17/86

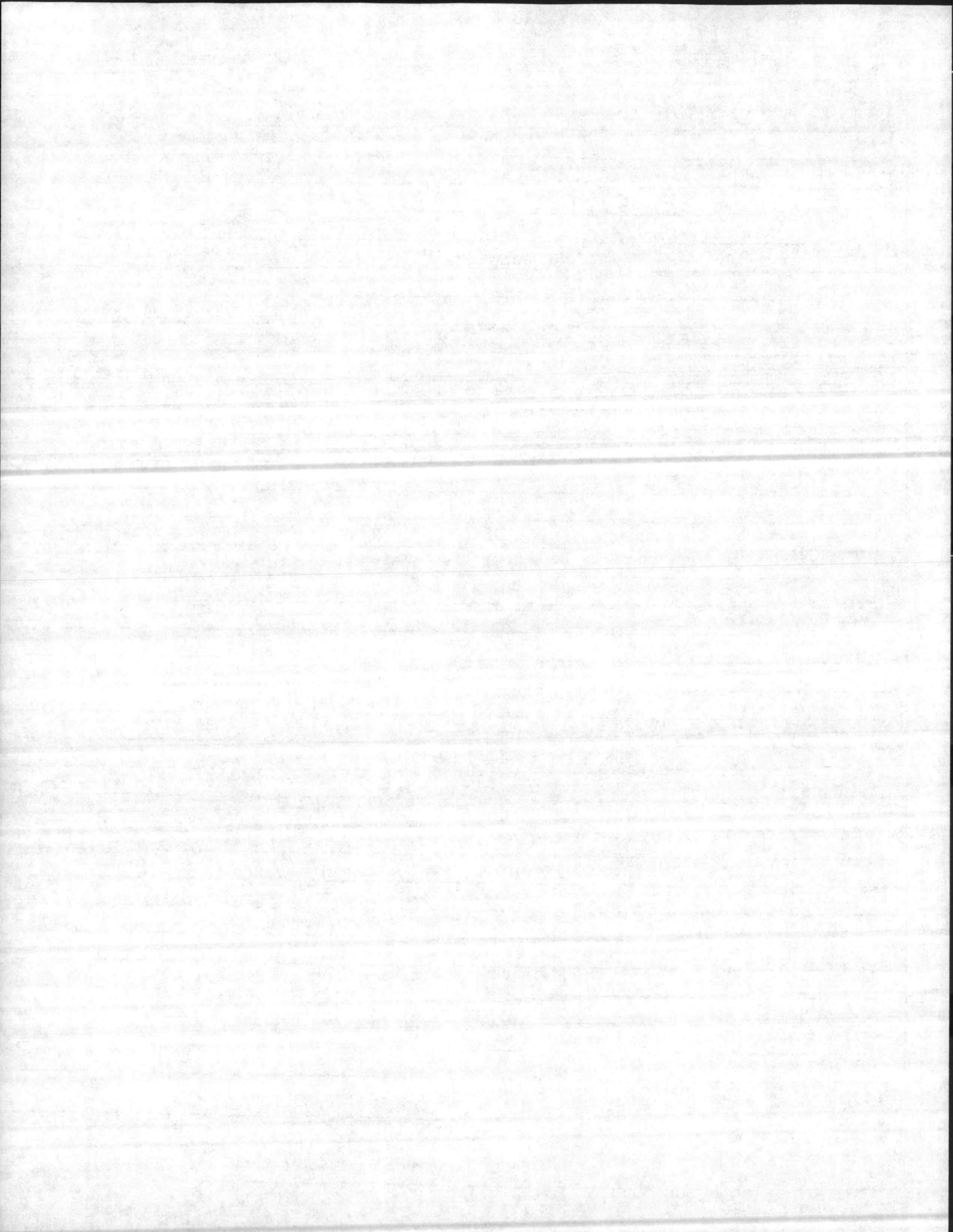
1st Spoon 130  
last Spoon 120  
well Complete 250

Station J Spcc



DATE

SIGNED

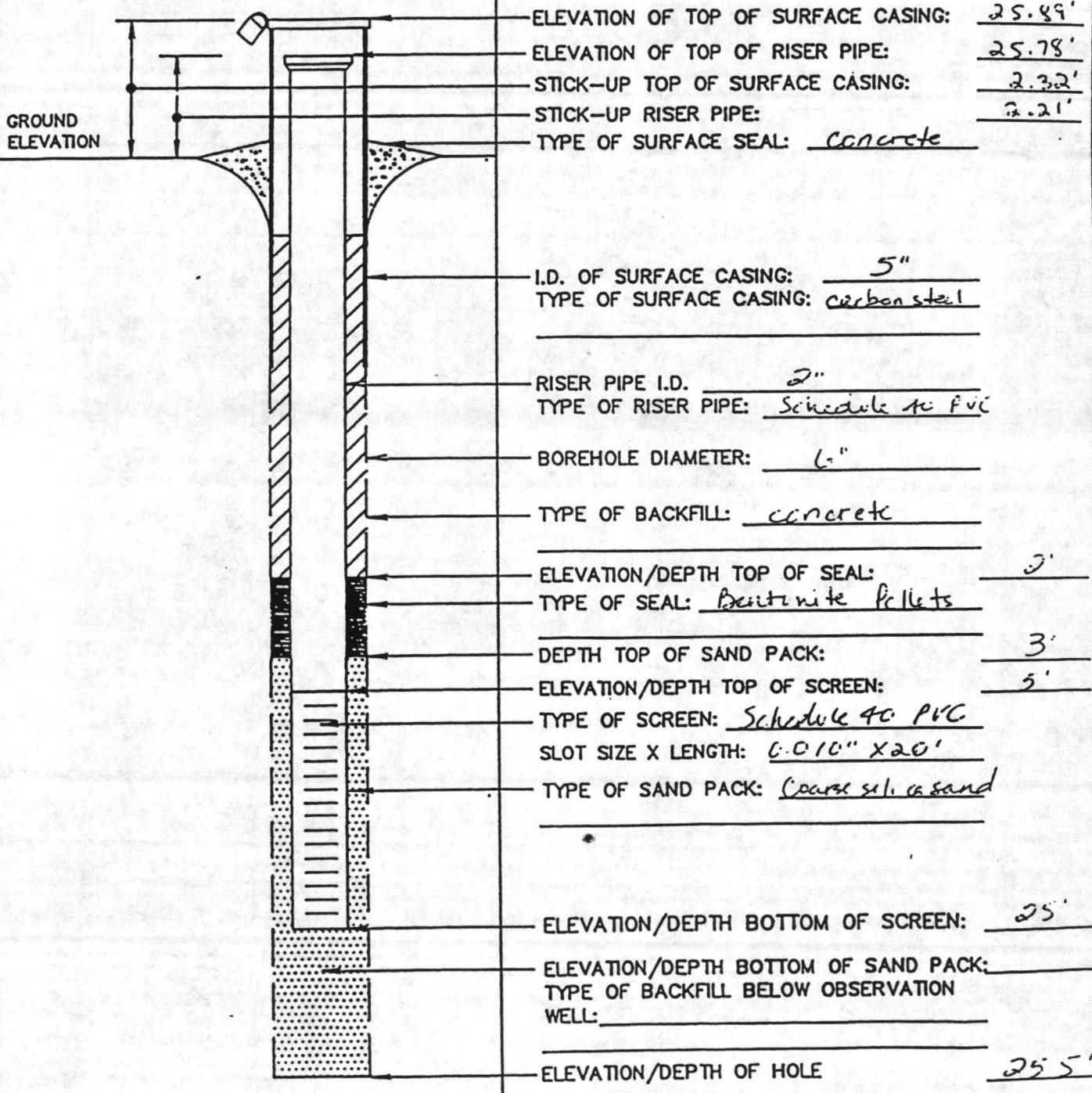


OVERBURDEN  
MONITORING WELL SHEET

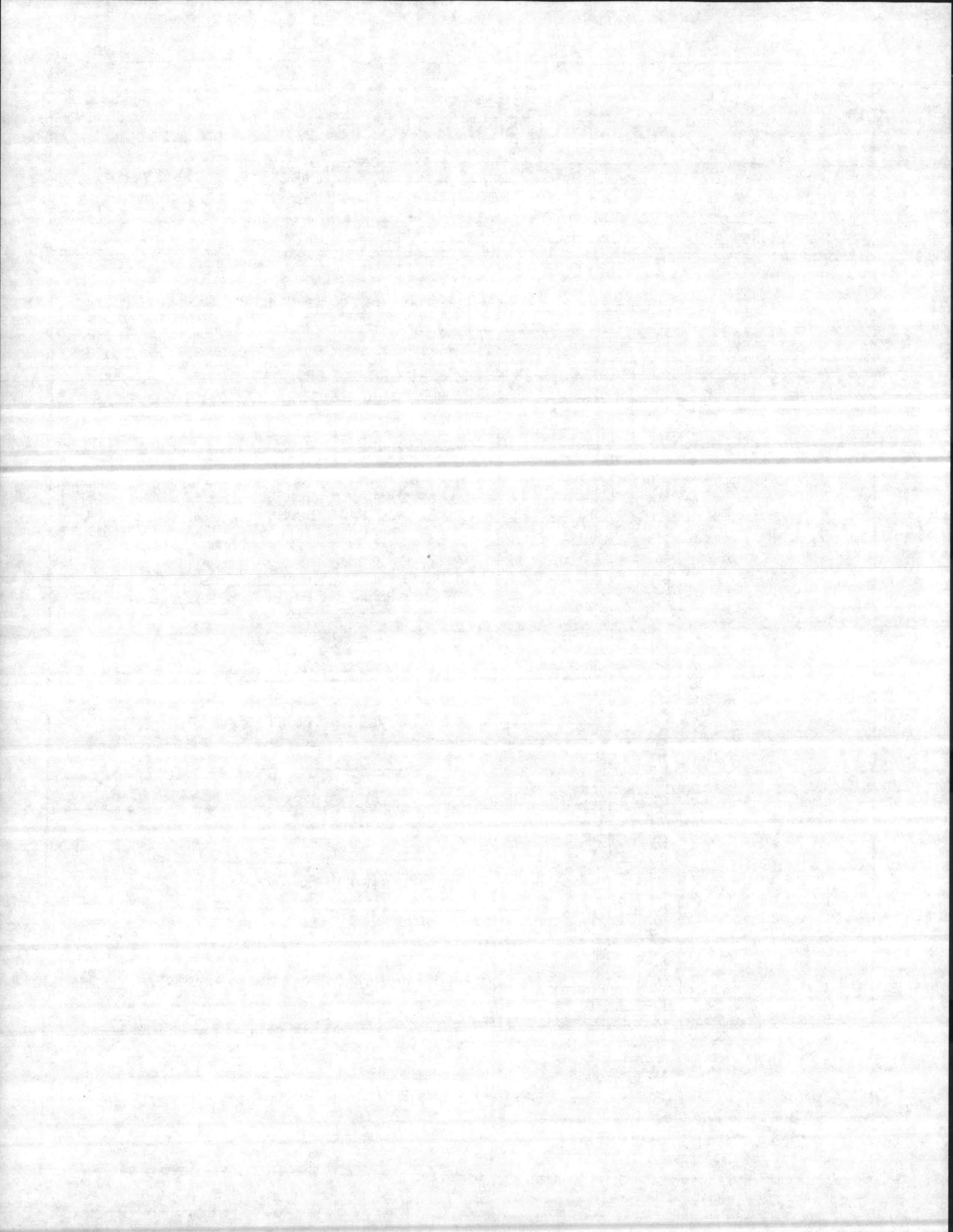
WELL NO. HP-GW13

PROJECT Camp Lejeune - HP1A  
 PROJECT NO. 49-62636 BORING NO. HP-GW13  
 ELEVATION \_\_\_\_\_ DATE 11/17/86  
 FIELD GEOLOGIST David Breatlinger (ESE)

DRILLER Davis Drilling Co.  
 DRILLING METHOD Hollow Stem Auger  
 DEVELOPMENT METHOD \_\_\_\_\_



NOT TO SCALE



FOR OFFICE USE ONLY

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

**WELL CONSTRUCTION RECORD**

DRILLING CONTRACTOR Davis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 66-0135-wm-014

1. WELL LOCATION: (Show sketch of the location below)  
 Nearest Town: Jacksonville N.C.

County: Onslow

(Road, Community, or Subdivision and Lot No.)

2. OWNER US Navy  
 ADDRESS Camp Lejeune N.C.  
 (Street or Route No.) 28542

Depth		DRILLING LOG
From	To	Formation Description
0.0	3.0	Silty fine sand
3.0	4.5	Silty fine sandy clay
4.5	6.0	Silty sandy clay
6.0	10.5	Silty clay
14.0	15.5	Silty med. sand
19.0	20.5	Silty med. sand
24.0	25.5	med. sand

3. DATE DRILLED 11/17/86 USE OF WELL monitor

4. TOTAL DEPTH 25.5' CUTTINGS COLLECTED  Yes  No

5. DOES WELL REPLACE EXISTING WELL?  Yes  No

6. STATIC WATER LEVEL: 12.00 FT.  above TOP OF CASING,  
 below TOP OF CASING IS 2.50 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_

8. WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	To	Depth	Diameter	Wall Thickness or Weight/Ft.	Material
From	12.5	To	-5.0	Ft. 2"	1/8" Pvc
From	_____	To	_____	Ft. _____	_____
From	_____	To	_____	Ft. _____	_____

If additional space is needed use back of form.  
**LOCATION SKETCH**  
 (Show direction and distance from at least two State Roads, or other map reference points)

11. GROUT:

From	To	Depth	Material	Method	
From	0.0	To	-2.0	Ft. concrete	_____
From	-2.0	To	-3.0	Ft. clay	_____

See fig. (1-5)

12. SCREEN:

From	To	Depth	Diameter	Slot Size	Material
From	-5.0	To	-25'	Ft. 2" in. 0.01 in.	PVC
From	_____	To	_____	Ft. _____ in. _____ in.	_____
From	_____	To	_____	Ft. _____ in. _____ in.	_____

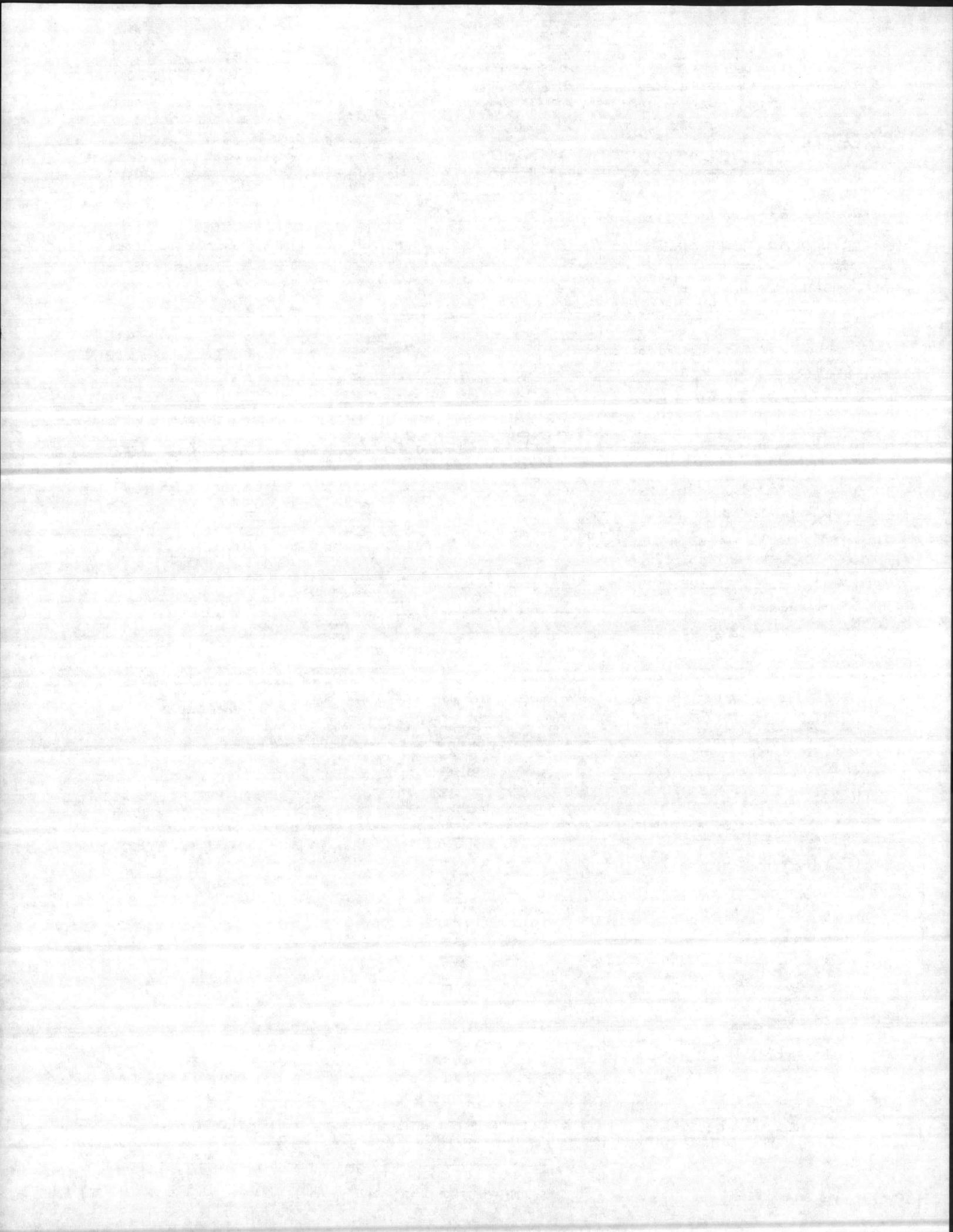
13. GRAVEL PACK:

From	To	Depth	Size	Material
From	-3.0	To	-25'	Ft. coarse sand
From	_____	To	_____	Ft. _____

REMARKS: \_\_\_\_\_

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

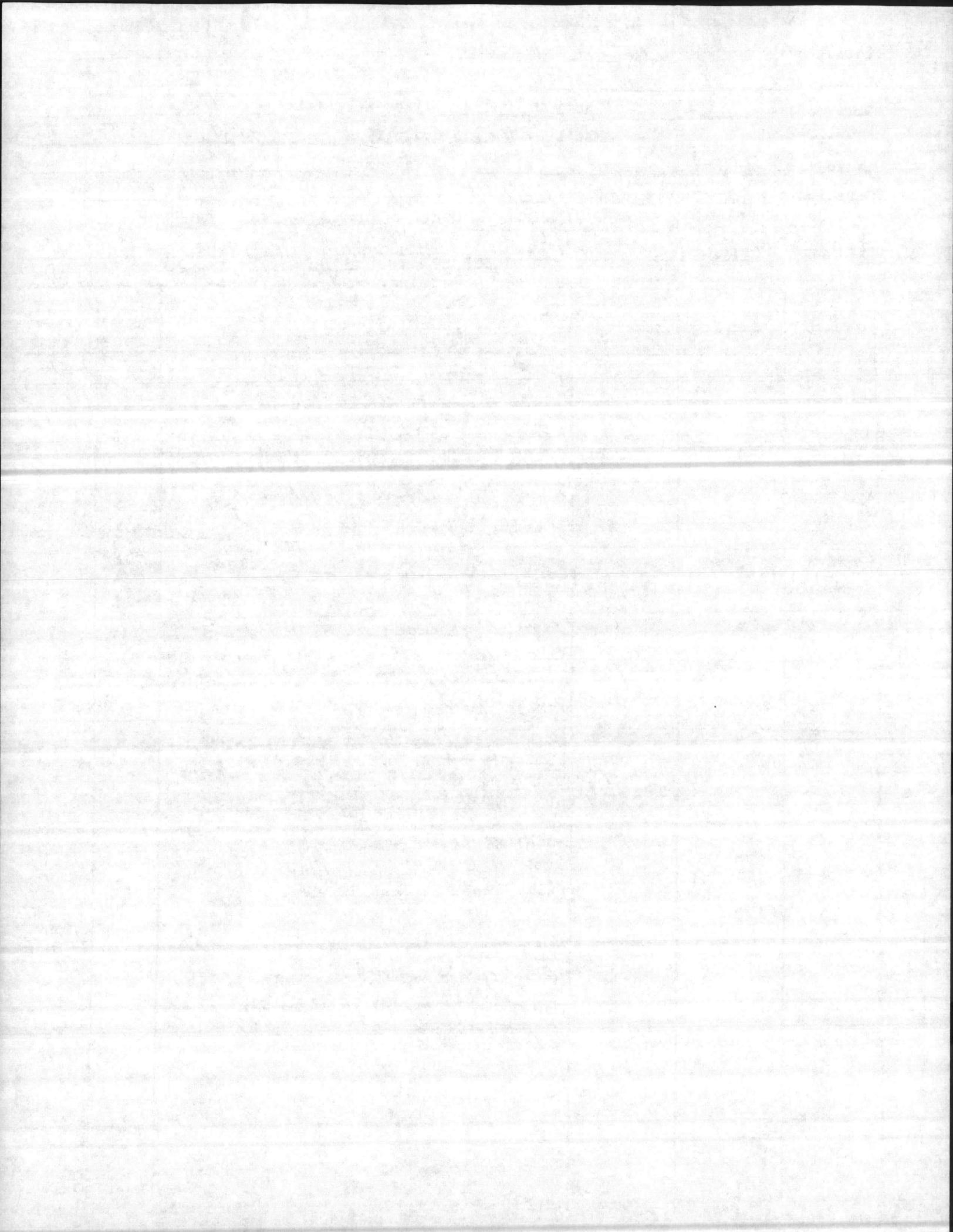
Davis Drilling Co. 2/11/87  
 SIGNATURE OF CONTRACTOR OR AGENT DATE



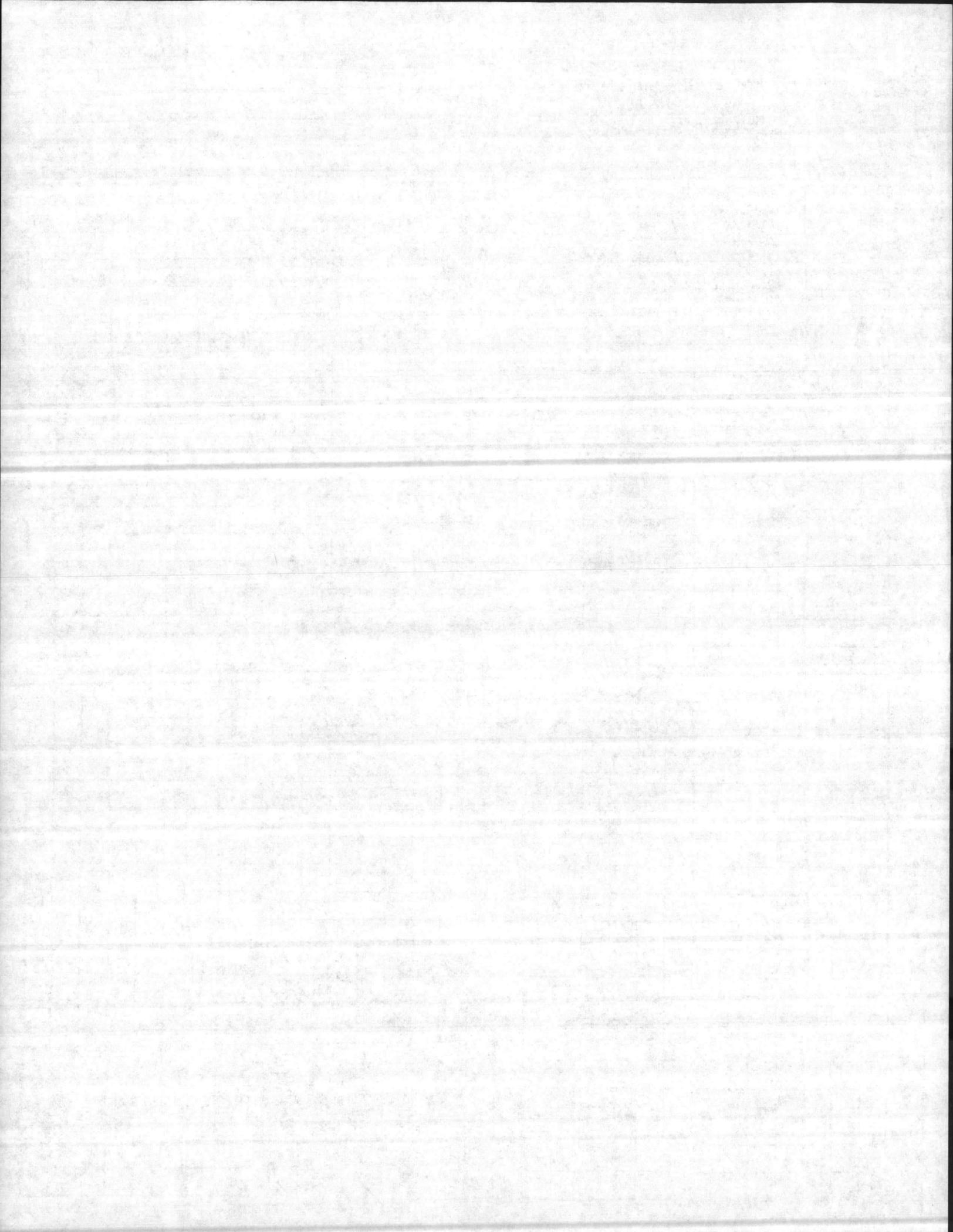
Boring No. HPGW 14 (near Bldg. 1300) Location Coordinates N  
 Hole Size 6" Slot 0.010 E  
 Screen Size 2" Mat'l PVC Filter Materials Silica Sand  
 Casing Size 2" Mat'l PVC Grout Type 1' Bentonite Seal  
 Geologist Paul Canrad Development \_\_\_\_\_  
 Date Start 11/5/86 Finish 11/5/86 Static Water Level 10.81'  
 Contractor Davis Drilling Co. Top of Well Elevation 13.31'  
 Driller Charlie Smith Drill Type Mobile 33.

ATV - Hollow Stem Augers

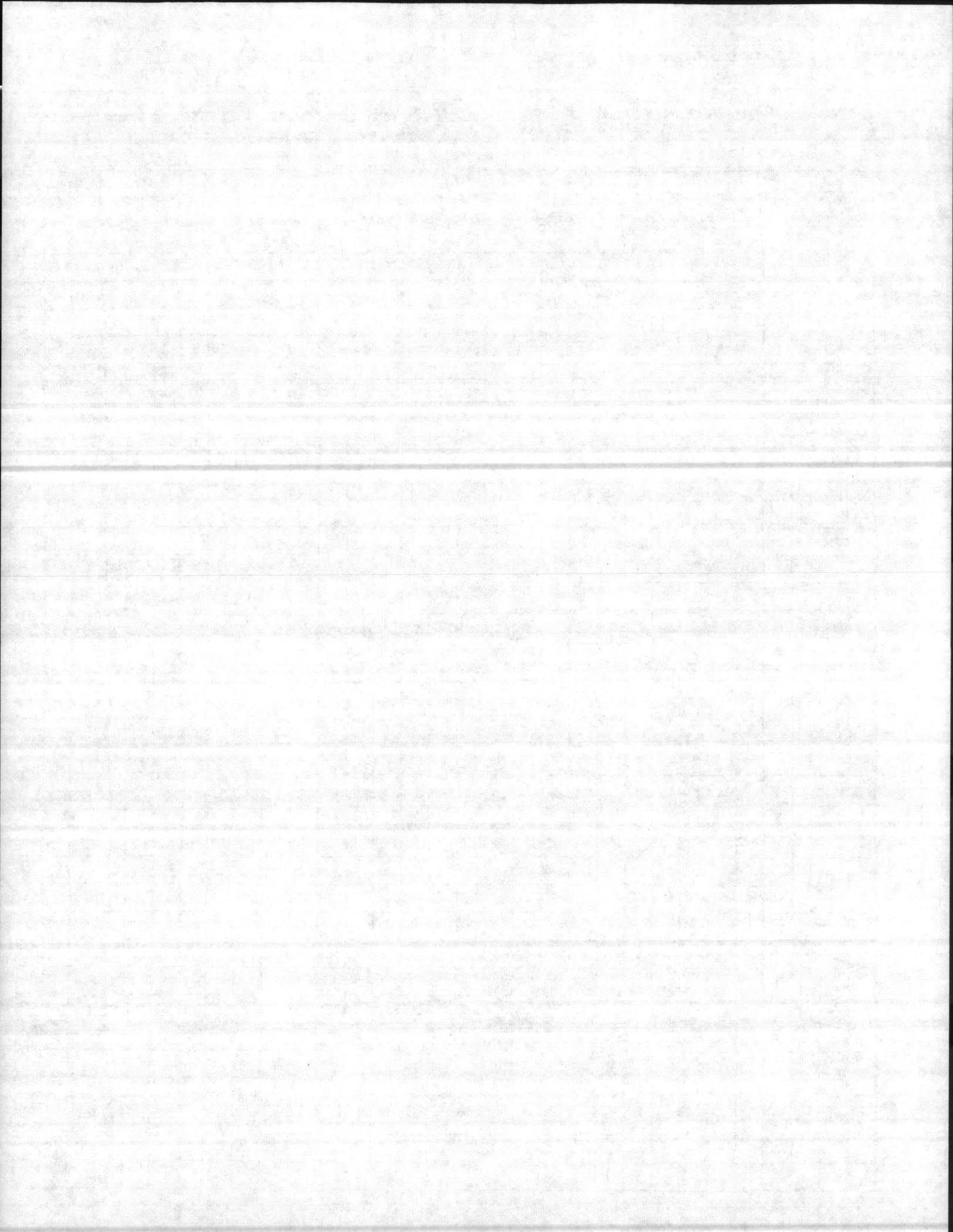
Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0-1.5			Peat, sand 5-10%, silty, roots & org. debris, s. less pt. at 1.5'; color 10 YR 3/1.5 (v. drk brn), mottled w/ 2.5Y 6M (light yllwish brn), med. dense, s. moist, non-plast.	PT	3-4-E
1.5-3			<del>Peat</del> Fine Sandy silt, sand 15-20%, organics ~ 35-40%, some clay (trace), non-plast., s. moist, color 2.5YR 6.5/4 (light yllwish brown) mottled w/ 10 YR 3/1.5 (v. drk brn), loose density.	ML	4-4-3
3-4.5			fine sandy silty clay, sand 15-20%, silt 5-10%, s. moist, low plast., med stiff, color mottled 7.5 YR 5/8 (strong brn) and 10YR 6/4 (light yllwish brn), thin roots encountered.	CL	3-4-3
4.5-6			Fine Sand, silt ~ 3%, clay ~ 3%, unifi' grains, moist, med. dense, color uniform 10 YR 7.5/2 (light gry to white).	SP	4-6-10



Depth (ft)	Lithology / Notes	USCS	SPT (BL/FT)
6-7.5	Silty Fine Sand, silt 25-30%, clay ~ 5%, color mottles from 10YR 8/2 (white) to 10YR 6/8 (brnisk yellow), non-plast, loose, moist.	SM	6-6-4
7.5-9	Clayey Fine Sand, clay 15-20%, moist, loose, non-plast. unless sat'd., color 10YR 7/2 (light gray), s. yellowish mottling.	ML	2-3-3
9-10.5	Fine Sandy Clay, sand 5-10%, silt-trace, plastic, moist, color 10YR 7/2 (light gray) with distinct black lines (5%) halloed by 7.5YR 5/8 (strong brown), soft.	CL	4-3
14-15.5	Peat, ~ 5% fine sand, saturated, s. faint odor, wood fragment (fibrous), non-plast, color 10YR 2/1 (black)	PT	1-0-1







12:30 pm New helper found. Travel to  
w.w.t. to get truck. Washed rig.  
Filled tank.

1:40 pm. Began sampling & drilling. Location  
between two paved roads (asphalt) - grass strip  
8' wide.

2:35 pm Last spoon. Backed out 2 auger sects. (5'  
before pouring silica sand. Casing  
installed.

3:15 All augers out. Poured silica sand. Hydraulic  
fluid running from fitting when mast  
tilted over. Apparently none w/in  
3 feet of hole.

Hole taking much sand. Fluidy drilling  
mud consistency in annulus, probably due  
to in-situ clay. (see comment following)

3:25 Well complete. 5 bags sand  
used (100lb). Bentonite seal in place.  
Sand somewhat suspended in annulus when finished  
Standard construction. but not significant

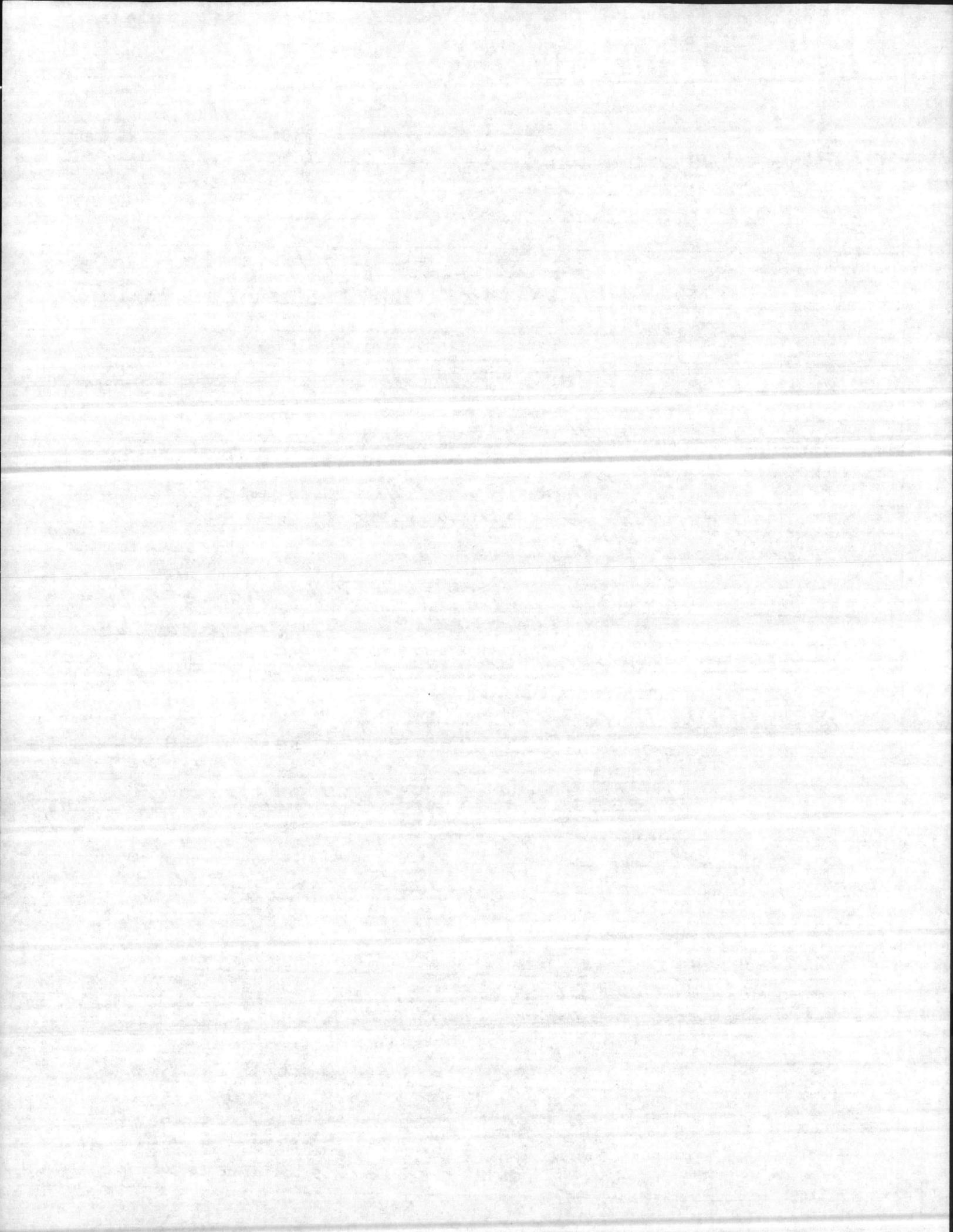
3:30 Began washing rig, etc.

4:00 Traveled back to w.w.t. area. End of day

1/5/86

Paul D. Conrad

SIGNED



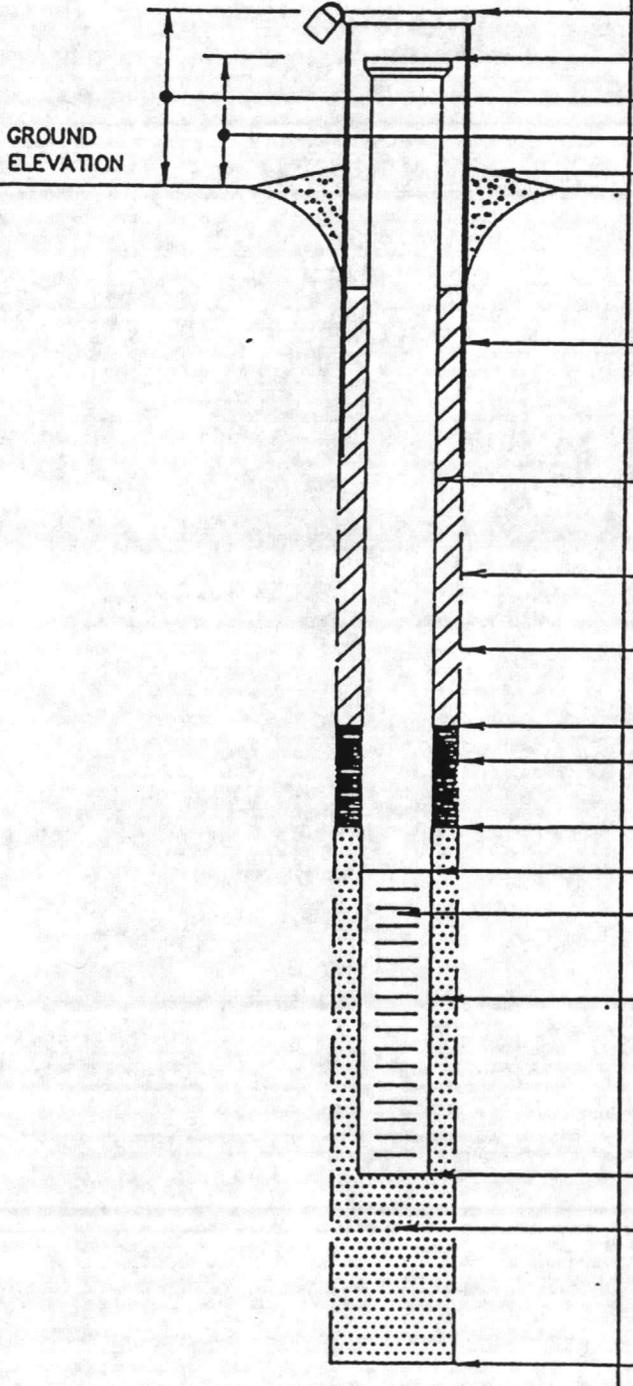
↑

## OVERBURDEN MONITORING WELL SHEET

WELL NO. HP-GW-14

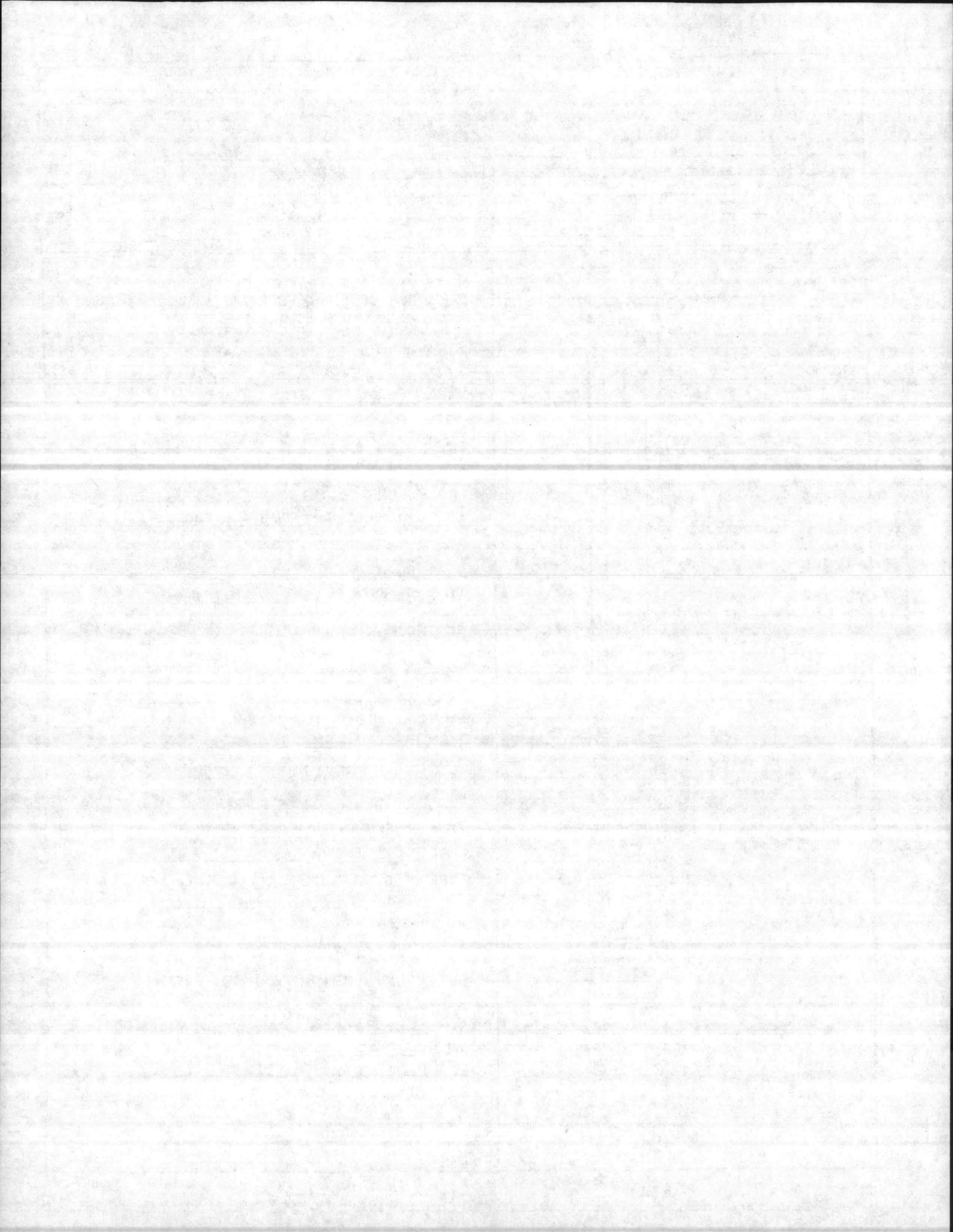
PROJECT Camp Lejeune - HPIA  
 PROJECT NO. H-60136 BORING NO. HP-GW-14  
 ELEVATION \_\_\_\_\_ DATE 11/5/86  
 FIELD GEOLOGIST Paul Conrad (ESE)

DRILLER Deer Drilling Co.  
 DRILLING METHOD Hollow Stem Auger  
 DEVELOPMENT METHOD \_\_\_\_\_



ELEVATION OF TOP OF SURFACE CASING:	<u>27.15'</u>
ELEVATION OF TOP OF RISER PIPE:	<u>26.99'</u>
STICK-UP TOP OF SURFACE CASING:	<u>2.08'</u>
STICK-UP RISER PIPE:	<u>1.92'</u>
TYPE OF SURFACE SEAL:	<u>concrete</u>
I.D. OF SURFACE CASING:	<u>5"</u>
TYPE OF SURFACE CASING:	<u>carbon steel</u>
RISER PIPE I.D.	<u>2"</u>
TYPE OF RISER PIPE:	<u>Schedule 40 PVC</u>
BOREHOLE DIAMETER:	<u>6"</u>
TYPE OF BACKFILL:	<u>concrete</u>
ELEVATION/DEPTH TOP OF SEAL:	<u>2'</u>
TYPE OF SEAL:	<u>benzotrite</u>
DEPTH TOP OF SAND PACK:	<u>3'</u>
ELEVATION/DEPTH TOP OF SCREEN:	<u>5'</u>
TYPE OF SCREEN:	<u>Schedule 40 PVC</u>
SLOT SIZE X LENGTH:	<u>0.010" x 20'</u>
TYPE OF SAND PACK:	<u>coarse silica sand</u>
ELEVATION/DEPTH BOTTOM OF SCREEN:	<u>25'</u>
ELEVATION/DEPTH BOTTOM OF SAND PACK:	_____
TYPE OF BACKFILL BELOW OBSERVATION WELL:	_____
ELEVATION/DEPTH OF HOLE:	<u>25.5'</u>

NOT TO SCALE



FOR OFFICE USE ONLY

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

**WELL CONSTRUCTION RECORD**

DRILLING CONTRACTOR Davis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 66-0135-WM-0141

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

Nearest Town: Jacksonville, N.C. County: \_\_\_\_\_

(Road, Community, or Subdivision and Lot No.)

2. OWNER US Navy  
 ADDRESS Camp Lejeune NC  
 (Street or Route No.) 28542  
 City or Town \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

3. DATE DRILLED 11/5/86 USE OF WELL Monitor

4. TOTAL DEPTH 25.5' CUTTINGS COLLECTED  Yes  No

5. DOES WELL REPLACE EXISTING WELL?  Yes  No

6. STATIC WATER LEVEL: 10.81 FT.  above TOP OF CASING,  
 TOP OF CASING IS 2.50 FT. ABOVE LAND SURFACE.  below

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_

8. WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	Depth	To	Diameter	Wall Thickness or Weight/Ft.	Material
<u>2.5</u>		<u>5.0</u>	<u>2"</u>	<u>1/8"</u>	<u>PVC</u>
From _____	To _____	Ft. _____	_____	_____	_____
From _____	To _____	Ft. _____	_____	_____	_____

11. GROUT:

From	Depth	To	Material	Method
<u>0.0</u>		<u>2.0</u>	<u>Concrete</u>	_____
<u>-2.0</u>		<u>-3.0</u>	<u>Clay</u>	_____

12. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
<u>-5.0</u>		<u>-25'</u>	<u>2"</u>	<u>0.15 in.</u>	<u>PVC</u>
From _____	To _____	Ft. _____	_____	_____	_____
From _____	To _____	Ft. _____	_____	_____	_____

13. GRAVEL PACK:

From	Depth	To	Size	Material
<u>-3.0</u>		<u>-25'</u>	<u>Course</u>	<u>Sand</u>
From _____	To _____	Ft. _____	_____	_____

REMARKS: \_\_\_\_\_

Depth	DRILLING LOG
From To	Formation Description
<u>0.0 - 1.5</u>	<u>Sandy Silt</u>
<u>1.5 - 3.0</u>	<u>Fine Sandy Silt</u>
<u>3.0 - 4.5</u>	<u>Fine Sandy Silty Clay</u>
<u>4.5 - 6.0</u>	<u>Fine Sand</u>
<u>6.0 - 7.5</u>	<u>Silty Fine Sand</u>
<u>7.5 - 9.0</u>	<u>Clayey Fine Sand</u>
<u>9.0 - 10.5</u>	<u>Fine Sandy Clay</u>
<u>14.0 - 15.5</u>	<u>Red</u>
<u>19.0 - 20.5</u>	<u>Silty Fine Sand</u>
<u>24.0 - 25.5</u>	<u>Clayey Sand</u>

If additional space is needed use back of form.

LOCATION SKETCH

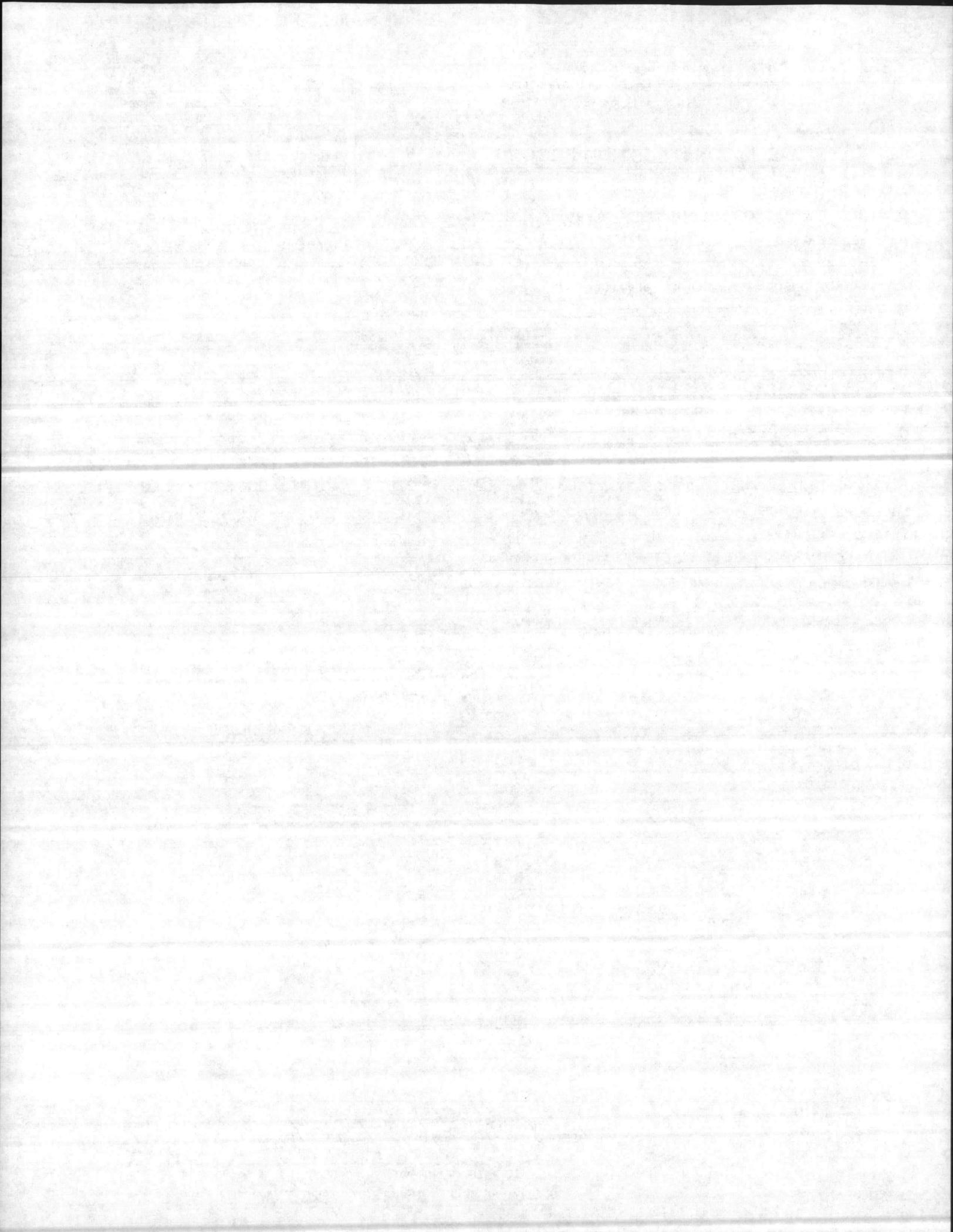
(Show direction and distance from at least two State Roads, or other map reference points)

See Fig. (2-5)

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT

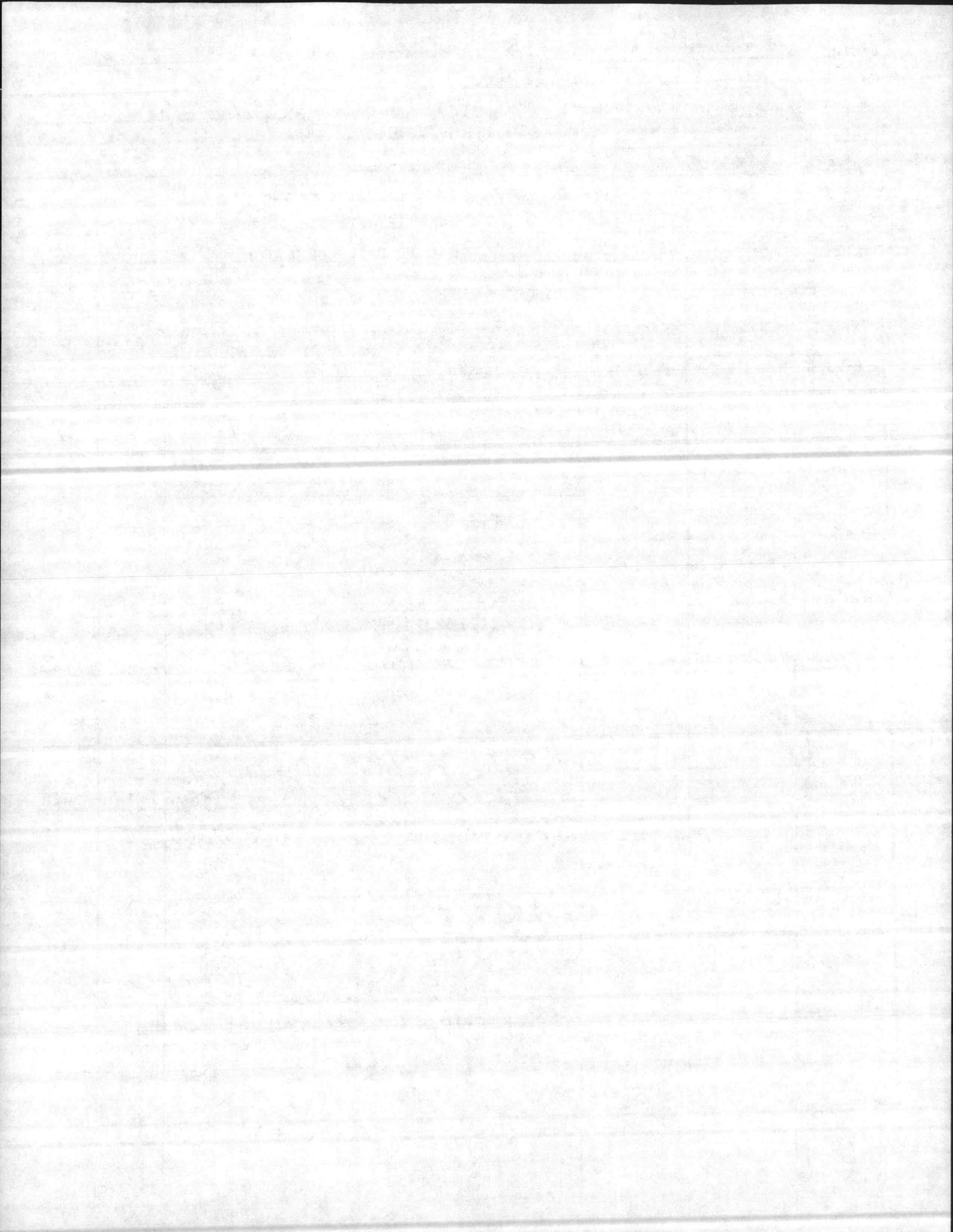
DATE



Boring No. ~~6640~~ 14PGW15  
 Hole Size 6" Slot 0.01  
 Screen Size 2" Mat'l PVC  
 casing Size 2" Mat'l PVC  
 Geologist David Brenlinger  
 Date Start 11/6/86 Finish 11/6  
 Contractor ESE  
 Driller Davis

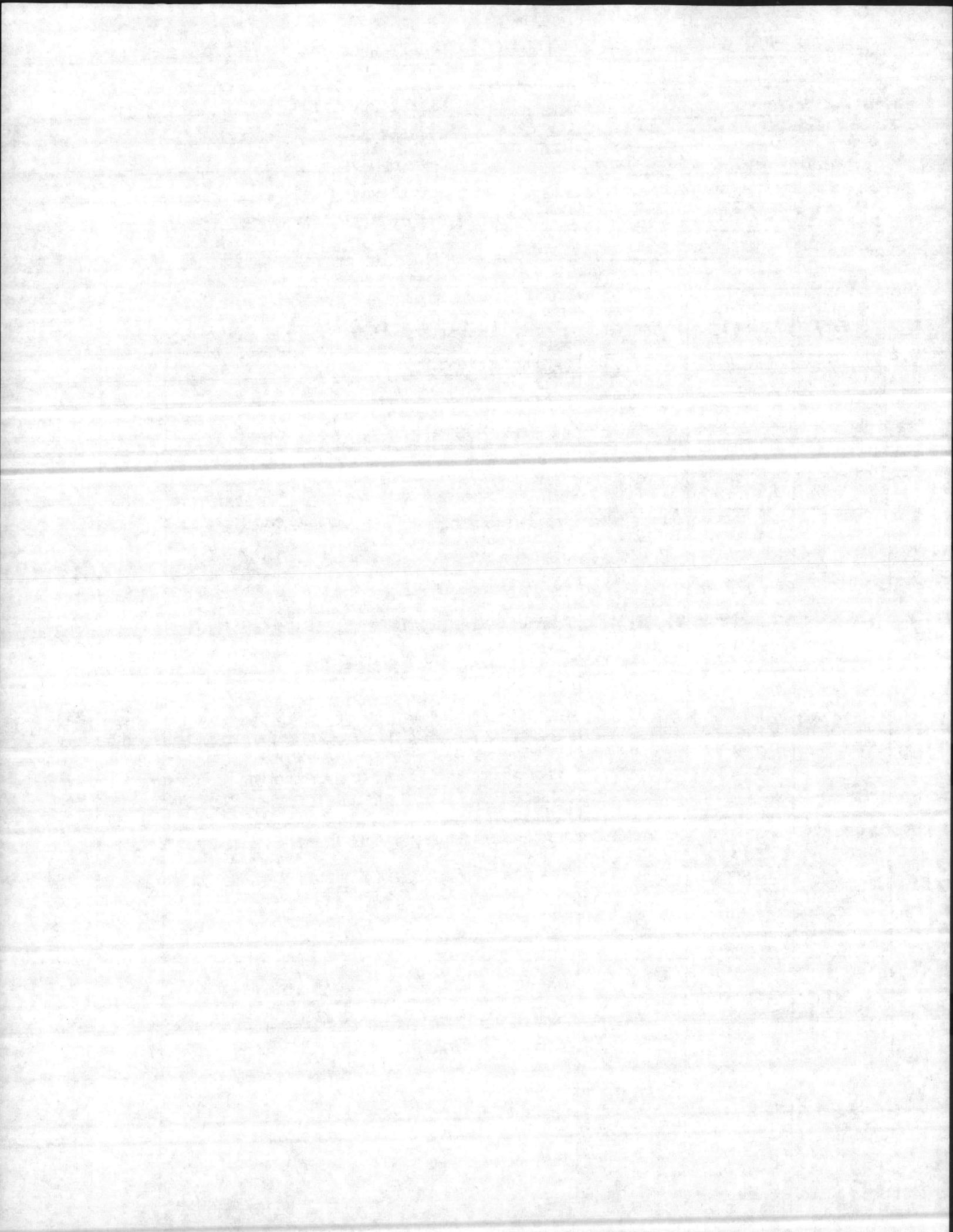
Location Coordinates N \_\_\_\_\_  
 E \_\_\_\_\_  
 Filter Materials Silica Sand  
 Grout Type Bentonite Pellets  
 Development \_\_\_\_\_  
 Static Water Level 12.21'  
 Top of Well Elevation 14.71'  
 Drill Type Hollow Stem Auger

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0.0-1.5		0.0' ↓	Cement - Asphalt		
1.5-3.0		1.9' ↓	Cement - Asphalt		
		1.7-3.0'	10YR 6.5/3 light grey Brown, silty fine sand (30% silt), loose, dry-moist, non plastic	SM	13 22 24
3.0-4.5			2.5Y 6.5/8, olive yellow, silty fine sand, (silt 30%) loose, dry-moist, non plastic	SM	3 6 4
4.5-6.0			10YR 7/8, yellow, silty clayey sand (silt + clay 40%), loose-slightly dense, slightly plastic	SM SC	4 5 5

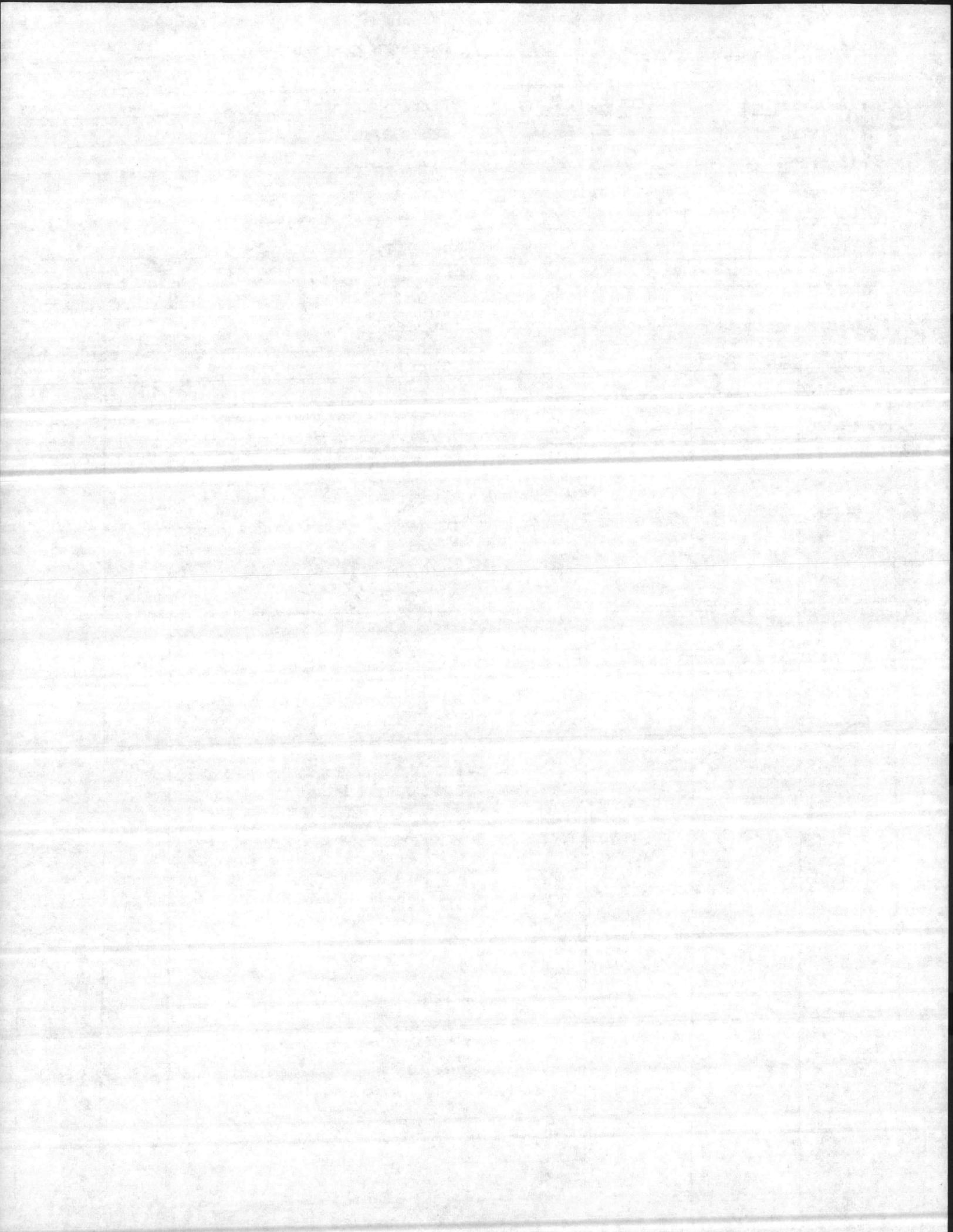


Boring No. 6W 10 HPGW 15 Location Coordinates N  
 Hole Size \_\_\_\_\_ Slot \_\_\_\_\_ E \_\_\_\_\_  
 Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
 casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
 ologist \_\_\_\_\_ Development \_\_\_\_\_  
 Date Start \_\_\_\_\_ Finish \_\_\_\_\_ Static Water Level \_\_\_\_\_  
 Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
 Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
6.0-7.5			104R 7.5/6 yellow - light brown, Silty fine sand (silt 10-15%), loose, moist	SC	6 8 8
7.5-9.0			104R 7.5/8, yellow, silty fine sand (silt 10-15%), clay + silty sand top 6" moist, loose - slightly dense, non plastic	SM	8 8 7
9.0-10.5			2.5Y 7.5/2, light grey - pale yellow, silty fine sand (silt 15-20%), loose, moist - wet, non plastic	SM	8 10 8
14.0-15.5			2.5Y 7.5/2, light grey, ultra fine sand with 30% uncemented clastics, wet, loose, non plastic	SW	0 0 3
19.0-20.5			104R 7.5/1 light grey, silty fine-med. sand, wet, loose, non plastic (silt 10-15%)	SW	0 3 6



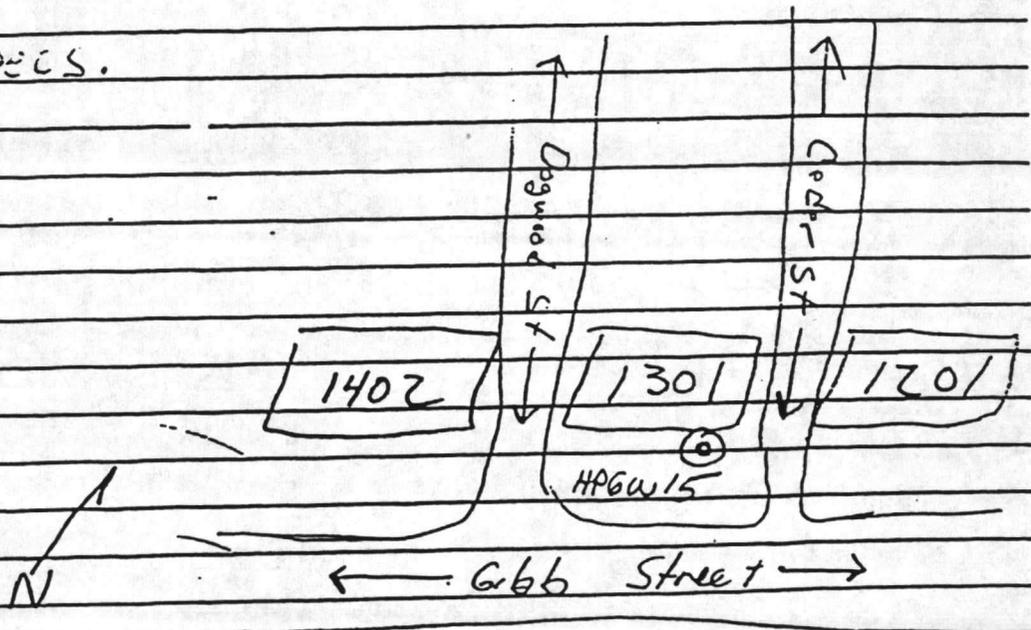




On Site 9:30 AM  
1st Spoon 9:40  
last Spoon 10:40  
Well finished 10:55

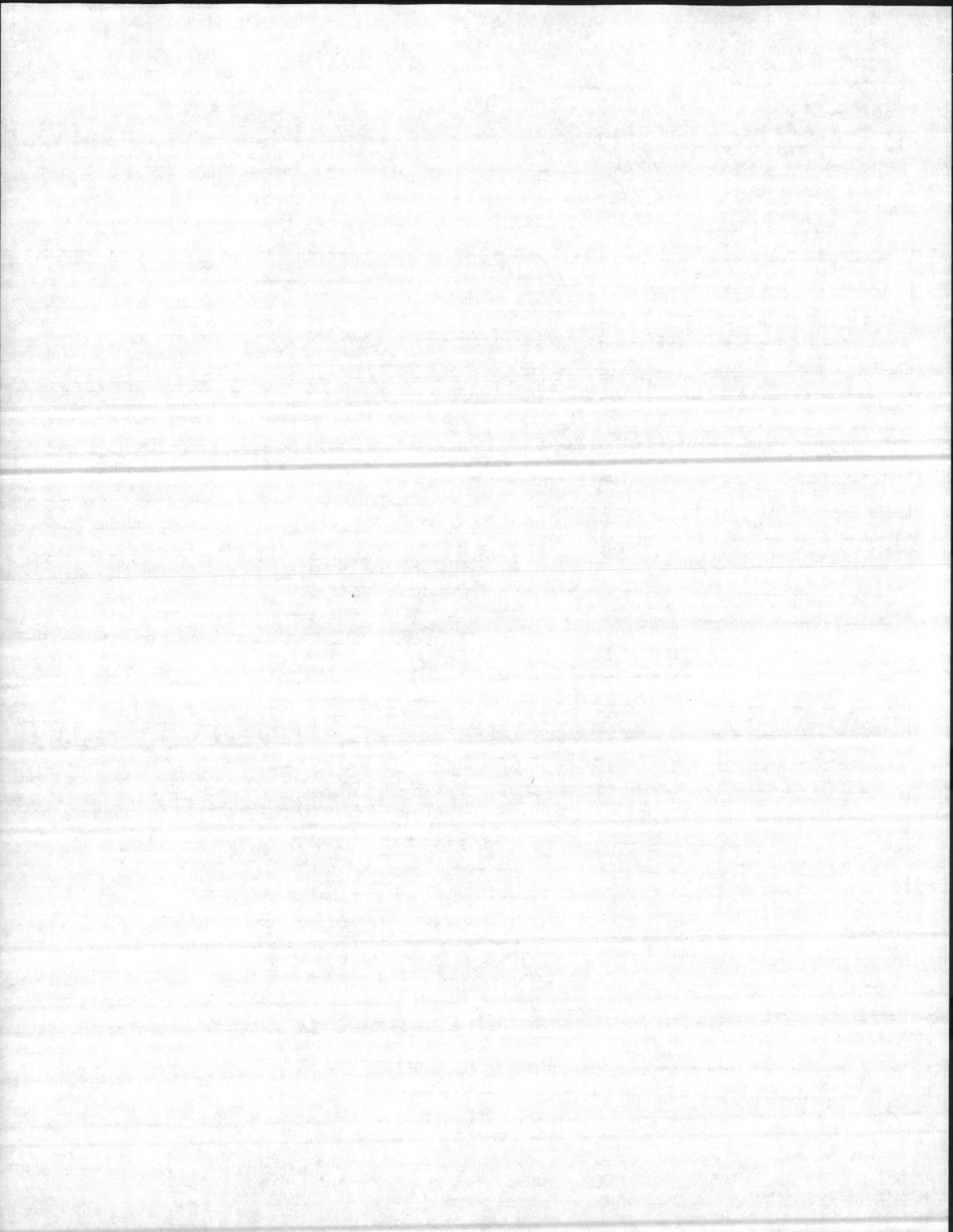
11/6/86

Standard Well Specs.



DATE

SIGNED

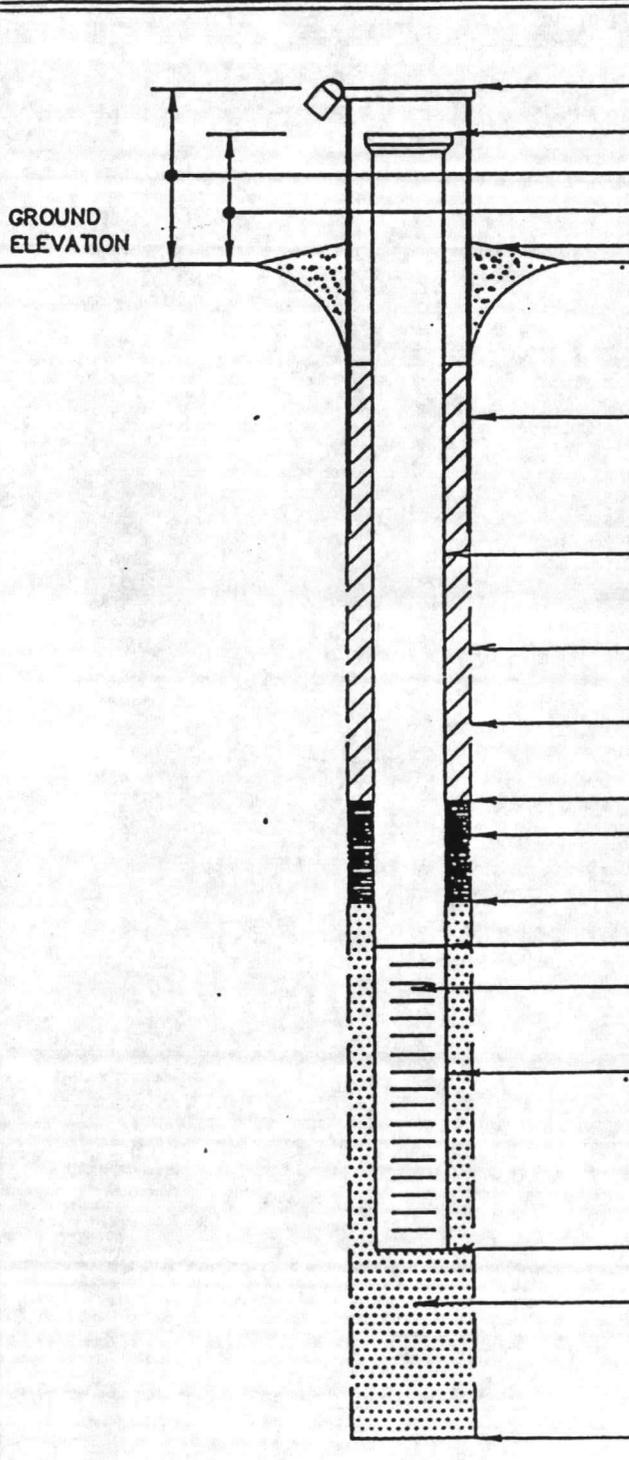


# OVERBURDEN MONITORING WELL SHEET

WELL NO. HP-GW15

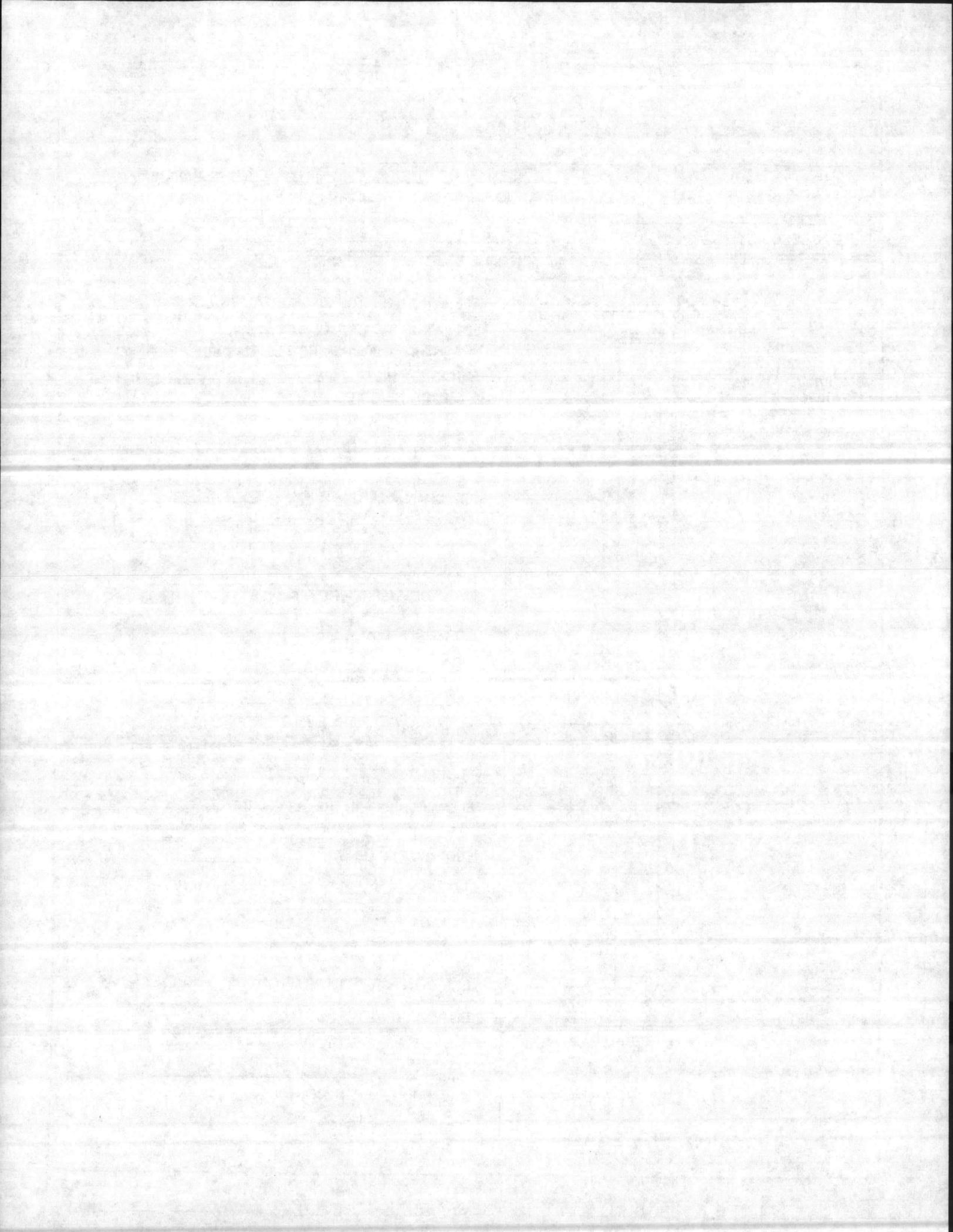
PROJECT Camp Lejeune HP1A  
 PROJECT NO. 19-C-2036 BORING NO. HP-GW15  
 ELEVATION \_\_\_\_\_ DATE 11/6/86  
 FIELD GEOLOGIST David Breatlinger (ESC)

DRILLER Davis Drilling Co.  
 DRILLING METHOD Hollow Stem Auger  
 DEVELOPMENT METHOD \_\_\_\_\_



- ELEVATION OF TOP OF SURFACE CASING: 27.15'
- ELEVATION OF TOP OF RISER PIPE: 26.54'
- STICK-UP TOP OF SURFACE CASING: 0.34'
- STICK-UP RISER PIPE: 0.08'
- TYPE OF SURFACE SEAL: concrete
- I.D. OF SURFACE CASING: 5" (?)
- TYPE OF SURFACE CASING: carbon steel
- RISER PIPE I.D.: 2"
- TYPE OF RISER PIPE: Schedule 40 PVC
- BOREHOLE DIAMETER: 6"
- TYPE OF BACKFILL: concrete
- ELEVATION/DEPTH TOP OF SEAL: 2'
- TYPE OF SEAL: butyrate pellets
- DEPTH TOP OF SAND PACK: 3'
- ELEVATION/DEPTH TOP OF SCREEN: 5'
- TYPE OF SCREEN: Schedule 40 PVC
- SLOT SIZE X LENGTH: 0.610" x 20'
- TYPE OF SAND PACK: coarse silica sand
- ELEVATION/DEPTH BOTTOM OF SCREEN: 25.5'
- ELEVATION/DEPTH BOTTOM OF SAND PACK: \_\_\_\_\_
- TYPE OF BACKFILL BELOW OBSERVATION WELL: \_\_\_\_\_
- ELEVATION/DEPTH OF HOLE: 25.5'

NOT TO SCALE



FOR OFFICE USE ONLY

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

**WELL CONSTRUCTION RECORD**

DRILLING CONTRACTOR Davis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 66-0135 - WM - 014

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

Nearest Town: Jacksonville, N.C.

County: Onslow

(Road, Community, or Subdivision and Lot No.)

2. OWNER US Navy  
 ADDRESS Camp Lejeune N.C.  
 (Street or Route No.) 28542  
 City or Town \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Depth		DRILLING LOG
From	To	Formation Description
0.0	1.9	Road Fill
1.9	4.5	Silty Fine Sand
4.5	6.0	Silty Clayey Sand
6.0	70.5	Silty Fine Sand
14.0	15.5	Ultra Fine Sand
19.0	20.5	Silty Fine-Med. Sand
24.0	25.5	Medium - Coarse Sand

3. DATE DRILLED 10/6/86 USE OF WELL Monitor  
 4. TOTAL DEPTH 25.5 CUTTINGS COLLECTED  Yes  No

5. DOES WELL REPLACE EXISTING WELL?  Yes  No  
 6. STATIC WATER LEVEL: 12.21 FT.  above TOP OF CASING,  
 below TOP OF CASING IS 0.00 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_  
 WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	To	Depth	Diameter	Wall Thickness or Weight/Ft.	Material
0.0	-5.0	Ft.	2"	1/8"	PUC

If additional space is needed use back of form.

LOCATION SKETCH

(Show direction and distance from at least two State Roads, or other map reference points).

11. GROUT:

From	To	Depth	Material	Method
0.0	-2.0	Ft.	Concrete	
-2.0	-3.0	Ft.	Clay	

See Fig. (2-5)

12. SCREEN:

From	To	Depth	Diameter	Slot Size	Material
-5.0	-25'	Ft.	2"	0.01 in.	PUC

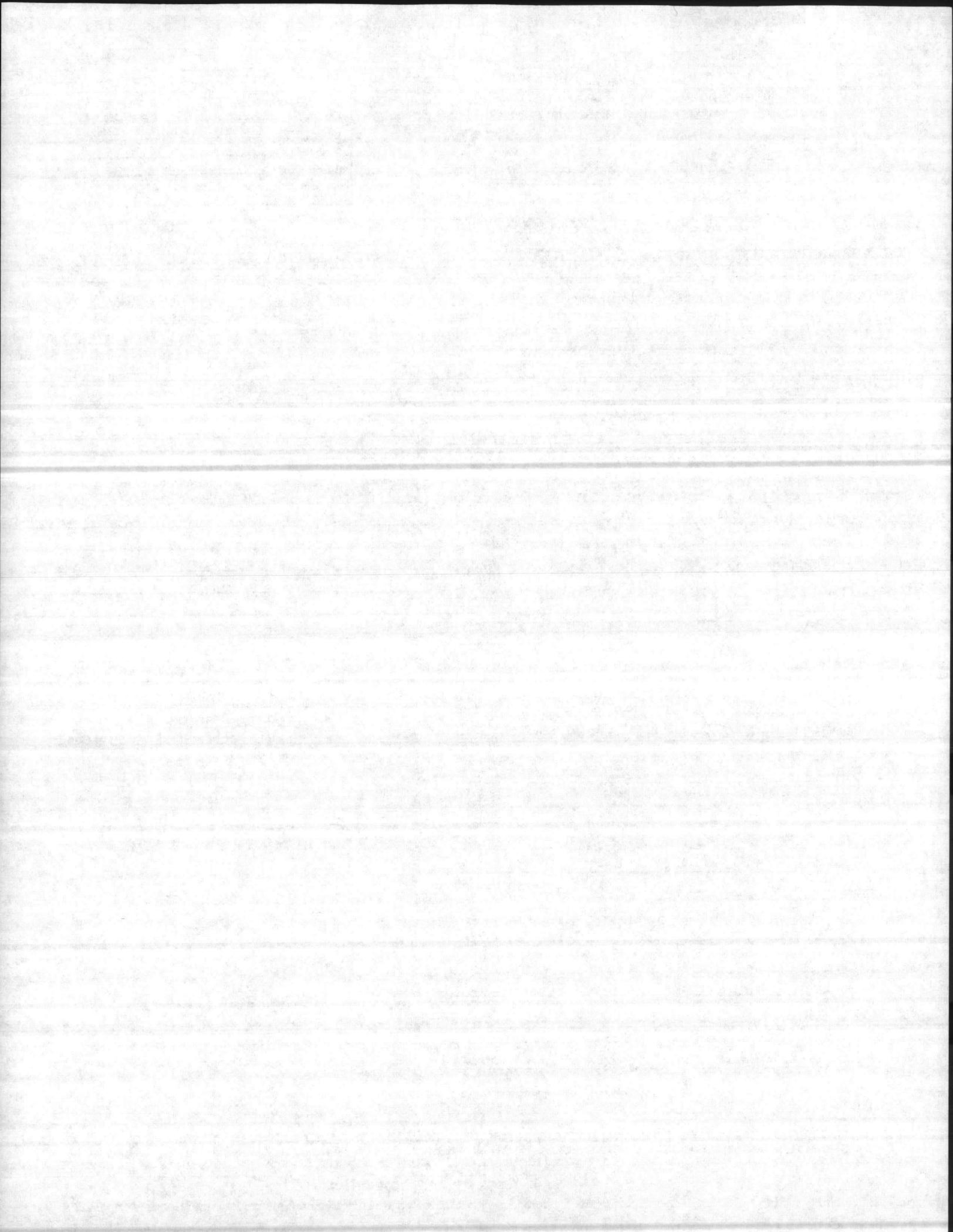
13. GRAVEL PACK:

From	To	Depth	Size	Material
-3.0	-25'	Ft.	Coarse	Sand

REMARKS: \_\_\_\_\_

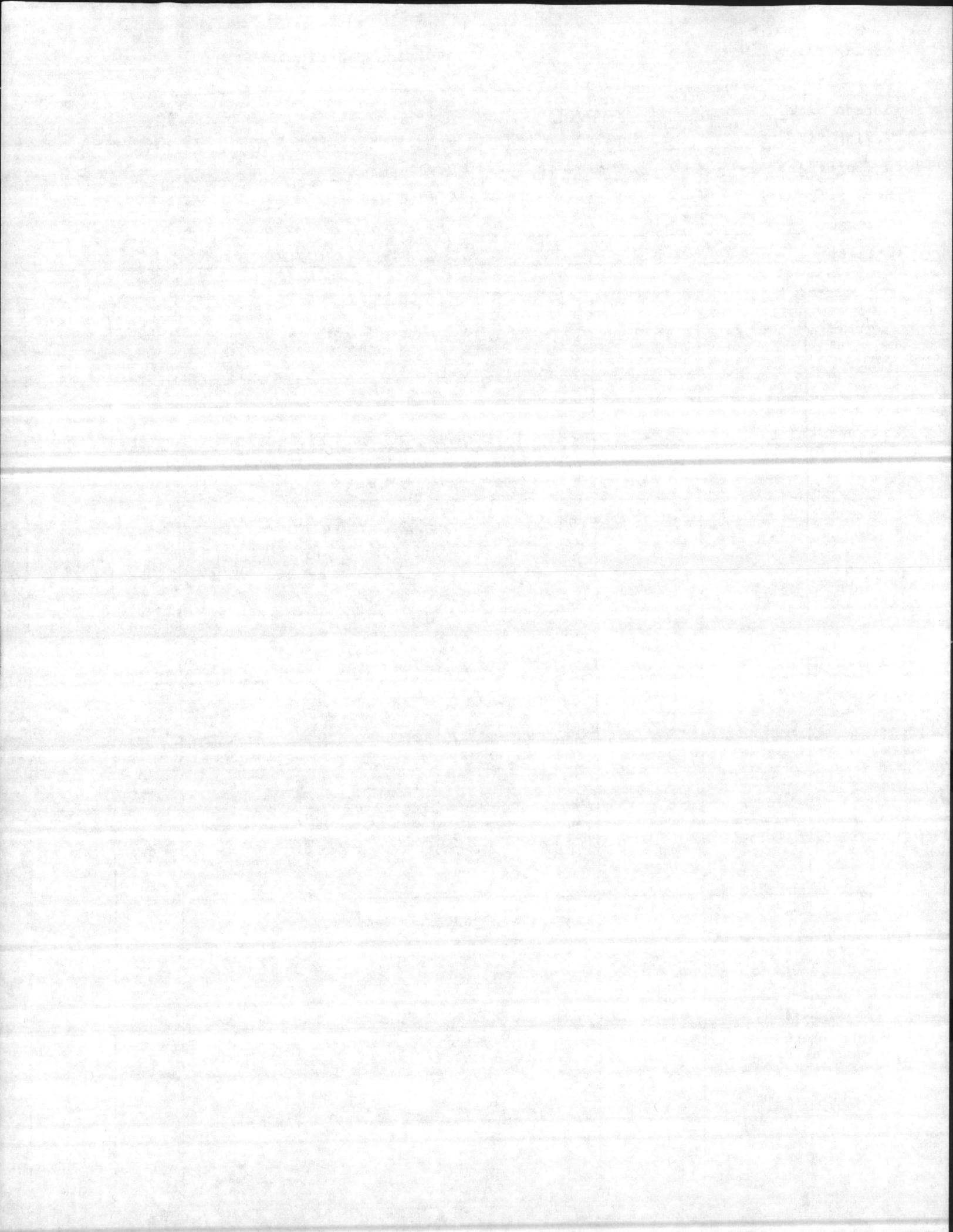
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

[Signature] 2/11/87  
 SIGNATURE OF CONTRACTOR OR AGENT DATE



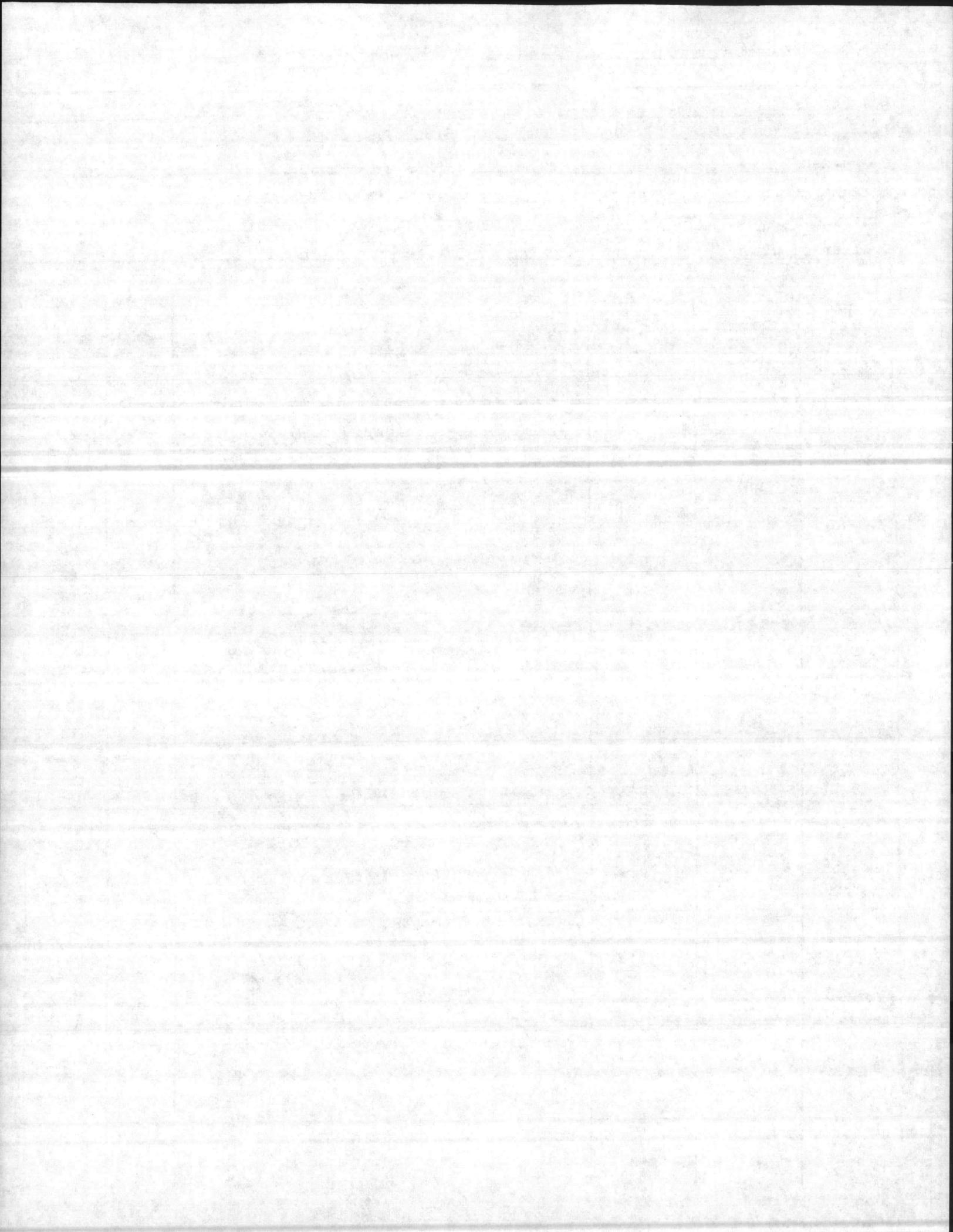
Boring No. HP6W16 Location Coordinates N \_\_\_\_\_  
E \_\_\_\_\_  
Hole Size 6" Slot 0.01  
Screen Size 2" Mat'l PUC Filter Materials Silica Sand  
Casing Size 2" Mat'l PUC Grout Type Ben ton. & Fe. e-  
Geologist David Brentlinger Development \_\_\_\_\_  
Date Start 11/19/86 Finish 11/19 Static Water Level 12.04'  
Contractor ESE Top of Well Elevation 14.54'  
Driller Davis Drill Type Hollow Stem Auger

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0.0-1.5			104R 3.25/1 very Dark grey, silty fine sand (silt 30%) organic matter top 8", loose, moist, non plastic	SM	3 3 5
1.5-3.0			2.54 5/6 light Olive Brown, Silty Sapoy Clay (silt + Sand 45%) slightly Plastic, Moist, slightly dense	SC	3 15 2
3.0-4.5			2.54 6/6 olive yellow, Silty Clayey fine Sand (silt + clay 45%), non plastic, moist, slightly dense	SM SC	3 12 3
4.5-6.0			104R 6.75/4 yellow - very pale yellow, silty fine sand (silt 30%), loose, moist, non plastic	SM	3 6 3
6.0-7.5	Alternating 2-3" layers throughout	50% → each ↓	104R 8/8 yellow silty fine sand loose, moist, non plastic	SM SW	5 9 12
			104R 8/1 white ultra fine sand, loose, moist, little to no silt		



Boring No. HP6W16 Location Coordinates N  
E  
Hole Size \_\_\_\_\_ Slot \_\_\_\_\_  
Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
 casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
Geologist \_\_\_\_\_ Development \_\_\_\_\_  
Date Start \_\_\_\_\_ Finish \_\_\_\_\_ Static Water Level \_\_\_\_\_  
Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
7.5-9.0			104R 7.5/6 Yellow - Very Pale Yellow, Silty Ultra Fine Sand (silt 20%), loose - slightly dense, moist, non plastic	SM SW	4 12 10
9.0-10.5			Same as above (7.5-9.0) with less silt	SW	10 12 15
14.0-15.5			104R 7.25/1 Light Grey White Silty Fine Sand, (Silt = 25%), moist-wet, loose, non plastic, 10% clay layers	SM	6 6 4
19.0-20.5			104R 5.5/8 Yellow Brown, silty fine-med. Sandy Clay, (silt + sand 45%), wet, sticky - plastic, clay very plastic, slightly dense	SC	3 4 10
24.0-25.5			104R 7.5/1 white - light Grey, Silty Clayey fine-med. Sand, (silt + clay 45%) clay layers plastic, wet, slightly dense	SC SW	3 8 10



Boring No. HPGW 16

SHEET        OF       

on site 1050

11/19/86

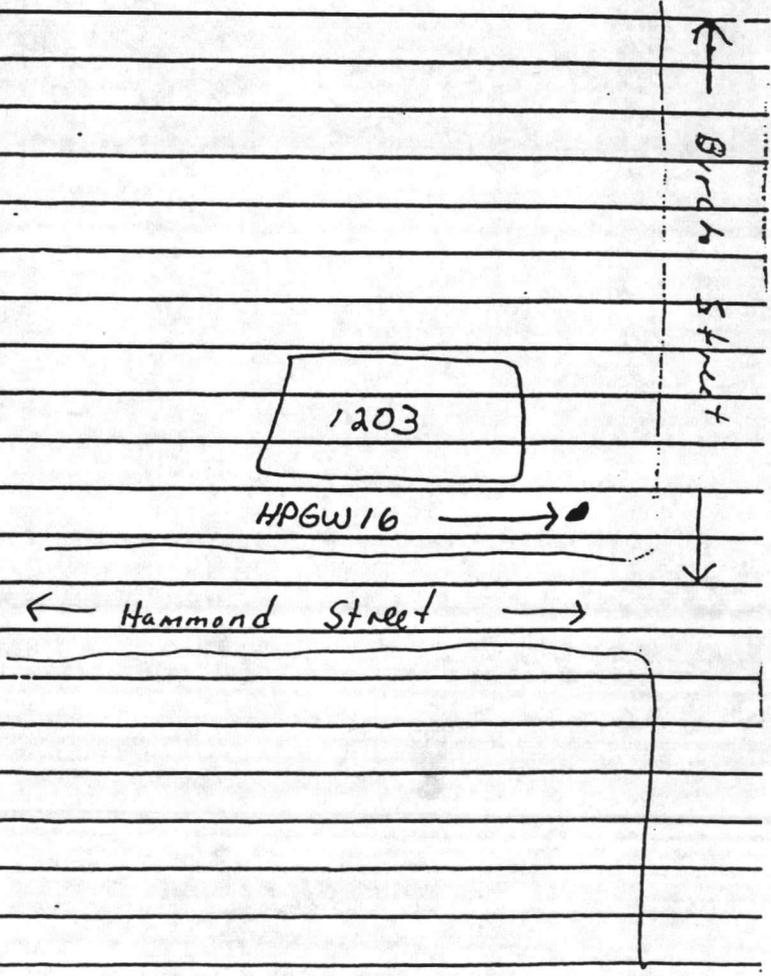
1<sup>st</sup> Spoon 1100

Last Spoon 1130

Well Complete 1150

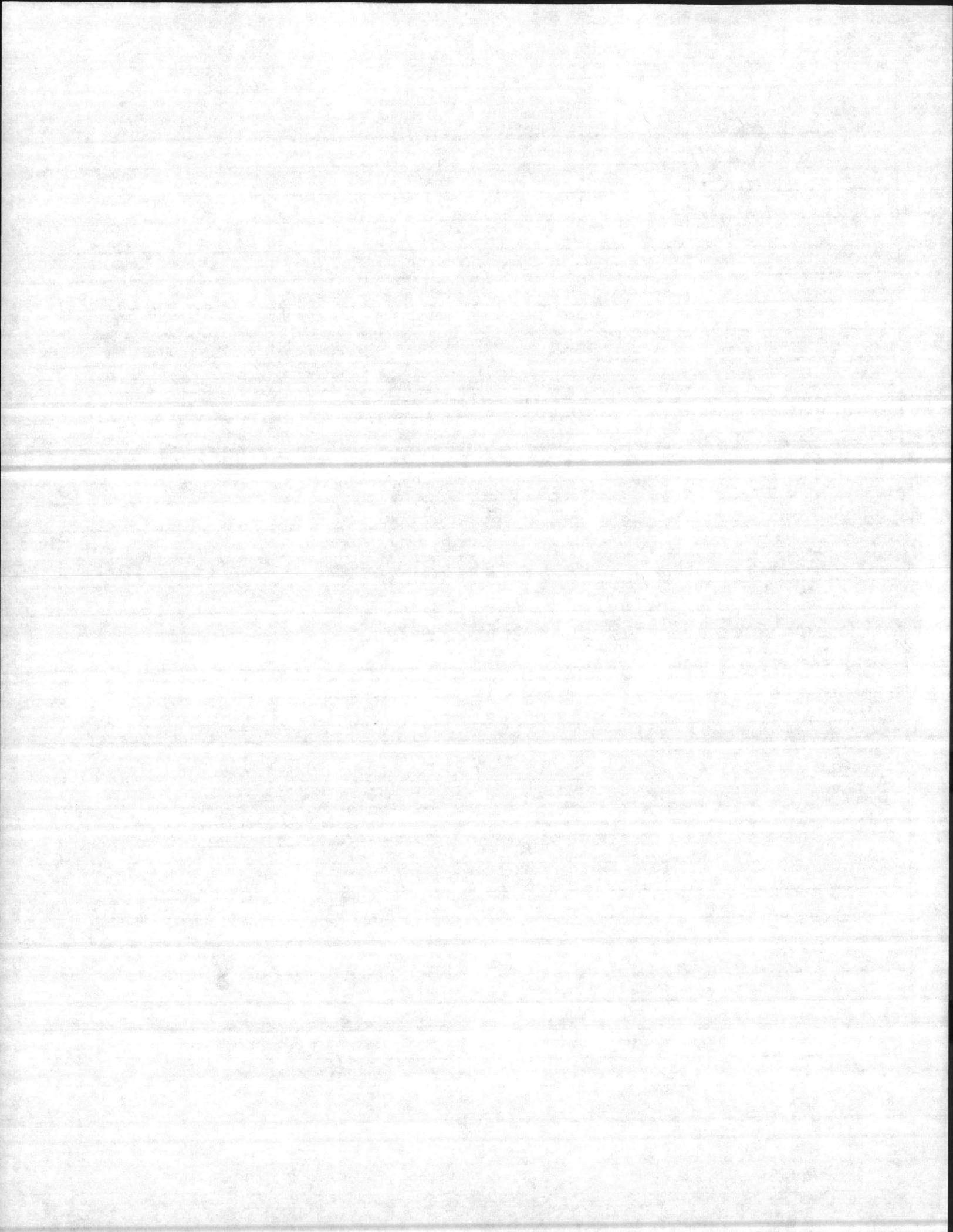
Standard Well Specs

\* there is no well point  
rather, sliding cap at  
base of casing



DATE \_\_\_\_\_

SIGNED \_\_\_\_\_



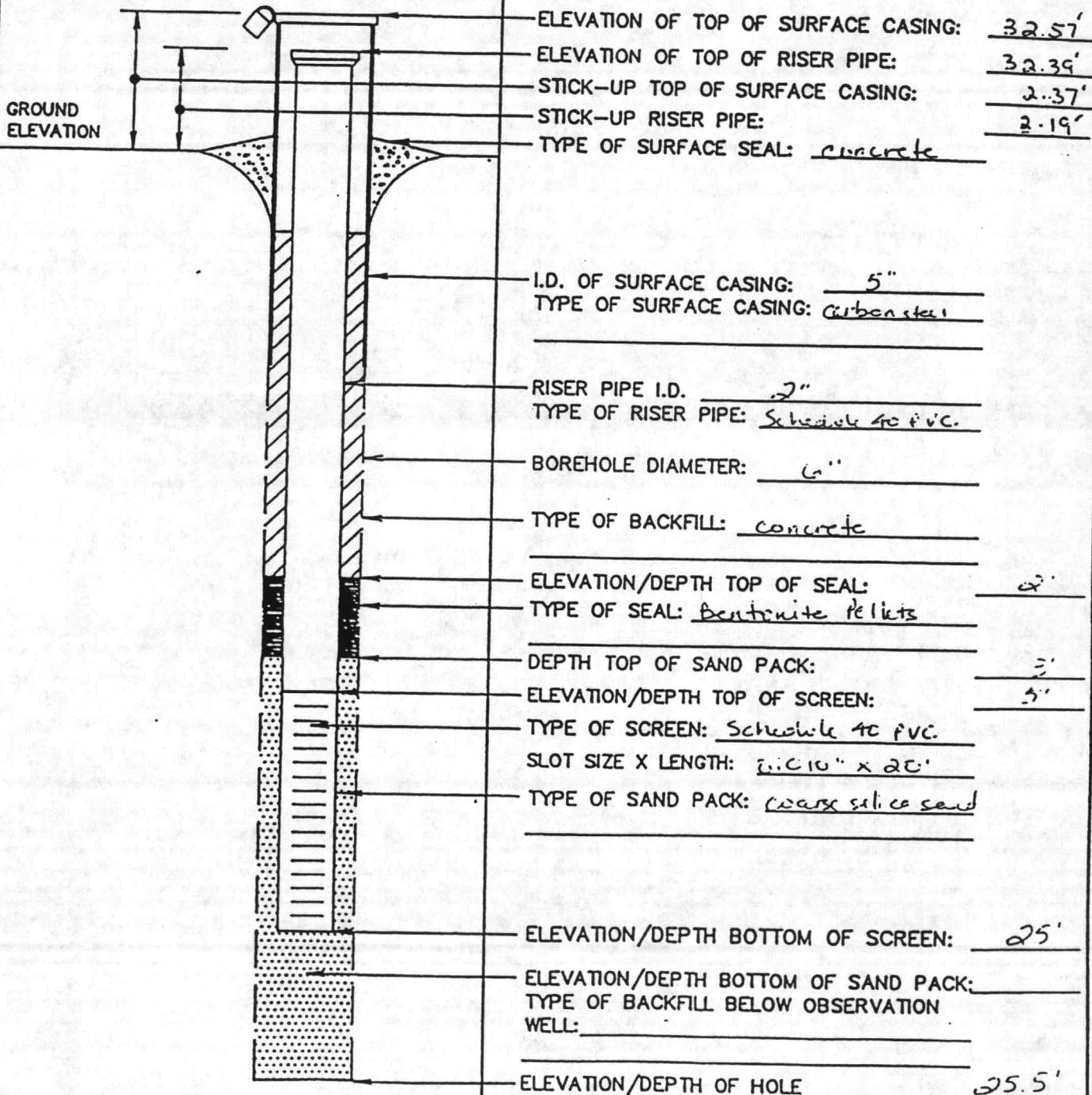
↑

## OVERBURDEN MONITORING WELL SHEET

WELL NO. HP-GW16

PROJECT Camp Lijuan - HPIA  
 PROJECT NO. 49-CAC-36 BORING NO. HP-GW16  
 ELEVATION \_\_\_\_\_ DATE 11/19/86  
 FIELD GEOLOGIST David Brentinger (ESE)

DRILLER Dawn Drilling Co  
 DRILLING METHOD Hollow Stem Auger  
 DEVELOPMENT METHOD \_\_\_\_\_





FOR OFFICE USE ONLY

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

PGW 16

**WELL CONSTRUCTION RECORD**

DRILLING CONTRACTOR Davis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 66-0135-WM-0141

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

Nearest Town: Jacksonville, N.C. County: Onslow

(Road, Community, or Subdivision and Lot No.)

2. OWNER US Navy  
 ADDRESS Camp Lejeune NC  
 (Street or Route No.) 28542  
 City or Town \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

3. DATE DRILLED 11/19/86 USE OF WELL Monitor

4. TOTAL DEPTH 25.5' CUTTINGS COLLECTED  Yes  No

5. DOES WELL REPLACE EXISTING WELL?  Yes  No

6. STATIC WATER LEVEL: 12.04 FT.  above TOP OF CASING,  below  
 TOP OF CASING IS 2.5 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_

8. WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	Depth	To	Diameter	Wall Thickness or Weight/Ft.	Material
<u>2.5</u>		<u>5.0</u>	<u>2"</u>	<u>1/8"</u>	<u>PVC</u>
From _____	To _____	Ft. _____	_____	_____	_____
From _____	To _____	Ft. _____	_____	_____	_____

If additional space is needed use back of form.

LOCATION SKETCH

(Show direction and distance from at least two State Roads, or other map reference points)

11. GROUT:

From	Depth	To	Material	Method
<u>0.0</u>		<u>2.0</u>	<u>Concrete</u>	_____
<u>-2.0</u>		<u>-3.0</u>	<u>Clay</u>	_____

See Fig. (2-5)

12. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
<u>-5.0</u>		<u>-25'</u>	<u>2"</u>	<u>0.01 in.</u>	<u>PVC</u>
From _____	To _____	Ft. _____	_____	_____	_____
From _____	To _____	Ft. _____	_____	_____	_____

13. GRAVEL PACK:

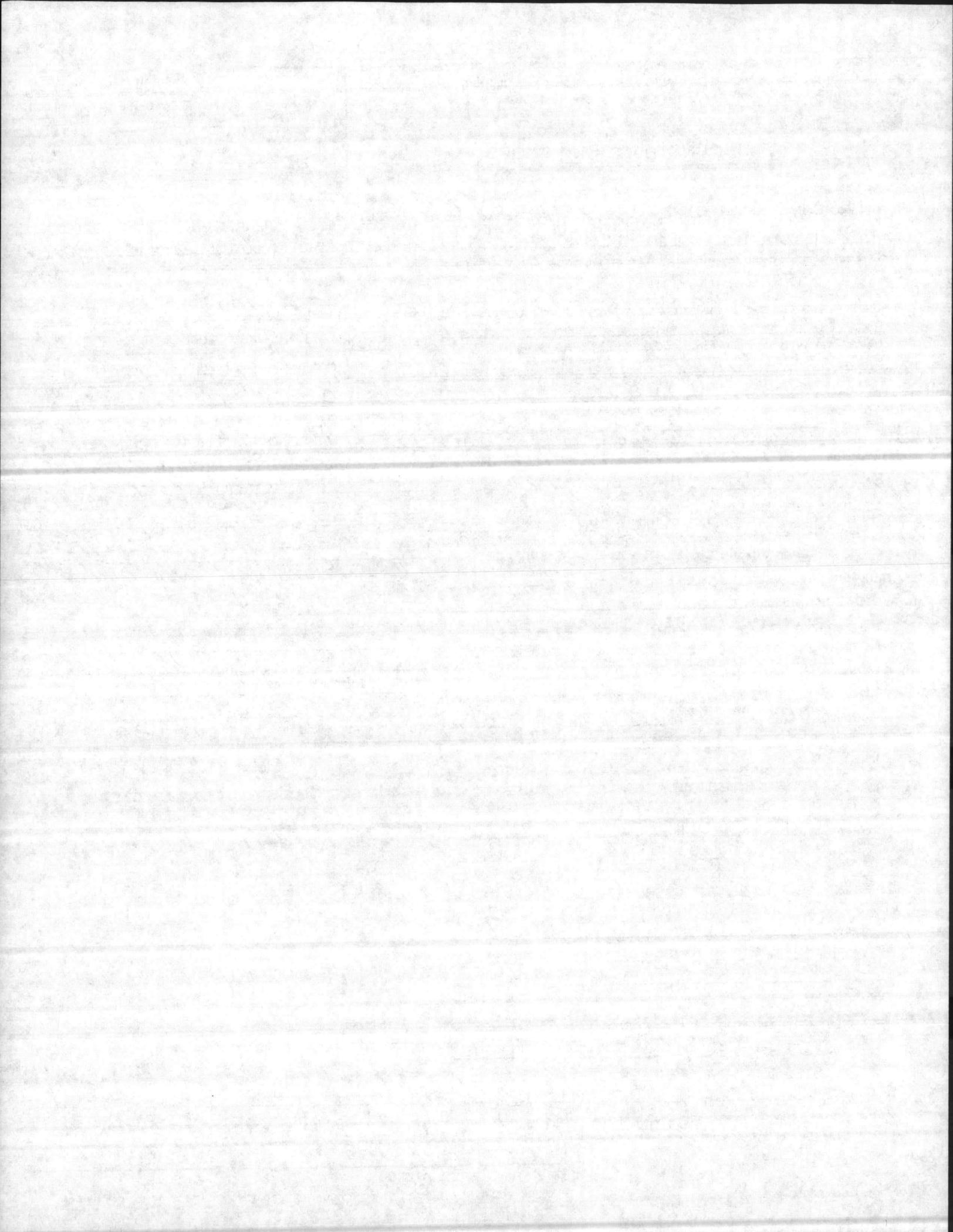
From	Depth	To	Size	Material
<u>-3.0</u>		<u>-25'</u>	<u>Coarse</u>	<u>Sand</u>
From _____	To _____	Ft. _____	_____	_____

REMARKS:

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

[Signature]  
 SIGNATURE OF CONTRACTOR OR AGENT

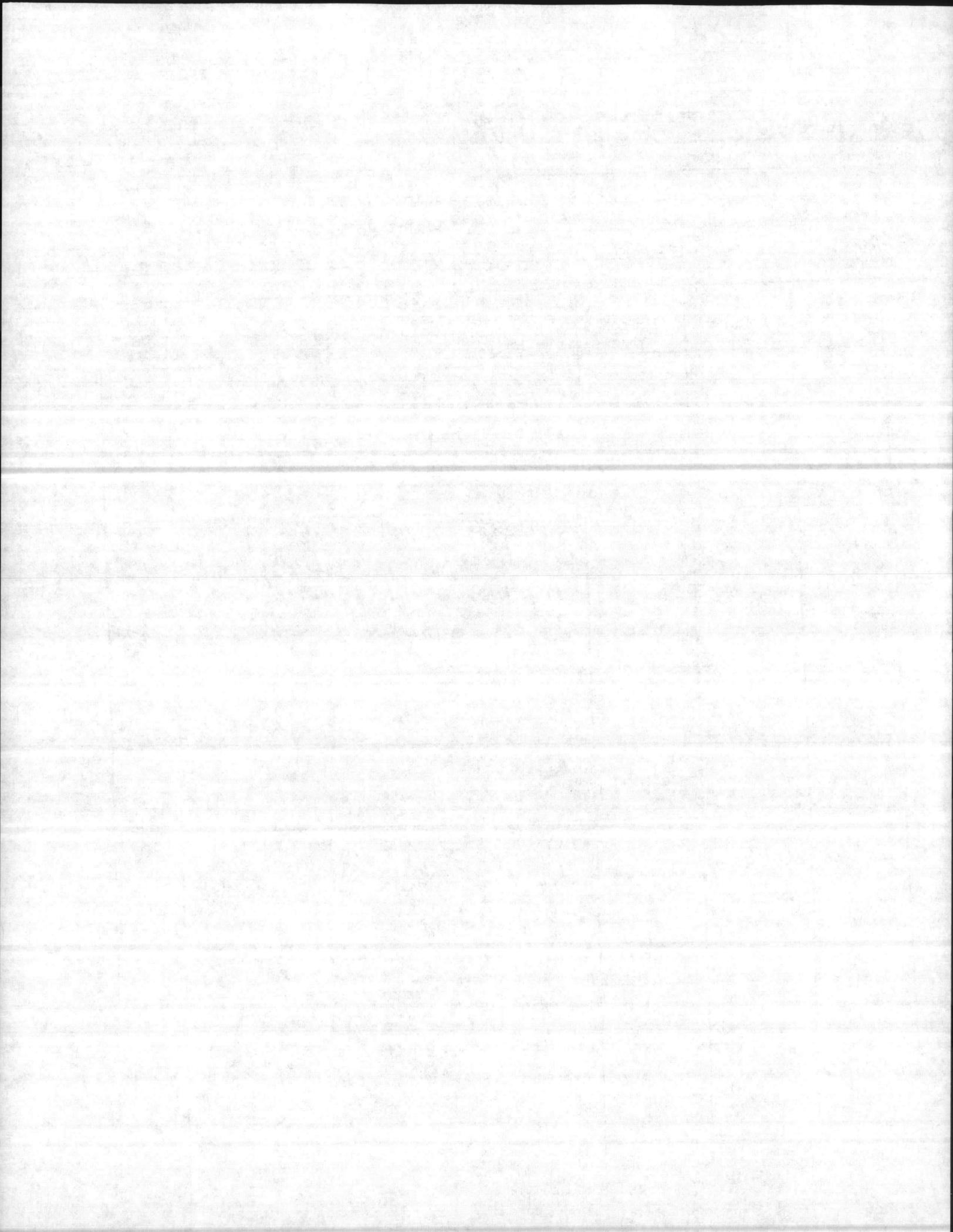
2/11/87  
 DATE



Boring No. 6W 12 HP6W17  
 Hole Size 6" Slot 0.01  
 Screen Size 2" Mat'l PVC  
 casing Size 2" Mat'l PVC  
 Geologist David Brentlinger  
 Date Start 11/6/86 Finish 11/6  
 Contractor ESE  
 Driller Davis

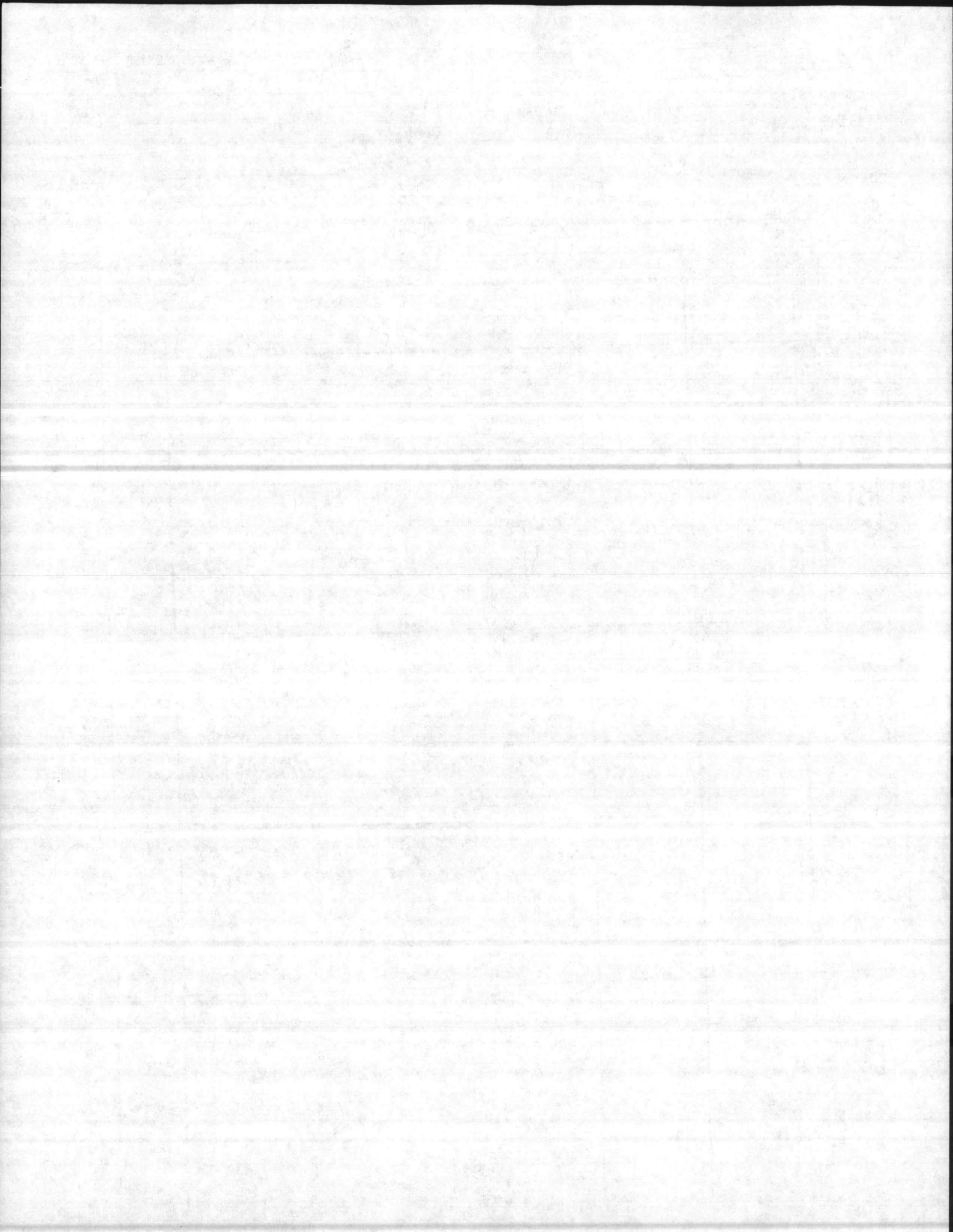
Location Coordinates N  
E  
 Filter Materials Silica Sand  
 Grout Type Bentonite Pellets  
 Development \_\_\_\_\_  
 Static Water Level 11.08'  
 Top of Well Elevation 13.58'  
 Drill Type Hollow Stem Auger

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0.0-1.5			10YR 2.5/2, very dark brown, silty fine sand (silt 30%), organic matter top 6", loose - slightly dense, moist non plastic	SM	2 2 4
1.5-3.0			10YR 6/3, light yellow brown silty clayey fine sand, (silt + clay 40%), mod. dense - loose, slightly plastic	SC SM	5 6 6
3.0-4.5			Same as (1.5-3.0)	SC SM	4 4 4
4.5-6.0			10YR 7.2/1 light grey, ultra fine - fine sand, (silt 30%) little/no silt bottom 6", moist, slightly denser	SM	3 4 3
6.0-7.5			10YR 7.8/1 light grey - white, silty fine sand (silt 30%), moist, loose - slightly dense, non plastic	SM	3 5 7



Boring No. GW17 HP6W17 Location Coordinates N \_\_\_\_\_  
E \_\_\_\_\_  
Hole Size \_\_\_\_\_ Slot \_\_\_\_\_  
Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
Casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
Geologist \_\_\_\_\_ Development \_\_\_\_\_  
Date Start \_\_\_\_\_ Finish \_\_\_\_\_ Static Water Level \_\_\_\_\_  
Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
7.5-9.0			Same as (6-7.5)	SM	5 6 5
9.0-10.5			10Y 7.5/1 light grey, silty sandy clay, (silt + sand 30%) wet, sticky, slightly plastic, mid. dense	SC	2 10 11
14.0-15.5			5Y 7.5/1 light grey, silty clayey sand (silt + clay 45%), 20% coarse sand, loose, slightly plastic, wet	SM SC	4 4 8
19.0-20.5			2.5Y 6.5/2 light brown grey silty fine-med. sand (silt 20%), wet, mod. dense - dense, non plastic, 20% coarse sand	SP	4 10 12
20-25.5			10Y 7.5/1 light grey-white, silty medium sand with 20% clay, silt 20%, loose - slightly dense, wet, clay mottles very plastic	SW SM	2 3 5



Boring No. GW 12 HP GW 17

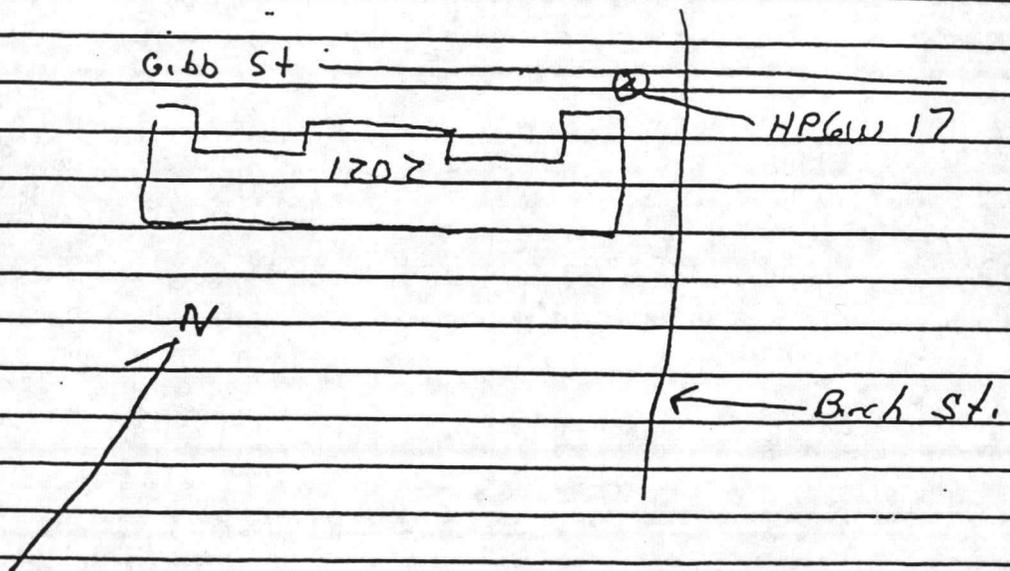
SHEET \_\_\_\_\_ OF \_\_\_\_\_

On Site 12:00 PM

11/6/86

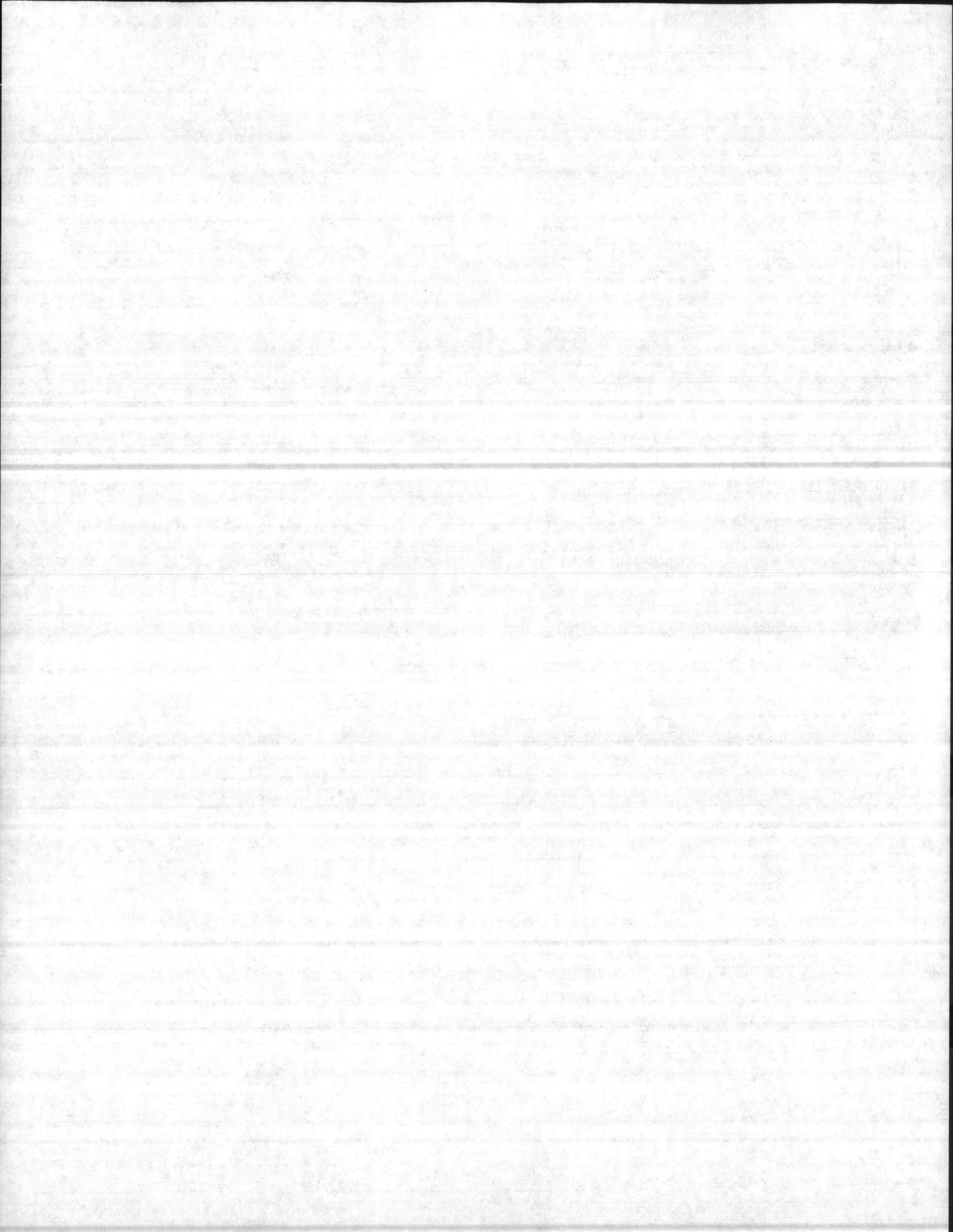
1st Spool 12:30  
last Spool 1:25  
well Complete 2:00

located at the corner of  
Gibb and Birch Street

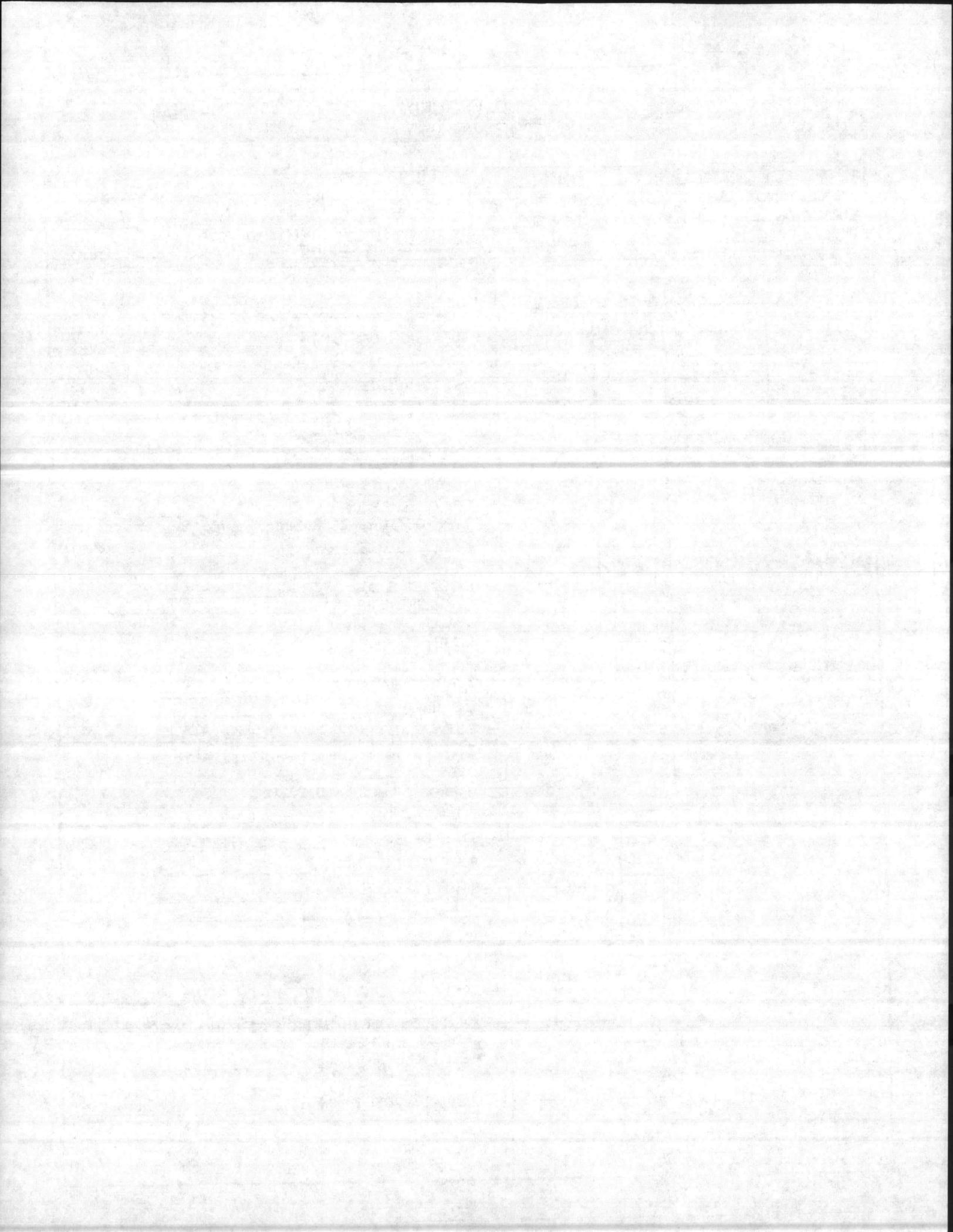


DATE

SIGNED







**FOR OFFICE USE ONLY**

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

APGW 17

**WELL CONSTRUCTION RECORD**

DRILLING CONTRACTOR Davis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 66-035-WM-0141

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

Nearest Town: Jacksonville, N.C.

County: Onslow

(Road, Community, or Subdivision and Lot No.)

2. OWNER US Navy  
 ADDRESS Camp LeJeune NC 28542  
(Street or Route No.)

Depth	DRILLING LOG
From To	Formation Description
0.0 - 1.5	Silty Fine Sand
1.5 - 4.5	Silty Clayey Fine Sand
4.5 - 6.0	ultra fine sand
6.0 - 9.0	Silty Fine Sand
9.0 - 10.5	Silty Sandy Clay
14.0 - 15.5	Silty Clayey Sand
19.0 - 20.5	Silty Fine-Med. Sand
24.0 - 25.5	Silty Med. Sand

3. DATE DRILLED 11/6/86 USE OF WELL monitor

4. TOTAL DEPTH 25.5' CUTTINGS COLLECTED  Yes  No

5. DOES WELL REPLACE EXISTING WELL?  Yes  No

6. STATIC WATER LEVEL: 11.08 FT.  above  below TOP OF CASING.  
 TOP OF CASING IS 2.50 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_

WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	Depth	To	Diameter	Wall Thickness or Weight/Ft.	Material
<u>+2.5</u>		<u>-5.0</u>	<u>2"</u>	<u>1/8"</u>	<u>PVC</u>
From _____	To _____	Ft. _____	_____	_____	_____
From _____	To _____	Ft. _____	_____	_____	_____

11. GROUT:

From	Depth	To	Material	Method
<u>0.0</u>		<u>-2.0</u>	<u>Concrete</u>	_____
<u>-2.0</u>		<u>-3.0</u>	<u>Clay</u>	_____

12. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
<u>-5.0</u>		<u>-25'</u>	<u>2"</u>	<u>0.01 in.</u>	<u>PVC</u>
From _____	To _____	Ft. _____	in. _____	in. _____	_____
From _____	To _____	Ft. _____	in. _____	in. _____	_____

13. GRAVEL PACK:

From	Depth	To	Size	Material
<u>-3.0</u>		<u>-25'</u>	<u>course</u>	<u>Sand</u>
From _____	To _____	Ft. _____	_____	_____

REMARKS: \_\_\_\_\_

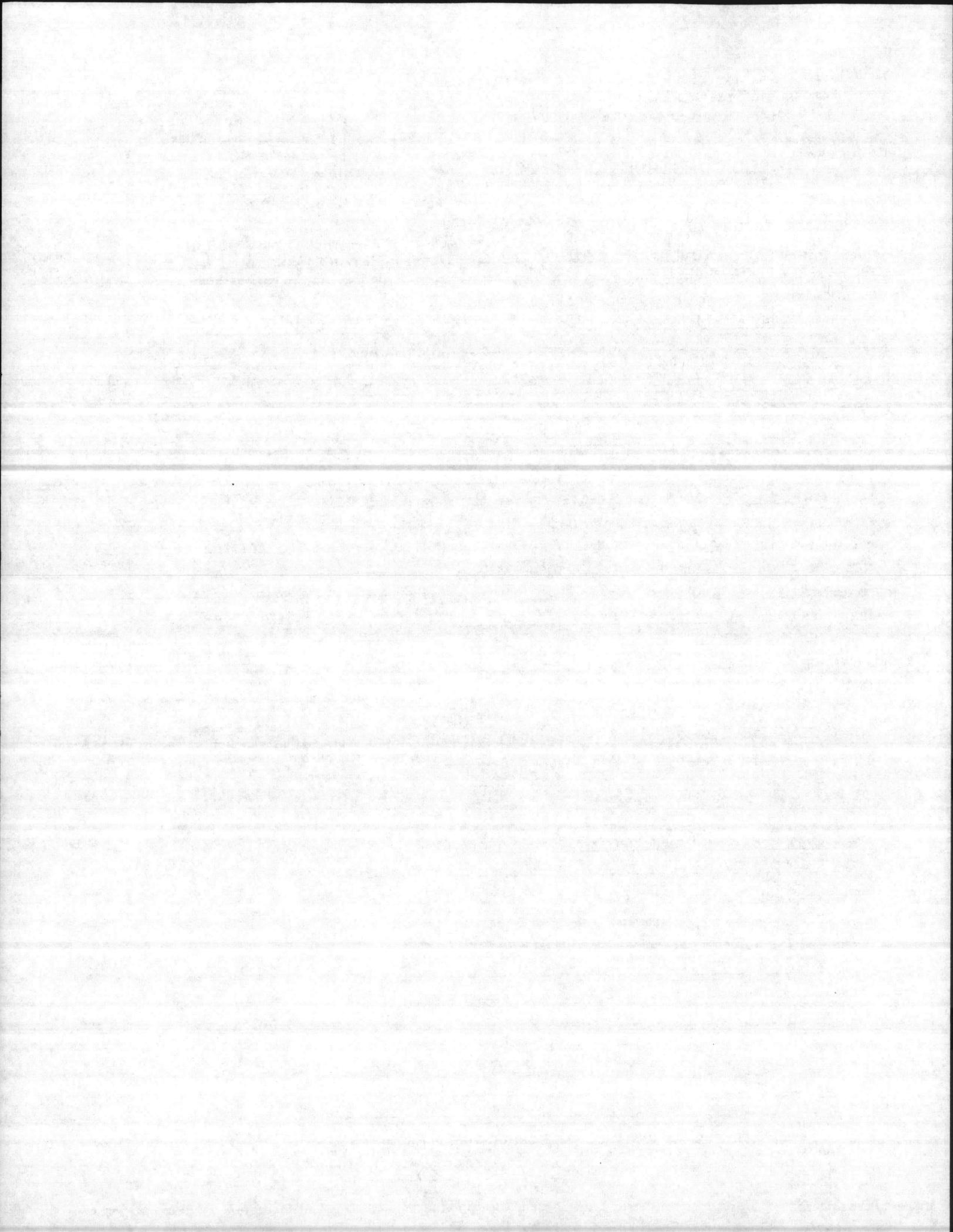
If additional space is needed use back of form.

**LOCATION SKETCH**  
 (Show direction and distance from at least two State Roads, or other map reference points)

see Fig. (2-5)

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

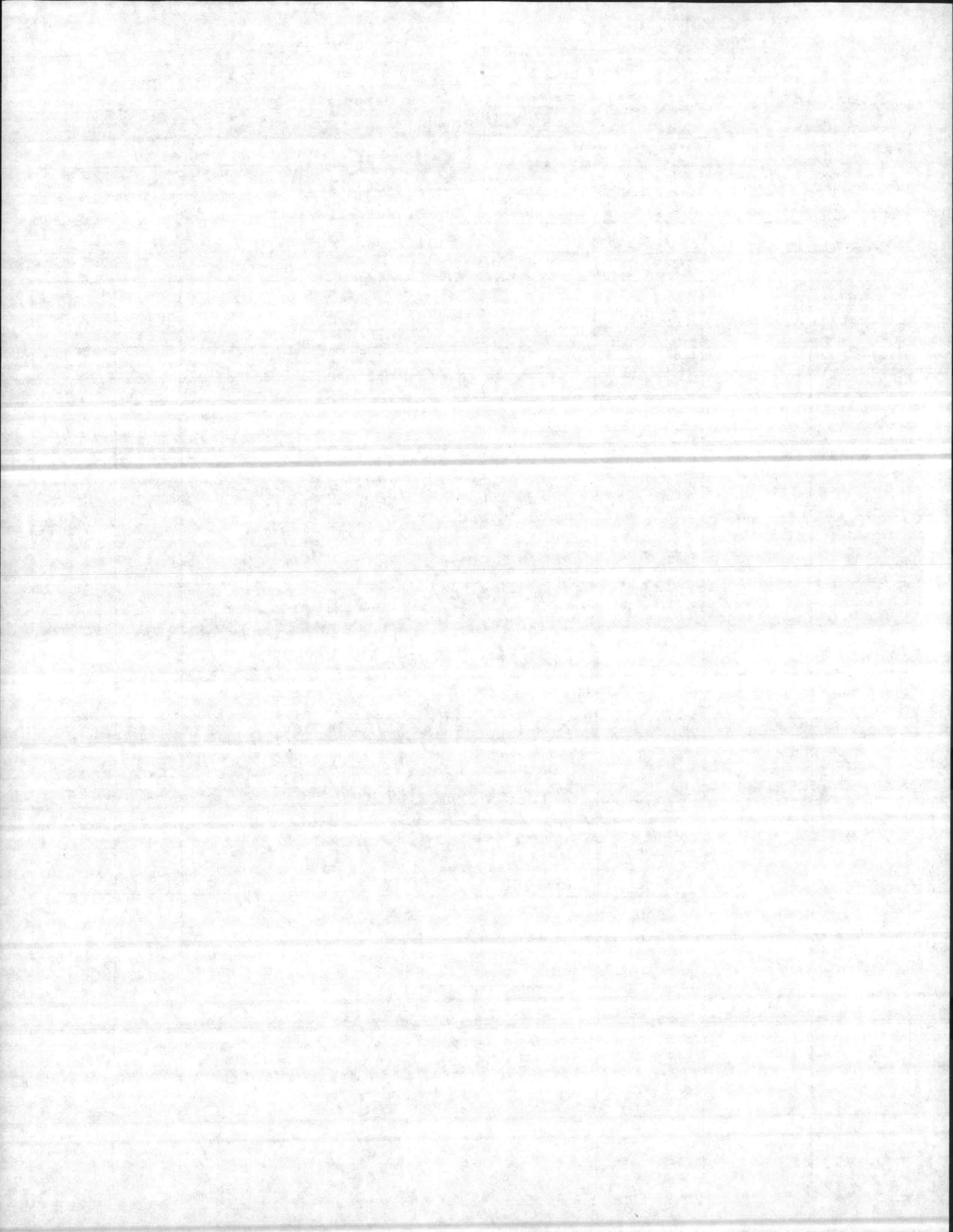
Davis Drilling Co.  
 SIGNATURE OF CONTRACTOR OR AGENT  
 DATE 2/11/87



Boring No. HP Gw 18  
 Hole Size 6" Slot 0.01  
 Screen Size 2" Mat'l PVC  
 Casing Size 2" Mat'l PVC  
 Geologist David Brentlinger  
 Date Start 11/19/86 Finish 11/19  
 Contractor ESE  
 Driller Davis

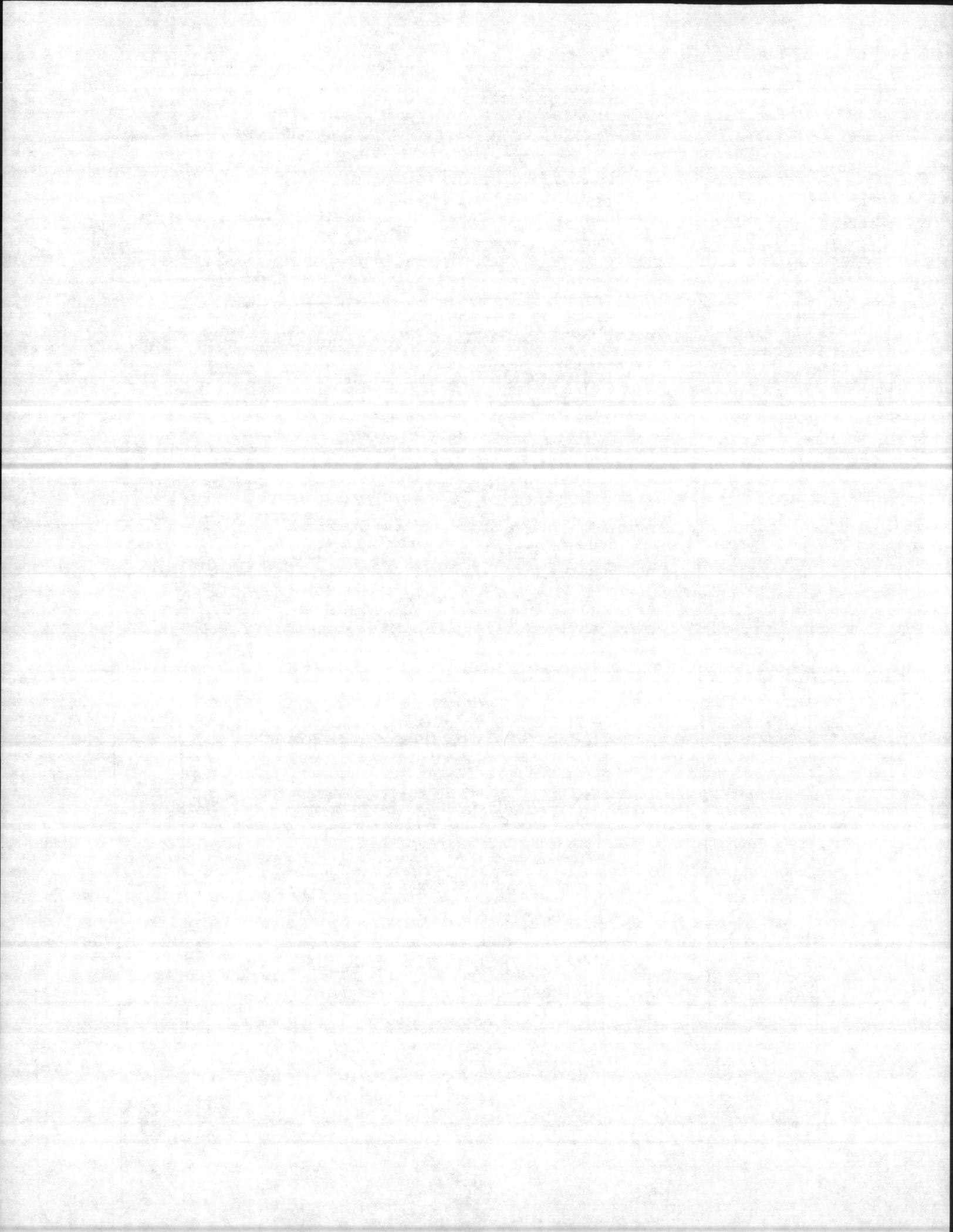
Location Coordinates N \_\_\_\_\_  
E \_\_\_\_\_  
 Filter Materials Silice Sand  
 Grout Type Bentonite Pellets  
 Development \_\_\_\_\_  
 Static Water Level 11.00  
 Top of Well Elevation 13.50'  
 Drill Type Hollow Stem Auger

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0.0-1.5			Roadside Gravel fill		8 15 11
1.5-3.0			10YR 6.5/4 Light Yellow Brown, silty clayey sand, (clay + silt 40%), moist, plastic, very dense	SC	8 10 12
3.0-4.5			10YR 7.5/3 Very Pale Brown, silty fine sand, (silt 40%), 10% clay mottles, moist, mod. dense, non plastic	SM	8 13 13
4.5-6.0			10YR 7.5/1 Light Grey, silty clayey fine sand, (silt + clay 40%), Bright Orange-Brown mottles throughout, moist, slightly plastic, mod. dense	SM SC	8 6 5
6.0-7.5	alternating layers throughout	50%	10YR 7/1 light grey same as about (4.5-6.0)	SC	4 6 6
		50%	10YR 6/8, Brown yellow, silty fine sandy clay plastic, mod. dense, loose		



Boring No. HP 6W 18 Location Coordinates N  
E  
Hole Size \_\_\_\_\_ Slot \_\_\_\_\_  
Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
Casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
Geologist \_\_\_\_\_ Development \_\_\_\_\_  
Date Start \_\_\_\_\_ Finish \_\_\_\_\_ Static Water Level \_\_\_\_\_  
Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
7.5-9.0			104R 7.5/1 Light Grey, Silty Fine Sandy Clay (silt + sand 30%), Brown Yellow mottles throughout, plastic, mod. dense, moist	SC	2 3 10
9.0-10.5			104R 6.5/8 Yellow-Brown Yellow, Silty Clayey Fine-med. Sand (silt-clay 40%), moist, slightly plastic, slightly dense	SC SM	7 7 8
11.0-13.5			104R 8/1 white Silty fine-med. Sand, (silt 30%), dense, moist, non plastic	SM	12 17 18
19.0-20.5			104R 8/1 white Fine-medium Sand, little to no silt, loose, wet, non plastic	SW	5 1 1
24.0-25.5			104R 8/4.5 Very Pale Brown Yellow, Fine-medium Sand Little to no silt, wet, med. dense - dense, 10% coarse material	SW	15 15 15



On site 830 Am.

11/19

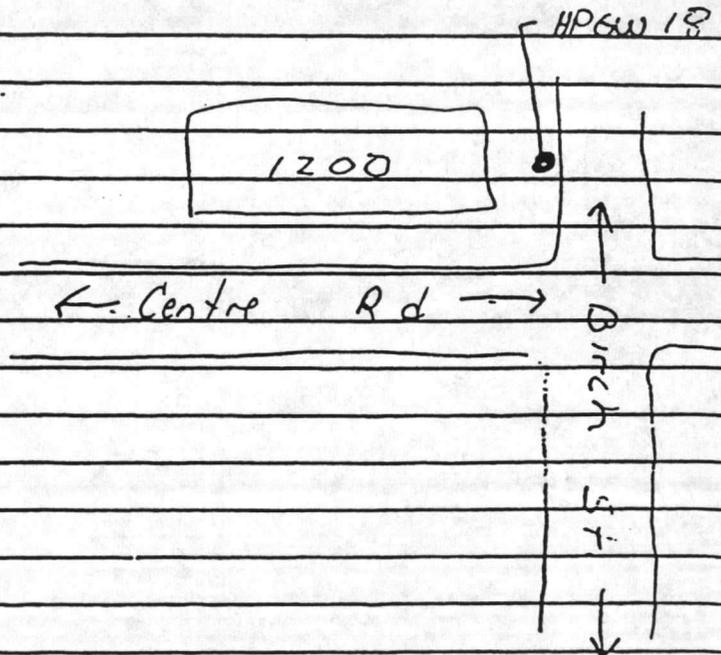
1st Spoon 845

last Spoon 945 ← Problem with augers locking up

Well Complete 1040

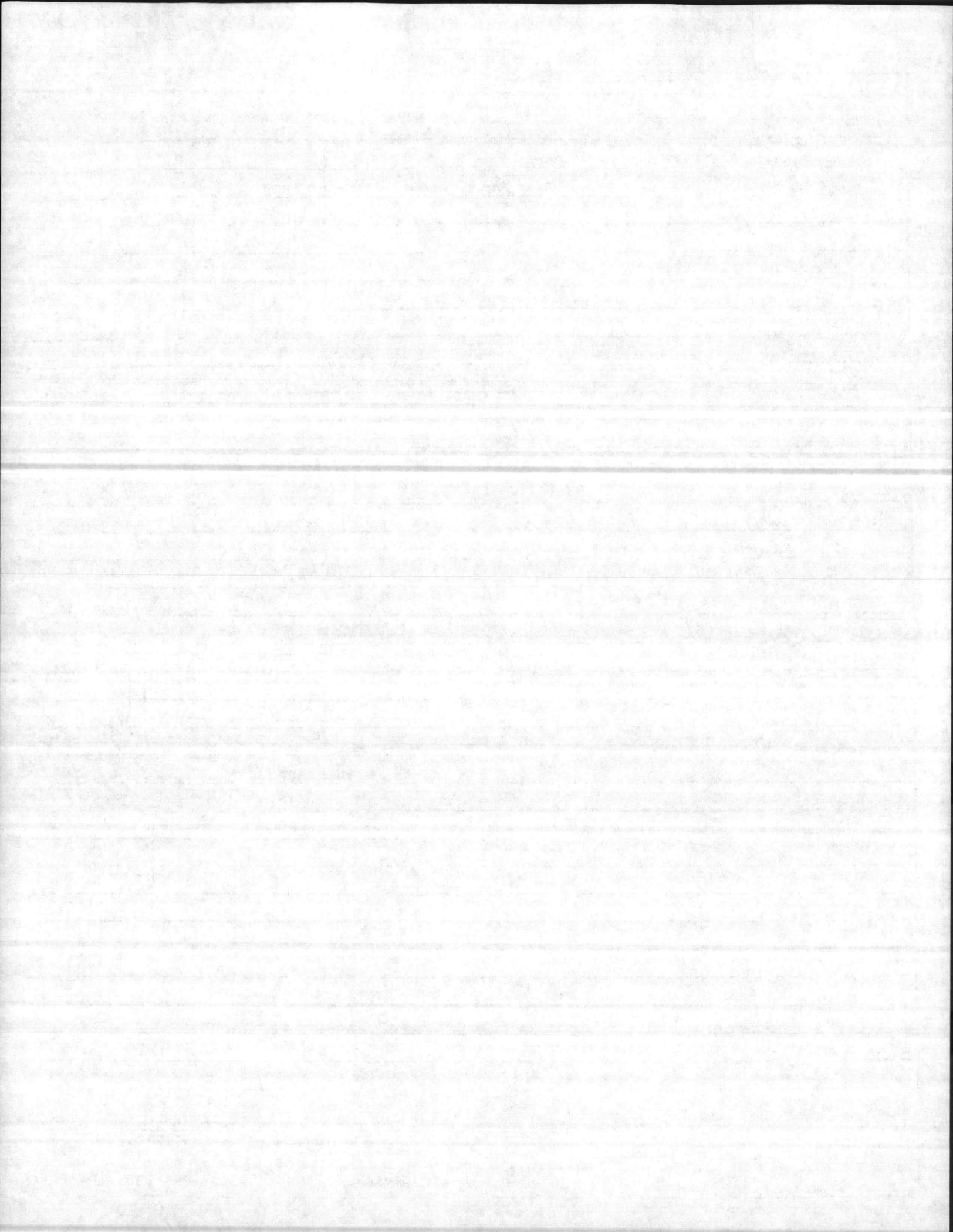
### Standard Well Specs

\* no well point on base  
of casing rather a  
sliding cap!



DATE

SIGNED



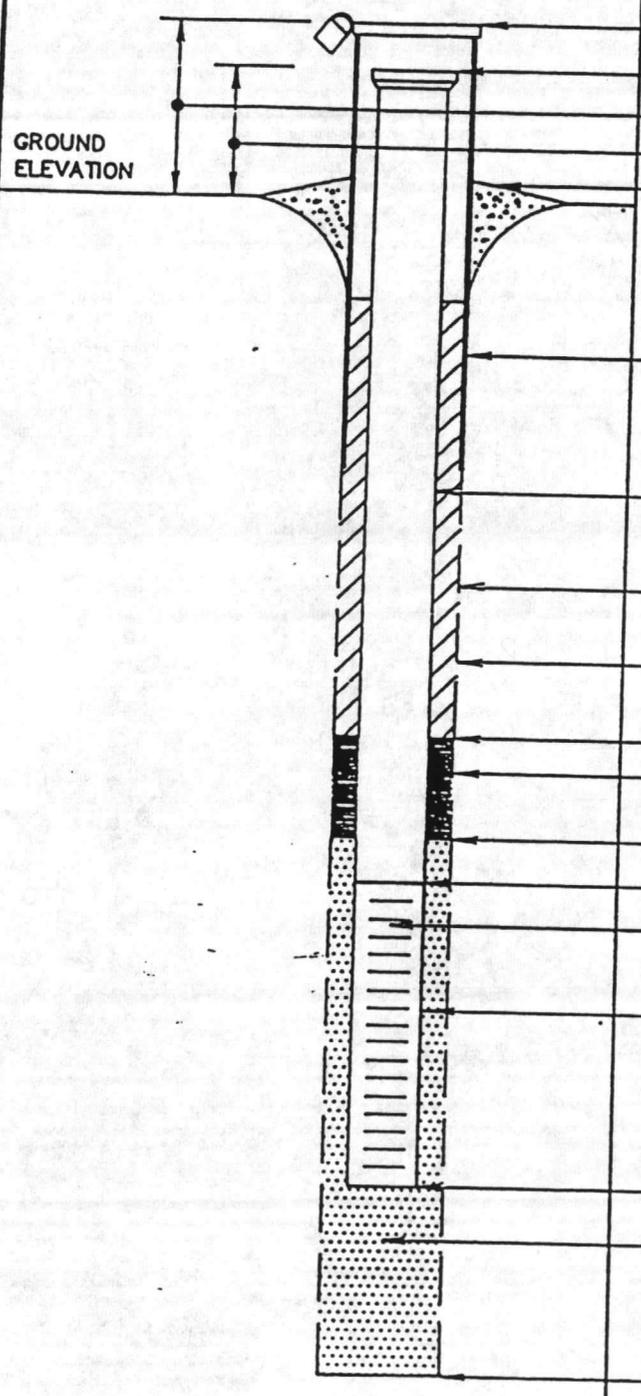
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## OVERBURDEN MONITORING WELL SHEET

WELL NO. HP-GW18

PROJECT Camp Lejeune - HP1A  
 PROJECT NO. 49-CAC36 BORING NO. HP-GW18  
 ELEVATION \_\_\_\_\_ DATE 11/19/86  
 FIELD GEOLOGIST David Breathnach (ESE)

DRILLER Davis Drilling Co.  
 DRILLING METHOD Hollow Stem Auger  
 DEVELOPMENT METHOD \_\_\_\_\_



ELEVATION OF TOP OF SURFACE CASING: \_\_\_\_\_  
 ELEVATION OF TOP OF RISER PIPE: \_\_\_\_\_  
 STICK-UP TOP OF SURFACE CASING: \_\_\_\_\_  
 STICK-UP RISER PIPE: \_\_\_\_\_  
 TYPE OF SURFACE SEAL: concrete Flush with top

I.D. OF SURFACE CASING: 5" ?  
 TYPE OF SURFACE CASING: carbon steel

RISER PIPE I.D. 2"  
 TYPE OF RISER PIPE: schedule 40 PVC

BOREHOLE DIAMETER: 6"

TYPE OF BACKFILL: concrete

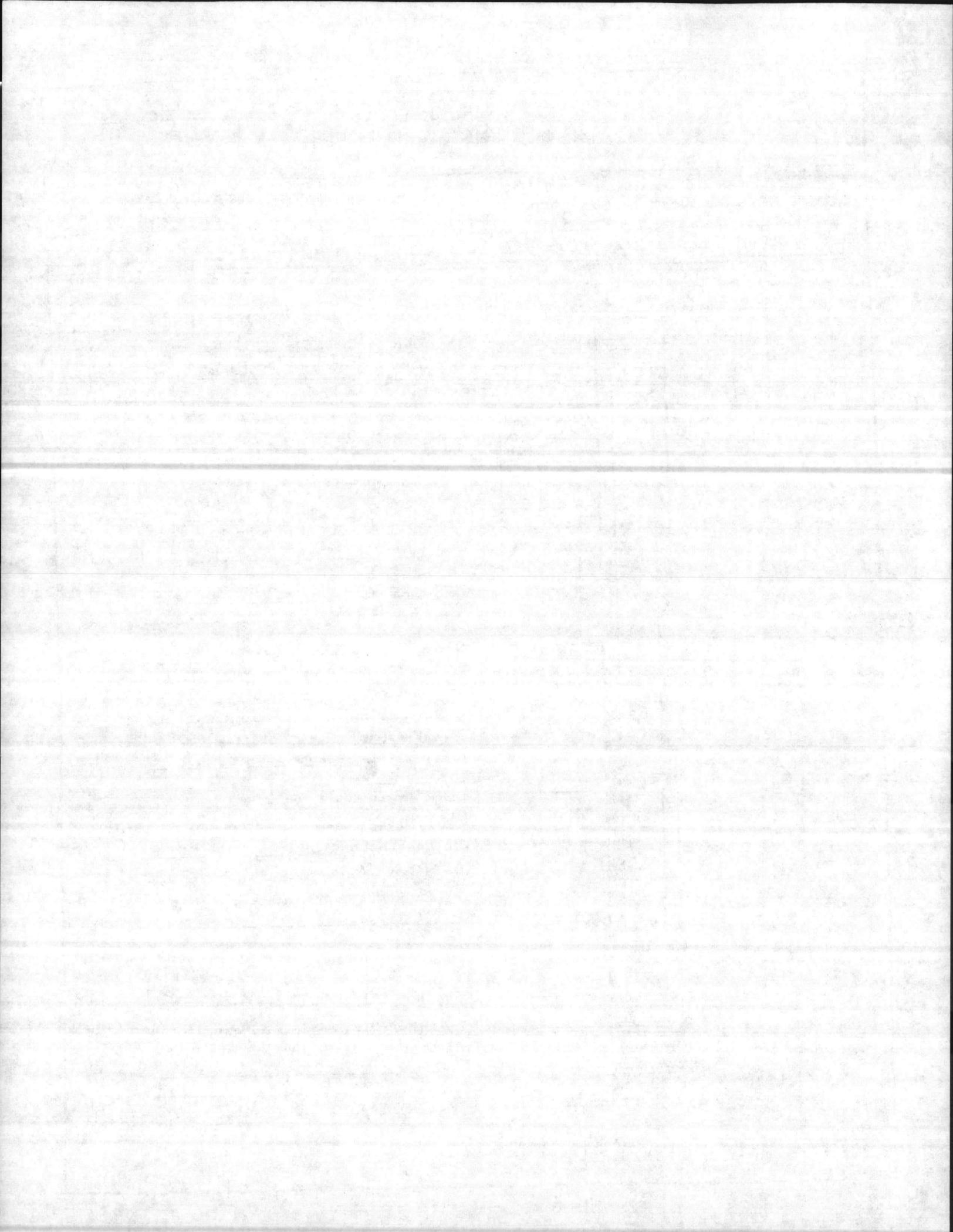
ELEVATION/DEPTH TOP OF SEAL: \_\_\_\_\_ 2'  
 TYPE OF SEAL:  Bentonite pellets

DEPTH TOP OF SAND PACK: \_\_\_\_\_ 3'  
 ELEVATION/DEPTH TOP OF SCREEN: \_\_\_\_\_ 5'  
 TYPE OF SCREEN: schedule 40 PVC  
 SLOT SIZE X LENGTH: 0.010" x 20'  
 TYPE OF SAND PACK: coarse silica sand

ELEVATION/DEPTH BOTTOM OF SCREEN: \_\_\_\_\_ 5.5'  
 ELEVATION/DEPTH BOTTOM OF SAND PACK: \_\_\_\_\_  
 TYPE OF BACKFILL BELOW OBSERVATION WELL: \_\_\_\_\_

ELEVATION/DEPTH OF HOLE \_\_\_\_\_ 25.5'

NOT TO SCALE



**FOR OFFICE USE ONLY**

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

16GW18

**WELL CONSTRUCTION RECORD**

DRILLING CONTRACTOR Davis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 66-0135-WM-0141

1. WELL LOCATION: (Show sketch of the location below)  
 Nearest Town: Jacksonville, NC County: Onslow

(Road, Community, or Subdivision and Lot No.) \_\_\_\_\_

2. OWNER US Navy  
 ADDRESS Camp Lejeune NC 28542  
(Street or Route No.)  
 City or Town \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

3. DATE DRILLED 11/19/86 USE OF WELL Monitor

4. TOTAL DEPTH 25.5' CUTTINGS COLLECTED  Yes  No

5. DOES WELL REPLACE EXISTING WELL?  Yes  No

6. STATIC WATER LEVEL: 11.00 FT.  above TOP OF CASING,  below TOP OF CASING IS 0.00 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_

8. WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	To	Depth	Diameter	Wall Thickness or Weight/Ft.	Material
0.0	5.0	5.0	2"	1/8"	PVC
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

**DRILLING LOG**

Depth	Formation Description
0.0 - 1.5	ROAD FILL
1.5 - 3.0	Silty Clayey Sand
3.0 - 4.5	Silty Fine Sand
4.5 - 6.0	Silty Clayey Fine Sand
6.0 - 7.5	50% layers of Silty Fine Sand and sandy clay
7.5 - 9.0	Silty Fine Sandy Clay
9.0 - 10.5	Silty Clayey Fine-Med Sand
14.0 - 15.5	Silty Fine-Med Sand
19.0 - 20.5	Fine-Med Sand
24.0 - 25.5	Fine-Med Sand

If additional space is needed use back of form.

**LOCATION SKETCH**

(Show direction and distance from at least two State Roads, or other map reference points)

See Fig. (2-5)

11. GROUT:

From	To	Depth	Material	Method
0.0	2.0	2.0	concrete	_____
2.0	3.0	3.0	Clay	_____

12. SCREEN:

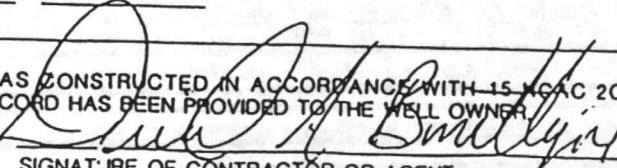
From	To	Depth	Diameter	Slot Size	Material
5.0	25.0	25.0	2"	0.01 in.	PVC
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

13. GRAVEL PACK:

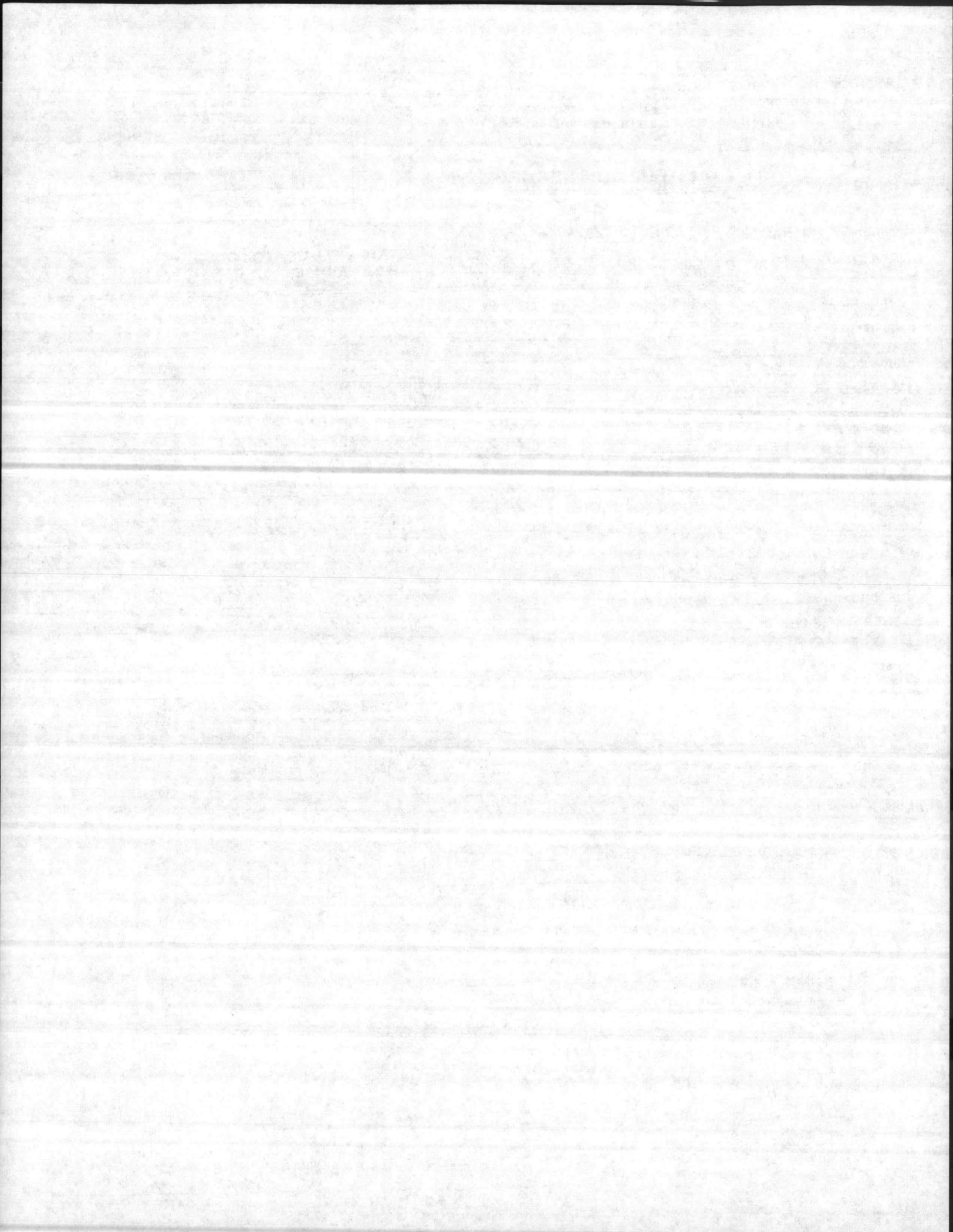
From	To	Depth	Size	Material
3.0	25.0	25.0	coarse	sand
_____	_____	_____	_____	_____

MARKS: \_\_\_\_\_

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

  
 SIGNATURE OF CONTRACTOR OR AGENT

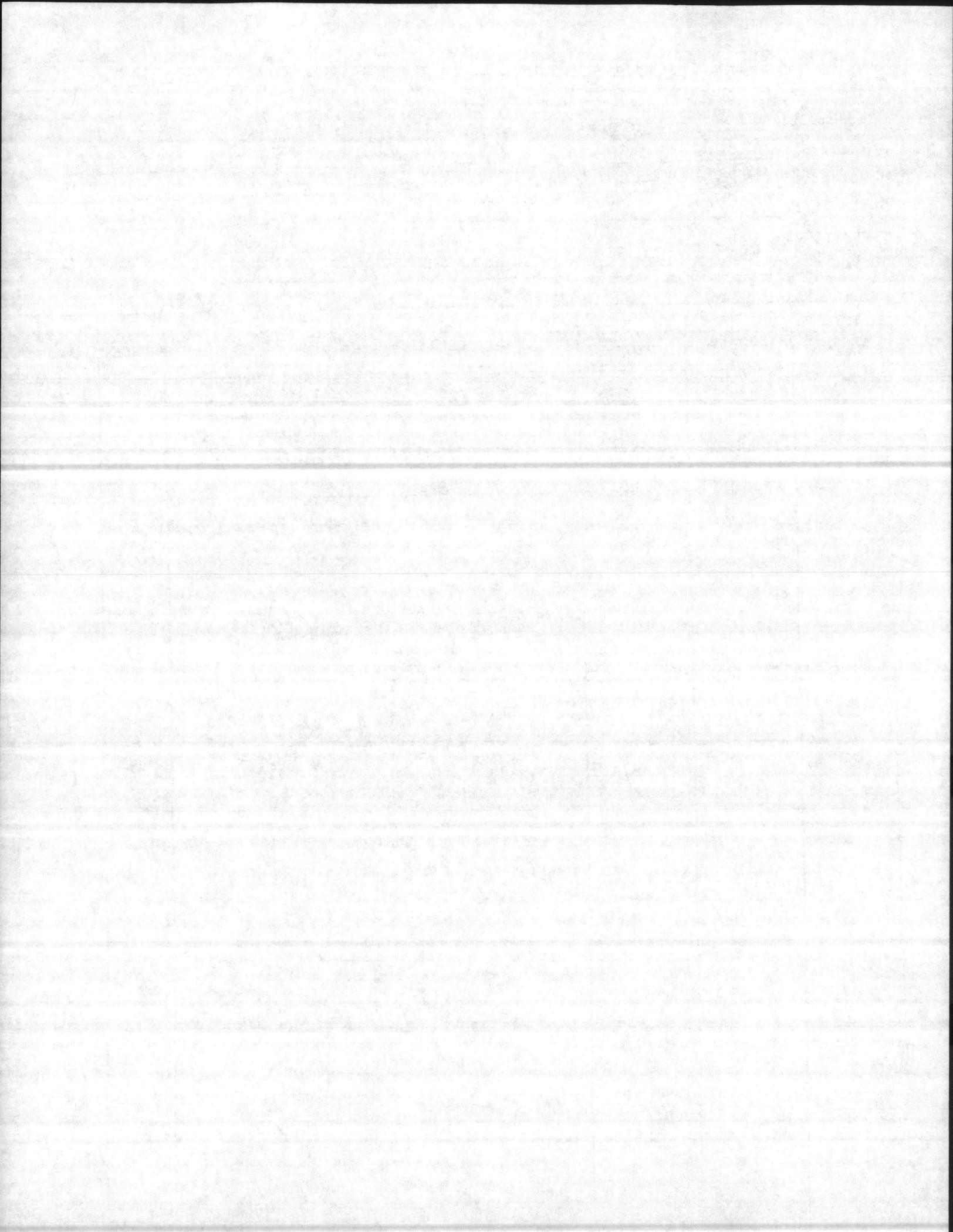
2/11/87  
 DATE



Boring No. GW 9 HAGW19  
 Hole Size 6" Slot 0.01  
 Screen Size 2" Mat'l PVC  
 casing Size 2" Mat'l PVC  
 Geologist David Brentlinger  
 Date Start 11/6/86 Finish 11/6  
 Contractor ESF  
 Driller DAVIS

Location Coordinates N  
E  
 Filter Materials Silica Sand  
 Grout Type Bentonite Pellets  
 Development \_\_\_\_\_  
 Static Water Level 9.08'  
 Top of Well Elevation 11.58'  
 Drill Type \_\_\_\_\_

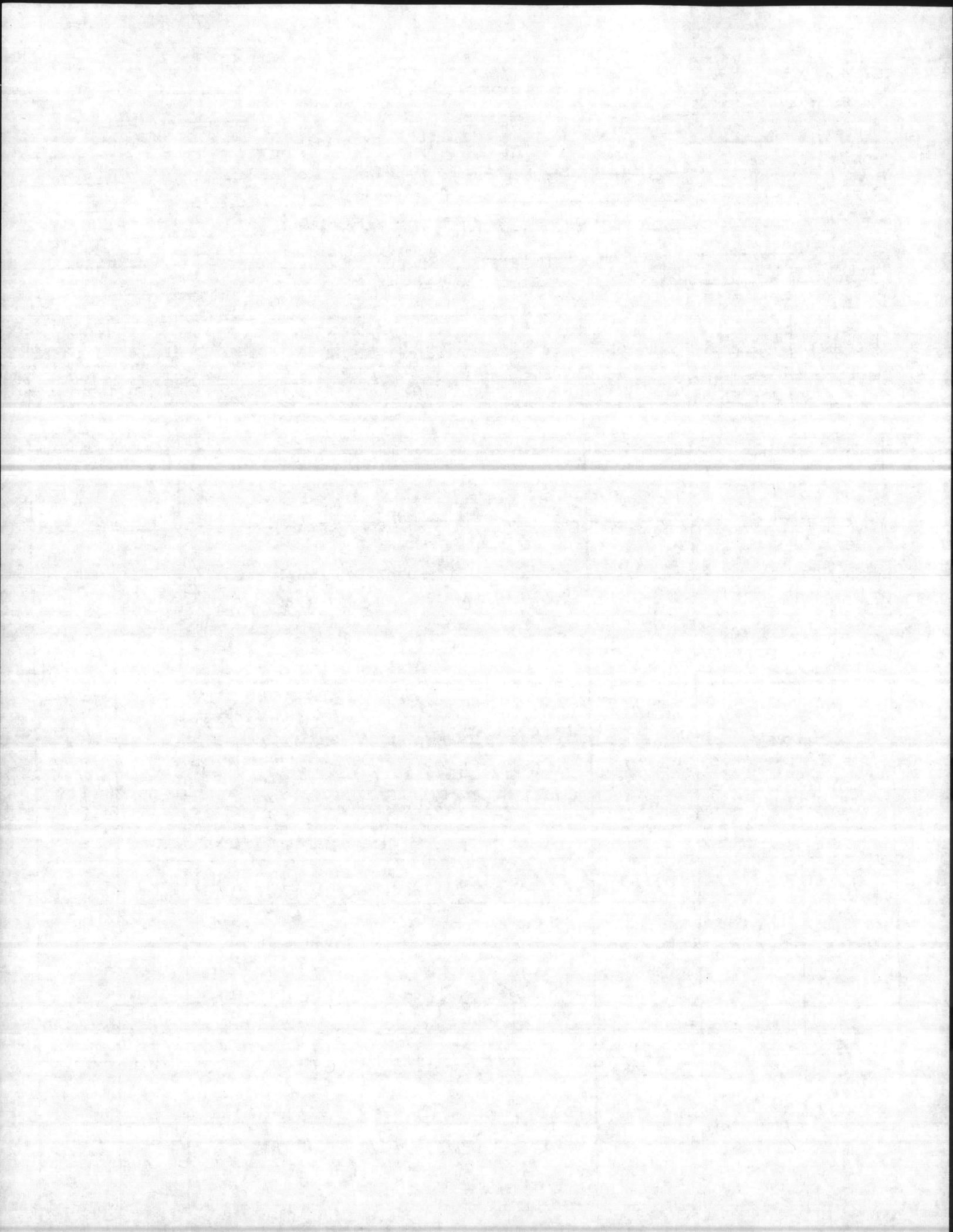
Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0.0-1.5			1042 7.5/3 very pale Brown Organic Matter top 6" silty Fine Sand, loose, moist silt 30%	SM	2 4 4
1.5-3.0			1042 6.5/2, light Brown grey Silty fine sand (silt 25%), 10% clay, clay mottles slightly plastic, mod. dense, moist	SM / SC	2 6 3
3.0-4.5			1042 5.5/1 grey - light grey, silty sandy clay, (silt + sand 30%), dense - mod. dense, slightly plastic, moist	SC / CH	4 5 6
4.5-6.0			Same as above (3.0-4.5) less silt + sand, Very Plastic	CH	3 4 5
6.0-7.5			Same as above 4.5-6.0	CH	3 4 3



Boring No. GW 9 HP GW 19 Location Coordinates N  
E  
Hole Size \_\_\_\_\_ Slot \_\_\_\_\_  
Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
 casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
Geologist \_\_\_\_\_ Development \_\_\_\_\_  
Date Start \_\_\_\_\_ Finish \_\_\_\_\_ Static Water Level \_\_\_\_\_  
Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
7.5-9.0			Same as above (4.5-6.0)	CH	2 3 2
9.0-10.5			10.4R 5/1 grey silty clay, Plastic, moist-wet mod. dense, Silt 40%	ML	1 1 2
14.0-15.5			7.5YR 5.5/0 light grey-gny, silty clayey fine-medium sand, (25-30% silt + clay), clay mottles very sticky, mod. dense, wet	SM	14 7 8
19.0-20.5		19.0-19.5	Same as above (14.0-15.5)		8 5 4
		19.5-20.5	7.5YR 3.75/0 dark - very dark grey, very plastic, wet, very sticky clay with 20% silt + sand	M.H.	
24.0-25.5			2.5Y 2/0, Black Dry-mast Organic clay with 20% silt, slightly Dense, slightly plastic	OL	1 2 1

water table 10'



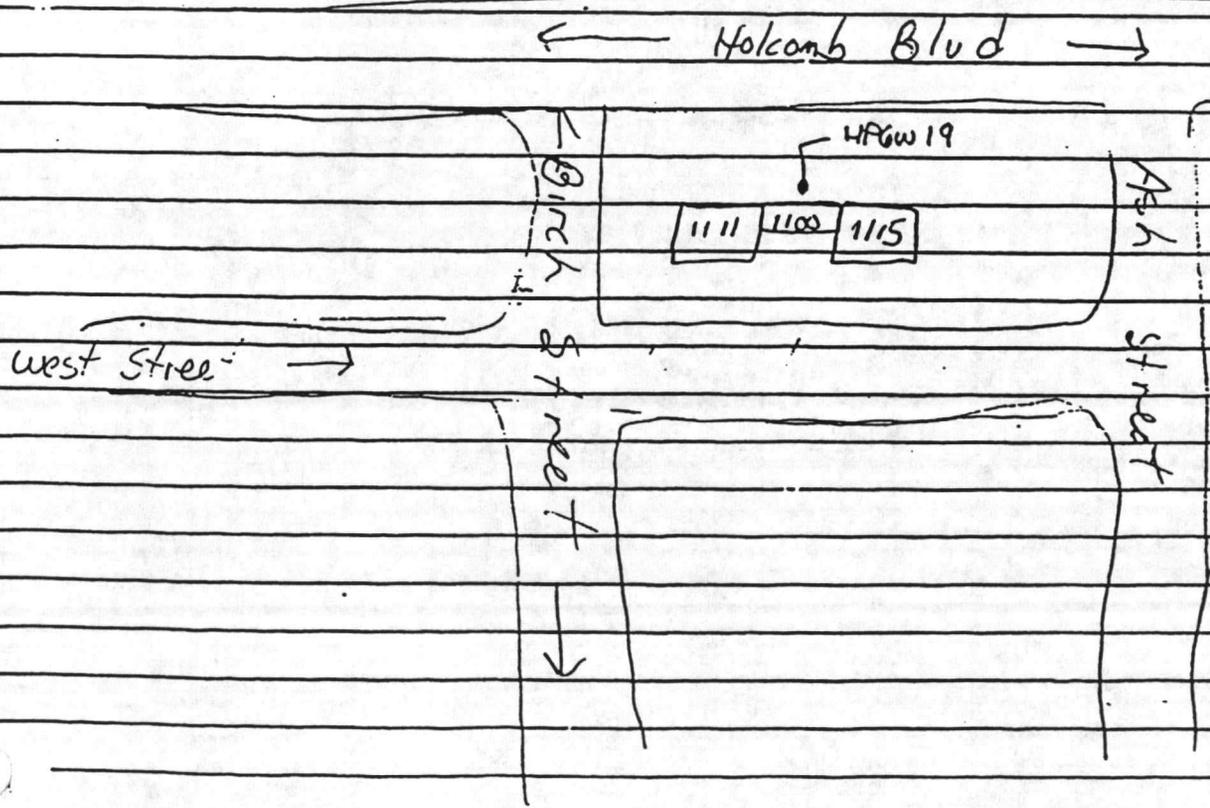
Boring No. EW 9 HPGW 19

SHEET \_\_\_\_\_ OF \_\_\_\_\_

11/6/86

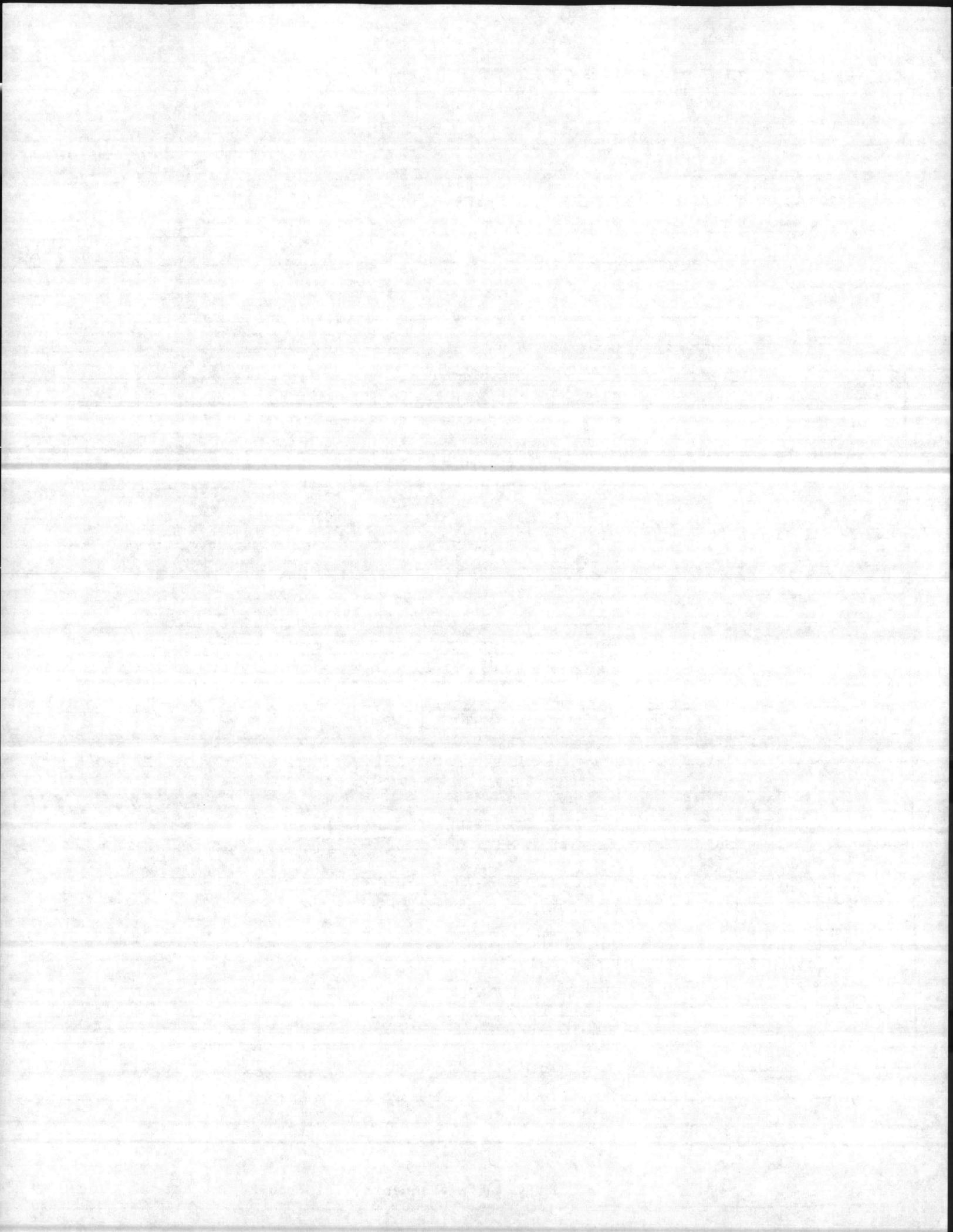
On site 230 PM  
1st Spoon 240 PM  
Last Spoon 345 PM  
Well complete 415 PM

Standard Well specs



DATE

SIGNED



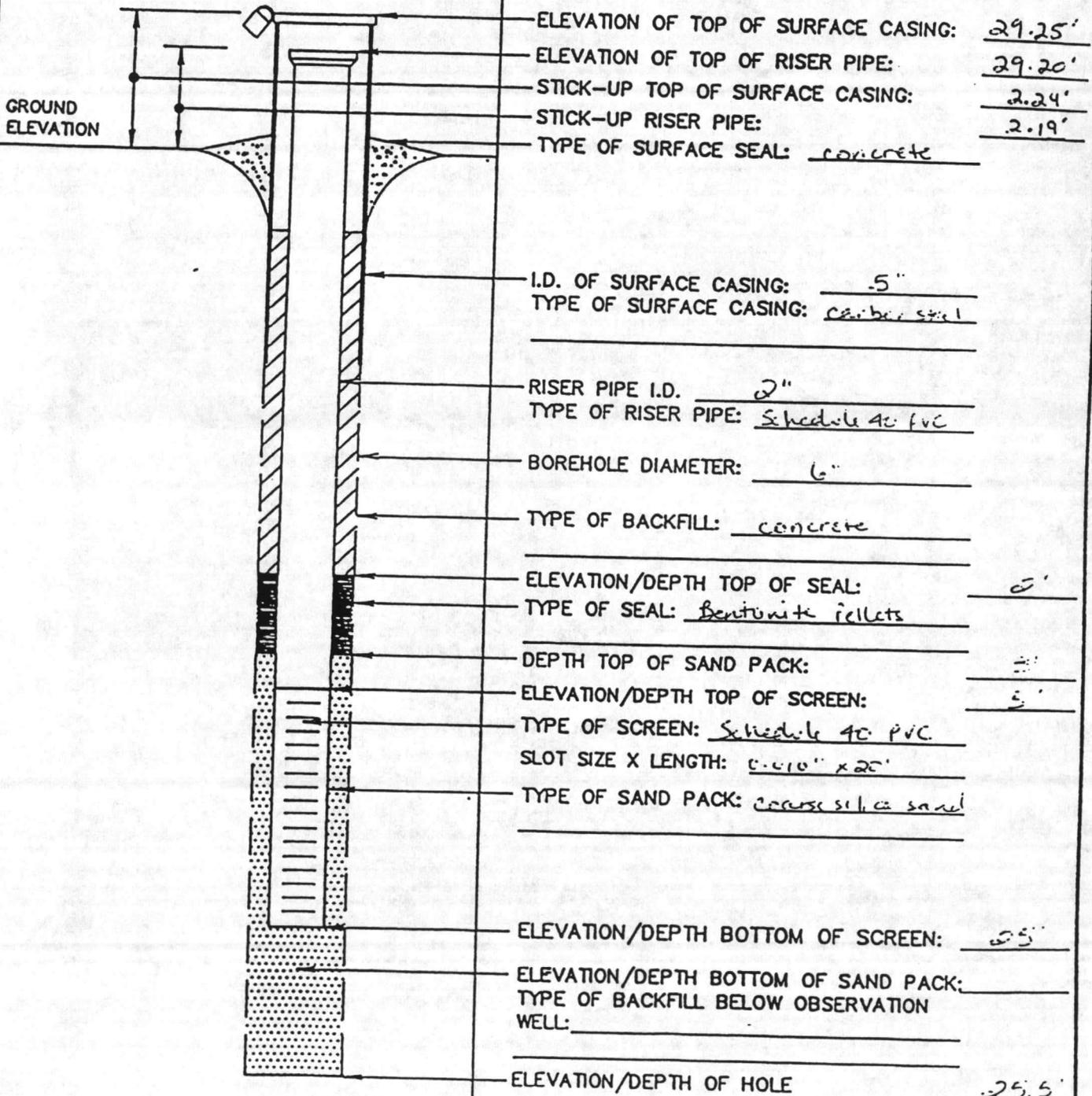
↑

## OVERBURDEN MONITORING WELL SHEET

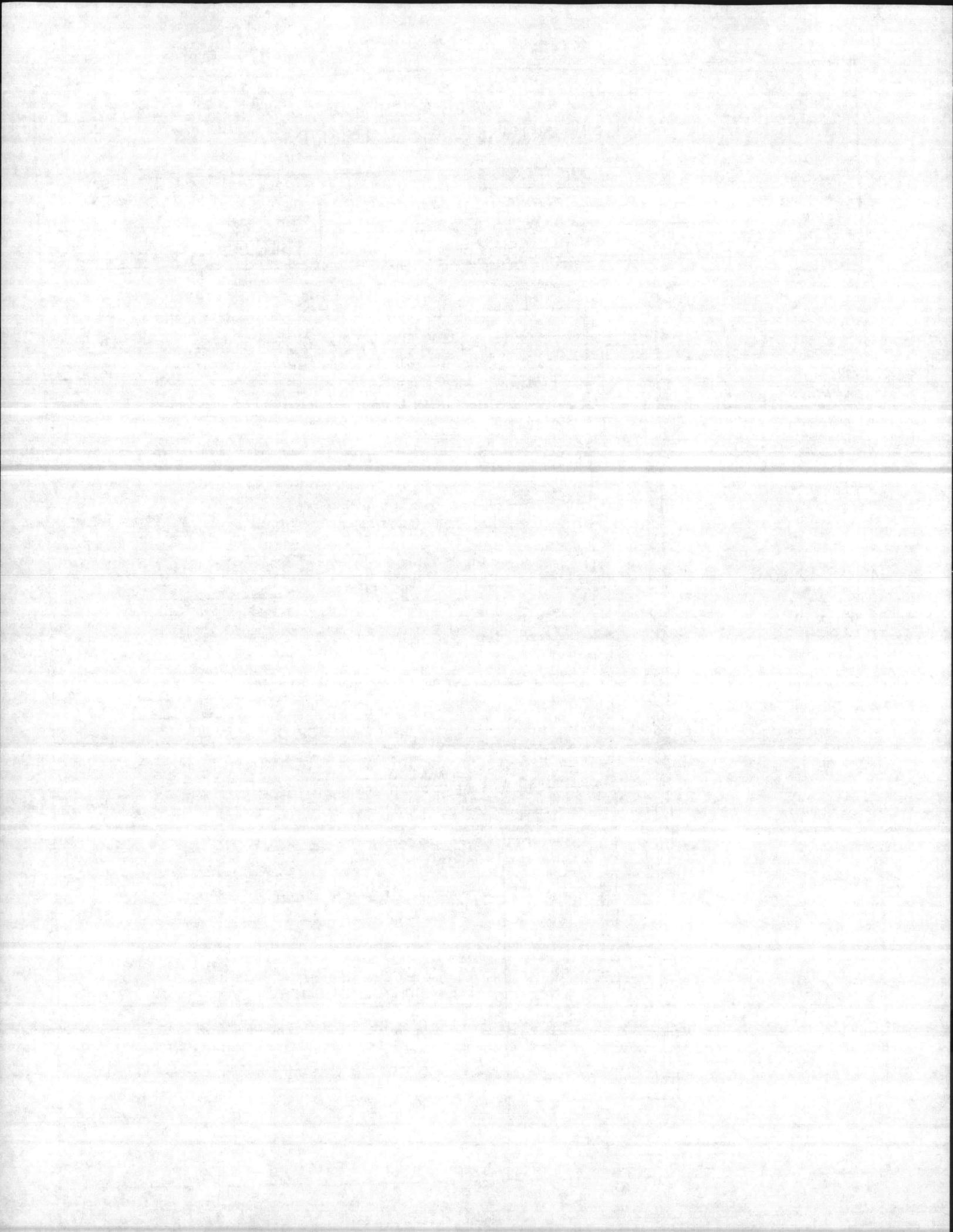
WELL NO. HP-6019

PROJECT Camp Lejeune - HTA  
 PROJECT NO. 49-60-26 BORING NO. HP-6019  
 ELEVATION \_\_\_\_\_ DATE 1/6/86  
 FIELD GEOLOGIST Edward Brentlinger (ESE)

DRILLER Javis Drilling Co  
 DRILLING METHOD \_\_\_\_\_  
 DEVELOPMENT METHOD Hollow Stem Auger



NOT TO SCALE



**FOR OFFICE USE ONLY**

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

PGW/19  
**WELL CONSTRUCTION RECORD**

DRILLING CONTRACTOR Davis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 66-0135-WM-0141

1. WELL LOCATION: (Show sketch of the location below)  
 Nearest Town: Jacksonville N.C.

County: Onslow

(Road, Community, or Subdivision and Lot No.)  
 2. OWNER US Navy  
 ADDRESS Camp Lejeune NC  
 (Street or Route No.) 28542  
 City or Town \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Depth	DRILLING LOG
From To	Formation Description
0.0 - 3.0	Silty Fine Sand
3.0 - 9.0	Silty Sandy Clay
9.0 - 10.5	Silty Clay
14.0 - 15.5	Silty Clayey Mid Sand
19.0 - 20.5	Clay
24.0 - 25.5	Organic Clay

3. DATE DRILLED 11/6/86 USE OF WELL monitor  
 4. TOTAL DEPTH 25.5 CUTTINGS COLLECTED  Yes  No

5. DOES WELL REPLACE EXISTING WELL?  Yes  No  
 6. STATIC WATER LEVEL: 9.08 FT.  above TOP OF CASING.  
 below TOP OF CASING IS 2.50 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_  
 WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	To	Depth	Diameter	Wall Thickness or Weight/Ft.	Material
12.5	5.0	Ft.	2"	1/8"	PVC
From	To	Ft.			
From	To	Ft.			

If additional space is needed use back of form.  
**LOCATION SKETCH**  
 (Show direction and distance from at least two State Roads, or other map reference points)

11. GROUT:

From	To	Depth	Material	Method
0.0	2.0	Ft.	concrete	
2.0	3.0	Ft.	clay	

See Fig. (2-5)

12. SCREEN:

From	To	Depth	Diameter	Slot Size	Material
5.0	2.5	Ft.	2"	0.01 in.	PVC
From	To	Ft.			
From	To	Ft.			

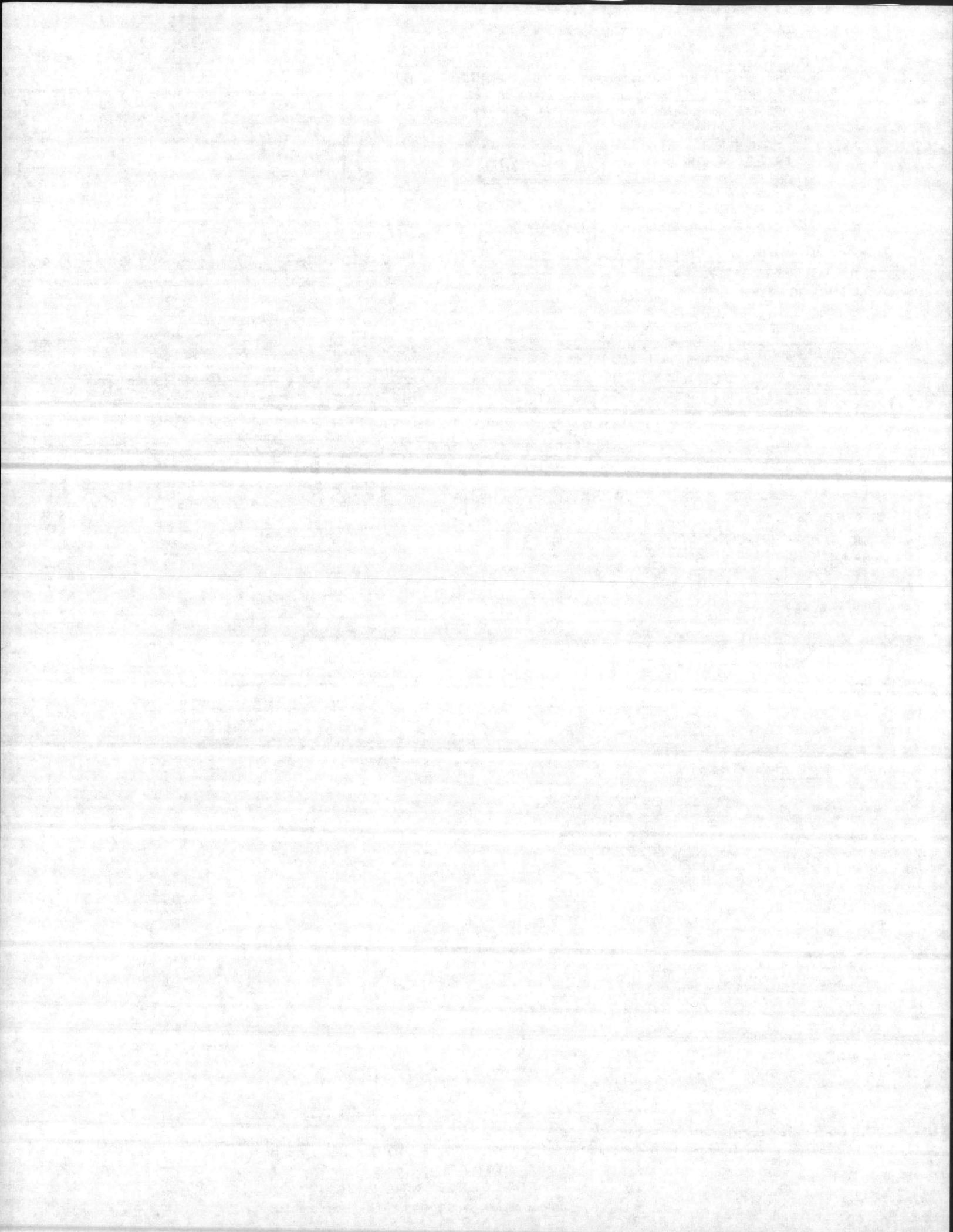
13. GRAVEL PACK:

From	To	Depth	Size	Material
3.0	2.5	Ft.	course	sand
From	To	Ft.		

REMARKS: \_\_\_\_\_

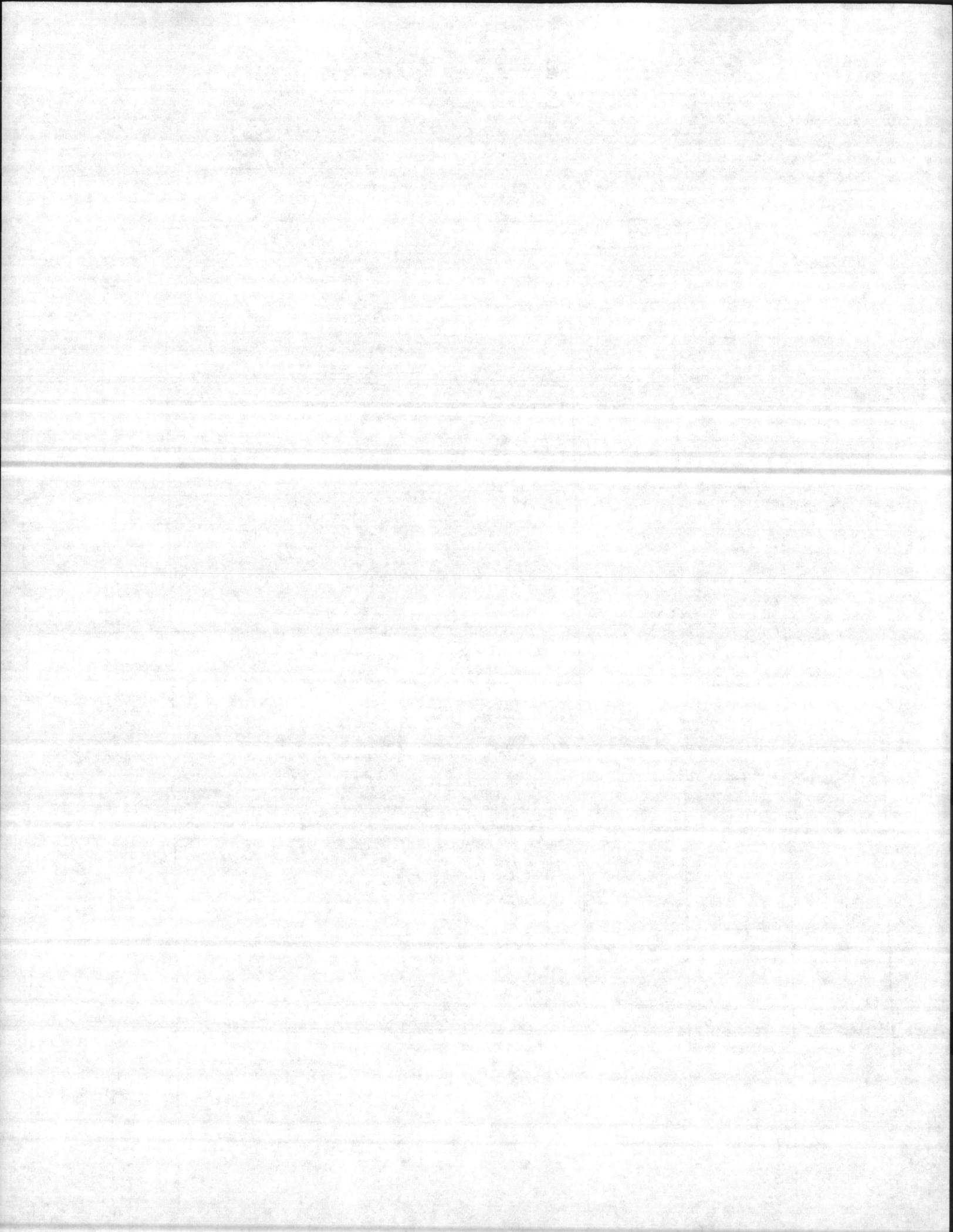
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

[Signature] 2/11/87  
 SIGNATURE OF CONTRACTOR OR AGENT DATE



Boring No. GW 602 HP6W20 Location Coordinates N  
 Hole Size 6" Slot 0.01 E  
 Screen Size 2" Mat'l PVC Filter Materials Silica Sand  
 casing Size 2" Mat'l PVC Grout Type Bentonite Pellets  
 Geologist David Brentlinger Development \_\_\_\_\_  
 Date Start 11/6/86 Finish 11/6 Static Water Level 8.17  
 Contractor ESE Top of Well Elevation 10.67'  
 Driller Davis Drill Type Hollow Stem Auger

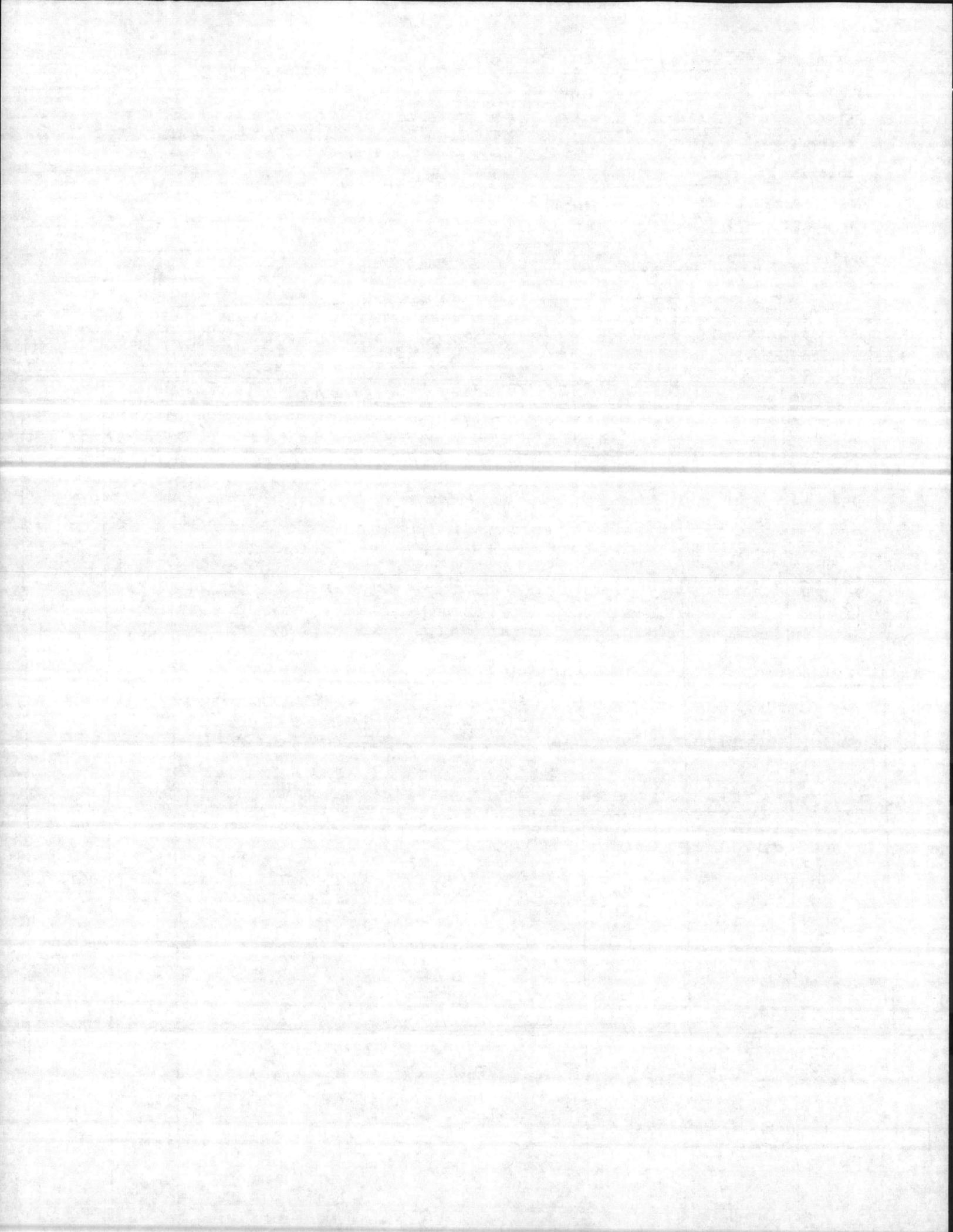
Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0.0-1.5			2.5Y 2.5/6 very dark grey-black, very dense clay, organic matter top 6", plastic, moist	CL MH	1 2 1
1.5-3.0			10YR 5.5/1 grey-light grey, very dense - dense clay, moist, softer than above (0.0-1.0), v. plastic	CH	2 3 5
3.0-4.5			10YR 6.5/1, light grey, silty clayey sand (silt + sand 40%), moist-wet, plastic in clay layers	SC	3 4 5
4.5-6.0			Very dense clay same as above (1.5-3.0), bright yellow mottles	CH	4 6 7
6.0-7.5			7.5YR 6.5/2, Brown-light brown, silty clayey sand, silt + clay 40%, sticky, slightly plastic, dense, moist	SC	4 6 7



Boring No. 6W 602 HP 6W 20 Location Coordinates N  
E  
Hole Size \_\_\_\_\_ Slot \_\_\_\_\_  
Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
 casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
Geologist \_\_\_\_\_ Development \_\_\_\_\_  
Date Start \_\_\_\_\_ Finish \_\_\_\_\_ Static Water Level \_\_\_\_\_  
Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
7.5-9.0			10YR 7.5/1, light grey, silty clayey sand, (silt + clay 40%), moist, slightly plastic, mod. dense, coarse material 10%	SC	3 3 3
9.0-10.5			Same as above (7.5-9.0) with less clay	SC SM	3 4 6
14.0-15.5			10YR 4.25/1 grey-dark grey, very dense, massive clay, plastic, moist	CH	13 18 21
19.0-20.5			10YR 7.5/1, light grey, silty clayey sand (40% medium sand 10% coarse sand), wet, slightly dense, clay layers sticky + very plastic	SC SM	2 6 7
21.0-25.5			2.5Y 4.5/0 grey-dark grey, silty med. sand (silt 10-15%), wet, loose, not plastic	SW SM	5 5 5

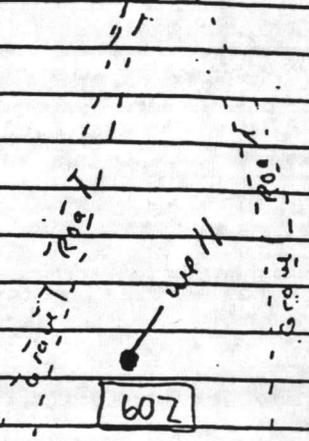
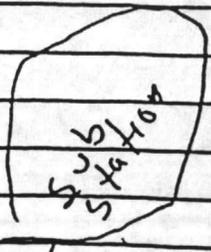
water table 10'



On Site 2:10 PM

11/5/86

1st Spoon 215  
20 minute Break (320-340)  
last spoon 340  
well complete 350



Standard Well Specs

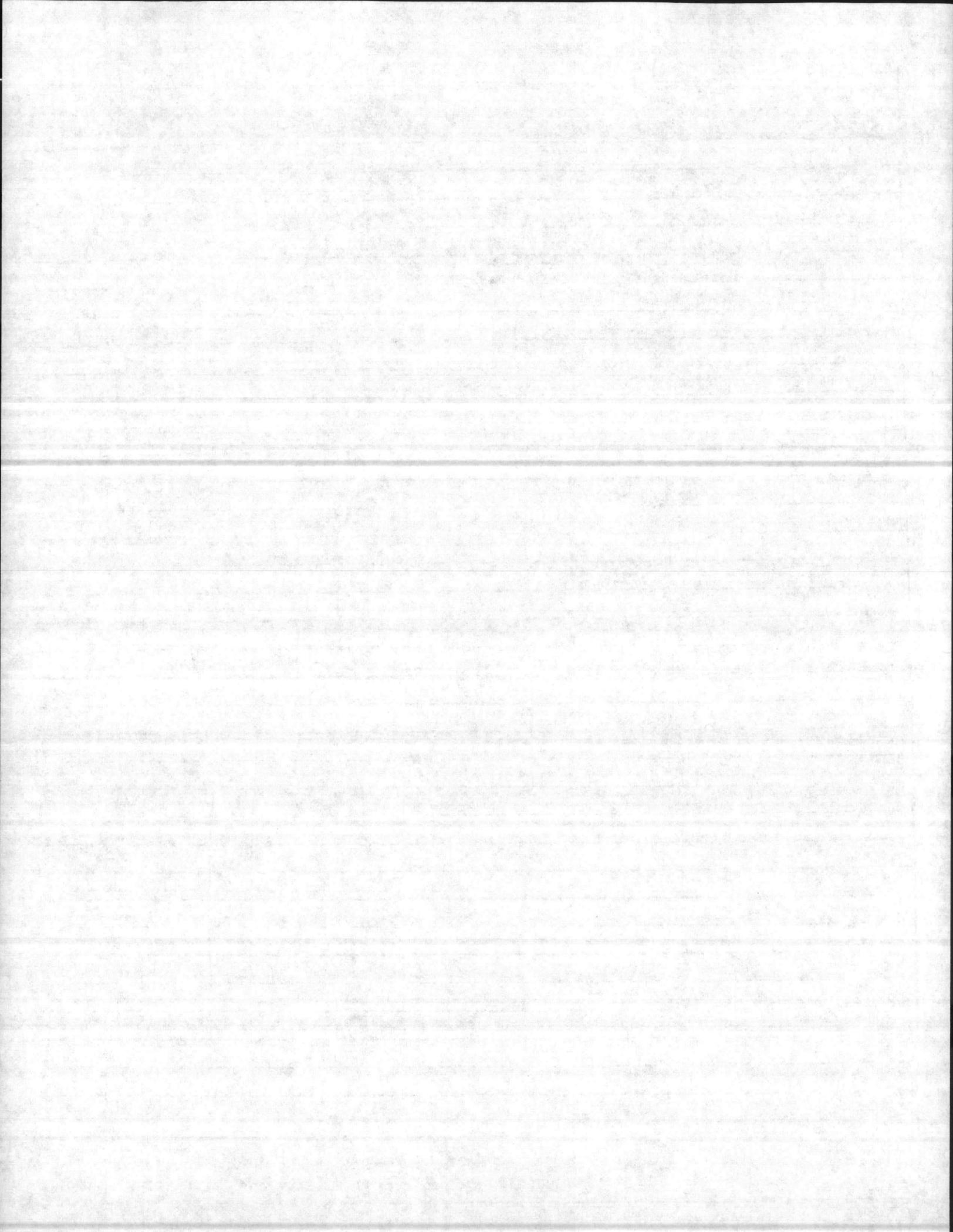
Hokomb Blvd

Ash Street



DATE

SIGNED

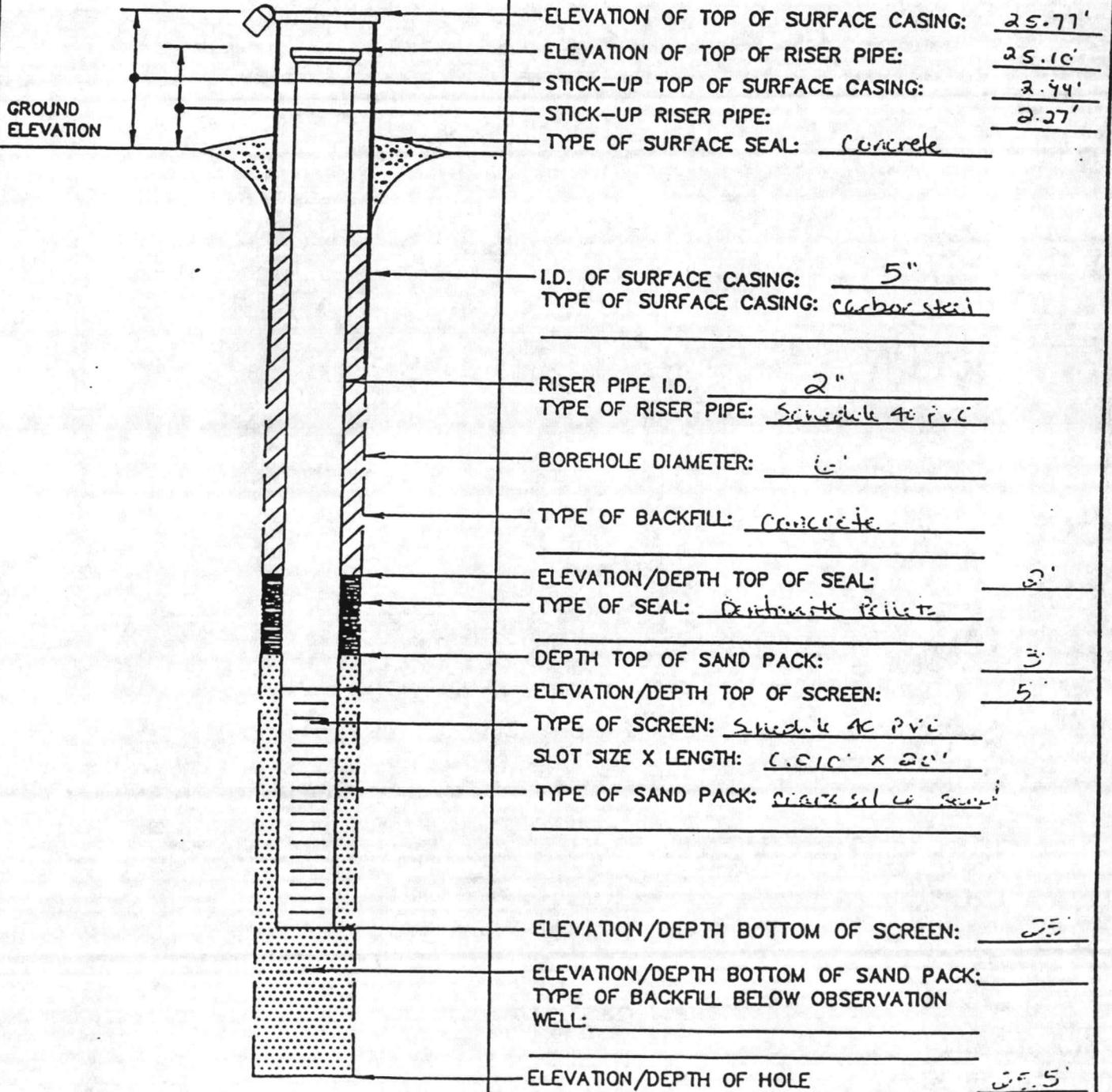


# OVERBURDEN MONITORING WELL SHEET

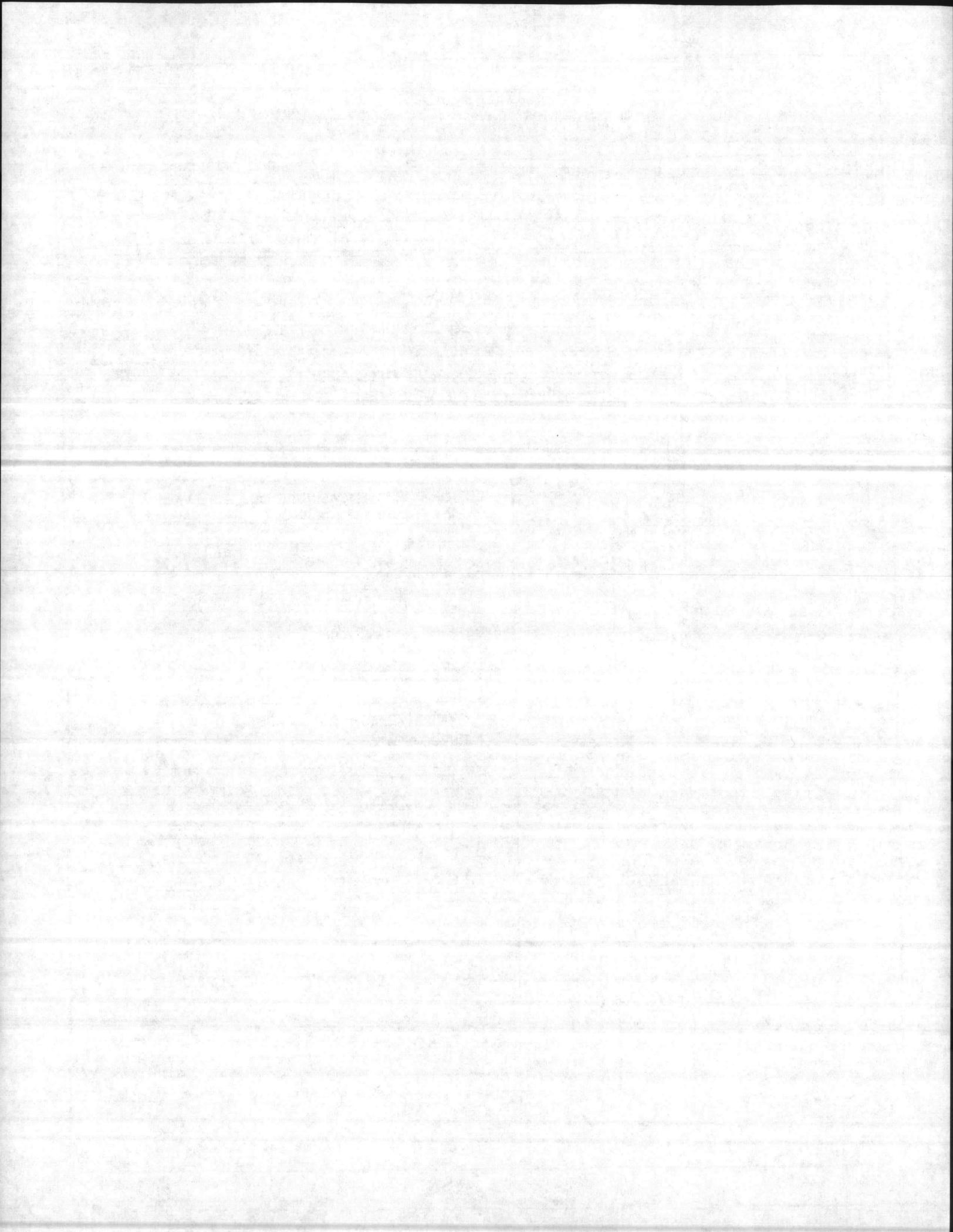
WELL NO. HP-6020

PROJECT Camp Lejeune - HP1A  
 PROJECT NO. 49-010-20 BORING NO. HP-6020  
 ELEVATION \_\_\_\_\_ DATE 11/6/86  
 FIELD GEOLOGIST David Forest Linger (ESC)

DRILLER Dawn Drilling Co.  
 DRILLING METHOD Hand - Star Auger  
 DEVELOPMENT METHOD \_\_\_\_\_



NOT TO SCALE



FOR OFFICE USE ONLY

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

07PGW20

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Davis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 66-0135-WM-0141

1. WELL LOCATION: (Show sketch of the location below)  
 Nearest Town: Jacksonville, N.C.

County: Onslow

(Road, Community, or Subdivision and Lot No.)  
 2. OWNER US Navy  
 ADDRESS Camp LeJeune NC 28542  
 (Street or Route No.)  
 City or Town State Zip Code

Depth		DRILLING LOG
From	To	Formation Description
0.0	3.0	Clay
3.0	4.5	Silty Clayey Sand
4.5	6.0	Clay
6.0	10.5	Silty Clayey Sand
10.5	14.0	Clay
14.0	15.5	Silty Clayey Sand
15.5	19.0	Clay
19.0	20.5	Silty Clayey Sand
20.5	24.0	Silty Med Sand

3. DATE DRILLED 11/6/86 USE OF WELL monitor

4. TOTAL DEPTH 25.5 CUTTINGS COLLECTED  Yes  No

5. DOES WELL REPLACE EXISTING WELL?  Yes  No

6. STATIC WATER LEVEL: 8.17 FT.  above TOP OF CASING.  
 below TOP OF CASING IS 2.50 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_

WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	Depth	To	Diameter	Wall Thickness or Weight/Ft.	Material
0.0	2.5	5.0	2"	1/8"	PVC
From	To	Ft.			
From	To	Ft.			

11. GROUT:

From	Depth	To	Material	Method
0.0	2.0	2.0	Concrete	
2.0	3.0	3.0	Clay	
From	To	Ft.		

12. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
5.0	25'	25'	2"	0.01 in.	PVC
From	To	Ft.			

13. GRAVEL PACK:

From	Depth	To	Size	Material
3.0	25'	25'	Coarse	Sand
From	To	Ft.		

REMARKS: \_\_\_\_\_

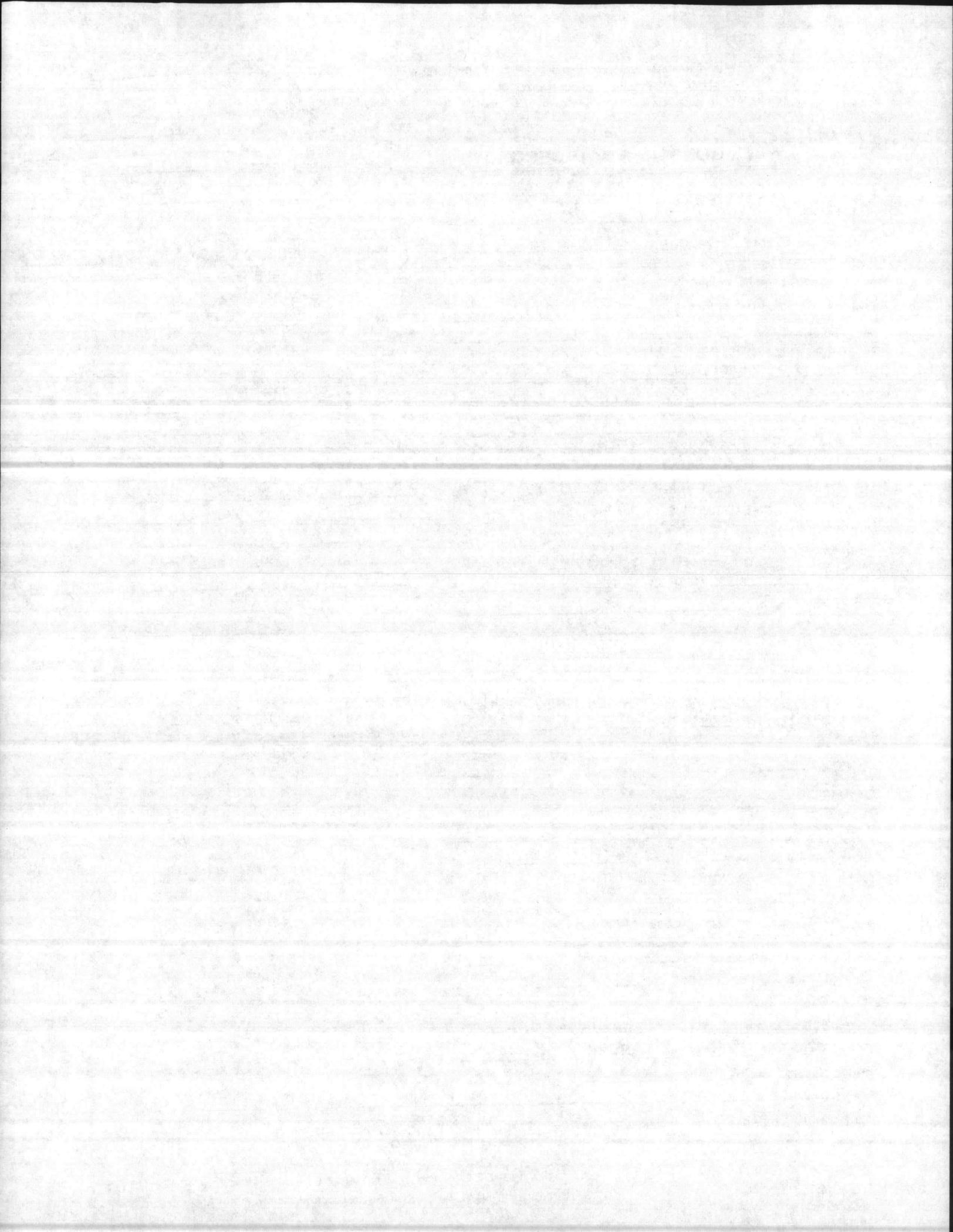
If additional space is needed use back of form.

LOCATION SKETCH  
 (Show direction and distance from at least two State Roads, or other map reference points)

See Fig. (2-5)

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

[Signature] 2/11/87  
 SIGNATURE OF CONTRACTOR OR AGENT DATE



Boring No. HP GW 21

Location Coordinates N

Hole Size 6" Slot 0.01

Location Coordinates E

Screen Size 2" Mat'l PVC

Filter Materials Silica Sand

Grouting Size 2" Mat'l PVC

Grout Type Bentony Pellets

Geologist David Brentlinger

Development -

Date Start 11/19/86 Finish 11/19

Static Water Level 9.08

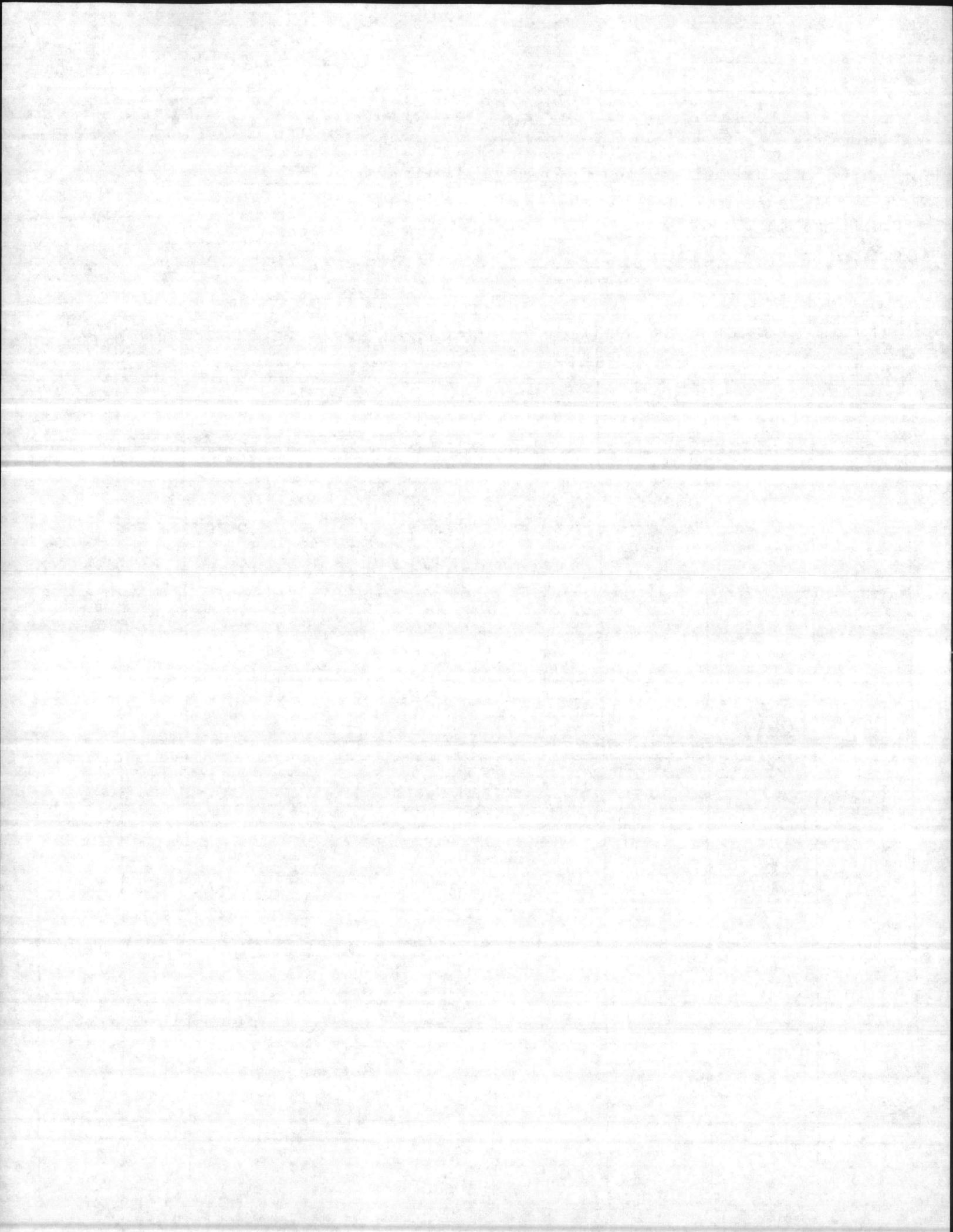
Contractor ESE

Top of Well Elevation 11.58'

Driller Davis

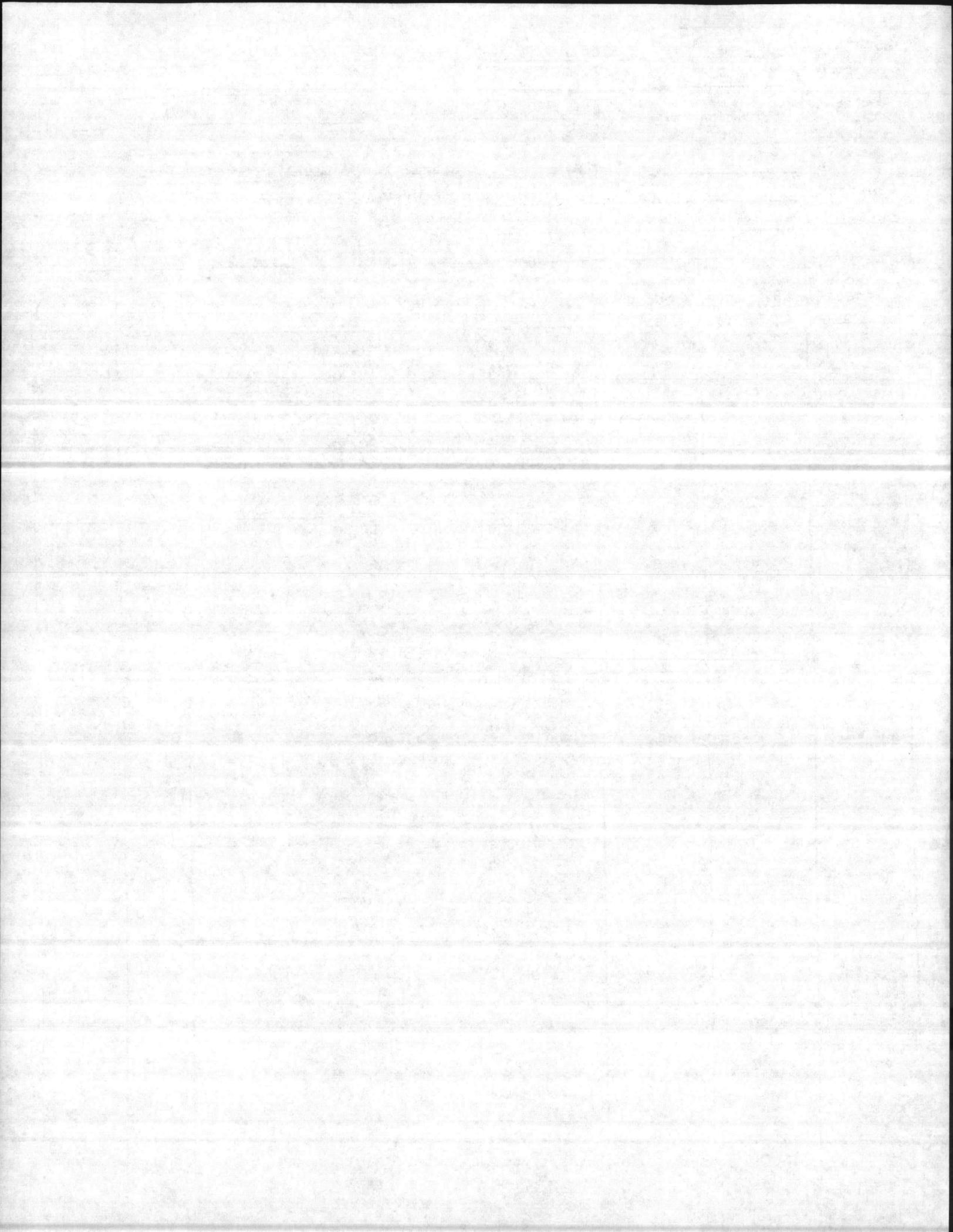
Drill Type Hollow Stem Auger

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0.0-1.5			Cement Fill + Gravel		6 6 6
1.5-3.0			2.5Y 2.5/8, Olive yellow-light olive Brown, silty fine sandy clay, (silt + sand 45%), slightly plastic, mod. dense, moist	sm sc	4 15 12
3.0-4.5			10YR 5/6, Yellow Brown, silty clayey fine sand (clay + silt 45%), non plastic slightly dense, moist	sc sm	15 5 6
4.5-6.0			5YR 8/1 white - light grey, silty ultra fine - fine sand, (silt 20-30%), loose, moist, non plastic	sm	12 5 1
6.0-7.5			Same as Above (4.5-6.0)	sm	6 10 8
7.5-9.0			2.5Y 7/5.5 Yellow - Pale yellow, silty fine sandy clay, (silt + sand 35%), slightly plastic, mod. dense	sc	15 11 11



Hole Size HPGW 21 Slot E  
 Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
 Casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
 Geologist \_\_\_\_\_ Development \_\_\_\_\_  
 Dr. Start \_\_\_\_\_ Finish \_\_\_\_\_ Static Water Level \_\_\_\_\_  
 Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
 Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
9.0-10.5	9.0-10.0		104R 8/1, white-light grey, silty fine sandy clay, wet same as above (7.5-9.0)	SC	3
	10.0-10.5		2.5Y 8/4, yellow-pale yellow, silty med. sand (silt 10-15%), wet, slightly dense	SW	4 6
14.0-15.5			2.5Y 4/0, dark grey, very soft, sticky clay with 30% silt, plastic, wet not dense	CH	1 1 1
19.0-20.5			7.5 YR 7/0, light grey, fine-med. sand with 10% clay layers throughout; wet, slightly dense, clay is plastic	SW	7 4 8
24.0-25.5			2.5Y 6/0, light grey, sandy silty marl, 50% cemented clastics, (silt + silt 30%), very dense, wet	GC	35 50-??



On Site 1245 PM

11/19/21

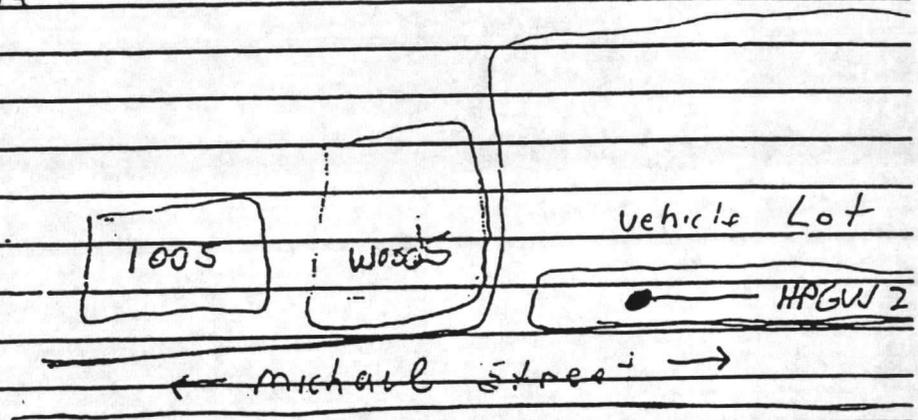
1st Spoon 1250

Last Spoon 145

Well Completed 250

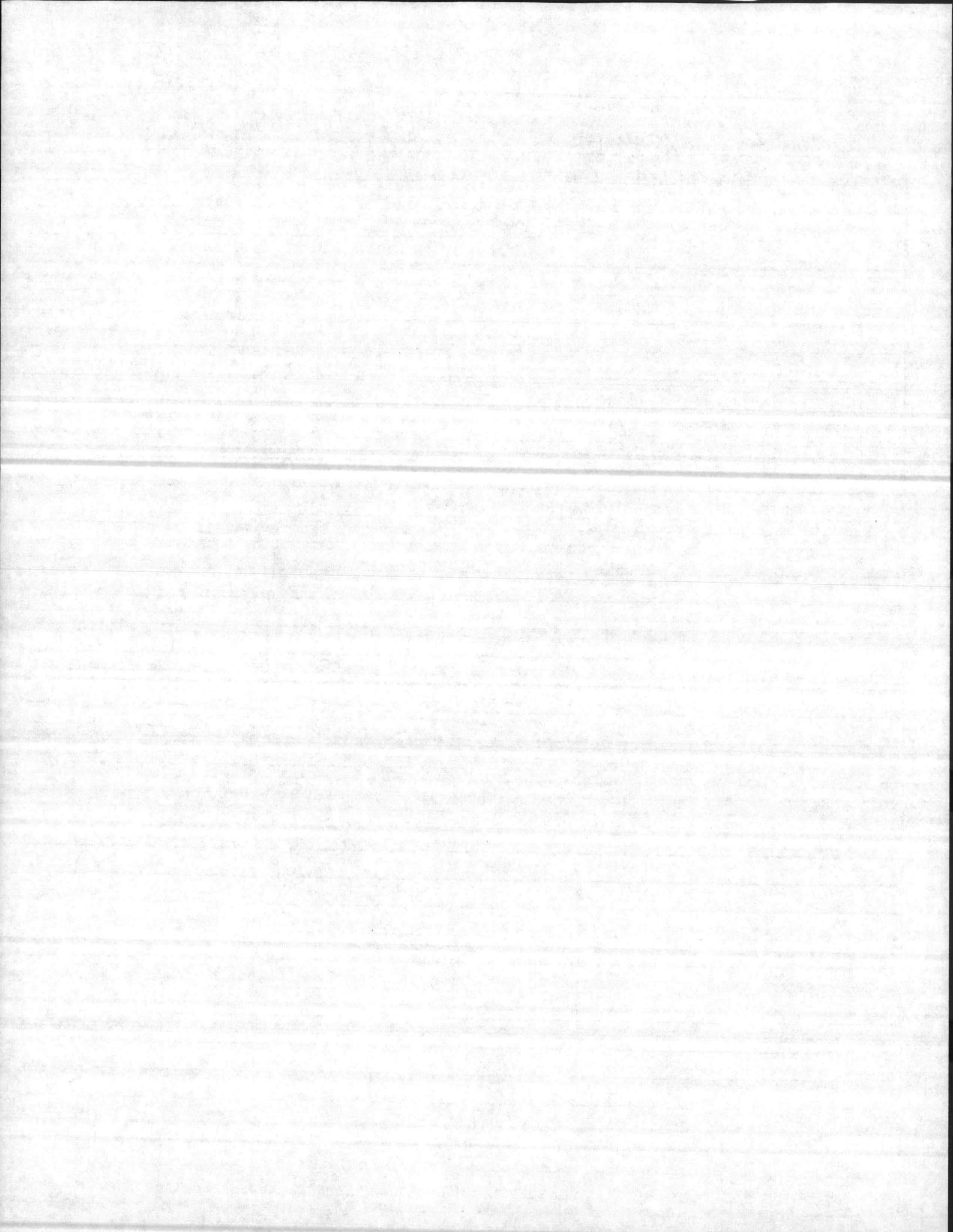
- Standard Well Specs

if there is no well point  
on base of casing  
refer a slide -  
on Cap



DATE

SIGNED

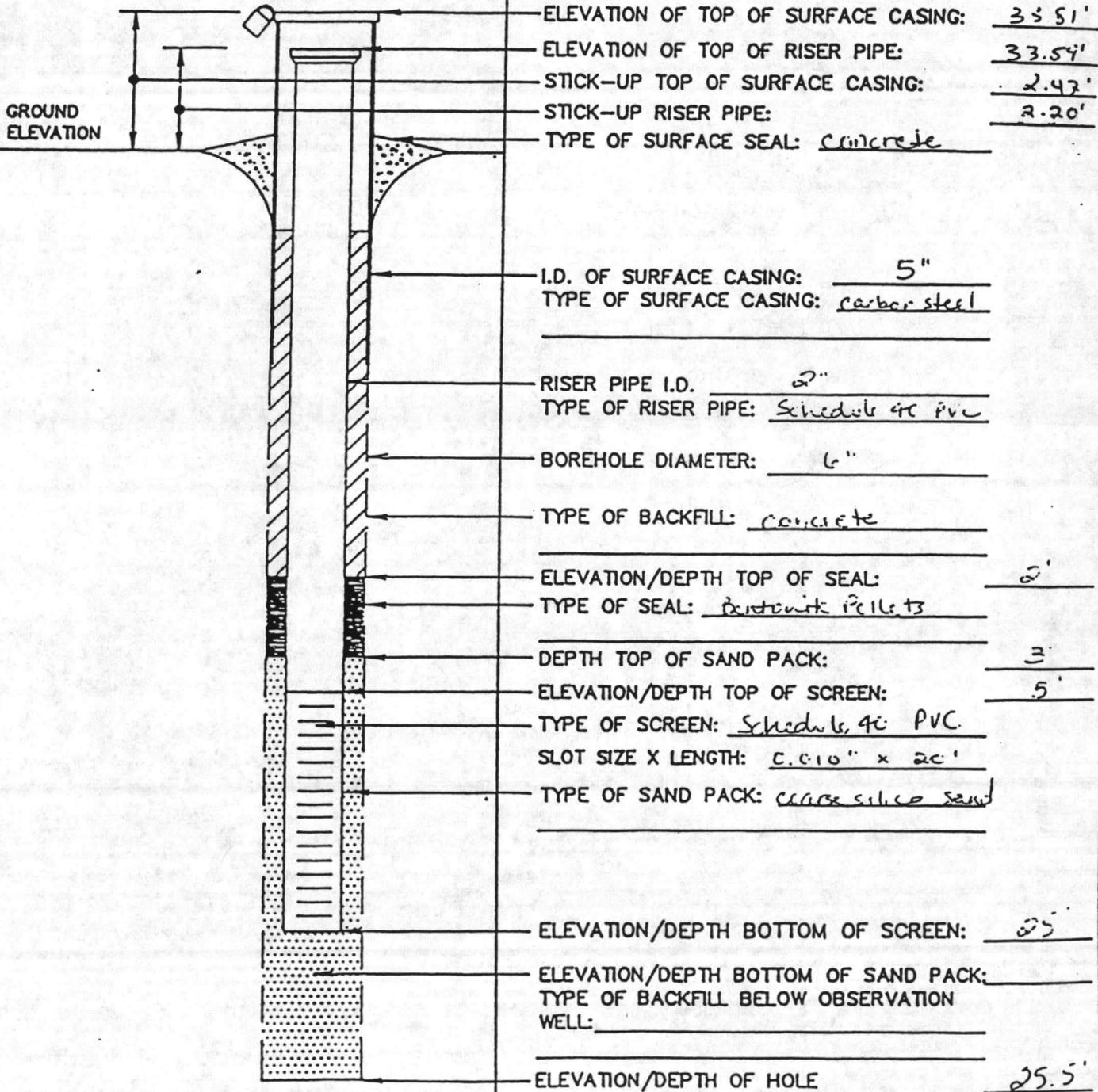


OVERBURDEN  
MONITORING WELL SHEET

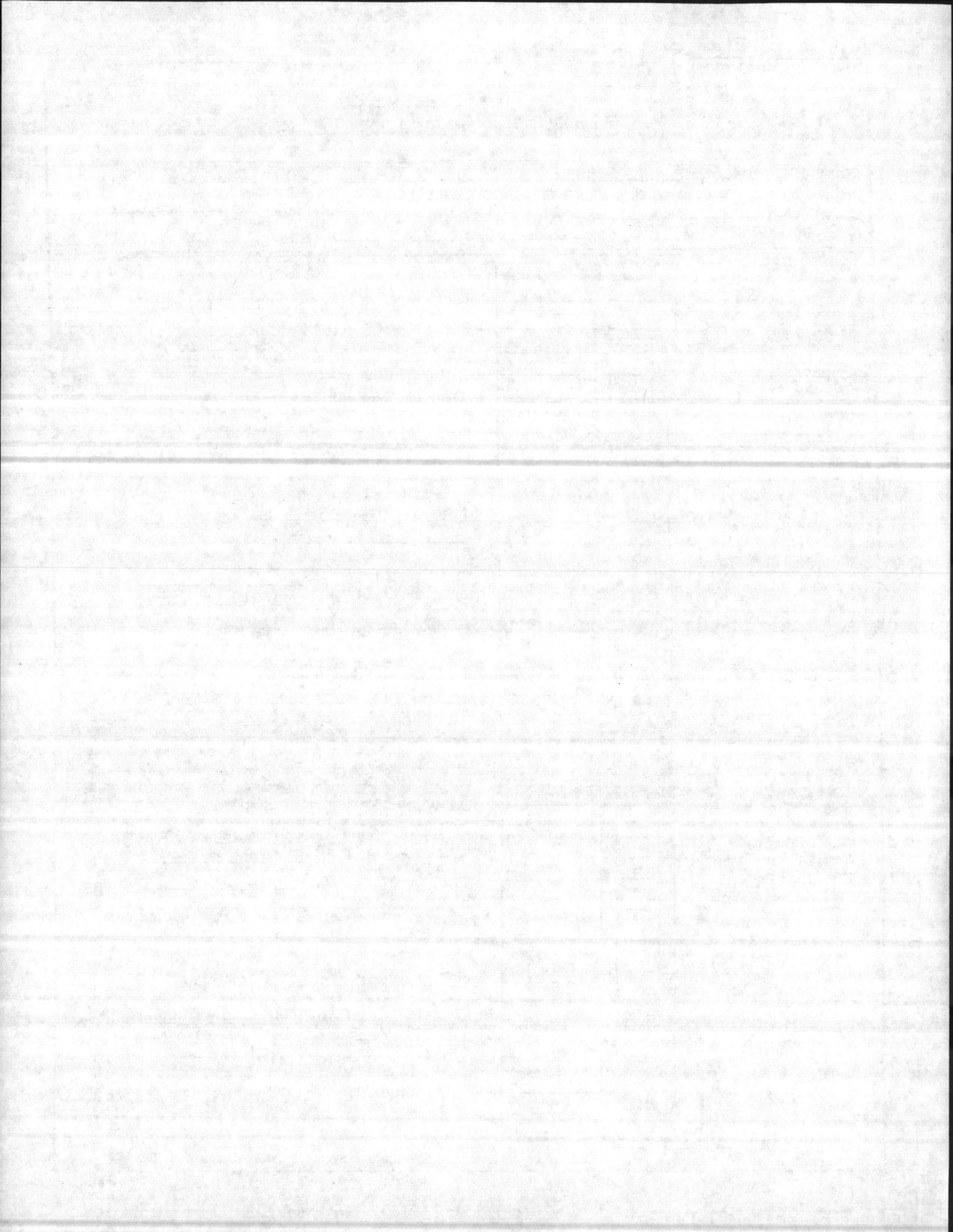
WELL NO. HP-GW 21

PROJECT Camp Lejeune - HPIA  
 PROJECT NO. 49-C2C36 BORING NO. HP-GW 21  
 ELEVATION \_\_\_\_\_ DATE 11/19/86  
 FIELD GEOLOGIST David Brantlinger (ES)

DRILLER Davis Drilling Co.  
 DRILLING METHOD Hydram Stem Auger  
 DEVELOPMENT METHOD \_\_\_\_\_  
 METHOD \_\_\_\_\_



NOT TO SCALE



**FOR OFFICE USE ONLY**

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

06W21

**WELL CONSTRUCTION RECORD**

DRILLING CONTRACTOR Davis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 66-0135-WM-0141

1. WELL LOCATION: (Show sketch of the location below)  
 Nearest Town: Jacksonville, NC

County: Onslow

(Road, Community, or Subdivision and Lot No.)

2. OWNER US Navy  
 ADDRESS Camelot Road NC 28542  
 (Street or Route No.)  
 City or Town \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Depth		DRILLING LOG
From	To	Formation Description
0.0	1.5	Cement Fill
1.5	3.0	Silty fine sandy clay
3.0	4.5	Silty clayey fine sand
4.5	7.5	Silty ultra fine sand
7.5	10.0	Silty fine sandy clay
10.0	10.5	Silty med. sand
14.0	15.5	Soft clay
19.0	20.5	Fine-med sand
24.0	25.5	Sandy silty marl

3. DATE DRILLED 11/19/86 USE OF WELL monitor

4. TOTAL DEPTH 25.5' CUTTINGS COLLECTED  Yes  No

5. DOES WELL REPLACE EXISTING WELL?  Yes  No

6. STATIC WATER LEVEL: 9.08 FT.  above  below TOP OF CASING.  
 TOP OF CASING IS 2.50 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_

WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	Depth	To	Diameter	Wall Thickness or Weight/Ft.	Material
2.5		5.0	2"	1/8"	PVC
_____		_____	_____	_____	_____
_____		_____	_____	_____	_____

11. GROUT:

From	Depth	To	Material	Method
0.0		2.0	Concrete	_____
2.0		3.0	Clay	_____

12. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
5.0		25'	2" in.	0.01 in.	PVC
_____		_____	_____	_____	_____
_____		_____	_____	_____	_____

13. GRAVEL PACK:

From	Depth	To	Size	Material
3.0		25'	Coarse	Sand
_____		_____	_____	_____

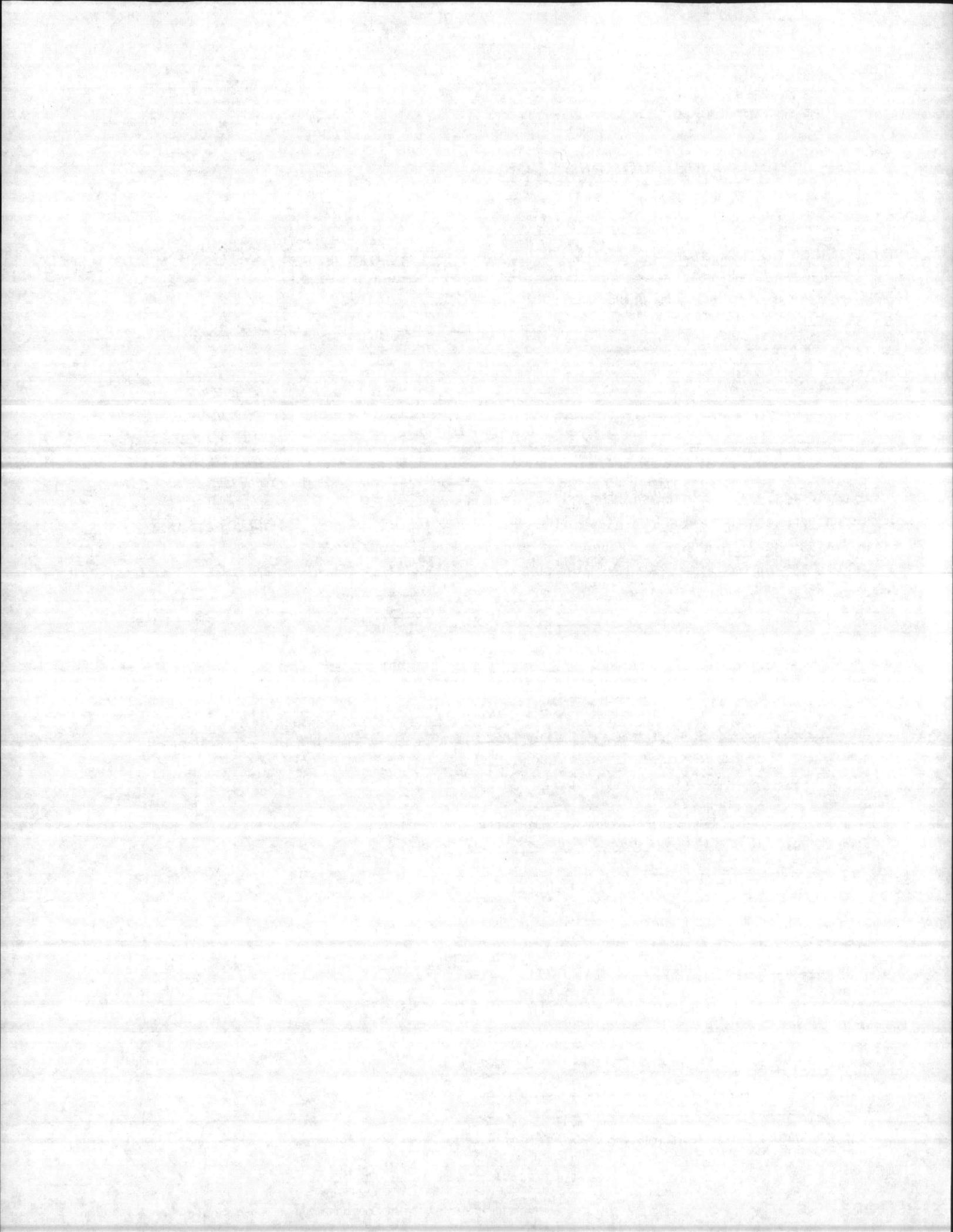
If additional space is needed use back of form.  
**LOCATION SKETCH**  
 (Show direction and distance from at least two State Roads, or other map reference points)

See fig. (2-5)

REMARKS: \_\_\_\_\_

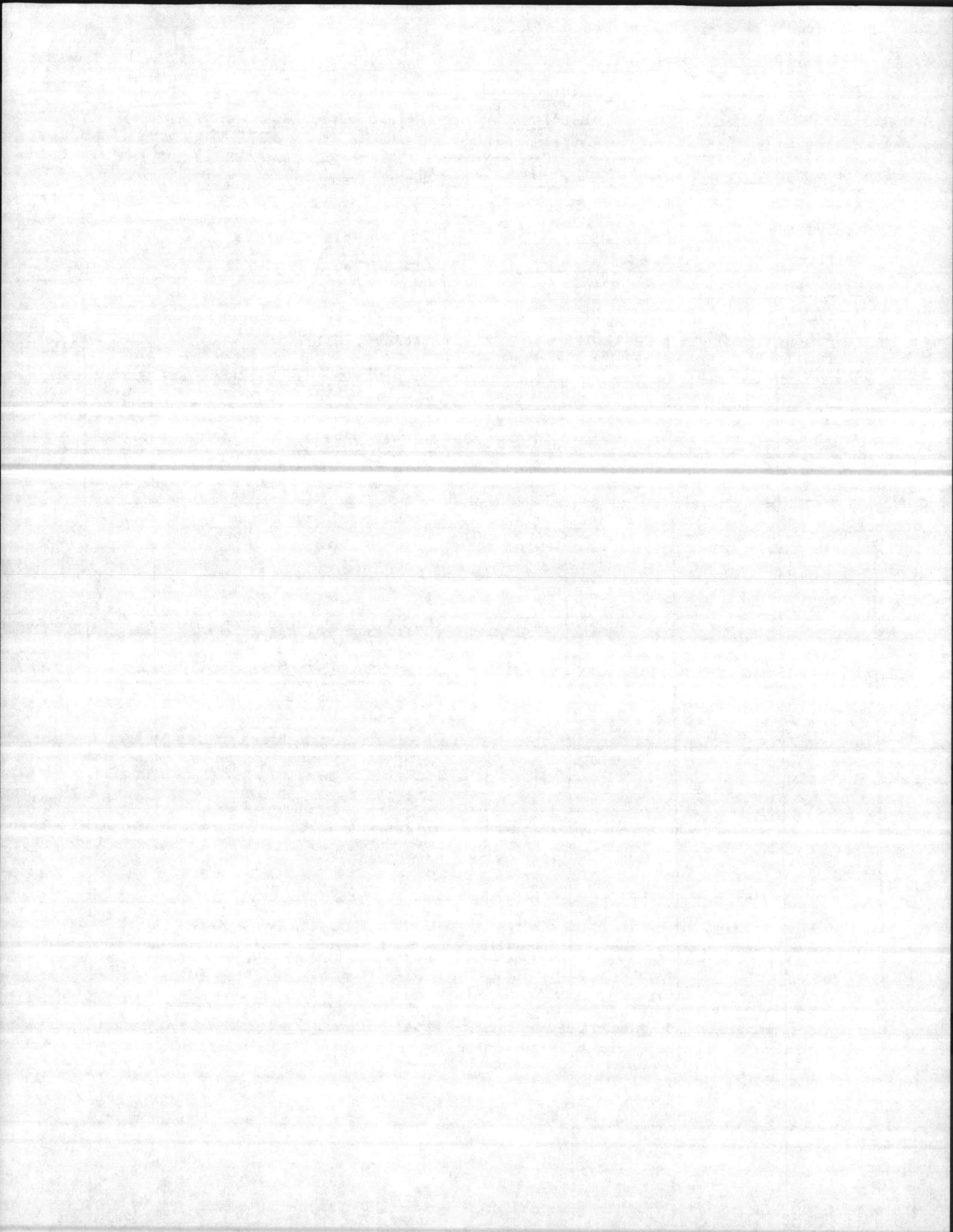
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Davis Drilling Co.  
 SIGNATURE OF CONTRACTOR OR AGENT  
 DATE 2/11/88



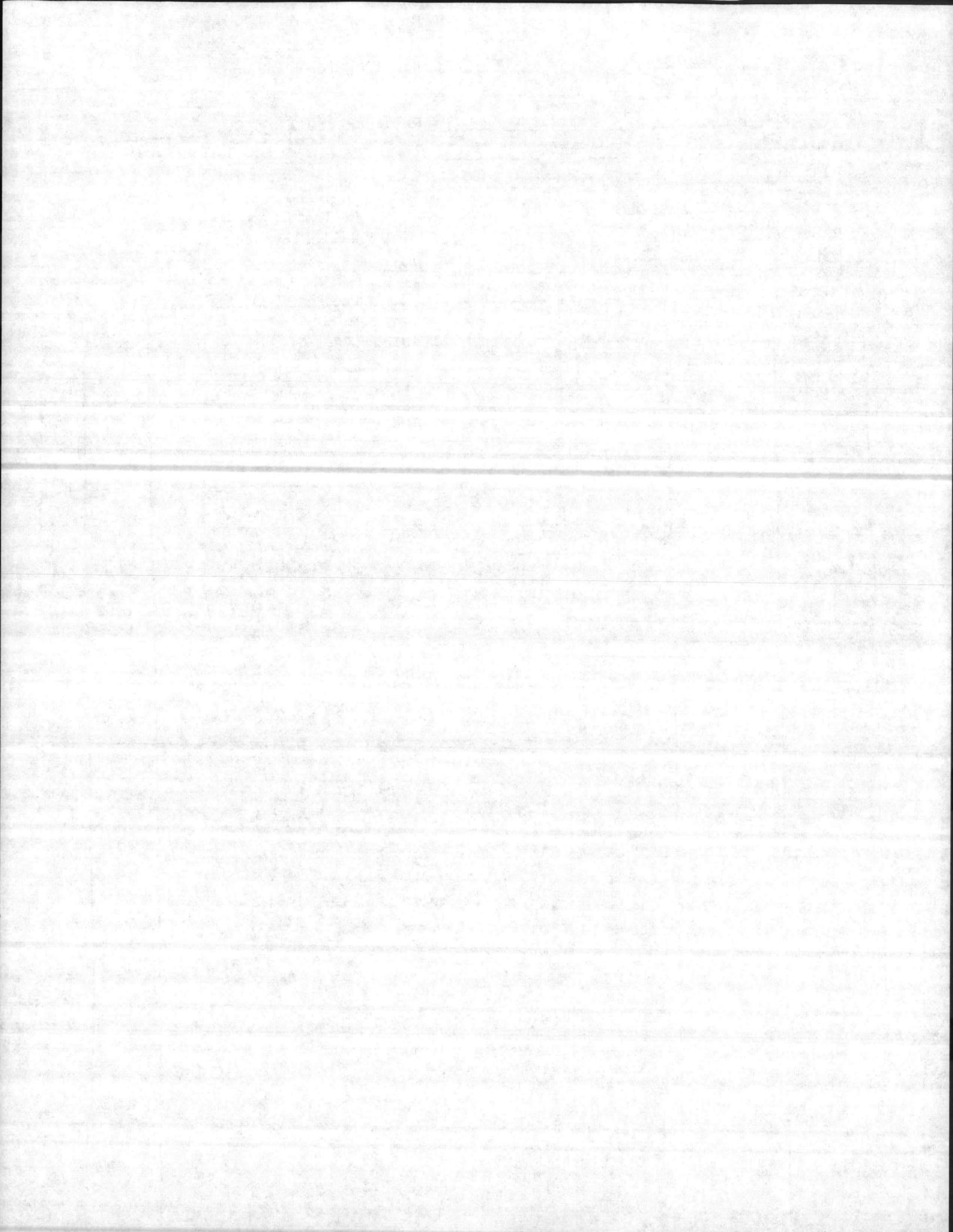
Boring No. GW13 HP6W22 Location Coordinates N  
 Hole Size 6" Slot 0.01 E  
 Screen Size 2" Mat'l PVC Filter Materials Silica Sand  
 Casing Size 2" Mat'l PVC Grout Type Bentonite Pellets  
 Geologist David Brentlinger Development \_\_\_\_\_  
 Date Start 11/4/86 Finish 11/4 Static Water Level 8.17'  
 Contractor ESE Top of Well Elevation 10.67'  
 Driller Davis Drill Type Hollow Stem Auger

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0.0-1.5			2.54 2.5/0 Black-dark grey silty fine sand (silt 25%) 20% organic matter, loose, moist, non plastic	SM	2 2 2
1.5-3.0			(lost sample ?) was not in spoon!		2 1 0
3.0-4.5			2.54 3.5/4 Reddish Brown silty fine sand (silt 30%) over 50% organic matter + roots	SM	0 0 2
4.5-6.0			54 2.75/2 dark Red Brown silty fine sand (silt 30%) organic matter 60%, loose moist, non plastic	SM	6 12 16
6.0-7.5			10.2R 7.5/1 light grey-white, silty fine sand tree roots 90% of sample, loose, moist, non plastic	SM	21 44 46



Boring No. 6W 13 HPGW 22 Location Coordinates N  
E  
Hole Size \_\_\_\_\_ Slot \_\_\_\_\_  
Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
Casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
Geologist \_\_\_\_\_ Development \_\_\_\_\_  
Date Start \_\_\_\_\_ Finish \_\_\_\_\_ Static Water Level \_\_\_\_\_  
Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/F)
7.5-9.0			Same as above (6.0-7.5) with less roots	sm	15 14 16
9.0-10.5			10YR 6.5/1, light grey silty fine sand, (silt 30%), organic matter 40% moist, loose, non plastic	sm	8 9 9
14.0-15.5		14.0-14.75	5YR 2.75, Black-very dark grey (red tint), silty sandy organic peat (organics 60%)	sm	4
		14.75-15.5	5Y 8/1 white (blue tint), silty sandy clay (silt + sand 25%), sticky, slightly plastic, moist	sc	6 8
19.0-20.5		Repetitive sand-silt-clay layers	10YR 6.5/2 Pale-very pale brown silty sandy clay, silt + sand 30%, more sand than silt bottom 6" wet plastic - v. plastic in clay layers, slightly dense	CH ↓ SC	7 5 8
24.0-25.5			10YR 2.5/1 very dark grey-black, silty sandy clay slightly plastic, wet slightly dense, clay is soft silt + sand 30%	CH /SC	1 3 6



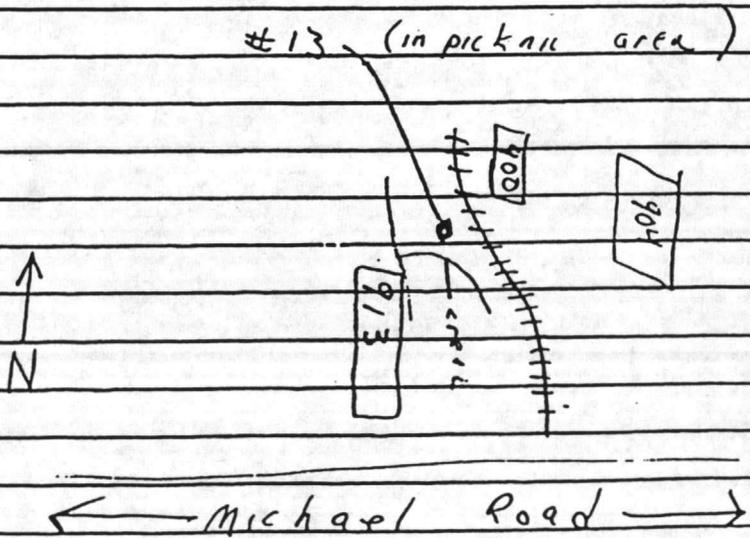
Boring No. ~~6W 13~~ HPGW 22

SHEET \_\_\_\_\_ OF \_\_\_\_\_

On Site 150 Pm  
First Spoon 210  
last Spoon 305  
well Complete 325

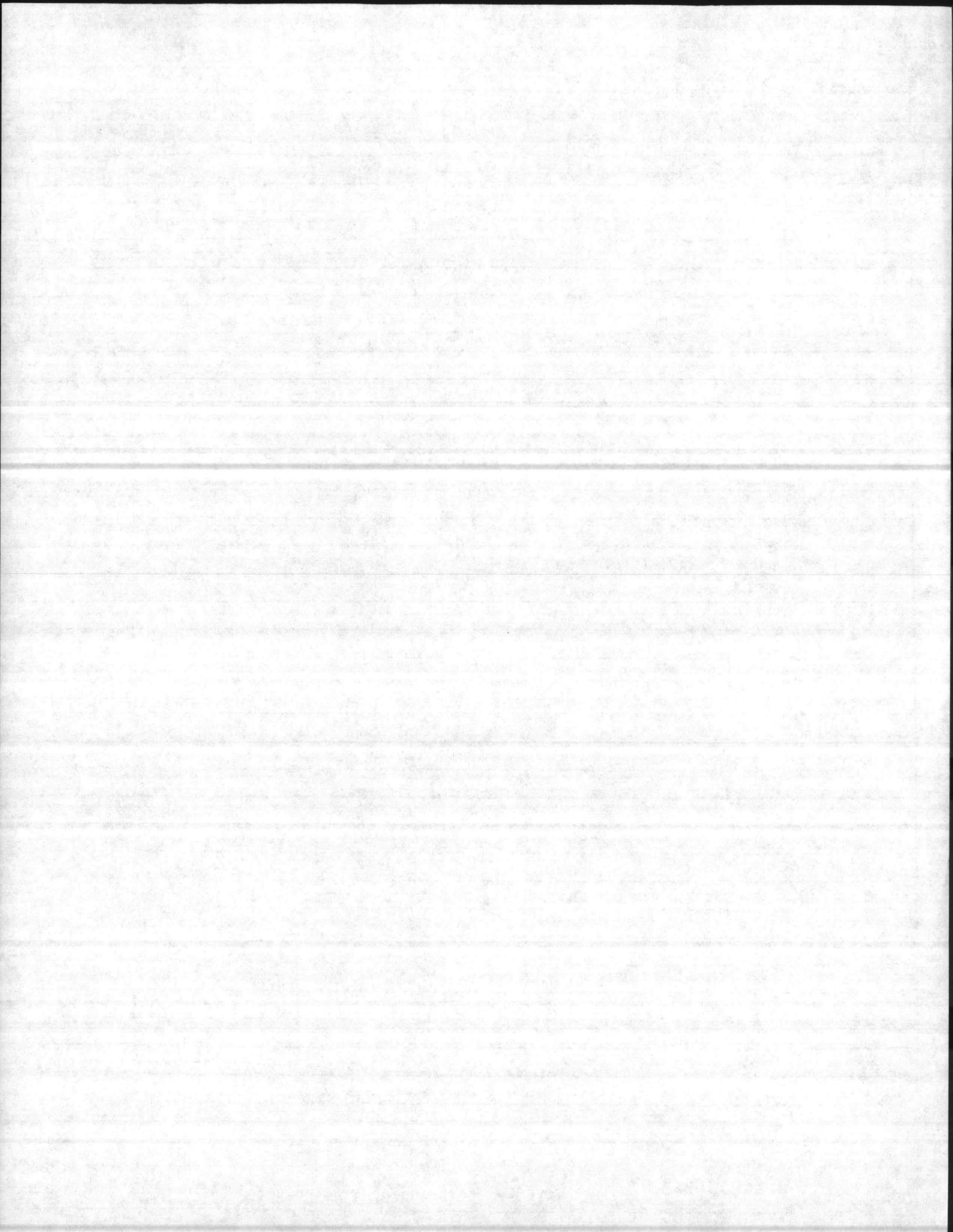
11/4/86

Standard Well Specs



DATE

SIGNED



06W22

**WELL CONSTRUCTION RECORD**

**FOR OFFICE USE ONLY**

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

DRILLING CONTRACTOR Davis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 06-0135-WM-014

1. WELL LOCATION: (Show sketch of the location below)  
 Nearest Town: Jacksonville, NC

County: Onslow

(Road, Community, or Subdivision and Lot No.)

2. OWNER US Navy  
 ADDRESS Camp Lejeune NC 28542  
 (Street or Route No.)

Depth	DRILLING LOG
From	Formation Description
0.0 - 10.5	Silty fine sand
14.0 - 15.5	50% Silty Sandy Peat
	50% Silty Sandy Clay
19.0 - 20.5	Silty Sandy Clay
24.0 - 25.0	Silty Sandy Clay

3. DATE DRILLED 11/4/86 USE OF WELL monitor

4. TOTAL DEPTH 25.5' CUTTINGS COLLECTED  Yes  No

5. DOES WELL REPLACE EXISTING WELL?  Yes  No

6. STATIC WATER LEVEL: 8.17 FT.  above TOP OF CASING,  below  
 TOP OF CASING IS 2.50 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_

WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	To	Depth	Diameter	Wall Thickness or Weight/Ft.	Material
12.5	5.0	2"	1/8"	PVC	
From _____	To _____	Ft. _____	_____	_____	_____
From _____	To _____	Ft. _____	_____	_____	_____

If additional space is needed use back of form.

11. GROUT:

From	To	Depth	Material	Method
0.0	2.0	Concrete		
2.0	3.0	Clay		

See Fig. (2-5)

12. SCREEN:

From	To	Depth	Diameter	Slot Size	Material
5.0	25'	2"	0.01 in.	PVC	
From _____	To _____	Ft. _____	in. _____	in. _____	_____
From _____	To _____	Ft. _____	in. _____	in. _____	_____

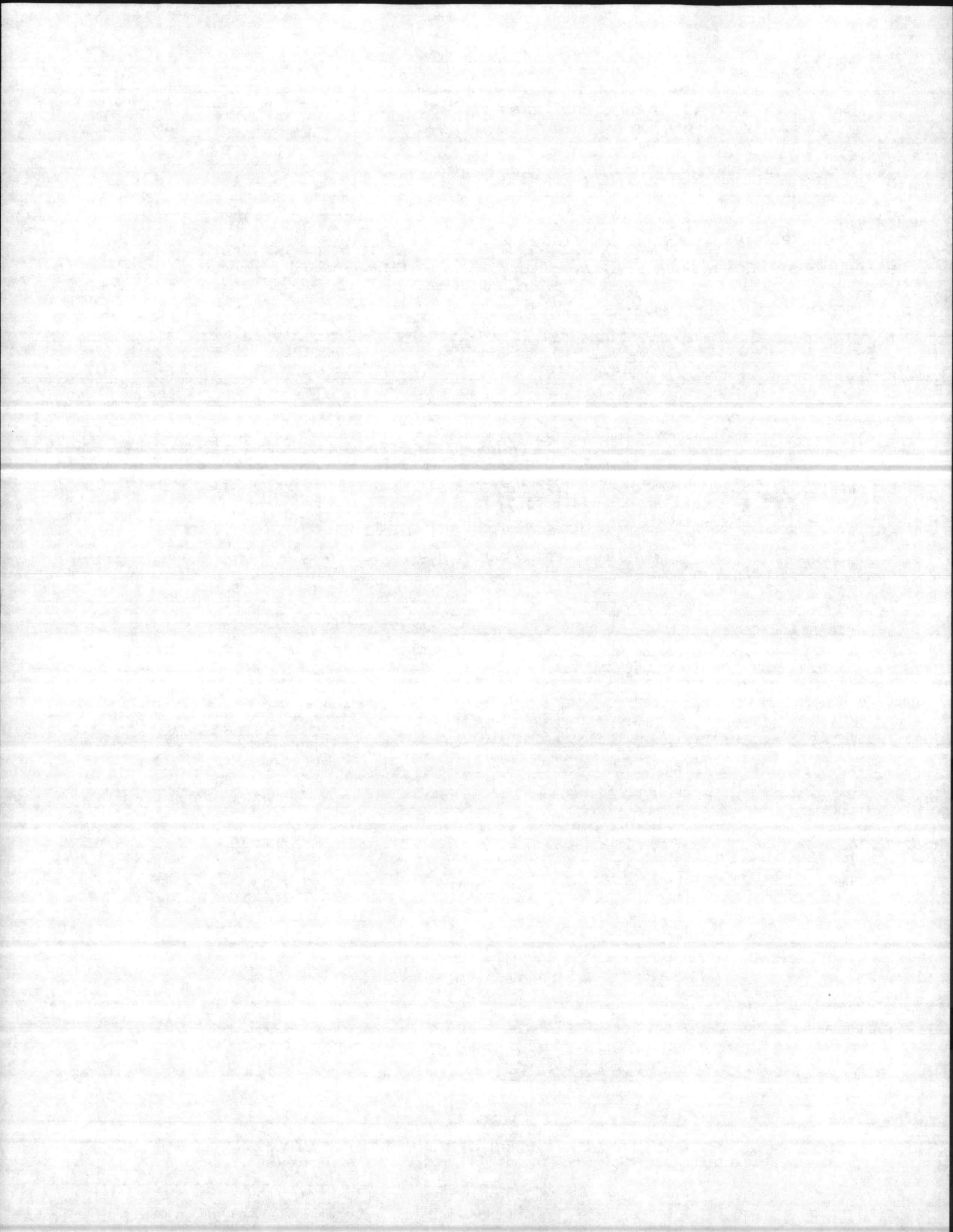
13. GRAVEL PACK:

From	To	Depth	Size	Material
3.0	25'	Coarse	Sand	
From _____	To _____	Ft. _____	_____	_____

REMARKS: \_\_\_\_\_

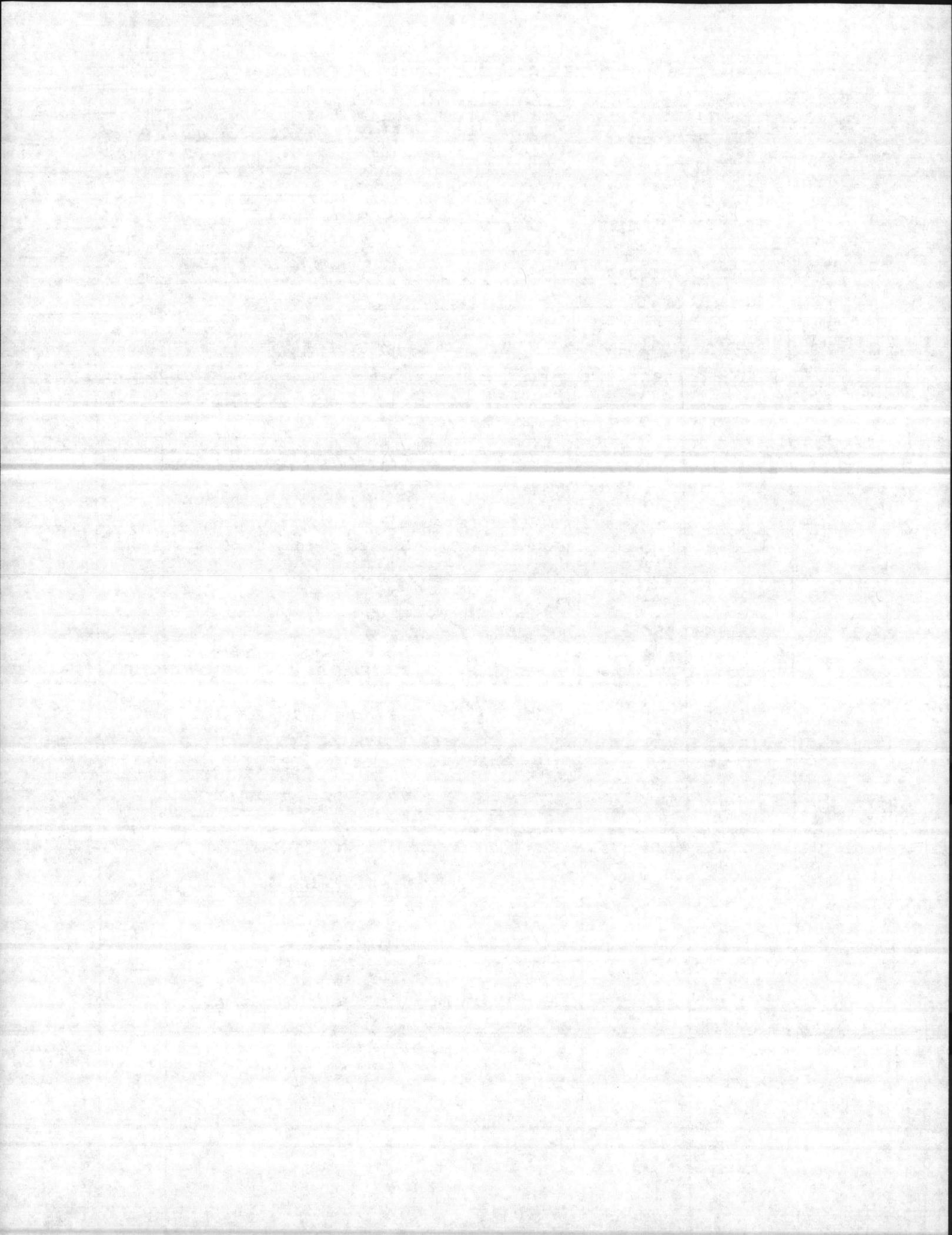
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Davis Drilling Co. 2/11/87  
 SIGNATURE OF CONTRACTOR OR AGENT DATE



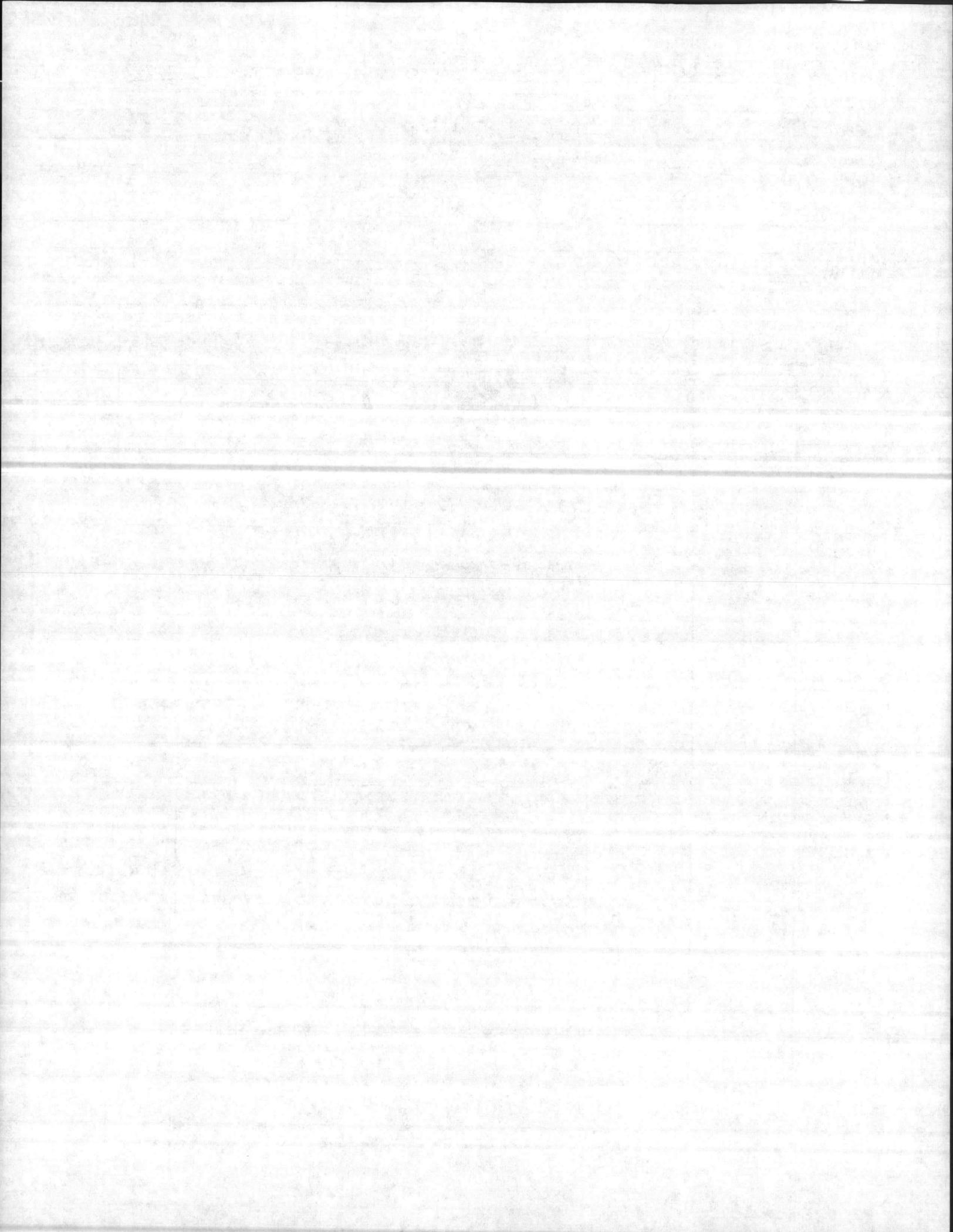
Spring No. GW 14 HP GW 23 Location Coordinates N  
 Hole Size 6" Slot 0.01 E  
 Screen Size 2" Mat'l PVC Filter Materials Silica Sand  
 casing Size 2" Mat'l PVC Grout Type Bentonite Pellets  
 Geologist David Brentlinger Development \_\_\_\_\_  
 Date Start 11/5/86 Finish 11/6 Static Water Level 11.08'  
 Contractor ESE Top of Well Elevation 13.58'  
 Driller Davis Drill Type Hollow Stem Auger

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0.0-1.5			104R 6.5/4, yellow - very pale yellow, silty fine sand, little/no organic matter, silt (25%), strong petroleum smell, loose, moist, mod. dense	SM	8 8 6
1.5-3.0			104R 3.5/2, Grey Brown - Dark Grey Brown, silty fine sand, silt 25%, strong smell of petroleum, moist, mod. dense, non plastic, gravel fill 10-15%	SM	8 8 6
3.0-4.5		3.0-4.0	Same as above (2.5-3.0)	SM ↓ Pt	2 3 4
		4.0-4.5	104R, 2/1, Black, silty peat, moist, mod. dense - loose, organic matter 70%		
4.5-6.0			Same as above (4.0-4.5) more silt than above	Pt	5 6 5



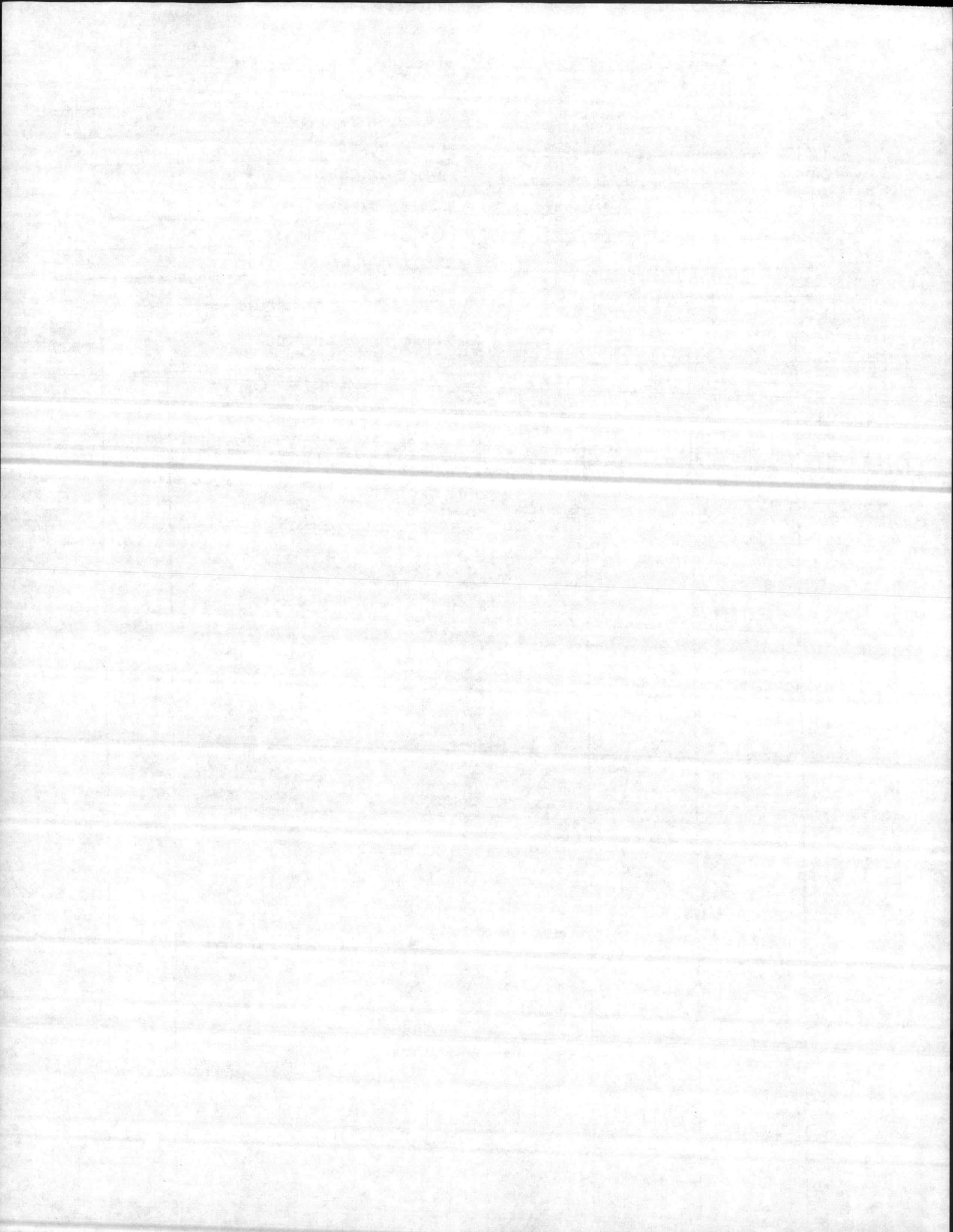
Boring No. 6W 14 HP 6W 23 Location Coordinates N  
E  
Hole Size \_\_\_\_\_ Slot \_\_\_\_\_  
Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
 casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
Geologist \_\_\_\_\_ Development \_\_\_\_\_  
Date Start \_\_\_\_\_ Finish \_\_\_\_\_ Static Water Level \_\_\_\_\_  
Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
6.0-7.5			7.5YR 3.5/3 Strong Brown, Silty fine Sand (silt 30%), 10% clay, Mod. dense, non plastic, moist-wet	SM	4 4 5
7.5-9.0			10YR 4.5/3 silty clayey fine Sand (silt + clay 45%), Brown-Dark Brown, moist mod. dense, slightly plastic	SM ↓ SC	6 6 8
9.0-10.5			10YR 4.5/3 Brown-dark Brown, Silty fine Sand, (silt 30%), moist-wet, mod. dense	SM	6 6 8
14.0-15.5			10YR 4.5/1 Grey-Dark Grey, silty clayey fine Sand, (silt + clay 20-30%), moist, sticky in clay layers, slightly plastic, slightly dense.	SM SC	3 5 8
19.0-20.5		19.0-20.0	2.5 YR 4.5/2, weak pale red silty clayey fine Sand, (silt + clay 40%), wet, slightly dense, slightly plastic	SC SM	4 7 7
		20.0-20.5	Silty fine-med. Sand, Same color, loose, non plastic (S.H 10-15%)	SW	



Boring No. SW 14-HPGW23 Location Coordinates N  
E  
Hole Size \_\_\_\_\_ Slot \_\_\_\_\_  
Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
Casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
Geologist \_\_\_\_\_ Development \_\_\_\_\_  
Date Start \_\_\_\_\_ Finish \_\_\_\_\_ Static Water Level \_\_\_\_\_  
Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
24.0-25.5			104R 7.5/1 white-light grey, silty fine-medium sand silt 10-15%, wet, loose, non plastic 10-15% coarse sand + pebbles	SW	3 3 5



Boring No. GW 14 HPGW 23

SHEET \_\_\_\_\_ OF \_\_\_\_\_

on site 400 PM

11/5/86

Continuous Spoon to 10'

Sampling over at 10' 430 PM

11/6/86

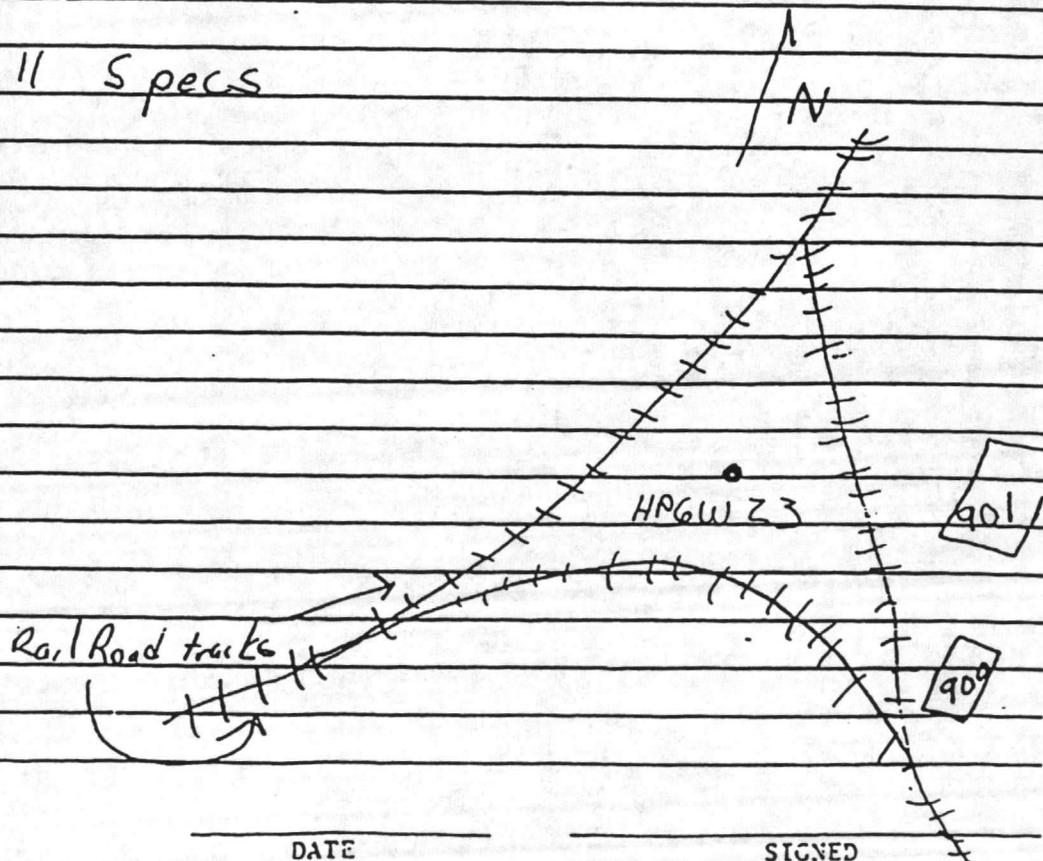
On site 730 AM

Re-Sampling begins 735

last Spoon 825

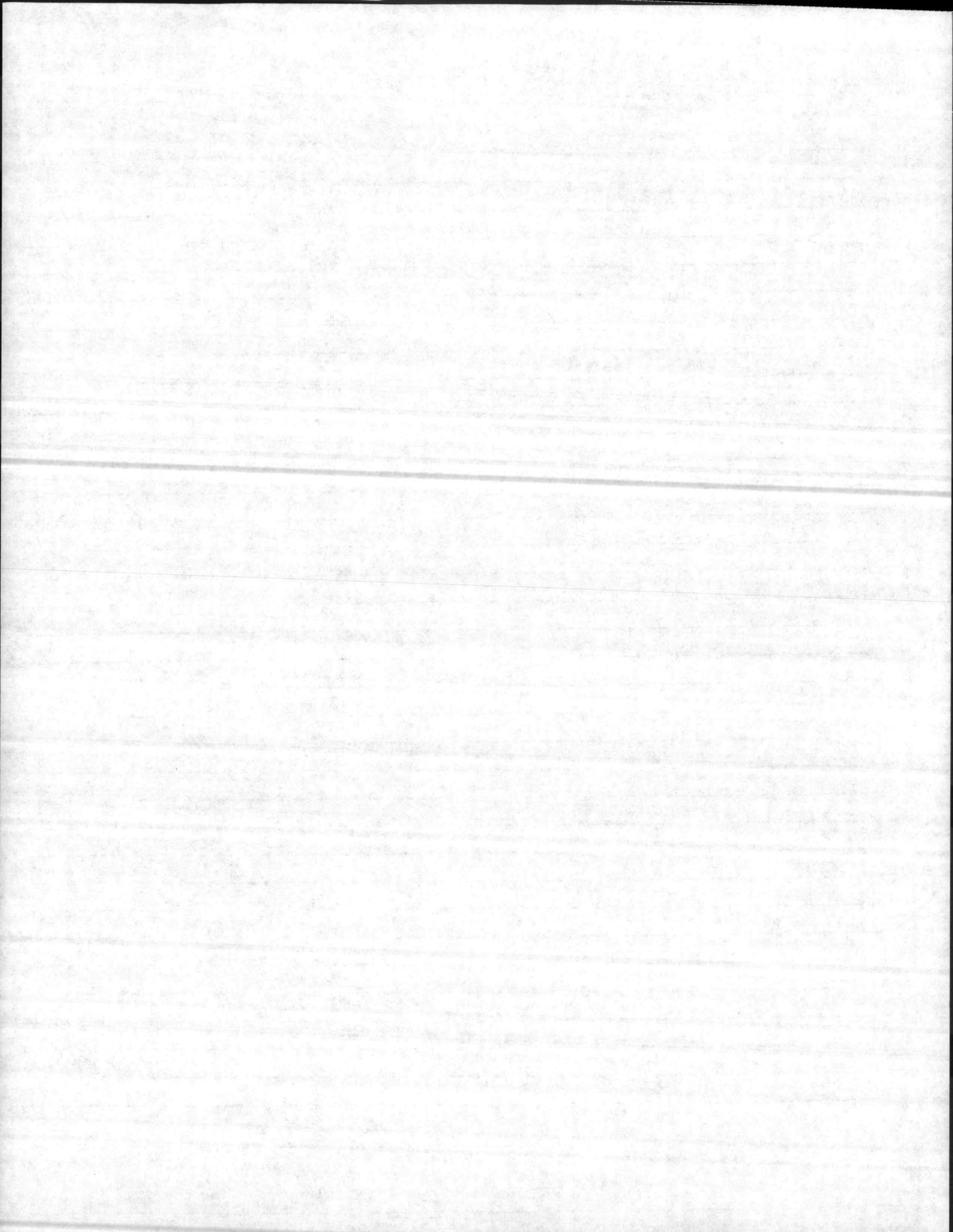
well Complete 845

Standard Well Specs



DATE \_\_\_\_\_

SIGNED \_\_\_\_\_



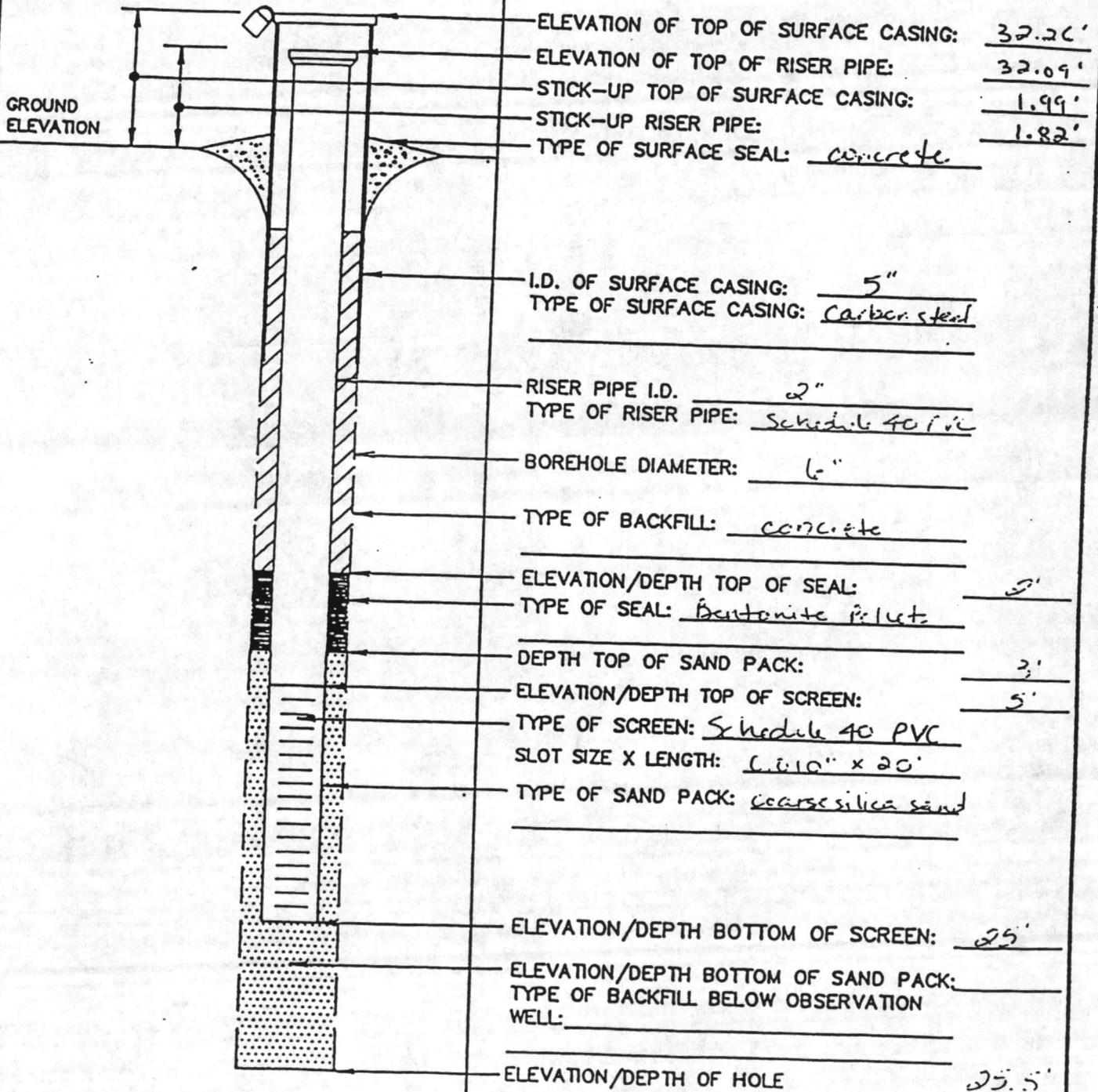
T

## OVERBURDEN MONITORING WELL SHEET

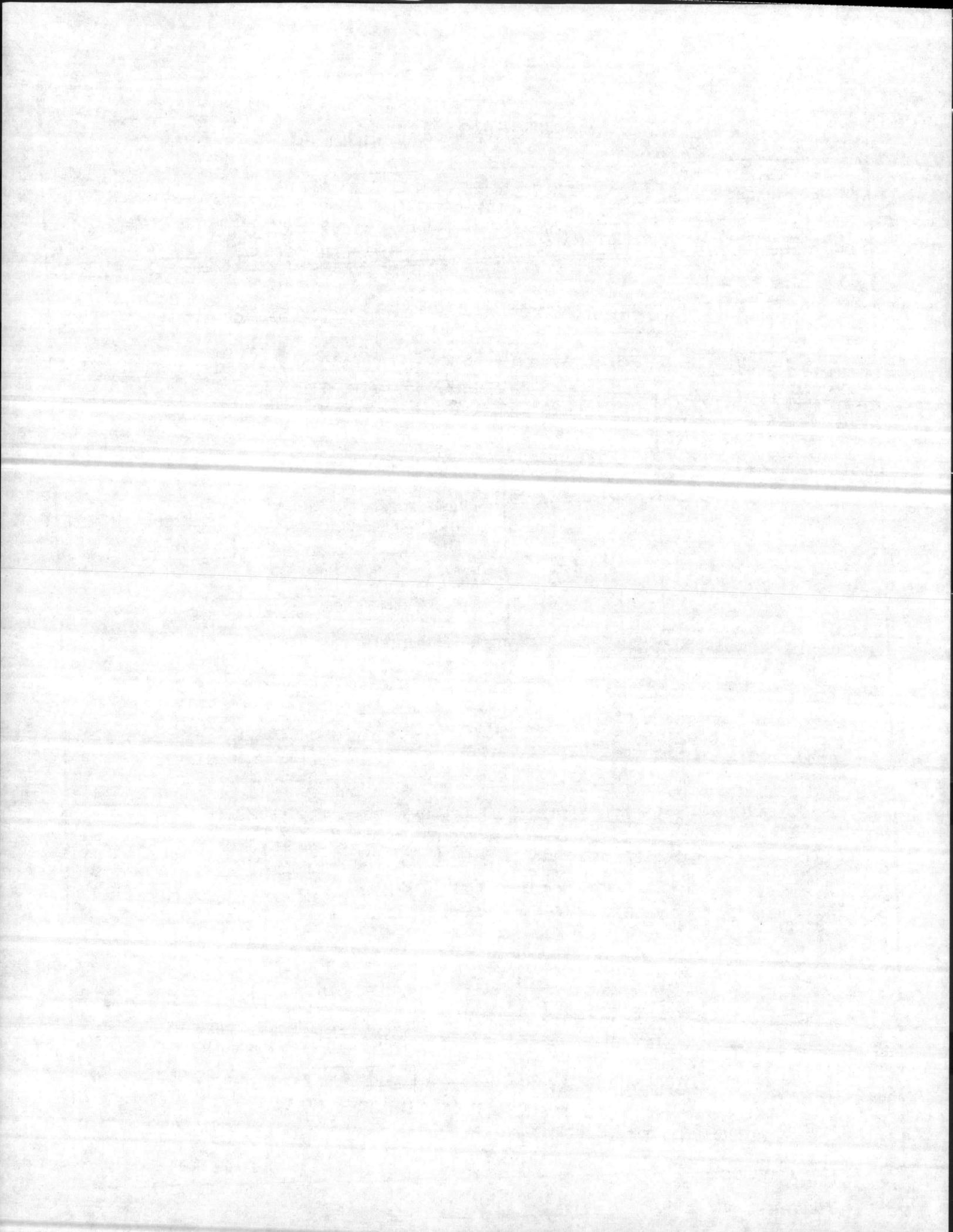
WELL NO. HP-GW 23

PROJECT Camp Lejeune - HPIA  
 PROJECT NO. 49-02C36 BORING NO. HP-GW 23  
 ELEVATION \_\_\_\_\_ DATE 11/5/86 - 11/6/86  
 FIELD GEOLOGIST David Brentlinger (ESE)

DRILLER Davis Drilling Co  
 DRILLING METHOD Hollow Stem Auger  
 DEVELOPMENT METHOD \_\_\_\_\_



NOT TO SCALE



**FOR OFFICE USE ONLY**

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

PGW 23  
**WELL CONSTRUCTION RECORD**

DRILLING CONTRACTOR Davis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 66-0135-WM-0141

1. WELL LOCATION: (Show sketch of the location below)  
 Nearest Town: Jacksonville, NC

County: Onslow

(Road, Community, or Subdivision and Lot No.) \_\_\_\_\_

2. OWNER US Navy  
 ADDRESS Camp Lejeune NC  
 (Street or Route No.) 28540  
 City or Town \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Depth		DRILLING LOG
From	To	Formation Description
0.0	4.0	Silty Fine Sand
4.0	6.0	Silty silt
6.0	7.5	Silty Fine Sand
7.5	9.0	Silty Clayey Fine Sand
9.0	10.5	Silty Fine Sand
10.5	14.0	Silty Clayey Fine Sand
14.0	15.5	Silty Clayey Fine Sand
15.5	19.0	Silty Clayey Fine Sand
19.0	20.5	Silty Clayey Fine Sand
20.5	24.0	Silty Fine - Med Sand

3. DATE DRILLED 11/5/86 USE OF WELL Monitor

4. TOTAL DEPTH 25.5' CUTTINGS COLLECTED  Yes  No

5. DOES WELL REPLACE EXISTING WELL?  Yes  No

6. STATIC WATER LEVEL: 11.08 FT.  above  below TOP OF CASING.  
 TOP OF CASING IS 2.50 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_

8. WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	Depth	To	Diameter	Wall Thickness or Weight/Ft.	Material
	<u>+2.5</u>	<u>-5.0</u>	<u>2"</u>	<u>18"</u>	<u>PVC</u>
From _____	To _____	Ft. _____	_____	_____	_____
From _____	To _____	Ft. _____	_____	_____	_____

If additional space is needed use back of form.

**LOCATION SKETCH**

(Show direction and distance from at least two State Roads, or other map reference points)

See Frq. (2-5)

11. GROUT:

From	Depth	To	Material	Method
	<u>0.0</u>	<u>-2.0</u>	<u>Concrete</u>	_____
	<u>-2.0</u>	<u>-3.0</u>	<u>Clay</u>	_____

12. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
	<u>-5.0</u>	<u>-25'</u>	<u>2"</u>	<u>0.01 in.</u>	<u>PVC</u>
From _____	To _____	Ft. _____	_____	_____	_____
From _____	To _____	Ft. _____	_____	_____	_____

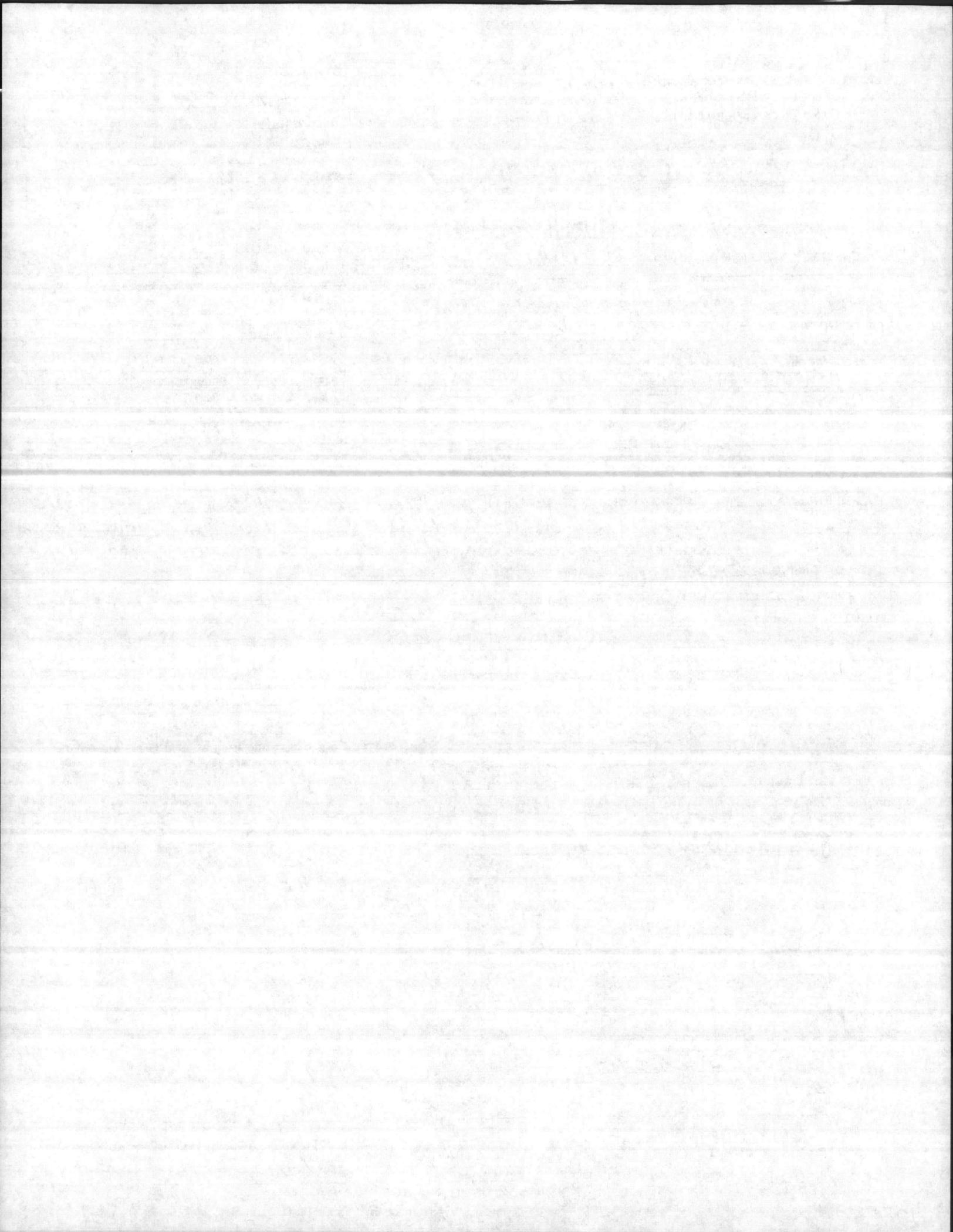
13. GRAVEL PACK:

From	Depth	To	Size	Material
	<u>-3.0</u>	<u>-25'</u>	<u>Coarse</u>	<u>Sand</u>
From _____	To _____	Ft. _____	_____	_____
From _____	To _____	Ft. _____	_____	_____

REMARKS: \_\_\_\_\_

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 N.C.A.C. 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

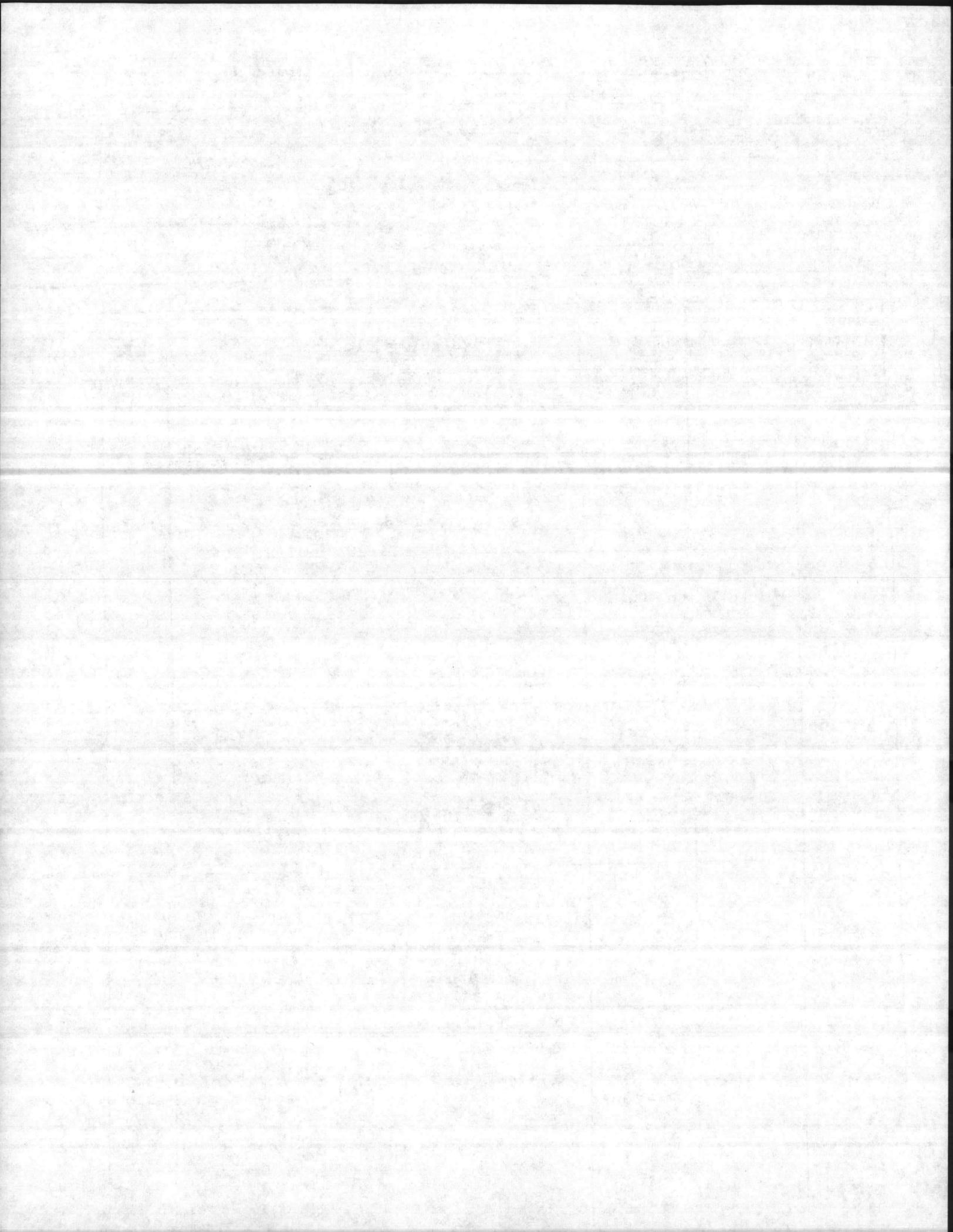
Carol A. Smith 2/11/87  
 SIGNATURE OF CONTRACTOR OR AGENT DATE



Boring No. HPGW 24  
 Hole Size 6" Slot 0.01  
 Screen Size 2" Mat'l PVC  
 casing Size 2" Mat'l PVC  
 Geologist David Brentlinger  
 Date Start 11/13/86 Finish 11/12  
 Contractor ESE  
 Driller Davis

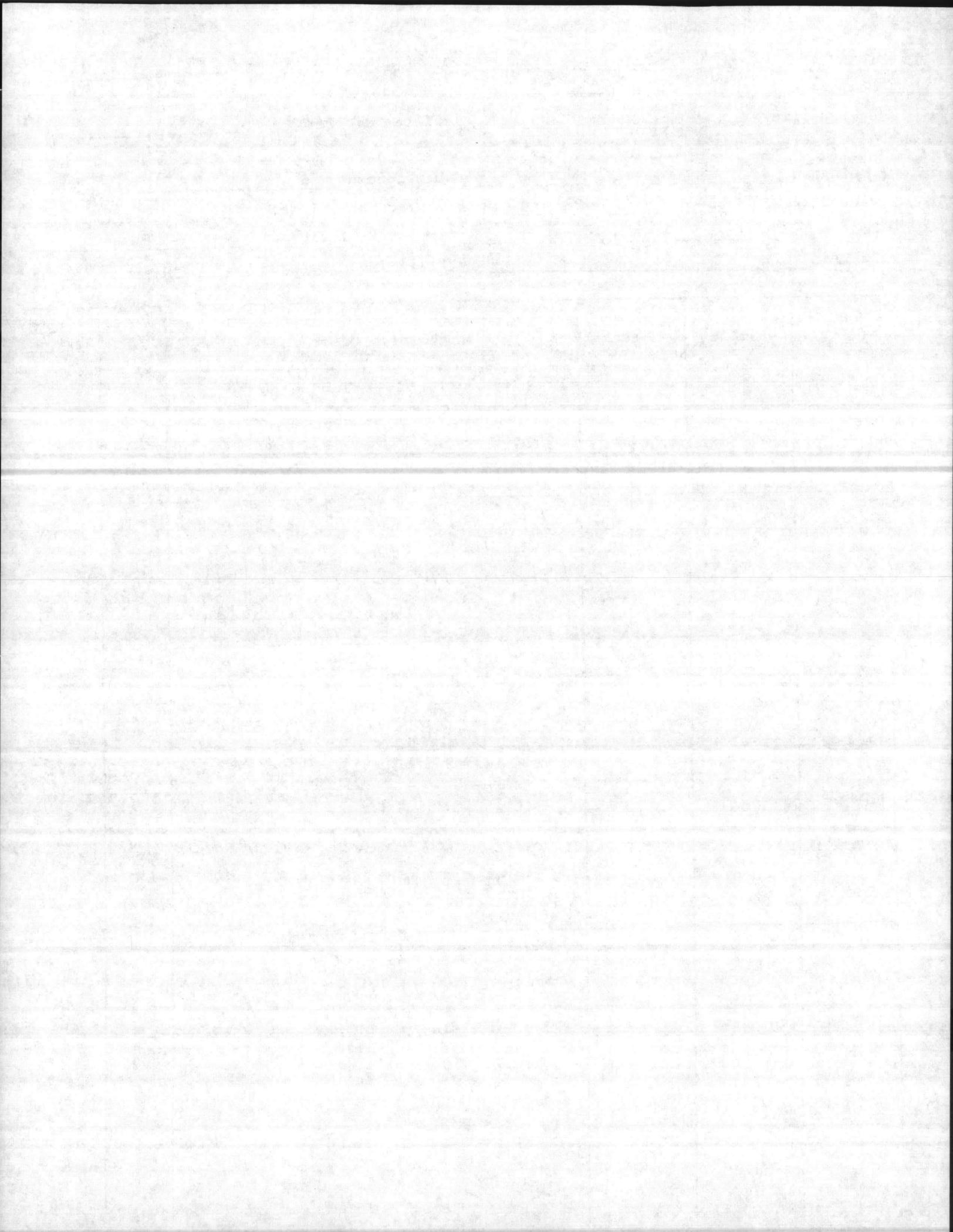
Location Coordinates N  
E  
 Filter Materials Silica Sand  
 Grout Type Bentonite Pellets  
 Development \_\_\_\_\_  
 Static Water Level 6.83'  
 Top of Well Elevation 9.33'  
 Drill Type Hollow Stem Auger

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0.0-1.5		0.0-0.75	10 YR 2.5/1 Black Silty Fine Sand, 50% organic matter, saturated H <sub>2</sub> O	SM	4
		0.75-1.5	10 YR 6.5/3 Pale - Very Pale Brown Silty Fine Sand (silt + 25%), loose, wet, slightly dense		3 4
1.5-3.0			Same as (0.75-1.5) less wet	SM	4 8 6
3.0-4.5			10 YR 5/3 light Brown with black-grey silty clay mottles throughout, silty fine sand (silt 30%), moist non-plastic, slightly dense	SM	5 9 7
4.5-6.0			10 YR 4.5/2 Grey - dark grey silty clayey sand, (silt + clay 45%), slightly dense - mod. dense, moist, slightly plastic	SC SM	2 3 4
6.0-7.5			10 YR 4.5/4 Yellow Brown - dark yellow Brown, silty clayey sand, (silt + clay 45%), slightly plastic - plastic, moist, slightly dense	SC SM	3 4 7



Boring No. HP GW 24 Location Coordinates N  
 Hole Size \_\_\_\_\_ Slot \_\_\_\_\_ E  
 Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
 casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
 (logist \_\_\_\_\_ Development \_\_\_\_\_  
 Date Start 11/12 Finish 11/12 Static Water Level \_\_\_\_\_  
 Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
 Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
7.5-9.0			104R 4/1, dark grey silty-clayey sand, (silt + clay 45%), moist, slightly plastic, mod. dense - dense	SC SM	5 10 26
9.0-10.5			104R 6.5/1, Grey - light grey, silty fine sand (silt 10-15%), loose, slightly dense, moist-wet top 5" black silty sand	SW	8 12 15
14.0-15.5			2.5Y 4.5/6 Grey - dark grey, silty fine sandy clay (silt + sand 30%), sticky, slightly dense, slightly plastic, wet	SC	2 1 1
19.0-20.5			74R 2/0, black, silty organic clay (organic matter 45%), firm, dense, moist, slightly plastic	ML PT	2 3 5
24.0-25.5			104R 2.5/1 Black silty sandy peat (silt + sand 30%), dry, mod. dense	PT	5 6 10



Boring No. HPGW24

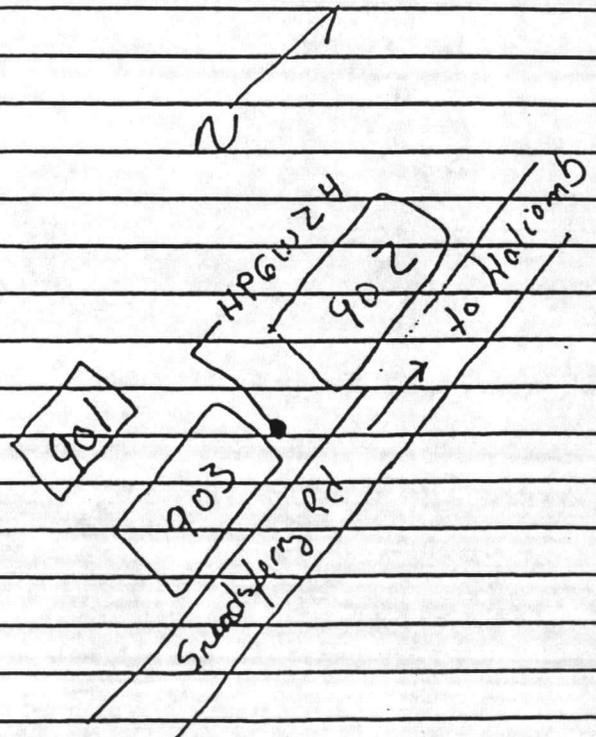
SHEET \_\_\_\_\_ OF \_\_\_\_\_

On site 1215 PM

11/12/86

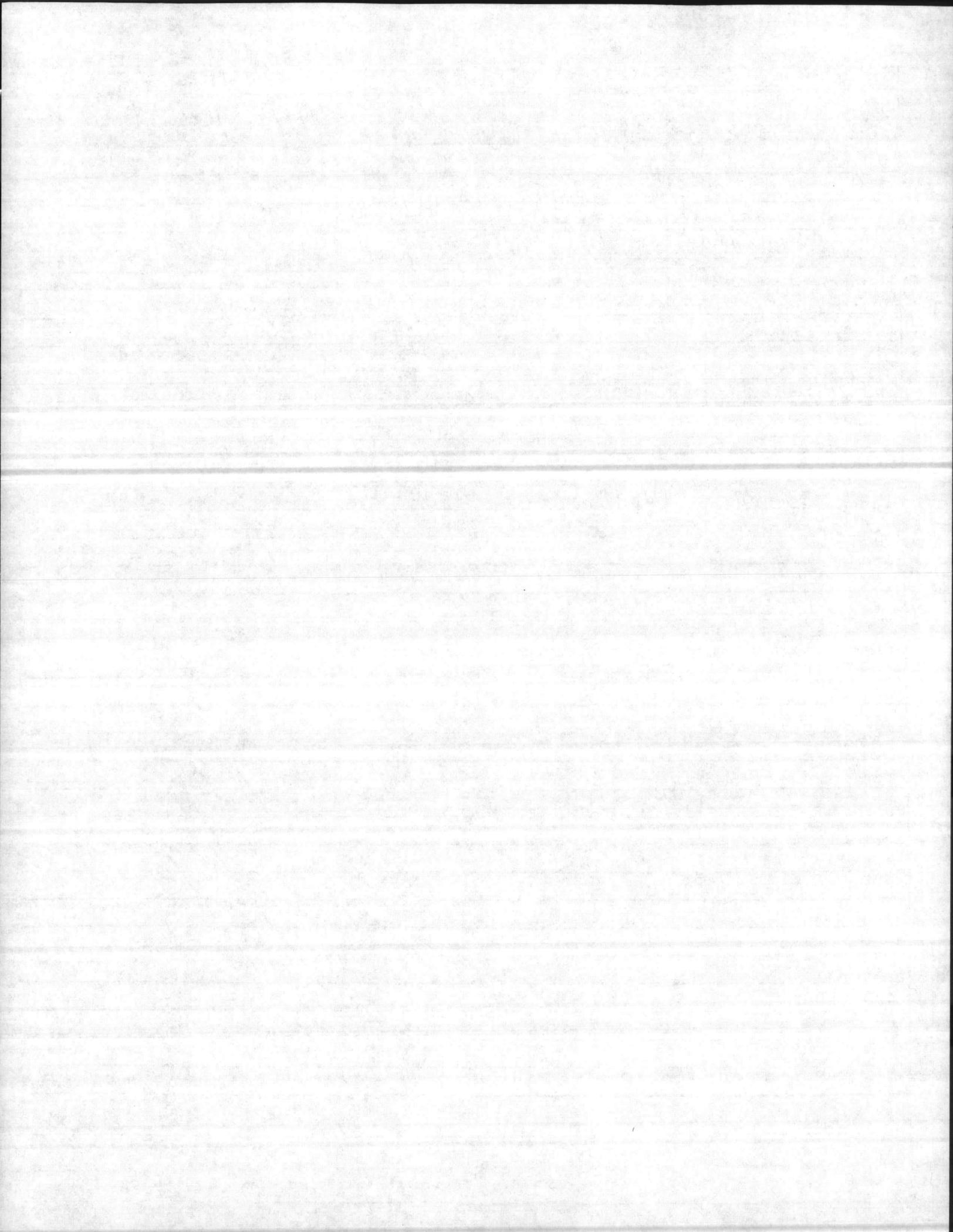
1st Spoon 1220  
last Spoon 120  
Well Complete 150

Standard Well Specs.



DATE

SIGNED

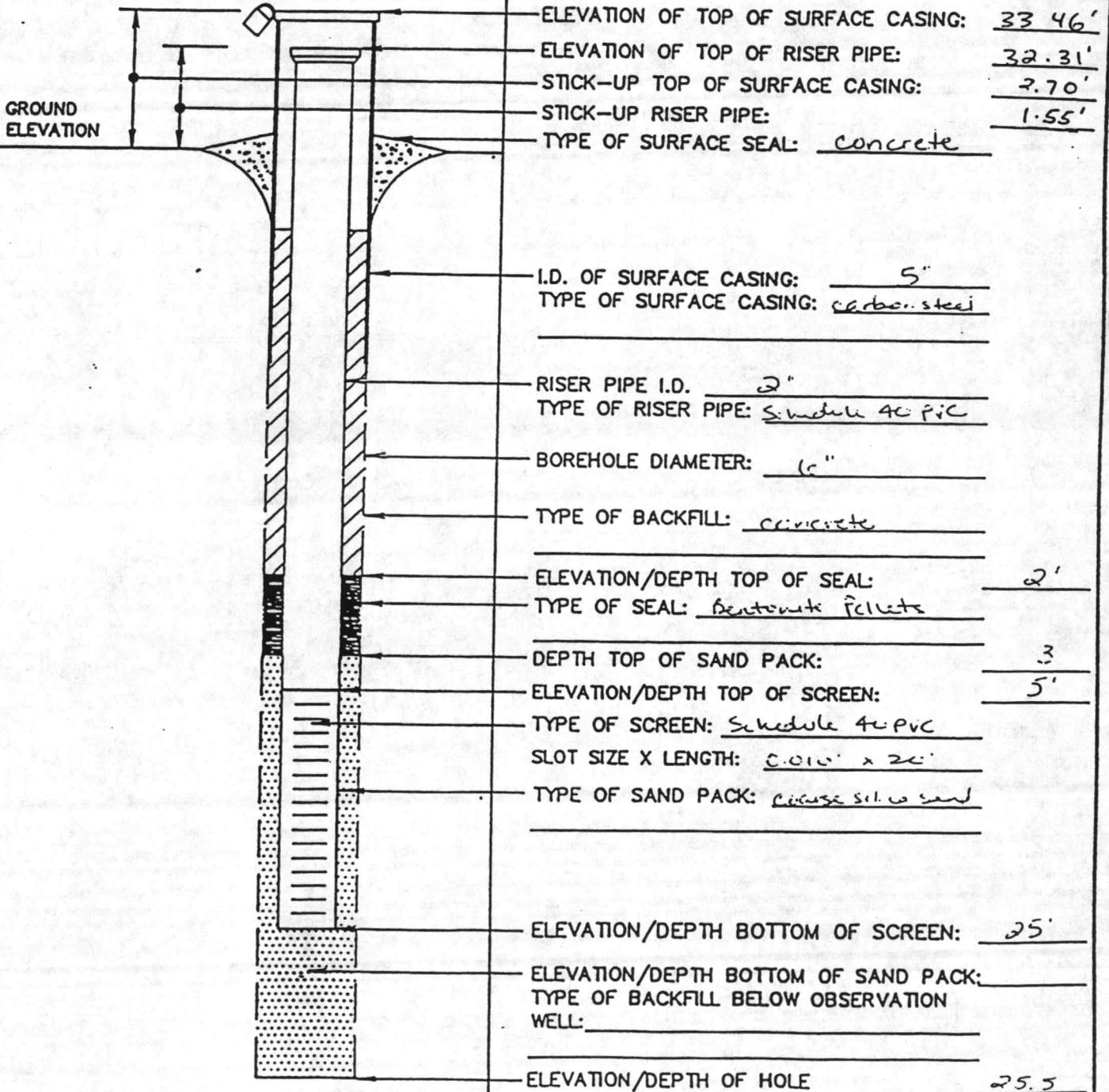


# OVERBURDEN MONITORING WELL SHEET

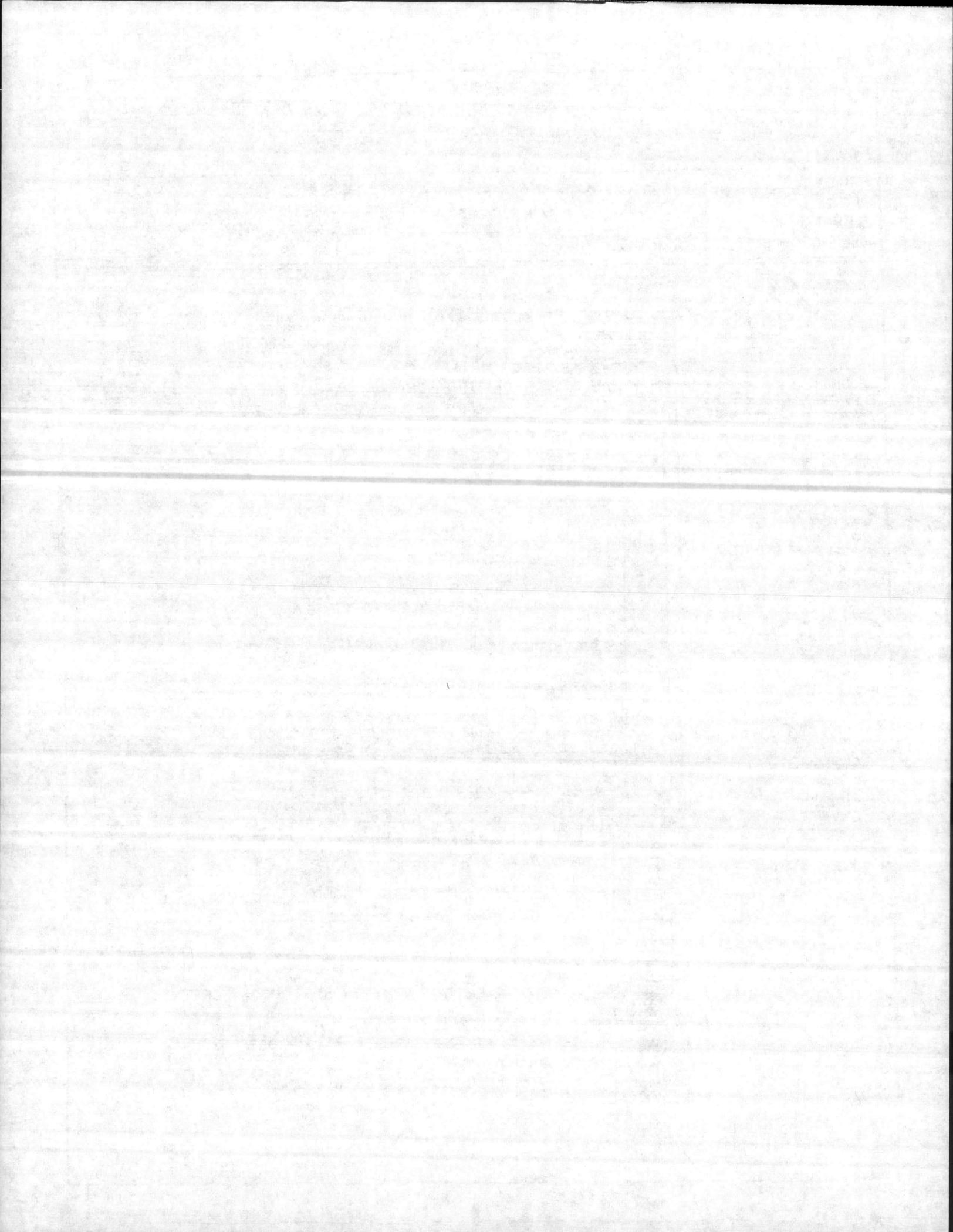
WELL NO. HP-GW24-1

PROJECT Camp Lejeune - HPIA  
 PROJECT NO. 49-02036 BORING NO. HP-GW24  
 ELEVATION \_\_\_\_\_ DATE 11/12/86 - 11/13/86  
 FIELD GEOLOGIST David Brantlinger (ESCI)

DRILLER David Drilling Co.  
 DRILLING METHOD Hollow Stem Auger  
 DEVELOPMENT METHOD \_\_\_\_\_



NOT TO SCALE



**FOR OFFICE USE ONLY**

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

**WELL CONSTRUCTION RECORD**

DRILLING CONTRACTOR Davis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 66-0135-WM-0141

1. WELL LOCATION: (Show sketch of the location below)  
 Nearest Town: Jacksonville NC

County: Onslow

(Road, Community, or Subdivision and Lot No.)  
 2. OWNER US Navy  
 ADDRESS Camp Lejeune  
 (Street or Route No.) 28542  
 City or Town \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Depth		DRILLING LOG
From	To	Formation Description
0.0	4.5	Silky Fine Sand
4.5	9.0	Silky Clayey Sand
9.0	10.5	Silky Fine Sand
10.5	15.5	Silky Fine Sandy Clay
15.5	20.5	Silky Clay
20.5	25.5	Silky Sandy Peat

3. DATE DRILLED 11/12/86 USE OF WELL monitor

4. TOTAL DEPTH 25.5 CUTTINGS COLLECTED  Yes  No

5. DOES WELL REPLACE EXISTING WELL?  Yes  No

6. STATIC WATER LEVEL: 6.83 FT.  above TOP OF CASING,  
 below TOP OF CASING IS 2.50 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_  
 WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	Depth	To	Diameter	Wall Thickness or Weight/Ft.	Material
	<u>+2.5</u>	<u>-5.0</u>	<u>2"</u>	<u>1/8"</u>	<u>PVC</u>
From _____	To _____	Ft. _____	_____	_____	_____
From _____	To _____	Ft. _____	_____	_____	_____

If additional space is needed use back of form.

**LOCATION SKETCH**

(Show direction and distance from at least two State Roads, or other map reference points)

See Fig. (2-5)

11. GROUT:

From	Depth	To	Material	Method
	<u>0.0</u>	<u>-2.0</u>	<u>Concrete</u>	_____
	<u>-2.0</u>	<u>-3.0</u>	<u>Clay</u>	_____

12. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
	<u>-5.0</u>	<u>-25'</u>	<u>2"</u>	<u>0.01 in.</u>	<u>PVC</u>
From _____	To _____	Ft. _____	_____	_____	_____
From _____	To _____	Ft. _____	_____	_____	_____

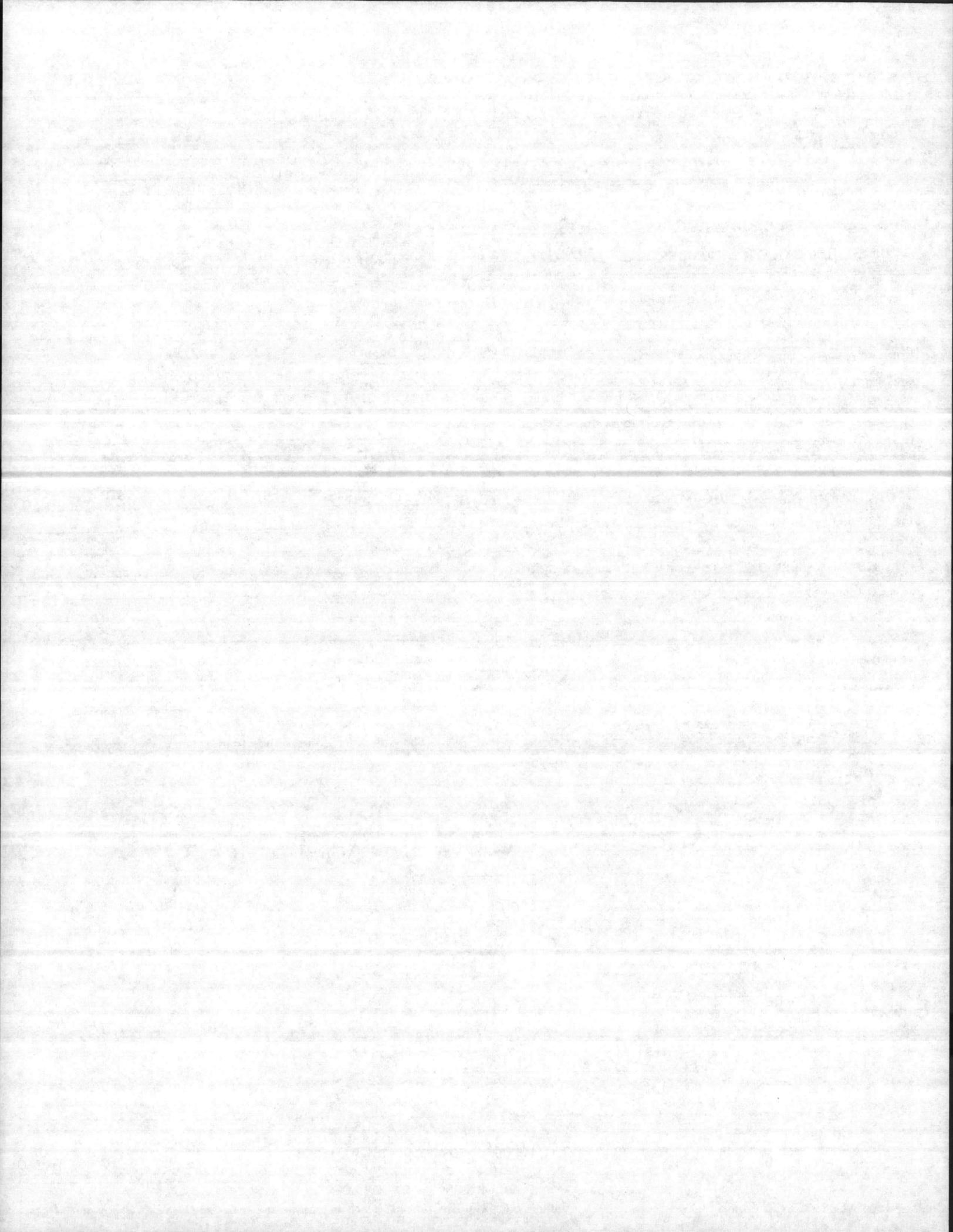
13. GRAVEL PACK:

From	Depth	To	Size	Material
	<u>-3.0</u>	<u>-25'</u>	<u>Coarse</u>	<u>Sand</u>
From _____	To _____	Ft. _____	_____	_____

REMARKS: \_\_\_\_\_

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

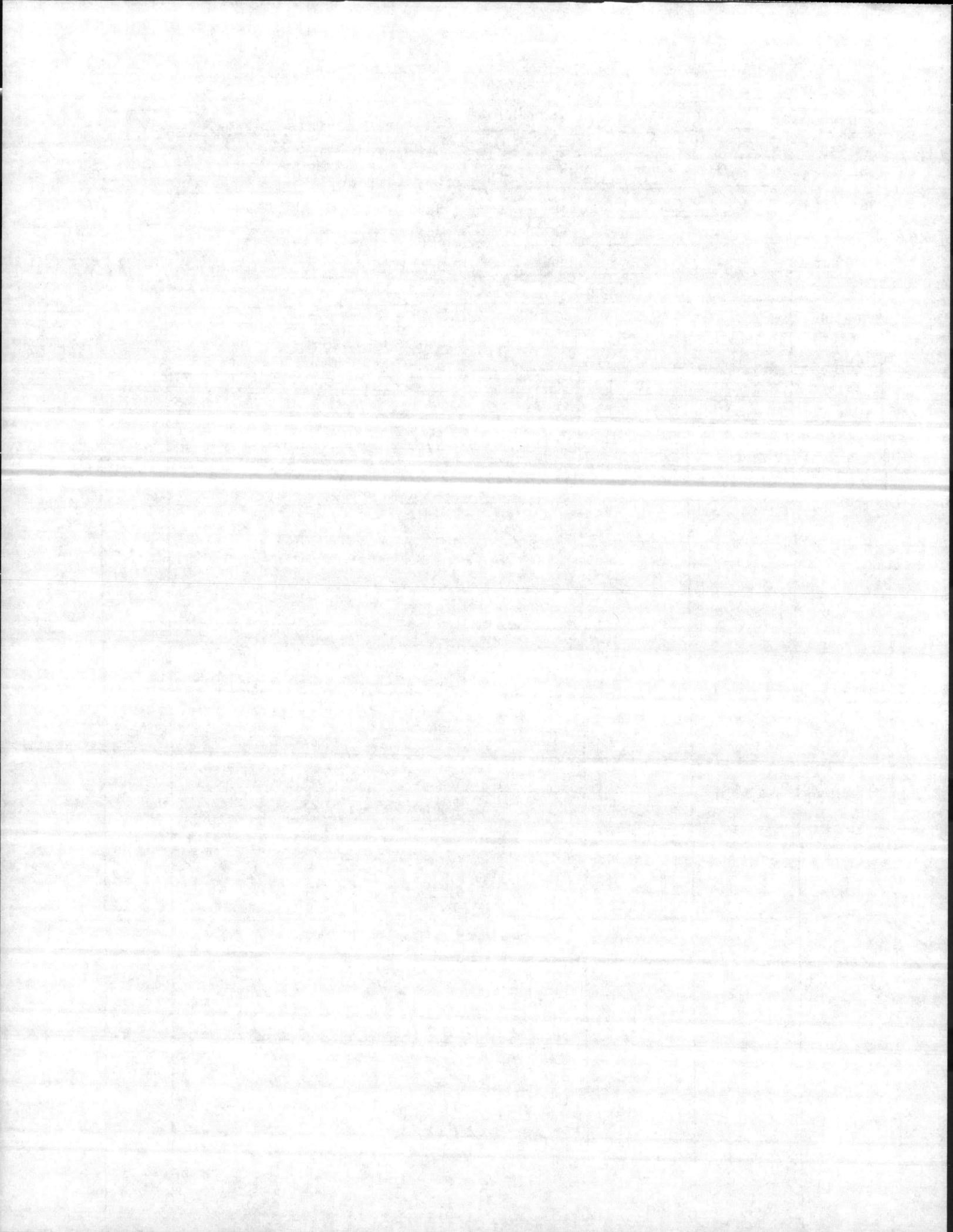
[Signature] 2/11/87  
 SIGNATURE OF CONTRACTOR OR AGENT DATE



Boring No. GW 15 HPGW 25  
 Hole Size 6" Slot 0.01  
 Screen Size 2" Mat'l PVC  
 casing Size 2" Mat'l PVC  
 Geologist David Brentlinger  
 Date Start 11/5/86 Finish 11/5  
 Contractor \_\_\_\_\_  
 Driller \_\_\_\_\_

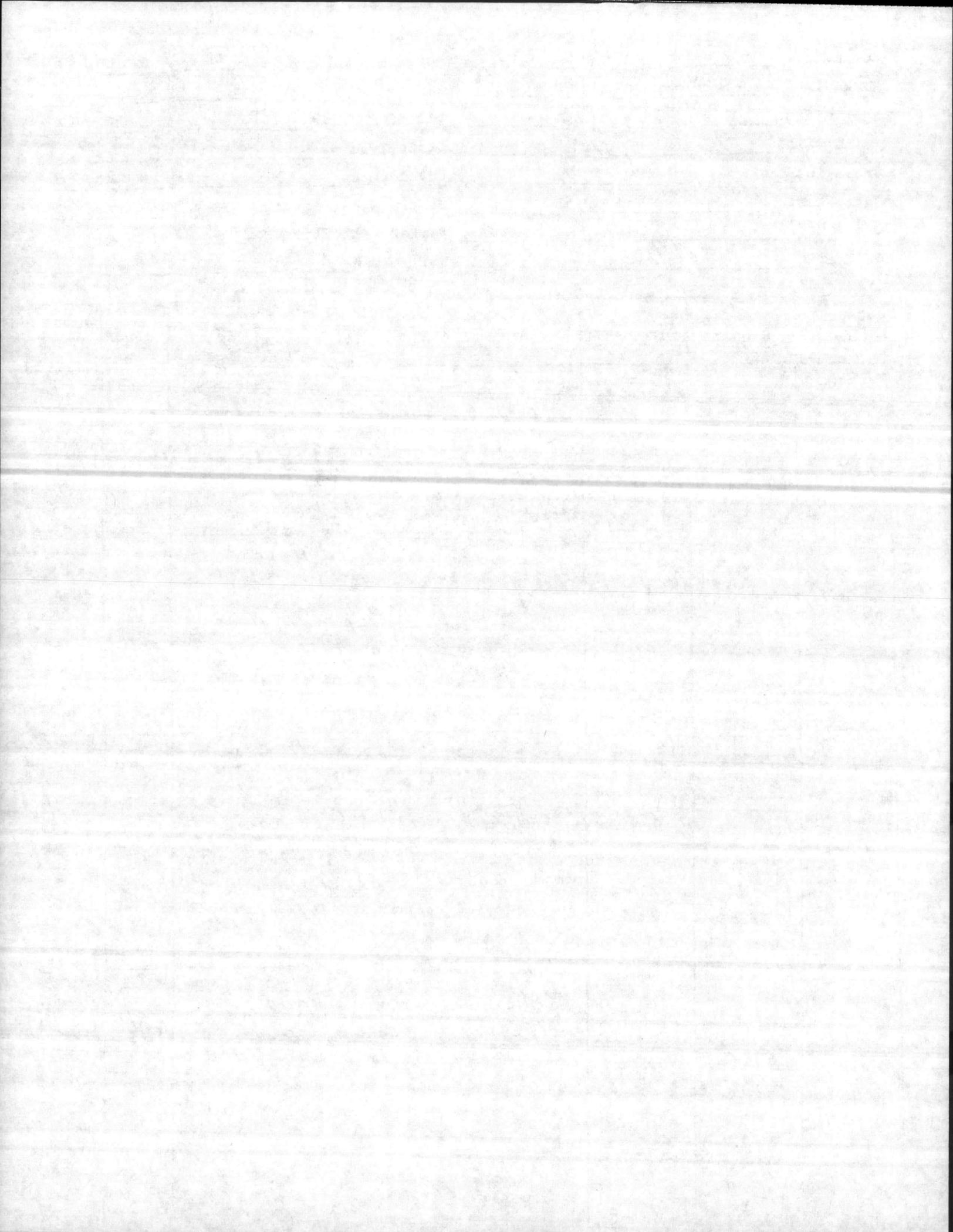
Location Coordinates N \_\_\_\_\_  
 E \_\_\_\_\_  
 Filter Materials Silica Sand  
 Grout Type Bentonite Pellets  
 Development \_\_\_\_\_  
 Static Water Level 9.00'  
 Top of Well Elevation 11.50'  
 Drill Type Hollow Stem Auger

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0.0-1.5			2.5Y 7.5/4, Pale yellow, silty fine sand (silt 25%) organic matter top 6" loose, moist, non plastic	SM	1 2 5
1.5-3.0			2.5Y 6.5/2, light brown, silty fine sand (silt 20%) loose, moist, non plastic	SM	5 5 6
3.0-4.5			2.5Y 7.5/2, white-pale yellow, silty fine sand, silt 10-15%, bright yellow mottles, loose, moist, non plastic	SM? SW	4 6 12
4.5-6.0			10YR 8.0/1, white, silty fine sand (silt 10-15%) loose, moist, non plastic	SW	8 16 12
6.0-7.5		6.0-7.0	Same as Above (4.5-6.0)		
		7.0-7.5	2.5Y 7.5/6, yellow silty clay (little sand) silt 30%, moist, mod. dense, non plastic, sticky when wet	SW ML	2 3 4



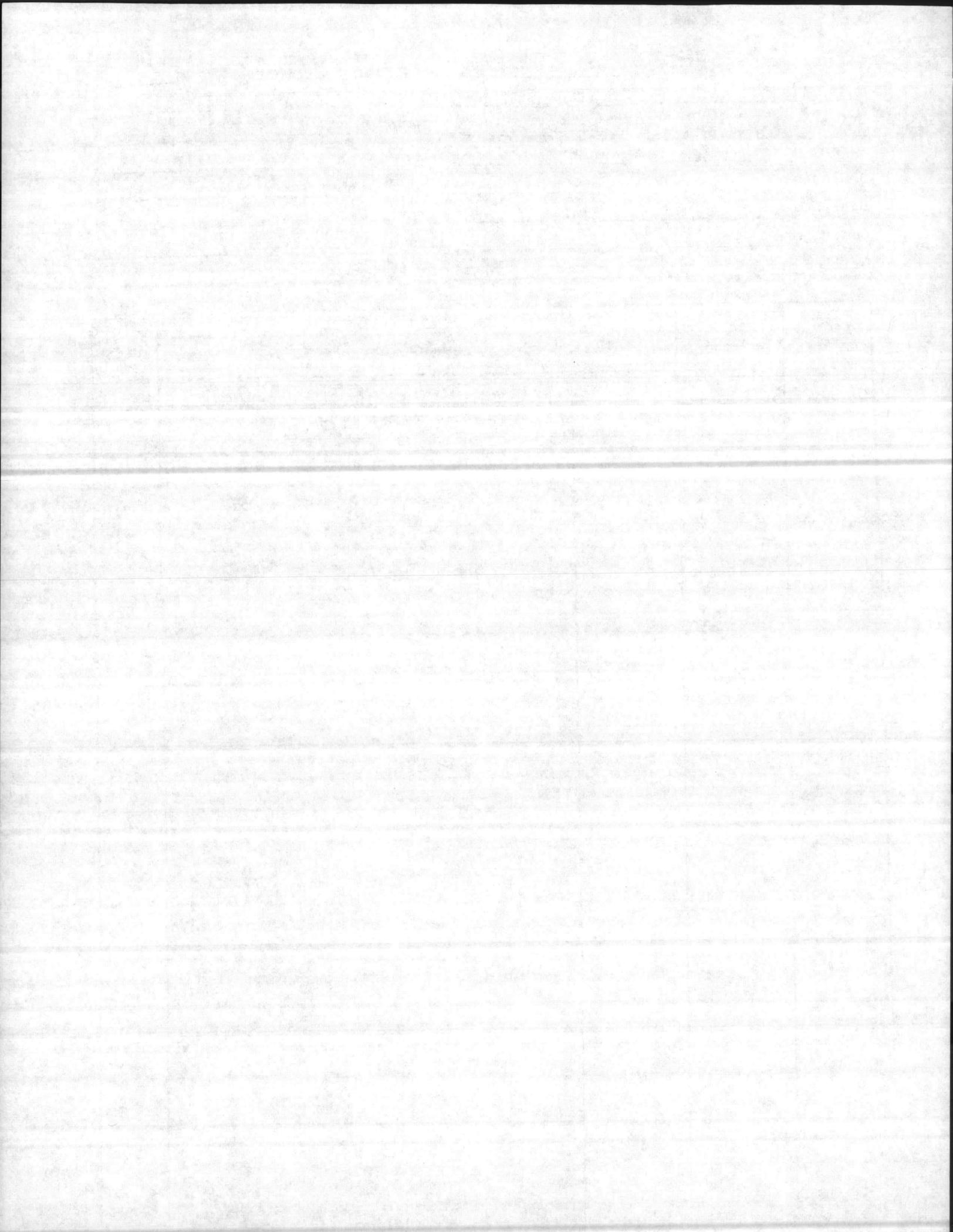
Boring No. GW 15 HPGW 25 Location Coordinates N  
E  
Hole Size \_\_\_\_\_ Slot \_\_\_\_\_  
Screen Size \_\_\_\_\_ Mac'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
Casing Size \_\_\_\_\_ Mac'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
Geologist \_\_\_\_\_ Development \_\_\_\_\_  
Date Start \_\_\_\_\_ Finish \_\_\_\_\_ Static Water Level \_\_\_\_\_  
Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
7.5-9.0			2.5Y 7.5/4 yellow, silty fine-med. sand, top 6" very silty clay, silt (20%) moist, mod. dense, non plastic	SW SM	4 8 6
9.0-10.5			2.5Y 7.5/4 yellow, silty clayey med. sand, (silt + clay 30%), 3" of firm clay in middle of sample, slightly dense, plastic in clay layers, moist - wet	SC SW	3 1 2
14.0-15.5		14.0-14.5	10YR 6/3 silty sandy clay top 6"		
		14.5-15.5	7.5YR 7.5+0 gray-white, very firm silty clay, with coarse sand bottom 2", plastic - v. plastic, dense, wet	SC CH	4 3 5
19.0-20.5			10YR 6/1 white med. sand with 30% clay, wet, slightly dense, plastic in clay mottles	SC	5 6 8



Boring No. GW 15 HPCW 25 Location Coordinates N  
E  
Hole Size \_\_\_\_\_ Slot \_\_\_\_\_  
Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
 casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
( geologist \_\_\_\_\_ Development \_\_\_\_\_  
Date Start \_\_\_\_\_ Finish \_\_\_\_\_ Static Water Level \_\_\_\_\_  
Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
24.0-25.5			Silty medium-coarse sand. (10-15% silt), 20% clay layers throughout, slightly plastic, wet, loose - slightly dense 10 YR 8/1, white	SW SC	2 4 1



Boring No. GW 15 HPGW 25

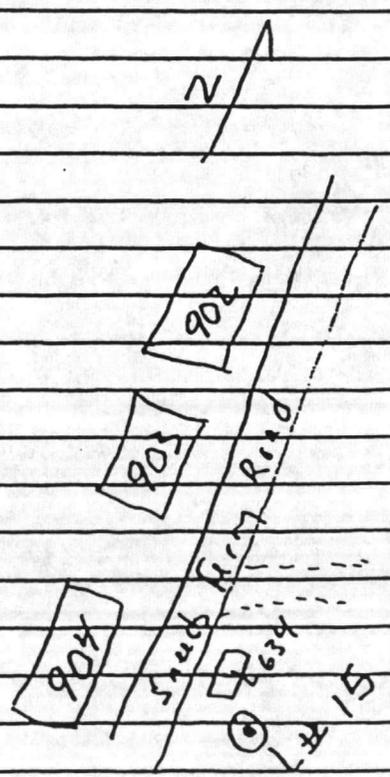
SHEET \_\_\_\_\_ OF \_\_\_\_\_

on site 930 am

11/5/86

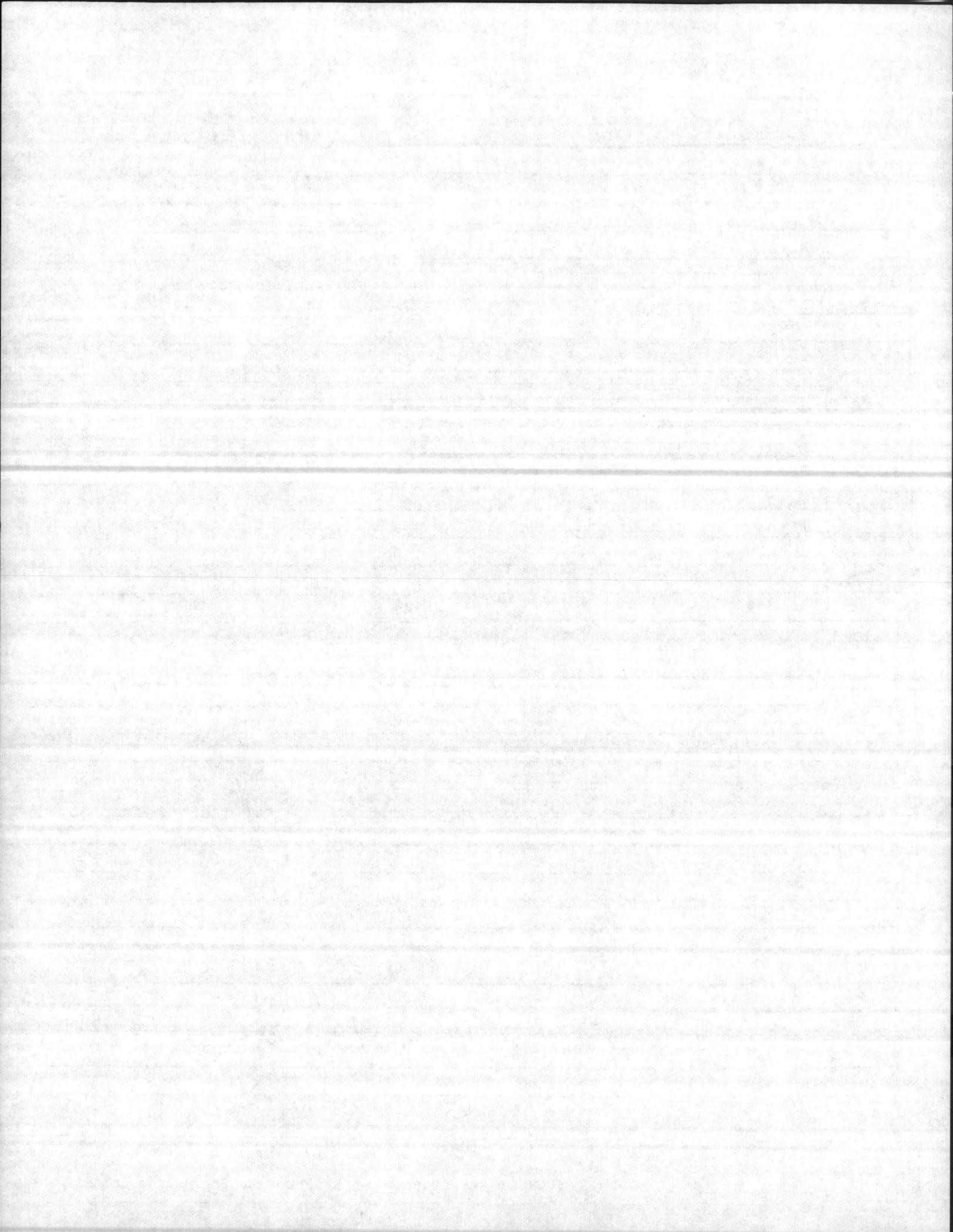
1st Spool 945  
last Spool 1040  
Well Complete 1115

Standard Well Specs



DATE

SIGNED

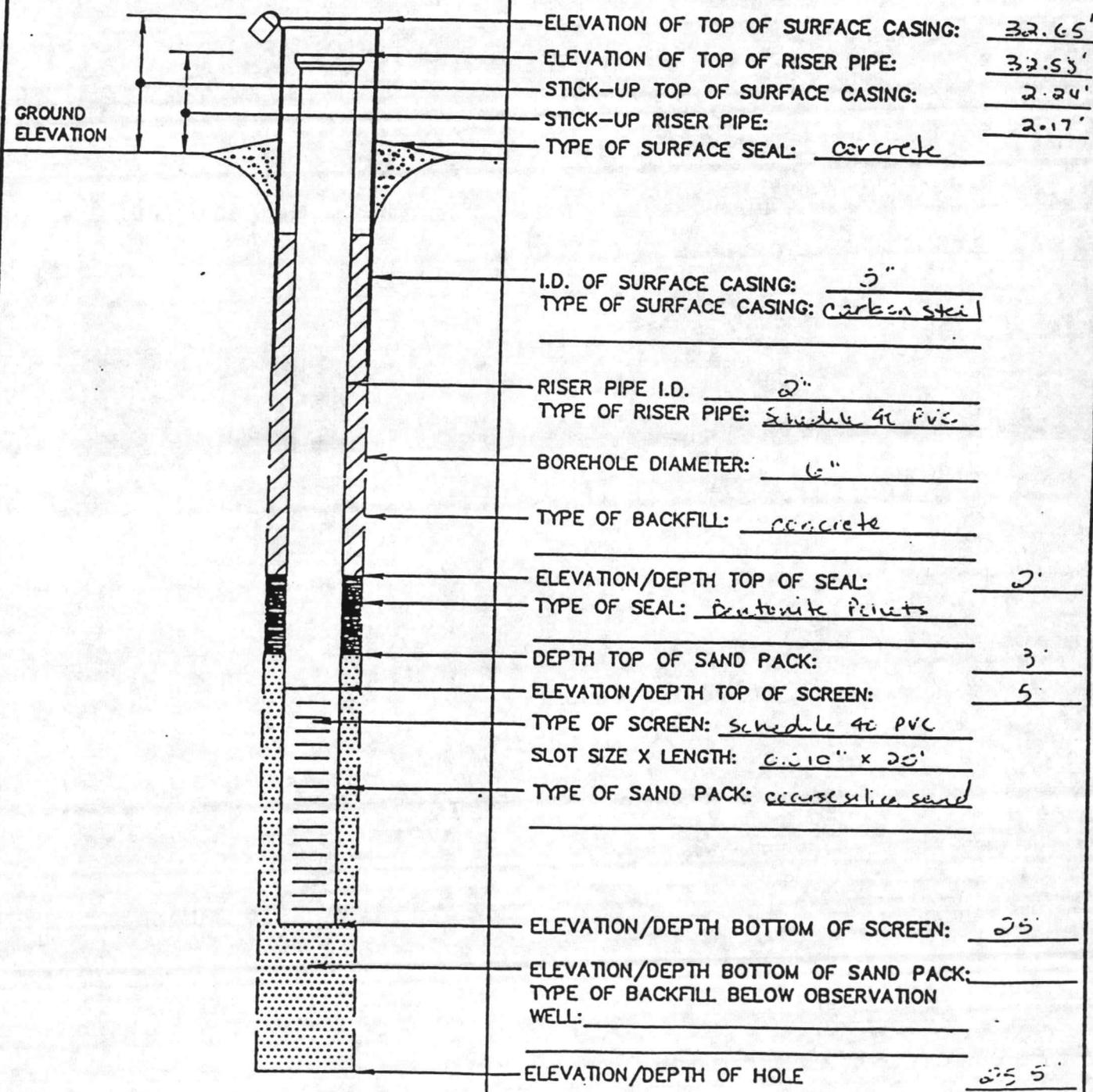


# OVERBURDEN MONITORING WELL SHEET

WELL NO. HP-GW-25

PROJECT Camp Lejeune - HP 1A  
 PROJECT NO. 49-02030 BORING NO. HP-GW-25  
 ELEVATION \_\_\_\_\_ DATE 11/5/86  
 FIELD GEOLOGIST David Brentlinger (ESU)

DRILLER Davis Drilling Co  
 DRILLING METHOD Hollow Stem Auger  
 DEVELOPMENT METHOD \_\_\_\_\_



ELEVATION OF TOP OF SURFACE CASING: 32.65'  
 ELEVATION OF TOP OF RISER PIPE: 32.53'  
 STICK-UP TOP OF SURFACE CASING: 2.24'  
 STICK-UP RISER PIPE: 2.17'  
 TYPE OF SURFACE SEAL: concrete

---

I.D. OF SURFACE CASING: 5"  
 TYPE OF SURFACE CASING: carbon steel

---

RISER PIPE I.D. 2"  
 TYPE OF RISER PIPE: schedule 40 PVC

---

BOREHOLE DIAMETER: 6"

---

TYPE OF BACKFILL: concrete

---

ELEVATION/DEPTH TOP OF SEAL: 2'  
 TYPE OF SEAL: bentonite pellets

---

DEPTH TOP OF SAND PACK: 3'  
 ELEVATION/DEPTH TOP OF SCREEN: 5'  
 TYPE OF SCREEN: schedule 40 PVC  
 SLOT SIZE X LENGTH: 0.10" x 20'  
 TYPE OF SAND PACK: coarse silica sand

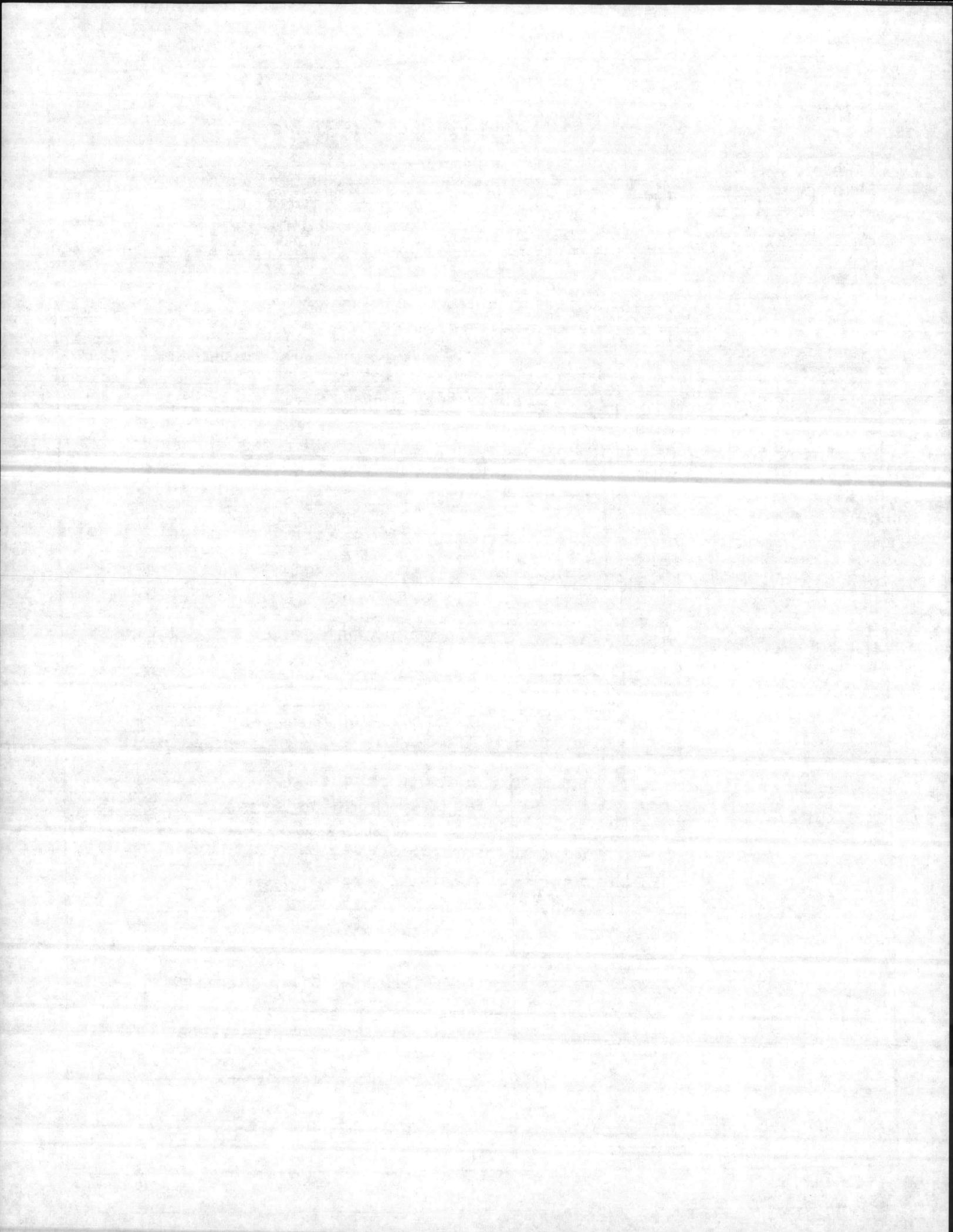
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ELEVATION/DEPTH BOTTOM OF SCREEN: 25'  
 ELEVATION/DEPTH BOTTOM OF SAND PACK: \_\_\_\_\_  
 TYPE OF BACKFILL BELOW OBSERVATION WELL: \_\_\_\_\_

---

ELEVATION/DEPTH OF HOLE: 25.5'

NOT TO SCALE



**FOR OFFICE USE ONLY**

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

**WELL CONSTRUCTION RECORD**

DRILLING CONTRACTOR Davis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 06-0135-WM-0141

1. WELL LOCATION: (Show sketch of the location below)  
 Nearest Town: Jacksonville, N.C.

County: Darlington

(Road, Community, or Subdivision and Lot No.)

2. OWNER US Navy  
 ADDRESS Camp Lejeune NC  
 (Street or Route No.) 28542

Depth	DRILLING LOG
From To	Formation Description
0.0 - 7.0	Silty Fine Sand
7.0 - 9.0	Silty Clay
9.0 - 10.5	Silty Clayey med. Sand
14.0 - 15.5	Silty Sandy Clay
19.0 - 20.5	Med. Sand
24.0 - 25.5	Silty med-coarse Sand

3. DATE DRILLED 11/5/86 USE OF WELL monitor  
 City or Town \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_  
 4. TOTAL DEPTH 25.5' CUTTINGS COLLECTED  Yes  No

5. DOES WELL REPLACE EXISTING WELL?  Yes  No

6. STATIC WATER LEVEL: 9.00 FT.  above TOP OF CASING,  
 below TOP OF CASING IS 2.50 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_

WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	Depth	To	Diameter	Wall Thickness or Weight/Ft.	Material
12.5		5.0	2"	18"	PVC
_____		_____	_____	_____	_____
_____		_____	_____	_____	_____

If additional space is needed use back of form.

**LOCATION SKETCH**

(Show direction and distance from at least two State Roads, or other map reference points)

11. GROUT:

From	Depth	To	Material	Method
0.0		2.0	Cement	_____
2.0		30	Clay	_____

See Fig. (2-5)

12. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
5.0		25'	2"	0.01 in.	PVC
_____		_____	_____	_____	_____
_____		_____	_____	_____	_____

13. GRAVEL PACK:

From	Depth	To	Size	Material
3.0		25'	Course	Sand
_____		_____	_____	_____

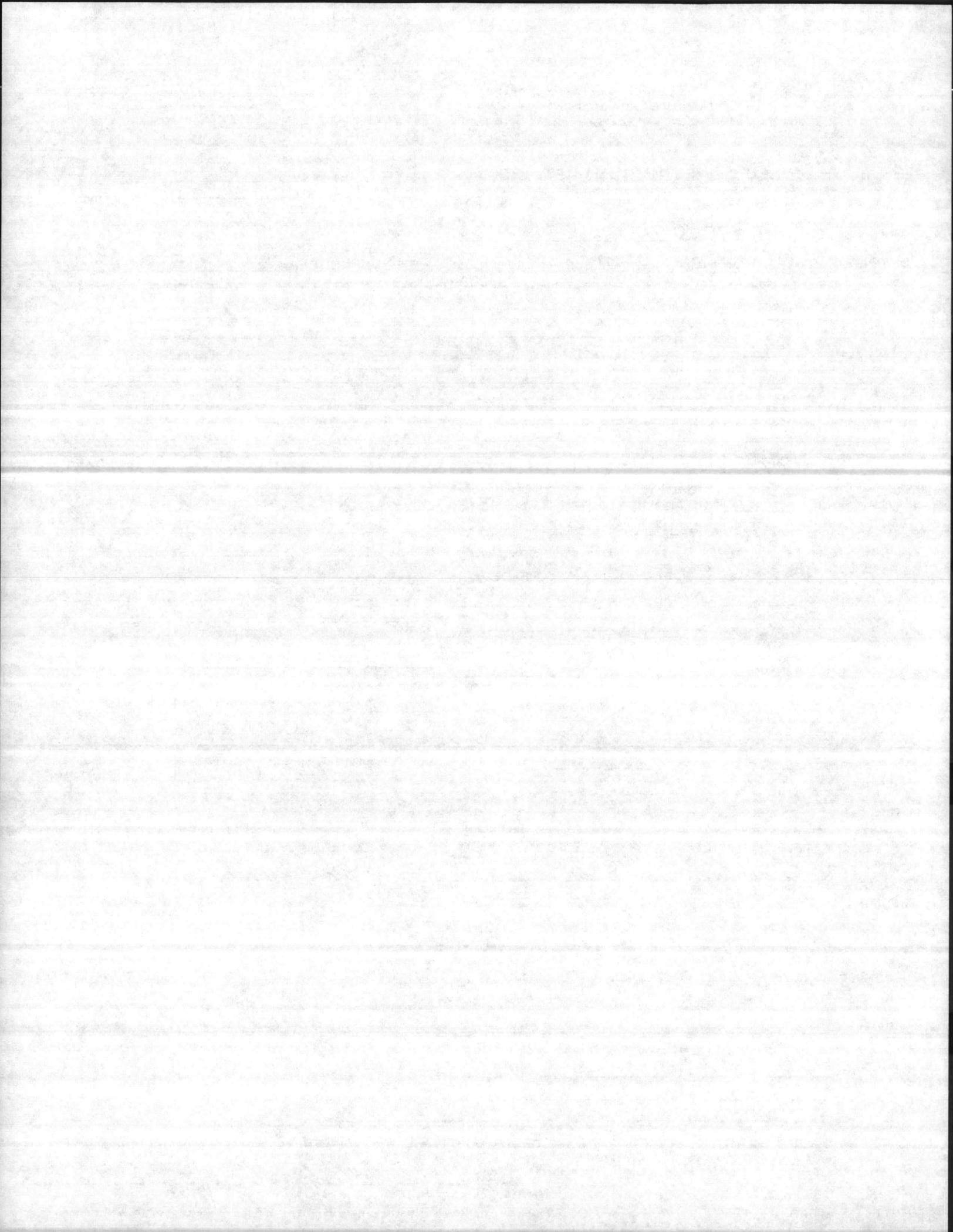
REMARKS: \_\_\_\_\_

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT

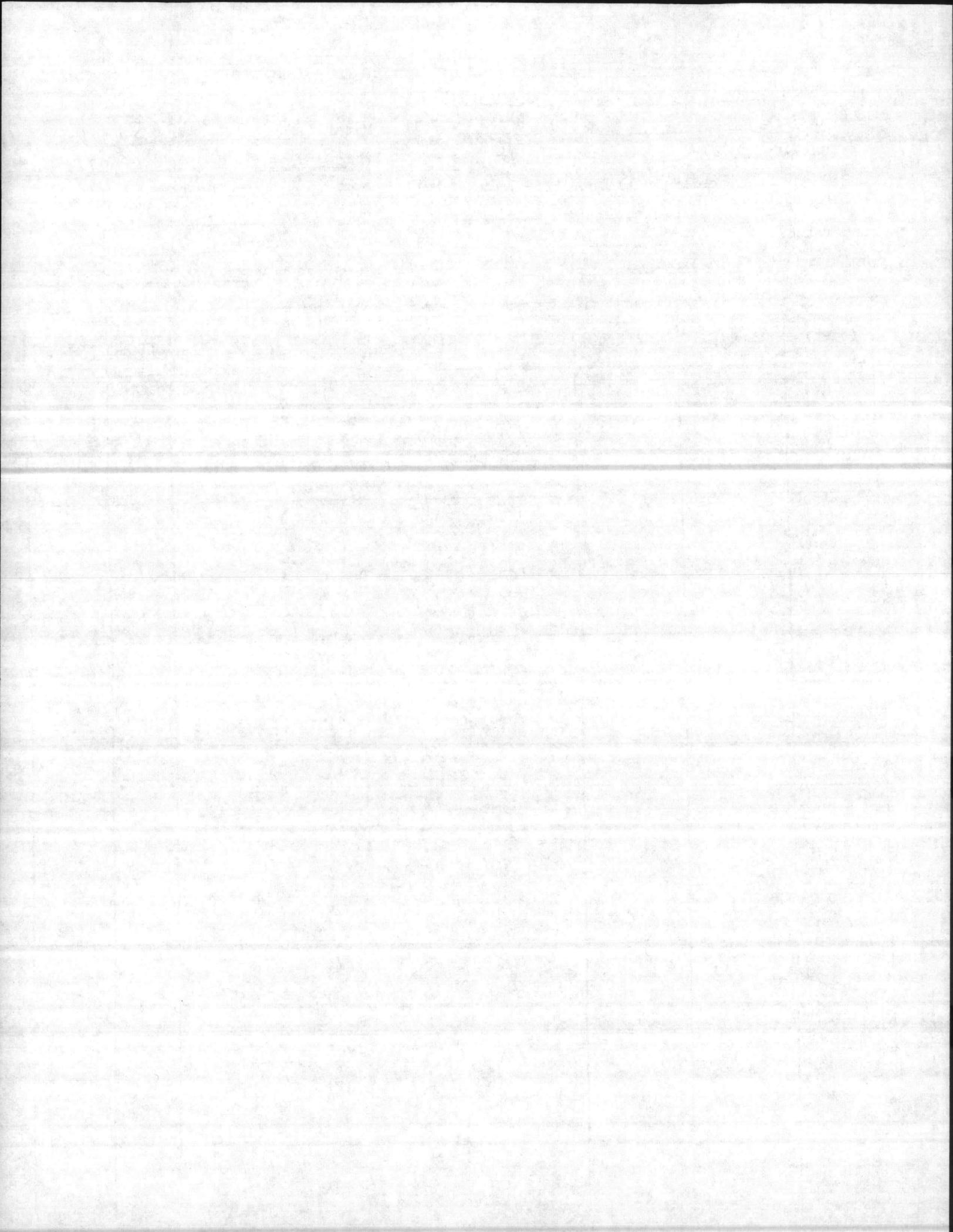
DATE

Submit original to Division of Environmental Management and copy to well owner.



Boring No. GW #8 HPGW 26 Location Coordinates N  
 Hole Size 6" Slot 0.01 E  
 Screen Size 2" Mat'l PVC Filter Materials Silica Sand  
 casing Size 2" Mat'l PVC Grout Type Bentonite Pellets  
 Geologist David Brentlinger Development \_\_\_\_\_  
 Date Start 11/5/86 Finish 11/5 Static Water Level 17.96'  
 Contractor PSE Top of Well Elevation 20.46'  
 Driller Davis Drill Type Hollow Stem Auger

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0.0-1.5			5YR 2.8/1 Black - dark grey, silty fine sand, silt 25%, loose, moist non plastic, organic matter top 6"	sm	1 2
1.5-3.0			7.5YR 4.5/6 strong Brown - Reddish yellow silty fine sand (silt 20%), loose, moist	SM	2 2 3
3.0-4.5			7.5YR 5.5/2, Brown - pink grey, silty fine sand (silt 20%), loose moist, non plastic	sm	3 4 5
4.5-6.0	water table 6'		7.5YR 5/2 Brown, silty fine sand, (silt 20%), 10% clay mottles, wet, slightly dense, non plastic	SM	5
6.0-7.5			7.5YR 8/0 white/blue tint), silty fine sand, (20% silt), 20% clay mottles, wet, clay wet plastic, slightly dense	SM	4 5



Boring No. GW #8 HPGW26 Location Coordinates N  
E  
 Hole Size \_\_\_\_\_ Slot \_\_\_\_\_  
 Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
 casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
 geologist \_\_\_\_\_ Development \_\_\_\_\_  
 Date Start \_\_\_\_\_ Finish \_\_\_\_\_ Static Water Level \_\_\_\_\_  
 Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
 Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
7.5-9.0			10YR 7.5/2 light grey - pale white, silty fine-med. sand, 45% silt + clay mottles, moist, plastic	SP	5 6
9.0-10.5			10YR 6.25/1 grey - light grey, silty fine sand with 10-15% clay throughout, moist, non plastic - slight plastic	SM SC	4 9 11
14.0-15.5			very soft sticky clay 2.5Y 4.5/0 dark grey, very plastic, wet	MH CH	3 1 2
19.0-20.5			5Y 5.5/2 olive - pale olive, silty clay with 10-15% medium-coarse sand layers, med. dense, wet, plastic	SC MH	4 4 4
24.0-25.5			5Y 5.5/1 grey - light grey, medium-coarse sand, 10-15% fines, loose, wet, non plastic	SW	5 6



Boring No. 6W 8 HP 6W 26

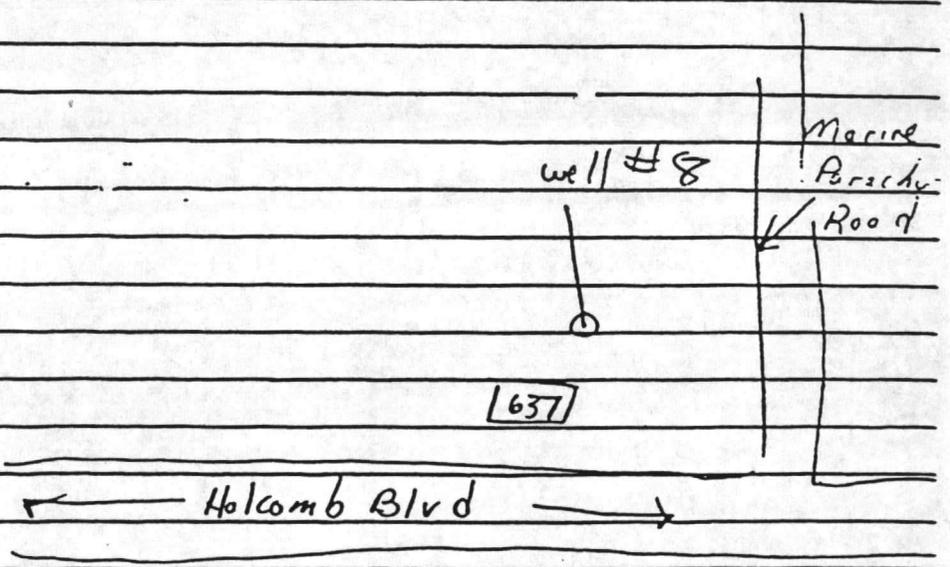
SHEET \_\_\_\_\_ OF \_\_\_\_\_

11/5/86

One Site 1215 PM

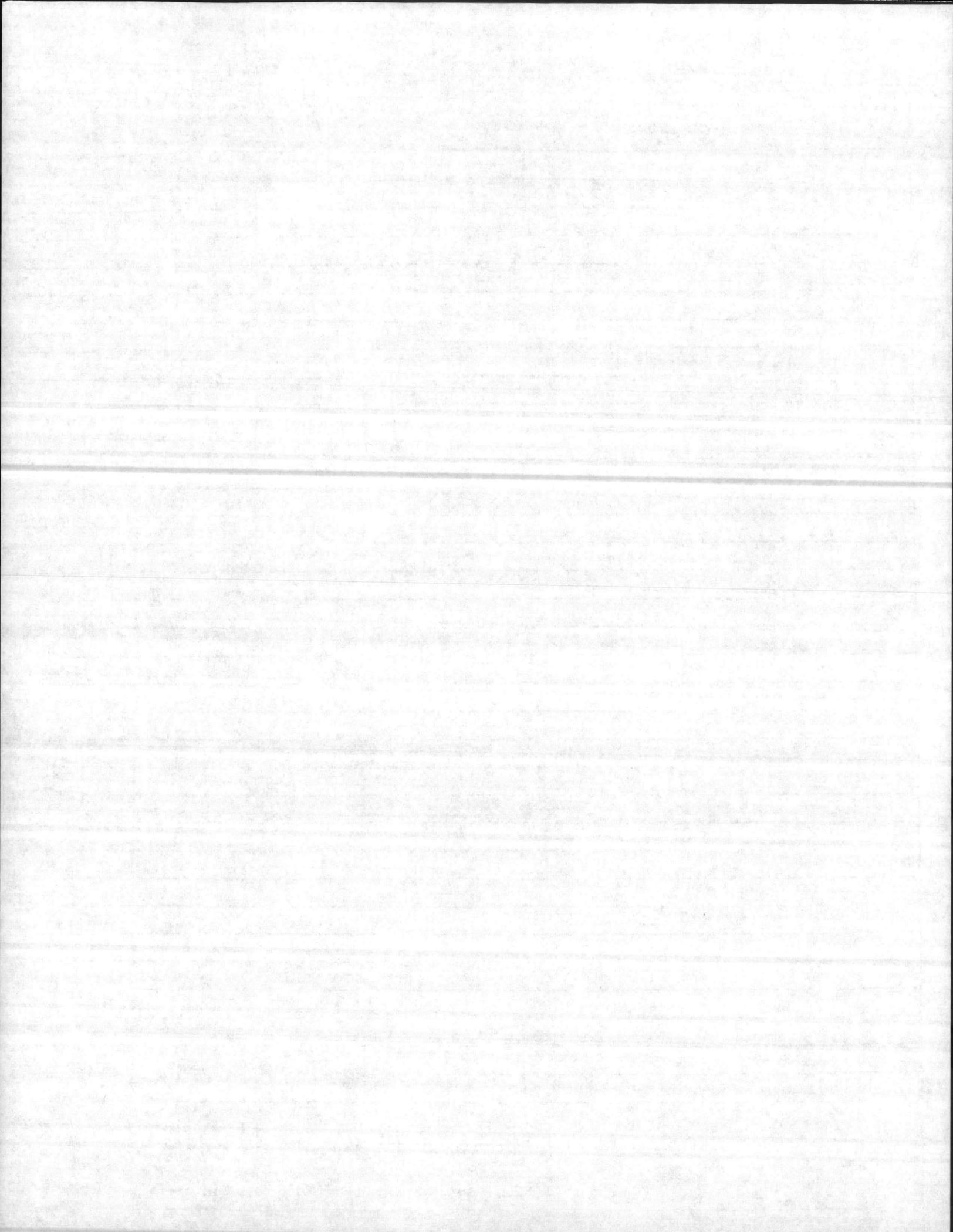
1st spoon 1220  
last spoon 115  
well complete 200

Standard Specs



DATE

SIGNED

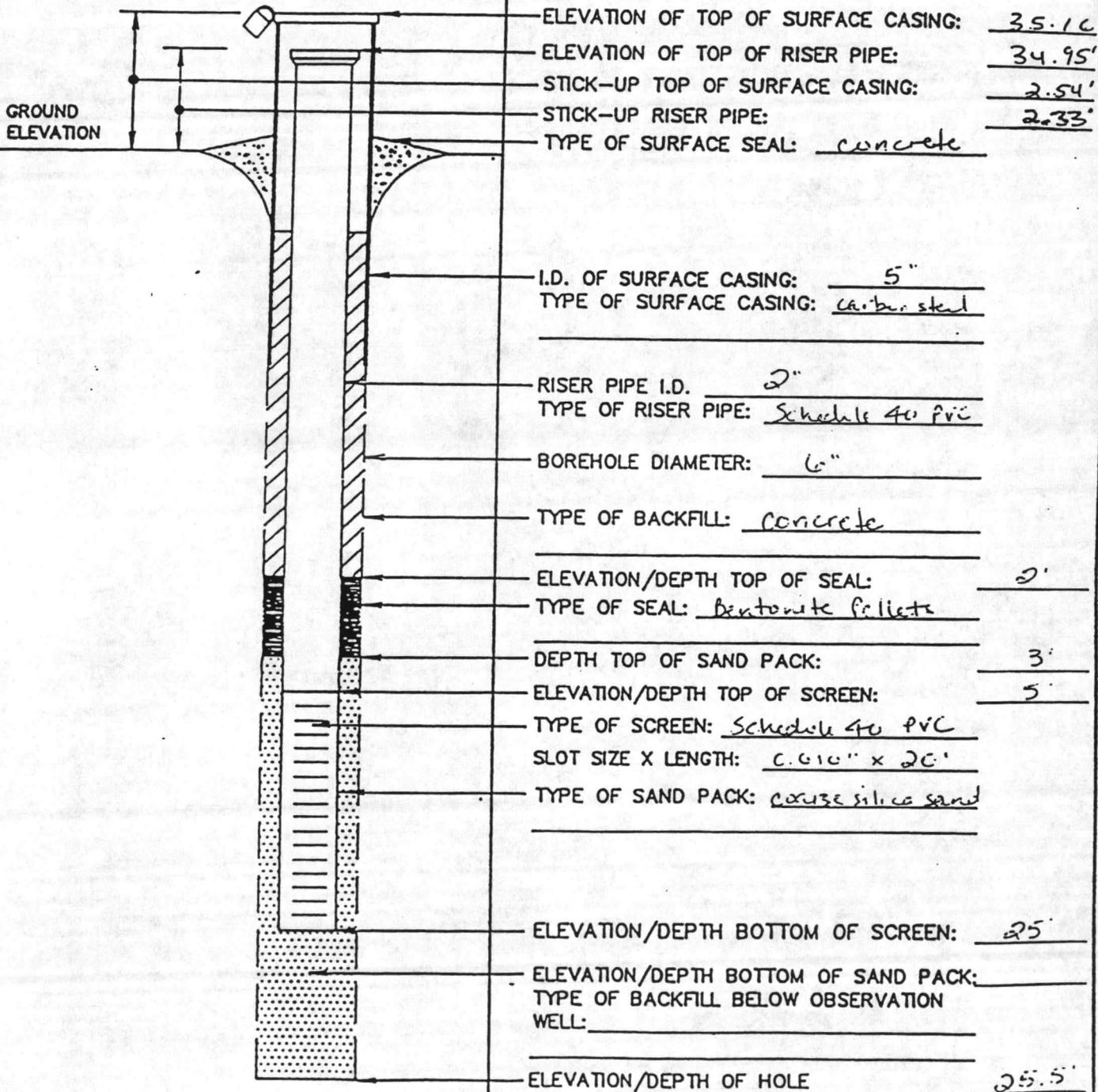


# OVERBURDEN MONITORING WELL SHEET

WELL NO. HP-GW-26

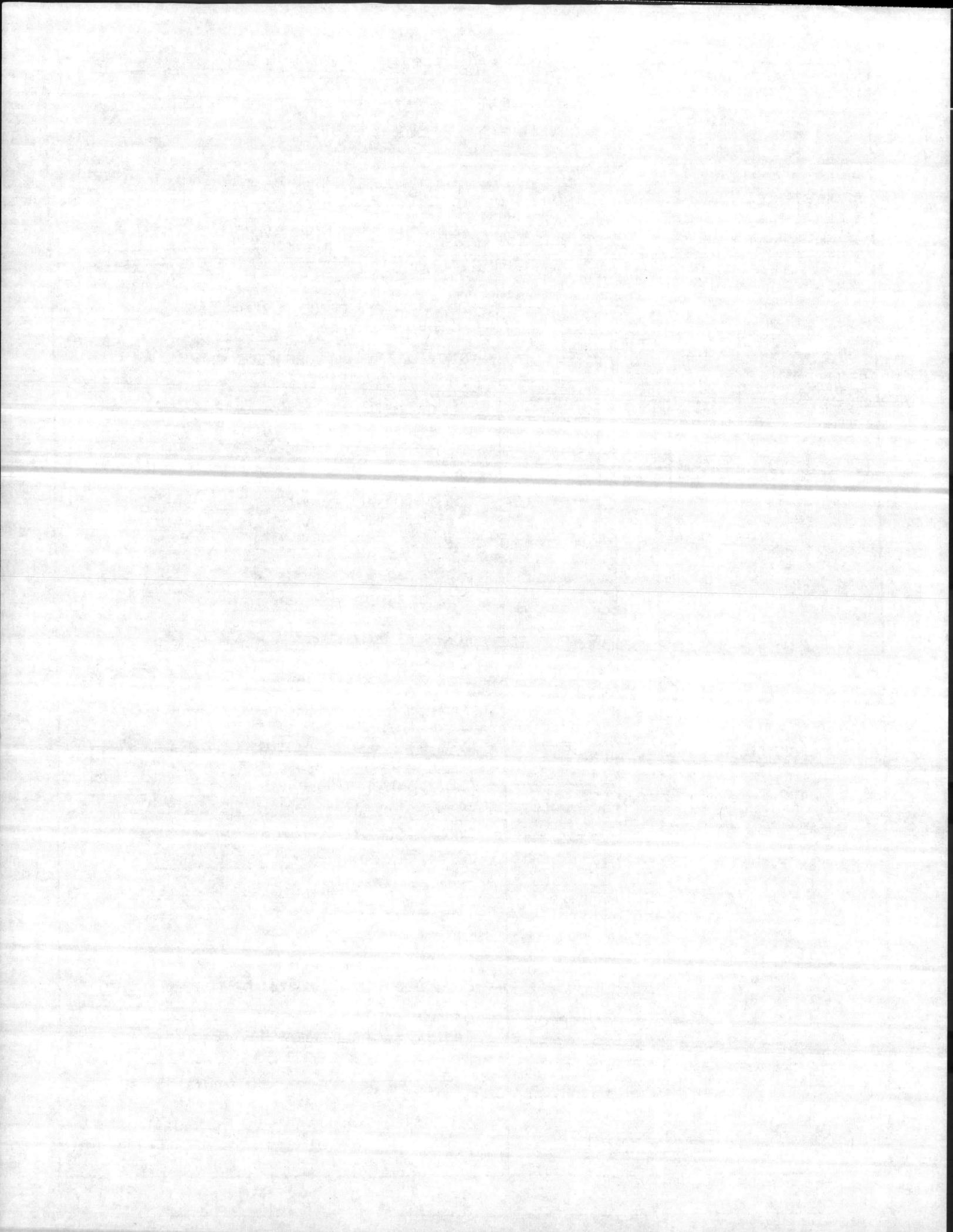
PROJECT Camp Lejeune - HP1A  
 PROJECT NO. HP-GW-26 BORING NO. HP-GW-26  
 ELEVATION \_\_\_\_\_ DATE 11/5/86  
 FIELD GEOLOGIST David Brentlinger (ESE)

DRILLER Davis Drilling Co  
 DRILLING METHOD Hollow Stem Auger  
 DEVELOPMENT METHOD \_\_\_\_\_



NOT TO SCALE

- ELEVATION OF TOP OF SURFACE CASING: 35.10'
- ELEVATION OF TOP OF RISER PIPE: 34.95'
- STICK-UP TOP OF SURFACE CASING: 2.54'
- STICK-UP RISER PIPE: 2.33'
- TYPE OF SURFACE SEAL: concrete
- I.D. OF SURFACE CASING: 5"
- TYPE OF SURFACE CASING: carbon steel
- RISER PIPE I.D. 2"
- TYPE OF RISER PIPE: Schedule 40 PVC
- BOREHOLE DIAMETER: 6"
- TYPE OF BACKFILL: concrete
- ELEVATION/DEPTH TOP OF SEAL: 2'
- TYPE OF SEAL: bentonite pellets
- DEPTH TOP OF SAND PACK: 3'
- ELEVATION/DEPTH TOP OF SCREEN: 5'
- TYPE OF SCREEN: Schedule 40 PVC
- SLOT SIZE X LENGTH: 0.610" x 20"
- TYPE OF SAND PACK: coarse silica sand
- ELEVATION/DEPTH BOTTOM OF SCREEN: 25'
- ELEVATION/DEPTH BOTTOM OF SAND PACK: \_\_\_\_\_
- TYPE OF BACKFILL BELOW OBSERVATION WELL: \_\_\_\_\_
- ELEVATION/DEPTH OF HOLE 25.5'



11) 11) PGW 26

**WELL CONSTRUCTION RECORD**

FOR OFFICE USE ONLY

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

DRILLING CONTRACTOR Davis Drilling Co.  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 66-0135-WM-014

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

Nearest Town: Jacksonville N.C. County: Onslow

(Road, Community, or Subdivision and Lot No.)

2. OWNER US Navy  
 ADDRESS Camp Lejeune N.C.  
 (Street or Route No.) 28542  
 City or Town \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

3. DATE DRILLED 11/5/86 USE OF WELL Monitor  
 4. TOTAL DEPTH 25.5' CUTTINGS COLLECTED  Yes  No

5. DOES WELL REPLACE EXISTING WELL?  Yes  No  
 6. STATIC WATER LEVEL: 17.96 FT.  above  below TOP OF CASING.  
 TOP OF CASING IS 2.5 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_  
 WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	To	Depth	Diameter	Wall Thickness or Weight/Ft.	Material
<u>+2.5</u>	<u>-5.0</u>	<u>5.0</u> Ft.	<u>2"</u>	<u>1/8"</u>	<u>PVC</u>
From _____	To _____	Ft. _____	_____	_____	_____
From _____	To _____	Ft. _____	_____	_____	_____

11. GROUT:

From	To	Depth	Material	Method
<u>0.0</u>	<u>-2.0</u>	<u>2.0</u> Ft.	<u>Cement</u>	_____
<u>-2.0</u>	<u>-3.0</u>	<u>1.0</u> Ft.	<u>Clay</u>	_____

12. SCREEN:

From	To	Depth	Diameter	Slot Size	Material
<u>-5.0</u>	<u>-25'</u>	<u>20'</u>	<u>2"</u>	<u>0.02</u> in.	<u>PVC</u>
From _____	To _____	Ft. _____	_____	_____	_____
From _____	To _____	Ft. _____	_____	_____	_____

13. GRAVEL PACK:

From	To	Depth	Size	Material
<u>-3.0</u>	<u>-25'</u>	<u>22'</u>	<u>Coarse</u>	<u>Sand</u>
From _____	To _____	Ft. _____	_____	_____

REMARKS: \_\_\_\_\_

Depth	Formation Description
<u>0.0 - 7.5</u>	<u>Silty Fine Sand</u>
<u>7.5 - 9.0</u>	<u>Silty Fine - Med. Sand</u>
<u>9.0 - 10.5</u>	<u>Silty Fine Sand</u>
<u>14.0 - 15.5</u>	<u>Soft Clay</u>
<u>19.0 - 20.5</u>	<u>S. 1/2 Clay</u>
<u>24.0 - 25.5</u>	<u>Med. Coars. Sand</u>

If additional space is needed use back of form.

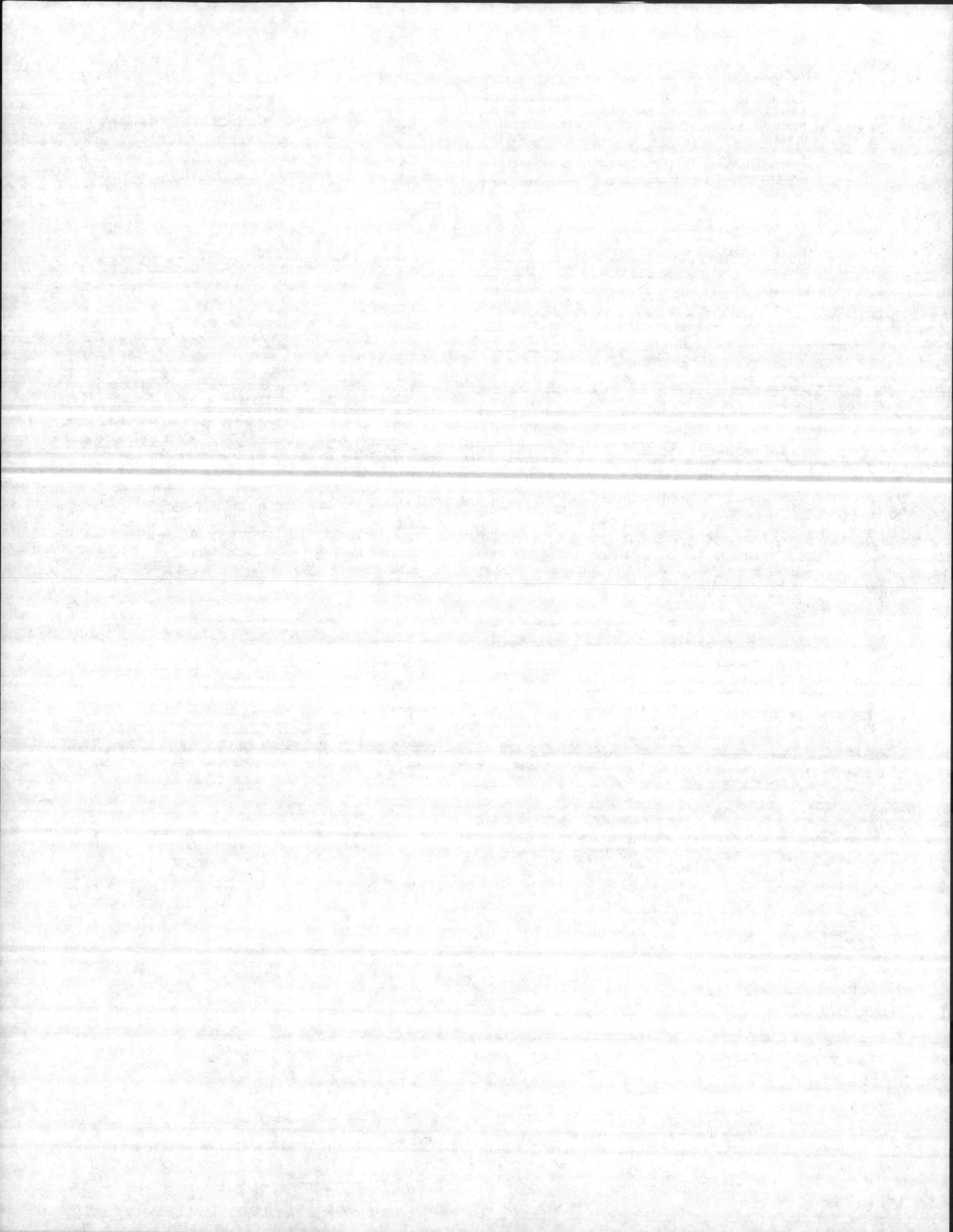
LOCATION SKETCH

(Show direction and distance from at least two State Roads, or other map reference points).

See Fig. (2-5)

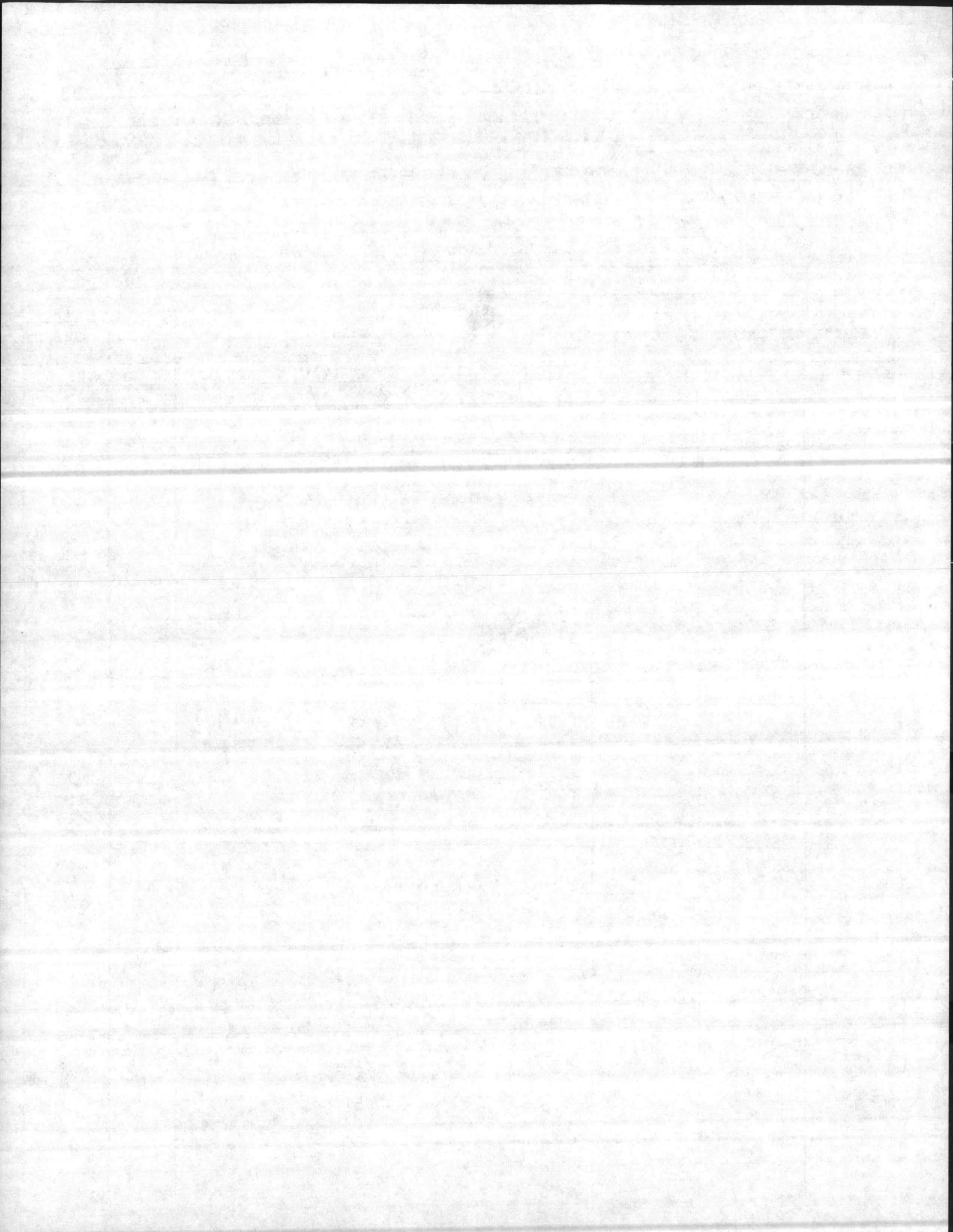
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Richard H. Emery 2/11/87  
 SIGNATURE OF CONTRACTOR OR AGENT DATE



Boring No. HP6W 29 Location Coordinates N  
 Hole Size 6" Slot 0.01 E  
 Screen Size 2" Mat'l PVC Filter Materials Silica sand  
 casing Size 2" Mat'l PVC Grout Type Bentonite pellets  
 Geologist David Brenlinger Development \_\_\_\_\_  
 Date Start 11/17/86 Finish 11/17 Static Water Level 19.8'  
 Contractor ESF Top of Well Elevation 22.3'  
 Driller DAVIS Drill Type Hollow Stem Auger

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0.0 - 1.5			10YR 5.5/4 yellow Brown, silty fine sand with 30% cement fill (silt 30%), organic matter 40%, slightly dense, moist, non plastic	SM	3 10 13
1.5 - 3.0	1.5 - 2.2		Same as above (0.0 - 1.5)		10
	2.2 - 3.0		2.5Y 7/4, Pale Yellow - Yellow, firm silty clay, silt 30%, dense, plastic, moist	SM CL	11 11
3.0 - 4.5			10YR 6/8 Brown Yellow silty clayey fine sand, (silt + clay 40%), mod. dense, non plastic, moist	SM SC	9 10 12
4.5 - 6.0			Same as above (3.0 - 4.5) less silt	SC	9 10 8
6.0 - 7.5	6.0 - 6.5		Same as above (4.5 - 6.0)		
	6.5 - 7.5		10YR 7.5/4, very pale Brown, (silt 25%), loose, moist, non plastic, less clay	SC SM	7 8 10

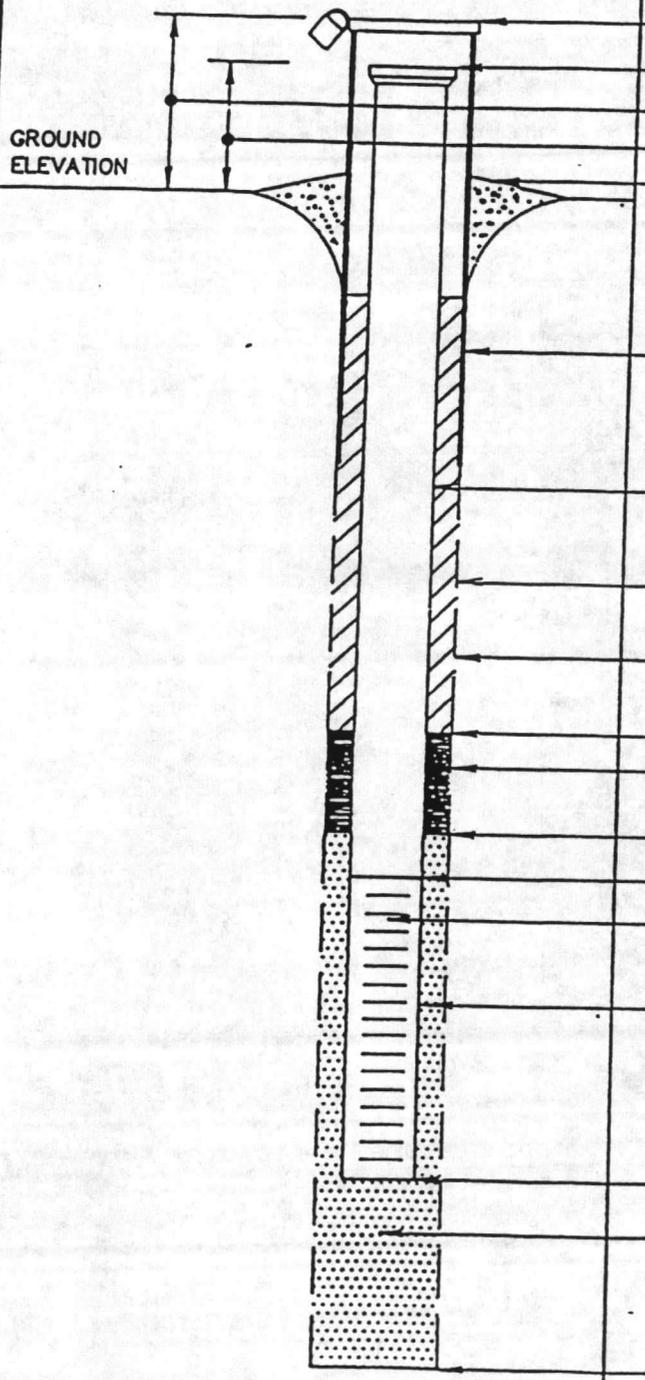


# OVERBURDEN MONITORING WELL SHEET

WELL NO. HP-GW29

PROJECT Camp Lejeune - HP1A  
 PROJECT NO. 44-C2030 BORING NO. HP-GW29  
 ELEVATION \_\_\_\_\_ DATE 11/17/86  
 FIELD GEOLOGIST David Brentlinger (ESE)

DRILLER Davis Drilling Co  
 DRILLING METHOD Hollow Stem Auger  
 DEVELOPMENT METHOD \_\_\_\_\_



ELEVATION OF TOP OF SURFACE CASING: 28.83'  
 ELEVATION OF TOP OF RISER PIPE: 28.82'  
 STICK-UP TOP OF SURFACE CASING: 2.40'  
 STICK-UP RISER PIPE: 2.39'  
 TYPE OF SURFACE SEAL: concrete

I.D. OF SURFACE CASING: 5"  
 TYPE OF SURFACE CASING: carbon steel

RISER PIPE I.D. 2"  
 TYPE OF RISER PIPE: Schedule 40 PVC

BOREHOLE DIAMETER: 6"

TYPE OF BACKFILL: concrete

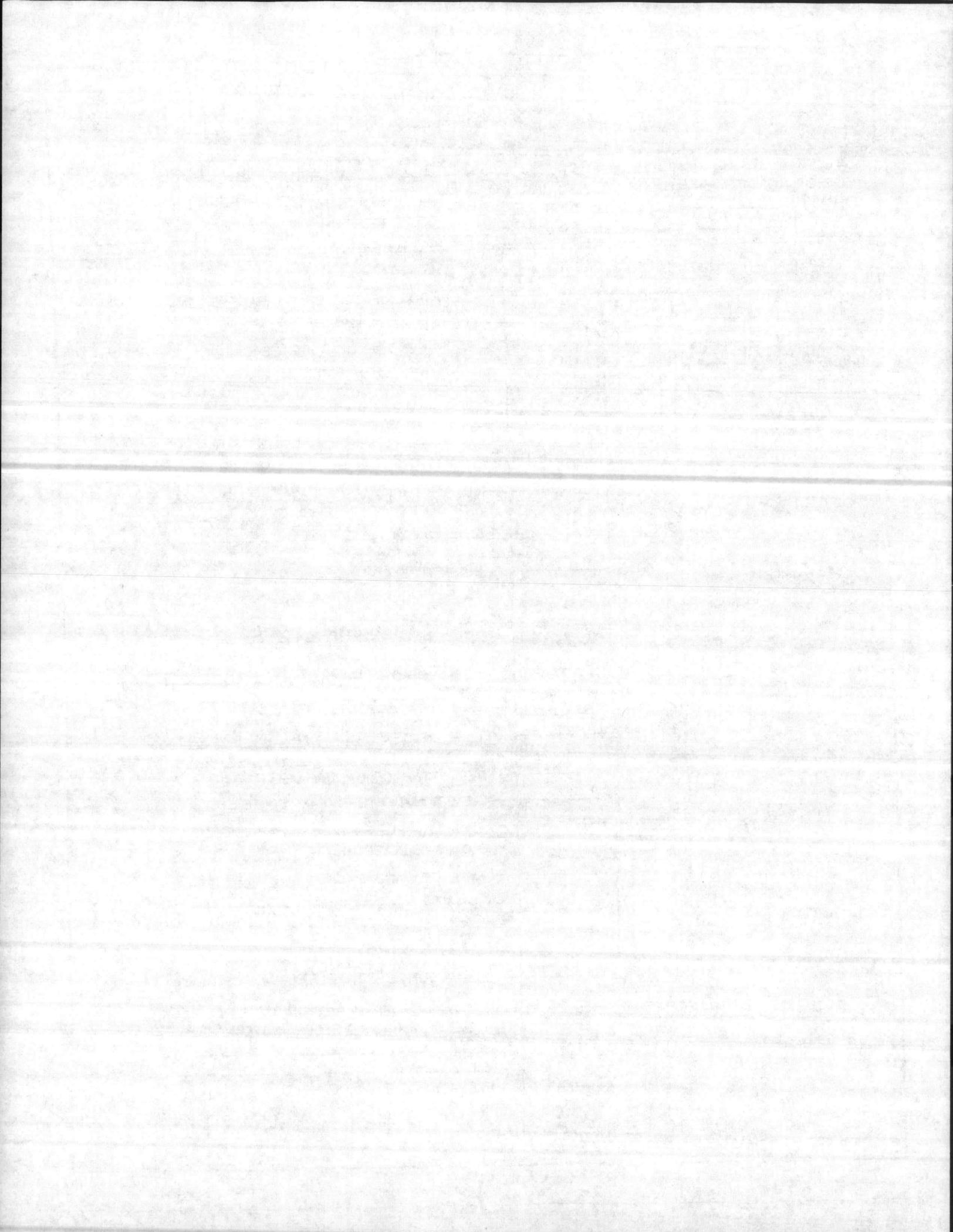
ELEVATION/DEPTH TOP OF SEAL: 5'  
 TYPE OF SEAL: Bentonite Pellets

DEPTH TOP OF SAND PACK: 3'  
 ELEVATION/DEPTH TOP OF SCREEN: 5'  
 TYPE OF SCREEN: \_\_\_\_\_  
 SLOT SIZE X LENGTH: 6.010' x 20'  
 TYPE OF SAND PACK: course silica sand

ELEVATION/DEPTH BOTTOM OF SCREEN: 25'  
 ELEVATION/DEPTH BOTTOM OF SAND PACK: \_\_\_\_\_  
 TYPE OF BACKFILL BELOW OBSERVATION WELL: \_\_\_\_\_

ELEVATION/DEPTH OF HOLE: 25.5'

NOT TO SCALE



Boring No. HPGW 29

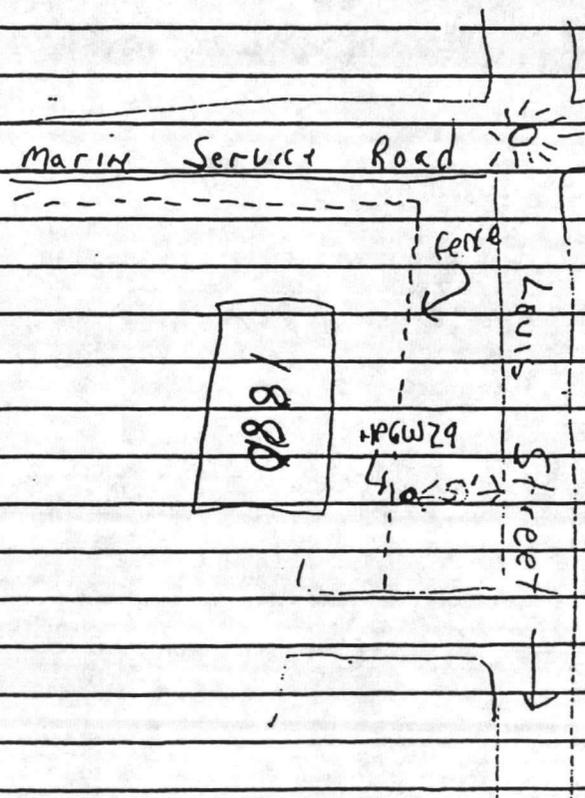
SHEET \_\_\_\_\_ OF \_\_\_\_\_

on site 930 Am

11/17/86

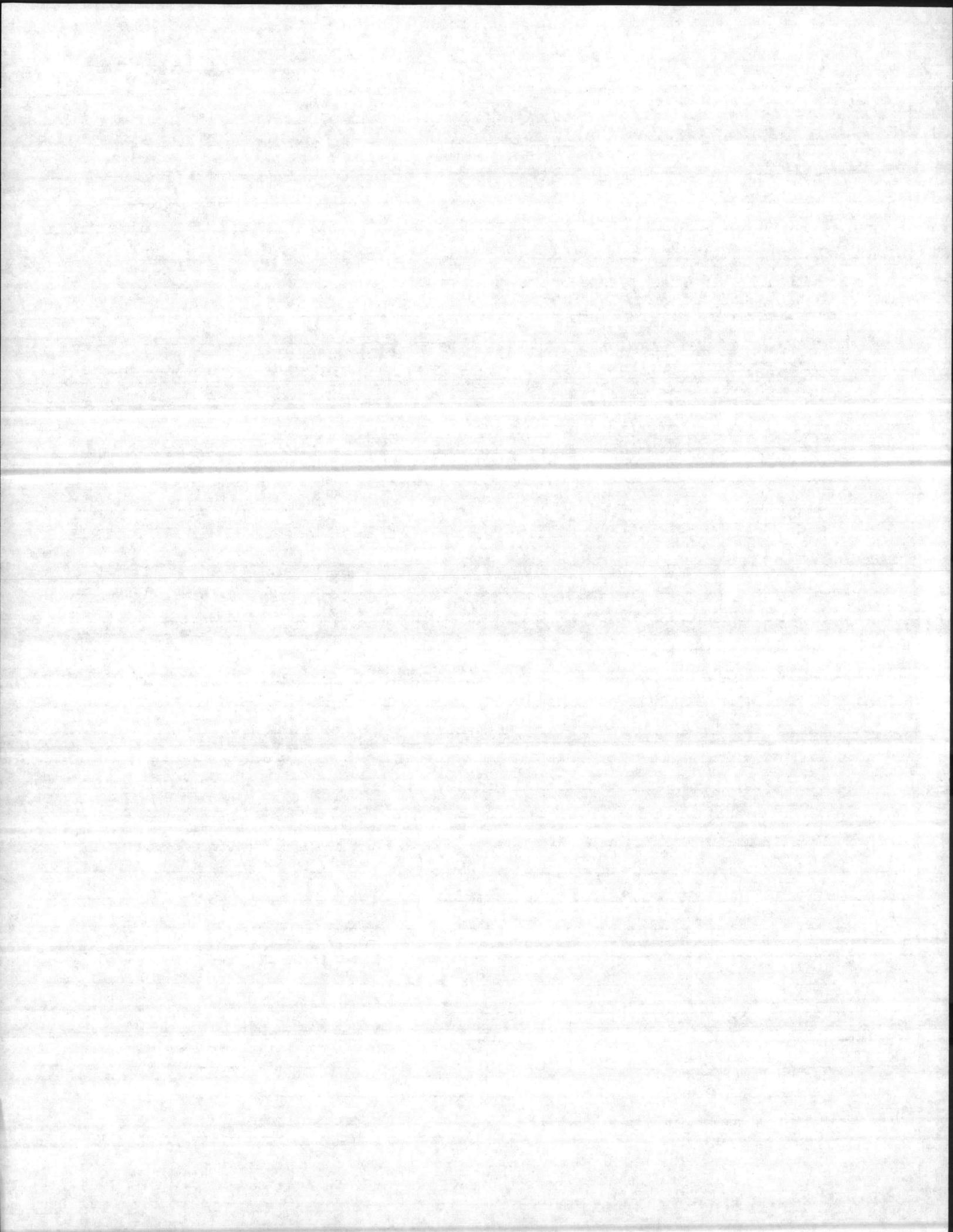
1st Spool 935  
Rain delay 1000  
Drilling resumes 1115  
last spool 1130  
well complete 1225

Standard Well Specs



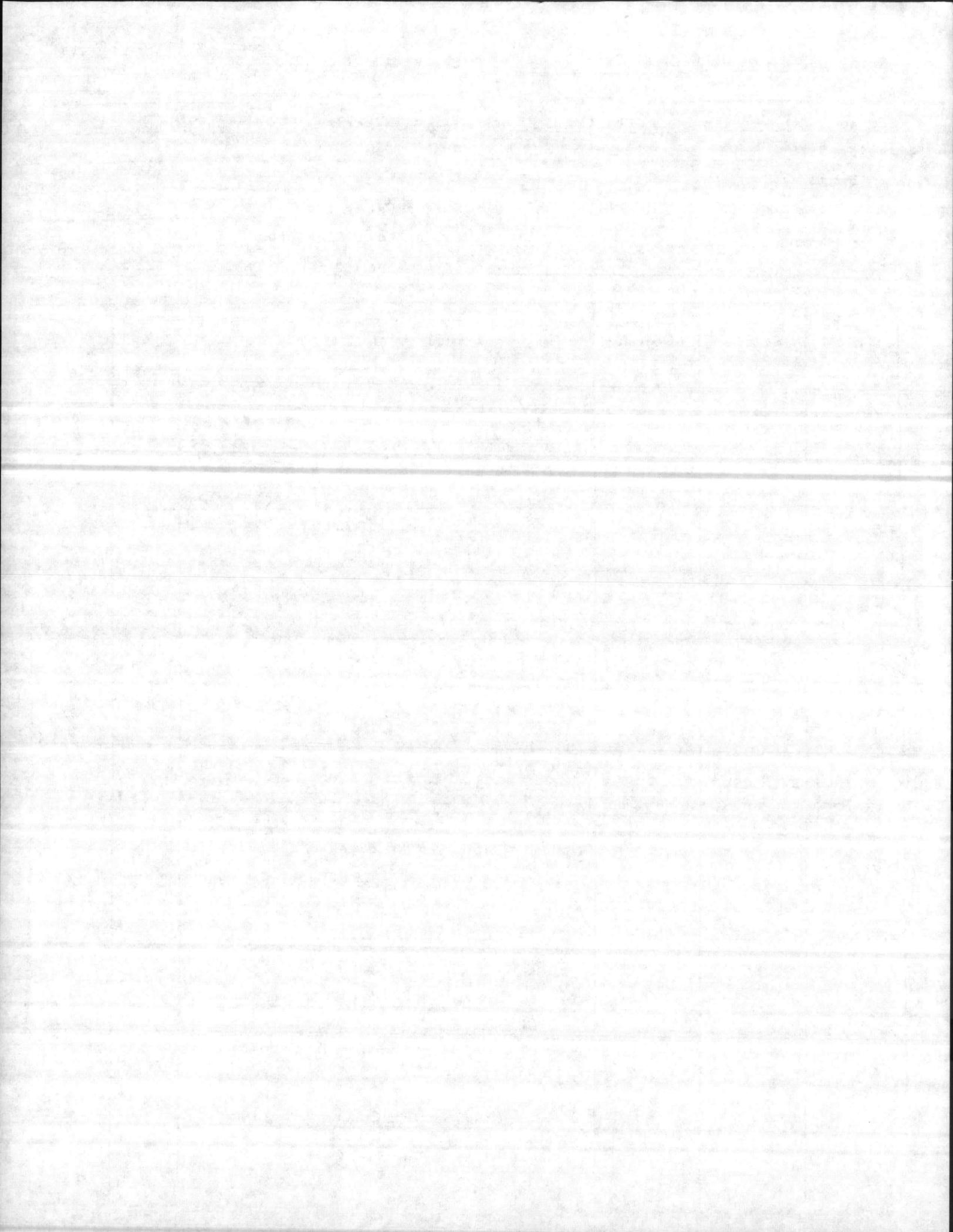
DATE

SIGNED



Boring No. HPGW 29 Location Coordinates N \_\_\_\_\_  
 Hole Size \_\_\_\_\_ Slot \_\_\_\_\_ E \_\_\_\_\_  
 Screen Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Filter Materials \_\_\_\_\_  
 casing Size \_\_\_\_\_ Mat'l \_\_\_\_\_ Grout Type \_\_\_\_\_  
 Geologist \_\_\_\_\_ Development \_\_\_\_\_  
 Date Start \_\_\_\_\_ Finish \_\_\_\_\_ Static Water Level \_\_\_\_\_  
 Contractor \_\_\_\_\_ Top of Well Elevation \_\_\_\_\_  
 Driller \_\_\_\_\_ Drill Type \_\_\_\_\_

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
7.0-9.0			104R 7.5/6 yellow silty fine sand, (silt 25%) slightly dense, non plastic, moist	SM	4 6 5
9.0-10.5			104R 8/1 white silty fine sand, (silt 10-15%), loose, dry-moist, non plastic	SW	10 12 20
14.0-15.5			104R 8/1 white silty fine sand with 10% clay layers (silt 15%), loose, moist, non-plastic	SM	9 7 11
19.0-20.5			104R 7.5/6 yellow silty clayey sand, (silt + clay 40%), wet, slightly dense, slightly plastic	SL	5 7 10
24.0-25.5			104R 5.75/8 yellow brown, silty fine-med. sand, (silt 10-15%), wet, slightly dense, non plastic, 3" clean medium sand on top	4 7 8 SW	



FOR OFFICE USE ONLY

Quad. No. \_\_\_\_\_ Serial No. \_\_\_\_\_  
 Lat. \_\_\_\_\_ Long. \_\_\_\_\_ Pc \_\_\_\_\_  
 Minor Basin \_\_\_\_\_  
 Basin Code \_\_\_\_\_  
 Header Ent. \_\_\_\_\_ GW-1 Ent. \_\_\_\_\_

**WELL CONSTRUCTION RECORD**

DRILLING CONTRACTOR Davis Drilling Co  
 DRILLER REGISTRATION NUMBER Pending

STATE WELL CONSTRUCTION PERMIT NUMBER: 06-0135-WM-0141

1. WELL LOCATION: (Show sketch of the location below)  
 Nearest Town: Jacksonville, NC

County: Onslow

(Road, Community, or Subdivision and Lot No.)

2. OWNER US Navy  
 ADDRESS Camp Lejeune NC  
 (Street or Route No.) 28542

Depth	DRILLING LOG
From To	Formation Description
0.0 - 2.25	Silty Fine Sand
2.25 - 3.0	Silty Clay
3.0 - 6.5	Silty Clayey Fine Sand
6.5 - 10.5	Silty Fine Sand
10.5 - 15.5	Silty Fine Sand
15.5 - 20.5	Silty Clayey Sand
20.5 - 25.5	Silty Fine-Med. Sand

3. DATE DRILLED 11/17/86 USE OF WELL monitor

4. TOTAL DEPTH 25.5' CUTTINGS COLLECTED  Yes  No

5. DOES WELL REPLACE EXISTING WELL?  Yes  No

6. STATIC WATER LEVEL: 19.80 FT.  above TOP OF CASING,  below  
 TOP OF CASING IS 2.50 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): \_\_\_\_\_ METHOD OF TEST \_\_\_\_\_

8. WATER ZONES (depth): \_\_\_\_\_

9. CHLORINATION: Type \_\_\_\_\_ Amount \_\_\_\_\_

10. CASING:

From	To	Depth	Diameter	Wall Thickness or Weight/Ft.	Material
0.0	5.0	5.0'	2"	1/8"	PVC
5.0	25.5	20.5'			

If additional space is needed use back of form.

**LOCATION SKETCH**

(Show direction and distance from at least two State Roads, or other map reference points).

1. GROUT:

From	To	Depth	Material	Method
0.0	2.0	2.0'	Concrete	
2.0	3.0	1.0'	Clay	

See sketch attached to Fig. (2-5)

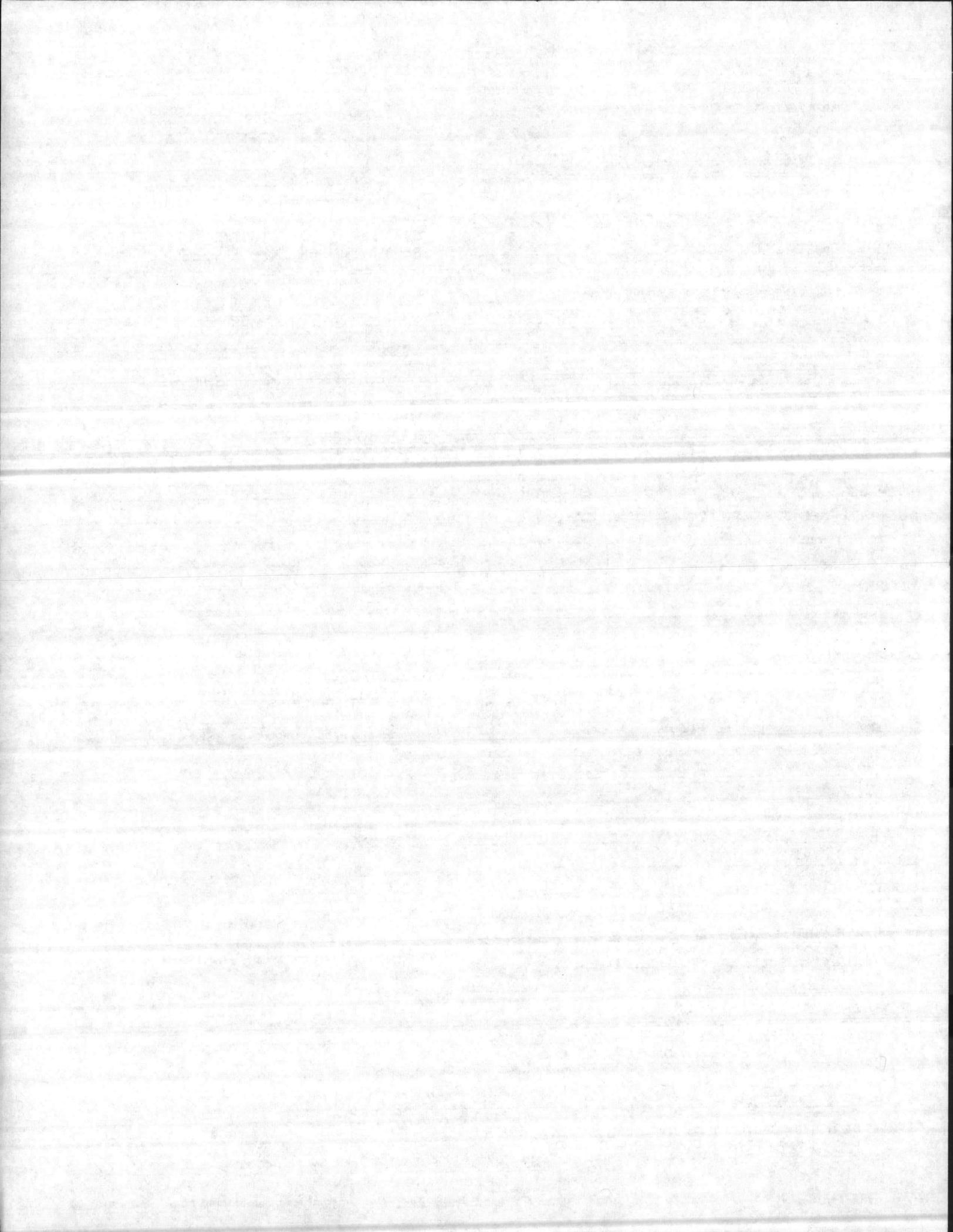
2. SCREEN:

From	To	Depth	Diameter	Slot Size	Material
5.0	25.5	20.5'	2"	0.01 in.	PVC

3. GRAVEL PACK:

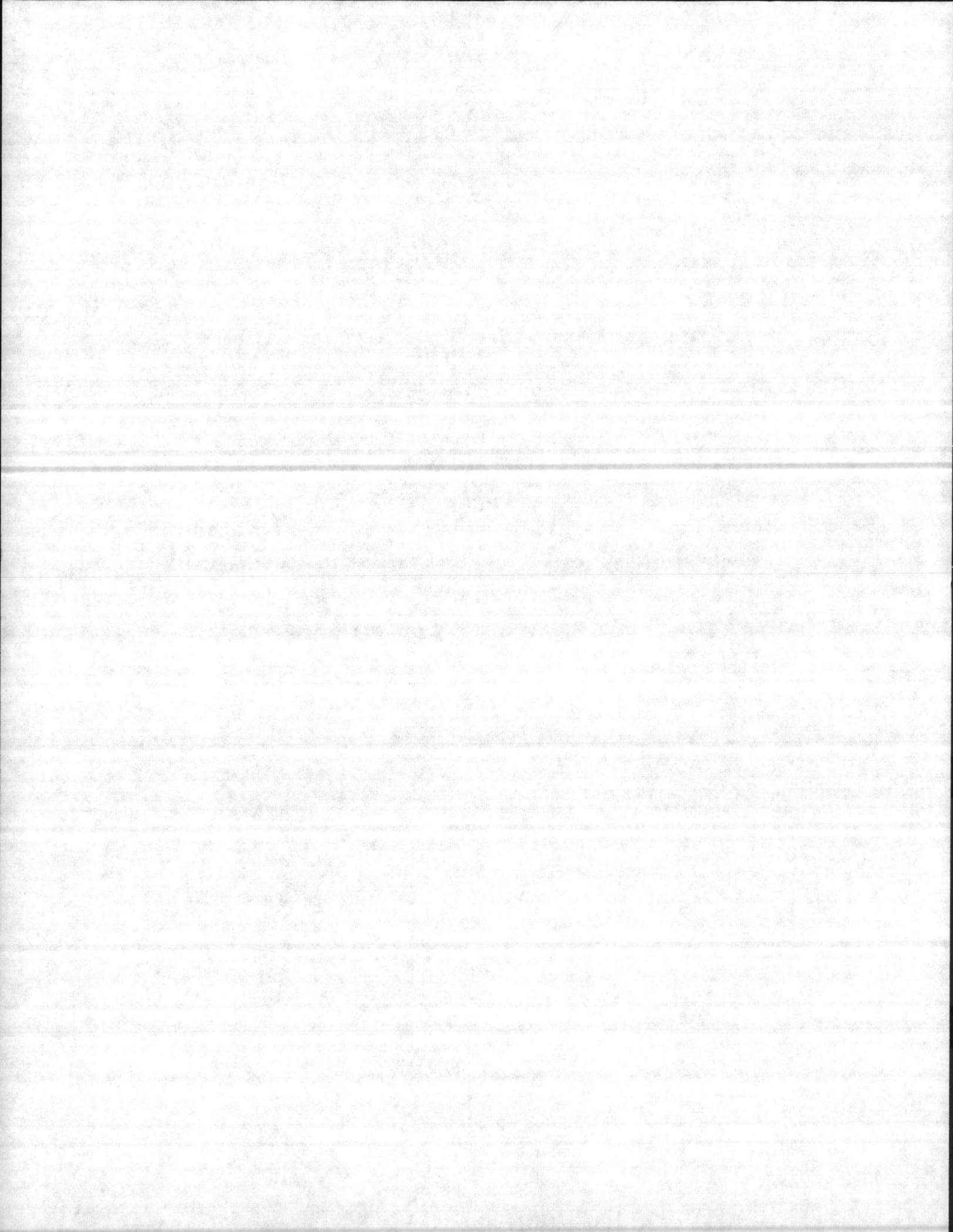
From	To	Depth	Size	Material
3.0	25.5	22.5'	Coarse	Sand

MARKS: \_\_\_\_\_  
 I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NEAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.  
 SIGNATURE OF CONTRACTOR OR AGENT [Signature] DATE 2/11/87

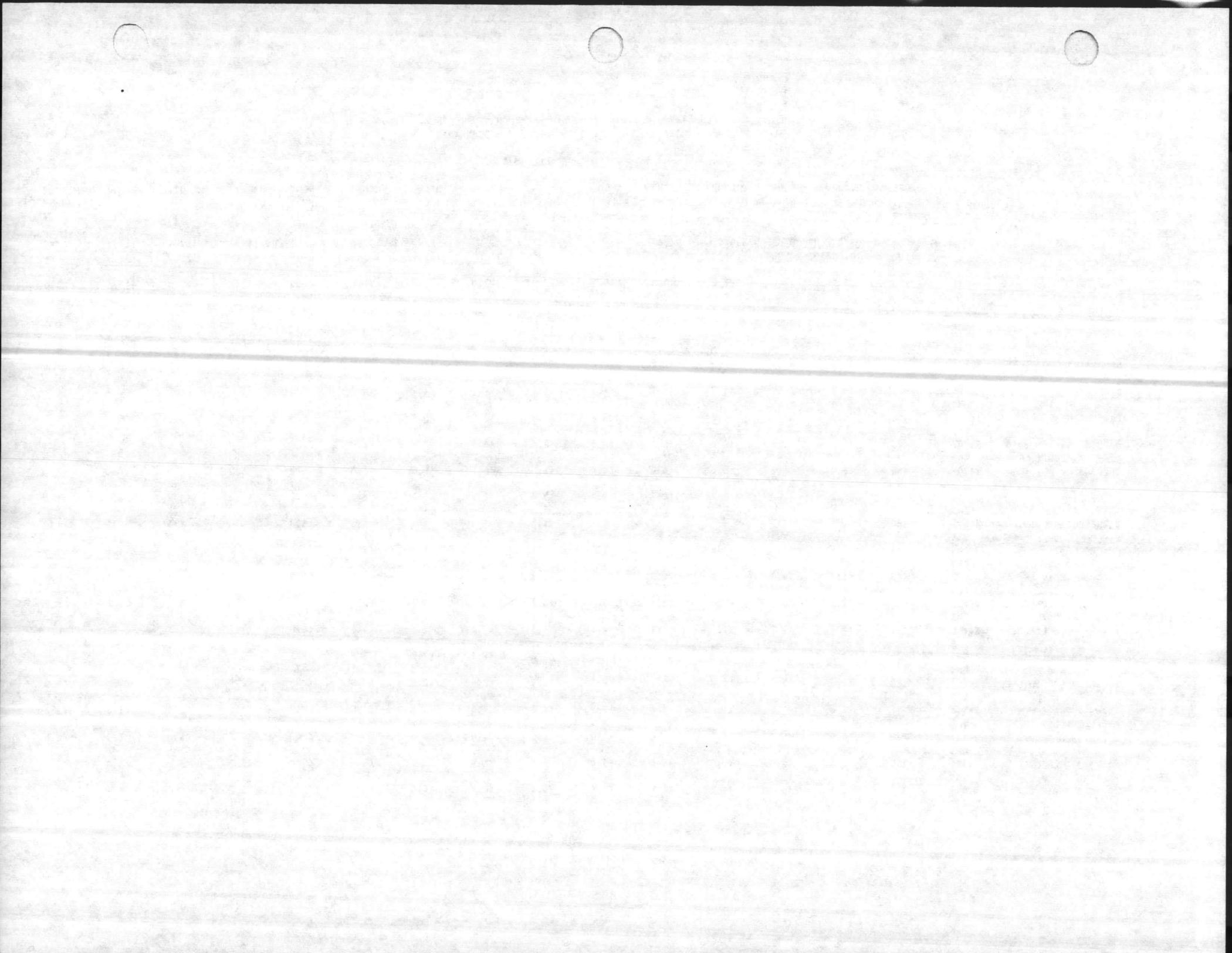


**APPENDIX B**

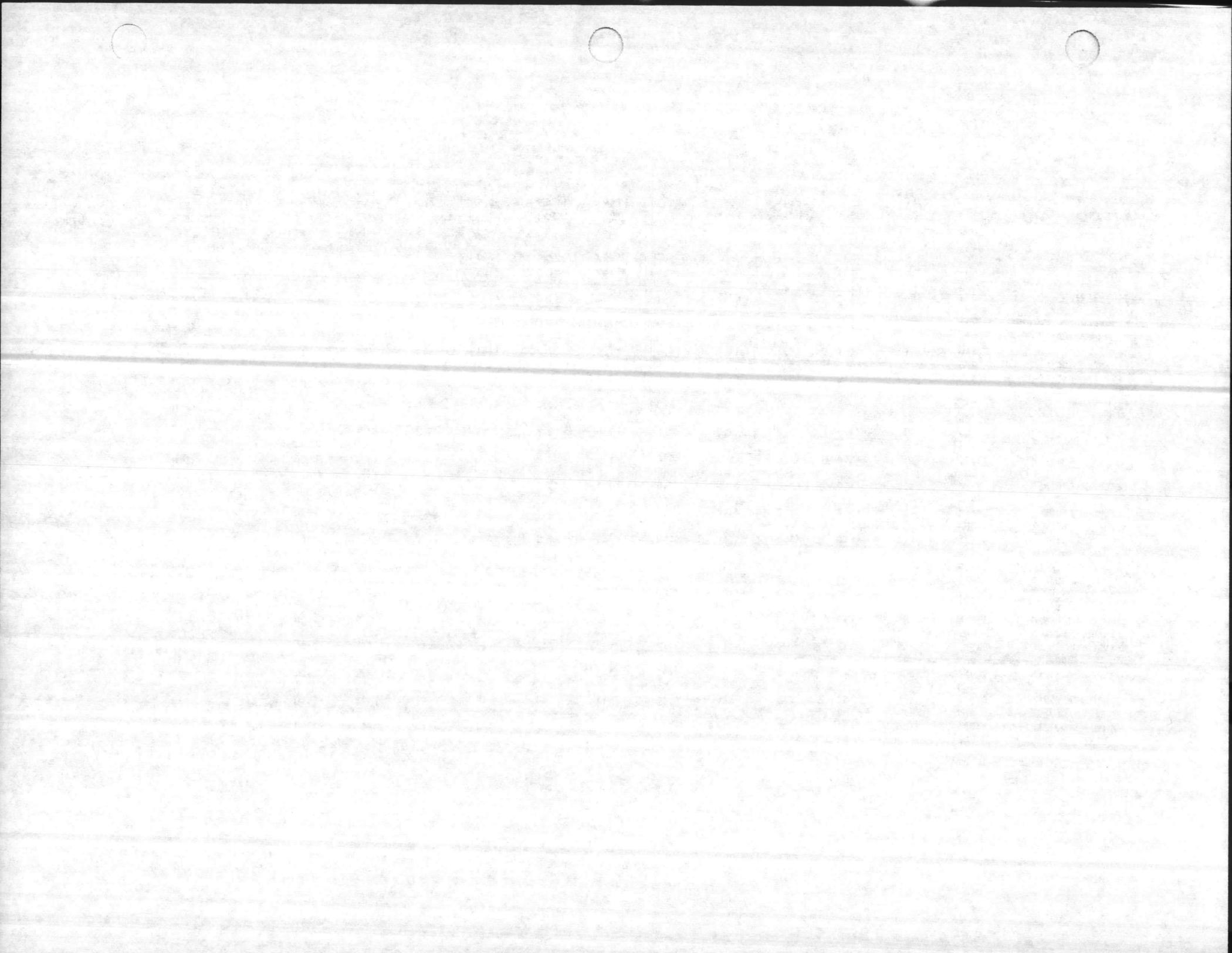
**ESE SHALLOW AQUIFER ANALYTICAL DATA SUMMARY**



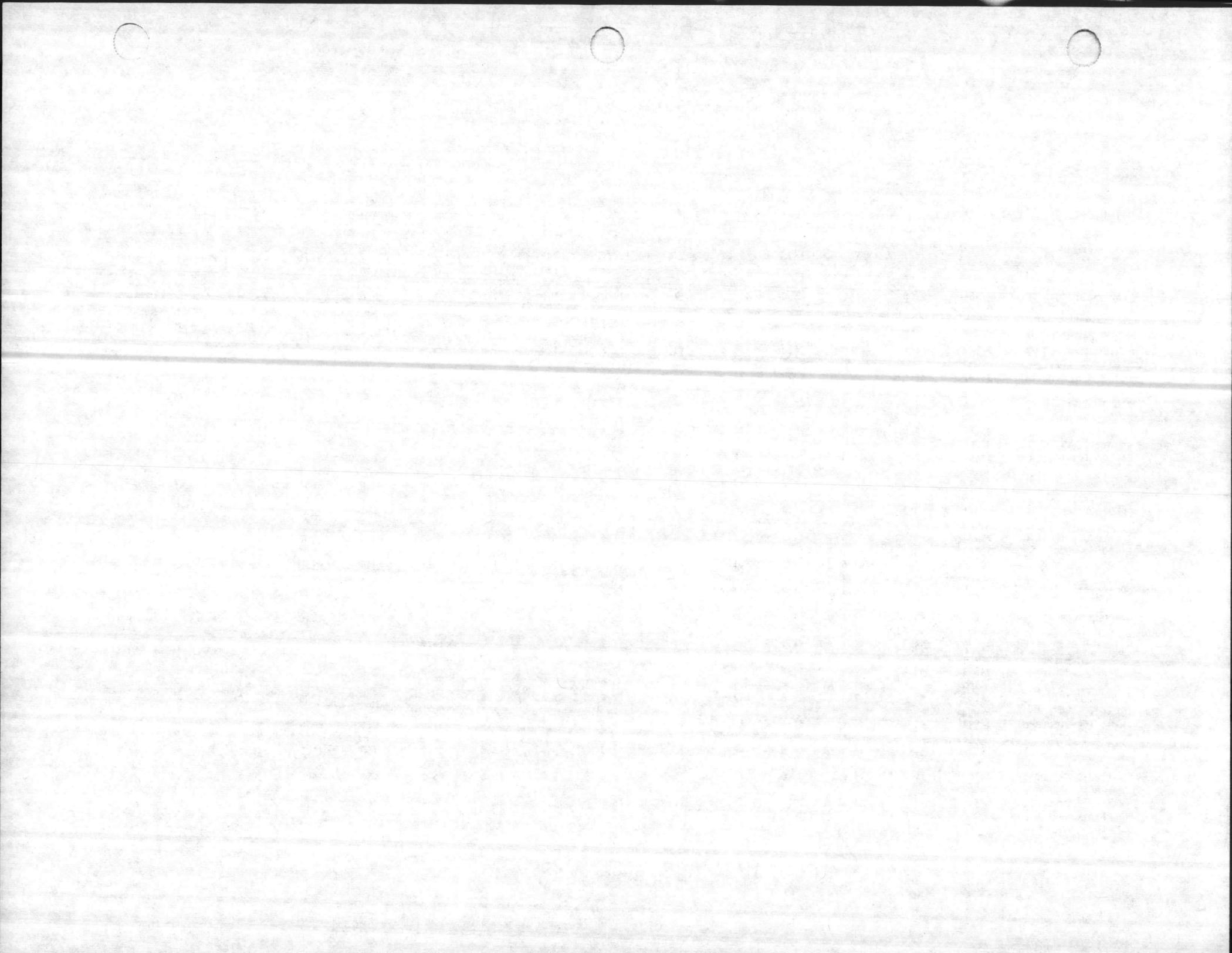




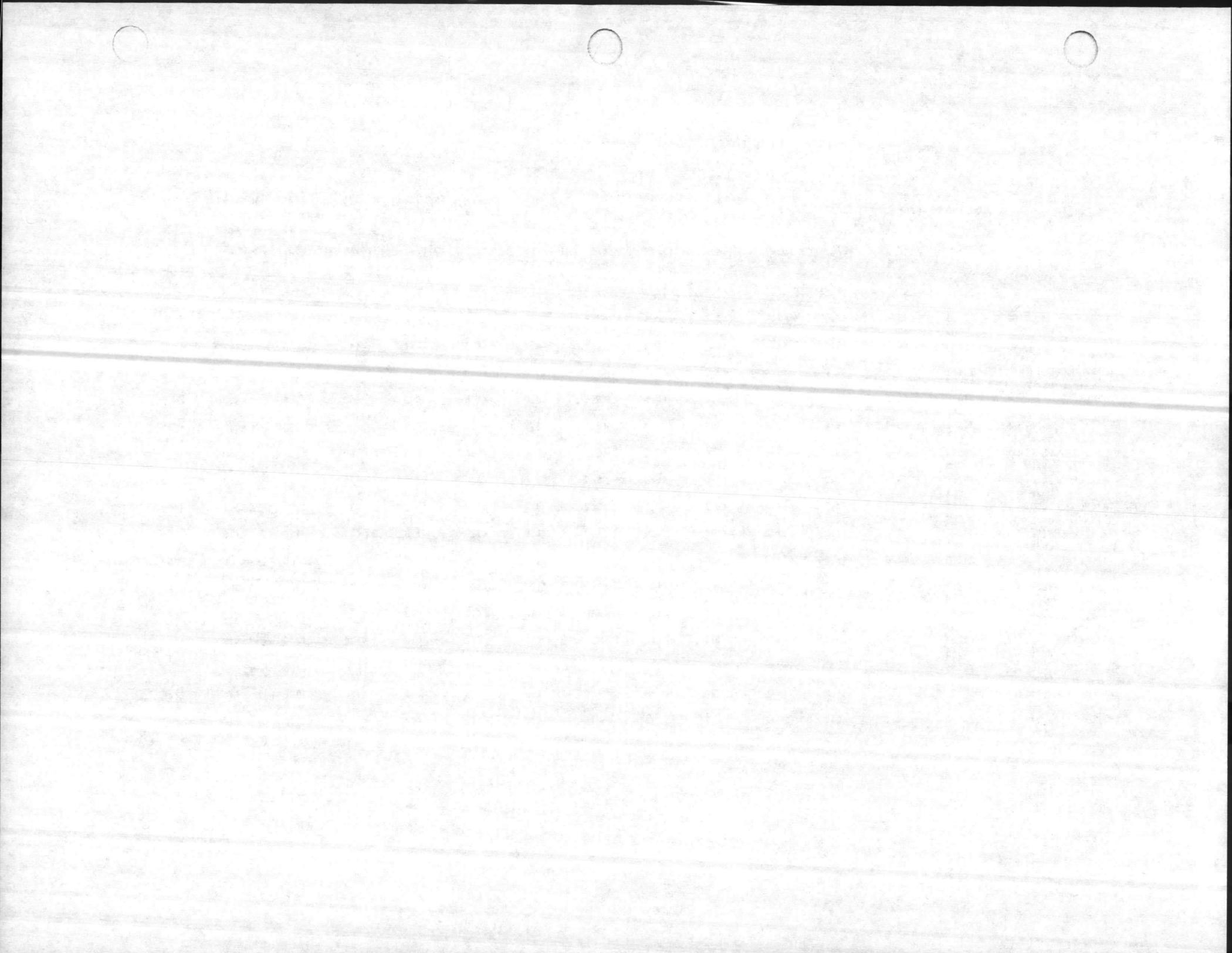








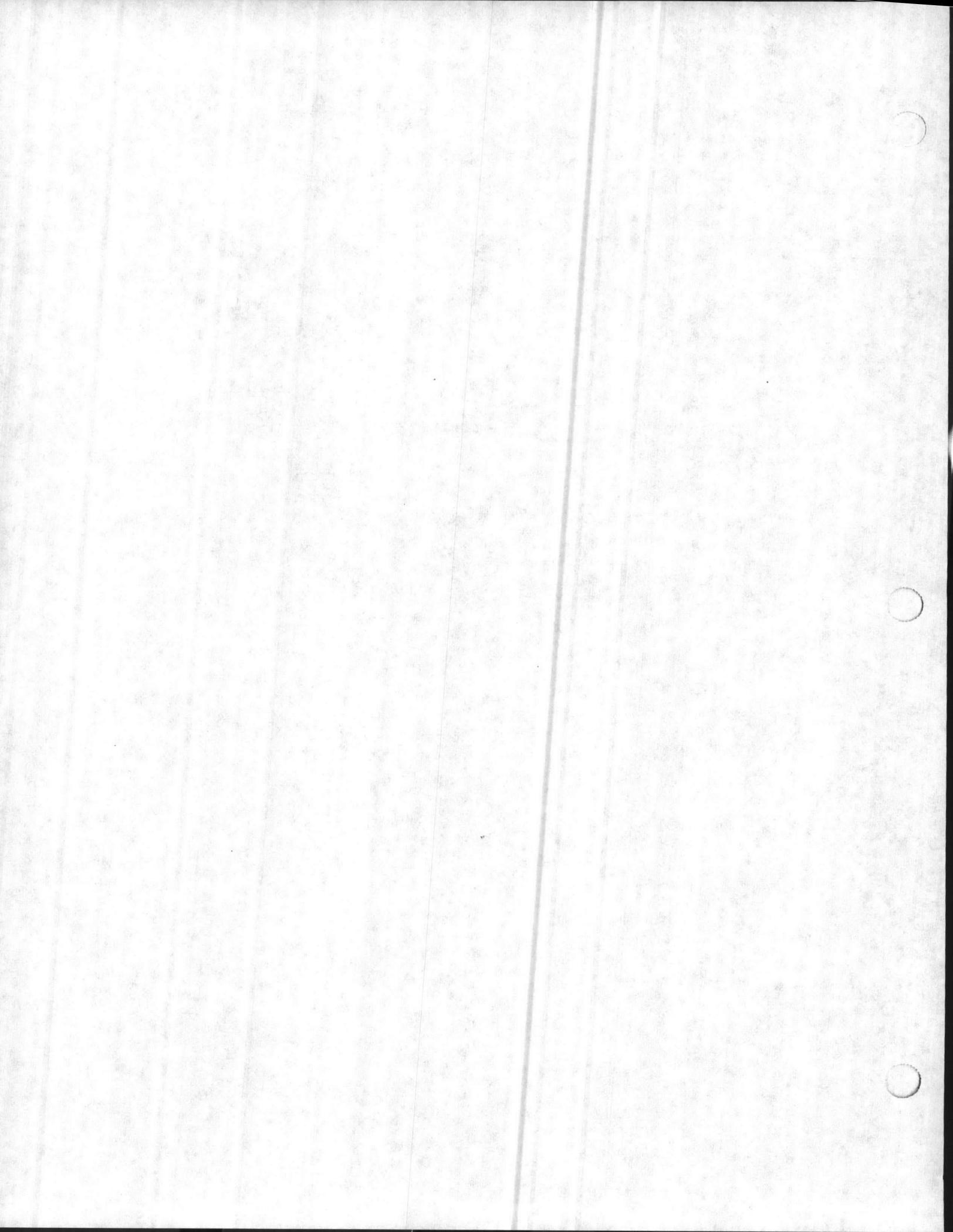




SHALLOW MONITOR WELLS

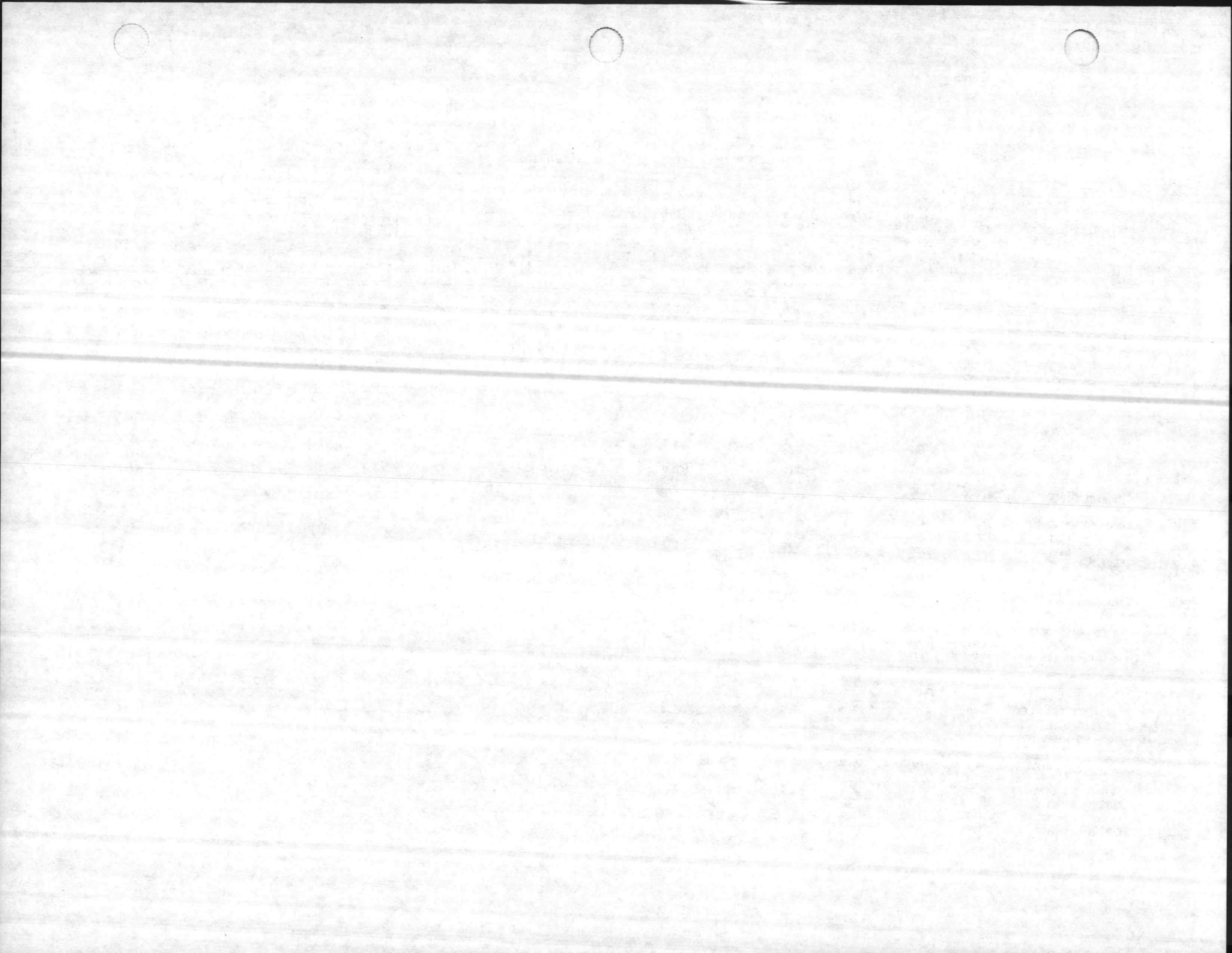
ANALYTICAL RESULTS

SET & DATA



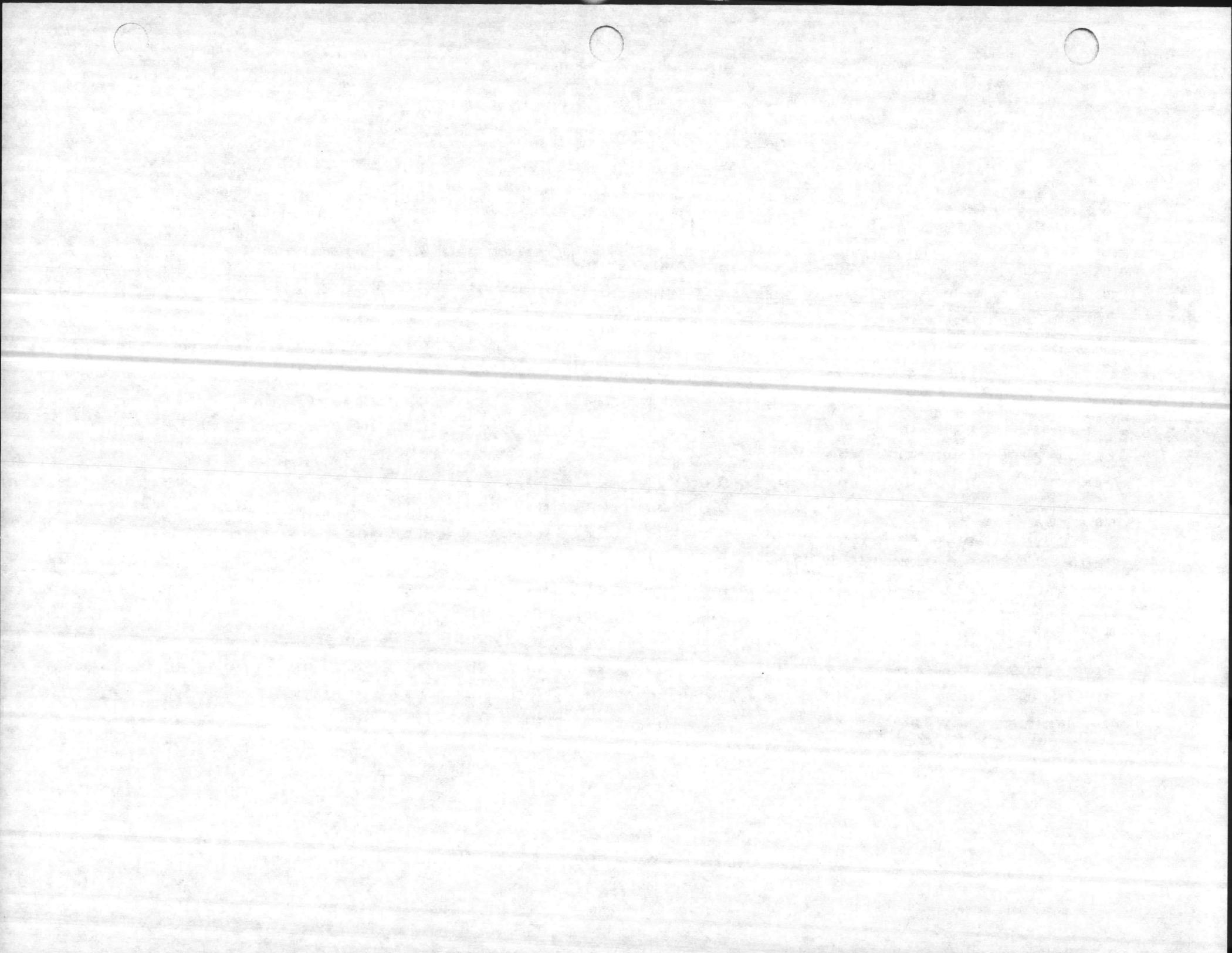
PROJECT NUMBER R6447 0404 PROJECT NAME NAVY - LEJEUNE HP2  
 FIELD GROUP LJHP-2 LAB COORDINATOR J.D. SHANIS

PARAMETERS	STORET #	SAMPLE ID/#														
		22GW1 LJHP-2 1	22GW2 LJHP-2 2	HPGW1 LJHP-2 3	HPGW2 LJHP-2 4	HPGW3 LJHP-2 5	HPGW4 LJHP-2 6	HPGW5 LJHP-2 7	HPGW6 LJHP-2 8	HPGW7 LJHP-2 9	HPGW8 LJHP-2 10	HPGW9 LJHP-2 11	HPGW10 LJHP-2 12	HPGW11 LJHP-2 13	HPGW12 LJHP-2 14	HPGW13 LJHP-2 15
UNITS	METHOD															
DATE		03/08/87	03/08/87	03/08/87	03/08/87	03/08/87	03/08/87	03/08/87	03/08/87	03/08/87	03/09/87	03/09/87	03/09/87	03/09/87	03/09/87	03/09/87
TIME		11:03	11:30	12:45	16:18	14:20	15:12	16:55	17:10	10:05	11:10	10:30	11:20	12:19	12:33	13:45
LEAD, TOTAL	1051	29.0	<27.0	<27.0	<27.0	<27.0	<27.0	<27.0	<27.0	29.0	<27.0	92.0	<27.0	<27.0	<27.0	<27.0
UC/L	ICAP															
OIL & GR, IR	560	11	<0.1	<0.1	<0.1	0.2	0.3	<0.1	<0.1	0.2	<0.1	11	<0.1	0.6	<0.1	<0.1
MC/L	1															
BENZENE	34030	10000	<1.0	3.9	<1.0	<1.0	3.2	<1.0	<1.0	<1.0	<1.0	<250	<1.0	<1.0	<1.0	<1.0
UC/L	GMS															
BROMODICHLOROMETHANE	32101	<2200	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<550	<2.2	<2.2	<2.2	<2.2
UC/L	GMS															
BROMOFORM	32104	<4700	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<1200	<4.7	<4.7	<4.7	<4.7
UC/L	GMS															
BROMOMETHANE	34413	<5800	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<1500	<5.8	<5.8	<5.8	<5.8
UC/L	GMS															
CARBON TETRACHLORIDE	32102	<2800	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<700	<2.8	<2.8	<2.8	<2.8
UC/L	GMS															
CHLOROBENZENE	34301	<6000	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<1500	<6.0	<6.0	<6.0	<6.0
UC/L	GMS															
CHLOROETHANE	34311	<8200	<8.2	<8.2	<8.2	<8.2	<8.2	<8.2	<8.2	<8.2	<8.2	<2100	<8.2	<8.2	<8.2	<8.2
UC/L	GMS															
2-CHLOROETHYL VINYL	34576	<15000	<15	<15	<15	<15	<15	<15	<15	<15	<15	<3800	<15	<15	<15	<15
ETHER	GMS															
CHLOROFORM	32106	<1600	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<400	<1.6	2.2	<1.6	<1.6
UC/L	GMS															
CHLOROMETHANE	34418	<4300	<4.3	<4.3	<4.3	<4.3	<4.3	<4.3	<4.3	<4.3	<4.3	<1100	<4.3	<4.3	<4.3	<4.3
UC/L	GMS															
DIBROMOCHLOROMETHANE	32105	<3100	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<780	<3.1	<3.1	<3.1	<3.1
UC/L	GMS															
1,1-DICHLOROETHANE	34496	<4700	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<1200	<4.7	<4.7	<4.7	<4.7
UC/L	GMS															
1,2-DICHLOROETHANE	34531	<2800	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<700	<2.8	<2.8	<2.8	<2.8
UC/L	GMS															
1,1-DICHLOROETHYLENE	34501	<2800	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<700	<2.8	<2.8	<2.8	<2.8
UC/L	GMS															
TRANS-1,2-DICHLORO	34546	<1600	<1.6	<1.6	<1.6	<1.6	2.2	<1.6	<1.6	<1.6	<1.6	<400	<1.6	7.2	<1.6	<1.6
ETHENE	GMS															
1,2-DICHLOROPROPANE	34541	<6000	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<1500	<6.0	<6.0	<6.0	<6.0
UC/L	GMS															
CIS-1,3-DICHLORO	34704	<5000	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1300	<5.0	<5.0	<5.0	<5.0
PROPENE	GMS															
TRANS-1,3-DICHLORO	34699	<6400	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<1600	<6.4	<6.4	<6.4	<6.4
PROPENE	GMS															



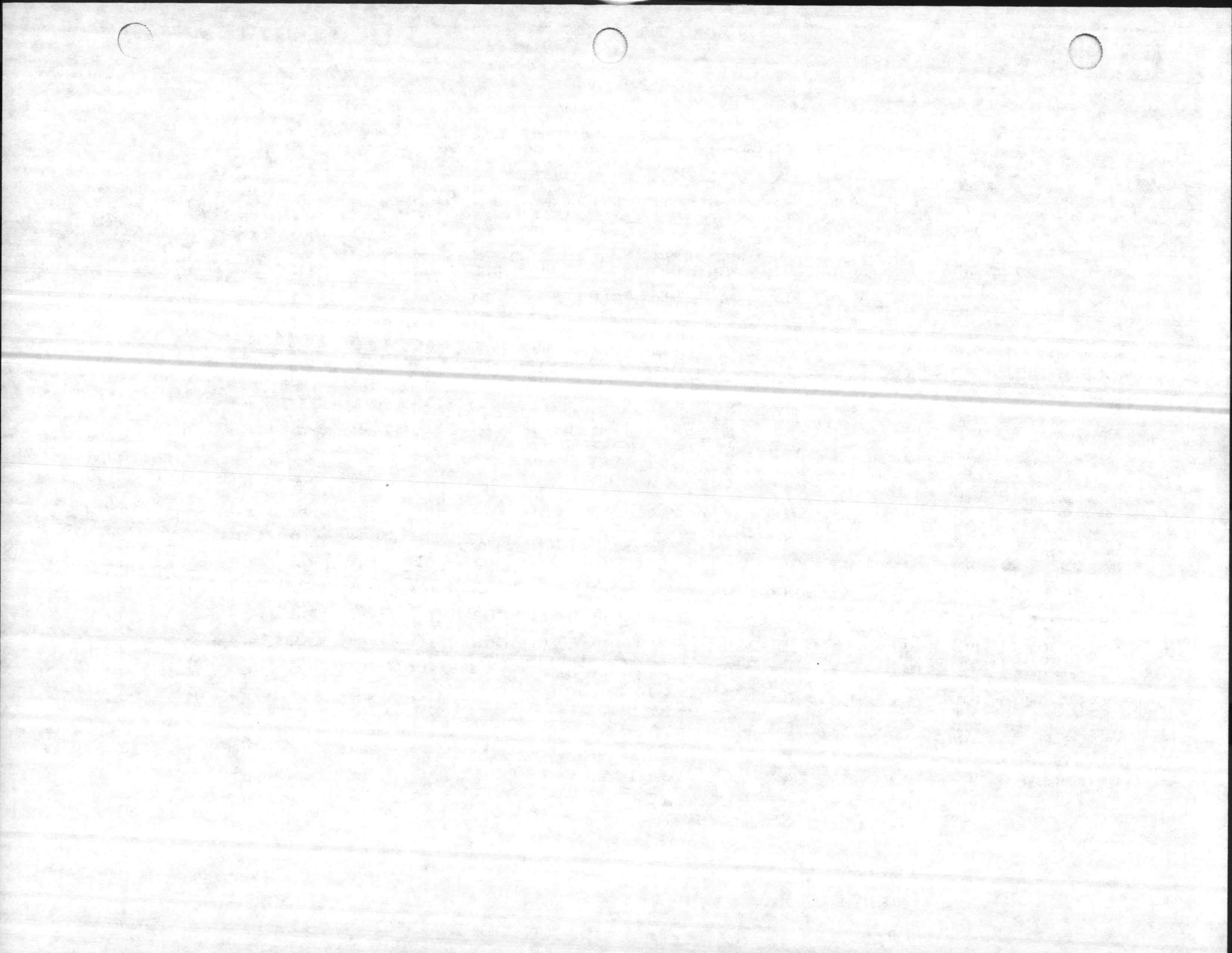
PROJECT NUMBER 86447 0404 PROJECT NAME NAVY - LEJEUNE HP2  
 FIELD GROUP LJHP-2 LAB COORDINATOR J.D. SHAMIS

PARAMETERS	STORET #	SAMPLE ID/#														
		22GW1 LJHP-2 1	22GW2 LJHP-2 2	HPGW1 LJHP-2 3	HPGW2 LJHP-2 4	HPGW3 LJHP-2 5	HPGW4 LJHP-2 6	HPGW5 LJHP-2 7	HPGW6 LJHP-2 8	HPGW7 LJHP-2 9	HPGW8 LJHP-2 10	HPGW9 LJHP-2 11	HPGW10 LJHP-2 12	HPGW11 LJHP-2 13	HPGW12 LJHP-2 14	HPGW13 LJHP-2 15
UNITS	METHOD															
DATE		03/08/87	03/08/87	03/08/87	03/08/87	03/08/87	03/08/87	03/08/87	03/08/87	03/08/87	03/09/87	03/09/87	03/09/87	03/09/87	03/09/87	03/09/87
TIME		11:03	11:30	12:45	16:18	14:20	15:12	16:55	17:10	10:05	11:10	10:30	11:20	12:19	12:33	13:45
ETHYLBENZENE	34371	<7200	<7.2	<7.2	<7.2	9.0	<7.2	<7.2	<7.2	<7.2	<7.2	<1800	<7.2	<7.2	<7.2	<7.2
UG/L	GMS															
METHYLENE CHLORIDE	34423	<2800	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<700	<2.8	<2.8	<2.8	<2.8
UG/L	GMS															
1,1,2,2-TETRACHLOROETHANE	34516	<4100	<4.1	<4.1	<4.1	<4.1	<4.1	<4.1	<4.1	<4.1	<4.1	<1000	<4.1	<4.1	<4.1	<4.1
UG/L	GMS															
TETRACHLOROETHENE	34475	<2000	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<750	<3.0	<3.0	3.6	<3.0
UG/L	GMS															
TOLUENE	34010	18000	<6.0	12	<6.0	<6.0	8.2	<6.0	<6.0	<6.0	<6.0	<1500	<6.0	<6.0	<6.0	<6.0
UG/L	GMS															
1,1,1-TRICHLOROETHANE	34506	<3800	<3.8	<3.8	<3.8	13	<3.8	<3.8	<3.8	<3.8	<3.8	<950	<3.8	<3.8	<3.8	<3.8
UG/L	GMS															
1,1,2-TRICHLOROETHANE	34511	<5000	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1300	<5.0	<5.0	<5.0	<5.0
UG/L	GMS															
TRICHLOROETHENE	39180	<1000	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	6100	8.6	34	<3.0	<3.0
UG/L	GMS															
TRICHLOROFLUOROMETHANE	34488	<3200	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	96	<800	<3.2	<3.2	<3.2	<3.2
UG/L	GMS															
VINYL CHLORIDE	39175	<1000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<250	<1.0	<1.0	<1.0	<1.0
UG/L	GMS															
ACROLEIN	34210	<100000	<100	<100	<100	<100	<100	<100	<100	<100	<100	<25000	<100	<100	<100	<100
UG/L	GMS															
ACRYLONITRILE	34215	<100000	<100	<100	<100	<100	<100	<100	<100	<100	<100	<25000	<100	<100	<100	<100
UG/L	GMS															
DICHLORODIFLUOROMETHANE	34668	<10000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<2500	<10	<10	<10	<10
UG/L	GMS															
M-XYLENE	98553	<12000	<12	<12	<12	<12	<12	<12	<12	<12	<12	<3000	<12	<12	<12	<12
UG/L	GMS															
O-AND/OR-P XYLENE	98554	<12000	<12	<12	<12	<12	<12	<12	<12	<12	<12	<3000	<12	<12	<12	<12
UG/L	GMS															
METHYL ETHYL KETONE	81595	<48000	<48	<48	<48	<48	<48	<48	<48	<48	<48	<12000	<48	<48	<48	<48
UG/L	GMS															
METHYL ISOBUTYL KETONE	81596	<12000	<12	<12	<12	<12	<12	<12	<12	<12	<12	<3000	<12	<12	<12	<12
UG/L	GMS															



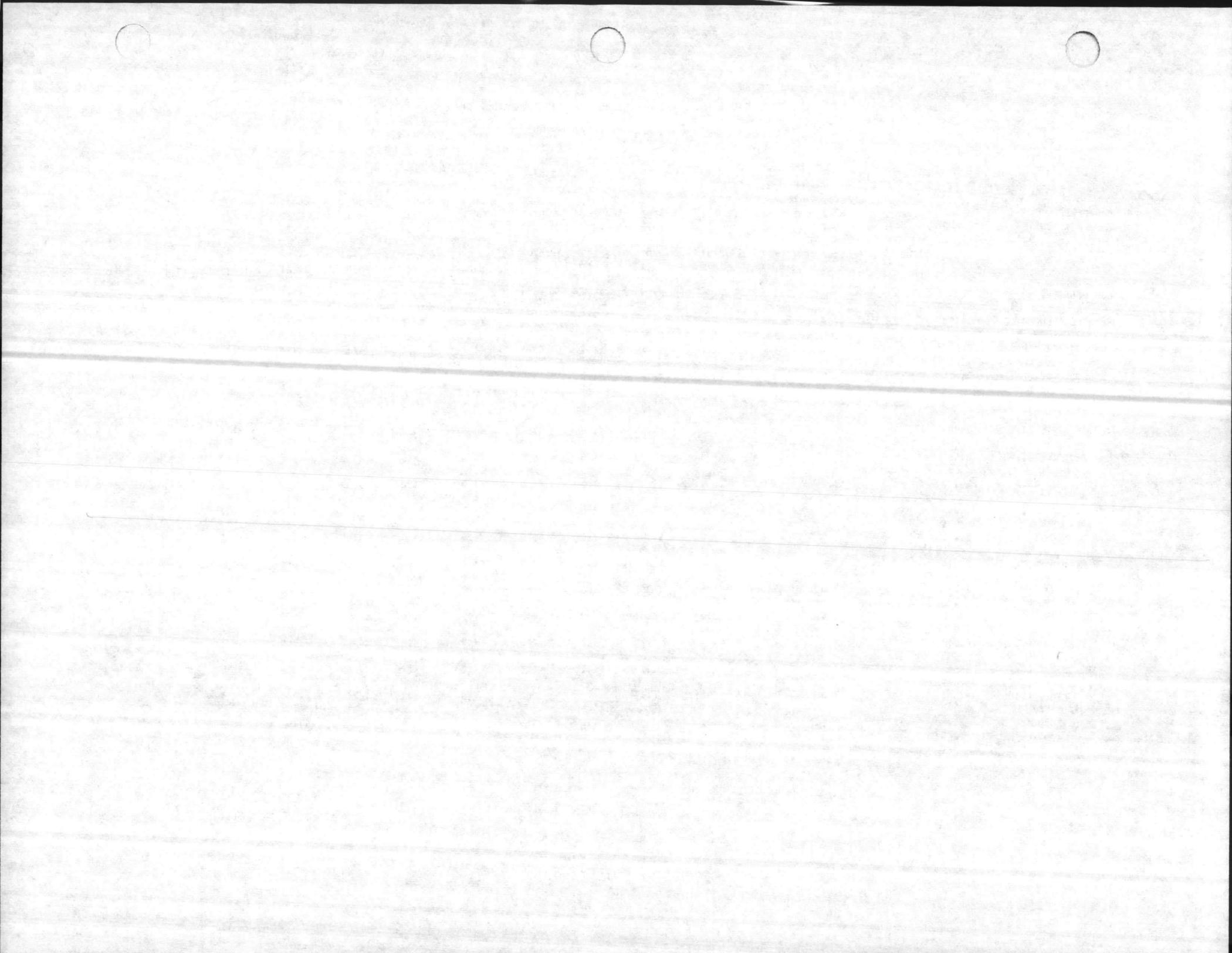
PROJECT NUMBER 86447 0404 PROJECT NAME NAVY - LEJEUNE HP2  
 FIELD GROUP LJHP-2 LAB COORDINATOR J.D. SHAMIS

PARAMETERS	STORET #	SAMPLE ID/#														
		HPGW14 LJHP-2 16	HPGW15 LJHP-2 17	HPGW16 LJHP-2 18	HPGW17 LJHP-2 19	HPGW18 LJHP-2 20	HPGW19 LJHP-2 21	HPGW20 LJHP-2 22	HPGW21 LJHP-2 23	HPGW22 LJHP-2 24	HPGW23 LJHP-2 25	HPGW24 LJHP-2 26	HPGW25 LJHP-2 27	HPGW26 LJHP-2 28	HPGW29 LJHP-2 29	
UNITS	METHOD															
DATE		03/09/87	03/09/87	03/10/87	03/10/87	03/10/87	03/10/87	03/10/87	03/10/87	03/10/87	03/11/87	03/11/87	03/11/87	03/11/87	03/12/87	03/12/87
TIME		13:55	15:10	12:07	12:26	11:40	13:35	13:50	16:26	10:42	10:25	12:01	12:15	13:10	14:00	
LEAD TOTAL	1051	<27.0	<27.0	41.0	<27.0	<27.0	<27.0	33.0	<27.0	<27.0	<27.0	<27.0	<27.0	<27.0	52.0	
UC/L	ICAP															
OIL & GR. IR	560	<0.1	<0.1	3	3	2	2	3	2	2	3	2	0.3	2	<0.1	
MG/L	1															
BENZENE	34030	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<100	<100	<1.0	<1.0	<1.0	
UC/L	GMS															
BROMODICHLOROMETHANE	32101	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<220	<220	<2.2	<2.2	<2.2	
UC/L	GMS															
BROMOFORM	32104	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<470	<470	<4.7	<4.7	<4.7	
UC/L	GMS															
BROMOMETHANE	34413	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<580	<580	<5.8	<5.8	<5.8	
UC/L	GMS															
CARBON TETRACHLORIDE	32102	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<280	<280	<2.8	<2.8	<2.8	
UC/L	GMS															
CHLOROBENZENE	34301	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<600	<600	<6.0	<6.0	<6.0	
UC/L	GMS															
CHLOROETHANE	34311	<8.2	<8.2	<8.2	<8.2	<8.2	<8.2	<8.2	<8.2	<8.2	<820	<820	<8.2	<8.2	<8.2	
UC/L	GMS															
2-CHLOROETHYL VINYL ETHER	34576	<15	<15	<15	<15	<15	<15	<26	<26	<26	<1500	<1500	<26	<26	<15	
UC/L	GMS															
CHLOROFORM	32106	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<160	<160	<1.6	<1.6	<1.6	
UC/L	GMS															
CHLOROMETHANE	34418	<4.3	<4.3	<4.3	<4.3	<4.3	<4.3	<4.3	<4.3	<4.3	<430	<430	<4.3	<4.3	<4.3	
UC/L	GMS															
DIBROMOCHLOROMETHANE	32105	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<310	<310	<3.1	<3.1	<3.1	
UC/L	GMS															
1,1-DICHLOROETHANE	34496	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<470	<470	<4.7	<4.7	<4.7	
UC/L	GMS															
1,2-DICHLOROETHANE	34531	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<280	<280	<2.8	<2.8	<2.8	
UC/L	GMS															
1,1-DICHLOROETHYLENE	34501	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<280	<280	<2.8	<2.8	<2.8	
UC/L	GMS															
TRANS-1,2-DICHLORO ETHENE	34546	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	6100	4300	<1.6	<1.6	<1.6	
UC/L	GMS															
1,2-DICHLOROPROPANE	34541	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<600	<600	<6.0	<6.0	<6.0	
UC/L	GMS															
CIS-1,3-DICHLORO PROPENE	34704	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<500	<500	<5.0	<5.0	<5.0	
UC/L	GMS															
TRANS-1,3-DICHLORO PROPENE	34699	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<640	<640	<6.4	<6.4	<6.4	
UC/L	GMS															



PROJECT NUMBER 86447 0404 PROJECT NAME NAVY - LEJEUNE HP2  
 FIELD GROUP LJHP-2 LAB COORDINATOR J.D. SHAMIS

PARAMETERS	STORET #	SAMPLE ID/#														
		HPGW14 LJHP-2 16	HPGW15 LJHP-2 17	HPGW16 LJHP-2 18	HPGW17 LJHP-2 19	HPGW18 LJHP-2 20	HPGW19 LJHP-2 21	HPGW20 LJHP-2 22	HPGW21 LJHP-2 23	HPGW22 LJHP-2 24	HPGW23 LJHP-2 25	HPGW24 LJHP-2 26	HPGW25 LJHP-2 27	HPGW26 LJHP-2 28	HPGW29 LJHP-2 29	
UNITS	METHOD															
DATE		03/09/87	03/09/87	03/10/87	03/10/87	03/10/87	03/10/87	03/10/87	03/10/87	03/10/87	03/11/87	03/11/87	03/11/87	03/11/87	03/12/87	03/12/87
TIME		13:55	15:10	12:07	12:26	11:40	13:35	13:50	16:26	10:42	10:25	12:01	12:15	13:10	14:00	
ETHYLBENZENE	34371	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<720	<720	<7.2	<7.2	<7.2	
UG/L	GMS															
METHYLENE CHLORIDE	34423	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	3.4	<2.8	<2.8	300	<280	2.9	6.5	<2.8	
UG/L	GMS															
1,1,2,2-TETRACHLOROETHANE	34516	<4.1	<4.1	<4.1	<4.1	<4.1	<4.1	<4.1	<4.1	<4.1	<410	<410	<4.1	<4.1	<4.1	
UG/L	GMS															
TETRACHLOROETHENE	34475	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<200	<200	<3.0	<3.0	<3.0	
UG/L	GMS															
TOLUENE	34010	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<600	<600	<6.0	<6.0	<6.0	
UG/L	GMS															
1,1,1-TRICHLOROETHANE	34506	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8	<380	<380	<3.8	<3.8	<3.8	
UG/L	GMS															
1,1,2-TRICHLOROETHANE	34511	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<500	<500	<5.0	<5.0	<5.0	
UG/L	GMS															
TRICHLOROETHENE	39180	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<1.0	<1.0	<1.0	13000	<100	<1.0	<1.0	<3.0	
UG/L	GMS															
TRICHLOROFLUOROMETHANE	34488	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	<320	<320	<3.2	<3.2	<3.2	
UG/L	GMS															
VINYL CHLORIDE	39175	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<100	<100	<1.0	<1.0	<1.0	
UG/L	GMS															
ACROLEIN	34210	<100	<100	<100	<100	<100	<100	<100	<100	<100	<10000	<10000	<100	<100	<100	
UG/L	GMS															
ACRYLONITRILE	34215	<100	<100	<100	<100	<100	<100	<100	<100	<100	<10000	<10000	<100	<100	<100	
UG/L	GMS															
DICHLORODIFLUOROMETHANE	34668	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1000	<1000	<10	<10	<10	
UG/L	GMS															
M-XYLENE	98553	<12	<12	<12	<12	<12	<12	<12	<12	<12	<1200	<1200	<12	<12	<12	
UG/L	GMS															
O-AND/OR-P XYLENE	98554	<12	<12	<12	<12	<12	<12	<12	<12	<12	<1200	<1200	<12	<12	<12	
UG/L	GMS															
METHYL ETHYL KETONE	81595	<48	<48	<48	<48	<48	<48	<48	<48	<48	<4800	<4800	<48	<48	<48	
UG/L	GMS															
METHYL ISOBUTYL KETONE	81596	<12	<12	<12	<12	<12	<12	<12	<12	<12	<1200	<1200	<12	<12	<12	
UG/L	GMS															



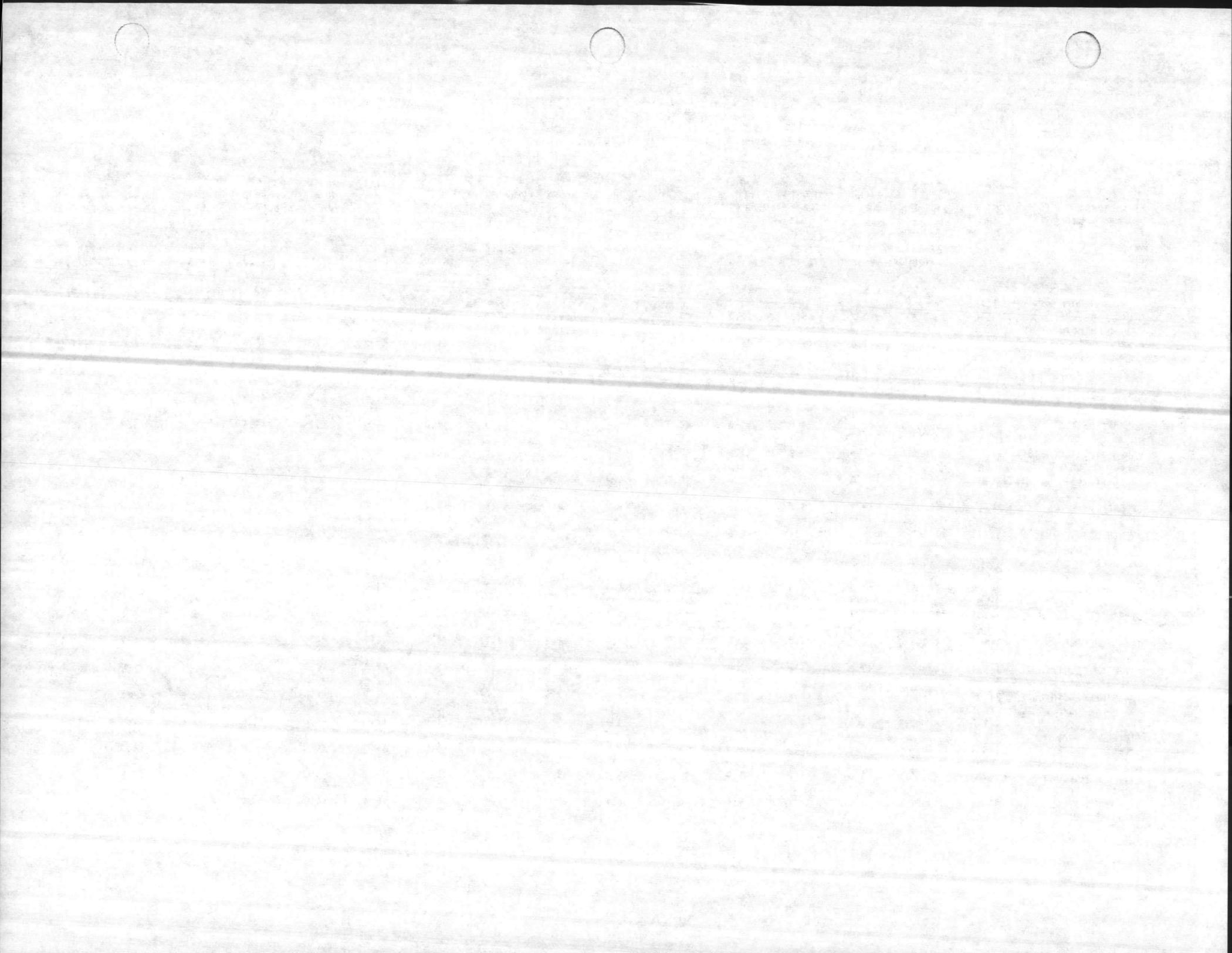
SHALLOW MONITOR WELLS

ANALYTICAL ~~DATA~~ RESULTS

SET 3 DATA



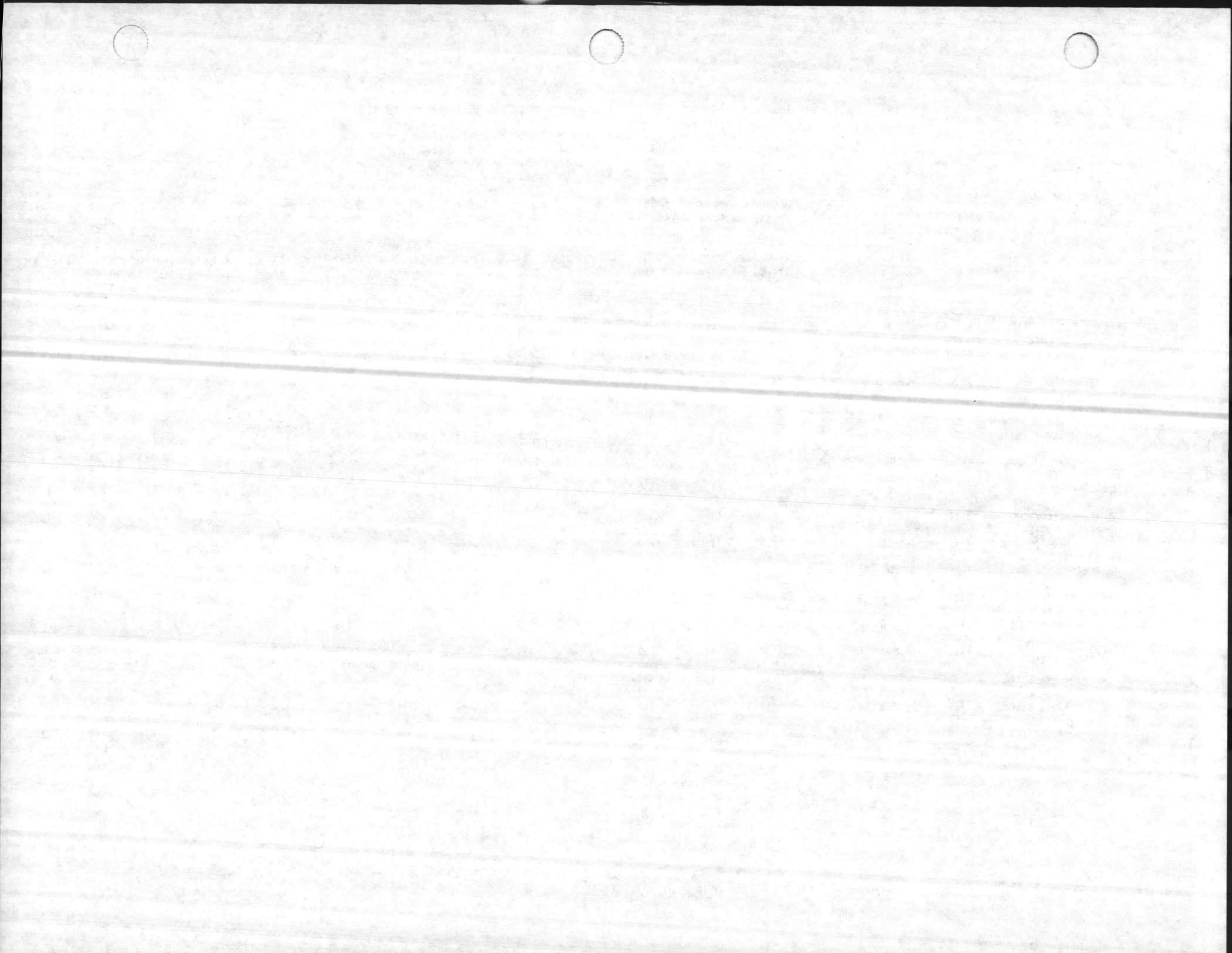




PROJECT NUMBER 86447 0405  
FIELD GROUP LJHP-3

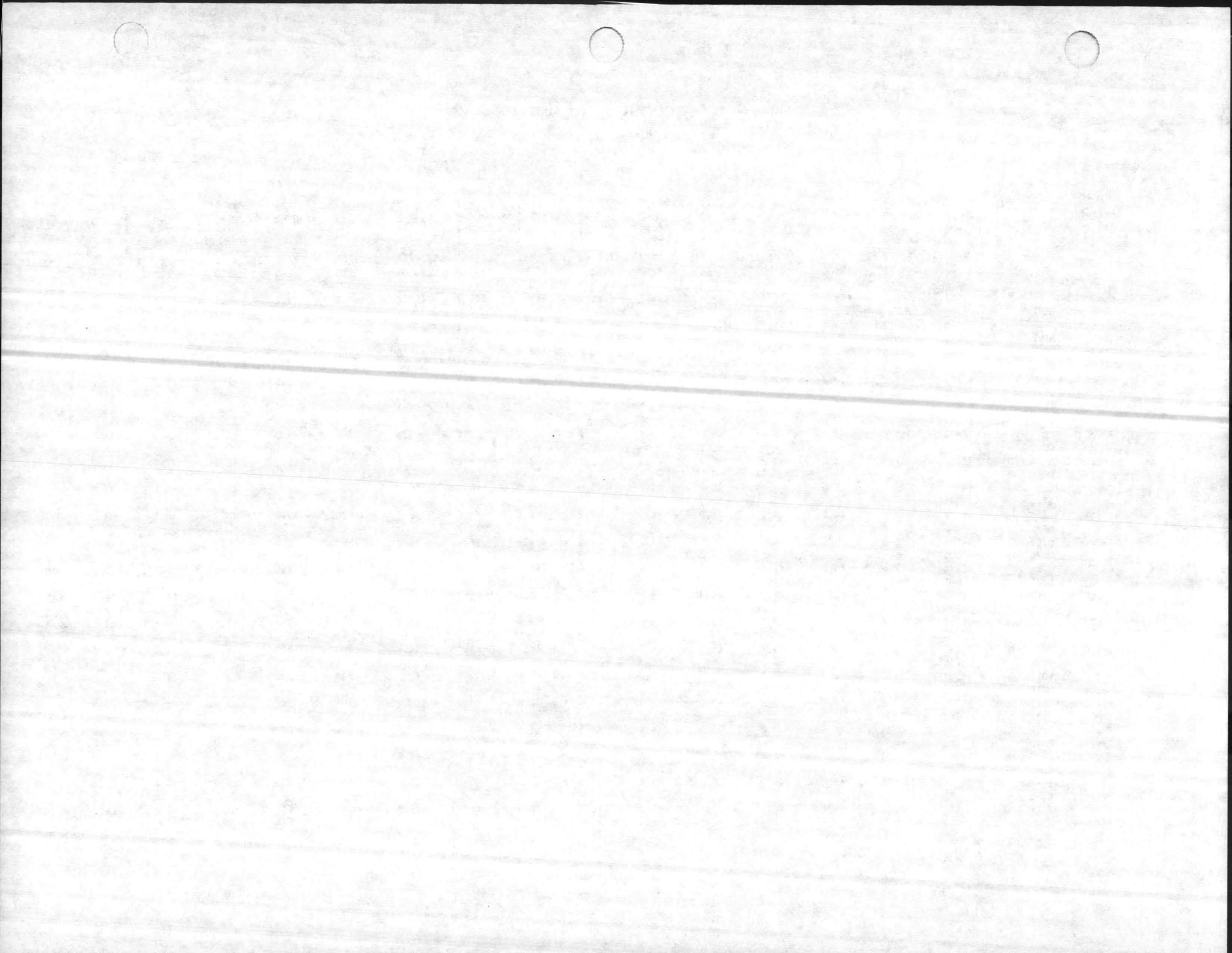
PROJECT NAME NAVY - LEJEUNE HP3  
PROJECT MANAGER J.D. SHAMIS  
LAB COORDINATOR JEFF SHAMIS

PARAMETERS	STORET #	SAMPLE ID/#														
		22GW1 LJHP-3 1	22GW2 LJHP-3 2	HPGW1 LJHP-3 3	HPGW2 LJHP-3 4	HPGW3 LJHP-3 5	HPGW4 LJHP-3 6	HPGW5 LJHP-3 7	HPGW6 LJHP-3 8	HPGW7 LJHP-3 9	HPGW8 LJHP-3 10	HPGW9 LJHP-3 11	HPGW10 LJHP-3 12	HPGW11 LJHP-3 13	HPGW12 LJHP-3 14	HPGW13 LJHP-3 15
UNITS	METHOD															
DATE		05/27/87	05/27/87	05/27/87	05/27/87	05/27/87	05/27/87	05/27/87	05/27/87	05/27/87	05/27/87	05/28/87	05/28/87	05/28/87	05/28/87	05/28/87
TIME		11:20	10:58	12:45	14:30	11:59	13:30	14:55	15:47	16:05	16:45	08:07	09:22	09:59	10:25	11:29
ETHYLBENZENE	34371	<7200	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<720	<7.2	<7.2	<7.2	<7.2
UC/L	GMS															
METHYLENE CHLORIDE	34423	<50000	<50	<50	<50	<50	<50	<50	<50	<50	<50	<280	<50	<50	<50	<50
UC/L	GMS															
1,1,2,2-TETRACHLOROETHANE	34516	<4100	<4.1	<4.1	<4.1	<4.1	<4.1	<4.1	<4.1	<4.1	<4.1	<410	<4.1	<4.1	<4.1	<4.1
UC/L	GMS															
TETRACHLOROETHENE	34475	<2000	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<200	<3.0	<3.0	<3.0	<3.0
UC/L	GMS															
TOLUENE	34010	24000	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<600	<6.0	<6.0	<6.0	<6.0
UC/L	GMS															
1,1,1-TRICHL*ETHANE	34506	<3800	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8	<380	<3.8	<3.8	<3.8	<3.8
UC/L	GMS															
1,1,2-TRICHL*ETHANE	34511	<5000	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<500	<5.0	<5.0	<5.0	<5.0
UC/L	GMS															
TRICHLOROETHENE	39180	<1000	<1.0	<1.0	<1.0	<1.0	7.7	<1.0	<1.0	<1.0	<1.0	<100	<1.0	24	<1.0	<1.0
UC/L	GMS															
TRICHLOROFLUORO-METHANE	34488	<3200	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	<320	<3.2	<3.2	<3.2	<3.2
UC/L	GMS															
VINYL CHLORIDE	39175	<1000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<100	<1.0	<1.0	<1.0	<1.0
UC/L	GMS															
ACROLEIN	34210	<100000	<100	<100	<100	<100	<100	<100	<100	<100	<100	<10000	<100	<100	<100	<100
UC/L	GMS															
ACRYLONITRILE	34215	<100000	<100	<100	<100	<100	<100	<100	<100	<100	<100	<10000	<100	<100	<100	<100
UC/L	GMS															
DICHLORODIFLUORO-METHANE	34668	<10000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1000	<10	<10	<10	<10
UC/L	GMS															
M-XYLENE	98553	<12000	<12	<12	<12	<12	<12	<12	<12	<12	<12	2000	<12	<12	<12	<12
UC/L	GMS															
O-AND/OR-P XYLENE	98554	<12000	<12	<12	<12	<12	<12	<12	<12	<12	<12	2000	<12	<12	<12	<12
UC/L	GMS															
METHYL ETHYL KETONE	81595	<48000	<48	<48	<48	<48	<48	<48	<48	<48	<48	<4800	<48	<48	<48	<48
UC/L	GMS															
METHYL ISOBUT*KETONE	81596	<12000	<12	<12	<12	<12	<12	<12	<12	<12	<12	<1200	<12	<12	<12	<12
UC/L	GMS															

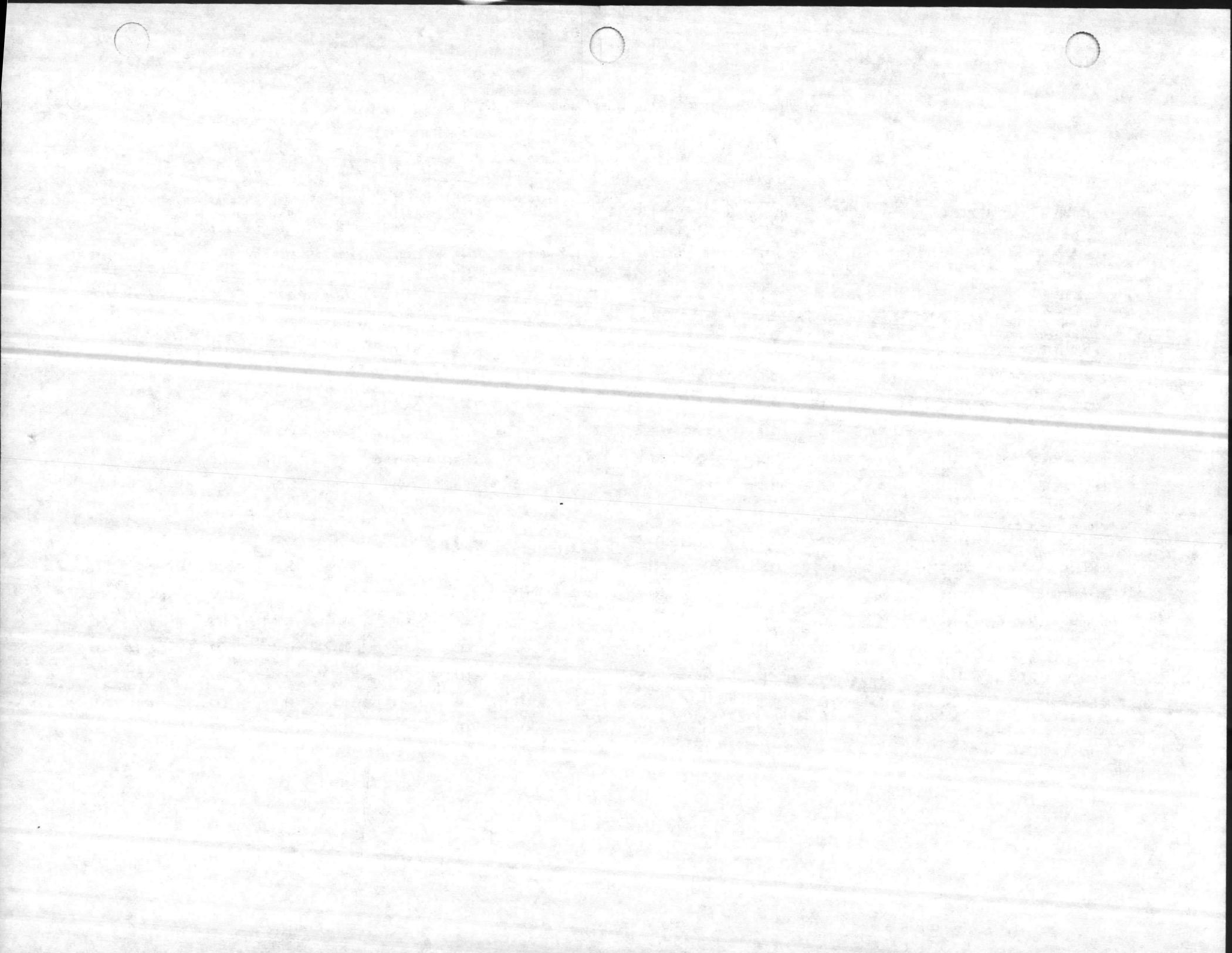


PROJECT NUMBER 86447 0405 PROJECT NAME NAVY - LEJEUNE HP3  
 FIELD GROUP LJHP-3 PROJECT MANAGER J.D. SHAMIS  
 LAB COORDINATOR JEFF SHAMIS

PARAMETERS	STORET #	SAMPLE ID/#													
		HPGW14 LJHP-3 16	HPGW15 LJHP-3 17	HPGW16 LJHP-3 18	HPGW17 LJHP-3 19	HPGW18 LJHP-3 20	HPGW19 LJHP-3 21	HPGW20 LJHP-3 22	HPGW21 LJHP-3 23	HPGW22 LJHP-3 24	HPGW23 LJHP-3 25	HPGW24 LJHP-3 26	HPGW25 LJHP-3 27	HPGW26 LJHP-3 28	HPGW29 LJHP-3 29
UNITS	METHOD														
DATE		05/28/87	05/28/87	05/28/87	05/28/87	05/28/87	05/28/87	05/28/87	05/28/87	05/29/87	05/29/87	05/29/87	05/29/87	05/29/87	05/29/87
TIME		11:45	13:00	13:20	14:14	13:57	15:10	15:50	18:12	10:03	09:35	11:05	11:23	12:45	13:05
LEAD, TOTAL	1051	<49.2	<49.2	<49.2	<49.2	<49.2	<49.2	<49.2	<49.2	<49.2	<49.2	<49.2	<49.2	<49.2	<49.2
UG/L	ICAP														
OIL & GR, IR	560	<0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
MG/L	1														
BENZENE	34030	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<100	<100	<1.0	<1.0	<1.0
UG/L	GMS														
BROMODICHLOROMETHANE	32101	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<220	<220	<2.2	<2.2	<2.2
UG/L	GMS														
BROMOFORM	32104	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<470	<470	<4.7	<4.7	<4.7
UG/L	GMS														
BROMOMETHANE	34413	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<580	<580	<5.8	<5.8	<5.8
UG/L	GMS														
CARBON TETRACHLORIDE	32102	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<280	<280	<2.8	<2.8	<2.8
UG/L	GMS														
CHLOROBENZENE	34301	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<600	<600	<6.0	<6.0	<6.0
UG/L	GMS														
CHLOROETHANE	34311	<8.2	<8.2	<8.2	<8.2	<8.2	<8.2	<8.2	<8.2	<8.2	<820	<820	<8.2	<8.2	<8.2
UG/L	GMS														
2-CHLOROETHYL VINYL	34576	<26	<26	<26	<26	<26	<26	<26	<26	<26	<1500	<1500	<26	<26	<26
ETHER	32106	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<160	<160	<1.6	<1.6	<1.6
UG/L	GMS														
CHLOROMETHANE	34418	<4.3	<4.3	<4.3	<4.3	<4.3	<4.3	<4.3	<4.3	<4.3	<430	<430	<4.3	<4.3	<4.3
UG/L	GMS														
DIBROMOCHLOROMETHANE	32105	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<310	<310	<3.1	<3.1	<3.1
UG/L	GMS														
1,1-DICHLOROETHANE	34496	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<470	<470	<4.7	<4.7	<4.7
UG/L	GMS														
1,2-DICHLOROETHANE	34531	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<280	<280	<2.8	<2.8	<2.8
UG/L	GMS														
1,1-DICHLOROETHYLENE	34501	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<280	<280	<2.8	<2.8	<2.8
UG/L	GMS														
TRANS-1,2-DICHLORO	34546	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	7100	4000	<1.6	<1.6	<1.6
ETHENE	34541	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<6.0	<600	<600	<6.0	<6.0	<6.0
UG/L	GMS														
1,2-DICHLOROPROPANE	34704	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<500	<500	<5.0	<5.0	<5.0
UG/L	GMS														
CIS-1,3-DICHLORO	34699	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<640	<640	<6.4	<6.4	<6.4
PROPENE	GMS														
TRANS-1,3-DICHLORO		<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<640	<640	<6.4	<6.4	<6.4
PROPENE	UG/L														







APPENDIX J

SUPPLEMENTAL CHARACTERIZATION INVESTIGATION  
SHALLOW MONITOR WELLS  
ANALYTICAL RESULTS



CAMP LEJEUNE - HP1A  
 PESTICIDES IN GROUNDWATER (SHALLOW WELLS)  
 Concentration in ug/l

CHART = HPPEST4

sy\wp8b\hp-pest.wr1 (4)

PESTICIDE/PCB	HPGW24-1	HPGW25	HPGW26	HPGW260 (GWDUP8)	HPGW29	21GW1	22GW1	22GW2
alpha-BHC	.05U	.05U	.05U	.05U	.05U	.05U	.05U	.05U
beta-BHC	.05U	.05U	.05U	.05U	.05U	.05U	.05U	.05U
delta-BHC	.05U	.05U	.05U	.05U	.05U	.05U	.05U	.05U
gamma-BHC (Lindane)	.05U	.05U	.05U	.05U	.05U	.05U	.05U	.05U
Heptachlor	.05U	.05U	.05U	.05U	.05U	.05U	.05U	.05U
Aldrin	.05U	.05U	.05U	.05U	.05U	.05U	.05U	.05U
Heptachlor epoxide	.05U	.05U	.05U	.05U	.05U	.05U	.05U	.05U
Endosulfan I	.05U	.05U	.05U	.05U	.05U	.05U	.05U	.05U
Dieldrin	.10U	.10U	.10U	.10U	.10U	.10U	.10U	.10U
4,4'-DDE	.10U	.10U	.10U	.10U	.10U	.10U	.10U	.10U
Endrin	.10U	.10U	.10U	.10U	.10U	.10U	.10U	.10U
Endosulfan II	.10U	.10U	.10U	.10U	.10U	.10U	.10U	.10U
4,4'-DDD	.10U	.10U	.10U	.10U	.10U	.10U	.10U	.10U
Endosulfan sulfate	.10U	.10U	.10U	.10U	.10U	.10U	.10U	.10U
4,4'-DDT	.10U	.10U	.10U	.10U	.10U	.10U	.10U	.10U
Methoxychlor	.50U	.50U	.50U	.50U	.50U	.50U	.50U	.50U
Endrin ketone	.10U	.10U	.10U	.10U	.10U	.10U	.10U	.10U
alpha-Chlordane	.50U	.50U	.50U	.50U	.50U	.50U	.50U	.50U
gamma-Chlordane	.50U	.50U	.50U	.50U	.50U	.50U	.50U	.50U
Toxaphene	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U
Aroclor-1016	.50U	.50U	.50U	.50U	.50U	.50U	.50U	.50U
Aroclor-1221	.50U	.50U	.50U	.50U	.50U	.50U	.50U	.50U
Aroclor-1232	.50U	.50U	.50U	.50U	.50U	.50U	.50U	.50U
Aroclor-1242	.50U	.50U	.50U	.50U	.50U	.50U	.50U	.50U
Aroclor-1248	.50U	.50U	.50U	.50U	.50U	.50U	.50U	.50U
Aroclor-1254	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U
Aroclor-1260	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U

PROJECT Camp Lejeune  
 PREPARED BY Judy Hanna  
 DATE April 1991  
 CHECKED BY E.D. King  
 DATE 5/6/91  
 COMMENTS

CAMP LEJEUNE - HP1A  
 PESTICIDES IN GROUNDWATER (SHALLOW WELLS)  
 Concentration in ug/l

CHART = HPPEST3

sy\wp8b\hp-pest.wr1 (3)

PESTICIDE/PCB	HPGW15	HPGW16	HPGW17-1	HPGW19	HPGW20	HPGW21	HPGW22	HPGW23
alpha-BHC	.05U	.05U	.05U	.05U	.05U	.05U	.05U	.05U
beta-BHC	.05U	.05U	.05U	.05U	.05U	.05U	.05U	.05U
delta-BHC	.05U	.05U	.05U	.05U	.05U	.05U	.05U	.05U
gamma-BHC (Lindane)	.05U	.05U	.05U	.05U	.05U	.05U	.05U	.05U
Heptachlor	.05U	.05U	.05U	.05U	.05U	.05U	.05U	.05U
Aldrin	.05U	.05U	.05U	.05U	.05U	.05U	.05U	.05U
Heptachlor epoxide	.05U	.05U	.05U	.05U	.05U	.05U	.05U	.05U
Endosulfan I	.05U	.05U	.05U	.05U	.05U	.05U	.05U	.05U
Dieldrin	.10U	.10U	.11	.10U	.10U	.10U	.10U	.10U
4,4'-DDE	.10U	.10U	.10U	.10U	.10U	.10U	.10U	.10U
Endrin	.10U	.10U	.10U	.10U	.10U	.10U	.10U	.10U
Endosulfan II	.10U	.10U	.10U	.10U	.10U	.10U	.10U	.10U
4,4'-DDD	.10U	.10U	.10U	.10U	.10U	.10U	.10U	.10U
Endosulfan sulfate	.10U	.10U	.10U	.10U	.10U	.10U	.10U	.10U
4,4'-DDT	.10U	.10U	.10U	.10U	.10U	.10U	.10U	.10U
Methoxychlor	.50U	.50U	.50U	.50U	.50U	.50U	.50U	.50U
Endrin ketone	.10U	.10U	.10U	.10U	.10U	.10U	.10U	.10U
alpha-Chlordane	.50U	.50U	.50U	.50U	.50U	.50U	.50U	.50U
gamma-Chlordane	.50U	.50U	.50U	.50U	.50U	.50U	.50U	.50U
Toxaphene	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U
Aroclor-1016	.50U	.50U	.50U	.50U	.50U	.50U	.50U	.50U
Aroclor-1221	.50U	.50U	.50U	.50U	.50U	.50U	.50U	.50U
Aroclor-1232	.50U	.50U	.50U	.50U	.50U	.50U	.50U	.50U
Aroclor-1242	.50U	.50U	.50U	.50U	.50U	.50U	.50U	.50U
Aroclor-1248	.50U	.50U	.50U	.50U	.50U	.50U	.50U	.50U
Aroclor-1254	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U
Aroclor-1260	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U

PROJECT Camp Lejeune  
 PREPARED BY Judy Kuma  
 DATE April 1991  
 CHECKED BY Ed Knight  
 DATE 5/6/91  
 COMMENTS



CAMP LEJEUNE - HPIA  
 PESTICIDES IN GROUNDWATER (SHALLOW WELLS)  
 Concentration in ug/l

CHART = HPPEST1

sy\wp8b\hp-pest.wr1 (1)

PESTICIDE/PCB	HPGW1	HPGW2	HPGW3	HPGW4-1	HPGW4-1D (GMDUP5)	HPGW5	HPGW6	HPGW7
alpha-BHC	.05U	.05U	.05U	.05U	.05U	.05U	.05U	.05U
beta-BHC	.05U	.05U	.05U	.05U	.05U	.05U	.05U	.05U
delta-BHC	.05U	.05U	.05U	.05U	.05U	.05U	.05U	.05U
gamma-BHC (Lindane)	.05U	.05U	.05U	.05U	.05U	.05U	.05U	.05U
Heptachlor	.05U	.05U	.05U	.05U	.05U	.05U	.05U	.05U
Aldrin	.05U	.05U	.05U	.05U	.05U	.05U	.05U	.05U
Heptachlor epoxide	.05U	.05U	.05U	.05U	.05U	.05U	.05U	.05U
Endosulfan I	.05U	.05U	.05U	.05U	.05U	.05U	.05U	.05U
Dieldrin	.10U	.10U	.10U	.10U	.10U	.10U	.10U	.10U
4,4'-DDE	.10U	.10U	.10U	.10U	.10U	.10U	.10U	.10U
Endrin	.10U	.10U	.10U	.10U	.10U	.10U	.10U	.10U
Endosulfan II	.10U	.10U	.10U	.10U	.10U	.10U	.10U	.10U
4,4'-DDD	.10U	.10U	.10U	.10U	.10U	.10U	.10U	.10U
Endosulfan sulfate	.10U	.10U	.10U	.10U	.10U	.10U	.10U	.10U
4,4'-DDT	.10U	.10U	.10U	.10U	.10U	.10U	.10U	.10U
Methoxychlor	.50U	.50U	.50U	.50U	.50U	.50U	.50U	.50U
Endrin ketone	.10U	.10U	.10U	.10U	.10U	.10U	.10U	.10U
alpha-Chlordane	.50U	.50U	.50U	.50U	.50U	.50U	.50U	.50U
gamma-Chlordane	.50U	.50U	.50U	.50U	.50U	.50U	.50U	.50U
Toxaphene	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U
Aroclor-1016	.50U	.50U	.50U	.50U	.50U	.50U	.50U	.50U
Aroclor-1221	.50U	.50U	.50U	.50U	.50U	.50U	.50U	.50U
Aroclor-1232	.50U	.50U	.50U	.50U	.50U	.50U	.50U	.50U
Aroclor-1242	.50U	.50U	.50U	.50U	.50U	.50U	.50U	.50U
Aroclor-1248	.50U	.50U	.50U	.50U	.50U	.50U	.50U	.50U
Aroclor-1254	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U
Aroclor-1260	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U

PROJECT Camp Lejeune  
 PREPARED BY Judy Summa  
 DATE April 1991  
 CHECKED BY SLK  
 DATE 5/6/91  
 COMMENTS \_\_\_\_\_







CAMP LEJEUNE - HPIA  
 INORGANICS IN GROUNDWATER (SHALLOW WELLS)  
 Concentration in ug/l

CHART = HPING1

wp8e\hp-inor.wr1 (1)

METAL/COMPOUND	HPGW1	HPGW2	HPGW3	HPGW4-1	HPGW4-1D (GWDUP5)	HPGW5	HPGW6	HPGW7
Aluminum	30600	56000	19300	97000	96800	3580	1050000	161000
Antimony	13.3U	15.6B	46.5B	21.9B	34.6B	13.3U	13.3U	22.0U
Arsenic	8.0B	24.1	15.6	15.5	19.4	1.5U	31.5	18.3
Barium	166B	84.4B	55.5B	268	273	13.6B	1960	670
Beryllium	6.0	1.7B	1.2B	6.7	6.4	0.86B	20.0	4.8B
Cadmium	4.3U	4.3U	4.3U	4.3U	4.3U	4.3U	4.3U	4.3U
Calcium	30100	46800	29800	296000	310000	80100	11200	10500
Chromium	87.0	64.3	16.7	187	195	3.6B	1590	313
Cobalt	6.0U	6.1B	8.0U	14.4B	18.2B	6.0U	51.9	17.7B
Copper	17.4B	17.3B	5.5B	35.4	39.2	4.1B	194	44.2
Iron	64100	34800	10400	100000	106000	3100	265000	65700
Lead	16.6	29.4	11.4	66.6	45.6	13.6	60.7	112
Magnesium	5590	3980B	2580B	12100	12500	11100	49700	18200
Manganese	16B	77.7	53.9	425	436	162	487	136
Mercury	0.10U	0.10U	0.10U	0.10U	0.10U	0.10U	1.4	0.25
Nickel	31.3B	16.9B	12.1B	57.0	64.3	5.2U	161	50.7
Potassium	3940B	4820B	2230B	9710	9520	3930B	55300	12000
Selenium	3.4U	3.6B	3.4U	3.4U	3.4U	4.4B	3.4U	2.6B
Silver	4.7B	1.6U	1.6U	1.6U	2.4B	1.6U	2.3B	6.2U
Sodium	10900	3680B	6390	11400	11100	22400	14800	11500
Thallium	4.4U	4.4U	4.4U	4.4U	4.4U	4.4U	4.4U	1.1U
Vanadium	92.1	160	35.9B	213	222	2.4U	1610	285
Zinc	163	88.2	59.8	228	272	71.3	537	218
Cyanide	10.0U	11.2U	11.2	10.0U	10.0U	10.0U	10.0U	10.0U

CAMP LEJEUNE - HP1A  
SEMI-VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER (SHALLOW WELLS)  
Concentration in ug/l

CHART = HPSV4B

wp8c\hp-sv.wr1 (4-B)

COMPOUND	HPG24-1	HPGW25	HPGW26	HPGW26D (GWDUP8)	HPGW29	21GW1	22GW1	22GW2
3-Nitroaniline	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
Acenaphthene	6.J	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2,4-Dinitrophenol	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
4-Nitrophenol	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
Dibenzofuran	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2,4-Dinitrotoluene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Diethylphthalate	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
4-Chlorophenyl-phenylether	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Fluorene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
4-Nitroaniline	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
4,6-Dinitro-2-methylphenol	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
N-Nitrosodiphenylamine	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
4-Bromophenyl-phenylether	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Hexachlorobenzene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Pentachlorophenol	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
Phenanthrene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Anthracene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Di-n-butylphthalate	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Fluoranthene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Pyrene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Butylbenzylphthalate	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
3,3'-Dichlorobenzidine	20.U	20.U	20.U	20.U	20.U	20.U	20.U	20.U
Benzo(a)anthracene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Chrysene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
bis(2-Ethylhexyl)phthalate	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Di-n-octylphthalate	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Benzo(b)fluoranthene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Benzo(k)fluoranthene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Benzo(a)pyrene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Indeno(1,2,3-cd)pyrene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Dibenz(a,h)anthracene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Benzo(g,h,i)perylene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U

PROJECT Camp Lejeune  
 PREPARED BY Judy Swann  
 DATE April 1991  
 CHECKED BY Ed Knight  
 DATE 5/6/91

CAMP LEJEUNE - HP1A  
SEMI-VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER (SHALLOW WELLS)  
Concentration in ug/l

CHART = HPSV4A

wp8c\hp-sv.wr1 (4-A)

COMPOUND	HPGW24-1	HPGW25	HPGW26	HPGW260 (GWDUP8)	HPGW29	21GW1	22GW1	22GW2
Phenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
bis(2-Chloroethyl)ether	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2-Chlorophenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
1,3-Dichlorobenzene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
1,4-Dichlorobenzene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Benzyl Alcohol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
1,2-Dichlorobenzene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2-Methylphenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
bis(2-Chloroisopropyl)ether	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
4-Methylphenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
N-Nitroso-di-n-propylamine	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Hexachloroethane	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Nitrobenzene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Isophorone	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2-Nitrophenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2,4-Dimethylphenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Benzoic acid	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
bis (2-Chloroethoxy) methane	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2,4-Dichlorophenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
1,2,4-Trichlorobenzene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Naphthalene	130.	10.U	10.U	10.U	10.U	10.U	10.U	10.U
4-Chloroaniline	10.U	10.U	10.U	10.U	10.U	10.U	230.	10.U
Hexachlorobutadiene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
4-Chloro-3-methylphenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2-Methylnaphthalene	3.J	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Hexachlorocyclopentadiene	10.U	10.U	10.U	10.U	10.U	10.U	28.	10.U
2,4,6-Trichlorophenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2,4,5-Trichlorophenol	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
2-Chloronaphthalene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2-Nitroaniline	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
Dimethylphthalate	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Acenaphthylene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2,6-Dinitrotoluene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U

PROJECT Camp Lejeune  
 PREPARED BY Edith Sturka  
 DATE April 1991  
 CHECKED BY [Signature]  
 DATE 5/1/91

COMMENTS





CAMP LEJEUNE - HPIA  
SEMI-VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER (SHALLOW WELLS)  
Concentration in ug/l

CHART = HPSV2B

mp8c\hp-sv.wr1 (2-B)

COMPOUND	HPGW8	HPGW9-1	HPGW10	HPGW11	HPGW12	HPGW12D (GWDUP2)	HPGW13	HPGW14
3-Nitroaniline	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
Acenaphthene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2,4-Dinitrophenol	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
4-Nitrophenol	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
Dibenzofuran	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2,4-Dinitrotoluene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Diethylphthalate	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
4-Chlorophenyl-phenylether	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Fluorene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
4-Nitroaniline	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
4,6-Dinitro-2-methylphenol	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
N-Nitrosodiphenylamine	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
4-Bromophenyl-phenylether	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Hexachlorobenzene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Pentachlorophenol	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
Phenanthrene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Anthracene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Di-n-butylphthalate	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Fluoranthene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Pyrene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Butylbenzylphthalate	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
3,3'-Dichlorobenzidine	20.U	20.U	20.U	20.U	20.U	20.U	20.U	20.U
Benzo(a)anthracene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Chrysene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
bis(2-Ethylhexyl)phthalate	2.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Di-n-octylphthalate	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Benzo(b)fluoranthene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Benzo(k)fluoranthene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Benzo(a)pyrene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Indeno(1,2,3-cd)pyrene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Dibenz(a,h)anthracene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Benzo(g,h,i)perylene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U

PROJECT Camp Lejeune  
 PREPARED BY Judy Bluma  
 DATE April 1991  
 CHECKED BY ED [Signature]  
 DATE 5/17/91  
 COMMENTS \_\_\_\_\_

CAMP LEJEUNE - HPIA  
SEMI-VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER (SHALLOW WELLS)  
Concentration in ug/l

CHART = HPSV2A

wp8c\hp-sv.wr1 (2-A)

COMPOUND	HPGW8	HPGW9-1	HPGW10	HPGW11	HPGW12	HPGW12D (GMDUP2)	HPGW13	HPGW14
Phenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
bis(2-Chloroethyl)ether	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2-Chlorophenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
1,3-Dichlorobenzene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
1,4-Dichlorobenzene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Benzyl Alcohol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
1,2-Dichlorobenzene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2-Methylphenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
bis(2-Chloroisopropyl)ether	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
4-Methylphenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
N-Nitroso-di-n-propylamine	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Hexachloroethane	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Nitrobenzene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Isophorone	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2-Nitrophenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2,4-Dimethylphenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Benzoic acid	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
bis(2-Chloroethoxy)methane	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2,4-Dichlorophenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
1,2,4-Trichlorobenzene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Naphthalene	10.U	190.	10.U	10.U	10.U	10.U	10.U	10.U
4-Chloroaniline	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Hexachlorobutadiene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
4-Chloro-3-methylphenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2-Methylnaphthalene	10.U	49.	10.U	10.U	10.U	10.U	10.U	10.U
Hexachlorocyclopentadiene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2,4,6-Trichlorophenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2,4,5-Trichlorophenol	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
2-Chloronaphthalene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2-Nitroaniline	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
Dimethylphthalate	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Acenaphthylene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2,6-Dinitrotoluene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U

PROJECT Camp Lejeune  
 PREPARED BY Judy Shima  
 DATE April 1991  
 CHECKED BY E. K. Hunt  
 DATE 5/10/91  
 COMMENTS \_\_\_\_\_

CAMP LEJEUNE - HPIA  
SEMI-VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER (SHALLOW WELLS)  
Concentration in ug/l

CHART = HPSV1B

wp8c\hp-sv.wr1 (1-8)

COMPOUND	HPGW1	HPGW2	HPGW3	HPGW4-1	HPGW4-1D (GWDUP5)	HPGW5	HPGW6	HPGW7
3-Nitroaniline	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
Acenaphthene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2,4-Dinitrophenol	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
4-Nitrophenol	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
Dibenzofuran	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2,4-Dinitrotoluene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Diethylphthalate	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
4-Chlorophenyl-phenylether	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Fluorene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
4-Nitroaniline	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
4,6-Dinitro-2-methylphenol	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
N-Nitrosodiphenylamine	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
4-Bromophenyl-phenylether	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Hexachlorobenzene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Pentachlorophenol	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
Phenanthrene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Anthracene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Di-n-butylphthalate	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Fluoranthene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Pyrene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Butylbenzylphthalate	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
3,3'-Dichlorobenzidine	20.U	20.U	20.U	20.U	20.U	20.U	20.U	20.U
Benzo(a)anthracene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Chrysene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
bis(2-Ethylhexyl)phthalate	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Di-n-octylphthalate	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Benzo(b)fluoranthene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Benzo(k)fluoranthene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Benzo(a)pyrene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Indeno(1,2,3-cd)pyrene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Dibenz(a,h)anthracene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Benzo(g,h,i)perylene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U

PROJECT Camp Lejeune  
 PREPARED BY Marty Skuma  
 DATE April 1991  
 CHECKED BY F. J. [unclear]  
 DATE 5/10/91

MENTS

CAMP LEJEUNE - HPIA  
SEMI-VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER (SHALLOW WELLS)  
Concentration in ug/l

CHART = HPSV1A

wp8c\hp-sv.wr1 (1-A)

COMPOUND	HPGW1	HPGW2	HPGW3	HPGW4-1	HPGW4-1D (GWDUP5)	HPGW5	HPGW6	HPGW7
Phenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
bis(2-Chloroethyl)ether	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2-Chlorophenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
1,3-Dichlorobenzene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
1,4-Dichlorobenzene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Benzyl Alcohol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
1,2-Dichlorobenzene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2-Methylphenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
bis(2-Chloroisopropyl)ether	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
4-Methylphenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
N-Nitroso-di-n-propylamine	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Hexachloroethane	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Nitrobenzene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Isophorone	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2-Nitrophenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2,4-Dimethylphenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Benzoic acid	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
bis(2-Chloroethoxy)methane	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2,4-Dichlorophenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
1,2,4-Trichlorobenzene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Naphthalene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
4-Chloroaniline	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Hexachlorobutadiene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
4-Chloro-3-methylphenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2-Methylnaphthalene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Hexachlorocyclopentadiene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2,4,6-Trichlorophenol	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2,4,5-Trichlorophenol	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
2-Chloronaphthalene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2-Nitroaniline	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
Dimethylphthalate	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Acenaphthylene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2,6-Dinitrotoluene	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U

PROJECT Camp Lejeune  
 PREPARED BY Julie Suma  
 DATE April 1991  
 CHECKED BY [Signature]  
 DATE 5/6/91  
 COMMENTS \_\_\_\_\_

CAMP LEJEUNE - HP1A  
VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER (SHALLOW WELLS)  
Concentration in ug/l

CHART = HPVOL4

wp8b\hp-vol.wr1 (4)

COMPOUND	HPGW24-1	HPGW25	HPGW26	HPGW26D (GWDUP8)	HPGW29	21GW1	22GW1	22GW2
Chloromethane	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Bromomethane	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Vinyl Chloride	25000.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Chloroethane	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Methylene Chloride	5.U	5.U	3.J	5.U	.9J	5.U	5.U	5.U
Acetone	10.U	10.U	7.8J	6.8J	10.U	10.U	10.U	10.U
Carbon Disulfide	7.	5.U	2.J	8.	5.U	5.U	5.U	5.U
1,1-Dichloroethene	65.	5.U	5.U	5.U	5.U	5.U	5.U	5.U
1,1-Dichloroethane	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
1,2-Dichloroethene (total)	42000.D	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Chloroform	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
1,2-Dichloroethane	.8J	5.U	5.U	5.U	5.U	5.U	110.B	5.U
2-Butanone	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
1,1,1-Trichloroethane	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Carbon Tetrachloride	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Vinyl Acetate	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Bromodichloromethane	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
1,2-Dichloropropane	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
cis-1,3-Dichloropropene	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Trichloroethene	180.	5.U	5.U	5.U	5.U	5.U	5.J	5.U
Dibromochloromethane	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
1,1,2-Trichloroethane	3.J	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Benzene	3.J	5.U	5.U	5.U	5.U	5.U	7900.	5.U
trans-1,3-Dichloropropene	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Bromoform	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
4-Methyl-2-Pentanone	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2-Hexanone	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Tetrachloroethene	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
1,1,2,2-Tetrachloroethane	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Toluene	13.	5.U	5.U	5.U	5.U	5.U	16000.	5.U
Chlorobenzene	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Ethylbenzene	3.J	5.U	5.U	5.U	5.U	5.U	1900.J	5.U
Styrene	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Xylene (total)	10.	5.U	5.U	5.U	5.U	5.U	9800.	5.U

CAMP LEJEUNE - HPIA  
VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER (SHALLOW WELLS)  
Concentration in ug/l

CHART = HPVOL3

wp8b\hp-vol.wr1 (3)

COMPOUND	HPGW15	HPGW16	HPGW17-1	HPGW19	HPGW20	HPGW21	HPGW22	HPGW23
Chloromethane	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Bromomethane	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Vinyl Chloride	10.U	10.U	10.U	10.U	10.U	10.U	10.U	8.J
Chloroethane	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Methylene Chloride	5.U	5.U	5.U	5.U	.9J	4.J	9.	5.U
Acetone	10.U	10.U	10.U	10.U	10.U	4.8J	10.U	10.U
Carbon Disulfide	5.U	5.U	5.U	5.U	2.J	5.U	5.U	5.
1,1-Dichloroethene	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
1,1-Dichloroethane	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
1,2-Dichloroethene (total)	7.	5.U	5.U	.8J	5.U	5.U	5.U	8900.
Chloroform	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
1,2-Dichloroethane	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
2-Butanone	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
1,1,1-Trichloroethane	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Carbon Tetrachloride	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Vinyl Acetate	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Bromodichloromethane	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
1,2-Dichloropropane	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
cis-1,3-Dichloropropene	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Trichloroethene	4.J	5.U	5.U	2.J	5.U	3.J	5.U	3700.
Dibromochloromethane	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
1,1,2-Trichloroethane	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Benzene	5.U	5.U	5.U	5.U	5.U	5.U	5.U	24.
trans-1,3-Dichloropropene	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Bromoform	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
4-Methyl-2-Pentanone	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2-Hexanone	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Tetrachloroethene	5.U	5.U	5.U	2.J	5.U	5.U	5.U	5.U
1,1,2,2-Tetrachloroethane	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Toluene	5.U	5.U	5.U	5.U	5.U	5.U	5.U	13.
Chlorobenzene	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Ethylbenzene	5.U	5.U	5.U	5.U	5.U	.9J	5.U	9.
Styrene	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Xylene (total)	5.U	5.U	5.U	5.U	5.U	5.	5.U	41.

CAMP LEJEUNE - HPIA  
VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER (SHALLOW WELLS)  
Concentration in ug/l

CHART = HPVOL2

wp8b\hp-vol.wr1 (2)

COMPOUND	HPGW8	HPGW9-1	HPGW10	HPGW11	HPGW12	HPGW12D (GWDUP2)	HPGW13	HPGW14
Chloromethane	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Bromomethane	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Vinyl Chloride	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Chloroethane	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Methylene Chloride	5.U	5.U	5.U	5.U	5.U	3.8J	1.J	5.U
Acetone	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Carbon Disulfide	5.U	13.	5.U	11.	5.U	5.U	5.U	5.U
1,1-Dichloroethene	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
1,1-Dichloroethane	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
1,2-Dichloroethene (total)	5.U	1200.	5.U	5.U	5.U	5.U	5.U	5.U
Chloroform	5.U	15.	5.U	5.U	5.U	5.U	5.U	5.U
1,2-Dichloroethane	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
2-Butanone	10.U	10.U	10.U	10.U	10.U	4.J	10.U	10.U
1,1,1-Trichloroethane	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Carbon Tetrachloride	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Vinyl Acetate	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Bromodichloromethane	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
1,2-Dichloropropane	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
cis-1,3-Dichloropropene	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Trichloroethene	2.J	14000.	5.U	5.U	5.U	5.U	5.U	5.U
Dibromochloromethane	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
1,1,2-Trichloroethane	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Benzene	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
trans-1,3-Dichloropropene	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Bromoform	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
4-Methyl-2-Pentanone	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
2-Hexanone	10.U	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Tetrachloroethene	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
1,1,2,2-Tetrachloroethane	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Toluene	5.U	330.J	5.U	5.U	5.U	5.U	5.U	5.U
Chlorobenzene	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Ethylbenzene	5.U	700.	5.U	5.U	5.U	5.U	5.U	5.U
Styrene	5.U	5.U	5.U	5.U	5.U	5.U	5.U	5.U
Xylene (total)	5.U	3300.	5.U	5.U	5.U	5.U	5.U	5.U



**APPENDIX C**

**DATA FOR WELLS LOCATED SOUTHWEST OF CEDAR STREET  
AND NORTHEAST OF CEDAR STREET**

DATA FOR WELLS LOCATED SOUTHWEST OF CEDAR STREET

Volatiles Detected in Groundwater																		
Well # Unit	N.C. Standards	Federal MCLs	HPGW1				HPGW2				HPGW3				HPGW4			HPGW4-1
			ug/L				ug/L				ug/L				ug/L			ug/L
Date Sampled	ug/L	ug/L	1/9/87	3/8/87	5/27/87	1/18/91	1/9/87	3/8/87	5/27/87	1/18/91	1/9/87	3/8/87	5/27/87	1/18/91	1/12/87	3/8/87	5/27/87	1/18/91
Acetone	none	none	N/A	N/A	N/A	10.0 J	N/A	N/A	N/A	10.0 U	N/A	N/A	N/A	10.0 U	N/A	N/A	N/A	40.0
Benzene	1.0	5.0	43.0	3.9	< 1.0	5.0 U	12.0	< 1.0	< 1.0	5.0 U	1.4	< 1.0	< 1.0	5.0 U	25.0	3.2	1.6	5.0 U
Carbon Disulfide	none	none	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U
Chloroform	0.19	none	< 1.6	< 1.6	< 1.6	5.0 U	< 1.6	< 1.6	< 1.6	5.0 U	< 1.6	< 1.6	< 1.6	5.0 U	< 1.6	< 1.6	< 1.6	5.0 U
Chloromethane	none	none	< 4.3	< 4.3	< 4.3	10.0 U	5.0	< 4.3	< 4.3	10.0 U	< 4.3	< 4.3	< 4.3	10.0 U	< 4.3	< 4.3	< 4.3	10.0 U
1,2-Dichloroethene (total)	none	none	N/A	N/A	N/A	73.0	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U
Trans-1,2-Dichloroethene	70.0	100.0	< 1.6	< 1.6	< 1.6	N/A	< 1.6	< 1.6	< 1.6	N/A	< 1.6	< 1.6	< 1.6	N/A	1.9	2.2	4.4	N/A
Ethylbenzene	29.0	700.0	12.0	< 7.2	< 7.2	5.0 U	< 7.2	< 7.2	< 7.2	5.0 U	8.2	9.0	< 7.2	5.0 U	< 7.2	< 7.2	< 7.2	5.0 U
Methylene Chloride	5.0	5.0(1)	< 2.8	< 2.8	< 50.0	5.0 U	< 2.8	< 2.8	< 50.0	5.0 U	< 2.8	< 2.8	< 50.0	5.0 U	< 2.8	< 2.8	< 50.0	5.0 U
Tetrachloroethene	0.7	5.0	< 3.0	< 3.0	< 3.0	5.0 U	< 3.0	< 3.0	< 3.0	5.0 U	< 3.0	< 3.0	< 3.0	5.0 U	< 3.0	< 3.0	< 3.0	5.0 U
Toluene	100.0	100.0	100.0	12.0	< 6.0	5.0 U	38.0	< 6.0	< 6.0	5.0 U	< 6.0	< 6.0	< 6.0	5.0 U	35.0	8.2	< 6.0	5.0 U
1,1,1-Trichloroethane	200.0	200.0	< 3.8	< 3.8	< 3.8	5.0 U	< 3.8	< 3.8	< 3.8	5.0 U	< 3.8	13.0	< 3.8	5.0 U	< 3.8	< 3.8	< 3.8	5.0 U
Trichloroethene	none	none	< 3.0	< 3.0	< 1.0	91.0	< 3.0	< 3.0	< 1.0	5.0 U	< 3.0	< 3.0	< 1.0	5.0 U	3.4	< 3.0	7.7	0.9 J
Trichlorofluoromethane	none	none	< 3.2	< 3.2	< 3.2	N/A	< 3.2	< 3.2	< 3.2	N/A	< 3.2	< 3.2	< 3.2	N/A	< 3.2	< 3.2	< 3.2	N/A
Xylenes (total)	400.0	10000.0	62.0	< 12.0	< 12.0	5.0 U	28.0	< 12.0	< 12.0	5.0 U	< 12.0	< 12.0	< 12.0	5.0 U	< 12.0	< 12.0	< 12.0	5.0 U
Oil & Grease	none	none	700.0	< 100.0	< 200.0	N/A	700.0	< 100.0	< 200.0	N/A	800.0	200.0	< 200.0	N/A	300.0	300.0	< 200.0	N/A

Volatiles Detected in Groundwater (Wells Located S. W. of Cedar Street)																		
Well # Unit	N.C. Standards	Federal MCLs	HPGW5				HPGW6				HPGW7				HPGW8			
			ug/L				ug/L				ug/L				ug/L			
Date Sampled	ug/L	ug/L	1/12/87	3/8/87	5/27/87	1/18/91	1/12/87	3/8/87	5/27/87	1/18/91	1/12/87	3/9/87	5/27/87	1/18/91	1/13/87	3/9/87	5/27/87	1/18/91
Acetone	none	none	N/A	N/A	N/A	10.0 U	N/A	N/A	N/A	10.0 U	N/A	N/A	N/A	10.0 U	N/A	N/A	N/A	10.0 U
Benzene	1.0	5.0	< 1.0	< 1.0	< 1.0	5.0 U	< 1.0	< 1.0	< 1.0	5.0 U	< 1.0	< 1.0	< 1.0	5.0 U	< 1.0	< 1.0	< 1.0	5.0 U
Carbon Disulfide	none	none	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U
Chloroform	0.19	none	< 1.6	< 1.6	< 1.6	5.0 U	< 1.6	< 1.6	< 1.6	5.0 U	< 1.6	< 1.6	< 1.6	5.0 U	< 1.6	< 1.6	< 1.6	5.0 U
Chloromethane	none	none	< 4.3	< 4.3	< 4.3	10.0 U	< 4.3	< 4.3	< 4.3	10.0 U	< 4.3	< 4.3	< 4.3	10.0 U	7.2	< 4.3	< 4.3	10.0 U
1,2-Dichloroethene (total)	none	none	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U
Trans-1,2-Dichloroethene	70.0	100.0	< 1.6	< 1.6	< 1.6	N/A	< 1.6	< 1.6	< 1.6	N/A	< 1.6	< 1.6	< 1.6	N/A	< 1.6	< 1.6	< 1.6	N/A
Ethylbenzene	29.0	700.0	< 7.2	< 7.2	< 7.2	5.0 U	< 7.2	< 7.2	< 7.2	5.0 U	< 7.2	< 7.2	< 7.2	5.0 U	< 7.2	< 7.2	< 7.2	5.0 U
Methylene Chloride	5.0	5.0 (1)	< 2.8	< 2.8	< 50.0	3.0 BJ	< 2.8	< 2.8	< 50.0	3.0 BJ	< 2.8	< 2.8	< 50.0	5.0 U	20.0	< 2.8	< 50.0	5.0 U
Tetrachloroethene	0.7	5.0	< 3.0	< 3.0	< 3.0	5.0 U	< 3.0	< 3.0	< 3.0	5.0 U	< 3.0	< 3.0	< 3.0	5.0 U	< 3.0	< 3.0	< 3.0	5.0 U
Toluene	1000.0	1000.0	< 6.0	< 6.0	< 6.0	5.0 U	< 6.0	< 6.0	< 6.0	5.0 U	< 6.0	< 6.0	< 6.0	5.0 U	< 6.0	< 6.0	< 6.0	5.0 U
1,1,1-Trichloroethane	200.0	200.0	< 3.8	< 3.8	< 3.8	5.0 U	< 3.8	< 3.8	< 3.8	5.0 U	< 3.8	< 3.8	< 3.8	5.0 U	< 3.8	< 3.8	< 3.8	5.0 U
Trichloroethene	2.8	5.0	< 3.0	< 3.0	< 1.0	5.0 U	< 3.0	< 3.0	< 1.0	5.0 U	< 3.0	< 3.0	< 1.0	5.0 U	< 3.0	< 3.0	< 1.0	2.0 J
Trichlorofluoromethane	none	none	< 3.2	< 3.2	< 3.2	N/A	< 3.2	< 3.2	< 3.2	N/A	< 3.2	< 3.2	< 3.2	N/A	14.0	96.0	< 3.2	N/A
Xylenes (total)	400.0	10000.0	< 12.0	< 12.0	< 12.0	5.0 U	< 12.0	< 12.0	< 12.0	5.0 U	< 12.0	< 12.0	< 12.0	5.0 U	< 12.0	< 12.0	< 12.0	5.0 U
Oil & Grease	none	none	900.0	< 100.0	< 200.0	N/A	200.0	< 100.0	< 200.0	N/A	3000.0	200.0	< 200.0	N/A	100.0	< 100.0	< 200.0	N/A

NOTES:  
 (1) Proposed MCL.  
 U - Compound was analyzed, but not detected.  
 B - Analyte found in associated blank.  
 J - Value is estimated.  
 <x Less than detection limit.  
 N/A Not Analyzed

DATA FOR WELLS LOCATED SOUTHWEST OF CEDAR STREET

Volatiles Detected in Groundwater																		
Well # Unit	N. C. Standards ug/L	Federal MCLs ug/L	HPGW9 ug/L			HPGW9-1 ug/L	HPGW10 ug/L				HPGW11 ug/L				HPGW12 ug/L			
			1/14/87	3/9/87	5/28/87	1/18/91	1/14/87	3/9/87	5/28/87	1/18/91	1/14/87	3/9/87	5/28/87	1/18/91	1/14/87	3/9/87	5/28/87	1/18/91
Acetone	none	none	N/A	N/A	N/A	10.0 U	N/A	N/A	N/A	10.0 U	N/A	N/A	N/A	10.0 U	N/A	N/A	N/A	10.0 U
Benzene	1.0	5.0	< 100.0	< 250.0	< 100.0	5.0 U	< 1.0	< 1.0	< 1.0	5.0 U	< 1.0	< 1.0	< 1.0	5.0 U	< 1.0	< 1.0	< 1.0	5.0 U
Carbon Disulfide	none	none	N/A	N/A	N/A	13.0	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	11.0	N/A	N/A	N/A	5.0 U
Chloroform	0.19	none	< 160.0	< 400.0	< 160.0	15.0	< 1.6	< 1.6	< 1.6	5.0 U	3.2	2.2	2.6	5.0 U	< 1.6	< 1.6	< 1.6	5.0 U
Chloromethane	none	none	< 430.0	< 1100.0	< 430.0	10.0 U	< 4.3	< 4.3	< 4.3	10.0 U	< 4.3	< 4.3	< 4.3	10.0 U	< 4.3	< 4.3	< 4.3	10.0 U
1,2-Dichloroethene (total)	none	none	N/A	N/A	N/A	1200.0	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U
Trans-1,2-Dichloroethene	70.0	100.0	740.0	< 400.0	2700.0	N/A	< 1.6	< 1.6	< 1.6	N/A	13.0	7.2	6.0	N/A	< 1.6	< 1.6	< 1.6	N/A
Ethylbenzene	29.0	700.0	1100.0	< 1800.0	< 720.0	700.0	< 7.2	< 7.2	< 7.2	5.0 U	< 7.2	< 7.2	< 7.2	5.0 U	< 7.2	< 7.2	< 7.2	5.0 U
Methylene Chloride	5.0	5.0(1)	< 280.0	< 700.0	< 280.0	5.0 U	< 2.8	< 2.8	< 50.0	5.0 U	< 2.8	< 2.8	< 50.0	5.0 U	< 2.8	< 2.8	< 50.0	5.0 U
Tetrachloroethene	0.7	5.0	< 300.0	< 750.0	< 200.0	5.0 U	< 3.0	< 3.0	< 3.0	5.0 U	< 3.0	< 3.0	< 3.0	5.0 U	< 3.0	3.6	< 3.0	5.0 U
Toluene	1000.0	1000.0	< 600.0	< 1500.0	< 600.0	330.0 J	< 6.0	< 6.0	< 6.0	5.0 U	< 6.0	< 6.0	< 6.0	5.0 U	< 6.0	< 6.0	< 6.0	5.0 U
1,1,1-Trichloroethane	200.0	200.0	< 380.0	< 950.0	< 380.0	5.0 U	< 3.8	< 3.8	< 3.8	5.0 U	< 3.8	< 3.8	< 3.8	5.0 U	< 3.8	< 3.8	< 3.8	5.0 U
Trichloroethene	2.8	5.0	5000.0	6100.0	< 100.0	14000.0	7.4	8.6	< 1.0	5.0 U	49.0	34.0	24.0	5.0 U	< 3.0	< 3.0	< 1.0	5.0 U
Trichlorofluoromethane	none	none	< 320.0	< 800.0	< 320.0	N/A	< 3.2	< 3.2	< 3.2	N/A	< 3.2	< 3.2	< 3.2	N/A	< 3.2	< 3.2	< 3.2	N/A
Xylene (total)	400.0	10000.0	4500.0	< 3000.0	4000.0	3300.0	< 12.0	< 12.0	< 12.0	5.0 U	< 12.0	< 12.0	< 12.0	5.0 U	< 12.0	< 12.0	< 12.0	5.0 U
Oil & Grease	none	none	320.0	11000.0	600.0	N/A	400.0	< 100.0	200.0	N/A	300.0	600.0	< 200.0	N/A	200.0	< 100.0	< 200.0	N/A

Volatiles Detected in Groundwater (Wells Located S. W. of Cedar Street)																		
Well # Unit	N. C. Standards ug/L	Federal MCLs ug/L	HPGW13 ug/L			HPGW14 ug/L	HPGW15 ug/L				HPGW29 ug/L							
			1/14/87	3/9/87	5/28/87	1/18/91	1/14/87	3/9/87	5/28/87	1/18/91	1/14/87	3/9/87	5/28/87	1/18/91	1/14/87	3/9/87	5/28/87	1/18/91
Acetone	none	none	N/A	N/A	N/A	10.0 U	N/A	N/A	N/A	10.0 U	N/A	N/A	N/A	10.0 U	N/A	N/A	N/A	10.0 U
Benzene	1.0	5.0	< 1.0	< 1.0	< 1.0	5.0 U	< 1.0	< 1.0	< 1.0	5.0 U	< 1.0	< 1.0	< 1.0	5.0 U	< 1.0	< 1.0	< 1.0	5.0 U
Carbon Disulfide	none	none	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U
Chloroform	0.19	none	< 1.6	< 1.6	< 1.6	5.0 U	< 1.6	< 1.6	< 1.6	5.0 U	< 1.6	< 1.6	< 1.6	5.0 U	< 1.6	< 1.6	< 1.6	5.0 U
Chloromethane	none	none	< 4.3	< 4.3	< 4.3	10.0 U	< 4.3	< 4.3	< 4.3	10.0 U	< 4.3	< 4.3	< 4.3	10.0 U	< 4.3	< 4.3	< 4.3	10.0 U
1,2-Dichloroethene (total)	none	none	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	7.0	N/A	N/A	N/A	5.0 U
Trans-1,2-Dichloroethene	70.0	100.0	< 1.6	< 1.6	< 1.6	N/A	< 1.6	< 1.6	< 1.6	N/A	< 1.6	< 1.6	< 1.6	N/A	< 1.6	< 1.6	< 1.6	N/A
Ethylbenzene	29.0	700.0	< 7.2	< 7.2	< 7.2	5.0 U	< 7.2	< 7.2	< 7.2	5.0 U	< 7.2	< 7.2	< 7.2	5.0 U	< 7.2	< 7.2	< 7.2	5.0 U
Methylene Chloride	5.0	5.0(1)	< 2.8	< 2.8	< 50.0	1.0 J	< 2.8	< 2.8	< 50.0	5.0 U	< 2.8	< 2.8	< 50.0	5.0 U	< 2.8	< 2.8	< 50.0	0.6 J
Tetrachloroethene	0.7	5.0	< 3.0	< 3.0	< 3.0	5.0 U	< 3.0	< 3.0	< 3.0	5.0 U	< 3.0	< 3.0	< 3.0	5.0 U	< 3.0	< 3.0	< 3.0	5.0 U
Toluene	1000.0	1000.0	< 6.0	< 6.0	< 6.0	5.0 U	< 6.0	< 6.0	< 6.0	5.0 U	< 6.0	< 6.0	< 6.0	5.0 U	< 6.0	< 6.0	< 6.0	5.0 U
1,1,1-Trichloroethane	200.0	200.0	< 3.8	< 3.8	< 3.8	5.0 U	< 3.8	< 3.8	< 3.8	5.0 U	< 3.8	< 3.8	< 3.8	5.0 U	< 3.8	< 3.8	< 3.8	5.0 U
Trichloroethene	2.8	5.0	< 3.0	< 3.0	< 1.0	5.0 U	< 3.0	< 3.0	< 1.0	5.0 U	< 3.0	< 3.0	< 1.0	4.0 J	< 3.0	< 3.0	< 1.0	5.0 U
Trichlorofluoromethane	none	none	< 3.2	< 3.2	< 3.2	N/A	< 3.2	< 3.2	< 3.2	N/A	< 3.2	< 3.2	7.1	N/A	< 3.2	< 3.2	< 3.2	N/A
Xylene (total)	400.0	10000.0	< 12.0	< 12.0	< 12.0	5.0 U	< 12.0	< 12.0	< 12.0	5.0 U	< 12.0	< 12.0	< 12.0	5.0 U	< 12.0	< 12.0	< 12.0	5.0 U
Oil & Grease	none	none	200.0	< 100.0	< 200.0	N/A	200.0	< 100.0	< 300.0	N/A	< 100.0	< 100.0	< 200.0	N/A	200.0	< 100.0	< 200.0	N/A

NOTES:  
 (1) Proposed MCL  
 U - Compound was analyzed, but not detected.  
 B - Analyte found in associated blank.  
 J - Value is estimated.  
 <x - Less than detection limit.  
 N/A Not Analyzed

DATA FOR WELLS LOCATED SOUTHWEST OF CEDAR STREET

Semi-Volatile Organic Compounds in Groundwater

Well #	N. C.	Federal	HPGW1	HPGW2	HPGW3	HPGW4-1	HPGW5	HPGW6	HPGW7	HPGW8	HPGW9-1	HPGW10	HPGW11	HPGW12	HPGW13	HPGW14	HPGW15	HPGW29
Unit	Standards	MCLs	ug/L															
Date Sampled	ug/L	ug/L	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91
bis(2-Ethylhexyl)phthalate	none	none	10.0 U	2.0 J	10.0 U													
2-Methylnaphthalene	none	none	10.0 U	49.0	10.0 U													
Naphthalene	none	none	10.0 U	190.0	10.0 U													

Inorganics in Groundwater

(Wells Located S. W. of Cedar Street)

Well #	N. C.	Federal	HPGW1	HPGW2	HPGW3	HPGW4-1	HPGW5	HPGW6	HPGW7	HPGW8	HPGW9-1	HPGW10	HPGW11	HPGW12	HPGW13	HPGW14	HPGW15	HPGW29
Unit	Standards	MCLs	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Date Sampled	ug/L	ug/L	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91
Aluminum	none	none	30600	56000	19900	97000.0	3580.0	1050000	161000	91700	59100	348000	95200	24000	13500	109000	18500	47800.0
Antimony	none	105(1)	13.3 U	15.6 B	46.5 B	21.9 B	13.3 U	13.3 U	22.0 U	22.0 U	17.6 B	22.0 U	22.0 U	22.0 U	13.3 U	13.3 U	22.0 U	13.3 U
Arsenic	50.0	50.0	8.0 B	24.1	15.6	15.5	1.5 U	31.5	18.3	28.4	3.0 B	39.9	9.1 B	1.8 U	47.0	45.6	1.8 U	25.6
Barium	1000.0	1000(2)	166.0 B	84.4 B	55.5 B	268.0	13.6 B	1960.0	670.0	173.0 B	126.0 B	492.0	298.0	91.5 B	128.0 B	299.0	119.0 B	633.0
Beryllium	none	1.0(3)	6.0	1.7 B	1.2 B	6.7	0.86 B	20.0	4.8 B	2.1 U	0.79 B	5.6	2.1 U	2.1 U	0.59 B	2.7 B	2.1 U	8.7
Calcium	none	none	30100	46800	29800	296000	80100	11200.0	10500	10600	23500	56200	9730.0	34100	4100.0 B	4340.0 B	12000	59200.0
Chromium	50.0	100.0	87.0	64.3	16.7	187.0	3.6 B	1590.0	313.0	91.8	66.4	310.0	140.0	25.5	48.9	127.0	21.4	178.0
Cobalt	none	none	6.0 U	6.1 B	8.0 U	14.4 B	6.0 U	51.9	17.7 B	7.9 B	6.0 U	31.4 B	6.4 U	6.4 B	9.3 B	12.9 B	6.4 U	17.8 B
Copper	1000.0	1300(4)	17.4 B	17.3 B	5.5 B	35.4	4.1 B	194.0	44.2	19.5 B	27.1	72.2	30.0	5.9 B	17.0 B	34.8	12.2 B	39.9
Iron	300.0	none	64100	34800	10400	100000	3100.0	265000	65700	40900	19800	119000	31800	5600.0	33500	87200	4800.0	76200.0
Lead	50.0	15(4)	16.6	29.4	11.4	66.6	13.6	60.7	112.0	54.1	128.0	186.0	45.2	15.7	9.0	66.5	16.6	29.1
Magnesium	none	none	5590.0	3980.0 B	2580.0 B	12100.0	11100	49700.0	18200	5780.0	11000	14900	11200	7700.0	7700.0	8770.0	5650.0	15000.0
Manganese	50.0	none	168.0	77.7	53.9	425.0	162.0	487.0	136.0	46.5	45.0	255.0	103.0	18.3	30.3	80.0	18.3	236.0
Mercury	1.1	2.0	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1.4	0.25	0.13 B	0.10 U	0.82	0.1 B	0.1 U	0.1 U	0.26	0.1 U	0.1 U
Nickel	150.0	100(3)	31.3 B	16.9 B	12.1 B	57.0	5.2 U	161.0	50.7	25.2 B	15.1 B	92.2	23.6 B	11.0 U	21.1 B	41.6	11.0 U	93.5
Potassium	none	none	3940.0 B	4820.0 B	2230.0 B	9710.0	3930.0 B	53300.0	12000	5300.0	5370.0	17100	7320.0	2600.0 B	4520.0 B	6890.0	3390.0 B	5900.0
Selenium	10.0	50.0	3.4 U	3.6 B	3.4 U	3.4 U	4.4 B	3.4 U	2.6 B	3.6 B	3.6 B	1.6 U	3.7 B	5.8	3.4 U	3.4 U	1.6 U	3.4 U
Silver	50.0	50(5)	4.7 B	1.6 U	1.6 U	1.6 U	1.6 U	2.3 B	6.2 U	6.2 U	1.6 U	6.2 U	6.2 U	6.2 U	2.1 B	2.5 B	6.2 U	3.1 B
Sodium	none	none	10900	3680.0 B	6390.0	11400.0	22400.0	14800.0	11500.0	8600.0	20400.0	3950.0 B	5410.0	9310.0	18100.0	11500.0	6950.0	7850.0
Vanadium	none	none	92.1	160.0	35.9 B	213.0	2.4 U	1610.0	285.0	945.0	75.3	376.0	166.0	31.1	40.5 B	163.0	24.9 B	108.0
Zinc	5000.0	none	163.0	88.2	59.8	228.0	71.3	537.0	218.0	118.0	115.0	224.0	94.0	46.6	127.0	206.0	88.1	328.0

NOTES:

- (1) Two Proposed MCL.
  - (2) Barium's current MCL is 1000 ug/L; it also has a proposed MCL of 2000 ug/L.
  - (3) Proposed MCL.
  - (4) MCL is action level for Public Water Supply Systems, becomes effective November 6, 1991.
  - (5) Silver currently has an MCL of 50 ug/L. As of July 30, 1992, silver will no longer have a primary MCL; it's secondary MCL of 100 ug/L will become effective.
- B - Reported value is < Contract Required Detection Limit (CRDL), but > Instrument Detection Limit (IDL).  
 U - Compound was analyzed, but not detected.

DATA FOR WELL LOCATED NORTHEAST OF CEDAR STREET

Volatiles Detected in Groundwater

Well # Unit	N.C. Standards ug/L	Federal MCLs ug/L	HPGW16				HPGW17			HPGW17-1	HPGW18			HPGW19			
			ug/L				ug/L			ug/L	ug/L			ug/L			
			1/15/87	3/10/87	5/28/87	1/18/91	1/15/87	3/10/87	5/28/87	1/18/91	1/15/87	3/10/87	5/28/87	1/16/87	3/10/87	5/28/87	1/18/91
Acetone	none	none	N/A	N/A	N/A	10.0 U	N/A	N/A	N/A	10.0 U	N/A	N/A	N/A	N/A	N/A	N/A	10.0 U
Benzene	1.0	5.0	< 1.0	< 1.0	< 1.0	5.0 U	< 1.0	< 1.0	< 1.0	5.0 U	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	5.0 U
Carbon Disulfide	none	none	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	N/A	N/A	N/A	5.0 U
1,1-Dichloroethane	none	none	< 4.7	< 4.7	< 4.7	5.0 U	< 4.7	< 4.7	< 4.7	5.0 U	< 4.7	< 4.7	< 4.7	< 4.7	< 4.7	< 4.7	5.0 U
1,2-Dichloroethane	0.4	5.0	< 2.8	< 2.8	< 2.8	5.0 U	< 2.8	< 2.8	< 2.8	5.0 U	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	5.0 U
1,1-Dichloroethene	7.0	7.0	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	N/A	N/A	N/A	5.0 U
1,2-Dichloroethene (total)	none	none	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	N/A	N/A	N/A	0.8 J
Trans-1,2-Dichloroethene	70.0	100.0	< 1.6	< 1.6	< 1.6	N/A	< 1.6	< 1.6	< 1.6	N/A	< 1.6	< 1.6	< 1.6	2.5	< 1.6	< 1.6	N/A
Ethylbenzene	29.0	700.0	< 7.2	< 7.2	< 7.2	5.0 U	< 7.2	< 7.2	< 7.2	5.0 U	< 7.2	< 7.2	< 7.2	< 7.2	< 7.2	< 7.2	5.0 U
Methylene Chloride	5.0	5.0 (1)	< 2.8	< 2.8	< 50.0	5.0 U	< 2.8	< 2.8	< 50.0	5.0 U	< 2.8	< 2.8	< 50.0	< 2.8	< 2.8	< 50.0	5.0 U
Tetrachloroethene	0.7	5.0	< 3.0	< 3.0	< 3.0	5.0 U	< 3.0	< 3.0	< 3.0	5.0 U	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	2.0 J
Toluene	1000.0	1000.0	< 6.0	< 6.0	< 6.0	5.0 U	< 6.0	< 6.0	< 6.0	5.0 U	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	5.0 U
1,1,2-Trichloroethane	none	5.0	< 5.0	< 5.0	< 5.0	5.0 U	< 5.0	< 5.0	< 5.0	5.0 U	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	5.0 U
Trichloroethene	2.8	5.0	< 3.0	< 3.0	< 1.0	5.0 U	< 3.0	< 3.0	< 1.0	5.0 U	< 1.0	< 3.0	< 1.0	6.0	< 3.0	< 1.0	2.0 J
Vinyl Chloride	0.015	2.0	< 1.0	< 1.0	< 1.0	10.0 U	< 1.0	< 1.0	< 1.0	10.0 U	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	10.0 U
Xylene (total)	400.0	10000.0	< 12.0	< 12.0	< 12.0	5.0 U	< 12.0	< 12.0	< 12.0	5.0 U	< 12.0	< 12.0	< 12.0	< 12.0	< 12.0	< 12.0	5.0 U
Oil & Grease	none	none	200	3000	< 200	N/A	< 100	3000.0	< 200	N/A	< 100	2000	< 200	200	2000	< 200.0	N/A

Volatiles Detected in Groundwater

Well # Unit	N.C. Standards ug/L	Federal MCLs ug/L	HPGW20				HPGW21				HPGW22			HPGW23				
			ug/L				ug/L				ug/L			ug/L				
			1/16/87	3/10/87	5/28/87	1/18/91	1/16/87	3/10/87	5/28/87	1/18/91	1/19/87	3/11/87	5/29/87	1/18/91	1/19/87	3/11/87	5/29/87	1/18/91
Acetone	none	none	N/A	N/A	N/A	10.0 U	N/A	N/A	N/A	4.0 BJ	N/A	N/A	N/A	10.0 U	N/A	N/A	N/A	10.0 U
Benzene	1.0	5.0	< 1.0	< 1.0	< 1.0	5.0 U	< 1.0	< 1.0	< 1.0	5.0 U	< 1.0	< 1.0	< 1.0	5.0 U	< 10.0	< 100.0	< 100.0	24.0
Carbon Disulfide	none	none	N/A	N/A	N/A	2.0 J	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0
1,1-Dichloroethane	none	none	< 4.7	< 4.7	< 4.7	5.0 U	< 4.7	< 4.7	< 4.7	5.0 U	< 4.7	< 4.7	< 4.7	5.0 U	< 47.0	< 470.0	< 470.0	5.0 U
1,2-Dichloroethane	0.4	5.0	< 2.8	< 2.8	< 2.8	5.0 U	< 2.8	< 2.8	< 2.8	5.0 U	< 2.8	< 2.8	< 2.8	5.0 U	< 28.0	< 280.0	< 280.0	5.0 U
1,1-Dichloroethene	7.0	7.0	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U
1,2-Dichloroethene (total)	none	none	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	8900.0
Trans-1,2-Dichloroethene	70.0	100.0	< 1.6	< 1.6	< 1.6	N/A	< 1.6	< 1.6	< 1.6	N/A	< 1.6	< 1.6	< 1.6	N/A	830.0	6100.0	7100.0	N/A
Ethylbenzene	29.0	700.0	< 7.2	< 7.2	< 7.2	5.0 U	< 7.2	< 7.2	< 7.2	0.9 J	< 7.2	< 7.2	< 7.2	5.0 U	< 72.0	< 720.0	< 720.0	9.0
Methylene Chloride	5.0	5.0 (1)	< 2.8	3.4	< 50.0	0.9 J	< 2.8	< 2.8	< 50.0	4.0 J	< 2.8	< 2.8	< 50.0	9.0	< 28.0	300.0	< 5000.0	5.0 U
Tetrachloroethene	0.7	5.0	< 3.0	< 3.0	< 3.0	5.0 U	< 3.0	< 3.0	< 3.0	5.0 U	< 3.0	< 3.0	< 3.0	5.0 U	< 30.0	< 200.0	< 200.0	5.0 U
Toluene	1000.0	1000.0	< 6.0	< 6.0	< 6.0	5.0 U	< 6.0	< 6.0	< 6.0	5.0 U	< 6.0	< 6.0	< 6.0	5.0 U	< 60.0	< 600.0	< 600.0	13.0
1,1,2-Trichloroethane	none	5.0	< 5.0	< 5.0	< 5.0	5.0 U	< 5.0	< 5.0	< 5.0	5.0 U	< 5.0	< 5.0	< 5.0	5.0 U	< 50.0	< 500.0	< 500.0	5.0 U
Trichloroethene	2.8	5.0	< 3.0	< 1.0	< 1.0	5.0 U	< 3.0	< 1.0	< 1.0	3.0 J	< 3.0	< 1.0	< 1.0	5.0 U	830.0	13000.0	4300.0	3700.0
Vinyl Chloride	0.015	2.0	< 1.0	< 1.0	< 1.0	10.0 U	< 1.0	< 1.0	< 1.0	10.0 U	< 1.0	< 1.0	< 1.0	10.0 U	< 10.0	< 100.0	< 100.0	8.0 J
Xylene (total)	400.0	10000.0	< 12.0	< 12.0	< 12.0	5.0 U	< 12.0	< 12.0	< 12.0	5.0	< 12.0	< 12.0	< 12.0	5.0 U	< 120.0	< 1200.0	< 1200.0	41.0
Oil & Grease	none	none	< 100	3000	< 200	N/A	200	2000.0	< 200	N/A	1000	2000	< 200	N/A	600	3000.0	< 200	N/A

NOTES:

- (1) Proposed MCL
- U - Compound was analyzed, but not detected.
- B - Analyte found in associated blank.
- J - Value is estimated.
- <x Less than detection limit.
- N/A Not Analyzed

DATA FOR WELLS LOCATED NORTHEAST OF CEDAR STREET

Volatiles Detected in Groundwater

Well # Unit Date Sampled	N. C. Standards ug/L	Federal MCLs ug/L	HPGW24 ug/L				HPGW24-1 ug/L	HPGW25 ug/L				HPGW26 ug/L				22GW1 ug/L			
			1/19/87	3/11/87	5/29/87	1/18/91	1/19/87	3/11/87	5/29/87	1/18/91	1/19/87	3/12/87	5/29/87	1/18/91	1/19/87	3/8/87	5/27/87	1/18/91	
			Acetone	none	none	N/A	N/A	N/A	10.0 U	N/A	N/A	N/A	10.0 U	N/A	N/A	N/A	7.0 BJ	N/A	N/A
Benzene	1.0	5.0	< 2.0	< 100.0	< 100.0	3.0 J	< 1.0	< 1.0	< 1.0	5.0 U	< 1.0	< 1.0	< 1.0	5.0 U	12000.0	10000.0	13000.0	7900.0	
Carbon Disulfide	none	none	N/A	N/A	N/A	7.0	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	2.0 J	N/A	N/A	N/A	5.0 U	
1,1-Dichloroethane	none	none	12.0	< 470.0	< 470.0	5.0 U	< 4.7	< 4.7	< 4.7	5.0 U	< 4.7	< 4.7	< 4.7	5.0 U	< 47.0	< 4700.0	< 4700.0	5.0 U	
1,2-Dichloroethane	0.4	5.0	< 280.0	< 280.0	< 280.0	0.8 J	< 2.8	< 2.8	< 2.8	5.0 U	< 2.8	< 2.8	< 2.8	5.0 U	< 28.0	< 2800.0	< 2800.0	110.0 B	
1,1-Dichloroethene	7.0	7.0	N/A	N/A	N/A	65.0	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U	
1,2-Dichloroethene (total)	none	none	N/A	N/A	N/A	42000.0 D	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U	N/A	N/A	N/A	5.0 U	
Trans-1,2-Dichloroethene	70.0	100.0	6400.0	4300.0	4000.0	N/A	< 1.6	< 1.6	< 1.6	N/A	< 1.6	< 1.6	< 1.6	N/A	< 16.0	< 1600.0	< 1600.0	N/A	
Ethylbenzene	29.0	700.0	< 720.0	< 720.0	< 720.0	3.0 J	< 7.2	< 7.2	< 7.2	5.0 U	< 7.2	< 7.2	< 7.2	5.0 U	1800.0	< 7200.0	< 7200.0	1900.0 J	
Methylene Chloride	5.0	5.0 (1)	< 280.0	< 280.0	< 5000.0	5.0 U	< 2.8	2.9	< 90.0	5.0 U	< 2.8	6.5	< 90.0	3.0 J	< 28.0	2800.0	< 50000.0	5.0 U	
Tetrachloroethene	0.7	5.0	< 300.0	< 200.0	< 200.0	5.0 U	< 3.0	< 3.0	< 3.0	5.0 U	< 3.0	< 3.0	< 3.0	5.0 U	< 30.0	< 2000.0	< 2000.0	5.0 U	
Toluene	1000.0	1000.0	< 600.0	< 600.0	< 600.0	13.0	< 6.0	< 6.0	< 6.0	5.0 U	< 6.0	< 6.0	< 6.0	5.0 U	15000.0	18000.0	24000.0	16000.0	
1,1,2-Trichloroethane	none	5.0	< 500.0	< 500.0	< 500.0	3.0 J	< 5.0	< 5.0	< 5.0	5.0 U	< 5.0	< 5.0	< 5.0	5.0 U	< 50.0	< 5000.0	< 5000.0	5.0 U	
Trichloroethene	2.8	5.0	< 57.0	< 100.0	< 100.0	180.0	< 3.0	< 1.0	< 1.0	5.0 U	< 3.0	< 1.0	< 1.0	5.0 U	< 30.0	< 1000.0	< 1000.0	5.0 J	
Vinyl Chloride	0.015	2.0	< 190.0	< 100.0	250.0	25000.0 U	< 1.0	< 1.0	< 1.0	10.0 U	< 1.0	< 1.0	< 1.0	10.0 U	< 10.0	< 1000.0	< 1000.0	10.0 U	
Xylene (total)	400.0	10000.0	< 1200.0	< 1200.0	< 1200.0	10.0	< 12.0	< 12.0	< 12.0	5.0 U	< 12.0	< 12.0	< 12.0	5.0 U	9000.0	< 12000.0	< 12000.0	9800.0	
Dil & Grease	none	none	100	2000	< 200	N/A	200	300.0	< 200	N/A	200	2000	< 200	N/A	7000	11000.0	9000	N/A	

Volatiles Detected in Groundwater

(Wells Located N. E. of Cedar Street)

Well # Unit Date Sampled	N. C. Standards ug/L	Federal MCLs ug/L	22GW2 ug/L			
			1/9/87	3/8/87	5/28/87	1/18/91
			Acetone	none	none	N/A
Benzene	1.0	5.0	< 1.0	< 1.0	< 1.0	5.0 U
Carbon Disulfide	none	none	N/A	N/A	N/A	5.0 U
1,1-Dichloroethane	none	none	< 4.7	< 4.7	< 4.7	5.0 U
1,2-Dichloroethane	0.4	5.0	< 2.8	< 2.8	< 2.8	5.0 U
1,1-Dichloroethene	7.0	7.0	N/A	N/A	N/A	5.0 U
1,2-Dichloroethene (total)	none	none	N/A	N/A	N/A	5.0 U
Trans-1,2-Dichloroethene	70.0	100.0	< 1.6	< 1.6	< 1.6	N/A
Ethylbenzene	29.0	700.0	< 7.2	< 7.2	< 7.2	5.0 U
Methylene Chloride	5.0	5.0 (1)	7.3	< 2.8	< 50.0	5.0 U
Tetrachloroethene	0.7	5.0	< 3.0	< 3.0	< 3.0	5.0 U
Toluene	1000.0	1000.0	< 6.0	< 6.0	< 6.0	5.0 U
1,1,2-Trichloroethane	none	5.0	< 5.0	< 5.0	< 5.0	5.0 U
Trichloroethene	2.8	5.0	< 1.0	< 3.0	< 1.0	5.0 U
Vinyl Chloride	0.015	2.0	< 1.0	< 1.0	< 1.0	10.0 U
Xylene (total)	400.0	10000.0	< 12.0	< 12.0	< 12.0	5.0 U
Dil & Grease	none	none	800	< 100	< 200	N/A

NOTES:

- (1) Proposed MCL
- U - Compound was analyzed, but not detected.
- B - Analyte found in associated blank.
- J - Value is estimated.
- <x - Less than detection limit.
- N/A - Not Analyzed

DATA FOR WELLS LOCATED NORTHEAST OF CEDAR STREET

Semi-Volatile Organic Compounds in Groundwater

Well #	N. C.	Federal	HPGW16	HPGW17-1	HPGW19	HPGW20	HPGW21	HPGW22	HPGW23	HPGW24-1	HPGW25	HPGW26	22GW1	22GW2
Unit	Standard	MCLs	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Date Sampled	ug/L	ug/L	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91
Acenaphthene	none	none	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	3.0 J	10.0 U	6.0 J	10.0 U	10.0 U	10.0 U	10.0 U
bis(2-Ethylhexyl)phthalate	none	none	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	3.0 J	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Dibenzofuran	none	none	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	2.0 J	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Fluorene	none	none	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	5.0 J	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
2-Methylnaphthalene	none	none	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	3.0 J	10.0 U	10.0 U	28.0	10.0 U
2-Methylphenol	none	none	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 J	10.0 U
Naphthalene	none	none	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	130.0	10.0 U	10.0 U	230.0	10.0 U

Inorganics in Groundwater

Well #	N. C.	Federal	HPGW16	HPGW17-1	HPGW19	HPGW20	HPGW21	HPGW22	HPGW23	HPGW24-1	HPGW25	HPGW26	22GW1	22GW2
Unit	Standard	MCLs	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Date Sampled	ug/L	ug/L	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91
Aluminum	none	none	213000	29000	6840	289000.0	38500	71800.0	82500	15400	218000	10400	587000	16900
Antimony	none	10/5(1)	22.0 U	22.0 U	13.3 U	21.9 B	13.3 U	24.6 B	24.6 B	22.0 U	13.3 U	13.3 U	20.9 B	13.3 U
Arsenic	50.0	50.0	17.3	1.8 U	5.0 B	49.4	12.1	7.2 B	6.6 B	4.2 B	13.2	1.5 U	50.3	11.0
Barium	1000.0	1000(2)	276.0	70.1 B	92.9 B	814.0	114.0 B	102.0 B	196.0 B	60.1 B	289.0	72.0 B	804.0	67.0 B
Beryllium	none	1 (3)	5.3	2.1 U	2.3 B	9.5	3.7 B	0.60 B	1.0 B	2.1 U	2.8 B	0.50 U	5.8	0.5 U
Calcium	none	none	33400	60800.0	3120 B	6370.0	26100	96300	7890.0	16600	6270	2830 B	33800	127000.0
Chromium	50.0	100.0	209.0	37.0	13.8	424.0	45.0	79.8	76.3	26.3	205.0	13.0	457.0	26.3
Cobalt	none	none	18.7 B	6.4 U	6.0 U	80.8	17.6 B	6.0 U	11.9 B	6.4 U	10.5 B	6.0 U	30.9 B	10.9 B
Copper	1000.0	1300(4)	44.6 B	20.0 B	8.6 B	97.7	28.3	40.0	30.5	11.5 B	57.7	9.1 B	81.4	11.2 B
Iron	300.0	none	47200	10500	36200	152000	56600	24400.0	23300	19200	46600	19000	101000	16200
Lead	50.0	15 (4)	100.0	23.7	31.7	20.0	49.4	39.4	45.0	21.4	71.6	9.0	307.0	16.2
Magnesium	none	none	8110.0	6790.0	4200.0 B	18000.0	10200	5210	6050.0	2430 B	10000.0	1830 B	21200	7730
Manganese	50.0	none	98.3	31.3	79.0	217.0	136.0	94.1	68.8	54.8	118.0	10.6 B	284.0	763.0
Mercury	1.1	2.0	0.13 B	0.1 U	0.1 U	0.5	0.1 U	0.1 U	0.1 U	0.1 U	0.10 U	0.10 U	0.35	0.1 U
Nickel	150.0	100(3)	41.0	11.9 B	7.3 B	168.0	30.8 B	23.2 B	33.2 B	14.0 U	39.2 B	5.2 U	186.0	17.0 B
Potassium	none	none	12100.0	3530.0 B	2370.0 B	16600.0	5160.0	6930.0	3880.0 B	3130 B	13100.0	2230.0 B	24000	3030.0 B
Selenium	10.0	50.0	1.6 U	1.6 U	3.4 U	3.4 U	3.5 B	3.4 U	3.4 U	1.6 U	3.4 U	3.4 U	3.4 U	4.2 B
Silver	50.0	50 (5)	6.2 U	6.2 U	2.9 B	4.3 B	1.6 U	2.5 B	6.6 B	6.2 U	3.9 B	1.6 U	4.1 B	1.6 U
Sodium	none	none	4960	4480.0 B	23500.0	11000.0	11800	5300.0	6260.0	11800.0	18200.0	5910.0	9560.0	8570.0
Thallium	none	2/1 (1)	1.4 B	1.1 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	1.1 U	4.4 U	4.4 U	4.4 U	4.4 U
Vanadium	none	none	225.0	52.1	19.8 B	419.0	178.0	100.0	77.6	39.2 B	259.0	149.0	518.0	40.3 B
Zinc	5000.0	none	157.0	76.5	81.1	637.0	273.0	77.4	89.3	70.5	119.0	68.1	295.0	91.8

NOTES:

- (1) Two Proposed MCLs.
  - (2) Barium's current MCL is 1000 ug/L; it also has a proposed MCL of 2000 ug/L.
  - (3) Proposed MCL.
  - (4) MCL is action level for Public Water Supply Systems, becomes effective November 6, 1991.
  - (5) Silver currently has an MCL of 50 ug/L; as of July 30, 1992 silver will no longer have a primary MCL it's secondary MCL of 100 ug/L will become effective.
- B - Reported value is < Contract Required Detection Limit (CRDL), but > Instrument Detection Limit (IDL).  
 U - Compound was analyzed, but not detected.

DATA FOR WELLS LOCATED NORTHEAST OF CEDAR STREET  
Pesticides in Groundwater

Well #	N. C.	Federal	HPGW16	HPGW17-1	HPGW19	HPGW20	HPGW21	HPGW22	HPGW23	HPGW24-1	HPGW25	HPGW26	22GW1	22GW2
Unit	Standards	MCLs	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Date Sampled	ug/L	ug/L	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91	1/18/91
Dieldrin	none	none	0.1 U	0.11	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U					

NOTES:

U - Compound was analyzed, but not detected.