May 28, 2020

William A. Jackson
289 High Road
Kensington, CT 06037

Mr. Michael DeLorenzo, Chairman
Conservation Commission
Town of Berlin, Connecticut
240 Kensington Road
Berlin, Connecticut 06037

Re: Water Supply to the Hatchery Brook Community Garden
Hatchery Brook Conservation Area, 685 Orchard Road, Berlin, Connecticut

Dear Mr. DeLorenzo:

The purpose of this letter is to: present a time-line of the various water services to the Hatchery Brook Community Garden ("HBCG"); describe the current water services as of May 2020; and, identify potential directions to modify the water services for the 2020 season.

Description of Water Services Through Time

2009 to 2012

The HBCG was established in 2009. Water for the gardeners' use was initially made available via 50-gallon capacity polyethylene containers with spigots. I understand that water containers were stored outside of the fenced area, adjacent to the parking lot, and filled by the Town Parks & Grounds, as needed.

A 4-inch diameter irrigation well was constructed inside the fenced area on February 6, 2010. The well extends 20-feet below the surface and has a 10-foot screened interval within the underlying aquifer. The glacial stratified-drift aquifer underlying much of the Hatchery Brook valley is a significant and valuable resource. The nearby Kensington State Fish Hatchery was originally developed in 1934 and has its production wells constructed within this aquifer.

A hand pump was initially installed at the well-head in 2010 and has been re-installed each season to the present. The hand pump is relied upon by gardeners (including myself) to fill water cans to irrigate the plants within their plots. A number of gardeners have found the hand pump adequate to provide water for the smaller A-series and B-series Plots located in the eastern section of HBCG.

2013 to 2018

A gasoline-powered centripetal pump was installed at the well-head circa 2013. The pump was installed and maintained by Keith Scheer. The pump had a 10 gallon-per-minute ("gpm") flow rate. The pump was used to fill the 50-gallon capacity water containers and to irrigate garden plots directly. The gasoline-powered centripetal pump was maintained at the HBCG until 2018 when the Conservation Commission directed that the pump be removed.

2019 to Present

An electric transfer pump was installed adjacent to the well in May 2019. The pump has an approx. 1.25-inch diameter rubber impeller and is powered by two 12-volt deep-cycle batteries; these batteries are re-charged via over-head solar-panels. Keith Scheer constructed and installed an adjustable frame to secure the three-solar panels. The Town of Berlin, Parks and Grounds, installed the pumping system, the deep-cycle batteries, and wired the solar panels. The electric transfer pump conducts water through a garden hose at a rate of approx. 2.5-gallons per minute. The electric pump was specified to maintain the water levels in five 50-gallon capacity water containers located within HBCG and to provide limited watering of individual plots.

Assessment

Throughout the 2019 Season and during May 2020, a number of the gardeners have expressed frustration because the 12-volt electric transfer pump does not have the capacity gardeners had become accustomed to directly water individual plots. The 12-volt electric transfer pump is effective to fill ("top-off") the five water containers on a daily basis; however, the pump cannot deliver hundreds of gallons of water per day to irrigate individual plots. Our experience has shown that the pump cannot sustain the current level of use; the pump loses prime and the impeller continues to burn out on a regular basis. When the transfer pump is down, the water containers are not filled and the only water available is via the hand pump. Following is an outline of potential options the Town may consider to move forward.

Option A – Install a Solar Pump Capable of Directly Irrigating Garden Plots

Hungerfords Pump Service, North Haven, CT, provided a verbal quote in 2019 to install a 4-inch diameter, 0.75 H.P., 113-volt, 6 to 8 gpm solar pump. The actual discharge rate would depend on the distance from the well. The Solar Pump would require four new solar panels that would replace the existing panels. The verbal quote for the solar pump and panels:

Solar Pump:	$ 3,500.00
Solar Panels	$ 4,500.00
Total:	**$ 8,000.00**

The quote for the solar panels assumes installation by the Town. Note that this pumping system relies on a controller that is directly powered by solar panels; there would be no batteries associated with this system to store power. Consequently, the pump would only function when there was sufficient sun-light present.

Option B – Install a 12-volt DC Submersible Well Pump Capable of Limited Irrigation

There is an imported 12-volt DC submersible well pump available on Amazon that may be suitable to fill the water container and provide limited irrigation of individual plots. The pump is identified as three-inch diameter Bokywox Stainless Submersible Water Well Pump, 240W, (S123T-20). This pump would likely deliver a 6 to 8 gpm flowrate after accounting for elevation head within the well and friction-head loss within the garden hose. The pump cost is Two Hundred ($200.00) Dollars. Another estimated $50.00 worth of plumbing supplies would be required to re-configure the piping from the well. Amazon shows decent reviews for the pump and the advertisement indicates that a three-year warranty is available.

Note: there may be "learning curve" issues as the pump is installed and activated. For example, the existing deep-cell batteries should not be discharged below "half-capacity". The existing 12-volt DC transfer pump uses 14 amps of power, and the Bokywox Submersible Well Pump would use 20 amps. In order to conserve batteries, it may be necessary to specify an additional battery in series and/or additional solar panels. Since the pump would be submersed in the well, the pump would not be subject to loss of prime or motor burn-out due to lack of flow. However, the pump will have limitations pertaining to power availability and flow duration.

Option C – Install an Electric Service to HBCG

If an electrical service were installed at HBCG, a standard 120-volt, AC submersible pump could be installed. Such a pump would have a capacity similar to the previous gasoline-powered pump and could be used to irrigate individual garden plots directly. If an electrical service within HBCG is a viable option, I will obtain a cost estimate for a submersible pump.

Option D – Town Maintains the Water Level in the Containers

Rely on the Town Parks & Grounds to maintain the water levels in the five 50-gallon capacity water containers.

Please contact me with any questions or comments regarding this information.

Sincerely,

William A. Jackson
HBCG, Plot B-2

cc: Maureen Giusti, Town of Berlin
Steve Wood, Town of Berlin