



WATER-RIGHT DOCKET

Cape Cod National Seashore

Docket No: 1

GRIFFIN ISLAND

Supporting Hydro Data

02-29-1968: letter to mr. stanton on final report enclosure; february 29, 1968



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Water Resources Division
2300 John Fitzgerald Kennedy Federal Building
Boston, Massachusetts 02203

File WR Docket

February 29, 1968

Mr. Richard L. Stanton, Chief
Office of Land and Water Rights
National Park Service
Washington Planning and Service Center
1730 North Lynn Street
Arlington, Virginia 22209

Attention: Mr. Richard W. Ketchum

Dear Mr. Stanton:

Enclosed is the final report of supervisory work by John Cotton of the Boston office of the Water Resources Division for the National Park Service under Contract No. 14-10-5-609-204 for Test Well Drilling at Hemenway Landing, Nauset Light, Eastham Visitor Center, and Griffin Island. All work was completed by The Able Drillers and Pump Company on September 2, 1967, in accordance with the plans and specifications of the contract.

Enclosed also is Standard Form 1081 prepared in accordance with the instructions in your letter of February 26, 1968.

A summary for each area is tabulated below.

	Well Depth	Well Development	Test Pumping	Test Drilling Hole / Depth
Hemenway Landing	99.2 ft.	24 hrs.	8 hrs.	1 106 ft.
Nauset Light	137.8 ft.	25.5 hrs.	9 hrs.	1 112 ft. 2 150 ft.
Eastham Visitor Center	115.7 ft.	24 hrs.	8 hrs.	1 120 ft. 2 111 ft.
Griffin Island	95.9 ft.	24 hrs.	10 hrs.	1 105 ft.

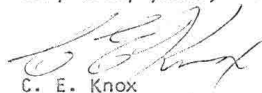
Mr. Richard Stanton

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The design sustained yield for each well was 20 gallons per minute (gpm); all four wells may be pumped safely at 20 gpm. In fact, all four wells will yield much more than 20 gpm. However, pumping from shallow coastal aquifers involves the danger of inducing salt-water movement into the fresh ground-water reservoir. One good principle to follow in establishing pumping schedules is not to allow the water level to fall below mean sea level (msl). The 'maximum' yield (following the above principle) for each of the four wells is given in the geohydrologic descriptions of the wells. Unfortunately, even with this precaution, salt-water encroachment may still occur with prolonged pumping. Therefore, the highest pumping rates should not exceed 50 percent of the 'maximum' yield reported for each well.

Very truly yours,


C. E. Knox
District Chief

JEC:g

TEST WELL DRILLING AT GRIFFIN ISLAND

Location of well. This well is about 1825 feet N35°E of the bench mark on the south side of the intersection of Chequesset Neck Road and the road to The Gut. It is about 20 feet south of the dirt road that runs from Chequesset Neck Road easterly to Herring River (see figure 5).

Physical description of well. This 8-inch diameter well is 95.9 feet deep with a 10 foot #15 Johnson stainless steel screen from 85.9 to 95.9 feet. The well casing extends 1.4 feet above the land surface; the top of the first coupling is 4.4 feet below land surface. For details see figure 6.

Geohydrologic description of well. The well is screened in unconsolidated sands. See table 10 for the log of subsurface materials. The land surface is estimated at about 60 feet above mean sea level. On August 8, 1967, the static water level was 56.43 feet below land surface or about 3.5 feet above mean sea level. Ocean tides probably have a very small affect on the water level.

The well was pumped for 10 hours at 44 gpm. At the end of 9 hours the drawdown was about 2.6 feet. Specific capacity of the well is about 17 gpm. With a drawdown of 3.5 feet this well will yield about 60 gpm. The design yield of 20 gpm is possible with little danger of salt-water encroachment.

Chemical quality of water. After 10 hours of pumping the chloride content (29 ppm) had not changed and was about normal for fresh ground water on Cape Cod. The iron content (0.05 ppm) is low and no treatment will be necessary. The complete chemical analysis is in table 11.

Test drilling. The only test well (about 4 feet north of the final well) was drilled to a depth of 105 feet. The log of this well is in table 10.

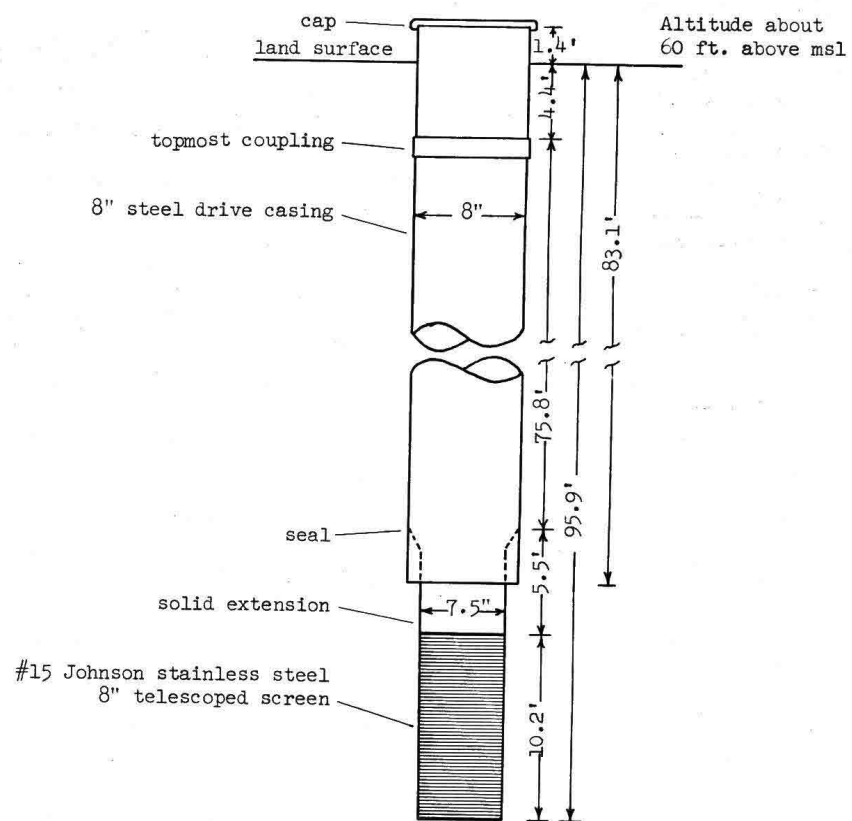


Figure 6.--Design of well at Griffin Island

Table 10.--Generalized combined log of test well
and final well at Griffin Island

Sample interval (ft. below surface)	Material description
0 - 3	Sand, coarse, buff
3 - 4	Sand, fine and medium, light gray
4 - 10	Sand, fine and medium, reddish brown
10 - 15	Sand, fine to coarse, reddish brown
15 - 20	Sand, fine to coarse, yellowish buff to reddish brown
20 - 25	Sand, fine to coarse, yellowish to reddish buff
25 - 30	Sand, medium and coarse, buff
30 - 35	Sand, medium and coarse, buff
35 - 40	Sand, medium and coarse, buff
40 - 45	Sand, medium and coarse, buff
45 - 50	Sand, medium and coarse, buff; scattered very fine gravel
50 - 55	Sand, medium and coarse, buff; scattered very fine gravel
55 - 60	Sand, medium and coarse, buff; scattered very fine gravel
60 - 65	Sand, medium and coarse, buff; scattered very fine gravel
65 - 70	Sand, medium and coarse, buff; scattered very fine gravel
70 - 75	Sand, medium and coarse, buff; scattered very fine gravel
75 - 80	Sand, coarse and very coarse, buff; scattered very fine gravel
80 - 85	Sand, coarse and very coarse, buff; scattered very fine gravel
85 - 90	Sand, coarse and very coarse, buff; scattered very fine gravel
90 - 95	Sand, coarse and very coarse, buff; scattered very fine gravel
95 - 97	Sand, medium to very coarse, buff
97 -105	Sand, fine and medium, buff

Table 11.--Complete chemical analysis, in parts per million, of water from well at Griffin Island

Date of collection-----	8/24/67	Chloride (Cl)-----	29
Temperature (°F)-----	52	Fluoride (F)-----	.1
Silica (SiO ₂)-----	9.1	Nitrate (NO ₃)-----	.1
Iron (Fe) total-----	.05	Dissolved solids	
Manganese (Mn) dissolved--	.02	Calculated-----	69
Calcium (Ca)-----	2.5	Residue on evaporation at 180°C--	70
Magnesium (Mg)-----	2.0	Hardness as CaCO ₃ -----	14
Sodium (Na)-----	16	Non-carbonate-----	8
Potassium (K)-----	.7	Specific conductance	
Bicarbonate (HCO ₃)-----	8	(micromhos at 25°C)-----	120
Carbonate (CO ₃)-----	0	pH-----	6.7
Sulfate (SO ₄)-----	5.5	Color-----	0

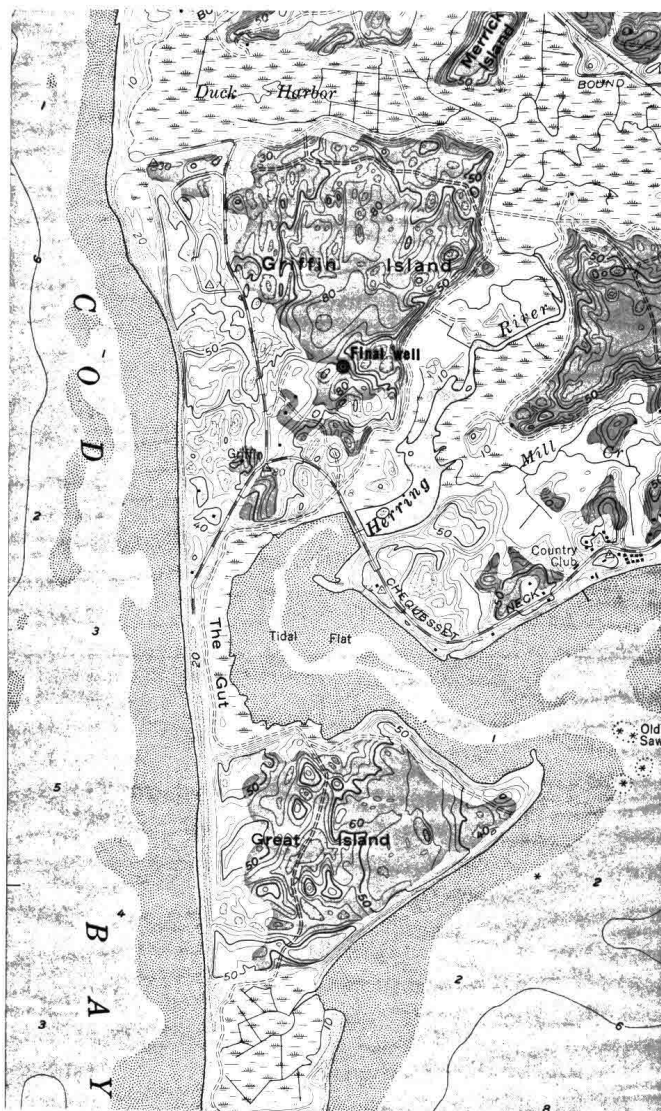


Figure 5.--Location of well at Griffin Island

Docket Information

Number of Documents in Docket 7
Documents Dated from 2/29/1968 to 2/29/1968
Docket Compiled: 2/1/2011