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(1) (10 WATER WORKS)

1924

Reference

# Report of Pump Test on Cutting Property near Baldwin's Pond, Wayland, Mass.

To Harvard Trust Company

Cambridge, Massachusetts

Trustee under the Will of Jonathan Parmenter, Deceased.

Gentlemen:

We have carried out the orders given by your Vice-President, Mr. Edward D. Whitford, namely to install additional wells and connect them to a power pump and conduct a pump test: as outlined in the letter, dated January 24, 1924, from Massachusetts Department of Public Health.

Attached to this report is a blue print showing approximate location of wells, detail sheets showing record of wells and soil conditions, also pumping and recovery records.

The surface conditions in the location of Test Well #14 appeared to be most favorable so eleven additional wells were driven in this location as shown on plan, and more fully described on Page 6.

The twelve wells were connected through a 6" suction main to a Dean Steam Plunger Pump, of ample size, using a 35 Horse-Power Steam Boiler to furnish power to operate the pump. A box, having a 15" Weir, was placed in position to receive the discharge from the pump.

The pump was provided with a proper vacuum gauge to record the vacuum created by drawing of the water from the wells.

Each well was controlled by a valve so it could be cut out of the line, should any necessity arise.

Original at Wayland Historical Society 4-79

Men, skilled in operating the pumping plant and keeping accurate records of the results of the test were provided for continuous service during the entire twenty-four hours of each of the ten days the pumping was in progress.

Complete records of the results of pumping are shown on Page 7.

The engineering office of the Public Health Department were notified of our readiness to start the pump. A representative was on the ground when the pump was started, March 17 at 12:00 noon. The engineer gave us full directions for securing such data as his department required and also took a sample of water from the pump after one hour of operation.

In addition to the twelve wells connected with the pump, four observation wells were required by the State Engineer. Blue print shows location of these wells, #13, #26, #27, and #29.

Before starting the pump record of the elevation of the water in each observation well and the pond was taken, and at frequent intervals after starting the pump until the elevation of the water became stable, and then every two hours. Record in detail are given on Page 8 of this report.

It will be noted from this record that we have lowered the water in Well #13 - 6½", #26 - 11½", #27 - 15½", #29 - 15½", during the period of pumping, or a maximum drop of 15½", thus showing that the water flows freely and in abundant quantity.

We are very much pleased to note the record of #13 well which is located 500 ft. from the pump and 300 ft. from the nearest well: indicating the open condition of the soil and the wide extent of area from which water can be drafted.

Careful records of all changes of conditions while pumping are very important but not more important than the record of what takes place when the pumping is stopped.

At 12:30 P. M., March 27th, the pump was stopped. A State Health Department Engineer was present and took careful observation of all conditions as they existed while the pump was still running, and noted what took place after the pump stopped. Detailed records of the recovery will be found on Page 8.

It will be noted that in three hours after stopping the pump the observation wells recovered as follows: #13 - 3", #26 - 2 1/4", #27 - 3 1/4", and #29 - 4 1/4".

#29 is located nearest to wells connected to pump and therefore it came back faster as it also dropped more while the pump was running.

#26 dropped less during the pumping and recovered slower than the others after stopping.

The records during the pumping and of the recovery clearly indicate free and open soil conditions, and an abundance of water.

## Quality of Water

The Engineer of Massachusett Public Health Department personally took a sample of water from the pump one hour after the pump was started, and delivered it to the State Laboratory for analysis. He took another sample just before the pump was stopped, in the same manner, and in addition to this we took a sample each day and expressed it to the Laboratory at the State House.

The results of their analysis and observations is fully set forth in the following report from the Massachusetts Department of Public

Health, which is copied herewith in full:

April 10, 1924

To Mr. Edward D. Thitford,

Vice President, Harvard Trust Company

Cambridge, Massachusetts

Dear Sir:

In further response to your request, the Department of Public Health has caused an examination to be made of a group of tubular wells which it is proposed to use as a source of water supply for the town of Wayland and has caused samples of water from these wells to be analyzed.

The wells are located in the vicinity of Baldwin's Pond where it was found that water could be pumped from porous soil with much freedom. Twelve of these wells have been connected to a power pump and water was pumped from them continuously for ten days from March 17th to March 27th at a rate of about 420,000 gallons per day. During this test, observations were made of the height of the ground water in the region about the wells, the results indicating that a quantity of water ample for the requirements of the town of Wayland could probably be obtained from the ground in this vicinity.

The results of the analyses of samples of water collected at frequent intervals during the test show that it is clear, colorless, low in organic matter, and of excellent quality in all respects for domestic purposes.

In view of the results of this test, the Department hereby approves the use of these wells as a source of water supply for the town of Wayland.

Respectfully,

Deput Commissioner of Public Health

The above approval by the State Health Department, brings our testing to a successful conclusion.

Respectfully submitted,

LEAD-HYDRO-[illegible] COMPANY.

MANAGER.

Report on Wells for Pump Test
Cutting Property at Baldwin's Pond, Wayland, Mass.

| Well No | Well Depth | Depth Soil or Mud | Depth of Sand | Depth of Fine Sand | Depth Coarse Sand | Depth Very Coarse Sand | Depth of Gravel | Material at Strainer Depth | Time to Clear | Gall. per Minute | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 43-11 | 1-16 | | 16-22 | 22-38 | 38-44 | | very coarse sand | 4 hrs. | 60 | * |
| 4 | 44-2 | 1-11 | 11-16 | | 16-22 | 22-38 | 38-44 | gravel | 3½ " | 80 | |
| 5 | 44 | 1-11 | 11-32 | | | 32-38 | 38-44 | " | 3 " | 60 | |
| 6 | 48-3 | 1-11 | 11-33 | | | 33-43 | 43-48 | " | 3 " | 60 | |
| 7 | 43 | 1-10 | 10-27 | | 27-32 | | 32-43 | " | 2½ " | 60 | |
| 8 | 43-9 | 1-11 | 11-27 | | 27-33 | | 33-43-9 | " | 2½ " | 60 | |
| 9 | 43-10 | 1-11 | 11-27 | | 27-33 | | 33-43-10 | " | 3 " | 60 | |
| 10 | 49-2 | 1-11 | 11-21 | | 21-44 | | 44-49 | " | 3 " | 60 | |
| 11 | 48-4 | 1-10 | | 10-21 | 21-42 | | 42-48-4 | " | 1 " | 80 | |
| 12 | 53-9 | | 21-48 | 1-21 | | | 48-53 | " | 2 " | 80 | |
| 13 | 59-5 | | 1-16 | 16-48 | | 48-54 | 54-59 | " | 2½ " | 95 | |
| 14 | 55 | | 1-27 | 27-48 | | 48-55 | | coarse sand | 2 " | 95 | |
| 15 | 52-7 | | | 1-48 | | | 48-52-7 | gravel | 2 " | 90 | * |
| 16 | 48-1 | | 1-42 | | | | 42-48 | " | 2 " | 90 | * |
| 17 | 44-1 | 1-16 | 16-38 | | | | 38-44 | " | 1 " | 90 | * |
| 18 | 58-11 | | 1-58-11 | | | | | | Could not clear | | |
| 19 | 37-8 | | 1-11 | 11-32 | | | 32-37-8 | " | 2 " | 90 | * |

* Observation Wells
Connected to test Pump, Diameter of Wells 2½"

Lead-Hydro-Lite Company

March 28, 1924

F. A. Hancom, Manager

# Records on Pumping Test
## At Wayland, Mass.

Started 12 Noon, March 17, 1924

| Date | Time | Vacuum | Flow over Weir | Height of water from the top of the well #13 | #26 | #27 | #29 | Height of water of pond from top of stake |
|---|---|---|---|---|---|---|---|---|
| March | | | | | | | | |
| 17,1924 | 12 Noon | 15 lb. | 4½" | -6½" | 3'-4" | -½" | 3'-2" | - 9" |
| " " | 1 P.M. | 12 " | 3½" | -9" | 3'-6" | -8½" | 3'-9" | - 9" |
| " " | 2 " " | 12 " | 3½" | -8" | 3'-7" | -9" | 3'-9" | - 9" |
| " " | 3 " " | 12 " | 3½" | -8" | 3'-8" | -9½" | 3'-9½" | - 9" |
| " " | 4 " " | 12 " | 3½" | -8½" | 3'-8" | -9½" | 3'-10" | - 9" |
| " " | 5 " " | 12 " | 3½" | -8½" | 3'-8" | -10" | 3'-10" | - 9" |
| " " | 6 " " | 12 " | 3½" | -8½" | 3'-9" | -10½" | 3'-11" | - 9" |
| " " | 7 " " | 12 " | 3½" | -8½" | 3'-8½" | -10½" | 3'-10½" | - 8½" |
| " " | 8 " " | 12 " | 3½" | -9" | 3'-8½" | -10½" | 3'-11" | - 8 " |
| " " | 9 " " | 12 " | 3½" | -9" | 3'-9" | -11" | 3'-11½" | - 8 " |
| " " | 10 " " | 12 " | 3½" | -9" | 3'-9½" | -11½" | 4'- | - 8 " |
| " " | 11 " " | 12 " | 3½" | -9½" | 3'-9½" | 1'- | 4'- | - 8 " |
| " " | 12 Mid | 12 " | 3½" | -9½" | 3'-9½" | 1'-½" | 4'- | - 8" |
| -3 " | 2 A.M. | 13 " | 3½" | -9½" | 3'-10" | 1'-1" | 4'-1" | - 8" |
| " " | 4 " " | 12 " | 3½" | -9½" | 3'-10" | 1'-½" | 4'-½" | - 8" |
| " " | 6 " " | 12 " | 3½" | -9½" | 3'-10½" | 1'-1" | 4'-1½" | - 8" |
| " " | 8 " " | 12 " | 3½" | -9½" | 3'-10½" | 1'-½" | 4'-1" | - |
| " " | 10 " " | 12 " | 3½" | -9½" | 3'-10½" | 1'-½" | 4'-1" | - |
| " " | 12 Noon | 12 " | 3½" | -9½" | 3'-10½" | 1'-½" | 4'-1" | - 8" |
| " " | 12 Mid. | 12 " | 3½" | -10" | 3'-11" | 1'- | 4'- | - 8" |
| 19 " | 12 Noon | 12 " | 3½" | -10½" | 3'-11" | 1'-1" | 4'-1" | - 8" |
| " " | 12 Mid. | 12 " | 3½" | -11" | 4'- | 1'-1" | 4'-2" | - 8" |
| 20 " | 12 Noon | 12 " | 3½" | -11½" | 4'-1" | 1'-2" | 4'-3" | - 8" |
| " " | 12 Mid. | 12 " | 3½" | -11½" | 4'-1" | 1'-2½" | 4'-3½" | - 8" |
| 21 " | 12 Noon | 12 " | 3½" | -11½" | 4'-1½" | 1'-2½" | 4'-3½" | - 8" |
| " " | 12 Mid. | 12 " | 3½" | 1'- | 4'-2" | 1'-2½" | 4'-3½" | - 8" |
| 22 " | 12 Noon | 12 " | 3½" | 1'- | 4'-2½" | 1'-2½" | 4'-4" | - 7½" |
| " " | 12 Mid. | 12 " | 3½" | 1'- | 4'-2½" | 1'-3" | 4'-5" | - 7½" |
| 23 " | 12 Noon | 12 " | 3½" | 1'-½" | 4'-2½" | 1'-2½" | 4'-4" | - 6½" |
| " " | 12 Mid. | 12 " | 3½" | 1'- | 4'-2" | 1'-2" | 4'-3" | - 6½" |
| 24 " | 12 Noon | 12 " | 3½" | 1'-½" | 4'-2½" | 1'-2½" | 4'-4" | - 6½" |
| " " | 12 Mid. | 12 " | 3½" | 1'-½" | 4'-2½" | 1'-3½" | 4'-4½" | - 6½" |
| 25 " | 12 Noon | 12 " | 3½" | 1'-½" | 4'-2½" | 1'-3½" | 4'-4½" | - 6½" |
| " " | 12 Mid. | 12 " | 3½" | 1'-½" | 4'-3" | 1'-4" | 4'-5" | - 7" |
| 26 " | 12 Noon | 12 " | 3½" | 1'-1" | 4'-3" | 1'-3½" | 4'-5" | - 7½" |
| " " | 12 Mid. | 12 " | 3½" | 1'-1" | 4'-3½" | 1'-4" | 4'-5½" | - 7½" |
| 27 " | 12 Noon | 12 " | 3½" | 1'-1½" | 4'-3½" | 1'-4½" | 4'-5½" | - 7½" |

Stopped pumping at 12:30 P. M.

## Records of Recovery of Water in Observation Wells

| Time | #13 | #26 | #27 | #29 |
|---|---|---|---|---|
| March 27, 1924 | | | | |
| 12:35 P. M. | 1'-[illegible]" | 4'-2" | -10" | 4'-2" |
| 1:05 " " | 1'-[illegible] | 4'-1[illegible]" | -8[illegible]" | 4'- |
| 1:35 " " | -11 5/8" | 4'-1" | -8" | 3'-11½" |
| 2:10 " " | -11 5/8" | 4'-[illegible]" | -7[illegible]" | 3'-10[illegible]" |
| 2:40 " " | -11[illegible]" | 4'-[illegible]" | -7½" | 3'-10½" |
| 3:10 " " | -11" | 4'- | -7" | -10" |
| 3:40 " " | -10[illegible]" | 3'-11[illegible]" | -6[illegible]" | 3'-9[illegible]" |
| 4:10 " " | -10½" | 3'-11½" | -6½" | 3'-9½" |
| 4:40 " " | -10" | 3'-11[illegible]" | -6[illegible]" | 3'-9[illegible]" |
| 5:10 " " | -10" | 3'-11" | -6" | 3'-9" |
| 5:40 " " | -9[illegible]" | 3'-10[illegible]" | -6" | 3'-8[illegible]" |
| 6:10 " " | -9[illegible]" | 3'-10½" | -5 7/8" | 3'-8½" |
| March 28, 1924 | | | | |
| 7:30 A. M. | -9" | 3'-9" | -4½" | 3'-6½" |
| 12:30 P. M. | -9" | 3'-9" | -4" | 3'-6" |
| 2:30 " " | Pulled | 3'-9" | -4" | 3'-6" |
| 4:00 " " | | 3'-9" | -4" | 3'-6" |
| March 29, 1924 | | | | |
| 7:30 A. M. | | 3'-7" | -3[illegible]" | 3'-5" |
| 12:00 M. | | 3'-7" | -3[illegible]" | 3'-5" |
| 4:00 P. M. | | 3'-7" | -3[illegible]" | 3'-5" |
| March 31, 1924 | | | | |
| 7:30 A. M. | | 3'-5" | -1[illegible]" | 3'-3" |
| 12:00 M. | | 3'-5" | -1[illegible]" | 3'-3" |
| 4:00 P. M. | | 3'-5" | -1[illegible]" | 3'-3" |
| April 1, 1924 | | | | |
| 7:30 A. M. | | 3'-5" | -1½" | 3'-3" |
| 12:00 M | | 3'-5" | -1½" | 3'-3" |
| 4:00 P. M. | | 3'-5" | -1½" | 3'-3" |
| April 3, 1924 | | | | |
| 7:30 A. M. | | 3'-4" | -[illegible]" | 3'-2" |
| 12:00 M. | | 3'-4" | -[illegible]" | 3'-2" |
| 4:00 P. M. | | 3'-4" | -[illegible]" | 3'-2" |