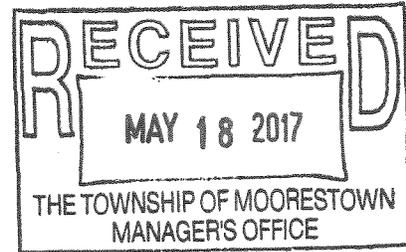


The Alaimo Group

200 High Street, Mt. Holly, New Jersey 08060 Tel: 609-267-8310 Fax: 609-267-7452
2 Market Street, Paterson, New Jersey 07501 Tel: 201-523-6200 Fax: 201-523-1765

May 15, 2017



Ms. Mary Simpson, Chief
New Jersey Department of Environmental Protection
Southern Bureau of Water Compliance & Enforcement
2 Riverside Drive, Suite 201
Camden, New Jersey 08103

Re: Township of Moorestown
Asset Management Plan
PWSID No.: 0322001
Our File No. A-730-062-000

Dear Ms. Simpson:

In response to the Department's letter dated October 17, 2016 and the attached review comments dated October 5, 2016, please find enclosed the Township of Moorestown's revised Asset Management Plan.

Should you have any questions regarding the revised plan, please contact our office.

Very truly yours,

ALAIMO GROUP


L. Russell Trice, P.E.
Senior Associate

LRT/JEB/das
Enclosures

cc: Thomas J. Merchel, Township Manager, Township of Moorestown
Martin Pratt, Utilities Superintendent, Township of Moorestown
James Bulicki, EIT, Alaimo Group
Diane E. Zalaskus, P.E, Bureau Chief, NJDEP

Certified Mail, Return Receipt Requested

Q:\Projects\A07300062000\Corresp\Simpson-rev asset mgt plan.docx

- Consulting Engineers -

Civil • Structural • Mechanical • Electrical • Environmental • Planners

ASSET MANAGEMENT PLAN

Prepared for:

**THE TOWNSHIP OF MOORESTOWN PUBLIC WORKS
WATER AND SEWER UTILITY**

**MOORESTOWN, NEW JERSEY
BURLINGTON COUNTY**

PWSID NO. 0322001

**DECEMBER 2015
REVISED MAY 15, 2017**

OUR FILE A-730-062-000

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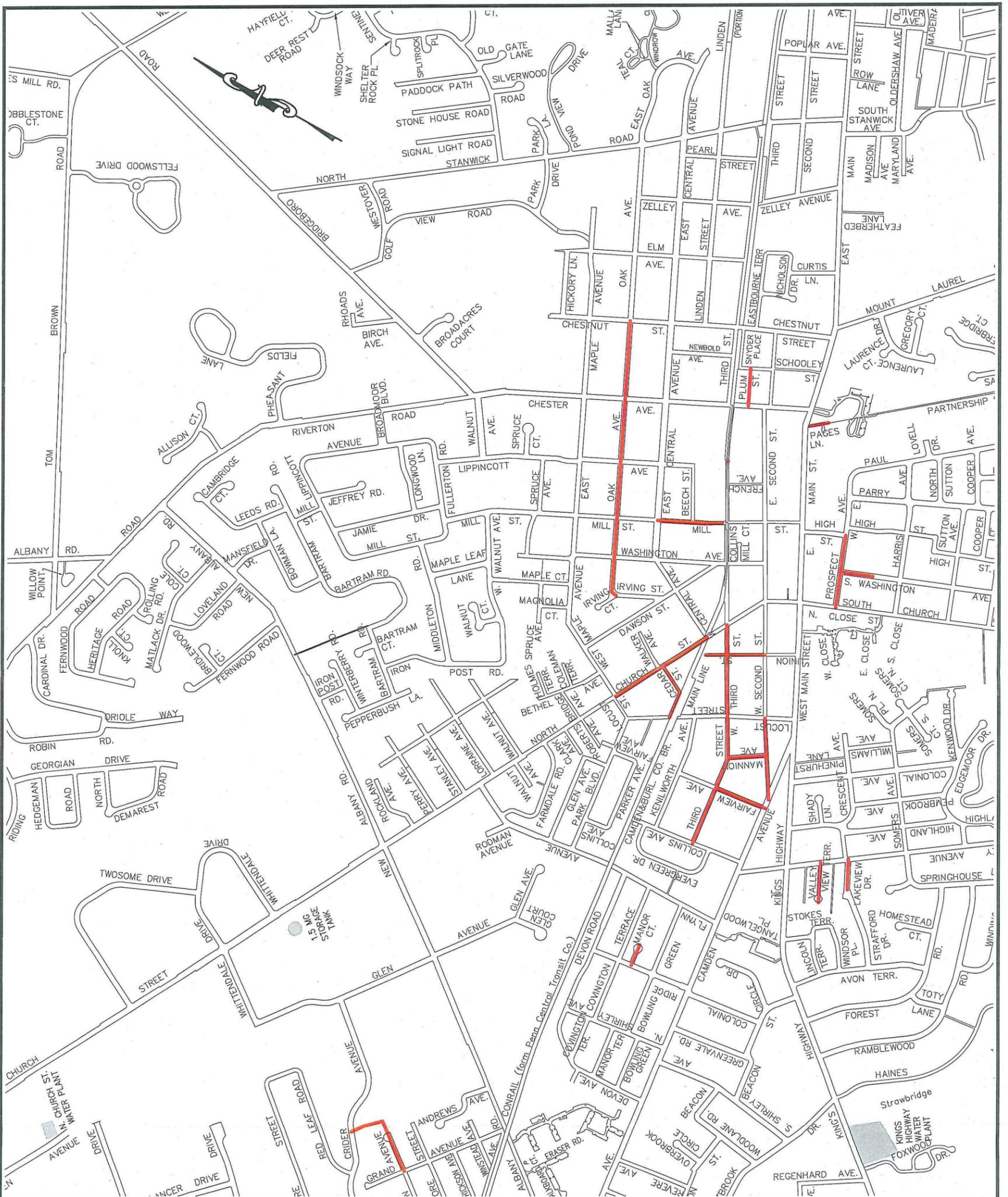
Executive Summary

This Asset Management Plan has been prepared for the Township of Moorestown Public Works Department – Water and Sewer Utility. The Water and Sewer Utility has a staff that performs day-to-day functions to maintain the utility’s proper operation. During the first nine months of 2015 the water system delivered an average of 3.269 million gallons per day (mgd) of water to 7,951 metered connections. Maps of the water utility’s components are maintained by the utility at the Township’s Public Works Department’s office.

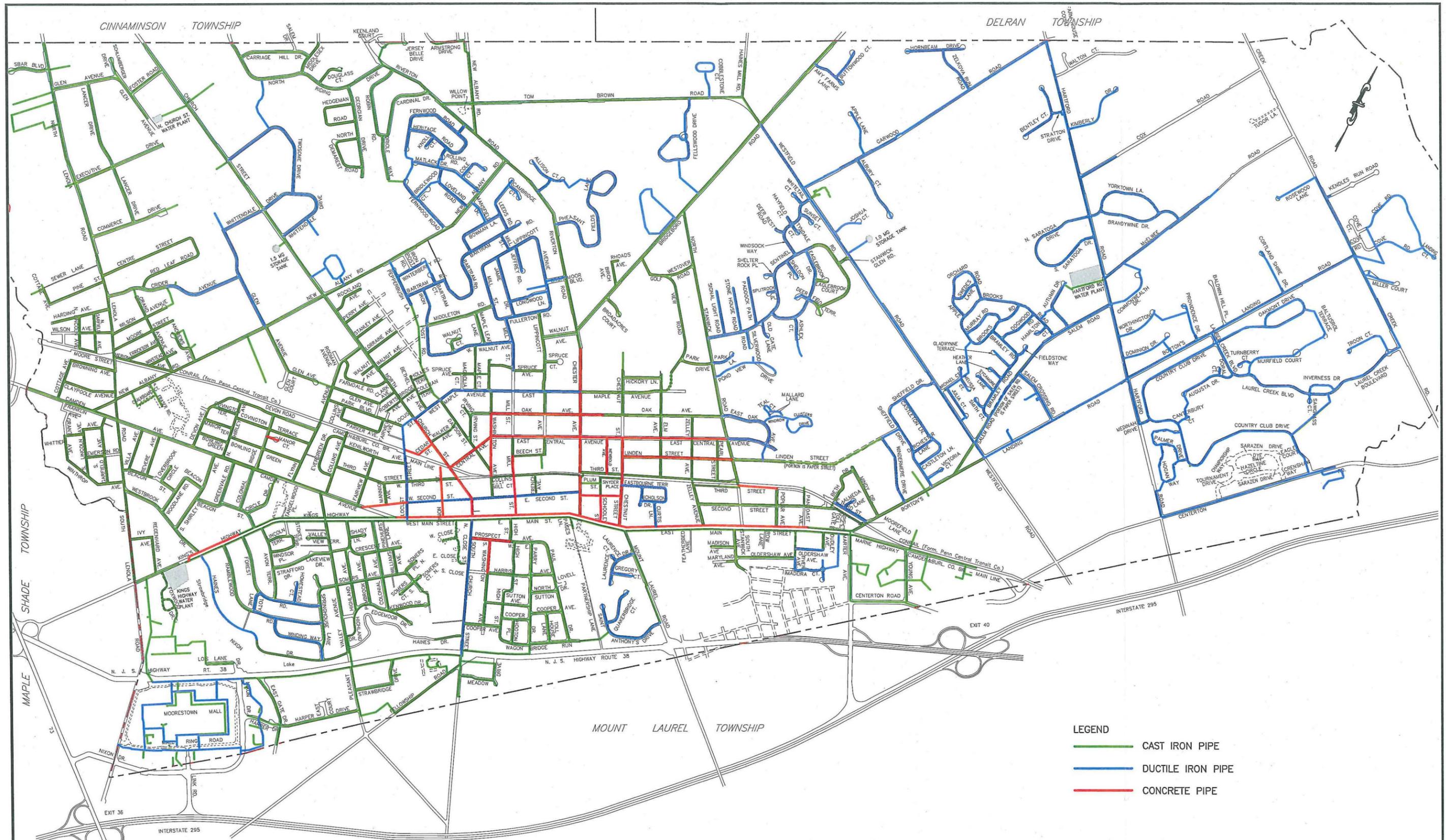
The Township of Moorestown Public Works - Water and Sewer Utility is considering a range of service levels for operation of the water system. The Level of Service goals and performance targets are summarized below in Table 1:

Table 1 Levels of Service

Goal	Performance Targets
1. Replace all mains four (4”) inch and smaller (Figure E-1)	Complete in 10 years
2. Replace all concrete mains (Figure E-2)	Complete in 10 years
3. Install mains to loop and eliminate dead ends	Complete in 15 years
4. Rehabilitate or replace unlined cast iron water mains	Cement line or replace all cast iron mains by 2030
5. Storage tanks cleaning and painting	Complete in 5 years
6. Inspect all fire hydrants twice per year.	100 % of hydrants each inspection
7. Flush all mains twice per year.	100 % of mains each flush
8. Reduce water losses to below 10%	Complete in 10 years
9. The water system will meet all state and federal regulatory standards.	100%
10. Review water rate projections	Review annually



MOORESTOWN TOWNSHIP	 ALAIMO GROUP Consulting Engineers 200 HIGH STREET MOUNT HOLLY, N.J. 2 MARKET STREET PATERSON, N.J.	FIGURE E-1
ASSET MANAGEMENT PLAN		4" AND SMALLER WATER PIPES
Scale: 1" = 1600'	Drawn By: MAC Check By: C.H.W.	Date: JANUARY 2016 Project No.: A-0730-0062-000



- LEGEND**
- CAST IRON PIPE
 - DUCTILE IRON PIPE
 - CONCRETE PIPE

MOORESTOWN TOWNSHIP	 ALAIMO GROUP Consulting Engineers 200 HIGH STREET · MOUNT HOLLY, N.J. 2 MARKET STREET · PATERSON, N.J.	FIGURE E-2
ASSET MANAGEMENT PLAN		WATER PIPE MATERIAL
Scale: 1" = 2,000'	Drawn By: MAC Check By: C.H.W.	Date: DECEMBER 2015
		Project No.: A-0730-0062-000

To support the above Level of Service goals the Township has budgeted funds to help improve overall service. The Township has currently identified a total of \$33.855 million dollars for various water system improvement projects to be completed in the next 5 years. Expenditures for the water system are funded through general rates, fees and charges. External financing for capital expenses is financed through the issuance of municipal bonds. Implementing the recommended additional Operation & Maintenance (O&M) goals will require additional funding for the Water and Sewer Utility.

An Action Plan has been developed as part of this Asset Management Plan to improve the overall operation of the system and to support the Level of Service goals (including addressing the financial management, environmental management and specific issues). The highest priority activities in the Township's Action Plan are reflected in Table 2.

Table 2 Action Plan – High Priority Actions

Urgency	Issue	Corrective Action Plan	Target Date for Completion
High	Reduce distribution system unaccounted for water.	Replace leaking valves and pipe joints	2025
High	Reduce water main breaks, improve water quality and system pressure	Replace concrete and undersized water mains	2025
High	Improve water quality and system pressures	Line or replace cast iron mains	2030
High	Improve water quality	Flush distribution system mains	Semi-Annually
High	Firm capacity does not meet NJDEP requirements.	Upgrade existing Water Treatment Facilities	2017-2020

1.0 Introduction

This Asset Management Plan, which has been prepared for the Township of Moorestown Public Works – Water and Sewer Utility describes how the utility will manage its infrastructure assets. Customer service requirements and regulations necessitate that the Township actively manage drinking water assets through careful maintenance, repair and replacement decisions. This plan is an effective tool for combining technical, management and financial practices to ensure that the level of service required by the community is provided at the appropriate cost.

The plan has the following purposes:

1. To demonstrate responsible management of the drinking water assets.
2. To communicate and justify funding requirements indicated by the plan.
3. To provide a management roadmap for the water system.
4. To serve as a link between the Township of Moorestown Water Department and its customers.

The Asset Management Plan contains an overview of the utility, mission statement, level of service agreement, critical asset list, operation and maintenance strategy and capital investment program.

1.1 Mission Statement

The following mission statement defines the goals of the Township of Moorestown Public Works - Water and Sewer Utility and is the guide for the Level of Service goals discussed in Section 3.0.

The Township Moorestown is committed to providing its customers and the community with safe and dependable water service through prompt service, courteous and helpful communication and excellence in the treatment and distribution of our most valued resource...water. The Township is committed to improving and maintaining the public health protection and performance of its distribution system assets, while minimizing the long-term cost of operating those assets. The Township strives to make the most cost-effective renewal and replacement investments and provide the highest-quality customer service possible.

1.2 Asset Management Team

The Township of Moorestown Public Works – Water and Sewer Utility has a staff that performs day-to-day functions to keep the utility functioning properly. Together, some of these individuals have been utilized as members of the "the asset management team." The Township Public Works – Water and Sewer Utility staff performs asset management planning responsibilities. The asset management team is responsible for preparing, implementing and updating this plan.

The Township Manager and Consultant regularly interface with the Public Works and Finance departments, These offices are involved with water and sewer utility projects and other township projects, while the Asset Management Team is responsible for coordinating such involvement in developing and implementing this plan. While other Township departments may not be responsible for implementation, they will need to provide support in implementing the Asset Management Plan. The current team is listed in Table 1-1. An overall organization chart for the Township is presented in Figure 1-1.

Table 1-1 Asset Management Team

Title	Organization	Role / Responsibility on Project
Township Manager	Township of Moorestown	Township Employee
Chief Financial Officer	Township of Moorestown	Township Employee
Director of Public Works	Township of Moorestown	Township Employee
Utilities Superintendent	Township of Moorestown	Township Employee/Licensed Operator
Utilities Engineer	Alaimo Group	Consultant

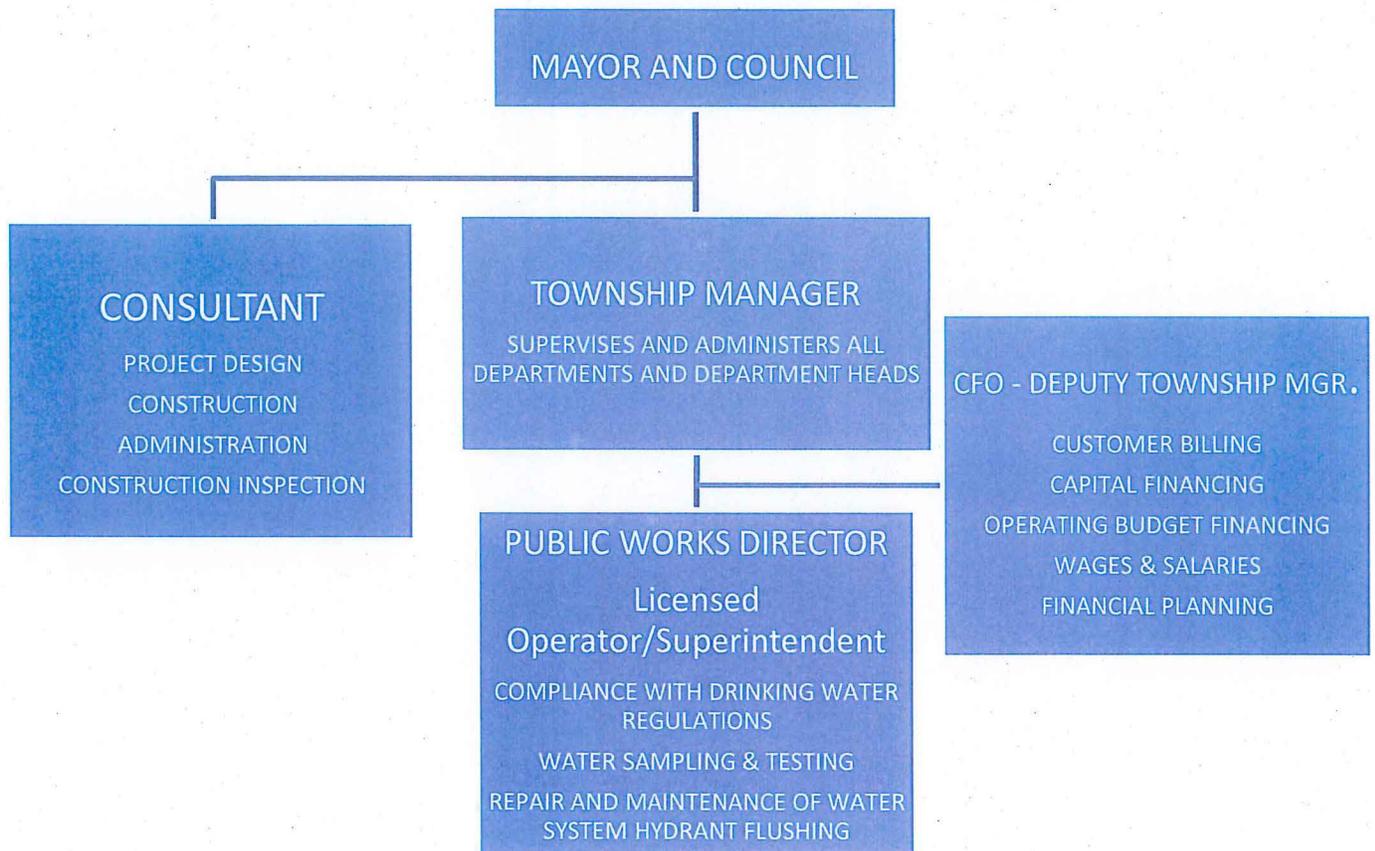


Figure 1-1 ORGANIZATION CHART

2.0 Water System Overview

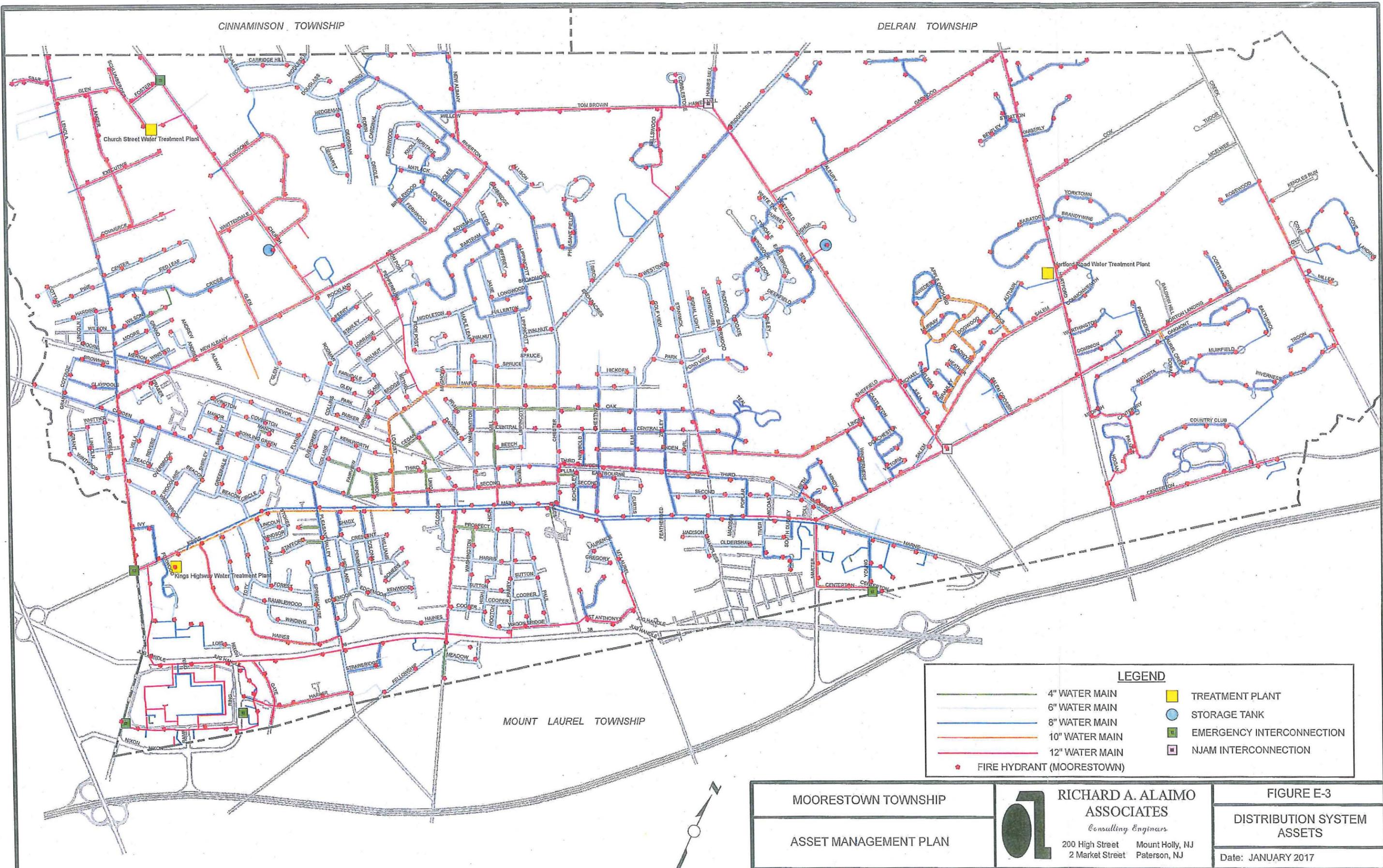
The Township of Moorestown Public Works - Water and Sewer Utility serves a population of approximately 20,700. Table 2-1 provides a breakdown of customers by type and water system assets. Maps of the utility are maintained by the utility at the Township Public Work's Office.

The Township of Moorestown owns and maintains its potable water distribution system. Water mains range in size from two (2") inches in diameter to twelve (12") inches in diameter. Figure E-3 shows these pipe's diameters throughout the Township, as well as hydrant locations, interconnections, treatment plants and storage tanks. The Distribution System also includes two (2) elevated storage tanks. These tanks are located on North Church Street (1.5 mg) and Westfield Road (1.0 mg). The water mains are constructed of cast iron (unlined), concrete, and cement lined ductile iron.

In general, the water system is in good condition as a result of the on-going rehabilitation and improvements to the infrastructure.

Table 2-1 Water System Data

Item	Units	Description
Water Customer Breakdown		
Residential	Units	6,782
Commercial	Units	835
Industrial	Units	5
Municipal	Units	<u>55</u>
TOTAL	Units	7,677
System Demands - 2014		
Unaccounted-for Water (2014)		12%
Volume Produced	Avg. Day	2.711 MG
Volume Sold	Avg. Day	2.687 MG
Peak Daily Consumption	Peak Day	5.829 MG
Supply and Distribution System Assets		
Water Treatment Plants	Units	3
Wells	Units	7
Valves	Units	2,250
Hydrants	Units	750
Meters	Units	7,951
Water Distribution Mains	Miles	110
Interconnections	Units	7
Distribution Storage Tanks	Units	2
Bulk Purchase Interconnections	Units	2
How Sourced		Water is purchased from New Jersey American Water Company (NJAWC)
Shared Emergency Interconnections with Other Purveyors	Units	5 The Township maintains emergency connections with Mount Laurel Township MUA (2), Maple Shade Township (2), and NJAWC (1).



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MOORESTOWN TOWNSHIP	 RICHARD A. ALAIMO ASSOCIATES Consulting Engineers 200 High Street Mount Holly, NJ 2 Market Street Paterson, NJ	FIGURE E-3
ASSET MANAGEMENT PLAN		DISTRIBUTION SYSTEM ASSETS
Scale: 1" = 2,000'(Approx.)	Drawn By: CFC	Checked By: JB
Date: JANUARY 2017		Project No.: A-0730-0062-000

The Township's water system has two (2) bulk purchase connections with NJAWC and five (5) emergency connections for both purchase and supply purposes. A summary is provided in *Table 2-2*.

Table 2-2 Interconnections

<i>Purchase</i>			
NJAWC	6"	Intersection of Haines Mill Road & Westfield Road connected to 54" pipeline	Available
	8"	Intersection of Borton's Landing Road & Westfield Road connected to 54" pipeline	Available
<i>Emergency Supply</i>			
Mount Laurel Township MUA (2)	8"	Nixon Drive	Normally Closed
	8"	Centerton Road	Normally Closed
Maple Shade Township (2)	8"	Nixon Drive	Normally Closed
	8"	Kings Highway	Normally Closed
NJAWC	8"	North Church Street	Normally Closed

Projected demands are based upon available information on historical water demands and growth patterns, approved and proposed development information and future development projections provided by the Township.

Township population increased from 19,017 in the 2000 Census to 20,726 in the 2010 Census. The Township expects water demands to increase over the next ten (10) years based on a number of development projects that are under construction and approved. The Township continually investigates options to increase the capacity of its water supply in order to meet growth projections and requirements.

Approved, proposed and future development projects are summarized in Tables 2-3A, 3B and 3C. These tables project an increase of 224,949 gpd in average daily water demand by 2030.

Developments listed in Tables 2-3A, 3B and 3C have been divided into three (3) timeframes for planning purposes. Items labeled "Approved" have been approved by the Township Planning or Zoning Board, and are assumed to be constructed in the next five

(5) years. Items labeled "Proposed" have not been approved and are assumed to be constructed between 2020 and 2025. Items labeled "Future" are assumed to be constructed after 2025.

Table 2-3A Developments (Approved)

PROJECT NAME	UNIT DESCRIPTION	STATUS	NUMBER OF UNITS	DEMAND/UNIT (GPD)	AVG. DAILY DEMAND	PEAK DEMAND
225 CEDAR	SINGLE FAMILY 4B	APP'D	1	395	395	1,185
RAVIKIO	SINGLE FAMILY 5B	APP'D	12	475	5,700	17,100
730 GARWOOD	SINGLE FAMILY 4B	APP'D	1	395	1,185	1,185
HERB	SINGLE FAMILY 4B	APP'D	1	395	395	1,185
BETHEL	SINGLE FAMILY 4B	APP'D	1	395	395	1,185
615 NEW ALBANY RD	SINGLE FAMILY 4B	APP'D	1	395	395	1,185
PARKER	SINGLE FAMILY 4B	APP'D	1	395	395	1,185
W. MAIN	COMMERCIAL	PROP'D	2,480 SF	0.125	310	930
230 MARTER REPUBLIC BANK	COMMERCIAL	APP'D	3,505 SF	0.125	438	1,314
DUBROW	SINGLE FAMILY 4B	APP'D	2	395	790	2,370
DAWSON	SINGLE FAMILY 4B	APP'D	2	395	790	2,370
GOLFVIEW	SINGLE FAMILY 4B	APP'D	1	395	395	1,185
McELWEE	SINGLE FAMILY 4B	FUTURE	1	395	395	1,185
		APP'D		SUB-TOTAL	11,188	33,564

Table 2-3B Developments (Proposed)

PROJECT NAME	UNIT DESCRIPTION	STATUS	NUMBER OF UNITS	DEMAND/UNIT (GPD)	AVG. DAILY DEMAND	PEAK DEMAND
93 WESTBROOK	SINGLE FAMILY 4B	PROP'D	1	395	395	1,185
750 McELWEE	SINGLE FAMILY 4B	PROP'D	1	395	395	1,185
JEFF DUBROW	SINGLE FAMILY 5B	PROP'D	4	395	1,580	4,740
PAPARONE	SINGLE FAMILY 4B	PROP'D	3	395	1,185	3,555
GARWOOD	SINGLE FAMILY 4B	PROP'D	5	395	1,975	5,925
322 E MAPLE AVE	SINGLE FAMILY 4B	PROP'D	1	395	395	1,185
JAFFE/DEY	APARTMENT 2B APARTMENT 1B	PROP'D	22	175	3,850	11,550
			4	120	480	1,440
LUTHERN HOME	ASSISTED LIVING	PROP'D	14	175	2,450	7,350
O'CONNOR PARKER AV	SINGLE FAMILY 4B	PROP'D	1	395	395	1,185
MOORESTOWN FARMS	SINGLE FAMILY 4B	PROP'D	0	0	0	0
MOORESTOWN FARMS	SINGLE FAMILY 4B	PROP'D	0	0	0	0
CREITZ	TOWNHOUSE 3B	PROP'D	5	210	1,050	3,150
JVS	SINGLE FAMILY 4B	PROP'D	2	395	790	2,370
NELSON	SINGLE FAMILY 4B	PROP'D	1	395	395	1,185
MAINES	SINGLE FAMILY 4B	PROP'D	2	395	790	2,370
MARTIN	SINGLE FAMILY 4B	PROP'D	1	395	395	1,185
BETHEL	SINGLE FAMILY 4B	PROP'D	1	395	395	1,185
ZALKIND	SINGLE FAMILY 4B	PROP'D	1	395	395	1,185
FREYNIK	SINGLE FAMILY 4B	PROP'D	2	395	790	2,370
WEINSTEIN	SINGLE FAMILY 4B	PROP'D	1	395	395	1,185
DiPAOLLO	SINGLE FAMILY 4B	PROP'D	2	395	790	2,370

RYAN VEASY	COMMERCIAL	PROP'D	15,000 SF (OFFICE) 4,000 GPD REST.		1,958	5,875
EAST GATE NIXON DRIVE	COMMERCIAL	PROP'D	15,038 SF	0.125	1,880	5,640
DeANGELO	SINGLE FAMILY 4B	PROP'D	1	395	395	1,185
AMANDA/BRYAN	SINGLE FAMILY 4B	PROP'D	1	395	395	1,185
IDYLL ACRES	SINGLE FAMILY 4B	PROP'D	15	395	5,925	17,775
BERNARDELLA	SINGLE FAMILY 4B	PROP'D	2	395	790	2,370
		PROP'D		SUB- TOTAL	30,628	91,885

Table 2-3C Developments (Future)

PROJECT NAME	UNIT DESCRIPTION	STATUS	NUMBER OF UNITS	DEMAND/ UNIT (GPD)	AVG. DAILY DEMAND	PEAK DEMAND
BENTLEY	SINGLE FAMILY 4B	FUTURE	1	395	395	1,185
37 ROBIN RD	SINGLE FAMILY 4B	FUTURE	0	0	0	0
DAWSON ST	SINGLE FAMILY 4B	FUTURE	2	395	790	2,370
1519 GLEN	COMMERCIAL	FUTURE	34,000 SF	0.125	4,250	12,750
NEW ALBANY	COMMERCIAL	FUTURE	52,000 SF	0.125	6,500	19,500
1530 GLEN	COMMERCIAL	FUTURE	15,000 SF	0.125	1,875	5,625
SBAR	COMMERCIAL	FUTURE	180,000 SF	0.125	22,500	67,500
NAGLE TRACT	APARTMENTS	FUTURE	150	175	26,250	78,750
MAYBURY TRACT	APARTMENTS	FUTURE	50	175	8,750	26,250
KNOWLES	SINGLE FAMILY 4B	FUTURE	21	395	8,295	24,885
WEST END	SINGLE FAMILY 4B	FUTURE	20	395	7,900	23,700
EAST END	SINGLE FAMILY 4B	FUTURE	20	395	7,900	23,700
LOCKHEED	COMMERCIAL	FUTURE	60,000 SF	0.125	7,500	22,500
EASTGATE	RETAIL	FUTURE	70,000 SF	0.125	8,750	26,250
RTE 38 OFFICES	OFFICE	FUTURE	100,000 SF	0.125	12,500	37,500
MARTER AVE	HEALTH CARE	FUTURE	80 BEDS	175	14,000	42,000
877 GOLFVIEW	SINGLE FAMILY 4B	FUTURE	1	395	395	1,185
MARTER & MAIN	RETAIL	FUTURE	16,000 SF	0.125	2,000	6,000
REPUBLIC BANK	RETAIL	FUTURE	5,000 SF	0.125	625	1,875
TOLL OFFICE	COMMERCIAL	FUTURE	100,000 SF	0.125	12,500	37,500
TOLL	APARTMENTS	FUTURE	70	270	18,900	56,700
ANDREWS	SINGLE FAMILY 4B	FUTURE	1	395	395	1,185
605 GLEN AVE	COMMERCIAL	FUTURE	10,000 SF	0.125	1,250	3,750
11-12-13 WEST MAIN	COMMERCIAL	FUTURE	1,885 SF	0.125	236	708
111/112/113 WEST MAIN	COMMERCIAL	FUTURE	2,480 SF	0.125	310	930
85 KINGS HWY	SINGLE FAMILY 1B	FUTURE	Addition	215	215	645
1255 N. CHURCH	INDUSTRIAL	FUTURE			1,000	3,000

PROJECT NAME	UNIT DESCRIPTION	STATUS	NUMBER OF UNITS	DEMAND/UNIT (GPD)	AVG. DAILY DEMAND	PEAK DEMAND
1259 N. CHURCH	INDUSTRIAL	FUTURE			1,000	3,000
700 CHESTER	SINGLE FAMILY 3B	FUTURE	1	320	320	960
33 EAST MAIN	COMMERCIAL	FUTURE	960 SF	0.125	120	360
20 MEADOW DRIVE	SINGLE FAMILY 3B	FUTURE	1	320	320	960
RTE 38 EAST	OFFICE	FUTURE	58,290 SF	0.125	7,286	21,858
TOM BROWN RD	SINGLE FAMILY 4B	FUTURE	2	395	790	2,370
309 BRIDGEBORO	HEALTH CARE	FUTURE	20 BEDS	175	3,500	10,500
EAST THIRD ST	SINGLE FAMILY 3B	FUTURE	1	320	320	960
225 E. MAIN STREET	HEALTH CARE	FUTURE	20 BEDS	175	3,500	10,500
PANCOAST AVE	SINGLE FAMILY 4B	FUTURE	1	395	395	1,185
MARTER, MARNE, CENTERTON	SINGLE FAMILY 4B	FUTURE	4	395	1,580	4,740
199 BORTON LANDING	OFFICE WAREHOUSE	FUTURE	13,200SF	0.125	2,070	6,210
MARNE YMCA	CLUB HOUSE	FUTURE	0	0	0	0
MARNE HWY	SINGLE FAMILY 4B	FUTURE	2	395	790	2,370
FLYING FEATHER	SINGLE FAMILY 4B	FUTURE	5	395	1,975	5,925
855 COX RD	SINGLE FAMILY 4B	FUTURE	5	395	1,975	5,925
McELWEE MANNION	SINGLE FAMILY 4B	FUTURE	1	395	395	1,185
CATHOLIC DIOCESE	CHURCH	FUTURE	150,000 SF	0.125	18,750	56,250
IDYLL ACRES	SINGLE FAMILY 4B	FUTURE	15	395	5,925	17,775
		FUTURE		SUB-TOTAL	226,992	680,976
				TOTAL	268,808	806,424

The future average day demand is projected using the 2014 average day of 2.687 mgd, plus the demand of the proposed developments by timeframe. The projected demand is presented in Table 2-4.

Table 2-4 Projected Average Day Demand

Year	Projected Growth	Average Day (mgd)
2014	--	2.687
2020	0.011	2.698
2025	0.031	2.729
2030	0.227	2.956

A peaking factor based on historical data was applied to the projected average day demand to obtain projected peak day and maximum day demands shown in Table 2-5.

Table 2-5 Projected Peak Day and Maximum Day Demands

Year	Average Day (mgd)	Peak Day Ratio	Peak Day Demand (mgd)	Maximum Day Ratio	Maximum Day Demand (mgd)
2014	2.687	3.00	8.061*	1.8	14.510
2020	2.698	3.00	8.094	1.8	14.569
2025	2.729	3.00	8.187	1.8	14.737
2030	2.956	3.00	8.868	1.8	15.962

* 5 Year Average

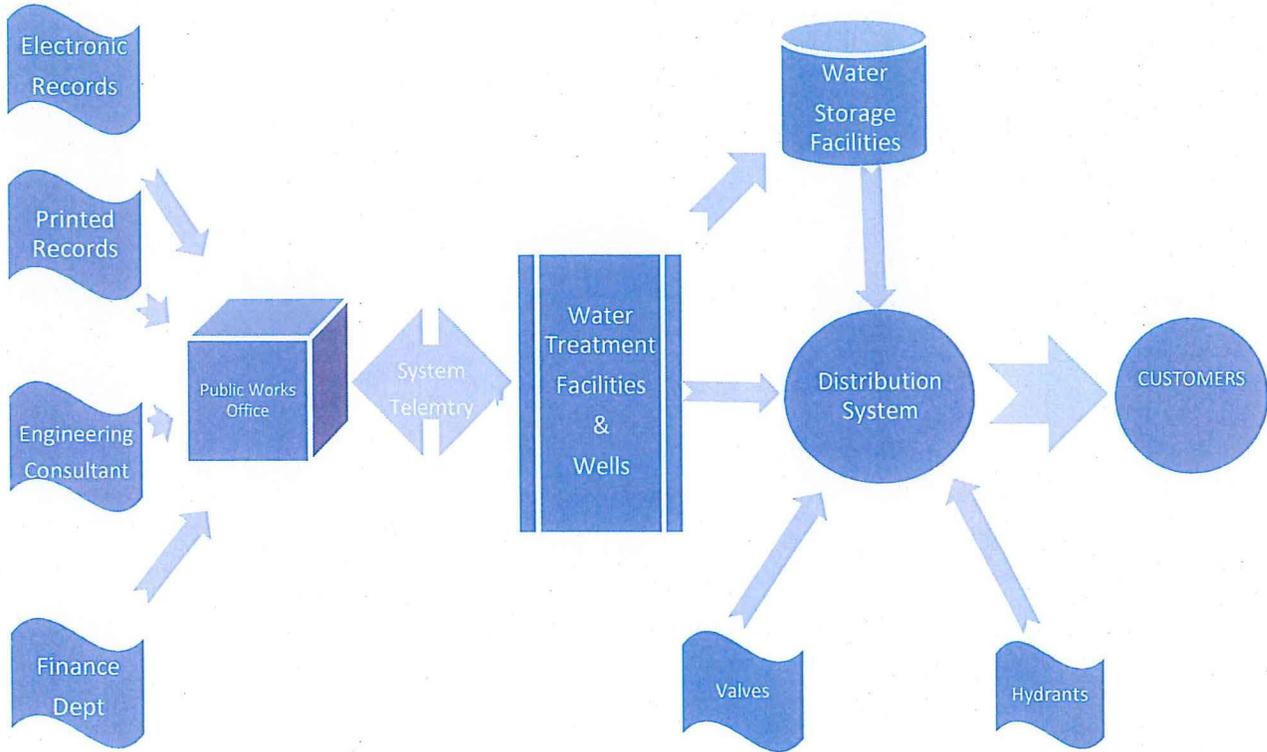


Figure 2-2 Water Department Assets

3.0 Level of Service

The goal of the Township of Moorestown Public Works - Water and Sewer Utility is to deliver safe water by providing services that meet or exceed customer expectations and comply with State and Federal regulations. This section describes the Township's Level of Service goals and the key performance targets for each Level of Service goal. Each Level of Service defines the objectives of the utility's performance by asking questions such as "how much", "of what nature" and "how frequently". The performance targets define how each level of service will be measured. The Township's progress towards meeting those goals will be reviewed annually.

The Level of Service goals determine the amount of funding that is required to maintain, renew and upgrade the water infrastructure to provide the customers with the levels of service specified. The Level of Service goals are defined across the service areas identified below and a performance target is defined for each goal as a measure for the Level of Service goal. Changes to the levels of service goals and how the utility addresses these changes will affect funding requirements and how well the Township can provide the proper service to the community. Target levels of service are identified in Table 3-1. This table lists the Level of Service goals and performance targets for each goal.

Table 3-1 Level of Service Goals

Service Area	Levels of Service	
	Goal	Performance Targets
Health, Safety and Security	System will meet all state and federal regulatory standards.	100%
Health, Safety and Security	Lower DBPs in the water distribution system.	Below 80% of the MCL
Health, Safety and Security	Inspect all fire hydrants twice per year.	100 % of hydrants each inspection
Service Quality and Cost	Respond to customer complaints and attempt to identify the nature and cause of complaint	Within 24 hours
Service Quality and Cost	Reduce customer complaints by investigating system water quality and water blending issues	Reduce customer complaints by 80%
Service Quality and Cost	Flush all mains including dead-end mains using unidirectional flushing twice per year.	100 % of mains each flush
Service Quality and Cost	Upgrade Water Treatment Plant.	Complete in 5 years
Service Quality and Cost	Install mains to loop and eliminate dead ends and replace or supplement undersized mains.	Complete in 10 years
Asset Preservation and Condition	Rehabilitate or replace unlined mains.	Complete by 2030
Asset Preservation and Condition	Replace all concrete mains and mains four (4") inches in diameter and smaller.	Complete in 10 years

Service Area	Levels of Service	
	Goal	Performance Targets
Asset Preservation and Condition	Reduce water losses to below 10%.	Complete in 10 years
Service Quality and Cost	Review water rates periodically to stabilize rate base.	Review annually

3.1 System Water Losses

Appendix D shows the water system losses of Moorestown water as calculated by the AWWA Free Water Audit Software. This information shows a number of values including the apparent, real and total losses. These losses and their possible solutions can be explained through a variety of reasons.

Metering

Distribution point of entry meters are read daily. Township water treatment plant meters are maintained and calibrated in order to maintain accuracy. Two metered New Jersey American Water Co. (NJAW) active interconnects are read and maintained by NJAW. Moorestown has an ongoing process for the replacement of service meters after 10 years of service in order to maintain accuracy and avoid under registering accounts resulting in unaccounted for water and loss of revenue. Account records are routinely reviewed to identify high readings, which are possibly due to leaks or low readings which may be due to stopped or slow meters. During routine service calls customer's services are inspected to identify leaks or slow reading meters and, if necessary, meter are replaced. Meters are tested upon customers' request. Currently meters are read quarterly. Township is currently determining cost and equipment needed to convert meter reading to monthly radio-read to improve accountability of metered water and reduce data handling errors. Water used in township street sweepers and for Township owned irrigation is metered and accounted for but unbilled.

Distribution Valves and Mains

Reducing losses within the distribution systems is done by regularly exercising system valves, using acoustic leak detection equipment to detect leaks at valves and through mains before they surface. Checking and documenting valve accessibility, operation, position, and leaks is also critical to minimizing losses. Schedule repairs or replacement as needed to maintain valve accessibility and operation as needed for main isolation as necessary and to control and repair

leaks. Record sounding levels to determine base level as a reference point for future soundings to aid in identifying undetected leaks at or near valve. Moorestown is in the process of replacing concrete and ductile iron 4" diameter or less water distribution mains. Accordingly accompanying valves and services are also being replaced. The main replacements will result in higher system pressure, water quality, and a reduction in water loss due to leaks.

SCADA

The Township is currently determining equipment needed and cost to link WTPs and storage tanks to a SCADA system in order to improve both WTP and distribution system monitoring and operation from remote locations. The integration will improve the balance of system supply and demand allowing improved system pressure control avoiding unnecessary higher pressures and limiting water loss through undetected leaks and tank overflows. Monitoring system tank levels & comparing to system supply and metered use will aid in leak detection and reduce nonrevenue water loss.

Quantifying Loss Estimates

To quantify losses from hydrant flushing, the residual pressure at hydrant and flow charts are used to determine flow. The flow is totalized after flushing to account for water usage. To quantify losses from leaks, flow charts based on diameter and pressure are used to estimate water loss through each repaired leak. The flow is totalized after the repair yearly to estimate water loss through leaks.

4.0 Critical Assets

The importance or critical value of water system assets varies depending on the Level of Service goals. To determine the risk associated with the failure of an asset, the CUPSS software developed by the U.S. Environmental Protection Agency was used to identify and prioritize critical assets. This process includes reviewing assets to record their condition (likelihood of failure), criticality to the utility (consequence of failure) and redundancy (the number of back-up systems to help support each asset). This analysis will enable the Township going forward, to achieve the identified level of service goals.

The Township of Moorestown Public Works – Water and Sewer Utility asset management team is in the process of completing the critical asset assessment. The asset management team is also working toward gathering the outstanding data such as valve information, pipe age and updating other information, as necessary.

As previously noted the Township has three (3) water treatment plants and seven (7) wells. The permitted capacities of the water treatment plants and wells are provided in Tables 4-1 and 4-2. Although these facilities are considered to be critical assets there are also many items located at each of these facilities that could be considered to be either critical or non-critical. Currently the Kings Highway WTP is running at a reduced capacity and a replacement plant is being constructed. The North Church Street WTP is also operating at a reduced capacity due to a temporary treatment system being installed to treat ground water contaminants and the Hartford Road WTP is inactive and not operable. Both the North Church Street and Hartford Road plants are planned to be replaced and are currently in the planning and design phases. Since all three (3) of Moorestown's water treatment plants will be replaced the Township does not intend to identify critical or non-critical assets at these locations at this time. Once construction work has been completed all assets at each location will be inventoried.

Table 4-1 Water Supply Well Inventory

Well Name	Location	Year Drilled	Depth (ft)	Capacity (gpm)
Well No. 3	Kings Highway WTP	1942	299	700
Well No. 4	Hartford Road WTP	1952	338	700
Well No. 5	Kings Highway WTP	1998	285	700
Well No. 6	Kings Highway WTP	1990	288	1000
Well No. 7	N. Church Street WTP	2003	396	2000
Well No. 8	Hartford Road WTP	1962	332	700
Well No. 9	N. Church Street WTP	2011	400	2000

Table 4-2 Water Treatment Plant Inventory

Treatment Plant Name	Capacity
Kings Highway WTP	2.268 MGD
North Church Street WTP	2.880 MGD
Hartford Road WTP	2.016 MGD

The Township is investigating potential funding sources to complete this considerable amount of work, such as the New Jersey Environmental Infrastructure Financing Program (NJEIFP). This work will be continuing for the foreseeable future as funds are appropriated and dispensed. This mapping is meant to be constantly updated as improvements are made and as such will be an ongoing project. The current information is being retained on-site due to its sensitivity. Additional information will also be retained on-site, as it is gathered. Table 4-3 identifies the risk of failure associated with each asset, which in turn will have an effect on achieving the Level of Service goals.

Table 4-3 Critical Asset Inventory

Asset	Condition	COF	Capacity	Risk
Water Supply Wells	Good	Moderate	Adequate	Low
Water Treatment Plants	Poor	Moderate	Not Adequate	Moderate
Water Storage Tanks	Fair	Moderate	Adequate	Moderate
Interconnections	Good	Minor	Adequate	Low
Transmission Mains	Fair (Average)	Minor	Marginal	Low
Distribution Mains	Good	Minor	Adequate	Low
Services	Fair (Average)	Minor	Adequate	Low
Hydrants	Good	Minor	NA	Low
Valves	Fair (Average)	Minor	NA	Low
Leased Lines and Telemetry	Fair (Average)	Moderate	Adequate	Moderate
COF = Consequence of Failure				

Currently, two of Moorestown’s water treatment plants are inactive and the third plant is operating at a reduced capacity. As a result Moorestown is satisfying the majority of its water demands by purchasing water from New Jersey American Water (NJAW) through two (2) existing interconnections with NJAW’s 54” Tri-County water supply main. As a result the risk associated with the failure of either treatment plants or wells is low since they are not critical under current operating scenarios to satisfying water demands. However, Moorestown plans to upgrade or replace its treatment plants so as to reduce its purchase of water to a minimum. Therefore, upgrade of the treatment plants and wells if required has been included in the short term capital improvement plan.

Although portions of Moorestown’s water distribution system are old and undersized the system as a whole is reinforced and the failure of any individual main would not pose a significant risk to the system as a whole. Therefore, the risk associated with the failure of the various components of the system such as transmission and distribution mains, services, valves, hydrants, etc. is considered to be low. Moorestown does experience a significant number of mains breaks and water quality complaints and occasionally low but adequate pressures in certain areas. As a result, the tasks identified in the Operation and Preventive Schedule (Table 5-1) are primarily associated with current operational problems. Although Moorestown does consider some of its current operational issues to be a result of purchasing a large volume of water from NJAW, it does realize that portions of its distribution system are old and undersized. Therefore, the replacement of water mains is the second largest line item in the short term capital improvement plan

(Table 7-1) and the largest in the long term capital improvement plan (Table 7-2).

In summary, the major issues that Moorestown must address are associated with the condition of their water treatment plants and distribution system and have therefore been identified in the action plans as high priority items.

5.0 Operation and Maintenance (O&M) Strategy

O&M consists of daily procedures necessary for system operation, preventive and emergency/reactive maintenance. In this section, the strategy for O&M varies by the asset, criticality, condition and operating history. The information in the Critical Asset Inventory provides a list of the utility's priority assets and identifies the risk value for each asset. This risk and consequence of failure were used as the basis for establishing the maintenance program, which will enable the Township to address the highest risk assets. The maintenance program is designed to address the level of service performance objectives identified.

Unexpected events could require changing the maintenance schedule for some assets. Corrective action may be required in response to unexpected incidents, including those found during routine inspections and O&M activities. Utility staff will record condition assessments when maintenance is performed, at established intervals or during scheduled inspections. Assets rated at the top of the priority ranking are presented below with the maintenance strategies. As an asset is repaired or replaced, its condition will improve and therefore can reduce the overall risk of the asset failing.

5.1 Operation and Preventive Maintenance

Operation and preventive maintenance is the day-to-day work necessary to keep assets operating properly. Operation and preventative maintenance includes the following:

1. Regular and ongoing annual tasks necessary to keep the assets at their required service level.
2. Day-to-day and general upkeep designed to keep the assets operating at the required levels of service.
3. Tasks that provide for the normal care and attention of the asset including repairs and minor replacements.

Preventive maintenance is carried out based on a planned maintenance program (such as regularly scheduled asset repairs) and historically problematic operations (such as main breaks and water quality at dead-ends). Equipment must be maintained according to manufacturer's recommendations to achieve maximum return on investment. By simply following the manufacturer's suggested preventive maintenance, the useful life of equipment can be increased 2 to 3 times when compared to no maintenance. Entities can achieve positive returns from a

relatively small additional investment in their operating budget for preventive maintenance practices.

Table 5-1 shows a preventive maintenance schedule based on best management practices. If maintenance tasks have been deferred because of inadequate funding or staffing, funding must be added to future operating budgets to increase the service life of assets.

Table 5-1 Operation and Preventive Maintenance Schedule

Task Name	Frequency
Test and record chlorine residual in the distribution system.	Monthly *
Obtain water meter readings and record water production.	Daily, 1 time per day
Conduct weekly security check.	Every week
Prepare and verify submittal of monthly reports.	Monthly
Exercise mainline valves.	Twice per year
Flush the distribution system and exercise/check 100% of all hydrants.	Spring
Flush the distribution system and exercise/check 100% of all hydrants.	Fall
Receive, record, and investigate customer complaints.	As Received
Locate and evaluate distribution system leaks.	Annually
Review past usage and prepare a Demand Forecast.	Annually
Read all customer meters. Compare with total water purchased.	Quarterly
Obtain and test appropriate monthly water quality samples.	Monthly
*Chlorine residuals are checked as part of normal sampling and testing as required by NJDEP (a minimum of twenty-four (24) sampling locations per month/8 per week).	

6.0 Water Quality

This section describes how the Township of Moorestown Public Works - Water and Sewer Utility addresses water quality and water efficiency issues under the two major federal statutes governing water are the Safe Drinking Water Act (SDWA) and State Drinking Water Regulations.

6.1 Source Water Assessments and Protection

The cost of water treatment, as well as the risks to public health, can be reduced by protecting source water from contamination. Since the township's own water supplies are derived from confined or semi-confined groundwater aquifers, assessment of these sources is not appropriate. However, water purchased from NJAWC is for the most part obtained from the Delaware River and is therefore subject to assessment. As a result, the Township of Moorestown Public Works - Water and Sewer Utility regularly reviews source water assessments available from NJAWC.

A list of contaminants present is provided in Appendix B.

6.2 Water and Energy Efficiency

The water and energy sectors are highly interdependent. Water suppliers use enormous amounts of energy to withdraw, treat and distribute water. Identifying approaches to integrate energy efficient practices into the daily management and long-term planning for a utility also contributes to the long-term sustainability of water infrastructure by reducing operation costs and adding to a utility's bottom line. Township of Moorestown public Works – Water and Sewer Utility is investigating the following steps to encourage water and energy efficiency to aid in forestalling future large capital expenditures in infrastructure:

1. Water audits and water loss control programs
2. Employing consumer outreach programs (free home water audits, rebate programs, etc.)

7.0 Capital Improvement Program (CIP)

The Township of Moorestown Public Works – Water and Sewer Utility’s Capital Improvement Program (CIP) plan is a description of future capital projects. Capital improvement projects generally create a new asset that previously did not exist or they upgrade and improve an existing asset. The projects can result from growth or environmental needs, such as the following:

1. Expenditures that purchase or create a new asset or in any way improve an asset beyond its original design capacity.
2. Upgrades that increase the capacity of the asset.
3. Construction designed to produce an improvement in the standard operation of the asset beyond its present capacity.

In addition to capital improvement projects, the asset management team has reviewed and is establishing a renewal (or rehabilitation) strategy. Renewal expenditure is anything that does not increase the asset's design capacity but restores an existing asset to its original capacity. Any improvement projects that require more than simply restoring an asset to its original capacity are deemed to be a renewal project, such as the following:

1. Activities that do not increase the capacity of the asset (i.e., upgrade and enhance the assets restoring them to their original size, condition, and capacity).
2. Rehabilitation involving improvements and realignment or restores the assets to a new or fresh condition.

In making renewal decisions, the utility considered the following categories:

1. Structural
2. Capacity
3. Level of service failures
4. Outdated functionality
5. Cost or economic impact

A summary of the current Capital Improvement Program is presented in Table 7-1 and Table 7-2. A detailed cost breakdown of the recommended improvements cost is provided in Appendix C. Since the expected needs of the utility will change each year, the CIP plan will be updated to reflect those changes.

Table 7-1 Short Term Capital Improvement Projects (5 Years)

Item	Description	Type of Project	Cost
1	Distribution Mains	Replace Concrete & Undersized Mains	\$11,470,000
2	Hydrants	Replace	\$100,000 ¹
3	Valves	Replace	\$35,000 ¹
4	Customer Meters	Replace	\$200,000 ¹
5	Water Treatment Plant Upgrades	New	\$21,150,000
6	Storage Tanks Cleaning/Painting	Maintenance	\$900,000
TOTAL			\$33,855,000

¹ Replacement by Township of Moorestown Public Works

Table 7-2 Long Term Capital Improvement Projects (2021 – 2025)

Item	Description	Type of Project	Cost
1	Eliminate Concrete Mains, Undersized Mains & Clean and Line Unlined Mains	Replace	\$17,515,000
2	Hydrants	Replace	\$100,000 ²
3	Valves	Replace	\$35,000 ²
4	Customer Meters	Replace	\$200,000 ²
TOTAL			\$17,850,000

² Replacement by Township of Moorestown Public Works

8.0 Financial Management Strategy

This section describes the Township of Moorestown's strategy for financing improvements to its water system. Capital costs are one-time expenses incurred to install new facilities and replace or upgrade existing facilities to provide increased capacity or comply with regulatory standards.

Capital expenditures can be financed through municipal bonds. The Township will review its financing options on a yearly basis to determine the most cost effective method of funding the capital improvements. User fees will be adjusted as necessary to fund the projects via the selected financing option. Table 8-1 identifies the Township's yearly planned revenues, appropriations and surpluses.

Table 8-1 Water and Sewer (2016-2020) Utility Asset Management Plan

	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>
REVENUES:					
Surplus Anticipated	\$ 2,794,000	\$ 2,190,500	\$ -	\$ 553,000	\$ 687,000
Water Rents	4,550,000	5,080,000	5,300,000	5,600,000	5,600,000
Sewer Rents	3,150,000	3,158,000	3,300,000	3,450,000	3,450,000
Other Revenues	606,000	671,500	658,000	660,000	670,000
Total Revenues	\$ 11,100,000	\$ 11,100,000	\$ 9,258,000	\$ 10,263,000	\$ 10,407,000

	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>
Appropriations:					
Operating Expenses:					
Salaries & Wages	\$ 1,941,529	\$ 1,978,007	\$ 2,020,000	\$ 2,050,000	\$ 2,081,000
Purchase of Water	3,766,994	4,000,000	2,200,000	2,255,000	2,312,000
Other Expenses	3,206,926	2,917,976	2,948,000	2,977,500	3,007,500
Statutory Expenses	346,624	348,808	360,000	370,500	381,500
Deferred Charges	-	856,600	-	-	-
Capital Improvements	947,500	167,500	200,000	200,000	200,000
Debt Service	890,427	831,109	1,530,000	2,410,000	2,425,000
Total Appropriations	\$ 11,100,000	\$ 11,100,000	\$ 9,258,000	\$ 10,263,000	\$ 10,407,000

Projected Year-end Surplus	\$ 5,510,722	\$ 4,220,222	\$ 4,720,222	\$ 4,500,000	\$ 4,000,000
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Utility Consumption Rates	<u>2016</u>	<u>2017*</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>
Water rates:					
<25,000 Gal/Qtr	\$ 3.00	\$ 3.50	\$ 3.50	\$ 3.50	\$ 3.50
>25,000<50,000 Gal/Qtr	\$ 6.50	\$ 7.15	\$ 7.15	\$ 7.15	\$ 7.15
>50,000 Gal/Qtr	\$ 6.90	\$ 7.60	\$ 7.60	\$ 7.60	\$ 7.60
Irrigation Lines:					
<50,000 Gal/Qtr	\$ 6.50	\$ 7.15	\$ 7.15	\$ 7.15	\$ 7.15
>50,000 Gal/Qtr	\$ 6.90	\$ 7.60	\$ 7.60	\$ 7.60	\$ 7.60
Sewer Rate	\$ 5.00	\$ 5.50	\$ 5.50	\$ 5.50	\$ 5.50

* Proposing to have rate increase effective 3rd quarter 2017.

9.0 Action Plan

The Township of Moorestown Public Works - Water and Sewer Utility Asset Management Plan refers to many objectives, targets, maintenance and improvements for the utility. Table 9-1 brings all these items together to clearly identify the actions required to successfully implement the Asset Management Plan.

Table 9-1 Action Plan

Urgency	Issue	Action Plan	Year	Status
<i>Highest Priority</i>				
High	Reduce distribution system unaccounted for water.	Replace residential customer meters	2020	In Progress
Low	Continue DBP Levels below 80% of the MCL.	Flush distribution system mains.	Annually	In Progress
High	Improve water quality	Flush distribution system mains, replace concrete and undersized mains.	Annually	In Progress
High	Improve water quality	Respond to complaints. Reduce complaints by identifying causes and related issues	Annually	In Progress
High	Improve water quality and pressure	Install larger mains and loop and eliminate dead ends.	Annually	In Progress
High	Firm capacity does not meet NJDEP requirements. Improve source water quality	Upgrade Water Treatment Plants	2015-2020	In Progress
High	Maintain water storage equipment	Clean and Paint Storage Tanks	2020	In Progress
<i>Lesser Priority</i>				

Medium	Extend service life of water mains, reduce pressure loss and water quality complaints.	Implement program to clean and line water mains.	2030	Proposed
Medium	Maintain distribution equipment	Inspect hydrants twice per year. Replace hydrants, valves, and meters as needed.	Annually	In Progress

9.1 Review Schedule

The Township of Moorestown Public Works - Water and Sewer Utility intends to review and update this plan annually.

APPENDICES

Appendix A Memorandum of Agreement

Appendix B Water Quality Report

Appendix C Details of Improvements

Appendix D System Attributes and Performance Indicators

APPENDIX A
MEMORANDUM OF AGREEMENT

**MEMORANDUM OF AGREEMENT
BETWEEN
THE TOWNSHIP OF MOORESTOWN AND
THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL
PROTECTION
Dated: April 27, 2015**

Purpose

This Memorandum of Agreement ("MOA" or "Agreement") between the New Jersey Department of Environmental Protection ("Department") with offices at 401 E. State Street, Trenton, New Jersey, 08625, and the Township of Moorestown, a municipal corporation of the State of New Jersey, Burlington County, New Jersey, with offices at 111 West 2nd Street, Moorestown, New Jersey 08057. ("Moorestown"), allows for Moorestown to proceed with water service connections for certain development projects, conditioned on Moorestown addressing its water allocation and water supply firm capacity deficits by undertaking water system infrastructure improvements and related actions specified in this MOA.

RECITALS

A. WHEREAS, this MOA is entered into pursuant to the authority vested in the Department by N.J.S.A. 13:1D-1 et seq.; the Water Supply Management Act, N.J.S.A. 58:1A- et seq., and the regulations promulgated pursuant thereto, N.J.A.C. 7:19-1 et seq.; the New Jersey Safe Drinking Water Act, N.J.S.A. 58:12A-1 et seq., and the regulations promulgated pursuant thereto, N.J.A.C. 7:10-1.1 et seq. and duly delegated to the Director, Division of Water Supply & GeoScience; and

B. WHEREAS, the Moorestown public water system supplies its customers with potable water pursuant to Potable Water System ID No. 0322001 and Water Allocation Permit No. 5121,

having diversion limits of 917 million gallons per year ("mgy") and 150 million gallons per month ("mgm") from all sources and 392 mgy from Well Nos. 3, 4, 5, 6 and 8 (Critical Area 2 – Depleted PRM Sources), which expires on July 31, 2023; and

C. WHEREAS, firm capacity calculated pursuant to N.J.A.C. 7:10-11.5(e)1 provides resiliency to water systems that protects public health and safety in the event of failure of major components of potable water supply systems; and

D. WHEREAS, the Department finds that Moorestown has a current 1.368 mgd firm capacity deficit (with Well Nos. 7 and 9 fully operable at their approved capacities) which exposes its users to the possibility of interruption in service in the event its largest pumping or treatment unit is out of service; and

E. WHEREAS, the Department also finds that Moorestown does not have any available monthly allocation based on current peak monthly demands and committed but not yet completed development projects; and

F. WHEREAS, N.J.A.C. 7:10-11.10(b)4 and (c) precludes the addition of water connections or extensions if a water system's demands exceed either its firm capacity or water allocation limits (including bulk purchase water agreements with another system); and

G. WHEREAS, on September 24, 2013 the Department issued Moorestown a letter prohibiting further water main extensions or connections because of a firm capacity deficit in Moorestown's water system and limited available monthly allocation; and

H. WHEREAS, on May 21, 2012 Moorestown entered into Amendment No. 5 of the regional water sales agreement ("Contract") with New Jersey American Water ("NJAW") to purchase 0.896 mgd, 27,773 mgm and 327 mgy of water on a routine basis; and

I. WHEREAS, historically, during the peak demand summer months, Moorestown has required and NJAW has provided more water on a daily and monthly basis than is included in the Contract; and

J. WHEREAS, NJAW has sufficient capacity beyond the Contract amounts to serve the demands required by Moorestown, including the development projects identified in Exhibit A as attached hereto, until Moorestown resolves its firm capacity and monthly water supply allocation deficits under this MOA; and

K. WHEREAS, on December 19, 2014, a meeting was held with representatives of Moorestown and the Department, to discuss Moorestown's needed infrastructure improvements to address its water supply allocation and firm capacity deficits and potential water supply connections for developments; and

L. WHEREAS, Moorestown agreed to develop and implement plans and schedules as set forth in paragraph 3 through 6 below for infrastructure improvements to address Moorestown's water allocation and water supply firm capacity deficits; and

M. WHEREAS, Moorestown's plan will provide for the design, permitting and the completion of upgrades to its treatment facilities; and the submittal of an application for a major modification of Water Allocation Permit No. 5121 to increase its monthly allocation; and

N. WHEREAS, on March 17, 2015 Moorestown provided the Department an updated listing of proposed projects, most which are single family homes, planned for Moorestown and some of the projects could be ready to commence construction by year 2015; and

O. WHEREAS, construction of the projects cannot proceed without water service connection approvals by Moorestown; and

P. WHEREAS, Moorestown has adopted an outdoor water use ordinance which limits lawn watering and other outdoor water uses and which can be implemented upon a declaration of a water emergency by Moorestown; and

Q. WHEREAS, Moorestown's commitment to ongoing system improvements set forth in paragraphs 3 through 6 below; its proposed increased monthly water supply allocation; the contract with NJAW which it can modify to purchase additional water; and water conservation measures, warrant the Department allowing water supply connections, provided Moorestown complies with the provisions set forth below in this MOA as determined by the Department.

NOW THEREFORE, IT IS AGREED THAT:

AGREEMENT/CONDITIONS

1. The foregoing recital clauses are incorporated herein.
2. Moorestown agrees to submit a complete application for a major modification of its Water Allocation Permit No. 5021 by May 1, 2015 to request an increase to the existing monthly allocation established from existing ground water sources of 150 mgm.
3. Moorestown agrees to submit an engineering evaluation and corrective action plan by May 1, 2015 which specifies the measures and staffing needed to enable its Kings Highway and

Hartford Road treatment plants to treat and to be operated to produce water at their approved design capacities of 2.268 mgd and 2.016 mgd respectively. The water supplied from each facility must be in full compliance with all primary and secondary drinking water standards. The plan shall include a detailed implementation schedule.

4. Moorestown agrees to implement the plan for the Kings Highway and Hartford Road treatment plants in accordance with the schedule provided therein.
5. Moorestown agrees to submit an engineering evaluation and corrective action plan by August 1, 2015 which specifies the measures to be constructed to enable the North Church Street treatment plant to produce water in full compliance with all primary and secondary drinking water standards (for manganese, trichloroethylene, gross alpha particle activity and combined radium, 226 and 228) at its approved design capacity of 2.880 mgd. The plan shall include a detailed implementation schedule.
6. Moorestown agrees to implement the plan for the North Church Street treatment plant in accordance with the schedule provided therein.
7. Moorestown agrees to submit for Department review and approval, by August 1, 2015, an Asset Management Plan for its water system including a schedule for implementation of the Plan. The Plan provides a tool to ensure that annual revenue reserves and reinvestment are sufficient to facilitate long-term viability of the water system. The Plan should include: undertaking an inventory and condition assessment of its water system's assets; defining system level of service goals; identifying critical/vulnerable assets; establishing life cycle costs of each asset, and developing a long-term funding strategy.

8. Moorestown agrees to implement the Asset Management Plan in accordance with the schedule provided therein upon the Department's approval of the Plan.
9. Moorestown agrees to expand its current water conservation opportunities including, but not limited to, adopting a water use restriction ordinance which limits irrigation to a two day per week watering schedule and restricting hours of lawn irrigation. An example of a suitable ordinance can be found at the Sustainable Jersey web site, <http://www.sustainablejersey.com>,
10. Moorestown agrees to submit a written progress report describing its efforts to adopt a water use restriction ordinance by May 31, 2015.
11. Moorestown agrees to test its emergency water supply system interconnections in accordance with N.J.A.C. 7:19-6.9 to help ensure the interconnections remain operational and available in the event of an emergency.
12. Moorestown agrees to comply with the monthly and annual water allocation limits as specified in its Water Allocation Permit No. 5121 at all times.
13. Moorestown agrees to resolve its firm capacity deficit of 1.368 mgd and its monthly allocation deficit by January 1, 2020 to ensure that an adequate supply is available to serve its current customers and those connections identified in Exhibit A.
14. The Department agrees to process a request if submitted by Moorestown, for an interim, one-year increase to the existing annual water allocation limitation of 392 mgd for wells 3, 4, 5, 6 and 8 which are depleted PRM sources located in Critical Area 2.

15. a. Upon Moorestown's execution of this MOA, the Department agrees Moorestown may approve additional water connections or extensions for projects that do not require a permit from the Department pursuant to N.J.A.C. 7:10-11.10(b), and the Department agrees to process water main extension permit applications submitted in accordance with N.J.A.C. 7:10-11.10(b), provided that the total peak day water demand does not exceed 40,000 gpd.

b. Upon written determination by the Department that Moorestown has satisfactorily addressed the requirements specified in paragraphs 2, 3, 9 and 10 above, the Department agrees Moorestown may approve additional water connections or extensions that do not require a permit from the Department, and the Department agrees to process water main extension permit applications submitted in accordance with N.J.A.C. 7:10-11.10(b), provided that the total peak day water demand of all projects, including the allotment referenced in 15.a. above, does not exceed 70,000 gpd.

c. Upon written determination by the Department that Moorestown has satisfactorily addressed the requirements specified in paragraphs 5 and 7 above, the Department agrees Moorestown may approve additional water connections or extensions that do not require a permit from the Department, and the Department agrees to process water main extension permit applications in accordance with N.J.A.C. 7:10-11.10(b), provided that the total peak day water demand of all projects, including the allotments referenced in 15.a. and b. above, does not exceed 100,000 gpd.

d. Upon satisfactorily satisfying 15 a. b. and c. above, for each incremental increase in firm capacity of 0.500 mgd, Moorestown may approve additional water connections or extensions that do not require a permit from the Department, and the Department agrees to process water main extension permit applications in accordance with N.J.A.C. 7:10-11.10(b), in the amount of 0.1 mgd.

Events	Firm Capacity (mgd)	Firm Capacity Deficit/Surplus (mgd)	Allowable New Demand - peak day (mgd)	Firm Capacity Deficit/Surplus - based on additional project demands (mgd)
Execution of the MOA	4.376	-1.368	0.04	-1.408
Satisfied requirements of Paragraphs 2, 3, 9, and 10	4.376	-1.408	0.03	-1.438
Satisfied requirements of Paragraphs 5 and 7	4.376	-1.438	0.03	-1.468
Increase in Firm Capacity of 0.5 mgd	4.876	-0.968	0.10	-1.068
Additional Increase in Firm Capacity of 0.5 mgd	5.376	-0.568	0.10	-0.668
Additional Increase in Firm Capacity of 0.5 mgd	5.876	-0.168	0.10	-0.268
Increase in Firm Capacity	6.254	0		

16. Moorestown may substitute, in its sole discretion, other development projects for those identified in its list dated March 13, 2015 attached hereto as Exhibit A and made a part hereof, including connections for single family residences on pre-existing individual lots which may or may not require a water main extension permit pursuant to N.J.A.C. 7:10-11.10(b).

17. Within 30 calendar days after providing water service connections to each project or portions thereof or residences pursuant to Paragraph 15, Moorestown shall notify the Department in writing: the name/location of the project; portions, or residence(s); the number of connections; the projected average day and peak day water demand for the project or residence(s); and the basis for the calculation of the water demand in accordance with N.J.A.C. 7:10-11.5(e).

18. No additional connections beyond those described herein shall be made until such time as the Department determines in writing that the firm capacity and water allocation deficits have been resolved by Moorestown.

19. Moorestown shall notify the Department in writing within seven (7) calendar days after Moorestown or its consultant become aware of any delay or anticipated delay, regarding the meeting of the requirements of this MOA. The notice shall describe the anticipated length of the delay, the precise cause or causes of the delay, any measures taken or to be taken to minimize the delay, and the time required to take any such measures to minimize the delay. Moorestown agrees to take all necessary action to prevent or minimize any such delay. The Department shall extend the time for performance for a period no longer than the delay resulting from such circumstances, unless the delay is a result of any event specified in paragraph 21 below of this MOA, or the Department agrees in writing to further extend the time for performance for good cause.

20. The following individual shall be the Moorestown contact for the Department:

Russell Trice - Township Engineer,

Telephone: (609) 267-8310 ext. 259 Fax #: (609) 267-7452

E-mail: rtrice@alaimogroup.com

The Alaimo Group

200 High Street

Mt. Holly, NJ 08060

The follow individuals shall be the Department's contacts for Moorestown:

Eugene Callahan,

Telephone: 609-292-2957, Fax: 609-633-1495,

E-mail: eugene.callahan@dep.nj.gov

Department of Environmental Protection, Mail Code 401-04Q,

Division of Water Supply & Geoscience,

Water Systems Operations Element, Bureau of Water System Engineering,

401 E. State Street - P.O. Box 420

Trenton, NJ 08625

AND

Jennifer Myers,

Telephone: 609-984-6831, Fax: 609-633-1231,

E-mail: Jennifer.myers@dep.nj.gov

Department of Environmental Protection, Mail Code 401-04Q,

Division of Water Supply & Geoscience,

NJ Geological and Water Survey Element,
Bureau of Water Allocation & Well Permitting
401 E. State Street - P.O. Box 420
Trenton, NJ 08625

21. Moorestown will not be in default of any provision of this Agreement, or liable for failures in performance resulting from the following force majeure acts or events: acts of God, civil or military authority; civil disturbance; war, strikes, fires, earthquakes, other catastrophes beyond the control of Moorestown as determined by the Department. The burden of proving that any delay is caused by circumstances beyond the control of Moorestown and the length of such delay attributable to those circumstances shall rest with Moorestown. If the Department determines that either Moorestown has not complied with the notice requirements of the preceding paragraph, or the event causing the delay is not beyond the control of Moorestown, failure to comply with the provisions of this Agreement shall constitute a breach of this Agreement.

22. This Agreement shall supersede the Department's letter dated September 24, 2013 to Moorestown.

23. If the Department determines in writing that Moorestown is not making sufficient, timely progress in meeting the tasks set forth in this Agreement, the Department may unilaterally terminate this Agreement if Moorestown fails to rectify any such deficiencies within 60 days after receipt of written notice by the Department.

24. Notwithstanding any other provision of this MOA, if the Department determines in writing that the public health and safety is at risk because of Moorestown's firm capacity and/or allocation deficit, the Department, after providing ten (10) days for Moorestown to respond to the Department in writing with the basis as to why Moorestown has determined that public health and safety is not at risk, may unilaterally terminate this Agreement and/or require Moorestown to take all actions necessary to correct the firm capacity and/or allocation deficit. This may include ordering Moorestown to modify its existing contract, impose mandatory water restrictions, and/or the execution of a water purchase agreement that guarantees Moorestown will purchase and the water provider will deliver additional water sufficient to meet the demands of the Moorestown public water system as determined by the Department and/or requiring Moorestown to take or arrange for the taking of any and all additional action in accordance with N.J.A.C. 7:19-1-1 et seq. and N.J.A.C. 7:10-1-1 et seq. Nothing in this Agreement shall constitute a waiver by Moorestown of any statutory or common law defenses, or of its right to appeal any such action by the Department specified in this paragraph.

25. This MOA shall be governed by the laws of the State of New Jersey, and construed as if it were drafted by both parties and both parties waive all statutory and common law presumptions which would serve to have this document construed in favor, or against, either party as the drafter hereof.

26. No modifications or waivers of this MOA shall be valid except by written amendment duly executed by both parties hereto.

27. This MOA may be executed in counterparts, each of which shall be deemed an original and when taken together, shall constitute one and the same instrument.

28. Moorestown shall submit to the Department, along with the executed original MOA, the appropriate documentary evidence, such as a resolution, from the Moorestown Township Council that the signatory for Moorestown has the authority to enter into this MOA.

29. This MOA shall become effective upon the execution by both parties hereto.

ENTIRE AGREEMENT

The provisions contained herein or incorporated herein by reference constitute the entire Agreement between the parties and supersede all previous communications or representations, either verbal or written, between the parties hereto with respect to the subject matter hereof.

EFFECTIVE DATE AND TERMINATION

This Agreement shall take effect upon approval and signature by the authorized representatives of both parties, and shall remain in effect, unless the Department terminates this Agreement pursuant to paragraph 23, until Moorestown completes all actions necessary to fully comply with the requirements of this Agreement, or until January 1, 2020, whichever occurs first.

IN WITNESS WHEREOF, the parties have caused their duly authorized representatives to execute this Agreement on and as of the day and year first written above. This Agreement shall be executed in two original copies for each party.

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

DATE: 9/30/15

BY: 
Fred Sickels, Director
Division of Water Supply & GeoScience

TOWNSHIP OF MOORESTOWN

DATE: 9/28/15

BY: 
Scott Carew, Township Manager

EXHIBIT A

Listing of all known projects with an associated water demand needing approval to connect

Dated 3/13/15 – Received 3/17/15

Project Name	Brief Description	Criteria Utilized	Unit Description	Number of Units	Demand /Unit (gpd)	ADD (gpd)	Peak Demand (gpd)	Calculated Monthly Demand (MGM)	Calculated Yearly Demand (MGY)
225 Cedar St.	2200/4 Residential	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	1	395	395	1185	0.018	0.144
730 Garwood	7100/15 Residential (using existing well)	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	1	395	395	1185	0.018	0.144
Ravikio	13 Lots Residential - 1 existing home, 2 already stubbed out.	NJAC 5:21-5.3 Table 5.1	Single Family 5 Bedroom	13	475	6175	18525	0.273	2.254
Paparone (Apple Ln.)	3 lots Residential	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	3	395	1185	3555	0.053	0.433
37 Robin Rd.	3701/11 Residential (Stubbed out, part of Tember Qpft Dev. 1960's)	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	1	395	395	1185	0.018	0.144
Herb	4801/11.01 Residential	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	1	395	395	1185	0.018	0.144
Jaffee/Dey (Not Approved)	22 (two bdrm) 4 (one bdrm)	NJAC 5:21-5.3 Table 5.1	Apartment 2 Bedroom	22	175	3850	11550	0.173	1.405
	26 Apartments		Apartment 1 Bedroom	4	120	480	1440	0.022	0.175

Lutheran Home	1 bed/unit (assisted living)	NJAC 7:10-12.6 Table 1	Nursing Home	14	175	2450	7350	0.110	0.894
O'Conner Parker Ave.	2 Lots (from 1 Demol) 402 Parker, using existing	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	1	395	395	1185	0.018	0.144
Moorestown Farms	7403/2.20 & 2.21 Residential	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	2	395	790	2370	0.036	0.288
Moorestown Farms	3 Lots remain Residential (Stubbed out)	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	3	395	1185	3555	0.053	0.433
Creitz	5 TH Units (three bedrms) 15 E. Camden (Res)	NJAC 5:21-5.3 Table 5.1	Townhomes 3 Bedroom	5	210	1050	3150	0.047	0.383
JVS	126 & 128 Plum St. (Res.)	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	2	395	790	2370	0.036	0.288
Nelson	2 Lots remaining McElwee Rd. Res.	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	2	395	790	2370	0.036	0.288
Maines	1902/13.01 & 13.02 Camden Ave. Res.	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	2	395	790	2370	0.036	0.288
Martin	5602/28	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	1	395	395	1185	0.018	0.144
Zalkind	1 Lot 125 Mt Laurel Rd. Res.	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	1	395	395	1185	0.018	0.144
Freyrik	2 Lots S. Church St. Res.	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	2	395	790	2370	0.036	0.288

Weinstein	8100/2.01 McElwee Rd. Res.	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	1	395	395	1185	0.018	0.144
D'Paqlo	2 Lots Garwood Rd. Res.	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	2	395	790	2370	0.036	0.288
Dawson Street	2 Lots residential (426&507)	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	2	395	790	2370	0.036	0.288
877 Golfview	4200/46 & 48	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	1	395	395	1185	0.018	0.144
Benardella	1 lot Residential access from Walton Farm	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	2	395	790	2370	0.036	0.288
	Tom Brown Road- 35 Residential Lots	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	15	395	5925	17775	0.267	2.163
	Bethel-1 Residential lot	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	1	395	395	1185	0.018	0.144
	615 New Albany Road- 1 Residential Lot	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	1	395	395	1185	0.018	0.144
	6505/14- 16,000 SF Retail Marter and Main Street	NJAC 7:10- 12.6 Table 1	Retail	16000	0.125	2000	6000	0.090	0.730
	Republic Bank, 230 Marter Av	NJAC 7:10- 12.6 Table 1	Retail	5000	0.125	625	1875	0.028	0.228
	Toll- 70 Units	NJAC 5:21- 5.3 Table 5.1	Apartment 3 Bedroom	70	270	18900	56700	0.851	6.899
Andrews	1 Lot residential	NJAC 5:21- 5.3 Table 5.1	Single Family 4 Bedroom	1	395	395	1185	0.018	0.144

Total Water Average Daily Demand
Total Water Peak

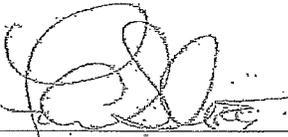
54885			
164655	2470		20,033

Note: the water demand calculations shown above were supplied by Moorestown. Their inclusion in this exhibit is not an endorsement by NJDEP. NJDEP reserves the right to revise the calculated demands.

IN WITNESS WHEREOF, the parties have caused their duly authorized representatives to execute this Agreement on and as of the day and year first written above. This Agreement shall be executed in two original copies for each party.

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

DATE: 9/30/15

BY: 

Fred Sickels, Director
Division of Water Supply & GeoScience

TOWNSHIP OF MOORESTOWN

DATE: 9/28/15

BY: 

Scott Carew, Township Manager

EXHIBIT A

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Dated 3/13/15 - Received 3/17/15

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Ravido	13 Lots Residential - 1 existing home, 2 already stubbed out.	NJAC 5:21-5.3 Table 5.1	Single Family 5 Bedroom	13	475	6175	18525	0.278	2.254
Paparone (Apple Ln.)	3 Lots Residential	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	3	395	1185	3555	0.053	0.433
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Herb	4801/11.01 Residential	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	1	395	395	1185	0.018	0.144
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	26 Apartments		Apartment 1 Bedroom	4	120	480	1440	0.022	0.175

Lutheran Home	1 bed/unit (assisted living)	NJAC 7:16-12.6 Table 1	Nursing Home	14	175	2450	7350	0.110	0.894
O'Connor Parker Ave.	2 Lots (from 1 Demo) 402 Parker, using existing	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	1	395	395	1185	0.018	0.144
Moorestown Farms	7403/2.20 & 2.21 Residential	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	2	395	790	2370	0.036	0.288
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M/S.	126 & 128 Plum St. (Res.)	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	2	395	790	2370	0.036	0.288
Nelson	2 Lots remaining McElwee Rd., Res.	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	2	395	790	2370	0.036	0.288
Matrjes	1902/13.01 & 13.02 Camden Ave. Res.	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	2	395	790	2370	0.036	0.288
Martin	5602/28	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	1	395	395	1185	0.018	0.144
Zalkind	1 Lot 125 Mt Laurel Rd. Res.	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	1	395	395	1185	0.018	0.144
Freynik	2 Lots S. Church St. Res.	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	2	395	790	2370	0.036	0.288

Welshstein	8100/2.01 McElwee Rd. Res.	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	1	395	395	1185	0.018	0.144
D'Paolillo	2 Lots Garwood Rd. Res.	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	2	395	790	2370	0.036	0.288
Dawson Street	2 Lots Residential (4268507)	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	2	395	790	2370	0.036	0.288
877 Golfview	4200/46 & 48	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	1	395	395	1185	0.018	0.144
Benardella	1 Lot Residential access from Walton Farm	NJAC 5:21-5.3 Table 5.1	Single Family 4 Bedroom	2	395	790	2370	0.036	0.288
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	Republic Bank, 230 Marler Av	NJAC 7:10- 12.6 Table 1	Retail	5000	0.125	625	1875	0.028	0.228
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Andrews	1 Lot residential	NJAC 5:21- 5.3 Table 5.1	Single Family 4 Bedroom	1	395	395	1185	0.018	0.144

Total Water Average Daily Demand

54885			
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Total Water Peak

164655	2470	20.033	
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Note: the water demand calculations shown above were supplied by Maorestown. Their inclusion in this exhibit is not an endorsement by NJDEP. NJDEP reserves the right to revise the calculated demands.

APPENDIX B
WATER QUALITY REPORT



Presented By
Township of Moorestown

ANNUAL
WATER
QUALITY
REPORT WATER TESTING
PERFORMED IN 2014

Our Mission Continues

We are proud to present once again our annual water quality report covering all testing performed between January 1 and December 31, 2014. Most notably, last year marked the 40th anniversary of the Safe Drinking Water Act (SDWA). This rule was created to protect public health by regulating the nation's drinking water supply. We celebrate this milestone as we continue to manage our water system with a mission to deliver the best quality drinking water. By striving to meet the requirements of SDWA, we are ensuring a future of healthy, clean drinking water for years to come.

Please let us know if you ever have any questions or concerns about your water.

Water Conservation

You can play a role in conserving water and saving yourself money in the process by becoming conscious of the amount of water your household is using and by looking for ways to use less whenever you can. It is not hard to conserve water. Here are a few tips:

- Automatic dishwashers use 15 gallons for every cycle, regardless of how many dishes are loaded. So get a run for your money and load it to capacity.
- Turn off the tap when brushing your teeth.
- Check every faucet in your home for leaks. Just a slow drip can waste 15 to 20 gallons a day. Fix it and you can save almost 6,000 gallons per year.
 - Check your toilets for leaks by putting a few drops of food coloring in the tank. Watch for a few minutes to see if the color shows up in the bowl. It is not uncommon to lose up to 100 gallons a day from an invisible toilet leak. Fix it and you save more than 30,000 gallons a year.
 - Use your water meter to detect hidden leaks. Simply turn off all taps and water using appliances. Then check the meter after 15 minutes. If it moved, you have a leak.

Where Does My Water Come From?

Your drinking water comes from a blend of sources that may include groundwater from the Potomac-Raritan-Magothy Aquifer and surface water from the Delaware River. Moorestown Township purchases surface water from New Jersey American Water.

Substances That Could Be in Water

To ensure that tap water is safe to drink, the U.S. EPA prescribes regulations limiting the amount of certain contaminants in water provided by public water systems. U.S. Food and Drug Administration regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of these contaminants does not necessarily indicate that the water poses a health risk.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals, in some cases, radioactive material, and substances resulting from the presence of animals or from human activity. Substances that may be present in source water include:

Microbial Contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, or wildlife;

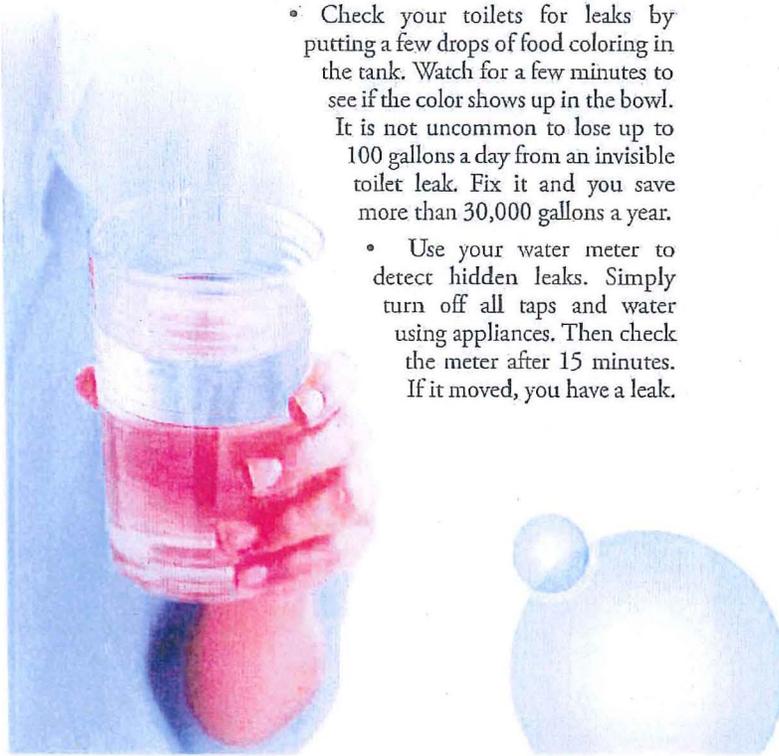
Inorganic Contaminants, such as salts and metals, which can be naturally occurring or may result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming;

Pesticides and Herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses;

Organic Chemical Contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production and may also come from gas stations, urban stormwater runoff, and septic systems;

Radioactive Contaminants, which can be naturally occurring or may be the result of oil and gas production and mining activities.

For more information about contaminants and potential health effects, call the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.



Lead in Home Plumbing

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. We are responsible for providing high-quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at www.epa.gov/safewater/lead.

Source Water Assessment

SWAP (Source Water Assessment Program) is a program of the New Jersey Department of Environmental Protection (NJDEP) to study existing and potential threats to the quality of public drinking water sources throughout the state. Sources are rated depending upon their contaminant susceptibility.

DEP considered all surface water highly susceptible to pathogens; therefore, all intakes received a high rating for the pathogen category. For the purpose of the Source Water Assessment Program, radionuclides are more of a concern for ground water than surface water. As a result, surface water intakes' susceptibility to radionuclides was not determined and a low rating was assigned.

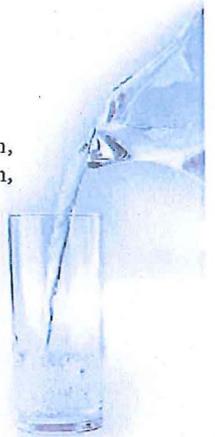
For susceptibility ratings of purchased water, refer to the specific water system's source water assessment report. Source Water Assessment Reports, Definitions, and Summaries are available for public water systems at www.state.nj.us/dep/swap/ or by contacting the NJDEP's Bureau of Safe Drinking Water at (609) 292-5550.

If a system is rated highly susceptible for a contaminant category, it does not mean a customer is or will be consuming contaminated drinking water. The rating reflects the potential for contamination of source water, not the existence of contamination. Public water systems are required to monitor for regulated contaminants and to install treatment if any contaminants are detected at frequencies and concentrations above allowable levels. As a result of the assessments, NJDEP may customize (change existing) monitoring schedules based on the susceptibility ratings.

Water Treatment Procedures

Kings Highway Treatment Plant: Aeration, Ph adjustment with hydrated lime, sedimentation, filtration and chlorine gas chlorination.

North Church Street Treatment Plant: Sequestration/Corrosion Control, aeration, ph adjustment with hydrated lime, chlorine gas chlorination.



Missed Monitoring

The Township was to monitor for nitrate for the North Church Street water treatment plant for the period 1/1/2014 through 12/31/2014. Our system was required to submit the samples between 1/1/2014 and 3/31/2014. The sample was collected on 2/12/2014 by the Township for analysis by our contract laboratory. Unfortunately, the laboratory lost the nitrate sample. The sample was retaken on 5/22/2014 with a result of 4.06 ppm.

QUESTIONS?

We want you to be informed about your drinking water. For more information about this report, or for any questions relating to your drinking water, please call Bill Butler at the Moorestown Township Department of Public Works at (856) 235-3520.

Sampling Results

During the past year we have taken hundreds of water samples in order to determine the presence of any radioactive, biological, inorganic, volatile organic or synthetic organic contaminants. The table below shows only those contaminants that were detected in the water. The state requires us to monitor for certain substances less than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent sample data are included, along with the year in which the sample was taken.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants may be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The U.S. EPA/CDC (Centers for Disease Control and Prevention) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline at (800) 426-4791.

REGULATED SUBSTANCES ¹									
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	Moorestown Township		Delaware River Regional WTP		VIOLATION	TYPICAL SOURCE
				AMOUNT DETECTED	RANGE LOW-HIGH	AMOUNT DETECTED	RANGE LOW-HIGH		
1,1-Dichloroethane (ppb)	2014	50	NA	0.06	ND-0.06	NA	NA	No	Discharge from metal degreasing sites and other factories
1,1-Dichloroethylene (ppb)	2014	2	2	0.100	ND-0.100	NA	NA	No	Discharge from industrial chemical factories
1,2-Dichloropropane (ppb)	2014	5	0	0.160	ND-0.160	NA	NA	No	Discharge from industrial chemical factories
Alpha Emitters ² (pCi/L)	2014	15	0	17.40	17.40-17.40	NA	NA	No	Erosion of natural deposits
Barium (ppm)	2014	2	2	0.0830	0.0310-0.0830	NA	NA	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Bromate (ppb)	2014	10	0	NA	NA	7	ND-7	No	By-product of drinking water disinfection
Chlorine (ppm)	2014	[4]	[4]	0.52	0.20-0.52	1.83 ³	0.52-1.83	No	Water additive used to control microbes
Chromium (ppb)	2014	100	100	NA	NA	1.8	0.8-1.8	No	Discharge from steel and pulp mills; Erosion of natural deposits
Combined Radium ⁴ (pCi/L)	2014	5	0	5.45	5.45-5.45	NA	NA	No	Erosion of natural deposits
Haloacetic Acids [HAA]-Stage 2 (ppb)	2014	60	NA	12.89	ND-12.89	NA	NA	No	By-product of drinking water disinfection
Nickel (ppb)	2014	100	NA	10.4	ND-10.4	NA	NA	No	Pollution from mining and refining operations; natural occurrence in soil
Nitrate (ppm)	2014	10	10	4.06	ND-4.06	1.14	1.14-1.14	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
TTHMs [Total Trihalomethanes]-Stage 2 (ppb)	2014	80	NA	35.5	ND-35.5	NA	NA	No	By-product of drinking water disinfection
Tetrachloroethylene (ppb)	2014	1	0	0.250	ND-0.250	NA	NA	No	Discharge from factories and dry cleaners
Total Organic Carbon (removal ratio)	2014	TT	NA	NA	NA	2.01	1.25-2.01	No	Naturally present in the environment
Trichloroethylene (ppb)	2014	1	0	0.72	0.59-0.72	NA	NA	No	Discharge from metal degreasing sites and other factories
Turbidity (NTU)	2014	TT	NA	NA	NA	0.13 ⁵	ND-0.13	No	Soil runoff
Turbidity (Lowest monthly percent of samples meeting limit)	2014	TT=95% of samples <0.3 NTU	NA	NA	NA	100	NA	No	Soil runoff

Tap water samples were collected for lead and copper analyses from sample sites throughout the community

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AL	MCLG	AMOUNT DETECTED (90TH%TILE)	SITES ABOVE AL/ TOTAL SITES	VIOLATION	TYPICAL SOURCE
Copper (ppm)	2014	1.3	1.3	0.0731	0/33	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2014	15	0	5.4	2/33	No	Corrosion of household plumbing systems; Erosion of natural deposits

SECONDARY SUBSTANCES - MOORESTOWN TOWNSHIP

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	RUL	MCLG	AMOUNT DETECTED	RANGE LOW-HIGH	EXCEEDANCE	TYPICAL SOURCE
Manganese ⁶ (ppb)	2014	50	NA	116	ND-116	Yes	Leaching from natural deposits

UNREGULATED SUBSTANCES - MOORESTOWN TOWNSHIP

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
1,2,3-Trichloropropane (ppb)	2014	0.067	0.066-0.067	Halogenated alkane, used as an ingredient in paint, varnish remover, solvents and degreasing agents.
Bromodichloromethane (ppb)	2014	0.540	ND-0.540	By-product of drinking water disinfection
Bromoform (ppb)	2014	0.200	ND-0.200	By-product of drinking water disinfection
Chloroform (ppb)	2014	0.0800	ND-0.0800	By-product of drinking water disinfection
Dibromochloromethane (ppb)	2014	0.570	ND-0.570	By-product of drinking water disinfection

OTHER SUBSTANCES - DELAWARE RIVER REGIONAL WTP

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Hexavalent Chromium (ppb)	2013/2014	1.06	0.65-1.22	Naturally occurring element; used in making steel and other alloys; chromium-3 or 6 forms are used for chrome plating, dyes and pigments, leather tanning, and wood preservation.
Molybdenum (ppb)	2013/2014	1.46	1.2-1.8	Naturally occurring elemental found in ores and present in plants, animals and bacteria; commonly used from molybdenum trioxide used as a chemical reagent.
Strontium (ppb)	2013/2014	75.7	62.4-90.2	Naturally occurring element; historically commercial use of strontium has been in the faceplate glass of cathode-ray tube televisions to block x-ray emissions.

¹ Under a waiver granted on December 30, 1998, by the State of New Jersey Department of Environmental Protection, our system does not have to monitor for synthetic organic chemicals/pesticides because several years of testing have indicated that these substances do not occur in our source water. The SDWA regulations allow monitoring waivers to reduce or eliminate the monitoring requirements for asbestos, volatile organic chemicals and synthetic organic chemicals. Our system received monitoring waivers for synthetic organic chemicals and asbestos.

² Alpha Emitters – Increased risk of cancer. Erosion of natural deposits of certain minerals that are radioactive and may emit a form of radiation known as alpha radiation.

³ Data represent the lowest and highest free chlorine residual entering the distribution system from our surface water treatment plant.

⁴ Radium 226 & 228 (Combined) – Increased risk of cancer. Erosion of natural deposits.

⁵ Turbidity is a measure of the cloudiness of the water. It is monitored because it is a good indicator of the effectiveness of the filtration system. The turbidity rule requires that 95% or more of the monthly samples must be less than or equal to 0.3 NTU (no sample may exceed 1 NTU).

⁶ The recommended upper limit for manganese is based on staining of laundry. Manganese is an essential nutrient, and toxicity is not expected from high levels which would be encountered in drinking water.

Definitions

AL (Action Level): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

MCL (Maximum Contaminant Level): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

MCLG (Maximum Contaminant Level Goal): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

MRDL (Maximum Residual Disinfectant Level): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

MRDLG (Maximum Residual Disinfectant Level Goal): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

NA: Not applicable

ND (Not detected): Indicates that the substance was not found by laboratory analysis.

NTU (Nephelometric Turbidity Units): Measurement of the clarity, or turbidity, of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

pCi/L (picocuries per liter): A measure of radioactivity.

ppb (parts per billion): One part substance per billion parts water (or micrograms per liter).

ppm (parts per million): One part substance per million parts water (or milligrams per liter).

removal ratio: A ratio between the percentage of a substance actually removed to the percentage of the substance required to be removed.

RUL (Recommended Upper Limit): RULs are established to regulate the aesthetics of drinking water like taste and odor.

TT (Treatment Technique): A required process intended to reduce the level of a contaminant in drinking water.

APPENDIX C
DETAILS OF IMPROVEMENTS

**TABLE C-1
WATER DISTRIBUTION SYSTEM IMPROVEMENTS
DECEMBER 2015**

DESCRIPTION/LOCATION	APPROXIMATE MAIN LENGTH (FT)	MATERIAL OF CONSTRUCTION	EXISTING MAIN SIZE	PROPOSED MAIN SIZE	PROPOSED CONSTRUCTION DATE	PRELIMINARY PROJECT COST ESTIMATE	PRELIMINARY PROJECT COST ESTIMATE BY YEAR	
Main Replacements								
North Church Street: East Main Street to East Central Avenue	1,200	C	6	12	2016	\$850,000		
Prospect Avenue: South Church Street to High Street	1,500	C	4	8	2016	\$410,000		
West Second Street: Locust Street to Camden Avenue	1,000	C	4	12	2016	\$430,000	2016	\$1,690,000
North Church Street: East Central Avenue to East Maple Avenue	1,400	C	4	12	2017	\$887,000		
North Church Street: East Maple Avenue to New Albany Rd	3,050	GS/CI	6	12	2017	\$1,601,000	2017	\$2,488,000
Oak Avenue: Irving Court to Chester Avenue	3,400	C/CI	4 & 6	8	2018	\$1,228,000		
Third Street: North Stanwick Road to Poplar Avenue	900	C	4	8	2018	\$368,000		
Centre Street: North Lenola Road to Red Leaf Road	4,200	GS/CI	6	8	2018	\$1,301,000	2018	\$2,897,000
Plum Street: Chester Avenue to Schooley Street	450	GS/CI	2	8	2019	\$149,000		
Lorraine Road: North Church Street to end	800	GS/CI	2	6	2019	\$265,000		
Pearl Street: Linden Avenue to East Third Street	450	GS/CI	2	8	2019	\$149,000		
West Third Street: North Church Street to Collins Avenue	2,900	GS/CI	4	8	2019	\$1,157,000		
South Washington Avenue: Prospect Avenue to Harris Avenue	800	C	4	8	2019	\$265,000		
Cedar Street: North Church Street to Locust Street	750	C	4	8	2019	\$255,000	2019	\$2,240,000
Valley View Terrace: Pleasant Valley Avenue to end of Cul-de-Sac	500	GS/CI	4	6	2020	\$173,000		
Lakeview Drive: Pleasant Valley Avenue to Strafford Drive	500	GS/CI	4	8	2020	\$173,000		
Mannion Street: West Second Street to West Third Street	500	GS/CI	4	8	2020	\$173,000		
East Wilson Avenue: Grand Avenue to end	600	GS/CI	4	6	2020	\$206,000		
Walker Avenue: North Church Street to Dawson Street	700	GS/CI	4	8	2020	\$238,000		
Beech Street: Mill Street to Lippincott Street	700	GS/CI	4	8	2020	\$238,000		
Fairview Avenue: Camden Avenue to Third Street	700	C/CI	4	8	2020	\$238,000		
Manor Court: Ridge Road to end of Cul-de-sac	300	C	4	8	2020	\$175,000		
Union Street: East Second Street to East Third Street	500	C	4	8	2020	\$173,000		
Mill Street: Second Street to Beech Street	900	C	4	8	2020	\$368,000	2020	\$2,155,000
Main Street: Chester Avenue to Borton's Landing Road	6,300	C	8	10	2021	\$4,350,000	2021	\$4,350,000
Main Street: Camden Avenue to Chester Avenue	4,100	C	8	10	2022	\$3,176,000	2022	\$3,176,000
Kings Highway: Westbrook Drive to Camden Avenue	4,600	C	8	10	2023	\$3,308,000	2023	\$3,308,000
Chester Avenue: Main Street to East Central Avenue	1,800	C	6	8	2024	\$1,453,000		

TABLE C-1 (continued)

DESCRIPTION/LOCATION	APPROXIMATE MAIN LENGTH (FT)	MATERIAL OF CONSTRUCTION	EXISTING MAIN SIZE	PROPOSED MAIN SIZE	PROPOSED CONSTRUCTION DATE	PRELIMINARY PROJECT COST ESTIMATE	PRELIMINARY PROJECT COST ESTIMATE BY YEAR	
Chestnut Street: Central Avenue to Main Street	2,000	C	8	8	2025	\$896,000		
East Central Avenue: North Church Street to Mill Street	1,700	C	6	8	2024	\$867,000		
Chester Avenue: East Central Avenue to East Maple	1,000	C	6	8	2024	\$586,000	2024	\$2,906,000
East Second Street: Chester Avenue to Chestnut Street	940	C	6	8	2025	\$418,000		
Linden Street: Chestnut Street to North Stanwick Road	2,500	C	6	8	2025	\$1,123,000		
North Washington Avenue: Oak Avenue to West Third Street	1,400	C	6	8	2025	\$633,000		
Newbold Avenue: East Central Avenue to East Third Street	800	C	8	8	2025	\$299,000		
Schooley Street: East Second Street to Main Street	900	C	8	8	2025	\$406,000	2025	\$3,775,000
Subtotal Main Replacements						\$28,985,000		\$28,985,000
System Main Extensions								
Cottage Avenue to Lincoln Avenue	450	-	-	12	Beyond 2025	\$293,000	TBD	TBD
Commerce Drive to Executive Drive to Glen Avenue	2,700	-	-	12	Beyond 2025	\$1,780,000	TBD	TBD
Cox Road to Creek Road to McElwee Road	8,000	-	-	12	Beyond 2025	\$5,266,000	TBD	TBD
Centerton Road to Creek Road	2,700	-	-	12	Beyond 2025	\$1,780,000	TBD	TBD
Creek Road: Laurel Creek Boulevard to Centerton Road	2,700	-	-	12	Beyond 2025	\$1,780,000	TBD	TBD
Subtotal System Main Extensions						\$8,940,000		
TOTAL WATER DISTRIBUTION SYSTEM IMPROVEMENTS						\$37,925,000		

C- Concrete

GS/CI- Galvanized Steel/Cast Iron

**TABLE C-2
WATER TREATMENT PLANT IMPROVEMENTS
DECEMBER 2015**

Location/Proposed Scope of Work	PROPOSED CONSTRUCTION DATE	PRELIMINARY PROJECT COST ESTIMATE
<p>Kings Highway Water Treatment Plant</p> <p>The proposed upgrade includes the abandonment of the majority of the existing plant and the construction of new treatment processes including aeration, chlorine addition for oxidation and disinfection, clarification, pressure filtration and lime addition for pH adjustment.</p>	2016-2017	\$7,250,000
<p>North Church Street Water Treatment Plant</p> <p>A pilot plant study, which evaluated two (2) treatment processes for the removal of 1,2,3-trichloropropane, tetrachloroethylene, manganese and radiological contaminants was completed in the summer/fall of 2015. Study results are being evaluated. It is anticipated that hydros manganese oxide addition with pressure filtration followed by carbon adsorption will be the recommended treatment processes.</p>	2016-2017	\$7,000,000
<p>Hartford Road Water Treatment Plant</p> <p>The recommended upgrade includes the demolition and replacement of all existing treatment units and the rehabilitation of the existing treatment building. New treatment processes will include aeration, chlorine addition for oxidation and disinfection, clarification, pressure filtration and lime addition for pH adjustment.</p>	2018-2020	\$6,900,000

APPENDIX D

SYSTEM ATTRIBUTES AND PERFORMANCE INDICATORS

