

WATER WELL COMPLETION REPORT

C-259
BWCM No. 143-346
W-6843

(Certification of Completion/County Permit)

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

County/City Henrico County County/City Stamp

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
397,805 N
2,343,269 E
 Latitude & Longitude
 _____ N
 _____ W

Topo. Map No. _____
 Elevation 51.7 ft.
 Formation _____
 Lithology _____
 River Basin _____
 Province _____
 Type Logs _____
 Cuttings _____
 Water Analysis _____
 Aquifer Test _____

Owner Henrico County
 Well Designation or Number Groundwater Exploration Program
 Address Project A-1(a) Box 2615
Last Well
 Phone _____

Drilling Contractor Hannon Well Co. Inc.
 Address P.O. Box 117B
Richmond 7 Kings, Va 23140
 Phone 963-2615

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 3/25/86 • Date completed 3/31/86 Type rig Mud Air Rotary Fig 12

1. WELL DATA: New Reworked _____ Deepened _____

Total depth 335 ft.
 Depth to bedrock _____ ft.
 Hole size (Also include reamed zones)
 • 8 3/4 inches from 0 to 50 ft.
 • 7 7/8 inches from 50 to 335 ft.
 _____ inches from _____ to _____ ft.
 Casing size (I.D.) and material see diagram
 • _____ inches from _____ to _____ 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) see diagram
 • _____ 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 _____ to _____ ft.
 • From _____ to _____ ft.
 Output
 • From _____ to _____ ft. Type _____
 • From _____ to _____ ft. Type _____

2. WATER DATA • Water temperature _____ OF

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

3. WATER ZONES: From _____ To _____
 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 _____
 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 _____

67 Samples

OVER RW 6/25/86

Spencer County

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)			11.	12. DIAGRAM OF WELL CONSTRUCTION (with dimensions)
DEPTH (feet)		TYPE OF ROCK OR SOIL (color, material, fossils, hardness, etc.)	REMARKS (water, caving, cavities, broken, core, shot, (etc.))	Drilling Time (Min.)
From	To			
		<i>See attached</i>		<i>See attached</i>

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 *Kay Richards* (Seal), Date *6-23-86*
 (Well driller or authorized person) License No. *15648*

State Water Control Board Regional Offices

Valley Reg. Off.
 116 North Main Street
 P. O. Box 263
 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
 312 Peters Creek Road
 York, Va. 24019
 804-743-7432

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

GAMMON WELL CO., INC.

WELL DRILLING • PUMPS & WATER SYSTEMS
INDUSTRIAL - COMMERCIAL - RESIDENTIAL
RT 2 BOX 117B PROVIDENCE FORGE, VA 23140
(804) 966-2615

(Bore Hole #2)
(submittal #3)

GROUND WATER EXPLORATION PROGRAM REGIONAL WASTEWATER TREATMENT FACILITY

PROJECT "A-1(a)"

DRILLER'S LOG

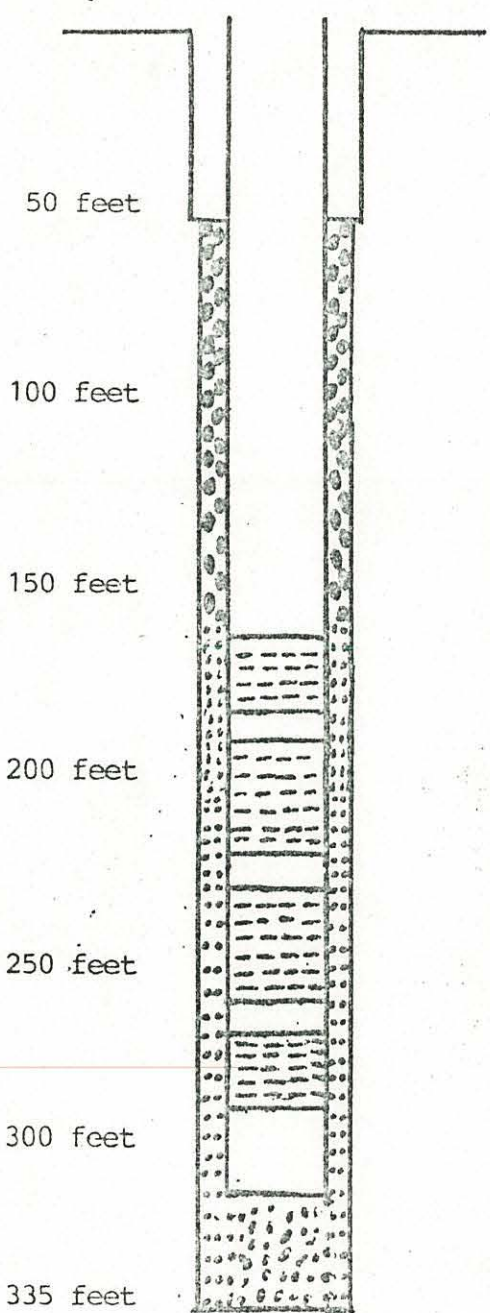
- 0 - 5 ft. Top soil, orange clay.
- 5 - 10 ft. Orange & light gray clay.
- 10 - 15 ft. Gray clay, gravel, (formation change to orange sand 12' - 14').
- 15 - 20 ft. Iron-orange gravel.
- 20 - 25 ft. Iron-orange gravel, brownish orange sand clay.
- 25 - 30 ft. Iron-orange sandy gravel, brownish orange sandy clay.
- 30 - 35 ft. Formation change to gray clay.
- 35 - 40 ft. Gray clay, formation change-42' green gravel.
- 40 - 45 ft. Green gravel, green clay.
- 45 - 50 ft. Green clay & gravel.
- 50 - 55 ft. Gravel, green clay.
- 55 - 60 ft. Gravel, green clay, white clay.
- 60 ft. Formation change-white clay & gravel.
- 60 - 65 ft. White clay, gravel.
- 65 - 70 ft. White clay, gravel.
- 70 - 75 ft. Gravel, white clay.
- 75 - 80 ft. White clay, coarse gravel (formation change-gray clay, coarse gravel).
- 80 - 85 ft. Coarse gravel, gray clay.
- 85 - 90 ft. Gray clay, coarse gravel.
- 90 - 95 ft. Gravel, dry gray clay.
- 95 - 100 ft. Gravel, dry gray clay.
- 100 - 105 ft. Dry gray clay, not as much gravel.
- 105 - 110 ft. Dry gray clay, some gravel (formation change-light gray sandy clay)
- 110 - 115 ft. Light gray sandy clay, small gravel.
- 115 - 120 ft. Light gray sandy clay, small gravel.
- 120 - 125 ft. More small gravel, gray clay.
- 125 - 130 ft. Small gravel, not as much gray clay, coarse sand.
- 130 - 135 ft. Small gravel, coarse sand.
- 135 - 140 ft. Coarse sand, small gravel, gray sandy clay.
- 140 - 145 ft. Gray sandy clay, coarse sand, coarse gravel (formation change-145 ft.)
- 145 - 150 ft. Coarse gravel, gray sandy clay.
- 150 - 155 ft. Coarse gravel, white sandy clay, coarse sand, (formation change-152 ft.)
- 155 - 160 ft. Coarse gravel, white sandy clay.
- 162 ft. Formation change-black clay.
- 165 - 170 ft. Black clay, gravel, gray clay.
- 170 - 175 ft. Gray clay, coarse gravel, coarse sand.
- 175 - 180 ft. Coarse gravel, gray clay.
- 180 - 185 ft. Gray clay, coarse gravel.
- 185 - 190 ft. Gray clay, less coarse gravel.
- 190 - 195 ft. Gray clay, small gravel, coarse sand.
- 195 - 200 ft. Coarse gravel, gray clay, coarse sand.
- 200 - 205 ft. Gray clay, coarse gravel.
- 205 - 210 ft. Gray clay, coarse gravel.
- 210 - 215 ft. Coarse gravel, coarse sand, gray clay.

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- 215 - 220 ft. Coarse sand, gray clay.
- 217 ft. Formation change.
- 220 - 225 ft. Gray clay, coarse sand.
- 226 ft. Light gray clay, coarse sand.
- 225 - 230 ft. Light gray clay, coarse sand.
- 230 - 235 ft. Sand, small gravel.
- 235 - 240 ft. Small gravel, sand.
- 240 - 245 ft. Sand, coarse gravel.
- 245 - 250 ft. Coarse gravel, gray clay.
- 250 - 255 ft. Gray clay, gravel.
- 255 - 260 ft. Gravel, gray clay.
- 260 - 265 ft. Gray clay, gravel, some white dry clay, (formation change-265 ft.).
- 265 - 270 ft. Gravel, gray clay, light gray clay, coarse sand.
- 270 - 275 ft. White clay, gravel, coarse sand.
- 275 - 280 ft. White clay, gravel (light gray clay-280 ft.).
- 280 - 285 ft. Light gray clay, small gravel (green clay-285 ft.).
- 285 - 290 ft. Green clay.
- 290 - 295 ft. Green clay.
- 295 - 300 ft. Green clay (brownish-red clay-297 ft.).
- 300 - 305 ft. Brownish-red clay, coarse gravel.
- 305 - 310 ft. Brownish-red clay, coarse gravel.
- 310 - 315 ft. Coarse gravel, brownish-red clay.
- 315 - 320 ft. Redish-brown coarse gravel.
- 320 - 325 ft. Coarse gravel, redish-brown clay.
- 325 - 330 ft. Redish-brown clay, gravel, green clay.
- 330 - 335 ft. Redish-brown clay, bedrock.

Bore Hole Construction, Section 2A-4



ground level
Cut an 8 3/4" hole from 0 to 50 feet

Grout with cement from 0 to 50 feet.
Grout will be installed at later date.

Cut a 7 7/8" hole from 50 to 335 feet

Install 4" SDR 21 PVC casing from 2 foot above grade to 160, 180 to 187, 217, to 225, 255 to 264, 284 to 304 ft.

Gravel pack with pea gravel from 155 to 50 feet.

Install 4" SDR 21 20 slot. PVC casing from 160 to 180, 187 to 217, 225, to 255, 264 to 284 ft.

Gravel pack with Cape May No. 2 well gravel from 335 to 155 feet.

Gannon Well Co., Inc. certifies the drawings for Bore Hole #1 & #2 comply with the Contract Documents.

O.K. MAR 17 1986

W. H. Gannon
W. H. Gannon, President

resubmitted

O.K. APR 14 1986

W. H. Gannon
W. H. Gannon, President

VIRGINIA DIVISION OF MINERAL RESOURCES
 Box 3667, Charlottesville, VA 22903

INTERVAL SHEET

Page 1 of 1

Well Repository No.: W- 6843

Date rec'd: 6/28/86 Date Processed: 7/1/86

Sample Interval: from 0 to: 335

PROPERTY: Henrico Co. Groundwater Exploration Program Project A-La. (Bore Hole #2)

Number of samples: 67

COMPANY: Hammon Well Co., Inc.

Total Depth: 335'

COUNTY: Henrico

Oil or Gas: Water: Exploratory!

From-To	From-To	From-To	From-To	From-To
0 - 5	150 - 155	300 - 305	-	-
5 - 10	155 - 160	305 - 310	-	-
10 - 15	160 - 165	310 - 315	-	-
15 - 20	165 - 170	315 - 320	-	-
20 - 25	170 - 175	320 - 325	-	-
25 - 30	175 - 180	325 - 330	-	-
30 - 35	180 - 185	330 - 335	-	-
35 - 40	185 - 190	-	-	-
40 - 45	190 - 195	-	-	-
45 - 50	195 - 200	-	-	-
50 - 55	200 - 205	-	-	-
55 - 60	205 - 210	-	-	-
60 - 65	210 - 215	-	-	-
65 - 70	215 - 220	-	-	-
70 - 75	220 - 225	-	-	-
75 - 80	225 - 230	-	-	-
80 - 85	230 - 235	-	-	-
85 - 90	235 - 240	-	-	-
90 - 95	240 - 245	-	-	-
95 - 100	245 - 250	-	-	-
100 - 105	250 - 255	-	-	-
105 - 110	255 - 260	-	-	-
110 - 115	260 - 265	-	-	-
115 - 120	265 - 270	-	-	-
120 - 125	270 - 275	-	-	-
125 - 130	275 - 280	-	-	-
130 - 135	280 - 285	-	-	-
135 - 140	285 - 290	-	-	-
140 - 145	290 - 295	-	-	-
145 - 150	295 - 300	-	-	-

Both Washed & Unwashed Samples.

OWNER: Henrico County
Groundwater Exploration Program, #2

W# 6843
C# 259

DRILLER: Gammon Well Co., Inc.

TOTAL DEPTH: 335
QUAD: Dutch Gap

COUNTY: Henrico County

ELEV: 51.7'

GEOLOGIC LOG

Depth
(feet)

- 0- 5 Sand, grayish orange (10Yr 7/4), fine - to coarse-grained, poorly sorted, subangular to subrounded; quartz, rare black opaque mineral, clay.
- 5- 10 Sand, very pale orange (10YR 8/2), fine - to coarse-grained, poorly sorted, angular to subrounded; quartz, feldspar, rare to common illmenite (?), clay.
- 10- 15 Sand, very pale orange (10YR 8/2), fine - grained to coarse granule, poorly sorted, angular to rounded; quartz, feldspar, illmenite (?), quartzite, clay.
- 15- 20 Gravel, multi-colored - white, orange, brown, very coarse granule to fine cobble; quartz, quartzite, granite, schist, pegmatite, ferricrete; no clay in washed sample.
- 20- 25 Gravel, same as above; in a sand matrix, fine - to medium-grained, moderately sorted sand, subangular to rounded; quartz, glauconite common; contact between overlying terrace and underlying marine unit is in thin interal.
- 25- 30 Sand, salt and pepper, fine-grained, moderately - well sorted, angular to rounded; quartz, glauconite (30-40%), gypsum (selenite).
- 30- 35 Sand, as above; glauconite(40-50%).
- 35- 40 Sand, salt and pepper, fine - to medium-grained, moderately - well sorted, subangular to rounded; quartz, glauconite (30-40%), gypsum (selenite); Mollusca fragments about 25% of sample, forams common.
- 40- 45 Gravel, white to light gray, coarse sand to finecobble, subangular to rounded, poorly sorted; quartz with white clay, feldspar, muscovite, quartzite; most quartz grains milk as opposed to rock crystal quartz above 40'; probably top of Potomac Group.
- 45- 50 Gravel, as above with pyrite and gneiss fragments.
- 50- 55 Gravel, as above.
- 55- 60 Gravel, as above.
- 60- 65 Gravel, as above.

Depth
(feet)

65- 70 Gravel, as above with no sand size gains.
70- 75 Gravel, as above with no sand size gains.
75- 80 Gravel, as above with no sand size gains.
80- 85 Gravel, as above with no sand size gains.
85- 90 Gravel, as above with no sand size gains.
90- 95 Gravel, as above with no sand size gains.
95-100 Gravel, as above with no sand size gains.
100-105 Gravel, as above with no sand size gains.
105-110 Sand, with pea size gravel, yellowish gray (5Y 8/1); medium - to coarse-grained, moderately sorted, angular to subrounded; quartz, feldspar, garnet, rock fragments.
110-115 Sand, yellowish gray (5Y 8/1); fine - to coarse-grained, subangular to subrounded, moderately sorted; quartz, feldspar, garnet, muscovite.
115-120 Sand, as above.
120-125 Sand, as above.
125-130 Sand, as above.
130-135 Sand, as above.
135-140 Sand, as above, about 5% pea gravel.
140-145 Sand, as above, about 5% pea gravel.
145-150 Sand, as above, about 10% pea gravel.
150-155 Sand, as above, about 50% pea gravel.
155-160 Gravel, same as 40'-50'.
160-165 Gravel, same as 40'-45', no sand size grains.
165-170 Gravel, same as 40'-45'.
170-175 Gravel, same as 40'-45', 5% sand.
175-180 Gravel, same as 40'-45', no sand size grains.
180-185 Gravel, same as 40'-45', 5% sand.

Depth
(feet)

- 185-190 Sand, light gray (N7), fine-grained to coarse granule; subangular to subrounded, poorly sorted; quartz, feldspar, garnet, 10 to 30% clay or silt.
- 190-195 Sand, light gray (N7), fine - to coarse-grained with granule size rock fragments, subangular to subrounded, poorly sorted; quartz, feldspar, garnet, 15-20% rock fragments.
- 195-200 Sand, as above with 10-15% clay or silt.
- 200-205 Gravel, same as 40'-45', with 15% sand.
- 205-210 Sand, light gray (N7), medium - to coarse-grained with 15% pea gravel, subangular to subrounded, poorly sorted; quartz, feldspar, clay, garnet.
- 210-215 Sand, as above with 20-25% pea gravel.
- 215-220 Sand, as above with 10-15% pea gravel.
- 220-225 Sand, as above with 10-15% per gravel.
- 225-230 Sand, as above with 10% pea gravel.
- 230-235 Gravel, same as 40'-45' with 10% sand.
- 235-240 Sand, same as 205'-210' with 15% pea gravel.
- 240-245 Sand, same as 205'-210' with 10-15% pea gravel.
- 245-250 Sand, same as 205'-210' with 10% pea gravel.
- 250-255 Sand, same as 205'-210' with 15-20% pea gravel.
- 255-260 Sand, same as 205'-210' with 10-15% pea gravel.
- 260-265 Gravel, same as 40'-45' with abundant sandy clay.
- 265-270 Sand, same as 205'-210' with 5-10% pea gravel.
- 270-275 Sand, same as 205'-210' with 10-15% pea gravel.
- 275-280 Sand, same as 205'-210' with 10% pea gravel.
- 280-285 Sand, same as 205'-210' with 5% pea gravel.
- 285-290 Clay, sandy, pale olive (10Y 6/2); sand - fine - to coarse-grained, subangular to subrounded; quartz, feldspar, - poorly sorted; 20-25% pea gravel.

Depth
(feet)

- 290-295 Clay, as above with 10-15% pea gravel.
- 295-300 Clay, as above with 25-30% pea gravel, few clay globs with faint reddish tinge; base of Potomac Group.
- 300-305 Sand, clayey, moderate reddish brown (10R 4/6); sand - fine - to coarse-grained, subangular to subrounded, quartz, feldspar (minor); poorly sorted; gravel 50-60%, may be contamination; top of Triassic.
- 305-310 Sand, as above, gravel may be contamination, color lighter.
- 310-315 Sand, as above, gravel may be contamination, color lighter.
- 315-320 Sand, as above, gravel may be contamination.
- 320-325 Sand, as above, gravel may be contamination, color lighter.
- 325-330 Sand, as above.
- 330-335 Sand, as above, mottled moderate reddish brown to light gray.

GEOLOGIC SUMMARY

	<u>Rock Unit</u>	<u>Age</u>
0- 25	Windsor Formation	Pliocene (?)
25- 40	Aquia Formation	Paleocene
40-300	Potomac Group	Cretaceous
300-335	Newark Supergroup	Triassic

Virginia Division of Mineral Resources
Eugene K. Rader, Geologist
August 26, 1986