



WATER-RIGHT DOCKET

Hopewell Furnace National Historic Site

Docket No: 1

CCC WELL. IN BUILDING "PUMPHOUSE"

Supporting Hydro Data

00-00-0000: specification - hydro - water supply system(description and materials)

SPECIFICATION - HYDRO-PNEUMATIC WATER SUPPLY SYSTEM Lloyd House, Hopewell Village NHS

- I. DESCRIPTION: The Hydro-Pneumatic Water Supply System shall consist of an electric motor driven submersible pump, motor starter, safety switch, pressure switch, air volume control, pressure relief valve, liquid level control, pressure gauge, galvanized steel pressure tank and all necessary controls, wiring and piping. The materials shall be assembled into a completely operable unit capable of supplying a minimum of 5 gpm from the existing well. The work shall include excavation, backfill, connection to existing line inside house, disinfecting pipeline, cleaning, capping spring supply, and necessary incidentals.
- II. MATERIALS
 1. Pump: The pump shall be capable of delivering 5 gpm against a total head of 200 feet with sufficient piping to set the pump approximately 150 feet below the existing ground. The pump unit shall be a submersible type, 2" riser pipe, driven by a minimum 3/4 hp, 60 cycle, 3500 rpm, single phase, 230 volt electric motor or approved equal.
 2. Underground Discharge Unit: Pitless adapter with check valve and watertight cap, and designed for a 6-inch diameter well and a 3-foot burial depth for the discharge line. Similar and equal to Monitor PS as manufactured by Baker Manufacturing Co., Evansville, Wisconsin.
 3. Electric Cable and Wire: Shall be #10 or larger cable in plastic pipe installed according to manufacturer's recommendations and conforming to the National Electrical Code.
 4. Pressure Switch: Pump shall be controlled by a pressure switch (not mercury) at the hydro-pneumatic tank, set to start pumping at 25 psi and stop at 45 psi tank pressure. An auxiliary switch shall be provided so that an operator may bypass the automatic controls and operate the pump manually.
 5. Air Volume Control: Shall be furnished and installed to automatically maintain the proper air charge in the pressure tank. All controls shall be installed in accordance with the manufacturer's recommendations and shall be of the proper size and type to operate the well pump. The units used shall be Jacuzzi Bros., Inc. line type Jet charger Figure No. 210B complete with 2" line air aspirator, or approved equal.
 6. Pressure Relief Valve: Shall be 1" with bronze body with a screwed side outlet, exposed regulating screw and have a male inlet. The pressure setting shall be at 60 psi.

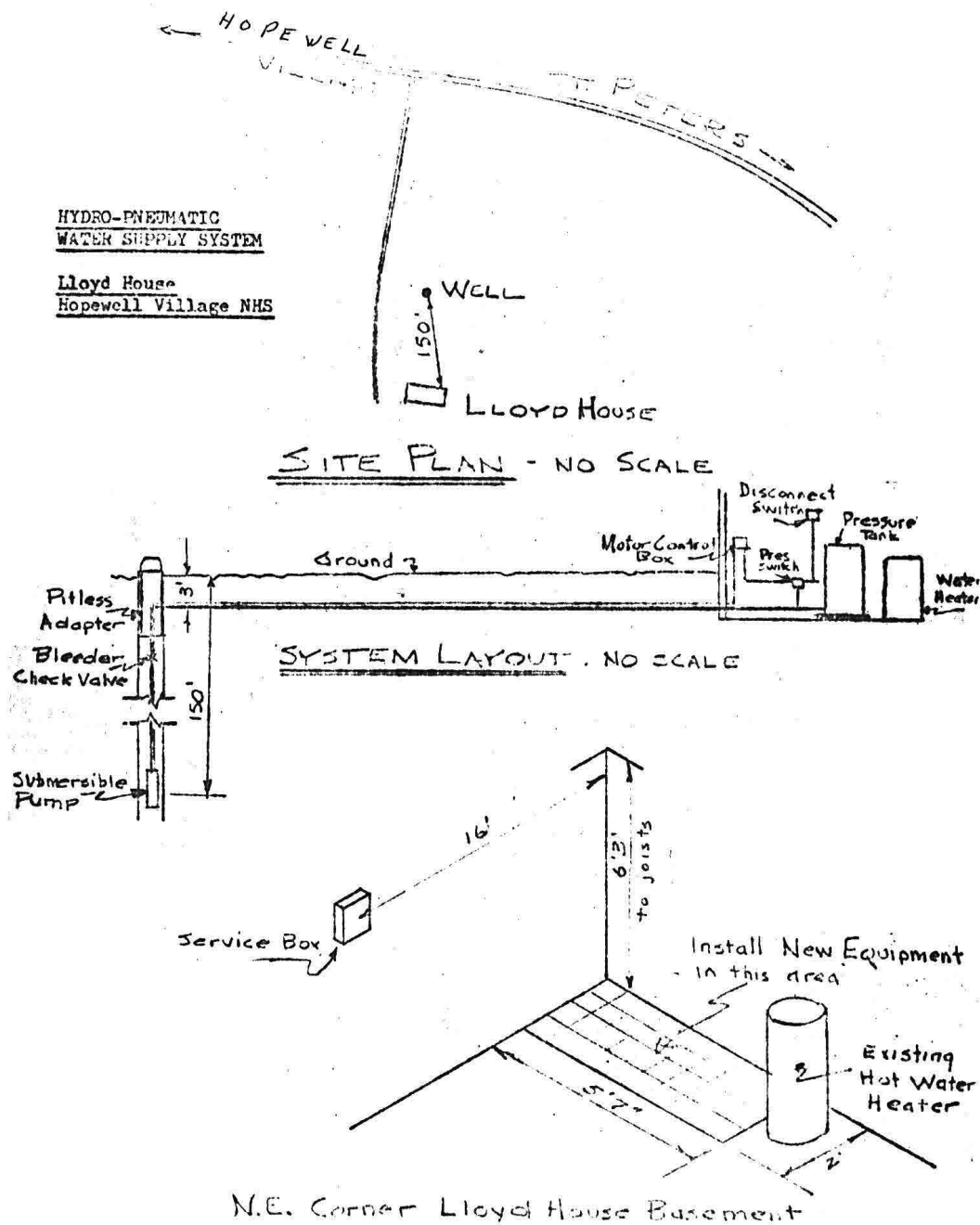
II. MATERIALS (CONT'D)

7. Bleeder Check Valve: Shall be 2" with bronze body and screwed threads.
8. Throttle Valve: Shall be a standard 2" gate valve with bronze body and screwed threads.
9. Liquid Level Control (Floatless): Shall be provided and installed in the well to protect the pump and motor during period of low water conditions. PUMP UP or PUMP DOWN, one-pole double-throw induction relay in NEMA 1 enclosure mounted at control panel for 115V, 60 cycles, with two shielded stainless steel electrodes suspended in well. Control unit shall be a Jacuzzi No. 23-1069, (formerly Fig. 65EL), or approved equal set to shut pump off at low well water level and restart pump at predetermined water level.
10. Pressure Gauge: Shall have a minimum diameter of 2-1/2" and shall be rust proof construction, with a dial reading from 0 to 100 psi. mounted on pressure tank for easy visibility.
11. Pressure Tank: Shall be of galvanized steel, vertical pneumatic tank with a minimum capacity of 120 gallons, a minimum shell thickness of 3/16" and have a minimum working pressure of 75 psi.
12. Galvanized Steel Pipe and Fittings: All piping shall be Class II, Weight A, welded or seamless pipe, zinc coated, conforming to the requirements of Federal Specifications WW-P-404c, and WW-P-521e.

III. CONSTRUCTION

1. Water Piping and Fittings: Shall be installed, tested and disinfected in accordance with manufacturer's recommendations and U.S. Public Health Service standards. Pipe shall be brought into building through a wall sleeve.
 2. Pump, Wiring and Controls: Shall be installed in accordance with these specifications and with the manufacturer's recommendations. The control panel shall be mounted on wall in a suitable location for easy access.
 3. Excavation and Backfill: Excavation shall be to lines and grades indicated. Backfill shall not be completed until entire system is tested.
- IV. MEASUREMENT: The hydro-pneumatic water supply system shall be considered as one unit and shall include pump, tank, controls, all piping, wiring, and appurtenances to make up a complete operable unit.

V. PAYMENT: Payment shall be made at the lump sum price bid. The lump sum price shall be full compensation for excavation and backfill and for furnishing and placing all materials, including all labor, tools, equipment and incidentals necessary to complete the Hydro-pneumatic water supply system as set forth in these specifications and shown on the enclosed plan.



FORM 10-131
APRIL 1964

PURCHASE ORDER

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

Hopewell Village N.H.S.

ISSUING OFFICE

REGISTRATION NO. 106 DATE OF ORDER 03/25/68	THIS NUMBER MUST APPEAR ON ALL INVOICES AND PAPERS RELATING TO THIS ORDER 376-82
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ACCOUNTING CLASSIFICATION	1481034 376-161140-23
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ORDER NO. ORDER DATE ORDER TIME	SHIP TO: (Consignee and Address) Superintendent Hopewell Village N.H.S. R.D. #1 Elverson, Penna. 19520
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ITEM NO.	ARTICLES OR SERVICES	QUANTITY ORDERED	UNIT	UNIT PRICE	AMOUNT
1	To install Hydro-Pneumatic water supply system from existing well to Lloyd House, Hopewell Village N.H.S. Work shall include excavation, backfill, connection to existing line inside house, disinfecting pipeline, cleaning, capping spring supply, and necessary incidentals. Work to be completed in strict accordance with the specifications submitted and the General Provisions attached, within 30 calendar days following notice to proceed. Job to be completed to the complete satisfaction of the Superintendent or his designated representative. Eight bidders were contacted, one bid was received which was determined by the Superintendent to be a reasonable bid and was accepted after concurrence with Regional Office on March 19, 1968.	1	job		1748.95
TOTAL					1748.95

THE ARTICLES OR SERVICES LISTED WERE RECEIVED ON 04/16/68 (DATE)

AND ACCEPTED ON 04/16/68 (DATE) RECEIVING REPORT NO: 81

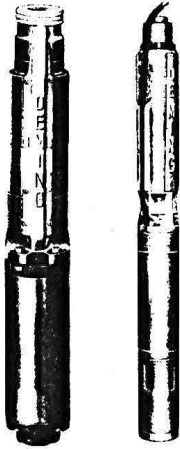
SIGNATURE: Charles H. Seidel
Foreman III, Charles H. Seidel

SIGNATURE

NAME AND TITLE John C. W. Kiddle
Superintendent

PURCHASING OFFICER

CRANE DEMING PUMPS

Bulletin No.
Subject:


10 GPM SERIES

ALF & ALS SUBMERSIBLE PUMPS - HEADS TO 1000 FEET

FOR DEEP WELL SERVICE: Designed for use in 4" I. D. or larger wells. These pumps are ideal for extremely deep wells. The ALS series is designed for depths up to 160 feet only. Our most popular series, these pumps provide adequate water for a family of five with one and one half baths. The ALF series provides ample water and pressure to allow three overage household faucets to run simultaneously.

IMPELLERS: Enclosed Delrin (R) impellers are perfectly balanced and assure long trouble-free service with minimum horsepower requirements.

DIFFUSERS: Made of Deming's exclusive Fianite (R) they are corrosion resistant and provide extra-smooth passage way for water being pumped.

BRASS: Is used extensively for its corrosion resistant quality. Discharge head is one piece brass construction with Delrin (R) check valve. Pump body is seamless brass tube to assure perfect pump alignment.

WATER LUBRICATED MOTOR: Nationally known manufacture. Windings are hermetically sealed in

stainless steel case. 3-wire design permits starting and running capacitor to be located above ground for easy access and maintenance.

SPLINE CONNECTIONS: Both motor shaft and pump shaft couplings are splined for positive drive. Spline wear is virtually eliminated by rubber boot which retards foreign matter from entering seal area.

STAINLESS STEEL PUMP SHAFT: Has extra-large diameter and is flattened on two sides to give eight times driving force of ordinary key-type shaft.

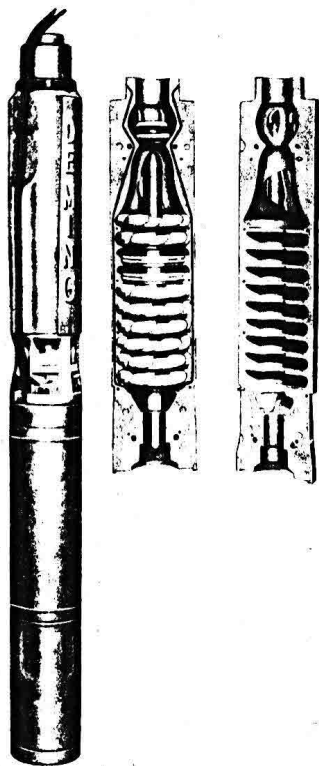
BASIC UNIT INCLUDES: (ALF Series) pump, motor and control box for single phase or magnetic starter for three phase units. (ALS Series) pump, 2-wire motor and cable connectors. For complete system add luster-lined tank, and system fittings package.

Select pump to fit your water requirements and well condition from chart below:

10 GPM PERFORMANCE CHART

UNIT NUMBER	2 ALF4				3 ALS10				3 ALF4				4 ALF4				5 ALF4				7 AL30				8 AL45			
HP & NO. STAGES BASIC UNIT PRODUCT NUMBER	1 HP - 7				1 1/2 HP - 10				1 1/2 HP - 10				2 HP - 13				2 HP - 16				2 HP - 30				3 HP - 45			
	115V 6700-402-03-001				115V 6700-400-03-101				115V 6700-402-02-001				230V 6700-402-04-001				230V 6700-402-05-001				230V V 6700-417-07-001				230V W 6700-412-08-001			
	230V 6700-402-02-002				230V 6700-400-03-102				230V 6700-402-03-002				230V 6700-402-04-001				230V 6700-402-05-001				220V W 6700-417-07-002				220V W 6700-412-08-002			
*SYSTEM FITTINGS PRODUCT NUMBER	PKG. NO. 1	PKG. NO. 2	PKG. NO. 1	PKG. NO. 2	PKG. NO. 1	PKG. NO. 2	PKG. NO. 1	PKG. NO. 2	PKG. NO. 1	PKG. NO. 2	PKG. NO. 1	PKG. NO. 2	PKG. NO. 1	PKG. NO. 2	PKG. NO. 1	PKG. NO. 2	VOLTS	PKG. NO. 1	PKG. NO. 2	VOLTS	PKG. NO. 1	PKG. NO. 2	VOLTS	PKG. NO. 1	PKG. NO. 2			
	0036183	0041990	0036183	0041990	0036183	0041990	0036183	0041990	0036183	0041990	0036183	0041990	0036183	0041990	0036184	0041991	230V	0036185	0041992	230V	0036184	0041991	220V	0036184	0041991			
																	440V	0054302	0054304	440V	0054302	0054304	440V	0054302	0054304			
TANK PRESS. PSI	20	30	40	60	20	30	40	60	20	30	40	60	20	30	40	60	20	30	40	60	20	40	60	80	20	40	60	80
40	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	
60	575	470	330	---	700	630	560	395	715	645	580	470	780	735	690	545	845	800	760	675	912	881	828	792	941	915	888	864
80	480	355	175	---	640	560	485	320	655	585	510	370	735	690	635	525	800	765	725	645	894	854	816	774	932	906	882	852
100	365	215	---	---	575	500	420	275	585	515	435	225	690	640	585	475	765	725	685	600	878	837	798	756	920	894	870	840
120	230	---	---	---	510	430	355	---	525	445	355	---	645	595	535	405	775	690	650	555	860	819	780	738	909	883	858	828
160	---	---	---	---	370	270	130	---	370	270	130	---	545	490	430	275	660	615	570	475	876	783	738	696	886	859	834	804
200	---	---	---	---	---	---	---	---	175	---	---	---	435	365	295	---	580	535	480	370	789	746	702	660	864	835	810	780
240	---	---	---	---	---	---	---	---	---	---	---	---	290	210	90	---	495	440	380	240	751	708	666	618	840	812	786	756
280	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	715	669	624	576	816	769	724	676	816	788	762	732
320	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	676	629	582	528	793	744	696	648	793	764	738	708
360	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	636	586	534	480	767	718	670	622	780	750	724	694
400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	595	541	492	437	743	694	646	598	737	707	681	651
440	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	550	495	446	392	717	668	620	572	717	687	661	631
480	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	503	445	396	300	681	631	583	535	681	651	625	595
520	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	452	387	312	216	656	606	558	510	656	626	600	570
560	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	396	321	234	108	639	589	541	493	639	609	583	553
600	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	331	240	138	---	612	562	514	466	612	582	556	526
650	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	234	120	---	---	576	526	478	430	576	546	520	490
700	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	108	---	---	---	538	488	440	392	538	508	482	452
750	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	497	447	399	351	497	467	441	411
800	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	456	406	358	310	456	426	400	370
850	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	407	357	309	261	407	377	351	321
900	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	358	308	260	212	358	328	302	272
950	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	296	246	198	150	296	266	240	210
1000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	278	228	180	132	278	248	222	192
1050	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	150	61	---	---	150	61	---	---

10 GPM SERIES — ALF & ALS SUBMERSIBLE PUMPS



SPECIFICATION TABLE

UNIT NO.	HP	PHASE	VOLTS	NO. STAGES	A	B	C	D	E	F	CPLD. STYLE
2 ALF 4	1/2	1	115	7	26 1/8	3 3/4	11 1/4	3 3/4	2 3/4	1	SPLINE
			230								
3 ALS 10	1/2	1	115	10	38 7/8	3 3/4	21 1/4	3 3/4	2 3/4	1	SPLINE
			230								
3 ALF 4	1/2	1	115	10	28 5/8	3 3/4	12 1/4	3 3/4	2 3/4	1	SPLINE
			230								
4 ALF 4	3/4	1	230	13	33 1/8	3 3/4	14 3/4	3 3/4	2 3/4	1	SPLINE
5 ALF 4	1	1	230	16	36 3/8	3 3/4	15 3/4	3 3/4	2 3/4	1 1/4	SPLINE
7 AL 30	2	1	230	30	38 3/8	3 3/4	25 1/8	3 3/4	2 3/4	1 1/4	SPLINE
		3	220		56 3/8		22 3/8				
8 AL 45	3	1	230	45	78 1/2		31 1/8				SPLINE
		3	220		72 1/2	3 3/4	25 3/8	3 3/4	2 3/4	1 1/4	

CABLE SELECTION TABLE

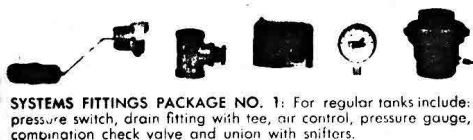
10 GPM SERIES		WIRE SIZE						
PHASE	HP	#14	#12	#10	#8	#6	#4	#2
115 Volts Single Phase	1/2	110	165	260	...	...	...	...
	1	110	130	92	310	...	...	...
	3	410	665	1,040	...	...	...	...
230 Volts Single Phase	1/2	315	490	775	1,230	...	...	...
	1	190	300	475	760	1,205	...	...
	3	165	260	415	660	1,050	...	...
220 Volts Three Phase	1	95	130	240	380	600	960	...
	2	...	100	155	245	395	625	990
	3	...	...	...	...	...	...	...
440 Volts Three Phase	1	480	760	1,210	1,930	...	...	...
	2	350	550	875	1,395	2,220	...	...
	3	1,930	3,050	...	...	...	...	...

Cable selection table — maximum cable length from pump motor to control box or starter near top of well.

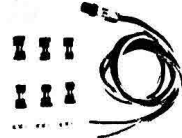
MOTOR LEAD ASSEMBLY SELECTION

10 GPM SERIES		WIRE SIZE						
PHASE	HP	#14	#12	#10	#8	#6	#4	#2
115 Volts Single Phase	1/2	25	40	65	105	165	260	...
	1	20	30	50	80	125	200	...
	3	100	165	260	415	650	1,050	...
230 Volts Single Phase	1/2	75	120	195	310	490	775	...
	1	45	75	120	190	300	480	...
	3	40	65	105	165	265	420	...
220 Volts Three Phase	1	25	40	60	95	150	240	385
	2	...	25	40	60	100	160	250
	3	120	190	300	480	765	1,215	...
440 Volts Three Phase	1	85	140	220	350	555	880	1,400
	2	480	790	...	...	...	...	...
	3	350	550	880	...	...	...	...

Maximum service supply wire length in feet from control box or starter to load center or transformer.



SYSTEMS FITTINGS PACKAGE NO. 1: For regular tanks include: pressure switch, drain fitting with tee, air control, pressure gauge, combination check valve and union with snifters.



THREE WIRE MOTOR LEAD: Assembly and splicing kit 48" long for 1/2 hp through 2 hp motor. For larger motors use 100" long kit.



SYSTEMS FITTING PACKAGE NO. 2: For air separator tanks include: brass combination check valve, control center, pressure gauge, snifter valve and pressure switch.

Deming submersible cable is available in bulk on reels or packaged to specific lengths with motor connector plug molded on one end. Cable is available with either plastic or rubber covering; twisted or parallel molded; two or three wire. See current Price Page for details.

CRANE CO. 4100 So. Kedzie, CHICAGO, ILL. 60632

VALVES • PUMPS • FITTINGS • WATER TREATMENT • PIPING • PLUMBING • HEATING • AIR CONDITIONING

RECEIVED

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LABORATORY
2249 FAIRVIEW STREET
READING, PENNSYLVANIA 19606

GILBERT ASSOCIATES, INC.
ENGINEERS AND CONSULTANTS
LABORATORY DIVISION

OFFICE
825 LANCASTER AVE., BOX 1498
READING, PENNSYLVANIA 19603

CERTIFICATE OF ANALYSIS

SAMPLE OF: RAW WATER
 LABORATORY NO: 230778
 YOUR NO:
 SUBMITTED BY: Hopewell Village
 R. D. 1
 Elverson, Pa.

SAMPLED: June 15, 1967

RECEIVED: June 15, 1967

REPORTED: June 19, 1967

MARKED: CCC WELL - 9:00 AM

		CaCO ₃ Equivalents	Ions
Calcium	ppm Ca	5.0	2.0
Magnesium	ppm Mg	2.0	0.5
Sodium	ppm Na	22.5	10.4
TOTAL CATIONS	ppm	29.5	
Bicarbonates	ppm HCO ₃	21.0	25.6
Sulfates	ppm SO ₄	1.6	1.5
Chlorides	ppm Cl ⁻	5.6	4.0
Nitrates	ppm NO ₃	1.3	1.6
TOTAL ANIONS	ppm	29.5	
Hydrogen Ion Conc.	pH		6.9
Conductivity	Mmho		45.2
M. O. Alkalinity	ppm CaCO ₃		21
Total Hardness	ppm CaCO ₃		7
Free Carbon Dioxide	ppm CO ₂		34.0
Silica - Soluble	ppm SiO ₂		19.2
Iron - Soluble	ppm Fe ²⁺		0.03
Iron - Total	ppm Fe		0.17
Manganese	ppm Mn		0.03
Copper	ppm Cu		0.04
Iron & Aluminum Oxides	ppm R ₂ O ₃		0.4
Color	ppm		0
Turbidity	ppm		10
Suspended Solids	ppm		4.2
Soluble Solids	ppm		52
Total Solids	ppm		56

Respectfully submitted,

W. J. Delp
 W. J. Delp
 Chief Chemist

EMS

cc: John C. Riddle, Supt. (3)

WATER SYSTEM DATA

AREA Hopewell Village DATE June 15, 1967 COLLECTED BY Moore
 1. Name of System: CCC Well in Building "Pump House"
 2. Location: State Pennsylvania County Berks General Area Hopewell
 Reference to permanent landmark 6" dia. static level 6.5 in.
 3. Source of Supply: Deep Well 150 feet case 65.5/ Capacity 360
 (Well, Spring, Stream, Impoundment, etc.)
 4. Type of System: Pumped
 (Pumped, Gravity, etc.)
 5. Treatment: None
 (Filtration, Chlorination, Aeration, etc.)
 6. Distribution Mains: Size Length ; Size Length
 None Size Length ; Size Length
 Size Length ; Size Length
 7. Pump Unit: Make Sumo; Type W11B11/180; Model No. W45221
 Serial No: - - -; Outlet 1 1/2 in.; Inlet 1 in.
 (Size) (Size)
 8. Power Source: (Elec., Gas, Generator) Motor: Make ; HP ;
 Serial No. ; Voltage 220; Amps ;
 RPM 60; Type ; Phase single;
 Cycles ; Others Mark I; Stages II
 9. Control: Automatic Pressure; Manual ;
 (Float, Electrobe, Pressure, Time)
 Other
 (Explain)

10. Pump Design: Capacity _____ gpm _____ gpm
(Actual) (Design)
Head _____ ft. _____ ft.
(Actual) (Design)

11. Pump Housing: Type Const. N/A; _____; Size _____
(Walls) (Roof)

12. Storage: _____; Type Const. _____
(Pneumatic, Elevated, Underground, etc.) (Concrete, Wood, Steel)
None
Size _____; Capacity _____; Inlet _____ ft. _____ in.
(Elev.) (Size)
Outlet _____ ft. _____ in.; Pressure Setting _____
(Elev.) (Size) (If pneumatic)

13. Distribution: Water Closets _____; Lavatory _____; Urinal _____
None Drinking Fountain _____; Hose Bids _____; Residences _____
Other _____; _____; _____

14. Metered or Nonmetered: _____; No. _____; Size _____
No. _____; Size _____
No. _____; Size _____

15. Fire Protection: Fire Hydrants _____ No _____; Yard Hydrants _____

16. Water Analysis: _____

Acting Regional Director, Northeast Region,
National Park Service, Phila., Pa.

June 13, 1968

District Geologist, GW, Harrisburg, Pa.

INFORMATION - Chemical analysis of water from old CCC well at
Hopewell Village, Berks County, Pa.

Enclosed is a copy of the chemical analysis of the water which was
sampled at the time of the pumping test.

There is no charge for the analysis.

Joseph E. Barclay

Encl.
cc: J. C. W. Riddle
Area Hydrologist
Dr. Socolow



U.S. DEPARTMENT OF THE INTERIOR

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
NORTHEAST REGION
143 SOUTH THIRD STREET
PHILADELPHIA, PA. 19106

4 COPIES

Memorandum

To: District Geologist, Geological Survey, Water Resources
Division, Branch of Ground Water

From: Acting Regional Director, Northeast Region

Subject: Well Test - Mayewell Village

Thank you for your March 15 letter transmitting results of the test of the old COC well performed by Messrs. Roth and Roth. We appreciate also that there will be no charge for the work.

It is our intention to install a submersible pump at about 110 feet below ground level to provide for fluctuations in the water table. We will then chlorinate and pump the well at 25 gallons per minute, allowing the water to run to waste. If a satisfactory bacteriological test is obtained at the end of 12 hours of pumping, we will introduce the well water into our system and disconnect the line from the spring, retaining the latter as a reserve.

We will be interested in receiving the results of the chemical test; reimbursement for this expense is available.

George A. Palmer

cc:

Director, w/e ins.

Chief, Office of EAC, FSC, w/e ins.

Supt., Mayewell Village, w/e ins.

WATER RESOURCES DIVISION
BRANCH OF GROUND WATER
100 North Cameron Street
Harrisburg, Pennsylvania
17101

Northeast Region		Issued and Date
MAR 22 1966		
Reg Director		
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cc: J. C. W. Riddle
Area Hydrologist
A. A. Socolow

Free Hydrocarbons

Investigation of well at Hopewell Village
National Historic Site, Pa.

The well was logged and test-pumped by William C. Roth and Charles W. Poth on March 14-15, 1966 in order to evaluate the well as a potential supply for the Village. The data are enclosed on the accompanying sheets.

The depth to the water-bearing zones was obtained by tracing the movement, while the well was pumped, of slugs of brine which had been added to the well at intervals throughout its depth. The range given for the uppermost zone reflects the inherent inaccuracy of the method when the yielding zone, the pump emplacement, and the pumping water level are so close together.

The data indicate that the well can be pumped at about 25 gallons per minute (gpm) for a period of about 18 hours, or at even higher rates for shorter periods. Pumping at higher discharges of for longer periods than this may draw the water level down below the point of entrance of the water in the upper zone and hence reduce its contribution to the well. The greater drawdown will increase the gradient of the water in the lower two zones, however, and will increase their yield to the well. Whether the increased yield of the lower two zones will compensate for the loss in the top zone cannot be determined without pumping the well at a higher rate. Such a rate is beyond our present equipment, but could be obtained through the use of a pump rented from a well driller.

The above interpretation is predicated on the present static water level. However, as the static level fluctuates in an annual cycle, standing closer to the surface during the late winter and spring months than it does in summer and fall, the potential yield of the well will also vary. Data on the size of the fluctuations of the water level in this well are not available, but because the well is about 100 feet above local surface drainage, annual fluctuations of 20 to 40 feet or more may occur. Measurements of the depth of the static water level should be made, preferably at weekly intervals, by someone at the Site. Records of the water level and the approximate amount of water pumped should be kept as they will serve as an invaluable guide to the future performance of the well.

When the results of the chemical analysis of the sample of water which you submitted to the U. S. Geological Survey, Quality of Water Laboratory in Philadelphia are returned to me I will forward them to you.

5002-10-11

U.S. Geological Survey well Be-523 located in pumphouse at Hopewell Village National Historic Site, Berks County, Pa. and owned by the National Park Service.

Measurements made March 14-15, 1966.

All measurements were made from the top of casing which is about 1.3 feet above land surface.

Well Depth: 150 feet

Casing depth: 65.5 feet, casing diameter 6 in.

Depth to static water level 65.41 feet.

Aquifer - Stockton Formation.

<u>Depth to water-bearing zones (feet)</u>	<u>Approximate contribution of zone (percent)</u>
75-85	83
108	13
120	4

Pumping test: well Be-523

Duration of pumping: 18 hrs.

Average pumping rate: 10.84 gpm.

Total amount pumped: 11,708 gal.

Total drawdown: 9.53 ft.

Specific Capacity: 1.14 gpm per ft.

Data: During pumping, not corrected for trend, barometric pressure, etc.

<u>Time (min.)</u>	<u>Drawdown (ft.)</u>	<u>Time (min.)</u>	<u>Drawdown (ft.)</u>
0.25	0.46	70.0	6.86
.5	.72	80	6.93
.75	1.13	97	7.05
1.0	1.53	105	7.08
1.25	2.05	120	7.23
1.5	2.57	135	7.31
1.75	2.97	152	7.34
2.0	3.37	165	7.41
2.5	4.24	180	7.44
3.0	4.62	210	7.47
3.5	5.24	240	7.60
4.0	5.45	270	7.67
4.5	5.63	300	7.80
5	5.78	330	7.81
6	5.99	364	7.98
7	6.14	390	8.04
8	6.24	420	8.11
9	6.32	450	8.13
10	6.34	480	8.20
12	6.36	510	8.23
14	6.38	540	8.28
16	6.43	570	8.34
18	6.52	600	8.18
20	6.53	630	8.43
23	6.58	660	8.64
26	6.61	690	8.72
30	6.69	720	8.81
35	6.70	750	8.86
40	6.75	780	8.89
45	6.80	810	8.87
50	6.64	840	9.07
60	6.88		

Pumping test - well Be-523, continued

<u>Time (min.)</u>	<u>Drawdown (ft.)</u>
870	9.06
900	9.16
938	9.20
960	9.25
990	9.30
1,020	9.46
1,050	9.47
1,080	9.53

Residual drawdown of water level measured from time pumping stopped.

<u>Time (min.)</u>	<u>Drawdown (ft.)</u>
0.25	6.77
.5	5.43
.75	4.13
1.0	3.29
1.25	3.11
1.5	3.18
1.75	3.35
2.0	3.39
2.5	3.48
3.0	3.53
3.5	3.56
4.0	3.55
4.5	3.52
5	3.50
6	3.47
7	3.45
8	3.42
9	3.39
10	3.37
12	3.33
14	3.29
16	3.27
18	3.25
20	3.21
23	3.19
26	3.16
30	3.12
35	3.07
40	3.12
45	3.03
50	2.97
60	2.93

Other Supporting Information

LEGEND HOPEWELL VILLAGE HS*

SPRINGS

No. 1 - Protected and Approved. Drinking Water 6 Penny Picnic Area.
 " 2 -
 " 3 -
 " 4 - Protected and Approved. Main Water Supply 6 Penny Picnic Area
 Fountains, etc.
 " 5 -
 " 6 - Now Being Protected
 " 7 - Now Being Protected
 " 8 -
 " 9 -
 " 10 - Now Being Protected
 " 11 -
 " 12 - Now Being Protected
 " 13 - Protected and Approved. Drinking Water Along Access Road.
 " 14 -
 " 15 -
 " 16 - Protected and Approved. Drinking Water West of Tent Camp.
 " 17 -
 " 18 - Now Being Protected.
 " 19 - Now Being Protected.
 " 20 - Protected and Approved. Water Supply for Residence No. 1
 " 21 -
 " 22 - Protected and Approved - Hopewell Village Water Supply
 " 23 -
 " 24 - Now Being Protected
 " 25 -
 " 26 -
 " 27 -
 " 28 - Protected and Approved-Water Supply North End of Baptism Creek
 Picnic Area, Fountains, etc.
 " 29 -
 " 30 - Protected and Approved-Water Supply South End of Baptism Creek
 Picnic Area, Fountains, etc.
 Nos. 31 through 48 - No comment.
 No. 49 - Now Being Protected.
 " 50 - " " "
 " 51 - " " "
 " 52 - " " "
 " 53 - " " "
 " 54 - " " "
 " 55 - " " "

WELLS

- No. 1-W - Deep Well-(300' Depth 6" Casing) Protected and Approved.
Water Supply for Organized Camp #1.
" 2-W - Deep Well-(170' Depth 128'-6" Casing) Protected and Approved
Water Supply for Organized Camp #2.
" 3-W -
" 4-W - Deep Well-(6" Casing) Protected and Approved Water Supply for
Scout Camp and Organized Camp #4 F.
" 5-W - Dug Well- Protected and Approved Water Supply for Superintendent's
Office.
" 6-W - Deep Well - (180' Depth 6" Casing) Protected and Approved Water
Supply for C.C.C. Camp N.P.4.
" 7-W - Dug Well - (18' -6" Depth) Prot. and Approved Water Supply for
Tenant House.
" 8-W -
" 9-W -
" 10-W -
" 11-W -
" 12-W -
" 13-W - Dug Well - (12'-6" Depth) Protected but not Approved for
Drinking-Water Supply for 6 Tenant houses.

NOTE: Springs and wells numbered but not described are not being used at
the present time. Information in regards to these springs and wells
will be forwarded when they are properly protected and approved as
water supplies.

*Copied from Legend which appears in French Creek General Development Plan
Map #FREN 9261-A-T

IN REPLY REFER TO

Northeast Region		Issued and Date
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cc: J. C. W. Riddle
Area Hydrologist
A. A. Socolow

free hydrocarbons

Investigation of well at Hopewell Village
National Historic Site, Pa.

The well was logged and test-pumped by William C. Roth and Charles W. Poth on March 14-15, 1966 in order to evaluate the well as a potential supply for the Village. The data are enclosed on the accompanying sheets.

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U.S. Geological Survey well Be-523 located in pumphouse at Hopewell Village National Historic Site, Berks County, Pa. and owned by the National Park Service.

Measurements made March 14-15, 1966.

All measurements were made from the top of casing which is about 1.5 feet above land surface.

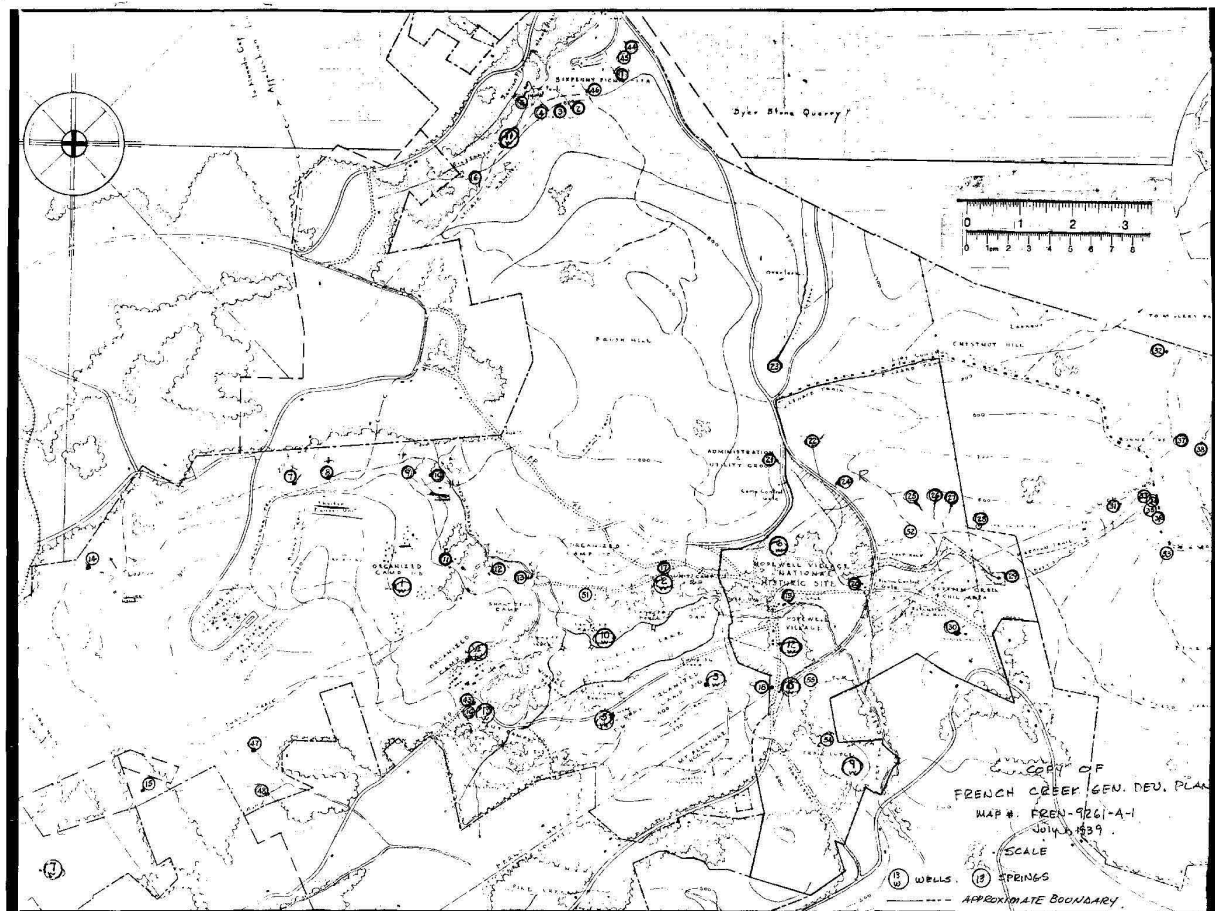
Well Depth: 150 feet

Casing depth: 63.5 feet, casing diameter 6 in.

Depth to static water level 63.41 feet.

Aquifer - Stockton Formation.

<u>Depth to water-bearing zones (feet)</u>	<u>Approximate contribution of zone (percent)</u>
75-85	83
108	13
120	4



Docket Information

Number of Documents in Docket 24

Documents Dated from 7/15/1939 to 3/25/1968

Docket Compiled: 4/11/2011