



WATER-RIGHT DOCKET

Virgin Islands National Park

Docket No: 4

WELL #4, LIND POINT

Supporting Hydro Data

00-00-0000: table: records of drilled test wells; construction data, hydrologic data, supplementary data

Table 1.--Records of drilled test wells, Virgin Islands																			
National Park, St. John, V. I.																			
DESIGNATION		CONSTRUCTION DATA					HYDROLOGIC DATA			SUPPLEMENTARY DATA									
Well number	Location	Type	Date completed (year)	Depth (feet)	Casing record		Finish Depth (feet)	Type of lift	Water level			Temp. of	Remarks						
					Depth (feet)	Diam-eter (inches)			Surface attitude (feet)	below land surface (feet)	Depth Date measured (mo. yr.)			Water-bearing material	Yield (gpm)	Use			
NPS-2	Cruz Bay	Drilled	1964	99	4	0	20	0	99	None	60	40.0	6-64	Vt	1	T, 0	82		
NPS-3	Cruz Bay	do	1964	54	6	0	25	0	25	54	None	40	26.5	6-64	Vt	5	T, 0	83	
NPS-4	Lind Point	do	1964	200	6	-	-	0	0	200	None	176	Dry	6-64	-	-	-		Casing pulled, hole destroyed.
NPS-5	Trunk Bay	do	1964	60	6	0	12	0	12	60	None	60	32.1	7-64	Vb	6	T, 0	80	
NPS-6	Cinnamon Bay	do	1964	70	6	0	50.7	0	50.7	70	None	60	56.9	11-64	Vt	8	T, 0	80	
NPS-7	Hawksnest Bay	do	1964	36	6	0	27	0	27	36	None	40	17.1	8-64	Vb	12	T, 0	80	
NPS-8	Cinnamon Bay	do	1964	50	6	-	-	0	0	50	None	20	Dry	9-64	-	-	T		Casing pulled, hole destroyed.
NPS-9	Cinnamon Bay	do	1964	60	6	0	38	0	38	60	Submersible	50	42.9	10-64	Vt, Vb	8	P	80	
NPS-10	Lameshur	do	1964	66	6	0	67	S	47	67	None	40	28.5	10-64	V	2	0	84	

Finish: 0 - open hole, S - slotted.

Water-bearing material: Vb, volcanic breccia; Vt, volcanic tuff; V, volcanic undifferentiated.

Use: T, test; O, observation; P, public supply.

HYDROLOGIC DATA									
Surface altitude (feet)	Depth below land surface (feet)	Date measured (mo. yr.)	Water-bearing material	Yield (gpm)	Use	Temp. °F	SUPPLEMENTARY DATA		
							REMARKS		
60	40.0	6-64	Vt	1	T, 0	82			
40	28.5	6-64	Vt	5	T, 0	83			
176	Dry	6-64	-	-	-	-			Casing pulled, hole destroyed.
60	32.1	7-64	Vb	6	T, 0	80			
60	56.9	11-64	Vt	8	T, 0	80			
40	17.1	8-64	Vb	12	T, 0	80			
20	Dry	9-64	-	-	T	-			Casing pulled, hole destroyed.
50	42.9	10-64	Vt, Vb	8	P	80			
40	28.5	10-64	V	2	0	84			

Table 2.--Chemical quality of water from drilled test wells, Virgin Islands National Park, St. John, V. I.

Well Number	Location	Date of collection	PARTS PER MILLION															Dis-charge (gpm)	
			Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Barite (BaSO ₄)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (micro-mhos at 25° C)	Hardness as CaCO ₃ (Calcium, magnesium, non-magnesium)	Specific conductance (micro-mhos at 25° C)	pH		
NPS-2	Cruz Bay	5-18-64	31	0.00	66	67	320	-	664	46	470	0.6	4.9	1,400	440	0	2,490	7.9	1
NPS-3	Cruz Bay	6-3-64	34	.00	94	77	377	-	632	45	480	.5	4.4	1,420	551	33	2,270	7.8	5
NPS-4	Cruz Bay housing	Dry hole																	
NPS-5	Trunk Bay	7-17-64	38	.05	80	61	188	-	482	39	300	.0	.0	988	450	55	1,670	7.9	6
NPS-6	Cinnamon Bay	8-2-64	34	.00	46	81	224	-	390	47	400	.3	.4	1,060	448	128	1,900	8.2	8
NPS-7	Hawke's Bay	8-8-64 ^{1/2}	35	.00	68	88	214	-	272	57	505	.1	2.2	1,260	534	308	2,090	7.9	12
NPS-7	Hawke's Bay	8-8-64 ^{2/2}	38	.05	106	577	628	-	360	276	2,425	.0	.4	5,640	2,637	2,342	7,440	7.5	12
NPS-8	Cinnamon Bay	Dry hole																	
NPS-9	Cinnamon Bay		36	.00	58	71	183	-	504	30	275	.5	.0	964	436	23	1,610	8.4	8
NPS-10	Lameshur Bay		23	.04	70	111	-	-	544	-	1,003	.3	.9	2,380	631	185	4,090	7.8	2

^{1/} Sample taken at beginning of test, 5 minutes pumping.^{2/} Sample taken at end of test, 12 hours pumping.

Other Supporting Information

14 Arroyo Street
Hato Rey, Puerto Rico 00918

January 12, 1965

Mr. Frank R. Givens, Superintendent
National Park Service
Virgin Islands National Park
P. O. Box 1707 Charlotte Amalie
St. Thomas, V. I. 00802

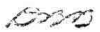
Dear Mr. Givens:

A tabulation is enclosed of funds spent on test-well drilling for the National Park Service in St. John, Virgin Islands. The funds were assigned in FY-1964, but the drilling contract carried over into FY-1965.

If you have any questions about the data shown, Mr. Donald G. Jordan, our resident engineer in St. Thomas, is in the best position to provide answers. Sufficient copies of the tabulation have been provided for your possible transmittal to appropriate other NPS offices.

Exploring for and finding water for some of your needs was an interesting technical problem. The second phase of observing how the well supplies stand up under regular use also will be interesting. Pivotal in this phase is knowing how much water is pumped. I believe Mr. Jordan has made recommendations on what information is needed.

Cordially yours,


Dean B. Bogart
Chief, Caribbean District, WRD

In triplicate

cc: D. G. Jordan, St. Thomas, V. I.

Area Hydrologist, Arlington, Va.

DBB/gmp

Water-Supply Project for National Park Service
in Virgin Islands National Park, St. John

Summary of costs of test-well drilling, FY-1964 funds

Funds assigned to drilling	\$15,000
Less: 12 3/4% Washington Office Technical Service Charge	<u>1,912</u>
Net funds available for drilling	<u>\$13,088</u>

Well number	Depth drilled, ft 14.75/ft	Casing installed, ft 5.00/ft	Casing pulled, ft 1.25/ft	Experimental time, hr \$11.00/hr	Pumping and bailing tests, hr \$11.00/hr	Cost
NPS-2	98	-	18	-	2 1/2	\$ 1,495.50
3	54	25	-	-	13 1/2	1,070.00
4	200	-	13	-	0	2,966.25
5	60	13	-	-	17	1,137.00
6	70	54	-	-	10 1/2	1,418.00
7	36	28	-	-	15 1/2	841.50
8	50	-	21	-	0	763.75
9	60	45 1/	-	1	9	1,220.00
10	<u>66</u>	<u>53 1/</u>	<u>-</u>	<u>-</u>	<u>8</u>	<u>1,326.50</u>
Total	694	218	52	1	73	\$12,238.50
Bulldozing 2/						<u>810.00</u>
						<u>\$13,048.50</u>

1/ 4-inch diameter plastic liner was installed, in addition to steel casing.

2/ Bulldozing drilling sites.

December 31, 1964

U. S. Geological Survey
San Juan, Puerto Rico

Virgin Islands Cooperative Water Resources Investigation

Water Resources Division
U. S. Geological Survey

MONTHLY REPORT NO. 6

Summary of Activities for National Park Service
July 1963

A 5-foot diameter test hole has been completed at Cinnamon Bay, St. John (see figure 1). The test hole penetrated very dry, reddish-brown alluvial rubble to a depth of 24 feet. The materials range from clay to boulders and have been deposited in layers ranging in thickness from one to three feet. The layers have a graded appearance with coarser material at the bottom grading upward to finer material. At a depth of 24 feet the color of the material changed to gray and numerous roots were observed. This represents the top of the capillary fringe over the water table. The material became progressively wetter below 24 feet and at 26 feet the first free water was observed. The test hole was completed at a depth of 24 ft. With the equipment and personnel available it was not possible to deepen the hole.

A short duration step drawdown pumping test was conducted on July 31. The results of this test are as follows:

<u>Pumping Rate</u> <u>(Gallons per Minute)</u>	<u>Duration of Pumping</u> <u>(Minutes)</u>	<u>Water Level</u> <u>(Feet below land surface)</u>
0	0	26.20
0.57	101	26.38
1.0	40	26.40

The data indicates that the well will produce 1 gpm with about 0.2 foot drawdown. The water has a chloride content of about 200 ppm, based on field tests. In view of the fact that the step drawdown test shows favorable results the test hole could be converted to a production well, as suggested in Figure 2. It is recommended that the hole be deepened two feet to a depth of 29 ft. and that an 18-inch concrete culvert be used as the casing. A gravel envelope should be placed around the casing below the water table. The bottom joint of casing should be perforated with say, 1/2-inch holes.

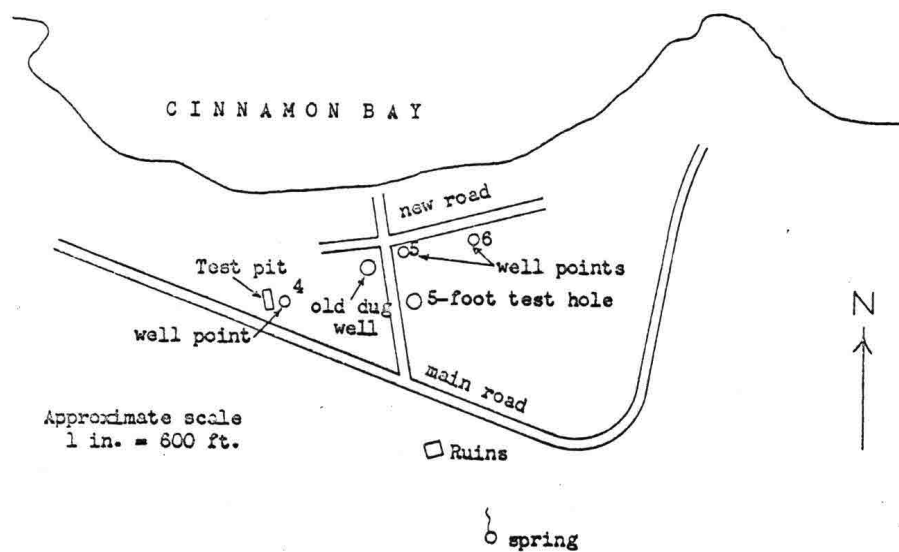
The hydrologic data obtained to date from the investigation at St. John indicate that wells of various types are feasible in the beach areas. Properly constructed wells can be installed to furnish potable water, but of course all water for drinking should be chlorinated. In addition, it is possible to obtain supplies of slightly brackish water suitable for such things as laundries, showers, and toilets.

The following table shows the chlorides of the water at various installations at Cinnamon and Trunk Bays.

Field chloride of water at various installations in Cinnamon and Trunk Bays, St. John, V. I.				
Source of sample	Date	Chloride (ppm)	Water Temp. (°F)	Remarks
Cistern at Cinnamon Bay	7-11-63	375		Water pumped from converted test pit.
4? Converted test pit (Figure 1)	7-11-63	350	88	Pit had been pumped 4 times on alternate days with a maximum drawdown of 0.5 ft.
6 Well point #6 (figure 1)	7-23-63	1,680		Pumped 1/2 gpm from a depth of 7.7 to 8.7 ft.
5 foot test hole (figure 1)	7-31-63	185		After pumping at 1 gpm for 40 min.
5 Dug well Trunk Bay	7-11-63	400		After well was cleaned.

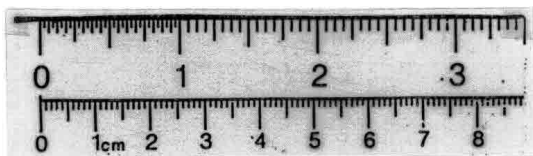
It is suggested that the water needs be determined in the various beach areas so that recommendations can be made as to the type, number, and location of well installations in each area.

The investigation of the north-shore beach areas will continue as time allows. Pumping tests are planned for wells at Cinnamon Bay, Trunk Bay, and Adrian Estate.



Water source	Chloride (ppm)
Test pit	400
Spring	236
Well point no. 4	225-245
Well point no. 5	490-530

Figure 1.— Sketch of the Cinnamon Bay area.



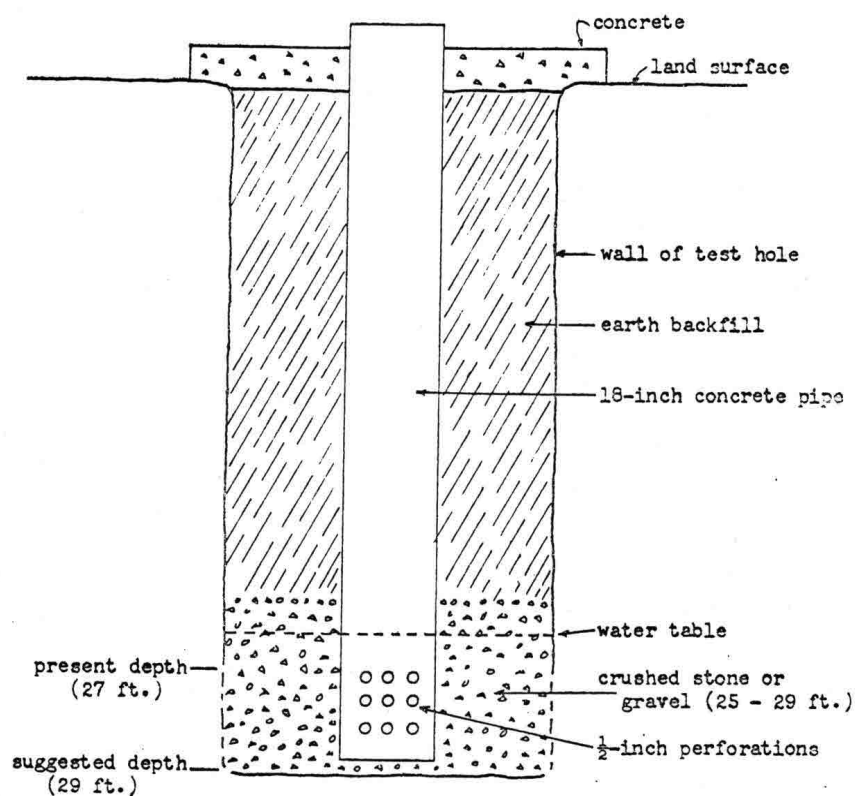


Figure 2:- Suggested construction for converting dug test hole to a production well at Cinnamon Bay, St. John.

Docket Information

Number of Documents in Docket 8

Documents Dated from 12/31/1964 to 1/12/1965

Docket Compiled: 7/28/2011