TOWN OF NARRAGANSETT, RHODE ISLAND WATER SUPPLY SYSTEM MANAGEMENT PLAN

EXECUTIVE SUMMARY

SEPTEMBER 16, 2020 FINAL SUBMISSION



Prepared for:

Town of Narragansett, Rhode Island 25 Fifth Avenue Narragansett, Rhode Island 02882

Prepared by:



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JGA Project No. 20-005

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 polices of this Act has been conferred to the Rhode Island Water Resources Board (RIWRB). To this end, the RIWRB has promulgated the Rules and Regulations for Water Supply System Management Planning, October 1998, as amended to implement the provisions of the Act.

Under this legislation, the Town of Narragansett – Narragansett Water Division, as a water purveyor supplying over 50 million gallons of water per year is responsible for the preparation and adoption of a WSSMP. It is also required that the Town update this WSSMP every five years and supply information as 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 Town. Further, the overall goals shall be consistent with State Guide Plan Element 721, Report 115 – *Rhode Island Water 2030* and the Town of Narragansett Comprehensive Plan. The purpose of this WSSMP is to outline the objectives of the Water Supply System Management Planning process for the Town of Narragansett Water Division, 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 Town of Narragansett Water Division to implement the recommendations and procedures outlined in this WSSMP in order to comply with the overall requirements of the Act.

Goals Statement

The goal of this updated WSSMP is to comply with the provisions of the Water Supply System Management Planning Act, the Federal Safe Drinking Water Act [42 U.S.C. § 300f et seq.], RI General Law

Chapter 46-13 – Public Drinking Water Supply, RI General Law Chapter 46-14 – Contamination of Drinking Water, administered by the Department of Health, RI General Law 45-22.2 – RI Comprehensive Planning and Land Use Act and State Guide Plan Element 721 both administered by the RI Statewide Planning Program. This goal shall be accomplished by updating the comprehensive Water Supply System Management Plan for the Town of Narragansett's water supply system that was completed and approved in November 2006. Components of this updated WSSMP will address the successful execution of effective and efficient conservation, development, utilization and protection of the system's resources in ways that satisfy the present and future needs of the Town of Narragansett.

A goal of the Town of Narragansett Comprehensive Plan is to maintain the Town as essentially a residential community, and controlling the rate of growth occurring within the Town. The Comprehensive Plan is recognized within this WSSMP update and its contents are referenced in the development of future water demand projections.

This plan is, furthermore, consistent with the overall goal of the RI Water Resources Board 2012 Strategic Plan and State Guide Plan No. 721 which is to develop a long range program to improve the quantity and quality of water required by the citizens within the service area in the most cost effective and environmentally sound manner.

Background

The Town of Narragansett Water Division is responsible for day to day operation of the water system. Figures 2-1 through 2-3 in the body of the report provide an overall organizational chart of the Town government as well as an expanded breakdown of the Town's Engineering Department and Water Division.

The Code of Ordinances of the Town of Narragansett, Chapter 78 "Utilities", Article II "Water" (revised November 21, 2005; attached as Appendix C in the report), provides the legal basis for all water distribution-related issues within the water supply system. In this format, the ordinances have the same legal effectiveness of local laws and can only be changed by a majority vote of the Town Council after two (2) separate duly advertised public readings of the section(s) in question. While the ordinances thus establish the framework for the Water Division's operations, the Town may periodically develop policies (typically adopted by Town Council resolution) for implementing specific water system goals and programs.

Water System Description

The Town of Narragansett owns and operates a water distribution system consisting of over 70 miles of water main, storage tanks, booster station, hydrants, meters and appurtenances that serve approximately 5,336 customer accounts in three (3) main areas of the Town.

Narragansett does not own or operate any independent surface or groundwater supply sources. The Town purchases all of the water it distributes on a wholesale basis from the following two (2) sources:

- Town of North Kingstown (Narragansett North End)
- Suez Water Rhode Island (formerly United Water Company) (Narragansett North End and South End)

The purchased water receives no treatment upon entering the Narragansett Water Supply System and, as such, the Water Division does not own or operate any water treatment facilities.

The Narragansett water system is divided into three (3) subsystems consisting of the North End, South End and Jerusalem service areas. The Jerusalem service area, located adjacent to the South End of the system was interconnected by link to Galilee in 2001 by directional drilling and installation of an 8-inch line. Although both the North End and South End service areas remain completely separate, they are connected indirectly by means of the Suez Water Rhode Island distribution system, which has the ability to furnish water to both areas.

The Narragansett water distribution system utilizes three (3) storage facilities located throughout the service area, one (1) booster pump station located on Point Judith Road (Route 108) between South Pier Road and Westmoreland Street, and three (3) chlorine injection treatment stations located throughout the service area. This is also the location of an interconnection between the Suez Water Rhode Island system and the Town's distribution system. The primary function of this station is to boost the system's hydraulic head when the incoming supply pressure from the Suez Water Rhode Island system is determined to be insufficient to accommodate the required demand. The actual booster station operation is directly related to the water elevation in both the Kinney Avenue and Point Judith water storage tanks.

The system's water transmission mains are primarily involved in the conveyance of potable water between the points of water purchase, the water supply system service area, and the system storage tanks. These water mains are 16-inches and 12-inches in diameter. The exact age of all these water mains is unknown; many of the ages have been estimated from historical records however, the first water mains installed as part of this water system were placed in service circa 1938 and consisted of asbestos cement (AC).

Almost all occupied structures (residential, commercial and industrial) within the portions of the Town under the responsibility of the Narragansett Water Division are serviced by the Division.

All undeveloped areas within the water service area are eligible to be serviced as the demand requires; and, depending upon the actual circumstances involved, the Town or the property developer may extend the existing water main lines. In either case, the new mains become the property of the Town after testing and acceptance. There are currently eleven (11) private drinking water wells located within the area of Town serviced by the Town water system.

The Narragansett Water Division services 5,336 area water customer accounts consisting of 5,164 residential connections, 115 commercial connections, 9 industrial connections and 48 governmental connections. The Water Division provides water to 63% of its residents and businesses in Narragansett. Within the water service area there are eleven (11) private wells in use that could be switched to public service and added to the current volume served. Current average day customer demand is 0.61 million gallons per day (mgd). Under projected water use for the 5-year planning period, it is expected that the average day demand will be equal to 0.64 mgd. For the 20-year planning period, it is expected that the demand will be 0.67 mgd. These projections are based primarily on population projections and do not account for significant water savings potentially realized through demand management techniques. They do, however, consider non-account water at the current rate of 13%.

It would appear that the Narragansett water system supplies are adequate to meet existing and future demands for the 5- and 20-year planning periods. As previously indicated, the Narragansett water supply system does not operate any surface or groundwater sources of supply but, instead, purchases 100% of its water on a wholesale basis from neighboring water supply systems (i.e. Suez Water Rhode Island, Town of North Kingstown).

All of the water purchased by the Narragansett Water Division is metered at the point of purchase as it enters the water supply system. These meters are Master Meters providing for 100% source metering and remote telemetry devices at each pit to allow for continuous monitoring and reading. There are six (6) Master Meters and the locations of these meters correspond to the system's interconnecting points.

Every residential, commercial and industrial customer serviced by the Town's water supply distribution system is metered, providing 100% distribution metering. All distribution meters are read quarterly (four times per year).

Over the past 10 years (2009 to 2019), wholesale water purchases have ranged from 276.50 million gallons per year (mgy) to 344.6 mgy. The Narragansett Water Division purchased 275.72 million gallons in the year 2019 with an average day demand (ADD) 0.755 mgd. The average system per capita demand for total water purchased in 2019 was estimated to be 60.24 gallons per capita per day (gpcd).

The Narragansett Water Division made 1.164 million gallons of wholesale water sales to Suez Water Rhode Island in 2019. Water consumption for the year 2019 was determined to be 222.65 million gallons which corresponds to an average day demand of 0.61 mgd. Residential water use was determined to be 191.89 million gallons which corresponds to an average day demand of 0.526 mgd.

The percentage of unaccounted water from 2009 to 2019 has ranged from 3.30% in 2013 to 14.00% in 2018 with a 9-year average of 9.38% and 13% for the current year, 2019. The Narragansett Water Division is working continuously to maintain the statewide goal of less than 15% non-account water. Currently, the Narragansett Water Division is below the goal of 15% unaccounted water at 14.00% and the average for the past 9-years is also below the goal of 15% unaccounted water at 9.38%.

The Narragansett Water Division practices the following demand management measures: 100% metering and billing of its water users including governmental accounts, an aggressive inclining block rate structure, a residential retrofit program and an "odd/even" outdoor water usage program in the North End portion of the water system.

The Narragansett Water Division continues its goal to eliminate any major identifiable deficiencies present in the Narragansett water distribution system. The Water Division's ongoing Capital Improvement Program continues to modify and improve the system by replacing meters, water mains and hydrants. To

reinforce the Water Division's commitment to improve the system's reliability and operating efficiency, in 2005 the Town purchased leak detection hardware and software ("Z Corr 4 Digital Correlating Logger System"). This equipment will allow the Water Division the opportunity to conduct system water audits company between the volume of water purchased and sold.

System Improvements

The Water Division employs an annual capital improvement program which addresses system improvement and replacement/rehabilitation projects. The most significant modifications and improvements since preparation of the previous WSSMP include the following.

North End Storage Tank

- Interior and exterior coatings complete rehabilitation 2016 (\$610,000)
- Cathodic protection system replaced 2016
- Interior cleaned and inspected December 2016

Kinney Avenue Storage Tank

- Exterior coating complete rehabilitation, non-wetted interior coating partial (above condensate ceiling) rehabilitation 2016 (\$855,000)
- Interior cleaned and inspected December 2016

Point Judith Storage Tank

- Interior cleaned and inspected December 2016
- Mechanical Mixer installed May 2020 (\$20,000)

West Bay Master Meter

Replaced 6" mag meter June 2019

Water Quality Protection

The Town of Narragansett does not own or operate any independent surface or groundwater supply sources. Instead, the Town purchases all if its water it distributes on a wholesale basis from either Suez Water Rhode Island or North Kingstown. For this component of the Narragansett Water Supply System Management Plan Update, please refer to either Suez Water Rhode Island or North Kingstown's Plan. Furthermore, the Narragansett Water Division directly supports the water quality protection efforts of Suez Water Rhode Island and North Kingstown through a billing surcharge.

Supply Management

The projections of the Narragansett Water Division's demands for water for the 5 year (2024) and 20 year (2039) planning horizons are made based on a review of current conditions, historical trends, US Census

data, RI Statewide Planning figures and projections, the Narragansett 2017 Update of the Comprehensive Plan and *Appendix D – Water Supply and Demand Estimating, Southern Region* of the RI Water Resources Board 2012 Strategic Plan. Presently, there exist no plans to wholesale water to other purchasers, nor are any mergers agreed to with neighboring water supply systems which would result in expansion of the existing system.

The following table details the average day and maximum day demands for the current year and the projected 5 and 20 year planning periods.

PROJECTED WATER DEMANDS							
		5 Year Projections (2024)			20 Year Projections (2039)		
Category	2019 ADD	Annual Use	ADD	MDD	Annual Use	ADD	MDD
Residential	0.526 MG	201.59 MG	0.55 MG	1.33 MG	211.19 MG	0.58 MG	1.26 MG
Commercial	0.055 MG	21.08 MG	0.06 MG	0.14 MG	22.08 MG	0.06 MG	0.13 MG
Industrial	0.012 MG	4.60 MG	0.01 MG	0.03 MG	4.82 MG	0.01 MG	0.03 MG
Government	0.017 MG	6.52 MG	0.02 MG	0.04 MG	6.83 MG	0.02 MG	0.04 MG
Total	0.610 MG	233.78 MG	0.64 MG	1.54 MG	244.92 MG	0.67MG	1.46 MG

The Narragansett water supply system purchases 100% of its water on a wholesale basis from the neighboring water supply systems, Suez Water Rhode Island, and North Kingstown. A review of the contracts between the Narragansett Water Division and its respective suppliers indicates that the volume of water currently available to the system totals an approximate average of 2,570,000 gallons per day. It would appear therefore, from a review of the projected water demands presented above, that the Narragansett water system supplies are adequate to meet existing and future demands for the 5 and 20 year planning periods. It bears noting, however, that the North End portion of the system will increasingly rely on supply from the Suez Water Rhode Island.

In 1956, a study was conducted to test seven (7) selected sites within the Town of Narragansett for the development of water supply sources. These sites provided two promising locations situated on land entitled "the Pasani property", in the vicinity of Mumford Road north of Kingstown Road (Route 1A) adjacent to the south portion of the supply system. A copy of the subsequent report submitted to the Narragansett Board of Water Commissioners estimated that one site could produce a safe yield of 170 gpm (or 240,000 gpd), and the other 180 gpm (or 260,000 gpd). The report also indicated that no well

tests had been performed in Narragansett north of the Narrows and that information at that time from the Providence office of the U.S. Geological Survey, indicated that the subsoil in that area was not suitable for development of a municipal groundwater supply source. Chemical analyses performed on the groundwater reported that the water had excellent taste, no color or turbidity, and indicated the presence of iron and manganese at concentrations less than 0.1 parts per million (ppm). Current State of Rhode Island Department of Health regulations require that iron concentration be less than 0.3 ppm, and manganese concentration be less than 0.05 ppm. No information was procured on the corrosiveness of the water. Consideration to utilize this water source, even on an emergency basis would likely require that the information presented by the 1956 investigation be updated with a current study. Location of this site is such that it could be interconnected to the existing south portion of the current water supply system with relative ease; however, the site is removed (3.5 miles) from the north portion of the system which would limit its feasibility for use in supplying that portion of the service area. The possibility of providing some form of treatment as well as the construction of transmission mains and a pumping station, including all appurtenant equipment and emergency power source, may also be necessary to complete activation of this source.

Demand Management

Demand Management consists of those conservation measures which achieve long-term water savings by providing incentives and technical assistance to consumers as a means of improving efficiency of water use and reducing waste. Such water conservation measures, whereby suppliers and/or local water departments and government work to influence water consumption, is the most fundamental approach to water conservation since the ability to conserve water lies primarily with the water user. Consequently, the success of these measures is highly dependent upon consumer participation and cooperation.

The Town has undertaken measures to achieve permanent and long-term water saving by implementing the following demand management techniques.

- Installation of water conserving, low-flow plumbing devices (retrofit) and revision of plumbing code regulations.
- Promotion of water recycling and efficient use and reuse; provision of technical assistance to industrial, commercial and municipal users. When funding permits, the Narragansett Water Division will consult RI State Guide Plan Element 721, Report 115 – Rhode Island Water 2030 for

applicable water reuse and recycling programs that may be implemented by the Narragansett Water Division.

- Public education on water conservation and water supply issues.
- Appropriate use of fees, rates and charges.
- Water use regulations and restrictions.

System Management

Water conservation practices involving system management initiatives are directed at improving the efficiency of and eliminating waste in the production and distribution of water within the Narragansett Water Division supply system. Such practices are necessary to ensure that the physical components of the water system are properly operated and maintained, and include the following:

- Meter Management:
 - Source Metering
 - Consumer Metering
- Leak Detection and Repair
- Preventive Maintenance
- Infrastructure Rehabilitation

It is essential for water utilities such as Narragansett's to continually look ahead in order to prepare for needed capital improvements. The development of criteria for service area extensions, analysis of Safe Drinking Water Act requirements, and the identification of necessary system rehabilitation projects will help ensure the future success of the system management program.

The system management goals for the Narragansett water supply system are to determine the cause and extent of sources of unaccounted-for water, reduce or eliminate these losses, and improve the overall efficiency of the water supply system. Given that the Water Division currently complies with the statewide goal of maintaining non-account water at 15%, it shall be an immediate goal to maintain non-account water at current levels (14.00%) with a long term goal set at 5%. Significant increases in unaccounted water occurred during the disinfection of the North End and Kinney Avenue tanks. This occurred during the disinfection process.

Every residential, commercial, industrial and wholesale customer serviced by the Town's water supply distribution system is metered, thus providing 100% distribution metering. All meters are read using remote recorders mounted on the exterior of user residences/facilities.

The Narragansett Water Division has developed a Meter Repair/Replacement Program which is a comprehensive meter maintenance, replacement, testing and calibration plan for all meters owned and operated as part of the system. This plan includes a schedule for meter maintenance and testing, as well as a schedule for calibration of major meters located at system interconnections so that applicable meter standards and registration accuracies are maintained.

The Narragansett Water Division annually provides for planned preventive maintenance of the water system components in the setting up of its yearly budget. This process provides for water main, meter, and gate valve replacement, as well as for standard day-to-day operations (valve exercising, hydrant flushing, etc.) of the Water Division appurtenances. In addition, annual testing of master meters and random testing of consumer meters is included as part of this program.

Emergency Management and Drought Management

The Emergency Management section of this Plan (Volume II) establishes the responsibilities and authority within the Narragansett Water Division 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.

The Narragansett Water Division relies on North Kingstown and the Suez Water Rhode Island for water supply, and therefore, they are also dependent on North Kingstown and the Suez Water Rhode Island for drought management. The Narragansett Water Division works in conjunction with North Kingstown and the Suez Water Rhode Island on preventive measures and maintenance to aid these suppliers in drought management. The Narragansett Water Division also provides response measures to emergency events, including drought, within the Emergency Response Plan, Volume II.

During a drought event, the Narragansett Water Division will work with State officials to institute stricter water conservation measures in accordance with the RI State Guide Plan Element 721, Report 115 – *Rhode Island Water 2030*. *Rhode Island Water 2030* identifies five (5) drought phases: normal conditions, drought advisory, drought watch, drought warning and drought emergency. Drought triggers based upon the supply capacity to the Narragansett water system from Suez Water and North Kingstown are utilized to determine the drought phase. Based upon the drought phase, the Water Division will consider appropriate water conservation measures and notify the public of these measures. Such water conservation measures might include voluntary or mandatory water use restrictions, declarations of a local water emergency and the prohibition of nonessential uses of potable water. Any drought restrictions implemented by the Water Division's suppliers, Suez Water Rhode Island and North Kingstown, in their systems shall be adopted by the Narragansett water system.

The Narragansett Water Division's drought triggers and water reduction goals and responses for each stage of drought are consistent with RI State Guide Plan Element 721, Report 115 – *Rhode Island Water 2030* guidelines.

Implementation Schedule

A detailed implementation schedule outlining the individuals responsible, timing and costs associated with recommendations of this updated Water Supply System Management Plan has been developed for the following programs:

- General Infrastructure (Mains) Improvements
- Hydrant Replacement Program
- General System Improvements (Sinking Fund)
- Public Education of Proposed Water Conservation Programs
- Master Meter Replacement Program
- Maintain Existing Master Meter Testing Program
- Perform Lead Detection Activities
- Vehicle/Rolling Stock Replacement
- Customer Meter / Radio Read Equipment Replacement
- SCADA System Controls Upgrade
- Cathodic Protection System Replacement Kinney Avenue and Point Judith Tanks

- Coordinate Expansion of Service Area with Suppliers and in Accordance with Town Comprehensive Plan
- Comply with Requirements of Safe Drinking Water Act
- Assist Wholesale Suppliers in Developing New Sources

Currently, it is a financial burden to the Narragansett Water Division to assist their wholesale suppliers in developing new sources. During the next assessment of the budget, the Narragansett Water Division shall consider assisting the wholesale suppliers in developing new sources and determine if it is financially feasible to do so.

Financial Management

The Narragansett Water Division operates as an Enterprise Fund Agency within the municipal corporation of the Town of Narragansett. The Town has established enterprise funds for operations that are organized to be self-supporting through user charges (i.e., the intent of the governing body is that the costs [expenses, including depreciation] of providing the services to the general public on a continuing basis be financed or recovered through user charges).

All operations of the Narragansett Water Division are financed from water revenues in the form of user fees. The budget for the Water Division is prepared to incorporate all the costs of operating the Division and the water rates are established so that the users pay for all of the activities of the Division. User fees and charges levied by the Water Division are established by the Town Council as an Ordinance of the Town of Narragansett.

The annual Town financial audit includes an audit of the financial accounts of the Narragansett Water Division. The Water Division is audited separately as an enterprise fund. The enterprise fund audits are combined with the complete Town audit but are shown separately in the Town's Annual Comprehensive Financial Report.

The Narragansett Water Division's rate structure is approved by the Town Council as an Ordinance of the Town of Narragansett. The rate structure includes a minimum charge which is based upon the size of the meter and a consumption charge. The minimum charge includes 6,000 cubic feet (44,800 gallons) per year. After exceeding the minimum, use of a three-step increasing block rate is charged for the consumption as follows:

Next 3,500 CF (26,180 gal.)

Next 3,500 CF (26,180 gal.)

All over 13,000 CF (97,240 gal.)

The Narragansett Water Division charges for meter and service installations, for temporary connections or services, for fire protection connections and for meter repairs. The Narragansett Water Division reads meters and bills each customer on a quarterly basis. Bills are due when rendered and collections of the bills are actively pursued. For each of the water customers that is served by the Town sewer system, the water and sewer bill are combined and rendered to the customer quarterly.

The Narragansett Water Division, with the assistance of the Town Finance Department, develops a budget including all costs of operating the water system and all anticipated revenues for approval by the Town Council. In the development of anticipated revenue, the water rates are evaluated to determine the capability of the rates to recover sufficient funds to cover all costs. Adjustments are made to the rates if necessary to assure that the revenue covers the operating costs. All is presented to the Town Council for approval.

Coordination

This Water Supply System Management Plan Update is intended to be consistent with the goals and policies of the Narragansett Comprehensive Plan. Conversely, the Town Engineering and Narragansett Water Division personnel shall promote consistency between the contents of this Plan and the policies of the Town's Comprehensive Plan.

Future land uses, zoning requirements, growth projections and other areas of mutual interest, with regard to service area expansion, shall be consistent with the ability of the water supply system to accommodate the expected potable water requirements of the system.

In addition, the Town of Narragansett shall pursue the accommodation of the current and future needs of its water supply system through the coordination of its efforts with those of the Town of North Kingstown and Suez Water Rhode Island This shall include efforts with regard to additional system interconnections, service area expansion, capabilities to assist in the response to water supply emergencies, the potential for regionalization, etc.

The joint billing technique affects the perceived cost of water and can provide positive changes in customer water use. The water and sewer bills are combined for the water customers that are also served by the Town sewer system.

The Narragansett Water Division is cognizant of the water usage rates within their water system but has no control over the withdrawal rates of the North Kingstown and Suez Water Rhode Island systems. If water conditions deem it necessary, the Narragansett Water Division shall attempt to institute watershed-based coordination with Suez Water Rhode Island and North Kingstown. As referenced in the *Water Efficiency and Demand Management Strategy (DMS)* reports of August 1, 2012 and July 2014, the Town of Narragansett has programs in place which promote efficient water usage by service customers.

Through the Town Engineering Director, the Narragansett Water Division participates in the preparation of the Community Comprehensive Plan. The Narragansett Water Division referred to the Town of Narragansett Comprehensive Plan during the preparation of the WSSMP update to insure consistency with the Town Comprehensive Plan. Projections of water usage are compared and adjusted to the general growth projections of Town population that provide part of the baseline foundation on which the Comprehensive Community Plan is based. The figures incorporated into Table 1 have been coordinated with the "Baseline Report" recently drafted for the forthcoming update of the Narragansett Comprehensive Plan. The Narragansett Water Division, through the Town Engineer, will forward the draft WSSMP to the Town of Narragansett Planning Director for concurrence of its projections with the general growth anticipated in the Comprehensive Community Plan.