

Waterville Estates Village District

Water System

May, 2022

History of the System

- ◆ Our History begins with the establishment of a private corporation; Waterville Estates Water Works, INC. This was an outgrowth of the original developer, Locke Waterville Corporation.
- ◆ In 1978, this corporation was sold for 1.00, transferring the water system to Winter Brook Water Co. INC. The deed was signed by James Locke, president of Locke Waterville Corporation.
- ◆ In 1977 the Waterville Estates Village District was formed for Roads only.

- ◆ In July, 1980 the voters within the bounds of the same area as the Waterville Estates Village District formed the Waterville Estates Water District. The Winter Brook Water Corporation assets were transferred to Waterville Estates Water District. The Water deed from the corporation to the District was signed December 16, 1980 and recorded February 18, 1981.
- ◆ The ownership was private until this time.

- ◆ The Waterville Estates Village District (WEVD) at their 1981 annual meeting voted to add the purposes of the Waterville Estates Water District (WEWD) to those of WEVD. The WEVD meeting recessed, the WEWD met and dissolved. The WEVD meeting resumed by accepting the assets of WEWD (the system deeded to it a month earlier by Winter Brook Water Company).

- ◆ Article 6 of the WEVD warrant for 1981 was approved in September of 1981 for an \$150 K bond for water capital. Article 8 in 1982 is when we first see the budget showing up in the now combined Roads and Water District.
- ◆ The Waterville Estates Home Owners Association (HOA) was also an outgrowth of the original Locke Waterville Corporation. The developer maintained control of the HOA until at some point this organization was turned over to the homeowners to manage.
- ◆ Deeds support the fact that the assets of the Water District were never owned by the Waterville Estates Homeowners Association.

- ◆ Taxes from 1982 until 2018 were the source of financial support for both the Roads and Water District.
- ◆ Effective October of 2017 a Water Ordinance was passed. The first annual water fee billows sent to homeowners. The \$200 fee was due in July of 2018. A letter sent to residents dated June 1, 2018 . The Ordinance “ will ensure that the targeted monies needed for new wells will be available within 10 years”. The letter also stated that “if needed earlier or if the cost for new wells exceeded the projected 1 Million, the water fees collected would help the District secure funding/ loan”.

- ◆ From 2018 until 2021 this \$200.00 water rate was assessed to each residential unit. The funds from this collection was placed in the budget for each year; any unspent funds for the year were moved to the unreserved fund balance. This balance was no longer reserved money for water system use only. There was no designated savings account for future water system needs.
- ◆ In 2021, the Waterville Estates Village District adopted a revised Water Ordinance, which established a designated (restricted) water fund that allows the unspent funds to be held in reserve for future water system needs.

- ◆ In 2021 the Water Department budget was funded from the \$200.00 rate fee with the balance coming from the WEVD unreserved fund balance. NO ADDITIONAL MONIES WERE RAISED AND APPROPRIATED in the 2021 Operating Budget. Not 2021 taxes revenues were used to fund the Water Department.

Current Operations

- ◆ The Water System is owned by the Village District and managed by the Waterville Estates Village District Board of Commissioners. The System operations are supervised by a District Employee licensed in Water System Operation, and contracted services are provided by Lakes Region Water Services.

Asset Management Plan

- ◆ The Asset Management Plan serves as a basis for decision making for the Village District. It catalogues the assets and what condition they are in, assisting the District in determining which assets should be replaced and when. This document is a constantly changing look at the current water system

- ◆ Population Served 1,325 people
- ◆ Homes Served (estimated) 530
- ◆ Total Pipe (estimated) 27 miles
- ◆ Pump Stations 4
- ◆ Atmospheric Storage 246,000 approximate
- ◆ Pressure Reducing Valve Pits 17

- ◆ The WEVD is subdivided into 838 lots (5/2022). there are currently approximately 530 homes built on these lots and served by the public water System. Adding 100 homes to the system over the next 30 years would add in increased demand of 23,250 gpd.

- ◆ In the early development of the system small satellite wells became interconnected over time. This was eventually abandoned due to low water production and poor water quality. By 1990 the Great Brook Reservoir and Reservoir Pump Station served as the only water source for the District, pumping water up to both Pegwood Hill tank and Sunset Hill tank. After Federal rules on treatment of surface water the WEVD developed as groundwater source at Liberty Lane near the Mad River and abandoned the Great Brook source.

- ◆ Liberty Lane is currently the only water source for the WEVD
- ◆ Recent growth and future potential growth require the WEVD to look at an additional source for providing more water. In 2019 the NHDES notified WEVD in a Sanitation Survey Document, the need for an additional water source.
- ◆ Liberty Lane wells pump to a dedicated transmission main and discharge into a “transfer tank” at the Ski Bowl Station. Aeration is provided here. Transfer pumps pump water into a 20,000 gallon buried tank adjacent to the station. Chemicals are injected for disinfection and PH adjustment
- ◆ Booster pumps at Ski Bowl pump into the distribution system based upon the water levels within the Pegwood storage tank.
- ◆ Ski Bowl Pumps distribute water to three separate locations within the system.

- ◆ WEVD extracts groundwater for drinking through 2 shallow, gravel "t-wells".
- ◆ These wells were installed in 1992 as two horizontal gravel wells, each about 30 feet in length; one to the depth of 17 ft and one to the depth of 19 ft below the ground surface.
- ◆ The type of well construction is not common due to the potential for wellhead contamination.
- ◆ Existing well pumps were replaced in 2021 and are controlled by variable frequency drives in the control building.
- ◆ Several of the well components are nearing the end of their useful lifespan and are in need of replacement at this time.
- ◆ Because WEVD has only one water source, any failures would stop the flow of water. This development of a a water source is a critical component to the system.

- ◆ WEVD has begun to collect well drawdown data (2021 meters added) for analysis of trends, use and viability. The information will provide data on water levels in the wells to determine how close the water surface is to the pumps. The data will help determine the safe yield of the wells. Low water levels have impacted the pumping capacity into the system. This limits the recharge of the wells and pumping of water into the system.

Water System Assets

- ◆ Two Shallow T Wells: They provide ALL the Water to WEVD. They are 17/19 feet deep and tap the top 8 feet of water off the aquifer. Drought conditions which drops the level of water in the aquifer limit the ability for the system to provide adequate water supply to the community. Extended periods of freezing temperatures also limit the ability to provide adequate water supply to the community. Shallow wells of this type are MORE susceptible to contamination. The two wells are seated only 40 feet apart adding to that concern.

Other Potential Water Sources

- ◆ WEVD investigated a site off a Snowood Village Common Area along Snowood Drive abutting the Mad River and Liberty Lane.
- ◆ WEVD hired Nobis Engineering, Inc to explore the possibility of developing a well site.
- ◆ A wetlands permit plan was developed to access the proposed well site; for the installation of three test wells; and for preliminary water quality testing.
- ◆ A partially developed access road was installed.
- ◆ Test information on the site has not been found. It is uncertain if testing was done.
- ◆ No additional information on the site proposed was found.

- ◆ Nobis Engineering Inc briefly looked at the possibility of a Bedrock well off Marden Lane in 2019. No hydrological information pursued at this time to determine water quality of volume at this site.
- ◆ The possibility of an interconnection to the Campton Water District was not supported by the Campton Village Precinct.

Overall Layout

- ◆ System comprised of pump stations and tanks, various sized distribution pipes and pressure reducing valves.
- ◆ Treatment occurs at the Ski Bowl site currently.
- ◆ Current system was developed over a period of time and is the result of a consolidation of several smaller water distribution systems that were originally developed in different areas.
- ◆ System is set up on 2 hillsides ,Pegwood and Sunset.
- ◆ Distribution pumps at Ski Bowl are controlled by water levels at Pegwood Tank.
- ◆ Interconnections are controlled with pressure reducing valves. It is unclear if there are High pressure interconnections that allow the Ski Bowl to fill Sunset Tank. The current understanding of the system is the water levels at Sunset Tank control the Reservoir Pump Station in order to fill the Sunset Storage Tank, but system valving and pipe sizes prevent Pegwood from overflowing the Sunset tank.

- ◆ Ski Bowl 1,219 ft above sea level
- ◆ Pegwood 1,625 ft above sea level
- ◆ Reservoir 1,183 ft above sea level
- ◆ Sunset 1,571 ft above sea level
- ◆ Taylor Road 1,825 ft above sea level
- ◆ Pump Stations listed above.

◆ Storage tanks listed below:

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|--------------------------|----------|-------------------|
| ◆ Ski Bowl Transfer Tank | 1,210 ft | 5,000 gallons |
| ◆ Ski Bowl Storage Tank | 1,235 ft | 20,000 gallons |
| ◆ Pegwood Tank | 1,625ft | 200,000 gallons |
| ◆ Sunset Tank | 1580ft | 18-22,000 gallons |
| ◆ Taylor Rd | 1825 ft | 1,000 gallons |

- ◆ Because of significant elevation changes in the system there are pressure reducing valves throughout the system to maintain water pressures at a reasonable level.

- ◆ Pipe size in the system varies:
- ◆ 17.23 miles of 2 inch pipe
- ◆ 1.71 miles of 3 inch pipe
- ◆ 3.86 miles of 4 inch pipe
- ◆ 1.52 miles of 6 inch pipe
- ◆ The distribution system is monitored by a Supervisory Control and Data Acquisition System (SCADA) located at the Community Center Offices. It allows operator to monitor tank levels and whether or not the pumps are running.

- ◆ Pump House Structures and the Stuff Inside: Liberty Pump Station, Pegwood Tank and Pump Station, Reservoir Pump Station, Ski Bowl Treatment Station and Pump Station, Sunrise Tank and Pump Station, Taylor Road Tank and Booster Pump.
- ◆ ALL HAVE: needed structural repairs, various equipment concerns, needed tank replacements, (Ski Bowl/ Sunset), major pipe corrosion issues, logistical issues with at Ski Bowl with the treatment/ distribution system, age and substandard pipes which are the pipes in the ground transmission system.
- ◆ Pressure manangement issues related to pipe in the ground breaks and leakage.
- ◆ Lack of Hydraulic modeling of the water system for proper management, growth and expansion.

Level of Service

- ◆ Proposed Goals:
 - ◆ System Reliability
 - ◆ Operational Performance
 - ◆ Effective Resource Management
 - ◆ Employee Development

System Reliability

- ◆ Inspect water tanks and well equipment annually
- ◆ Flush Water tanks as needed
- ◆ Exercise and Clean Valves
- ◆ Systematically evaluate and repair pipe leaks
- ◆ Manage Water Pressure
- ◆ Investigate/ Identify/ Permit new water source to meet the demands/ growth and recreational needs of the WEVD.

Operational Performance

- ◆ Complete and Implement the Asset Management Plan (2022)
- ◆ Develop a Strategic Plan in 2022 which includes a capital plan
- ◆ Develop Strategies for Funding Capital projects
- ◆ Comply with NHDES regulations and permits
- ◆ Develop a program/ maintained/ which documents maintenance to the system and continually updates the asset plan
- ◆ Respond to water service requests in a timely manner

- ◆ Budget adequate revenue to cover yearly operations
- ◆ Seek Grant and Low Interest Loan Options for major Capital Projects.

Effective Resource Management

- ◆ Maintain an updated Master Plan/ Asset Plan for Water Services
- ◆ Develop and Maintain Water System Maintenance Records
- ◆ Implement Water Meter Installation Options which will collect water data in transmission pipes and in residential properties
- ◆ Implement a water leak detection and Pipe repair/ replacement program
- ◆ Implement procedures to verify system pressures for existing and new customers.

Employee Development

- ◆ Maintain Employee Certifications to manage the WEVD Water System
- ◆ Offer Continuing Education opportunities for effective Water System management
- ◆ Provide training for effective Municipal Management Practices

Water Meters

- ◆ Distribution System Water Meters: Purchased 2021, Install 2022. Will provide important flow information to assist with leak Identification and pressures. Will locate “trouble” quicker and more accurately.
- ◆ Household Water Meters and Water Rates: Rates were established in 2021 for January 2022 billing. Intended to be step toward the availability of actual water usage metering. Will be a long term transition in installation of meters by residents and development of affordable rate structure for metered residential units.

- ◆ Benefits of meters include: based on actual water usage, assist in location of internal home water leaks, assist with identifying leaks from distribution meters to household meter.
- ◆ Cost of Residential Meter: Current pricing: \$360.00 meter; \$290.00 for K Horn (if needed), Installation born by resident with a privately hired plumber. An installation spec sheet is available with the Ordinance at : waterville-estatesnh.gov

Let's Talk Ordinance

- ◆ Research which began in 2019 showed that the Waterville Estates Village District (WEVD) did not have a definitive water USE ordinance as required by the New Hampshire Department of Environmental Services.
- ◆ The purpose of the Ordinance is to define WEVD responsibilities, protect and provide safe drinking water, regulate policies for that protection, ensure sustainability of the system going into the future, and establish water rates/ fees necessary to operate, maintain and construct the water system.
- ◆ A complete copy of the amended ordinance is available at: waterville-estatesnh.gov

◆ Five Public Hearings related to the adoption of the Ordinance and setting of water rates were held by the WEVD Commissioners on :

◆ 08/16/21

◆ 09/23/21

◆ 04/06/22

◆ 04/20/22

◆ 05/18/22

- ◆ The Waterville Estates Village District Commission established a Roads and Water Advisory Committee in 2019.
- ◆ The Waterville Estates Village District Commission adopted RSA 38:28 process of funding Water Department with Water Rates on March 17, 2021.

Accomplishments to Date

- ◆ 2021 Contract for Water MasterPlan/ Asset Management Plan. With a matching \$20,000 Grant secured for partial funding
- ◆ Adoption of a "Definitive Use Water Ordinance" by the WEVD Commission
- ◆ 2021 Purchase and 2022 Installation of Meters in the Main Distribution lines of the Water System
- ◆ Award of contract by the Commission for the purchase of Water Meters based upon requests for proposals documents.
- ◆ 2022 Submission for grant to Identify leaks in a 3 mile portion of WEVD
- ◆ 2022 submission for and Energy Audit Grant made to NHDES with cost covered by Utility Companies

- ◆ May 31 2022 submission for Asset Management 20,000 grant
- ◆ June 1 2022 pre application submission for a 2.1 million dollar Improvement Grant for the purpose of:
 - ◆ locating and developing a new water source for WEVD.
 - ◆ Replacement of the Treatment and Transfer Station at the Ski Bowl
 - ◆ Replacement of Distribution Water Main in the Parker, Bell Valley, Richardson Loop

Challenges to Date

- ◆ System Potential Breakdowns Continue to Date
- ◆ Substantial Financial Investment needed in System. Catastrophic Failures are likely sooner or later.
- ◆ Biting off Prioritized Maintenance, Repairs, Replacement and Reconstruction.
- ◆ AFFORDABILITY (meet requirements for low interest loans and grant)
- ◆ Development of a Strategic Plan in 2022

Most Immediate Work Needs

- ◆ Development of a New Water Source
- ◆ Ski Bowl Treatment /Transfer Station rehabilitation/relocation
- ◆ Sunset Evaluation as related to the Strategic Plan under Development
- ◆ Reservoir Station Evaluation as related to the Strategic Plan under Development
- ◆ Evaluation of Road System and Development of long term strategic plan for repair and replacement.
- ◆ Continuous Identification and Leak Repair

Work Budgeted for 2022

- ◆ Development of Long Term Strategic Plan
- ◆ Sunset Tank Building Maintenance Repairs
- ◆ Reservoir Water Building Maintenance Repairs
- ◆ Ski Bowl Building Maintenance Building Repairs
- ◆ Pegwood Tank Maintenance Building Repairs
- ◆ Pump House at Center/ Paint
- ◆ Water Line Upgrades equaling 54, 200
- ◆ Water Pumps/ Phased Replacements 19,555
- ◆ Purchase of Water Meters 40,000
- ◆ These items above are in addition to the Water Department Budgeted Expenses for General Operation of the Department.

Need more Information

- ◆ Minutes of the WEVD Water Ordinance and Rate Public Hearings can be found in Commission Minutes
- ◆ All Water and Roads Committee Minutes
- ◆ The Complete Asset Management Report
- ◆ All can be found at: waterville-estatesnh.gov