

WELL PUMP TEST
REPORT
FOR
PRIVATE WELLS
TO SERVE
RDM WAREHOUSES

230 NEELYTOWN ROAD
TOWN OF HAMPTONBURGH
ORANGE COUNTY, NEW YORK

PREPARED BY



December 2019
REVISED DECEMBER 2020

W.O. 1284.02

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1.0 SITE & PROJECT INFORMATION

1.1 Site Location

The Site is located on the east side of Neelytown Road, 1,500 feet south of its intersection with Eager Road in the Town of Hamptonburgh, Orange County, New York. The Site is situated east of New York State Route 416 and south of Interstate I-84. The subject parcel is identified on Town of Hamptonburgh Tax Maps as Section 1 Block 1 Lot 6.

1.2 Site Description

The Project Site is approximately 77.95 acres in size. There is an existing farmhouse, two barns, two frame garages and five frame sheds on the Site. The Site is currently composed of active corn fields, former agricultural lands including open fields, brush and wooded area, some impervious surfaces in the form of dirt roads, house and farm structures, and designated wetland areas. There is an active railroad line that bisects the southern corner of the Site.

1.3 Project Description

The Project involves the subdivision of Tax Lot 1-1-6 into two commercial lots and the development of former and current agricultural lands into two commercial warehouses. Lot 1 is proposed to contain a 100,000 square-foot warehouse and Lot 2 will contain a 245,000 square foot warehouse. A private roadway is proposed to serve both lots. The roadway will be owned by a shared entity and have a use and maintenance agreement between Lots 1 and 2. Domestic water for each lot will be provided by a privately-owned well located on each respective lot. Sewage from each lot will be treated in a privately-owned Subsurface Disposal System (SDS) located on each respective lot.

Water Demand for the Project is estimated below

Use	<u>TOTAL # OF ANTICIPATED Employees PER DAY</u> Units	Demand rate per unit (gpd)	Estimated Average Daily Water Demand (gpd)	Estimated Average Daily Water Demand (gpm)
Lot 1 Warehouse	60 Employees	15	900	0.63
Lot 2 Warehouse	145 Employees	15	2,175	1.51
Total Demand:			3,075	2.14

1.4 Location of On-Site Wells

There are two drilled wells proposed to serve the Project. Well #1 is located on Lot 1 within the uplands surrounded by a NYSDEC Wetland GO-13, approximately 220 feet from Neelytown Road and 330 feet from the proposed Site entrance drive. Well #2 is located on Lot 2 near the center of the Site, approximately 100 feet from the proposed warehouse and 350 feet from the proposed Site private drive cul-de-sac.

There is an existing well on the Site located adjacent to the farmhouse. The existing well will be abandoned once the Project is constructed. Figure #1 in Appendix A depicts the well locations.

2.0 WELL DESCRIPTIONS

2.1 Pumping Wells

Wells #1 and #2 were tested as pumping wells during the study. The Orange County Health Department was contacted, and it was determined that the proposed wells will supply a Non-Transient Non-Community Water System (NTNCWS) based on the warehouse use and the proposed number of employees. Well Data for Wells #1 and #2 is provided in Appendix B, including the permit number, construction details and well logs.

2.2 Observation Well

The existing farmhouse well was used as an observation well during the pump test.

3.0 PUMPING TEST DESCRIPTION

3.1 Test Overview

A simultaneous 72-hour pumping test of Wells #1 and #2 was performed from Tuesday, December 3rd until Friday, December 6th. The goal of the pumping test was to demonstrate the available yield of the wells and achieve stabilized drawdown - defined as a water level that has not fluctuated by more than plus or minus 0.5 foot for each 100 feet of water in the well (i.e., static water level to bottom of well) over at least a four-hour period of constant pumping flow rate. The flow rates of the pumping wells were monitored using a flow meter. During the 72-hour pumping test on Wells #1 and #2, the on-site farmhouse well was used as an observation well.

Prior to the start of the pumping test background measurements of external influences and static water readings in the pumping and observation wells began on Sunday, December 1st around 1:00pm. Before the pumping test was completed on Friday, December 6th, water quality samples were collected from Wells #1 and #2 and are being analyzed for the chemicals listed in the New York State Sanitary Code, Subpart 5-1 for Non-Transient Non-Community Water System (NTNCWS) as listed in Appendix E.

In addition, since the Site contains several areas of surface water (wetlands), a Microparticulate Analysis (MPA) was performed on both Well #1 and Well #2 to determine if the water supply from the wells are under direct influence of surface water. After the appropriate discharge piping connections were made to accommodate the MPA filter setup, both well pumps were turned back on Monday, December 9th at 8am. At 1:00pm the MPA filter was installed and the pumps continued to run until 9:00am on Tuesday, December 10th, when the MPA filters were removed and taken to the laboratory for testing.

3.2 *External Influences*

3.2.1 *Precipitation & Barometric Pressure*

There was no precipitation recorded during the background, test and recovery periods. The Barometric Pressure was recorded during background, test and recovery periods. The pressure ranged from a high of 30.30 inches on December 8th to a low of 29.23 on December 3rd. The daily precipitation and pressure data are included in Appendix C.

3.2.2 *External Pumpages*

Offsite public water supply wells are located more than 1,000 feet from the test wells and were not expected to influence the study and were therefore not measured. Existing individual ~~homeowner-private~~ wells which are located more than 750 feet from the test wells. were also not measured due to the relatively low proposed groundwater withdrawal rate.

3.2.3 *Surface Waters*

Although it is unlikely that there is a direct hydraulic connection between the bedrock wells and the adjacent wetlands, elevations of ponded water within the wetlands adjacent to Well #1 were recorded during the test with a staff gauge. The

horizontal distance between the observation point and the pumping Well #1 was ± 348 feet and $\pm 1,077$ feet to Well #2. The vertical elevation of the fixed reference point of the observation point was established to be 364.15 as reported in standard USGS elevations. Readings were measured to the nearest 0.01 ft periodically during the background, testing and recovery periods. The water level remained constant at elevation 364.15 during all phases of the test.

3.3 *Pre-Pumping (Background) Period Monitoring*

Background data collection of external influences and static water levels at the pumping and observation well began on Sunday, December 1st around 1pm, approximately 45.5 hours prior to the start of the pumping test.

Static water levels at the pumping and observation wells were measured with automatic water level transducers. The transducers recorded the water level in the wells every 5 minutes, throughout the background period. The surface water stage in the wetlands was recorded on December 1st and 3rd prior to the start of the test. The baseline depth of water in the wetland was determined to be 364.15.

3.4 *Pumping Test Period Monitoring*

On Tuesday, December 3rd, pumping of Well #2 started around 10:20 am and pumping of Well #1 began at 12:00pm. Pumping of Well #1 and #2 was terminated at approximately 4:00pm on December 6th. The simultaneous pumping test lasted approximately 76 hours. The automatic water level transducers recorded the water level in Wells #1, 2 & 3 every five minutes, throughout the pumping period. Manual water level readings in the pumping wells were conducted generally in accordance the table below.

Time After Pumping Start (min)	Measurement Interval (min)
0-15	5
15-60	10
60-120	15
120-480	30
480-1440	60
1440-4320	120

The target pumping rates were as follows:

Well Number	Pumping Rate (gpm)
1	5

2	6
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The pumping rate for the wells was measured using flow meters. The discharge flow rate was recorded manually at least every 15 minutes during the first hour of pumping and every hour thereafter. The well water discharge from the pumping wells was directed towards the Beaverdam Brook, which flows through the rear portion of the Site, as depicted in Figure F-1 in Appendix A.

Well #1

The pumping test on Well #1 started at 12:00 pm on December 3, 2019 at a constant rate of 5 gpm for the entire test. At this rate, the pumping water level declined from a pre-test static water level of 2.72 feet below the top of well casing to a final pumping water level of 27.36 feet just prior to shutdown of the test at 4:00 pm on December 6, 2019. The total drawdown at the end of the test was 24.64 feet. Substantial yield and drawdown stabilization were achieved during the last 48 hours of the pumping test. Water level data measured during the test and plots of the data for Well #1 are provided in Appendix D.

After the test was terminated, recovery measurements were made on Well #1 for a period of 70 hours. The water level was reported to be 100 percent recovered 24 hours following the shutdown of the test.

Well #2

The pumping test on Well #2 started at 10:20 am on December 3, 2019 at a 6 gpm. At this rate, the pumping water level declined from a pre-test static water level of 13.82 feet below the top of well casing to a final pumping water level of 50.29 feet just prior to shutdown of the test at 4:00 pm on December 6, 2019. The total drawdown at the end of the test was 36.47 feet.

It is noted that the pumping of Well #2 was inadvertently ceased twice during the pump test due to mechanical issues. Once at 6:35 am on December 4, 2019, the second time at approximately 6:00 pm on December 5, 2019. The pump was restarted both time and the test continued as planned. Sustained yield and stabilized drawdown were not achieved in Well #2 due to the pump issues, however the recorded results indicate a trending towards a sustained yield and stabilized drawdown. Since the water level within the well column never fell below the bottom of the well casing and the pumping rate was four (4) times the average daily demand; it can be inferred that there is sufficient water supply within Well #2

for the proposed use. Water level data measured during the test and plots of the data for Well #1 are provided in Appendix D.

3.5 *Post-Pumping (Recovery Period) Monitoring*

The post pumping period monitoring continued until Sunday, December 8, 2019, about 48 hours after pumping ceased. To obtain accurate data during the recovery period, a check valve was installed at the base of the pump column pipe in the pumping well to eliminate backflow of water into the well. During the post-pumping period, static water levels in the testing and observations wells were automatically measured every five minutes. External influences were measured daily.

Within the first 12 hours of the recovery period, the water-level in both of the pumping wells recovered from the drawdown level to 99 percent of the initial water level. Table 1 in Appendix D shows the water level elevations and recovery readings for the post-pumping period.

4.0 **CONCLUSION & RECOMMENDATIONS**

- The water demand for the proposed project is estimated to be about 3,075 gpd or about 2.14 gpm. Both Wells #1 and #2 demonstrated that they can each provide a minimum 5 gpm.
- The pumping test of Wells #1 and #2 demonstrates that an adequate water supply is available to serve the proposed project, and that the well supply did not adversely impact adjacent surface water features during the pumping test nor will it adversely impact neighboring wells. The testing conducted to date is deemed satisfactory for SEQRA, regulatory and permitting purposes.
- The water quality results from Wells #1 and #2 are being analyzed for New York State drinking water standards and MPA analysis sampling has been taken to determine if the wells will require treatment for ground water under the direct influence of surface water. The water quality results will be provided once they are available.
- The ground-water supply for the proposed project will be further reviewed and approved by the OCDOH upon a SEQR determination for the project.

APPENDIX A

FIGURES

APPENDIX B

WELL DATA & LOGS

APPENDIX C

WEATHER DATA

APPENDIX D

PUMP TEST GRAPHS & DATA

APPENDIX E

NON-TRANSIENT NON-COMMUNITY WATER SOURCE PART 5 TESTING REQUIREMENTS

APPENDIX F

WATER SAMPLE CHAIN OF CUSTODY & LAB RESULTS