Town of Cumberland, Rhode Island

2016 Water Supply System Management Plan Update

EXECUTIVE SUMMARY

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July 2016

EXECUTIVE SUMMARY

Introduction

This Water Supply System Management Plan (WSSMP) has been prepared as required under Rhode Island General Laws 46-15.3, as amended and titled "The Water Supply System Management Planning Act" (Act). The legislative authority to effectuate the goals and policies of this Act has been conferred to the Rhode Island and Providence Plantations RI Water Resources Board (RIWRB). To this end, the RIWRB has promulgated the Rules and Regulations for Water Supply System Management Planning, October 2002, as amended to implement the provisions of the Act.

Under this legislation, the Town of Cumberland – Cumberland Water Department (CWD), as a water purveyor supplying over 50 million gallons (MG) of water per year, is responsible for the preparation and adoption of a WSSMP. It is also required that the CWD review and update this WSSMP at least once every five years, or as otherwise stipulated in the Regulations.

This WSSMP has been prepared to provide the proper framework to promote the effective and efficient conservation, development, utilization and protection of the natural water resources of the State, as utilized by the CWD. Further, the overall goals shall be consistent with State Guide Plan Element 721, "Water Supply Policies for Rhode Island." The purpose of this WSSMP is to outline the objectives of the WSSMP process for the CWD, and to serve as a guide to employ the proper decision making processes.

The WSSMP contains a detailed description of the water system and includes the policies and procedures related to the general operation and management of the water system. The Emergency Management section relates to the vulnerability assessment of the water system for use in emergency planning. It shall be incumbent upon the CWD to implement the recommendations and procedures outlined in this WSSMP in order to comply with the overall requirements of the Act.

Background

The CWD was established by legislation of the General Assembly of the State of Rhode Island in 1893. In 1929, the Town of Cumberland, Rhode Island (Town of Cumberland), utilizing Sneech Pond as its supply, installed a pump station, a 0.35 MG tank, and transmission and distribution piping in and around Nate Whipple Highway and Mendon Road. By the early 1940's, the system had been expanded to service the area of Cumberland Hill, and also to the adjoining Town of Lincoln to serve the village of Albion and the Berkshire Hathaway Mill Complex. In the 1950's, with the formation of the Lincoln Water System, these portions of the water system were turned over to Town of Lincoln. An emergency interconnection is still maintained with the Town of Lincoln to this day.

In the 1950's the CWD constructed a water treatment plant (WTP) at Sneech Pond and expanded its service area to include Ashton, Berkley, Upper Lonsdale, Monastery Heights, Diamond Hill, Arnold Mill and Grants Mill areas of Town. Note that this treatment facility was upgraded in 2007-2008 to improve compliance with the newer, and stricter, water quality requirements in place since the plant's original construction. In the mid to late 1960's and 1970's the Town of Cumberland developed new well supplies in Cumberland Hill, Arnold Mills and at Martin and Lennox Street. These wells have since been abandoned due to contamination from a neighboring site. Wells were installed at the Manville and Abbott Run well sites in 1968. Additional wells were installed at the Abbott Run well site in 1988 and 1992 and satellite wells were installed at the Manville well site in 1995. In 1955, the Marshall Avenue Pump Station was constructed. This station, forming the interconnection with the Pawtucket Water Supply Board (PWSB), is designed to boost water purchased from Pawtucket into the CWD system. Upgrades to this station were performed in the early 1990's to increase overall capacity and reliability, and again in 2012 to improve energy efficiency at the current, lower pumping requirements. The CWD currently relies on the wholesale interconnection with PWSB as a source of supply.

In 2015, the CWD placed into service a gravity (non-pumped) interconnection between the Town of Cumberland and the Woonsocket Water Division (WWD). This newly constructed interconnection has allowed the CWD to help satisfy consumption during peak demands as well as offset wholesale water delivered from the PWSB, which requires pumping to reach the higher elevations at the north end of the Town of Cumberland.

Water System Description

The CWD currently supplies drinking water to approximately 22,564 residents using five different water sources. These sources include:

1. Surface Water from Sneech Pond;
2. Groundwater from the Abbott Run Wells;
3. Groundwater from the Manville Wells;
4. Purchased water from the PWSB; and
5. Purchased water from the WWD.

Over the past several years, approximately 20-55% of source water was obtained from the PWSB or WWD. The newly constructed interconnection with the WWD, which was partially funded through the Rhode Island Water Resources Board Emergency Interconnection Program, has allowed CWD to help satisfy consumption during peak demand period. The CWD is currently in negotiations with the PWSB on a new long-term contract and agreement.

Surface Water and Groundwater Sources:

Sneech Pond is a natural body of water located in the northwest section of the Town of Cumberland, adjacent to Nate Whipple Highway. The surface area of the reservoir is approximately 46 acres, with a safe yield of 0.75 million gallons per day (MGD). Source water from Sneech Pond is treated using a conventional process, which includes pre-chlorination, alum coagulation, mixing and flocculation, sedimentation, filtration, post chlorination and final pH adjustment.

The CWD draws groundwater from the Manville Wells and the Abbott Run Wells. In recent years, the wells have undergone an aggressive reconditioning program that has increased their yield. In 2012, the CWD began evaluating alternative sources of water supply and identified two new potential groundwater sources. Permit applications for the development of these sites were submitted in 2015 and conditional approvals were received in 2016.

Infrastructure:

The system operated by the CWD includes critical infrastructure components necessary to deliver water to their customers. Infrastructure components include treatment facilities, transmission/distribution piping, booster pump stations, well pump stations, and storage facilities. Master meters and distribution meters are also maintained by the CWD.

As previously mentioned, water from Sneech Pond is treated through a conventional treatment process at the Sneech Pond WTP. This WTP is the only treatment facility in the system; however, chemical addition is performed at the Abbott Run Wells and at Manville Well #1 and Manville Well #2.

The transmission and distribution system consists of upwards of 137 miles of asbestos cement, cast iron, ductile iron, and polyvinyl chloride (PVC) water mains, ranging in size 6-inch to 20-inch diameter. The system is relatively young, with the majority of water mains installed in the 1940's through the 1960's. New and replacement main installations consist predominately of cement lined ductile iron (CLDI) and PVC pipe materials.

The CWD operates six booster pump stations of varying capacities including stations at Marshall Avenue, Angell Road, Girard Road, Sneech Pond, Fisher Road, and Mendon Road. The Marshall Avenue station serves as the

interconnection with the PWSB. Additionally, three well pump stations are operated by the CWD. They include stations at the Abbott Run Wells, Manville Well #1, and Manville Well #2.

There are five water storage facilities in the CWD's system. They include the Monastery (Palomino) Tank, Thompson Hill Tank, Coppermine Tank, Fisher Road Tank, and the Highland Park Tank. In total, the system contains 10.66 MG of storage capability. It should be noted that the Fisher Road Tank is contracted for replacement in 2016.

There are six master meters in the system located at Manville Well #1, Manville Well #2, Abbott Run Wells, Sneech Pond WTP, and the interconnections with PWSB and WWD. All customers serviced by the CWD are metered, except for 14 locations at the Town of Cumberland owned facilities. The field conditions at these facilities complicate the installation of meters, with the majority of them requiring the installation of a metering pit. All residential customers are equipped with Sensus meters and a fixed base Automatic Meter Reading (AMR) system. This is the result of a system wide meter replacement program, started in 2009, consisting of approximately 7,900 meters. The installation of the new meters and AMR system has greatly improved the efficiency of the billing process at the CWD.

Interconnections

As mentioned, the CWD maintains interconnections with the PWSB and WWD for wholesale water purchase purposes and an emergency interconnection with the Town of Lincoln. The interconnection with the PWSB is located at the Marshall Avenue Pump Station, in the southern portion of the system. The recently improved connection can supply up to 4.5 MGD. The CWD continues to coordinate with the PWSB and hopes to establish a new wholesale purchase agreement by the end of 2016. The interconnection with WWD is via the Highland Corporate Park Station, located in the northwest of the system. The newly constructed connection can supply up to 2.0 MGD and has allowed the CWD to satisfy consumption during peak demand periods. The emergency interconnection with the Town of Lincoln is located in Albion Road but has not been used.

Service Area

Geographic Area

The CWD's water service area does not include the entire Town of Cumberland, since the Valley Falls area is served directly by the PWSB. The area that is serviced by the CWD is divided into five pressure zones, each of which operates independently of the others.

Population and Projections

As mentioned, the CWD's service area does not include the entire Town of Cumberland. In 2015 the population served by the water system was approximately 22,654, or about 66% of the total population of the Town of Cumberland (34,301 based on the 2015 estimate by the US Census). The CWD currently has 8,267 total service connections with 8,253 metered services. There are approximately 2.74 people per service connection. It should be noted that approximately 5,673 people in the Valley Falls area are serviced by the PWSB with approximately 5,974 peopled serviced from private wells in the Town of Cumberland. It is estimated that the population served in 2020 will be approximately 24,299 and 25,944 in 2025.

Water Use

CWD provides service to residential, commercial, industrial, and governmental users. On average, the CWD supplies approximately 2.4 MGD of water. The peak daily demand has historically been as high as 7 MGD, but has declined over the last several years due in part to the loss of several large commercial and industrial customers. Historically, residential use consumes the majority of the water supply. In Fiscal Year (FY) 2015, the residential consumption was approximately 82% of the total supply usage. Commercial use was approximately 10% and industrial and government use were approximately 5.5% and 3%, respectively.

There are 10 major users that each consume more than 2.50 MG per year. Together, these 10 large users account for approximately 10% of the total system demand. Current average day demand is 2.4 MG with a maximum day demand of 4.3 MG. Under projected water use for the 5- and 10-year planning periods, it is expected that the average day demand will be about 2.20 MG and 2.30 MG, respectively. These projections are based primarily on population projections and do not account for significant water savings potentially realized through demand management strategies. These projections also assume the loss of commercial and industrial major users, which is predicted to continue in the planning period.

Over the previous six years, 2009-2015, the CWD has exhibited a significant reduction in the volume of unaccounted water volume. In 2014 and 2015, the unaccounted-for water was 10%, down from 31% in 2009, and satisfying the goal of 15% identified in the State Guide Plan Element 721. The CWD, in consideration of maintaining these percentages, is committed to further reducing this unaccounted water volume. As of 2007, the CWD had a five-year schedule for the implementation and development of the following programs:

- main break tracking system
- tracking of flows from the annual flushing program
- leak detection program

Since 2007, the CWD has developed a main break tracking system and implemented its use. The CWD plans on tracking flows from the annual flushing program during the current year. The CWD performs leak detection on an annual and ongoing basis. The CWD will strive to continue to achieve the recommended 15% unaccounted water for this next five-year period.

Water Quality Protection

Water quality protection is an important aspect to the CWD, as the sources of supply continue to be affected by growth, potential pollution sources, and increases in residential demand. The water supply for the CWD is obtained from a combination of surface and groundwater sources. The surface water supply consists of Sneech Pond and the groundwater sources are wells located near the Blackstone River and Abbott Run Brook. In addition, the PWSB, the primary wholesaler of water to the CWD, has surface and groundwater supply sources partially in the Town of Cumberland along Abbott Run Brook. The CWD and PWSB are both working in conjunction with the Town of Cumberland's Planning Department on the development of zoning regulations for a Drinking Water Quality Protection Overlay District for sources of water supply within the Town of Cumberland.

Supply & Demand Management

The CWD has taken an active stance to protect its existing and future water supply sources. Presently, the Town of Cumberland owns the majority of properties abutting its surface water supply at Sneech Pond and is investigating the purchase of additional property surrounding each of their sources on an ongoing and continuous basis.

Projected Future Demands

The Town of Cumberland's Comprehensive Community Plan provided projections for population growth in the Town of Cumberland. This population growth was considered in future water use demands. Several critical assumptions were made to develop these projections through the year 2036, and they include:

- The total Town of Cumberland population in 2035 is 37,548 people.
- A population of 8,314 people are served directly by the PWSB (Valley Falls) or by private wells in 2035. It is estimated that 3,333 people who are currently served by private wells will be added to the public water system in the 20-year planning horizon.
- An average day demand of 2.54 MG in 2035.

Available Water and Alternative Supplies

It is the overall objective of the CWD to ensure the availability of an adequate supply of potable water to meet the existing and future demands of its customers. Future demands can be met through the increase production from the current sources of supply and the development of the two new identified well sites.

Although the Sneech Pond WTP has the capacity of producing 1.5 MGD, safe yield from Sneech Pond is estimated at 0.75 MGD. All three of the Abbott Run Wells are rated to produce 0.3 MGD. Combined, the Manville Wells have a potential yield of 1.0 MGD. The CWD also has the ability to purchase up to 4.5 MGD of water from the PWSB and 2.0 MGD from the WWD.

Demand Management

In August 2012, the CWD developed a Water Efficiency and Demand Management Strategy report, which outlined the current per capita water use, efficient indoor and outdoor water use methods and strategies, accounting for non-billed water, leakage reduction, and metering goals. Through these strategies, the CWD has been able to reduce the demand and effectuate efficient use of water resources.

As mentioned, the CWD has greatly reduced the amount of unaccounted-for water. Several programs have been implemented to help better document areas where water is used but not billed. These include methods to quantify water used during flushing programs, street sweeping, Fire Department training, main breaks, leakage, and construction sites.

Financial Management

The CWD has recently contracted with a consultant to perform a cost-of-service water rate study. The objectives of the cost of service study are:

1. Examine the recent historical performance of the existing water rate structure;
2. Provide a projection of future operating budgets, including the budgetary impacts of expected capital upgrades;
3. Evaluate the rate impacts of debt financing and cash financing of the proposed capital upgrades; and
4. Use both historical consumption and non-consumption revenue data to calculate water usage charges that generate revenues sufficient to fully fund the Town of Cumberland's water operations, make needed capital investments, and maintain adequate reserve fund balances.

The current water consumption charge is:

- Step 1: 0-50,000 Gallons – $3.1846/1,000 gallons
- Step 2: 50,000-200,000 Gallons – $4.4639/1,000 gallons
- Step 3: 200,000 + Gallons – $4.7436/1,000 gallons

Capital Improvement

A five-year Capital Improvement Plan was adopted along with the department's FY 2016 annual operating budget by the Town of Cumberland's Town Council. A detailed 5-year and 20-year improvement plan was developed and included in the CWD's Clean Water Infrastructure Replacement Plan (CWIRP). Some of the projects span over several years due to the design and construction timelines. These projects are necessary for the CWD to continue to maintain and improve their system. Projects included in the 5-year improvement plan prioritize infrastructure that requires immediate

attention. In addition, the CWD has put a strong focus on developing the additional groundwater sources and reducing their purchase of water from neighboring systems. Projects included in the 20-year improvement plan do not require immediate attention and focus on tank rehabilitation, pump station rehabilitation/replacement, and further improvements to the distribution system.

Emergency Management

The Emergency Management section of the Plan establishes the responsibilities and authority within the CWD for responding to most probable emergencies and outlines specific tasks for carrying out functional and constructive solutions based on a review of the potential emergencies and risks. The procedures outlined are consistent with the goals of the State Emergency Water Supply System Management Plan. It is also intended that this document provide guidance to ensure that the primary aspects of recovery from an emergency are addressed in an organized manner to aid in an efficient response and in maintaining drinking water quality and quantity.

Coordination

The CWD maintains close working relationships with the PWSB, the WWD, and the Town of Lincoln in regards to the interconnections and the potential need for additional emergency supply, specifically in times of drought. This WSSMP was developed in conjunction with the Town of Cumberland's Comprehensive Community Plan 2016-2036, and is consistent with the aspects of that plan.