



# City of Appleton

100 North Appleton Street  
Appleton, WI 54911-4799  
[www.appleton.org](http://www.appleton.org)

## Meeting Agenda - Final-revised Utilities Committee

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Tuesday, October 8, 2019

5:00 PM

Council Chambers, 6th Floor

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1. Call meeting to order

2. Roll call of membership

3. Approval of minutes from previous meeting

[19-1446](#) Approval of the September 24, 2019 Utilities Committee Meeting Minutes.

**Attachments:** [September 24, 2019 Utilities Committee Meeting Minutes.pdf](#)

### 4. Public Hearings/Apearances

[19-1450](#) Water System Distribution Master Plan Update presentation by AECOM.

**Attachments:** [Revised Executive Summary 10\\_3\\_19.pdf](#)

### 5. Action Items

[19-1447](#) Amend 2019J Stormwater Consulting Services Contract for Phase I Final Design and Construction documents and 2019 Construction Related Services (CRS) for Spartan Drive with Brown and Caldwell (BC) in an amount not to exceed \$36,540.

**Attachments:** [2019J Spartan Phase I final design BC Amendment Memo.pdf](#)

[19-1451](#) Anticipated award of contract for Unit N-19 Spot Repairs, Protruding Tap and Mineral Deposit Removal (Bids to be opened on Monday, October 7, 2019.)

### 6. Information Items

[19-1470](#) Recent Precipitation Events and Impacts to DPW and AWWTP.

[19-1448](#) 2020 Department of Utilities Budget Review

[19-1449](#)

2020 Department of Public Works Budget Review

## 7. Adjournment

*Notice is hereby given that a quorum of the Common Council may be present during this meeting, although no Council action will be taken.*

*Reasonable Accommodations for Persons with Disabilities will be made upon Request and if Feasible.*

*For questions on the agenda, contact Chris Shaw at 920-832-5945 or Paula Vandehey at 920-832-6474.*



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## Meeting Minutes - Final Utilities Committee

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Tuesday, September 24, 2019

5:00 PM

Council Chambers, 6th Floor

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1. Call meeting to order

*Chairperson Meltzer called the Utilities Committee meeting to order at 5:00 p.m.*

2. Roll call of membership

**Present:** 5 - Meltzer, Reed, Firkus, Otis and Fenton

3. Approval of minutes from previous meeting

[19-1413](#)

Approval of the September 4, 2019 Utilities Committee Meeting Minutes.

**Attachments:** [September 4, 2019 Utilities Committee Meeting Minutes.pdf](#)

Reed moved, seconded by Firkus, that the Minutes be approved. Roll Call.  
Motion carried by the following vote:

**Aye:** 5 - Meltzer, Reed, Firkus, Otis and Fenton

4. Public Hearings/Appearances

5. Action Items

[19-1415](#)

Amend 2019G French Road Urbanization Study Contract with raSmith by an amount not to exceed \$9,100.

**Attachments:** [2019G French Urbanization Amendment 1 Memo Util Cmte 09-17-2019 final.pdf](#)

Reed moved, seconded by Firkus, that the Report Action Item be recommended for approval. Roll Call. Motion carried by the following vote:

**Aye:** 5 - Meltzer, Reed, Firkus, Otis and Fenton

6. Information Items

[19-1416](#)

Overview of WDNR Stormwater Permit.

**Attachments:**    [2019 September 24 Permit Overview.pdf](#)  
[2019 WPDES-WI-S050075-03.pdf](#)

*The permit was reviewed.*

[19-1425](#)

Monthly Reports August 2019:  
-Water Distribution and Meter Team Monthly Report

**Attachments:**    [Water Main Breaks August 2019.pdf](#)

*The report was reviewed.*

## 7.     Adjournment

**Reed moved, seconded by Firkus, that the Utilities Committee be adjourned at 5:17 p.m. Roll Call. Motion carried by the following vote:**

**Aye:**    5 -    Meltzer, Reed, Firkus, Otis and Fenton

## Executive Summary

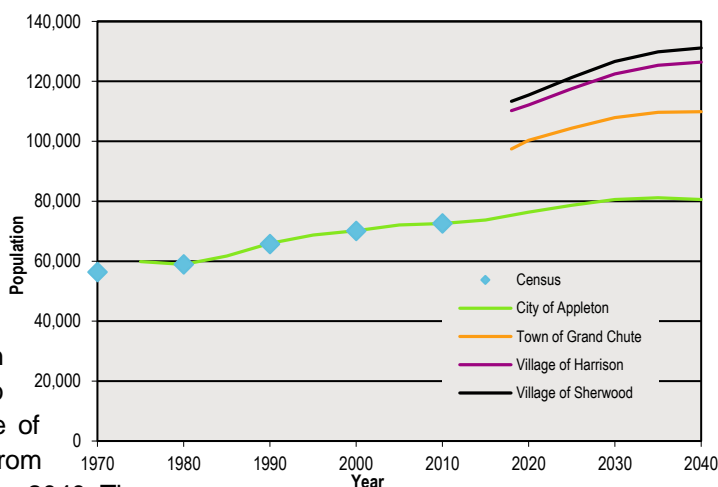
The City of Appleton is a community of nearly 75,000 persons located in East Central Wisconsin. The Utility provides water service to residences and businesses within the City of Appleton and wholesale water supply to Town of Grand Chute, Village of Sherwood and Harrison Utilities.

The City of Appleton water system consists of a surface water treatment plant (WTP), 4 elevated storage tanks, 1 standpipe, 1 reservoir, 2 booster pumping stations, 2 valve stations and approximately 379 miles of transmission and distribution water mains. The water system is separated into three pressure zones to meet the service needs of the customers.

### Population and Future Service Area

The 2018 City of Appleton population, according to the Wisconsin Department of Administration (DOA), was approximately 74,700. For this study, it was assumed the City of Appleton population served by the Utility by the year 2040 will be 80,605.

It is projected that the Town of Grand Chute will increase in population from approximately 22,700 to approximately 29,300 by the year 2040. The Village of Harrison is projected to increase in population from approximately 12,800 to approximately 16,600 by the year 2040. The Village of Sherwood is projected to increase in population from approximately 3,100 to approximately 4,700 by the year 2040. The potential wholesale customer Town of Clayton currently has a population of approximately 4,200 and is projected to increase to approximately 5,700 by the year 2040.

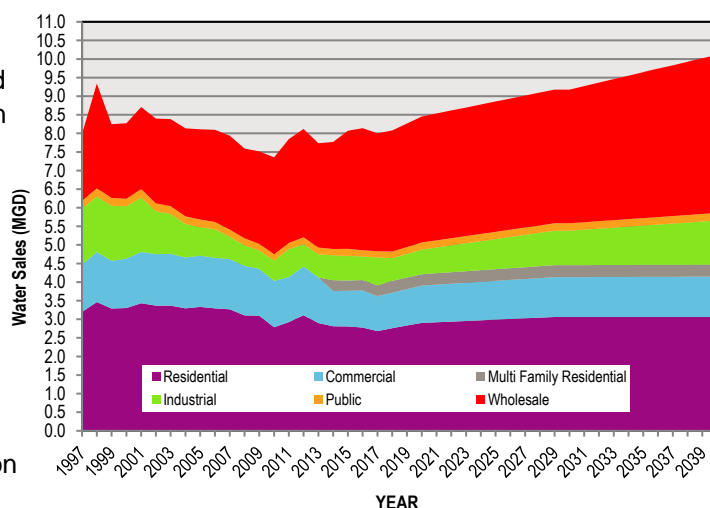


### Water Requirements

Based on an analysis of land development and population growth in the City of Appleton and within current and potential wholesale customers, the projected 2040 maximum day water demand is estimated to be approximately 17.7 million gallons per day (MGD). This represents an increase in water requirements of nearly 16 percent from the current average day water requirement of approximately 14.9 MGD.

### Water System Evaluation

The major findings from the water system evaluation are summarized in Table ES-1.

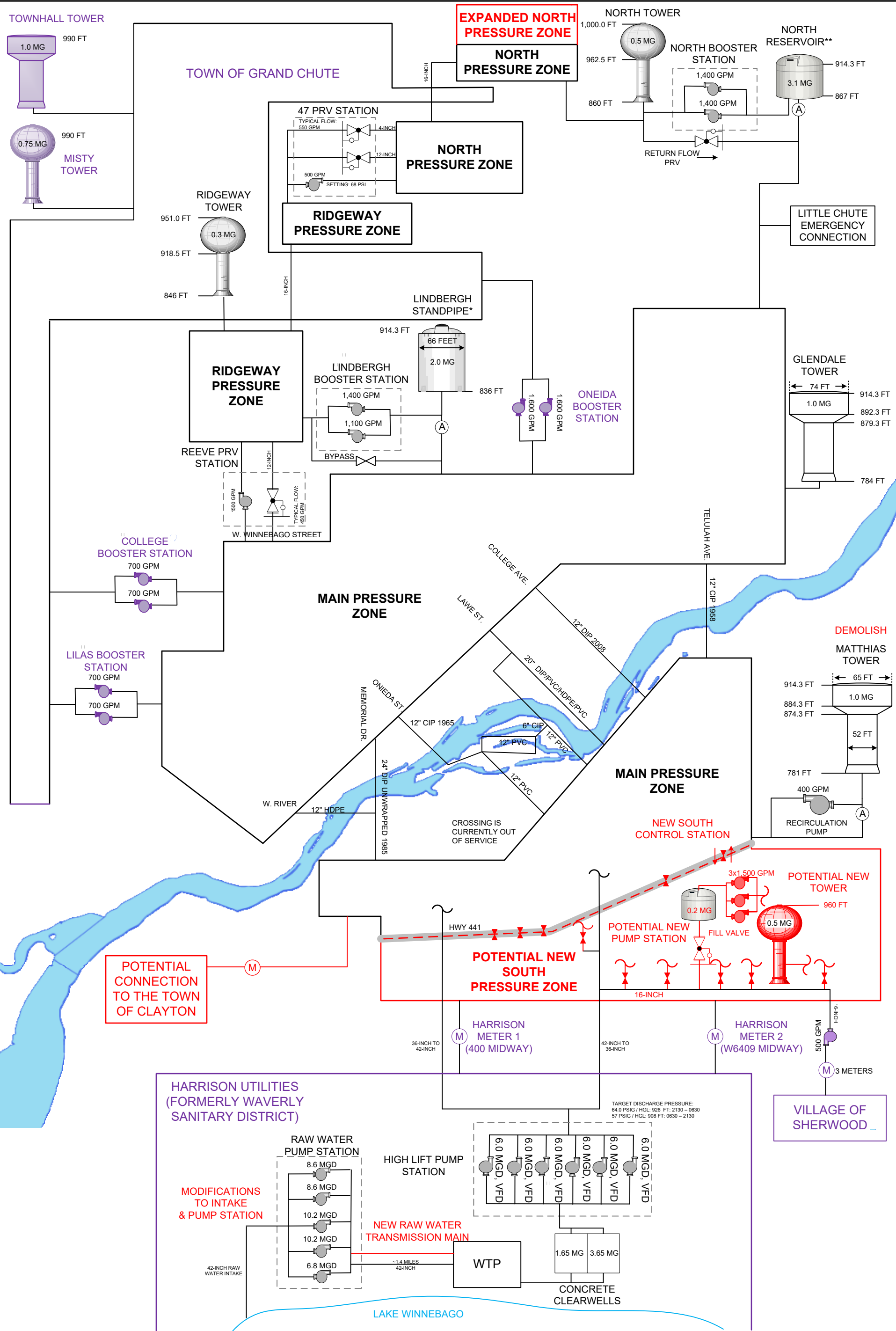


### Capital Improvement Plan

The schematic of the recommended future water distribution system is illustrated in Figure ES-1. **Error! Reference source not found.** summarizes the proposed Capital Improvement Plan for the Appleton water system, which is illustrated in Figure ES-2.

TABLE ES-1: SUMMARY OF WATER SYSTEM EVALUATION

Water System Pressures					
Pressure Zone	Pressure Range		Average Pressure		Notes
	Average Day	Peak Hour	Average Day	Peak Hour	
Main Pressure Zone	~ 30 to 90 psi (day) ~ 35 to 95 psi (night)	~ 30 to 86 psi	~54 psi (day) ~59 psi (night)	~53 psi	~ 35 psi near Lake Park Road and Midway Road ~ 30-35 psi near Northland Avenue and Richmond Street (near pressure zone boundary) ~ 30-35 psi on 16-inch supply line to Lindbergh Standpipe (has customer services) ~10 psi on Ballard Road to North Reservoir (~50 psi at last customer service) ~ 65-90 psi near the Fox River
Ridgeway Pressure Zone	~ 40 to 70 psi	~ <40 to 68 psi	~55 psi	~50 psi	
North Pressure Zone	~ <35 to 90 psi	~ <35 to 86 psi	~65 psi	~60 psi	~90 psi on Apple Creek Road
Available Fire Flows					
Pressure Zone		Percent of Hydrants Providing Required Fire Flow		Notes	
Main Pressure Zone		95 percent		Small diameter/older main including some 4-inch mains, dead ends.	
Ridgeway Pressure Zone		94 percent		Dead ends at pressure zone boundary, small diameter/older mains.	
North Pressure Zone		99 percent			
Hydraulic Capacity (Headloss/Velocity)					
<ul style="list-style-type: none"><li>No water mains have higher than recommended velocities or headlosses.</li></ul>		<div>Guidelines</div> <ul style="list-style-type: none"><li>AWWA Manual M32 recommends that all pipe velocities should be less than 4 to 6 feet per second (fps) during normal operation.</li><li>AWWA Manual M32 recommends headlosses in pipes less than 16-inches in diameter should be less than 5 to 7 feet per 1,000 feet of pipe during normal operating conditions. The recommended headloss limit for larger pipes in AWWA Manual M32 is 2 to 3 feet per 1,000 feet of pipe during normal operating conditions.</li></ul>			
Water Age (Water Quality)					
<ul style="list-style-type: none"><li>Water age in Main Pressure Zone ranges typically from 1-5 days, with water age greater than 5 days at extremities/dead ends.</li><li>Water age in North Pressure Zone and Ridgeway Pressure zone typically 5 to 8 days, with greater than 8 days at extremities/dead ends.</li></ul>				<ul style="list-style-type: none"><li>Chlorine levels measured indicate that chlorine residuals are maintained within the system</li></ul>	
Supply					
<ul style="list-style-type: none"><li>Adequate reliable supply (22 MGD hydraulic capacity of high lift pumps) to meet existing (14.9 MGD) and projected (17.7 MGD) maximum day demands.</li><li>Adequate reliable capacity to supply the Ridgeway Pressures Zone and the North Pressure Zone under existing and projected 2040 demand conditions.</li></ul>					
Storage					
<ul style="list-style-type: none"><li>The Main Pressure Zone had adequate total available effective storage to meet existing and projection demand conditions; however, has a deficiency in operational storage that is projected to grow to approximately 0.43 MG by 2040. The deficiency in operational storage can be offset with excess reliable supply capacity.</li><li>The Ridgeway Pressure Zone has a storage deficiency of approximately 0.68 MG; however, it can be offset with excess reliable pumping capacity and the ability to transfer water from the North Pressure Zone via 47 Valve Station.</li><li>The North Pressure Zone has a storage deficiency which is projected to grow to approximately 0.38 MG based on projected 2040 projections. The deficiency can be offset with excess pumping capacity under existing conditions; however, is projected to be slightly deficient (approximately 50,000 gallons) by 2040 with the additional demands and the increase in fire storage requirement (assuming industrial development).</li></ul>					
System Reliability					
<ul style="list-style-type: none"><li>The raw water lake intake and transmission from the Raw Water Pump Station to the WTP have no redundancy to ensure a reliable supply of water to the WTP.</li><li>Appleton can maintain water supply provided with auxiliary sources of power in the event of a power emergency or interruption. Appleton has standby power on site at the WTP and the North Booster Station, and a transfer switch at the Lindbergh Booster Station for a portable generator.</li></ul>					
Water Loss Evaluation – Performance Indicators				Leak/Break Frequency	
Real Losses: 301 MG/year, 29 gallons per service connection per day Infrastructure Leakage Index (ILI): 1.9 Financial: <ul style="list-style-type: none"><li>Non-revenue water as percent by volume of water supplied: 17.9% (has ranged from 13.7 percent to 17.9 percent in the past 5 years)</li><li>Non-revenue water as percent of cost of operating system: 1.2%</li></ul>				<ul style="list-style-type: none"><li>Average number of leaks/breaks per 100 miles per year 22 leaks/breaks per 100 miles per year (10 years) 25 leaks/breaks per 100 miles per year (5 years)</li><li>Optimized distribution system failure frequency identified in WRF Water Loss Report: ~15 failures per 100 miles per year</li><li>Aggregate North American failure frequencies identified in WRF Water Loss Report: ~25 failures per 100 miles per year.</li></ul>	
Water Main Reinvestment Level (KANEW Analysis)					
<ul style="list-style-type: none"><li>The City's water distribution system is an “average aged” water system; approximately 30 percent of the water mains are over 50 years old and approximately 10 percent of the water mains are over 70 years old.</li><li>Based on the long and short life expectancies in the KANEW analysis, the total recommended replacement lengths in the first 10 years of replacement are approximately 80 miles (21 percent) and 104 miles (28 percent), respectively.</li><li>Based on the long and short life expectancies in the KANEW analysis, the total replacement lengths over the 20 year period of replacement are approximately 103 miles (27 percent) and 128 miles (34 percent), respectively.</li></ul>					



NOTES:  
\* TANK CONTAINS A MIXER.  
\*\*TANK CONTAINS TWO MIXERS.

**AECOM**

**FIGURE ES-1**  
**RECOMMENDED WATER DISTRIBUTION**  
**SYSTEM SCHEMATIC**  
**APPLETON, WISCONSIN**

SEPTEMBER 2019

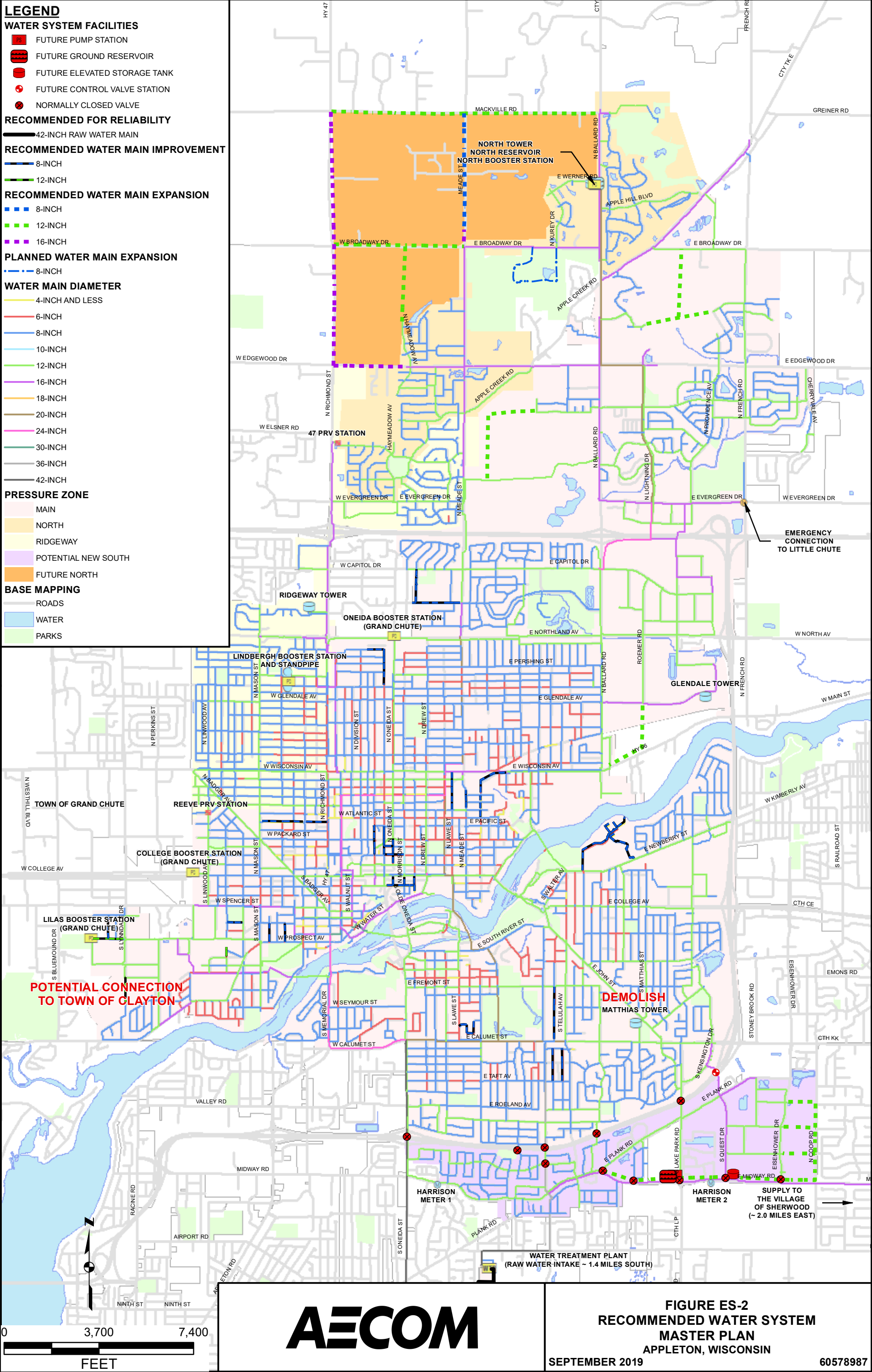
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TABLE ES-2: CAPITAL IMPROVEMENT PLAN

Short-Term Improvements (5 Years)	Estimated Cost	Long-Term Improvements (10-20 Years)	Estimated Cost
42-inch Raw Water Main to WTP for Reliability (approximately 7,500 feet) <sup>1</sup>	\$7,500,000	Transmission Mains for Development (approximately 12.3 miles)	\$4,400,000
Raw Water Intake Main at Raw Water Pump Station <sup>1</sup>	\$9,000,000	Water Main Replacement- Year 11: ~3.8 miles <sup>3</sup>	\$2,700,000
		Water Main Replacement- Year 12: ~3.8 miles <sup>3</sup>	\$2,700,000
Improvements & Modifications to Existing Lake Pump Station & Existing Lake Intake System <sup>1</sup>	\$3,600,000	Water Main Replacement- Year 13: ~3.8 miles <sup>3</sup>	\$2,700,000
		Water Main Replacement- Year 14: ~3.8 miles <sup>3</sup>	\$2,700,000
Water Main Replacement to Address Fire Deficiencies (~ 7 miles, ~1.4 miles annually) <sup>2</sup>	\$5,500,000	Water Main Replacement- Year 15: ~3.8 miles <sup>3</sup>	\$2,700,000
		Water Main Replacement- Year 16: ~3.8 miles <sup>3</sup>	\$2,700,000
Water Main Replacement - Year 1: ~6.6 miles <sup>3</sup>	\$4,600,000	Water Main Replacement- Year 17: ~3.8 miles <sup>3</sup>	\$2,700,000
Water Main Replacement - Year 2: ~6.6 miles <sup>3</sup>	\$4,600,000	Water Main Replacement- Year 18: ~3.8 miles <sup>3</sup>	\$2,700,000
Water Main Replacement - Year 3: ~6.6 miles <sup>3</sup>	\$4,600,000	Water Main Replacement - Year 19: ~3.8 miles <sup>3</sup>	\$2,700,000
Water Main Replacement - Year 4: ~6.6 miles <sup>3</sup>	\$4,600,000	Water Main Replacement -Year 20: ~3.8 miles <sup>3</sup>	\$2,700,000
Water Main Replacement - Year 5: 6.6 miles <sup>3</sup>	\$4,600,000	Demolish Matthias Tower	\$180,000
<b>Subtotal</b>	<b>\$47,900,000</b>	<b>Subtotal</b>	<b>\$31,580,000</b>
Engineering and Contingencies <sup>4</sup>	\$19,160,000	Engineering and Contingencies <sup>4</sup>	\$12,632,000
<b>Total</b>	<b>\$67,060,000</b>	<b>Total</b>	<b>\$44,212,000</b>
Mid-Term Improvements (5-10 Years)	Estimated Cost	Grand Total	
Transmission Mains for Development (approximately 12.3 miles)	\$4,400,000	<b>Footnotes:</b> 1 Estimated cost from Appleton Public Works Department, November 2018. 2 Replacement cost provided by Appleton Department of Public Works at \$130 per foot for 8-inch water main, and \$150 per foot for 12-inch water main replacement. 3 Replacement rates based on KANEW analysis with first 5 years lowered to include recommended water main replacements for fire flow deficiencies. Replacement cost provided by Appleton Department of Public Works at \$130 per foot for 8-inch water main 4 Assumed 15 percent for engineering and 25 percent for contingencies.  <b>Notes:</b> • Estimates do not include land purchase, if necessary. • The Engineer's Estimate is only an estimate of possible construction costs for budgeting purposes. This estimate is limited to the conditions existing at its issuance and is not a guaranty of actual price or cost. Uncertain market conditions such as, but not limited to: local labor or contractor availability, wages, other work, material market fluctuations, price escalations, force majeure events, and developing bidding conditions, etc. may affect the accuracy of this estimate. AECOM is not responsible for any variance from this estimate or actual prices and conditions obtained. • This estimate is an AACE Class 4 Order of Magnitude cost estimate. • Estimates are 2019 dollars unless otherwise noted.	
Water Main Replacement - Year 6: ~8.0 miles <sup>3</sup>	\$5,500,000		
Water Main Replacement - Year 7: ~ 8.0 miles <sup>3</sup>	\$5,500,000		
Water Main Replacement - Year 8: ~8.0 miles <sup>3</sup>	\$5,500,000		
Water Main Replacement - Year 9: ~8.0 miles <sup>3</sup>	\$5,500,000		
Water Main Replacement - Year 10: ~8.0 miles <sup>3</sup>	\$5,500,000		
<b>Potential New South Pressure Zone:</b>			
New 0.5 MG Spheroid Tower in Potential South Pressure Zone	\$1,200,000		
New Flow Control Valve from Potential South Pressure Zone to Main Pressure Zone	\$210,000		
South Pump Station including VFD, 0.2 MG Underground Reservoir, backup generator, SCADA	\$1,500,000		
<b>Subtotal</b>	<b>\$34,810,000</b>		
Engineering and Contingencies <sup>4</sup>	\$13,924,000		
<b>Total</b>	<b>\$48,734,000</b>		





## Additional Recommendations

Additional recommendations include:

- The City currently alternates discharge pressure at the water treatment plant (WTP) between day and night to facilitate turnover of water storage within the Main Pressure Zone. Areas of the water distribution system currently experience pressures below 35 psi when the WTP is set to the lower discharge pressure. As older mains are continued to be replaced, the City should consider raising the WTP pressure discharge set points by approximately 5 psi to raise pressure in these areas of lower pressure to above 35 psi.
- AECOM recommends that a unidirectional flushing (UDF) plan for a small pilot area in a location with colored water complaints be designed and performed as a preventative water quality and distribution system maintenance practice. The water quality metrics before and after within the pilot area should be quantified and a determination made on whether a system wide UDF plan be implemented. A UDF program may require signs, public notice, and additional equipment purchases by the City. A pilot UDF plan for the area defined on Figure 10-13 would cost approximately \$12,000 to \$15,000.
- The City should update the water system hydraulic model on an annual basis.
- The City should plan on updating the master plan every 5 to 10 years or after significant changes that are not outlined in this document are made to the water distribution system.
- The City should continue to perform tank maintenance as scheduled.
- The City should complete the water audit annually.
- The City should consider having a leak detection survey performed.

The Town of Clayton has expressed an interest in obtaining water from the City of Appleton for future water supply. If the Town of Clayton requests water supply from the City, the City should extend the 12-inch water main on Prospect Avenue and provide the necessary infrastructure (meter and SCADA) for service.

## Department of Public Works – Engineering Division

### MEMO

**TO:** Utilities Committee

**FROM:** Paula Vandehey, Director of Public Works  
Sue Olson, Staff Engineer  
Pete Neuberger, Staff Engineer

**DATE:** October 1, 2019

**RE:** Amend 2019J stormwater consulting services contract for Phase 1 Final Design and Construction documents and 2019 Construction Related Services (CRS) for Spartan Drive with Brown and Caldwell (BC) in an amount not to exceed \$36,540.

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The Department of Public Works is requesting approval to amend the 2019J stormwater consulting services contract for Phase 1 Final Design and Construction Documents and 2019 Construction Related Services (CRS) for Spartan Drive with Brown and Caldwell (BC) in an amount not to exceed \$36,540. If the amendment is approved, the total contract amount will be \$183,280.

Construction on the Spartan Drive area started in early September, with Unit Z-19 Sewer and Water Construction on Spartan Drive, Sommers Drive, and Haymeadow Avenue. City staff designed this bid package and are performing construction inspection. The second bid package for work in this area is Unit AA-19 Bear Creek Culvert and Spartan/Sommers Retaining Wall. The contractor is working through all the necessary submittals and securing materials in anticipation of a December 2, 2019 start of construction.

Several things have resulted in changes to the consulting work anticipated at the time of the December 2018 permit application and February 2019 scope development for this project.

- The unusually wet conditions the last two years created additional concerns for the stream and wetland soils where the box culvert and retaining wall are to be constructed, resulting in the need for expanded plans and specifications.
- Permits from the Department of Natural Resources and Army Corps of Engineers were received approximately two months later than anticipated.
- Property acquisition did not start until staff was sure state and federal permits would be received, thereby resulting in the need to obtain Town of Grand Chute and Outagamie County permits. BC assisted with obtaining these permits out of the approved scope of services to keep the project moving forward.

- There is a significant amount of construction work across the state, resulting in fewer available contractors during the anticipated construction schedule. Timelines for 2019 work have been extended to encourage more bidders to participate.
- Wet weather has also resulted in the need to extend construction timelines.
- The extended 2019 timelines have resulted in the need for additional coordination from the sewer and water project to the box culvert/retaining wall project and then to the 2020 street grading and road construction project, with the goal of completing this phase by November 1, 2020.

Additions to the original scope include:

- Additional structural drawings for the AA-19 bid set to clarify information for contractors
- Additional administration time for BC due to extended construction timelines
- Hours for BC to review up to 9 Contractor submittal packages, including the precast box culvert and railing design
- Hours for BC and their geotechnical consultant to attend the preconstruction meeting
- Hours for BC to answer up to 6 Requests for Information from the City and/or Contractor during construction, if needed
- Hours for BC to assist with up to three (3) change orders, if needed
- Computer modeling for earthwork calculations to account for changes between the bid packages and determine pay quantities

This will be a time and materials contract and only completed tasks will be invoiced.