



HYDROGEOLOGIC INVESTIGATION

**CHESAPEAKE ENERGY CENTER
CHESAPEAKE, VIRGINIA**

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URS Job No. 49498-001-155

September 21, 2001

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1.0 BACKGROUND AND OBJECTIVES

URS Corporation (URS) was retained by Dominion to provide engineering support services, groundwater modeling, and a risk assessment for an approximate 200-acre parcel (the Site) located in Chesapeake, Virginia. Fly ash will be used as fill material for construction of a golf course at the Site. As part of a feasibility study for the proposed use of fly ash, it was determined that an evaluation of the potential impact of fly ash on groundwater at the proposed Site was necessary. To complete the evaluation, a hydrogeologic study was conducted concurrently with an evaluation of the stabilization requirements of the ash, groundwater modeling, and risk assessment. This report provides the results of the hydrogeologic investigation.

Specifically, the objectives of the investigation were to evaluate hydrogeologic conditions and existing groundwater quality at the Site through:

- A preliminary evaluation of potential receptors;
- An evaluation of current soil and groundwater chemical conditions;
- Collection of site specific physical data; and,
- A preliminary analysis of groundwater flow conditions/aquifer characteristics.

2.0 SITE LOCATION AND DESCRIPTION

The Site is an approximate 200-acre parcel located at the southwest corner of the intersection of Centerville Turnpike and Whittamore Road in Chesapeake, Virginia (Figure 1). The Site is located within the city limits of Chesapeake, Virginia in an area transitioning from rural agricultural and residential to suburban residential. Current land use within 2,000 feet of the facility is residential and agricultural. Reportedly, the Site has historically been used for agricultural purposes.

The Site is bounded on the north by Whittamore Road and agricultural fields, on the south by residential properties, on the west by Centerville Turnpike and residential properties, and on the east by undeveloped, wooded property and residential properties. Water supply wells are not present on the Site; however, the surrounding properties utilize private water supply wells for domestic potable use. Additional information regarding these water supply wells is presented in Section 4.0. Based on knowledge of the area and inquiries with the City of Chesapeake Public Utilities office, public water supply is not currently available to the Site. Public water is available to a subdivision located west of the Site, and a water main is located between 300 to 1,000 feet south of the Site along Centerville Turnpike.

The Site is represented on the Fentress, Virginia 7.5-minute USGS topographic quadrangle at an approximate elevation of 10 to 15 feet (ft) above mean sea level (MSL). The Site slopes in an easterly direction and east-west trending drainage swales are located across the Site. Based on a review of the USGS topographic map, the swales appear to drain to a tributary to the Pocaty River, which is located approximately 3.25 miles east of the Site. The Pocaty River flows eastward into North Landing River, which flows south and discharges into Currituck Sound in North Carolina approximately 15 miles southeast of the Site.

3.0 GEOLOGY AND HYDROGEOLOGY

The Site is located within the Coastal Plain Physiographic Province of Virginia, in an area of “unconsolidated sediments consisting primarily of sand, clay, silt, and gravel with variable amounts of shell material” (Hamilton and Larson, 1988). Sediments range in age from early Cretaceous to Quaternary. Within the Site vicinity, an unconfined and six confined aquifers and six confining units are documented (Meng and Harsh, 1988, McFarland, 1999) as shown in the generalized hydrogeologic section in Figure 2. The total thickness of the sediment (aquifers and confining units) is estimated to exceed 3,000 feet in the Chesapeake area. The lithologic units are discussed from the deepest to the shallowest unit in this section.

Bedrock generally consists of gently eastward-dipping erosional surfaced crystalline rocks. This surface slopes eastward from the surface along the north-south trending "Fall Line", 80 miles west of the Site. The Fall Line passes through Richmond, Virginia. The crystalline rock surface has a slope of 50 to 100 feet per mile immediately east of the Fall Line. The slope of the rock surface ultimately decreases to approximately 40 feet per mile. The Fall Line marks the maximum westernmost extent of the unconsolidated units overlying the bedrock and is the primary recharge area for all but the Yorktown-Eastover and Columbia aquifers.

The Potomac Formation consists of three aquifers and confining units and directly overlies the bedrock. These aquifers are termed the Lower, and Middle Potomac, and the Brightseat-Upper Potomac aquifers. As with the other regional aquifers, the Potomac is thinnest along its western limit near the Fall Line and thickens seaward. They reach a total thickness of approximately 1,500 feet in the study area. The aquifers generally consist of interbedded sequences of medium to very coarse-grained sand, clayey sand, and clay with interbedded gravel. The confining units, like the aquifers, thicken seaward. These three aquifers are the most productive in the region with typical yields of 100 to

800 gallons per minute (gpm) in the Lower, 20 to 160 gpm in the Middle, and 20 to 400 gpm in the Brightseat-Upper Potomac aquifers.

The Aquia aquifer overlies the Brightseat-Upper Potomac along a 40 to 60-mile band between the Fall Line and the Site and is absent east of the Site. The Aquia aquifer is 65 feet thick west of the Site but gradationally changes from sandy sediments to clay. The Aquia aquifer is an important groundwater resource in the region west of the Site (15 to 210 gpm typical yields). The Aquia aquifer is confined by the Nanjemoy-Marlboro confining unit.

The Chickahominy and Piney Point Formations comprise the Chickahominy-Piney Point aquifer that overlies the Nanjemoy-Marlboro confining unit. It is approximately 180 feet thick in the vicinity of the Site and consists of shelly, glauconitic sand; interbedded with silt, clay, and thin indurated shell beds. This aquifer is an important groundwater resource in this region and is used for domestic, small industrial and municipal water supplies. It typically yields 10 to 110 gpm. It is overlain by the Calvert Confining unit.

The Yorktown and Eastover Formations of the Chesapeake Group comprise the Yorktown-Eastover aquifer. The deepest aquifer used by residential wells near the Site and is approximately 350 feet thick. The aquifer is unconfined along a band parallel to the Fall Line to the west but confined in the vicinity of the Site. The aquifer consists of interfingering shelly, very fine- to coarse-grained sand, interbedded with silt, clay, shell beds, and gravel. This aquifer is used as a source of groundwater for domestic, commercial and light industrial uses and is considered an important recharge source for lower aquifers. The aquifer is confined by a bedded clay and silty clay unit formed by the fining-upwards of depositional sequences that formed the underlying sandy sediments of the Yorktown-Eastover aquifer. This confining unit is highly dissected and may be absent less than 5 miles east and west of the Site resulting in a connection between the Yorktown-Eastover aquifer and the unconfined Columbia aquifer.

The uppermost aquifer is the Columbia aquifer. This aquifer is part of the Columbia Group and is the Lynnhaven Member of the Tabb Formation. The Tabb Formation consists of a fining-upward sequence of sediments composed of fine to coarse, gray sand with pebbles and cobbles grading upward into clayey and silty, fine sand and sandy silt. Locally, the aquifer is 20 to 50-feet thick and is unconfined throughout its extent. The Columbia aquifer is an important groundwater resource for rural and domestic users as well as a major source of recharge to the underlying aquifer system.

4.0 WELL RECORDS REVIEW

Water supply wells are not present on the Site; however, surrounding properties utilize private water supply wells for domestic potable use. A site visit was conducted to obtain addresses of nearby residences and visually observe the presence/absence of private water supply wells. No private water supply wells were noted during reconnaissance in the near vicinity of the Site. A request, which included specific residential addresses and tax parcel identification information, was submitted to the City of Chesapeake Health Department to obtain information regarding construction of local water supply wells.

The Health Department provided information for three wells located along Whittamore Road (northeast of the Site) and 14 wells along Murray Road (south of the Site). Copies of the information provided by the Health Department are included as Appendix A. Well information is summarized in Table 1. The average well yield is 18 gallons per minute (gpm) and the average well depth is 66 ft below ground surface (bgs). Well depths, water bearing zones, and stratigraphy were reviewed to evaluate which wells have been completed in the unconfined water table aquifer (Columbia aquifer) and which wells have been completed in the uppermost confined aquifer (Yorktown aquifer). Ten wells are completed to a depth of less than 53 ft bgs and appear to intersect water-bearing zones between 20 and 53 ft bgs. These ten wells are believed to utilize water from the Columbia aquifer. Five wells are completed to depths between 80 and 90 ft bgs within a water-bearing zone noted between 70 and 90 ft bgs. In most borings, a clay rich zone was observed above the 70 to 90 ft bgs water-bearing zone. The clay layer is similar to descriptions of the Yorktown confining layer and the deeper water-bearing zone appears to be part of the Yorktown-Eastover aquifer. The remaining two wells were advanced to depths of 122 and 130 ft bgs and are screened across a water bearing zone from approximately 70 to 130 ft bgs, again presumed to be part of the Yorktown aquifer.

5.0 SUBSURFACE INVESTIGATION

To assess Site soil and groundwater conditions, seven soil borings were advanced at the Site. Five soil borings were completed as groundwater monitoring wells. Soil and groundwater samples were collected from each location for analysis of geotechnical and chemical parameters. Field testing of aquifer characteristics by slug testing was also conducted.

To evaluate current subsurface conditions in the vicinity of proposed ash placement areas, and minimize potential disturbance during future construction; boring and monitoring well locations were positioned in areas outside of proposed ash fill area(s). Boring and monitoring well locations, as well as proposed ash fill areas, are identified on Figure 3.

5.1 SOIL BORINGS/MONITORING WELL CONSTRUCTION

Drilling activities were conducted on July 24 and 25, 2001. Two borings, B-1 and B-2, were advanced using an all-terrain vehicle (ATV) mounted, mud rotary drill rig. Mud rotary drilling was necessary to support and stabilize the borehole walls to prevent caving caused by heaving sands. The remaining borings (B-1A, B-1B, B-3, B-4, B-5) were advanced using an ATV-mounted, hollow-stem auger drill rig. Borings B-1A, B-2, B-3, B-4, and B-5 were completed as two-inch diameter groundwater monitoring wells. Monitoring wells were positioned to: 1) evaluate Site chemistry (soil and groundwater) and soil physical properties at the Site, 2) determine the direction of groundwater flow, and 3) potentially provide long-term monitoring capabilities. At each location, borings were sampled continuously from the ground surface to a depth of 10 ft bgs and every five feet thereafter to a total depth of 25 ft bgs using split-spoon sampling equipment.

Split spoon samples were visually classified by a URS geologist. Samples for geotechnical testing were collected from Shelby tubes or as bulk samples and samples for chemical analysis were collected from split spoons. Copies of the boring logs are included as Appendix B.

Borings B-1, B-1A, and B-1B were co-located. Boring B-1, located in the central portion of the study Site was advanced to a depth of 50 ft bgs to evaluate subsurface stratigraphy and to evaluate if a confining layer was present within 50 feet of ground surface. As previously mentioned, boring B-1A was completed as two-inch diameter groundwater monitoring well. Boring B1-B was advanced to 2.5 ft bgs for collection of shallow samples for geotechnical testing.

Monitoring well construction consisted of installing 10 feet of two-inch diameter, 0.010-inch slotted PVC screen at depths of 15 to 25 ft bgs. Each well was completed with approximately 17 feet of two-inch diameter PVC casing and a locking steel casing. The screened interval was selected in order to monitor groundwater conditions at depths similar to that intersected by nearby shallow water supply wells. The filter pack for each monitoring well consisted of a mix of artificial sand and natural sand pack as a result of “running sands” entering the annular space. The filter pack for each monitoring well was extended approximately two feet above the well screen. A two-foot bentonite seal was installed above the sand pack, and the remaining annular space was filled to the ground surface with a bentonite/cement grout mixture. Well completion diagrams are included in Appendix B. Well construction data are summarized on Table 2.

Drill cuttings were spread around each area of drilling. Mud rotary boreholes were abandoned after completion by backfilling to ground surface with a bentonite/cement grout mixture. Following installation, each well was developed by surging and pumping using a submersible pump until the development water was clear and no longer visually turbid. Development water was discharged to the ground surface in the vicinity of each well.

5.2 SOIL SAMPLING

Geotechnical Soil Sampling

Shelby tube samples were collected from borings B-1, B-1B, B-2, and B-3. Borings B-2 and B-3 were located in the presumed downgradient portion of the Site. One Shelby tube sample was collected at 0.5 to 2.5 ft bgs from boring B-1B, located approximately 10 feet west of boring B-1. One Shelby tube was collected at 20 to 22 ft bgs from boring B-1 and at 18 to 20 ft bgs from borings B-2 and B-3. A bulk sample of drill cuttings was also obtained from the borings at a similar depth as the Shelby tube samples. Four Shelby tube samples and bulk samples were submitted for laboratory analysis of permeability, specific gravity, grain size analysis, Atterberg limits, moisture content, unit weight, total organic carbon, and classification by the Unified Soil Classification System (USCS). Results are discussed in Section 6.0.

Chemical Soil Sampling

Soil samples were collected for chemical analyses using a split spoon samples at a depth of 20 to 22 ft bgs in boring B-1, 23 to 25 ft bgs in boring B-2, and 20 to 22 ft bgs in boring B-3. Each soil sample was placed in a clean stainless steel bowl and thoroughly homogenized before placement in a soil jar. One duplicate sample was collected for laboratory analysis from boring B-1. Four soil samples were submitted for laboratory analysis of selected metals (silver, arsenic, cadmium, chromium, lead, selenium, thallium, vanadium, aluminum, barium, beryllium, boron, calcium, copper, iron, potassium, magnesium, manganese, sodium, nickel, and zinc), and major cations and anions (total phosphorus, chloride, sulfate, fluoride, nitrate, and bromide). Results are discussed in Section 6.0.

5.3 WELL SURVEY AND WATER LEVELS

Following installation of the wells, their locations and elevations were surveyed to the nearest 0.1 foot by Hassell & Folkes, P.C. The surveyors tied the elevation data to the existing Site survey used for development of Site plans for the proposed golf course.

On August 1, 2001, water levels were measured in each of the five wells prior to groundwater sampling. Water levels were measured from the top of the PVC casing, to the nearest 0.01 foot, in each monitoring well using an electronic water-level indicator. Water level and elevation data are summarized in Table 2.

5.4 GROUNDWATER SAMPLING

Groundwater samples were collected on August 1, 2001. Samples were collected from MW-1, MW-2, and MW-3. These three wells are located in the center and downgradient portions of the Site and at the same locations that were sampled for soil analysis (B-1, B-2, and B-3). The monitoring wells were purged and sampled using disposable, Teflon® bailers. Three well volumes (including the well casing and filterpack) were purged from each well. Stabilization within 0.1 standard units (SU) for pH and 3% for specific conductance was achieved prior to sampling.

Because field measurements of turbidity exceeded the field criteria of 5 nephelometric turbidity units (NTU), samples for metals analysis were filtered in the field through a 0.45 micron filter and then properly preserved. Samples were placed in an ice-filled cooler for shipment to the laboratory. Samples were submitted for analysis of selected metals (silver, arsenic, cadmium, chromium, lead, selenium, thallium, vanadium, aluminum, barium, beryllium, boron, calcium, copper, iron, potassium, magnesium, manganese, sodium, nickel, and zinc), major cations and anions (total phosphorus, chloride, sulfate, fluoride, nitrate, and bromide). Results are presented and discussed in Section 6.0.

5.5 AQUIFER CHARACTERIZATION

Aquifer testing consisted of both falling head and rising head slug tests in monitoring wells MW-2 and MW-4. The slug tests were conducted to determine an estimate of the hydraulic conductivity of the aquifer near the well.

To conduct the test, the static water level of each well was measured using an electronic water-level indicator. A pressure transducer and data logger (Troll) was then placed in the well and the static water level was allowed to recover. The Troll was connected to a laptop computer to record the start and end of each test. A slug, consisting of a sand-filled PVC pipe connected to a length of rope, was first dropped into the wells resulting in a rapid displacement of water. Falling water levels were then recorded as the well returned to static conditions.

The slug was then removed from the well resulting in rapid displacement of water downward. Rising water levels were then recorded as the well returned to static conditions. Data collected from the falling head and rising head tests for each well are presented in Appendix C and results are discussed in Section 6.0.

6.0 RESULTS OF FIELD INVESTIGATION

Field investigations were performed to ascertain information on Site geology, hydrogeology, soil and groundwater chemistry, soil physical properties, and aquifer characteristics.

6.1 SITE GEOLOGY AND HYDROGEOLOGY

The results of the field investigation and geotechnical testing of the soil indicate the presence of the Columbia Group and the Yorktown Formation (top of the Yorktown confining unit). Soil geotechnical results are summarized in Table 3 and presented in Appendix D.

Columbia Group - Shallow soils at the Site consist of dark olive brown to black-gray fine sandy silts and clays ranging in depths from 0 to 5.5 ft bgs. Geotechnical laboratory results indicate that the soil sample collected from boring B-1 from 0.5 to 2.5 ft bgs was classified as lean clay (CL). The porosity for this soil sample was reported at 38.2 percent and total organic carbon was reported at 0.3 percent. Vertical permeability testing conducted on an undisturbed soil sample was reported as 8.2×10^{-7} centimeters per second (cm/sec).

From approximately 5.5 to 25 ft bgs in four borings and to 43 ft bgs in one boring, soils consisted of gray to dark gray and greenish gray medium to fine sand. Geotechnical laboratory results indicate that soil samples from three borings (B-1, B-2, and B-3) at depths ranging from 18 to 25 feet bgs were classified as poorly graded sands and silty sands (SP to SM). Silt and clay lenses were observed approximately 24 to 25 ft bgs in the upgradient borings (B-4 and B-5). Porosity values for the three samples ranged from 40.7 to 41.7 percent and total organic carbon results ranged from 0.2 to 0.3 percent. Vertical permeability testing was conducted on remolded bulk samples (remolded to the undisturbed density and moisture content) and results ranged from 2.4×10^{-3} to 3.0×10^{-3} cm/sec.

Yorktown Formation (top of the Yorktown confining unit) - From approximately 43 ft to 50 ft bgs in boring B-1, soils were described as dark greenish gray, fine sandy silts with some clay. Based upon visual classification the soils are described as silts (ML), very fine sands (SP), and clays (CL).

A subsurface investigation was also completed by McCallum Testing Laboratories, Inc., (McCallum) and was provided to URS by Combustion Products Management (CPM). It is our understanding that CPM will be responsible for placement of fly ash at the Site. McCallum collected samples from 12 borings advanced to 25.5 ft bgs throughout the subject property. A copy of the McCallum Report is included as Appendix E.

McCallum collected continuous samples by split spoon to 10 ft bgs, and every five feet thereafter. Samples were visually examined and classified by laboratory personnel. Their report presents boring logs and generalized cross-sections traversing the Site in a generally east-west direction. The cross-sections indicate fine silty sands and clays ranging from ground surface to a depth between 4 and 6 ft bgs, followed by fine to medium sands to boring termination. There appear to be lenses of silty and clayey sands at varying depths throughout the Site, with peat and clay observed at 22 to 25.5 ft bgs in two borings. The findings from their report are generally consistent with stratigraphic conditions observed during this field investigation.

Site Hydrogeology

During drilling, groundwater and wet soil conditions were observed directly below the shallow clayey layer, at an approximate depth of 5 to 6 ft bgs. Water levels were measured in the five monitoring wells on August 1, 2001. Water level data and survey information are summarized in Table 2. Based on groundwater elevations measured on August 1, 2001, the hydraulic gradient between upgradient well MW-5 and downgradient well MW-3 is 0.0016 (unitless). The groundwater elevations were utilized to generate a groundwater contour map (Figure 4). The results indicate that groundwater flows in an east to southeasterly direction.

6.2 SOIL ANALYTICAL RESULTS

Four soil samples were submitted to the North Canton, Ohio location of Severn Trent Laboratories. Samples were analyzed using USEPA SW-846 Methods or Methods of Chemical Analysis of Water and Waste (MCAWW). Soil chemical results are summarized in Table 4 and Laboratory Analytical Data Packages are presented in Appendix F. The following analytes were detected in soil samples submitted for this study; arsenic, chromium, lead, selenium, vanadium, aluminum, barium, beryllium, calcium, iron, manganese, zinc, chloride, sulfate, and phosphorous. These data will be used as representative of Site conditions for the groundwater modeling and risk assessment portions of the study.

6.3 GROUNDWATER RESULTS

Four groundwater samples were submitted to the North Canton, Ohio location of Severn Trent Laboratories. Samples were analyzed using USEPA SW-846 Methods or MCAWW.

Groundwater chemical results are summarized in Table 5 and Laboratory Analytical Data Packages are presented in Appendix F. The following analytes were detected in groundwater samples submitted for this study; calcium, iron, potassium, magnesium, manganese, and sodium.

In addition, reportable concentrations of bicarbonate alkalinity, alkalinity, chloride, sulfate, total dissolved solids and total organic carbon were detected. These data will be used as representative of Site conditions for the groundwater modeling and risk assessment portions of the study.

6.4 QUALITY ASSURANCE/QUALITY CONTROL SUMMARY

Soil Results

A field duplicate soil sample (B-1A Dup) was collected to provide a measure of accuracy and precision for laboratory analysis. The results of the duplicate indicate that the relative percent differences (RPD) in the results for sample B-1A and its associated duplicate sample, B-1A Dup were within control limits (20 percent) except for analysis of chloride. The RPD value observed outside of the control limits is likely a result of sample heterogeneity based on the results of the laboratory QA/QC, which indicated instrument and analytical performance within specified criteria. No action was necessary based on these results.

A review of the laboratory QA/QC indicates the following:

- The temperature of the cooler upon sample receipt was 11.7°C; however, it was noted that the temperature blank was not located proximal to the ice in the cooler.
- Targeted constituents were not detected in the laboratory method blank samples.
- Laboratory control sample recoveries and relative percent differences (RPDs) were within the limits specified by the laboratory.
- Matrix spike and matrix spike duplicate recoveries were within the limits specified by the laboratory, except for aluminum, iron and phosphorous. The QA/QC anomalies for aluminum and phosphorous are likely the result of matrix heterogeneity. Iron QA/QC anomalies are attributed to high natural iron levels in the soil.

Groundwater Results

A field duplicate groundwater sample (MW-NE 2 Dup) was collected to provide a measure of accuracy and precision for laboratory analysis. Results of the field QA/QC

indicate the RPD in the results for sample MW-2 and its associated duplicate sample, MW-2 Dup were within control limits (20 percent).

A review of the laboratory QA/QC indicates the following:

- Targeted constituents were not detected in the laboratory method blank.
- Laboratory control sample recoveries were within the limits specified by the laboratory.
- Matrix spike and matrix spike duplicate recoveries were within the limits specified by the laboratory; except for sulfate in the duplicate sample. The QA/QC anomaly for sulfate is likely the result of matrix interferences attributed to elevated sulfate levels in the groundwater samples.

6.5 AQUIFER TEST ANALYSIS

Data from slug testing was reduced and imported into AQTESOLV (version 2.5) to calculate aquifer characteristics.

The Bouwer-Rice solution method for a slug test was used to determine hydraulic conductivity (K) values for both the rising head and falling head tests. Hydraulic conductivity values for rising head slug test analysis for MW-2 and MW-4 are 1.1×10^{-3} and 2.6×10^{-3} cm/sec, respectively. Hydraulic conductivity values for falling head slug test analysis for MW-2 and MW-4 are 8.5×10^{-4} and 2.6×10^{-3} cm/sec, respectively. Slug test data are presented in Appendix C. Note that URS used late-time data in our analysis to minimize potential impacts of the sandpack and well construction.

To estimate groundwater flow velocity using the slug test results, Darcy's equation was used:

$$V = \frac{K i}{N_e}$$

Where:

- V = Velocity
- K = Hydraulic Conductivity (cm/sec)
- i = Hydraulic Gradient (unitless; based on site specific data, this report)
- N_e = Effective Porosity (40%; based on site specific data, this report)

Substituting Site maximum conductivity values yields:

$$V = \frac{(2.6 \times 10^{-3})(0.0016)}{(0.30)}$$

$$V = 1.4 \times 10^{-5} \text{ cm/sec or } 14.49 \text{ ft/yr}$$

Substituting minimum conductivity values yields:

$$V = \frac{(8.5 \times 10^{-4})(0.0016)}{(0.30)}$$

$$V = 4.5 \times 10^{-6} \text{ cm/sec or } 4.66 \text{ ft/yr}$$

Therefore, groundwater flow velocity beneath the Site is in the range of 4.7 to 14.5 feet per year. This velocity is representative of the flow of groundwater and does not reflect the rate of chemical migration which is dependent on factors that will be addressed in the groundwater modeling and risk assessment report.

7.0 CONCLUSIONS

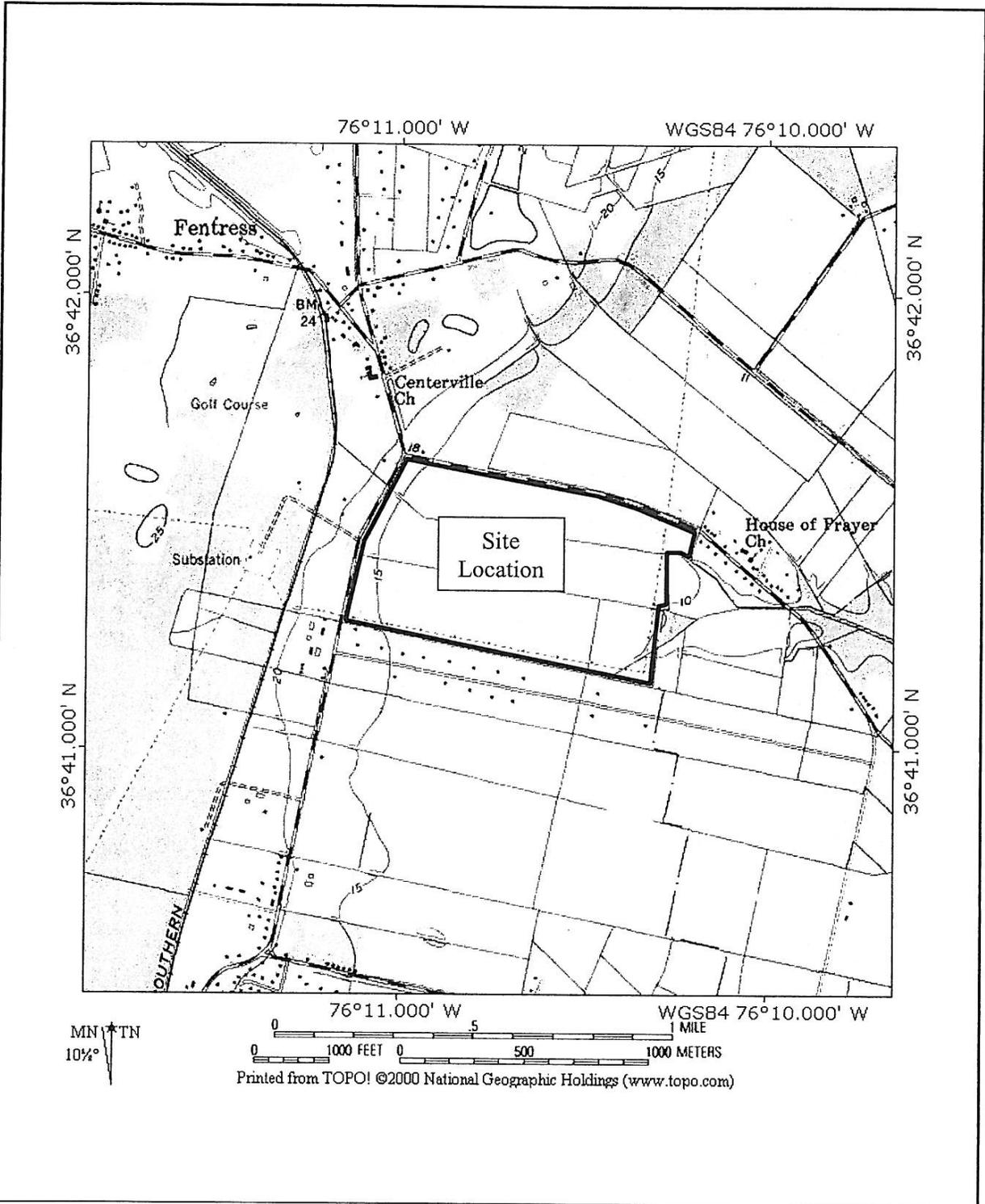
- Geologic conditions beneath the Site consist of the Tabb Formation (or Columbia Group), a fining-upward sequence of sediments composed of fine to coarse, gray sand with pebbles and cobbles grading upward into clayey and silty, fine sand and sandy silt. The Columbia Group is underlain at approximately 50 ft bgs by the Yorktown Formation, which consists of an upper clay-rich unit and a lower sandy unit.
- Hydrogeologic conditions beneath the Site consist of an upper, unconfined water-table aquifer in the Tabb Formation bounded below by the upper Yorktown confining unit. The upper Yorktown confining unit is underlain by a confined aquifer within the Yorktown Formation.
- A total of 17 private, domestic water supply wells were identified in the immediate Site area. Wells derive their water from both the upper water table and lower confined aquifers.
- Groundwater is present at approximately 2 to 5 ft bgs and flows in an east-southeasterly direction.
- Soil geotechnical analyses indicate that the upper portion of the Columbia Group is clay with a vertical hydraulic conductivity of 8.2×10^{-7} cm/sec and a porosity of 38.2%. The lower portion of the Columbia Group is a sand with vertical hydraulic conductivity values ranging from 2.4×10^{-3} to 3.0×10^{-3} cm/sec, and a porosity of 40.7 to 41.1 percent.
- Aquifer slug testing and analysis indicates that horizontal hydraulic conductivity values range from 2.6×10^{-3} to 8.5×10^{-4} cm/sec. Groundwater flow velocity ranges from 4.7 to 14.5 ft/yr.

- Soil and groundwater chemical results are within acceptable QA/QC limits and will be used in the groundwater modeling and risk assessment portions of the study.

8.0 REFERENCES

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FIGURES



Boundaries are approximate.

Reference: USGS 7.5 minute Quadrangle
Fentress, VA. 1982 Revised 1986

Figure 1
Site Location Map
Chesapeake Energy Center
Proposed Golf Course Project
Chesapeake, Virginia

July 2001



PIEDMONT PHYSIOGRAPHIC PROVINCE
 COASTAL PLAIN PHYSIOGRAPHIC PROVINCE

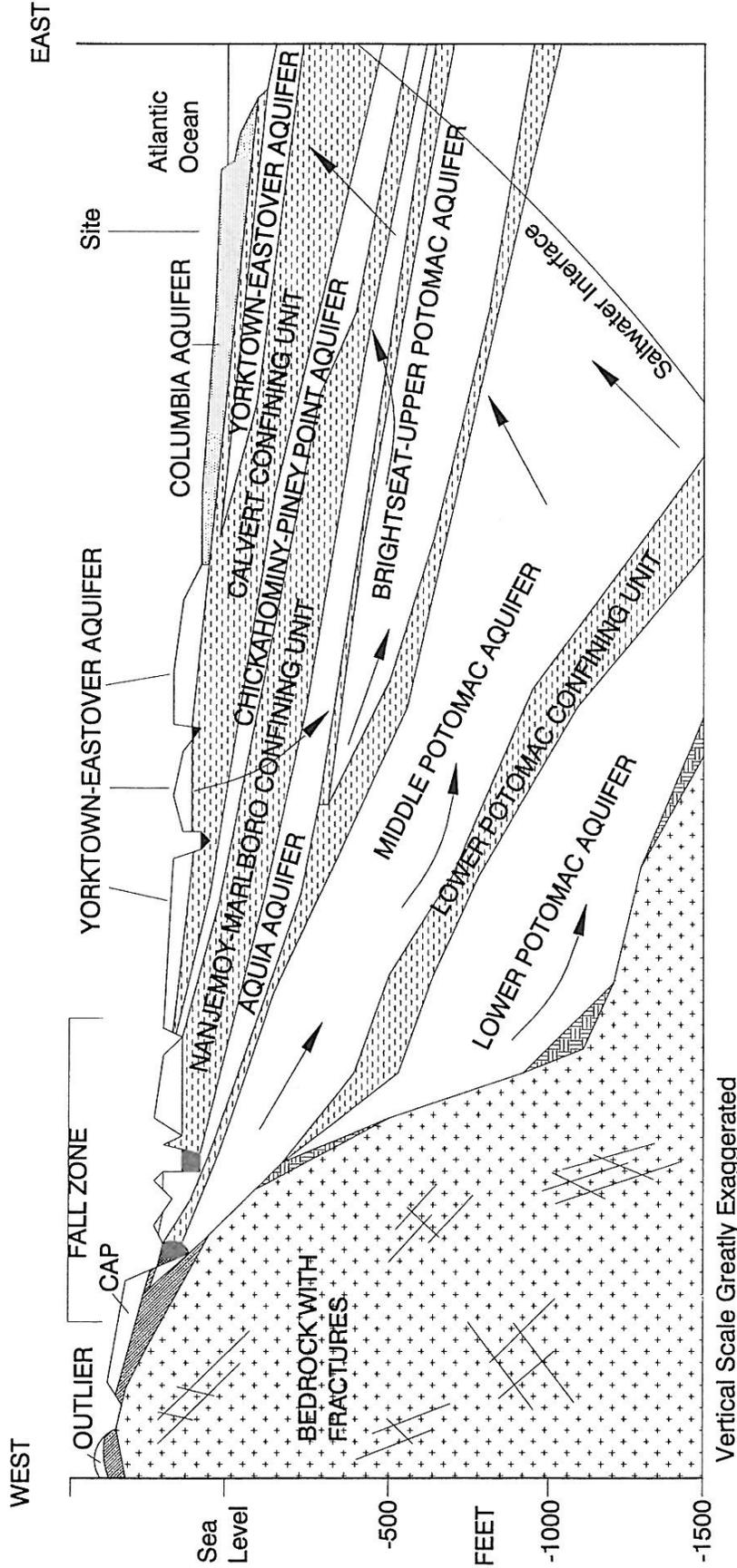


FIGURE 2

GENERALIZED HYDROGEOLOGIC
 CROSS SECTION

| | |
|----------------|--------------|
| DATE: | DRAWN BY: |
| SEPTEMBER 2001 | DMG |
| JOB NUMBER: | FILE NAME: |
| 49-498-001-155 | AQUIFERS.DWG |

URS
 5640 FALLMOUTH FT. DRIVE 201
 EXETER, VA 23020
 PHONE: 804-986-9000
 FAX: 804-986-9764

- BEDROCK WITH FRACTURES
- SAPROLITE
- CONFINING UNITS
- COLUMBIA AQUIFER
- GROUNDWATER FLOW DIRECTION
- FRACTURES

REFERENCE: McFarland, 1999

Whittamore Rd.

Centerville Turnpike

B-5/MW-5

APPROX LIMITS OF PROPOSED ASH/FILL (TYP)

APPROX OF PR ASH F (TYP)

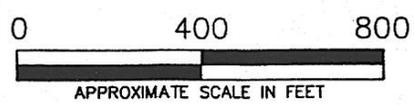
B-1/MW-1
B-1A, B-1B

B-4/MW-4

PROP. FUTURE WATER BODIES

EXISTING 120' VIRGINIA POWER EASEMENT

Murray Road



Base drawing

TABLES

TABLE 1
 LOCAL WATER SUPPLY WELL SUMMARY
 CHESAPEAKE ENERGY CENTER
 PROPOSED GOLF COURSE
 CHESAPEAKE, VIRGINIA

| Property Owner | Property Address | Date Drilled | Total Well Depth (ft bgs) | Yield (gpm) | Water Zones (ft bgs) | Screened Zone (ft bgs) | Static Water Level (ft bgs) | Stabilized Water Level (ft bgs) | Driller | Rock Type |
|---------------------|----------------------|--------------|---------------------------|-------------|----------------------|------------------------|-----------------------------|---------------------------------|-------------------------------|--|
| Willie L. Phillips | 1405 Whittemore Road | Aug-95 | 55 | 10 | 30-55 | 30-55 | 12 | na | Willets Well Drilling Service | 0-2 top soil |
| | | | | | | | | na | | 2-10 clay |
| | | | | | | | | na | | 10-30 sugar sand 30-55 coarse sand |
| Willie L. Phillips | 1405 Whittemore Road | Aug-95 | 41 | 10 | 20-41 | 20-41 | 12 | na | Willets Well Drilling Service | 0-2 top soil |
| | | | | | | | | na | | 2-8 clay |
| | | | | | | | | na | | 8-20 sugar sand 20-41 coarse sand |
| Willie L. Phillips | 1405 Whittemore Road | Aug-95 | 55 | 10 | 30-55 | 40-55 | 12 | na | Willets Well Drilling Service | 0-2 top soil |
| | | | | | | | | na | | 2-10 clay |
| | | | | | | | | na | | 10-30 sugar sand 30-55 coarse sand |
| Michael D. Clifton | 1104 Murray Road | Mar-96 | 122 | 18 | 85-90 112-122 | 107-122 | 8 | 10 | Gildersleeve Pump & Well | 0-11 gray clay |
| | | | | | | | | 10 | | 11-42 gray sand |
| | | | | | | | | 10 | | 42-65 gray sand/clay/shell 65-85 gray clay/shell 85-90 gray sand 90-115 gray clay 113-122 fine shell |
| John C. Munday, Jr. | 1204 Murray Road | Sep-86 | 80 | 12 | 7-45 65-80 | 67-80 | 8 | 10 | Johnson Well Drilling | 0-7 clay |
| | | | | | | | | 10 | | 7-45 gray sand |
| | | | | | | | | 10 | | 45-65 clay 65-80 gray sand |
| Paul J. Romeo | 1208 Murray Road | Jan-96 | 50 | 25 | 40-50 | 40-50 | 7 | 12 | Saunders | 0-10 clay |
| | | | | | | | | 12 | | 10-20 sand clay |
| | | | | | | | | 12 | | 20-30 clay 30-40 clay, bedrock 40-50 bedrock 0-10 clay silt sand |
| Joseph E. Diaz, Jr. | 1215 Murray Road | Aug-90 | 43 | 25 | 20-25 35-43 | 38-43 | 5 | 16 | Saunders | 10-20 sand |
| | | | | | | | | 16 | | 20-25 bedrock |
| | | | | | | | | 16 | | 25-35 clay silt 35-43 bedrock |

TABLE 1 (continued)

| Property Owner | Property Address | Date Drilled | Total Well Depth (ft bgs) | Yield (gpm) | Water Zones (ft bgs) | Screened Zone (ft bgs) | Static Water Level (ft bgs) | Stabilized Water Level (ft bgs) | Driller | Rock Type |
|-----------------------|------------------|--------------|---------------------------|-------------|--------------------------|------------------------|-----------------------------|---------------------------------|--------------------------------|---|
| Jesse C. Whitley, Jr. | 1305 Murray Road | Nov-86 | 42 | 25 | 20-42 | 32-42 | 8 | 10 | Pinkston Pump & Well | 0-12 top soil, clay & sand 12-20 fine sand 20-42 coarse sand & gravel top soil heavy sand gray sand clay clay shell 70-80 sand shell |
| Gerald T. Kanter | 1313 Murray Road | Dec-94 | 80 | 20 | 70-80 | 50-80 | 15 | 15 | Virginia Well Service | 0-10 clay 10-20 sand 20-70 clay 70-80 shell |
| " | " | Dec-94 | 80 | 20 | 70-80 | 60-80 | 15 | 16 | Virginia Well Service | |
| Michael D. Hall | 1317 Murray Road | Feb-94 | 48 | 25 | 43-48 | 40-48 | 9 | na | Pinkston Well ? | 0-11 top soil and clay 11-26 sand 26-36 mud 36-48 sand 0-8 clay 8-15 sand |
| Donald L. Froehler | 1325 Murray Road | Jul-98 | 32 | 15 | 25-32 | 25-32 | 12 | 16 | Chesapeake Well & Pump Service | 15-21 clay 21-32 sand 0-5 top soil, clay 5-15 clay 15-25 fine gray sand 25-40 black clay 40-50 coarse gray sand 50-70 fine sand and clay 70-130 shell + fine salt and pepper sand |
| Terry E. Jackson | 1316 Murray Road | Jun-86 | 130 | 20 | 15-25 40-50 70-130 | 70-130 | 8 | 15 | L.E. Stillman | |

TABLE 1 (continued)

| Property Owner | Property Address | Date Drilled | Total Well Depth (ft bgs) | Yield (gpm) | Water Zones (ft bgs) | Screened Zone (ft bgs) | Static Water Level (ft bgs) | Stabilized Water Level (ft bgs) | Driller | Rock Type |
|------------------|-------------------|--------------|---------------------------|-------------|----------------------|------------------------|-----------------------------|---------------------------------|-----------------------------------|--|
| William N. Deck | 1320 Murray Road | Jun-87 | 80 | 18 | 26-32 65-80 | 65-80 | 9 | 25 | T. E. Gildersleeve Pump & Well | 0-6 brown clay 6-14 fine sand and gray clay 14-18 gray clay 18-24 fine gray sand 24-32 coarse gray sand 32-38 coarse gray sand, clay breaks 38-55 gray clay 55-65 fine gray silt and clay 65-80 fine gray sand and shell 0-10 clay silt sand |
| Hank R. Chitwood | 1324 Murray Road | Jul-87 | 90 | 10 | 40-45 85-90 | 85-90 | 8 | 16 | Joe Saunders Well Drilling | 10-20 clay 20-30 clay silt sand 30-40 silty sand 40-45 bedrock 45-55 clay silt 55-65 silt clay 65-75 clay 75-85 silt clay 85-90 bedrock |
| Brian R. Lomax | 1328 Murray Road | 1993 | 45 | 20 | 40-45 | 35-45 | 4 | 23 | Joe Saunders Well Drilling | 0-10 clay silt sand 10-20 silt sand 20-25 clay silt sand 25-35 bedrock silt sand 35-45 bedrock 0-10 clay silt sand |
| | 1379 Murray Drive | 8/19/1994 | 53 | 20 | 45-53 | 42-53 | 9 | 23 | Joe Saunders Well Drilling | 10-20 silt sand 20-30 bedrock 30-40 clay 40-50 bedrock 50-53 bedrock |

| Total Depth | |
|-------------|-------------|
| (ft bgs) | Yield (gpm) |
| Maximum | 130 |
| Minimum | 32 |
| Average | 66 |
| Median | 55 |
| Mode | 80 |

ft bgs - feet below ground surface
gpm - gallons per minute

Statistics

TABLE 2
SUMMARY OF WELL CONSTRUCTION DATA
CHESAPEAKE, VIRGINIA
PROPOSED GOLF COURSE
CHESAPEAKE, VIRGINIA

| Monitoring Well ID | Ground Surface Elevation (ft MSL) | Top of Casing Elevation (ft MSL) | Depth to Bentonite (ft bgs) | Depth to Top of Sand (ft bgs) | Depth to Bottom of Well (ft bgs) | Depth to Groundwater (ft BTOC) | Groundwater Elevation (ft MSL) |
|--------------------|-----------------------------------|----------------------------------|-----------------------------|-------------------------------|----------------------------------|--------------------------------|--------------------------------|
| MW-1 | 9.90 | 13.16 | 11 | 13 | 25 | 6.18 | 6.98 |
| MW-2 | 9.86 | 13.11 | 11 | 13 | 25 | 6.80 | 6.31 |
| MW-3 | 9.71 | 12.75 | 11 | 13 | 25 | 7.67 | 5.08 |
| MW-4 | 11.13 | 14.09 | 11 | 13 | 25 | 5.70 | 8.39 |
| MW-5 | 10.53 | 13.23 | 11 | 13 | 25 | 4.63 | 8.60 |

Notes:

Monitoring well locations and elevations provided by Hassell & Folkes, P.C.
ft MSL feet above mean sea level
ft bgs feet below ground surface
ft BTOC feet below top of PVC casing
ID identification

TABLE 3
SUMMARY OF GEOTECHNICAL RESULTS
CHESAPEAKE ENERGY CENTER
PROPOSED GOLF COURSE
CHESAPEAKE, VIRGINIA

| Boring No. | Depth (ft) | Moisture Content (%) | Atterberg Limit ¹ | | | Grain Size Analysis ² | | | | USCS ³ | Specific Gravity | Unit Wt. (lbs/cu ft) | | Porosity (%) | Total Organic Carbon (%) | Permeability (cm/sec) |
|------------|------------|----------------------|------------------------------|----|----|----------------------------------|----------|----------|----------|-------------------|------------------|----------------------|-------|--------------|--------------------------|-----------------------|
| | | | LL | PL | PI | Gravel (%) | Sand (%) | Silt (%) | Clay (%) | | | Wet | Dry | | | |
| B-1B | 0.5-2.5 | 23.6 | 40 | 20 | 20 | 0 | 7 | 65 | 28 | CL | 2.66 | 126.90 | 102.7 | 38.2 | 0.3 | 8.2×10^{-7} |
| B-1 | 20-22 | 22.2 | NP | NP | NP | 0 | 96 | 3 | 1 | SP | 2.68 | 119.30 | 97.6 | 41.7 | 0.2 | 2.8×10^{-3} |
| B-2 | 18-20 | 22.1 | NP | NP | NP | 0 | 90 | 7 | 3 | SP-SM | 2.68 | 121.10 | 99.2 | 40.7 | 0.3 | 3.0×10^{-3} |
| B-3 | 18-20 | 19.7 | NP | NP | NP | 0 | 95 | 4 | 1 | SP | 2.67 | 117.40 | 98.1 | 41.1 | 0.3 | 2.4×10^{-3} |

Notes

(1) Atterberg Limits:

LL: Liquid Limit

PL: Plasticity Limit

PI: Plasticity Index (PI = LL - PL)

NP: Nonplastic

(2) Grain Size Analysis:

Gravel: Particles of rock that are retained on a 4.75 mm (No. 4) sieve

Sand: Particles that will pass a 4.75 mm sieve, but are retained on a 0.075 mm (no.200) sieve

(3) USCS: Unified Soil Classification System

%

ft

Wt.

lbs/cu ft

pounds per cubic foot

cm/sec

centimeters per second

Table 4
Soil Analytical Results
Chesapeake Energy Center
Proposed Golf Course
Chesapeake, Virginia

| Sample ID | | | B-1A | B-1A Dup. | B-2 | B-3 | B-1B |
|---------------------------|---------|-----------|-----------|-----------|-----------|-----------|-----------|
| Sample Depth (ft) | | | 20-22 | 20-22 | 23-25 | 20-22 | 0.5-2.5 |
| Date Sampled | | | 7/24/2001 | 7/24/2001 | 7/25/2001 | 7/25/2001 | 7/25/2001 |
| Parameter | Units | Method | | | | | |
| Metals | | | | | | | |
| Aluminum | mg/kg | 6010B | 337 | 403 | 287 | 428 | 6860 |
| Arsenic | mg/kg | 6010B | 1.7 | 1.9 | 0.86 B | 0.99 B | 1.7 |
| Barium | mg/kg | 6010B | <20.0 | <20.0 | <20.0 | <20.0 | 41.7 |
| Beryllium | mg/kg | 6010B | <0.50 | <0.50 | <0.50 | <0.50 | 0.54 |
| Boron | mg/kg | 6010B | <20.0 | <20.0 | <20.0 | <20.0 | <20.0 |
| Cadmium | mg/kg | 6010B | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| Calcium | mg/kg | 6010B | <500 | <500 | <500 | <500 | 1230 |
| Chromium | mg/kg | 6010B | 1.3 | 1.5 | 1.5 | 1.6 | 7.9 |
| Copper | mg/kg | 6010B | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 |
| Iron | mg/kg | 6010B | 1640 | 1970 | 1360 | 1250 | 2800 |
| Lead | mg/kg | 6010B | 0.69 | 0.71 | 0.48 | 0.59 | 5.1 |
| Magnesium | mg/kg | 6010B | <500 | <500 | <500 | <500 | <500 |
| Manganese | mg/kg | 6010B | 12.8 | 14.9 | 11.3 | 11.2 | 27.1 |
| Mercury | mg/kg | 7471A | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Nickel | mg/kg | 6010B | <4.0 | <4.0 | <4.0 | <4.0 | <4.0 |
| Potassium | mg/kg | 6010B | <500 | <500 | <500 | <500 | <500 L |
| Selenium | mg/kg | 6010B | <0.50 | <0.50 | <0.50 | <0.50 | 0.64 |
| Silver | mg/kg | 6010B | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Sodium | mg/kg | 6010B | <500 | <500 | <500 | <500 | <500 |
| Thallium | mg/kg | 6010B | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Vanadium | mg/kg | 6010B | <5.0 | <5.0 | <5.0 | <5.0 | 8.5 |
| Zinc | mg/kg | 6010B | 2.9 | 3.2 | 6.8 | 16.6 | 3.9 L |
| Inorganic Analysis | | | | | | | |
| Bromide | mg/kg | 300.0A | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Chloride | mg/kg | 300.0A | 34.5 | 10.6 | 27.3 | 21.1 | 17.7 |
| Fluoride | mg/kg | 300.0A | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| Nitrate as N | mg/kg | 300.0A | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Sulfate | mg/kg | 300.0A | 42.5 | 43.0 | 43.4 | 40.4 | 21.7 |
| Total Phosphorus | mg/kg | 365.2 | <10 | <10 | <10 | 21 | 120 |
| Total Residue | % Solid | 160.3 mod | 79.3 | 81.7 | 81.8 | 78.6 | 79.5 |

Notes:

* = Data is presented in mg/kg.

B = Estimated result. Result less than RL.

L = Serial dilution of a digestate in the analytical batch indicates that physical and chemical interferences are present.

RL = Reporting Limit

Table 5
Groundwater Analytical Results
Chesapeake Energy Center
Proposed Golf Course
Chesapeake, Virginia

| Sample ID | | | MW-1 | MW-2 | MW-2 | MW-3 |
|---------------------------|-------|--------|----------|----------|-----------|----------|
| Date Sampled | | | 8/1/2001 | 8/1/2001 | Duplicate | 8/1/2001 |
| Parameter | Units | Method | | | 8/1/2001 | 8/1/2001 |
| Dissolved Metals | | | | | | |
| Aluminum | ug/L | 6010B | <200 | <200 | <200 | <200 |
| Arsenic | ug/L | 6010B | <10.0 | <10.0 | <10.0 | <10.0 |
| Barium | ug/L | 6010B | <200 | <200 | <200 | <200 |
| Beryllium | ug/L | 6010B | <5.0 | <5.0 | <5.0 | <5.0 |
| Boron | ug/L | 6010B | <200 | <200 | <200 | <200 |
| Cadmium | ug/L | 6010B | <2.0 | <2.0 | <2.0 | <2.0 |
| Calcium | ug/L | 6010B | 92000 | 37800 | 38800 | 77300 |
| Chromium | ug/L | 6010B | <5.0 | <5.0 | <5.0 | <5.0 |
| Copper | ug/L | 6010B | <25.0 | <25.0 | <25.0 | <25.0 |
| Iron | ug/L | 6010B | 10200 | 4860 | 4750 | 4790 |
| Lead | ug/L | 6010B | <3.0 | <3.0 | <3.0 | <3.0 |
| Magnesium | ug/L | 6010B | 13200 | 18700 | 19100 | 15600 |
| Manganese | ug/L | 6010B | 339 | 237 | 242 | 160 |
| Mercury | ug/L | 7471A | <0.20 | <0.20 | <0.20 | <0.20 |
| Nickel | ug/L | 6010B | <40.0 | <40.0 | <40.0 | <40.0 |
| Potassium | ug/L | 6010B | <5000 | 8190 | 8340 | <5000 |
| Selenium | ug/L | 6010B | <5.0 | <5.0 | <5.0 | <5.0 |
| Silver | ug/L | 6010B | <5.0 | <5.0 | <5.0 | <5.0 |
| Sodium | ug/L | 6010B | 32400 | 34000 | 34700 | 48200 |
| Thallium | ug/L | 6010B | <10.0 | <10.0 | <10.0 | <10.0 |
| Vanadium | ug/L | 6010B | <7.0 | <7.0 | <7.0 | <7.0 |
| Zinc | ug/L | 6010B | <20.0 | <20.0 | <20.0 | <20.0 |
| Inorganic Analysis | | | | | | |
| Bicarbonate Alkalinity | mg/L | 310.1 | 130 | 75 | 75 | 160 |
| Alkalinity | mg/L | 310.1 | 130 | 75 | 9.7 | 160 |
| Bromide | ug/L | 300.0A | <500 | <500 | <500 | <500 |
| Chloride | ug/L | 300.0A | 74300 | 54000 | 54000 | 53300 |
| Fluoride | ug/L | 300.0A | <1000 | <1000 | <1000 | <1000 |
| Nitrate as N | ug/L | 300.0A | <100 | <100 | <100 | <100 |
| Sulfate | ug/L | 300.0A | 139000 | 103000 | 103000 | 112000 |
| Total Phosphorus | ug/L | 365.2 | 210 | 170 | 190 | 390 |
| Filterable Residue (TDS) | mg/L | 160.1 | 510 | 390 | 380 | 460 |
| Total Organic Carbon | mg/L | 415.1 | 3 | 2 | 2 | 6 |
| Field Analysis | | | | | | |
| pH | S.U. | | 7.04 | 5.82 | 5.82 | 6.25 |
| temperature | °C | | 18 | 17.8 | 17.8 | 16.2 |
| conductivity | uS | | 765 | 545 | 545 | 699 |
| dissolved oxygen | mg/L | | 1.4 | 1.78 | 1.78 | 1.88 |
| turbidity | NTU | | 68.1 | 89.2 | 89.2 | 62.9 |

Notes:

S.U. = standard units for pH

°C = Celsius

uS = microsiemens per square centimeter at 25 degrees Celsius

mg/L = milligrams per Liter

NTU = nephelometric turbidity units

APPENDIX A

**City of Chesapeake Health Department
Residential Water Supply Well Records**

1/17/96

B14
Lot 1A

CLASS III B well
drinking water

Commonwealth of Virginia
Uniform Water Well Completion Report

Owner Willie Phillips
Address 1401 Louis Drive
Chesapeake VA
Phone 343-7698
Location well at 1405 Whitmore Rd County _____
Tax Map ID M5062100400012
VDH Permit _____
VWCB Permit _____
VWCB ID 234-95-2035

Well Data

Drilling Method rotary Date Completed 8-12-95 Total Dept of Well 55 ft
Depth to Bedrock NA Yield 10 (GPM) Length of Test 1 hour
Static Water Level 12 Stabilized Water Level NA Natural Flow NA
Well Disinfected (Y/N) YES Disinfectant Used Chlorine Amount Used 1.991

10 ft. wellpoint

Casing
From _____ To 30 ft From _____ To _____ From _____ To _____
Size 1 1/4 Material PVC Size _____ Material _____ Size _____ Material _____
Weight/Schedule PR200 Weight/Schedule _____ Weight/Schedule _____

Gravel Pack
From _____ To 55 ft From _____ To _____ From _____ To _____

Grout
From _____ To 30 ft From _____ To _____ From _____ To _____
Bore Hole Size 1 3/4 Bore Hole Size _____ Bore Hole Size _____
Type neat cement Type _____ Type _____
Method pour pump Method _____ Method _____

Water zones or Screened Intervals
From _____ To _____ From _____ To _____ From _____ To _____
Mesh Size .00 Diam _____ Mesh Size _____ Diam _____ Mesh Size _____ Diam _____
From _____ To _____ From _____ To _____ From _____ To _____
Mesh Size _____ Diam _____ Mesh Size _____ Diam _____ Mesh Size _____ Diam _____

CLASS III B

Use Data

Private Well: Domestic _____ Agriculture _____ Industrial _____ Monitoring _____
Public Well: Community _____ Non Community _____

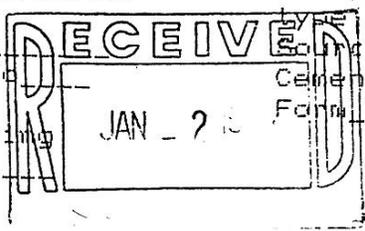
Abandonment Information

Bored or Dug Wells
Casing Removed, Y/N? _____
If Y Depth to which casing was removed _____
Depth and Type of Fill: _____

Wells other than Bored Wells
Casing removed Y/N? _____
If Y Depth to which casing was removed _____
If Applicable, depth(s), and type of gravel/sand fill: _____

Source of Fill: _____
Bentonite Plugs: From _____ To _____
From _____ To _____
Method of permanently marking location _____

Source of gravel or sand _____
Cement: From _____ to _____
From _____ to _____





DRILLERS LOG

| Depth | Description of Formation or Sediment | Remarks |
|-------|--------------------------------------|----------------------|
| 55 ft | 0-2 ft top soil | 55 ft. water bearing |
| | 2-10 ft clay | |
| | 10-30 ft sugar sand | |
| | 30-55 ft coarse sand | |

(Use additional sheets if necessary)

I certify that the information contained here is true and that this well was installed and constructed in accordance with the permit and further that the well complies with all applicable state and local regulations, ordinances and laws.

WILLETTS WELL DRILLING SERVICE
2121 CEDAR ROAD
CHESAPEAKE, VA 23323
(804)487 8755

DRILLERS SIGNATURE John H. Willetts
DATE 12-28-95 REPRESENTING WILLETTS WELL DRILLING SERVICE

Also MS 624
Lot 12

Commonwealth for Virginia
Uniform Water Well Completion Report

Owner Willie Phillips Tax Map ID M.50621004000012
Address 1401 Lewis Drive VDH Permit _____
Chesapeake VA WVCB Permit _____
Phone 543-7698 WVCB ID 234-95-2035
Location well was done at 1405 Whitamore Rd County Stafford

Well Data

Drilling Method rotary Date Completed 8-12-95 Total Depth of Well 41 ft
Depth to Bedrock NA Yield 10 (GPM) Length of Test 1 hour
Static Water Level 12 Stabilized Water Level NA Natural Flow NA
Well Disinfected (Y/N) yes Disinfectant Used Chlorine Amount Used 1 gal

10 ft. wellpoint

Casing
From _____ To 20 ft Form _____ To _____ From _____ To _____
Size 1 1/4 Material PVC Size _____ Material _____ Size _____ Material _____
Weight/Schedule PR200 Weight/Schedule _____ Weight/Schedule _____

Gravel Pack
From _____ To 41 ft From _____ To _____ From _____ To _____

Grout
From _____ To 20 ft From _____ To _____ From _____ To _____
Bore Hole Size 4 3/4 Bore Hole Size _____ Bore Hole Size _____
Type neat cement Type _____ Type _____
Method pour pump Method _____ Method _____

Water Zones or Screened Intervals
From _____ To _____ From _____ To _____ From _____ To _____
Mesh Size 10/10 Diam _____ Mesh Size _____ Diam _____ Mesh Size _____ Diam _____
From _____ To _____ From _____ To _____ From _____ To _____
Mesh Size _____ Diam _____ Mesh Size _____ Diam _____ Mesh Size _____ Diam _____

Use Data

Private Well: Domestic ~~Agriculture~~ ~~Industrial~~ ~~Monitoring~~
Public Well: Community _____ Non Community _____

Abandonment Information

Bored or Dug Wells
Casing Removed, Y/N? _____
If Y Depth to which casing was removed _____
Depth and Type of Fill: _____
Source of Fill: _____
Bentonite Plugs: From _____ To _____
From _____ To _____
Method of Permanently Marking Location _____

Wells other than Bored Wells
Casing Removed Y/N? _____
If Y Depth to which casing was removed _____
If Applicable, Depth(s), and type of gravel/sand fill: _____
Source of gravel or sand: _____
Cement: From _____ To _____
From _____ To _____

DRILLERS LOG

| Depth | Description of Formation or Sediment | Remarks |
|-------|--------------------------------------|------------------------|
| 41 ft | 0-2 ft top soil | |
| | 2-8 ft clay | |
| | 8-20 ft sugar sand | |
| | 20-41 ft coarse sand | ← water bearing 41 ft. |

(Use additional sheets if necessary)

I certify that the information contained here is true and that this well was installed and constructed in accordance with the permit and further that the well complies with all applicable state and local regulations, ordinances and laws.

WILLETTS WELL DRILLING SERVICE
2121 CEDAR ROAD
CHESAPEAKE, VA 23323
(304)487 8755

DRILLERS SIGNATURE John H. Willetts
DATE 8-15-95 REPRESENTING WILLETTS WELL DRILLING SERVICE

VIRGINIA CONTRACTORS LICENSE NUMBER 9506423 1995



MS 62A
GGO Blk 4
1/24/96 Lot 1B

Class III B
Well
drinking water

Commonwealth of Virginia
Uniform Water Well Completion Report

Owner Willie Phillips Tax Map ID M50621040006
Address 1401 Louis Drive VDH Permit _____
Chesapeake VA VWCB Permit _____
Phone 543-7698 VWCB ID 234-95-2035
Location well was at 1405 Whitmore Rd County _____

Well Data

Drilling Method rotary Date Completed 8-12-95 Total Dept of Well 55 ft
Depth to Bedrock N/A Yield 10 (GPM) Length of Test 1 hour
Static Water Level 12 Stabilized Water Level N/A Natural Flow N/A
Well Disinfected (Y/N) YES Disinfectant Used Chlorine Amount Used 1991

15 ft. wellpoint

Casing
From 0ft To 55 ft From _____ To _____
Size _____ Material _____ Size _____ Material _____
Weight/Schedule _____ Weight/Schedule _____ Weight/Schedule _____

Gravel Pack
From 40ft To 55 ft From _____ To _____

Grout
From 0ft To 40ft From _____ To _____
Bore Hole Size 4 3/4 Bore Hole Size _____
Type neat cement Type _____
Method pour pump Method _____

Water Zones or Screened Intervals
From _____ To _____ From _____ To _____ From _____ To _____
Mesh Size 0.10 Diam _____ Mesh Size _____ Diam _____ Mesh Size _____ Diam _____
From _____ To _____ From _____ To _____ From _____ To _____
Mesh Size _____ Diam _____ Mesh Size _____ Diam _____ Mesh Size _____ Diam _____

Class III B

Use Data

Private Well: Domestic Agriculture _____ Industrial _____ Monitoring _____
Public Well: Community _____ Non Community _____

Abandonment Information

Bored or Dug Wells
Casing Removed, Y/N? _____
If Y Depth to which casing
was removed _____
Depth and Type of Fill: _____

Source of Fill: _____
Bentonite Plugs: From _____ To _____
From _____ To _____

Method of permanently marking
location N/A could not find old

Wells other than Bored Wells
Casing removed Y/N? _____
If Y Depth to which casing
was removed _____
If Applicable, depth(s), and
type of gravel/sand fill: _____
Source of gravel or sand _____
Cement: From _____ to _____
Form _____ to _____

DRILLERS LOG

| Depth | Description of Formation or Sediment | Remarks |
|-------|--|--------------------|
| 55ft | 0-2ft Top soil 2-10ft clay 10-30ft sugar sand 30-55ft coarse sand | 55ft water bearing |



(Use additional sheets if necessary)

I certify that the information contained here is true and that this well was installed and constructed in accordance with the permit and further that the well complies with all applicable state and local regulations, ordinances and laws.

WILLETTS WELL DRILLING SERVICE
2121 CEDAR ROAD
CHESAPEAKE, VA 23323
(804)487 8755

DRILLERS SIGNATURE John H. Willetts
DATE 1-22-96 REPRESENTING WILLETTS WELL DRILLING SERVICE

PROFESSIONAL CONTRACTORS LICENSE NUMBER 2500122 1995



118 CYPRESS AVENUE
ROANOKE, VIRGINIA 24060
TELEPHONE 804/425/1498
FACSIMILE 804/422/9176

ANALYTICAL CHEMISTS

Certificate of Analysis

TO W. Phillips
1401 Louis Dr.
Chesapeake, Va. 23320

DATE 9/12/95

SAMPLE DESCRIPTION

Drinking Water
Sample received: 9/11/95 @ 10:55 a.m.
Sample taken: 9/11/95 @ 10:15 a.m.
Sample marked: 1405 Whittamore Rd.
Chesapeake, Va.

ANALYSIS NO 95-3045

Total Coliform.....Negative

"This water sample is bacteriologically safe for consumption."

✓ cc: Chesapeake Health Department

Chemist

Schematic drawing of sewage disposal and/or water supply system and topographic features.

Show the lot lines of the building site, sketch of property showing any topographic features which may impact on the design of the well or sewage disposal system, including existing and/or proposed structures and sewage disposal systems and wells within 200 feet. The schematic drawing of the well site or area and/or sewage disposal system shall show sewer lines, pretreatment unit, pump station, conveyance system, and subsurface soil absorption system, reserve area, etc. When a nonpublic drinking water supply is to be permitted, show all sources of pollution within 200 feet.

SCALE $\geq 1"=40'$

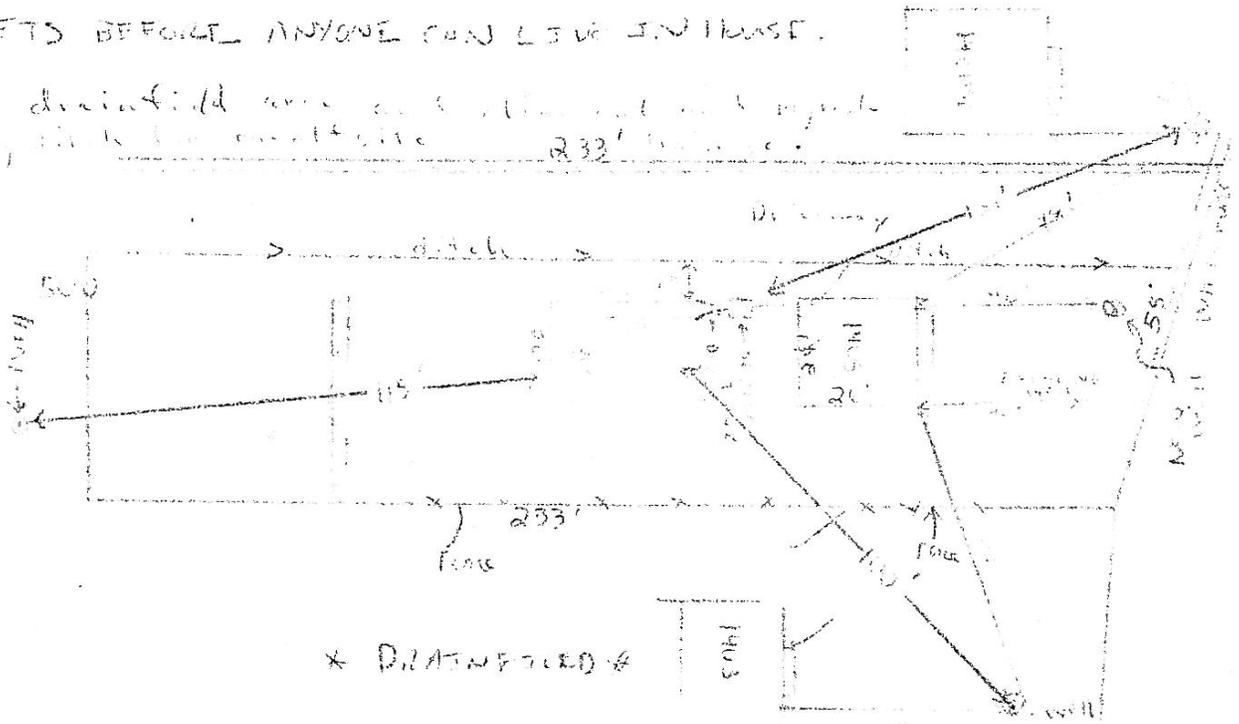
The information required above has been drawn on the attached copy of the sketch submitted with the application. Attach additional sheets as necessary to illustrate the design.

① SEE ATTACHED SHEETS.

② MUST SUBMIT WELL ABANDONMENT REPORT.

③ HEALTH DEPARTMENT MUST INSPECT SYSTEM & TOILETS BEFORE ANYONE CAN LIVE IN HOUSE.

4) Grade drainfield area and all other work must comply with local code.



This sewage disposal system and/or water supply is to be constructed as specified by the permit or attached plans and specifications .

SEE ATTACHED VARIANCE.

This sewage disposal system and/or well construction permit is null and void if (a) conditions are changed from those shown on the application (b) conditions are changed from those shown on the construction permit.

No part of any installation shall be covered or used until inspected, corrections made if necessary, and approved, by the local health department or unless expressly authorized by the local health dept. Any part of any installation which has been covered prior to approval shall be uncovered, if necessary, upon the direction of the Department.

Date: _____ Issued by: [Signature]

Sanitarian

Date: 7-11-95 Reviewed by: [Signature]

Supervisory Sanitarian

This Construction Permit Valid until December 1996

If FHA or VA financing

Reviewed by Date _____ Date _____

Supervisory Sanitarian

Regional Sanitarian

**Commonwealth of Virginia
Uniform Water Well Completion Report**

Owner WARREN CONSTRUCTION
 Address 521 WEST 25TH
NORFOLK, VA 23517
 Phone 627-2187
 Location 1317 MURRAY DR., CHESAPEAKE, VA

Tax Map ID 234-93-1002
 VDH Permit _____
 WWCB Permit MSGTC Lot 7
 WWCB ID _____
 County _____

* Well Data *

General Information

Drilling Method ROTARY
 Depth to Bedrock _____
 Static Water Level 0
 Well Disinfected (Y or N) Y

Date Completed 2/1/94
 Yield 25 (GPM)
 Stabilized Water Level _____
 Disinfectant Used CHLOROX

Total Depth of Well 48'
 Length of Test 1 HR
 Natural Flow (Rate) N
 Amount Used 1 GAL

Casing

From 0 to 43
 Size 1 1/4 Material PVC
 Weight/Schedule 20.200

From _____ to _____
 Size _____ Material _____
 Weight/Schedule _____

From _____ to _____
 Size _____ Material _____
 Weight/Schedule _____

Gravel Pack

From 40 to 48

From _____ to _____

From _____ to _____

Grout

From 0 to 20
 Bore Hole Size 4 1/2
 Type Bentonite
 Method Grout

From _____ to _____
 Bore Hole Size _____
 Type _____
 Method _____

From _____ to _____
 Bore Hole Size _____
 Type _____
 Method _____

Water Zones or Scraped Intervals

From 43 to 48
 Mesh Size 20 Diam. 1 1/4
 From _____ to _____
 Mesh Size _____ Diam. _____

From _____ to _____
 Mesh Size _____ Diam. _____
 From _____ to _____
 Mesh Size _____ Diam. _____

From _____ to _____
 Mesh Size _____ Diam. _____
 From _____ to _____
 Mesh Size _____ Diam. _____

* Use Data *

Private Well: Domestic Agricultural _____ Industrial _____ Monitoring _____
 Public Well: Community _____ Non Community _____

1317 MURRAY DR

Drillers Log *

(Use additional sheets if necessary)
Description of Formation or Sediment

Depth

Remarks

| Depth | Description of Formation or Sediment | Remarks |
|-------|--------------------------------------|---------|
| 0-11 | TOP SOIL & CLAY | |
| 11-26 | SAND | |
| 26-36 | MUD | |
| 36-48 | SAND | |

I certify that the information contained here is true and that this well was installed and constructed in accordance with the per that the well complies with all applicable state and local regulations, ordinances and laws.

Name LARRY PINKSTON

Address 2525 BROADWAY DR

Phone 703-264-1000

621-7643 / 426-2018

Drillers Signature Larry Pinkston Date 2/27/94 Representing PINKSTON WELLS

Virginia Contractors License Number 016859

WATER WELL COMPLETION REPORT

BWCM No. 1 Or

(Certification of Completion/County Permit)

State Water Control Board
P. O. Box 11143
2111 North Hamilton St.
Richmond, Va. 23230

County/City

Chesapeake Va

County/City Stamp

Virginia-Plane Coordinates

N _____ E _____

Latitude & Longitude

N _____ W _____

Topo. Map No. _____

Elevation _____ ft.

Formation _____

Lithology _____

River Basin _____

Province _____

Type Logs _____

Cuttings _____

Water Analysis _____

Aquifer Test _____

Owner Eric C. Smith

Well Designation or Number _____

Address 580 John Githridge Rd Chesapeake Va

Phone 421 2244

Drilling Contractor Joe Saunders Well Drilling

Address 9410 Mt Pleasant Rd Chesapeake Va - 23320

Phone 452 1408

SWCB Permit _____

County Permit _____

Certification of inspecting official:
This well does _____ does not _____
meet code/low requirements.
S. _____
Date _____

For Office Use

Map I.D. No. 234-90-0131

Subdivision Greenhaven

Section MS-61C

Block BK-2-plot 23

Lot 1-(23)

Class Well: I _____ IIA _____
IIB _____ IIA IIB _____
IIC _____ IID _____ IIE _____

WELL LOCATION: _____ (feet/miles _____ direction) of _____
and _____ (feet/miles _____ direction) of _____
(If possible please include map showing location marked)

Date started 8-3-90 • Date completed 9-3-90 Type rig Hyd-Drill

WELL DATA: New Reworked _____ Deepened _____

Total depth 43 ft.

Depth to bedrock 35 ft.

Hole size (Also include reamed zones)

- 6 inches from 0 to 43 ft.
- _____ inches from _____ to _____ ft.
- _____ inches from _____ to _____ ft.

Casing size (I.D.) and material

- 2 inches from 0 to 38 ft. Material PVC
- Wt. per foot _____ or wall thickness _____ in.
- _____ inches from _____ to _____ ft. Material _____
- Wt. per foot _____ or wall thickness _____ in.
- _____ inches from _____ to _____ ft. Material _____
- Wt. per foot _____ or wall thickness _____ in.

Screen size and mesh for each zone (where applicable)

- 2 inches from 38 to 43 ft. Mesh size 20/12 Type PVC
- _____ inches from _____ to _____ ft. Mesh size _____ Type _____
- _____ inches from _____ to _____ ft. Mesh size _____ Type _____
- _____ inches from _____ to _____ ft. Mesh size _____ Type _____
- _____ inches from _____ to _____ ft. Mesh size _____ Type _____

Gravel pack

- From 35 to 43 ft.
- From _____ to _____ ft.

Grout

- From 0 to 22 ft., Type Cement
- From _____ to _____ ft., Type _____

2. WATER DATA • Water temperature 53° OF

- Static water level (unpumped level-measured) 5 ft.
- Stabilized measured pumping water level 16 ft.
- Stabilized yield 25 gpm after 2 hours
- Natural Flow: Yes _____ No flow rate: _____ gpm
- Comment on quality good

3. WATER ZONES: From 30 To 35

From 35 To 43 From _____ To _____

From _____ To _____ From _____ To _____

4. USE DATA:

Type of use: Drinking Livestock Watering _____

Irrigation _____ Food processing _____ Household _____

Manufacturing _____ Fire safety _____ Cleaning _____

Recreation _____ Aesthetic _____ Cooling or heating _____

Injection _____ Other _____

• Type of facility: Domestic Public water supply _____

Public institution _____ Farm _____ Industry _____

Commercial _____ Other _____

5. PUMP DATA: Type _____ Rated H.P. 3/4

• Intake depth _____ Capacity _____ at _____ head

6. WELLHEAD: Type well seal _____

Pressure tank _____ gal. Loc. _____

Sample tap _____ Measurement port _____

Well vent _____ Pressure relief valve _____

Gate valve _____ Check valve (when required) at well head

Electrical disconnect switch on power supply _____

7. DISINFECTION: Well disinfected yes _____ no _____

Date 8-3-90 Disinfectant used chlorine

Amount 65/14/1 Hours used 24

8. ABANDONMENT (where applicable) • yes _____ no

Casing pulled yes _____ no _____ not applicable _____

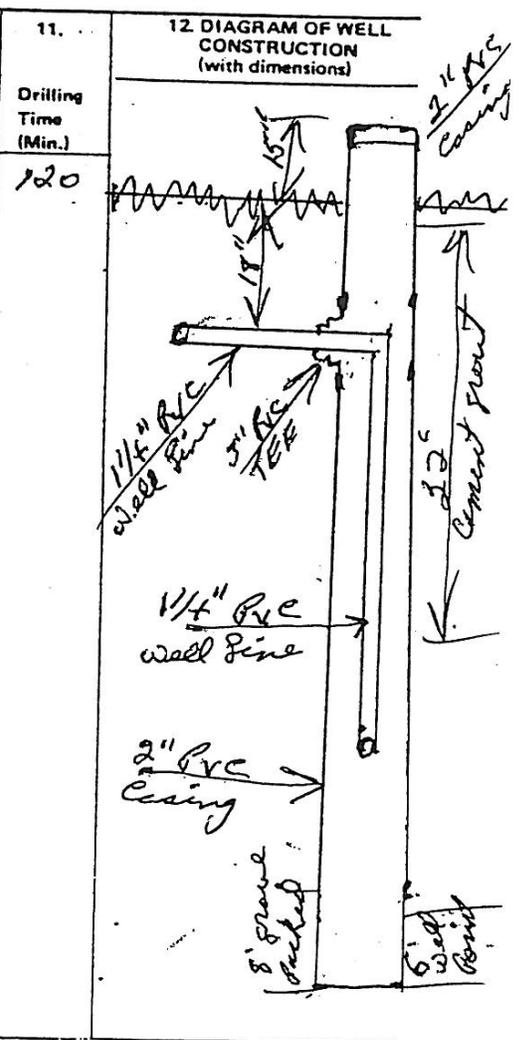
Plugging grout From _____ to _____ material _____

OVER

9. State law requires submitting to the Virginia State Water Control Board information about groundwater and wells for every well made in the State intended for water, or any other non-exempt well. This information must be submitted whether the well is completed, on standby, or abandoned. Information required includes: an accurately and completely prepared water well completion report, full data from any aquifer pumping tests, drill cuttings taken at ten foot intervals (unless exemption is secured), the results of any chemical analyses, and copies of any geophysical logs. Quarterly pumpage and use reports are required from owners of public supply and industrial wells. County or State permits to drill may be required in some parts of the state. Some counties require submission of a water well completion report. The Virginia State Health Department requires a water well completion report for public supply wells.

10. DRILLERS LOG (use additional Sheets if necessary)

| DEPTH (feet) | | TYPE OF ROCK OR SOIL (color, material, fossils, hardness, etc.) | REMARKS (water, caving, cavities, broken, core, shot, (etc.)) |
|--------------|----|--|--|
| From | To | | |
| 0 | 10 | clay silt sand | |
| 10 | 20 | sand | |
| 20 | 25 | Bed rock | |
| 25 | 35 | clay silt | |
| 35 | 43 | Bed Rock | |



13. Well lot dedicated? _____; Size _____ ft. X _____ ft.; Well house? _____
 Distance to nearest pollutant source _____ ft., Type _____
 Distance to nearest property line _____ ft., Building 100 ft.

14. WATER SERVICE PIPE: Checked under _____ p.s.i. for _____ minutes. Pipe size _____ inches, Material _____
 Installer _____
 Date _____

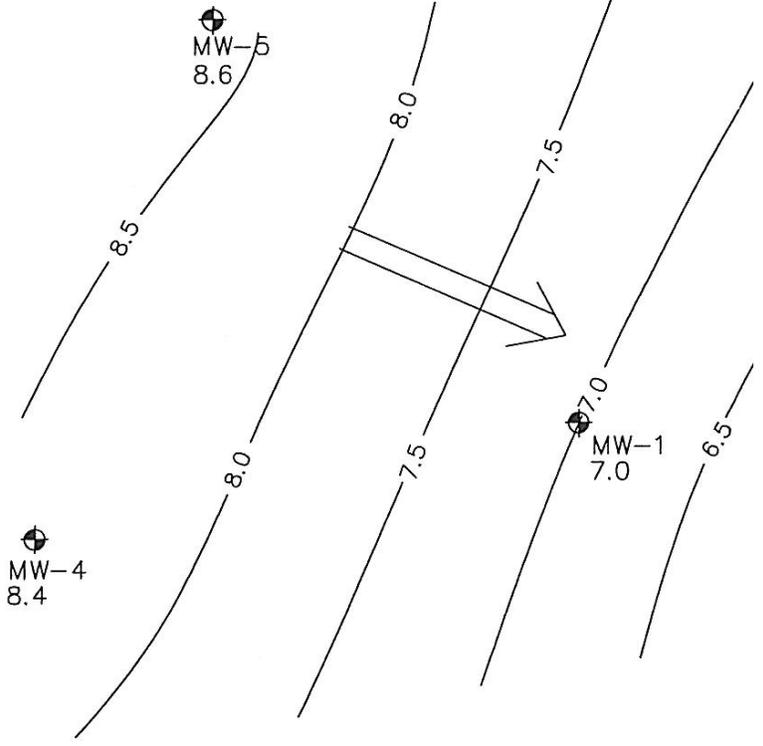
15. I certify that the information contained herein is true and correct and that this well and/or system has been installed and constructed in accordance with the requirements for well construction as specified in compliance with appropriate county or independent city ordinances and the laws and rules of the Commonwealth of Virginia.

- State Water Control Board Regional Offices
- Valley Reg. Off.
16 North Main Street
P.O. Box 268
Ridgewater, Va. 22812
03-828-2595
 - Southwest Reg. Off.
08 East Main Street
P.O. Box 476
Kingston, Va. 24210
33-628-5183
 - West Central Reg. Off.
Executive Park
312 Peters Creek Road
Danoke, Va. 24019
28-982-7432
 - Piedmont Reg. Off.
4010 West Broad Street
P.O. Box 6616
Richmond, Va. 23230
804-257-1006
 - Tidewater Reg. Off.
287 Pembroke Office Park
Suite 310 Pembroke No. 2
Va. Beach, Va. 23462
804-499-8742
 - Northern Virginia Reg. Off.
5515 Cherokee Avenue
Suite 404
Alexandria, Va. 22312
703-750-9111

Signature Joe Saunders (Seal), Date 8-6-90
 Well driller or authorized person
 License No. 9002501

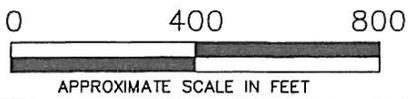
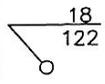
Whittamore Rd.

Centerville Turnpike



EXISTING 120' VIRGINIA POWER EASEMENT

Murray Road



Note: gpm=
ft MSL=
gw= gr

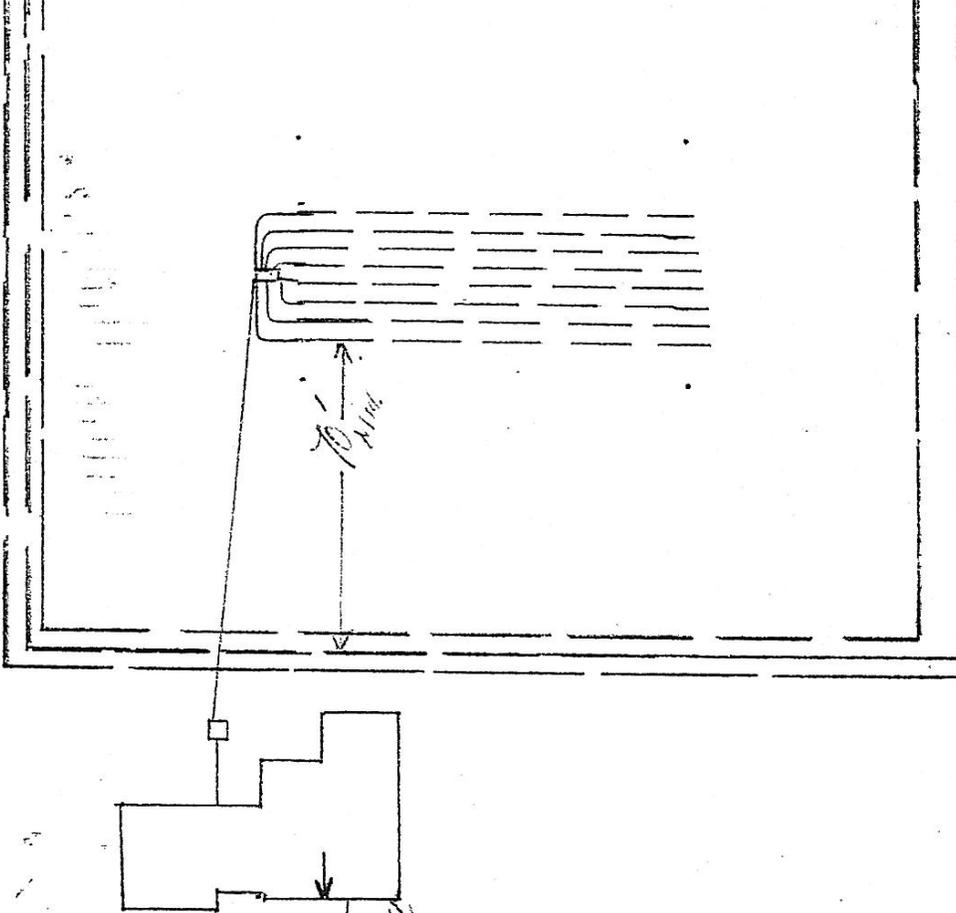
NOTE: STATIC WATER ELEVATIONS COLLECTED ON AUGUST 1, 2001.

Base drawing

Schematic drawing of sewage disposal system and topographic features.

Show the lot lines of the building lot and building site, sketch of property showing any topographic features which may impact on the design of the system, all existing and/or proposed structures including sewage disposal systems and wells within 100 feet of sewage disposal system and reserve area. The schematic drawing of the sewage disposal system shall show sewer lines, pretreatment unit, pump station, conveyance system, and subsurface soil absorption system, reserve area, etc. When a nonpublic drinking water supply is to be located on the same lot show all sources of pollution within 100 feet.

The information required above has been drawn on the attached copy of the sketch submitted with the application. Attach additional sheets as necessary to illustrate the design.



1. DRAINFIELD WILL BE 10' x 10' x 10' FT LINES 2 FT WIDE
 2. SEPTIC TANK MUST HAVE AT LEAST 900 GAL CAP.
 3. DRAINFIELD MUST BE IN AREA AS SHOWN ON THE SOIL DRAINAGE MANAGEMENT PLAN.
 4. WELL MUST BE AT LEAST 100 FT FROM HOUSE FOUNDATION & DRAIN FIELDS.
 5. DRAINFIELD AREA MUST BE LANDSCAPED & GRADED TO COMPLY WITH THE SOIL DRAINAGE MANAGEMENT PLAN. THIS MUST BE INSPECTED & APPROVED BY THE OFFICE.
- DESIGNED FOR THREE (3) BEDROOMS

The sewage disposal system is to be constructed as specified by the permit or attached plans and specifications .

This sewage disposal system construction permit is null and void if (a) conditions are changed from those shown on the application (b) conditions are changed from those shown on the construction permit.

No part of any installation shall be covered or used until inspected, corrections made if necessary, and approved, by the local health department or unless expressly authorized by the local health dept. Any part of any installation which has been covered prior to approval shall be uncovered, if necessary, upon the direction of the Department.

Date: 7-31-90 Issued by: Curt S. Eddy
Sanitarian
 Date: 7-31-90 Reviewed by: WR Haddimott
Supervisory Sanitarian

This Construction Permit Valid until 1-95

If FHA or VA financing

Reviewed by Date _____ Date _____
Supervisory Sanitarian Regional Sanitarian



18 CYPRESS AVENUE
VIRGINIA BEACH, VA 23451
TELEPHONE 804/425/1498
FACSIMILE 804/422/9176

ANALYTICAL CHEMISTS

Certificate of Analysis

TO Joe Wilkey
Remax Associates
123 S. Lynnhaven Road
Virginia Beach, Va 23452

DATE 3/18/94

SAMPLE DESCRIPTION Drinking water
Sample received 3/15/94 @ 1:35 p.m.
Sample taken 3/14/94 @ 5:00 p.m.
Sample Marked: 1465 Whittamore Road
Chesapeake, VA 23322

ANALYSIS NO. 94-713

MS #62A Lot #10 HDID #234-93-0029

Total Coli form Negative
"This water sample is bacteriologically safe for consumption."

✓ Copy: Chesapeake Health Dept

Schematic drawing of sewage disposal system and topographic features.

Show the lot lines of the building lot and building site, sketch of property showing any topographic features which may impact on the design of the system, all existing and/or proposed structures including sewage disposal systems and wells within 100 feet of sewage disposal system and reserve area. The schematic drawing of the sewage disposal system shall show sewer lines, pretreatment unit, pump station, conveyance system, and subsurface soil absorption system, reserve area, etc. When a nonpublic drinking water supply is to be located on the same lot show all sources of pollution within 100 feet.

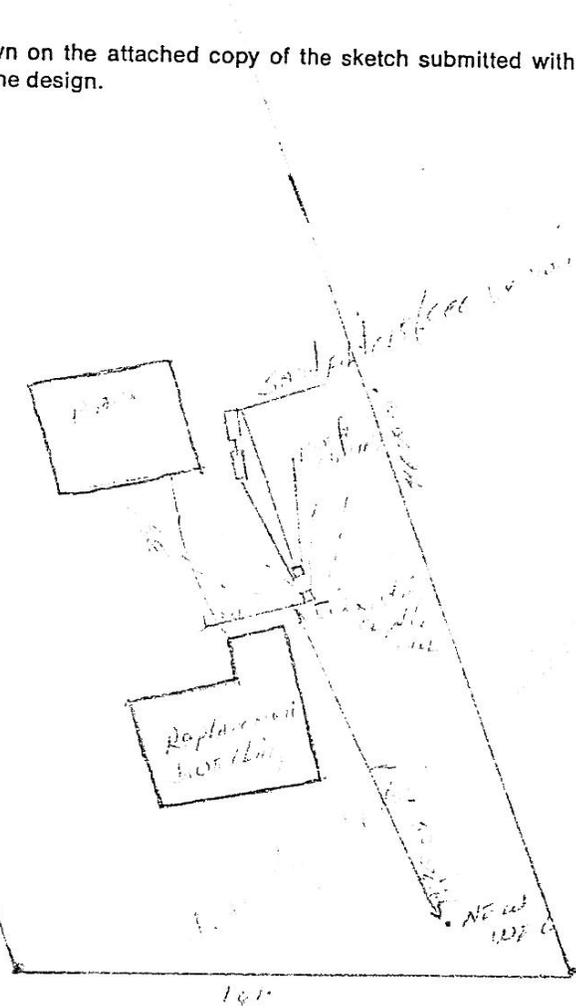
The information required above has been drawn on the attached copy of the sketch submitted with the application. Attach additional sheets as necessary to illustrate the design.

1. The house on the property must have only one existing septic system. No other septic system shall be installed. This must be inspected & approved by this office.

2. New house, etc. must be installed.

3. New house, etc. must be installed.

4. New house, etc. must be installed.



The sewage disposal system is to be constructed as specified by the permit or attached plans and specifications .

This sewage disposal system construction permit is null and void if (a) conditions are changed from those shown on the application (b) conditions are changed from those shown on the construction permit.

No part of any installation shall be covered or used until inspected, corrections made if necessary, and approved, by the local health department or unless expressly authorized by the local health dept. Any part of any installation which has been covered prior to approval shall be uncovered, if necessary, upon the direction of the Department.

Date: 4-2-82 Issued by: [Signature] Sanitarian

Date: 4-6-82 Reviewed by: [Signature] Supervisory Sanitarian

This Construction Permit Valid until 10-11

If FHA or VA financing

Reviewed by Date _____ Date _____

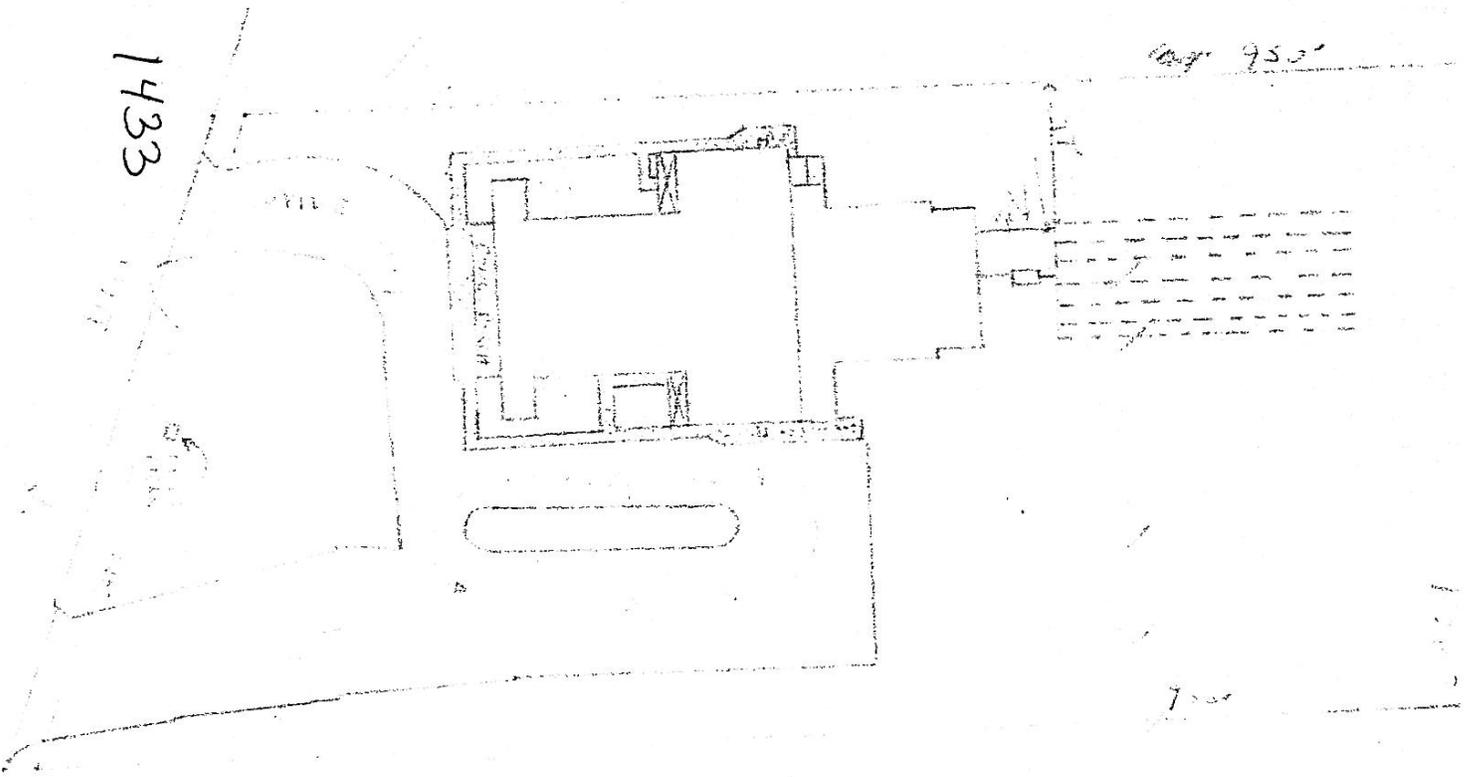
C.H.S. 202B Revised 6/84 Supervisory Sanitarian II-2A Regional Sanitarian

FILE COPY

Schematic drawing of sewage disposal system and topographic features.

Show the lot lines of the building lot and building site, sketch of property showing any topographic features which may impact on the design of the system, all existing and/or proposed structures including sewage disposal systems and wells within 100 feet of sewage disposal system and reserve area. The schematic drawing of the sewage disposal system shall show sewer lines, pretreatment unit, pump station, conveyance system, and subsurface soil absorption system, reserve area, etc. When a nonpublic drinking water supply is to be located on the same lot show all sources of pollution within 100 feet.

The information required above has been drawn on the attached copy of the sketch submitted with the application. Attach additional sheets as necessary to illustrate the design.



The sewage disposal system is to be constructed as specified by the permit or attached plans and specifications .

This sewage disposal system construction permit is null and void if (a) conditions are changed from those shown on the application (b) conditions are changed from those shown on the construction permit.

No part of any installation shall be covered or used until inspected, corrections made if necessary, and approved, by the local health department or unless expressly authorized by the local health dept. Any part of any installation which has been covered prior to approval shall be uncovered, if necessary, upon the direction of the Department.

Date: 1-27-94 Issued by: [Signature]
Sanitarian

Date: 1-27-94 Reviewed by: [Signature]
Supervisory Sanitarian

This Construction
Permit Valid until
7-95

If FHA or VA financing

Reviewed by Date _____ Date _____
Supervisory Sanitarian Regional Sanitarian

WATER WELL COMPLETION REPORT

• BWCM No. _____

(Certification of Completion/County Permit)

State Water Control Board
P. O. Box 11143
111 North Hamilton St.
Richmond, Va. 23230

County/City Chesapeake Va

| |
|---|
| SWCB Permit _____ |
| County Permit _____ |
| Certification of inspecting official: This well does _____ does not _____ meet code/low requirements. S. _____ Date _____ |
| For Office Use |

| | |
|----------------------------|---------|
| Virginia Plane Coordinates | N _____ |
| | E _____ |
| Latitude & Longitude | N _____ |
| | W _____ |
| Topo. Map No. _____ | |
| Elevation _____ | ft. |
| Formation _____ | |
| Lithology _____ | |
| River Basin _____ | |
| Province _____ | |
| Type Logs _____ | |
| Cuttings _____ | |
| Water Analysis _____ | |
| Aquifer Test _____ | |

County/City Stamp

• Owner Jeffery S. Spicher
 • Well Designation or Number Lot 41 new # 19 - Chesapeake
 Address 633 Baltimore Drive
Wa Beach Va
 Phone 463 7953
 • Drilling Contractor Jim Saunders Well Drilling
 Address 941 Ant Pleasant Rd
Chesapeake Va 23320
 Phone 482 1408

| |
|---|
| Tax Map I.D. No. _____ |
| Subdivision <u>Greenhaven</u> |
| Section <u>MS-61C</u> |
| Block _____ |
| Lot <u>old-41-new # 19</u> |
| Class Well I _____, IIA _____ |
| IIIB _____, IIIA <input checked="" type="checkbox"/> , IIIB _____ |
| IIIC _____, IIID _____, IIIE _____ |

WELL LOCATION: _____ (feet/miles _____ direction) of _____
 and _____ feet/miles _____ (direction) of _____
 (If possible please include map showing location marked)

Date started 7-24-87 • Date completed 7-24-87 Type rig Hydraulic Drill

NELL DATA: New Reworked _____ Deepened _____

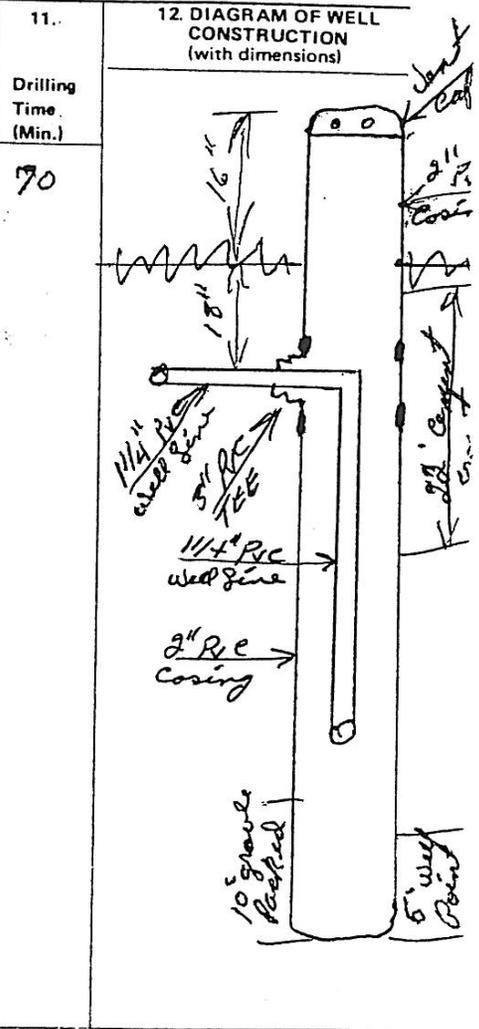
• Total depth 90 ft.
 • Depth to bedrock 85 ft.
 • Hole size (Also include reamed zones)
 • 6 inches from 0 to 90 ft.
 • _____ inches from _____ to _____ ft.
 • _____ inches from _____ to _____ ft.
 • Casing size (I.D.) and material
 • 2 inches from 0 to 85 ft.
 Material PVC
 Wt. per foot _____ or wall thickness _____ in.
 • _____ inches from _____ to _____ ft.
 Material _____
 Wt. per foot _____ or wall thickness _____ in.
 • _____ inches from _____ to _____ ft.
 Material _____
 Wt. per foot _____ or wall thickness _____ in.
 • Screen size and mesh for each zone (where applicable)
 • 2 inches from 85 to 90 ft.
 • Mesh size .012 Type PVC
 • _____ inches from _____ to _____ ft.
 • Mesh size _____ Type _____
 • _____ inches from _____ to _____ ft.
 • Mesh size _____ Type _____
 • _____ inches from _____ to _____ ft.
 • Mesh size _____ Type _____
 • _____ inches from _____ to _____ ft.
 • Mesh size _____ Type _____
 Gravel pack
 • From 80 to 90 ft.
 • From _____ to _____ ft.
 Grout
 • From 0 to 22 ft., Type concrete
 • From _____ to _____ ft., Type _____

2. WATER DATA • Water temperature 63° of _____
 • Static water level (unpumped level-measured) 8 ft.
 • Stabilized measured pumping water level 16 ft.
 • Stabilized yield 10 gpm after 2 hours
 Natural Flow: Yes _____ No , flow rate _____ gpm
 Comment on quality very good for this area
 3. WATER ZONES: From 40 To 45
 From 85 To 90 From _____ To _____
 From _____ To _____ From _____ To _____
 4. USE DATA:
 Type of use: Drinking , Livestock Watering _____
 Irrigation _____, Food processing _____, Household _____
 Manufacturing _____, Fire safety _____, Cleaning _____
 Recreation _____, Aesthetic _____, Cooling or heating _____
 Injection _____, Other _____
 • Type of facility: Domestic , Public water supply _____
 Public institution _____, Farm _____, Industry _____
 Commercial _____, Other _____
 5. PUMP DATA: Type _____ • Rated H.P. 3/4 max
 • Intake depth _____ • Capacity _____ at _____ head
 6. WELLHEAD: Type well seal _____
 Pressure tank _____ gal., Loc. _____
 Sample tap _____, Measurement port _____
 Well vent , Pressure relief valve _____
 Gate valve _____, Check valve (when required) at wellhead
 Electrical disconnect switch on power supply _____
 7. DISINFECTION: Well disinfected yes _____ no _____
 Date 7-24-87, Disinfectant used chlorine
 Amount 65/14/1, Hours used 1
 8. ABANDONMENT (where applicable) • yes _____ no
 Casing pulled yes _____ no _____ not applicable _____
 Plugging grout From _____ to _____ material _____

9. State law requires submitting to the Virginia State Water Control Board information about groundwater and wells for every well made in the State intended for water, or any other non-exempt well. This information must be submitted whether the well is completed, on standby, or abandoned. Information required includes: an accurately and completely prepared water well completion report, full data from any aquifer pumping tests, drill cuttings taken at ten foot intervals (unless exemption is secured), the results of any chemical analyses, and copies of any geophysical logs. Quarterly pumpage and use reports are required from owners of public supply and industrial wells. County or State permits to drill may be required in some parts of the state. Some counties require submission of a water well completion report. The Virginia State Health Department requires a water well completion report for public supply wells.

10. DRILLERS LOG (use additional Sheets if necessary)

| DEPTH (feet) | | TYPE OF ROCK OR SOIL (color, material, fossils, hardness, etc.) | REMARKS (water, caving, cavities, broken, core, shot, (etc.)) |
|--------------|----|--|--|
| From | To | | |
| 0 | 10 | clay silt sand | |
| 10 | 20 | clay | |
| 20 | 30 | clay silt sand | |
| 30 | 40 | silt sand | |
| 40 | 45 | bed Rock | |
| 45 | 55 | clay silt | |
| 55 | 65 | silt clay | |
| 65 | 75 | clay | |
| 75 | 85 | silt clay | |
| 85 | 90 | bed Rock | |



13. Well lot dedicated? _____; Size _____ ft. X _____ ft.; Well house? _____
 Distance to nearest pollutant source _____ ft., Type _____
 Distance to nearest property line _____ ft., Building 100 ft.

14. WATER SERVICE PIPE: Checked under _____ p.s.i. for _____ minutes. Pipe size _____ inches, Material _____
 Installer _____
 Date _____

15. I certify that the information contained herein is true and correct and that this well and/or system has been installed and constructed in accordance with the requirements for well construction as specified in compliance with appropriate county or independent city ordinances and the laws and rules of the Commonwealth of Virginia.

State Water Control Board Regional Offices

- Valley Reg. Off.
116 North Main Street
P. O. Box 268
Bridgewater, Va. 22812
703-828-2595
- Southwest Reg. Off.
408 East Main Street
P. O. Box 476
Abingdon, Va. 24210
703-628-5183
- West Central Reg. Off.
Executive Park
3312 Peters Creek Road
Roanoke, Va. 24019
703-982-7432
- Piedmont Reg. Off.
4010 West Broad Street
P. O. Box 6616
Richmond, Va. 23230
804-257-1006
- Tidewater Reg. Off.
287 Pembroke Office Park
Suite 310 Pembroke No. 2
Va. Beach, Va. 23462
804-499-8742
- Northern Virginia Reg. Off.
5515 Cherokee Avenue
Suite 404
Alexandria, Va. 22312
703-750-9111

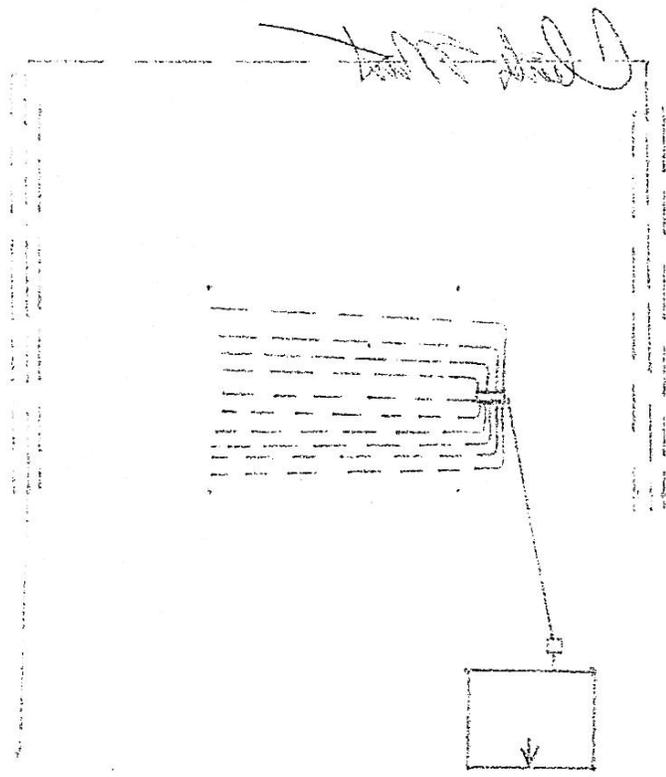
Signature Joe Saunders (Seal), Date 7-24-87
 Well driller or authorized person
 License No. 70018

Schematic drawing of sewage disposal system and topographic features.

Show the lot lines of the building lot and building site, sketch of property showing any topographic features which may impact on the design of the system, all existing and/or proposed structures including sewage disposal systems and wells within 100 feet of sewage disposal system and reserve area. The schematic drawing of the sewage disposal system shall show sewer lines, pretreatment unit, pump station, conveyance system, and subsurface soil absorption system, reserve area, etc. When a nonpublic drinking water supply is to be located on the same lot show all sources of pollution within 100 feet.

The information required above has been drawn on the attached copy of the sketch submitted with the application. Attach additional sheets as necessary to illustrate the design.

Not To Scale



1. Drain field will require 10-foot LINES 5 FT wide.
2. Septic tank will require at least 1500 GAC CAP.
3. Drain field must be as near as shown on soil drainage diagram plan. Drain field must be at least 60 FT from any well.
4. Landscaping & grading must comply with the soil drainage diagram plan. This must be inspected & approved by this office prior to house occupancy.
5. Well must be at least 100 FT from house foundation & driveway.

The sewage disposal system is to be constructed as specified by the permit or attached plans and specifications .

This sewage disposal system construction permit is null and void if (a) conditions are changed from those shown on the application (b) conditions are changed from those shown on the construction permit.

No part of any installation shall be covered or used until inspected, corrections made if necessary, and approved, by the local health department or unless expressly authorized by the local health dept. Any part of any installation which has been covered prior to approval shall be uncovered, if necessary, upon the direction of the Department.

Date: 6-2-87 Issued by: [Signature]
 Sanitarian
 Date: 6-2-87 Reviewed by: [Signature]
 Supervisory Sanitarian

This Construction Permit Valid until _____

If FHA or VA financing

Reviewed by Date _____ Date _____
 Supervisory Sanitarian Regional Sanitarian

chesap
2/94

MS⁺ 61-

Commonwealth of Virginia
Uniform Water Well Completion Report

Est. 42

Owner Albert Viala
Address Po Box 6186 Chesap. Va
Phone 4873987
Location Murray Drive - In Green Haven
1328

Tax Map ID _____
VDH Permit 234-93-1138
VWCB Permit _____
VWCB ID _____
County _____

* Well Data *

General Information

Drilling Method Hyd-Drill
Depth to Bedrock 30
Static Water Level 4
Well Disinfected (Y or N) yes

Date Completed 1-26-94
Yield 20 (GPM)
Stabilized Water Level 23
Disinfectant Used chlorine

Total Depth of Well 45
Length of Test 3 HRS
Natural Flow (Rate) 20
Amount Used 65/1/1

Casing

From 0 to 40
Size 2 Material PVC
Weight/Schedule _____

From _____ to _____
Size _____ Material _____
Weight/Schedule _____

From _____ to _____
Size _____ Material _____
Weight/Schedule _____

Gravel Pack

From 38 to 45

From _____ to _____

From _____ to _____

Grout

From 0 to 20
Bore Hole Size 6
Type Cement & Bent Seal
Method pour

From _____ to _____
Bore Hole Size _____
Type _____
Method _____

From _____ to _____
Bore Hole Size _____
Type _____
Method _____

Water Zones or Screened Intervals

From 40 to 45
Mesh Size 20/2 Diam. 2
From _____ to _____
Mesh Size _____ Diam. _____

From _____ to _____
Mesh Size _____ Diam. _____
From _____ to _____
Mesh Size _____ Diam. _____

From _____ to _____
Mesh Size _____ Diam. _____
From _____ to _____
Mesh Size _____ Diam. _____

* Use Data *

Private Well: Domestic Agricultural _____ Industrial _____
Public Well: Community _____ Non Community _____

Drillers Log
(Use additional sheets if necessary)

| Depth | Description of Formation or Sediment | Remarks |
|----------|--------------------------------------|---------|
| 0 to 10' | clay silt sand | |
| 10 - 20 | silt sand | |
| 20 - 25 | clay silt sand | |
| 25 - 35 | Bed Rock silt sand | |
| 35 - 45 | Bed Rock | |

I certify that the information contained here is true and that this well was installed and con in accordance with the permit and further that the well complies with all applicable state local regulations, ordinances and laws.

Drilling Contractor Joe Saunders Well Drilling
 Address 1941 Mt. Pleasant Rd
Charlottesville VA 22920
 Phone 4821408

Drillers Signature Joe Saunders Date 1-26-94
 Representing _____
 Virginia Contractors License Number 018280

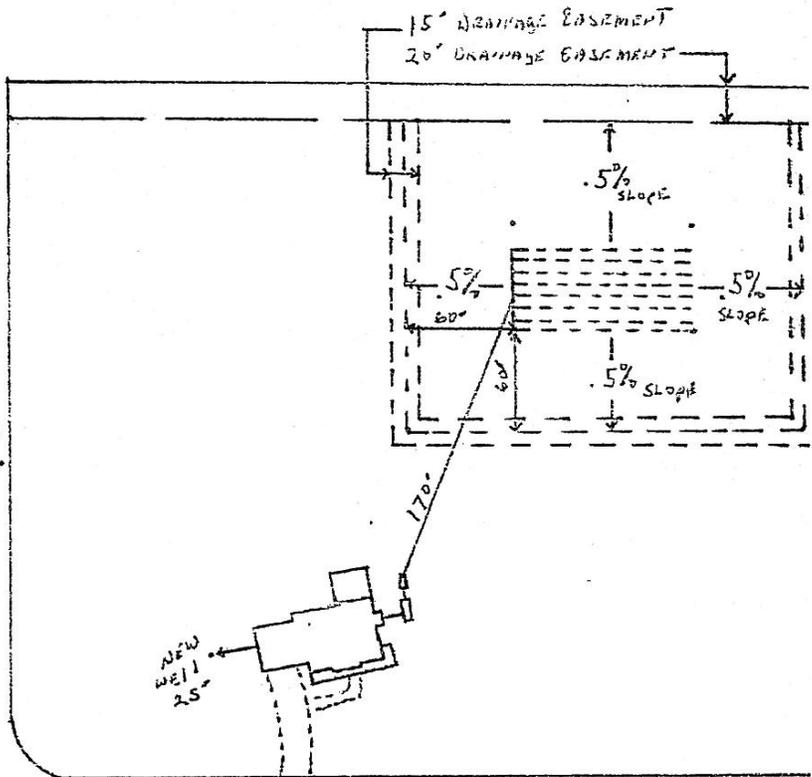
Schematic drawing of sewage disposal system and topographic features.

Show the lot lines of the building lot and building site, sketch of property showing any topographic features which may impact on the design of the system, all existing and/or proposed structures including sewage disposal systems and wells within 100 feet of sewage disposal system and reserve area. The schematic drawing of the sewage disposal system shall show sewer lines, pretreatment unit, pump station, conveyance system, and subsurface soil absorption system, reserve area, etc. When a nonpublic drinking water supply is to be located on the same lot show all sources of pollution within 100 feet.

The information required above has been drawn on the attached copy of the sketch submitted with the application. Attach additional sheets as necessary to illustrate the design.

- 1) 8-2' x 100' DRAINFIELD TRENCHES.
- 2) MAX. DEPTH OF DRAINFIELD TRENCHES - 18".
- 3) GRADE BANKS REQUIRED.
- 4) PUMP REQUIRED (SEE PG 3 OF 3)
- 5) FOUR (4) BEDROOMS ONLY.
- 6) Comply w/APPROVED SOIL DRAINAGE MANAGEMENT PLAN.
- 7) FINAL GRADE MUST BE COMPLETED AND INSPECTED BY HEALTH DEPT.
- 8) KEEP WELL 25' FROM HOUSE, 50' FROM SEPTIC TANK + PUMP AND 100' FROM DRAINFIELD.
- 9) A G.W. -2 IS REQUIRED FROM WELL DEPT.
- 10) WATER SAMPLE REQUIRED + MUST BE SCHEDULED W/ HEALTH DEPT.

SCALE 1" = 100'



MURRAY DR.

The sewage disposal system is to be constructed as specified by the permit or attached plans and specifications .

This sewage disposal system construction permit is null and void if (a) conditions are changed from those shown on the application (b) conditions are changed from those shown on the construction permit.

No part of any installation shall be covered or used until inspected, corrections made if necessary, and approved, by the local health department or unless expressly authorized by the local health dept. Any part of any installation which has been covered prior to approval shall be uncovered, if necessary, upon the direction of the Department.

Date: 11-18-93 Issued by: [Signature]
 Sanitarian
 Date: 11-18-93 Reviewed by: [Signature]
 Supervisory Sanitarian

This Construction Permit Valid until 5-98

If FHA or VA financing

Reviewed by Date _____ Date _____
 Supervisory Sanitarian Regional Sanitarian

COMMONWEALTH OF VIRGINIA
WATER WELL COMPLETION REPORT
(Certification of Completion/County Permit)

BWCM No. _____

Water Control Board
Box 11143
111 North Hamilton St.
Richmond, Va. 23230

County/City _____

County/City Stamp

- Virginia Plane Coordinates
 - N _____
 - E _____
 - Latitude & Longitude _____
 - N _____
 - W _____
- Topo. Map No. _____
- Elevation _____ ft.
- Formation _____
- Lithology _____
- River Basin _____
- Province _____
- Type Logs _____
- Cuttings _____
- Water Analysis _____
- Aquifer Test _____

Owner WHITBY
Well Designation or Number _____
Address 1305 MURRAY DR
CHESAPEAKE
Phone _____
Drilling Contractor PINESTON PUMP & WELL CO
Address 2525 ENTRADA DR
VIRGINIA BEACH VA
Phone 804-426-2018

SWCB Permit _____
County Permit _____
Certification of inspecting official:
This well does _____ does not _____
meet code/low requirements.
S. _____
Date _____
For Office Use

Tax Map I.D. No. _____
Subdivision _____
Section _____
Block _____
Lot _____
Class Well: I _____, IIA _____
IIB _____, IIIA _____, IIIB _____
IIIC IIID _____, IIIE _____

WELL LOCATION: _____ (feet/miles _____ direction) of _____
and _____ feet/miles _____ (direction) of _____
(If possible please include map showing location marked)
Date started 11/21 • Date completed 11/21/86 Type rig HEB TOP DRIB

WELL DATA: New Reworked _____ Deepened _____
depth 42 ft.
to bedrock _____ ft.
Hole size (Also include reamed zones)
• 4 1/2 inches from 0 to 42 ft.
• _____ inches from _____ to _____ ft.
• _____ inches from _____ to _____ ft.
Casing size (I.D.) and material
• 2 inches from 0 to 20 ft.
Material _____
Wt. per foot _____ or wall thickness _____ in.
• 1 1/4 inches from 20 to 32 ft.
Material _____
Wt. per foot _____ or wall thickness _____ in.
• _____ inches from _____ to _____ ft.
Material _____
Wt. per foot _____ or wall thickness _____ in.
Screen size and mesh for each zone (where applicable)
• 1 1/4 inches from 32 to 42 ft.
• Mesh size .010 Type PVC
• _____ inches from _____ to _____ ft.
• Mesh size _____ Type _____
• _____ inches from _____ to _____ ft.
• Mesh size _____ Type _____
• _____ inches from _____ to _____ ft.
• Mesh size _____ Type _____
Pack
From 30 to 42 ft.
• From _____ to _____ ft.
Grout
• From 0 to 20 ft. Type PORTLAND
• From _____ to _____ ft. Type _____

2. WATER DATA • Water temperature 60 OF
• Static water level (unpumped level-measured) 8 ft.
• Stabilized measured pumping water level 10 ft.
• Stabilized yield 25 gpm after 1 1/2 hours
Natural Flow: Yes No _____ flow rate: _____ gpm
Comment on quality 2.0 FO
3. WATER ZONES: From 20 To 42
From _____ To _____ From _____ To _____
From _____ To _____ From _____ To _____
4. USE DATA:
Type of use: Drinking Livestock Watering _____
Irrigation _____ Food processing _____ Household _____
Manufacturing _____ Fire safety _____ Cleaning _____
Recreation _____ Aesthetic _____ Cooling or heating _____
Injection _____ Other _____
• Type of facility: Domestic Public water supply _____
Public institution _____ Farm _____ Industry _____
Commercial _____ Other _____
5. PUMP DATA: Type _____ Rated H.P. _____
• Intake depth _____ Capacity _____ at _____ head
6. WELLHEAD: Type well seal 1 1/2" JMBAR
Pressure tank _____ Lgd. Loc. _____
Sample tap _____ Measurement port _____
Well vent _____ Pressure relief valve _____
Gate valve _____ Check valve (when required) _____
Electrical disconnect switch on power supply _____
7. DISINFECTION: Well disinfected Yes _____ no _____
Date 11/21/86 Disinfectant used CHLORINE PILL
Amount 402 H₂O used 48
8. ABANDONMENT (where applicable) Yes _____ no _____
Casing pulled yes _____ no _____ not applicable _____
Plugging grout From _____ to _____ material _____

9. State law requires submitting to the Virginia State Water Control Board information about groundwater and wells for every well made in the State intended for water, or any other non-exempt well. This information must be submitted whether the well is completed, on standby, or abandoned. Information required includes: an accurately and completely prepared water well completion report, full data from any aquifer pumping tests, drill cuttings taken at ten foot intervals (unless exemption is secured), the results of any chemical analyses, and copies of any geophysical logs. Quarterly pumpage and use reports are required from owners of public supply and industrial wells. County or State permits to drill may be required in some parts of the state. Some counties require submission of a water well completion report. The Virginia State Health Department requires a water well completion report for public supply wells.

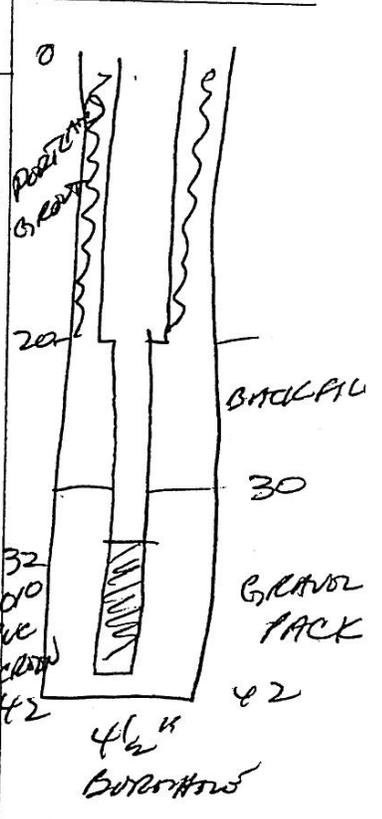
10. DRILLERS LOG (use additional Sheets if necessary)

| DEPTH (feet) | | TYPE OF ROCK OR SOIL (color, material, fossils, hardness, etc.) | REMARKS (water, caving, cavities, broken, core, shot, etc.) |
|--------------|----|--|--|
| From | To | | |
| 0 | 12 | TOP SOIL CLAY & SAND | |
| 12 | 20 | FINE SAND | |
| 20 | 42 | COURSE SAND & GRAVEL | |

11. Drilling Time (Min.)

1 HR 15 MIN

12. DIAGRAM OF WELL CONSTRUCTION (with dimensions)



13. Well lot dedicated? _____; Size _____ ft. X _____ ft.; Well house? _____
 Distance to nearest pollutant source _____ ft., Type _____
 Distance to nearest property line _____ ft., Building _____ ft.

14. WATER SERVICE PIPE: Checked under _____ p.s.i. for _____ minutes. Pipe size _____ inches, Material _____
 Installer _____
 Date _____

15. I certify that the information contained herein is true and correct and that this well and/or system has been installed and constructed in accordance with the requirements for well construction as specified in compliance with appropriate county or independent city ordinances and the laws and rules of the Commonwealth of Virginia.

Signature Larry [Signature] (Seal), Date 11/21/86
 License No. 030472

State Water Control Board Regional Offices

Valley Reg. Off.
 116 North Main Street
 P. O. Box 268
 Bridgewater, Va. 22812
 703-828-2595

Piedmont Reg. Off.
 4010 West Broad Street
 P. O. Box 6618
 Richmond, Va. 23230
 804-257-1006

Southwest Reg. Off.
 408 East Main Street
 P. O. Box 476
 Abingdon, Va. 24210
 703-628-5183

Tidewater Reg. Off.
 287 Pembroke Office Park
 Suite 310 Pembroke No. 2
 Va. Beach, Va. 23462
 804-499-8742

West Central Reg. Off.
 Executive Park
 5312 Peters Creek Road
 Roanoke, Va. 24019
 703-982-7432

Southern Virginia Reg. Off.
 315 Cherokee Avenue
 Suite 404
 Alexandria, Va. 22312
 703-750-9111

Schematic drawing of sewage disposal system and topographic features.

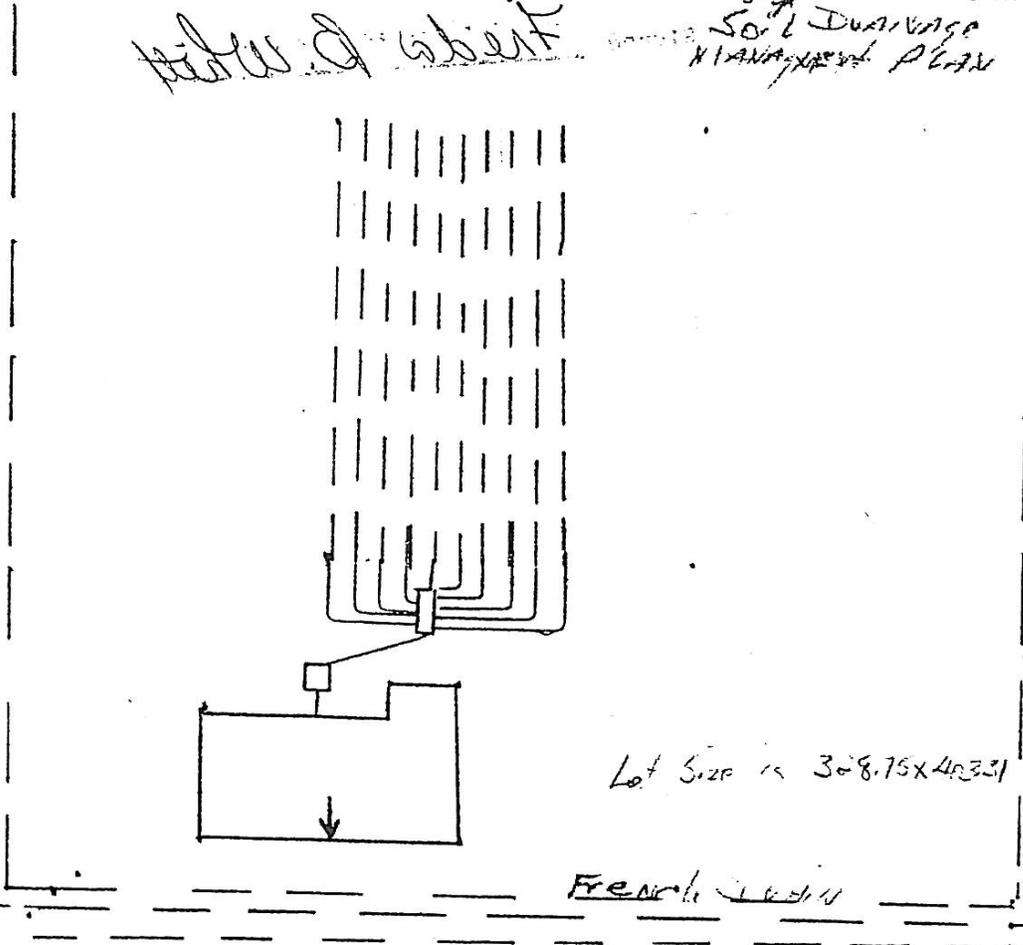
Show the lot lines of the building lot and building site, sketch of property showing any topographic features which may impact on the design of the system, all existing and/or proposed structures including sewage disposal systems and wells within 100 feet of sewage disposal system and reserve area. The schematic drawing of the sewage disposal system shall show sewer lines, pretreatment unit, pump station, conveyance system, and subsurface soil absorption system, reserve area, etc. When a nonpublic drinking water supply is to be located on the same lot show all sources of pollution within 100 feet.

The information required above has been drawn on the attached copy of the sketch submitted with the application. Attach additional sheets as necessary to illustrate the design.

Notes & about

SOIL DRAINAGE MANAGEMENT PLAN

Not To Scale



1. DRAIN FIELD WILL REQUIRE 10-100 FT LINE 2 FT WIDE.
2. SEPTIC TANK WILL REQUIRE 900 GAL. CAP.
3. DISTRIBUTION BOX MUST HAVE 10 IN.
4. DRAIN FIELD MUST BE IN AREA AS SHOWN ON SOIL DRAINAGE MANAGEMENT PLAN. LANDSCAPING & GRADING MUST COMPLY WITH PLAN & BE INSPECTED BY THIS OFFICE PRIOR TO HOUSE BEING PERMITTED.
5. WELL MUST BE 100 FT FROM SEPTIC & HOUSE FOUNDATION.
6. KEEP ALL WOOD 900000 OF 1.4 IN AT LEAST 10 FT FROM SEPTIC SYSTEM.

The sewage disposal system is to be constructed as specified by the permit or attached plans and specifications .

This sewage disposal system construction permit is null and void if (a) conditions are changed from those shown on the application (b) conditions are changed from those shown on the construction permit.

No part of any installation shall be covered or used until inspected, corrections made if necessary, and approved, by the local health department or unless expressly authorized by the local health dept. Any part of any installation which has been covered prior to approval shall be uncovered, if necessary, upon the direction of the Department.

Date: 5-28-86 Issued by: Curt B. Estep
Sanitarian

Date: 5-29-86 Reviewed by: WR Holdsworth
Supervisory Sanitarian

This Construction Permit Valid until
11-88

If FHA or VA financing

Reviewed by Date _____ Date _____
Supervisory Sanitarian Regional Sanitarian

THIS BOTTLE CONTAINS THIOSULPHATE

M561C - 10/15/50

DATE COLLECTED *10/15/50* TIME *10:15* COUNTY *Charlottesville*

NAME OF CITY OR TOWN *Charlottesville*

NON-PUBLIC SUPPLY PUBLIC SUPPLY COMMUNITY NON-COMMUNITY

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF GENERAL SERVICES
BUREAU OF MICROBIOLOGICAL SCIENCE
DIVISION OF CONSOLIDATED LABORATORY SERVICES - BUREAU OF MICROBIOLOGICAL SCIENCE
REPORT ON BACTERIOLOGICAL EXAMINATION OF WATER
DO NOT WRITE IN SPACE BELOW.

NAME OF SUPPLY *1321 Murray Dr*

SUPPLY OWNED BY *Thomas J. Murray*

SAMPLE COLLECTED BY *Robert G. Stuchlik*

SAMPLE WAS TAKEN FROM *Setback* (WELL, APPROVED TAP, ETC.)

IS SUPPLY CHLORINATED? YES NO

WAS CHLORINE TEST MADE AT SAMPLING POINT? YES NO

RES. CL. *PPM* REPORT RESULTS TO -

PRINT *Thomas J. Murray*

1321 Murray Dr -

Charlottesville, VA 22910

See reverse side for collection information

| Portion Of Sample Tested | Bact. of Coliform Group | Portion Of Sample Tested | Bact. of Coliform Group | SAMPLE NO. |
|--------------------------|-------------------------|--------------------------|-------------------------|-----------------------|
| .0001 ml. | | 10 ml. | — | <i>1000</i> |
| .001 ml. | | 10 ml. | — | <i>RECEIVED</i> |
| .01 ml. | | 10 ml. | — | <i>PPM test #1127</i> |
| .1 ml. | | 10 ml. | — | <i>COMPLETED</i> |
| 1 ml. | | 10 ml. | — | <i>8-3-50</i> |

Membrane Filter *12-1-50* Coliforms per 100 ml.

+ Opposite Portion Tested Means Bacteria Indicating Contamination WERE Present.

— Means Bacteria Indicating Contamination WERE NOT Present.

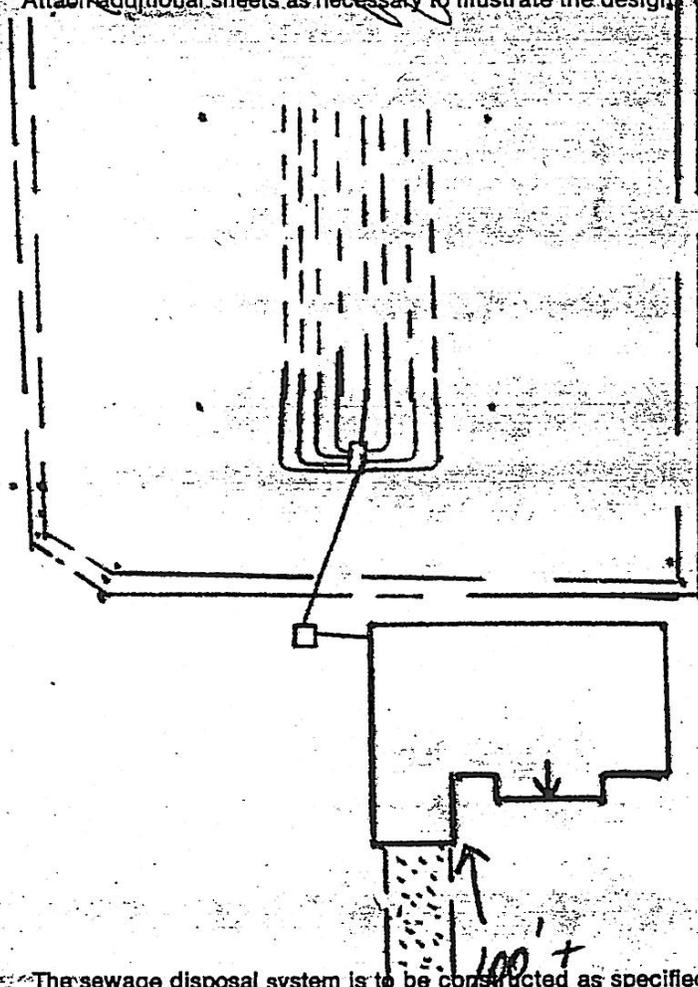
Results Based on Confirmed Tests Unless Otherwise Specified

Schematic drawing of sewage disposal system and topographic features. PAGE 1 OF 2

Show the lot lines of the building lot and building site; sketch of property showing any topographic features which may impact on the design of the system; all existing and/or proposed structures including sewage disposal systems and wells within 100 feet of sewage disposal system and reserve area. The schematic drawing of the sewage disposal system shall show sewer lines, pretreatment unit, pump station, conveyance system, and subsurface soil absorption system, reserve area, etc. When a nonpublic drinking water supply is to be located on the same lot show all sources of pollution within 100 feet.

Not To Scale

The information required above has been drawn on the attached copy of the sketch submitted with the application. Attach additional sheets as necessary to illustrate the design.



1. Drainfield will require 8-100ft lines 3ft wide.
2. Septic tank must have at least 1200 gal. cap.
3. Drainfield must be in ARPA as shown on Soil Drainage Management Plan.
4. Landscaping & grading must comply with BMP. This must be inspected & approved by this or prior to house foundation.
5. Well must be at least 100ft from septic tank & house foundation.
6. Keep all underground utility at least 10ft from septic system.

The sewage disposal system is to be constructed as specified by the permit or attached plans and specifications .

This sewage disposal system construction permit is null and void if (a) conditions are changed from those shown on the application (b) conditions are changed from those shown on the construction permit.

WELL

No part of any installation shall be covered or used until inspected, corrections made if necessary, and approved, by the local health department or unless expressly authorized by the local health dept. Any part of any installation which has been covered prior to approval shall be uncovered, if necessary, upon the direction of the Department.

Date: 6-25-86 Issued by: *Carl S. Edger*
 Sanitarian

Date: 6-26-86 Reviewed by: *WR Hoddinott*
 Supervisory Sanitarian

This Construction Permit Valid in 1988

If FHA or VA financing

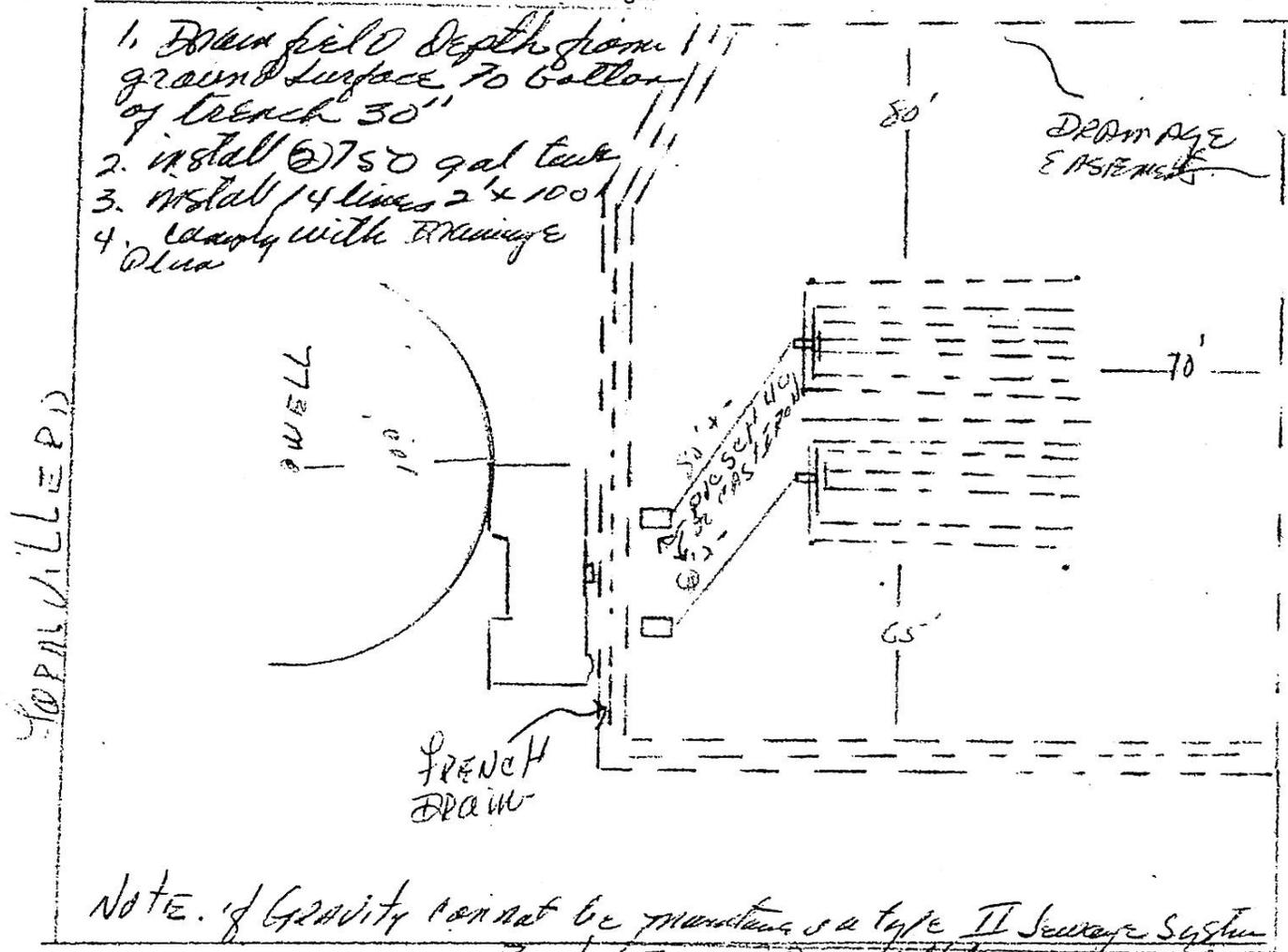
Reviewed by Date _____ Date _____
 Supervisory Sanitarian Regional Sanitarian

Schematic drawing of sewage disposal system and topographic features.

Show the lot lines of the building lot and building site, sketch of property showing any topographic features which may impact on the design of the system, all existing and/or proposed structures including sewage disposal systems and wells within 100 feet of sewage disposal system and service area. The schematic drawing of the sewage disposal system shall show sewer lines, pretreatment unit, pump station, conveyance system, and subsurface soil absorption system, reserve area, etc. When a nonpublic drinking water supply is to be located on the same lot show all sources of pollution within 100 feet.

NOT TO SCALE

The information required above has been drawn on the attached copy of the sketch submitted with the application. Attach additional sheets as necessary to illustrate the design.



The sewage disposal system is to be constructed as specified by the permit or attached plans and specifications .

This sewage disposal system construction permit is null and void if (a) conditions are changed from those shown on the application (b) conditions are changed from those shown on the construction permit. If construction has not commenced within 12 months of date of issuance, the construction permit must be revalidated.

Any part of any installation shall be covered or used until inspected, corrections made if necessary, and approved, by the local health department unless expressly authorized by the local health dept. Any part of any installation which has been covered prior to approval shall be uncovered, if necessary, upon the direction of the Department.

Date: 5-23-1984 Issued by: [Signature] Sanitarian

Date: 5-23-84 Reviewed by: [Signature] Supervisory Sanitarian

If FHA or VA financing

Reviewed by Date _____ Date _____
Supervisory Sanitarian Regional Sanitarian

COMMONWEALTH OF VIRGINIA
WATER WELL COMPLETION REPORT

MS 61C Bl 1 Lot 20

• BWCM No. _____

State Water Control Board
P.O. Box 11143
111 North Hamilton St.
Richmond, Va. 23230

(Certification of Completion/County Permit)

County/City _____

| |
|---|
| SWCB Permit _____ |
| County Permit _____ |
| Certification of inspecting official: This well does _____ does not _____ meet code/low requirements. S. _____ Date _____ |
| For Office Use |

Virginia Plane Coordinates
N _____
E _____
Latitude & Longitude
N _____
W _____
Topo. Map No. _____
Elevation _____ ft.
Formation _____
Lithology _____
River Basin _____
Province _____
Type Logs _____
Cuttings _____
Water Analysis _____
Aquifer Test _____

County/City Stamp

• Owner ^(Builder) Don Hansen (John Munday)
• Well Designation or Number _____
Address 1204 Murray
Chesapeake Va
Phone 482 5409
• Drilling Contractor Johnson Well Drilling
Address 232 Green St.
Chesapeake, Va
Phone 482-0561

| |
|---|
| Tax Map I.D. No. _____ |
| Subdivision _____ |
| Section <u>61C</u> |
| Block <u>1</u> |
| Lot <u>20</u> |
| Class Well: I _____, IIA _____ IIB _____, IIIA _____, IIIB _____ IIIC _____, IIID _____, IIIE _____ |

WELL LOCATION: _____ (feet/miles _____ direction) of _____
and _____ feet/miles _____ (direction) of _____
(If possible please include map showing location marked)

Date started 9/15/86 • Date completed _____ Type rig Rotary

WELL DATA: New Reworked _____ Deepened _____

Total depth 80H ft.
Depth to bedrock _____ ft.

Hole size (Also include reamed zones)
• 3 7/8 inches from 0 to 80 ft.
• _____ inches from _____ to _____ ft.
• _____ inches from _____ to _____ ft.

Casing size (I.D.) and material
• 2 inches from 0 to 20 ft.
Material PVC

Wt. per foot _____ or wall thickness Sch 40 in.
• 1 1/2 inches from 0 to 80 ft.
Material PVC

Wt. per foot _____ or wall thickness Sch 40 in.
• _____ inches from _____ to _____ ft.
Material _____

Wt. per foot _____ or wall thickness _____ in.

Screen size and mesh for each zone (where applicable)
• 1 1/2 inches from 67 to 80 ft.
• Mesh size 1010 Type PVC

• _____ inches from _____ to _____ ft.
• Mesh size _____ Type _____

• _____ inches from _____ to _____ ft.
• Mesh size _____ Type _____

• _____ inches from _____ to _____ ft.
• Mesh size _____ Type _____

Gravel pack
• From 66 to 80 ft.
• From _____ to _____ ft.

Grout
• From -1 to 20 ft., Type Portland
• From _____ to _____ ft., Type _____

2. WATER DATA • Water temperature _____ of _____

• Static water level (unpumped level-measured) 8 ft.
• Stabilized measured pumping water level 10 ft.
• Stabilized yield 12 gpm after 1 hours
Natural Flow: Yes _____ No _____, flow rate. _____ gpm
Comment on quality _____

3. WATER ZONES: From 7 To 45
From 65 To 80 From _____ To _____
From _____ To _____ From _____ To _____

4. USE DATA:
Type of use: Drinking , Livestock Watering _____
Irrigation _____, Food processing _____, Household _____
Manufacturing _____, Fire safety _____, Cleaning _____
Recreation _____, Aesthetic _____, Cooling or heating _____
Injection _____, Other _____

• Type of facility: Domestic , Public water supply _____
Public institution _____, Farm _____, Industry _____
Commercial _____, Other _____

5. PUMP DATA: Type _____ • Rated H.P. _____
• Intake depth _____ • Capacity _____ at _____ head

6. WELLHEAD: Type well seal _____
Pressure tank _____ gal., Loc. _____
Sample tap _____, Measurement port _____
Well vent _____, Pressure relief valve _____
Gate valve _____, Check valve (when required) _____
Electrical disconnect switch on power supply _____

7. DISINFECTION: Well disinfected yes _____ no _____
Date _____, Disinfectant used _____
Amount _____, Hours used _____

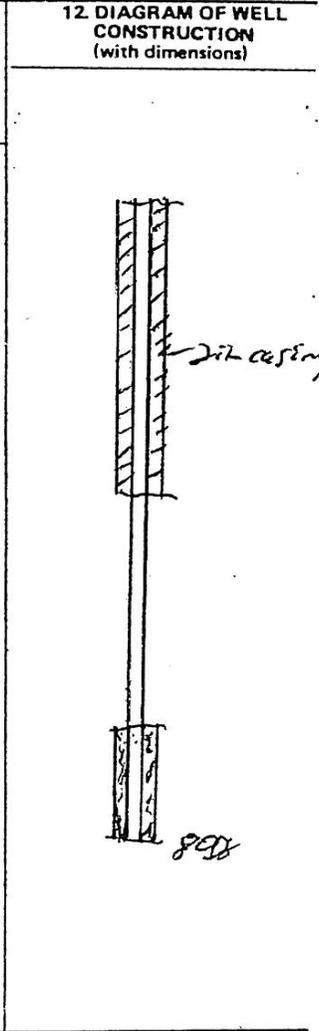
8. ABANDONMENT (where applicable) • yes _____ no _____
Casing pulled yes _____ no _____ not applicable _____
Plugging grout From _____ to _____ material _____

9. State law requires submitting to the Virginia State Water Control Board information about groundwater and wells for every well made in the State intended for water, or any other non-exempt well. This information must be submitted whether the well is completed, on standby, or abandoned. Information required includes: an accurately and completely prepared water well completion report, full data from any aquifer pumping tests, drill cuttings taken at ten foot intervals (unless exemption is secured), the results of any chemical analyses, and copies of any geophysical logs. Quarterly pumpage and use reports are required from owners of public supply and industrial wells. County or State permits to drill may be required in some parts of the state. Some counties require submission of a water well completion report. The Virginia State Health Department requires a water well completion report for public supply wells.

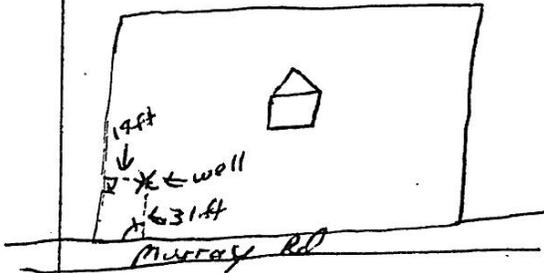
10. DRILLERS LOG (use additional Sheets if necessary)

| DEPTH (feet) | | TYPE OF ROCK OR SOIL (color, material, fossils, hardness, etc.) | REMARKS (water, caving, cavities, broken, core, shot, (etc.)) |
|--------------|----|--|--|
| From | To | | |
| 0 | 7 | clay | |
| 7 | 45 | gray sand | |
| 45 | 65 | clay | |
| 65 | 80 | gray sand | |

11. Drilling Time (Min.) _____



Well Location



13. Well lot dedicated? _____; Size _____ ft. X _____ ft.; Well house? _____
 Distance to nearest pollutant source _____ ft., Type _____
 Distance to nearest property line _____ ft., Building _____ ft.

14. WATER SERVICE PIPE: Checked under _____ p.s.i. for _____ minutes. Pipe size _____ inches, Material _____
 Installer _____
 Date _____

15. I certify that the information contained herein is true and correct and that this well and/or system has been installed and constructed in accordance with the requirements for well construction as specified in compliance with appropriate county or independent city ordinances and the laws and rules of the Commonwealth of Virginia.

State Water Control Board Regional Offices

Valley Reg. Off.
 116 North Main Street
 P. O. Box 268
 Bridgewater, Va. 22812
 703-828-2595

Southwest Reg. Off.
 408 East Main Street
 P. O. Box 476
 Abingdon, Va. 24210
 703-628-5183

West Central Reg. Off.
 Executive Park
 5312 Peters Creek Road
 Roanoke, Va. 24019
 703-982-7432

Piedmont Reg. Off.
 4010 West Broad Street
 P. O. Box 6616
 Richmond, Va. 23230
 804-257-1006

Tidewater Reg. Off.
 287 Pembroke Office Park
 Suite 310 Pembroke No. 2
 Va. Beach, Va. 23462
 804-499-8742

Northern Virginia Reg. Off.
 5515 Cherokee Avenue
 Suite 404
 Alexandria, Va. 22312
 703-750-9111

Signature Frederick Johnson (Seal), Date 10/26/80
 (Well driller or authorized person)
 License No. 033160

Schematic drawing of sewage disposal system and topographic features.

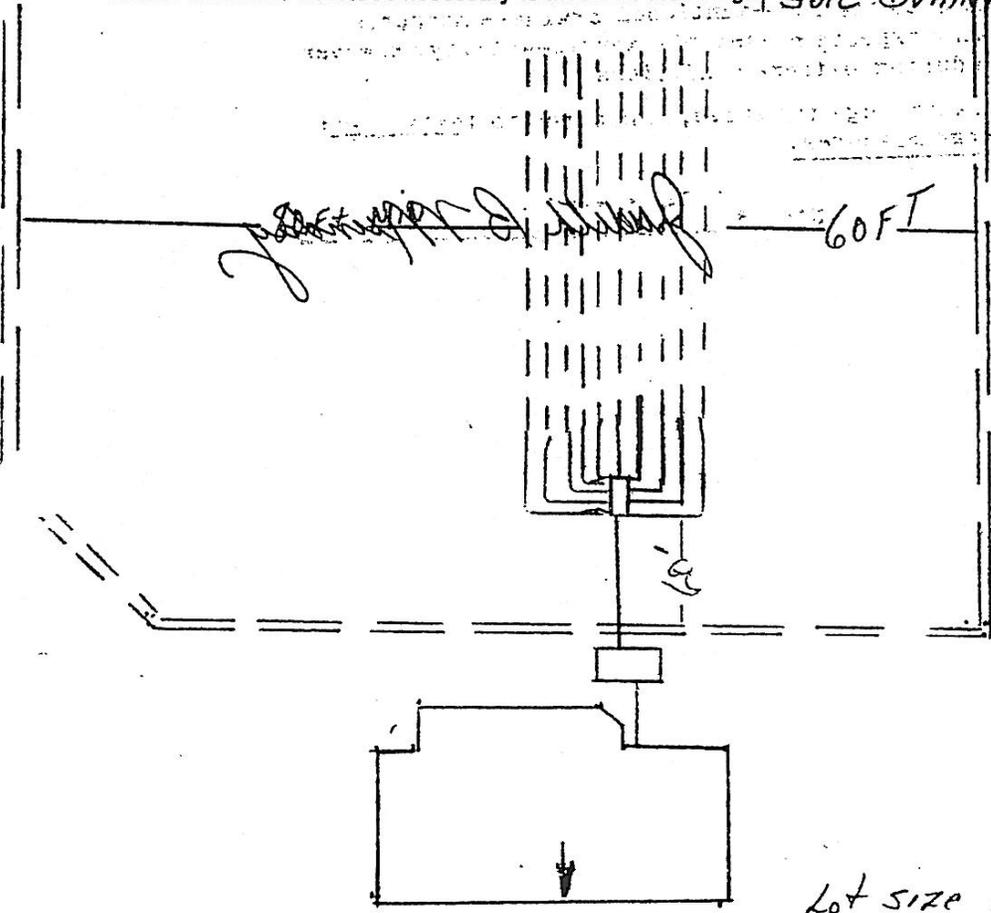
Show the lot lines of the building lot and building site, sketch of property showing any topographic features which may impact on the design of the system, all existing and/or proposed structures including sewage disposal systems and wells within 100 feet of sewage disposal system and reserve area. The schematic drawing of the sewage disposal system shall show sewer lines, pretreatment unit, pump station, conveyance system, and subsurface soil absorption system, reserve area, etc. When a nonpublic drinking water supply is to be located on the same lot show all sources of pollution within 100 feet.

The information required above has been drawn on the attached copy of the sketch submitted with the application. Attach additional sheets as necessary to illustrate the design.

NOT TO SCALE

SOIL DRAINAGE MANAGEMENT PLAN

1. DRAINFIELD WILL REQUIRE 10-100 FT LINES 2 FT WIDE
2. SEPTIC TANK WILL REQUIRE 1200 GAL CAP.
3. DRAINFIELD MUST BE IN AREA SHOWN ON SUMP. LANDSCAPING GRADING MUST COMPLY WITH SUMP. & BE INSPECTED BY THIS OFF. PRIOR TO HOUSE BEING OCY
4. WALL MUST BE 100 FT FROM HOUSE FOUNDATIONS & DRAINFIELDS
5. KEEP ALL UNDERGROUND UTILITIES 10 FT FROM SEPTIC SYSTEM.



LOT SIZE IS 3 ACRES

The sewage disposal system is to be constructed as specified by the permit or attached plans and specifications .

This sewage disposal system construction permit is null and void if (a) conditions are changed from those shown on the application (b) conditions are changed from those shown on the construction permit.

No part of any installation shall be covered or used until inspected, corrections made if necessary, and approved, by the local health department or unless expressly authorized by the local health dept. Any part of any installation which has been covered prior to approval shall be uncovered, if necessary, upon the direction of the Department.

Date: *5-5-86* Issued by: *Curt B. Estep*

Sanitarian

Date: *5-9-86* Reviewed by: *WR Haddmott*

Supervisory Sanitarian

This Construction Permit Valid until *11-88*

If FHA or VA financing

Reviewed by Date _____ Date _____

Supervisory Sanitarian

Regional Sanitarian

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF GENERAL SERVICES
DIVISION OF CONSOLIDATED LABORATORY SERVICES - BUREAU OF MICROBIOLOGICAL SCIENCE

REPORT ON BACTERIOLOGICAL EXAMINATION OF WATER

DO NOT WRITE IN SPACE BELOW.

| Portion Of Sample Tested | Bact. of Coliform Group | Portion Of Sample Iny'd | Bact. of Coliform Group | Coliforms per 100 ml. |
|--------------------------|-------------------------|-------------------------|-------------------------|-----------------------|
| .0001 ml. | | 10 ml. | + | |
| .001 ml. | | 10 ml. | - | |
| .01 ml. | | 10 ml. | - | |
| .1 ml. | | 10 ml. | - | |
| 1 ml. | | 10 ml. | - | |

SAMPLE NO. 08255

Results Based on Confirmed Tests Unless Otherwise Specified

DATE COLLECTED 12-27-75

NAME OF SUPPLY Box Murray Co.

CITY OR COUNTY Chesapeake

SUPPLY OWNED BY John E. Munday

SAMPLE COLLECTED BY Dr. E. E. Munday

SAMPLE WAS TAKEN FROM Water in house

SUPPLY CHLORINATED? YES NO

WAS CHLORINE TEST MADE AT SAMPLING POINT? YES NO

RES. CL. _____ PPM. REPORT RESULTS TO -

CHESAPEAKE HEALTH DEPT.

P.O. Box 1463

CHESAPEAKE, VA. 25520

Membrane Filter _____ Coliforms per 100 ml.

+ Opposite Portion Tested Means Bacteria Indicating Contamination WERE Present.

- Means Bacteria Indicating Contamination WERE NOT Present.

Amodei

THIS BOTTLE CONTAINS THIOSULPHATE

FORM LHS-154

See reverse side for collection information

DCLIS-02-078 (REV. 3-77)

Ph. 487-5709

DEERLAWNEY
 234 86-0199
 MS 610 507# 20

NON-PUBLIC SUPPLY

NAME OF CITY OR COUNTY
 DATE COLLECTED 6-17-87 TIME 11:55 COUNTY W. VA.

ADDRESS OF SUPPLY 204 McHenry St.
 SUPPLY OWNED BY John C. McHenry
 SAMPLE COLLECTED BY W.H. E. McHenry
 SAMPLE WAS TAKEN FROM Central Water
 IS SUPPLY CHLORINATED? YES NO
 WAS CHLORINE TEST MADE AT SAMPLING POINT YES NO
 RES. CL. _____ PPM - REPORT RESULTS TO -
EPHESIARENE HEALTH DEPT.
P.O. Box 1443
EPHESIARENE, VA 23320

THIS BOTTLE CONTAINS THIOSULPHATE

COMMONWEALTH OF VIRGINIA
 DEPARTMENT OF GENERAL SERVICES
 DIVISION OF CONSOLIDATED LABORATORY SERVICES
REPORT ON BACTERIOLOGICAL EXAMINATION OF WATER
 DO NOT WRITE IN SPACE BELOW.

| Portion Of Sample Tested | Bact. of Coliform Group | Portion Of Sample Tested | Bact. of Coliform Group | SAMPLE NO. |
|--------------------------|-------------------------|--------------------------|-------------------------|------------|
| .0001 ml. | | 10 ml. | | 9353 |
| .001 ml. | | 10 ml. | | |
| .01 ml. | | 10 ml. | | |
| .1 ml. | | 10 ml. | | |
| 1 ml. | | 10 ml. | | |

RECEIVED
 W.C. R. K.
 08255
 5/11/87 AM 11M
 Results Based on Confirmed Tests Unless Otherwise Specified

Membrane Filter _____ Coliforms per 100 ml.
 + Opposite Portion Tested Means Bacteria Indicating Contamination WERE Present.
 - Means Bacteria Indicating Contamination WERE NOT Present.

See reverse side for collection information
 DGS-22-058 (6-85)

0059

GW-2
978-10,000

State Water Control Board
P.O. Box 11143
111 North Hamilton St.
Richmond, Va. 23230

COMMONWEALTH OF VIRGINIA
WATER WELL COMPLETION REPORT
(Certification of Completion/County Permit)

MS61C Bl 2 Lot 18
BWCM No. CE
Plat #40

County/City Chesapeake

County/City Stamp

Virginia Plane Coordinates

N _____
E _____
Latitude & Longitude
N _____
W _____

Topo. Map No. _____
Elevation _____ ft.
Formation _____
Lithology _____
River Basin _____
Province _____
Type Logs _____
Cuttings _____
Water Analysis _____
Aquifer Test _____

• Owner Roy Mendelsohn
• Well Designation or Number Class 2 B
Address Lot 40 1320 Murray Drive
Chesapeake, Va.
Phone 420-7249

• Drilling Contractor T.E. Gildersleeve Pump & Well, Inc
Address 5855-A Hargrove Street
Norfolk, Virginia 23502
Phone 461-7867/ 464-0461

SWCB Permit _____
County Permit _____

Certification of inspecting official:
This well does _____ does not _____
meet code/low requirements.
S. _____
Date _____

For Office Use

Tax Map I.D. No. _____
Subdivision _____
Section _____
Block _____
Lot _____
Class Well: I _____, IIA _____
IIB X, IIIA _____, IIIB _____
IIIC _____, IIID _____, IIIE _____

WELL LOCATION: 60 (feet ~~from~~ in front direction) of house
and 15' feet ~~from~~ from (direction) of driveway (see enclosed site plan)
(If possible please include map showing location marked) well head completed 1" above ground per code
Date started 6-21-87 • Date completed 6-21-87 Type rig mud rotary

WELL DATA: New X Reworked _____ Deepened _____

• Total depth 80' ft.
• Depth to bedrock n/a ft.
• Hole size (Also include reamed zones)
• 7 inches from 0 to 80 ft.
• _____ inches from _____ to _____ ft.
• _____ inches from _____ to _____ ft.

• Casing size (I.D.) and material
• 4 inches from 0 to 65 ft.
Material _____
Wt. per foot _____ or wall thickness _____ in.
• _____ inches from _____ to _____ ft.
Material _____
Wt. per foot _____ or wall thickness _____ in.
• _____ inches from _____ to _____ ft.
Material _____
Wt. per foot _____ or wall thickness _____ in.

• Screen size and mesh for each zone (where applicable)
• 4 inches from 65 to 80 ft.
• Mesh size .010 Type Timco slotted pvc
• _____ inches from _____ to _____ ft.
• Mesh size _____ Type _____
• _____ inches from _____ to _____ ft.
• Mesh size _____ Type _____
• _____ inches from _____ to _____ ft.
• Mesh size _____ Type _____

• Gravel pack
• From 60 to 80 ft.
• From _____ to _____ ft.

• Grout
• From 0 to 50 ft., Type Portland Type 2
• From _____ to _____ ft., Type _____

2. WATER DATA • Water temperature 60 OF
• Static water level (unpumped level-measured) 9' ft.
• Stabilized measured pumping water level 25 ft.
• Stabilized yield 18 gpm after 2 hours
Natural Flow: Yes _____ No X, flow rate: _____ gpm
Comment on quality ph 7.0, iron 0.6 ppm, hardness 2

3. WATER ZONES: From 26 To 32 chlor 350 ppm
From 65 To 80 From _____ To _____
From _____ To _____ From _____ To _____

4. USE DATA:
Type of use: Drinking X, Livestock Watering _____
Irrigation _____ Food processing _____, Household X
Manufacturing _____, Fire safety _____, Cleaning _____
Recreation _____, Aesthetic _____, Cooling or heating _____
Injection _____, Other _____

• Type of facility: Domestic X, Public water supply _____
Public institution _____, Farm _____, Industry _____
Commercial _____, Other _____

5. PUMP DATA: Type Sub. • Rated H.P. 1/2
• Intake depth 45' • Capacity 18gpm at 30 psi head

6. WELLHEAD: Type well seal pitless adapter §
Pressure tank X-trolgal., Loc. garage
Sample tap X, Measurement port X
Well vent X, Pressure relief valve X
Gate valve X, Check valve (when required) X
Electrical disconnect switch on power supply X

7. DISINFECTION: Well disinfected X yes _____ no _____
Date 6-21-87, Disinfectant used chlorine tablets
Amount 6 (six), Hours used 4 (four)

8. ABANDONMENT (where applicable) • yes _____ no _____
Casing pulled yes _____ no _____ not applicable _____
Plugging grout From _____ to _____ material _____

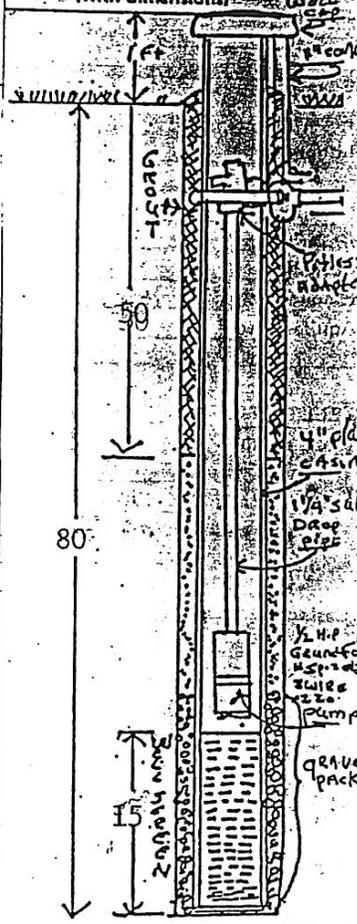
9. State law requires submitting to the Virginia State Water Control Board information about groundwater and wells for every well made in the State intended for water, or any other non-exempt well. This information must be submitted whether the well is completed, on standby, or abandoned. Information required includes: an accurately and completely prepared water well completion report, full data from any aquifer pumping tests, drill cuttings taken at ten foot intervals (unless exemption is secured), the results of any chemical analyses, and copies of any geophysical logs. Quarterly pumpage and use reports are required from owners of public supply and industrial wells. County or State permits to drill may be required in some parts of the state. Some counties require submission of a water well completion report. The Virginia State Health Department requires a water well completion report for public supply wells.

10. DRILLERS LOG (use additional Sheets if necessary)

| DEPTH (feet) | | TYPE OF ROCK OR SOIL (color, material, fossils, hardness, etc.) | REMARKS (water, caving, cavities, broken, core, shot, etc.) |
|--------------|----|--|--|
| From | To | | |
| 0 | 6 | brown clay | |
| 6 | 14 | fine sand and gray clay | |
| 14 | 18 | gray clay | |
| 18 | 24 | fine gray sand | |
| 24 | 32 | coarse gray sand | water bearing |
| 32 | 38 | coarse gray sand, clay breaks | |
| 38 | 55 | gray clay | |
| 55 | 65 | fine gray silt and clay | |
| 65 | 80 | fine gray sand and shell | water bearing |

11. Drilling Time (Min.) _____

12. DIAGRAM OF WELL CONSTRUCTION (with dimensions)



13. Well lot dedicated? No; Size _____ ft. X _____ ft.; Well house? NO
 Distance to nearest pollutant source 60 ft., Type foundation treatment
 Distance to nearest property line 15 ft., Building 60 ft.

State Water Control Board Regional Offices

Valley Reg. Off.
 116 North Main Street
 P. O. Box 268
 Bridgewater, Va. 22812
 703-828-2595

Piedmont Reg. Off.
 4010 West Broad Street
 P. O. Box 6616
 Richmond, Va. 23230
 804-257-1006

Southwest Reg. Off.
 408 East Main Street
 P. O. Box 476
 Abingdon, Va. 24210
 703-628-5183

Tidewater Reg. Off.
 287. Pembroke Office Park
 Suite 310 Pembroke No. 2
 Va. Beach, Va. 23462
 804-499-8742

West Central Reg. Off.
 Executive Park
 5312 Peters Creek Road
 Roanoke, Va. 24019
 703-982-7432

Northern Virginia Reg. Off.
 5515 Cherokee Avenue
 Suite 404
 Alexandria, Va. 22312
 703-750-9111

14. WATER SERVICE PIPE: Checked under 75 p.s.i. for 60 minutes. Pipe size 1 1/2 inches, Material pvc sch 40
 Installer Michael A. Gildersleeve
 Date 6-21-87

15. I certify that the information contained herein is true and correct and that this well and/or system has been installed and constructed in accordance with the requirements for well construction as specified in compliance with appropriate county or independent city ordinances and the laws and rules of the Commonwealth of Virginia.

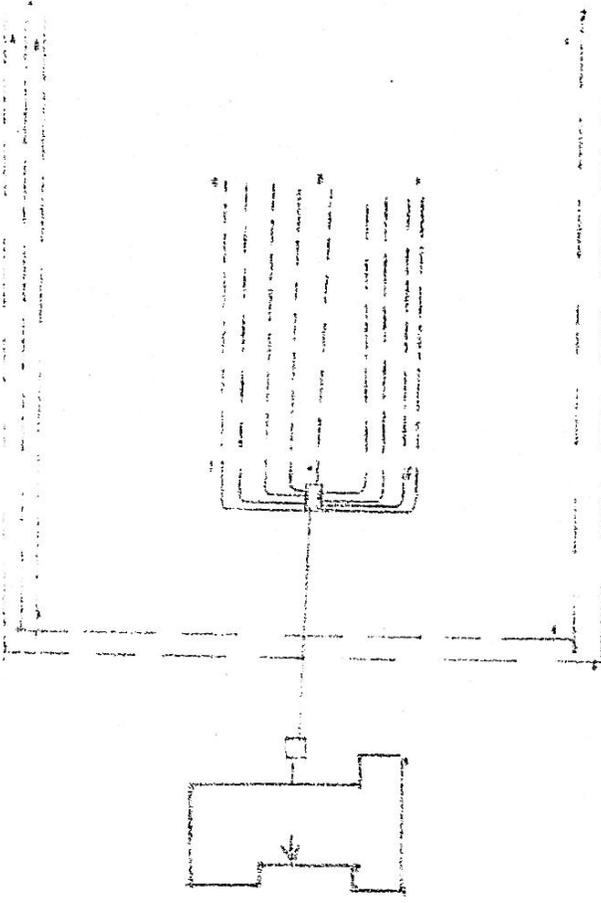
Signature Michael A. Gildersleeve (Seal), Date 6-22-87
 (Well driller or authorized person)

License No# 021427

Schematic drawing of sewage disposal system and topographic features.

Show the lot lines of the building lot and building site, sketch of property showing any topographic features which may impact on the design of the system, all existing and/or proposed structures including sewage disposal systems and wells within 100 feet of sewage disposal system and reserve area. The schematic drawing of the sewage disposal system shall show sewer lines, pretreatment unit, pump station, conveyance system, and subsurface soil absorption system, reserve area, etc. When a nonpublic drinking water supply is to be located on the same lot show all sources of pollution within 100 feet.

The information required above has been drawn on the attached copy of the sketch submitted with the application. Attach additional sheets as necessary to illustrate the design.



- Not to scale*
1. Septic tank will be approx 7-100 ft long & 4 ft wide.
 2. Septic tank will be approx 700 gal. Cap. max.
 3. Driveway must be in rear as shown on lot & no other structures allowed.
 4. Final grading & landscaping must comply with local ordinances. Prop. This must be approved by the other dept. before any digging.
 5. Keep well head no closer than 100 ft from tank.

The sewage disposal system is to be constructed as specified by the permit or attached plans and specifications .

This sewage disposal system construction permit is null and void if (a) conditions are changed from those shown on the application (b) conditions are changed from those shown on the construction permit.

No part of any installation shall be covered or used until inspected, corrections made if necessary, and approved, by the local health department or unless expressly authorized by the local health dept. Any part of any installation which has been covered prior to approval shall be uncovered, if necessary, upon the direction of the Department.

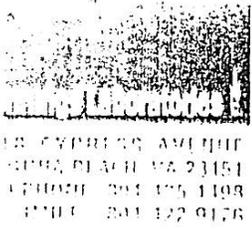
Date: 11-21-86 Issued by: [Signature]
 Sanitarian

Date: 1-5-87 Reviewed by: [Signature]
 Supervisory Sanitarian

This Construction
 Permit Valid until

If FHA or VA financing

Reviewed by Date _____ Date _____
 Supervisory Sanitarian Regional Sanitarian



MS 61c
Lot 21



ANALYTICAL CHEMISTS

Certificate of Analysis

10 PAUL ROMEO
1208 MURRAY DRIVE
CHESAPEAKE VA 23322

DATE 05/12/97

Drinking Water
Sample received: 05/09/97 @ 2:40 p.m.
Sample collected: 05/09/97 @ 1:30 p.m.
Sample marked: 1208 Murray Drive
Chesapeake, Virginia
Sampled by: Paul Romeo

ANALYSIS NO 97-2357

Total Coliform.....Negative

"This water sample is bacteriologically safe for human consumption."

✓ copy to: Chesapeake Health Department

W. A. [Signature]

CBE 4/16/98
MJC Lot 21

Commonwealth of Virginia Uniform Water Well Completion Report

Owner Paul J. Rones
Address Box 21, Green Haven (Murray Lane)
Chesapeake
Phone 331 0966
Location Front of land

Tax Map ID 21
VDH Permit 234952004
VWCB Permit _____
VWCB ID _____
County _____

* Well Data *

General Information
Drilling Method Hyd Drill
Depth to Bedrock 35
Static Water Level 7
Well Disinfected (Y or N) yes

Date Completed 1, 23, 98
Yield 25 (GPM)
Stabilized Water Level 11
Disinfectant Used chlorine

Total Depth of Well 50
Length of Test 2 hrs
Natural Flow (Rate) 10
Amount Used 0.5119 gal

Casing
From 0 to 40
Size _____ Material _____
Weight/Schedule 211

From _____ to _____
Size _____ Material _____
Weight/Schedule _____

From _____ to _____
Size _____ Material _____
Weight/Schedule _____

Gravel Pack
From 38 to 50

From _____ to _____

From _____ to _____

Grout
From 0 to 20
Bore Hole Size 6 1/2
Type Cement + Best Seal
Method pour

From _____ to _____
Bore Hole Size _____
Type _____
Method _____

From _____ to _____
Bore Hole Size _____
Type _____
Method _____

Water Zones or Screened Intervals
From 40 to 50
Mesh Size 20 Diam. 2 1/2
From _____ to _____
Mesh Size _____ Diam. _____

From _____ to _____
Mesh Size _____ Diam. _____
From _____ to _____
Mesh Size _____ Diam. _____

From _____ to _____
Mesh Size _____ Diam. _____
From _____ to _____
Mesh Size _____ Diam. _____

* Use Data *

Private Well: Domestic Agricultural _____ Industrial _____ Monitoring _____
Public Well: Community _____ Non Community _____

(Use additional sheets if necessary)

Depth

Description of Formation or Sediment

Remarks

| Depth | Description of Formation or Sediment | Remarks |
|-------|--------------------------------------|---------|
| 0 | clay | |
| 10 | clay sand | |
| 10 26 | sand clay | |
| 20 30 | clay | |
| 30 40 | clay, Bed Rock | |
| 40 50 | Bed Rock | |

I certify that the information contained here is true and that this well was installed and constructed in accordance with the permit and further that the well complies with all applicable state and local regulations, ordinances and laws.

Drilling Contractor Richard Saunders Well Drilling
Address 941 Mt Pleasant Rd
Chesapeake VA 23322
Phone 482 1404

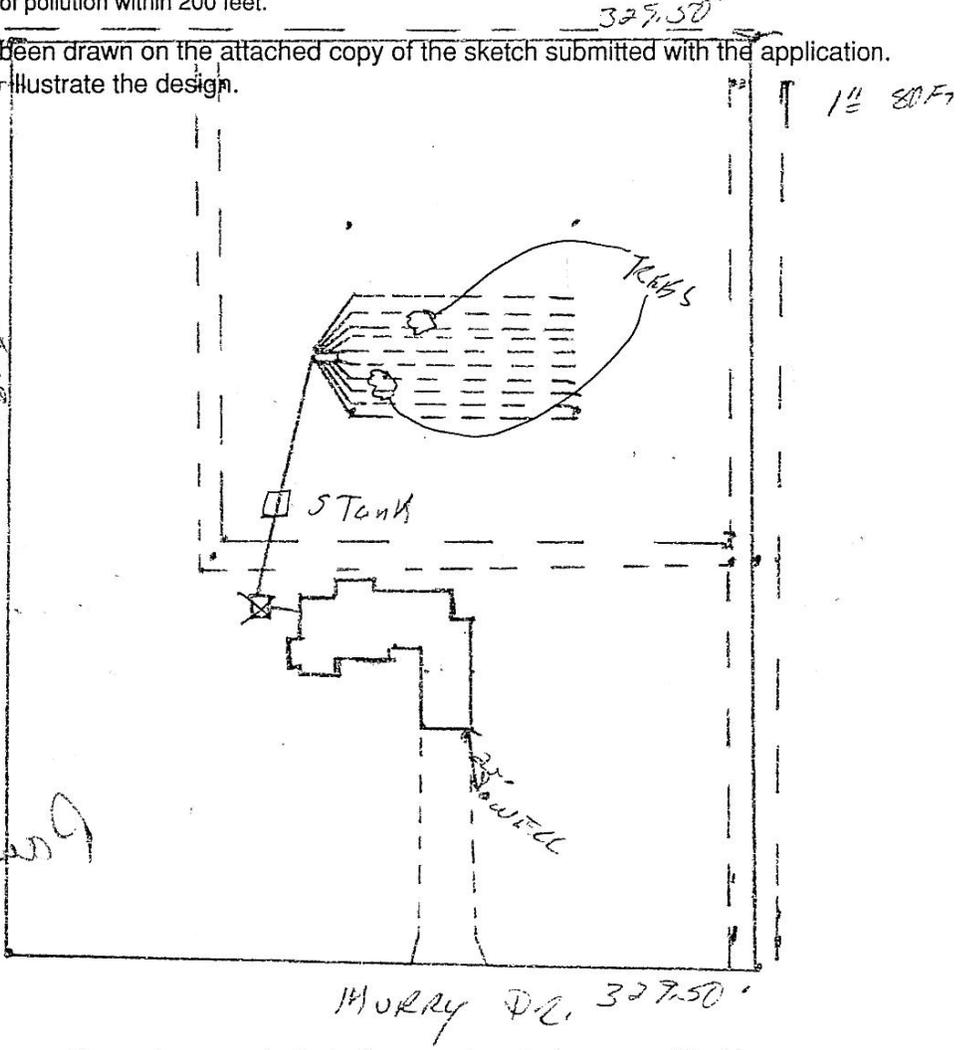
Drillers Signature Richard Saunders Date 1, 23, 98
Representing Richard Saunders Well Drilling
Virginia Contractors License Number 2705 C304000

Schematic drawing of sewage disposal and/or water supply system and topographic features.

Show the lot lines of the building site, sketch of property showing any topographic features which may impact on the design of the well or sewage disposal system, including existing and/or proposed structures and sewage disposal systems and wells within 200 feet. The schematic drawing of the well site or area and/or sewage disposal system shall show sewer lines, pretreatment unit, pump station, conveyance system, and subsurface soil absorption system, reserve area, etc. When a nonpublic drinking water supply is to be permitted, show all sources of pollution within 200 feet.

The information required above has been drawn on the attached copy of the sketch submitted with the application. Attach additional sheets as necessary to illustrate the design.

1. Drain Field Will require 10-100 ft Lines 8ft wide.
 2. Comply with all rules & Regs of Soil & Water Management.
 3. Well must be class II Cased & grouted to soft at least 100 ft from drain field & soft from septic tank.
 4. Drain field area must be landscaped & grouted to comply with the soil & water management plan. This office must inspect & approve prior to house being occupied. I don't know.
- DES. for ~~four~~ Four bedrooms



This sewage disposal system and/or water supply is to be constructed as specified by the permit _____ or attached plans and specifications _____.

This sewage disposal system and/or well construction permit is null and void if (a) conditions are changed from those shown on the application (b) conditions are changed from those shown on the construction permit.

No part of any installation shall be covered or used until inspected, corrections made if necessary, and approved, by the local health department or unless expressly authorized by the local health dept. Any part of any installation which has been covered prior to approval shall be uncovered, if necessary, upon the direction of the Department.

Date: 10-18-75 Issued by: [Signature]
 Sanitarian

Date: _____ Reviewed by: _____
 Supervisory Sanitarian

This Construction Permit Valid until 4-98

If FHA or VA financing

Reviewed by Date _____ Date _____

1305 Murray Dr

Health Department Identification Number 224-05-0228

Schematic drawing of sewage disposal system and topographic features.

PAGE 2 OF 2

Show the lot lines of the building lot and building site, sketch of property showing any topographic features which may impact on the design of the system, all existing and/or proposed structures including sewage disposal systems and wells within 100 feet of sewage disposal system and reserve area. The schematic drawing of the sewage disposal system shall show sewer lines, pretreatment unit, pump station, conveyance system, and subsurface soil absorption system, reserve area, etc. When a nonpublic drinking water supply is to be located on the same lot show all sources of pollution within 100 feet.

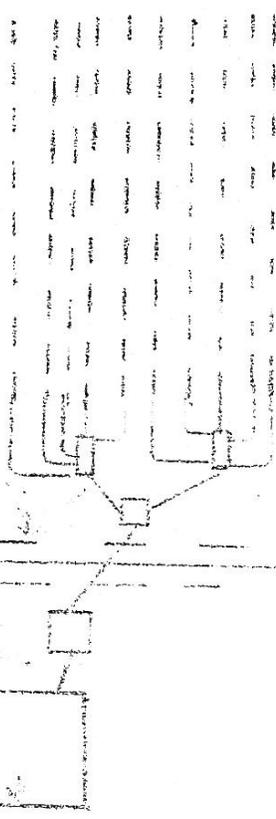
NOT TO SCALE

The information required above has been drawn on the attached copy of the sketch submitted with the application. Attach additional sheets as necessary to illustrate the design.

*Sanitary sewer system 12" dia. 40' depth
14' width
Septic tank 12' x 12' x 6' deep
Cess tank 12' x 12' x 6' deep
12' x 12' x 6' deep
5' x 12' x 6' deep
etc.*

*12" dia. sewer line
to connect to street
Street at corner
Show on plan
The sewer line
to be installed
by the contractor
The lot
is to be
used for
residential*

*12" dia. sewer line
to connect to street
Street at corner
The lot
is to be
used for
residential*



The sewage disposal system is to be constructed as specified by the permit or attached plans and specifications .

This sewage disposal system construction permit is null and void if (a) conditions are changed from those shown on the application (b) conditions are changed from those shown on the construction permit.

No part of any installation shall be covered or used until inspected, corrections made if necessary, and approved, by the local health department or unless expressly authorized by the local health dept. Any part of any installation which has been covered prior to approval shall be uncovered, if necessary, upon the direction of the Department.

Date: 8-12-95 Issued by: [Signature] Sanitarian

Date: 9-12-95 Reviewed by: [Signature] Supervisory Sanitarian

This Construction Permit Valid until

If FHA or VA financing

Reviewed by Date _____ Date _____
Supervisory Sanitarian Regional Sanitarian

CBE
3/21/96

Commonwealth of Virginia Uniform Water Well Completion Report

(1104)

Owner MICHAEL CLIFTON
 Address 1106 MURRY DR
CHESAPEAKE, VA
 Phone _____
 Location _____

Tax Map ID Lot 13
 VDH Permit 239-93-0700
 WCB Permit _____
 WCB ID _____
 County _____

* Well Data *

General Information

Drilling Method MUD ROTARY
 Depth to Bedrock N/A
 Static Water Level 8
 Well Disinfected (Y or N) Y

Date Completed 3-4-96
 Yield 18 (GPM)
 Stabilized Water Level 10
 Disinfectant Used Chlorine

Total Depth of Well 122
 Length of Test 2 HRS
 Natural Flow (Rate) N/A
 Amount Used 3 GAL

Casing

From 0 to 112
 Size 4" Material PVC
 Weight/Schedule 40

From _____ to _____
 Size _____ Material _____
 Weight/Schedule _____

From _____ to _____
 Size _____ Material _____
 Weight/Schedule _____

Gravel Pack

From 107 to 122

From _____ to _____

From _____ to _____

Grout

From 0 to 25
 Bore Hole Size 1 1/2"
 Type BENTONITE
 Method PUMP

From _____ to _____
 Bore Hole Size _____
 Type _____
 Method _____

From _____ to _____
 Bore Hole Size _____
 Type _____
 Method _____

Water Zones or Screened Intervals

From 112 to 122
 Mesh Size 20 Diam. 4"
 From _____ to _____
 Mesh Size _____ Diam. _____

From _____ to _____
 Mesh Size _____ Diam. _____
 From _____ to _____
 Mesh Size _____ Diam. _____

From _____ to _____
 Mesh Size _____ Diam. _____
 From _____ to _____
 Mesh Size _____ Diam. _____

* Use Data *

Private Well: Domestic _____ Agricultural _____ Industrial _____ Monitoring _____
 Public Well: Community _____ Non Community _____

"NEW WELL"

Drillers Log
(Use additional sheets if necessary)

| Depth | Description of Formation or Sediment | Remarks |
|-----------------------|--------------------------------------|---------|
| <i>1106 MURRY DR.</i> | | |
| 0-11 | GRAY CLAY | |
| 11-42 | GRAY SAND | |
| 42-65 | GRAY SAND/CLAY/SHELL | |
| 65-85 | GRAY CLAY/SHELL | |
| 85-90 | GRAY SAND - - - - - | WATER |
| 90-113 | GRAY CLAY | |
| 113-122 | FINE SHELL - - - - - | WATER |

I certify that the information contained here is true and that this well was installed and constructed in accordance with the permit and further that the well complies with all applicable state and local regulations, ordinances and laws.

Drilling

Contractor Gildersleeve Pump & Well, Inc.

Address: 5855-A Hargrove Street

Norfolk, Va. 23507-4636

Phone (804) 461-7867

Drillers Signature Kevin Finney Date 3-4-96

Representing Gildersleeve Pump & Well, Inc.

Virginia Contractors License Number 2701 021427

Jennings Laboratories

1118 CYPRESS AVENUE
VIRGINIA BEACH, VA 23451
TELEPHONE 804/425/1498
FACSIMILE 804/422/9176

CBE

3/11/96

CI

Lot 13

ANALYTICAL CHEMISTS

Certificate of Analysis

TO GILDERSLEEVE WELL & PUMP
5855A HARGROVE STREET
NORFOLK VIRGINIA 23502

DATE 03/06/96

SAMPLE DESCRIPTION

Drinking Water
Sample received: 03/05/96 @ 3:50 p.m.
Sample taken: 03/04/96 @ 4:30 p.m.
Sample marked: Clifton
1106 Murray Drive
Virginia Beach, Virginia

ANALYSIS NO 96-1077

Total Coliform.....Negative
"This water sample is bacteriologically safe for consumption."

Chemist



OFFICIAL METHODS OF A.O.A.C., P.O.C.S., A.S.T.M., E.P.A., A.P.H.A. & N.E.P.A. USED IN ALL ANALYSIS UNLESS OTHERWISE STATED

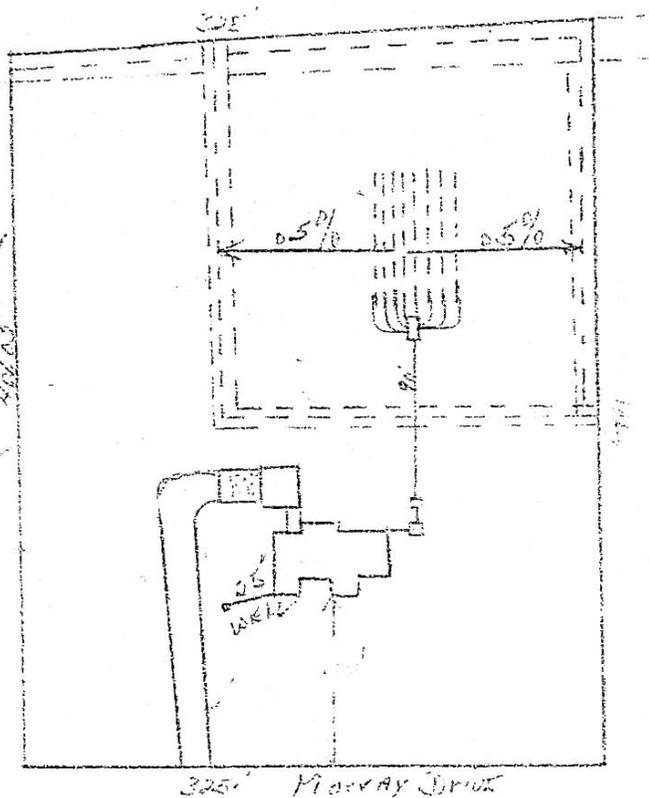
Schematic drawing of sewage disposal system and topographic features.

show the lot lines of the building lot and building site, sketch of property showing any topographic features which may impact on the design of the system, all existing and/or proposed structures including sewage disposal systems and wells within 100 feet of sewage disposal system and area. The schematic drawing of the sewage disposal system shall show sewer lines, pretreatment unit, pump station, conveyance system, subsurface soil absorption system, reserve area, etc. When a nonpublic drinking water supply is to be located on the same lot show all details of pollution within 100 feet.

Scale 1" = 100'

The information required above has been drawn on the attached copy of the sketch submitted with the application. Attach additional sheets as necessary to illustrate the design.

*Drainage will require 8-10' of concrete
 24" wide -
 Comply with all codes & pages of
 code book and management.
 When model class etc. cannot
 be used to well, at least meet the
 minimum of 25' Foundation
 treated Foundations
 Area - all must be landscaped
 & graded to comply with the soil
 drainage management plan, this must
 be inspected & approved by this office
 before backfill is completed.
 Contact this office to determine if
 water sample to be taken.*



The sewage disposal system is to be constructed as specified by the permit or attached plans and specifications .

This sewage disposal system construction permit is null and void if (a) conditions are changed from those shown on the application (b) conditions are changed from those shown on the construction permit.

No part of any installation shall be covered or used until inspected, corrections made if necessary, and approved, by the local health department or unless expressly authorized by the local health dept. Any part of any installation which has been covered prior to approval shall be uncovered, if necessary, upon the direction of the Department.

Date: 2-1-94 Issued by: [Signature]
 Sanitarian
 Reviewed by: [Signature]
 Supervisory Sanitarian

This Construction Permit Valid until
2-97

If FHA or VA financing

by Date _____ Date _____
 Supervisory Sanitarian Regional Sanitarian

COMMONWEALTH OF VIRGINIA WATER WELL COMPLETION REPORT

• BWCM No. _____

State Water Control Board
P.O. Box 11143
111 North Hamilton St.
Richmond, Va. 23230

(Certification of Completion/County Permit)

County/City _____

Virginia Plane Coordinates

N _____
E _____

Latitude & Longitude

N _____
W _____

Topo. Map No. _____
Elevation _____ ft.

Formation _____
Lithology _____
River Basin _____
Province _____
Type Logs _____
Cuttings _____
Water Analysis _____
Aquifer Test _____

County/City Stamp

• Owner Henry Schepers

• Well Designation or Number _____

Address 1311 Murray Ave
Chesapeake Va

Phone _____

• Drilling Contractor L.E. STILLMAN JR

Address 1513 Hawthorne Dr
Chesapeake Va

Phone 426 0061

SWCB Permit _____
County Permit _____

Certification of inspecting official:
This well does _____ does not _____
meet code/low requirements.
S. _____
Date _____

For Office Use

Tax Map I.D. No. _____
Subdivision _____
Section _____
Block _____
Lot _____
Class Well I _____, IIA _____
IIB _____, IIIA , IIIB _____
IIIC _____, IIID _____, IIIE _____

WELL LOCATION: 100 (feet/miles) North (direction) of house
and 75 feet/miles West (direction) of East property line
(If possible please include map showing location marked)

Date started 6-9-86 • Date completed 6-10-86 Type rig mud Rotary

WELL DATA: New Reworked _____ Deepened _____

Total depth 130 ft.

Depth to bedrock _____ ft.

Hole size (Also include reamed zones)

- 6 inches from 0 to 20 ft.
- 3 inches from 20 to 130 ft.
- _____ inches from _____ to _____ ft.

Casing size (I.D.) and material

- 2 inches from +1 to 70 ft.
- Material PUC
- Wt. per foot _____ or wall thickness Sch 40 in.
- _____ inches from _____ to _____ ft.
- Material _____
- Wt. per foot _____ or wall thickness _____ in.
- _____ inches from _____ to _____ ft.
- Material _____
- Wt. per foot _____ or wall thickness _____ in.

Screen size and mesh for each zone (where applicable)

- 1/4 inches from 70 to 130 ft.
- Mesh size 008 Type PUC
- _____ inches from _____ to _____ ft.
- Mesh size _____ Type _____
- _____ inches from _____ to _____ ft.
- Mesh size _____ Type _____
- _____ inches from _____ to _____ ft.
- Mesh size _____ Type _____

Gravel pack

- From 70 to 130 ft.
- From _____ to _____ ft.

Sealant

- From 0 to 20 ft., Type neat
- From _____ to _____ ft., Type _____

2. WATER DATA • Water temperature 59 of _____

- Static water level (unpumped level-measured) 8 ft
- Stabilized measured pumping water level 15 ft
- Stabilized yield 20 gpm after 4 hours
- Natural Flow Yes _____ No flow rate _____ gpm
- Comment on quality _____

3. WATER ZONES: From 15 To 25

From 40 To 50 From 70 To 130

From _____ To _____ From _____ To _____

4. USE DATA:

Type of use: Drinking Livestock Watering _____
Irrigation _____ Food processing _____ Household _____
Manufacturing _____ Fire safety _____ Cleaning _____
Recreation _____ Aesthetic _____ Cooling or heating _____
Injection _____ Other _____

• Type of facility: Domestic Public water supply _____
Public institution _____ Farm _____ Industry _____
Commercial _____ Other _____

5. PUMP DATA: Type _____ • Rated H.P. _____
• Intake depth _____ • Capacity _____ at _____ head

6. WELLHEAD: Type well seal _____
Pressure tank _____ gal., Loc. _____
Sample tap _____ Measurement port _____
Well vent _____ Pressure relief valve _____
Gate valve _____ Check valve (when required) _____
Electrical disconnect switch on power supply _____

7. DISINFECTION: Well disinfected yes _____ no _____
Date 6-9-86 Disinfectant used Chlorine
Amount 200 PPM Hours used 24

8. ABANDONMENT (where applicable) • yes _____ no _____
Casing pulled yes _____ no _____ not applicable _____
Plugging grout From _____ to _____ material _____

OVER

Owner Henry Scheiters

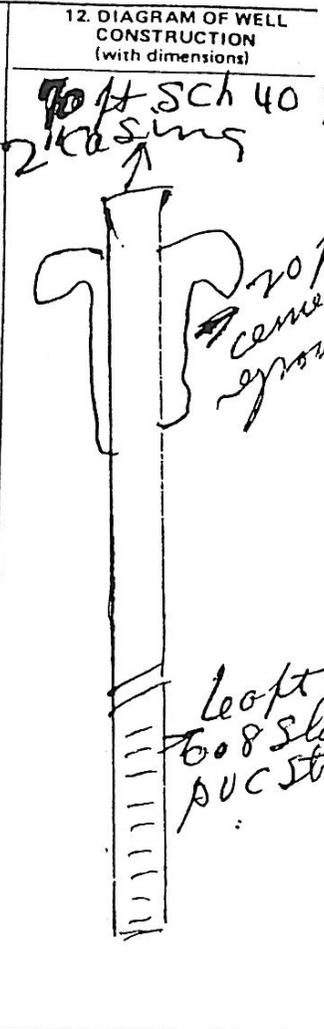
BWCM No. _____

9. State law requires submitting to the Virginia State Water Control Board information about groundwater and wells for every well made in the State intended for water, or any other non-exempt well. This information must be submitted whether the well is completed, on standby, or abandoned. Information required includes an accurately and completely prepared water well completion report, full data from any aquifer pumping tests, drill cuttings taken at ten foot intervals (unless exemption is secured), the results of any chemical analyses, and copies of any geophysical logs. Quarterly pumpage and use reports are required from owners of public supply and industrial wells. County or State permits to drill may be required in some parts of the state. Some counties require submission of a water well completion report. The Virginia State Health Department requires a water well completion report for public supply wells.

10. DRILLERS LOG (use additional Sheets if necessary)

| DEPTH (feet) | | TYPE OF ROCK OR SOIL (color, material, fossils, hardness, etc.) | REMARKS (water, caving, cavities, broken, core, shot, (etc.)) |
|--------------|-----|--|--|
| From | To | | |
| 0 | 5 | top soil & clay | |
| 5 | 15 | clay | |
| 15 | 25 | fine grey sand | |
| 25 | 40 | clay block | |
| 40 | 50 | sand coarse grey | |
| 50 | 70 | fine sand & clay | |
| 70 | 130 | shell & fine salt & pepper sand | |

11. Drilling Time (Min.)



13. Well lot dedicated? _____; Size _____ ft. X _____ ft., Well house? _____
 Distance to nearest pollutant source 150 ft., Type Septic tank
 Distance to nearest property line 10 ft., Building 100 ft.

14. WATER SERVICE PIPE: Checked under _____ p.s.i. for _____ minutes. Pipe size _____ inches, Material _____
 Installer _____
 Date _____

15. I certify that the information contained herein is true and correct and that this well and/or system has been installed and constructed in accordance with the requirements for well construction as specified in compliance with appropriate county or independent city ordinances and the laws and rules of the Commonwealth of Virginia.
 Signature L. E. Stillman (Seal), Date 6-10-86
 (Well driller or authorized person) License No. 009852

State Water Control Board Regional Offices

Valley Reg. Off.
 116 North Main Street
 P. O. Box 268
 Bridgewater, Va. 22812
 703-828-2595

Piedmont Reg. Off.
 4010 West Broad Street
 P. O. Box 6616
 Richmond, Va. 23230
 804-257-1006

Southwest Reg. Off.
 408 East Main Street
 P. O. Box 476
 Abingdon, Va. 24210
 703-628-5183

Tidewater Reg. Off.
 287 Pembroke Office Park
 Suite 310 Pembroke No. 2
 Va. Beach, Va. 23462
 804-499-8742

West Central Reg. Off.
 Executive Park
 3312 Peters Creek Road
 Roanoke, Va. 24019
 703-982-7432

Northern Virginia Reg. Off.
 5515 Cherokee Avenue
 Suite 404
 Alexandria, Va. 22312
 703-750-9111

Chesapeake
W.A.N.

Commonwealth of Virginia
Uniform Water Well Completion Report

Jan - 10

Owner Norman Const.
Address 5125 Watahuck Court - Suite 102
Do Beach rd
Phone 4999834
Location Green Haven - 1379 Murray Drive

Tax Map ID M15-61C
VDH Permit 234-94-0075
VWCB Permit _____
VWCB ID _____
County _____

* Well Data *

General Information

Drilling Method Hyd-Drill
Depth to Bedrock 40
Static Water Level 9
Well Disinfected (Y or N) yes

Date Completed 8-19-94
Yield 20 (GPM)
Stabilized Water Level 23
Disinfectant Used chlorine

Total Depth of Well 53
Length of Test 2 hrs
Natural Flow (Rate) 20
Amount Used 65/19/1

Casing

From 0 to 45
Size 2 Material PVC
Weight/Schedule _____

From _____ to _____
Size _____ Material _____
Weight/Schedule _____

From _____ to _____
Size _____ Material _____
Weight/Schedule _____

Gravel Pack

From 42 to 53

From _____ to _____

From _____ to _____

Grout

From 0 to 20
Bore Hole Size 6
Type Cement & Bent Seal
Method pour

From _____ to _____
Bore Hole Size _____
Type _____
Method _____

From _____ to _____
Bore Hole Size _____
Type _____
Method _____

Water Zones or Screened Intervals

From 45 to 53
Mesh Size 20/2 Diam. 2
From _____ to _____
Mesh Size _____ Diam. _____

From _____ to _____
Mesh Size _____ Diam. _____
From _____ to _____
Mesh Size _____ Diam. _____

From _____ to _____
Mesh Size _____ Diam. _____
From _____ to _____
Mesh Size _____ Diam. _____

* Use Data *

Private Well: Domestic Agricultural _____ Industrial _____
Public Well: Community _____ Non Community _____

Drillers Log *
(Use additional sheets if necessary)

| Depth | Description of Formation or Sediment | Remarks |
|----------|--------------------------------------|---------|
| 0 To 10' | clay silt sand | |
| 10 - 20 | silt sand | |
| 20 - 30 | Bed Rock | |
| 30 - 40 | clay | |
| 40 - 50 | Bed Rock | |
| 50 - 53 | Bed Rock | |

I certify that the information contained here is true and that this well was installed and completed in accordance with the permit and further that the well complies with all applicable state and local regulations, ordinances and laws.

Drilling Contractor Joe Saunders Well Drilling
 Address 1941 Mt. Pleasant Rd
Chesapeake Va 23320
 Phone 4821408

Drillers Signature Joe Saunders Date 8-19-94
 Representing _____
 Virginia Contractors License Number 018280



1118 CYPRESS AVENUE
VIRGINIA BEACH, VA 23451
TELEPHONE 804/425/1498
FACSIMILE 804/422/9176

ANALYTICAL CHEMISTS

Certificate of Analysis

TO Norman Construction
5125 Witchduck Court, Suite 102
Virginia Beach, Va 23462

DATE 10/13/94

SAMPLE DESCRIPTION

Drinking water
Sample received 10/3/94 @ 9:35 a.m.
Sample taken 10/3/94 @ 9:10 a.m.
Sample Marked: 1329 Murray Drive
Chesapeake, Va
MS #61C Lot #10 or 32 HDID #234-94-0075

ANALYSIS NO 94-3803

Total Coliform..... Negative

"This sample is bacteriologically safe for human consumption."

✓ Copy: Chesapeake Health Dept

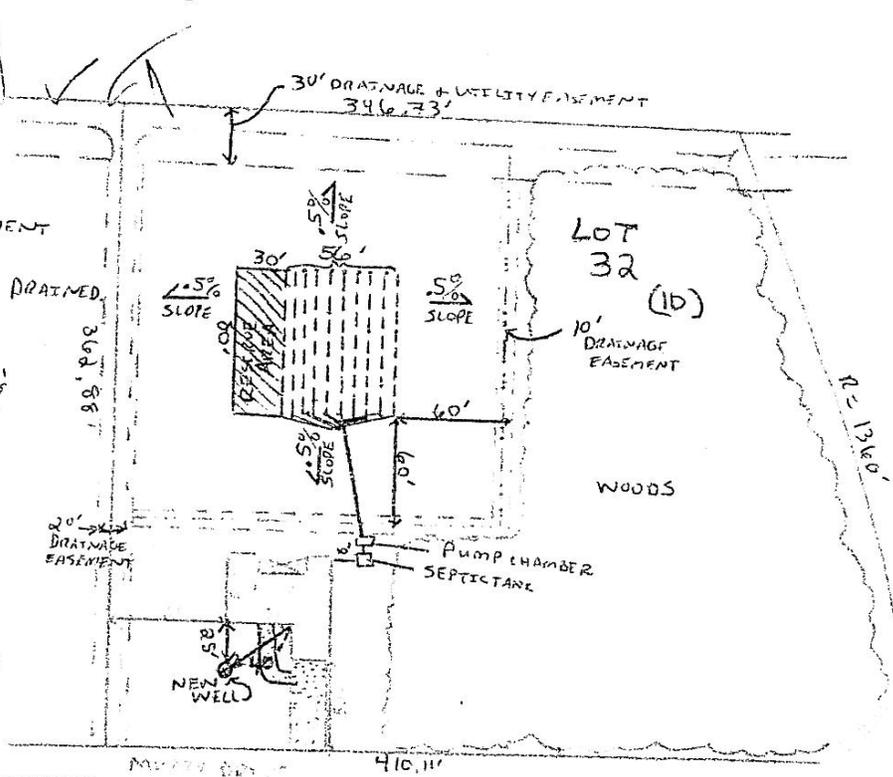
Chemist

Schematic drawing of sewage disposal and/or water supply system and topographic features.

Show the lot lines of the building site, sketch of property showing any topographic features which may impact on the design of the well or sewage disposal system, including existing and/or proposed structures and sewage disposal systems and wells within 200 feet. The schematic drawing of the well site or area and/or sewage disposal system shall show sewer lines, pretreatment unit, pump station, conveyance system, and subsurface soil absorption system, reserve area, etc. When a nonpublic drinking water supply is to be permitted, show all sources of pollution within 200 feet.

The information required above has been drawn on the attached copy of the sketch submitted with the application. Attach additional sheets as necessary to illustrate the design.

- ① 10 - 2' X 80' DRAINFIELD TRENCH LINES.
- ② MAXIMUM DEPTH OF DRAINFIELD - 15"
- ③ GRADE BOARDS REQUIRED.
- ④ COMPLY WITH SOIL DRAINAGE MANAGEMENT PLAN.
- ⑤ 25% OF TOTAL DITCHES MAY BE FRENCH DRAINED.
- ⑥ (4) BEDROOMS ONLY.
- ⑦ KEEP WELL 25' FROM HOUSE FOUNDATION & 50' FROM SEPTIC TANK & PUMP CHAMBER.
- ⑧ FINAL GRADE MUST BE COMPLETED & INSPECTED BEFORE THIS OFFICE CAN ALLOW HOUSE TO BE OCCUPIED.
- ⑨ WELL DRILLER MUST SUBMIT A G.W. 2 TO THIS OFFICE.
- ⑩ ONE (1) CLASS III CWELL TO BE INSTALLED FOR DRINKING WATER. MUST BE CASED & GROUTED TO 20' MINIMUM.
- ⑪ PUMP CHAMBER TO BE INSTALLED IN ACCORDANCE TO SECTION 4.23B. SEE PAGE 3 OF 3.
- ⑫ A WATER SAMPLE MUST BE TAKEN & TESTED BY AN APPROVED LABORATORY.



This sewage disposal system and/or water supply is to be constructed as specified by the permit X or attached plans and specifications _____.

This sewage disposal system and/or well construction permit is null and void if (a) conditions are changed from those shown on the application (b) conditions are changed from those shown on the construction permit.

No part of any installation shall be covered or used until inspected, corrections made if necessary, and approved, by the local health department or unless expressly authorized by the local health dept. Any part of any installation which has been covered prior to approval shall be uncovered, if necessary, upon the direction of the Department.

Date: 6-14-94 Issued by: [Signature] Sanitarian
 Date: 6-14-94 Reviewed by: [Signature] Supervisory Sanitarian

This Construction Permit Valid until
November 1994

If FHA or VA financing

Reviewed by Date _____ Date _____
Supervisory Sanitarian Regional Sanitarian

Commonwealth of Virginia Uniform Water Well Completion Report

Owner Dou Froehle
 Address 941 Wynngate
Chesapeake, Va
 Phone 547-0192
 Location 1325 Murray Dr 48230

Tax Map ID _____
 VDH Permit 23497-5289
 VWCB Permit _____
 VWCB ID _____
 County _____

* Well Data *

General Information

Drilling Method Mud Rotary Date Completed 7-14-98 Total Depth of Well 32 FT.
 Depth to Bedrock 25 FT. Yield 15 (GPM) Length of Test 1 Hour
 Static Water Level 12 FT Stabilized Water Level 16 FT. Natural Flow (Rate) No
 Well Disinfected (Y or N) Y Disinfectant Used Chlorine Amount Used 50/Gl

Casing

From 1 To 25 From _____ To _____ From _____ To _____
 Size 2 Material PVC Size _____ Material _____ Size _____ Material _____
 Weight/Schedule 200 Weight/Schedule _____ Weight/Schedule _____

Gravel Pack

From 25 To 32 FT. From _____ To _____ From _____ To _____

Grout

From 1 To 25 From _____ To _____ From _____ To _____
 Bore Hole Size 5 7/8 Bore Hole Size _____ Bore Hole Size _____
 Type Benseal Type _____ Type _____
 Method POURED Method _____ Method _____

Water Zones or Screened Intervals

From 25 To 32 From _____ To _____ From _____ To _____
 Mesh Size 10th Diam 2" Mesh Size _____ Diam _____ Mesh Size _____ Diam _____
 From _____ To _____ From _____ To _____ From _____ To _____
 Mesh Size _____ Diam _____ Mesh Size _____ Diam _____ Mesh Size _____ Diam _____

* Use Data *

Private Well: Domestic Agricultural _____ Industrial _____ Monitoring _____
 Public Well: Community _____ Non Community _____

* Abandonment Information *

Bored or Dug Wells

Casing Removed, Y or N?: _____
 If Y, Depth to which casing was removed: _____
 Depth and Type of Fill: _____
 Source of Fill _____
 Bentonite Plugs: From _____ to _____ From _____ to _____

Wells other than Bored Wells

Casing removed, Y or N? _____
 Depth to which casing was removed: _____
 Applicable, depth(s), and type of gravel/sand fill: _____
 Source of gravel or sand: _____
 Cement: From _____ to _____ From _____ to _____

Method of permanently marking location: _____

Post-It* Fax Note

7871

Date 12-65 # of pages 3

| Depth | Description of Formation or Sediment | Remarks |
|---------|--------------------------------------|---------|
| 0 - 8 | Clay | |
| 8 - 15 | Sand | |
| 15 - 21 | Clay | |
| 21 - 32 | Sand | |

HEALTH DEPARTMENT
 WELL INSPECTED AND APPROVED BASED
 ON WATER WELL COMPLETION REPORT

Laura B.
 SIGNATURE

12-29-98
 DATE

I certify that the information contained here is true and that this well was installed and constructed in accordance with the permit and further that the well complies with all applicable state and local regulations, ordinances and laws.

Drilling Contractor Chesapeake Well & Pump Service Inc.
 Address P.O. Box 15280
Chesapeake, VA 23028
 Phone 004-436-2605

Drillers Signature *[Signature]* Date 12-1-98
 Representing Chesapeake Well & Pump Service Inc.
 Virginia Contractors License Number 030034



THE COMMONWEALTH OF VIRGINIA
 DEPARTMENT OF HEALTH AND HUMAN SERVICES
 DIVISION OF LABORATORY SERVICES

Certificate of Analysis

MSW
12/21/98
 MS 61C
 Bk 2
 Lt 9

ANALYTICAL CHEMISTS

TO CHESAPEAKE WELL & PUMP SERVICE
 ATTN: GIGI
 P.O. BOX 15280
 CHESAPEAKE, VA 23328-5280

DATE 12/3/98

SAMPLE DESCRIPTION

ANALYSIS NO

Water 98-6889
 Sample Received: 12/1/98 2:00 p.m.
 Sample Collected: 12/1/98 9:00 a.m.
 Sample Location: 1325 Murray Dr., Chesapeake (234-97-5289)
 Sample Marked: Tap
 Collected By: Steve

TOTAL COLIFORMNEGATIVE

Based on Virginia State Requirements for Drinking Water
 "Negative Coliform Bacteria" indicates that
 "This water sample is bacteriologically safe for human consumption."

Method: SM 9222 B

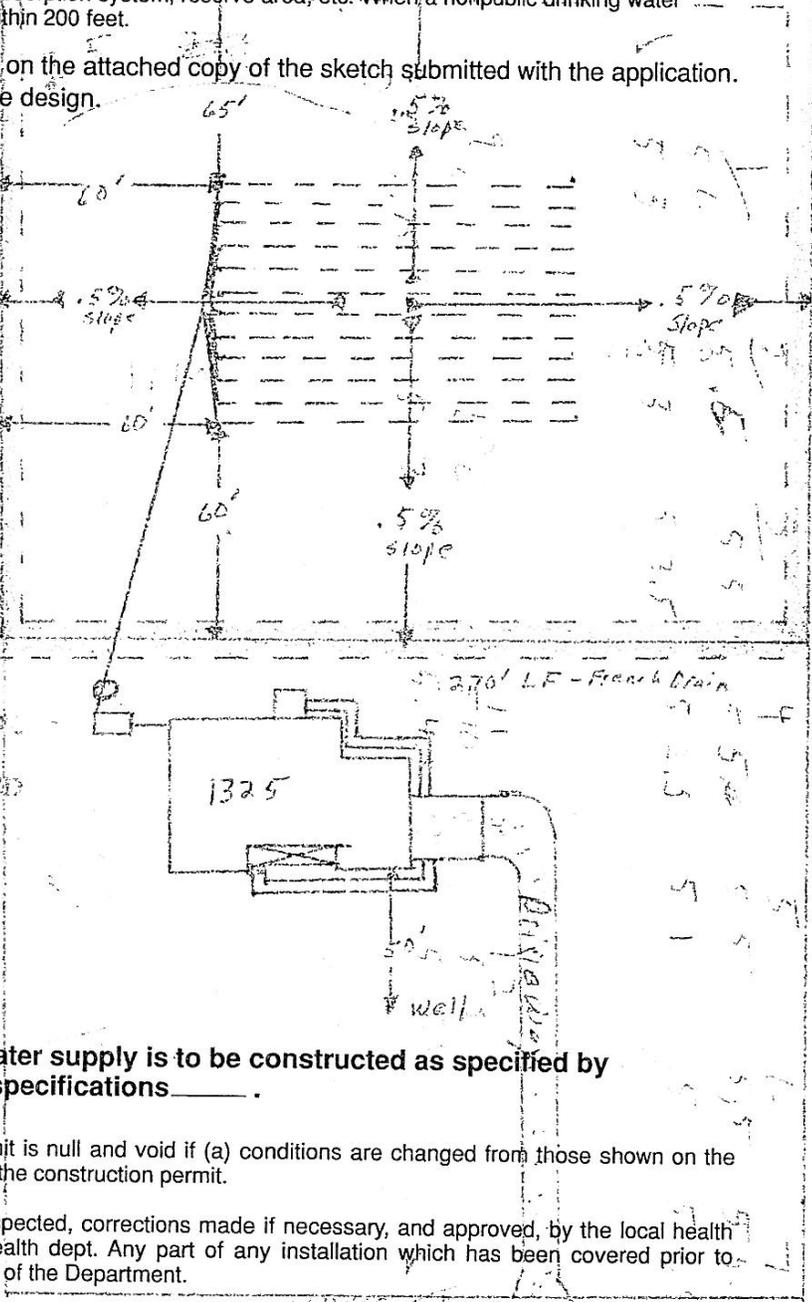
W. J. [Signature]

Schematic drawing of sewage disposal and/or water supply system and topographic features. *Not to Scale*

Show the lot lines of the building site, sketch of property showing any topographic features which may impact on the design of the well or sewage disposal system, including existing and/or proposed structures and sewage disposal systems and wells within 200 feet. The schematic drawing of the well site or area and/or sewage disposal system shall show sewer lines, pretreatment unit, pump station, conveyance system, and subsurface-soil absorption system, reserve area, etc. When a nonpublic drinking water supply is to be permitted, show all sources of pollution within 200 feet.

The information required above has been drawn on the attached copy of the sketch submitted with the application. Attach additional sheets as necessary to illustrate the design.

1. THIS PERMIT GOOD FOR 4 BATHROOMS ONLY.
2. INSTALL 12 - 3' X 100' DRAINFIELD LINES.
3. COMPLY WITH SOIL DRAINAGE MANAGEMENT PLAN.
4. TRENCH DEPTH TO START AT 18" WITH 2 1/2" Fall. Max. depth 24".
5. GRADE DRIVEWAY TO SLOPE OF DRAINFIELD.
6. DRIVEWAY MUST BE WITHIN 1/4" OF SODD LATCH EASEMENT.
7. FINAL GRADE MUST BE COMPLETED AND APPROVED BY THE OFFICE BEFORE AN OPERATION PERMIT CAN BE ISSUED.
8. SEE PAGE 3 FOR PUMP SPECIFICATIONS.
9. INSTALL ONE CLASS III C WELL FOR DRINKING WATER.
10. WELL DRILLER MUST SUBMIT A GWL TO THE OFFICE.
11. WATER SAMPLE REPORT FROM AN APPROVED LABORATORY IS REQUIRED.
12. WATER ROTINER SHOULD NOT BE CONNECTED TO SEWIC SYSTEM.



This sewage disposal system and/or water supply is to be constructed as specified by the permit or attached plans and specifications _____.

This sewage disposal system and/or well construction permit is null and void if (a) conditions are changed from those shown on the application (b) conditions are changed from those shown on the construction permit.

No part of any installation shall be covered or used until inspected, corrections made if necessary, and approved, by the local health department or unless expressly authorized by the local health dept. Any part of any installation which has been covered prior to approval shall be uncovered, if necessary, upon the direction of the Department.

Date: 3-6-98 Issued by: W. R. W. [Signature]
 Sanitarian

Date: _____ Reviewed by: _____
 Supervisory Sanitarian

This Construction Permit Valid until
8-99

If FHA or VA financing

Reviewed by Date _____ Date _____
 Supervisory Sanitarian Regional Sanitarian

Commonwealth of Virginia
Uniform Water Well Completion Report

1110 6111
lot 28

Owner GERALD T. KANTER Tax Map ID _____
 Address 1346 BOXWOOD CIRCLE NORFOLK VDH Permit 234-940067
 1313 MURRAY LOT (28) (6) VWCB Permit _____
 Phone 588-7164 VWCB ID _____
 Location 234 - GREEN HAVEN (MAP) County _____

* Well Data *

General Information

Drilling Method Rotary Date Completed 12-27-94 Total Depth of Well 80
 Depth to Bedrock 70 Yield 20 (GPM) Length of Test 1:45
 Static Water Level 15 Stabilized Water Level 20.15 Natural Flow (Rate) 20
 Well Disinfected (Y or N) Yes Disinfectant Used Chlorine tablet Amount Used all

Casing

| | | |
|--|---------------------------|---------------------------|
| From <u>80</u> to <u>0</u> | From _____ to _____ | From _____ to _____ |
| Size <u>2" inc</u> Material <u>PVC</u> | Size _____ Material _____ | Size _____ Material _____ |
| Weight/Schedule <u>40</u> | Weight/Schedule _____ | Weight/Schedule _____ |

Gravel Pack

| | | |
|-----------------------------|---------------------|---------------------|
| From <u>80</u> to <u>50</u> | From _____ to _____ | From _____ to _____ |
|-----------------------------|---------------------|---------------------|

Grout

| | | |
|-----------------------------|----------------------|----------------------|
| From <u>50</u> to <u>0</u> | From _____ to _____ | From _____ to _____ |
| Bore Hole Size <u>5 1/2</u> | Bore Hole Size _____ | Bore Hole Size _____ |
| Type <u>Benseal</u> | Type _____ | Type _____ |
| Method <u>Pour</u> | Method _____ | Method _____ |

Water Zones or Screened Intervals

| | | |
|---|-----------------------------|-----------------------------|
| From <u>70</u> to <u>80</u> | From _____ to _____ | From _____ to _____ |
| Mesh Size <u>10000</u> Diam. <u>1 1/4</u> | Mesh Size _____ Diam. _____ | Mesh Size _____ Diam. _____ |
| From _____ to _____ | From _____ to _____ | From _____ to _____ |
| Mesh Size _____ Diam. _____ | Mesh Size _____ Diam. _____ | Mesh Size _____ Diam. _____ |

* Use Data *

Private Well: Domestic Agricultural _____ Industrial _____ Monitoring _____
 Public Well: Community _____ Non Community _____

Drillers Log *

(Use additional sheets if necessary)
Description of Formation or Sediment

Depth

Remarks

| | | |
|--|--|--|
| <p>80 FT</p> <p>TOP SOIL</p> <p>SAND HEAVY</p> <p>GRAY SAND</p> <p>CLAY</p> <p>CLAY SHELL</p> <p>CLAY SHELL</p> <p>SAND SHELL</p> <p>SAND SHELL</p> <p>10 FT</p> | | |
|--|--|--|

I certify that the information contained here is true and that this well was installed and constructed in accordance with the that the well complies with all applicable state and local regulations, ordinances and laws.

Name Virginia Well Service
 Address 827 Lynnhaven Hwy. #114
Wal. Beach, Va. 23452
 Phone 468-1484

Drillers Signature Tom Battelle Date _____ Representing _____

Virginia Contractors License Number 2705-021830

**Commonwealth of Virginia
Uniform Water Well Completion Report**

Owner Serald Kanter
 Address 1313 Murray A
chen
 Phone _____
 Location _____

Tax Map ID 64 A lot 28
 VDH Permit _____
 VWCB Permit _____
 VWCB ID 234-94-0067
 County _____

* Well Data *

General Information

Drilling Method Artisan
 Depth to Bedrock 70'
 Static Water Level 15'
 Well Disinfected (Y or N) Y

Date Completed 12-27-94
 Yield 20 (GPM)
 Stabilized Water Level 16'
 Disinfectant Used chlorine

Total Depth of Well 80
 Length of Test 20 min
 Natural Flow (Rate) 16 gpm
 Amount Used 320

Casing

From 70 to 0
 Size 2" Material PVC
 Weight/Schedule 40

From _____ to _____
 Size _____ Material _____
 Weight/Schedule _____

From _____ to _____
 Size _____ Material _____
 Weight/Schedule _____

Gravel Pack

From 80 to 60

From _____ to _____

From _____ to _____

Grout

From 60 to 0
 Bore Hole Size 5/4
 Type hole Plug
 Method pour

From _____ to _____
 Bore Hole Size _____
 Type _____
 Method _____

From _____ to _____
 Bore Hole Size _____
 Type _____
 Method _____

Water Zones or Screened Intervals

From 80 to 70
 Mesh Size 10mm Diam. 1/4
 From _____ to _____
 Mesh Size _____ Diam. _____

From _____ to _____
 Mesh Size _____ Diam. _____
 From _____ to _____
 Mesh Size _____ Diam. _____

From _____ to _____
 Mesh Size _____ Diam. _____
 From _____ to _____
 Mesh Size _____ Diam. _____

* Use Data *

Private Well: _____
 Public Well: _____

Domestic ✓
 Community _____

Agricultural _____
 Non Community _____

Industrial _____

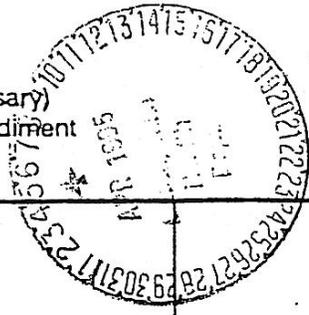
Monitoring _____

Drillers Log *

(Use additional sheets if necessary)
Description of Formation or Sediment

Depth

Remarks



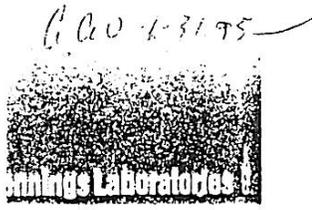
| | | |
|----|--|--|
| 10 | | |
| 20 | | |
| 70 | | |
| 80 | | |

I certify that the information contained here is true and that this well was installed and constructed in accordance with the code that the well complies with all applicable state and local regulations, ordinances and laws.

Name **VIRGINIA WELLSERVICE**
 Address **829 LYNNHAVEN PKWY #114**
VA BEACH, VA 23452
 Phone 468-1484

Drillers Signature *[Signature]* Date 3-30-95 Representing VA Well

Virginia Contractors License Number 2705-021830



18 CYPRESS AVENUE
VIRGINIA BEACH, VA 23451
TELEPHONE 804/425/1498
FACSIMILE 804/422/9176

Certificate of Analysis

TO Mr Kanter
1346 Boxwood Circle
Norfolk, Va 23518

DATE 1/27/95

SAMPLE DESCRIPTION Drinking water
Sample received 1/24/95 @ 4:35 p.m.
Sample taken 1/24/95 @ 1:00 p.m.
Sample Marked: 1313 Murray Drive
Chesapeake, Va

ANALYSIS NO 95-213

MS #61A Lot #28 HDID #234-94-0067

Total Coliform..... Negative

" This water sample is bacteriologically safe for consumption."

✓ Copy: Chesapeake Health Dept

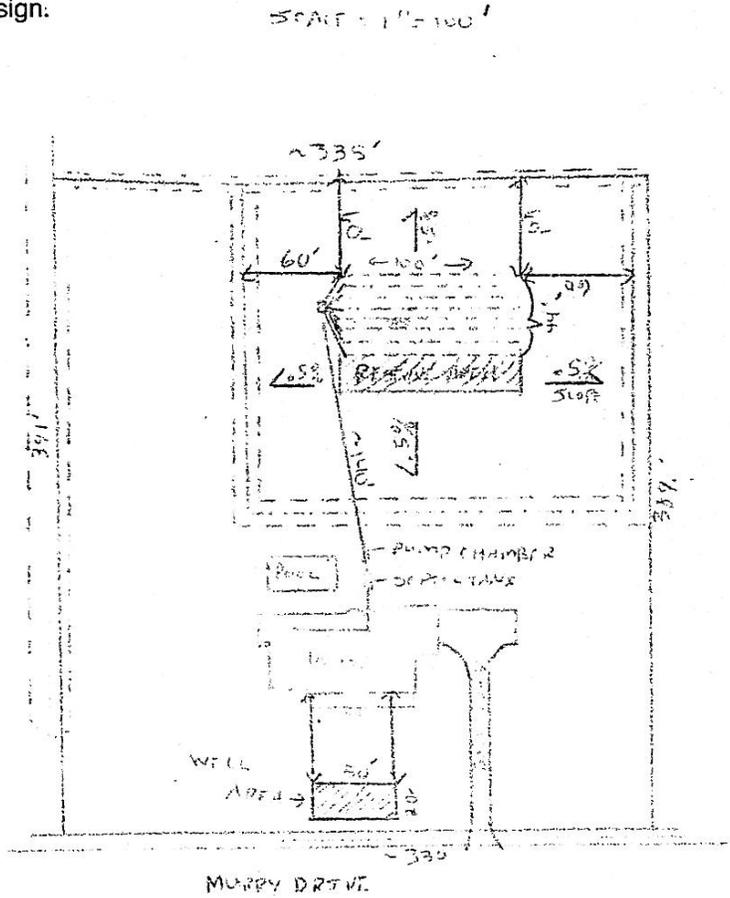
Schematic drawing of sewage disposal and/or water supply system and topographic features.

Show the lot lines of the building site, sketch of property showing any topographic features which may impact on the design of the well or sewage disposal system, including existing and/or proposed structures and sewage disposal systems and wells within 200 feet. The schematic drawing of the well site or area and/or sewage disposal system shall show sewer lines, pretreatment unit, pump station, conveyance system, and subsurface soil absorption system, reserve area, etc. When a nonpublic drinking water supply is to be permitted, show all sources of pollution within 200 feet.

The information required above has been drawn on the attached copy of the sketch submitted with the application. Attach additional sheets as necessary to illustrate the design.

1. 8-2 x 100 Drainfield Trench Lines.
2. Maximum Depth of Drainfield Trenches- 12".
3. Grade Boards Required
4. (3) FHPIE Bedrooms Only.
5. Comply with Soil Drainage Management Plan.
6. Final grade must be completed and inspected before this office can issue an operation permit.
7. Keep well 50' from house foundation & 50' from septic tank & pump chamber.
8. One (1) Class III C well to be installed for drinking water. Well must be cased and grouted to 20' Minimum.
9. Well Driller must submit a GW2 to this office.

Pump Chamber to be installed in accordance to section 4.23E. See Page 2 of 2.
11. Owner must arrange to have a water sample taken and tested by an approved laboratory.



This sewage disposal system and/or water supply is to be constructed as specified by the permit or attached plans and specifications .

This sewage disposal system and/or well construction permit is null and void if (a) conditions are changed from those shown on the application (b) conditions are changed from those shown on the construction permit.

No part of any installation shall be covered or used until inspected, corrections made if necessary, and approved, by the local health department or unless expressly authorized by the local health dept. Any part of any installation which has been covered prior to approval shall be uncovered, if necessary, upon the direction of the Department.

Date: 9/29/94 Issued by: [Signature] Sanitarian
 Date: 9-29-94 Reviewed by: [Signature] Supervisory Sanitarian

This Construction Permit Valid until
March 1996

If FHA or VA financing

Reviewed by Date _____ Date _____
 Supervisory Sanitarian Regional Sanitarian

APPENDIX B

URS Boring Logs and Well Construction Diagrams

BORING LOG

| | |
|--|---------------------------|
| Project: Chesapeake Golf Course | Project No.: 49498-001 |
| Location: Chesapeake, Virginia | Boring No.: B-1 |
| Observer: M.R. | Date of Boring: 7/24/01 |
| Type of Boring: 4-in Mud Rotary | Elevation (ground): 9.90' |
| Drilling Contractor: Fishburne Drilling Inc. | File Name: log1.dwg |

| Depth ft. | Stratum Description | Depth of Sample | Sample Blows* | Sample Description |
|---|-------------------------|-----------------|---------------|---|
| 0 - 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 - 16 - 17 - 18 - 19 - 20 - 21 - 22 - 23 - 24 - 25 | Fine SANDY SILT CLAY | 0-2 | | Top soil, dark olive brown (2.5Y,3/3) with yellowish brown mottles (10YR,5/6) Fine SANDY SILTY CLAY, dry. |
| | Fine SANDY SILT | 2-4 | 7-7-7-7 | Black-gray (10YR,3/2) Fine SANDY SILT, moist. |
| | | 4-6 | 7-8-11-11 | Dark grayish brown (10YR,3/2) Fine SANDY SILT, moist. 5' Increasing sand, becoming Medium SAND. 5.5' Becoming olive brown (2.5Y,4/3). 6' Becoming gray, wet. |
| | Medium to Fine SAND | 6-8 | 10-11-11-13 | Olive gray (5Y,5/2), Medium SAND, wet. 7.6' Gray (5Y,5/1), Fine SAND, wet. |
| | | 8-10 | | Gray (2.5Y,5/0), Fine SAND, wet. |
| | | 10-13 | | Same as above. |
| | | 13-15 | | |
| | | 15-18 | | |
| | | 18-20 | 5-6-10-11 | |
| | | | | 18.75' Dark gray (5Y,4/1), Medium SAND with some pebbles (quartz, rounded), wet. |
| | | 20-22 | | Shelby tube |
| | | 22-23 | | |
| | | 23-25 | 1-1-2-3 | Gray (5Y,6/1) Medium-Fine SAND with some shell fragments and black heavy minerals, wet. |

| | |
|---|--|
| <p>GROUNDWATER DATA: Groundwater encountered at ~ 6.0 ft bgs. Water Level is _____ ft. below ground surface 24 hours after completion.</p> <p>* No. of Blows 140-Lb. Hammer, 30-in fall, required to drive 2-in O.D., 1.375 I.D. sampler 6 inches.</p> <p>Note: Survey data provided by Hassell & Folks, P.C.</p> | |
|---|--|

BORING LOG

2 of 2

| | |
|--|---------------------------|
| Project: Chesapeake Golf Course | Project No.: 49498-001 |
| Location: Chesapeake, Virginia | Boring No.: B-1 |
| Observer: M.R. | Date of Boring: 7/24/01 |
| Type of Boring: 4-in Mud Rotary | Elevation (ground): 9.90' |
| Drilling Contractor: Fishburne Drilling Inc. | File Name: log2.DWG |

| Depth ft. | Stratum Description | Depth of Sample | Sample Blows* | Sample Description |
|--|---|-----------------|---------------|--|
| 25 - 26 - 27 - | | 25-28 | | |
| 28 - 29 - 30 - 31 - 32 - 33 - | Medium to Coarse SAND | 28-30 | 12-17-25-29 | Olive-gray (5Y,5/2), Medium-Coarse SAND. 28.5' Light gray (5Y,6/1), Medium-Coarse SAND, with some fines (coarse grains-pink, green, black), wet. |
| | | 30-33 | | |
| 34 - 35 - 36 - 37 - 38 - | Medium SAND with SILT | 33-35 | 10-12-15-16 | Very dark gray (5Y,3/1), Medium SAND with some SILT, wet. |
| | | 35-38 | | |
| 39 - 40 - 41 - 42 - 43 - | Fine to Medium SAND | 38-40 | 3-5-6-6 | Olive gray (5Y,4/2) Fine-Medium SAND with shell fragments (tan,pink), wet. |
| | | 40-43 | | |
| 44 - 45 - 46 - 47 - 48 - | <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">Fine SILTY SAND</div> <div style="width: 55%;">Fine SANDY SILT</div> </div> | 43-45 | 4-4-6-6 | Olive gray (5Y,4/2) Fine SILTY SAND to Fine SANDY SILT, with some shell fragments, wet. |
| | | 45-48 | | |
| 49 - 50 | Fine SANDY SILT with CLAY | 48-50 | 2-2-2-3 | Olive gray (5Y,4/2) Fine SANDY SILT with some CLAY, wet. |

GROUNDWATER DATA: Groundwater Encountered at ~ 6.0 ft.
Water Level is _____ ft. below ground surface 24 hours after completion.

* No. of Blows 140-Lb. Hammer, 30-in fall, required to drive 2-in O.D., 1.375 I.D. sampler 6 inches.
Note: Survey data provided by Hassell & Folks, P.C.



BORING LOG

| | |
|--|-------------------------|
| Project: Chesapeake Golf Course | Project No.: 49498-001 |
| Location: Chesapeake, Virginia | Boring No.: B-1A |
| Observer: M.R. | Date of Boring: 7/24/01 |
| Type of Boring: 4 1/4-in HSA | Elevation (ground): |
| Drilling Contractor: Fishburne Drilling Inc. | File Name: log3.DWG |

| Depth ft. | Stratum Description | Depth of Sample | Sample Blows* | Sample Description |
|-----------|------------------------------|-----------------|---------------|---|
| 0 | | | | |
| - | | | | |
| 1 | | | | |
| - | | | | |
| 2 | | | | |
| - | | | | |
| 3 | | | | |
| - | | | | |
| 4 | | | | |
| - | | | | |
| 5 | | | | |
| - | | | | |
| 6 | | | | |
| - | | | | |
| 7 | | | | |
| - | | | | |
| 8 | | | | |
| - | | | | |
| 9 | | | | |
| - | | | | |
| 10 | | | | |
| - | | | | |
| 11 | | | | |
| - | | | | |
| 12 | | | | |
| - | | | | |
| 13 | | | | |
| - | | | | |
| 14 | | | | |
| - | | | | |
| 15 | | | | |
| - | | | | |
| 16 | | | | |
| - | | | | |
| 17 | | | | |
| - | | | | |
| 18 | | | | |
| - | | | | |
| 19 | | | | |
| - | | | | |
| 20 | | | | Dark gray (5Y,4/1), Medium-Coarse SAND, with pebbles. |
| - | | | | |
| 21 | | 20-22 | | |
| - | | | | |
| 22 | | | | |
| - | | | | |
| 23 | | | | |
| - | | | | |
| 24 | | | | |
| - | | | | |
| 25 | Boring Terminated • 25.0 FT. | | | |

| | |
|---|---|
| <p>GROUNDWATER DATA: Groundwater Encountered at ~ Water Level is _____ ft. below ground surface 24 hours after completion.</p> <p>* No. of Blows 140-Lb. Hammer, 30-in fall, required to drive 2-in O.D., 1.375 I.D. sampler 6 inches.</p> <p>Note: Survey data provided by Hassell & Folks, P.C.</p> |  |
|---|---|

BORING LOG

| | |
|--|-------------------------|
| Project: Chesapeake Golf Course | Project No.: 49498-001 |
| Location: Chesapeake, Virginia | Boring No.: B-2 |
| Observer: M.R. | Date of Boring: 7/25/01 |
| Type of Boring: 4-in Mud Rotary | Elevation (ground): |
| Drilling Contractor: Fishburne Drilling Inc. | File Name: log4.DWG |

| Depth ft. | Stratum Description | Depth of Sample | Sample Blows* | Sample Description |
|---|---|-----------------|---------------|--|
| 0 - 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 - 16 - 17 - 18 - 19 - 20 - 21 - 22 - 23 - 24 - 25 | <div style="display: flex; justify-content: space-between;"> Fine SANDY CLAYEY SILT Stiff SILTY CLAY </div> | 0-2 | 2-3-4-4 | Top soil, Olive brown (2.5Y,4/3), Fine SANDY CLAYEY SILT, dry, grading to stiff SILTY CLAY with light olive brown mottles (2.5Y, 5/6), moist. |
| | <div style="display: flex; justify-content: space-between;"> Fine SANDY CLAY Fine SILTY SAND </div> | 2-4 | 4-4-4-4 | Dark gray (5Y,4/1) Fine SANDY CLAY with brownish yellow mottles (10YR,6/8) grading to gray (2.5Y,6/1) fine SILTY SAND with brownish yellow mottles (10YR,6/8), moist |
| | Fine SANDY CLAY | 4-6 | 3-4-6-10 | Mottled yellowish brown (10YR,5/8) and gray (5Y,6/1) Fine SANDY 4.6. CLAY wet Alternating brown Medium to Coarse SAND, wet. |
| | Medium to Coarse SAND | 6-8 | 8-8-13-10 | |
| | Fine to Medium SAND | 8-10 | 6-11-12-10 | Yellow-brown (10YR 5/6) Medium-Coarse SAND. 6.9'-Gray, light brown and tan (2.5Y,5/0) (7.5Y, 6/3) Fine-Medium SAND, wet. Olive gray (5Y, 5/2), Fine SAND, wet. |
| | Fine SAND | 10-13 | | |
| | Fine SAND | 13-15 | 8-9-9-11 | |
| | Fine SAND | 15-18 | | |
| | Fine SAND | 18-20 | | |
| | Fine SAND | 20-23 | | Shelby tube |
| | Medium SAND | 23-25 | 6-7-9-16 | Dark gray (5Y,4/1) Medium SAND, wet. |

GROUNDWATER DATA: Groundwater Encountered at ~ 5.0 ft.
Water Level is _____ ft. below ground surface 24 hours after completion.

* No. of Blows 140-Lb. Hammer, 30-in fall, required to drive 2-in O.D., 1.375 I.D. sampler 6 inches.

Note: Survey data provided by Hassell & Folks, P.C.



BORING LOG

| | |
|--|---------------------------|
| Project: Chesapeake Golf Course | Project No.: 49498-001 |
| Location: Chesapeake, Virginia | Boring No.: B-3 |
| Observer: M.R. | Date of Boring: 7/24/01 |
| Type of Boring: 4 1/4 in-HSA | Elevation (ground): 9.71' |
| Drilling Contractor: Fishburne Drilling Inc. | File Name: log5.DWG |

| Depth ft. | Stratum Description | Depth of Sample | Sample Blows* | Sample Description |
|---|----------------------|-----------------|---------------|--|
| 0 - 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 - 16 - 17 - 18 - 19 - 20 - 21 - 22 - 23 - 24 - 25 | SILT with CLAY | 0-2 | 2-3-3-3 | Very dark grayish brown (10YR,3/2) SILT with some CLAY, gray (10YR,6/1) and yellowish brown (10YR,5/6) mottles, moist. |
| | | 2-4 | 4-5-5-5 | |
| | CLAY with SILT | 4-6 | 2-3-3-3 | 5.5 Very dark brown (7.5YR, 2.5/2) SILTY CLAY with light Olive brown Mottles (2.5YR, 5/6), moist. |
| | Medium SAND | 6-8 | 6-11-10-11 | Gray (7.5YR,6/0), Medium SAND with pebbles. |
| | Fine SAND | | | 6.8' Light yellow-brown (10YR,6/4) Fine SAND, wet. |
| | Medium SAND | 8-10 | 3-4-4-5 | Gray (5Y,5/1), Medium SAND with angular to subangular grains, wet. |
| | | 10-13 | | |
| | Fine to Medium SAND | 13-15 | 5-8-10-10 | Gray (5Y,5/1), Fine to Medium SAND, wet. |
| | | 15-18 | | |
| | | 18-20 | | |
| | Medium SAND | 20-22 | 4-5-5-4 | Dark gray (2.5Y,4/1), Medium SAND with some shell fragments, wet. |
| | | 22-25 | 5-6-7-7 | Becoming more gray (5Y,4/1), wet. |

Boring Terminated @ 25.0 FT.

GROUNDWATER DATA: Groundwater Encountered at ~ 6.8 ft.
Water Level is _____ ft. below ground surface 24 hours after completion.

* No. of Blows 140-Lb. Hammer, 30-in fall, required to drive 2-in O.D., 1.375 I.D. sampler 6 inches.
Note: Survey data provided by Hassell & Folks, P.C.



BORING LOG

| | |
|--|----------------------------|
| Project: Chesapeake Golf Course | Project No.: 49498-001 |
| Location: Chesapeake, Virginia | Boring No.: B-4 |
| Observer: M.R. | Date of Boring: 7/25/01 |
| Type of Boring: 4 1/4 in Mud Rotary | Elevation (ground): 11.13' |
| Drilling Contractor: Fishburne Drilling Inc. | File Name: log6.DWG |

| Depth ft. | Stratum Description | Depth of Sample | Sample Blows* | Sample Description |
|-----------|----------------------------|-----------------|---|--|
| 0 | Fine SILTY CLAYEY SAND | 0-2 | 2-2-2-3 | Black (5Y,2.5/1), Fine, SILTY, CLAYEY, SAND, moist. |
| 1 | Fine SAND | | | 1.5' Very dark grayish brown (2.5Y,3/2) Fine SAND, moist |
| 2 | | | | 1.75' Grading to dark olive gray (5Y,3/2), moist. |
| 3 | Fine SANDY CLAY | 2-4 | 2-3-2-2 | Dark grayish brown (2.5Y,3/2), Fine SANDY CLAY, moist. |
| 4 | Fine SILTY CLAYEY SAND | | | 2.5'-Grading to olive brown (2.5Y,4/3), Fine-Medium SAND with some SILT, Dark grayish brown (2.5Y,3/2) CLAY,wet. |
| 5 | Fine to Medium SAND | 4-6 | 1-5-8-10 | Olive brown (2.5Y,4/4), Fine-medium SAND, saturated |
| 6 | Fine SAND | | | 4.5'-Gray (5Y,6/1) Fine-Medium SAND with some pebbles, wet. |
| 7 | | | | |
| 8 | | 6-8 | 7-8-9-10 | Gray (5Y,5/1), Fine SAND, wet. |
| 9 | | | | |
| 10 | | 8-10 | 3-7-10-11 | Same as above, wet. |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | 13-15 | 4-2-3-3 | Same as above, wet. |
| 16 | | | | |
| 17 | | | | |
| 18 | | | | |
| 19 | | | | |
| 20 | 18-20 | 4-4-3-4 | Grading to dark olive gray (5Y,4/1) with black mineral grains, wet. | |
| 21 | | | | |
| 22 | | | | |
| 23 | | | | |
| 24 | Medium CLAYEY SAND | 23-25 | | 24.5-Gray (5Y,5/1), Medium SAND with black mineral grains and thin CLAYEY lenses, wet. |
| 25 | Boring Terminated 25.0 FT. | | | |

GROUNDWATER DATA: Groundwater Encountered at ~ 2.5 ft.
 Water Level is _____ ft. below ground surface 24 hours after completion.

* No. of Blows 140-Lb. Hammer, 30-in fall, required to drive 2-in O.D., 1.375 I.D. sampler 6 inches.
 Note: Survey data provided by Hassell & Folks, P.C.



BORING LOG

| | |
|--|----------------------------|
| Project: Chesapeake Golf Course | Project No.: 49498-001 |
| Location: Chesapeake, Virginia | Boring No.: B-5 |
| Observer: M.R. | Date of Boring: 7/25/01 |
| Type of Boring: 4 1/4 in HSA | Elevation (ground): 10.53' |
| Drilling Contractor: Fishburne Drilling Inc. | File Name: log7.DWG |

| Depth ft. | Stratum Description | Depth of Sample | Sample Blows* | Sample Description | |
|-----------|---------------------|-----------------|---------------|---|--|
| 0 | CLAYEY SANDY SILT | 0-2 | 2-3-5-5 | Dark olive brown (2.5Y,3/3), CLAYEY SILT with some SAND. 0.9' Mottled (yellow, brown) (10YR, 5/6), dark gray (5Y,3/1) SILTY CLAY, moist. | |
| 1 | SILTY CLAY | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | Medium to Fine SAND | 2-4 | 6-5-10-9 | Black (5Y, 2.5/2) SILTY CLAY, moist. 2.2'-Light yellowish brown and gray (2.5Y,6/3) (5Y,6/2) Medium-Fine SAND, moist. | |
| 5 | | | | | |
| 6 | SILTY CLAY | 4-6 | 5-5-7-10 | 4.0' Grading to pale yellow (2.5Y,7/3), moist. 4.2' Black (2.5Y,2.5/1) SILTY CLAY, moist. | |
| 7 | Fine SAND | | | 4.3' Light olive brown (2.5Y,5/4), dark gray (5Y,4/1) Fine SAND, saturated. | |
| 8 | Medium SAND | 6-8 | 6-7-7-8 | 6.0-Grading to gray (5Y,5/1), wet. 6.5'-Gray (5Y,5/1), Medium SAND,wet. | |
| 9 | | | | | |
| 10 | Fine to Medium SAND | 8-10 | 2-6-7-6 | Dark greenish (5GY,4/1), Fine-Medium SAND, wet. | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | 13-15 | 5-4-5-6 | Same as above, wet. | |
| 16 | | | | | |
| 17 | | 15-18 | | | |
| 18 | | | | | |
| 19 | | | | | |
| 20 | | 18-20 | 5-4-6-1 | Grading dark gray (2.5Y,4/1), Fine-Medium SAND, wet. 19' Wood fragments | |
| 21 | | | | | |
| 22 | | 20-23 | | | |
| 23 | | | | | |
| 24 | Medium SAND | | | | |
| 25 | CLAYEY SANDY SILT | 23-25 | 1-1-2-2 | Dark gray (5Y,4/1), Medium SAND, saturated 23.5' Grading to SANDY SILT with CLAY to SILTY CLAY and soft CLAY, wet. | |
| | SILTY CLAY | | | | |

Boring Terminated @ 25.0 FT.

GROUNDWATER DATA: Groundwater Encountered at ~ 4.0 ft.
Water Level is _____ ft. below ground surface 24 hours after completion.

* No. of Blows 140-Lb. Hammer, 30-in fall, required to drive 2-in O.D., 1.375 I.D. sampler 6 inches.
Note: Survey data provided by Hassell & Folks, P.C.



MONITORING WELL CONSTRUCTION LOG

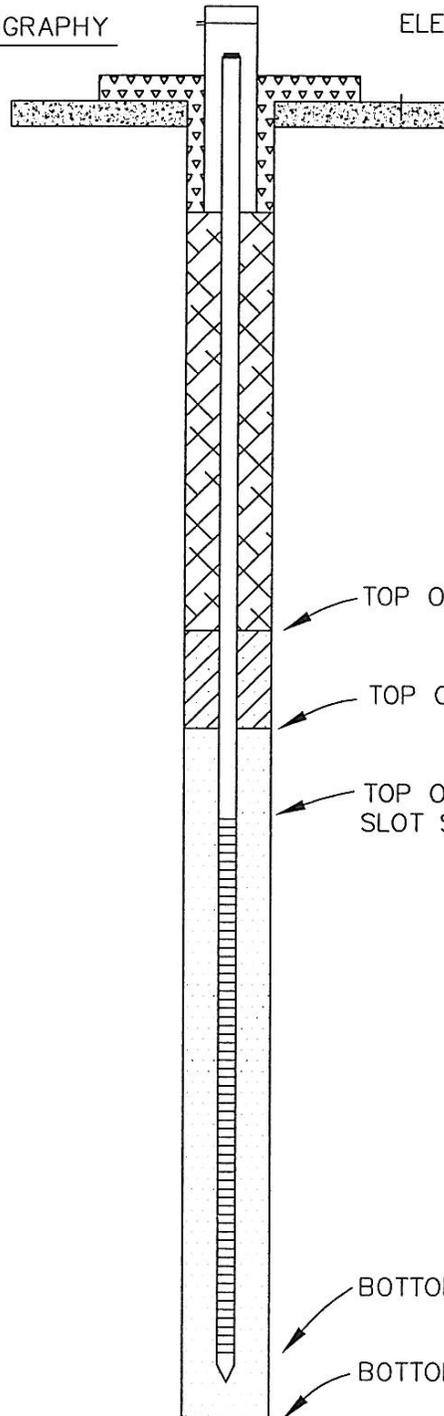
MONITORING WELL: MW-1 JOB NO.: 49498-001 DATE: 7-24-01
 PROJECT: Chesapeake Golf Course
 SITE LOCATION: Chesapeake, Virginia GEOLOGIST: M.R.
 DRILLING CONTRACTOR: Fishburne Drilling Inc.



GENERALIZED STRATIGRAPHY

ELEVATIONS: GROUND SURFACE: 9.90
 TOP OF CASING: 13.16

- 0
-
- 1
-
- 2
-
- 3
-
- 4
-
- 5
-
- 6
-
- 7
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- 8
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- 9
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- 10
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- 11
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- 12
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- 13
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- 18
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- 19
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- 20
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- 22
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- 23
-
- 24
-
- 25



TOP OF BENTONITE SEAL: DEPTH (FEET) 11

TOP OF SAND PACK: DEPTH (FEET) 13

TOP OF SCREEN: DEPTH (FEET) 15.00
 SLOT SIZE: 0.01

BOTTOM OF SCREEN: DEPTH (FEET) 25

BOTTOM OF BORING: DEPTH (FEET) 25