STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DIVISION OF PUBLIC UTILITIES AND CARRIERS

In re: City of Woonsocket Water Division - Application to Implement Multi-Year Rate Plan **Docket No. 4879**

CITY OF WOONSOCKET WATER DIVISION'S ("WWD") RESPONSE TO THE DIVISION OF PUBLIC UTILITIES AND CARRIERS' FIRST SET OF DATA REQUESTS

1-1:	Reference page 4, lines 5-14, of Mr. Pratt's testimony. Please explain how WWD can have the capability to produce a safe yield of 13.5 MGD but increasing production beyond 5.5 to 6.0 MGD cannot easily or safely be provided.
WWD Response 1-1:	The 13.5 MGD safe yield is the volume of treatable water that is safely and reliably available from the reservoir system. The 5.5 to 6.0 MGD is what can be reliably treated at the existing treatment plant. In other words, more water is available from the reservoirs that can be safely treated.
Respondent:	Jon Pratt
Date:	October 15, 2018

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DIVISION OF PUBLIC UTILITIES AND CARRIERS

In re: City of Woonsocket Water Division - Application to Implement Multi-Year Rate Plan **Docket No. 4879**

CITY OF WOONSOCKET WATER DIVISION'S ("WWD") RESPONSE TO THE DIVISION OF PUBLIC UTILITIES AND CARRIERS' FIRST SET OF DATA REQUESTS

1-2:	Reference page 4, lines 25-26, of Mr. Pratt's testimony. Please provide a copy of the contract executed by the Parties.
WWD Response 1-2:	Please see **Exhibit 1-2**.
Respondent:	Jon Pratt
Date:	October 15, 2018

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DIVISION OF PUBLIC UTILITIES AND CARRIERS

In re: City of Woonsocket Water Division - Application to Implement Multi-Year Rate Plan **Docket No. 4879**

CITY OF WOONSOCKET WATER DIVISION'S ("WWD") RESPONSE TO THE DIVISION OF PUBLIC UTILITIES AND CARRIERS' FIRST SET OF DATA REQUESTS

1-3:	Reference page 7, lines 10, of Mr. Pratt's testimony. Please provide a copy of the updated IFR plan.
WWD Response 1-3:	Please see **Exhibit 1-3**.
Respondent:	Jon Pratt
Date:	October 15, 2018

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DIVISION OF PUBLIC UTILITIES AND CARRIERS

In re: City of Woonsocket Water Division - Application to Implement Multi-Year Rate Plan **Docket No. 4879**

CITY OF WOONSOCKET WATER DIVISION'S ("WWD") RESPONSE TO THE DIVISION OF PUBLIC UTILITIES AND CARRIERS' FIRST SET OF DATA REQUESTS

1-4:	Please provide copies of the schedules attached to Mr. Bebyn's testimony (Schedule DGB-TY-1 through Schedule DGB-COS-14) in Excel format with all formulas intact.
WWD Response 1-4:	The Schedules are broken into four separate excel files. See Attached Excel Filed: **Exhibit 1-4(A)**----DGB Test Year, **Exhibit 1-4(B)**----DGB Rate Year, **Exhibit 1-4(C)**----DGB cos and **Exhibit 1-4(D)**----DGB cos to rate elements.
Respondent:	David Bebyn, CPA
Date:	October 15, 2018

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DIVISION OF PUBLIC UTILITIES AND CARRIERS

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CITY OF WOONSOCKET WATER DIVISION'S ("WWD") RESPONSE TO THE DIVISION OF PUBLIC UTILITIES AND CARRIERS' FIRST SET OF DATA REQUESTS

1-5:	Reference Schedule DGB-TY-1a. (a) Please provide the current number of accounts and the number of accounts as of December 31 for each of the last three years for each line item; and (b) Explain how the count quantity for each line item is determined from the current number of accounts.
WWD Response 1-5:	(a) Attached as **Exhibit 1-5** is a spreadsheet analysis concerning the current number of accounts and the number of accounts as of December 31 for each of the last three years for each line item.
	(b) The quantity for each line was determined by taking the meter counts and multiplying by four to determine annual counts for each line item.
Respondent:	David Bebyn, CPA
Date:	October 15, 2018

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DIVISION OF PUBLIC UTILITIES AND CARRIERS

In re: City of Woonsocket Water Division - Application to Implement Multi-Year Rate Plan **Docket No. 4879**

CITY OF WOONSOCKET WATER DIVISION'S ("WWD") RESPONSE TO THE DIVISION OF PUBLIC UTILITIES AND CARRIERS' FIRST SET OF DATA REQUESTS

1-6:	Reference Schedule DGB-COS-2C. Please explain in detail how the 3,500 GPM demand for fire was determined. Include supporting workpapers and calculations.
WWD Response 1-6:	The 3,500 GPM demand for fire used was not custom calculated as part of this filing. It is the same fire demands used in Woonsocket Water Division's ("WWD") last cost of service study which was approved in Docket No. 4320.
Respondent:	David Bebyn, CPA
Date:	October 15, 2018

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DIVISION OF PUBLIC UTILITIES AND CARRIERS

In re: City of Woonsocket Water Division - Application to Implement Multi-Year Rate Plan **Docket No. 4879**

CITY OF WOONSOCKET WATER DIVISION'S ("WWD") RESPONSE TO THE DIVISION OF PUBLIC UTILITIES AND CARRIERS' FIRST SET OF DATA REQUESTS

1-7:	Please provide monthly sales volumes by retail and wholesale customer classifications for the most recent 3-year period available in Excel format. Include wholesale volumes by customer.
WWD Response 1-7:	The sales volumes by retail and wholesale customer are only available on a quarterly basis since WWD only bills its customers on a quarterly basis. Attached as **Exhibit 1-7** is a spreadsheet analysis concerning the quarterly sales volumes by retail and wholesale customer classifications for the most recent three-year period available.
Respondent:	David Bebyn, CPA
Date:	October 15, 2018

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
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In re: City of Woonsocket Water Division - Application to Implement Multi-Year Rate Plan **Docket No. 4879**

CITY OF WOONSOCKET WATER DIVISION'S ("WWD") RESPONSE TO THE DIVISION OF PUBLIC UTILITIES AND CARRIERS' FIRST SET OF DATA REQUESTS

1-8:	What is the population of the WWD retail service territory? Explain in detail how the population was determined.
WWD Response 1-8:	The total population of the WWD retail service territory is estimated at 43,816. The estimation was determined using the City of Woonsocket's 2010 census count. The averages for outside of the City used an average 2.5 persons per household. Cumberland, Blackstone, and Bellingham used average people per household * services connection = Population retail service. North Smithfield used the formula above for retail customers and also added the number of units for nursing homes, rehabilitation hospital and large residential buildings. Units * 1 for nursing homes and hospital, Units * 2 for residential. See the analysis attached as **Exhibit 1-8**.
Respondent:	David Bebyn, CPA
Date:	October 15, 2018

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DIVISION OF PUBLIC UTILITIES AND CARRIERS

In re: City of Woonsocket Water Division - Application to Implement Multi-Year Rate Plan **Docket No. 4879**

CITY OF WOONSOCKET WATER DIVISION'S ("WWD") RESPONSE TO THE DIVISION OF PUBLIC UTILITIES AND CARRIERS' FIRST SET OF DATA REQUESTS

1-9:	Please provide the average daily, maximum day, and maximum hour demands of the wholesale class and each wholesale customer for the last three years.
WWD Response 1-9:	No data is available to compute average daily, maximum daily and maximum hour demands. The data for each wholesale customer is provided by quarterly readings. North Smithfield uses water on an ongoing basis while Cumberland uses water as needed for their system.
Respondent:	David Bebyn, CPA
Date:	October 15, 2018

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
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In re: City of Woonsocket Water Division - Application to Implement Multi-Year Rate Plan **Docket No. 4879**

CITY OF WOONSOCKET WATER DIVISION'S ("WWD") RESPONSE TO THE DIVISION OF PUBLIC UTILITIES AND CARRIERS' FIRST SET OF DATA REQUESTS

1-10:	Provide the average daily, maximum day, and maximum hour system-wide demands in each of the last three years.
WWD Response 1-10:	The average daily and max day figures for the last three years are as follows: Calendar year 2015: Max – 5.158 MG, Daily average 3.605 MG Calendar year 2016: Max – 5.272 MG, Daily Average 3.841 MG Calendar year 2017: Max - 5.196 MG, Daily Average 3.897 MG These numbers are from plant effluent which takes into account backwash water which is put to waste. Average of backwash is 4.060 MG per/month. No data on hourly is available.
Respondent:	David Bebyn, CPA
Date:	October 15, 2018

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
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CITY OF WOONSOCKET WATER DIVISION'S ("WWD") RESPONSE TO THE DIVISION OF PUBLIC UTILITIES AND CARRIERS' FIRST SET OF DATA REQUESTS

1-11:	For each wholesale customer, explain whether WWD is the sole source of supply or whether the customer uses other sources of supply.
WWD Response 1-11:	WWD currently has only two wholesale customers, the Town of Cumberland and the Town of North Smithfield. WWD is not the sole source of water for each community. The Town of Cumberland does purchase water for its southern section of Town and has a surface water treatment plant its northern section of Town. The Town of Cumberland purchases water from Pawtucket, along with their own wells and the treatment plant. The Cumberland plant does have restrictions on the production based on the level of its reservoir. WWD and the Town of Cumberland's wells supplement Cumberland's water needs when the reservoir levels are low. The Town of North Smithfield's sole source of water is WWD.
Respondent:	David Bebyn, CPA
Date:	October 15, 2018

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DIVISION OF PUBLIC UTILITIES AND CARRIERS

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CITY OF WOONSOCKET WATER DIVISION'S ("WWD") RESPONSE TO THE DIVISION OF PUBLIC UTILITIES AND CARRIERS' FIRST SET OF DATA REQUESTS

1-12:	Please explain the nature of the metering arrangements for private fire services.
WWD Response 1-12:	The majority of private fire services have by-pass meters. WWD has five unmetered fire services left. These fire services are older, and WWD is currently working to update these fire services with proper backflow and bypass meters. The water usage on the fire services is minimal. (Usage would be for annual flow test and/or if a leak developed in the fire system.)
Respondent:	David Bebyn, CPA
Date:	October 15, 2018

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
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CITY OF WOONSOCKET WATER DIVISION'S ("WWD") RESPONSE TO THE DIVISION OF PUBLIC UTILITIES AND CARRIERS' FIRST SET OF DATA REQUESTS

1-13:	Please explain the nature of the billing arrangements for public and private fire.
WWD Response 1-13:	Private fire services have account numbers in the WWD's billing system. These accounts are billed quarterly, along with the retail and wholesale water consumption sales. There are very few individual public fire service bills and as a result are billed manually to each customer on an annual basis. The majority of the public services are to the Town of North Smithfield.
Respondent:	David Bebyn, CPA
Date:	October 15, 2018

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
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CITY OF WOONSOCKET WATER DIVISION'S ("WWD") RESPONSE TO THE DIVISION OF PUBLIC UTILITIES AND CARRIERS' FIRST SET OF DATA REQUESTS

1-14:	Please provide a breakdown of meter investment by meter size.
WWD Response 1-14:	WWD does not breakdown its asset records by meter size. The asset classification for meters is only aggregated by total meters.
Respondent:	David Bebyn, CPA
Date:	October 15, 2018

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DIVISION OF PUBLIC UTILITIES AND CARRIERS

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CITY OF WOONSOCKET WATER DIVISION'S ("WWD") RESPONSE TO THE DIVISION OF PUBLIC UTILITIES AND CARRIERS' FIRST SET OF DATA REQUESTS

1-15:	Please provide the current average or typical cost of purchasing and installing each size meter.
WWD Response 1-15:	See attached **Exhibit 1-15**.
Respondent:	David Bebyn, CPA
Date:	October 15, 2018

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DIVISION OF PUBLIC UTILITIES AND CARRIERS

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CITY OF WOONSOCKET WATER DIVISION'S ("WWD") RESPONSE TO THE DIVISION OF PUBLIC UTILITIES AND CARRIERS' FIRST SET OF DATA REQUESTS

1-16:	Please provide a large-scale map of WWD's water utility facilities showing treatment plants, major transmission lines, large customers, sales for resale customers, etc.
WWD Response 1-16:	See attached **Exhibit 1-16**.
Respondent:	David Bebyn, CPA
Date:	October 15, 2018

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DIVISION OF PUBLIC UTILITIES AND CARRIERS

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CITY OF WOONSOCKET WATER DIVISION'S ("WWD") RESPONSE TO THE DIVISION OF PUBLIC UTILITIES AND CARRIERS' FIRST SET OF DATA REQUESTS

1-17:	Does WWD provide free water service to any customer class? If yes, please identify the customer classes and the annual volumes.
WWD Response 1-17:	No, WWD does not provide free water service to any customers.
Respondent:	David Bebyn, CPA
Date:	October 15, 2018

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DIVISION OF PUBLIC UTILITIES AND CARRIERS

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CITY OF WOONSOCKET WATER DIVISION'S ("WWD") RESPONSE TO THE DIVISION OF PUBLIC UTILITIES AND CARRIERS' FIRST SET OF DATA REQUESTS

1-18:	What is the Company's proposal with respect to the scale back of rates in the event that the Commission authorizes an increase which is less than the requested increase?
WWD Response 1-18:	If the Commission scales back the increase in the first three years, there would be room to still makes the debt service coverage requirements. This action would, however, lead to larger increases for the following years as more of an increase would be required so that WWD could make those later debt service coverage requirements.
Respondent:	David Bebyn, CPA
Date:	October 15, 2018

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DIVISION OF PUBLIC UTILITIES AND CARRIERS

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CITY OF WOONSOCKET WATER DIVISION'S ("WWD") RESPONSE TO THE DIVISION OF PUBLIC UTILITIES AND CARRIERS' FIRST SET OF DATA REQUESTS

1-19:	Please provide a breakdown of mains investment by pipe size diameter.
WWD Response 1-19:	WWD does not breakdown its asset records by pipe size. The asset classification for pipe is only aggregated by total pipe. WWD does, however, have an estimated breakdown of investment by pipe size in its IFR plan which is attached as **Exhibit 1-3**.
Respondent:	David Bebyn, CPA
Date:	October 15, 2018

CITY OF WOONSOCKET
By its Attorneys,

/s/ Alan M. Shoer
Alan M. Shoer, Esq. (#3248)
Nicole M. Verdi, Esq. (#9370)
Adler Pollock & Sheehan, P.C.
One Citizens Plaza, 8th Floor
Providence, RI 02903-1345
Tel: 401-274-7200
Fax: 401-751-0604
Dated: October 15, 2018

CERTIFICATE OF SERVICE

I hereby certify that on October 15, 2018, I delivered a true copy of the foregoing response to the **Division of Public Utilities and Carriers' First Set of Data Requests** via electronic mail to the parties on the attached service list.

/s/ Alan M. Shoer

EXHIBIT 1-2

WOONSOCKET DRINKING WATER TREATMENT FACILITY

CAPITAL IMPROVEMENTS, OPERATIONS, MAINTENANCE AND MANAGEMENT AGREEMENT BY AND BETWEEN

THE CITY OF WOONSOCKET, RHODE ISLAND AND WOONSOCKET WATER SERVICES LLC

JULY 31, 2017

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WOONSOCKET DRINKING WATER TREATMENT FACILITY CAPITAL IMPROVEMENTS, OPERATIONS, MAINTENANCE AND MANAGEMENT AGREEMENT

This WOONSOCKET DRINKING WATER TREATMENT FACILITY CAPITAL IMPROVEMENTS, OPERATIONS, MAINTENANCE AND MANAGEMENT AGREEMENT ("Agreement"), dated as of July 31, 2017 ("Agreement Date"), is entered into by and between the ***City of Woonsocket, Rhode Island***, a Rhode Island municipal corporation ("City"), and ***Woonsocket Water Services LLC***, a limited liability company organized and existing under the laws of the State of Delaware ("Company").

W I T N E S S E T H:

WHEREAS, the City owns and operates the existing City of Woonsocket drinking water treatment facility located on Manville Road, Woonsocket, Rhode Island (as more particularly described below, the "Existing Facility");

WHEREAS, the City issued a request for proposals on August 5, 2015 for the design and construction of a new drinking water treatment facility to be located on City-owned property on Jillson Avenue, Woonsocket (as more particularly described below, the "New Facility"), and for the long-term operation, maintenance and management of the New Facility, as well as for the operation, maintenance and management of the Existing Facility pending completion of the New Facility;

WHEREAS, in response to the RFP (as defined herein), the Company submitted a proposal;

WHEREAS, pursuant to the RFP, the City has selected the Company;

WHEREAS, the Company desires to design and perform the capital improvements and to operate, maintain and manage the New Facility in accordance with the terms and subject to the conditions of this Agreement;

WHEREAS, the Guarantors shall execute the Guaranty Agreements in the forms attached as an exhibit hereto, guarantying the Company's obligations under this Agreement.

NOW, THEREFORE, in consideration of the mutual covenants, representations, warranties and agreements contained herein, and intending to be legally bound hereby, the parties agree as follows:

ARTICLE I
SCHEDULES

Section 1.1 Schedules and Exhibits.

The following Schedules and Exhibits are attached hereto and made a part of this Agreement. In the event of a conflict or inconsistency between or among the Schedules and this Agreement, the provisions of this Agreement control over the Schedules unless otherwise agreed to in writing by the parties or unless otherwise specifically provided in this Agreement.

EXHIBIT H – BLASTING PROVISIONS

EXHIBIT I – SAMPLE QUALITY MANAGEMENT PLAN

ARTICLE II
CERTAIN DEFINITIONS

Section 2.1 Definitions.

As used herein, these terms shall have the following meanings:

"Acceptance" means demonstration by the Company in accordance with the terms of this Agreement that the Acceptance Test has been conducted and the Acceptance Standards have been achieved.

"Acceptance Date" means the date on which Acceptance is granted by the City.

"Acceptance Deadline" has the meaning specified in Section 6.9 hereof.

"Acceptance Standards" means the standards for Acceptance set forth in Schedule 1 hereto.

"Acceptance Test(s)" or "Acceptance Testing" means the tests, plans and procedures set forth in Schedule 13 hereto.

"Affiliate(s)" means any person, corporation or other entity directly or indirectly controlling or controlled by another person, corporation or other entity or under direct or indirect common control with such person, corporation or other entity.

"Analytical Services" has the meaning specified in Schedule 2 hereto.

"Annual Facility Inspection" has the meaning specified in Schedule 2 hereto.

"Annual Report" has the meaning specified in Schedule 2.

"Applicable Law" means any law, rule, regulation, requirement, action, determination, guideline, order of, or any legal entitlement issued by any governmental body having jurisdiction, applicable from time to time to the siting, design, acquisition, construction, equipping, financing, ownership, possession, start-up, testing, operation, maintenance or repair of the Existing Facility or the New Facility, the delivery, treatment, or storage of water, the transfer, handling, transportation or disposal of residue or any other transaction or matter contemplated hereby including, without limitation, any of the foregoing which pertain to water.

"Auditor" has the meaning specified in Section 10.3 hereof.

"Auditor's Report" has the meaning specified in Section 10.3 hereof.

"Authorized Representative" has the meaning specified in Section 5.3 hereof.

"Billing Month" means each calendar month in a Contract Year.

"Bonds" mean the Construction Payment and Performance Bond, the Labor and Materials Bond and the Operations Bond.

"Buildings Services" has the meaning specified in Schedule 2 hereto.

"Capital Improvement(s)" has the meaning specified in Section 5.4.2 hereof.

"Certificates" means insurance certificates as specified in Schedule 4 hereto.

"Change in Law" means:

(a) the enactment, adoption, promulgation, modification or repeal after the Agreement Date of any federal, State, or local law, ordinance, code, rule, regulation or other similar legislation or the modification or change in interpretation after the Agreement Date of any federal, State, or local law, ordinance, code, rule, regulation, official permit, license or approval by any regulatory or judicial entity having jurisdiction with respect to the operation or maintenance of the Existing Facility or the New Facility, as applicable; or

(b) the imposition after the Agreement Date of any material conditions on the issuance, modification or renewal of any official legal permit, license or approval necessary for the operation and maintenance of the Existing Facility or the New Facility, which, in the case of either (a) or (b) above, modifies the Company's obligations in connection with the Existing Facility's or the New Facility's performance or decreases or increases the cost of the Company's operation or maintenance of the Existing Facility or the New Facility and which is less or more burdensome than the most stringent requirements:

(i) in effect on the Agreement Date; or

(ii) agreed to by the City in any applications for official permits, licenses or approvals for the Existing Facility or the New Facility, other than any requirements set forth in said applications to comply with future laws, ordinances, codes, rules, regulations or similar legislation; or

(iii) in the Performance Standards set forth in Schedule 1 hereto and operation and maintenance standards set forth in Schedule 2 hereto; or

(iv) of "Prudent Industry Practices" meaning those methods, techniques, standards and practices which, at the time they are employed and in light of the circumstances known or reasonably believed to exist at the time, are generally accepted as reasonably prudent in the water treatment industry or other industry in which services similar to the Services are provided as practiced in the United States with respect to a plant of similar type as the Existing Facility and the New Facility.

For purposes of part (a) of this definition of the term "Change in Law," no enactment, adoption, promulgation or modification of laws, ordinances, codes, rules, regulations or similar requirement or enforcement policy with respect to any such requirement shall be considered a

Change in Law if, as of the Agreement Date, such law, ordinance, code, rule, regulation or other similar requirement would have affected directly the continued management, operation and maintenance of the Existing Facility or the New Facility by the City after the Commencement Date in the absence of this Agreement and such law, ordinance, code, rule, regulation or other similar requirement was either (i) officially proposed by the responsible agency and published in final form in the Federal Register or equivalent federal, State or local publication and thereafter becomes effective without further action or (ii) enacted into law or promulgated by the appropriate federal, State or local body before the Agreement Date, and the comment period with respect to which expired on or before the Agreement Date and any required hearing concluded on or before the Agreement Date in accordance with applicable administrative procedures and which thereafter becomes effective without further action. In no event shall a change in any federal, State or local tax law relating to corporate income tax be considered a Change in Law.

"Change Order" means a written order issued by the City to the Company after execution of this Agreement, authorizing or requiring: (1) Extra Construction Work, or deleted or omitted Construction Work, pursuant to Section 5.15 hereof; (2) an increase or reduction in the Fixed Construction Price; or (3) any other change in this Agreement prior to the Acceptance Date, including any change in the Design Requirements.

"Chemical(s)" has the meaning specified in Schedule 2, Section 2.2.5 hereto.

"City Employee(s)" has the meaning specified in Section 3.9 hereof.

"City Engineer" means (1) an engineer employed by the City, or (2) a consulting engineer or firm of consulting engineers, in either case having experience with respect to the design, construction, testing, operation and maintenance of water treatment facilities, who is designated for purposes of this Agreement as the City Engineer from time to time in writing by the City.

"City Fault" means any breach (including the untruth or breach of any City representation or warranty set forth herein), failure, nonperformance or noncompliance by the City under this Agreement which is not attributable to any Uncontrollable Circumstance or Company Fault, and which materially and adversely affects the Company's rights or ability to perform under this Agreement.

"City Indemnitees" has the meaning specified in Section 7.4.1 hereof.

"Commencement Date" means the date upon which the Company commences operations and related duties in connection with the Existing Facility.

"Commencement Date Deadline" has the meaning specified in Section 3.1.1 hereof.

"Company Construction Superintendent" has the meaning specified in Section 5.19.3 hereof.

"Company Fault" means any breach (including the untruth or breach of any Company representation or warranty set forth herein), failure, nonperformance or noncompliance by the Company under this Agreement (whether or not attributable to any officer, member, agent, employee, contractor, subcontractor of any tier, or an independent contractor of the Company or any

Affiliate of the Company) which is not directly attributable to any Uncontrollable Circumstance or City Fault, and which materially and adversely affects the City's rights or ability to perform under this Agreement.

"Compliance Plan" has the meaning specified in Section 3.10 hereof.

"Consent Agreement" means that certain Modified Consent Agreement No. RIA-382 dated June 19, 2012 entered into by RIDEM and the City.

"Construction Date" means the first date on which all of the Construction Date Conditions shall be satisfied or waived, as agreed to in writing by the parties, pursuant to Section 4.6 hereof.

"Construction Date Conditions" has the meaning specified in Section 4.5.1 hereof.

"Construction Date Deadline" has the meaning specified in Section 4.6.2 hereof.

"Construction Payment and Performance Bond" means the bond that guarantees the Company's timely performance of its payment, construction and other specified obligations for the benefit of the City.

"Construction Period" means the period from and including the Construction Date to the Acceptance Date.

"Construction Price" has the meaning specified in Section 5.17.1 hereof.

"Construction Work" means everything required to be furnished and done for and relating to the New Facility or the Site pursuant to this Agreement during the Construction Period, including all design work and including the design and construction of the Capital Improvements. A reference to Construction Work shall mean any part and all of the Construction Work unless the context otherwise requires, and shall include all Extra Construction Work authorized by Change Order pursuant to Section 5.15 hereof.

"Contract Term" or "Term" has the meaning specified in Section 10.1.1 hereof.

"Contract Year" means the consecutive twelve (12) month period commencing on July 1 in any year and ending on the following June 30; provided, however, that the first Contract Year shall begin on the Commencement Date and shall end on the following June 30, and the last Contract Year shall commence on July 1 prior to the date this Agreement expires or is terminated, whichever is appropriate, and shall end on the last day of the Contract Term or the effective date of any termination, as applicable.

"Cost Substantiation" means, with respect to any cost reasonably incurred or to be incurred by the Company which is directly or indirectly chargeable in whole or in part to the City hereunder, delivery to the City of a certificate signed by an officer of the Company, setting forth the amount of such cost and the provisions of this Agreement under which such cost is properly chargeable to the City, stating that such cost is a fair market price for the service or materials supplied or to be supplied and that such services and materials are reasonably required pursuant to this Agreement, and accompanied by copies of such documentation as shall be necessary to reasonably demonstrate that the cost as to which Cost Substantiation is required under this Agreement has been or will be

incurred. Such documentation shall include reasonably detailed information concerning (1) all Subcontracts; (2) the amount and character of materials furnished or to be furnished, the persons from whom purchased or to be purchased, the amounts payable therefor and related delivery and transportation costs and any sales or personal property Taxes, if any; (3) a statement of the equipment used or to be used and any rental payable therefor; (4) Company worker hours, duties, wages, salaries, benefits, assessments, taxes and premiums; and (5) Company expenses, including administrative expenses, bonds, insurance, overhead, and other expenses; and (6) Company profit (5% on Construction Work and 4.0% on Operation Services). Cost Substantiation, as applicable to the Fixed Construction Price, the fixed component of the Service Fee or any costs for which the City and Company have negotiated a lump sum price, shall mean documentation reasonably acceptable to the City but in no event less than that required by any City lender providing funding for the Services.

"Credit Enhancement Guaranty" has the meaning specified in Section 11.2.4 hereof.

"Credit Enhancement Letter of Credit" has the meaning specified in Section 11.2.4 hereof.

"Deliverable Material" has the meaning specified in Section 5.16 hereof.

"Design Requirements" means the Design Requirements for the Capital Improvements set forth in Schedule 12 hereto, as the same may be changed or modified in accordance with this Agreement.

"Development Period" has the meaning specified in Section 4.1 hereof.

"Discretionary Termination Amount" has the meaning specified in Section 8.4.1 hereof.

"Disposal Agreement" has the meaning specified in Section 3.5 hereof.

"Disposal Facility" has the meaning specified in Section 3.5 hereof.

"Disputed Work" has the meaning specified in Section 5.15.7 hereof.

"Distribution System" means any water collection, conveyance, or transmission piping, conduits or underground electrical wiring not within the confines of the Existing Facility or any pump station.

"Encumbrance(s)" means any lien, lease, mortgage, security interest, charge, judgment, judicial award, attachment or encumbrance of any kind with respect to the Site, other than Permitted Encumbrances.

"Enterprise Fund" means the City's fund through which all City water revenues are collected and expenses are paid, as authorized by the Rhode Island Public Utilities Commission.

"EPA" means the United States Environmental Protection Agency or any successor.

"Equipment" means all vehicles, machinery, structures, components, parts and materials located at the Existing Facility or the New Facility that are utilized in the operation, maintenance

and management of the Existing Facility or the New Facility.

"Equipment and Chemical Responsibilities" has the meaning specified in Schedule 2 hereto.

"Extension Period" means the period mutually agreed to by the City and the Company, extending the Acceptance Deadline. The Extension Period shall commence on the day after the Acceptance Deadline except in the event of one or more delays caused by (i) Uncontrollable Circumstances, (ii) City requested Change Orders or (iii) City Fault occurring during such period, in which case the Extension Period shall be deemed to have commenced on the date that is the next business day following the date calculated by adding to the Acceptance Deadline the aggregate number of days of such delay.

"Extra Construction Work" means any Construction Work ordered by the City in addition to the Construction Work originally required hereunder.

"Extra Payment" has the meaning specified in Section 5.15.2 hereof.

"Existing Facility" or "Existing WTP" means the existing City Water Treatment Facility, including but not limited to all treatment processes, disposal facilities, laboratory, water storage, pump stations, discharge facilities, and fixtures, equipment, tools and other property stored on or constituting the water plant, pump stations, intake structure, and associated site properties.

"Facility Modification" means any improvement, alteration, addition or other modification to the New Facility following Substantial Completion, which is requested or approved by the City. New Facility Modifications do not include maintenance, repair or replacement activities required to be undertaken by the Company pursuant to this Agreement.

"Facility Operations Report" has the meaning specified in Schedule 3 hereto.

"Fees and Costs" means reasonable fees and expenses of employees, attorneys, architects, engineers, expert witnesses, contractors, consultants and other persons, and costs of transcripts, printing of briefs and records on appeal, copying and other reimbursed expenses, and expenses reasonably incurred in connection with any Legal Proceeding.

"Final Completion" means completion of the Construction Work in compliance with the Design Requirements and the requirements of Section 6.11 hereof.

"Final Punch List" has the meaning specified in Section 6.2.2 hereof.

"Fiscal Year" means the fiscal year of the City, currently July 1 through June 30.

"Future Finished Water Requirements" means limits as of the Agreement Date set forth in the column labeled "Finished Water Quality Long Term Performance Standards" in Table 2.5 of Schedule 1 hereto.

"Future Operation Period" means the time period beginning with the Acceptance Date and ending on the last day of the Contract Term.

"FY" means Fiscal Year.

"Governmental Body" means any federal, State, City or regional legislative, executive, judicial or other governmental board, agency, authority, commission, administration, court or other body, or any official thereof having jurisdiction.

"Guaranty" or "Guaranty Agreements" means the agreements executed between the City and the Project Guarantors at Exhibit B.

"Hazardous Material" means, collectively, Hazardous Substance and Hazardous Waste.

"Hazardous Substance" has the meaning given such term in the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"), 42 U.S.C. § 9601 et seq., applicable State law and the regulations promulgated thereunder.

"Hazardous Waste" means any hazardous, toxic or dangerous waste, substance or material, or contaminant, pollutant or chemical, oil or petroleum product or byproduct, know or unknown, defined or identified as such in (or for the purposes of) any existing or future local, State or federal law, statute, code, ordinance, rule, regulation, guideline, decree or order relating to human health or the environment or environmental conditions, including but not limited to the Resource Conservation and Recovery Act (" RCRA"), 42 U.S.C. § 6901 et seq.; the Toxic Substances Control Act (" TSCA"), 15 U.S.C. § 2601 et seq.; the Federal Water Pollution Control Act, 49 U.S.C. § 1801 et seq.; the Safe Drinking Water Act, 42 U.S.C. § 300 et seq.; CERCLA; the Clean Air Act, 42 U.S.C. § 7401 et seq.; the Hazardous Materials Transportation Act, 49 U.S.C. App. § 1802 et seq.; the Occupational Safety and Health Act, 29 U.S.C. § 651 et seq.; including all similar State of Rhode Island laws and municipal ordinances; including all rules, regulations and guidelines promulgated under such statutes and including all amendments and supplements to such statutes and rules, regulations and guidelines and any order or decree relating to or imposing liability or standards or conduct concerning, or prohibiting, limiting or regulating exposure to, any waste, material, substance, contaminant, pollutant or chemical.

"Inflation Index" means the annual change in the blended index comprised of sixty percent (60%) of the U.S. Department of Labor, Consumer Price Index (CPI) for all urban consumers in the Northeast Area, ID CUUR0100SA0 (or its successor index) and forty percent (40%) of the U.S. Department of Labor, Bureau of Labor Statistics, Employment Cost Index (ECI), ID CIU2010000000210A, Compensation: Total Compensation, Industry/Occupation: Northeast, Sector: Private Industry (or its successor index).

"Infrastructure Bank" means the Rhode Island Infrastructure Bank (formerly known as the Rhode Island Clean Water Finance Agency) or its successor.

"Insurance" has the meaning specified in Schedule 4 hereto.

"Insurance Requirement(s)" means any rule, regulation, code, or requirement issued by any fire insurance rating bureau or any body having similar functions or by any insurance company which has issued a policy of Insurance under this Agreement, as in effect during the Contract Term, compliance with which is a condition to the effectiveness of such policy.

"Interim Finished Water Requirements" shall have the same meaning as Future Finished Water Requirements.

"Interim Operation Period" means the time period, beginning with the Commencement Date, during which the Existing Facility will operate under the Interim Finished Water Requirements and ending with the Acceptance Date.

"Labor and Materials Bond" means the bond, in an amount equal to the Fixed Construction Price, which guarantees to the City the Company's timely payment for all labor, materials, supplies, implements, and machinery and equipment to be furnished with respect to the Facility.

"Legal Entitlement" means any and all Permits, licenses, approvals, authorizations, consents and entitlements of whatever kind and however described, which are required under Applicable Law to be obtained or maintained by any person with respect to the construction of the Capital Improvements or the operation, maintenance and management of the Existing Facility or the New Facility or the performance of any other obligation of the Company under this Agreement, including without limitation, the Consent Agreements and Permits detailed in Schedule 6 hereto.

"Legal Proceeding" means every action, suit, litigation, arbitration, administrative proceeding, mediation and any other legal or equitable proceeding having a bearing upon this Agreement.

"Lien" means any and every lien against the Existing Facility or the New Facility or the Site or against any moneys due or to become due from the City to the Company under this Agreement, for or on account of the Construction Work or the Services, including without limitation mechanics', materialmen's, laborers' and lenders' liens.

"Loss-and-Expense" means any and all loss, expense, liability, forfeiture, obligation, damage, delay, penalty, judgment, deposit, cost, claim, demand, charge, tax, or expense, except as explicitly excluded or limited under any provision of this Agreement.

"Maintenance Management System" has the meaning specified in Schedule 2 hereto.

"Manuals" means the Operations Manual and related operations and maintenance manuals, including future operations manuals issued with new Equipment.

"Material Decline in Guarantor's Credit Standing" has the meaning specified in Section 11.2.3 hereof.

"Monthly Meeting" has the meaning specified in Schedule 2 hereto.

"Monthly Reports" has the meaning specified in Schedule 2 hereto.

"New Facility" or "New WTP" means the new City Water Treatment Facility to be designed and built pursuant to this Agreement, including but not limited to all treatment processes, disposal facilities, laboratories, water storage facilities, pump stations, pipelines, discharge facilities, and fixtures, equipment, tools and other property stored on or constituting the water plant, pump stations, aeration systems, well fields, intake structure, and associated site properties.

"Notice to Proceed" has the meaning specified in Section 5.4.1 hereof.

"Operation and Maintenance Fee" means the component of the Service Fee consisting of the costs of performing the Services exclusive of the Capital Improvements.

"Operation and Maintenance Manual" has the meaning specified in Section 3.3 hereof.

"Operations and Maintenance Plan" or "O&M Plan" has the meaning specified in Schedule 3 hereto.

"Operation Period" means the period of time commencing with and including the Commencement Date, through and including the last day of the Contract Term. The Operation Period is comprised of the Interim Operation Period and the Future Operation Period.

"Operation Period Letter of Credit" has the meaning specified in Section 11.3.3 hereof.

"Operations Bond" has the meaning specified in Section 11.3.2 hereof.

"Operations Records" has the meaning specified in Schedule 2 hereto.

"Pass Through Cost(s)" means that component of the monthly invoices from the Company to the City consisting of those costs of the Company listed on Schedule 10 hereto, but not included in the Service Fee.

"Performance Guaranties" means the Bonds, the Guaranty Agreements, the Operation Period Letter of Credit, the Credit Enhancement Letter of Credit, the Credit Enhancement Guaranty, and the Insurance set forth in Schedule 4, or any combination thereof.

"Performance Requirements" means the Performance Standards set forth in Schedule 1 hereto as well as any other performance requirements relating to the Existing Facility or the New Facility set forth in this Agreement that are the responsibility of the Company.

"Performance Standards" has the meaning specified in Schedule 1 hereof.

"Permits" has the meaning specified in Schedule 6 hereto.

"Permitted Encumbrances" means, as of any particular time, any one or more of the following:

(1) encumbrances for utility charges, taxes rates and assessments not yet delinquent or, if delinquent, the validity of which is being contested diligently and in good faith by the Company and against which the Company has established appropriate reserves in accordance with generally accepted accounting principles;

(2) any encumbrance arising out of any judgment rendered which is being contested diligently and in good faith by the Company, the execution of which has been stayed or against which a bond or bonds in the aggregate principal amount equal to such judgments shall have been posted with a financially sound insurer and which does not have a material and adverse effect on the

ability of the Company to construct or operate the New Facility;

(3) any encumbrance arising in the ordinary course of business imposed by law dealing with materialmen's, mechanics', workmen's, repairmen's, warehousemen's, landlords', vendors' or carriers' encumbrances created by law, or deposits or pledges which are not yet due or, if due, the validity of which is being contested diligently and in good faith by the Company and against which the Company has established appropriate reserves;

(4) servitudes, licenses, easements, encumbrances, restrictions, rights-of-way and rights in the nature of easements or similar charges which will not in the aggregate materially and adversely impair the construction and operation of the New Facility by the Company; and

(5) zoning and building bylaws and ordinances, municipal bylaws and regulations, and restrictive covenants which do not materially interfere with the construction and operation of the New Facility by the Company.

"Plans" has the meaning specified in Schedule 3 hereto.

"Pre-Construction Period" means the period from and including the Agreement Date to the Construction Date.

"Pre-Existing Environmental Condition" means, and is limited to, the following occurrences to the extent not reasonably discoverable as part of the Site and geotechnical investigations contemplated in Section 4.3 hereof: (1) the presence anywhere in, on or under the Sites on the Contract Date of underground storage tanks (for the storage of chemicals or petroleum products); (2) the presence of Hazardous Materials or other Regulated Substances in environmental media anywhere in, on or under the Sites (including the presence in surface water, groundwater, soils or subsurface strata) as of the Contract Date; and (3) the off-site migration of pollutants or contamination to or from the Sites, including any migration during any dewatering required for the construction of the Work, which is not caused by the failure of the Company to perform dewatering in accordance with Prudent Engineering and Construction Practice.

"Project Guarantors" or "Guarantors" means the Initial Guarantor, AECOM Technical Services Inc., a California corporation, and the Successor Guarantor, SUEZ Water Inc., a Delaware corporation, the entities financially guarantying the performance of the Company to fulfill the obligations of this Agreement by issuing the Guaranties.

"Proposal" means the Company's Proposal submitted in response to the RFP and the responses submitted by the Company including (a) responses to the City's (i) Requests for Clarifications; and (ii) Interview Questions and (b) all clarifying documents and correspondence from the Company to the City. The Proposal is made a part hereof by reference and is intended to be used for background and interpretation purposes in the event of any ambiguity in this Agreement; provided, however, that in the event of a conflict between the Proposal and the terms and conditions of this Agreement (including all Schedules and Exhibits thereto other than the Proposal), this Agreement shall be controlling.

"Proposal A" means the proposal in response to the RFP addressing meeting existing

Finished Water regulatory requirements with existing facilities.

"Proposal A Service Fee" means the Service Fee under Proposal A.

"Proposal B" means the proposal in response to the RFP addressing meeting the requirements hereof for newly constructed facilities.

"Proposal B Service Fee" means the Service Fee under Proposal B.

"Pump Station(s)" has the meaning specified in Schedule 2.

"Rating Service" means Moody's Investors Service or Standard & Poor's Rating Services, or any of their respective successors.

"Record Documents" has the meaning specified in Section 6.5.6 hereof.

"Renewal and Replacement Plan" has the meaning specified in Schedule 3 hereto.

"Repair and Replacement Fund" has the meaning specified in Section 3.7 hereof.

"Residuals" or "Facility Residuals" means any liquid, semisolid or solid material resulting from the water treatment process at the Existing Facility or the New Facility.

"RFP" means the Request for Proposals for Capital Improvements, Operations, Maintenance, and Management of City of Woonsocket Water Treatment Facility, dated August 5, 2015 and all addenda thereto and all Requests for Clarifications and Interview Questions submitted by the City. The RFP is made a part hereof by reference and is intended to be used for background and interpretation purposes in the event of any ambiguity in this Agreement; provided, however, that in the event of a conflict between the RFP and the terms and conditions of this Agreement (including all Schedules and Exhibits thereto other than the RFP), this Agreement shall be controlling.

"RIDEM" means the Rhode Island Department of Environmental Management or its successor.

"RIPUC" means the Rhode Island Public Utilities Commission or its successor.

"RIWRB" means the Rhode Island Water Resources Board or its successor.

"Rolling Stock" means vehicular Equipment included in the New Facility.

"Safety and Security Plan" has the meaning specified in Schedule 3 hereto.

"SCADA System" means the supervisory control and data acquisition system at the New Facility.

"Schedule(s)" mean(s) the schedule(s) attached to this Agreement, which together with this Agreement and the Exhibits attached thereto constitute the entire Agreement with respect to the

Capital Improvements, operations, maintenance, and management of the Existing Facility or the New Facility.

"Selected Proposer" means the Company.

"Service Fee" means the annual amount payable to the Company by the City for the Services, exclusive of Capital Improvements, provided under this Agreement as set forth in Schedule 11 hereto and including the Proposal A Service Fee and the Proposal B Service Fee.

"Service Territory" means the City and all other territory in which customers are served by the Existing Facility or the New Facility during the Contract Term.

"Services" means the Capital Improvements to, and operations, maintenance, and management of the Existing Facility and the New Facility to be provided by the Company in accordance with the terms and provisions of this Agreement.

"Site" means the real property upon which the Existing Facility or the New Facility, as applicable, shall be situated.

"Special Subsurface Condition" means the presence at the Sites of subsurface or latent physical conditions (other than Pre-existing Environmental Conditions) that materially differ from the subsurface conditions described as existing or assumed to exist in the documents supplied by the City during the RFP process and/or included as the baseline conditions outlined in the Proposal and Schedule 12, including the presence of subsurface structures, materials or conditions having historical, geological, archeological, religious or similar significance, to the extent said subsurface conditions were also not reasonably discoverable during the Site investigations contemplated in Section 4.3 hereof.

"Staffing Plan" has the meaning specified in Schedule 2 hereto.

"State" means the State of Rhode Island and all its relevant administrative, contracting and regulatory agencies and offices.

"Subcontract" means an agreement between the Company and a Subcontractor, or between two Subcontractors, as applicable.

"Subcontractor" means every person (other than employees of the Company) employed or engaged by the Company or any person directly or indirectly in privity with the Company (including every subcontractor of whatever tier) whether for the furnishing of labor, materials, equipment, supplies, services, or otherwise.

"Substantial Completion" has the meaning specified in Section 6.2 hereof.

"System" means the City's drinking water treatment system as described in Exhibit A hereto, and including any and all modifications to the System during the Contract Term, but not including the operation and maintenance of the watershed lands and reservoir system and the water distribution system and appurtenances (excluding pump stations and those transmission facilities designed or rehabilitated by the Company), capital planning, policy development, long range and

Service Area planning, the setting of customer rates and charges, meter reading, billing and collection.

"System Revenues" means all revenues derived by the City in connection with the operation of the System and accounted for under the City's Enterprise Fund.

"Termination for Convenience" has the meaning specified in Section 8.4.1 hereof.

"Transaction Costs" has the meaning specified in Section 3.11.1 hereof.

"Transaction Cost Payment" has the meaning specified in Section 3.11.1 hereof.

"Transition Plan" has the meaning specified in Schedule 3 hereto.

"Transmission Line" means any major water conveyance pipeline located outside the treatment plant and/or pump stations for the transportation (i.e. transmission) of water to or from the water treatment plant. In the latter case, the transmission lines are part of the water distribution system of the City.

"Uncontrollable Circumstances" means any act, event or condition to the extent that it impacts the cost of performance of or materially and adversely affects the ability of either party to perform any obligation under this Agreement (except for payment of obligations), if such act, event or condition, in light of the circumstances known or reasonably believed to exist at the time, is beyond the reasonable control and is not a result of the willful or negligent act, error or omission or failure to exercise reasonable diligence on the part of the party relying thereon; provided, however, that the contesting in good faith or the failure in good faith to contest such action or inaction shall not be construed as a willful or negligent act, error or omission or a lack of reasonable diligence of either party.

Subject to the foregoing, such acts, events or conditions may include, but are not limited to, the following:

(a) Inclusions:

(1) an act of God (but not including reasonably anticipated weather conditions as of the date hereof for the geographic area of the Existing Facility or, as applicable, the New Facility), landslide, earthquake, fire, explosion, flood, sabotage or similar occurrence, acts of a public enemy, extortion, war blockade or insurrection, riot or civil disturbance;

(2) a Change in Law;

(3) the failure of any appropriate governmental agency or private utility to provide and maintain utilities;

(4) the preemption, confiscation, diversion, destruction, or other interference in possession or performance of material or services by, on behalf of, or with authority of a governmental body in connection with a declared or asserted public emergency or any condemnation or other taking by eminent domain or similar action of any portion of the Existing

Facility or the New Facility;

(5) Contamination of the Sites groundwater, soil or airborne Hazardous Material, Hazardous Substances, or Toxic Substances migrating from sources outside of the Sites and not caused by Company Fault;

(6) the existence of a Special Subsurface Condition, except as may be specifically identified in and resolved following the Written Test Report;

(7) the existence of a Pre-existing Environmental Condition, except as may be specifically identified in and resolved following the Written Test Report.

(b) Exclusions:

(1) general economic conditions, interest or inflation rate fluctuations, commodity prices or changes in prices, or currency or exchange rate fluctuations;

(2) changes in the financial condition of the City, the Company, the Project Guarantors, or any of their affiliates or subcontractors;

(3) union work rules which increase the Company's operating cost for the Existing Facility or the New Facility;

(4) any impact of prevailing wage laws on the Company's cost;

(5) the consequence of Company error, including any errors of Company Affiliates or Subcontractors;

(6) failure of any Subcontractor or supplier to furnish labor, services, materials or equipment on the dates agreed to;

(7) local strikes, work stoppages or labor disputes of the Company's employees, agents or Subcontractors;

(8) equipment failure (unless caused by an Uncontrollable Circumstance); or

(9) litigation against the Company.

"Utilities" means any and all utility services and installations whatsoever (including gas, heating, fuel oil, water, sewer, electricity, telephone, and telecommunication), and all piping, wiring, conduit, and other fixtures of every kind whatsoever related thereto or used in connection therewith.

"Vehicle(s)" means all cars, trucks, vans or other modes of transportation used in connection with the operation of the Existing Facility or the New Facility for transporting people or things or used for other necessary functions in the operation or maintenance of the Existing Facility or the New Facility.

"Vehicle Maintenance Responsibilities" has the meaning described in Schedule 2 hereto.

ARTICLE III
OPERATION, MAINTENANCE AND MANAGEMENT OF THE FACILITY

Section 3.1 Conditions Precedent to the Commencement Date.

Section 3.1.1. Company Obligations.

The Commencement Date shall occur no later than midnight, December 31, 2018, or such other date as mutually agreed by the City and Company (the "Commencement Date Deadline"). The Commencement Date shall be subject to the satisfaction by the Company, to the City's sole satisfaction, of all of the following conditions precedent:

(a) The Guarantors shall have executed and delivered to the City the Guaranty. Agreements to be provided by the Guarantors in the forms attached hereto as Exhibit B. Each Guaranty Agreement shall be effective in accordance with its respective terms and conditions.

(b) The Company shall have delivered to the City (i) a certificate of an authorized officer of the Company, dated as of the Commencement Date, to the effect that each of the representations of the Company set forth in this Agreement is true and correct in all material respects as if made on such date, and an (ii) opinion of counsel to the Company, in customary form and reasonably acceptable to the City, regarding matters of law set forth in Sections 9.2.1 through 9.2.5 hereof.

(c) The City shall have received documentation that all Insurance required to be obtained by the Company pursuant to this Agreement has been obtained.

(d) The Company shall have delivered to the City the Operations Bond, duly executed by its issuer in the amount equal to the then-current year's annualized Service Fee.

(e) The Company shall have recruited, retained and employed all management and other personnel necessary for its performance of the Services hereunder, which personnel shall be duly licensed as and to the extent required by Applicable Law, and shall have delivered to the City a roster of all such personnel together with copies of the licenses of all personnel required to be licensed.

(f) The Company shall have obtained and shall have submitted to the City copies of all Legal Entitlements required to be obtained by the Company by Applicable Law as a condition of performing the Services hereunder as of the Commencement Date.

(g) The Company shall have provided to the City resumes of key staff, including but not limited to the Company plant manager, construction site construction manager and construction design project manager.

Section 3.1.2. City Obligations.

The Commencement Date shall be subject to the satisfaction by the City of each of the

following conditions precedent:

(a) The City shall have delivered to the Company a certificate of an authorized representative of the City, dated as of the Commencement Date, to the effect that each of the representations of the City set forth in this Agreement is true and correct in all material respects as if made on such date.

(b) The City shall have delivered to the Company a notice that the City has received approvals for the public and private financing for the Capital Improvements necessary as of the Commencement Date.

Section 3.1.3. Non-Compliance.

If all of the Commencement Date Conditions for which the Company is responsible are not either satisfied by the Company or waived by the City on or prior to the Commencement Date Deadline, then the Company shall pay to the City, in addition to other costs and expenses required to be paid pursuant to this Agreement (including without limitation fines, penalties or other expenses imposed on or incurred by the City in connection with the Company's failure to meet such deadline), a daily delay non-compliance assessment in the amount of $7,500 for each day that such Commencement Date Conditions remain unsatisfied after said date until any termination of this Agreement for an Event of Default. In the event that the Commencement Date Conditions are not either satisfied or waived as required hereunder due to the sole fault of the City, then schedule relief will be granted by the City consistent with documented evidence of such fault and delay provided by the Company to the City's satisfaction.

In addition to the foregoing, the Company shall also be responsible to reimburse the City one hundred percent (100%) of the City's documented costs for supervision, management and other labor and materials expenses incurred by the City in connection with the Company's failure to timely meet the Commencement Date Deadline.

Section 3.2 Satisfaction of Conditions Precedent.

The Company and City shall satisfy or waive the conditions precedent identified in Section 3.1.1 and Section 3.1.2 on or before the Commencement Date Deadline; each party shall give the other prompt notice when any condition precedent has been satisfied. Upon satisfaction of all such conditions precedent, the City shall give written notice to the Company, and the Commencement Date shall occur on the Commencement Date Deadline or such other date as shall be agreed upon by the Parties, so long as, as of such date:

(1) No action, suit, proceeding or official investigation shall have been overtly threatened or publicly announced or commenced by any person or federal, State or local governmental authority or agency other than the City in any federal, State or local court, that seeks to enjoin, assess civil or criminal penalties against, assess civil damages against or obtain any judgment, order or consent decree with respect to the City or the Company as a result of the City's or the Company's negotiation, execution, delivery or performance of this Agreement, other than any such action, suit, proceeding or investigation which would not, if adversely determined, materially adversely affect this Agreement or the performance by the parties of their respective obligations

hereunder; or

(2) No changes shall have occurred after the Agreement Date and on or before the Commencement Date in any applicable federal, State or local rule, regulation or ordinance thereunder, or in the interpretation thereof by any applicable regulatory authority, that would make (i) the execution or delivery of this Agreement by the City or the Company or (ii) compliance by the City or the Company with the terms and conditions of this Agreement, a violation of such law, rule, regulation or ordinance.

If all such conditions precedent set forth in Sections 3.1.1 and 3.1.2 hereof are not so satisfied or waived on or before the Commencement Date Deadline or such later date mutually agreed to in writing by the parties hereto, or if any circumstances described in clauses (1) or (2) above, if any, exist and continue as of such date, then the City, by notice in writing to the Company, may terminate this Agreement or may extend the date upon which the Commencement Date shall occur. If the City shall give a written termination notice to the Company for failure of the Company to fulfill the Company obligations set forth in Section 3.1.1 or clauses (1) or (2) above, the City shall have recourse to, in addition to any other recourse provided hereunder, the Construction Payment and Performance Bond to recoup the City's costs in connection with reprocurement.

If the City shall not have fulfilled the City obligations set forth in Section 3.1.2, or if the circumstances described in clauses (1) or (2) above exist and continue, as of the Commencement Date Deadline, then the Company may terminate this Agreement by written notice.

Section 3.3 Overall Company Responsibilities.

On and after the Commencement Date and throughout the Contract Term, the Company shall:

(1) operate, maintain and manage the Existing Facility and the New Facility in accordance with this Agreement (including, without limitation, the requirements set forth in the Schedules hereto) and Applicable Law, said Company responsibilities including, without limitation, the following:

(a) preparing and delivering to the City an updated Operation and Maintenance Manual for the New Facility, including the Capital Improvements (the "Operation and Maintenance Manual"), which shall be provided to the City in hard copy and electronic format;

(b) conducting day-to-day operations and monitoring in accordance with this Agreement, including all Schedules hereto, and in compliance with Applicable Law;

(c) preparing and submitting to appropriate authorities all reports and plans mandated by this Agreement and by Applicable Law;

(d) complying with all emergency and safety requirements set forth in Schedule 3 hereto and required by Applicable Law;

(e) performing all scheduled maintenance to ensure the long-term efficient operation of the Existing Facility and the New Facility;

(f) in addition to the Capital Improvements, performing maintenance, repairs and replacements as needed on infrastructure components;

(g) maintaining the inventory and inventory records for the consumable supplies and Equipment needed for the operations and maintenance of the System, including, without limitation, the Equipment and Chemicals Inventory described more particularly in Schedule 2 hereto;

(h) maintaining the grounds at the Site in a neat and orderly condition;

(i) disposing of residuals from the Existing Facility or the New Facility;

(j) plowing access roads and parking areas when snow levels reach two (2) or more inches;

(k) integrating, on an on-going basis, the SCADA System with New Facility operations, including, without limitation, (a) any staff training with regard to the SCADA System that may be required, and (b) any modifications to the SCADA System that may be required in connection with the Capital Improvements;

(l) hiring and retaining appropriate staff for the Existing Facility and the New Facility while maintaining compliance with Section 3.9 hereof; and

(m) maintaining any and all appropriate records in connection with the activities specified above for the longer period of (1) the minimum periods required by Applicable Law, or (2) the duration of this Agreement; and

(2) Except for Equipment and other facilities and materials included in the Existing Facility as of the Commencement Date, and except for the Capital Improvements and expenditures under the Repair and Replacement Fund, provide, at its sole cost and expense, all labor, materials, machinery, vehicles, equipment, office equipment (i.e. copiers, computers, etc.), fuel, chemicals, supplies, spare parts, expendables, consumables, testing and laboratory analysis and any other items required for operation, maintenance repair, replacement, renewal and management of the Existing Facility and the New Facility in accordance with this Agreement.

(3) As requested by the City, provide facilities and facility operation of any future Existing Facility or New Facility upgrades or expansions in accordance with terms and conditions mutually agreed to by the City and the Company.

Section 3.4 [INTENTIONALLY OMITTED].

Section 3.5 Identification of an Authorized Disposal Facility.

The Company shall be responsible for making all arrangements, subject to the City's approval, with respect to quantity, quality and timing of discharge of any residuals to the City's sewer system.

Section 3.6 Responsibilities.

On and after the Commencement Date and during the remainder of the Contract Term, the City shall:

(1) pay, or cause to be paid, the Service Fee to the Company in accordance with the terms and conditions of this Agreement for the Company's performance of its obligations under this Agreement;

(2) afford the Company access to the Existing Facility and the New Facility to the extent necessary for the Company to perform its obligations hereunder;

(3) retain responsibility for the operation and maintenance of the Distribution System, perform meter reading and maintenance, and perform long-term System and Service Area planning and management of watershed dams and reservoirs;

(4) make available to the Company Equipment warranty information, engineering drawings, calculations, maintenance manuals, operational records, logs, reports, submittals, repair records, audits, and information which may be in the City's possession or that of its agents, relating to the design, condition, operation or maintenance of the Existing Facility or the New Facility.

Section 3.7 Repair and Replacement.

The City recognizes that repair and replacement capital spending may be required during the Interim Operation Period to maintain its functional performance until such time as the New WTP becomes operational.

The Company shall include the following for repair and replacement budgets during the Interim Operation Period:

a. All repair and replacement expenditures will be funded by the Company for all expenses less than $10,000 per event (i.e., shall be budgeted by the Company as part of the Service Fee).

b. Any Company repair and replacement expenses greater than $10,000 will be funded by the City on a "time and materials" basis following written request by the Company and approval by the City.

New Facility:

For the first ten full years of the Future Operation Period, the Company shall be responsible for all repair and replacement expenses regardless of the amount (i.e., such amounts shall be included in the Service Fee). Following the first ten full years, consistent with the Company's obligations during the Interim Operation Period, the Company shall be responsible for all repair and replacement expenses less than $10,000 per event (i.e., such amounts shall be included in the Service Fee).

Commencing ten years following the Acceptance Date and continuing annually until the termination of this Agreement, the City will establish a "Repair and Replacement Fund" in the amount of $300,000 (to be adjusted by the change in the Inflation Index, using 2017 as a baseline) per fiscal year. The Repair and Replacement Fund shall be available beginning on the tenth (10^{th}) anniversary of

the Acceptance Date (the "Repair and Replacement Fund Eligibility Date"). Beginning on the Repair and Replacement Fund Eligibility Date, certain repair and replacement expenses in excess of $10,000 (to be adjusted by the change in the Inflation Index, using 2017 as a baseline) will be funded separately from the Service Fee through the Repair and Replacement Fund, but only with City approval and authorization (not to be unreasonably withheld) following documented submittals by the Company to the City. Costs for repair and replacement expenditures over and above the Repair and Replacement Fund shall be the responsibility of the Company; provided, however, if the Company's expenditures from the Repair and Replacement Fund exceed the yearly amount, such expenditures may, at the Company's option, be charged against the fund amount for the following year only (not subsequent years). For the avoidance of doubt, the foregoing is not a one-time allowance over the term of the Agreement; rather, the Company may exercise the option to charge against the fund for the following year repeatedly over the term of the Agreement.

No funds shall be disbursed from the Repair and Replacement Fund without the prior written consent of the City. Commencing on the Repair and Replacement Fund Eligibility Date, the Company, on a monthly basis, shall submit to the City a report on expenses that should be reimbursed out of the Repair and Replacement Fund and may request the City to pay such expenses directly from the Repair and Replacement Fund.

On the Repair and Replacement Fund Establishment Date and periodically thereafter, the Company shall recommend and perform activities to be paid for from the Repair and Replacement Fund as follows:

The Company shall evaluate the necessity for performing any major repair and replacement activities payable from the Repair and Replacement Fund. Ordinary maintenance activities shall continue to be paid for by the Company.

The Company shall prepare written recommendations for all major repair and replacement activities to be paid from the Repair and Replacement Fund that the Company advises are required to keep the Facility in a state of good operating order, which recommendations shall include the approximate cost of completing such activities.

The City, within fifteen (15) days of the receipt of such written recommendations, shall either approve or deny the Company's recommendation in writing, provided that if the City fails to timely notify the Company in writing, such recommendation shall be deemed denied.

In the event that the City shall approve the Company's recommendation, and in the event the cost of the major repair or replacement activity plus the total aggregate cost of all such activities previously incurred during any Contract Year does not exceed the total amount in the Repair and Replacement Fund, the Company shall proceed with the recommended work, and it shall be paid for from the Repair and Replacement Fund.

In the event the City shall approve the Company's recommendation, but the cost of the major repair or replacement activity plus the total aggregate cost of all such activities previously made during the current Contract Year exceeds the total amount then in the Repair and Replacement Fund, the Company shall be responsible for providing the additional funding.

Any amounts not used by the Company and remaining in the Repair and Replacement Fund at the end of each Contract Year will be rolled over and accumulate. Any amounts not used by the Company and remaining in the Repair and Replacement Fund at the end of the Term shall revert back to the City.

Section 3.8 Company Project Manager.

The Company has designated Chris Jacobs as the Company's full-time Project Manager. The Project Manager, and any successor (which successor shall be subject to the approval of the City, as described below), shall, within ninety (90) days after the Commencement Date, reside either within the City service area or within thirty (30) miles of the Site. The Project Manager will be responsible for all duties customarily assigned to project managers. The City has selected the Company to perform the services contemplated under this Agreement based, in part, on the past successful experience and expertise of the designated Project Manager. Accordingly, the Company shall not, absent good cause, replace such Project Manager during the term of this Agreement, without the prior approval of the City. If such Project Manager or any City-approved successor shall retire, resign as Project Manager or otherwise cease employment with the Company, the Company shall not appoint a successor Project Manager without the prior written approval of the City. If the City, in its sole discretion, determines that the Project Manager is performing in an unsatisfactory manner, or if an unworkable relationship between the Project Manager and the City shall arise, the Company, upon notice by the City of such circumstance, shall promptly replace such Project Manager with a successor acceptable to the City; provided, however, the City represents that it will not give such notice to the Company unless and until the City, in its sole determination, has exercised reasonable good faith efforts to rectify to its satisfaction the adverse circumstance regarding the Project Manager.

Section 3.8A Company Design/Build Manager.

The Company has designated Rhonda Pogodzienski as the Company's manager of the design/build of the New Facility to be provided by the Company from commencement of the Agreement through acceptance of the New Facility. The Company Design/Build Manager will be responsible for all duties customarily assigned to project managers. The City has selected the Company to perform the services contemplated under this Agreement based, in part, on the past successful experience and expertise of the designated Design/Build Manager. Accordingly, the Company shall not, absent good cause, replace such Design/Build Manager during the term of this Agreement, without the prior written approval of the City. If such Design/Build Manager or any City-approved successor shall retire, resign as Design/Build Manager or otherwise cease employment with the Company, the Company shall not appoint a successor Design/Build Manager without the prior written approval of the City. If the City, in its sole discretion, determines that the Design/Build Manager is performing in an unsatisfactory manner, or if an unworkable relationship between the Design/Build Manager and the City shall arise, the Company, upon notice by the City of such circumstance, shall promptly replace such Design/Build Manager with a successor acceptable to the City; provided, however, the City represents that it will not give such notice to the Company unless and until the City, in its sole determination, has exercised reasonable good faith efforts to rectify, to its satisfaction, the adverse circumstance regarding the Design/Build Manager.

Section 3.8B Company On-Site Construction Project Manager.

The Company has designated Steve Emmendorfer as the Company's on-site construction project manager of the New Facility to be provided by the Company from commencement of Construction activities through acceptance of the New Facility. The On-Site Construction Project Manager will be responsible for all duties customarily assigned to project managers. The City has selected the Company to perform the services contemplated under this Agreement based, in part, on the past successful experience and expertise of the designated On-Site Construction Project Manager. Accordingly, the Company shall not, absent good cause, replace such On-Site Construction Project Manager during the term of this Agreement, without the prior written approval of the City. If such On-Site Construction Project Manager or any City-approved successor shall retire, resign as On-Site Construction Project Manager or otherwise cease employment with the Company, the Company shall not appoint a successor On-Site Construction Project Manager without the prior written approval of the City. If the City, in its sole discretion, determines that the On-Site Construction Project Manager is performing in an unsatisfactory manner, or if an unworkable relationship between the On-Site Construction Project Manager and the City shall arise, the Company, upon notice by the City of such circumstance, shall promptly replace such On-Site Construction Project Manager with a successor acceptable to the City; provided, however, the City represents that it will not give such notice to the Company unless and until the City, in its sole determination, has exercised reasonable good faith efforts to rectify, to its satisfaction, the adverse circumstance regarding the On-Site Construction Project Manager.

Section 3.9 Personnel

Section 3.9.1. Orientation and Career Planning.

The Company shall conduct a Company orientation and career planning workshop or workshops for City Employees, at the Company's sole cost and expense. The workshop(s) shall apprise City Employees of applicable legal requirements relative to their employment rights, and shall orient the City Employees to the Company's management, operation and maintenance policies (and its plan for providing such services under this Agreement), its career planning policy, its hiring program and criteria and its compensation and benefits plans. The Company's obligation to hire City employees is subject to the Company's standard hiring practices, including background checks and drug testing, to the extent consistent with the Memoranda referenced in Section 3.9.2. The City makes no representations as to whether such practices are consistent with such memoranda, and the City assumes no obligation to act in the event the Company's City employees challenge such practices.

Section 3.9.2. Continued and Comparable Employment.

The parties hereby incorporate the terms of those certain Memoranda of Agreement by and among (a) Rhode Island Council 94, AFSCME-CIO on behalf of City of Woonsocket; Rhode Island Employees Local 670, the City and the Company, and (b) Rhode Island Council 94, AFSCME-CIO on behalf of City of Woonsocket Professional and Technical Employees Local 3851, the City and the Company, attached hereto as Schedule 18.

Section 3.10 Noncompliance Assessment for Failure to Meet Water Quality Standards.

The Company is required to satisfy the requirements of Applicable Law with respect to the quality of treated raw water by the Existing Facility and the New Facility as set forth in Schedule 1 hereto except during events of Uncontrollable Circumstances. Except where such failure is due to Uncontrollable Circumstances, failure to satisfy such requirements, or failure to operate the Existing Facility and the New Facility in such a manner as to minimize noise and/or dust emanating from the Existing Facility and the New Facility, shall result in the imposition on the Company of a noncompliance assessment in the manner and in the amounts set forth in this Section 3.10. If the Company fails to meet Interim or Future Finished Water Requirements as and when required hereunder:

(1) the Company shall immediately take all reasonable and appropriate action to satisfy all Interim or Future Finished Water Requirements as applicable;

(2) the Company shall provide a plan to the City outlining corrective actions for achieving compliance with Interim or Future Finished Water Requirements as applicable (the "Compliance Plan") within forty-eight (48) hours of written notice of noncompliance given by the City;

(3) the City will review and provide written comments on the Compliance Plan within forty-eight (48) hours after receipt; and

(4) the Company shall immediately implement the Compliance Plan, which shall address the City's comments.

The Company will be responsible for performing any and all operational modifications as specified by the Compliance Plan. If the Company fails to either provide a Compliance Plan or to implement the corrective actions set forth in the Compliance Plan, the Company shall be liable for a noncompliance assessment in the amount of $5,000 per day from either (i) the date on which the Compliance Plan should have been submitted, or (ii) the date on which corrective actions should have commenced pursuant to the Compliance Plan. Such noncompliance assessment of $5,000 per day shall be continued for any repeated failure to comply with the same particular standard previously violated within any twelve (12) month period under this Section 3.10. The Company's liability for non-compliance assessments under this provision shall not exceed $1,000,000 per occurrence requiring a Compliance Plan. This limitation shall be included under the aggregate limitation of liability included under below Section 7.1. Neither the review of or comment on, nor the failure of the City to comment on, any Compliance Plan proposed by the Company, nor the Company's obligation to pay noncompliance assessments hereunder, shall relieve the Company of

any of its responsibilities under this Agreement, shall be deemed to constitute a representation by the City that the corrective actions proposed in any such Compliance Plan will cause the Existing Facility or the New Facility to be in compliance with the Interim or Future Finished Water Requirements, as applicable, or otherwise impose any liability on the City.

All fines or penalties imposed on the City or the Company by any Governmental Body as a result of failure of the Existing Facility to conform to the Interim Finished Water Requirements or the New Facility to conform to the Future Finished Water Requirements shall be the obligation of and shall be paid by the Company.

Section 3.11 Fees and Payments.

Section 3.11.1. Reimbursement for Procurement and Related Costs.

Upon delivery of an invoice by the City, the Company shall pay the City a one-time payment for the fee and expenses of a consultant to assist the Woonsocket Fire Department in their review of submittals, in the amount of Thirty Thousand Dollars ($30,000).

Also upon delivery of an invoice by the City, the Company shall pay the City a one-time payment for the fee and expenses of National Grid to extend the power from the corner of Getchell Avenue and Jillson Avenue to a location 200 feet from the pad mounted transformer shown on the Company's proposed site plan, in the amount of Fifty Thousand Dollars ($50,000).

Also upon delivery of an invoice by the City, the Company shall pay for the fee and expenses to cover the costs of permit fees associated with the project as described in this Agreement, in the amount of Ten Thousand Dollars ($10,000). The allowance shall only be used towards the permit fee itself. The allowance shall not be used for reimbursement for any time and expense associated with preparation of applications for the permits or for any costs associated with meeting the requirements of the permits. Any additional permits resulting from alternate approaches proposed by the Company shall be the responsibility of the Company and shall not be paid by utilization of the allowance.

Section 3.11.2. Service Fee.

Commencing with the first Billing Month after the Commencement Date and for each Billing Month thereafter, the City shall pay to the Company a Service Fee for managing, operating and maintaining the Existing Facility or the New Facility, as applicable, pursuant to the terms and conditions of this Agreement. The Service Fee paid shall be dependent upon the phase of operation. The initial Service Fee shall be the Existing WTP Service Fee as set forth on Schedule 11. The Existing WTP Service Fee shall terminate on the Acceptance Date and the New WTP Service Fee as set forth on Schedule 11 shall commence. Except as otherwise provided in this Agreement, the Service Fee includes all compensation to the Company for managing, operating and maintaining the Facility. The annual Service Fee, as applicable, shall be paid in increments of 1/12th each during each month of a Contract Year and shall be paid via wire transfer. Company shall invoice the City in arrears for all other amounts due, if any. Partial months shall be prorated. Such invoices shall be due and payable within thirty (30) days from the date received by the City. The City will review

Company's invoices, and if the City questions any items, the City shall notify Company within twenty-one (21) days of receipt of the invoice. All amounts not in dispute will be paid when due.

Section 3.11.3. Service Fee Adjustment.

The Service Fee shall be consistent with the private activity limitations described in Section 141 of the Internal Revenue Code and regulations and official interpretations issued thereunder, including, without limitation, Revenue Procedure 2017-13 ("Private Activity Limitations"). The City shall have the right to equitably adjust the Service Fee payment formula over the course of the Contract Term as follows.

(1) As necessary to comply with the Private Activity Limitations. Notwithstanding any provision hereof to the contrary, the City and the Company agree that the City shall be under no obligation to, and shall not, pay compensation for services to the Company to the extent that such payment would result in less than 80% of the Company's compensation for services for such contract year being based on a periodic fixed fee or would result in any portion of the Company's compensation being based on net profit, as such terms are defined in Rev. Proc. 2017-13. The City and the Company further agree that any payment or portion thereof that is not made by virtue of the first sentence of this paragraph shall be paid to the Company, without interest, during the next annual period in which such payment will not result in less than 80% of the Company's compensation being based on a periodic fixed fee and in which such payment will not be based on net profit or, if in the last Contract Year, in the year immediately thereafter. The Parties further agree that adjustments hereunder shall be made if necessary to comply with the limitation contained in Rev. Proc. 2017-13 that the term of this Agreement, including all renewal options, may not exceed the lesser of thirty (30) years or 80% of the reasonably expected useful life of the financed property. It is the intent of the City and the Company that this Agreement shall be construed and applied so as to constitute a management contract that does not result in private business use of property financed by the City within the meaning and intent of Rev. Proc. 2017-13, and no payments shall be made to the Company hereunder that would result in such private business use under Rev. Proc. 2017-13. Any such adjustments shall be such that the fixed and variable components of the Service Fee are within the specified percentages allowed by the Private Activity Limitations. Adjustments shall not entitle the Company to additional compensation. Should such adjustments not be possible so that continued compliance with the Private Activity Limitations is not possible, the City reserves the right to terminate this Agreement upon thirty (30) days' notice to the Company. Any such termination shall be deemed to be a Termination for Convenience pursuant to and governed by Subsection 8.4.1 hereof.

(2) If the 12-month moving average for finished water quantity falls outside of the established range of "3.6 MGD +/- 15%" for the monthly average of finished water production and/or the 12-month moving averages for raw water quality parameters fall outside of the range of +/- 15% of the values specified in Schedule 1, then the Company and the City shall negotiate in good faith to adjust upward or downward the Service Fee in accordance with the adjustment methodology set forth in Schedule 11 incorporated by reference herein and made a part hereof.

(3) By (i) mutual agreement of the parties as to the amount and/or methodology and (ii) determination by the City that any such adjustment will not contravene the Applicable Law (including, without limitation, any law relating to procurement) or the Private Activity Limitations.

(4) Annually on the anniversary date of the Commencement Date, the Service Fee will be adjusted to reflect changes resulting from inflation or deflation using the Inflation Index, as outlined in Schedule 11 hereto, which adjustment shall utilize the percentage change in the indices for the prior 12 month period using all indices published for that 12 month period as outlined in Schedule 5.

(5) On an annual basis, the City shall monitor compliance with the Private Activity Limitations. In the event the City determines that any payment or fee would result in a violation of the Private Activity Limitations, the City shall immediately notify the Company. The City and the Company shall then mutually agree to make any and all adjustments necessary to comply with Applicable Law.

Section 3.11.4. Cost Savings.

The Company shall actively pursue improvements in the effectiveness and efficiency of the operation, maintenance and management of the Existing Facility and the New Facility that may reduce the Service Fee or Pass Through Costs. Any Company proposals for such improvements, including the costs, benefits and anticipated net savings, shall be provided to the City in writing. If the City approves any such proposals, and if implementation of any such proposal results in net savings to the City as determined by the City, the City shall pay the Company an amount equal to forty percent (40%) of the aggregate net savings to the City resulting from the implementation of any such proposal. Such share of net savings shall be, at the discretion of the City, either (i) a one-time payment to the Company, or (ii) an annual payment, depending on the nature of the modification and the resulting net savings. Any such payment shall be consistent with the Private Activity Limitations.

Section 3.12 Additional Compliance Obligations.

Should the Company fail to timely perform the other aspects of the work scope contained in this Agreement, including reporting and administrative requirements, and should such failure continue following written notification to cure and a five business day period to cure, the Company shall be liable to the City for a noncompliance assessment in the amount of $1,000 per day until such time as the noted deficiency is corrected. In the event of repeated failure to timely perform such aspects of this Agreement within any twelve (12) month period, such fine shall be increased to $5,000 per day until such time as the noted deficiency is corrected.

Section 3.13 Pass Through Costs

Pass Through Costs for any Billing Month shall be the sum of the costs and expenses (set forth in Schedule 10 hereto), and except for electricity, Pass Through Costs shall be subject to overhead and administrative fee of fifteen percent (15%), exclusive of profit to the Company or any Company Affiliate, which were incurred by the Company during such Billing Month, provided that the Company provides documentation of such costs and expenses; provided further, however, that electricity Pass Through Costs shall be reimbursed up to the maximum KwH usage amount set forth in Schedule 10.

ARTICLE IV
CAPITAL IMPROVEMENTS: DEVELOPMENT PHASE

Section 4.1 Development Phase Generally.

The period beginning on the Commencement Date and ending on the Construction Date shall be referenced herein as the "Development Period." The obligations of the parties to proceed with their respective obligations during the Construction Period shall not commence until all Construction Date Conditions have been satisfied. During the Development Period, the obligations of the parties with regard to the Capital Improvements shall be as provided for in this Article.

Section 4.2 Site Suitability Confirmation.

Section 4.2.1. Site Familiarity.

The Company acknowledges that the Company's agents and representatives have visited, inspected and are familiar with the observable conditions at the Site, its surface physical condition relevant to the obligations of the Company pursuant to this Agreement, including surface conditions, normal and usual soil conditions, roads, utilities, topographical conditions and air and water quality conditions; that the Company is familiar with all local and other conditions which may be material to the Company's performance of its obligations under this Agreement (including but not limited to transportation; seasons and climate; access, availability, disposal, handling and storage of materials and Equipment; and availability and quality of labor and Utilities), and has received and reviewed all information regarding the Site provided to it as part of the RFP process or obtained in the course of performing its obligations hereunder.

Section 4.2.2. Assumption of Structural Suitability Risk.

Based on the review of information provided by the City prior to the Agreement Date and subject to the Company's right to conduct additional Site investigations, the Parties' subsequent agreement to price and schedule relief and Section 4.3.1 (a) hereof, which the Company acknowledges to be sufficient for this purpose, the Company assumes the risk of all subsurface geotechnical conditions at the New Facility Site as they may affect the structural suitability of the Site or the Company's excavation or construction costs or schedules, and agrees that any such subsurface geotechnical condition revealed during excavation for or construction of the Capital Improvements which has such an effect shall not be an Uncontrollable Circumstance.

Section 4.3 Company Responsibilities During the Development Period.

Section 4.3.1. Obligation to Proceed.

Following the Agreement Date, the Company shall, at its own cost and expense and in good faith and using due diligence, promptly satisfy all of the following responsibilities:

(a) Geotechnical Investigation. On or prior to the date that is one hundred twenty (120) days following the Agreement Date, the Company shall cause a fully integrated

geotechnical investigation to be performed by qualified professionals, including but not limited to an exploratory boring and soil sampling program, in-situ testing of soils, and geophysical investigations, consistent with Prudent Industry Practices, and as necessary for construction of all required Sites for Capital Improvements.

(1) *Generally.* Such geotechnical investigation shall include, without limitation: synthesizing available data; retaining all required permits; conducting field and laboratory investigations; characterizing and confirming site stratigraphy and soil properties, evaluating engineering alternatives, including proposed load-bearing fill support or subsoil improvement techniques, if applicable; identifying bearing levels; selecting the appropriate foundation system(s); formulating design and construction criteria; and performing appropriate constructability and field tests. Such geotechnical program shall be integrated with design and construction quality assurance to ensure a continuity of purpose and philosophy that effectively reduces the risks associated with unanticipated subsurface conditions and design and construction deficiencies.

(a) As part of the required geotechnical investigation, the Company will conduct a focused environmental site assessment with the objective of better determining the presence of oil and Hazardous Materials in ground water and soils. The focused site assessment will include review of reasonably available information on existing environmental conditions in accordance with American Society for Testing Materials (ASTM) documents E1527-13, including such records that might be available from the City, EPA or RIDEM.

(2) *Water Treatment Plant and Pump Station Sites.* With respect to the areas planned to be excavated by the Company at the water treatment plant and pump station Sites, the focused environmental site assessment shall, in addition to the actions described in Section 4.3.1(a)(1), include the collection of soil and ground water for laboratory analysis to assess soil and ground water for reasonably anticipated contaminated and hazardous substances, including volatile organic compounds, RCRA 8 metals, semi-volatile organic compounds and petroleum products. Soil samples will be collected at each boring and test pit location (13 locations at the New Facility water treatment plant Site) and groundwater samples will be collected at up to three (3) locations, if groundwater is encountered during the geotechnical investigation). Three (3) soil samples will be collected at the pump station Site and up to three (3) groundwater samples will be collected if groundwater is encountered.

(3) *Pipeline Routes.* With respect to the areas planned to be excavated by the Company for any new transmission mains, the focused environmental site assessment shall mean visual and olfactory characterization of soils and screening for volatile organic compounds using field instrumentation at each location where geotechnical testing for the presence of ledge or rock will be conducted, no less frequently than once every 300 feet, as well as collection of soil and groundwater samples at each location.

(4) *Written Test Report.* Within forty-five (45) days following the completion of the geotechnical investigation, including the focused environmental site assessments, the Company shall furnish the City with a written report describing and certifying the

geotechnical tests and focused environmental site assessments conducted, the results of each test, and the level of satisfaction of the tests relating thereto and all other requirements specified herein (the "Written Test Report"). The Written Test Report shall include copies of the original data sheets, log sheets, and all calculations used to determine the suitability of the Site for the Capital Improvements, and laboratory reports conducted in conjunction with the Site investigation. If Hazardous Materials or contaminated soils or ground water are discovered, the Written Test Report will include recommendations for mitigation and an assessment of potential mitigation costs, including required costs for reporting to RIDEM and estimated unit and total costs for required remediation or removal of the identified Hazardous Materials and contaminated soils and groundwater.

(a) The Written Test Report also shall detail the geotechnical and environmental conditions, if any, that were not previously identified by the Company or the City or in the information provided by the City with the RFP and reasonably could not have been identified by the Company and, therefore, were not included in the baseline geotechnical conditions description provided in the Proposal and in Schedule 12 hereof. If applicable, the Written Test Report also will detail, for acceptance by the City, the impact on the design of the Capital Improvements and on the Fixed Construction Price of accommodating the newly identified geotechnical condition(s) in a manner consistent with generally accepted design standards and sound, professional engineering and construction methodologies. If the Company demonstrates to the City's satisfaction that the revisions to the Capital Improvements are necessary to accommodate the newly identified geotechnical condition(s), the City will make appropriate adjustments to the Fixed Construction Price and schedule. Under no circumstances shall the Company be eligible for an adjustment to the Fixed Construction Price or schedule based on geotechnical conditions at the Site not identified in the Written Test Report except for Pre-Existing Environmental Conditions or Special Subsurface Conditions.

(b) With respect to geotechnical conditions for the various new pipelines and utilities, the City and Company acknowledge that it is impractical to perform sufficient geotechnical investigations to fully characterize the extent of rock and unsuitable materials along the proposed pipeline and utility alignments and therefore agree that a rock profile will be prepared for the proposed transmission pipelines based on the number of rock probes or borings as described in Schedule 12. A unit price for removal for rock and unsuitable materials, including Hazardous Materials, removal will be provided in the Written Test Report together with an estimated quantity of rock and unsuitable materials and price for removal. This will be used to establish an allowance for rock and unsuitable soil removal to be added to the Fixed Construction Price. Final payment for rock and unsuitable soil removal will be based on the actual quantities removed.

(c) The Company shall certify, through the Written Test Report, either (i) that the Site constitutes an acceptable and suitable Site for the Capital Improvements and the operation, maintenance and management of the New Facility in accordance with the terms of this Agreement and that the Capital Improvements can be constructed

within the Fixed Construction Price, or (ii) that modifications to the Fixed Construction Price are necessary because of newly identified geotechnical conditions.

(d) The City shall determine within twenty (20) days of its receipt of the Written Test Report whether it concurs with such certification. If the City states in writing that it concurs with the Company's certification, then the geotechnical investigation shall be deemed complete. If the City determines that it does not concur with such certification, the City shall promptly send written notice to the Company of the basis for its disagreement. In the event of any such non-concurrence by the City, either party may elect to refer the dispute to mediation for resolution.

(b) Permit Applications and Fee Payments. The Company shall prepare and submit, on behalf of the City as applicant, applications, including any and all required studies and supporting documentation, for those Permits and approvals required for the design and construction of the New Facility. The Company shall pay all Permit and utility fees, permitting agency costs and charges due in connection therewith using the allowance established in Schedule 14, and shall take all action necessary on behalf of the City as applicant in connection with all associated permitting before all appropriate Governmental Bodies if and to the extent required in order to obtain, designate and provide for the use of the Site for the purposes of this Agreement, and obtain all permits necessary to commence construction of the New Facility not later than the Construction Date. Any Permit fees or agency costs in excess of the allowance established in Schedule 14 shall be paid by the City.

(c) Legal Entitlements. The Company shall submit, on behalf of the City as applicant, applications and take all other steps which are necessary to obtain all Legal Entitlements for the design and construction of the New Facility required to be issued under Applicable Law before the Construction Date, in form and substance satisfactory to the City.

(d) Site-Related Plans. The Company shall prepare and submit to the appropriate Governmental Body, as required, any and all plans necessary for issuance of any Permit, including but not limited to (a) clearing and grading plans, (b) erosion and sediment control plans, (c) drainage plans, (d) wetland mitigation plans, and (e) landscaping plans.

(e) Supplemental Environmental Site Investigation Report(s). The Company shall prepare for the City all supplements and addenda to any environmental Site Investigation Reports and other environmental reports prepared by the City with respect to the Sites which are required under Applicable Law to undertake and complete the Capital Improvements or to obtain any necessary Permits and approvals. Notwithstanding the foregoing, if an Environmental Release Notification Form or Impact Report is required by a Governmental Body with respect to matters identified in the Company's Written Test Report, the Company shall be entitled to a price and schedule adjustment arising as a direct consequence of this requirement.

(f) Information to Support Site Easements. In the event that the City is required to grant Utility easements on the Sites in connection with the Capital Improvements, the Company shall provide complete descriptions of all Utility connections and routes on the Sites necessary for such purposes.

(g) Site Survey. The Company shall prepare or have prepared a property line survey of the Sites as of a date subsequent to the Agreement Date showing (i) the exact dimensions and locations of the Site, (ii) the exact location of all means of access thereto and all easements relating thereto, (iii) that the proposed location(s) of any Capital Improvements at the New Facility are in compliance with all applicable building and set-back lines and do not encroach on or interfere with existing easements (whether on, above or below ground), (iv) no encroachments from the New Facility extending to adjacent property or from adjacent property onto the New Facility, nor any gaps, gores, projections, protrusions or other survey defects, and (v) that the New Facility, after completion of the Capital Improvements, will comply with the zoning classification applicable thereto. Notwithstanding the foregoing, the City acknowledges that a zoning variance may be required for the proposed location of the Raw Water Pumping Station.

(h) Zoning. If necessary, the Company shall obtain from the appropriate Governmental Body any required zoning relief or change in the zoning classification applicable to the Sites, or any portion thereof, caused by the Capital Improvements so that, no later than the Construction Date, a zoning ordinance, or a variance or special exception thereto, shall then be effective which permits the construction of the Capital Improvements and operation of the New Facility as contemplated hereby, and the Company shall furnish confirming evidence thereof to the City. The City's entry into this Agreement shall in no way constitute a waiver of any municipal ordinances or other authority applicable to the project. Notwithstanding the foregoing, if a required zoning change or relief is delayed or denied due to (i) the sole fault of the City, then the Company shall be entitled to a price and schedule adjustment arising as a direct consequence of the delay or denial; or (ii) any reason other than Company fault in seeking a dimensional variance for the raw water pump station in the alternative location proposed by the Company (the "Variance"), then the Company shall be entitled to a price and schedule adjustment arising as a direct consequence of the delay or denial; or (iii) any reason other than Company fault with respect to zoning matters other than the Variance, the Company shall be entitled to a schedule adjustment arising as a direct consequence of the delay or denial.

(i) Utilities. The Company shall make all arrangements necessary to secure the availability of all Utilities required to support the New Facility, including the Capital Improvements in the capacities required hereunder.

(j) Technical Materials and Safety Plans. The Company shall provide to the City copies of all plans, technical specifications, blueprints, drawings, reports and other design documents and safety plans prepared by or on behalf of the Company prior to the Construction Date for permitting, regulatory compliance, financing, bonding, credit enhancement and insurance purposes. Documents to support Permit applications shall be submitted to the City for review prior to submittal to permitting agencies.

(k) Construction Plans. All drawings, blueprints, plans and specifications prepared shall be consistent with all terms and conditions of this Agreement, and shall be subject to review and comment by the City. No such review or comment by the City shall amend, alter or affect this Agreement or the Company's obligations hereunder in any manner, nor shall the City incur any liability or expense as a result thereof.

(l) Applicable Law Compliance. The Company shall comply with all

requirements of Applicable Law pertaining to the activities constituting the Construction Date Conditions.

(m) Insurance. The Company shall submit to the City the necessary Certificates and/or such other evidence as the City in its sole discretion shall determine to be satisfactory, for all Insurance specified in Schedule 4 hereto.

(n) Emergency Response Plan. The Company shall have completed and furnished to the City, and the City shall have accepted, the Emergency Response Plan described in Schedule 3 hereto.

(o) Financing Assistance. The Company shall cooperate with and assist the City in providing any information, certifications or documents which reasonably may be required in connection with the issuance of City revenue obligations, accessing funds through the Infrastructure Bank or otherwise obtaining the funds necessary to pay the Fixed Construction Price.

(p) Representations. The representations of the Company set forth in this Agreement and of the Guarantors set forth in the Guaranty Agreements shall be true and correct in all material respects as of the Construction Date as if made on and as of the Construction Date, and the Company shall deliver to the City a certificate of an authorized officer of each to that effect, together with appropriate certified authorizing resolutions and incumbency certificates.

(q) Documents Evidencing Required Activities. The Company shall have provided to the City copies of all filings and reports conducted, prepared or obtained with respect to or evidencing the Company's activities pursuant to this Section 4.3.

(r) Financial Condition. The Company shall provide audited financial statements of the Company, if available (and if not available, shall provide such statements of the Company's members) and the Guarantor for the most recently completed fiscal year and unaudited quarterly period. Since the Agreement Date, there shall not have occurred any change, financial or otherwise, in the condition of the Company or the Guarantor that would materially and adversely affect the ability of the Company or the Guarantor to perform its respective obligations under this Agreement or the Guaranty Agreements.

(s) Notice of Default. The Company shall provide to the City, promptly following the receipt thereof, copies of any notice of default, breach or noncompliance received under or in connection with any Permit or any other matter pertaining to the Development Period.

(t) Construction Performance Bond and Labor and Materials Bond. On or before the Construction Date, the Company shall provide or cause to be provided financial security for the performance of Construction Period obligations hereunder through the Construction Performance and Labor and Materials Bonds issued by a surety acceptable to the City. The Construction Performance and Labor and Materials Bonds shall be issued in a form as approved by the City no later than ten (10) days prior to the Construction Date and in the amount of the Fixed Construction Price.

Section 4.4 City Responsibilities During the Development Period.

Promptly following the Agreement Date, the City shall proceed at its own cost and expense to exercise good faith and due diligence in order to satisfy all of the following responsibilities.

Section 4.4.1. Financing.

The City shall obtain financing, through the public or private sector, for the Capital Improvements and deliver to the Company a notice that the City has received approvals for the financing for the Capital Improvements. The capital improvements and operations will be performed by the Company to comply with all Federal, State, and local laws, ordinances, rules, regulations and requirements, including requirements for projects financed through the Infrastructure Bank or RIWRB. The Company shall assist the City with periodic RIPUC/ Rhode Island Division of Public Utilities ("RIDPU") rate filings and hearings by supporting the needs of the City as the City prepares for such meetings and hearings, if any. Without limiting the foregoing, the Company shall perform its obligations under this Agreement in a manner consistent and compliant with the Rhode Island Department of Health ("RIDOH"), Office of Drinking Water Quality's Drinking Water State Revolving Fund Program *Contract Specifications Package*, as the same may be amended or modified from time to time.

Section 4.4.2. Legal Entitlements.

The City shall cooperate with the Company in the submittal, on behalf of the City as applicant, of all applications for Legal Entitlements which the Company is obligated to submit pursuant to Section 4.3 hereof.

Section 4.4.3. Zoning.

The City will cooperate with (including signing as applicant, if necessary) and assist the Company in any application for any change in zoning classification or zoning relief that may be required to undertake the Capital Improvements.

Section 4.5 Construction Date Conditions.

Section 4.5.1. Construction Date Conditions.

The obligations of the Company and the City to proceed with their respective obligations hereunder during the Construction Period shall not commence until all of the following conditions are satisfied or waived in writing by the City and the Company (the "Construction Date Conditions"):

(a) Company Development Period Responsibilities. The Company shall have fulfilled all of its responsibilities with respect to the Development Period under Section 4.3 hereof.

(b) Development Period Responsibilities. The City shall have fulfilled all of its responsibilities with respect to the Development Period under Section 4.4 hereof.

(c) Legal Entitlements. All Permits and other Legal Entitlements required to

commence construction of the Capital Improvements shall have been issued or obtained and shall be in full force and effect.

(d) Acceptability and Effectiveness of Documents. All of the documents, instruments and agreements identified in this Section 4 shall be in form and substance reasonably satisfactory to both parties, and shall be valid, in full force and effect and enforceable against each party thereto as of the Construction Date. No such documents, instruments or agreements shall be subject to the satisfaction of any outstanding condition precedent except those expressly to be satisfied after the Construction Date, no party to any such document, instrument or agreement shall have repudiated or be in default or imminent default thereunder, and each party shall have received such certificates or other evidence reasonably satisfactory to it of such facts as such party shall have reasonably requested. The City and the Company shall each proceed at their own cost and expense, in good faith and with due diligence, to take such actions as may reasonably be under their respective control in order to satisfy the condition set forth in this Section 4.5.1(d).

(e) Legal Proceedings. There shall be no Legal Proceeding which (1) challenges, or might challenge, directly or indirectly, the authorization, execution, delivery, validity or enforceability of this Agreement or the Guaranty Agreements, or (2) seeks to enjoin or restrict the use of the Site for the purposes contemplated by this Agreement or seeks damages, fines, remediation or any other remedy in connection with the environmental condition or any other factor pertaining to the Site.

(f) No Change In Law. No Change In Law shall have occurred after the Agreement Date that would make the authorization, execution, delivery, validity, enforceability or performance of this Agreement or the Guaranty Agreements a violation of Applicable Law.

Section 4.5.2. Required Development Milestone Completion Dates.

Without limiting the Company's obligations under Section 4.3 hereof, and notwithstanding the occurrence of any Uncontrollable Circumstance, the Company shall meet, complete and satisfy in full the following milestones by the dates indicated:

Milestone	Guaranteed Completion Date
1. Submit to the City the final schedule and reconfirmation of the envisioned components of the Capital Improvements	(1) 90 days after the Agreement Date
2. Submit to the City all applications for Legal Entitlements	(2) In accordance with Schedule 6

Section 4.5.3. Conditions to Legal Entitlements.

The Company shall apply on behalf of the City for any Legal Entitlement required to ensure that the terms and conditions of any such Legal Entitlement are not inconsistent with the Company's obligations hereunder, and shall notify the City of any terms and conditions proposed by the issuing or approving Governmental Body that are more stringent or burdensome than the standards set forth in Schedule 1 hereto. Within ten (10) days of the receipt of information as to proposed terms,

conditions or requirements to be contained in any draft or final Legal Entitlement, the Company shall provide the City with written notice of its determination and reasoning as to whether and why the terms and conditions of any such draft or final Legal Entitlement are more burdensome or stringent than those set forth in Schedule 1 hereto. In the event the Company claims that such Legal Entitlement contains conditions or requirements which are more burdensome or stringent than those set forth in Schedule 1, and therefore constitutes a Change In Law, the Company shall provide the City with notice and information required pursuant to Section 5.14.3 hereof and the parties shall negotiate any equitable adjustment to the Service Fee as appropriate.

Section 4.5.4. Denial of a Legal Entitlement.

In the event that at any time during the Development Period any application (or appeal from the denial of an application) for a Legal Entitlement required to be obtained by the Company hereunder for the Capital Improvements is denied, the City may elect to either (1) direct the Company to appeal the denial at the sole cost and expense of the City (unless the denial is due to the failure of the Company to fulfill its obligations under this Agreement, in which event the appeal shall be brought at the Company's sole cost and expense), or (2) terminate this Agreement with the same effect as if the Company had terminated this Agreement upon a failure of the parties to satisfy the Construction Date Conditions contained in Section 4.5 hereof by the time required under Section 4.6.2 hereof. The City shall make any such election within sixty (60) days of the date it receives final formal notice of the denial action. If the City elects to direct the Company to appeal the initial denial, denial at a higher appellate level of the same Legal Entitlement shall give rise to an additional termination option as set forth in subparagraph (2) hereof.

Notwithstanding the foregoing, upon documenting the same to the City's reasonable satisfaction the Company shall be entitled to a price and schedule adjustment arising as a direct consequence of the denial of an application for, a delay in the review, issuance or renewal of, or the suspension, termination, or interruption of any Governmental Approval or the imposition of an unforeseeable, arbitrary term, condition or requirement only to the extent that such occurrence is not the result of negligent action, error or omission or a lack of reasonable diligence of the Company but is solely the fault of the applicable governmental agency reviewing the application.

Section 4.6 Closing the Development Period.

Section 4.6.1. Satisfaction of Conditions.

The parties will give each other prompt notice when each Construction Date Condition has been achieved. Upon the satisfaction or waiver in writing by both the City and the Company of all of such Construction Date Conditions, the parties shall hold a formal closing acknowledging such satisfaction and certifying that the Construction Date has occurred. Written documents or instruments constituting or evidencing satisfaction of the Construction Date Conditions shall be furnished to each party prior to or on the Construction Date.

Section 4.6.2. Failure to Satisfy Construction Date Conditions.

If all of the Construction Date Conditions for which the Company is responsible are not either satisfied by the Company or waived by the City on or prior to November 15, 2018 (the "Construction Date Deadline"), then the Company shall pay to the City, in addition to fines and penalties imposed on or incurred by the City in connection with the Company's failure to meet the Construction Date Deadline), a daily delay non-compliance assessment in the amount of $2,500 for each day that such Construction Date Conditions remain unsatisfied after said date until either the Construction Date Conditions are satisfied or this Agreement is terminated for an Event of Default. In the event that the Construction Date Conditions are not either satisfied or waived as required hereunder due to the sole fault of the City, then schedule relief will be granted by the City consistent with documented evidence of such fault and delay provided by the Company to the City's satisfaction. Except as otherwise specifically provided herein, such non-compliance assessment shall constitute the sole and exclusive remedy for all delay related costs in meeting the Construction Date Deadline, whether based in contract, tort or otherwise. The Company's liability for non-compliance assessments under this provision shall not exceed $1,000,000. This limitation shall be included under the aggregate limitation of liability included under below Section 7.1.

Section 4.7 City Termination and Suspension Options.

Section 4.7.1. City Convenience Termination Option.

As set forth more fully in Section 8.4.1 hereof, the City shall have the right to terminate this Agreement at its sole discretion, for its convenience and without cause.

Section 4.7.2. City Suspension Option During the Development Period.

The City shall have the right at any time prior to the Construction Date, exercisable in its sole discretion, for any reason by written notice to the Company and without terminating this Agreement, to suspend the obligations of the Company and the City to seek the fulfillment of the Construction Date Conditions. Upon any such suspension, the City shall reimburse the Company for its substantiated actual direct costs and demobilization and mobilization costs, all of which shall be documented to the City's satisfaction, incurred and paid to third parties from the Agreement Date to the date on which this Agreement is suspended by the City, less any amounts already paid to the Company; provided, however, that all such costs and expenses must have been (a) directly related to the Company's performance of its Development Period obligations hereunder, and (b) necessary to be performed prior to the Construction Date. The Company shall not be further obligated during the suspension to seek to fulfill the Construction Date Conditions.

The City may, in its sole discretion at any time after a suspension, upon written notice to the Company, reinstate the obligations of the Company to fulfill the Construction Date Conditions. At that time, an amount equal to all substantiated actual direct expenses previously reimbursed to the Company, not including demobilization and mobilization costs, shall be deducted from the Fixed Construction Price and the obligations of the Company as to the Construction Date Conditions shall resume. In such event, schedule and price relief shall be granted by the City to the Company based upon documented evidence to the City's satisfaction of the necessity of such relief due to the suspension. If the City does not reinstate the obligation of the Company to seek to fulfill the

Construction Date Conditions within twelve (12) months following the suspension, the Company may, at any time thereafter, terminate this Agreement upon written notice to the City.

Section 4.7.3. Cost of Records and Reporting.

During the Development Period, the Company shall prepare and maintain proper, accurate and complete records of the cost and description of the permitting and other Development Period costs of the Company since the Agreement Date which are directly related to the Company's obligations under this Agreement, the cost of which would be the responsibility of the City if the City were to elect to suspend or terminate this Agreement pursuant to Section 4.7.1 or 4.7.2 hereof. All financial records of the Company and its Subcontractors shall be maintained in accordance with generally accepted accounting principles and auditing standards. The Company shall submit all books and records or a reasonably detailed summary thereof acceptable to the City, together with a summary statement of monthly and aggregate reimbursable expenses incurred, to the City on a monthly basis after the Agreement Date until either the City exercises its right to suspend or terminate this Agreement or until the Construction Date occurs, whichever is earlier. If the Company fails to provide such monthly reports to the City within sixty (60) days from the last business day of any such month, the Company waives its right to claim and receive any reimbursable expenses incurred for that month. Specific requests by the Company for the payment of reimbursable expenses shall include documentation substantiating such expense. In addition, on the Agreement Date and on the first day of each month thereafter, the Company shall provide to the City an itemized list of all work related to the Capital Improvements expected to be undertaken in the following month and the expected costs thereof. The City shall have the right to question the Company's decision to undertake such activities and to provide notice to the Company that such costs will not be reimbursed.

Section 4.7.4. Delivery of Development Period Work Product to the City.

Concurrent with payment by the City to the Company of any amount due on termination or suspension of this Agreement by the City under this Section 4.7, the Company shall deliver to the City all its Development Period work product for the Capital Improvements during the period commencing on the Agreement Date and ending on the date of payment. Such work product immediately shall become the property of the City and shall include, without limitation, all plans, specifications, designs, drawings, renderings, blueprints, manuals, equipment layouts, and Legal Entitlements and related applications, submittals and other information prepared for the purpose of planning, designing, constructing and operating the Capital Improvements and securing Legal Entitlements.

Section 4.8 Termination for Cause During the Development Period.

The City shall have the right during the Development Period to terminate this Agreement for cause and to pursue all remedies available pursuant to Article VIII hereof, without cost or liability to the City, based upon (1) any failure of the Company to satisfy the Development Period responsibilities specified in Section 4.3 hereof by the required date or failure by the Company to meet the Construction Date conditions under Section 4.5 hereof by the date required in Section 4.6.2 or (2) the occurrence of an Event of Default during the Development Period by the Company. The Company shall have the right during the Development Period to terminate this Agreement for

cause and pursue all remedies available pursuant to Article VIII hereof, based upon the occurrence of an Event of Default during the Development Period by the City.

Section 4.9 City Election to Initiate Construction Work.

Notwithstanding anything in this Agreement to the contrary and without changing any of the obligations of the City or the Company other than those expressly changed under this Section 4.9, the City may provide written notice to the Company during the Development Period directing the Company to initiate certain portions of the Capital Improvements prior to the Construction Date. If the City provides such written notice to the Company to so direct the commencement of certain portions of the Capital Improvements, then the costs and expenses payable under Section 4.7.1 shall include such portions of the Capital Improvements which are authorized to be initiated prior to the Construction Date. In order to be eligible for any adjustment to the Fixed Construction Price, the Company shall be obligated to document to the City's satisfaction any change in Capital Improvement cost resulting from this early commencement of certain Capital Improvements prior to commencing such Capital Improvements. Otherwise, there shall be no change in the Fixed Construction Price as a result of an election by the City under this Section 4.9.

ARTICLE V
DESIGN AND CONSTRUCTION OF THE CAPITAL IMPROVEMENTS

Section 5.1 Construction Period - Generally.

The period beginning on the Construction Date and ending on the Acceptance Date shall be referred to as the Construction Period. The Company shall complete all Capital Improvements during the Construction Period; provided, however, that the Company shall not begin construction until after issuance by the City of the Notice to Proceed. During the Construction Period, the Company shall be entitled to payments for construction of the Capital Improvements as provided in this Article V.

Section 5.2 New Facility Ownership.

The New Facility shall be owned by the City or its assignee for financing purposes at all times. The Company shall perform the Capital Improvements and other Services provided for herein as an independent contractor and shall not have any ownership or other property interest in the New Facility or the Site.

Section 5.3 Authorized Representative.

The City and the Company shall each designate in writing by the Construction Date a person to transmit instructions, receive information and otherwise coordinate service matters arising pursuant to this Agreement during the Construction Period (each, an "Authorized Representative"). Either party may designate a successor or substitute Authorized Representative at any time by written notice to the other party.

Section 5.4 Design and Construction Generally.

Section 5.4.1. Commencement of Design and Construction.

Following the Construction Date, the City shall have the right to issue a written Notice to the Company to begin the Construction Work (the "Notice to Proceed"). The Notice to Proceed shall be issued within thirty (30) days of the Construction Date unless the City provides a reason to the Company that the Notice to Proceed will not be issued within such period. If the City does not issue the Notice to Proceed within 30 days of the Construction Date, the Company shall be entitled to a schedule adjustment arising as a direct consequence of the City's delay. Immediately following the issuance of the Notice to Proceed, except as otherwise provided in this Section 5.4, the Company shall commence and proceed to undertake, perform and complete the Capital Improvements at its sole cost and expense in accordance with all provisions of this Agreement. The Company's failure to achieve Acceptance on or before the Acceptance Deadline shall result in the assessment of the delay non-compliance assessments under Section 6.9 hereof.

Section 5.4.2. Elements of the Capital Improvements Construction.

The Company shall be responsible for the design and construction of all necessary water system capital improvements to meet the Future Finished Water Requirements, including all capital improvement requirements for the New Facility necessary to achieve compliance with all Applicable Law, including but not limited to the capital improvements set forth in Schedule 12 hereto (the "Capital Improvements") (but not including any design or construction obligations with respect to the City's distribution system except as expressly provided in this Agreement). In constructing the Capital Improvements generally, the Company shall, in accordance with all of the terms and conditions of this Agreement, (1) prepare and excavate the Site, (2) demolish and remove any existing facilities or systems indicated in the Company's Proposal, (3) reroute or replace any underground Utilities, pipes or systems, (4) dispose of any demolition or construction debris on the Site and any soil excavated therefrom, (5) supply and install all labor, materials and equipment necessary to design and construct the Capital Improvements, (6) monitor the Capital Improvements construction work, (7) maintain continuous compliance with all Legal Entitlements and Applicable Law, (8) allow free and unlimited access to the New Facility by the City and/or its representatives, (9) start up and commission the Capital Improvements, (10) conduct the Acceptance Tests required, and (11) operate, maintain and manage the Capital Improvements and the existing New Facility as an integrated system following completion and endorsement of the Acceptance Tests, all so that the New Facility is suitable and adequate for meeting the Future Finished Water Requirements as provided herein.

Section 5.4.3. Liens and Subcontracts.

The Company shall promptly discharge or bond any liens or Encumbrances arising out of the Company's construction of the Capital Improvements or operation of the Existing Facility or the New Facility, and shall provide evidence to the City of such bond or discharge within ten (10) business days of the placement of such lien or encumbrance. Contracts and Subcontracts entered into by the Company for the construction of the Capital Improvements shall neither supersede nor abrogate any of the terms or provisions of this Agreement.

Section 5.4.4. Payment of Costs.

The Company shall pay directly all costs and expenses of the design and construction of the Capital Improvements of any kind or nature whatsoever, without payment or reimbursement from the City except through payment of the Fixed Construction Price, including any Fixed Construction Price Adjustments, based on achievement of milestones listed in the drawdown schedule set forth in Schedule 14 hereof. Such costs and expenses, without limiting the generality of the foregoing, shall include all costs of permitting, regulatory compliance and Legal Proceedings brought against the Company; obtaining and maintaining all forms of Company credit enhancement required hereunder during the Development Period and Construction Period; payments due under the Construction Contract, if any, contracts with Subcontractors or otherwise for all labor and materials and equipment; legal, financial, engineering, architectural and other professional services of the Company; general supervision by the Company of all design and construction; the cost of all design and construction performed by or on behalf of the Company; Company preparation of schedules, budgets and reports; keeping all construction accounts and cost records; and all other costs required to achieve Acceptance. In accordance with Applicable Law, the Company shall pay all wages and benefits to its employees when due and require its Subcontractors to pay all wages and benefits of its employees when due.

Section 5.5 Company Design.

Section 5.5.1. Sole Responsibility.

The Company shall have the sole and exclusive responsibility for the design of the Capital Improvements hereunder and the preparation of all plans, technical specifications, drawings, blueprints or other design documents necessary or appropriate to construct the Capital Improvements. The Company warrants that the New Facility, upon the occurrence of Acceptance, will be capable of achieving the performance requirements specified in Schedules 1 and 2 hereof. Further, all components, materials, equipment and workmanship incorporated in the Work shall be of good quality and in accordance with Prudent Industry Practices and all relevant industry standards. The New Facility shall be constructed consistent with the standard of care, professional judgment, skill and attention in the construction industry, and the Company shall give the Project a high priority among its projects. The Company shall ensure that this standard of performance is the standard it requires of each of its subcontractors. The City shall have the right to review such design documents, but shall have no right of approval with respect thereto except in order to confirm the compliance and consistency of the design documents with the requirements set forth in the Schedules hereto. Any architects and engineers engaged by the Company related to the construction of the Capital Improvements shall be licensed in the State of Rhode Island, experienced and qualified to perform such services and shall be selected in the manner consistent with Section 5.19 hereof.

Section 5.5.2. City Interest in Design Requirements.

The Company acknowledges the City's material interest in each provision of the Design Requirements and, notwithstanding the Acceptance Standards and Performance Guaranties of the Company and associated non-performance remedies of the City, agrees that no change to the Design Requirements shall be made except upon the terms and conditions set forth in this Section and

pursuant to a City Change Order.

Section 5.5.3. Company Requested Changes.

The Company shall have the right to request changes to the Design Requirements. At its sole cost and expense, it must give written notice to the City containing detailed information concerning the design changes and the expected effects thereof on the Company's Performance Guaranties. The notice shall contain sufficient information to enable the City to determine that such changes (1) do not adversely affect the ability of the New Facility to be operated so as to meet the Performance Guaranties set forth in this Agreement, (2) do not impair the quality, integrity, durability or reliability of the New Facility as set forth in the Design Requirements, (3) do not impair, and are necessary for, the Company's ability to fulfill all of its obligations under this Agreement, and (4) are feasible.

Section 5.5.4. City Approval of Changes.

The City shall have the right to review all changes requested by the Company under this Section, and if the City agrees in writing that the requested change meets the design change criteria set forth in Section 5.5.3, then the City shall permit the change to the Design Requirements, and the Company shall be responsible for all additional costs, including additional costs to the City, resulting from such changes to the Design Requirements. Cost savings resulting from such change to the Design Requirements shall be to the benefit of both the Company and the City in a ratio to be negotiated. If the City and the Company cannot agree that a requested change meets the design change criteria set forth in Section 5.5.3, then the dispute shall be submitted to mediation in accordance with Section 8.8.2 hereof. No such change shall result in an increase in the Fixed Construction Price or an extension of the Acceptance Deadline unless otherwise agreed by the City in its sole discretion.

Section 5.6 Construction Practice.

Unless the Design Requirements or this Agreement expressly provide otherwise, the Company shall perform the Construction Work in a good and workmanlike manner and in accordance with generally accepted construction practice and shall have exclusive responsibility for all construction means, methods, techniques, sequences, and procedures necessary or desirable for the correct, prompt, and orderly prosecution and completion of the Capital Improvements as required by this Agreement. The responsibility to provide the construction means, methods, techniques, sequences and procedures referred to above shall include but not be limited to the obligation of the Company to provide the following construction requirements: temporary power and light, temporary offices and construction trailers, site access control and safety, adherence to construction requirements contained within Schedule 12, required design certifications, required approvals, weather protection, site clean-up and housekeeping construction trade management, temporary parking, safety and first aid facilities, correction of or compensation for defective work or equipment, Subcontractors' insurance, storage areas, workshops and warehouses, temporary fire protection, site security, temporary utilities, including potable water, phone, sanitary and gas, Subcontractor and vendor qualification, receipt and unloading of delivered materials and equipment, erection rigging, temporary supports, and construction coordination. Laydown and staging areas for construction material shall be located on the Site, or at other locations approved by and arranged

and paid for by the Company. In addition to the Site, the City has designated land adjacent to the existing blending chamber facilities for use in laydown and staging.

Section 5.7 [INTENTIONALLY OMITTED].

Section 5.8 Compliance with Law and Equipment Operating Requirements.

In designing, constructing, starting-up and testing the Capital Improvements, the Company shall comply with Applicable Law, shall operate all Equipment and systems comprising the New Facility in accordance with good engineering practice and applicable equipment manufacturer's specifications and recommendations, and shall observe, at minimum, the same safety standards as are set forth in Schedule 2 and Schedule 3 hereof with respect to the operation of the Existing Facility and the New Facility, as applicable, while maintaining all responsibilities related to health and safety.

Section 5.9 Legal Entitlements Necessary for Continued Construction.

Company, at its own cost and expense and on behalf of the City as applicant, shall make all further filings, applications and reports necessary to obtain and maintain all Legal Entitlements required to be made, obtained or maintained under Applicable Law in connection with the continuance of work with respect to the design, construction, start-up and testing of the Capital Improvements. The City shall cooperate with the Company in connection with the foregoing undertaking and shall provide the Company with such relevant data or documents as are within its control which are reasonably required for such purpose.

Section 5.10 Engagement of the City Clerk of the Works and City Engineer.

Section 5.10.1. Duties.

The Company shall fully cooperate with any City Clerk of the Works and City Engineer designated by the City to assist it in connection with the administration of this Agreement. In the performance of such services, the Company agrees that the Clerk of the Works and City Engineer may, without limiting other possible services to the City: review and monitor construction progress, payments and procedures; confirm the completion of specified portions of the Construction Work and review the release of City funds in payment of the Construction Price; review proposed changes to the Design Requirements pursuant to Section 5.5.4 hereof; review New Facility plans, drawings and specifications for compliance with the Design Requirements; monitor the Acceptance Tests undertaken by the Company pursuant to Article VI hereof and Schedule 13 hereto; review validity of Company's written notice that an Uncontrollable Circumstance has occurred; review and advise the City with respect to material changes to the New Facility during the Contract Term; issue one or more stop work orders in the event the City Clerk of the Works or City Engineer determines the same may be necessary in response to a Company breach or Event of Default hereunder; and provide certificates and perform such other duties as may be specifically conferred on the Clerk of the Works and City Engineer hereunder. The Company agrees to cooperate with all reasonable requests made by the City Engineer and the City Clerk of the Works in connection with the performance of such duties for the City.

Section 5.10.2. Fees.

The Company shall reimburse the City for the reasonable fees and expenses of the City Engineer and costs of City personnel for services in connection with repetition of any Acceptance Tests unless such additional or repeated Acceptance Tests are required as a result of City Fault or Uncontrollable Circumstances. Any fees of the City Engineer and City personnel after Acceptance shall be paid by the City without reimbursement by the Company except as otherwise specifically provided by this Agreement.

Section 5.11 Monthly Progress Report.

The Company shall submit to the City a monthly progress report detailing work accomplished and an updated schedule. The monthly progress report shall include a summary of work activities during the reporting month, a listing of upcoming work activities, a listing of submittals delivered during the reporting month, a listing of submittals scheduled for delivery the following month, a listing of any permit violations, and an updated schedule which reflects critical path activities. The updated schedule shall set forth major activities and reflect any change in the Company's estimated construction progress schedule from the schedule submitted the prior month. The Company agrees that the Company's submission of the monthly progress report is for the City's information only, and the City's acceptance of the monthly progress report shall not bind the City in any manner. Thus, the City's acceptance of the monthly progress report shall not imply that the City: (1) approves the Company's proposed staffing or scheduling of the Construction Work; (2) agrees or guaranties to the Company or any other person that the Company has the capacity or ability to complete the Construction Work in accordance with the progress schedule, or that the Construction Work can or will be completed in accordance with the monthly progress schedule; or (3) consents to any changes in scheduling, or agrees to any extension of time, unless the City agrees specifically in writing to the applicable change.

Section 5.12 Construction Monitoring, Observations, Testing and Uncovering of Work.

Section 5.12.1. Observation and Design Review Program.

During the progress of the Construction Work through Acceptance, the Company shall at all times during normal working hours afford the City and the City Engineer every reasonable opportunity for observing all Construction Work at the Site. During any such observation, all representatives of the City and the City Engineer shall comply with all safety and other rules and regulations applicable to presence in or upon the Site or the New Facility, including those adopted by the Company, and shall in no material way interfere with the Company's performance of any Construction Work. The Company shall provide the City with five (5) copies, plus electronic (pdf files) of the construction design drawings, blueprints, detailed plans and technical Design Requirements and of all other Deliverable Materials. The Company shall provide the City with electronic files of manufacturing and shop drawings.

Section 5.12.2. Company Tests.

The Company shall conduct all tests of the Construction Work (including shop tests) or inspections required by good engineering practice, by the Design Requirements, by Applicable Law

or for Insurance purposes. The Company shall give the City and the City Engineer reasonable advance notice (no less than three working days) of tests or inspections prior to the conduct thereof; provided, however, that in no event shall the inability, failure or refusal to attend or be present of the City or the City Engineer at or during any such test or inspection delay the conduct of such test or inspection or the performance of the Construction Work. Costs for the City or City Engineer to witness shop tests or inspections shall be borne by the City. If required by Applicable Law or for Insurance purposes, the Company shall engage a registered engineer or architect at its sole cost and expense to conduct or witness any such test or inspection. All analyses of test samples shall be conducted by persons appearing on lists of laboratories authorized to perform such tests by the State or federal agency having jurisdiction or, in the absence of such an authorized list in any particular case, shall be subject to the approval of the City, which consent shall not be unreasonably withheld. Acceptance Testing shall be conducted in accordance with Schedule 13 hereto.

Section 5.12.3. City Tests, Observations and Inspections.

The City, its employees, agents, representatives and contractors (which may be selected in the City's sole discretion), and all Governmental Bodies having lawful jurisdiction, may at any reasonable time and with reasonable notice conduct such on-Site observations and inspections, and such civil, structural, mechanical, electrical, chemical, or other tests as the City deems necessary or desirable to ascertain whether the Construction Work complies with this Agreement. The City shall pay for any test, observation or inspection requested by the City and any Governmental Bodies, and in addition to that required of the Company (Section 5.12.2), and the costs of such test, observation or inspection shall be borne by the City unless such test, observation or inspection reveals a material failure of the Construction Work to comply with this Agreement or Applicable Law, in which event the Company shall bear all reasonable costs and expenses of such test, observation or inspection. In the event that any requested test, observation or inspection causes a material delay in the construction schedule, the Acceptance Deadline shall be extended to reflect the actual period of time needed for completion as directly caused by the requested testing, but only if such testing, observation or inspection does not reveal any material failure or noncompliance as set forth herein.

Section 5.12.4. Certificates and Reports.

The Company shall secure and deliver to the City promptly, at the Company's sole cost and expense, all required certificates of inspection, test reports, work logs, certified payroll or approvals with respect to the Construction Work as and when required by the Design Requirements, Applicable Law or the Insurance Requirements. The Company shall provide to the City, within (2) days after the receipt thereof, copies of any notice of default, breach or noncompliance received by the Company under or in connection with, any Legal Entitlement, Subcontract, any Bond, the Guaranty Agreements or agreement pertaining to the Construction Period.

Section 5.12.5. Notice of Covering Construction Work.

The Company shall give the City reasonable notice of its upcoming schedule with respect to the covering and completion of any Construction Work. The City shall give the Company reasonable notice of any intended inspection or testing of such Construction Work in progress prior to its covering or completion, which notice shall be sufficient to afford the City a reasonable opportunity to conduct a full inspection of such Construction Work. At the City's written request,

the Company shall take apart or uncover for inspection or testing any previously-covered or completed Construction Work; provided, however, that the City's right to make such requests shall be limited to circumstances where there is a reasonable basis for concern by the City that the disputed Construction Work conforms with the requirements of this Agreement. The cost of uncovering, taking apart or replacing such Construction Work along with the costs related to any delay in performing Construction Work caused by such actions, shall be borne as follows: (1) by the Company, if such Construction Work has been covered prior to any observation or test required by the Design Requirements, Applicable Law or the Insurance Requirements or if such Construction Work has been covered prior to any observation or test as to which the City has provided reasonable advance notice hereunder; and (2) in all other cases, as follows: (a) by the Company, if such observation or test reveals that the Construction Work does not comply with this Agreement, or (b) by the City, if such observation or test reveals that the Construction Work complies with this Agreement.

In the event such Construction Work does comply with this Agreement, the delay caused by such observation or test shall be treated as having been caused by an Uncontrollable Circumstance and any costs incurred with respect to such observation or test shall be borne by the City (through and only through a Fixed Construction Price Adjustment). Either the City or the Company may request confirmation of the test results pursuant to Section 8.8 of this Agreement.

Section 5.12.6. Meetings and Design and Construction Review.

During the Construction Period, the Company and the City shall conduct meetings on a monthly basis at a minimum. At such meetings, discussions shall be held concerning all aspects of the construction of the Capital Improvements including but not limited to construction schedule, progress payments, Extra Construction Work, shop drawings, catalogued and dated progress photographs, and any soil boring data and shop test results. Monthly project construction progress reports containing all relevant information shall be prepared by the Company and provided to the City at least five (5) business days prior to each monthly meeting, together with a list of agenda items for the meeting. The Company shall also attend any on-call meeting which may be required by the City from time to time in connection with the Construction Work, provided that the Company has at least twenty-four (24) hours notice of such meeting. The Company shall provide to the City, for its planning, budgeting and financing purposes, monthly estimates of the commencement date for start-up operations, the date upon which the Acceptance Tests shall commence, and the Acceptance Date.

Section 5.13 Correction of Work.

Section 5.13.1. Correction of Non-Conforming Construction Work.

Throughout the Contract Term, including the period of any renewal pursuant to Section 10.2 hereof, the Company at its sole cost and expense, shall complete, repair, replace, restore, rebuild and correct promptly any Construction Work which does not conform with the Design Requirements and all other requirements of this Agreement.

Section 5.13.2. Election to Accept Non-Conforming Construction Work.

The City may elect, by Change Order, at the Company's request, to accept Construction Work that does not conform to the Design Requirements and charge the Company (by a reduction in the Fixed Construction Price) for the amount agreed upon by the parties by which the value of the Company's services or Construction Work has been reduced.

Section 5.13.3. Relation to Other Obligations.

The obligations specified in this Section establish only the Company's specific obligation to correct the Construction Work and shall not be construed to establish any limitation with respect to any other obligations or liabilities of the Company under this Agreement. This Section is intended to supplement (and not to limit) the Company's obligations under the Acceptance Test procedures and standards, the Future Finished Water Requirements and any other provisions of this Agreement or Applicable Law.

Section 5.14 Damage to the Construction Work

Section 5.14.1. Damage Prevention.

From the Construction Date until Acceptance (or whenever earlier or later performing Construction Work on the Site), the Company shall use care and diligence, and shall take all appropriate precautions, to guard the Construction Work and the Site and the property of other persons (including any materials, equipment, or other items furnished by the City) from damage prior to the Acceptance Date. For such purpose, the Company shall provide fencing, protective features (such as tarpaulins, boards, boxing, frames, canvas guards, and fireproofing), and other safeguards to the extent the Company reasonably determines (subject to agreement by the City) are necessary and proper in the performance of the Construction Work.

Section 5.14.2. Restoration.

In case of damage or destruction to the Construction Work or the Site resulting from any cause, and regardless of the extent thereof or the estimated cost of repair, replacement or restoration, and whether or not any insurance proceeds are sufficient or available for the purpose, the Company shall immediately undertake and complete the repair, replacement and restoration of the damage or destruction to Construction Work to the character and condition thereof existing immediately prior to the damage or destruction in accordance with the construction procedures set forth herein, as applicable, all at the Company's sole cost and expense, except in the event that such damage or destruction is caused by City Fault.

Section 5.14.3. Notice and Reports.

The Company shall notify the City immediately of any damage or destruction to the Construction Work or the Site or any accident or permit violation on the Site, including but not limited to Hazardous Substance spills or releases, damage to sensitive areas, permit conditions violations, fires and injuries. Additionally, the Company shall notify the insurers under any risk insurance and all applicable Insurance of any damage or destruction to the Construction Work or the

Site, or any accidents on the Site, as promptly as possible after the Company learns of any such damage, destruction or accidents. As soon as practicable after learning of any such occurrence, the Company shall submit a full and complete written report to the City. The Company shall also submit to the City within twenty-four (24) hours copies of all reports relating to the subject matter of this subparagraph which are filed with, or given to the Company by, any insurance company, adjuster, or Governmental Body.

Section 5.15 Change Orders and Extra Construction Work

Section 5.15.1. Right to Issue Change Orders.

The City, subject to the provisions of Section 5.15.6, may issue Change Orders pertaining to any and all aspects of the Construction Work at any time and for any reason whatsoever, whether and however such Change Orders revise this Agreement, add Extra Construction Work or omit Construction Work or affect the Acceptance Deadline. Notwithstanding anything contained herein to the contrary, the City shall have no obligation to request that the Company perform any work outside of the work scope specifically set forth in this Agreement; the City may, at its option, undertake such work itself and/or may award such work to any other entity. In such event, the Company shall reasonably cooperate with the City and/or other entity to achieve the work in an efficient, timely and cost-effective manner.

Section 5.15.2. Obligation to Complete Extra Construction Work.

The Company shall, except to the extent excused under Section 5.15.6, undertake and complete promptly all Extra Construction Work authorized under this Section. The Company shall not perform any Extra Construction Work without a Change Order authorized by the City. The Company shall be entitled to reasonable additional compensation and/or additional time for Extra Construction Work determined in accordance with this Section 5.15 ("Extra Payment").

Section 5.15.3. Effect of Company Fault.

The Company shall not be entitled to any Extra Payment for any Extra Construction Work required by reason of any Company Fault. The Fixed Construction Price shall be reduced for omitted Construction Work resulting from any Company Fault by the greater of: (1) the reduction in value of the New Facility due to the omitted Construction Work, or (2) the reduction in the Company's cost as a result of the omitted Construction Work.

Section 5.15.4. Cost Reductions.

The Fixed Construction Price shall be reduced if and to the extent that any Change Order, whether for omitted Construction Work or otherwise, results in any reduction in the Company's cost of the Construction Work.

Section 5.15.5. Proposal for Extra Work.

The Company shall promptly submit a written quotation on a lump-sum basis for Extra Construction Work covered by any proposed Change Order. The Company shall include with each quotation Cost Substantiation therefor and, with respect to any Extra Construction Work

necessitated by Uncontrollable Circumstances, the Company shall be limited to five percent (5%) profit with respect thereto. Any such quotation shall be deemed the Company's offer to the City, binding for ninety (90) days to perform the Extra Construction Work at the price quoted. In addition, each quotation shall include the effect, if any, of the Extra Construction Work on the progress schedule, the Performance Guaranties, the Acceptance Deadline, the Fixed Construction Price, the Service Fee and any of the other obligations of the Company under this Agreement.

Section 5.15.6. Conditions to the Obligation to Proceed.

The parties shall promptly proceed to negotiate in good faith to reach agreement on the price to be paid the Company for the Extra Construction Work and on the effect of the Extra Construction Work on any other obligations of the Company under this Agreement. The Company acknowledges that it shall not be entitled to seek nor shall it receive a price for the Extra Construction Work which is in excess of the fair market price of such Extra Construction Work, whether such work is to be performed solely by the Company or by a Subcontractor under the Company's supervision. Utilization of a "Time and Materials" cost determination may be ordered by the City in the absence of agreement on a fair market price. The Company shall not be obligated to proceed with the Extra Construction Work except following agreement as to the price to be paid therefor and as to any adjustments to the Performance Guaranties and its other obligations hereunder which are necessitated by the Change Order requiring the Extra Construction Work. Payments for Extra Construction Work shall be paid only as a Fixed Construction Price Adjustment, in accordance with Section 5.17.6. Except to the extent that the City and the Company shall agree, no such work shall modify the Acceptance Deadline, or impair the ability of the Company to meet the Performance Guaranties, comply with any other term or condition of this Agreement, affect any right of the Company or impose any additional liability or obligation on the Company under this Agreement; but the Company shall have no right of objection with respect to such work if the City affords the Company price, schedule and any other relief hereunder agreed to by the parties to be necessary to avoid any such impairment.

Section 5.15.7. Disputed Work.

If the Company is of the opinion that any Construction Work which it elects to perform in the absence of any agreement hereunder is Extra Construction Work and not original Construction Work ("Disputed Work"), the Company shall give the City a written notice of dispute before commencing the Disputed Work.

Section 5.15.8. Notice; Waiver.

The Company shall give at least thirty (30) days advance notice to the City in writing of the scheduling of all Extra Construction Work and all Disputed Work. The Company's failure to give such written notice of Disputed Work under this Section shall constitute a waiver of Extra Payment, any extension of time, and all other Loss-and-Expense whatsoever relating to the particular Disputed Work.

Section 5.16 Deliverable Material.

Section 5.16.1. Delivery and Use.

The Design Requirements and all other documents forming any part of this Agreement shall be and remain the property of the City and may be utilized for all appropriate public purposes in reference to the New Facility, provided that the City use of any such documents shall be at its own risk. As the Construction Work progresses (or upon the termination of the Company's right to perform the Construction Work), the Company shall deliver to the City all documents, reports and other deliverable materials required for the Construction Work ("Deliverable Material"), as described and set forth in Schedule 12 hereto together with the Operations and Maintenance Manual described at Section 3.3 hereof. If any Deliverable Material utilized in the Construction Work is patented or copyrighted by other persons (or is or may be subject to other protection from use or disclosure), the City shall, upon and following the Construction Date, have a royalty-free perpetual license to use the same, but solely for purposes of the ownership, construction, and operation of the New Facility. However, if the Company does not have the right to grant such a license, the Company shall obtain for the City such rights of use as the City may request, without separate or additional compensation, whether such Deliverable Material is patented or copyrighted or becomes subject to other protection from use before, during or after performance of the Construction Work. The City shall have the right from and after the Agreement Date to use (or permit use) of all such Deliverable Material, process or equipment, all oral information whatsoever received by the City in connection with the Construction Work, and all ideas or methods represented by such Deliverable Material, process or equipment, without additional compensation.

Section 5.16.2. Injunction on Use.

If the Company or the City is enjoined from using any Deliverable Material (or any affected Construction Work) from and after the Construction Date for reasons other than Uncontrollable Circumstances or City Fault, the City may, at the City's option, require the Company (1) to provide, at the Company's expense, equivalent substitutes for the Deliverable Material (and any affected Construction Work), (2) to take such steps necessary to eliminate the injunction or to otherwise obtain the right to use the Deliverable Materials; or (3) to take such steps as to make the Deliverable Materials non-infringing on any patent, copyright, trade secret or other intellectual property right.

Section 5.17 Payment of the Construction Price.

Section 5.17.1. Construction Price Generally.

The Company shall be entitled to receive the Construction Price for the Construction Work on a progress basis in accordance with the terms of this Section. The Construction Price shall be the sum of the Fixed Construction Price and the Fixed Construction Price Adjustments, as adjusted by Change Orders.

Section 5.17.2. Fixed Construction Price.

The Fixed Construction Price is an amount equal to $56,752,800.

Section 5.17.3. Fixed Construction Price Adjustments.

The following items shall constitute the Fixed Construction Price Adjustments: (1) an adjustment for Change Orders given pursuant to Section 5.15 hereof; (2) an adjustment for any increases in taxes imposed by the City at any time during the Term of this Agreement; and (3) cost increases due to a Change in Law, (4) cost adjustments due to Uncontrollable Circumstances if and to the extent expressly provided for in this Agreement; or (5) any other adjustment as expressly provided for in this Agreement.

Section 5.17.4. Limitation on Payments for Construction Costs.

The Company agrees that the Construction Price shall be the Company's entire compensation and reimbursement for the performance of the Construction Work, including obtaining all Utilities that the Company will require to perform the Construction Work, except utility infrastructure fees imposed by any utility to bring electric power, telephone, internet and natural gas to the Site as described in Schedule 14. In no event shall the Company be entitled to any payment for Construction Costs in excess of the Construction Price (including the adjustments provided for pursuant to Section 5.17.3), notwithstanding any cost overruns, except for additional amounts payable to the Company on account of Uncontrollable Circumstances or Change Orders (except in the event of any City Fault, as and to the extent provided in Article VIII hereof). The Company shall pay for or finance any such excess Construction Costs which are the Company's responsibility in any manner it chooses without reimbursement from or other claim upon the City.

Section 5.17.5. Construction Disbursement Procedure.

Upon the issuance of the Notice to Proceed by the City, the Company shall be entitled to submit a requisition for the initial payment of the Fixed Construction Price set forth in the milestone payments provided for in Schedule 14 hereto. Following the initial payment, the Company shall be entitled to submit requisitions on a monthly basis, as requested by the City, the remainder of the milestone payments, which (1) shall be made only upon completion of the milestone required to be completed as the basis for such payment as set forth in Schedule 14 hereto, including additional intermediate milestones or progress portions thereof to be developed by the Company and approved by the City as allowed by Schedule 14; (2) shall be subject to the maximum payment limitations for each major milestone specified in Schedule 14 hereto; and (3) shall be subject to the conditions of payment regarding disbursement disputes set forth in Section 5.18 hereof. Any Fixed Construction Price Adjustments shall be payable monthly when and as the cost or expense constituting the Fixed Construction Price Adjustment is paid or incurred. Each requisition shall be accompanied by a certificate of an authorized officer of the Company certifying (1) the portion of the Fixed Construction Price which is payable to the Company, (2) the amount of Fixed Construction Price Adjustments which are payable to the Company, together with Cost Substantiation for such amounts, (3) that the Company is neither in default under this Agreement nor in breach of any material provision of this Agreement such that the breach would, with the giving of notice or passage of time, constitute an Event of Default, and (4) that all items applicable to the milestone

entitling the Company to request payment under the milestone payment schedule in Schedule 14 hereto have been completed in accordance therewith and with the Design Requirements. In addition, the Company shall submit all completed forms required by the Infrastructure Bank. The City shall review the Company's certified requisitions to the City for each Fixed Construction Price payment and for Fixed Construction Price Adjustment payments, and within ten (10) business days of receipt of the Company's written submission shall verify or dispute in writing (or by telecommunication promptly confirmed in writing) the Company's certification that the Company has achieved the level of progress indicated and is entitled to payment. The Company shall be entitled to payment within thirty (30) days of the expiration of such ten (10) business day period if (1) the City determines that the work has progressed to the milestone indicated in the Company's certified requisition or that the costs constituting Fixed Construction Price Adjustments have been paid or incurred and the City provides written notice thereof to the Company, or (2) the City fails to verify or dispute the certified requisition within ten (10) business days of receipt. Disputes regarding payments of the Fixed Construction Price and Fixed Construction Price Adjustments shall be resolved in accordance with Section 5.18 hereof.

Section 5.17.6. Information Supporting Requisition.

With each requisition the Company shall submit to the City, the following:

(a) a verified statement setting forth the information required under any Applicable Law pertaining to prevailing wages;

(b) a reasonably detailed description of all Construction Work actually completed to date;

(c) any revisions to the progress schedule (or a revised progress schedule), which shall reflect changes in the Company's construction schedule since the date of the last requisition;

(d) any revisions to the critical path schedule, which shall reflect changes in the critical path schedule since the date of the last requisition;

(e) notice of any Liens which have been filed together with evidence that the Company has bonded against any such Liens;

(f) any other documents or information relating to the Construction Work or this Agreement requested by the City, the City Engineer or the Infrastructure Bank as contemplated hereunder as may be required by Applicable Law, this Agreement or generally accepted accounting practices and principles; and

(g) any construction progress photographs as may be requested by the City.

Section 5.17.7. Permissible Withholdings.

The City may disapprove and withhold and retain all or any portion of any payment requested in a requisition in any amount equal to the sum of:

(a) any amounts which are permitted under this Section to be withheld from any

payment requested in any requisition;

(b) any amounts which are due the City under this Article;

(c) any delay non-compliance assessments which are payable under Article VI hereof;

(d) any indemnification amounts which are due and owing to the City under Section 7.4 hereof;

(e) any other deductions which are required by Applicable Law;

(f) any payments with respect to which documents to be delivered in connection therewith are not correct and complete;

(g) an amount equal to the cost to the City of performing any work in the event of a failure by the Company or any Subcontractor to timely perform its obligations hereunder;

(h) any payments with respect to which the Construction Work covered by such requisition (or any previous requisition) does not comply with this Agreement;

(i) any payments with respect to which any person has filed a Lien resulting from the acts or omissions of the Company in performing the Construction Work, where such Lien remains unreleased or unbonded;

(j) any payments by the City due to the failure of the Company to make payment properly to Subcontractors or for labor, materials and equipment; and

(k) all requisitioned payments, if an Event of Default of the Company has occurred under Section 8.2 hereof.

Section 5.17.8. Set-Off.

The Company hereby grants to the City a lien upon, security interest in and right of set-off against, as security for all liabilities and obligations of the Company to the City arising under or relating to this Agreement or any other documents related thereto, all deposits, credits, collateral, proceeds and property of the Company, now or hereafter in the possession, custody, safekeeping or control of the City or any entity under the control of the City (including any and all payments due the Company from City). THE COMPANY HEREBY KNOWINGLY, VOLUNTARILY AND IRREVOCABLY WAIVES ANY AND ALL RIGHTS TO REQUIRE THE CITY TO EXERCISE ITS RIGHTS OR REMEDIES WITH RESPECT TO ANY OTHER COLLATERAL WHICH SECURES ANY SUCH LIABILITY OR OBLIGATION, PRIOR TO EXERCISING ITS RIGHT OF SETOFF WITH RESPECT TO SUCH PROPERTY OF THE COMPANY RELATED TO OR EMPLOYED IN THE PERFORMANCE OF THIS AGREEMENT.

Section 5.17.9. Required Company Certification.

Any notice, certification, report or requisition delivered by the Company to the City in connection with the Construction Work or payment therefor under this Agreement shall be accompanied by a certificate of the Company affirming the accuracy thereof to the best knowledge of the Company.

Section 5.17.10. Retainage.

Each progress payment for the Fixed Construction Price shall be subject to a five percent (5%) retainage holdback for the first fifty percent (50%) of the Fixed Construction Price and two and one-half percent (2.5%) retainage holdback for the remaining fifty percent (50%) of the Fixed Construction Price. Interest earned on the retainage holdback shall be for the City's benefit only. Upon Substantial Completion, the City shall release to the Company an amount equal to the retainage holdback less an amount equal to two times the Final Punch List value. Such amount held back for the punch list shall be released upon Final Completion.

Section 5.18 Disbursement Dispute Procedures.

Section 5.18.1. Dispute Notice.

If the City disputes in writing pursuant to Section 5.17.6 that the Construction Work required for any payment has progressed to the milestone indicated or disputes any requisition for Fixed Construction Price Adjustments, such dispute notice from the City shall include the City's reasons for such dispute, in detail reasonably available to the City. After receiving such dispute notice, the Company may make the necessary corrections and resubmit a certified requisition to the City, or the City may agree on a revised amount, requisition or estimate, as applicable, in which case the Company shall be entitled to payment accordingly.

Section 5.18.2. Dispute Resolution.

If the Company is unable to reach agreement with the City as to the progress of work, the Company may exercise its right to Dispute Resolution pursuant to Section 8.8 hereof. The Company shall not be entitled to payment of the amount so requisitioned and disputed except upon resolution of the dispute in accordance with this Section; provided, however, that the Company shall be entitled to all requisitioned amounts which are not in dispute. Nothing contained in this Section shall be deemed to alter the rights of the parties, if any, under Article VIII hereof. The Company shall continue the Construction Work while the dispute is being resolved.

Section 5.19 Personnel

Section 5.19.1. Personnel Performance.

The Company shall enforce discipline and good order at all times among the Company's employees and all Subcontractors. All persons engaged by the Company for Construction Work shall have requisite skills for the tasks assigned. The Company shall employ or engage and compensate engineers and other consultants to perform all engineering and other services specified in this Agreement and as required for the layouts, locations, and levels of the Construction Work.

Each such engineer and consultant shall have current professional registration or certification to practice in the State of Rhode Island.

Section 5.19.2. Prevailing Wages.

The Company shall take all action necessary directly and through its Subcontractors to assure that all laborers performing services in connection with the Construction Work are paid prevailing wages under Applicable Law whether or not such legal prevailing wage requirements are held to be applicable to the Construction Work. Certified payrolls and other relevant information shall be furnished to the City in order to permit the City to monitor compliance by the Company with this Section. Prevailing wage rates shall be paid in accordance with the applicable U.S. Department of Labor Davis-Bacon Wage Determination for the Project.

Section 5.19.3. Company Construction Superintendent.

The Company shall designate an employee of the Company, any Affiliate of the Company, or the Company's construction manager (the "Company Construction Superintendent"), who shall be present on the Site with any necessary assistants on a full time basis when the Company or any Subcontractor is performing Construction Work on the Site. The Company Construction Superintendent shall, among other things:

(a) be familiar with the Construction Work and all requirements of this Agreement;

(b) coordinate the Construction Work and give the Construction Work regular and careful attention and supervision;

(c) maintain a daily status log of the Construction Work; and

(d) attend all construction progress meetings with the City.

The Company may change the person assigned as Company Construction Superintendent, subject to the provisions of Section 5.19.4.

Section 5.19.4. City Rights With Respect to Key Personnel.

The Company acknowledges that the identity of the key management and supervisory personnel proposed by the Company and its Subcontractors was a material factor in the selection of the Company to perform this Agreement. Such personnel and their affiliations are set forth in Schedule 3 hereto. The Company shall utilize such personnel to direct services unless such personnel are unavailable for good cause shown. "Good cause" for this purpose shall not include performing services on other projects. In the event of any such unavailability for good cause, the Company shall utilize replacement key management and supervisory personnel of equivalent experience and reputation. Any such personnel change shall be proposed to the City for its approval within a reasonable advance time period.

Section 5.19.5. Labor Disputes.

The Company shall have exclusive responsibility for all disputes or jurisdictional issues among unions or trade organizations representing employees of the Company or its Subcontractors. The City shall have no responsibility whatsoever for any such disputes or issues.

Section 5.20 Construction Books and Records.

In order to ensure that the City can review and consider changes in the Construction Price, the Company shall prepare and maintain proper, accurate and complete books and records regarding the Construction Work and all other transactions related to the permitting, design, construction, start-up and testing of the New Facility, including all books of account, bills, vouchers, invoices, personnel rate sheets, cost estimates and bid computations and analyses, Subcontracts, purchase orders, time books, daily job diaries and reports, correspondence, and any other documents showing all acts and transactions in connection with or relating to or arising by reason of the Construction Work, this Agreement, any Subcontract or any operations or transactions in which the City has or may have a financial or other material interest hereunder. The Company shall produce such construction books and records (except financial ledgers and statements) for examination and copying in connection with the costs of Change Orders, Extra Construction Work, Uncontrollable Circumstance costs, costs associated with the implementation of the Capital Improvements that result in savings to the Parties pursuant to Section 3.11.4, or other costs in addition to the Fixed Construction Price on the basis of which the City may be responsible for increases in the Service Fee payable hereunder with respect to work performed prior to the Acceptance Date. The Company shall keep and maintain all such construction books and receipts for at least six (6) years after the Acceptance Date, or such longer period during which any Legal Proceeding with respect to the New Facility commenced within six (6) years of the Acceptance Date may be pending.

ARTICLE VI
ACCEPTANCE OF THE FACILITY

Section 6.1 Acceptance - Generally.

At such time during the Construction Period that the Company accomplished Substantial Completion of the New Facility, the Company shall then conduct the Acceptance Test as provided for in this Article. Once the Acceptance Test has been successfully passed and Final Completion shall have occurred, the Construction Period and Interim Operation Period shall end and the Future Operation Period shall begin. However, in no event shall the Future Operation Period begin after the Acceptance Deadline without the written approval of the City.

Section 6.2 Substantial Completion.

Section 6.2.1. Requirements for Substantial Completion.

The Company shall not commence operations in preparation for conducting the Acceptance Tests until Substantial Completion has occurred. Substantial Completion shall occur only when the City certifies that all of the following conditions have been satisfied:

(1) a preliminary or temporary certificate of occupancy has been issued for the New Facility;

(2) the Company is authorized, on a temporary or permanent basis, to operate the New Facility under Applicable Law, and such authorization has not been withdrawn, revoked, superseded, suspended, or materially impaired or amended;

(3) all Utilities specified or required under this Agreement are connected and functioning properly;

(4) the Company and the City have agreed in writing upon the Final Punch List (or, if they are unable to agree, the City shall have prepared and issued the Final Punch List to the Company within fifteen (15) business days of the Company having submitted its Final Punch List to the City);

(5) the City has approved in writing the certification by the Company that all Construction Work, excepting the items on the Final Punch List, is complete and in all respects is in compliance with this Agreement;

(6) the Company has delivered to the City written certification from equipment manufacturers that all major items of machinery and equipment have been properly installed and tested in accordance with the manufacturers' recommendations and project requirements;

(7) the Company has delivered to the City a Claims Statement setting forth in detail all claims of every kind whatsoever of the Company connected with, or arising out of, this Agreement or the Construction Work and arising out of or based on events prior to the date when the Company gives such statement to the City (if there are no such claims, the Company shall deliver a Claims Statement to that effect);

(8) the Company has delivered to the City the initial Operating Protocol and the Operations and Maintenance Manual required to be delivered by Section 3.3 hereof;

(9) the Company has submitted to the City and the City has reviewed and approved the plan for Acceptance Testing as required by Schedule 13 hereto;

(10) RIDEM, RIDOH and any other applicable authority have approved the plan for Acceptance Testing and have authorized the Acceptance Tests to be conducted if such approval is required by the applicable authority;

(11) the Company has submitted to the City and the City has reviewed and approved the Transition Plan; and

(12) the Company has submitted written certification that all of the foregoing conditions have been satisfied and the City has approved the Company's certification.

Alternatively, Substantial Completion shall occur on such earlier date (than would otherwise be required by this Section) as certified by the City, which shall have the discretion to waive any of the foregoing conditions.

Section 6.2.2. Final Punch List.

The Company shall submit a proposed Final Punch List to the City and the City Engineer when the Company believes that the Construction Work has been substantially completed in compliance with this Agreement. The "Final Punch List" shall be a statement by the Company, accepted by the City, of minor repairs, corrections, adjustments and incomplete aspects of the Construction Work. The proposed "Final Punch List" shall be a statement of those items that:

(a) the Company can complete before the Company's agreed date for Final Completion and with minimal interference to the occupancy, use and lawful operation of the New Facility; and

(b) would represent, to perform or complete, a total cost of not more than one and one-half percent (1.5%) of the Fixed Construction Price (unless the City determines that a higher percentage is acceptable).

The Final Punch List shall be approved by the City, and completion of the Final Punch List work shall be verified by a final walk-through of the New Facility conducted by the City and the City Engineer with the Company and the Company Engineer.

Section 6.3 Notice of Start-Up Operations

Section 6.3.1. Submittal of Acceptance Test Plan.

The Company shall prepare and submit an Acceptance Test plan, which shall conform to the requirements of Schedule 13 hereto in all respects.

Section 6.3.2. Notice of Substantial Completion.

The Company shall provide the Authorized Representative of the City at least thirty (30) days prior written notice of the expected date of Substantial Completion and of commencement of start-up operations at the New Facility in preparation for conducting the Acceptance Tests.

Section 6.3.3. Notice of Commencement of Acceptance Test.

The Company shall provide the Authorized Representative of the City at least thirty (30) days prior written notice of the expected initiation of the Acceptance Tests in accordance with the requirements of Schedule 13 hereto. At least ten (10) days prior to the actual commencement of Acceptance Testing, the Company shall certify in writing that it is ready to begin Acceptance Testing in accordance with the Acceptance Test Plan and Schedule 13 hereto.

Section 6.4 Transitional Operations.

At least one hundred eighty (180) days before the Acceptance Deadline, the Company shall prepare and submit to the City for its approval a detailed Transition Plan. If the Company and City are unable to agree upon an acceptable Transition Plan within thirty (30) days of such submission, their inability to agree shall be treated as an engineering dispute subject to construction period alternative dispute resolution as set forth in Section 8.8. The Transition Plan shall ensure that

operations and Acceptance Testing of the New Facility are conducted in a manner which has no adverse effect on the ability of the City to process water to meet the Future Finished Water Requirements at all times without interruption and in accordance with Applicable Law.

Section 6.5 Acceptance Date Conditions.

The following conditions shall constitute the "Acceptance Date Conditions," each of which may be satisfied in all material respects by the Company at its cost, expense and risk in order for the Acceptance Date to occur, and each of which must be and remain satisfied as of the Acceptance Date.

Section 6.5.1. Construction Date Conditions.

Each of the Construction Date Conditions shall be and remain satisfied as of the Acceptance Date.

Section 6.5.2. Achievement of Acceptance Standards.

The Company shall have completed the Acceptance Tests and such tests shall have demonstrated that the New Facility has met the Acceptance Standards as defined in Schedule 1.

Section 6.5.3. Substantial Completion.

The Company shall demonstrate that Substantial Completion has occurred.

Section 6.5.4. Utility Usage.

It is recognized that the actual energy use will be affected by environmental conditions outside the Company's control. For the water treatment plant only, the Company shall demonstrate in meeting the Acceptance Standards that Utility usage has been within an error of +/- 25% of the forecasted limits of the Guaranteed Maximum Electricity Utilization ("GMEU"). Such demonstration may be made by the submittal of calculations showing the forecasted energy use of the constructed facility as compared to the forecasted limits of the GMEU; provided, however, that the GMEU will not be modified as a result of such margin of error.

Section 6.5.5. Operating Legal Entitlements.

Legal Entitlements required under Applicable Law which are necessary for the continued routine operation of the New Facility shall have been duly obtained by the Company and shall be in full force and effect. Copies of all such Legal Entitlements, to the extent not in the City's possession, certified by the Company shall have been delivered to the City.

Section 6.5.6. Record Documents.

The Company shall maintain current as-built or record drawings and documents, including but not limited to shop drawings and manufacturer's guaranties ("Record Documents") at the New Facility for inspection by the City. The Company also shall have delivered to the City a final and complete reproducible set of Record Documents, together with six (6) copies thereof, in a size and

form required by the City and as required by the Design Requirements and shall certify that the Capital Improvements were constructed in accordance with the Design Requirements, including any Change Orders. The Company shall also provide an electronic file of the Record Documents in such format as the City may specify.

Section 6.5.7. Equipment Warranties and Manuals.

The Company shall be in possession of, and shall have delivered to the City, copies of the warranties of all machinery, Equipment, fixtures and Rolling Stock constituting a part of the New Facility, together with copies of all related operating manuals supplied by the equipment supplier.

Section 6.5.8. Contract Compliance Calendar.

The Company shall have delivered to the City a calendar schedule of all required activities to be performed by both parties under this Agreement during the Future Operation Period.

Section 6.5.9. No Default.

There shall be no Event of Default by the Company under this Agreement or by the Guarantor under the Guaranty Agreement, or event which with the giving of notice or the passage of time would constitute an Event of Default by the Company hereunder or an Event of Default by the Guarantor under the Guaranty Agreement.

Section 6.6 Acceptance Test Report.

Within forty five (45) days following conclusion of the Acceptance Test, the Company shall furnish the City and the City Engineer with an Acceptance Test report consistent with the requirements of Schedule 13.

Section 6.7 Concurrence or Disagreement with Test Results

Section 6.7.1. Acceptance Date Concurrence.

If the Company certifies in its Acceptance Test report that the full Acceptance Standards have been achieved, the City shall determine within thirty (30) days of its receipt of such report whether it concurs in such certification. If the City states in writing that it concurs with the Company's certification, the New Facility shall be deemed to have achieved Acceptance and the Acceptance Date shall be deemed to have been established on a permanent basis on the date upon which the City received Acceptance Test Report.

Section 6.7.2. Acceptance Date Disagreement.

If the City determines at any time during such thirty (30) day review period that it does not concur with the Company's certification that the full Acceptance Standards have been achieved, the City shall immediately send written notice to the Company of the basis for its disagreement.

In the event of any such non-concurrence by the City, or in the event the City fails to act within such thirty (30) day review period, the dispute shall be referred to mediation for resolution.

Acceptance shall not be deemed to have been achieved unless the Acceptance Test is conducted in a unified and continuous manner as provided in the Acceptance Test Plan and Schedule 13 hereto, and demonstrates that all of the Acceptance Standards have been met. In the event the Company, in conducting such Acceptance Test, does not successfully meet each Acceptance Standard, the City shall have the right, in its sole discretion, to permit the Company to re-test the New Facility for compliance only with the Acceptance Standards not previously achieved through an earlier Acceptance Test. Nothing in this Section shall prevent the Company from repeating any Acceptance Test in order to establish the achievement of Acceptance.

Section 6.8 Extension Period.

If Acceptance shall not have occurred on or before the Acceptance Deadline for any reason other than Uncontrollable Circumstances or City Fault, the Company shall be entitled to conduct or repeat the Acceptance Test at its sole cost and expense as often as it desires in order to secure Acceptance of the New Facility during the Extension Period, if applicable.

Section 6.9 Delay Non-Compliance Assessment.

If the Acceptance Date occurs subsequent to December 31, 2020 (the "Acceptance Deadline"), then the Company shall pay to the City, in addition to other costs and expenses required to be paid pursuant to this Agreement (including without limitation fines, penalties or other expenses imposed on or incurred by the City in connection with the Company's failure to meet such deadline), a daily delay non-compliance assessment in the amount of $5,000 for each day that the Acceptance Date falls after said date. Except as otherwise specifically provided herein, such delay non-compliance assessment shall constitute the sole and exclusive remedy for delay in meeting the Construction Date Deadline whether based in contract, tort or otherwise. The Company's liability for such non-compliance assessments shall not exceed $3,000,000. The limitation shall be included under the aggregate limitation of liability included under below Section 7.1. It is understood that the delay non-compliance assessment shall not limit the City's right to recover from the Company for the Company's failure to timely achieve Acceptance with respect to liability, claims and damages (other than routine operations and maintenance costs) associated with the continued operation of the existing Facility after the Acceptance Deadline, including without limitation structural/equipment repairs (other than (i) latent defects not reasonably identifiable by the Company and (ii) matters that were previously recommended for repair by the Company but not authorized for repair by the City), and regulatory assessments or penalties imposed by RIDEM or other government authorities.

Section 6.10 Failure to Meet Acceptance Standard.

If, as of the Acceptance Deadline, as extended (if applicable), the Acceptance Test has not been conducted or has failed to demonstrate that the New Facility operates at a standard equal to or greater than the full Acceptance Standard, an Event of Default by the Company will be deemed to have occurred under Section 8.2 hereof notwithstanding any absence of notice, further cure opportunity or other procedural rights accorded the Company thereunder, and the City shall thereupon have the right to terminate this Agreement upon written notice to the Company. Upon any such termination, the City shall have all of the rights provided in Article VIII hereof upon a termination of the Company for cause.

Section 6.11 Final Completion.

Section 6.11.1. Requirements.

"Final Completion" shall occur when all of the following conditions have been satisfied:

(a) Certificate of Occupancy Issued. If necessary, a certificate of occupancy has been issued for the New Facility;

(b) Acceptance Achieved. The Acceptance Test has been conducted, the Acceptance Standards have been achieved and Acceptance has occurred;

(c) Construction Work Completed. All Construction Work (including all items on the Final Punch List) is complete and in all respects is in compliance with this Agreement; and

(d) Deliverable Material and Record Documents Furnished. The Company has furnished to the City all Deliverable Material and Record Documents required to be delivered prior to Acceptance.

(e) Existing WTP Demobilized. The Company has met all requirements for shutdown and demobilization of the existing WTP, as described in Schedule 12.

Section 6.11.2. Final Voucher and Claims Statement.

The Company shall also prepare and submit to the City as soon as practicable following the Acceptance Test, for purposes of demonstrating Final Completion and obtaining Final Completion payment of the Construction Price, (1) a voucher for payment of the Construction Price, accompanied by a certificate of an authorized officer of the Company certifying (a) the amount of the Fixed Construction Price which is payable, (b) the amount of Fixed Construction Price Adjustments which are to be added or subtracted from the Fixed Construction Price (together with Cost Substantiation if not previously submitted), (c) that all Construction Work has been completed in accordance herewith and with the Design Requirements, and (d) that Acceptance of the New Facility has occurred, and (2) a Claims Statement setting forth in detail all claims of every kind whatsoever against the City in connection with or arising out of this Agreement or the Construction Work the Company may have, and (3) waivers, releases or discharges of any rights to mechanics' lien claims for labor or material that could be brought by any contractor or subcontractor. The City shall review the certified voucher to the City for the Construction Price and the Claims Statement and shall verify or dispute them in writing within thirty (30) days of receipt. When the City determines them to be correct, the Company shall be entitled to payment of the remainder of the Construction Price as of the date of the City's determination. In the event of disputes regarding the certification, the parties shall attempt in good faith to resolve the dispute and, if they are unable to do so, the Company may exercise its right to submit the dispute to resolution pursuant to Section 8.8 hereof.

Section 6.12 No Acceptance, Waiver or Release.

Unless other provisions of this Agreement specifically provide to the contrary, none of the following shall be construed as the City's acceptance of any Construction Work which is defective,

incomplete, or otherwise not in compliance with this Agreement, as the City's release of the Company from any obligation under this Agreement, as the City's extension of the Company's time for performance, as an estoppel against the City, or as the City's acceptance of any claim by the Company:

(1) the City's payment to the Company or any other person of all or any portion of the Fixed Construction Price;

(2) the City's approval or acceptance of any drawings, submissions, punch lists, other documents, certifications (other than certificates relating to completion or Acceptance of the Capital Improvements), or Construction Work of the Company or any Subcontractor;

(3) the City's review of (or failure to prohibit) any construction applications, means, methods, techniques, sequences, or procedures for the Construction Work;

(4) the City's entry at any time on the Site (including any area in which the Construction Work is being performed);

(5) any inspection, testing, or approval of any Construction Work (whether finished or in progress) by the City or any other person; or

(6) the failure of the City or any City consultant to respond in writing to any notice or other communication of the Company.

ARTICLE VII
LIABILITY, INSURANCE, UNCONTROLLABLE CIRCUMSTANCES AND INDEMNIFICATION

Section 7.1 Liability.

The Company shall be liable for injuries and death to any and all persons and for damage to the Existing Facility, the New Facility and the property of others which result from the acts, errors or omissions by the Company occurring in connection with, or arising out of, the design, construction, start-up, testing, operation and maintenance of the Existing Facility or the New Facility.

With respect to the Design and Construction of the New Facility, in recognition of the relative risks and benefits of the Project to both City and Company, City agrees, to the fullest extent permitted by law and notwithstanding any other provision in this Agreement, that any liability created by or arising out of this Agreement on the part of Company to City and any person or entity claiming by, through or under City, for any and all claims, liabilities, losses, costs, damages of any nature whatsoever, whether in contract, tort or otherwise, or claims expenses from any cause or causes (including without limitation any attorneys' fees under this Agreement), shall not exceed fifty percent (50%) of the Fixed Construction Price, inclusive of non-compliance assessments above including but not limited to Sections 4.6.2 and 6.9.

With respect to the operations and maintenance obligations hereunder during the Operation Period, any liability created by or arising out of this Agreement on the part of Company to City and any person or entity claiming by, through or under City, for any and all claims, losses, costs, damages of any nature whatsoever, whether in contract, tort or otherwise, or claims or expenses from any cause or causes (including without limitation any attorneys' fees under this Agreement) shall not exceed the amount of three (3) times the Annual Service Fee applicable at the time such claim is made, inclusive of assessments pursuant to Section 3.10.

Notwithstanding anything to the contrary contained herein, the limitations on liability and caps on noncompliance assessments provided for in this Agreement shall not apply to the Company's (a) indemnification obligations described in Section 7.4.1 or (b) obligations to pay fines and penalties that may be assessed by any governmental agency. Further, said limitations on liability and caps on noncompliance assessments shall apply only to liability over and above the recovery of proceeds of insurance required under this Agreement, such that recovery of proceeds of insurance required under this Agreement shall not be included toward the limitation of liability and caps on noncompliance assessments.

Section 7.2 Insurance.

Section 7.2.1. General Requirements.

At all times during the Contract Term, the Company or, with the consent of the City, the Company's approved design/builder and operator, shall, at its own cost and expense, obtain and maintain Insurance in accordance with Schedule 4 hereto. If the Company fails to pay any premium for the Insurance, or if any insurer cancels any Insurance and the Company fails to obtain replacement coverage so that the Existing Facility and the New Facility, as applicable, and the Site remain insured on a continuous basis, then, at the City's election (but without any obligation to do so), the City may pay such premium or procure similar insurance coverage from such company or companies as the City, in its sole discretion, chooses, and upon such payment by the City the amount thereof shall be immediately reimbursable to the City by the Company or deducted by the City from any payment(s) due the Company. The Company shall not perform any construction work on the Capital Improvements, or allow any of the Company's or any Subcontractor's employees on the Site, during any period when any policy of Insurance is not in effect. The Company shall take all steps necessary to assure that the Existing Facility and the New Facility, as applicable, and the Site remain continuously insured in accordance with the requirements of this Agreement during the Contract Term, and that no gaps in coverage occur. Should any such gap in coverage occur, the Company shall bear, indemnify and defend the City against any and all expense arising out of the failure of the Company to provide such continuous Insurance coverage. The City and its employees, officers and consultants shall be additional insureds on Insurance policies in accordance with Schedule 4 hereto. No material change shall be made to the Insurance coverage in effect as of the Commencement Date without the prior written consent of the City.

Section 7.2.2. Insurers, Deductibles and City Rights.

All Insurance shall be procured and maintained from financially sound and generally recognized responsible insurance companies selected by the Company with the consent of the City, which consent shall not be unreasonably withheld, and authorized to write such insurance in the

State. Such insurance may be written with deductible amounts comparable to those on similar policies carried by other companies engaged in businesses similar in size, character and respects to those in which the Company is engaged. The Company shall be responsible for any deductible amounts. All policies evidencing such insurance shall provide for (1) payment of the losses to the City and the Company as their respective interests may appear under the Builder's Risk policy, and (2) at least thirty (30) days prior written notice of the cancellation thereof to the Company and the City, except for cancellation due to non-payment of premium, which shall provide for at least ten (10) days prior written notice of cancellation. All policies of insurance required by this Section shall be primary insurance without any right of contribution from other insurance carried by the City.

Section 7.2.3. Certificates, Policies and Notice.

The Company shall deliver to the City, as soon as practicable after the execution of this Agreement and prior to each Contract Year thereafter, a certificate setting forth in reasonable detail the particulars as to all insurance policies which the Company is required to maintain pursuant to this Section, listing the risks that are covered thereby, the name of the insurers issuing such insurance, certifying that the same are in full force and effect and giving the amounts and expiration dates of such insurance. The Company shall also supply to the City certified copies of said policies promptly following issuance by the insurers. Whenever a Subcontractor is utilized, the Company shall either procure and maintain, or require the Subcontractor to procure and maintain, during the Construction Period and the Operation Period, as applicable, insurance coverage subject to the requirements of Schedule 4.

Section 7.3 Uncontrollable Circumstances.

Section 7.3.1. Relief from Obligations.

Except as expressly provided under the terms of this Agreement, neither party to this Agreement shall be liable to the other for any loss, damage, delay or failure to perform any obligation to the extent it results from an Uncontrollable Circumstance. The occurrence of an Uncontrollable Circumstance shall not excuse or delay the performance of a party's obligation to pay monies previously accrued and owing under this Agreement.

Section 7.3.2. Notice and Mitigation.

The party experiencing an Uncontrollable Circumstance shall notify the other party in writing, within a reasonable time after the date the party experiencing such Uncontrollable Circumstance first knew of the commencement thereof, followed within fifteen (15) days by a written description of (1) the Uncontrollable Circumstance and the cause thereof (to the extent known), (2) the date the Uncontrollable Circumstance began, its estimated duration, the estimated time during which the performance of such party's obligations hereunder shall be delayed, and the impact, if any, on the anticipated Acceptance Date, (3) the amount, if any, by which the Construction Price or the Service Fee is proposed to be adjusted as a result of such Uncontrollable Circumstance, (4) estimated impact on the other obligations of such party under this Agreement, and (5) any areas where costs might be reduced and the approximate amount of such cost reductions. Each party shall provide prompt written notice of the cessation of such Uncontrollable

Circumstance. Whenever such act, event or condition shall occur, the party claiming to be adversely affected thereby shall, as promptly as reasonably possible, use its best efforts to eliminate the cause therefor, reduce costs and resume performance under this Agreement; provided, however that Company's reasonable costs of mitigation are eligible for price relief as an adjustment to the Fixed Construction Price or Annual Service Fee, as applicable. While the delay continues, the affected party shall give notice to the other party, before the first day of each succeeding month, updating the information previously submitted.

The party experiencing an Uncontrollable Circumstance shall furnish promptly (if and to the extent available to the Company) any additional documents or other information relating to the Uncontrollable Circumstance reasonably requested by the other party.

Section 7.3.3. Conditions and Schedule Relief.

If and to the extent that Uncontrollable Circumstances delay the Company's performing its obligations in accordance herewith, and the Company has given timely notice as required by this Section, the Company may be entitled to an extension of the schedule during the Construction Period equal to the time lost as a result thereof, and appropriate adjustment in Fixed Construction Price for reasonable costs associated with the delay, in each case only to the minimum extent reasonably forced on the Company by the event, and the Company shall perform all other services required hereunder.

In the event that the Company believes it is entitled to any relief on account of any Uncontrollable Circumstance, it shall furnish the City written notice of the specific relief requested and detailing the event giving rise to the claim within thirty (30) days after the giving of notice delivered pursuant to Section 7.3.2. In connection therewith, the Company shall be required to establish that the time delay requested is necessary, not merely that the Uncontrollable Circumstances occurred over a given period. Within thirty (30) days after receipt of such a timely submission from the Company, the City shall issue a written determination as to the extent, if any, it concurs with the Company claim for schedule relief, and the reasons therefor.

The proceeds of insurance required under this Agreement that cover any increased cost attributed to an Uncontrollable Circumstance shall be applied to such purpose prior to any determination of cost increase payable by the City under this Section. In particular, the Company shall apply the proceeds of insurance required under this Agreement by the Company for builder's risk to the reconstruction of the Capital Improvements should an insured event under such builder's risk insurance cause property damage prior to the Acceptance.

Section 7.3.4. [INTENTIONALLY OMITTED]

Section 7.3.5. No Reimbursement for Costs Due to Delays Caused by Uncontrollable Circumstances.

If an Uncontrollable Circumstance under (a)1.of the definition thereof causes the Company a delay in performance of any of its obligations under this Agreement during the Construction Period, the sole remedy available to the Company shall be a reasonable extension of time pursuant to Section 7.3.3 hereof. The Company shall not be entitled to any reimbursement of costs due to any such

delay. Otherwise if an Uncontrollable Circumstance causes the Company a delay in performance of any of its obligations under this Agreement during the Construction Period, the Company shall be entitled to an extension of time pursuant to Section 7.3.3 hereof and any other directly attributable costs based on such delay or hindrance which costs shall be limited to actual, direct costs, documented to the City's reasonable satisfaction by Cost Substantiation and subject to the Company's duty to mitigate its damages.

Section 7.3.6. Acceptance of Relief Constitutes Release.

The Company's acceptance of any Service Fee or Schedule relief under this Section shall be construed as a release of the City by the Company (and all persons claiming by, through, or under the Company) for any and all Loss-and-Expense resulting from, or otherwise attributable to, the event giving rise to the relief claimed.

Section 7.4 Indemnification.

Section 7.4.1. Indemnification by the Company.

The Company agrees that it shall protect, indemnify, defend and hold harmless the City, and its officers, employees, agents and persons under the City's control or supervision (the "City Indemnitees"), from and against (and pay the full amount of) all claims for Loss-and-Expense incurred by a City Indemnitee to third parties and shall defend the City Indemnitees in any suit, including appeals, for personal injury to, or death of, any person, or loss or damage to property to the extent arising from or in connection with (or alleged to arise from or in connection with) (1) the negligence, wrongful conduct or other fault of the Company or any of its officers, members, employees, agents, representatives, contractors or Subcontractors in connection with its obligations or rights under this Agreement, (2) the negligence, wrongful conduct or other fault of the Company or any of its officers, members, employees, agents, representatives, contractors or Subcontractors in connection with the operation of the Existing Facility or the New Facility by or under the direction of the Company, or (3) the performance or non-performance of the Company's obligations or rights under this Agreement.

The Company shall not, however, be required to reimburse or indemnify any City Indemnitee for any Loss-and-Expense to the extent due to (a) the negligence or other wrongful conduct of any City Indemnitee or due to any Uncontrollable Circumstance or (b) any act or omission of any City Indemnitee responsible for or contributing to the Loss-and-Expense, and the City Indemnitee whose negligence or other wrongful conduct, act or omission is adjudged to have caused such Loss-and-Expense shall be responsible therefor in the proportion that its negligence or wrongful conduct caused or contributed to the Loss-and-Expense. A City Indemnitee shall promptly notify the Company of the assertion of any claim against it for which it is entitled to be indemnified hereunder, shall give the Company the opportunity to defend such claim, and shall not settle the claim without the approval of the Company.

These indemnification provisions are for the protection of the City Indemnitee only and shall not establish, of themselves, any liability to third parties. Except as set forth herein, this indemnification obligation shall include, but shall not be limited to, all claims against the City by an employee or former employee of the Company, the Guarantor or any Subcontractor. The provisions

of this Section shall survive termination of this Agreement.

Section 7.4.2. Indemnification by the City.

The City shall, to the extent permitted by applicable law, indemnify, defend and hold harmless the Company, and its officers, directors, employees, representatives and agents (each, a "Company Indemnitee"), from and against any and all Loss-and-Expense incurred by a Company Indemnitee to third parties to the extent arising from or in connection with (or alleged to arise from or in connection with): (1) any failure by the City or any of its elected officials, employees, agents, representatives, or contractors to perform its obligations under this Agreement or (2) the negligence or willful misconduct of the City or any of its elected officials, employees, agents, representatives, or contractors in connection with its obligations or rights under this Agreement. The City shall also indemnify the Company as and to the extent provided elsewhere in this Agreement. The City shall not be required to reimburse or indemnify any Company Indemnitee for any and all Loss-and-Expense to the extent caused by the failure of Company Indemnitee(s) to perform its obligations under this Agreement, or the negligence or other wrongful misconduct of any Company Indemnitee or to the extent attributable to any Uncontrollable Circumstance. A Company Indemnitee shall promptly notify the City of the assertion of any claim against it for which it is entitled to be indemnified hereunder, and the City shall have the right to assume the defense of the claim in any Legal Proceeding and to approve any settlement of the claim.

Notwithstanding anything contained in this Agreement to the contrary, the City's indemnity obligations hereunder shall be limited to matters for which the City is able to recover directly or through right of subrogation under its insurance policies, if any, and the City shall maintain reasonable levels of insurance coverage throughout the term of this Agreement. These indemnification provisions are for the protection of the Company Indemnitee only and shall not establish, of themselves, any liability to third parties, and these provisions are not intended to benefit any third parties. The provisions of this Section shall survive termination of this Agreement.

ARTICLE VIII
EVENTS OF DEFAULT, REMEDIES AND TERMINATION

Section 8.1 Remedies for Breach.

Section 8.1.1. General.

Except as otherwise specifically provided for in this Agreement, neither party shall have the right to terminate this Agreement. In the event that (1) either party breaches any obligation under this Agreement or (2) any representation made by either party hereunder is untrue in any material respect, the other party shall have the right to take any action at law or in equity it may have to enforce the payment of any damages or to secure the performance of any obligation hereunder. Such right to recover damages or to secure the performance of such obligations as provided herein shall constitute an adequate remedy for any breach of such obligation or any material untruth in any such representation. Any action taken shall be subject to the dispute resolution provisions more fully set forth in Section 8.8 hereof.

Section 8.1.2. No Damages for City Delay.

If the Company shall claim to have sustained any damages or costs by reason of delays, extraordinary or otherwise, or hindrances which it claims to be due to any action, omission or direction of the City, the Company shall be entitled to an extension of time and any other claim, cause or action against the City based on such delay or hindrance shall be limited to actual, direct costs, documented to the City's reasonable satisfaction by Cost Substantiation and subject to the Company's duty to mitigate its damages.

Section 8.2 Events of Default by the Company.

Section 8.2.1. Events of Default Not Requiring Notice or Cure Opportunity.

Due to the opportunity already given to cure or the seriousness of the Event of Default, each of the following shall constitute an Event of Default by the Company upon which the City may terminate this Agreement without any requirement to provide notice or further opportunity to cure:

(1) Failure to Apply for Certain Legal Entitlements. The failure of the Company to submit applications or required submittals, to be complete by the dates and in the manner for the milestones required by Section 4.5.2 hereof.

(2) Failure to Achieve Acceptance. The failure of the Company to achieve Acceptance within the time period required under this Agreement.

(3) Failure to Comply. The failure of the Company to comply with the Finished Water Quality Long-Term Performance Standards set forth in Schedule 1, Table 2.5.1 for three (3) consecutive days in any Contract Year.

(4) Abandonment. The failure to operate or the abandonment of the Existing Facility or the New Facility for a period of one (1) or more days in any Contract Year.

(5) Failure to Pay or Credit. The failure of the Company to pay or credit amounts not in dispute (including performance non-compliance assessments and/or non-compliance assessments) owed to the City under this Agreement as and when such payments become due and owing.

(6) Failure to Provide, Extend or Replace Security. The failure of the Company to provide, extend or replace any Bond or Letter of Credit or other security acceptable in the sole discretion of City when and if required by Section 11.3 hereof.

(7) Bankruptcy. The voluntary or involuntary filing by or against the Company or the Guarantor of a petition seeking relief under the Federal Bankruptcy Code or any Federal or State statute intended to provide relief for entities that are insolvent or unable to meet their obligations as they come due.

Section 8.2.2. Events of Default Requiring Notice and Cure Opportunity.

Each of the following shall be an Event of Default by the Company upon which the City may terminate this Agreement upon notice and cure opportunity as set forth herein:

1. the failure or refusal of the Company to perform any material obligation under this Agreement, other than those indicated in Subsection 8.2.1 above.

2. the failure of the Company or the Guarantor to satisfy their respective covenants and agreements (other than those indicated in Subsection 8.2.1 above), the material untruth of any representation or warranty of the Company contained in this Agreement or of the Guarantor contained in, the Guaranty Agreement, or the failure of the Company or the Guarantor to comply with the terms and conditions of Subsections 11.2.4 or 11.2.5 hereof, as applicable, after a Material Decline in Guarantor's Credit Standing occurs.

3. the failure of the Company to comply with the limits set forth in the column labeled "Finished Water Quality Acceptance Standards" in Table 2.5 of Schedule 1, to the extent that such limits are more stringent than the Future Finished Water Requirements, for ten (10) cumulative days per parameter in any Contract Year, provided that the remedy for breach of this failure shall be a daily liquidated damage payment to the City in the amount of One Hundred Dollars ($100) for each day that such failure shall continue, provided further that the Company takes and continues to take all steps necessary to remedy and mitigate such failure required under this Agreement. In the event that such failure is not so remedied within ten (10) days of first occurring, the daily liquidated damage limitation set forth above shall be nullified and the City may pursue any and all remedies available to it for the failure to perform a material obligation hereunder.

Failure to Perform Any Other Material Obligation. The failure of the Company to perform any material obligation hereunder where said failure is caused by any job action, including but not limited to a labor strike or slow down, a work stoppage, a walkout, or a secondary boycott, by employees of the Company performing services pursuant to this Agreement.

However, no such failure to perform (other than those set forth in Subsection 8.2.1) shall give the City the right to terminate this Agreement for cause under this Section unless:

(a) the City has given prior written notice to the Company stating that a specified failure or refusal to perform exists which constitutes a material breach of this Agreement by the Company which gives the City a right to terminate this Agreement for cause under this Section, unless such default is corrected within a reasonable time; and

(b) the Company has neither (i) challenged in an appropriate forum the City's conclusion that such failure or refusal to perform has occurred or constitutes a material breach of this Agreement nor (ii) corrected or diligently taken steps to correct such default within ten (10) days from receipt of the notice given pursuant to the preceding paragraph (but if the Company shall have diligently taken steps to correct such default within a reasonable period of time, the same shall not constitute an Event of Default for as long as the Company is diligently continuing to take such steps to correct such default).

Section 8.2.3. Termination Damages and Other Legal Rights Upon Company Default.

The right of termination provided under this Section upon an Event of Default by the Company is not exclusive. Upon the occurrence of an Event of Default by the Company, the City may exercise, without prejudice to any other right held by the City, any rights provided by law to the City to bring appropriate legal action to recover actual damages for failure in the performance by the Company of its obligations pursuant to this Agreement for the remaining Contract Term. In calculating actual damages, the Company's obligation to pay delay non-compliance assessment amounts accruing during the Extension Period in accordance with Section 6.9 hereof shall in no way limit the right of the City to receive damages. No such termination or other exercise of legal rights shall affect the right of the City to exercise its rights under any Bonds, nor shall any value in the Facility created on account of the surety's performance under any Bonds be offset against, credited or otherwise reduce the amount of such actual damages.

Section 8.2.4. Enforcement Costs.

The Company agrees to pay to the City all reasonable Fees and Costs incurred by or on behalf of the City in enforcing payment or performance of the Company's obligations hereunder.

Section 8.3 Events of Default by the City.

Section 8.3.1. Events of Default Requiring Notice and Cure Opportunity for Termination.

The following shall be an Event of Default by the City upon which the Company may terminate this Agreement upon the conditions stated in (1) and (2) below:

(a) The City fails or refuses to perform any material obligation under this Agreement (unless such failure or refusal is excused by an Uncontrollable Circumstance or Company Fault),

(b) The City fails to provide funding for (a) Facility Modifications necessary over the life of the Agreement Term to achieve environmental compliance due to Changes in Law and (b) Repair and Replacement amounts that are subject to City approval pursuant to Section 3.7 as necessary to maintain system condition and achieve environmental compliance during the Agreement Term and such failure results in a loss to the Company or a claim by a Governmental Body that the Facility is out of compliance with Applicable Law, following notice to the City and 60 days for the City to cure, no such cure having been effectuated. Further, the City shall release the Company from liability as to any claim, loss, liability, damage, non-compliance, fine, penalty or enforcement action arising in connection with the City's failure to provide such funding. All funding under this Agreement shall be subject to appropriation by the City in accordance with its Charter, ordinances and applicable State law.

(c) The failure of the City to pay undisputed amounts owed to the Company under this Agreement in either case where:

(1) the Company has given prior written notice to the City stating that a specified failure or refusal to perform exists which shall, unless corrected, constitutes a material breach of this Agreement on the part of the City and which shall, in the Company's opinion, give the Company a right to terminate this Agreement for cause under this Section unless such default is corrected within a reasonable period of time; and

(2) the City has neither challenged in an appropriate forum the Company's conclusion that such failure or refusal to perform has occurred or constitutes a material breach of this Agreement nor corrected or diligently taken steps to correct such default within a reasonable period of time but not more than sixty (60) days from the date of the notice given pursuant to the preceding paragraph (but if the City shall have diligently taken steps to correct such default within a reasonable period of time, but in no event greater than sixty (60) days, the same shall not constitute an Event of Default for as long as the City is continuing diligently to take such steps to correct such default).

Section 8.3.2. Termination During the Initial Term.

If this Agreement is terminated by the Company for cause as a result of an Event of Default by the City during the Initial Term (as defined in Section 10.1.1 hereof), the City shall be obligated to pay the Company, as liquidated damages upon any such termination, the sum specified in Section 8.4 hereof which would be payable if this Agreement were terminated during the Initial Term, according to the year of termination, at the election of the City for convenience and without cause. The parties agree that since the Company's actual damages upon termination of the City for cause under this Section during the Initial Term would be difficult or impossible to ascertain, that the termination liquidated damages provided for in this Section are intended to place the Company in the same economic position it would have been had the Event of Default permitting termination for cause during the Initial Term not occurred, and that such termination liquidated damages shall constitute the only amounts payable by the City upon any such termination for cause, regardless of legal theory.

Section 8.4 City Discretionary Termination.

Section 8.4.1. Discretionary Termination Right.

The City shall have the right to terminate this Agreement in its sole discretion, for its convenience and without cause at any time upon ninety (90) days' written notice to the Company (a "Termination for Convenience"). A Termination for Convenience will be deemed to have occurred if the City terminates this Agreement for either of the following reasons: (1) funds for the Capital Improvements or for the operations, maintenance and management of the Existing Facility or the New Facility are not appropriated or otherwise made available; and (2) an Uncontrollable Circumstance, regardless of the cause, shall have occurred relative to a material obligation of the Company hereunder, and said material obligation of the Company is not performed for a period of thirty (30) days following the initial occurrence of said Uncontrollable Circumstance; provided, however, that in the event of a Termination for Convenience for the reasons specified in (1) and (2) above, the City may terminate this Agreement upon fifteen (15) days' written notice. The amount paid for termination ("Discretionary Termination Amount") shall be calculated in accordance with Schedule 16, plus the compensation allowed under Section 8.4.2, if such termination occurs within

the first five (5) years of the term. Beginning in the sixth (6th) year of the term, the maximum amount for termination shall be calculated in accordance with Schedule 16, plus the compensation allowed under Section 8.4.2, plus demobilization-related costs, which demobilization-related costs amount shall not be subject to reduction.

Section 8.4.2. Discretionary Termination - Costs.

If the City exercises its right to terminate this Agreement pursuant to this Section within the first five (5) years of the Contract Term, and the Company, upon the request of the City, demonstrates that the Company is ready, willing and able to perform its obligations under this Agreement, the City shall reimburse the Company for its substantiated actual direct costs incurred and any expenses paid or incurred to third parties from the Agreement Date to the date on which this Agreement is terminated by the City, less any amounts already paid to the Company; provided, however, that all such costs and expenses must have been (a) directly related to the Company's performance of its Development Period obligations hereunder, and (b) necessary to be performed prior to the Construction Date, provided, however, that the total payment due to the Company under items (a) and (b) shall not exceed a maximum amount of the fees and payments contemplated by and calculated in accordance with Schedule 16.

Section 8.4.3. Payment of Amounts Owing Through the Termination Date.

Upon any termination pursuant to this Section, the Company shall also be paid all amounts due for services hereunder to be paid as part of the Construction Price and the Service Fee due but not yet paid as of the date of termination.

Section 8.4.4. Adequacy of Termination Payment.

The Company agrees that the applicable termination payments provided in this Section constitute full and adequate compensation to the Company and all Subcontractors for all profits, costs, expenses, losses, liabilities, damages, taxes, and charges of any kind whatsoever (whether foreseen or unforeseen) attributable to such termination of the Company's right to perform this Agreement.

Section 8.4.5. Completion or Continuance by the City.

After the date of any termination under this Section, the City may at any time (but without any obligation to do so) take any and all actions necessary or desirable to continue and complete the Construction Work or continue the Operations Services so terminated, including without limitation entering into contracts with other contractors.

Section 8.5 Certain Obligations of the Company Upon Termination or Expiration.

Section 8.5.1. Company Obligations Upon Termination.

Upon a termination of the Company's right to perform this Agreement under Sections 8.2, 8.3 or 8.4 hereof or upon the expiration of this Agreement under Section 10.1 hereof, the Company shall, as applicable: (1) stop the Construction Work and/or the Operation Services, as applicable, on the date and to the extent specified by the City; (2) promptly take all action as necessary to

protect and preserve all materials, equipment, tools, facilities and other City property; (3) promptly remove from the Site all construction equipment, implements, machinery, tools, temporary facilities of any kind and other property owned or leased by the Company, and repair any damage caused by such removal; (4) clean the Site and Existing Facility and/or the New Facility, as applicable, and leave the same in a neat and orderly condition; (5) promptly remove all employees of the Company and any Subcontractors and vacate the Site; (6) promptly deliver to the City copies of any and all Subcontracts, together with a statement of: (a) the items ordered and not yet delivered pursuant to each agreement; (b) the expected delivery date of all such items; (c) the total cost of each agreement and the terms of payment; and (d) the estimated cost of canceling each agreement; (7) deliver to the City promptly a list of: (a) all special order items previously delivered or fabricated by the Company or any Subcontractor but not yet incorporated in the Construction Work or the Operation Services; and (b) all other supplies, materials, machinery, equipment, and other property previously delivered or fabricated by the Company or any Subcontractor but not yet incorporated in the Construction Work or the Operation Services; (8) advise the City promptly of any special circumstances which might limit or prohibit cancellation of any Subcontract; (9) unless the City directs otherwise, terminate all Subcontracts and make no additional agreements with Subcontractors; (10) as directed by the City, transfer to the City by appropriate instruments of title, and deliver to the Site (or such other place as the City may specify), all special order items pursuant to this Agreement; (11) promptly transfer to the City all warranties given by any manufacturer or Subcontractor with respect to particular components of the Construction Work or the Operation Services; (12) notify the City promptly in writing of any Legal Proceedings against the Company by any Subcontractor relating to the termination of the Construction Work or the Operation Service (or any Subcontracts); (13) give written notice of termination, effective as of date of termination of this Agreement, promptly under each policy of Insurance (with a copy of each such notice to the City), but permit the City to continue such policies thereafter at its own expense, if possible; and (14) take such other actions, and execute such other documents as may be necessary to effectuate and confirm the foregoing matters, or as may be otherwise necessary or desirable to minimize the City's costs, and take no action which shall increase any amount payable by the City under this Agreement.

Section 8.5.2. Additional Obligations.

Upon termination of the Company's right to perform this Agreement under Sections 8.2, 8.3 or 8.4 hereof or upon the expiration of this Agreement under Section 10.1 hereof, the Company at its cost and expense shall provide, and shall use its best reasonable efforts to cause its Subcontractors to provide, operational, systems, technological and design advice and support to the City or any replacement operator designated by the City. Such advice and support shall be for a period of twelve (12) months and shall include providing any existing plans, drawings, renderings, blueprints, operating manuals, maintenance and operating records (each as the same may exist as of the date of termination), or other information useful or necessary for the City or any replacement operation designated by the City or any such replacement operator to complete and carry out the Construction Work and to perform the Operation Services. If terminated during the Operation Period, the Company shall exercise its best efforts to maintain the performance of the Existing Facility or the New Facility, as applicable, during the transfer to the City.

Section 8.5.3. Company Payment of Certain Costs.

If termination is pursuant to Section 8.2.1 or 8.2.2 hereof, the Company shall be obligated to

pay the costs and expenses of undertaking its post-termination responsibilities under this Section. If the Company fails to comply with any obligations under this Section, the City may perform such obligations and the Company shall pay on demand all reasonable costs thereof subject to receipt of invoices or other substantiation.

Section 8.5.4. City Payment of Certain Costs.

If termination is not in connection with a Company Event of Default, the City shall pay to the Company within sixty (60) days of the date of the Company's invoice supported by Cost Substantiation all reasonable costs and expenses incurred by the Company in satisfying the requirements of this Section, subject to the limitations set forth in this Section 8.5.

Section 8.6 No Waivers.

No action of the City or Company pursuant to this Agreement (including but not limited to any investigation or payment), and no failure to act, shall constitute a waiver by either party of the other party's compliance with any term or provision of this Agreement. No course of dealing or delay by the City or Company in exercising any right, power or remedy under this Agreement shall operate as a waiver thereof or otherwise prejudice such party's rights, powers and remedies. No single or partial exercise of (or failure to exercise) any right, power or remedy of the City or Company under this Agreement shall preclude any other or further exercise thereof or the exercise of any other right, power or remedy.

Section 8.7 No Consequential or Punitive Damages.

The parties shall not be liable to each other for special, indirect, consequential or punitive damages except as such are brought by a third party and are subject to indemnification by virtue of this Agreement.

Section 8.8 Dispute Resolution.

To the extent the parties cannot, after good faith attempts, resolve any controversy or dispute that may have arisen hereunder, either party, to the extent its interests are adversely impacted, may refer the matter to mediation. If despite the good faith efforts of the parties to resolve the dispute, the mediation does not conclude with a resolution of the dispute, the parties shall follow the procedure set forth in Section 8.8.4 hereof.

The parties shall continue to perform services and make payments not in dispute under this Agreement, without interruption or slowdown, pending resolution of any dispute(s), unless the matter at issue precludes such continued activity until resolved. This Section shall survive termination of this Agreement.

Section 8.8.1. Negotiation.

The City and the Company agree, prior to invoking any other method of dispute resolution as provided in this Agreement, first to engage in good faith negotiations regarding any dispute. Either party may invoke good faith negotiations by written notice to the other, and, upon receipt of such written notice, said negotiations shall commence forthwith. If the dispute has not been resolved by mutual agreement within seven (7) calendar days of the commencement of negotiations, either party may refer the dispute to non-binding mediation as provided below.

Section 8.8.2. Independent Panel Establishment.

The Parties will establish, within one hundred twenty (120) days after executing this Agreement, an Independent Panel of Engineers (the "Independent Panel") to conduct non-binding mediation of any disputes referred for mediation which the Parties have been unable to resolve through good faith negotiation. The Independent Panel shall consist of one member nominated by the City and approved by the Company, one member nominated by the Company and approved by the city, and a third member nominated by the first two members and approved by both the City and the Company. The Independent Panel shall consist of engineers or other persons with expertise and experience in design, build and operate projects for private, public or municipal water treatment plants, or other similar type facilities, similar in size and complexity to the Facility.

Section 8.8.3. Non-Binding Mediation.

In the event that any dispute cannot be resolved through negotiation, either party may invoke the services of the Independent Panel to conduct non-binding mediation of the dispute by (a) giving written notice to the other of its intent to invoke non-binding mediation before the Independent Panel, which notice shall include a brief but detailed description of the dispute, including the relief requested, and (b) providing a copy of such notice to the Independent Panel. Within seven (7) days of its receipt of the written notice, the Independent Panel shall designate one member to serve as a mediator in the dispute, and so notify the Parties. The member so designated shall fix a time and place for the non-binding mediation, which date shall not be later than fourteen (14) days from the date of the receipt of such notice, and shall give the parties at least five (5) business days written notice of the initial mediation session. The Independent Panel shall meet with the parties until either (a) the dispute is resolved or (b) the Independent Panel decides that further meetings will not likely result in a resolution by agreement. All costs and expenses incurred by the mediator in the performance of the mediator's duties and responsibilities shall be shared equally between the City and the Company. If the dispute has not been resolved by non-binding mediation within forty-five (45) days of the written notice convening such non-binding mediation, either party may refer the dispute to binding arbitration as provided below.

Section 8.8.4. Binding Arbitration.

All disputes arising out of or relating to this Agreement, which have not been resolved by negotiation or mediation as provided above, shall be decided by binding arbitration conducted in accordance with the Public Works Arbitration Act, R.I. Gen. Laws § 37-16-1, et seq. The demand for arbitration shall be filed in writing with the other party to this Agreement and with the American

Arbitration Association. A demand for arbitration shall be made within a reasonable time after the dispute has arisen, and in no event shall it be made after the date when institution of legal or equitable proceedings would be barred by the applicable statute of limitations. The party filing a notice of demand for arbitration must assert in the demand all disputes then known to that party on which arbitration is permitted to be demanded. The award rendered by the arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

ARTICLE IX
REPRESENTATIONS AND WARRANTIES

Section 9.1. Representations of the City.

The City represents and warrants to the Company as follows:

Section 9.1.1. Due Authorization and Binding Obligation.

This Agreement has been duly authorized, executed and delivered by all necessary action of the City and constitutes a legal, valid and binding obligation of the City, enforceable against the City in accordance with its terms, except as the same may be limited by bankruptcy, insolvency or other similar laws affecting creditors' rights from time to time in effect.

Section 9.1.2. No Conflict.

Neither the execution nor delivery by the City of this Agreement, nor the performance by the City of its obligations in connection with the transactions contemplated hereby or the fulfillment by the City of the terms or conditions hereof (1) conflicts with, violates or results in the breach of any constitution, law or governmental regulation applicable to the City, or (2) conflicts with, violates or results in the breach of any term or condition of any order, judgment or decree, or any contract, agreement or instrument, to which the City is a party or by which the City or any of its properties or assets are bound, or constitutes a default under any of the foregoing.

Section 9.1.3. No Approvals Required.

Except for City Council authorization of financing and the RIPUC/RIDPU approval of financing arrangements and water rates to pay for the City operational and capital costs, no approval, authorization, order or consent of, or declaration, registration or filing with, any Governmental Body or referendum of voters is required for the valid execution and delivery by the City of this Agreement or the performance by the City of its payment or other obligations hereunder except as the same have been disclosed to the Company and have been duly obtained or made.

Section 9.1.4. No Litigation.

There is no action, lawsuit or proceeding, at law or in equity, before or by any court or Governmental Body, or proceeding for referendum or other voter initiative, pending or, to the best of the City's knowledge, threatened against the City, which is likely to result in an unfavorable decision, ruling or finding which would materially and adversely affect the execution and delivery of this Agreement or the validity, legality or enforceability of this Agreement, or any other

agreement or instrument entered into by the City in connection with the transactions contemplated hereby, or which would materially and adversely affect the ability of the City to perform its obligations hereunder or under any such other agreement or instrument.

Section 9.1.5. No Implied Representations or Warranties.

Except as expressly set forth in this Agreement, the City shall not be deemed to have made and has not made (1) any representations or warranties, either express or implied, irrespective of any reviews or other action by the City, or its representatives, with respect to the Site, (2) any representations or warranties as to compliance with, design, operation, fitness for use, condition or capacity, actual or design, of the Existing Facility or the New Facility or any component thereof, or (3) any representations or warranties as to the suitability of the Existing Facility or the New Facility for the purpose specified in this Agreement or for any other purpose specified in this Agreement or otherwise.

Section 9.2 Representations and Warranties of the Company.

The Company represents and warrants to the City as follows:

Section 9.2.1. Existence and Powers.

The Company is a corporation duly organized, validly existing and in good standing under the laws of the State of Delaware and has the authority to do business in the State of Rhode Island, with the full legal right, power and authority to enter into and perform its obligations under this Agreement.

Section 9.2.2. Due Authorization and Binding Obligation.

This Agreement has been duly authorized, executed and delivered by all necessary corporate action of the Company and constitutes a legal, valid and binding obligation of the Company, enforceable against the Company in accordance with its terms, except to the extent that its enforceability may be limited by bankruptcy, insolvency or other similar laws affecting creditors' rights from time to time in effect.

Section 9.2.3. No Conflict.

Neither the execution nor delivery by the Company of this Agreement nor the performance by the Company of its obligations in connection with the transactions contemplated hereby or the fulfillment by the Company of the terms or conditions hereof (1) conflicts with, violates or results in a breach of any constitution, law or governmental regulation applicable to the Company or (2) conflicts with, violates or results in a breach of any order, judgment or decree, or any contract, agreement or instrument to which the Company is a party or by which the Company or any of its properties or assets are bound, or constitutes a default under any of the foregoing.

Section 9.2.4. No Approvals Required.

No approval, authorization, order or consent, or declaration, registration or filing with any governmental authority is required for the valid execution and delivery of this Agreement by the

company or the performance of its payment or other obligations hereunder except as the same have been disclosed to the City and have been duly obtained or made.

Section 9.2.5. No Litigation.

There is no action, lawsuit or proceeding, a law or in equity, before or by any court or Governmental Body pending or, to the best of the Company's knowledge, threatened against the Company, which is likely to result in an unfavorable decision, ruling or finding which would materially and adversely affect the execution and delivery of this Agreement or the validity, legality or enforceability of this Agreement, or any other agreement or instrument entered into by the Company in connection with the transactions contemplated hereby, or which would materially and adversely affect the ability of the Company to perform its obligations hereunder or under any such other agreement or instrument.

Section 9.2.6. Practicability of Performance.

The Company assumes and shall have exclusive responsibility for the design and the technology to be employed in the Capital Improvements and maintenance and operation of the Existing Facility and the New Facility, and for their efficacy. The Company (1) assumes the risk of the practicability and possibility of performance of the Existing Facility or the New Facility in accordance with its obligations required hereunder, (2) assumes the risk of treating water through the operation of the Existing Facility and the New Facility which meets all of the requirements hereof even though such performance and supply may involve technological or market breakthroughs or overcoming facts, events or circumstances which may be different from those assumed by the Company in entering into this Agreement, and (3) agrees that sufficient consideration for the assumption of such risks and duties is included in the Fixed Construction Price and the Service Fee. The Company's warranties in this paragraph shall apply notwithstanding the occurrence of any Uncontrollable Circumstance other than those specifically enumerated in item (a)(l) and (a)(7) of the definition thereof.

Section 9.2.7. Adequacy of Price and Schedule.

The Company has reviewed carefully the Capital Improvements described in Schedule 12 hereto and all other documents forming part of this Agreement, as existing on the Agreement Date. Subject to the terms of this Agreement, the Company agrees that it can perform the Capital Improvements for the Fixed Construction Price, can achieve Acceptance on or before the Acceptance Deadline, and can perform the operations maintenance and management of the Existing Facility and the New Facility for the Service Fee set forth in Schedule 11 hereto.

Section 9.2.8. Information Supplied by the Company.

The information in this Agreement supplied by the Company is correct and complete in all material respects.

Section 9.3 Representations and Warranties Against Patent Infringement.

Section 9.3.1. Patents and Licenses.

The Company warrants that it owns, or is authorized to use under patent rights, licenses, franchises, trademarks, copyrights, or otherwise, the technology necessary for the performance by the Company of this Agreement and the transactions contemplated hereby, without any known material conflict with the rights of others.

Section 9.3.2. Warrant Against Infringement.

The Company warrants that it shall pay all applicable royalties and license fees and shall at its own cost and expense defend, indemnify, save and hold harmless, and pay any and all awards of damages assessed against the City from and against any and all damages, costs, claims, expenses, and liabilities including, without limitation, all fees and costs, on account of infringements of patents, copyrighted or uncopyrighted works, secret processes, trade secrets, patented or unpatented inventions, articles or appliances, or claims thereof pertaining to the Existing Facility or the New Facility, or any part or operation thereof, combinations thereof, processes therein or the use of any tools or implements used by the Company, or its Subcontractors; provided, however, that the City (1) promptly upon receipt forwards to the Company any communication charging infringement; (2) promptly forwards to the Company all process, pleadings, and other papers served in any action charging infringement; and (3) gives the Company the opportunity to defend any such action which defense shall be at the Company's sole cost and expense.

Section 9.3.3. Preliminary Injunction.

If in any suit or proceeding, a temporary restraining order or preliminary injunction with respect to the Project is requested by any third party, the Company shall immediately retain counsel and shall use its best efforts, by giving a satisfactory bond or otherwise, to avoid the issuance of or alternatively to secure the release of the order or injunction.

Section 9.3.4. Permanent Injunction.

If in any suit or proceeding the Existing Facility or the New Facility, or any part or combination thereof or process therein, is held to constitute an infringement and its use is permanently enjoined, the Company shall at once use its best efforts to secure for the City and the Company a license, at the Company's expense, including payment of any fee or royalty related thereto, authorizing the continued use of the Existing Facility or the New Facility, part thereof, or combination therein.

Section 9.3.5. Replacement.

If the Company is unable to secure such license within a reasonable time as determined by the City, the Company shall, at its own expense, and without impairing any Performance Requirements for the construction or operation of the New Facility, cause the infringing portion of the New Facility to be replaced with non-infringing components or parts or modify the same so that they become non-infringing.

Section 9.4 Survival of Representations and Warranties.

Notwithstanding any other provision of this Agreement, the representations, warranties and covenants in this Article IX are intended to and shall survive termination of this Agreement.

ARTICLE X
TERM

Section 10.1 Term of Agreement.

Section 10.1.1. Effective Date and Termination Rights.

This Agreement shall become effective on the Agreement Date and shall continue in effect for twenty (20) years following the Interim Operations Period (the "Initial Term") unless (1) if renewed at the option of the City as provided in Section 10.2 hereof, this Agreement shall remain effective until the last day of any applicable renewal term (the "Renewal Term"; the Initial Term and any Renewal Term being referred to herein collectively as the "Term" or the "Contract Term"), or (2) if earlier terminated pursuant to the termination provisions of Article IV or Article VIII hereof, in which event the Term shall be deemed to have ended as of the date of such termination. Notwithstanding anything contained herein to the contrary, the Parties agree that adjustments to the Term (including any Renewal Term) hereunder shall be made if necessary to comply with the limitation contained in Rev. Proc. 2017-13 that the term of this Agreement, including all renewal options, may not exceed the lesser of thirty (30) years or 80% of the reasonably expected useful life of the financed property (the Existing Facility or the New Facility).

Section 10.1.2. Survival of Certain Provisions.

All representations and warranties of the parties contained in this Agreement are intended to and shall survive the termination of this Agreement, and no termination of this Agreement shall limit or otherwise affect the respective rights and obligations of the parties hereto accrued prior to the date of such termination.

Section 10.2 Renewal.

The City shall have the option to renew this Agreement for two (2) additional periods, the first of which shall be five (5) years, the second of which shall be the lesser of five (5) years or the maximum total Term permitted under the Private Activity Limitations. If the City determines that it wishes to renew this Agreement pursuant to this Section, the City shall give the Company written notice of the City's irrevocable election to renew this Agreement on or before one hundred eighty (180) days preceding the last day of the Initial Term hereof or the then effective Renewal Term hereof. If the City so elects to renew this Agreement, such renewal shall be on the same terms and conditions as are applicable during the Initial Term hereof. However, the Company may terminate this Agreement at the expiration of the Initial Term only if, following request by the Company, the City does not permit a reconsideration and adjustment of the amount of the Service Fee, based upon documented evidence, over a minimum of the previous three (3) years of the Initial Term, presented by the Company in support of such request for reconsideration.

Section 10.3 Review at Expiration of Agreement.

During the first three (3) months of the final Contract Year, the Company and the City shall mutually select an independent, technically qualified firm (the "Auditor") to perform an audit of the New Facility to determine the condition of the New Facility. The cost of the services provided by the Auditor shall be divided equally between the Company and the City.

The Auditor will conduct a detailed and comprehensive survey and inspection of the New Facility, including but not limited to all Equipment, buildings, structures, pavements, grounds, utility lines, spare parts inventories, operation and maintenance records, to identify the physical and operational conditions and general status of repair of the New Facility. The Auditor will prepare a detailed report documenting the findings of the survey and inspection during the first six (6) months of the final Contract Year (the "Auditor's Report"). The Auditor's Report will include, but not be limited to, the following: an assessment of the current condition of each item or component, its estimated remaining service life, and whether its current condition is consistent with the maintenance and general upkeep requirements of this Agreement and expected normal wear and tear. An estimated cost, including a reasonable contingency allowance which will vary depending on the nature of the work required, for repair, renewal or replacement, as appropriate, will be included in the Auditor's Report for each item or component that is judged to be deficient by the Auditor.

The Auditor will provide a draft of the Auditor's Report to the City and the Company for their respective review and comments. In the case of any disagreement between the City and the Company as to the appraised condition of items or portions of the New Facility, or the estimated cost for repair, renewal or replacement, the Auditor's determination will be final and binding upon both parties.

ARTICLE XI
MISCELLANEOUS

Section 11.1 Limited Recourse to City.

Section 11.1.1. No Recourse to General Fund.

No recourse shall be had to the general fund or general credit of the City for the payment of any amount due the Company hereunder, whether on account of the Construction Price, the Service Fee, any Indemnity payment, or for any Loss-and-Expense or payment or claim of any nature arising from the performance or non-performance of the City's obligations hereunder. The sole recourse of the Company for all such amounts shall be to the funds held in the City's Enterprise Fund to the benefit of the drinking water treatment plant and related facilities. All amounts held in the Enterprise Fund shall be held for the uses permitted thereby, and no such amounts shall constitute property of the Company.

Section 11.1.2. Enforcement of Collections.

The City will use reasonable efforts to enforce its right to receive the System Revenues and will use reasonable efforts to enforce and collect the fees, rates and charges as contemplated in this

Section. The City shall, so long as this Agreement is in full force and effect, take such lawful action necessary or required, as determined in its sole discretion, to continue to entitle the City to receive the System Revenues in an amount sufficient to satisfy its payment obligations hereunder.

Section 11.2 Company Business Activities and Guarantor Credit Standing.

Section 11.2.1. Company Business.

The Company agrees that its business will be limited to that contemplated by this Agreement and it will not engage in activities or incur liabilities other than in connection with the Company's performance of this Agreement and the transactions contemplated hereby.

Section 11.2.2. Guaranty Agreements.

During the Contract Term, the Company shall cause to be provided and maintained the Guaranty Agreements, substantially in the form attached hereto as Exhibit B. The parties acknowledge that the Initial Guarantor and the Successor Guarantor have negotiated the explicit terms under which the Successor Guarantor shall be obligated to issue the Successor Guaranty Certificate of Effectiveness in accordance with this Agreement and the Guaranty Agreements. Accordingly, and without limiting the obligations of the Company or the Guarantors, the Company shall indemnify, defend and hold harmless the City Indemnitees in the manner provided in Section 7.4.1 of this Agreement (Indemnification by the Company), and the Guarantors shall indemnify, defend and hold harmless the City Indemnitees in the manner provided in the Guaranty Agreements, from and against any and all Loss-and-Expense arising out of or related to any disputes between the Initial Guarantor and the Successor Guarantor as to whether and when the Successor Guaranty Certificate of Effectiveness is to be issued by the Successor Guarantor, and as to which the Guaranty Agreements is effective.

Section 11.2.3. Material Decline in Guarantor's Credit Standing.

For purposes of this Section, a "Material Decline in Guarantor's Credit Standing" shall be deemed to have occurred if (1) the Guarantor's long-term senior debt outstanding is rated by either Rating Service at or below investment grade level, or (2) in the event that the Guarantor does not have long-term senior debt outstanding or such debt is not rated by either Rating Service, net worth of the Guarantor declines below $100,000,000. The Company immediately shall notify the City of any Material Decline in the Guarantor's Credit Standing.

Section 11.2.4. Credit Enhancement.

If, at any time, a Material Decline in Guarantor's Credit Standing occurs, the Company shall cause to be provided credit enhancement of its obligations hereunder within thirty (30) days after such occurrence. Such credit enhancement shall be in the form either of (1) an unconditional guaranty of all of the Company's obligations hereunder provided by a corporation or financial institution whose long-term senior debt is or would be rated investment grade by either Rating Service (the "Credit Enhancement Guaranty"), or (2) a letter of credit securing the Company's obligations hereunder in the face amount of Five Million Dollars ($5,000,000), provided by a financial institution whose long-term senior debt is or would be rated investment grade by either

Rating Service (the "Credit Enhancement Letter of Credit"). Such Credit Enhancement Letter of Credit shall be maintained until the Guarantor's credit standing has been restored. Should the Company fail to provide such credit enhancement, the Company shall pay to the City a daily delay non-compliance assessment in the amount of $500 each day, commencing on the date that is thirty (30) days from the date of occurrence of such Material Decline in Guarantor's Credit Standing until the date that such credit enhancement is provided or the date upon which Guarantor's credit standing has been restored, whichever is earlier.

Section 11.2.5. Annual Financial Reports.

The Company shall furnish the City, within one hundred and twenty (120) days after the end of each Guarantor's fiscal year, consolidated balance sheets and income statements for the Guarantor (which shall include the respective statements of the Company) attached to the Guarantor's audited year-end financial statements reported upon by the independent public accountant. The Company shall also furnish the City with copies of the quarterly and annual reports and other filings of the Guarantor filed with the Securities and Exchange Commission if applicable.

Section 11.3 Financial Security for the Performance of the Company's Obligations.

Section 11.3.1. Construction Payment and Performance Bond; Labor and Materials Bond.

Simultaneously with the execution of this Agreement, the Company shall cause to be provided to the City the Construction Payment and Performance Bond and the Labor and Materials Bond as security for the performance of all of its Pre-Construction Period and Construction Period obligations hereunder. The Construction Payment and Performance Bond and the Labor and Materials Bond shall be issued by a surety (1) having ratings no lower than the second highest long-term and short term rating by Moody's and Standard and Poor's; (2) listed in the United States Treasury Department's Circular 570 "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsurance Companies"; and (3) holding a certificate of authority to transact surety business in the State issued by the Director of the Department of Insurance. The Construction Payment and Performance Bond and the Labor and Materials Bond, which shall remain open until Final Completion, shall be issued in substantially the forms specified in Exhibit D and, in any event, shall satisfy the requirements of R.I. Gen. Laws § 37-13-14. The Construction Payment and Performance Bond and the Labor and Materials Bond shall provide that the City will be given not less than thirty (30) days written notice prior to any termination, lapse or non-renewal of the Construction Payment and Performance Bond or the Labor and Materials Bond.

Section 11.3.2. Operations Bond.

The Company shall cause to be provided to the City an Operations Bond issued by a surety reasonably acceptable to the City as security for performance of its operations and maintenance obligations hereunder during the Operation Period (the "Operations Bond"). The Operations Bond shall be in the amount of the Annual Service Fee plus pass-through costs at the time it is issued, shall be for a term of one (1) year, shall be continuously renewed, extended or replaced throughout the term of the Operations Period, or for as long as required by the City, and shall be issued in substantially the form specified in Exhibit D. Failure to renew the annual performance bond or

provide alternate security acceptable to the City shall be an event of default by the Company and constitute cause for termination under the provisions of this Agreement. However, neither the non-renewal of the Operations Bond by the surety nor the failure of the Company to provide a replacement Operations Bond shall constitute a loss to the City recoverable under the Operations Bond or any renewal thereof. The Operations Bond shall provide that the City will be given not less than thirty (30) days written notice prior to any termination, lapse or non-renewal of the Operations Bond.

Section 11.3.3. Operation Period Letter of Credit.

Upon the occurrence of one or more of the following conditions:

(1) Any Event of Default specified in Section 8.2;

(2) The failure or refusal promptly to cure any Event of Default specified in Section 8.2.1; or

(3) Continued and repeated material events of non-compliance with the Performance Requirements of Schedule 1 hereto; the Company shall provide a letter of credit in the stated amount of 150% of the then-established annual Service Fee, including pass through costs, and shall be annually adjusted thereafter by the annual Inflation Index as determined in Section 3.11.3(5). Such letter of credit shall be issued by a bank whose long-term debt is rated "A" or better by either Rating Service (the "Operation Period Letter of Credit"). The Operation Period Letter of Credit shall be for a term of one (1) year, shall be continuously renewed, extended or replaced so that it remains in effect for the entire Term of this Agreement, or such shorter period of time as determined by the City, in its sole discretion, and shall be issued in form and substance acceptable to the City. The City shall be authorized under the Operation Period Letter of Credit to make one or more sight drawings thereon upon certification to the issuing bank of the Company's failure to pay any amounts due and owing under this Agreement when and as due as the result of an Event of Default by the Company. The Operation Period Letter of Credit shall permit a drawing thereon in the full stated amount thereof in the event that any required renewal, extension or replacement thereof is not made prior to thirty (30) days of its expiration. Such Operation Period Letter of Credit shall serve as a security for the performance of the Company's obligations hereunder, and the stated amount thereof shall in no way limit the amount of damages to which the City may be entitled for any Company Event of Default.

Section 11.4 Relationship of the Parties.

The Company is an independent contractor of the City and the relationship between the parties shall be limited to the performance of this Agreement in accordance with its terms. Neither party shall have any responsibility with respect to the services to be provided or contractual benefits assumed by the other party. Nothing in this Agreement shall be deemed to constitute either party a partner, agent or legal representative of the other party. Except as otherwise provided herein, no liability or benefits, such as workers' compensation, pension rights or liabilities, or other provisions or liabilities arising out of or related to a contract for hire or employer/employee relationship shall arise or accrue to any party's agent or employee as a result of this Agreement or the performance.

Section 11.5 Property Rights.

The Company shall pay all royalties and license fees relating to the design, construction, start-up, and testing of the Capital Improvements, and to the operation and maintenance of the Existing Facility and the New Facility. The Company shall indemnify and hold harmless the City, and any of the City Indemnities from and against all Loss and Expense, and shall defend the City Indemnities in any suit, including appeals, arising out of or related to infringement of such patent, trademark or copyright relating to, or for the unauthorized use of trade secrets by reason of the design, construction, start-up, and testing of the Capital Improvements, and to the operation and maintenance of the Existing Facility and New Facility, or at its option, shall acquire the rights of use under infringed patents, or modify or replace infringing equipment with equipment equivalent in quality, performance, useful life and technical characteristics and development so that such equipment does not so infringe. The Company shall not, however, be required to reimburse or indemnify any person for any losses and expenses due to the negligent or willful conduct of such person. The provisions of the Section shall survive termination of this Agreement.

Section 11.6 Interest on Overdue Obligations.

Except as otherwise provided herein, all amounts due hereunder, whether as damages, credits, revenue, charges or reimbursements, that are not paid when due shall bear interest at the rate of interest which is the lower of (1) the maximum rate permitted by the law of the State or (2) 6% per annum above the then-applicable London Interbank Offered Rate ("LIBOR") on the amount outstanding from time to time, on the basis of a 365-day year, counting the actual number of days elapsed, and such interest accrued at any time, to the extent permitted by law, shall be deemed added to the amount due as accrued.

Section 11.7 No Discrimination.

During the performance of this Agreement, the Company agrees that it will comply with all applicable anti-discrimination statutes, ordinances and regulations, and will take affirmative action or have affirmative action programs.

Section 11.8 Subcontractors.

Section 11.8.1. Limited Review and Approval.

The City shall have the right, to the extent provided below in this Section, to approve Subcontractors engaged for Construction Work and Operation Services at the Existing Facility and the New Facility, except: (1) Affiliates of the Company, (2) equipment suppliers, (3) Subcontractors the common stock of which is publicly traded on a national exchange or over-the-counter, (4) Governmental Bodies, and (5) Subcontractor(s) required for emergency response, and (6) pre-approved Subcontractors listed in Schedule 7. At least 10 days prior to subcontracting with any Subcontractor not on the pre-approved Subcontractor list, the Company shall furnish the City written notice of its intention to engage such Subcontractors, together with all information requested by or otherwise available to the Company pertaining to the proposed Subcontractor and subcontract pertaining to the demonstrated responsibility of the proposed Subcontractor in the following areas: (a) any conflicts of interest, (b) any record of felony criminal convictions or pending felony

criminal investigations, (c) any final judicial or administrative finding or adjudication of illegal employment discrimination, (d) any unpaid State, City or local taxes, and (e) any final judicial or administrative findings or adjudication of non-performance in contracts with the City. In the event the City fails to respond to any such notice of intention within ten (10) days of receipt thereof, the City shall be deemed to have approved the proposed Subcontractor. The approval or withholding thereof by the City of any proposed Subcontractor shall not create any liability of the City to the Company, to third parties or otherwise. In no event shall any Subcontract be awarded to any person debarred, suspended or disqualified from working in the State. In the event of an emergency, the City may waive the requirements of this Section 11.8.1.

Section 11.8.2. Indemnity for Subcontractor Claims.

No Subcontractor shall have any right against the City for labor, services, materials or equipment furnished for the Construction Work or the Operation Services. The Company acknowledges that its indemnity obligations under Section 7.4 hereof shall extend to all claims for payment or damages by any Subcontractor who furnishes or claims to have furnished any labor, services, materials or equipment in connection with the Construction Work or the Operation Services.

Section 11.9 Actions of the City in its Governmental Capacity.

Section 11.9.1. Rights as Government Not Limited.

Nothing in this Agreement shall be interpreted as limiting the rights and obligations of the City in its governmental or regulatory capacity, or as limiting the right of the Company to bring any action against the City, not based on this Agreement, arising out of any act or omission of the City in its governmental or regulatory capacity.

Section 11.9.2. No City Obligation to Issue Legal Entitlements.

Notwithstanding any other provision of this Agreement, the City shall not be obligated in any manner to issue or approve any Legal Entitlement required with respect to the Existing Facility or the New Facility, nor shall the City be deemed to be in breach or default hereunder as a result of any delay or failure in the issuance or approval of any such Legal Entitlement. The City retains all issuance and approval rights the City has have under Applicable Law with respect to such Legal Entitlements, and none of such rights shall be deemed to be waived, modified or amended as a consequence of the execution of this Agreement.

Section 11.10 Assignment.

Section 11.10.1. By the Company.

The Company shall not assign, transfer, convey, lease, encumber or otherwise dispose of this Agreement, its right to execute the same, or its right, title or interest in all or any part of this Agreement whatsoever whether equitably or legally, by power of attorney or otherwise to another entity without the prior written consent of the City, in the City's sole discretion. Any such approval given in one instance shall not relieve the Company of its obligation to obtain the prior written

approval of the City to any further assignment. Any such assignment shall require the assignee of the Company to assume the performance of and observe all obligations, representations and warranties of the Company under this Agreement, and no such assignment shall relieve the Guarantor of any of its obligations under the Guaranty, which shall remain in full force and effect during the Contract Term. The approval of any assignment, transfer or conveyance shall not operate to release the Company in any way from any of its obligations under this Agreement unless such approval specifically provides otherwise. The following shall constitute an assignment for purposes hereof: (i) the sale, lease, or other disposal of all or substantially all of the Company's stock or assets to any other person, firm, corporation or association, or (ii) the entry by the Company into any agreement to any such effect. No purported assignment shall be valid absent the City's approval, and any such attempted assignment shall fail, be invalid and void and shall constitute a breach of this Agreement.

Section 11.10.2. By the City.

The City may not assign its rights or obligations under this Agreement without the prior written consent of the Company, except that the City may assign its rights and obligations under this Agreement, without the consent of the Company, to another public or quasi-public entity if such entity is legally capable of discharging the duties and obligations of the City hereunder.

Section 11.11 Amendment.

This Agreement may not be amended, except by a written agreement signed by the parties. This Agreement shall not be amended in such a way as to make any tax-exempt financing of this Agreement taxable.

Section 11.12 No Other Agreements.

All negotiations, proposals and agreements prior to the date of this Agreement are merged herein and superseded hereby, there being no agreements or understandings other than those written or specified herein, unless otherwise provided. This Agreement, including all Schedules attached hereto, constitutes the entire Agreement between the City and the Company with respect to the design, construction, start-up, and Acceptance Testing of the Capital Improvements, and the management, operation and maintenance of the Existing Facility and the New Facility. No obligation or covenant of good faith or fair dealing shall be implied or interpreted as conferring upon either party any right, duty, obligation or benefit other than as expressly set forth herein, notwithstanding the fact that certain terms and conditions hereof may give either party discretion in the manner of performance under this Agreement.

Section 11.13 Notices.

All notices required or permitted hereunder must be in writing and shall be deemed to have been given, delivered or made, as the case may be (notwithstanding lack of actual receipt by the addressee) (i) when delivered by personal delivery, (ii) three (3) business days after having been deposited in the United States mail, certified or registered, return receipt requested, sufficient postage affixed and prepaid, (iii) one (1) business day after having been deposited with an expedited, overnight courier service, or (iv) when delivered by electronic mail, which electronic

mail is followed by delivery by an expedited, overnight courier service, addressed to the party to whom notice is intended to be given at the address set forth below:

(a) If to the City:	City of Woonsocket 169 Main Street Woonsocket, RI 02895 Attn: Director, Department of Public Works Phone: 401-762-6400
With a copy to:	Burns & Levinson LLP One Citizens Plaza, Suite 1100 Providence, RI 02903 Richard M. Coen, Esq. Phone: 401-831-3010 Electronic Mail: rcoen@burnslev.com
(b) If to the Company:	AECOM Technical Services, Inc. 250 Apollo Drive Chelmsford, MA 01824 Attn: Scott Thibault Phone: 978-905-3217 Electronic Mail: scott.thibault@aecom.com
With a copy to:	Suez Water Inc. 461 From Road, Suite 400 Paramus, NJ 07652 Jason O'Brien Phone: 203-270-4313 Electronic Mail: jason.obrien@suez-na.com

Either party may, by like notice, designate further or different addresses to which subsequent notices shall be sent. Any notice hereunder signed on behalf of the notifying party by a duly authorized attorney at law shall be valid and effective to the same extent as if signed on behalf of such party by a duly authorized officer or employee.

Section 11.14 Binding Effect.

This Agreement shall bind and inure to the benefit of and shall be binding upon the City and the Company and any assignee acquiring an interest hereunder consistent with Section 11.10.

Section 11.15 Consent to Jurisdiction.

THE COMPANY IRREVOCABLY (1) AGREES THAT ANY LEGAL PROCEEDING ARISING OUT OF THIS AGREEMENT SHALL BE BROUGHT IN THE STATE OR FEDERAL COURTS IN PROVIDENCE COUNTY, RHODE ISLAND, (2) CONSENTS TO THE

JURISDICTION OF SUCH COURTS IN ANY SUCH SUIT, (3) WAIVES ANY OBJECTION WHICH IT MAY HAVE TO THE LAYING OF THE JURISDICTION OF ANY LEGAL PROCEEDING, AND (4) WAIVES ITS RIGHT TO A TRIAL BY JURY IN ANY LEGAL PROCEEDING IN ANY OF SUCH COURTS.

Section 11.16 Further Assurances.

The City and the Company each agree to execute and deliver such further instruments and to perform any acts that may be necessary or reasonably requested in order to give full effect to this Agreement. The City and the Company each agree, in order to carry out this Agreement, to use all reasonable efforts to provide such information, execute such further instruments and documents and take such actions as may be reasonably requested by the other and not inconsistent with the provisions of this Agreement and not involving the assumption of obligations or liabilities different from or in excess of or in addition to those expressly provided for herein.

Section 11.17 Counterparts.

This Agreement may be executed in any number of original counterparts. All such counterparts shall constitute one and the same document.

Section 11.18 Governing Law.

This Agreement shall be governed by and construed in accordance with the laws of the State of Rhode Island.

Section 11.19 Headings.

The Table of Contents and any heading preceding the text of Articles, Sections and subsections of this Agreement shall be solely for convenience of reference and shall not constitute a part of this Agreement, nor shall they affect its meaning, construction or effect.

Section 11.20 Days.

All references to days herein are references to calendar days, unless otherwise specified in this Agreement.

Section 11.21 Time of Essence.

Time is of the essence of this Agreement. Unless another time is specifically stated herein, the expiration of any period of time prescribed in this Agreement shall occur at 11:59 p.m. of the last day of the period. Should any period of time prescribed herein end on a Saturday, Sunday or legal holiday (recognized in Providence, Rhode Island), the period of time shall automatically be extended to 11:59 p.m. of the next full business day.

Section 11.22 Interpretation.

Whenever the context hereof shall so require, the singular shall include the plural, the male gender shall include the female gender and neuter and vice versa. This Agreement and any related

instruments shall not be construed more strictly against one party than against the other by virtue of the fact that initial drafts were made and prepared by counsel for one of the parties, it being recognized that this Agreement and any related instruments are the product of extensive negotiations between the parties hereto and that both parties hereto have contributed substantially and materially to the final preparation of this Agreement and all related instruments.

Section 11.23 Severability.

In case any one or more of the provisions contained in the Agreement shall for any reason be held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provision hereof, and this Agreement shall be construed as if such invalid, illegal or unenforceable provision had never been contained herein.

[The remainder of this page is intentionally left blank]

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their duly authorized representatives as of the day and year first above written.

WITNESS:

CITY OF WOONSOCKET

By: Lisa Baldelli-Hunt
Name (Print): Lisa Baldelli-Hunt
Its duly authorized MAYOR

[WOONSOCKET WATER SERVICES LLC signature page follows]

WOONSOCKET WATER SERVICES LLC

By: Scott K. Thibault
Name (Print): Scott K. Thibault
Its duly authorized Vice President

EXHIBIT 1-3

FINAL
REPORT

Infrastructure Rehabilitation Plan

City of Woonsocket, Rhode Island

City of Woonsocket, RI

July 2018

CDM Smith

CDM Smith
260 West Exchange Street, Suite 300
Providence, Rhode Island 02903
tel: 401 751-5360
fax: 401 274-2173

July 30, 2018

Mr. Marc Viggiani, Superintendent
Woonsocket Water Division
P.O. Box B
Woonsocket, RI 02895-4379

Subject: Woonsocket Water Division-Final Infrastructure Rehabilitation Plan

Dear Mr. Viggiani:

CDM Smith has prepared the City's Final Infrastructure Rehabilitation Plan (IRP) and attached two copies and one CD for your files. We have also submitted copies to the Rhode Island Department of Health, Woonsocket Department of Public Works and Engineering Department as you requested.

As you know, we completed the draft of the IRP while concurrently working on the 2018 Water Model Update, Calibration and ISO Fire Flow Evaluation. The technical memorandum for this evaluation was completed on February 28, 2018 and CDM Smith has included a copy of the technical memorandum in Appendix L of the IRP.

CDM Smith appreciates the opportunity to work on this important project with the Woonsocket Water Division. Should you have any immediate questions, please call me at (508) 505-1056.

Very truly yours,

Charles Adelsberger, P.E., BCEE
Associate
CDM Smith Inc.

cc: Steve D'Agostino, Director (Woonsocket Department of Public Works)
Jon R. Pratt, P.E., City Engineer (Woonsocket Engineering Department)
Anthony M. Sylvia, P.E. (Rhode Island Department of Health, Drinking Water Section)
Bob Otoski, Doug Martin, Lauren Kershaw (CDM Smith)

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Section 1
Introduction

1.1 Purpose of Plan

The Rhode Island Department of Health (RIDOH) requires that every Rhode Island water supplier develop a long-term management strategy of infrastructure rehabilitation for its water supply system. Clean Water Infrastructure Plans must be submitted to RIDOH addressing all water supply system components. The City of Woonsocket, Rhode Island (City) contracted CDM Smith to prepare an Infrastructure Rehabilitation Plan (IRP) for its water supply system. The City previously submitted IRPs to RIDOH in 1999 and in 2007 as part of their comprehensive 2007 Water Distribution System Evaluation. CDM Smith has combined information from these past studies along with information on recent improvements to the City's water supply system while preparing this updated IRP.

CDM Smith has completed the 2017 IRP, and presents it to the City with confidence that it will serve as an important infrastructure rehabilitation management planning tool. By employing this tool, the City can effectively continue rehabilitation of its water supply and distribution system and continue to properly serve its customers over the next 20 years.

1.2 Goals of Plan

The City is committed to providing a safe, reliable, and adequate water supply to its residents. RIDOH's Rules and Regulations for Clean Water Infrastructure Plans require plans be submitted, which address all components of the water supply system. The overall goal of the plan is to provide a justified facility replacement program with a prioritized infrastructure replacement plan to prevent the erosion of the City's drinking water infrastructure.

1.3 Recent Developments and Improvements Since 2007 IRP

The main component in the City's system is the Charles Hamman Water Treatment Plant (WTP), which was built in 1962 and is located on Manville Road, on the bank of the Blackstone River in Woonsocket, Rhode Island. The WTP provides conventional treatment and was last upgraded in 1989. The City is currently replacing the existing WTP due to its age and as required by the Rhode Island Department of Environmental Management (RIDEM) in the Modified Consent Agreement dated June 19, 2012 (See **Appendix A**).

Since signing the Modified Consent Agreement, the City has proactively performed various system evaluations and studies investigating potential sites for the new water treatment facility. Following this extensive siting assessment process, Woonsocket's City Council selected the site for its new WTP off Jillson Avenue near the intersection of Sharkey Avenue in Woonsocket. In 2012, the City purchased several parcels totaling approximately 19.08 acres and joined them together into one parcel with the intention of utilizing the site to build the new WTP. The property is bound to the west by Jillson Avenue and to the east by Acre Avenue, a paper (City owned but not developed) street identified on the City of Woonsocket Tax Map 30. The City of

Woonsocket also owns the open space/undeveloped land located to the north of the property (Lot 30-3), and north of this land area is the Bernon Heights Elementary School located along Logee Street. Residential properties are located at the southern boundary of the site.

With CDM Smith's assistance, the City corresponded with RIDOH and the United Stated Environmental Protection Agency (USEPA) following the selection of the site to request approval for location of the new WTP and to purchase the land using funding from the Drinking Water State Revolving Fund (DWSRF) program. In a letter dated February 29, 2012, the USEPA concurred with RIDOH's recommendation that the City purchase the site with the purpose of constructing their new WTP. In the letter, USEPA also approved the use of funds from the DWSRF program to purchase all parcels identified by the City.

With the purchase of this land, the City initiated a design-build-operate (DBO) procurement process for the construction of a new WTP on the Jillson Avenue site. Following receipt and review of proposals from three DBO teams, the City executed a DBO contract on July 31, 2017 with the joint venture team including AECOM Technical Services, C.H. Nickerson General Contractors and SUEZ Water Environmental Services, Inc. To fully integrate the team for the life of the contract, AECOM and SUEZ formed Woonsocket Water Services LLC to serve as the DBO contractor for the term of the design-build-operate agreement with the City.

Additional discussion on the existing WTP along with the siting and proposed design and construction of the new treatment facility and all other system components in **Section 2** of this report.

After submitting the 2007 IRP, the City methodically rehabilitated its source water dams, three high service area booster pump stations, painted two storage tanks and installed water mains within the distribution system. With this work completed, the City has focused on scheduling improvements to the existing WTP and as discussed above a new WTP on another site. The remaining components needing improvement are both the transmission and distribution system piping. We have provided a thorough evaluation of the piping system from both a hydraulic and infrastructure assessment perspective.

As for the piping system, CDM Smith with the City, believes that the top priority for the City is to address potential fire protection concerns. To determine these deficiencies and properly address them, we utilized the updated water system hydraulic model created in 2017. The hydraulic model was primarily used to recommend improvements to address fire protection deficiencies.

With this report, CDM Smith has enhanced the City's IRP while presenting and evaluating the current condition of the City's water supply system while also defining necessary improvements. These improvements will rehabilitate the water supply system allowing the City to continue to provide a safe and high-quality water supply to its customers for the next 20 years.

1.4 Plan Contents

The Plan is organized as follows:

- **Section *2*** describes the City's existing water supply in detail.
- **Section 3** identifies various water main improvement alternatives and estimates construction costs for each alternative.
- **Section 4** presents our evaluation of the City's water supply components and describes our findings. We also reviewed data provided by the Water Division, recommend improvements and present an implementation schedule for the City's Rehabilitation Improvement Program (RIP).
- **Section 5** provides a financial analysis for the Authority's Infrastructure Rehabilitation Plan and defines the mandated Infrastructure Rehabilitation Fund.

This plan complies with RIDOH's *Rules and Regulations for Clean Water Infrastructure Plans, October 1994* (Chapter 46-15.6) As Amended January 2002.

Section 2

Existing System Description

2.1 Woonsocket Water Division Organization

The Woonsocket water system is a regulated public utility under Rhode Island General Law 39-1-1 and operates under the jurisdiction of Rhode Island Public Utilities Commission. The Woonsocket water system is owned by the City and is operated by the Water Division. The City Council and City Administration provide oversight and the Director of Public Works provides administrative supervision. **Figure 2-1** shows the Water Division's functional organizational chart.

As shown, the Water Division is managed by the Superintendent, who has overall responsibility for the system and serves as the primary liaison with the Director of Public Works, City Engineer and other city departments, as well as with state regulatory agencies. The distribution Supervisor oversees the distribution system including the operation crews and the meter readers. The Superintendent and the Distribution Supervisor are certified with Class IV treatment and distribution licenses as issued by the Rhode Island Department of Health (RIDOH). The Superintendent also oversees the work of the accounting section, which provides billing and Water Division accounting functions, engineering, water work inspections, oversees laboratory and the distribution system.

2.2 Sources of Supply

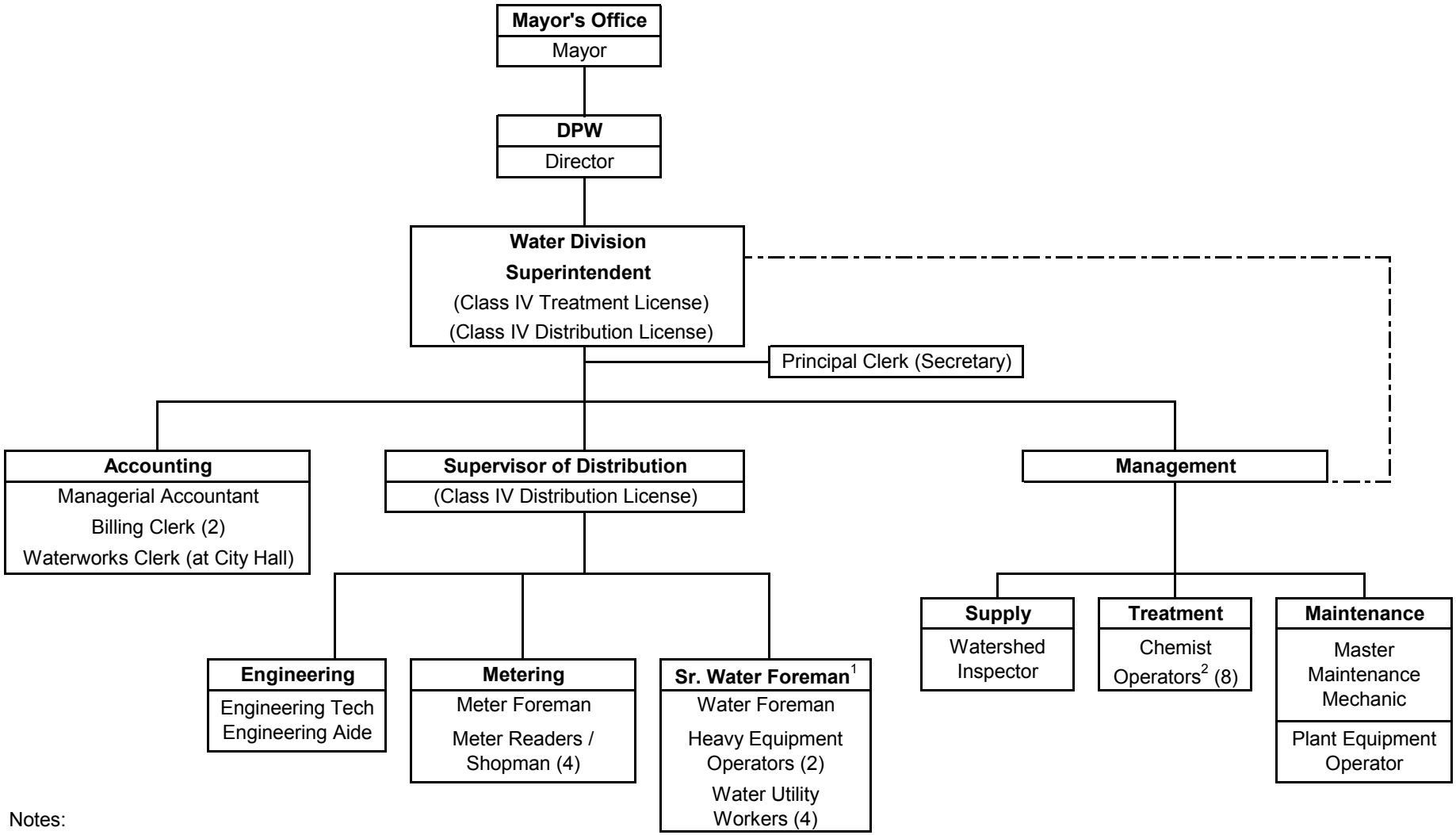
2.2.1 Reservoirs and Raw Water Facilities

The City's water supply system consists of three reservoirs, Reservoir No. 3, Reservoir No. 1, and Harris Pond. **Figures 2-2** and **2-3** display a schematic of the reservoir system and the water distribution system hydraulic profile, respectfully.

2.2.1.1 Reservoir No. 3

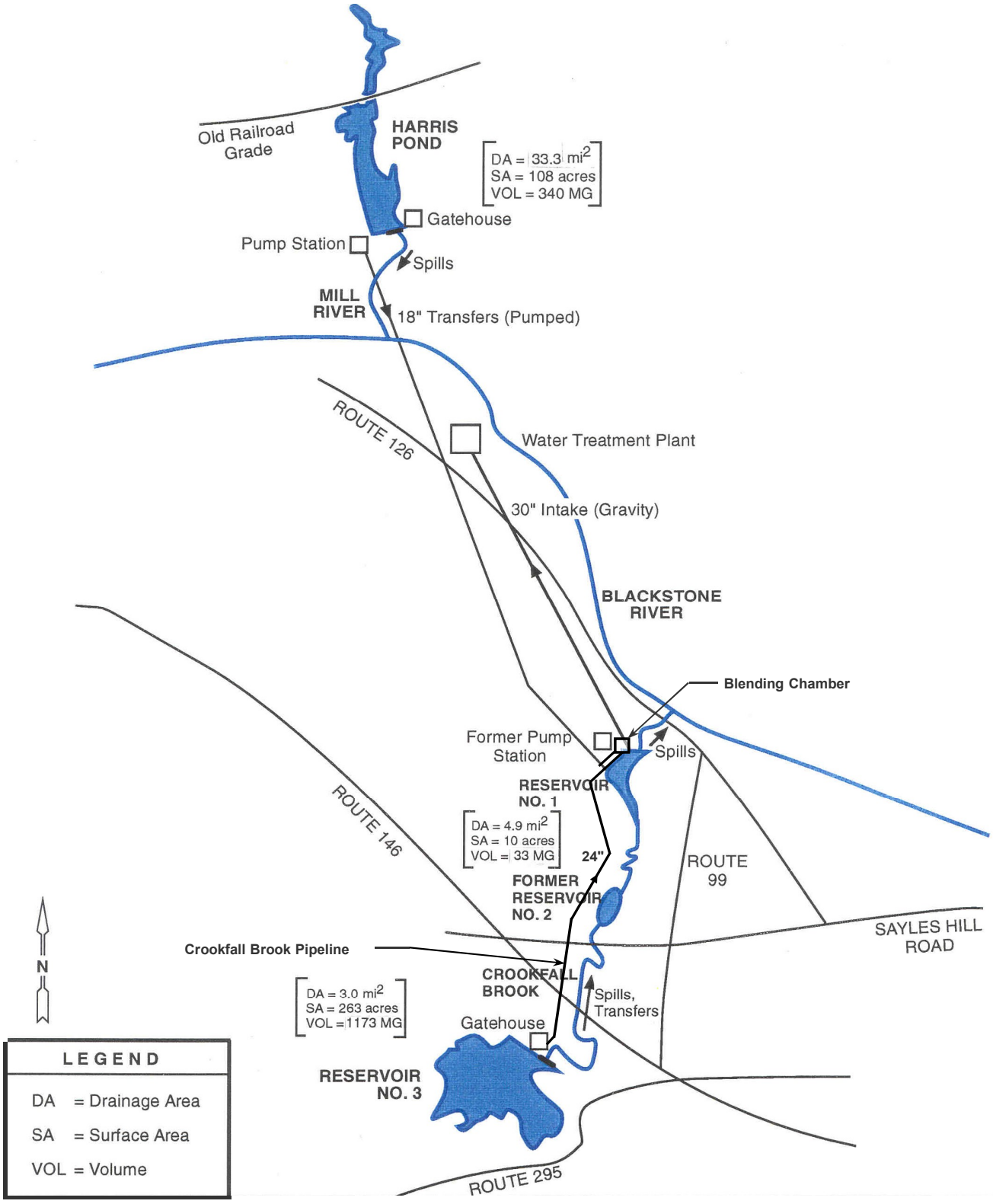
Reservoir No. 3, the largest of the three reservoirs, is located between Smithfield and North Smithfield, Rhode Island, with a total surface area of 263 acres and a total storage volume of 1,173 million gallons at the dam spillway elevation of 337.06 feet. The outflow from this reservoir is controlled through two low-level gated outlets which supply Reservoir No. 1 via Crookfall Brook. Spills from this reservoir also enter Crookfall Brook and reach Reservoir No. 1. This dam has an emergency spillway at elevation 341.0 feet.

In 2014, the City contracted with Pare Corporation to inspect the dam for Reservoir No. 3, which impounds water along Crookfall Brook to form the reservoir. Pare's report, dated August 1, 2014, (**Appendix B**) provides the following description of the dam and its appurtenances.



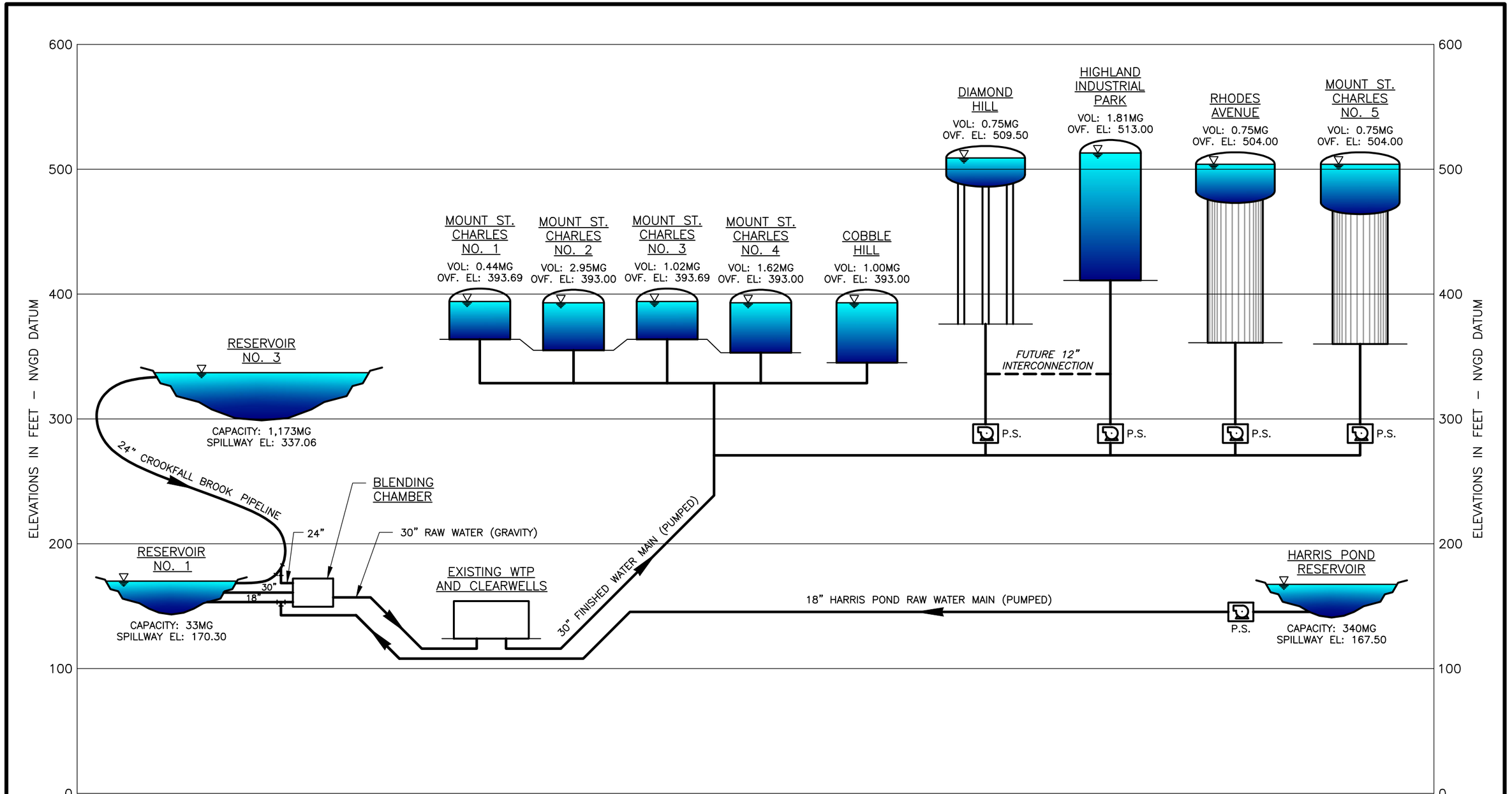
Notes:
1) Located at Incinerator Building (51 Circle Street, Woonsocket, RI)
2) Class III Treatment License

Figure 2-1
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Division Organization



Not to Scale

Figure 2-2
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Supply Sources Schematic



HYDRAULIC PROFILE

NOT TO SCALE

CDM Smith

Figure 2-3
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Hydraulic Profile

The Woonsocket Reservoir No. 3 Dam is an earthen embankment approximately 2,225-ft. long, with a maximum height of approximately 31-ft. (dam crest to channel invert), and an average crest width of 15 ft. Record plans indicate that the dam was constructed with a stone masonry and concrete core wall. The upstream slope of the embankment is 2H to 1V and is protected by riprap. The downstream slope of the dam is 2.75H to 1V and is grassed. The crest of the dam is earthen with grass cover.

The dam crest was raised 5 ft. to El. 345 in 1982, and the embankment slopes were flattened to their current configuration. Also, part of the 1982 project was the addition of an emergency spillway, blanket drain, toe drain, raising the core wall, and longitudinal retaining walls adjacent to the spillway.

The primary spillway is a 30-ft long uncontrolled broad crested weir with a cascaded drop. The spillway is constructed of stone masonry to approximately El. 336 with a concrete overlay to roughly El. 337 ft. The training walls are constructed of cast-in-place concrete extensions from El. 340 to 345 ft. (constructed in 1982) above stone masonry overlaid with 6 inches of shotcrete (sprayed on cementitious material). Discharges from the spillway flow into Crookfall Brook and pass beneath Reservoir Road approximately 200 ft. downstream of the spillway.

The auxiliary spillway is 50 ft. long located to the right of the primary spillway. The auxiliary spillway channel is filled to about 2 feet below the dam crest elevation with what is described as random fill in the 1982 construction drawings. The surface of the fill supports a healthy turf cover. The overflow channel beneath the fill is protected by riprap at El. 341.

The outlet works consists of two 20-inch diameter cast-iron pipes adjacent to the spillway. There are two gate valves on each of these pipes; controls are housed in a brick and cement block frame and timber framed roof gatehouse at the downstream toe of the dam. Under normal operation both outlets feed the Crookfall Brook Pipeline. However, operation of two butterfly valves located downstream of the gatehouse can divert flow from one of the outlets directly to the spillway discharge channel.

During the improvements in 1982, a blanket and toe drain system was installed along the downstream slope. The drainage system consists of a blanket drain laid on the original downstream slope of the dam and an 8-inch perforated pipe toe drain along the existing toe of the slope. The blanket drain consists of one foot of crushed stone wrapped in a geotextile fabric. The blanket drain is tied to 8-inch diameter toe drain by 6-inch diameter transverse sub drains spaced at 10 to 20-foot intervals. Five manholes and clean-outs are located along the toe drain to provide access for inspection and cleaning.

Pare's dam inspection report (attached) provides information on their 2014 assessments and recommendations for improving the dam. In 2015, the City implemented some of the recommended improvements with the design and construction of the Reservoir No. 3 Dam Primary Spillway Repairs project.

2.2.1.2 Reservoir No. 1

Reservoir No. 1 is located about 2.5 miles downstream of Reservoir No. 3, along Crookfall Brook in North Smithfield and Lincoln, Rhode Island. This reservoir has a total surface area of 10.2

acres and a total storage volume of 33.2 million gallons at the dam spillway elevation of 170.30 feet. Water from this reservoir flows through a 30-inch intake, which connects with the 24-inch raw water line at the treatment facility, and a 12-inch drain pipe, which discharges to the Blackstone River. In addition, the 16-inch and 24-inch intakes have been capped and sealed. Spills from this reservoir enter the Blackstone River and are lost from the system.

In 2015, Pare Corporation inspected the dam for Reservoir No. 1 and developed a report of conditions for the dam along the Crookfall Brook in Lincoln and North Smithfield, Rhode Island. Pare performed their inspection of the dam on March 19, 2015 and April 6, 2015 and the report provides the following description of the dam and its appurtenances.

The Woonsocket Reservoir No. 1 Dam is an earthen embankment approximately 900-ft long with a maximum height of 50-ft (dam crest to toe of embankment), and has an average crest width of 15 ft. Record plans indicate that the dam was constructed with a stone masonry and concrete core wall. The upstream slope of the embankment is approximately 2.75H to 1V and is protected by riprap. The downstream slope of the dam is 2.75 H to 1V and is grassed. The crest of the dam is earthen with grass cover.

The dam crest was raised about 3.6 ft. to El. 179.6 in 1982 and the downstream slope was flattened to the current configuration. Raising the crest required construction of a new embankment to the left of the spillway. As part of the 1982 project, a blanket drain, and toe drain was installed on the main (right) embankment.

The spillway is a 45-ft long uncontrolled trapezoidal weir with a cascaded drop. The spillway training walls are constructed of stone masonry to approximately El. 176 with concrete extensions to El. 180. According to design drawings the stone masonry is overlaid with 6 inches of shotcrete (sprayed on cementitious material). Discharges from the spillway flow into Crookfall Brook and pass beneath Manville Road approximately 500 ft. downstream of the spillway and beneath the Providence & Worcester Railroad (P&W) about 700 ft. downstream.

The outlet works consist of a 30-inch diameter water supply intake through the left embankment, leading to the Crookfall Brook Pipeline. The controls for this intake are located at the Crookfall Brook Pipeline Blending Chamber, located approximately 200 ft. downstream of the dam.

There are also three abandoned outlets through the embankments including a 24-inch and a 16-inch intake beneath the left embankment, passing through the abandoned pump station; and a 12-inch low-level outlet through the right embankment. The 12-inch pipe has reportedly been plugged at the upstream end. The outlet/termination locations for each of these pipes are unknown. There is reportedly a tap on the 16-inch diameter line, inside the abandoned pump station, which is used as a piezometer to monitor the reservoir level and there is a butterfly valve near the toe drain outlet on the downstream end.

The drainage system is made up of a blanket drain laid on the original downstream slope of the dam and an 8-inch perforated pipe toe drain from the existing toe of the slope to the new toe of the slope. Based on existing plans, the blanket drain consists of one foot of crushed stone wrapped in a geotextile fabric. The 8-inch perforated pipes join and outlet through a headwall downstream of the toe of the slope.

There is a pressure-relief blow-off structure from the Crookfall Brook Pipeline located on the reservoir edge, upstream of the left abutment. If the pressure in the Crookfall Brook Pipeline were to exceed the design criteria, water from the pipeline would be released into Woonsocket Reservoir No. 1.

Pare's dam inspection report (attached in **Appendix B**) provides information on their 2014 assessments and recommendations for improving the dam. The City has implemented some of the recommended improvements following the dam inspection.

2.2.1.3 Harris Pond

Harris Pond is located in Blackstone, Massachusetts, with its dam just over the state line in Woonsocket, Rhode Island. The pond has a total surface area of 108 acres and a usable storage volume of 340 million gallons at the spillway elevation of 167.5 feet. This source was developed as a supplementary supply for the city following the 1960's drought period. For original approval, the RIDOH required pre-chlorination for this source (RIDOH, 1968). Before using Harris Pond water, the Water Division must notify RIDOH (RIDOH, 1990). Water from this reservoir is controlled by a gatehouse from which a 20-inch pipe transfers flows to the Harris Pond pump station. The 4.5 million gallons per day (mgd) pump station discharges to an 18-inch main, which supplies Reservoir No. 1, where it is aerated, or to the blending chamber. Spills from this reservoir enter the Mill River and are lost from the system.

In 2016, the City retained Pare Corporation to inspect the dam for Harris Pond, which impounds water along Mill River to form the pond. Pare's report, dated February 3, 2016, (**Appendix B**) provides the following description of the dam and its appurtenances.

The present Harris Pond Dam was reconstructed in 1968-69 from the remains of an existing earth embankment, which was breached at its left end in 1955.

The original dam was about 38 feet high and 500 feet long, closing off the valley between a right sloping abutment and a low knoll at the left abutment. The spillway for the original dam was located at a saddle about 200 feet to the left of the left end of the dam. During the 1955 failure, the main dam remained intact, but the spillway and saddle area were breached and eroded for about a 100 foot width to about 25 feet below the then-existing crest level of the dam.

The 1969 reconstruction involved providing an outlet works conduit with a control shaft at approximately the level of the bottom of the breached area, refilling the gap to the same cross section as the main dam and constructing a new spillway at the knoll at the left abutment of the existing embankment. The main dam embankment was raised slightly and the slopes were reshaped. A low dike was constructed along the right abutment, sloping from the level of the right end of the dam to meet existing ground at a lower level about 300 feet to the right.

The profile along the crest of the dam and dike is not horizontal, but ramped each way from the spillway to the dam abutments. The crest of the dam varies from elevation 180.3 to 177.3, and the crest of the dike varies from elevation 177.3 to 172.2, the lowest point being at the right abutment. The minimum freeboard above normal storage for the main dam embankment is 9.8 feet.

The typical reconstructed cross section in the area encompassing the original dam has a 2 ½ horizontal to 1 vertical upstream slope and a 2 to 1 downstream slope. The upstream slope basically consists of a sloping impervious earthfill blanket placed against the pre-existing earth dam, which is covered with a 12-inch layer of bank run gravel and a 6-inch layer of screened gravel. These layers are in turn overlain by an 18-inch-thick layer of rip rap over the entire upstream slope. The downstream slope consists of a pervious earthfill. The crest width is 35 feet and supports a partially paved access road. A stone gutter was incorporated along the toe of the downstream slope. A drain blanket was and a toe drain collector system were installed at the toe of the downstream slope as shown on the contract drawings. The typical dam section in the east abutment breached area is a continuation of the typical embankment section previously described, except that a random pervious fill material was used to fill the breached gap.

A cut-off trench was provided beneath the impervious zone along the toe of the upstream slope of the embankment. This cut-off trench was extended either to bedrock or to a maximum depth of approximately 10 feet for the entire length of the dam. The dike from the right end of the dam apparently had no cut-off. Where the cut-off trench did not contact rock, a considerable thickness of natural granular soil overlies the rock. Seepage from the reservoir would, therefore, be expected to go through this layer. Analytical studies were made in 1968 by the dam engineer and seepage was predicted through this area. A toe drainage system was incorporated to intercept this seepage.

The spillway is located on the knoll between the main embankment to the right and the refilled breach gap to the left. The spillway channel is directed along the downstream face of the knoll, its centerline making an angle of about 69 degrees with the axis of the dam. The spillway has a 150-foot-long ungated ogee crest converging to a 90 foot wide, three-stepped rectangular concrete-lined chute, and then to a trapezoidal riprap-lined stilling pool. The ogee crest is at elevation 167.3; the floor of the riprapped basin is at elevation 132. The total length of the concrete chute is about 250 feet. The spillway was designed for a normal capacity of 8,500 cfs at a surcharge head of about 6 feet, which is 1.3 feet higher than the low point of the dike. The spillway capacity when the dike would start to be overtopped is 5,500 cfs.

The spillway ogee crest structure, chute walls and floor slabs were placed on natural ground, with a gravel blanket and open-jointed vitrified pipe underdrainage system.

Outlet pipes at three selective levels are provided for releasing stored waters from the reservoir. Two 16-inch diameter cast iron inlet pipes, at elevations 160.5 and 153.0, lead into a wet well shaft where inflows are controlled by butterfly valves. A 20-inch diameter pipeline (also referred to as a suction pipe) conveys these flows from the shaft to a pumping station situated to the right of the spillway. A 36-inch diameter low-level outlet pipe at elevation 144.5 leads from the reservoir to empty into a downstream channel, with control regulated by two, 24-inch diameter butterfly valves located in the wet well shaft.

Pare's dam inspection report provides information on their 2016 assessments and recommendations for improving the Harris Pond dam. The Water Division is currently evaluating deficiencies and proposed repairs.

2.2.1.4 Crookfall Brook Pipeline and Raw Water Blending Chamber

In 1991, the City began designing the Crookfall Brook pipeline and the new raw water blending chamber. The project was necessary to provide more flexibility with raw water transport from the City's three reservoirs to the Charles Hamman Water Treatment Plant (WTP).

The City encountered several constructability and regulatory issues during the design and construction of these facilities, mainly the Crookfall Brook pipeline which traverses cross country from Reservoir No. 3 to Reservoir No. 1. The pipe is a 24-inch ductile iron pipe which carries water by gravity between the reservoirs. The pipeline route was changed on several occasions from 1991 to 1997 to meet the regulatory requirements of the Rhode Island Department of Environmental Management (RIDEM) involving wetlands. After addressing all RIDEM's concerns, the Crookfall Brook Pipeline was completed in 1997.

The pipeline was installed to enhance raw water quality that is delivered to the WTP. Reservoir No. 3 has the best water quality in the City's reservoir system but, in the past, the water quality was diminished while being transported through Crookfall Brook to Reservoir No. 1. While flowing through the brook, the raw water's color and turbidity would increase thereby causing increased treatment cost at the WTP. With the new Crookfall Brook pipeline, flow from Reservoir No. 3 is now piped to Reservoir No. 1 or the Blending Chamber and avoids the Crookfall Brook. The Reservoir No. 3 gate house provides flexibility for the City in that raw water can be diverted to either the brook or the pipeline depending on reservoir levels, needed water supply and customer demands.

The blending chamber, located adjacent to Reservoir No. 1, was constructed to enhance and regulate the raw water quality being delivered to the WTP. The City has several options on supplying raw water to the WTP by utilizing the extensive valve arrangement in both the downstream piping from all three reservoirs and within the blending chamber. With the new DBO contract, AECOM is responsible for operating and maintaining the blending chamber but will not make any operational changes without City consent.

With these raw water facilities and valve arrangement, the City can transport water from both Reservoir No. 3 and Harris Pond to Reservoir No. 1. The valves can also be arranged so raw water from any reservoir can be mixed at the Blending Chamber and then transported to the WTP.

As part of the WTP DBO project, Woonsocket Water Services LLC will design and construct raw water transmission main improvements at the blender chamber site and to proposed raw water booster pump station on Manville Road at the existing WTP site. These improvements will provide required raw water transmission redundancy between the existing blending chamber and the proposed raw water pump station. Section 4 will provide more detailed information on the proposed improvements.

2.2.2 Watershed Areas and Supplier-Owned Lands

Through the WTP DBO contract, Woonsocket Water LLC will own and operate the raw water transmission system while the City still maintains ownership of their existing watershed area and the three raw water reservoirs.

2.2.2.1 Reservoir No. 1

The Reservoir No. 1 watershed area is about 4.9 square miles, and is hilly with steep slopes near Mill Brook and Crookfall Brook. This watershed is traversed by major highways, and has commercial development focused along Route 146 and Route 116. The City of Woonsocket owns about 124 acres, or 4 percent, of this watershed.

2.2.2.2 Reservoir No. 3

The Reservoir No. 3 watershed area measures about 3.0 square miles, and is hilly with large areas of wetlands or marsh lands. The watershed is primarily undeveloped but does include some residential and agricultural land use. The City of Woonsocket owns about 636 acres, or 31 percent, of this watershed.

2.2.2.3 Harris Pond

The Harris Pond watershed measures about 33.3 square miles in area, and includes the Mill River. The watershed is within the Massachusetts communities of Blackstone, Mendon, Hopedale, Upton, Bellingham and Milford. The Water Division owns Harris Pond and about 10 acres of the watershed along the shoreline near the intake.

The Water Division plans to purchase additional lands under the Rhode Island Water Resources Board Watershed Protection Bond Program.

2.3 Raw Water Transmission

Downstream of the reservoir system, the City's current raw water transmission piping continues with a 30-inch main, which carries raw water by gravity from the Blending Chamber to the WTP. This transmission main then connects with the 24-inch raw water line at the WTP. The Harris Pond pump station pulls raw water from Harris Pond through an 18-inch transmission main to an aerator in Reservoir No. 1 or to the Blending Chamber through gravity flooded suction at the Harris Street Pump Station. The 18-inch main also connects with the 24-inch raw water line at the WTP.

The Harris Pond station contains booster pumps, which are used only during peak summer demands.

Section 4 will provide information on scheduled improvements to the raw water transmission system which will be implemented by the Woonsocket Water Services LLC.

2.4 Treatment Facilities

2.4.1 Charles Hamman Water Treatment Plant

The Charles Hamman Water Treatment Plant (WTP), built in 1962, is located on Manville Road, on the Blackstone River in Woonsocket, Rhode Island. In 1989, the City made modifications to the sedimentation-filtration units at the WTP and the plant can now treat up to about 13.25 mgd with the ability to expand to about 15 mgd. The WTP has a maximum finished water pumping capacity of 13.5 mgd. The average flow rate was 3.50 mgd over the last five years with a maximum daily flow of 5.30 mgd in 2013. As discussed above, the WTP is supplied by a 24-inch raw water line which connects with the 30-inch gravity transmission main from Reservoir No. 1.

Figure 2-4 shows a schematic of the conventional treatment process, which includes the following in consecutive order:

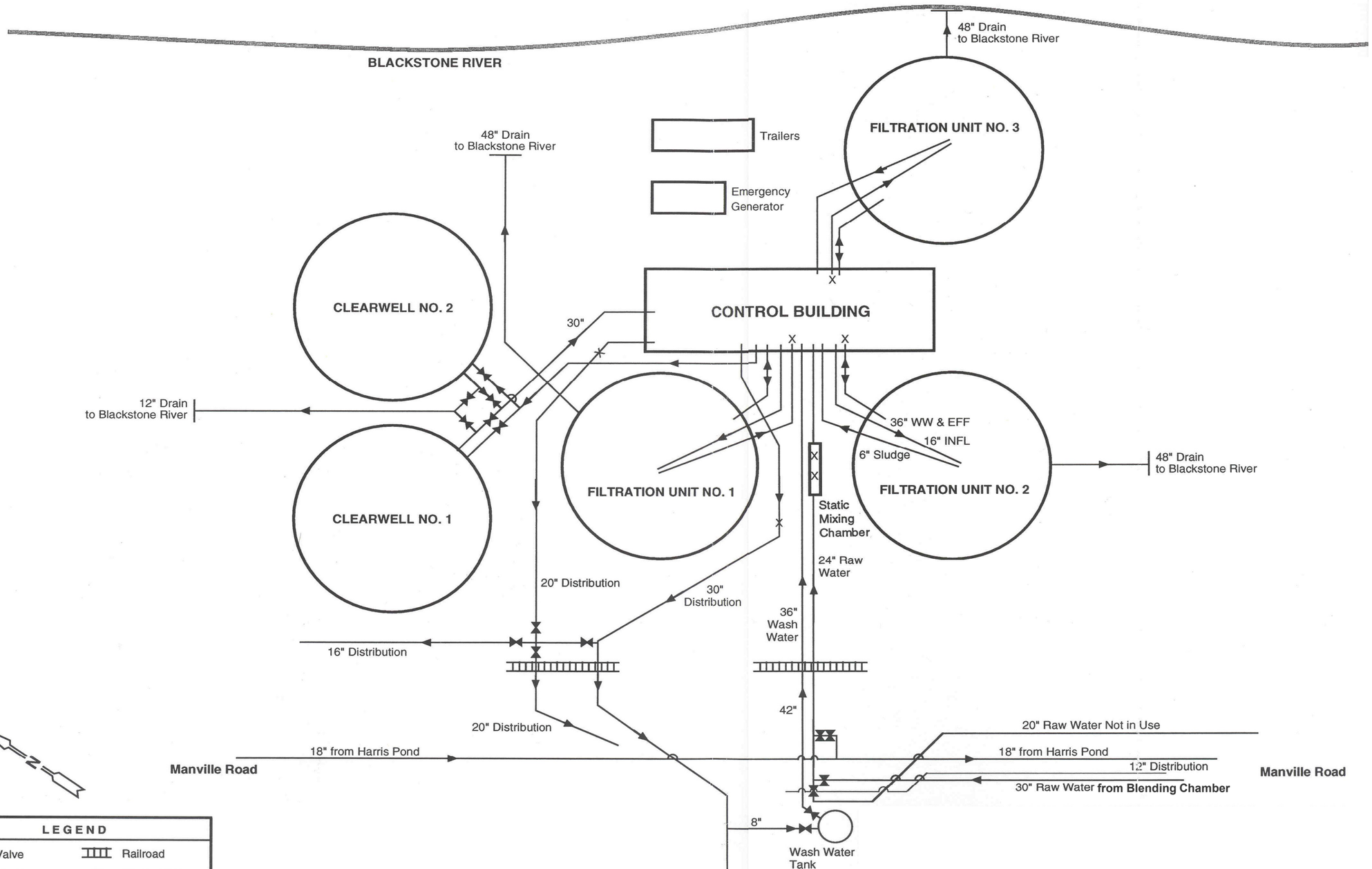
- Pretreatment chemical addition of alum, lime (occasionally), and chlorine (occasionally) with the ability to feed polymer followed by static mixing
- Flocculation, clarification, and filtration
- Addition of post-treatment chemicals including chlorine, fluoride, and corrosion inhibitor
- Storage in two, 0.5 mg clearwells to provide disinfection contact time
- Post-clearwell pH adjustment (using lime)
- Pumping to the distribution system

The WTP discharges sludge to the sanitary sewer. Filter backwash is discharged to the Blackstone River under the City's RIPDES permit with RIDEM. The treatment facility consists of a control/administration building, three above ground sedimentation-filtration units, and two aboveground 0.5 mg clearwells. The treatment facility also includes an off-site aboveground backwash water tank, which is located across Manville Road. Since the 2007 IRP, the City contracted with Underwater Solutions Inc. to inspect the backwash water tank in April 2018 and the inspection report has been included in **Appendix C**.

The WTP contains three centrifugal, finished water pumps, each with a capacity of 3,800 gallons per minute (gpm). The electric, motor-driven pumps can operate in parallel and transport treated water into the low service distribution system. The plant features an auxiliary standby diesel direct-drive pump with a capacity of 5,000 gpm (7.2 mgd) for finished water pumping, and a standby electrical generator to operate treatment processes and support systems.

The WTP also features a laboratory certified by RIDOH for monitoring water quality parameters.

As discussed, the Woonsocket Water Services LLC has initiated the design of a new WTP off Jillson Avenue in Woonsocket as part of their DBO agreement with the City. CDM Smith has provided more information on the replacement of the existing WTP in **Section 4**.



Not to Scale

Figure 2-4
City of Woonsocket, Rhode Island
Water Distribution System
Charles G. Hamman Water
Treatment Facility Schematic

CDM Smith

2.4.2 Harris Pond Pump Station

The Harris Pond Pump Station is located off Privilege Street in Woonsocket, down the slope of the Harris Pond dam. The pump station takes raw water from Harris Pond and sends to either Reservoir No. 1 or the Blending Chamber. The building is a one-story structure approximately 40 feet by 21 feet in plan dimensions with a full basement. The flat roof of the structure consists of a cast-in-place reinforced concrete slab supported by steel beam and concrete masonry unit bearing walls. The subsurface structure consists of reinforced concrete walls and base slabs. Constructed in 1968, this pump station contains two electric-driven horizontal, split-case pumps, each having a capacity of 1,560 gpm (2.25 mgd). When Harris Pond is being used, sodium hypochlorite is applied as the water is pumped through an 18-inch main which carries flows to the Blending Chamber or an aerator discharge in Reservoir No. 1. RIDOH has required the use of sodium hypochlorite at Harris Pond since 1968.

2.5 Distribution System Storage Facilities

There are nine distribution storage facilities in the Woonsocket system, with five servicing the low service area and four servicing the high service areas. **Table 2-1** lists these facilities and some physical characteristics of each storage tank. Since 2007, the City has rehabilitated existing tanks and replaced the Mount Saint Charles high service area elevated storage tank. **Table 2-1** has been revised to include updated information of the storage facilities along with the date of recent tank inspections performed by Underwater Solutions Inc. **Appendix C** includes copies of the recent tank inspection reports.

The Water Division constructed a new 750,000 gallon fluted column, elevated storage tank to replace the existing Mount Saint Charles No. 5 high service area tank in 2006 and the new storage tank has been in operation since 2007.

In 2016, the Woonsocket Water Division also rehabilitated the Mount Saint Charles Tanks 1 and 3 by recoating the interior and exterior surfaces of both tanks.

Table 2-1 Distribution System Storage Tanks

Storage Tank	Type	Total Volume (MG)	Service	Overflow Elevation	Inspection Dates
Cobble Hill	Reservoir	1.00	Low	393.00	June 2018
Mount St. Charles 1	Reservoir	0.44	Low	393.69	June 2018
Mount St. Charles 2	Reservoir	2.95	Low	393.00	May/June 2018
Mount St. Charles 3	Reservoir	1.02	Low	393.69	May 2018
Mount St. Charles 4	Reservoir	1.62	Low	393.00	May 2018
Mount St. Charles 5	Elevated	0.75	High	504.00	June 2018
Highland Industrial Park	Standpipe	1.81	High	513.00	June 2018
Rhodes Avenue	Elevated	0.75	High	504.00	June 2018
Diamond Hill	Elevated	0.75	High	509.50	June 2018
Clearwell No. 1	Reservoir	0.50	Low	-	April 2018
Clearwell No. 2	Reservoir	0.50	Low	-	April 2018
	Total:	**12.09**			

2.6 Booster Pump Stations

The Woonsocket Water Division operates four booster pump station facilities which supply water to high service areas within the distribution system. A description of each station is provided below.

2.6.1 Mount Saint Charles Booster Pump Station

The Mount Saint Charles booster pump station is located at the intersection of Welles Street and Washington Street and was originally constructed around 1915. The City replaced the original pumping facility in 2008 along with the existing Mount Saint Charles high service area storage tank No. 5 as described above. The pumping equipment is housed in the base of the new elevated storage and is comprised of two-112 horsepower, vertical turbine pumps both with 2,000 gpm capacities operating at a total dynamic head of 176 feet. The existing Mount Saint Charles pump station was demolished following startup of the new pumping facilities.

Similar to past operations, the high service area pumps lift water to the new 750,000-gallon, elevated Mount Saint Charles No. 5 storage tank. The storage tank is 143.5 feet tall with an overflow elevation of 504 feet.

Emergency stand-by power is supplied by a diesel driven Caterpillar generator with a subbase fuel tank. The 85 kw/68 kVA generator is located outdoors and is connected to the electrical system by a 200A, 600V automatic transfer switch.

2.6.2 Diamond Hill Road Booster Pump Station

The Diamond Hill booster pump station was constructed in 1959 on Diamond Hill Road. The structure measures approximately 15 feet by 29 feet in plan dimensions. The City and CDM Smith teamed on the Cumberland Interconnection construction project, which upgraded the Diamond Hill Road mechanical, instrumentation and electrical systems in 2017. The station contains two horizontal split-case pumps each with a capacity of about 1,000 gpm and a total dynamic head (TDH) of 223 feet. Each pump is powered by 60 horsepower motors.

The pump station supplies water to both the Diamond Hill Road and Industrial Park storage tanks. The Diamond Hill tank is about 133 feet tall with an overflow elevation of about 509.5 feet and the Industrial Park tank is 102 feet tall with an overflow elevation of 513 feet.

A new exterior, diesel driven generator provides standby power to the pump station. During the Cumberland Interconnection project, the generator system was upgraded at the Diamond Hill booster pump station and the generator is a Caterpillar generator set , Model D125, and is rated at 125 kW, 156.25 kVA, 187.5 A, Standby Power 277/480 volt with three phase power.

2.6.3 Highland Industrial Park Booster Pump Station

The Highland Industrial Park booster pump station is located at the entrance to the industrial park site and the original structure was constructed around 1981. The building measures approximately 15 feet by 21 feet in plan dimensions and houses three horizontal split-case pumps. In 2017, the City upgraded the mechanical, instrumentation and electrical systems with the construction of the Cumberland Interconnection project. Two pumps have capacities of 1,000 gpm with 60 horsepower motors.

The pump station lifts water to Highland Industrial Park storage tank which is 102 feet tall with an overflow elevation of 513 feet as well as the Diamond Hill Road storage tank which is about 133 feet tall with an overflow elevation of about 513 feet.

Emergency stand by power is supplied by a diesel driven Caterpillar generator with a subbase fuel tank. The 125 kW/156.25kVA generator is located outdoors and provides three-phase standby power at 277/480 volt.

2.6.4 Rhodes Avenue Booster Pump Station

The Rhodes Avenue booster pump station was originally constructed in 1963 and rehabilitated in 2000. It measures approximately 15 feet by 21 feet in plan dimensions and houses two horizontal split-case pumps. The pumps each have capacities of 450 gpm with 20 horsepower motors. The station has a 100 kW Kohler diesel generator.

2.7 Distribution System

2.7.1 Service Area

The Water Division's service area includes all customers in the City of Woonsocket, along with sections of North Smithfield and Cumberland, Rhode Island and Blackstone and Bellingham, Massachusetts.

2.7.2 Transmission Piping System

Since 2007, the City has constructed the Cumberland Interconnection project, the Mount Saint Charles Avenue project, and designed the Park Avenue Area Water Main Improvements project. Both projects are described below.

2.7.2.1 Diamond Hill Road and Industrial Park High Service Area Connection

Water Main Improvements

To remedy the City's water supply limitations, the City connected their Diamond Hill high service area with their Industrial Park high service area with a new 12-inch diameter ductile iron water main. When connected, the City can maintain water supply to both areas of their system by providing redundant pumping from both the Diamond Hill Road and Industrial Park booster pump stations. The interconnection will also provide dual storage to both areas by connecting the Diamond Hill Road and Industrial Park high service areas.

With the 12-inch water main connecting the high service areas, the City can reliably provide water supply to both high service areas with either pump station. The water main route extends from Park East Drive to Brookhaven Estates where it connects with the existing 12-inch water main. The total length of the new water main is about 3,200 feet and provides a connection between the Highland Industrial Park high service area and the Diamond Hill Road service area.

High Service Area Supply Redundancy

Under previous conditions, the City had adequate pumping capacities at both the Diamond Hill Road and Industrial Park booster pump stations to provide all domestic (i.e., average day, maximum day and peak hour) demands in both service areas.

With these improvements, both pump stations provide water supply and maintain pressures within the high service areas while the other station is off-line. The improvements will also sustain levels in both storage tanks during maximum day demand conditions ensuring the City has adequate fire protection in both high service areas.

The City installed the 12-inch water main connection between the two high service areas in 2016. The new ductile iron water main has been activated and provides the needed supply and storage redundancy for both the Diamond Hill Road and Industrial Park high service areas. The pump station improvements have been completed in 2017.

2.7.2.2 Park Avenue Area Water Main Improvements Project

In the 2007 distribution system hydraulic evaluation, CDM Smith evaluated the City's distribution system for its ability to provide needed fire flows as determined by the Insurance Services Office (ISO). Specifically, we evaluated the distribution system piping, as well as the storage tanks and pump stations. We determined that water main improvements were needed in the Mount Saint Charles High Service Area to provide adequate fire protection in the Park Avenue area of the City's distribution system.

By constructing these water mains, the Woonsocket water distribution system can provide the needed fire flows while maintaining the required minimum residual pressure of 20 pounds per square inch (psi) throughout the Mount Saint Charles high service area including the Park Avenue and Providence Street areas at the extremities of the distribution system. The following paragraphs discuss piping improvements and provide a brief description of why they are necessary.

Mount Saint Charles Avenue

The City replaced the 6-inch water main in Mount Saint Charles Avenue from Manville Road to Rhode Island Avenue with a new 12-inch water main. The new 12-inch water main connects to the existing 12-inch water main in Mount Saint Charles Avenue, which runs from Rhode Island Avenue to the end of Mount Saint Charles Avenue at Logee Street. With this improvement, the distribution system can provide the needed fire flow to this area through the new 12-inch water main and maintain sufficient pressure at the ends of Mount Saint Charles Avenue and Rhode Island Avenue.

In March 2017, the Water Division designed the 12-inch ductile iron water main in Mount Saint Charles Avenue from Manville Road to Rhode Island Avenue. This design also included the removal and replacement of the existing 6-inch water main in Saint Barnabe Street from Mount Saint Charles Avenue to Verdun Street with a new 8-inch ductile iron water main.

Mount Saint Charles High Service Area

To create an additional hydraulic loop and redundancy in the Mount Saint Charles high service area, some of the existing 6-inch and 8-inch water mains in Knight Street, Cottage Street, Blakely Street, Park Avenue, Smithfield Road, and Providence Street with a new 12-inch water main in the 2007 distribution system evaluation. CDM Smith recommended installing a new 12-inch water main in sections of Blakely Street and Smithfield Road which currently do not have any water mains.

The City and CDM Smith teamed to design the Park Avenue Area Water Main Improvements in 2016 and 2017 and will finalize the design in the winter of 2019 after receiving final comments and permitting conditions from the Rhode Island Department of Transportation (RIDOT), National Grid and the Town of North Smithfield. When final comments are received and addressed, the City will bid the project for construction in early spring of 2020.

When constructed, these improvements enhance fire protection while also creating an additional transmission path from the Mount Saint Charles high service storage tank to the extremity of this service area. This new 12-inch main, along with the existing 10-inch main from the tank to the service zone, maintain pressures in the entire service zone during the simulated fire events. The improvements will also provide looping and redundancy on Providence Street at this extremity of the distribution system while also enhancing volume to the City's service area in North Smithfield along Smithfield Road and Great Road.

2.7.3 Distribution Piping System

The distribution system includes about 130.6 miles of pipe, of which about 74 percent is unlined cast iron, and 26 percent ductile iron with some small lengths of asbestos cement (AC) pipe. **Table 2-2** documents the growth of the distribution system over time by listing installed pipes lengths by decade. **Table 2-3** lists the total lengths of water mains by diameter. **Appendices D and E** contain more specific information about each water main within the City's distribution system such as pipe information by street and dead ends, respectfully. **Appendix F and G** include information on distribution system hydrants and valves, respectively.

Table 2-2 Piping by Decade

Year	Piping Length (ft.)	Piping Length (mi.)	Percent Increase from Base Year
1890	139,310	26.4	Base Year
1900	217,530	41.2	156.1%
1910	273,820	51.9	196.6%
1920	318,710	60.4	228.8%
1930	418,015	79.2	300.1%
1940	449,260	85.1	322.5%
1950	476,695	90.3	342.2%
1960	554,395	105.0	382.0%
1970	613,460	116.2	440.4%
1980	639,890	121.2	459.3%
1990	676,105	128.1	485.3%
2000	679,375	128.7	487.7%
2006	685,875	129.9	492.3%
2017	689,430	130.6	494.8%

Table 2-3 Transmission and Distribution System Piping

Diameter (in.)	Length (ft.)
1	980
1.25	220
1.5	660
2	5,325
4	12,495
6	142,470
8	329,400
10	12,250
12	117,610
14	1,250
16	12,850
18	18,000
20	18,700
30	18,200
Total:	689,430
Total (mi.):	130.6

Notes:
(1) Excludes service connections

2.8 Interconnections

The City currently has one water supply interconnection with the Lincoln Water Commission (LWC) in Lincoln, Rhode Island and two interconnections with the Town of Cumberland, Rhode Island. The City can either supply or receive drinking water via these interconnections. While these interconnections cannot provide for all the City's current water demands, the LWC and Cumberland can supplement Woonsocket's current and future treated water supply. The existing interconnections and associated recent improvements are briefly described below.

The City also supplies sections of North Smithfield, Rhode Island on a permanent basis through an interconnection on Rhodes Avenue. A brief description of the existing North Smithfield is below.

2.8.1 Lincoln Water Commission

The City's LWC interconnection is on Manville Road and is supplied by a 6-inch water main that extends service through North Smithfield to a pump station in Lincoln. The Lincoln interconnection has not been used recently since the LWC receives most of its wholesale water supply from the Providence Water Supply Board. The LWC maintains its pump station along with the water main between Woonsocket and Lincoln.

Should Woonsocket have a water supply emergency, the LWC could provide limited water supply to Woonsocket.

2.8.2 Town of Cumberland, Rhode Island

The City has recently constructed an interconnection with the Cumberland Water Department. Details on the project are below.

Introduction and Project Background

In spring of 2009, CDM Smith evaluated potential emergency interconnection sites near the Highland Corporate Industrial Park for the Woonsocket Water Division and Cumberland Water Department. The work included a hydraulic modeling evaluation to determine whether each system could supply the bordering water system, should a major emergency occur in either Cumberland or Woonsocket. For this study, CDM Smith prepared a letter report entitled "*Emergency Interconnection – Water Supply Evaluation*" dated June 9, 2009.

After this evaluation, CDM Smith performed additional assessments and determined that both Cumberland and Woonsocket could avoid the additional expenses of new pumping infrastructure, by installing two emergency interconnections.

Cumberland Emergency Interconnection-Contract No. 1 (Constructed in 2015)

Historically, the Town of Cumberland had experienced water supply and pressure problems in their distribution system near Woonsocket in the summer. The Cumberland Water Department expressed concerns about meeting the needs of their customers during high demand conditions because they must pump water from their interconnection with the Pawtucket Water Supply Board (PWSB) across their distribution system to its extremity and the Town border with Woonsocket.

During high summer demands, the Town had difficulty providing water supply and pressures to western Cumberland near Woonsocket. By implementing CDM Smith's recommended improvements, the Cumberland Water Department provided the necessary water supply and pressures to its customers during all peak demand conditions.

Woonsocket Emergency Interconnection-Contract No. 2 (Constructed in 2017)

As cited in this report, the City of Woonsocket is currently replacing their existing WTP on Manville Road as stipulated in the signed consent agreement. Due to concerns that the current treatment facility may experience significant problems prior to construction of the new WTP, the City constructed an interconnection with the Town of Cumberland on Mendon Road. The City plans on using the emergency connection if a failure occurs at the WTP. The Mendon Road interconnection will provide drinking water for Woonsocket residents, should a water supply emergency occur.

2.8.3 Town of North Smithfield, Rhode Island

Woonsocket is currently supplying the Town of North Smithfield through an interconnection on Rhodes Avenue in the Rhodes Avenue high service area. North Smithfield is supplied by a 10-inch water main downstream of the Rhodes Avenue high service area pump station.

Section 3

Water Main Improvement Alternatives

3.1 General

As documented in **Section 2**, the Water Division has been proactive by implementing the recommendations from the 2007 Water Distribution System Evaluation and IRP. These improvements included rehabilitation and improving its reservoir dams, booster pumping stations, storage tanks and transmission mains while also planning for the replacement of its aging WTP through the recently completed Design-Build-Operate (DBO) procurement process. Woonsocket's aggressive approach to improving its water supply and distribution system is essential and important when rehabilitating an urban water supply system that was initiated over a century ago.

While performing the 2007 evaluation, Woonsocket's objective was to improve the system from the source through the transmission system and then the distribution system and storage facilities. Since the source water, treatment, pump station and storage facilities improvements have either been completed or initiated, the City is now targeting the aging infrastructure in the distribution system. **Section 3** provides a description of several water distribution system improvement alternatives that can be used to further rehabilitate the City's aging distribution system.

Water mains are one of the most important and the most expensive facilities in Woonsocket's water supply system. Improper maintenance or neglect of the mains will result in an increase of leaks and breaks, reduction of water quality to users, and reduced hydraulic capacity for peak demand and fire flow capacity. With proper maintenance, water mains will continue to provide sufficient hydraulic capacity and high quality drinking water.

In the 2007 evaluation, the City developed a workable plan to address typical problems associated with an over 100-year-old water supply system, some of which are listed below:

- Loss of water and revenues due to joint leak, main breaks and service leaks;
- Water main breaks related to external corrosion;
- Water quality problems because of tuberculation and internal corrosion;
- Low pressures and high head losses caused by tuberculation; and
- Defective valves and hydrants due to age.

The City has focused on the improvement of its major water supply facilities including its dams, pump stations, tanks and most recently the design and construction of a new WTP. With many of these tasks completed or in progress, the Water Division has concerns about these distribution system piping challenges and wishes to address them. By addressing their concerns, the City can continue to properly operate the system and provide quality service to their customers.

Rehabilitation can correct these problems and prolong the useful life of water mains while outright replacement may be necessary for mains that cannot be rehabilitated due to structural deficiencies. In our past studies, CDM Smith researched eight improvement alternatives to evaluate each replacement or rehabilitation process for its advantages and disadvantages. The improvement alternatives investigated were:

- water main replacement,
- cleaning without lining,
- cleaning and cement-mortar lining,
- epoxy or calcite lining,
- slip lining,
- pipe bursting and insertion of replacement pipe,
- abandonment of selected water mains where parallel mains exist, and
- flushing program.

While reviewing these options with the City, CDM Smith learned that the Water Division will likely only consider using either water main replacement or cleaning and cement mortar lining of its existing cast iron water mains. The City may consider the other pipe rehabilitation options list above on a case-by-case basis but we will focus on replacement and cleaning and cement mortar lining in this section.

CDM Smith estimated construction costs for these two alternatives on a cost per linear foot basis. We have also provided costs for abandonment of water mains where parallel mains exist on a per service connection basis since this is a viable option for abandoning older infrastructure if a newer parallel pipe can supply customers in select neighborhoods. Cost estimates for design and construction are for the New England area and are based on November 2017 pricing and include allowances for engineering and contingencies.

This section describes each rehabilitation improvement alternative in more detail. Following any pipeline rehabilitation process, the contractor must clean, pressure test and disinfect the water main prior to activation. **Table 3-1** presents the advantages, disadvantages and estimated construction costs for the recommended water main replacement and cleaning and cement mortar lining improvement alternatives along with the transfer of service connections where parallel water mains exist.

We have also included distribution system flushing in the list above. As recommended in 2007, the City moved forward with the modeling and development of a unidirectional flushing program. CDM Smith prepared the flushing program in 2008 and updated the program in 2012. Water Division personnel have been flushing the distribution system in the spring and fall since the flushing program was developed in 2008.

Table 3-1 Recommended Water Main Improvement Alternatives

Alternative	Advantages	Disadvantages	Cost Estimate
Water Main Replacement	• increase useful life 100 years	• slow, expensive construction	$215/foot (8")
	• minor disruption water supply	• conflicts with other utilities	$240/foot (10")
	• increases capacity (larger mains)	• disrupts traffic & water service	$280/foot (12")
	• improves water quality	• requires relocation of services	$330/foot (16")
	• reduces breaks & leakage	• high pavement repair costs	$420/foot (20")
	• improves flow & fire protection		$550/foot (30")
	• increases system pressures		
	• provides corrosion protection		
	• performed by local contractor		
Cleaning and Cement Mortar Lining	• increase useful life 50 years	• difficulty maintaining service	$110/foot (8")
	• proven process	• requires temporary service	$130/foot (10")
	• improves water quality	• contingent on weather	$150/foot (12")
	• increases capacity (larger mains)	• provide warm water	$175/foot (16")
	• minor disruption of water supply	• inconvenient temporary piping	$210/foot (20")
	• minor disruption of water supply	• inconvenient temporary piping	$290/foot (30")
	• increases system pressures	• customer relations problems	
	• performed on any size pipe	• risk of vandalism to piping	
		• risk private property damage	
		• disposal of cleaned material	
Transferring Services to Parallel Water Main	• minimizes excavation	• parallel main must be available	$1,600 per
	• can increase capacity	• requires evaluation of water main	service
	• minor disruption water supply	• parallel main may be in poor	connection

	• improves water quality	condition	(average)
	• reduces breaks & leakage		
	• improves flow & fire protection		
	• increases system pressures		
	• performed by local contractor		

3.2 Water Main Replacement

3.2.1 General

When rehabilitating a water distribution system, water main replacement with ductile iron pipe must be considered as an improvement alternative. This is especially true for older water supply systems like Woonsocket. The aging process tends to reduce the structural integrity and the hydraulic carrying capacity of water mains. Older mains experience more frequent leaks or breaks, increased maintenance, and water quality problems. Smaller water mains, installed 100 years ago, may be inadequately sized to carry today's required water demands and fire flows. Therefore, the best alternative may be to replace a water main instead of rehabilitating it.

Compared to other alternatives, water main replacement is often more costly and disruptive during construction but a new water main will have a service life of about 75 to 100 years. CDM Smith has highlighted the advantages and disadvantages of water main replacement below.

3.2.2 Advantages

- increases useful life by 75 to 100 years
- minor disruption of water supply
- increases capacity by installing larger diameter main
- improves water quality
- reduces break frequency and leakage
- improves flow for service and fire protection
- increases system pressure
- provides excellent corrosion protection
- does not require a specialist; local contractors can perform construction

3.2.3 Disadvantages

- construction is slow and expensive
- may cause conflicts with other utilities

- disrupts traffic and water service
- may require relocation of service connections
- damages road surfaces increasing pavement costs
- performed only when weather permits (if used, temporary piping can freeze)
- provides warm water during summer installation, if temporary piping is used
- installs temporary piping across driveways and walkways, if used
- causes customer relations problems if temporary piping is used because of leaking temporary service piping and hoses, inconvenient hose connections to houses and service interruptions
- risk of vandalism to temporary service piping, if used
- increased risk of customer property damage through installation of temporary service, if used

3.2.4 Construction Costs

Construction costs for water main replacement vary depending on method of installation. We have discussed two methods below and provide construction cost estimates.

3.2.4.1 Temporary Service Piping

The water main can be installed in the same trench using temporary service piping. Service is transferred from the existing water main to the temporary service piping. The existing water main is then removed and the new ductile iron water main is installed in its place. This method of construction eliminates future construction problems by removing the existing pipe and there are no conflicts with other utilities. Temporary piping increases the cost of installation, causes temporary loss of water supply to customers, requires maintenance by the contractor and may be a public relations problem. The contractor must ensure proper domestic and fire protection service for the duration of the project.

3.2.4.2 Abandoning Existing Water Main

The City can also install a new water main in a separate trench in areas with few utilities. This process offers a much easier construction since the existing water main can remain in service until the new main is installed. Following pressure testing and disinfection, service connections are transferred to the new pipe causing a minor disruption of service to the customer. The contractor must then plug and abandon the old main and remove all valve boxes and hydrants. The disadvantage is that the old main is left in place and may become an obstacle for future utility work.

The City should require that accurate record drawings are prepared during construction including measurements/ties to both new and abandoned water mains. This information will prove valuable during future utility construction in the project area.

3.2.4.3 Water Main Replacement Costs

For water main replacement, CDM Smith has estimated construction costs assuming removal of the existing water main by using temporary piping. Like most cities, Woonsocket has many underground utilities located in the City streets. By using temporary piping, the existing water main can be removed and the new water main installed in the same trench. This methodology will avoid conflicts with existing utilities and ledge and prevent the possibility of future utility conflicts with abandoned water mains. Since some locations in the City have minimal underground utilities, this approach may seem somewhat conservative but it is considered appropriate for planning purposes. Woonsocket can then evaluate the construction method and cost on a project-by-project basis. CDM Smith recommends that more detailed cost estimates will be performed during the design phase.

Our estimates for water main replacement are listed below by pipe size. These costs are current (November 2017) and include construction contingencies.

Diameter	Cost
8”	$215/foot
10”	$240/foot
12”	$280/foot
16”	$330/foot
20”	$420/foot
30”	$550/foot

The larger transmission mains are the City’s major supply lines from the reservoirs to the WTP and from the WTP to the distribution system. When they require replacement, CDM Smith recommends that the construction occur during a low flow (demand) period to minimize disruption in system operations.

3.3 Cleaning and Cement-Mortar Lining

3.3.1 General

Cleaning and cement lining of unlined, cast iron water mains is the most common and effective pipeline rehabilitation technique in use today. This process has been improving water systems since the mid-1930s and is used on a wide variety of pipe diameters.

To gain access to the pipe, the contractor excavates two pits a minimum of 600 feet apart along the water line. Before lining, the contractor must thoroughly clean the pipe using either the drag line or pig cleaning methods. Other cleaning techniques do not prepare the interior of the pipe properly for application of the cement lining and therefore they should not be used as a first step to the cleaning and cement-mortar lining process.

The cement mortar lining can be applied in either a centrifugal or a mandrel process. In both processes, a device is pulled through the water main using a cable. The device emits cement and spreads it against the interior pipe walls. In the centrifugal method, a lining machine with a rotating head dispenses cement mortar in front of the machine and then smooths the cement

using a series of trowels. During the mandrel process, the cement mortar is applied by compressed air and is then smoothed by the cone shaped mandrel.

The cement mortar lining seals the interior of the water main and prevents contact between the cast iron and the water. This rehabilitation process protects the interior of the pipe from further corrosion. CDM Smith recommends that the water utility take a pipe sample (i.e., coupon or spool piece) following rehabilitation to ensure that the contractor has properly lined the pipe.

3.3.2 Advantages

- increases useful life of water main by as much as 50 years
- proven process
- improves water quality
- increases carrying capacity
- minor disruption of water supply
- increases system pressure
- performed on any size water main

3.3.3 Disadvantages

- difficulty maintaining proper domestic and fire service during construction with temporary piping
- requires temporary piping for customer service and fire protection
- performed only when weather permits (temporary piping can freeze)
- provides warm water (temporary piping) during summer construction
- installs temporary piping across driveways and walkways
- causes customer relations problems because of leaking temporary service piping and hoses, inconvenient hose connections to houses and service interruptions
- risk of vandalism to temporary service piping
- increased risk of customer property damage through installation of temporary service
- disposing material cleaned out of pipe

3.3.4 Construction Costs

CDM Smith reviewed bid tabulations for many recent cleaning and lining projects in the Woonsocket area. Our estimates for water main cleaning and cement mortar lining are listed below by pipe size.

Diameter	Cost
8”	$110/foot
10”	$130/foot
12”	$150/foot
16”	$175/foot
20”	$210/foot
30”	$290/foot

3.4 Flushing Program

3.4.1 General

In many water systems (particularly older systems), water chemistry can change significantly through chemical, physical and biological changes occurring in the distribution system. Pipe corrosion is a major cause for deterioration of water quality. Water quality can change as water travels from the treatment facility to the extremities of the distribution system. Water utilities can use a carefully planned flushing program to maintain water quality and service to their customers.

A flushing program is used primarily to improve water quality and remove sediment buildup in pipes, and not as a rehabilitation measure. It can also be performed on different levels from localized flushing of a certain area to eliminate a quality problem to system-wide flushing of the entire system. To properly combat water quality problems, a water utility should flush twice annually (spring and fall) to scour and clean all water mains.

A successful flushing program starts at the system’s source (in Woonsocket’s case, the Water Treatment Plant) and moves out, unidirectionally, in a controlled manner, to the extremities of the system. The water utility will close valves to strategically isolate areas (small districts) of the system and then open several hydrants to create high velocities to scour and flush water and particulate matter out of the pipes. By closing the correct valves, the operator controls flow direction and water velocities in the pipe thereby scouring tuberculation and sediment off the pipe walls.

3.4.2 Background

The City has already developed and implemented their distribution system flushing program and has been very successful in flushing its system and removing corrosion products and sediment from the water mains. If not removed in the flushing process, these undesirable materials can cause many problems in the City’s water distribution systems, including poor appearance and taste, and can harbor biological growths. By removing these materials, the City is maintaining and sustaining proper distribution system water quality awhile reducing consumer complaints.

The Rhode Island Department of Health (RIDOH) recommends periodic hydrant flushing programs as part of operation and maintenance programs. With the implementation of their annual hydrant flushing program, the City has improved operation of the distribution system, enhanced quality water and minimize potential impacts to aesthetics and taste of the drinking water for its customers.

3.4.3 On-going Flushing Procedures

In 2007, the City took major steps towards initiating a successful flushing program by preparing a calibrated water distribution system model using Innovyze's InfoWater software as part of the Water Distribution System Evaluation. When developing the model, the City's intent was to create a flushing program using the Innovyze InfoWater Unidirectional Flushing Program (UDF) module. In 2008, CDM Smith used the calibrated model to create the City's flushing program using the InfoWater UDF software in order to optimize the distribution system flushing.

The City is using their unidirectional flushing program to effectively clean water mains and maintain water quality and system capacity in its distribution system. The program requires a limited amount of water as a means of cleaning out the distribution system. In the unidirectional flushing program, Water Division staff closed valves and open hydrants while creating one-way flow patterns. This process promotes high-speed flushing (minimum 4 feet/second) while accelerating the flow of the water in the mains and maximizing shear (i.e., scouring) velocity near the pipe wall. This scouring action effectively removes sediment deposits and biofilm.

Among its many advantages, unidirectional flushing can help improve water quality by restoring the disinfectant residual, reducing bacterial re-growth, dislodging biofilms, removing sediments and deposits, controlling corrosion, restoring flows and pressures, eliminating taste and odor problems, and reducing disinfectant demand throughout the distribution system. These benefits can also prolong the life expectancy of the system and reduce the potential for waterborne disease outbreaks.

The City's unidirectional flushing program is essential in maintaining and enhancing water quality while also improving operation of the distribution system. Since implementation of the program, the City's distribution crews have become proficient while performing the flushing protocol including:

- order in which valves are opened and shut to insure unidirectional flow
- length of each segment being flushed
- number and sequence of hydrants to be opened and
- duration of each hydrant flush.

The crews must be carefully consider the flushing tasks to maximize the benefits of the program.

When performing its flushing operations, the City notifies all customers and other entities (regulatory agencies, police, fire, etc.) before beginning a flushing procedures. At times, the flushing causes water quality (i.e., colored water) problems and prior public notifications

increases awareness and limits concerns of the residents. The City performs flushing at night and during the spring and fall seasons to lessen the impact on water demands, limit customer complaints and minimize customer interference. The distribution crews operate all valves slowly to avoid destructive pressure surges. They also flow hydrants in the direction of storm drains to prevent flooding, erosion and to protect traffic and pedestrians.

3.4.4 Advantages

- improves water quality
- reduce customer complaints
- removes easily loosened tuberculation and sediment from the system
- promotes operation of hydrants and valves
- records conditions of mains, hydrants and valves

3.4.5 Disadvantages

- ineffective form of pipe rehabilitation
- initially causes water quality problems
- could flood basements and cause erosion if not instituted properly
- may cause fluctuations in pressure which may damage system if the program is not controlled or instituted properly
- valves inadvertently left closed

3.5 Conclusions

CDM Smith has used the information and recommendations in this section to prepare the City's 20-year water main IRP, which is presented in **Section 4**. The Water Division will continue to flush the water distribution system piping network annually with half of the system flushed every spring and fall using their established unidirectional flushing program.

Section 4

Water System Evaluation and Recommended Improvements

4.1 General

In November 2007, CDM Smith prepared the City of Woonsocket's Water Distribution System Evaluation, which included an update of the original 1999 Infrastructure Rehabilitation Plan (IRP) as required by the Rhode Island Department of Health (RIDOH) and the Clean Water Infrastructure Act. For that plan, we evaluated all components within the City's water supply system while also developing a water system hydraulic model and used it to assess the distribution piping network. CDM Smith based our evaluations on the rules and regulations established by Rhode Island General Law and specifically Chapter 46-15.6 Clean Water Infrastructure Act, as amended. We evaluated the water supply facilities based on information in Appendix 1 of the "Rules and Regulations for Clean Water Infrastructure Plans" (attached in **Appendix H**). Appendix 1 lists the typical life expectancies of all water supplies components.

Since submitting the 2007 Water Distribution System Evaluation and IRP to RIDOH, the City, through its Water Division, has methodically and efficiently rehabilitated or replaced many of its major components. **Table 4-1** presents the City's 20-year IRP as presented in the 2007 report along with the status of each project. The City should be commended for taking such an aggressive approach to rehabilitating its aging water supply system.

Section 2 discusses the City's progress on infrastructure rehabilitation since 2007. In this section, CDM Smith has provided our assessment of the remaining components needing rehabilitation or replacement. We have also updated the City's recommended improvements for the 10-year and 20-year IRP as required by RIDOH rules and regulations for Clean Water Infrastructure Plans. **Table 4-2** provides an updated list of proposed IRP projects along with a description of why the improvement is needed. **Table 4-3** presents the City's updated 20-year IRP by listing the project, estimate construction costs and a schedule for implementing the improvements.

In 2007, CDM Smith also used a calibrated hydraulic computer model to evaluate the operation of the City's water distribution system during both existing and future conditions. The model was used to evaluate low- and high-pressure areas as well as the system's ability to provide required fire protection. We are currently updating the City's hydraulic model and will evaluate the system in the same manner.

With the hydraulic computer model, CDM Smith develops improvements to address fire protection deficiencies first. The model runs are made to simulate both current and future fire flow conditions and to determine improvements needed to provide adequate fire protection. CDM Smith then targets improvements that are needed to address infrastructure improvements that will further improve the hydraulics/flow conditions throughout the system.

Projects	Status of Project
Studies	
Infrastructure Rehabilitation Plan Update	Completed
Tanks	
Mount Saint Charles No. 5 Tank (High)	Completed
Mount Saint Charles No. 3 Low	Completed
Mount Saint Charles No. 1 Low	Completed
Rhodes Avenue	Completed
Diamond Hill	Completed
Cobble Hill	Completed
Highland Industrial Park	Inspected
Pump Stations	
Mount Saint Charles High	Completed
Rhodes Avenue	Completed
Harris Pond	Completed
Diamond Hill	Completed
Industrial Park	Completed
Dam Rehabilitation	Dam Inspections Completed
	Dam rehabilitations have been completed or are on-going
	City will continue Dam Rehabilitation/Maintenance Program every 5 years
Treatment Facility	
Study	Completed
Design-Build-Operate (DBO) Procurement	Completed
Final Design	On-going
Construction	Started Spring 2018
Distribution Pipes	On-going
Transmission Mains	
Water Treatment Plant to Logee Street	Completed
Logee Street to River Street	Completed
Mount Saint Charles Avenue	Completed
Park Avenue Area Water Main Improvements	Designed - Construction Spring 2019

Table 4-1
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Summary of Progress on 2017
Infrastructure Rehabilitation Program

CDM Smith

Facility	Age	Description	Reason for Improvement	Total Cost	Schedule
Reports					
Evaluation/Preliminary Design on Rhodes Avenue High Service Area	52 years	Assessment of Existing Pumping and Storage regarding Future Expansion and Fire Protection	City wishes to supply an additional 1.0 mgd to North Smithfield through existing interconnection in Rhodes Avenue high service area. Existing pump station will need upgrades to supply additional flows.	$ 55,000	2018
Preliminary Evaluation of Proposed Highland Industrial Park Elevated Storage Tank		Assessment of Replacing Existing Industrial Park Standpipe-style Storage Tank with Elevated Storage Tank including permitting, siting, hydraulic modeling, sizing and anticipated project costs	City wishes to evaluate the replacement of the existing Highland Industrial Park standpipe tank with a new elevated storage tank to reduce potential for water-age related water quality degradation and safety concerns involving deep dive interior tank inspections.	$ 75,000	2020
Entire System	Varies	Infrastructure Rehabilitation Plan Update	HEALTH requires update every ten years	$ 200,000 $ 200,000	2027 2037
Design/Construction					
Source Water Dams	132 years	Rehabilitation of Reservoir No. 1 Dam	general maintenance, clearing vegetation, minor rehabilitation to spillway	(1)	
	117 years	Rehabilitation of Reservoir No. 3 Dam	general maintenance, clearing vegetation, minor rehabilitation to spillway		
	47 years	Rehabilitation of Harris Pond Dam	general maintenance, clearing vegetation, minor rehabilitation to spillway		
Charles Hamman Water Treatment Plant (2)	54 years	Design/Construction of New Water Treatment Plant	Need to replace existing plant to meet current water quality regulations and requirements	$ 56,752,800	2017-2019
Transmission Mains	40 to 125 years	Water main replacement/cleaning & lining Transmission Main Replacement	Improvements needed from WTP to Court Street and tanks	$ 2,895,700	2023
Distribution Mains (Fire Protection)	Up to 125 years	Reinforce transmission/distribution system to enhance fire protection	Hydraulic model evaluation documented several areas in the distributions system with limited fire protection.	$ 11,524,000	2020
Distribution Mains (IRP)	Up to 125 years	Water main replacement and cleaning and cement lining	Need and schedule documented through CDM's evaluations and rating schedule	$ 13,220,550 $ 13,080,600 $ 12,780,850	2022 2027 2032
Instrumentation and Controls		New Comprehensive SCADA System		(3)	2018
			Total:	$ 110,709,500	

Notes:
(1) City obtained costs for future dam inspections and rehabilitation from Pare Corporation.
(2) All costs are Current (November 2017) and include allowances for engineering and contingencies except for WTP project.
(3) Costs for comprehensive instrumentation package for entire system to be addressed during design phase of new WTP.

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Table 4-2
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Summary of 20 Year Rehabilitation Improvement Program

Projects	5 Year Period 1 to 5	6 to 10	11 to 15	16 to 20	Total	Funding Source
Infrastructure Rehabilitation Plan Update		$200,000		$200,000	$400,000	User Rates
Preliminary Design Evaluations	$130,000				$130,000	User Rates
New Water Treatment Plant [1]	$56,752,800				$56,752,800	Bonds
Distribution Pipes (Fire Protection) [2][3]	$7,300,000	$6,744,500			$14,044,500	User Rates
Distribution Pipes (IRP) [2][3]			$31,459,800	$7,600,000	$39,059,800	Bonds and User Rates
Transmission Mains [2]		$2,044,500	$842,000		$2,886,500	User Rates
Totals	**$64,182,800**	**$8,989,000**	**$32,301,800**	**$7,800,000**	**$113,273,600**	

Notes:

[1] WTP design and construction costs are from July 31, 2017 agreement between City and Woonsocket Water Services LLC.

[2] Anticipated to be eligible for SRF Funding with low interest loans.

[3] With implementation schedule as a function of prioritized evaluation.

[4] All cost except for the WTP are current (November 2017) and include allowances for engineering and contingencies.

Table 4-3
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Schedule for 20 Year Capital Improvement Program and Funding

CDM Smith

By implementing the IRP, the City will reduce vulnerability within their water supply system and provide safe and dependable drinking water to its customers. Like many other older cities in the northeast with an aging water supply and distribution system, Woonsocket's water supply and distribution system requires implementation of a planned rehabilitation program. This IRP will continue this necessary rehabilitation process. CDM Smith has provided a description of the evaluation, findings and recommended improvements below.

4.2 Charles Hamman Water Treatment Plant

4.2.1 Background

The City owns and operates the Charles G. Hammann Memorial Water Treatment Plant (WTP). The WTP, built in 1962, is located on Manville Road and can treat a maximum flow of 13.25 million gallons per day (mgd) with a maximum finished water pumping capacity of 13.5 mgd. The plant currently (based on the 5 most recent years of records) produces an average of approximately 3.5 mgd of treated water, with a current maximum daily flow rate of 6.5 mgd.

In March 2017, CDM Smith prepared a Request for Proposal (RFP) for the Design-Build-Operate (DBO) of the new Water Treatment Facility. Replacement of the WTP is required by the Rhode Island Department of Environmental Management (RIDEM), through its consent agreement with Woonsocket. The facility currently meets the Rhode Island Department of Health (RIDOH) standards as the contact time at the clearwells does not present any issues at this time. Factors contributing to the need for replacement of the WTP include:

- **Raw Water Quality** — Woonsocket is continuously challenged by fluctuations in raw water quality entering the WTP and the treatment limitations of the current plant. These treatment challenges are especially evident during rain events when the turbidity of the raw water spikes. While the existing blending chamber has mitigated this concern somewhat, the City is cognizant of elevated raw water turbidity levels and must react to these increased levels to ensure compliance with all drinking water quality regulations and standards.
- **Concerns about Cross Contamination of Raw and Finished Water** — There are concerns for potential internal leakage within the existing WTP filters where corrosion may allow raw, untreated water to short-circuit the treatment process. Should leakage occur in the internal walls of the filters, raw water will not be adequately filtered and treated prior to entering the clear well tanks.
- **Potential Turbidity Violations** — With only two filters operating, flow into the operating filters must be reduced to prevent the sludge blanket from overflowing from the sedimentation basin into the media in the operating filters; thereby reducing plant capacity.

The City initially entered into a Second Modified Consent Agreement with RIDEM, dated September 19, 2017, to eliminate the discharge of backwash water into the Blackstone River; this agreement has since been modified. Due to the age and condition of the existing WTP, the only cost-effective and prudent solution to eliminating this discharge into the Blackstone River is to construct a new facility where the backwash would be recycled to the raw water supply entering the plant.

The City is undertaking the on-going WTP DBO project in response to these concerns and to comply with RIDEM requirements.

4.2.2 Project Description and Implementation

During the RFP process, the City's goals were to engage the DBO Team for the Design/Build Work and Management Services. The RFP defined these services, which included, but are not limited to, the following:

- **Permitting** –The selected DBO Team is responsible for acquiring the permits and approvals required for the Design/Build Work.
- **Design** – The DBO Team has full responsibility for design of the new WTP and for providing the final design for all facilities with stamped design documents prepared by professionals registered to perform engineering and architectural services in the State of Rhode Island. The DBO Team's design is currently being prepared in different packages to accommodate review by the City, City Advisors, and RIDOH with permitting for a phased construction approach.
- **Construction** – The DBO Team is also responsible for all construction activities including safety, security, and quality management associated with the implementation of the Design/Build Work. CDM Smith and RIDOH are monitoring all design and construction activities; however, the DBO Team remains fully responsible for all construction related issues including schedule, quality and safety.
- **Acceptance Testing** – Following construction, the DBO Team will conduct performance tests for completed Design/Build Work before placing the new WTP into service. CDM Smith and RIDOH will monitor acceptance testing and review the results of such testing.
- **Operation, Maintenance and Asset Management** – The DBO Team will then be responsible for the day-to-day operation of the new WTP and will perform normal and ordinary maintenance as well as asset management services including the major maintenance, renewal and replacement of all managed assets while operating the WTP. The initial term for the operation and maintenance (O&M) phase will be twenty (years, subject to City election to extend or terminate early. The O&M phase includes asset management services along with the preparation and execution of policies and procedures, which will identify and correct asset shortcomings prior to failures that would disrupt services or create a potential compliance issue. Additionally, the DBO Team is responsible for the day-to-day operation and normal and ordinary maintenance of the City's existing WTP while the new WTP is under construction.

4.2.2.1 Raw Water Pumping Facilities

The RFP also included a new Raw Water Pumping Station (RWPS) and new raw water supply transmission mains. This construction work would require coordination with the City while maintaining operation of the existing WTP and during construction of the new raw water facilities. The RWPS will pump raw water flowing by gravity from the existing blending chamber to the new WTP. **Appendix I** includes a copy of CDM Smith's Technical Memorandum, which describes the proposed raw water improvements and provides the preliminary design for these

facilities. This preliminary design is conceptual and may be modified by the DBO Team during the design-build process.

4.2.2.2 Water Treatment Plant Process Overview

The new WTP will serve as the primary component of the DBO project and will remove organics, particulate, pathogens and other undesirable constituents from the source water while producing finished water which is safe, reliable, and acceptable to the public. The DBO Team is responsible for complying with all State and Federal primary and secondary drinking water standards/regulations throughout the duration of the 20-year term of the operations agreement. The WTP's process units (rapid mix through filtration) will be arranged so that the plant can be easily expanded from the initial design flow rate of 7.0 mgd to 10.5 mgd in the future. The DBO Contractor will also design residuals handling, chemical storage and feed systems and finished water pumping for the initial and then the proposed future 10.5 mgd flow rates.

The new WTP will include a state certified lab to handle all water quality analysis for operation of the new WTP as well as for the distribution system sampling and analysis. The DBO Team will be responsible for all regulatory required testing including all testing required for best practices operation of both the WTP and the distribution system.

Treatment Trains

The proposed WTP's process treatment trains will provide conventional treatment through the following trains:

- *Coagulation and Flocculation:* Rapid Mix Basins and Flocculation Basins
- *Clarification*: Dissolved Air Flotation Basins
- *Oxidation:* Chlorine Dioxide Contact Basins
- *Filtration:* Filtration System
- Primary Disinfection

The overall WTP will provide conventional treatment to comply with all State and Federal primary and secondary drinking water standards/regulations through the 20-year operations term.

4.2.3 Project Costs and Schedule

After receiving proposals from three DBO Teams, the City signed a contract with Woonsocket Water Services, LLC (also known as the DBO Team of Suez/AECOM/Nickerson) on July 31, 2017. Woonsocket Water Services, LLC has initiated the Design-Build phase of the project with submission of their preliminary design documents to the City and CDM Smith for review. RIDOH is also reviewing the design deliverables with their consulting engineer, who has been hired by the City to assist RIDOH throughout the duration of the DBO process. Woonsocket Water Services, LLC preliminary design is the first stage of the Design-Build process, which includes obtaining all necessary permits and approvals (including RIDOH approval of plans and specifications before construction). The intent of the DBO process is to construct the required facilities so the City can complete construction and acceptance testing with full time water delivery from the new WTP and shutting down the existing WTP no later than the end of the day December 31, 2019.

The DBO Team is responsible for operation of the existing WTP at the end of December 31, 2018; testing of the new WTP shall commence by September 30, 2019.

Woonsocket Water Services, LLC was awarded the project following an extensive review of all three proposals by the City and their consultants for the design-build cost of $56,752,800, which was approved and endorsed by the Woonsocket City Council.

4.3 Source Water Dams

As discussed in **Section 2**, Woonsocket's three water supply reservoirs are Reservoir No. 1, Reservoir No. 3, and Harris Pond. We have included a description of Pare Corporation's findings and recommended improvements. As mentioned in **Section 2**, **Appendix B** includes copies of Pare Corporation's dam inspection reports.

4.3.1 Reservoir No. 1 Dam

As stated by Pare Corporation, the Reservoir No. 1 dam and its associated infrastructure each have a projected useful life of about 132 years old. The service life for earthen embankment dams is often given as 150 years. However, many dams and pipelines in New England have been in operation for longer lifetimes, and if properly maintained can last indefinitely.

In 2005, the City rehabilitated Reservoir No. 1 dam and this work involved the removal of trees and brush on the upstream slope of the dike and the far end of the dam. This maintenance represented the clearing of about 2,500 square feet (sf) of tree and shrub growth. In addition, the City also removed the brush and tree growth from the sides of the spillway discharge channel.

The spillway structure was also rehabilitated with the reapplication of shotcrete to protect the underlying masonry from the effects of weathering. This improvement helped to prevent exposure and deterioration of the underlying masonry. During the application of shotcrete, several leaks were observed in the spillway step and these leaks were repaired during the 2005 dam improvements project. Following the 2005 repairs, further inspections revealed another leak in the summer of 2006, which was subsequently repaired.

In 2015, Pare Corporation inspected the dam again and made the following recommendations:

- Complete repairs at the primary spillway, including removing and replacing the shotcrete surface along the stepped spillway, repairing the cracks on the training walls, and repairing the concrete base
- Evaluate means to provide low level outlet discharge capacity
- Repair the shotcrete at the service spillway

4.3.2 Reservoir No. 3 Dam

Reservoir No. 3 dam is about 122 years old. Pare Corporation indicated that the service life for earthen embankment dams is about 150 years.

In 2005, the City rehabilitated the Reservoir No. 3 dam. This work included the removal of growth on the upstream slope. The City removed about 8,000 square feet of tree and shrub growth on the dam. The City upgraded the spillway structure with new poured concrete walls and steps. Pare Corporation recommended this improvement to prevent further deterioration and exposure and the possible future deterioration of the underlying masonry.

In 2014, Pare Corporation inspected the Reservoir No. 3 dam and prepared a detailed inspection report. Following their inspection, Pare Corporation recommended the following improvements:

- Evaluate the potential hydraulic capacity impacts the security fencing may have on the auxiliary spillway and potential remedial measures if needed.
  - The City has adjusted the security fencing to not obstruct the auxiliary spillway.
- Complete video and underwater inspections of the low-level outlet pipe and internal components to evaluate the condition of the culvert, intake and trash rack; and to inspect the submerged approach for sediment buildup during subsequent inspections.
- Develop and implement a monitoring program to further assess the flow at the outlet located at the right channel wall to the primary spillway. The monitoring program should include procedures for recording observed flow rates at various impoundment levels and monitoring the discharge area for evidence and/or volume of sediment transport.
- Continue scheduled clearing and mowing (i.e. late spring and fall).
- Fill the eroded upstream area left of the primary spillway and protect with riprap to match the adjacent sections.
- Re-seed and fertilize the thatched areas along the crest to allow re-growth of grass.
- Fill the sloughed area along the upstream slope at the left side of the primary spillway and between the auxiliary spillway and the right abutment using riprap. Monitor the slope for horizontal and vertical movement using survey measurements performed at selected time intervals.
- Implement a program of regular inspection and monitoring of the dam. As the dam is currently classified as a high hazard potential dam, Pare Corporation recommended a

formal visual dam inspection by a Rhode Island registered professional engineer familiar with dam engineering every 2 years.

4.3.3 Harris Pond Dam

In 1968, The City improved this dam to its original condition to extend it useful life. In 2005, the City rehabilitated the Harris Pond dam by clearing and removing tree and shrub growth from its slopes. The City repaired erosion, which was occurring at the dam crest on each side of the spillway and restored the paved drainage ditches running along both sides of the spillway retaining walls. This improvement prevented further erosion of the lower dam embankments and potential undermining of the spillway structure.

In 2016, Pare Corporation inspected the Harris Pond Dam and recommended the following improvements:

- Perform biannual clearing (i.e. late spring and fall)
- Inspect the spillway structure, which was inaccessible during 2016 inspection
- Perform video inspection of the tow drain outlet pipes
- Seal/repair the crack in the left training wall
- Seal and fill open construction joints in the spillway, including construction joints in the training walls, spillway surfaces and within the bridge deck
- Repair/patch areas of concrete deterioration
- Fill the eroded area behind the left training wall with compacted structural fill and install a riprap swale in this area to limit reoccurrence
- Provide additional riprap to augment the thinning areas of the spillway approach
- Continue regular maintenance activities
- Implement a program of regular inspection and monitoring of the dam. The dam is currently classified as a high hazard potential dam and Pare Corporation recommended that the dam be inspected by a Rhode Island registered professional engineer familiar with dam engineering every 2 years.

4.4 Pump Stations

For the 2007 plan, CDM Smith personnel from each engineering discipline visited and evaluated four of Woonsocket's pumping facilities. These facilities were the Mount Saint Charles station, Diamond Hill station, Harris Pond raw water station and the Industrial Park station. The City also evaluated the Rhodes Avenue pump station in a separate project at about the same time. Subsequent to both evaluations, the City replaced, upgraded or rehabilitated all pump station facilities. CDM Smith has provided a brief description of each station along with rehabilitation work completed since 2007 below.

4.4.1 Mount Saint Charles Pump Station

The City has proactively moved forward with CDM Smith's recommendation and replaced the Mount Saint Charles pump station and finalized. construction in December 2006.

4.4.2 Diamond Hill Pump Station

The Diamond Hill pump station is now about 55 years old. The City acted on CDM Smith's 2007 recommendation and performed a thorough evaluation of the Diamond Hill pump station during the Cumberland Interconnection project. Following the evaluation, CDM Smith and the City teamed on the design and construction of the pump station which renovated and rehabilitated the station with the following improvements.

- New mechanical system (pumps, motors, piping, valves, flow meter, fittings and appurtenances)
- New electrical system (rewiring of emergency generator, power wiring, controls, starter, switches)
- Architectural/Building renovations (exterior wall/fascia rehabilitation and new roof
- SCADA/Instrumentation system upgrades (telemetry, control system, computer process and control system at the WTP)

4.4.3 Harris Pond Pump Station

CDM Smith understands that the Harris Pond pump station is about 47 years old. Therefore, we believe that the life expectancy has been extended due to its infrequent use.

The City continues to maintain and repair the Harris Pond pump station, as needed, to ensure proper operation should the station be needed for supply of Harris Pond raw water to the WTP. The chemical feed system has also been upgraded to mitigate potential spills of sodium hypochlorite and currently meets all current safety requirements for containment and ventilation.

4.4.4 Highland Industrial Park Pump Station

The Highland Industrial Park pump station is about 30 years old and recently renovated and rehabilitated in 2017 during the City's Cumberland Interconnection project. Like the Diamond Hill pump station, the pump station was upgraded with the following improvements.

- New mechanical system (pumps, motors, piping, valves, flow meter, fittings and appurtenances)
- New electrical system (rewiring of emergency generator, power wiring, controls, starter, switches)
- Architectural/Building renovations (exterior wall/fascia rehabilitation)
- SCADA/Instrumentation system upgrades (telemetry, control system, computer process and control system at the WTP)

4.5 Storage Tanks

In 2012 through 2013, Underwater Solutions Inc. inspected all twelve of Woonsocket's storage tanks including the clearwell and wash water storage tanks. These storage facilities include the Clearwell (west), Clearwell (east), Mount Saint Charles Water Storage Tank No. 1, Water Storage Tank No. 2, Water Storage Tank No. 3, Water Storage Tank No. 4, the Mount Saint Charles No. 5 high service area tank , the Cobble Hill Water Storage Tank, the Diamond Hill Water Storage Tank, Highland Industrial Park Water Storage Tank, the Rhodes Water Storage Tank, and the Wash Water Storage Tank. As mentioned in **Section 2**, **Appendix C** contains copies of these inspection reports.

In 2016, the Mount Saint Charles Tanks No. 1 and No. 3 were painted on the interiors and exteriors to prevent corrosion and protect the steel tanks as recommended by Underwater Solutions Inc.

Following discussions with Water Division personnel, CDM Smith learned that the only remaining tank that requires rehabilitation is the Highland Industrial Park steel standpipe where this tanks coating has started to deteriorate. The City believes that the tank will not need recoating for another five to ten years but anticipates replacing the tank with an elevated steel storage tank instead of rehabilitating the existing standpipe. With tank recoating and replacement costs being comparable, the Water Division has decided to construct a new elevated storage tank to relieve their concerns about water age causing potential water quality issues and the hazards involved with diving inspections of deep standpipes like the existing Highland Industrial Park tank.

With the Water Division's concerns in mind, CDM Smith recommends that the City perform a preliminary evaluation in 2020 for the replacement of the existing standpipe with a new elevated steel storage tank. This evaluation will determine permitting, design and construction requirements while also assessing siting, required storage volumes (i.e., fire protection, emergency and equalization storage volumes) for the Diamond Hill Road area and the growing Woonsocket industrial park and maintaining required storage volumes during construction of the new elevated storage tank. The final report will also define current final design and construction costs for the new storage tank.

4.6 Transmission Mains

In September 1998, CDM Smith evaluated the condition of 14-, 20- and 30-inch transmission mains at eight locations throughout the City's water system. The evaluations included visual examination to identify any cracking, pitting or corrosion. Our subconsultants, Thielsch Engineering, Inc. (TEI) performed nondestructive ultrasonic inspections to determine pipe thicknesses and identify areas of internal pitting and corrosion. TEI's inspections and findings indicated that the existing cast iron transmission mains were structurally sound and maintained a significant and robust wall thickness.

Table 4-4 presents the results of TEI's nondestructive ultrasonic thickness testing on the transmission mains. The table provides the test location and the range of field thickness measurements. All testing results are within the limits established by the American National Standard Institute (ANSI).

CDM Smith determined that the unlined cast iron transmission mains have acceptable thickness measurements and can be cleaned and cement mortar lined since all test results meet ANSI requirements. **Table 4-5** describes the City's transmission mains and lists our recommended improvements for the pipelines including current estimated costs, method of improvement and schedule. As shown in the table, the City has already completed some of the transmission main improvements with the completion of the 2004 Water Main Rehabilitation project in 2006.

4.7 Fire Protection

CDM Smith is currently updating the Woonsocket water model and will evaluate the distribution system based on the ability to provide needed fire flows as determined by the Insurance Services Office (ISO). Specifically, CDM Smith will evaluate the system's distribution system piping, as well as the storage tanks and pump stations. The following paragraphs describe our recommended improvements to remedy the fire protection deficiencies remaining from the 2007 IRP and the City will forward any updated improvements to RIDOH following completion of the on-going distribution system hydraulic model upgrade project.

4.7.1 Piping Improvements for Fire Protection

During the 2007 evaluation, CDM Smith determined distribution system piping improvements by simulating new pipes in the model under both existing and future (2030) conditions to ensure that the needed fire protection could be provided. **Table 4-6** presents the results of the model fire simulations with the recommended piping improvements for all the areas with deficient fire flows under current conditions. **Table 4-7** presents the results of the model fire simulations with the recommended piping improvements throughout the entire city under future (2030) conditions. Both **Tables 4-6** and **4-7** show that after the recommended piping improvements have been constructed, the Woonsocket water distribution system is able to provide the needed fire flow for all areas while maintaining the required minimum residual pressure of 20 pounds per square inch (psi) throughout the entire distribution system.

Location	Pipe Size (inches)	Thickness Reading (inches)	Low Thickness Reading (inches)
Mount Saint Charles and Logee Street	14	0.754	0.660
Maple and Logee Street	14	0.864	0.804
Bernon and Allen Street	14	0.781	0.660
Second Avenue	14	0.825	0.675
Maple and Wallon Avenue	20	0.964	0.810
Bridge	20	0.948	0.860
Lydia and Myette Avenue	30	1.664	1.435
Lydia and Wanda Avenue	30	1.648	1.448

Table 4-4
City of Woonsocket, Rhode Island
2017 Infrastructure Rehabilitation Plan
1998 Nondestructive Ultrasonic Thickness Testing Results

Location	Description	Age	Length (feet)	Cost	Method of Improvement	Cumulative Cost	Schedule
Logee Tanks to River Street	14-inch Cast Iron	1885	10,750	--	Replaced with New 16-inch DI Pipe	--	Completed
WTP to Logee Tanks	30-inch Cast Iron	1885	8,000	--	Reinforced with Parallel 30-inch	--	Completed
WTP to Court Street and tanks	20-inch Cast Iron	1885	15,000	$2,895,700	Cleaning and Lining (2)	$2,895,700	2023
WTP to Mendon Road	16-inch Cast Iron	1948	2,870	$474,900	Cleaning and Lining (2)	$3,370,600	(3)
Harris Pond to Reservoir No. 1	18-inch Asbestos Cement	1960	18,000	$7,446,200	Repalcement with 20-inch	$10,816,800	(3)
Reservoir No. 1 to WTP	30-inch RCP	1959	3,700	--	Repalcement with 30-inch	--	(4)
Reservoir No. 1 to WTP	20-inch Cast Iron	1885	3,700	--	Cleaning and Lining	--	(4)

Notes:

(1) Cost are current (November 2017) and include allowances for engineering and contingencies.
(2) Costs include replacement of in-line valves.
(3) These improvements will occur after the 20-year planning period.
(4) Included in proposed WTP DBO project.

CDM Smith

Table 4-5
City of Woonsocket, Rhode Island
2017 Infrastructure Rehabilitation Plan
Transmission Main Improvements

ISO COMMERCIAL RISK SERVICES, INC. DATA					HYDRAULIC MODEL SIMULATION RESULTS						
Test Number	District Type	Test Location	Zone	Needed Fire Flow at 20 psi (gpm)	Fire Flow Model Node	Fire Flow Duration (hours)	Critical Node at Needed Fire Flow	Critical Node Location	Pressure at Critical Node during Required Fire Flow (psi)	Available Fire Flow at 20 psi (gpm)	Recommended Improvement Phase (see Table 4-8)
1A	Commercial	Mount Saint Charles Avenue and Rhode Island Avenue (4)	Low	3,500	J1928	3	J3698	End of Mount Saint Charles Avenue	23.65	3,850	Completed 2017
1B	Commercial	Mount Saint Charles Avenue and Rhode Island Avenue (4)	Low	2,250	J1928	2	J3698	End of Mount Saint Charles Avenue	33.62	3,950	Completed 2017
3	Commercial	Park Avenue and Hemond Avenue (5)	High	2,250	J2038	2	J4736	End of Louis Way	47.61	3,500	1
4	Commercial	Providence Street and Fabien Street (5)	High	3,000	J662	3	J122	Smithfield Road at White Parkway, North Smithfield	32.87	3,150	1
5	Commercial	Rockland Avenue and Roberta Avenue	Low	2,000	J1080	2	J614	Woonsocket Hill Road and Bellevue Avenue, North Smithfield	23.94	2,250	3
7A	Commercial	Fairmount Street and Water Street	Low	3,500	J2640	3	J3834	End of Fairmount Street	21.68	3,750	3
8	Residential	Fairmount Street and Eight Street	Low	1,000	J200	2	J3834	End of Fairmount Street	32.14	2,275	3
9A	Commercial	Singleton Street and River Street	Low	3,500	J434	3	J4098	Rhodes Avenue High Service Pump Station Suction Side	20.85	3,500	2

NOTES

1. All ISO fire flow tests simulated under 2001 maximum day demand conditions (the highest maximum day demand in the last 5 years).
2. Critical pressure was determined at end of each ISO fire flow simulation.
3. CDM Smith is currently revising the Water Division's hydraulic model and will re-simulate all ISO fire flow simulations following recalibration of the distribution system modeling.
4. The City constructed the Mount Saint Charles Avenue and Rhode Island Avenue water mains in 2017.
5. CDM Smith and the City have teamed on the design of the Park Avenue Area Water Main Improvements project and the City plans on bidding the project in the winter of 2018 with construction following in the spring of 2018.

ISO COMMERCIAL RISK SERVICES, INC. DATA					HYDRAULIC MODEL SIMULATION RESULTS					
Test Number	District Type	Test Location	Zone	Needed Fire Flow at 20 psi (gpm)	Fire Flow Model Node	Fire Flow Duration (hours)	Critical Node at Needed Fire Flow	Critical Node Location	Pressure at Critical Node during Required Fire Flow (psi)	Available Fire Flow at 20 psi (gpm)
1A	Commercial	Mount Street Charles Avenue and Rhode Island Avenue	Low	3,500	J1928	3	J3698	End of Mount Saint Charles Avenue	22.67	3,750
1B	Commercial	Mount Street Charles Avenue and Rhode Island Avenue	Low	2,250	J1928	2	J3698	End of Mount Saint Charles Avenue	32.80	3,800
2	Commercial	Paradis Avenue and Willow Street	Low	1,500	J2402	2	J4918	Wilson Avenue and Bernon Street	26.26	1,675
3	Commercial	Park Avenue and Hemond Avenue	High	2,250	J2038	2	J4736	End of Louis Way	46.36	3,475
4	Commercial	Providence Street and Fabien Street	High	3,000	J662	3	J4736	End of Louis Way	23.96	3,100
5	Commercial	Rockland Avenue and Roberta Avenue	Low	2,000	J1080	2	J614	Woonsocket Hill Road and Bellevue Avenue, North Smithfield	21.03	2,100
6	Commercial	Bernon Street and Main Street	Low	3,000	J3888	3	J3834	End of Fairmount Street	22.54	3,350
7A	Commercial	Fairmount Street and Water Street	Low	3,500	J2640	3	J3834	End of Fairmount Street	20.00	3,500
7B	Commercial	Fairmount Street and Water Street	Low	1,750	J2640	2	J3834	End of Fairmount Street	27.81	2,925
8	Residential	Fairmount Street and Eighth Street	Low	1,000	J200	2	J3834	End of Fairmount Street	29.55	1,900
9A	Commercial	Singleton Street and River Street	Low	3,500	J434	3	J4098	Rhodes Avenue High Service Pump Station Suction Side	20.00	3,500
9B	Commercial	Singleton Street and River Street	Low	2,000	J434	2	J4098	Rhodes Avenue High Service Pump Station Suction Side	27.84	3,000
10A	Commercial	North Main Street and Social Street	Low	3,500	J2780	3	J3834	End of Fairmount Street	22.79	4,000
10B	Commercial	North Main Street and Social Street	Low	2,000	J2780	2	J3834	End of Fairmount Street	29.29	4,200
11	Commercial	North Main Street and Social Street	Low	3,500	J2780	3	J3834	End of Fairmount Street	22.79	4,000
12	Commercial	Clinton Street and Pond Street	Low	3,000	J954	3	J3834	End of Fairmount Street	26.19	4,500
13A	Commercial	Social Street and Elm Street	Low	3,500	J3892	3	J3834	End of Fairmount Street	26.10	4,500
13B	Commercial	Social Street and Elm Street	Low	1,500	J3892	2	J3834	End of Fairmount Street	32.18	5,000
14	Commercial	Diamond Hill Road and Social Street	Low	3,500	J3006	3	J1272	End of Morris Street	25.34	3,875
15	Commercial	Winthrop Street and All Saints Street	Low	2,250	J3588	2	J1272	End of Morris Street	27.33	3,750
16	Commercial	Cass Avenue and Mailloux Street	Low	3,000	J4086	3	J1272	End of Morris Street	31.70	3,000
17	Commercial	Mendon Road and Cass Avenue	Low	2,250	J3594	2	J1272	End of Morris Street	29.63	2,800
19	Residential	Knollwood Drive and Diana Drive	High	1,000	J3558	2	J1302	Bound Road and Stoneham Drive	37.57	3,750
20	Commercial	Park East Drive and Century Drive	High	2,000	J276	2	J276	Park East Drive and Century Drive	46.11	6,850
21	Commercial	Cumberland Hill Road and Columbus Street	Low	2,000	J1584	2	J1272	End of Morris Street	32.37	2,000

NOTES

1. All ISO fire flow tests simulated under projected 2030 maximum day demand conditions with recommended improvements in place.
2. Critical pressure was determined at end of each ISO fire flow simulation.
3. CDM Smith is currently revising the Water Division's hydraulic model and will update all ISO fire flow simulations following recalibration of the distribution system modeling.

CDM Smith

Table 4-7
City of Woonsocket, Rhode Island
2017 Infrastructure Rehabilitation Plan
Model Simulation Results of ISO Fire Flow Tests
with Recommended Piping Improvements

Table 4-8 presents a summary of our recommended piping improvements, as well as the estimated cost for these improvements. These improvements are also shown schematically on **Figure 4-1**. The following paragraphs discuss our recommended piping improvements and provide a brief description of why they are necessary.

4.7.1.1 Mount Saint Charles High Service Area

To create an additional hydraulic loop and redundancy in the Mount Saint Charles high service area, CDM Smith recommends replacing some of the existing 6-inch and 8-inch water mains in Knight Street, Cottage Street, Blakely Street, Park Avenue, Smithfield Road, and Providence Street with a new 12-inch water main. We also recommend installing a new 12-inch water main in sections of Blakely Street and Smithfield Road which currently do not have any water mains.

These improvements create an additional transmission path from the Mount Saint Charles high service storage tank to the extremity of this service area. This new 12-inch main, along with the existing 10-inch main from the tank to the service zone, maintain pressures in the entire service zone during the simulated fire events. CDM Smith teamed with the City to design this Park Avenue Area Water Main Improvements project and we anticipate bidding the project for spring 2018 construction.

4.7.1.2 Singleton Street / River Street Area

Although the Singleton Street/River Street area does not have the largest fire flow deficiency, it requires the most distribution system piping improvements to remedy the deficiency in this area. CDM Smith also understands that Woonsocket will be increasing its sales to the Town of North Smithfield in the near future. This increase will be supplied through the Rhodes Avenue high service area. We have recommended improvements for fire protection in this area but the new water mains will also reinforce the City's transmission system on the suction side of the Rhodes Avenue high service pump station, which will be necessary to increase sales to North Smithfield.

CDM Smith recommends replacing the existing 12-inch mains in sections of Main Street, Blackstone Street, Singleton Street, and River Street. These 12-inch mains were all installed in the late 1890s and early 1900s. To provide sufficient fire protection in this area, we determined that the existing 12-inch mains should be replaced with new 16-inch pipe.

We also recommend replacing existing 6-inch and 8-inch mains in Spring Street, Woodland Road, Gaskill Street, Winter Street, East School Street and Privilege Street. Our model simulations indicated that new 16-inch pipe should be installed in Spring Street, Woodland Road, and Gaskill Street and new 12-inch pipe constructed in Winter Street, East School Street and Privilege Street. Because Harris Avenue was recently paved, CDM Smith did not recommend improvements to the existing 8-inch and 12-inch mains in this street, although the City should also consider upgrading these older mains.

Finally, we recommend replacing a section of the existing 12-inch main in Rhodes Avenue with a new 16-inch ductile iron water main to maintain pressure to the high service pump station.

These improvements will hydraulically loop this area of the City's transmission system with the new 16-inch water main in River Street, which was installed in the 2004 Water Main

IMPROVEMENT PHASE	STREET	LOCATION	EXISTING WATER MAIN				RECOMMENDED REHABILITATION			CUMULATIVE LENGTH (FEET)	CUMULATIVE COST
			YEAR INSTALLED	PIPE SIZE (INCHES)	PIPE MATERIAL	LENGTH (FEET)	METHOD	NEW PIPE SIZE (INCHES)	ESTIMATED COST		
Completed	Mount Saint Charles Avenue [1]	Manville Road to Rhode Island Avenue	1912	6	CI	1,300	Remove and replace	12	(Completed)	1,300	(Completed)
1	Logee Street [2]	At interesection with Cottage / Knight Street	1910	8	CI	145	Remove and replace	12		1,445	
1	Knight Street [2]	Logee Street to Cottage Street	1910	8	CI	150	Remove and replace	12		1,595	
1	Cottage Street [2]	Knight Street to Williams Street	1960	8	CI	920	Remove and replace	12		2,515	
1	Blakeley Street [2]	Cottage Street to Grove Street	-	-	-	310	Install new main	12		2,825	
1	Blakeley Street [2]	Grove Street to Park Avenue	1891	6	CI	320	Remove and replace	12	$4,800,000	3,145	$4,800,000
1	Park Avenue [2]	Blakeley Street to Smithfield Road, NS	1890	8	CI	3,500	Remove and replace	12		6,645	
1	Smithfield Road, North Smithfield [2]	Park Avenue to White Parkway, NS	-	-	-	1,150	Install new main	12		7,795	
1	Smithfield Road, North Smithfield [2]	White Parkway, NS to Providence Street	1928	8	CI	900	Remove and replace	12		8,695	
1	Providence Street [2]	Smithfield Road, NS to Fabien Street	1921	8	CI	350	Remove and replace	12		9,045	
2	Main Street	High Street to Blackstone Street	1889	12	CI	1,000	Remove and replace	16	$330,000	10,045	$5,130,000
2	Blackstone Street	Main Street to Harris Avenue	1889	12	CI	2,600	Remove and replace	16	$858,000	12,645	$5,988,000
2	Harris Avenue	Intersection with Blackstone Street	1905	12	CI	100	Remove and replace	16	$33,000	12,745	$6,021,000
2	Blackstone Street	Harris Avenue to River Street	1893	12	CI	1,200	Remove and replace	16	$396,000	13,945	$6,417,000
2	Spring Street	Blackstone Street to Woodland Road	1899	8	CI	600	Remove and replace	16	$198,000	14,545	$6,615,000
2	Woodland Road	Spring Street to Winter Street	1896	6	CI	1,750	Remove and replace	16	$577,500	16,295	$7,192,500
2	Woodland Road	Winter Street to Gaskill Street	1925	8	CI	1,250	Remove and replace	16	$412,500	17,545	$7,605,000
2	Gaskill Street	Woodland Road to Edmund Street	1892	6	CI	400	Remove and replace	16	$132,000	17,945	$7,737,000
2	Gaskill Street	Edmund Street to Harris Avenue	1892	8	CI	800	Remove and replace	16	$264,000	18,745	$8,001,000
2	Singleton Street	Harris Avenue to River Street	1911	12	CI	2,100	Remove and replace	16	$693,000	20,845	$8,694,000
2	River Street	Singleton Street to Second Avenue	1922	12	CI	1,300	Remove and replace	16	$429,000	22,145	$9,123,000
2	Rhodes Avenue	Second Avenue to Rhodes Avenue PS	1948	12	CI	1,250	Remove and replace	16	$412,500	23,395	$9,535,500
2	Winter Street	Harris Avenue to North Main Street	1897	8	CI	3,100	Remove and replace	12	$868,000	26,495	$10,403,500
2	East School Street	Pond Street to Hazel Street	1895	8	CI	1,200	Remove and replace	12	$336,000	27,695	$10,739,500
2	Privilege Street	Winter Street to Rathbun Street	1907	6	CI	1,000	Remove and replace	12	$280,000	28,695	$11,019,500
2	Privilege Street	Winter Street to Rathbun Street	1891	8	CI	350	Remove and replace	12	$98,000	29,045	$11,117,500
3	South Main Street	Front Street to Great Road, NS	1890	12	CI	5,000	Remove and replace	16	$1,650,000	34,045	$12,767,500
3	Fairmount Street	River Street to Second Avenue	1907	8	CI	1,800	Remove and replace	16	$594,000	35,845	$13,361,500
3	Fairmount Street	Second Avenue to Fourth Avenue	1922	6	CI	550	Remove and replace	16	$181,500	36,395	$13,543,000
4	Fairmount Street	Fourth Avenue to End	1897	8	CI	1,800	Remove and replace	16	$594,000	38,195	$14,137,000
4	Asylum Street	Roberta Avenue to Bourdon Boulevard	-	-	-	500	Install new main	8	$107,500	38,695	$14,244,500

Notes:

1. The City constructed the Mount Saint Charles Avenue and Rhode Island Avenue water mains in 2017.
2. CDM Smith and the City have teamed on the design of the Park Avenue Area Water Main Improvements project and the City plans on bidding the project in the winter of 2018 with construction following in the spring of 2018.

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Table 4-8
City of Woonsocket, Rhode Island
2017 Infrastructure Rehabilitation Plan
Recommended Piping Improvements for Fire Protection

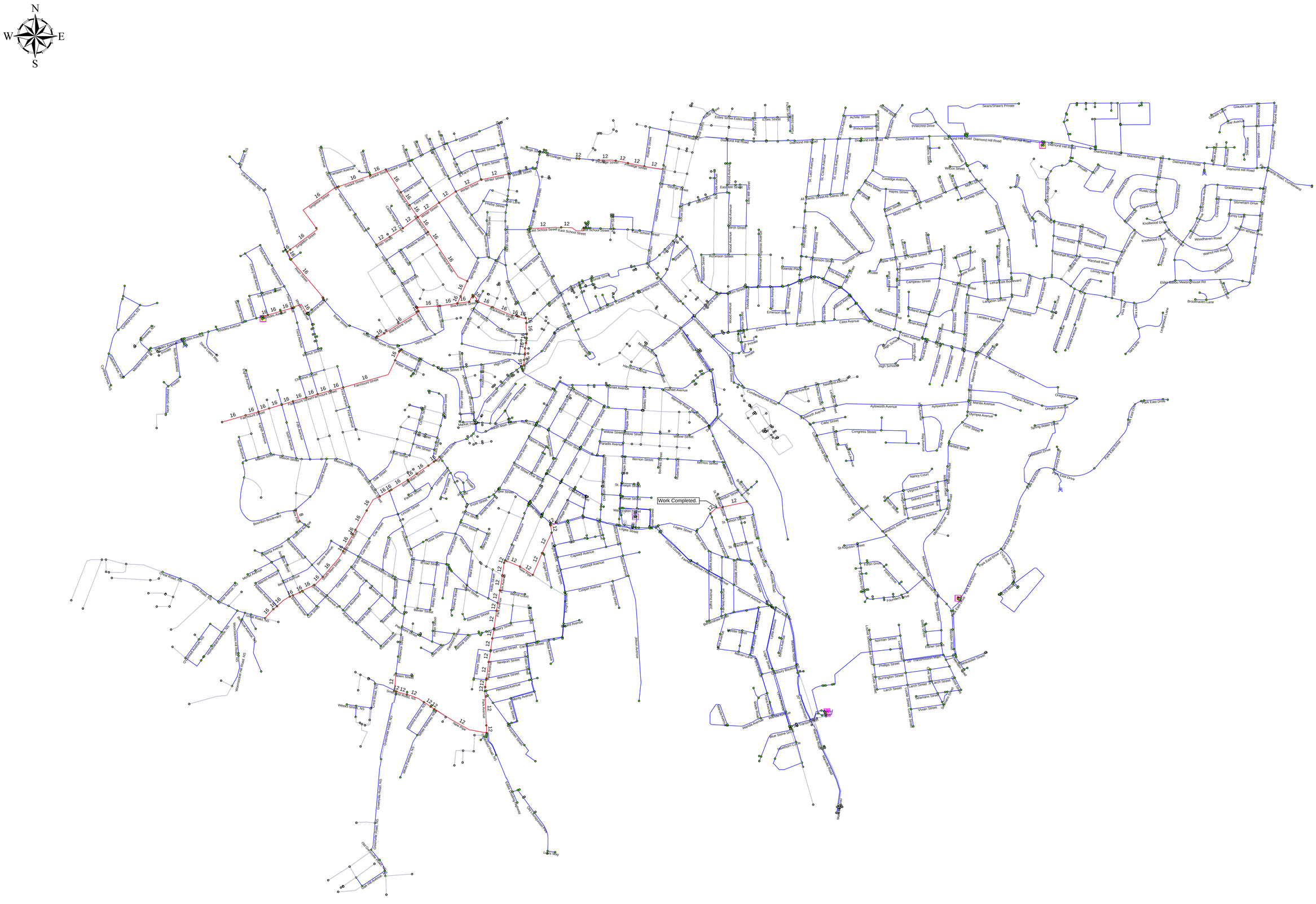

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FIGURE 4-1
CITY OF WOONSOCKET, RHODE ISLAND
WATER DISTRIBUTION SYSTEM EVALUATION
RECOMMENDED FIRE PROTECTION PIPING IMPROVEMENTS

Rehabilitation project. Replacing these mains will also reduce pressure losses to this area since these water mains were originally installed in the 1890s and early 1900s.

4.7.1.3 Fairmount Street Area

CDM Smith recommends replacing the existing 6-inch and 8-inch water mains in Fairmount Street with a new 12-inch water main. This improvement will help provide flow volume and maintain pressures to the Fairmount Street area.

We also recommend replacing the existing 12-inch water main in a section of South Main Street with a new 16-inch water main. This improvement will reduce head losses and maintain pressures to the extremity of the distribution system in North Smithfield. The existing 12-inch water main in South Main Street was installed in the 1890s and is beyond its useful life.

4.7.1.4 Rockland Avenue / Roberta Avenue

By replacing the 12-inch main in South Main Street, the City will remedy the fire flow deficiency in the Rockland Avenue / Roberta Avenue area as previously discussed for the Fairmount Street area. CDM Smith also recommends installing a new 8-inch water main from Roberta Avenue to Bourdon Boulevard to hydraulically loop the Fairmount Street Area with this area of the distribution system.

4.8 Low Pressure Areas

While performing hydraulic model simulations, CDM Smith determined that there are isolated areas of the City's distribution system which experience pressures below 35 psi under peak demand conditions. Specifically, these areas around the Mount Saint Charles low service tanks, the area surrounding the intersection of Diamond Hill Road and Mendon Road near the Cobble Hill tank site, the area, Fairmount Street west of Eighth Avenue, Beausoleil Street, and the area surrounding Great Road in North Smithfield.

The low pressures near the Mount Saint Charles tank site are a direct result of the high ground elevation for the storage tanks. Because domestic service in this area is available from the Mount Saint Charles high service area where pressures are maintained above 35 psi, CDM Smith does not believe that there is a low pressure problem in this area.

Low pressures near the Cobble Hill tank site are also a result of high ground elevations. Although the tank site has the lowest pressures because it is at the highest elevation, there are areas along Diamond Hill Road and Mendon Road that experience pressures below 35 psi under peak hour demand conditions. These areas supply water to residential customers.

High ground elevation is the primary cause of the low pressures at the end of Fairmount Street, west of Eighth Avenue. These low pressures are further complicated because Fairmount Street is a dead end with no hydraulic loop. There are also piping restrictions along Fairmount Street with aging, unlined cast-iron 6-inch and 8-inch water mains between River Street and the end of Fairmount Street. Because the pipe diameters reduce from 8-inches to 6-inches and the cast-iron mains have low C-factors, head losses are increased as water flows to the end of Fairmount Street. As mentioned in 4.7.1.3, it is recommended that Fairmount Street water main be replaced with a

12-inch ductile iron water main as well as provide residential booster pumps to the homes affected at the end of Fairmount Street at higher elevations affected by these lower pressures.

The Beausoleil Street area experiences pressures below 35 psi under peak demand conditions due to high ground elevations and the lack of a hydraulic loop at the end of this street.

Finally, the Great Road area in North Smithfield experiences pressures below 35 psi under peak demand conditions due to high ground elevations and the condition of the existing 12-inch main in South Main Street. During the model calibration process, CDM determined that the C-factor of the existing 12-inch main is quite low, causing significant head losses at high flow rates. This 12-inch cast-iron main, installed in the 1890s, is the only major transmission main that supplies water to this area of North Smithfield.

By replacing the existing 12-inch water main in South Main Street as previously discussed for fire protection improvements, the City will minimize pressure losses to the Great Road area in North Smithfield.

Because low pressures only affect a small number of water users, the City may choose to install individual residential booster pumps in homes that experience low water pressure in order to provide adequate domestic pressures. The City can investigate these on a case-by-case basis if customers call the Water Division with complaints of low water pressure. The City can also provide larger service connections to some of the customers in these areas in lieu of the standard ½-inch service connections. These larger service connections will help to reduce friction loss and maintain a slightly higher water pressure.

4.9 High Pressure Areas

There are two areas of the City's distribution system that experience high pressures that warrant further investigation. In both cases, CDM Smith recommends that the Water Division monitor pressures in these areas to confirm the high pressures predicted by the computer model.

The first location is along Holly Lane where model simulations document pressures that exceed 120 psi along the edge of the Highland Industrial Park high service area. The Water Division indicated that the condominium complex in this area installed pressure reducing valves to reduce pressures to more acceptable levels. CDM Smith recommends that the Water Division confirm that all units in this complex have pressure reducing valves.

Transit Street is the second location where pressures exceed 120 psi at the intersection with Broad Street. This small section of Transit Street is served by the Mount Saint Charles high service area. The high pressures are the result of lower ground elevations. If the Water Division determines that pressures do exceed 120 psi at this location, CDM Smith recommends modifying the high service boundary in Transit Street to serve this area by the low service zone.

4.10 Water Mains

4.10.1 Evaluation of Water Mains

4.10.1.1 Piping System Data Collection

Data collection is the most important step in an infrastructure rehabilitation study. The City has proactively and continuously collected piping data on every water main in the distribution system since initiating their infrastructure rehabilitation program in 1999. As with the 1999 and 2007 IRP submissions, the City has compiled the information in their water distribution system data base in an Excel spreadsheet. The piping spreadsheet included information on location, size, material, a year of installation and length for each pipe. This information was used to construct the database, evaluate the condition of the water mains and to recommend rehabilitation improvements. The database information was relevant in assessing the condition of a main and determining if an improvement is necessary while preparing Woonsocket's initial IRP.

We have recommended to the City that the fire protection water main improvements presented in this section be completed first, to ensure proper fire flows throughout the distribution system. CDM Smith has therefore removed existing water mains from the database, which will be replaced and upsized during the fire protection piping improvement program.

CDM Smith has also updated this data base to include additional distribution system piping that has been installed since 2007. The City provided this information during the data collection phase of this project. We recommend that this database be checked yearly for accuracy and updated with any new piping that is installed in the distribution system.

4.10.1.2 Excel Spreadsheet

CDM Smith has utilized the updated distribution system pipe information in the Excel spreadsheet which allows the data to be sorted by row or column, either alphabetically or numerically, and in either ascending or descending order. This feature is extremely important and effective when preparing a database since the information can be listed in whichever sequence the user would like. As mentioned in **Section 2**, **Appendix D** includes the entire database which was sorted alphabetically by street name.

Pipe Evaluation Criteria

Table 4-9 lists criteria which can be examined during an infrastructure rehabilitation study. Each distribution system has its own characteristics and individuality and, therefore; certain criteria may be important to one system but not for another. The pipe evaluation criteria listed in **Table 4-9** can be expanded or reduced to meet the specific requirements of any system. The availability of information may be the limiting factor on which criteria are used when performing an infrastructure rehabilitation plan.

Table 4-9 also identifies a potential weighting range for each criterion, provides a brief description of each criteria and how the weighting system can be applied.

Rating Schedule

CDM Smith initially formulated the piping rating schedule for the City while preparing the 1999 IRP and updated the schedule in the and 2007 IRP. Since the existing rating schedule has been an

effective means of determining pipe condition, CDM Smith and the City decided to maintain the rating criteria and schedule. **Table 4-10** presents this schedule which was used to rank each pipe in the data base. The table lists the pertinent criteria and the weighting, rating and maximum weighted value for each criterion.

Of the twelve criterions listed in **Table 4-9**, we used only the first five in the rating schedule and for evaluation of each pipe candidate and the sixth (availability of parallel pipe) can be used as a possible recommended improvement. In the future, the rating schedule can be expanded to include evaluation of each pipe candidate under criteria six (6) through 12 as listed in **Table 4-9**. As the City's rehabilitation improvement program evolves and more information becomes available, these additional items can be included in the future rating process.

CDM Smith used the weighting to reflect the City's emphasis on certain variables. We determined that pipe diameter, age and water main breaks were the most important factors in assessing the rehabilitation of the distribution system. We assigned a 0.250 weighting factor to these three characteristics since they are the major factors in determining potential improvements. The pipe material and ownership are less prominent in the review process and therefore; it received a

Number	Criteria	Range	Description
1	Main Size	0 to 5	A pipeline candidate receives up to 5 points depending on main size.
2	Age	0 to 5	A pipeline candidate receives up to 5 points depending on its date of installation.
3	Water Main Breaks	0 or 5	A pipeline candidate receives up to 5 points if there are frequent water main breaks.
4	Type of Pipe	0 to 5	A pipeline candidate receives up to 5 points depending on the type of material.
5	Private Mains	0 or 5	A pipeline candidate receives 5 points if it is a private water main.
6	Dead End Mains	0 or 5	A pipeline candidate receives 5 points if it is a dead end water main.
7	Number of Parallel Mains	0 or 5	A pipeline candidate receives 0 points if a parallel mains are available to provide interim or permanent service.
8	Field Pipe Sample	0 or 5	A pipeline candidate receives 5 points if field samples indicate a high degree of internal tuberculation, graphitization or internal/external corrosion.
9	Water Quality Data	0 or 5	A pipeline candidate receives 5 points for an excessive number of water quality complaints.
10	Fire Flow Availability	0 to 5	A pipeline candidate receives up to 5 points depending on the documented fire flow rate at 20 psi. Priority is given to pipes with fire flow capacity < 750 gpm.
11	System Pressure	0 to 5	A pipeline candidate receives up to 5 points depending on system pressure. Priority is given to candidates with excessive system pressures or lack of system pressures.
12	Leadite Joints	0 or 5	A pipeline candidate receives 5 points if it was constructed with leadite joints.

Table 4-9
City of Woonsocket, Rhode Island
2017 Infrastructure Rehabilitation Plan
Pipe Evaluation Criteria

Criteria	Weight	Rating	Maximum Weighted Value
1. Main Size	0.250	< 6 inch diameter = 5 points = 6 inch diameter = 2.5 points < 6 inch diameter = 0 points	1.25
2. Age	0.250	> 100 years old = 5 points 80 to 100 years old = 4 points 60 to 80 years old = 3 points 40 to 60 years old = 2 points 20 to 40 years old = 1 points < 20 years old = 0 points	1.25
3. Water Main Breaks	0.250	More than one break on main = 5 points One break on main = 2.5 points No breaks on main = 0 points	1.25
4. Type of Pipe	0.125	Galvanized Iron = 5 points Unlined cast iron = 5 points Asbestos Cement = 5 points Copper Tubing = 3 points PVC = 2 points Ductile Iron = 0 points	0.63
5. Private Mains	0.125	Yes = 5 points No = 0 point	0.63
Total:	1.000		5.00

Table 4-10
City of Woonsocket, Rhode Island
2017 Infrastructure Rehabilitation Plan
Rating Schedule for Piping Database

weighted value of 0.125. CDM Smith also determined whether the pipes were dead end water mains and included this information in the data base. These criteria were not used in the rating schedule because our recommended improvements would not eliminate dead end mains. This criterion was used to form an additional database which only lists dead end pipes. As mentioned in **Section 2, Appendix E** included all dead-end water mains in the City's system.

We determined the maximum weighted value for each criterion by multiplying each weighting factor by the maximum rating of five. We used five as the maximum rating to further define the condition of each pipe. A breakdown of the five points by criteria is shown in column three of **Table 4-10**.

The ratings range from a low of zero to a high of five, meaning the higher the rating, the more likely a pipe candidate should be improved under some certain criteria. For example, a galvanized iron pipe will receive a five rating for pipe material because it is more likely to cause problems than a cement lined ductile iron pipe which receives a zero rating under this criterion.

Every pipe in the database was reviewed under this rating schedule to determine its need for improvement. The rating for each criterion was multiplied by the appropriated weighted value for each candidate and the summation of points generated from each criterion determined the total rating. To clarify this process, we have calculated below the total rating of a 2-inch, galvanized iron pipe on Pound Hill Road in North Smithfield which was installed in 1929.

Criteria	Weight	Rating	Weighted Value
1. Main Size	0.250	5 points (< 6" in diameter)	1.25
2. Type of Pipe	0.125	5 points (galvanized)	0.63
3. Age of Pipe	0.250	3 points (70 years old)	0.75
4. Water Main Breaks	0.250	0 points (0 break)	0.00
5. Ownership	0.125	5 points (N. Smithfield)	0.63
		Total Weighted Value	3.26

CDM Smith has prepared a spreadsheet which ranks every pipe candidate in the data base by the total rating. **Appendix J** presents this spreadsheet which sorts the pipes by total rating in descending order. This table forms a base for the City's twenty-year infrastructure rehabilitation program. The pipes receiving the highest total rating will be considered first for rehabilitation or replacement.

4.10.2 Recommended Water Main Improvement Criteria

After reviewing the piping database, CDM Smith determined that few distribution mains have been replaced over the last 40 years. As these water mains age with limited maintenance, they become more susceptible to leaks and breaks; therefore, they potentially jeopardize water service to the City's customers. Also, older pipes are undersized and may not provide adequate fire

protection in some areas of the distribution system. This proposed 20-year IRP pro-actively improves and rehabilitates the City's important water distribution infrastructure.

The IRP was formed using existing data and may change as additional information becomes available. When the IRP is initiated, the City plans to obtain pipe coupons or samples of the existing pipe to further assess the condition of the water mains to be improved.

Like the 1999 and 2007 IRPs, CDM Smith recommends two options for rehabilitating the City's distribution piping system.

- water main replacement
- water main cleaning and cement-mortar lining

This section discusses our criteria for using only these alternatives for the City's rehabilitation improvement program.

4.10.2.1 Water Main Replacement

The diameter is often the main pipe characteristic used to determine whether a water main should be replaced or rehabilitated. The water utility must determine whether the water main has capacity to meet existing and future water demands and all fire protection requirements; if not, the main should be replaced with a larger diameter pipe rather than investing in rehabilitation of an undersized pipe.

CDM Smith recommends that all pipes in **Appendix J** with diameters 8-inches or less be replaced with new 8-inch ductile iron mains. We question the structural integrity of these smaller pipes and the cost-effectiveness of rehabilitating them. Age correlates well with structural integrity; older mains will have more internal and external corrosion which reduces the structural integrity. Prior to design of these replacements, CDM Smith recommends that the City take pipe coupons or samples to assess the actual condition of the main and whether replacement is necessary.

Also, standard waterworks practice recommends that water mains less than 8-inches in diameter be replaced with larger diameter pipes with a minimum of 8-inch in diameter for new piping since the smaller diameter water mains do not provide adequate fire protection flows and pressures. Pipes that are 10-inches can be replaced with new 12-inch ductile iron pipe. This criterion ensures proper hydraulic capacity and removes any questions about structural integrity.

Section 3 discusses other potential water main improvement techniques. With the information we collected about the City's piping system, CDM Smith will not recommend these other improvement alternatives. Any of the lining techniques will improve water quality and restore the pipe's original capacity but will not increase the capacities of the City's undersized, aging pipes. We do not recommend slip lining of water mains because pipe carrying capacity will decrease further compounding flow deficiencies. Similarly with pipe bursting, the City may have to install a protective sleeve pipe following the bursting process. The installation of this sleeve may reduce the hydraulic carrying capacity. Also, in areas where other utilities are present, the bursting pressure can subject adjacent utility lines to potential damage.

4.10.2.2 Water Main Cleaning and Cement-Mortar Lining

In general, rehabilitation of a 100-year-old, cast iron pipe is a questionable recommendation. Replacement is generally considered a better option. These concerns are most evident in large, urban systems, like the City of Boston, where stray electrical currents and corrosive soils cause more rapid deterioration in water mains. We do not consider this to be a concern in Woonsocket's system. In systems like Woonsocket, information on pipe coupons indicates that the structural integrity of larger cast iron water mains has not been comprised but significant internal tuberculation has occurred. For these reasons, we do not anticipate replacement of unlined, cast iron water mains with diameters greater than 10-inches. We do, however, recommend that the City take pipe samples during the preliminary design phase to ensure that the water main is a good candidate for cleaning and lining. If the main is not structurally sound, it should be replaced.

We recommend that all unlined, cast iron water mains with diameters greater than 10-inches be cleaned and cement-mortar lined if structurally sound. Cleaning and cement lining is a proven and inexpensive rehabilitation process with local, experienced firms available to provide quality work. CDM Smith considers cleaning and lining, under most conditions, to be the best rehabilitation alternative for larger diameter mains in Woonsocket's residential distribution system.

Some water utilities clean and cement line 8-inch cast iron water mains. If the City considers cleaning and lining 8-inch water mains, CDM Smith recommends that a pipe section be taken prior to design to ensure proper structural integrity (i.e., no metal loss due to graphitization).

4.11 Woonsocket's 20-Year Water Main IRP

CDM Smith has determined Woonsocket's IRP for the entire system by selecting the appropriate improvement method for each pipe, estimating costs, and listing improvements in order of priority (e.g., total rating). **Appendix K** presents the IRP including the cumulative cost estimate.

The Rules and Regulations for Clean Water Infrastructure Plans require rehabilitation be established for a 20-year time frame and that improvements be prioritized over 5 year intervals. The cost to rehabilitate the entire distribution system totals approximately $130,034,050.

CDM Smith recommends that this entire water main IRP be completed over a 50-year period. Assuming the IRP begins in 2022 after the fire protection improvements have be completed, most of the pipes in the database will have reached the 100-year useful life typically used in the water industry by 2062. By rehabilitating all pipes within this 50-year period, Woonsocket will spend about $2.6 million per year or about $52.0 million over the 20-year infrastructure planning period.

We reviewed all the water main improvements listed in **Appendix K** and divided the first $52.0 million worth of improvements into four phases:

Phase	Schedule	Cumulative Expenditures	Final Pipe Improvement
1	2022-2026	$13,003,405	Rhodes Avenue
2	2027-2031	$26,006,810	Gaskill Street
3	2032-2036	$39,010,215	Elmore Street
4	2037-2041	$52,013,620	Canal Street

Water main improvements for the first $52.0 million were prioritized into each phase by relative need. The pipelines with the highest rated value were considered first for rehabilitation. The most urgent improvements were included in Phase 1 (2022-2026) with the lowest priority improvements occurring in Phase 4 (2037-2041). CDM Smith anticipates that each phase will be completed in five-year periods with recommended improvements totaling $52.0 million constructed by the year 2042. Woonsocket can implement this phased plan more quickly if resources are available. **Tables 4-11** through **4-14** list the water main improvements by five-year phases of the IRP. When the plan is updated in ten years, the City can evaluate the progress of their infrastructure rehabilitation and modify the 20-year IRP as necessary. We stress that the City's IRP is only a plan and can be modified while in progress. The City may wish to alter the scheduling of water main improvements due to road restorations or construction of other utilities.

4.12 System Flushing

Hydrant flushing programs are performed to remove corrosion products and sediment from water mains. These undesirable materials can cause many problems in water distribution systems, including poor appearance and taste, and can harbor biological growths. Removing these materials helps sustain proper distribution system water quality and reduce consumer complaints. The RIDOH recommends periodic hydrant flushing programs as part of operation and maintenance programs.

A unidirectional flushing program is the most effective way of cleaning water mains and maintaining water quality and system capacity. This type of program also requires a limited amount of water as a means of cleaning out the distribution system. In a unidirectional flushing program, valves are closed and hydrants opened to create a one-way flow. This type of high-speed flushing (minimum 4 feet/second) increases the swiftness of the water in the mains, maximizing shear (i.e., scouring) velocity near the pipe wall. This produces a scouring action that effectively removes sediment deposits and biofilm. Among its many advantages, unidirectional flushing can help improve water quality by restoring the disinfectant residual, reducing bacterial re-growth, dislodging biofilms, removing sediments and deposits, controlling corrosion, restoring flows and pressures, eliminating taste and odor problems, and reducing disinfectant demand throughout the distribution system. These benefits can also prolong the life expectancy of the system and reduce the potential for waterborne disease outbreaks.

This unidirectional flushing program should start at the water treatment plant and proceed toward the system's extremities. The water system should be subdivided into several areas with each capable of being isolated from the rest of the system (by valve operation). Flushing should occur in one area at a time moving toward the end of the system. This procedure results in a one-way movement of deposits within the water mains which facilitates cleaning.

CDM Smith recommends that Woonsocket continue to maintain their distribution system with their on-going unidirectional flushing program.

Pipe Ranking	Street	Size (in)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
1	Greenville Road, NS	6	AC	1953	4,160.00	3.88	$894,400	Water Main Replacement	$894,400
2	Hamlet Avenue	6	CI	1889	2,800.00	3.75	$602,000	Water Main Replacement	$1,496,400
3	Avenue B	6	CI	1904	840.00	3.75	$180,600	Water Main Replacement	$1,677,000
4	Cato Street	6	CI	1885	1,310.00	3.75	$281,650	Water Main Replacement	$1,958,650
5	Summit Street	6	CI	1893	800.00	3.75	$172,000	Water Main Replacement	$2,130,650
6	Great Road, NS	6	CI	1928	1,620.00	3.50	$348,300	Water Main Replacement	$2,478,950
7	Pound Hill Road, NS	2	GI	1929	1,080.00	3.50	$232,200	Water Main Replacement	$2,711,150
8	Smithfield Road, NS	1	GI	1928	220.00	3.50	$47,300	Water Main Replacement	$2,758,450
9	Oaklawn Road, NS	2	GI	1951	250.00	3.25	$53,750	Water Main Replacement	$2,812,200
10	Hillview Avenue, NS	4	CI	1940	980.00	3.25	$210,700	Water Main Replacement	$3,022,900
11	Oak Hill Avenue, NS	4	AC	1953	1,000.00	3.25	$215,000	Water Main Replacement	$3,237,900
12	Birch Hill Avenue, NS	4	AC	1953	880.00	3.25	$189,200	Water Main Replacement	$3,427,100
13	Norwood Road, NS	4	CI	1951	520.00	3.25	$111,800	Water Main Replacement	$3,538,900
14	Asylum Street	6	CI	1894	1,100.00	3.13	$236,500	Water Main Replacement	$3,775,400
15	Prospect Street	8	CI	1889	3,020.00	3.13	$649,300	Water Main Replacement	$4,424,700
16	Carrington Avenue	6	CI	1895	1,100.00	3.13	$236,500	Water Main Replacement	$4,661,200
17	Grove Street	6	CI	1890	2,120.00	3.13	$455,800	Water Main Replacement	$5,117,000
18	Cold Spring Place	4	CI	1893	240.00	3.13	$51,600	Water Main Replacement	$5,168,600
19	Cottage Street	6	CI	1891	1,580.00	3.13	$339,700	Water Main Replacement	$5,508,300
20	South Main Street	12	CI	1890	5,940.00	3.13	$891,000	Cleaning and Lining	$6,399,300
21	West Street	6	CI	1886	760.00	3.13	$163,400	Water Main Replacement	$6,562,700
22	Pleasant Street	6	CI	1890	1,000.00	3.13	$215,000	Water Main Replacement	$6,777,700
23	Merida Avenue	6	CI	1914	640.00	3.13	$137,600	Water Main Replacement	$6,915,300
24	Rhodes Avenue	6	CI	1895	340.00	3.13	$73,100	Water Main Replacement	$6,988,400
25	Vose Street	6	CI	1896	760.00	3.13	$163,400	Water Main Replacement	$7,151,800
26	Privilege Street	6	CI	1891	1,490.00	3.13	$320,350	Water Main Replacement	$7,472,150
27	South Street	6	CI	1886	440.00	3.13	$94,600	Water Main Replacement	$7,566,750
28	High School Street	6	CI	1889	220.00	3.13	$47,300	Water Main Replacement	$7,614,050
29	Park Avenue	8	CI	1890	2,380.00	3.13	$511,700	Water Main Replacement	$8,125,750
30	Privilege Street	12	CI	1907	1,160.00	3.13	$174,000	Cleaning and Lining	$8,299,750
31	Elm Street	8	CI	1886	1,700.00	3.13	$365,500	Water Main Replacement	$8,665,250
32	Water Street	4	CI	1891	200.00	3.13	$43,000	Water Main Replacement	$8,708,250
33	Sayles Street	4	CI	1885	170.00	3.13	$36,550	Water Main Replacement	$8,744,800
34	Sayles Street	4	CI	1885	280.00	3.13	$60,200	Water Main Replacement	$8,805,000
35	Ascension Street	4	CI	1887	370.00	3.13	$79,550	Water Main Replacement	$8,884,550
36	Clark Court	4	CI	1888	180.00	3.13	$38,700	Water Main Replacement	$8,923,250
37	High School Street	4	CI	1889	320.00	3.13	$68,800	Water Main Replacement	$8,992,050

Table 4-11
City of Woonsocket, Rhode Island
2017 Infrastructure Rehabilitation Plan
2022 Distribution System Piping Improvements
1 of 2

CDM Smith

Pipe Ranking	Street	Size (in)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
38	Bradford Street	4	CI	1890	420.00	3.13	$90,300	Water Main Replacement	$9,082,350
39	West Park Place	4	CI	1890	480.00	3.13	$103,200	Water Main Replacement	$9,185,550
40	Willow Street	4	CI	1890	700.00	3.13	$150,500	Water Main Replacement	$9,336,050
41	Snow Street	4	CI	1891	440.00	3.13	$94,600	Water Main Replacement	$9,430,650
42	Adams Street	4	CI	1893	180.00	3.13	$38,700	Water Main Replacement	$9,469,350
43	Blackstone Street	4	CI	1893	1,060.00	3.13	$227,900	Water Main Replacement	$9,697,250
44	Daniels Street	4	CI	1893	280.00	3.13	$60,200	Water Main Replacement	$9,757,450
45	Social Street	4	CI	1894	370.00	3.13	$79,550	Water Main Replacement	$9,837,000
46	Paradis Avenue	4	CI	1896	160.00	3.13	$34,400	Water Main Replacement	$9,871,400
47	Park Place	4	CI	1896	320.00	3.13	$68,800	Water Main Replacement	$9,940,200
48	Ruby Street	4	CI	1908	300.00	3.13	$64,500	Water Main Replacement	$10,004,700
49	Wilbur Avenue	4	CI	1910	320.00	3.13	$68,800	Water Main Replacement	$10,073,500
50	Mendon Road, NS	8	CI	1964	800.00	3.00	$172,000	Water Main Replacement	$10,245,500
51	Armand Street	2	CT	1947	400.00	3.00	$86,000	Water Main Replacement	$10,331,500
52	Merrimac Street, NS	1	CT	1949	440.00	3.00	$94,600	Water Main Replacement	$10,426,100
53	Walsh Avenue, NS	2	CT	1949	540.00	3.00	$116,100	Water Main Replacement	$10,542,200
54	Mowry Avenue, NS	2	CT	1957	500.00	3.00	$107,500	Water Main Replacement	$10,649,700
55	Chester Street, NS	2	CT	1949	240.00	3.00	$51,600	Water Main Replacement	$10,701,300
56	Smithfield Road, NS	1	CT	1950	100.00	3.00	$21,500	Water Main Replacement	$10,722,800
57	Smithfield Road, NS	2	CT	1950	220.00	3.00	$47,300	Water Main Replacement	$10,770,100
58	Lamoureux Boulvevard, NS	1	CT	1953	340.00	3.00	$73,100	Water Main Replacement	$10,843,200
59	Fairview Avenue, NS	2	CT	1953	530.00	3.00	$113,950	Water Main Replacement	$10,957,150
60	Moore Street	6	CI	1919	160.00	2.88	$34,400	Water Main Replacement	$10,991,550
61	Edmund Street	8	CI	1931	530.00	2.88	$113,950	Water Main Replacement	$11,105,500
62	Summit Avenue, NS	8	CI	1928	880.00	2.88	$189,200	Water Main Replacement	$11,294,700
63	Homestead Avenue, NS	6	CI	1928	740.00	2.88	$159,100	Water Main Replacement	$11,453,800
64	Francis Street	4	CI	1917	140.00	2.88	$30,100	Water Main Replacement	$11,483,900
65	Bentley Street	4	CI	1922	280.00	2.88	$60,200	Water Main Replacement	$11,544,100
66	Holder Lane	4	CI	1923	280.00	2.88	$60,200	Water Main Replacement	$11,604,300
67	John Street	4	CI	1923	360.00	2.88	$77,400	Water Main Replacement	$11,681,700
68	Crest Road, NS	2	GI	1928	1,000.00	2.88	$215,000	Water Main Replacement	$11,896,700
69	Woonsocket Hill Road, NS	2	GI	1928	1,230.00	2.88	$264,450	Water Main Replacement	$12,161,150
70	Buell Avenue, NS	2	CT	1960	120.00	2.75	$25,800	Water Main Replacement	$12,186,950
71	Madeleine Avenue	8	CI	1955	1,400.00	2.63	$301,000	Water Main Replacement	$12,487,950
72	Westwood Road, NS	4	CI	1951	840.00	2.63	$180,600	Water Main Replacement	$12,668,550
73	Rhodes Avenue	10	CI	1948	2,300.00	2.63	$552,000	Water Main Replacement	$13,220,550

Table 4-11
City of Woonsocket, Rhode Island
2017 Infrastructure Rehabilitation Plan
2022 Distribution System Piping Improvements
2 of 2

Pipe Ranking	Street	Size (in)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
74	Lapre Road, NS	6	AC	1951	2,000	2.63	$430,000	Water Main Replacement	$430,000
75	Woodlawn Road, NS	6	AC	1951	1,040	2.63	$223,600	Water Main Replacement	$653,600
76	Bamford Street, NS	6	CI	1941	280	2.63	$60,200	Water Main Replacement	$713,800
77	Getchell Street, NS	6	CI	1947	110	2.63	$23,650	Water Main Replacement	$737,450
78	O'Donnell Avenue, NS	6	CI	1950	840	2.63	$180,600	Water Main Replacement	$918,050
79	Leo Avenue, NS	6	AC	1953	480	2.63	$103,200	Water Main Replacement	$1,021,250
80	Oaklawn Road, NS	6	AC	1951	480	2.63	$103,200	Water Main Replacement	$1,124,450
81	Old Greenville Road, NS	6	AC	1953	720	2.63	$154,800	Water Main Replacement	$1,279,250
82	Pine Court, NS	6	AC	1954	240	2.63	$51,600	Water Main Replacement	$1,330,850
83	Providence Street	6	CI	1891	1,400	2.50	$301,000	Water Main Replacement	$1,631,850
84	Highland Street	6	CI	1893	1,140	2.50	$245,100	Water Main Replacement	$1,876,950
85	Rockland Avenue	6	CI	1905	1,000	2.50	$215,000	Water Main Replacement	$2,091,950
86	North Main Street	8	CI	1889	1,400	2.50	$301,000	Water Main Replacement	$2,392,950
87	Broad Street	8	CI	1908	700	2.50	$150,500	Water Main Replacement	$2,543,450
88	Olo Street	6	CI	1890	240	2.50	$51,600	Water Main Replacement	$2,595,050
89	Front Street	6	CI	1887	2,460	2.50	$528,900	Water Main Replacement	$3,123,950
90	Oakley Road	6	CI	1913	1,360	2.50	$292,400	Water Main Replacement	$3,416,350
91	Social Street	8	CI	1890	2,800	2.50	$602,000	Water Main Replacement	$4,018,350
92	Winter Street	12	CI	1891	860	2.50	$129,000	Cleaning and Lining	$4,147,350
93	Mowry Street	8	CI	1909	800	2.50	$172,000	Water Main Replacement	$4,319,350
94	Orchard Street	6	CI	1907	860	2.50	$184,900	Water Main Replacement	$4,504,250
95	Sayles Street	6	CI	1885	480	2.50	$103,200	Water Main Replacement	$4,607,450
96	Woodland Road	6	CI	1896	1,680	2.50	$361,200	Water Main Replacement	$4,968,650
97	East School Street	6	CI	1890	480	2.50	$103,200	Water Main Replacement	$5,071,850
98	Kendrick Avenue	6	CI	1886	660	2.50	$141,900	Water Main Replacement	$5,213,750
99	Pond Street	6	CI	1889	1,440	2.50	$309,600	Water Main Replacement	$5,523,350
100	Diamond Hill Road	6	CI	1891	3,090	2.50	$664,350	Water Main Replacement	$6,187,700
101	Winter Street	6	CI	1892	500	2.50	$107,500	Water Main Replacement	$6,295,200
102	Division Street	6	CI	1893	760	2.50	$163,400	Water Main Replacement	$6,458,600
103	Cass Avenue	6	CI	1894	1,080	2.50	$232,200	Water Main Replacement	$6,690,800
104	Elm Street	6	CI	1886	360	2.50	$77,400	Water Main Replacement	$6,768,200
105	Pond Street	8	CI	1889	660	2.50	$141,900	Water Main Replacement	$6,910,100
106	Chestnut Street	6	CI	1886	260	2.50	$55,900	Water Main Replacement	$6,966,000
107	Jeffers Street	6	CI	1887	700	2.50	$150,500	Water Main Replacement	$7,116,500
108	Second Avenue	6	CI	1887	2,380	2.50	$511,700	Water Main Replacement	$7,628,200
109	Gaulin Avenue	6	CI	1888	1,140	2.50	$245,100	Water Main Replacement	$7,873,300

Table 4-12
City of Woonsocket, Rhode Island
2017 Infrastructure Rehabilitation Plan
2027 Distribution System Piping Improvements
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Pipe Ranking	Street	Size (in)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
110	Wood Avenue	6	CI	1888	1,960	2.50	$421,400	Water Main Replacement	$8,294,700
111	Avenue A	6	CI	1889	340	2.50	$73,100	Water Main Replacement	$8,367,800
112	Boyden Street	6	CI	1889	1,060	2.50	$227,900	Water Main Replacement	$8,595,700
113	Coe Street	6	CI	1889	2,720	2.50	$584,800	Water Main Replacement	$9,180,500
114	Harrison Avenue	6	CI	1889	440	2.50	$94,600	Water Main Replacement	$9,275,100
115	Paradis Avenue	6	CI	1889	1,660	2.50	$356,900	Water Main Replacement	$9,632,000
116	Shove Street	6	CI	1889	320	2.50	$68,800	Water Main Replacement	$9,700,800
117	Third Avenue	6	CI	1889	1,300	2.50	$279,500	Water Main Replacement	$9,980,300
118	Andrews Street	6	CI	1890	780	2.50	$167,700	Water Main Replacement	$10,148,000
119	Barton Street	6	CI	1890	370	2.50	$79,550	Water Main Replacement	$10,227,550
120	Bellevue Avenue	6	CI	1890	400	2.50	$86,000	Water Main Replacement	$10,313,550
121	Bernon Street	6	CI	1890	300	2.50	$64,500	Water Main Replacement	$10,378,050
122	Fourth Avenue	6	CI	1890	1,300	2.50	$279,500	Water Main Replacement	$10,657,550
123	North Main Street	6	CI	1890	2,520	2.50	$541,800	Water Main Replacement	$11,199,350
124	Park Avenue	6	CI	1890	240	2.50	$51,600	Water Main Replacement	$11,250,950
125	Unity Street	6	CI	1890	440	2.50	$94,600	Water Main Replacement	$11,345,550
126	Blakeley Street	6	CI	1891	320	2.50	$68,800	Water Main Replacement	$11,414,350
127	Farm Street	6	CI	1891	610	2.50	$131,150	Water Main Replacement	$11,545,500
128	Grand Street	6	CI	1891	1,480	2.50	$318,200	Water Main Replacement	$11,863,700
129	Lincoln Street	6	CI	1891	1,400	2.50	$301,000	Water Main Replacement	$12,164,700
130	Welles Street	6	CI	1891	720	2.5	$154,800	Water Main Replacement	$12,319,500
131	Elbow Street	6	CI	1892	670	2.5	$144,050	Water Main Replacement	$12,463,550
132	Gaskill Street	6	CI	1892	2,870	2.5	$617,050	Water Main Replacement	$13,080,600

Table 4-12
City of Woonsocket, Rhode Island
2017 Infrastructure Rehabilitation Plan
2027 Distribution System Piping Improvements
2 of 2

Pipe Ranking	Street	Size (in)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
133	Olo Street	6	CI	1892	1,450	2.50	$311,750	Water Main Replacement	$311,750
134	Rebekah Street	6	CI	1892	300	2.50	$64,500	Water Main Replacement	$376,250
135	Third Avenue	6	CI	1892	1,180	2.50	$253,700	Water Main Replacement	$629,950
136	Adams Street	6	CI	1893	1,420	2.50	$305,300	Water Main Replacement	$935,250
137	Bernon Street	6	CI	1893	1,480	2.50	$318,200	Water Main Replacement	$1,253,450
138	Cross Street	6	CI	1893	540	2.50	$116,100	Water Main Replacement	$1,369,550
139	Earle Street	6	CI	1893	1,020	2.50	$219,300	Water Main Replacement	$1,588,850
140	Willow Street	6	CI	1893	700	2.50	$150,500	Water Main Replacement	$1,739,350
141	Rathbun Street	6	CI	1894	340	2.50	$73,100	Water Main Replacement	$1,812,450
142	Valley Street	6	CI	1894	100	2.50	$21,500	Water Main Replacement	$1,833,950
143	Ethel Street	6	CI	1896	320	2.50	$68,800	Water Main Replacement	$1,902,750
144	Island Place	6	CI	1896	400	2.50	$86,000	Water Main Replacement	$1,988,750
145	Jenckes Street	6	CI	1896	1,340	2.50	$288,100	Water Main Replacement	$2,276,850
146	Park Place	6	CI	1896	1,440	2.50	$309,600	Water Main Replacement	$2,586,450
147	Vose Street	6	CI	1896	500	2.50	$107,500	Water Main Replacement	$2,693,950
148	Bellingham Street	6	CI	1897	590	2.50	$126,850	Water Main Replacement	$2,820,800
149	Morton Avenue	6	CI	1897	320	2.50	$68,800	Water Main Replacement	$2,889,600
150	Social Street	6	CI	1897	1,320	2.50	$283,800	Water Main Replacement	$3,173,400
151	Pearl Street	6	CI	1898	380	2.50	$81,700	Water Main Replacement	$3,255,100
152	Sweet Avenue	6	CI	1898	780	2.50	$167,700	Water Main Replacement	$3,422,800
153	Gilbert Street	6	CI	1899	620	2.50	$133,300	Water Main Replacement	$3,556,100
154	St. Simon Street	6	CI	1899	540	2.50	$116,100	Water Main Replacement	$3,672,200
155	James Street	6	CI	1900	260	2.50	$55,900	Water Main Replacement	$3,728,100
156	Napoleon Street	6	CI	1900	260	2.50	$55,900	Water Main Replacement	$3,784,000
157	Eighth Avenue	6	CI	1901	520	2.50	$111,800	Water Main Replacement	$3,895,800
158	Roland Street	6	CI	1901	820	2.50	$176,300	Water Main Replacement	$4,072,100
159	Burnside Avenue	6	CI	1902	1,940	2.50	$417,100	Water Main Replacement	$4,489,200
160	Chester Street	6	CI	1902	740	2.50	$159,100	Water Main Replacement	$4,648,300
161	Collins Street	6	CI	1902	690	2.50	$148,350	Water Main Replacement	$4,796,650
162	Erie Street	6	CI	1902	260	2.50	$55,900	Water Main Replacement	$4,852,550
163	Kindergarten Street	6	CI	1902	660	2.50	$141,900	Water Main Replacement	$4,994,450
164	Thomas Street	6	CI	1902	590	2.50	$126,850	Water Main Replacement	$5,121,300
165	Charles Street	6	CI	1904	490	2.50	$105,350	Water Main Replacement	$5,226,650
166	Dulude Avenue	6	CI	1904	1,100	2.50	$236,500	Water Main Replacement	$5,463,150
167	Bernon Street	6	CI	1905	880	2.50	$189,200	Water Main Replacement	$5,652,350
168	Dean Street	6	CI	1905	460	2.50	$98,900	Water Main Replacement	$5,751,250

Table 4-13
City of Woonsocket, Rhode Island
2017 Infrastructure Rehabilitation Plan
2032 Distribution System Piping Improvements
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Pipe Ranking	Street	Size (in)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
169	Estes Street	6	CI	1905	1,240	2.50	$266,600	Water Main Replacement	$6,017,850
170	Garden Street	6	CI	1905	740	2.50	$159,100	Water Main Replacement	$6,176,950
171	Huntington Avenue	6	CI	1905	920	2.50	$197,800	Water Main Replacement	$6,374,750
172	Vine Street	6	CI	1905	440	2.50	$94,600	Water Main Replacement	$6,469,350
173	Glen Road	6	CI	1906	1,140	2.50	$245,100	Water Main Replacement	$6,714,450
174	Ninth Avenue	6	CI	1907	850	2.50	$182,750	Water Main Replacement	$6,897,200
175	Lyman Street	6	CI	1908	780	2.50	$167,700	Water Main Replacement	$7,064,900
176	Rivulet Street	6	CI	1908	100	2.50	$21,500	Water Main Replacement	$7,086,400
177	Bennett Street	6	CI	1909	1,100	2.50	$236,500	Water Main Replacement	$7,322,900
178	Manville Road	6	CI	1909	1,220	2.50	$262,300	Water Main Replacement	$7,585,200
179	Roberts Street	6	CI	1909	960	2.50	$206,400	Water Main Replacement	$7,791,600
180	Federal Street	6	CI	1910	600	2.50	$129,000	Water Main Replacement	$7,920,600
181	Sixth Avenue	6	CI	1910	380	2.50	$81,700	Water Main Replacement	$8,002,300
182	Roberta Avenue	6	CI	1911	440	2.50	$94,600	Water Main Replacement	$8,096,900
183	Seventh Avenue	6	CI	1911	1,140	2.50	$245,100	Water Main Replacement	$8,342,000
184	East Orchard Street	6	CI	1912	680	2.50	$146,200	Water Main Replacement	$8,488,200
185	Temple Street	6	CI	1912	300	2.50	$64,500	Water Main Replacement	$8,552,700
186	Cleveland Street	6	CI	1913	440	2.50	$94,600	Water Main Replacement	$8,647,300
187	Heroux Avenue	6	CI	1913	400	2.50	$86,000	Water Main Replacement	$8,733,300
188	St. Barnabe Street	6	CI	1913	280	2.50	$60,200	Water Main Replacement	$8,793,500
189	Trent Street	6	CI	1913	440	2.50	$94,600	Water Main Replacement	$8,888,100
190	Cote Avenue	6	CI	1914	890	2.50	$191,350	Water Main Replacement	$9,079,450
191	Baxter Street	6	CI	1915	240	2.50	$51,600	Water Main Replacement	$9,131,050
192	Read Avenue	6	CI	1915	370	2.50	$79,550	Water Main Replacement	$9,210,600
193	Rhode Island Avenue	6	CI	1915	360	2.50	$77,400	Water Main Replacement	$9,288,000
194	Meadow Road	6	CI	1916	980	2.50	$210,700	Water Main Replacement	$9,498,700
195	Mechanic Avenue	6	CI	1916	520	2.50	$111,800	Water Main Replacement	$9,610,500
196	Williams Street	6	CI	1916	760	2.50	$163,400	Water Main Replacement	$9,773,900
197	Gilfillan Road, NS	6	CI	1959	740	2.38	$159,100	Water Main Replacement	$9,933,000
198	Dewey Street	6	CI	1917	460	2.25	$98,900	Water Main Replacement	$10,031,900
199	Monty Avenue	8	CI	1930	860	2.25	$184,900	Water Main Replacement	$10,216,800
200	St. Leon Avenue	8	CI	1932	1,200	2.25	$258,000	Water Main Replacement	$10,474,800
201	All Saints Street	8	CI	1932	750	2.25	$161,250	Water Main Replacement	$10,636,050
202	Hamilton Street	6	CI	1921	620	2.25	$133,300	Water Main Replacement	$10,769,350
203	Reservoir Avenue	12	CI	1919	2,660	2.25	$399,000	Cleaning and Lining	$11,168,350
204	Warren Avenue, NS	6	CI	1928	380	2.25	$81,700	Water Main Replacement	$11,250,050
205	Francis Street	6	CI	1917	220	2.25	$47,300	Water Main Replacement	$11,297,350
206	Laval Street	6	CI	1917	480	2.25	$103,200	Water Main Replacement	$11,400,550

Table 4-13
City of Woonsocket, Rhode Island
2017 Infrastructure Rehabilitation Plan
2032 Distribution System Piping Improvements
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Pipe Ranking	Street	Size (in)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
207	Victor Street	6	CI	1917	300	2.25	$64,500	Water Main Replacement	$11,465,050
208	Foundry Street	6	CI	1919	180	2.25	$38,700	Water Main Replacement	$11,503,750
209	Lafayette Street	6	CI	1919	320	2.25	$68,800	Water Main Replacement	$11,572,550
210	Snow Street	6	CI	1919	400	2.25	$86,000	Water Main Replacement	$11,658,550
211	Verry Street	6	CI	1919	840	2.25	$180,600	Water Main Replacement	$11,839,150
212	Crawford Street	6	CI	1920	360	2.25	$77,400	Water Main Replacement	$11,916,550
213	Hill Street	6	CI	1920	540	2.25	$116,100	Water Main Replacement	$12,032,650
214	Ward Street	6	CI	1920	560	2.25	$120,400	Water Main Replacement	$12,153,050
215	Mill Street	6	CI	1921	610	2.25	$131,150	Water Main Replacement	$12,284,200
216	Robinson Street	6	CI	1921	500	2.25	$107,500	Water Main Replacement	$12,391,700
217	Upland Road	6	CI	1921	640	2.25	$137,600	Water Main Replacement	$12,529,300
218	Chalapa Avenue	6	CI	1922	570	2.25	$122,550	Water Main Replacement	$12,651,850
219	Fairmount Street	6	CI	1922	280	2.25	$60,200	Water Main Replacement	$12,712,050
220	Homestead Road	6	CI	1923	200	2.25	$43,000	Water Main Replacement	$12,755,050
221	Elmore Street	6	CI	1927	120	2.25	$25,800	Water Main Replacement	$12,780,850

Table 4-13
City of Woonsocket, Rhode Island
2017 Infrastructure Rehabilitation Plan
2032 Distribution System Piping Improvements
3 of 3

Pipe Ranking	Street	Size (in)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
222	Crest Road, NS	6	CI	1928	500	2.25	$107,500	Water Main Replacement	$107,500
223	Great Road, NS	6	CI	1928	260	2.25	$55,900	Water Main Replacement	$163,400
224	Smithfield Road, NS	6	CI	1928	420	2.25	$90,300	Water Main Replacement	$253,700
225	Woonsocket Hill Road, NS	6	CI	1928	2,040	2.25	$438,600	Water Main Replacement	$692,300
226	Buell Avenue, NS	1	CT	1960	100	2.13	$21,500	Water Main Replacement	$713,800
227	Lydia Avenue	8	CI	1954	3,360	2.00	$722,400	Water Main Replacement	$1,436,200
228	Priscilla Road	8	CI	1956	850	2.00	$182,750	Water Main Replacement	$1,618,950
229	Roberta Avenue	6	CI	1954	340	2.00	$73,100	Water Main Replacement	$1,692,050
230	Morse Avenue	6	CI	1954	340	2.00	$73,100	Water Main Replacement	$1,765,150
231	Weeks Street, NS	8	CI	1954	700	2.00	$150,500	Water Main Replacement	$1,915,650
232	Chapel Street	6	CI	1942	240	2.00	$51,600	Water Main Replacement	$1,967,250
233	Newland Avenue	6	CI	1947	480	2.00	$103,200	Water Main Replacement	$2,070,450
234	Priscilla Road	6	CI	1949	280	2.00	$60,200	Water Main Replacement	$2,130,650
235	Redwood Street	6	CI	1955	150	2.00	$32,250	Water Main Replacement	$2,162,900
236	Harrison Avenue	8	CI	1892	680	1.88	$146,200	Water Main Replacement	$2,309,100
237	Hazel Street	8	CI	1905	940	1.88	$202,100	Water Main Replacement	$2,511,200
238	Fourth Avenue	8	CI	1913	420	1.88	$90,300	Water Main Replacement	$2,601,500
239	Clinton Street	12	CI	1888	1,900	1.88	$285,000	Cleaning and Lining	$2,886,500
240	Bertenshaw Road	8	CI	1908	1,280	1.88	$275,200	Water Main Replacement	$3,161,700
241	Rathbun Street	12	CI	1887	2,640	1.88	$396,000	Cleaning and Lining	$3,557,700
242	Water Street	8	CI	1891	420	1.88	$90,300	Water Main Replacement	$3,648,000
243	Cumberland Hill Road	12	CI	1902	6,000	1.88	$900,000	Cleaning and Lining	$4,548,000
244	Pond Street	12	CI	1891	3,180	1.88	$477,000	Cleaning and Lining	$5,025,000
245	Kendrick Avenue	12	CI	1889	960	1.88	$144,000	Cleaning and Lining	$5,169,000
246	Manville Road	12	CI	1906	490	1.88	$73,500	Cleaning and Lining	$5,242,500
247	Elm Street	8	CI	1913	2,900	1.88	$623,500	Water Main Replacement	$5,866,000
248	Davison Avenue	12	CI	1916	1,120	1.88	$168,000	Cleaning and Lining	$6,034,000
249	Davison Avenue	12	CI	1916	1,120	1.88	$168,000	Cleaning and Lining	$6,202,000
250	Florence Drive	12	CI	1916	1,100	1.88	$165,000	Cleaning and Lining	$6,367,000
251	Florence Drive	12	CI	1916	1,100	1.88	$165,000	Cleaning and Lining	$6,532,000
252	Kendrick Avenue	12	CI	1916	150	1.88	$22,500	Cleaning and Lining	$6,554,500
253	Sayles Street	8	CI	1885	360	1.88	$77,400	Water Main Replacement	$6,631,900
254	Social Street	12	CI	1885	820	1.88	$123,000	Cleaning and Lining	$6,754,900
255	Grove Street	8	CI	1886	760	1.88	$163,400	Water Main Replacement	$6,918,300
256	Grove Street	8	CI	1886	960	1.88	$206,400	Water Main Replacement	$7,124,700
257	South Street	8	CI	1886	360	1.88	$77,400	Water Main Replacement	$7,202,100

Table 4-14
City of Woonsocket, Rhode Island
2017 Infrastructure Rehabilitation Plan
2037 Distribution System Piping Improvements
1 of 2

Pipe Ranking	Street	Size (in)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
258	Grove Street	12	CI	1886	480	1.88	$72,000	Cleaning and Lining	$7,274,100
259	Church Street	8	CI	1887	1,240	1.88	$266,600	Water Main Replacement	$7,540,700
260	Orchard Street	8	CI	1887	960	1.88	$206,400	Water Main Replacement	$7,747,100
261	Pine Street	8	CI	1887	640	1.88	$137,600	Water Main Replacement	$7,884,700
262	Arnold Street	8	CI	1888	940	1.88	$202,100	Water Main Replacement	$8,086,800
263	Arnold Street	8	CI	1888	1,400	1.88	$301,000	Water Main Replacement	$8,387,800
264	Cass Avenue	8	CI	1889	3,180	1.88	$683,700	Water Main Replacement	$9,071,500
265	Center Street	8	CI	1889	1,000	1.88	$215,000	Water Main Replacement	$9,286,500
266	East Street	8	CI	1889	960	1.88	$206,400	Water Main Replacement	$9,492,900
267	First Avenue	8	CI	1889	1,300	1.88	$279,500	Water Main Replacement	$9,772,400
268	Fountain Street	8	CI	1889	820	1.88	$176,300	Water Main Replacement	$9,948,700
269	High Street	8	CI	1889	700	1.88	$150,500	Water Main Replacement	$10,099,200
270	Mason Street	8	CI	1889	3,080	1.88	$662,200	Water Main Replacement	$10,761,400
271	Summer Street	8	CI	1889	1,310	1.88	$281,650	Water Main Replacement	$11,043,050
272	Union Street	8	CI	1889	580	1.88	$124,700	Water Main Replacement	$11,167,750
273	Watson Street	8	CI	1889	420	1.88	$90,300	Water Main Replacement	$11,258,050
274	Blackstone Street	12	CI	1889	3,160	1.88	$474,000	Cleaning and Lining	$11,732,050
275	Cumberland Street	12	CI	1889	2,260	1.88	$339,000	Cleaning and Lining	$12,071,050
276	East School Street	12	CI	1889	470	1.88	$70,500	Cleaning and Lining	$12,141,550
277	East School Street	12	CI	1889	1,380	1.88	$207,000	Cleaning and Lining	$12,348,550
278	Main Street	12	CI	1889	2,500	1.88	$375,000	Cleaning and Lining	$12,723,550
279	Transit Street	12	CI	1889	1,240	1.88	$186,000	Cleaning and Lining	$12,909,550
280	Canal Street	8	CI	1890	320	1.88	$68,800	Water Main Replacement	$12,978,350

Table 4-14
City of Woonsocket, Rhode Island
2017 Infrastructure Rehabilitation Plan
2037 Distribution System Piping Improvements
2 of 2

Section 5

Funding of Recommended Improvements

5.1 General

Rules and Regulations for Clean Water Infrastructure Plans were promulgated by the Department of Health in August of 1994. These regulations were developed to comply with requirements of RIGL Chapter 46-15.6. Key elements of the regulations deal with the funding proposed for the infrastructure plan. Water suppliers subject to the Act are expected to develop plans for the orderly repair, replacement and rehabilitation of the existing infrastructure. Revenues derived to pay for the program are to come from the existing users in proportion to their use of the system. Water utilities can either sell bonds to finance the improvements or pay for the cost from current revenues. Funds are to be deposited in a separate account and dedicated to improvements outlined in the plan.

The Woonsocket water utility is operated as a quasi-municipal division under the Public Works Department of the City. As such, the appropriations are under the control of the City Council of Woonsocket. However, because Woonsocket sells water outside its City limits, its rates and charges are subject to review and approval by the Rhode Island Public Utilities Commission (RIPUC). Along with the review and approval of rates, the RIPUC can also require the establishment of restricted receipt accounts that can only be used for specified purposes. B&E Consulting, LLC supported the City while preparing Section 5 and assessing the funding impact of the Infrastructure Replacement Program.

5.1.1 Woonsocket's Renewal & Replacement Account

In Docket No. 4320, signed on June 13, 2013, the RIPUC ordered the continued maintenance of a restricted account for renewal and replacement (R&R). Per that order, the fund level was established at $120,000 per year. The RIPUC also continued maintenance of a restricted debt service accounts whereby specified revenues could only be used to pay for debt service.

The Infrastructure Replacement Act requires a special, restricted account (designated as the "Infrastructure Replacement Fund") be set up "solely to implement and carry out the replacement and rehabilitation of infrastructure in accordance with the approved plan". Consistent with the requirements of the Act, Woonsocket's infrastructure replacement projects can be financed from the RIPUC's restricted R&R account or (if so ordered by the RIPUC) the restricted debt service account. In Docket No. 4320, signed on June 13, 2013, the RIPUC ordered the continued maintenance of a restricted account dedicated to the Infrastructure Replacement Fund (IFR). Per that order, the fund level was established at $1,700,000 per year.

5.2 Assets of the Woonsocket Water Division

To determine an appropriate level of financing for the orderly replacement of the Division's Infrastructure, it was necessary to analyze the existing assets. There are few detailed asset records, which can be relied on to estimate the value of the system. Instead, we developed a listing of major assets and determined the present-day replacement costs. Section 4 presents

information on recommended improvements and costs for major assets of the Water Division. Because pipes represent such a major portion of the infrastructure, they were analyzed separately in Sections 3 and 4. Non-pipe assets were categorized according to PUC account classification.

Replacement cost for various types of assets were determined as follows:

Source of Supply

These assets generally include the dams and supply mains (see Sections 2.2 and 2.3). The dams and intakes were inspected as part of previous studies. Section 2 documents the findings and dam improvement costs of these previous studies and the information is restricted to the approximate estimated cost of structures and mechanical equipment associated with the dams. No costs are included for the replacement of earthwork. For the supply mains, the current day replacement costs were developed based on costs for similar size pipe in recent projects and are detailed in Section 4.

Pumping Plant

There are five booster pump stations (see Section 2.6) in the Woonsocket water system. Section 4 provides recommended improvement costs, if required, for these booster pump stations.

Water Treatment

A new water treatment facility (see Section 2.4) has been recommended for Woonsocket. The City will replace the existing WTP in 2018 through a design-build-operate approach and signed a contract with Woonsocket Water Services, LLC (also known as the DBO Team of Suez/AECOM/Nickerson) on July 31, 2017. As discussed in Section 4.2, Woonsocket Water Services, LLC was awarded the project following an extensive review of all three proposals by the City and their consultants for the design-build cost of $56,752,800, which was approved and endorsed by the Woonsocket City Council.

Transmission and Distribution

As discussed above, the replacement for the existing transmission and distribution pipes were analyzed in detail in Section 3 and 4. The cost of these pipes includes valves, hydrants, and service connections, as well as paving. Meters were considered separately and are excluded from and the analyses in this report. The City plans on performing a comprehensive meter replacement program within the next few years.

Because the pipes represent such a major part of the infrastructure, they were analyzed separately. Section 4 provides tables that list all the pipes sorted by type. It presents the year installed and the estimated replacement value. Section 4 provides estimated replacement and cleaning and lining costs by size. We have also presented an estimated service life based on the apparent durability of existing pipe and studies elsewhere. Using the replacement costs and the estimated service lives, we developed an annual replacement cost as defined in Section 4.

To determine an appropriate annual level for replacements we have also estimated the useful or service life of each asset. It must be noted that the estimated lives used herein should NOT be confused with the life used for depreciation purposes. The lives used in this analysis are intended

to represent the approximate years of service that can be expected before replacement is necessary.

The result of this analysis is an approximation of the level of annual expenditures needed for infrastructure replacement over the life of the assets. In effect this is the amount that needs to be spent each year to perpetually renew the existing infrastructure as well as the proposed new treatment facilities. It must be remembered that the level of expenditure is based on today's replacement costs. To the extent that inflation continues to increase the cost of utility construction, expenditures for infrastructure replacements will have to increase as well in future years.

Based on our analysis of the Water Division assets, they have a replacement value more than $110 million, exclusive of land and non-depreciable organization costs. This is a considerable investment that should be protected through a systematic replacement program. Based on our analysis of the asset values and the expected service lives, average annual infrastructure replacement/rehabilitation funding of nearly $1.7 million is indicated to keep the system perpetually renewed.

It must be recognized that this is an average annual value over the life of the system. Based on the analysis of the system needs presented earlier, it is recommended that funding for the first five years be set at approximately $1.7 million.

5.3 Funding of Recommended Improvements

The Act allows for funding of Infrastructure Replacements from a combination of current revenues or bonds. Through the regulation of the City's rates and charges, the RIPUC in effect provides guidance on how the City should finance improvements. The RIPUC has considered this issue in several earlier rate filings (Providence Water and Kent County Water Authority). In those cases, the Commission has ordered that the Infrastructure Replacement Program be funded through current revenues rather than bonds. Because the funding of the Infrastructure Replacement Program is an annual expense, it may be appropriate to fund this program from annual revenues. Funding from current revenues will eliminate the interest expense associated with a bond issue, will eliminate the cost of issuance associated with bonds, and will not require approval of annual debt issues by the Division of Public Utilities and Carriers. Due to the magnitude of the initial five-year recommendations and its impact on rates, B&E Consulting recommends primary reliance on debt financing initially.

As discussed earlier, the City is constructing a new water treatment facility starting in 2018. While this facility would replace the existing treatment facilities, it is a one-time, major expense. Considering the significant expense associated with a totally new water treatment facility, the new treatment facilities will be funded with a future bond issue. This report includes estimated costs of the new facilities in the calculation of the average annual funding to ensure that funds will be available in the future for treatment facility replacements, and possible for design costs.

5.4 Impact of Infrastructure Replacement Program

While the RIPUC has ordered IRP funding to be phased-in slowly for some other utilities in Rhode Island, the current needs necessitate full funding from the first five years in Woonsocket. Most

notably of these projects is the new water treatment plant construction and its short window for completion.

The City should select the pipe replacement projects to be funded based on the approximate order presented earlier. The exact schedule should be flexible to consider paving projects that may be going on. For example, if the City is planning to pave a street that has a pipe scheduled for replacement in the next five years, that pipe should be moved up to coincide with the repaving program.

B&E Consulting analyzed the impact of the funding recommendation on the City's rates. To perform this analysis, we have made several assumptions:

For purposes of this analysis, expenses equal those that are projected for a pending rate filing before the RI PUC. It should be noted that the City had accumulated $8 million in its IFR reserve account before the first year of this plan. These funds will help reduce the need for an increase in the $1.7 million yearly IFR funding and help reduce rate increases required for additional debt service issued to cover capital not financed by the IFR account.

Approximately $64.2 million in infrastructure replacement funding has been allocated for the first five years. In the first year, we recommend that $3.5 million of associated with new water treatment plant construction be funded from rate revenues accumulated in the IFR reserve account. We also recommend that $1.7 million of associated with new water treatment plant construction be funded from rate revenues. The remaining $29 million associated with new water treatment plant construction be funded from new bonds. Phase 1 of the new bonds will issue $12.5 million in the spring of 2018, and then Phase 2 plans to borrow approximately $17 million in August of 2018.

In the second year, we recommend that $1.5 million of associated with distribution pipes for fire protection be funded from rate revenues. The remaining $24 million associated with new water treatment plant construction be funded from new bonds in Phase 3 of the borrowings and is planned for the spring of 2019. Lastly in the third, fourth and fifth years, we recommend that $5.8 million of associated with distribution pipes for fire protection be funded from rate revenues.

In the planning for the financing of the new water treatment plant, the City took into consideration that a couple of existing bonds would be repaid in the sixth and seventh years of the plan. Using this knowledge, the Phase 1, Phase 2 and Phase 3 borrowing was structured to minimize the payments in the first five years so that the debt service would be level after the fifth year of the plan. Furthermore, the debt plan utilizes the current year funding of the IFR to used for a debt service reserve, so the City can meet debt service coverage of 125% required by the bonds trust indenture. The current year IFR spending utilizes the rate revenues accumulated in the IFR reserve account from prior years.

Based on these assumptions, the City will not need any rate adjustment for any additional infrastructure funding. B&E Consulting is recommending the City continued maintenance of a restricted account dedicated to the Infrastructure Replacement Fund (IFR) in the amount of $1,700,000 per year. To finance the remaining projects not covered by the IFR plan of the first

five-year plan, bond issues totaling of approximately $57.25 million will be required. This will add approximately $2.9 million by the fifth year to the Division's revenue needs and result in further increases by approximately a 35% increase in rates. However, the increase will be proposed to be spread over a four-year period, based upon the approved rate year revenue requirement from Docket #4320. If the loan was structured without a phase in period, and if the debt service was required to be all funded in year one of the loans, then the impact the average ratepayer would be approximately a 45% increase in rates. It must be noted that these adjustments do NOT account for the proposed new bond issue for distribution pipe work done starting after year 10 of plan, nor increases that may be due for other cost increases after the current rate filing.

The impact of these infrastructure-related increases, considering the construction of a new water treatment plant, on a typical residential customer appears to affordable. The estimated impacts of the bond issue ($57.25 million) of infrastructure replacement funding on a typical resident using 9,759 cubic feet per year (200 gallons per day) is an increase of approximately $288 per year or $24 per month.

As discussed earlier, B&E Consulting recommends funding with a bond issue for the initial program (new water treatment plant). We have examined the impacts if all the costs after year 10 were bond funded or all IFR costs were rate (revenue) financed. Bond funding of the Infrastructure Replacement Program for these later years would keep the rate increase down. To accomplish the needs after year 10 the IFR funding would have to increase to $2.6 million per year vs approximal $1.5 million per year increase for a bond issued in the 10th year. We believe that the proposed initial financing bond issue and subsequent year funding from a combination of revenues and bond is a practical compromise to keep the future rate increases at reasonable levels.

APPENDIX A

RIDEM Modified Consent Agreement dated June 19, 2012

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES

IN RE: AAD No. 06-007/WRA *No. RIA-382*

SECOND MODIFIED CONSENT AGREEMENT

This Consent Agreement is entered into by and between the Department of Environmental Management ("DEM") and The City of Woonsocket (the "Respondent"), which is responsible for the operation of the Woonsocket Drinking Water Treatment Plant (the "Plant"), located at 1500 Manville Road in Woonsocket, Rhode Island. This Agreement is entered into in accordance with Chapters 46-12 and 42-17.1 of the Rhode Island General Laws ("RIGL").

The DEM issued a final permit to the Respondent for the Plant on September 13, 2006 (the "Permit"). By a letter dated October 10, 2006, the Respondent requested an administrative hearing and moved to stay certain conditions of the Permit. On June 27, 2008 the DEM and the Respondent entered into Consent Agreement RIA-382. By letter dated December 30, 2009, DEM alleged that the Respondent failed to meet the deadlines required in paragraphs 10(b), 10(c), and 11(b) of the Consent Agreement and the Consent Agreement's interim pH limits for outfalls 001, 002, and 003 for the months from June 2008 through September 2009. In a letter dated May 26, 2010 the Respondent requested modifications to the Consent Agreement. In order to effect a resolution of all violations alleged in the DEM's December 30, 2009 letter relating to RIPDES permit No. RI0001627, the parties agreed to enter into a revised Consent Agreement which was executed on June 19, 2012. In subsequent correspondence dated December 3, 2015 the Respondent requested further modifications to the compliance schedule contained in the Consent Agreement. In order to effect a resolution of the Respondent's request to modify the Consent Agreement's compliance schedule the parties agree as follows:

1. The Respondent is subject to the provisions of Chapter 46-12 of the RIGL for purposes of this Agreement.

2. DEM has jurisdiction over the subject matter of this Agreement and has personal jurisdiction over the Respondent for purposes of this Agreement.

3. The provisions of this Agreement shall apply to and be binding upon the Respondent, its agents, servants, employees, successors and assigns, and all persons, firms and corporations acting under, through and for it.

4. The compliance with the terms of this Agreement does not relieve the Respondent from compliance with any other applicable laws or regulations administered by DEM or any other governmental entity. This Agreement shall not operate to shield the Respondent from liability arising from future activities, as of the date of execution of this Agreement.

5. Upon the determination by the Director of the DEM that there is an immediate threat to the public health or the environment, or upon the discovery of new information, the DEM reserves the right to order additional remedial action or other enforcement measures as provided by law or regulations.

6. The Director of the DEM may, for good cause shown, defer any of the compliance dates prescribed herein. In the event that the Respondent believes that good cause exists for extending any such dates, the Respondent may submit a written request to DEM for an extension at least seven (7) days prior to such deadline, together with a complete statement of the reasons why the Respondent believes that such an extension is justified. Approval of the extension request shall not be unreasonably withheld. If DEM denies the Respondent's extension request that decision may be appealed to Superior Court in accordance with RIGL 42-35-1 et seq. The Agreement may be amended by mutual agreement of the parties in writing.

7. In the event that the Respondent fails to comply with any of the schedules in paragraph 11 of this Agreement it shall pay a stipulated penalty of one thousand dollars ($1,000) a day for each and every day it remains in violation of the schedule. The payment of a stipulated penalty in accordance with this paragraph shall not preclude DEM from seeking any other appropriate remedy.

8. In the event the Respondent fails to comply with any of the interim limits of paragraph 11 of this Agreement it shall be subject to an administrative penalty as determined by the DEM in accordance with the Rules and Regulations for Assessment of Administrative Penalties. The payment of an administrative penalty in accordance with this paragraph shall not preclude DEM from seeking any other appropriate remedy.

9. This Agreement shall have the full force and effect of a final compliance order issued after a full hearing on the merits pursuant to the Administrative Procedures Act (RIGL Chapter 42-34-1 et seq.) from which no timely appeal was taken, and which shall be fully enforceable in the Superior Court of the State of Rhode Island.

10. Within thirty (30) days, from the date of execution of this Agreement, the DEM shall initiate procedures to reissue RIPDES permit No. RI0001627 as noted in Attachment A. The Respondent agrees not to contest reissuance of RIPDES permit No. RI0001627 included as Attachment A, so long as the schedule and interim limits outlined in paragraph 11 remain in effect. However, if DEM initiates procedures to reissue the RIPDES permit to contain limits more stringent than those contained in Attachment A and the Respondent appeals said reissuance, DEM will not object to the Respondent raising any issues that the Respondent could have raised in an appeal of the Permit.

11. The Respondent shall attain compliance with the final effluent limits for Total Suspended Solids and the mandatory filter backwash treatment requirements applicable to outfalls 001A, 002A, and 003A, as specified in Attachment A, in accordance with the following schedule:

    (a) By December 31, 2020, the Respondent agrees to complete Start-up and Initiation of Operations of a New Water Treatment Plant (the "New Plant") that will eliminate the surface water discharges from the existing water treatment plant located at 1500 Manville Hill Road, Woonsocket, RI.

    (b) From the date of execution of this Agreement until the completion of Part 11(a), the Respondent is required to submit semi-annual project status reports to the DEM. The semi-annual project status reports are due on January 15th and July 15th of each year. The status reports will serve to communicate with the DEM the progress that is being made to comply with the project schedule.

    (c) From the date of execution of this Agreement until start-up and initiation of operations of the New Plant, the Respondent shall meet the interim limits for Total Suspended Solids, as found in Attachment B, which is attached hereto and incorporated herein.

12. No later than fourteen (14) calendar days following a date identified in any schedule of compliance, the Respondent shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirements.

13. All reports and other documentation that the Respondent is required to submit to the DEM by the terms of this Agreement shall be sent to the Office of Water Resources, RIPDES Program, 235 Promenade Street, Providence, RI 02908-5767. Each document shall be subject to DEM review and approval. Upon DEM review of the document, DEM shall provide written notification to the Respondent, either granting approval or stating the deficiencies revealed therein. Within fourteen (14) days (unless a longer time is specified) of receiving a notification of deficiencies, the Respondent shall submit to DEM a revised document consistent with the DEM comments.

14. This Agreement shall be deemed entered as of the date of execution by the parties.

15. This Agreement and any disputes or claims arising out of or in connection with its subject matter or formation shall be governed by and be interpreted in accordance with the laws of the State of Rhode Island, without regard to its conflict of laws rules.

16. Each party irrevocably agrees that the courts of Rhode Island shall have exclusive jurisdiction to settle any dispute or claim that arise out of or in connection with this Agreement or its subject matter or formation.

17. If a provision of this Agreement is or becomes illegal, invalid, or unenforceable that will not affect the legality, validity or enforceability of any other provision of this Agreement.

18. The parties and their respective counsel either have or have had a reasonable opportunity to review this Agreement.

THE CITY OF WOONSOCKET, RHODE ISLAND

Steven D'Agostino, DPW Director

Name Title

The individual signing on behalf of the City of Woonsocket, Rhode Island represents that he/she has the actual authority to enter into this Agreement, and the authority to bind the City of Woonsocket Rhode Island to the requirements contained within.

In WOONSOCKET, on the 13th day of SEPTEMBER

2017, before me personally appeared Steven D'Agostino (signing party's name), to me known and known by me to be the party executing the foregoing Consent Agreement on behalf of the City of Woonsocket Rhode Island and the acknowledged said instrument executed by him/her to be his/her free act and deed.

Priscilla T. Steenbergen
Notary Public
My Commission expires: 12/1/19

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
FOR THE DIRECTOR

Angelo S. Liberti

Angelo S. Liberti, P.E.
Chief of Surface Water Protection

September 19, 2017
Date

ATTACHMENT A

DRAFT RIPDES PERMIT NO. RI0001627

AUTHORIZATION TO DISCHARGE UNDER THE
RHODE ISLAND POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of Chapter 46-12 of the Rhode Island General Laws, as amended,

The City of Woonsocket
169 Main Street
Woonsocket, RI 02895

is authorized to discharge from a facility located at

Woonsocket Water Treatment Plant
1500 Manville Road
Woonsocket, RI 02895

to receiving waters named

Blackstone River

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective on _____.

This permit and the authorization to discharge expire at midnight, five (5) years from the effective date.

This permit supersedes the permit issued on September 13, 2006.

This permit consists of ten (10) pages in Part I including effluent limitations, monitoring requirements, etc. and 10 pages in Part II including General Conditions.

Signed this_____day of _____, 2017.

DRAFT

_____
Angelo S. Liberti, P.E., Chief of Surface Water Protection
Office of Water Resources
Rhode Island Department of Environmental Management
Providence, Rhode Island

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 001A. (Consisting of Treated Filter Backwash from Treatment Unit # 1). Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations Quantity - lbs./day		Concentration - specify units		Monitoring Requirement		
	Average Monthly	Maximum Daily	Average Monthly *(Minimum)	Average Weekly *(Average)	Maximum Daily *(Maximum)	Measurement Frequency	Sample Type
Flow	0.37 MGD	--- MGD				Continuous	Recorder
TSS	93 lb/day	155 lb/day	30 mg/l		50 mg/l	2/Month	Composite[1]
Turbidity			--- NTU		--- NTU	2/Month	Composite[1]
pH			(6.5 S.U.)		(9.0 S.U.)	2/Month	Grab[2]
Total Residual Chlorine[3]			2.0 mg/l		2.0 mg/l	2/Month	Grab
Total Aluminum			13 mg/l		110 mg/l	2/Month	Composite[1]
Total Cadmium			--- mg/l		--- mg/l	1/Quarter	Composite[1]
Total Lead			--- mg/l		--- mg/l	1/Quarter	Composite[1]

[1]All composite sampling must consist of a minimum of four (4) grabs spaced equally apart during a typical filter backwash discharge.

[2] Compliance with these limitations shall be determined by taking a minimum of one (1) grab sample. The grab sample must be analyzed for pH immediately (<15 minutes after sample collection). The maximum value to be reported is the highest individual measurement obtained during the monitoring period. The minimum value to be reported is the lowest individual measurement obtained during the monitoring period.

[3]The following methods may be used to analyze the grab samples: (1) DPD Spectrophotometric, EPA No. 330.5 or Standard Methods (18th Edition) No. 4500-Cl G; (2) DPD Titrimetric (ferrous titrimetric), EPA No. 330.4 or Standard Methods (18th edition) No. 4500-Cl F; (3) Amperometric titration, EPA No. 330.1 or Standard Methods (18th edition) No. 4500-Cl D; (4) Iodometric Direct Titration, EPA No. 330.3 or Standard Methods (18th edition) No. 4500-Cl B; (5) Iodometric Back Titration, EPA No. 330.2 or Standard Methods (18th edition) No. 4500-Cl C.

--- signifies a parameter which must be monitored and data must be reported; no limit has been established at this time.

* Average Monthly Flow is calculated by dividing the total filter backwash flow per month by the total number of discharge days for the outfall during the corresponding month.

** Values in parentheses ( ) are to be reported as Minimum/Maximum for the reporting period rather than Average Monthly/Maximum Daily.

*** All filter backwash discharges must be treated prior to discharging from Outfall 001A.

****Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: Outfall 001A (Treated Filter Backwash from Treatment Unit #1)

PART I

A. **EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

2. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 002A. (Consisting of Treated Filter Backwash from Treatment Unit # 2). Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations Quantity - lbs./day		Concentration - specify units		Monitoring Requirement		
	Average Monthly	Maximum Daily	Average Monthly *(Minimum)	Average Weekly *(Average)	Maximum Daily *(Maximum)	Measurement Frequency	Sample Type
Flow	0.37 MGD	--- MGD				Continuous	Recorder
TSS	93 lb/day	155 lb/day	30 mg/l		50 mg/l	2/Month	Composite[1]
Turbidity			--- NTU		--- NTU	2/Month	Composite[1]
pH			(6.5 S.U.)		(9.0 S.U.)	2/Month	Grab[2]
Total Residual Chlorine[3]			2.0 mg/l		2.0 mg/l	2/Month	Grab
Total Aluminum			13 mg/l		110 mg/l	2/Month	Composite[1]
Total Cadmium			--- mg/l		--- mg/l	1/Quarter	Composite[1]
Total Lead			--- mg/l		--- mg/l	1/Quarter	Composite[1]

[1]All composite sampling must consist of a minimum of four (4) grabs spaced equally apart during a typical filter backwash discharge.

[2] Compliance with these limitations shall be determined by taking a minimum of one (1) grab sample. The grab sample must be analyzed for pH immediately (<15 minutes after sample collection). The maximum value to be reported is the highest individual measurement obtained during the monitoring period. The minimum value to be reported is the lowest individual measurement obtained during the monitoring period.

[3]The following methods may be used to analyze the grab samples: (1) DPD Spectrophotometric, EPA No. 330.5 or Standard Methods (18th Edition) No. 4500-Cl G; (2) DPD Titrimetric (ferrous titrimetric), EPA No. 330.4 or Standard Methods (18th edition) No. 4500-Cl F; (3) Amperometric titration, EPA No. 330.1 or Standard Methods (18th edition) No. 4500-Cl D; (4) Iodometric Direct Titration, EPA No. 330.3 or Standard Methods (18th edition) No. 4500-Cl B; (5) Iodometric Back Titration, EPA No. 330.2 or Standard Methods (18th edition) No. 4500-Cl C.

--- signifies a parameter which must be monitored and data must be reported; no limit has been established at this time.

* Average Monthly Flow is calculated by dividing the total filter backwash flow per month by the total number of discharge days for the outfall during the corresponding month.

** Values in parentheses ( ) are to be reported as Minimum/Maximum for the reporting period rather than Average Monthly/Maximum Daily.

*** All filter backwash discharges must be treated prior to discharging from Outfall 002A.

****Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: Outfall 002A (Treated Filter Backwash from Treatment Unit #2).

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

3. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 003A. (Consisting of Treated Filter Backwash from Treatment Unit #3). Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations Quantity - lbs./day		Concentration - specify units		Monitoring Requirement		
	Average Monthly	Maximum Daily	Average Monthly *(Minimum)	Average Weekly *(Average)	Maximum Daily *(Maximum)	Measurement Frequency	Sample Type
Flow	0.37 MGD	--- MGD				Continuous	Recorder
TSS	93 lb/day	155 lb/day	30 mg/l		50 mg/l	2/Month	Composite[1]
Turbidity			--- NTU		--- NTU	2/Month	Composite[1]
pH			(6.5 S.U.)		(9.0 S.U.)	2/Month	Grabs[2]
Total Residual Chlorine[3]			2.0 mg/l		2.0 mg/l	2/Month	Grab
Total Aluminum			13 mg/l		110 mg/l	2/Month	Composite[1]
Total Cadmium			--- mg/l		--- mg/l	1/Quarter	Composite[1]
Total Lead			--- mg/l		--- mg/l	1/Quarter	Composite[1]

[1]All composite sampling must consist of a minimum of four (4) grabs spaced equally apart during a typical filter backwash discharge.

[2] Compliance with these limitations shall be determined by taking a minimum of one (1) grab sample. The grab sample must be analyzed for pH immediately (<15 minutes after sample collection). The maximum value to be reported is the highest individual measurement obtained during the monitoring period. The minimum value to be reported is the lowest individual measurement obtained during the monitoring period.

[3]The following methods may be used to analyze the grab samples: (1) DPD Spectrophotometric, EPA No. 330.5 or Standard Methods (18th Edition) No. 4500-Cl G; (2) DPD Titrimetric (ferrous titrimetric), EPA No. 330.4 or Standard Methods (18th edition) No. 4500-Cl F; (3) Amperometric titration, EPA No. 330.1 or Standard Methods (18th edition) No. 4500-Cl D; (4) Iodometric Direct Titration, EPA No. 330.3 or Standard Methods (18th edition) No. 4500-Cl B; (5) Iodometric Back Titration, EPA No. 330.2 or Standard Methods (18th edition) No. 4500-Cl C.

--- signifies a parameter which must be monitored and data must be reported; no limit has been established at this time.

* Average Monthly Flow is calculated by dividing the total filter backwash flow per month by the total number of discharge days for the outfall during the corresponding month.

** Values in parentheses ( ) are to be reported as Minimum/Maximum for the reporting period rather than Average Monthly/Maximum Daily.

*** All filter backwash discharges must be treated prior to discharging from Outfall 003A.

****Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: Outfall 003A (Treated Filter Backwash from Treatment Unit #3).

4. The pH of the effluent must be in the range of 6.5 - 9.0 standard units.

5. The discharge shall not cause visible discoloration of the receiving waters.

6. The effluent shall contain neither a visible oil sheen, foam, nor floating solids at any time.

7. The turbidity of the receiving water shall not exceed 10 NTU over natural background.

8. Solids, sludges, or biosolids removed in the course of treatment or control of wastewaters, shall be properly disposed of in compliance with applicable state laws, regulations, and permit requirements, and in a manner such as to prevent any pollutant from such materials from entering the waters of the state.

9. The permittee is required to maintain and implement a comprehensive Residuals Management Plan. The components of the Residuals Management Plan must include the following:

    a. Characterization of the form, quantity, and quality of the residuals;

    b. Determination of the appropriate regulatory requirements;

    c. Identification of feasible disposal options;

    d. Selection of appropriate residuals processing/treatment technologies and development of a residuals management strategy that meets the regulatory goals established for the water treatment facility;

    e. Development of best management practices which at a minimum include the following: a) an evaluation of the water treatment residuals storage capacity within each residuals treatment unit and identification of criteria which will serve as a trigger to determine when treatment units (i.e. lagoons, equalization basins, etc.) need to be pulled offline in order to avoid short circuiting and potential permit violations; b) development of procedures and periodic evaluation techniques necessary to gauge the remaining storage capacity of residuals treatment units; c) an evaluation of the need for coordination between WTP operators and personnel responsible for the operation of the WTP residuals treatment units; d) development of maintenance procedures to deactivate and prepare treatment units for sludge removal. These maintenance procedures must identify the appropriate steps necessary to temporarily lower the water level in the treatment unit, remove settled sludges, and restore the flow through the treatment unit in such a way that degradation of the receiving waters and permit violations will be prevented;

    f. A requirement that all critical activities associated with the operations and maintenance of the water treatment plant residuals treatment units be documented and copies of such documentation be kept on site at all times throughout the effective life of the permit;

    g. A requirement to review the Residuals Management Plan (at a minimum) on a yearly basis, which also requires the Plan to be updated as necessary. A copy of the Residuals Management Plan and records of the annual reviews must be available on site at all times throughout the effective life of the permit.

The DEM may notify the permittee at any time that the Residuals Management Plan is deficient or does not meet one or more of the minimum requirements of the permit. After such notification from the DEM, the permittee shall make changes to the Residuals Management Plan and shall submit to the DEM a written certification that the requested changes have been made. Unless

otherwise provided by the DEM, the permittee shall have thirty (30) days after such notification to make the necessary changes. The permittee shall immediately amend the Residuals Management Plan if it proves to be ineffective in achieving the general objectives of controlling pollutants in discharges associated with the water treatment facility. Changes must be noted and then submitted to the DEM within thirty (30) days of amending the Residuals Management Plan. Amendments to the Residuals Management Plan may be reviewed by the DEM in the same manner as specified above.

10. This permit authorizes the use of aluminum based water treatment chemicals, hydrated lime, Magnafloc E30 (polyacrylamide), and chlorine as indicated in the permit application. The permittee must notify the DEM and obtain written approval prior to using any other chemicals.

11. All existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Director as soon as they know or have reason to believe:

    a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

        (1) One hundred micrograms per liter (100 ug/l);

        (2) Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitro-phenol; and one milligram per liter (1 mg/l) for antimony;

        (3) Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 C.F.R. s122.21(g)(7); or

        (4) Any other notification level established by the Director in accordance with 40 C.F.R. s122.44(f) and Rhode Island Regulations.

    b. That any activity has occurred or will occur which would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

        (1) Five hundred micrograms per liter (500 ug/l);

        (2) One milligram per liter (1 mg/l) for antimony;

        (3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 C.F.R. s122.21(g)(7); or

        (4) Any other notification level established by the Director in accordance with 40 C.F.R. s122.44(f) and Rhode Island Regulations.

    c. That they have begun or expect to begin to use or manufacture as an intermediate or final product or by-product any toxic pollutant which was not reported in the permit application.

12. This permit serves as the State's Water Quality Certificate for the discharges described herein.

B. **DETECTION LIMITS**

The permittee shall assure that all wastewater testing required by this permit, is performed in conformance with the method detection limits listed below. In accordance with 40 CFR Part 136, EPA approved analysis techniques, quality assurance procedures and quality control procedures shall be followed for all reports required to be submitted under the RIPDES program. These procedures are described in "Methods for the Determination of Metals in Environmental Samples" (EPA/600/4-91/010) and "Methods for Chemical Analysis of Water and Wastes" (EPA/600/4-79/020).

The report entitled "Methods for the Determination of Metals in Environmental Samples" includes a test which must be performed in order to determine if matrix interferences are present, and a series of tests to enable reporting of sample results when interferences are identified. Each step of the series of tests becomes increasingly complex, concluding with the complete Method of Standard Additions analysis. The analysis need not continue once a result which meets the applicable quality control requirements has been obtained. Documentation of all steps conducted to identify and account for matrix interferences shall be documented and maintained onsite.

If, after conducting the complete Method of Standard Additions analysis, the laboratory is unable to determine a valid result, the laboratory shall report "could not be analyzed". Documentation supporting this claim shall be maintained onsite. If valid analytical results are repeatedly unobtainable, DEM may require that the permittee determine a method detection limit (MDL) for their effluent or sludge as outlined in 40 CFR Part 136, Appendix B.

When calculating sample averages for reporting on discharge monitoring reports (DMRs):

1. "could not be analyzed" data shall be excluded, and shall not be considered as failure to comply with the permit sampling requirements;

2. results reported as less than the MDL shall be reported as zero in accordance with the DEM's DMR Instructions, provided that all appropriate EPA approved methods were followed.

Therefore, all sample results shall be reported as: an actual value, "could not be analyzed", or zero. The effluent or sludge specific MDL must be calculated using the methods outlined in 40 CFR Part 136, Appendix B. Samples which have been diluted to ensure that the sample concentration will be within the linear dynamic range shall not be diluted to the extent that the analyte is not detected. If this should occur the analysis shall be repeated using a lower degree of dilution.

LIST OF TOXIC POLLUTANTS

The following list of toxic pollutants has been designated pursuant to Section 307(a)(1) of the Clean Water Act. The Method Detection Limits (MDLs) represent the required Rhode Island MDLs.

Volatiles - EPA Method 624		MDL ug/l (ppb)
1V	acrolein	10.0
2V	acrylonitrile	5.0
3V	benzene	1.0
5V	bromoform	1.0
6V	carbon tetrachloride	1.0
7V	chlorobenzene	1.0
8V	chlorodibromomethane	1.0
9V	chloroethane	1.0
10V	2-chloroethylvinyl ether	5.0
11V	chloroform	1.0
12V	dichlorobromomethane	1.0
14V	1,1-dichloroethane	1.0
15V	1,2-dichloroethane	1.0
16V	1,1-dichloroethylene	1.0
17V	1,2-dichloropropane	1.0
18V	1,3-dichloropropylene	1.0
19V	ethylbenzene	1.0
20V	methyl bromide	1.0
21V	methyl chloride	1.0
22V	methylene chloride	1.0
23V	1,1,2,2-tetrachloroethane	1.0
24V	tetrachloroethylene	1.0
25V	toluene	1.0
26V	1,2-trans-dichloroethylene	1.0
27V	1,1,1-trichloroethane	1.0
28V	1,1,2-trichloroethane	1.0
29V	trichloroethylene	1.0
31V	vinyl chloride	1.0

Acid Compounds - EPA Method 625		MDL ug/l (ppb)
1A	2-chlorophenol	1.0
2A	2,4-dichlorophenol	1.0
3A	2,4-dimethylphenol	1.0
4A	4,6-dinitro-o-cresol	1.0
5A	2,4-dinitrophenol	2.0
6A	2-nitrophenol	1.0
7A	4-nitrophenol	1.0
8A	p-chloro-m-cresol	2.0
9A	pentachlorophenol	1.0
10A	phenol	1.0
11A	2,4,6-trichlorophenol	1.0

Pesticides - EPA Method 608		MDL ug/l (ppb)
1P	aldrin	0.059
2P	alpha-BHC	0.058
3P	beta-BHC	0.043
4P	gamma-BHC	0.048
5P	delta-BHC	0.034
6P	chlordane	0.211
7P	4,4 ' -DDT	0.251
8P	4,4 ' -DDE	0.049
9P	4,4 ' -DDD	0.139
10P	dieldrin	0.082
11P	alpha-endosulfan	0.031
12P	beta-endosulfan	0.036
13P	endosulfan sulfate	0.109
14P	endrin	0.050
15P	endrin aldehyde	0.062
16P	heptachlor	0.029
17P	heptachlor epoxide	0.040

Pesticides - EPA Method 608		MDL ug/l (ppb)
18P	PCB-1242	0.289
19P	PCB-1254	0.298
20P	PCB-1221	0.723
21P	PCB-1232	0.387
22P	PCB-1248	0.283
23P	PCB-1260	0.222
24P	PCB-1016	0.494
25P	toxaphene	1.670

Base/Neutral - EPA Method 625		MDL ug/l (ppb)
1B	acenaphthene *	1.0
2B	acenaphthylene *	1.0
3B	anthracene *	1.0
4B	benzidine	4.0
5B	benzo(a)anthracene *	2.0
6B	benzo(a)pyrene *	2.0
7B	3,4-benzofluoranthene *	1.0
8B	benzo(ghi)perylene *	2.0
9B	benzo(k)fluoranthene *	2.0
10B	bis(2-chloroethoxy)methane	2.0
11B	bis(2-chloroethyl)ether	1.0
12B	bis(2-chloroisopropyl)ether	1.0
13B	bis(2-ethylhexyl)phthalate	1.0
14B	4-bromophenyl phenyl ether	1.0
15B	butylbenzyl phthalate	1.0
16B	2-chloronaphthalene	1.0
17B	4-chlorophenyl phenyl ether	1.0
18B	chrysene *	1.0
19B	dibenzo (a,h)anthracene *	2.0
20B	1,2-dichlorobenzene	1.0
21B	1,3-dichlorobenzene	1.0
22B	1,4-dichlorobenzene	1.0
23B	3,3 ' -dichlorobenzidine	2.0
24B	diethyl phthalate	1.0
25B	dimethyl phthalate	1.0
26B	di-n-butyl phthalate	1.0
27B	2,4-dinitrotoluene	2.0
28B	2,6-dinitrotoluene	2.0
29B	di-n-octyl phthalate	1.0
30B	1,2-diphenylhydrazine (as azobenzene)	1.0
31B	fluoranthene *	1.0
32B	fluorene *	1.0
33B	hexachlorobenzene	1.0
34B	hexachlorobutadiene	1.0
35B	hexachlorocyclopentadiene	2.0
36B	hexachloroethane	1.0
37B	indeno(1,2,3-cd)pyrene *	2.0
38B	isophorone	1.0
39B	naphthalene *	1.0
40B	nitrobenzene	1.0
41B	N-nitrosodimethylamine	1.0
42B	N-nitrosodi-n-propylamine	1.0
43B	N-nitrosodiphenylamine	1.0
44B	phenanthrene *	1.0
45B	pyrene *	1.0
46B	1,2,4-trichlorobenzene	1.0

OTHER TOXIC POLLUTANTS

	MDL ug/l (ppb)
Antimony, Total	3.0
Arsenic, Total	1.0
Beryllium, Total	0.2
Cadmium, Total	0.1
Chromium, Total	1.0
Chromium, Hexavalent	20.0
Copper, Total	1.0
Lead, Total	1.0
Mercury, Total	0.2
Nickel, Total	1.0
Selenium, Total	2.0
Silver, Total	0.5
Thallium, Total	1.0
Zinc, Total	5.0
Asbestos	**
Cyanide, Total	10.0
Phenols, Total	50.0
TCDD	**
MTBE (Methyl Tert Butyl Ether)	1.0
Turbidity	0.2 NTU
Fecal Coliform	2.0 MPN/100 ml

** No Rhode Island Department of Environmental Management (RIDEM) MDL

NOTE:
The MDL for a given analyte may vary with the type of sample. MDLs which are determined in reagent water may be lower than those determined in wastewater due to fewer matrix interferences. Wastewater is variable in composition and may therefore contain substances (interferents) that could affect MDLs for some analytes of interest. Variability in instrument performance can also lead to inconsistencies in determinations of MDLs.

To help verify the absence of matrix or chemical interference the analyst is required to complete specific quality control procedures. For the metals analyses listed above the analyst must withdraw from the sample two equal aliquots; to one aliquot add a known amount of analyte, and then dilute both to the same volume and analyze. The unspiked aliquot multiplied by the dilution factor should be compared to the original. Agreement of the results within 10% indicates the absence of interference. Comparison of the actual signal from the spiked aliquot to the expected response from the analyte in an aqueous standard should help confirm the finding from the dilution analysis. (Methods for Chemical Analysis of Water and Wastes EPA-600/4-79/020).

For Methods 624 and 625 the laboratory must on an ongoing basis, spike at least 5% of the samples from each sample site being monitored. For laboratories analyzing 1 to 20 samples per month, at least one spiked sample per month is required. The spike should be at the discharge permit limit or 1 to 5 times higher than the background concentration determined in Section 8.3.2, whichever concentration would be larger. (40 CFR Part 136 Appendix B Method 624 and 625 subparts 8.3.1 and 8.3.11).

C. MONITORING AND REPORTING

The monitoring program in the permit specifies sampling and analysis, which will provide continuous information on compliance and the reliability and effectiveness of the installed pollution abatement equipment. The approved analytical procedures found in 40 CFR Part 136 are required unless other procedures are explicitly required in the permit. The Permittee is obligated to monitor and report sampling results to the DEM within the time specified within the permit.

Unless otherwise specified in this permit, the permittee shall submit reports, requests, and information and provide notices in the manner described in this section.

1. Submittal of DMRs Using NetDMR

   The permittee shall continue to submit its monthly monitoring data in discharge monitoring reports (DMRs) to DEM no later than the 15th day of the month electronically using NetDMR. When the permittee submits DMRs using NetDMR, it is not required to submit hard copies of DMRs to DEM.

2. Submittal of Reports as NetDMR Attachments

   Unless otherwise specified in this permit, the permittee must submit electronic copies of documents in NetDMR that are directly related to the DMR. These include the following:

   - DMR Cover Letters
   - Below Detection Limit summary tables
   - Monthly Operating Reports

3. Submittal of Reports in Hard Copy Form

   The following notifications and reports shall be submitted as hard copy with a cover letter describing the submission. These reports shall be signed and dated originals submitted to DEM.

   A. Written notifications required under Part II
   B. Notice of unauthorized discharges

   This information shall be submitted to DEM at the following address:

   Rhode Island Department of Environmental Management
   RIPDES Program
   235 Promenade Street
   Providence, Rhode Island 02908

4. Verbal Reports and Verbal Notifications

   Any verbal reports or verbal notifications, if required in Parts I and/or II of this permit, shall be made to the DEM. This includes verbal reports and notifications which require reporting within 24 hours. (See Part II.(I)(5) General Requirements for 24-hour reporting) Verbal reports and verbal notifications shall be made to DEM at (401) 222-4700 or (401) 222-3070 at night.

2.

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
235 PROMENADE STREET
PROVIDENCE, RHODE ISLAND 02908-5767

STATEMENT OF BASIS

RHODE ISLAND POLLUTANT DISCHARGE ELIMINATION SYSTEM (RIPDES) PERMIT TO DISCHARGE TO WATERS OF THE STATE

RIPDES PERMIT NO.

RI0001627

NAME AND ADDRESS OF APPLICANT:

City of Woonsocket
169 Main Street
Woonsocket, RI 02895

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Woonsocket Water Treatment Plant
1500 Manville Road
Woonsocket, Rhode Island 02895

RECEIVING WATER:

Blackstone River

CLASSIFICATION:

B1

I. Proposed Action, Type of Facility, and Discharge Location

The above named applicant has applied to the Rhode Island Department of Environmental Management (DEM) for reissuance of a RIPDES Permit to discharge into the designated receiving water. The facility is involved in the production of potable water for "domestic" and "industrial" uses. The discharge is from three outfalls associated with the backwashing of three water treatment units used for the production of potable water. The bulk of the total settled residuals produced in each of the three treatment units is discharged directly to the Woonsocket Waste Water Treatment Facility under the authorization of the Woonsocket Waste Water Treatment Plant Industrial Pretreatment Program. This permit only authorizes the discharge of treated filter backwash to the Blackstone River.

II. Permit Limitations and Conditions

The effluent limitations, monitoring requirements, and any implementation schedule (if required) may be found in the draft permit. A quantitative description of the discharge in terms of significant effluent parameters based on historic discharge monitoring report (DMR) data is shown in Attachment 1. When the 2006 permit was issued it was determined that the discharges from outfalls 001A, 002A, and 003A would not comply with certain permit limitations and requirements applicable to these outfalls. By a letter dated October 10, 2006 the City requested an administrative hearing and moved to stay certain conditions of the RIPDES permit for pH, Total Suspended Solids, and the mandatory filter backwash treatment requirements applicable to

outfalls 001A, 002A, and 003A. The DEM granted the stay request for outfalls 001A, 002A, and 003A. Consent Agreement No. RIA-382 was subsequently signed on June 27, 2008 which provided interim limitations for outfalls 001A, 002A, and 003A and a schedule for the City to bring the discharges into compliance with the 2006 permit limitations. On January 14, 2010 the City completed the installation of the pH adjustment system in order to comply with pH limitations. The consent agreement included a compliance schedule to bring the City into compliance with the TSS and mandatory filter backwash treatment requirements applicable to outfalls 001A, 002A, and 003A. The compliance option selected by the City was the construction of a new water treatment plant which would eliminate the need for a surface water discharge. The City of Woonsocket indicated to the DEM that upgrading or replacing the existing water treatment plant was also required as a result of the aging infrastructure present at the facility in addition to anticipated changes to the drinking water quality criteria. The original deadline established in RIA-382 to eliminate all discharges from the existing water treatment plant was March 1, 2013. In a letter dated May 26, 2010 the City requested modifications to the consent agreement. On June 19, 2012 a modified Consent Agreement No. RIA-382 was established and executed by both parties establishing interim milestones with a deadline to complete startup and initiation of operations of a new water treatment plant and elimination of all discharges by May 1, 2016. In December 2015 the City requested further modifications to RIA-382. The City projects that a Design-Build-Operate (DBO) contract will be awarded to the selected vendor by July 31, 2016. The City has also requested at this same time an extension to the deadline for completion of the new water treatment plant and elimination of the discharge to December 31, 2019. The DEM has revised RIA-382 to contain these new deadlines. Once this permit is finalized the City will be subject to interim limits for TSS and the mandatory filter backwash treatment requirements for Outfalls 001A, 002A, and 003A under Consent Agreement No. RIA-382 until the discharge is eliminated on December 31, 2019.

III. Permit Basis and Explanation of Effluent Limitation Derivation

The Facility

The City of Woonsocket operates a Water Treatment Plant at 1500 Manville Road in Woonsocket, RI. The Woonsocket Water Treatment Plant (WTP) is engaged in the treatment of water to produce potable water for "domestic" and "industrial" uses. The plant receives raw water from a combination of sources which include a series of ponds and reservoirs. The WTP utilizes surface water from the Crookfall Brook and Harris Pond Watersheds. The Crookfall Brook watershed, located within the town of Smithfield, North Smithfield, and Lincoln consists of Reservoir #3, Reservoir #1, and Crookfall Brook. The Crookfall Brook is the primary source for the WTP and extends over approximately 7.93 mi^2. The Harris Pond watershed area is used as a supplemental source on an as needed basis and consists of approximately 33.3 mi^2 extending through Massachusetts including the communities of Blackstone, Mendon, Hopedale, Upton, Bellingham, and Milford.

Treatment Process

The plant treats raw surface water by a series of processes. The first step in the process includes pretreatment by chemical addition. Incoming raw water is treated with the following pretreatment chemicals: aluminum sulfate, hydrated lime (as needed), chlorine (as needed), and non-ionic polymer. Once the pretreatment chemical addition process is complete, the pretreated water enters a static mixing chamber and then is directed to one of three units designed for flocculation, clarification, and filtration. Following the flocculation and clarification process settled sludge is discharged directly to the Woonsocket Waste Water Treatment Plant Sanitary Sewer system on a daily basis. The Woonsocket WTP currently holds an industrial user permit for these discharges as authorized by the Woonsocket Waste Water Treatment Plant Industrial Pretreatment Program. Once filtration has occurred chlorine, fluoride, and a corrosion inhibitor is added to the treated water prior to entering one of the two clear wells. Once the treated water exits the clear wells, it is then

treated with lime and enters the distribution system. The surface water discharge consists of filter backwash originating from each of the three filtration units. During normal operation of the plant backwashing from any one of the three filtration units takes place approximately three days per week in the winter and four days per week in the summer due to higher seasonal demands on the treatment system. Based on historical operating data provided by the City of Woonsocket, the monthly average discharge flow limit has been set at 0.37 MGD. The treatment plant may backwash one of the filters any day of the week, although under certain circumstances two of the filters may be discharged in one day for a total backwash flow of 0.8 MGD. Each filtration unit discharges to a separate outfall. The outfalls discharge directly into the Blackstone River and are designated as 001A, 002A, and 003A. The Woonsocket WTP process diagram is included in Attachment 2.

Discharge Location

The discharges from this facility exit through outfalls 001A, 002A, and 003A and enter the Blackstone River which is designated in the RI Water Quality Regulations as Water Body ID No. RI0001003R – 01A. This segment of the Blackstone River begins at the Massachusetts-Rhode Island border and extends to the Combined Sewer Outfall located at River and Samoset Streets in Central Falls. This segment is located in the following municipalities: Woonsocket, North Smithfield, Cumberland, Lincoln, and Central Falls. This water body is classified as Class B1 which according to the RI Water Quality Regulations are waters which are designated for primary and secondary contact recreational activities and fish and wildlife habitat. They shall be suitable for compatible industrial processes and cooling, hydropower, aquacultural uses, navigation, and irrigation and other agricultural uses. These waters shall have good aesthetic value. Primary contact recreational activities may be impacted due to pathogens from approved wastewater discharges. However all Class B criteria must be met.

The attainment of the Clean Water Act goals is measured by determining how well waters support their designated uses. According to the 2014 303(d) List of Impaired Waters this segment of the Blackstone River is listed as not supporting the fish and wildlife habitat use due to impairments associated with Benthic-Macroinvertebrate Bioassessments, Cadmium, Eurasian Water Milfoil, Myriophyllum Spicatum, Lead, Non-Native Aquatic Plants, Dissolved Oxygen, and Total Phosphorus. In addition, this waterbody segment is not supporting the fish consumption use due to impairments associated with Mercury and PCBs in Fish Tissue. This waterbody segment is not supporting primary and secondary contact recreational uses due to impairments associated with Enterococcus and Fecal Coliform.

General Requirements

Development of RIPDES permit limitations is a multi-step process consisting of the following steps: identifying applicable technology-based limits; calculating allowable water-quality based discharge levels based on instream criteria, background data and available dilution; establishing Best Professional Judgement (BPJ) limits in accordance with Section 402 of the CWA; and assigning the most stringent as the final discharge limitations.

Water quality criteria are comprised of numeric and narrative criteria. Numeric criteria are scientifically derived ambient concentrations developed by EPA or States for various pollutants of concern to protect human health and aquatic life. Narrative criteria are statements that describe the desired water quality goal. A technology-based limit is a numeric limit, which is determined by examining the capability of a treatment process to reduce or eliminate pollutants.

Appendix B of the Water Quality Regulations describes the flows used to determine compliance with the aquatic life criteria, specifying that the design flow to be utilized for aquatic life criteria shall not be exceeded at or above the lowest average 7 consecutive day low flow with an average recurrence frequency of once in 10 years (7Q10). The DEM has calculated the 7Q10 at the location

of the WTP outfalls (001A, 002A, and 003A) based on a comparison of the drainage areas for the Blackstone River at the USGS Woonsocket Gauging Station # 01112500, the drainage area for the location of the WTP outfalls, and the 7Q10 flow at Station # 01112500. Using the following steps a site specific 7Q10 flow value was determined:

Step 1: Determine the Drainage Area of the watershed that is upstream of the gauge station:

$$DA_{Upstream\ of\ Gauge} = 416\ mi^2$$

Step 2: Find the 7Q10 flow for the gauge station:

$$7Q10_{Gauge} = 102.25\ ft^3/sec$$

Step 3: Determine drainage area of the watershed that is upstream from the point of discharge:

$$DA_{Upstream\ of\ discharge} = 423\ mi^2$$

Step 4: Calculate the equivalent 7Q10 flow using the following formula:

$$7Q10_{Woonsocket\ WTP} = (7Q10_{Gauge}/DA_{Upstream\ of\ gauge}) \times (DA_{Upstream\ of\ discharge})$$

$$7Q10_{Woonsocket\ WTP} = 104\ ft^3/sec\ (cfs)$$

Based on the site specific 7Q10 flow in the Blackstone River at the location of the WTP outfalls 001A, 002A, and 003A, a dilution factor was then determined for each of the outfalls:

$$DF = \frac{Q_D + Q_{dis.}}{Q_{dis.}}$$

Where: DF = Dilution Factor
Q_D = Design Flow (Receiving Water 7Q10 Flow)
$Q_{dis.}$ = Discharge Flow

Outfall 001A, 002A, and 003A

The dilution factor was determined to be 183, based on a 7Q10 flow of 104 cfs and a monthly average discharge flow of 0.572 cfs (0.37 MGD).

Water Quality Based Permit Limitations

The allowable effluent limitations were established based on the non-class A freshwater acute and chronic aquatic life criteria and human health criteria specified in Appendix B of the Rhode Island Water Quality Regulations, as amended, using 80% allocation when no background data was available or background data is impacted by upstream sources and 90% allocation when background data is available. Since either there is no background data available, or the background data is impacted by upstream sources, the allowable water quality-based discharge levels are set equal to 80% of the water quality criteria for Class B waters as listed in Appendix B of the Rhode Island Water Quality Regulations. Aquatic life criteria have been established to ensure the protection and propagation of aquatic life while human health criteria represent the pollutant levels that would not result in a significant risk to public health from ingestion of aquatic organisms. The more stringent of the two criteria was then used in establishing allowable effluent limitations.

For water quality-based limitations the allowable discharge limits were calculated as follows:

Background concentration unknown or available data is impacted by sources that have not yet achieved water quality based limits.

$$Limit_1 = (DF)^* (Criteria)^*(80\%)$$

In accordance with 40 CFR 122.44(d)(1)(iii), water quality based effluent limitations are only required for those pollutants in the discharge that have the reasonable potential to cause or contribute to the exceedence of instream criteria. In order to evaluate the need for permit limits, the allowable monthly average (chronic) and allowable maximum daily (acute) discharge concentrations are compared to the monthly average and maximum daily Discharge Monitoring Report (DMR) data or other monitoring data.

Total Suspended Solids

The previous permit issued on September 13, 2006 included monthly average and daily maximum TSS limitations of 30 mg/l monthly average and 50 mg/l daily maximum. These permit limits were assigned based on Best Professional Judgment (BPJ). The DEM has determined that the use of the best available treatment technologies are not cost prohibitive and that by using the best available treatment technologies such as a settling lagoon or other device(s) whereby comparable control of suspended solids is possible, the 30 mg/l and 50 mg/l TSS limitations can be achieved. According to the U.S. Environmental Protection Agency Filter Backwash Recycling Rule Technical Guidance Manual, there are several options available for solids separation from spent filter backwash water and other residual waste streams. Typical treatment technologies that are available to meet these limitations are settling lagoons, sand drying beds, mechanical dewatering systems such as tube and plate settlers and centrifuge equipment. Mass based limits for outfall 001A, 002A, and 003A were previously determined using the concentration based limits and the monthly average flow limit of 0.37 MGD resulting in TSS loading limits of 93 lb/day monthly average and 155 lb/day daily maximum. These previous TSS concentration and loading based permit limitations have been carried forward in this permit.

Turbidity

Turbidity monitoring requirements have been included in this permit in order to establish a database of NTU data that can be used to determine compliance with water quality criteria. The permit also includes a narrative condition that the receiving water's turbidity not be increased more than 10 NTU over background.

Total Iron

The previous permit issued on September 13, 2006 required monitoring for Total Iron only during months in which iron based coagulation agents were used in the water treatment process. During all other periods sampling was not required. Since the permit was previously issued the City of Woonsocket has not used iron based water treatment chemicals at the drinking water plant. As a result, monitoring for this parameter was not conducted and effluent data was not reported. The DEM has not included monitoring requirements for Total Iron in this permit. However, this permit does authorize the use of aluminum based chemicals in the water treatment process. The permittee must notify the DEM and request a permit modification prior to using any other coagulation agents other than those specifically addressed in Part I.A.10 of the permit.

Total Aluminum

The previous permit issued on September 13, 2006 specified permit limitations for Total Aluminum due to the fact that the discharges from outfalls 001A, 002A, and 003A contain aluminum. This is due to the fact that the Woonsocket WTP utilizes Aluminum Sulfate as the primary coagulation agent in the water treatment process. Using discharge monitoring report data

from the previous five years the RIPDES program evaluated the impact that these discharges are having on the receiving water during filter backwash discharges. The following results were obtained by averaging the values submitted on the DMRs between May 2007 and September 2015: Outfall 001A (6.4 mg/l monthly average and 7.2 mg/l daily maximum), Outfall 002A (5.4 mg/l monthly average and 6.1 mg/l daily maximum), Outfall 003A (5.0 mg/l monthly average and 5.6 mg/l daily maximum). Applicable permit limitations were calculated by using the following equation:

Background concentration unknown or available data is impacted by sources that have not yet achieved water quality based limits.

$$Limit_1 = (DF)^* (Criteria)^*(80\%)$$

This calculation bears the following Total Aluminum values: Monthly Average = 13 mg/l, and Daily Maximum = 110 mg/l. Although the DMR data collected and submitted in accordance with the 2006 permit are below these values, the DEM has determined that there is reasonable potential for the discharge to violate water quality criteria for Total Aluminum and therefore permit limitations have been assigned to outfalls 001A, 002A, and 003A.

Receiving Water Body Impairments

The previous permit issued on September 13, 2006 required quarterly monitoring for Total Copper and Total Lead based on the fact that the Blackstone River from the MA-RI border to the CSO outfall located at River and Samoset Streets in Central Falls was impaired for Copper and Lead according to the State of Rhode Island 2004 303(d) List, List of Impaired Waters dated May 2005. As indicated above, the receiving water is currently listed as impaired for Total Cadmium and Total Lead and is no longer listed as impaired for Total Copper. Based on the monitoring data collected over approximately the last five years it has been determined that there is no reasonable potential for the proposed discharge from outfalls 001A, 002A, and 003A to violate the applicable permit limitations established for Copper (monthly average limit = 417 ug/l and daily maximum limit = 554 ug/l). As a result these monitoring requirements for Copper have been eliminated from the draft permit. However, since the receiving water is listed as impaired for Cadmium and Lead, monitoring for these pollutants has been included in the permit. The discharge from this facility is not expected to contribute to any of the other impairments.

Total Residual Chlorine

Total Residual Chlorine (TRC) limits have been assigned in this permit due to the fact that there is reasonable potential for the discharge to exceed water quality criteria limits for TRC. When calculating TRC limits 100% allocation of TRC was used due to the fact that chlorine is not expected to be found in ambient water and it is a non-conservative pollutant. Therefore, the permit limit is calculated using the following equation:

$$Limit_1 = (DF)^* (Criteria)^*(100\%)$$

Based on the above mentioned equation, limits for chlorine were calculated as: Monthly Average Limit = 2009 ug/l, and Maximum Daily Limit = 3470 ug/l. In order to prevent acute toxic impacts in the receiving water at the point of discharge the DEM typically applies a BPJ limit of 2.0 mg/l as a technology based limit in cases where water quality based limitations are less stringent. Therefore, a technology based limit of 2.0 mg/l has been applied.

pH

The effluent limitations for pH have been established in accordance with the Rhode Island Water Quality Regulations Table 1.8.D.(2) Class Specific Criteria – Class B Fresh Waters. Table

1.8.D.(2) Class Specific Criteria – Class B Fresh Waters specifies that the pH must be in the range of 6.5-9.0 s.u. or as naturally occurs.

Residuals Management Requirements

Water treatment plant residuals form when suspended solids in the raw water react with chemicals such as coagulants added in the treatment processes and from the addition of other process control chemicals such as lime and polymer. Some potable water treatment processes generate residuals that are relatively easy to process and dispose of. For example, leaves, limbs, logs, plastic bottles, and other large floating debris separated from water during the initial screening process can be disposed of at conventional solid waste landfills. However, most other treatment processes produce more complex residual waste streams that may require advanced processing and disposal methods to protect human health and the environment.

The primary residuals produced at the Woonsocket WTP are sludges (i.e., water that contains suspended solids from the source water and the reaction products of chemicals added in the treatment process). The Woonsocket WTP utilizes *aluminum sulfate* (for solids removal), *hydrated lime* (for pH adjustment as needed), *chlorine* (for disinfection as needed), and a *non-ionic polymer* (for additional solids removal) for the pretreatment process prior to beginning the flocculation, clarification, and filtration phase. For a typical coagulation filtration system the typical disposal options for these residuals consist of the following: landfilling, directly discharging to the sanitary sewer under authorization of the local industrial pretreatment program, or by shipping the residuals to a facility which possesses an effective Solid Waste Beneficial Use Determination (BUD) issued by the DEM Office of Waste Management. The Woonsocket WTP directs the majority of its residuals to the Woonsocket WWTF. These residuals are piped directly from the bottom of each of the flocculation, coagulation, filtration units to the Woonsocket WWTF under the authorization of the Woonsocket WWTF Industrial Pretreatment Program. Any remaining residuals produced by the treatment process are filtered in one of the three flocculation, coagulation, filtration units operated at the WTP and are discharged periodically as part of the routine filter backwashing process described previously. This permit requires that a Residuals Management Plan be maintained and implemented at the water treatment facility in order to ensure that this waste stream is properly managed. The specific Residuals Management Plan requirements can be found in the permit.

Water Treatment Chemicals

TRC, Total Aluminum, and pH limits have been assigned in the permit to regulate the concentrations of aluminum sulfate, calcium hydroxide hydrated lime (slaked lime), and liquid chlorine discharged to the Blackstone River in the filter backwash waste streams. The environmental impact of the non-ionic polymer has been evaluated based on the concentration in use in the process water prior to filter backwash operations and the toxicity information presented in the Material Safety Data Sheets (MSDS). The concentration of non-ionic polymer, identified as *Magnafloc E30 (*polyacrylamide*)*, intended for use as a coagulation and flocculation additive, listed in the permit reapplication dated February 9, 2012 is in the range of 0.1 mg/l to 0.35 mg/l. The MSDS identified the following LC50 concentrations for 96 hour toxicity tests: Bluegill LC50 > 100 mg/l, and Trout LC50 > 100 mg/l. Not considering dilution at the receiving water and the potential for a reduction in concentration of the non-ionic polymer from the pretreatment step to the final filter backwashing step, the DEM is confident that the concentrations of non-ionic polymer discharged from the WTP will have minimal adverse impact on the Blackstone River.

Stormwater

This permit does not authorize the discharge of stormwater from the facility. The Woonsocket WTP falls under Standard Industrial Classification (SIC) 4941 – Water Supply, which applies to establishments primarily engaged in distributing water for sale for domestic, commercial, and

industrial use. Based on the RIPDES Program's review it has been determined that facilities that fall under SIC code 4941 are not required to obtain coverage under the NPDES Storm Water Multi-Sector General Permit and therefore the facility is not required to apply.

Antibacksliding/Antidegradation

The Antibacksliding Provision of the Clean Water Act (found at Section 402(o) and repeated at 40 CFR 122.44(l)) prohibits reissuing a permit containing less stringent effluent limits than the comparable limits from the previous permit. Since none of the permit limits, both concentration and mass loadings, are less stringent than in the previous permit, antibacksliding regulations are being met. The draft permit is being reissued with limitations as stringent or more stringent than those in the existing permit with no change to the outfall location.

Selection of Final Permit Limits

The effluent monitoring requirements have been specified in accordance with RIPDES regulations as well as 40 CFR 122.41(j), 122.44(l), and 122.48 to yield data representative of the discharge. The Office has determined that all permit limitations are consistent with the Rhode Island Antidegradation Policy.

The remaining general and specific conditions of the permit are based on the RIPDES regulations as well as 40 CFR Parts 122 through 125 and consisting primarily of management requirements common to all permits.

IV. Comment Period, Hearing Requests, and Procedures for Final Decisions

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to the Rhode Island Department of Environmental Management, Office of Water Resources, 235 Promenade Street, Providence, Rhode Island, 02908-5767. Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to the Rhode Island Department of Environmental Management. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty (30) days public notice whenever the Director finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit the Director will respond to all significant comments and make these responses available to the public at DEM's Providence Office.

Following the close of the comment period, and after a public hearing, if such hearing is held, the Director will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice. Within thirty (30) days following the notice of the final permit decision any interested person may submit a request for a formal hearing to reconsider or contest the final decision. Requests for formal hearings must satisfy the requirements of Rule 49 of the Regulations for the Rhode Island Pollutant Discharge Elimination System.

IV. **DEM Contact**

Additional information concerning the permit may be obtained between the hours of 8:30 a.m. and 4:00 p.m., Monday through Friday, excluding holidays from:

Joseph B. Haberek, PE
RIPDES Program
Department of Environmental Management
235 Promenade Street
Providence, Rhode Island 02908
Telephone: (401) 222-4700, ext. 7715
Email: joseph.haberek@dem.ri.gov

DRAFT

Date

Joseph B. Haberek, PE
Supervising Sanitary Engineer
RIPDES Permitting Section
Office of Water Resources
Department of Environmental Management

ATTACHMENT 1

DESCRIPTION OF DISCHARGE: Filter Backwash from Water Treatment Unit No. 1
DISCHARGE: 001A

AVERAGE EFFLUENT CHARACTERISTICS AT POINT OF DISCHARGE OF SELECTED POLLUTANTS:

PARAMETER	MONTHLY AVERAGE[1]	DAILY MAXIMUM[1]
Aluminum, Total (mg/l)	6.4	7.2
Chlorine, Total Residual (mg/l)	0.03	0.05
Copper, Total (ug/l)[2]	0	0
Lead, Total (ug/l)[2]	0	0
pH (s.u.)	6.04 (MIN)	7.77(MAX)
Total Suspended Solids (lb/day)	104	113
Total Suspended Solids (mg/l)[3]	48.2	54.3
Turbidity (NTU)	18.21	21.42
Flow (mgd)	0.29	0.32

[1] All data represents the average of the monthly average data and the average of the daily maximum discharge monitoring report data submitted by the permittee for approximately the last five years (May 2007 thru September 2015).

[2] Total Copper and Total Lead data represents the average of the monthly average data and the average of the daily maximum discharge monitoring report data submitted by the permittee on a quarterly basis from June 2008 thru September 2015.

[3] Total Suspended Solids data represents the average of the monthly average data and the average of the daily maximum discharge monitoring report data submitted by the permittee for July 2008 thru September 30, 2015.

DESCRIPTION OF DISCHARGE: Filter Backwash from Water Treatment Unit No.2
DISCHARGE: 002A

AVERAGE EFFLUENT CHARACTERISTICS AT POINT OF DISCHARGE OF SELECTED POLLUTANTS:

PARAMETER	MONTHLY AVERAGE[1]	DAILY MAXIMUM[1]
Aluminum, Total (mg/l)	5.4	6.1
Chlorine, Total Residual (mg/l)	0.04	0.05
Copper, Total (ug/l)[2]	0.83	0.83
Lead, Total (ug/l)[2]	0	0
pH (s.u.)	6.12 (MIN)	7.73 (MAX)

Total Suspended Solids (lb/day)	83	92
Total Suspended Solids (mg/l)[3]	40	45
Turbidity (NTU)	15.5	17.8
Flow (mgd)	0.29	0.31

[1] All data represents the average of the monthly average data and the average of the daily maximum discharge monitoring report data submitted by the permittee for approximately the last five years (May 2007 thru September 2015).

[2] Total Copper and Total Lead data represents the average of the monthly average data and the average of the daily maximum discharge monitoring report data submitted by the permittee on a quarterly basis from June 2008 thru September 2015.

[3] Total Suspended Solids concentration data represents the average of the monthly average data and the average of the daily maximum discharge monitoring report data submitted by the permittee for July 2008 thru September 30, 2015.

DESCRIPTION OF DISCHARGE: Filter Backwash from Water Treatment Unit No. 3
DISCHARGE: 003A

AVERAGE EFFLUENT CHARACTERISTICS AT POINT OF DISCHARGE OF SELECTED POLLUTANTS:

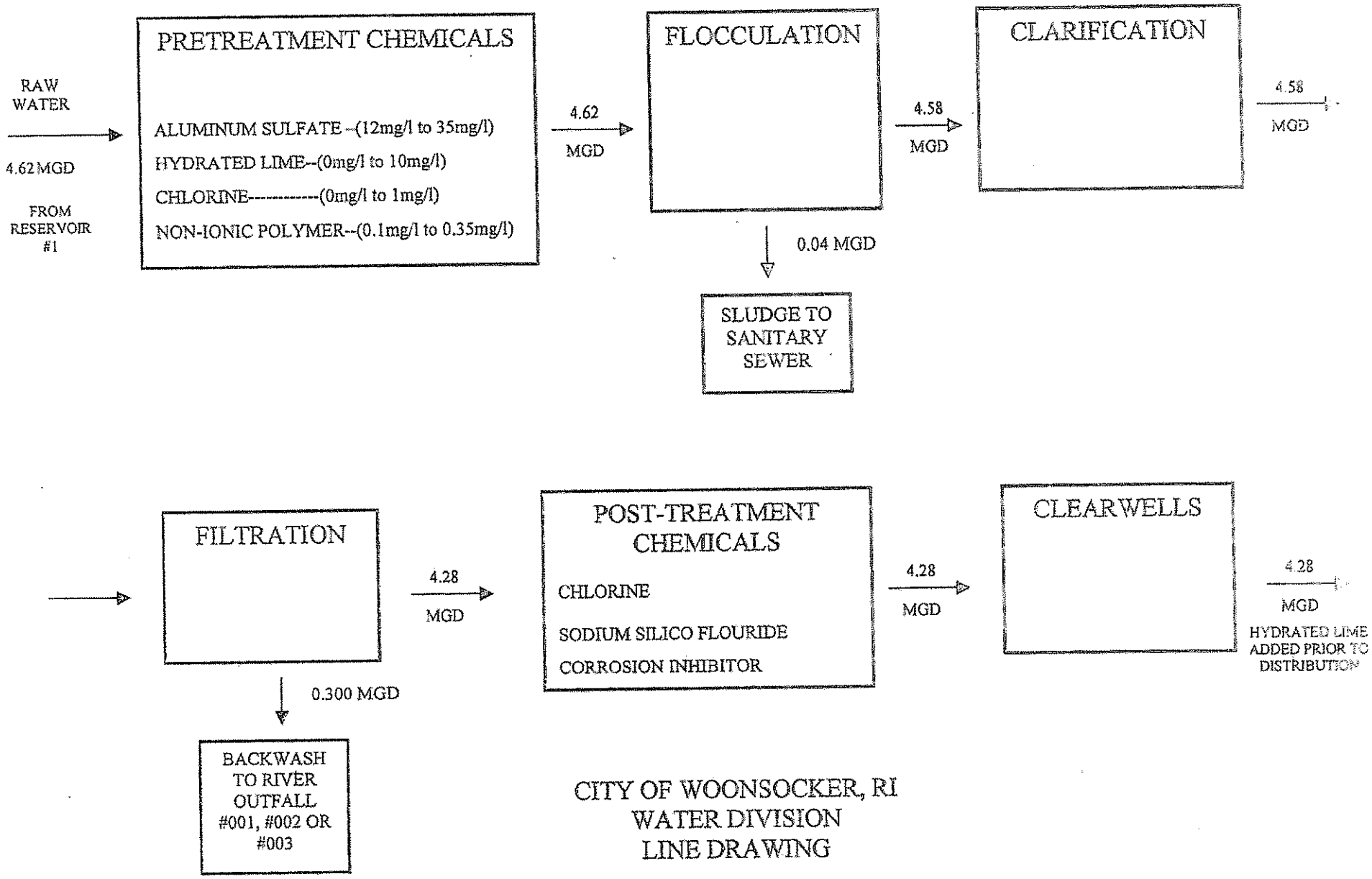
PARAMETER	**MONTHLY AVERAGE[1]**	**DAILY MAXIMUM[1]**
Aluminum, Total (mg/l)	5.0	5.6
Chlorine, Total Residual (mg/l)	0.03	0.04
Copper, Total (ug/l)[2]	1.03	1.03
Lead, Total (ug/l)[2]	0	0
pH (s.u.)	6.11	7.73
Total Suspended Solids (lb/day)	79	85
Total Suspended Solids (mg/l)[3]	37	41
Turbidity (NTU)	13.9	16.0
Flow (mgd)	0.29	0.31

[1] All data represents the average of the monthly average data and the average of the daily maximum discharge monitoring report data submitted by the permittee for approximately the last five years (May 2007 thru September 2015).

[2] Total Copper and Total Lead data represents the average of the monthly average data and the average of the daily maximum discharge monitoring report data submitted by the permittee on a quarterly basis from June 2008 thru September 2015.

[3] Total Suspended Solids data represents the average of the monthly average data and the average of the daily maximum discharge monitoring report data submitted by the permittee for July 2008 thru September 30, 2015.

ATTACHMENT 2



CITY OF WOONSOCKER, RI
WATER DIVISION
LINE DRAWING

ATTACHMENT B

Permit No. RI0001627

PART I

A. **EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

1. During the period beginning on the effective date of Consent Agreement RIA-382 and lasting until the completion of Paragraph 10(b) the permittee is authorized to discharge from outfall serial numbers 001A, 002A, and 003A. The interim TSS limits and monitoring requirements applicable to each outfall are specified below:

Effluent Characteristic	Discharge Limitations				Monitoring Requirement	
	Quantity - lbs./day		Concentration - specify units			
	Average Monthly	Maximum Daily	Average Monthly *(Minimum)	Maximum Daily *(Maximum)	Measurement Frequency	Sample Type
Total Suspended Solids	210 lb/day	307 lb/day	--- mg/l	--- mg/l	2/Month	Composite[1]

[1] All composite sampling must consist of a minimum of four (4) grabs spaced equally apart during a typical filter backwash discharge.

--- signifies a parameter which must be monitored and data must be reported; final limits are not in effect at this time.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: Outfall 001A, 002A, and 003A (Filter Backwash from Treatment Unit #1, #2, and #3 respectively).

APPENDIX B

Dam Visual Inspection Reports by Pare

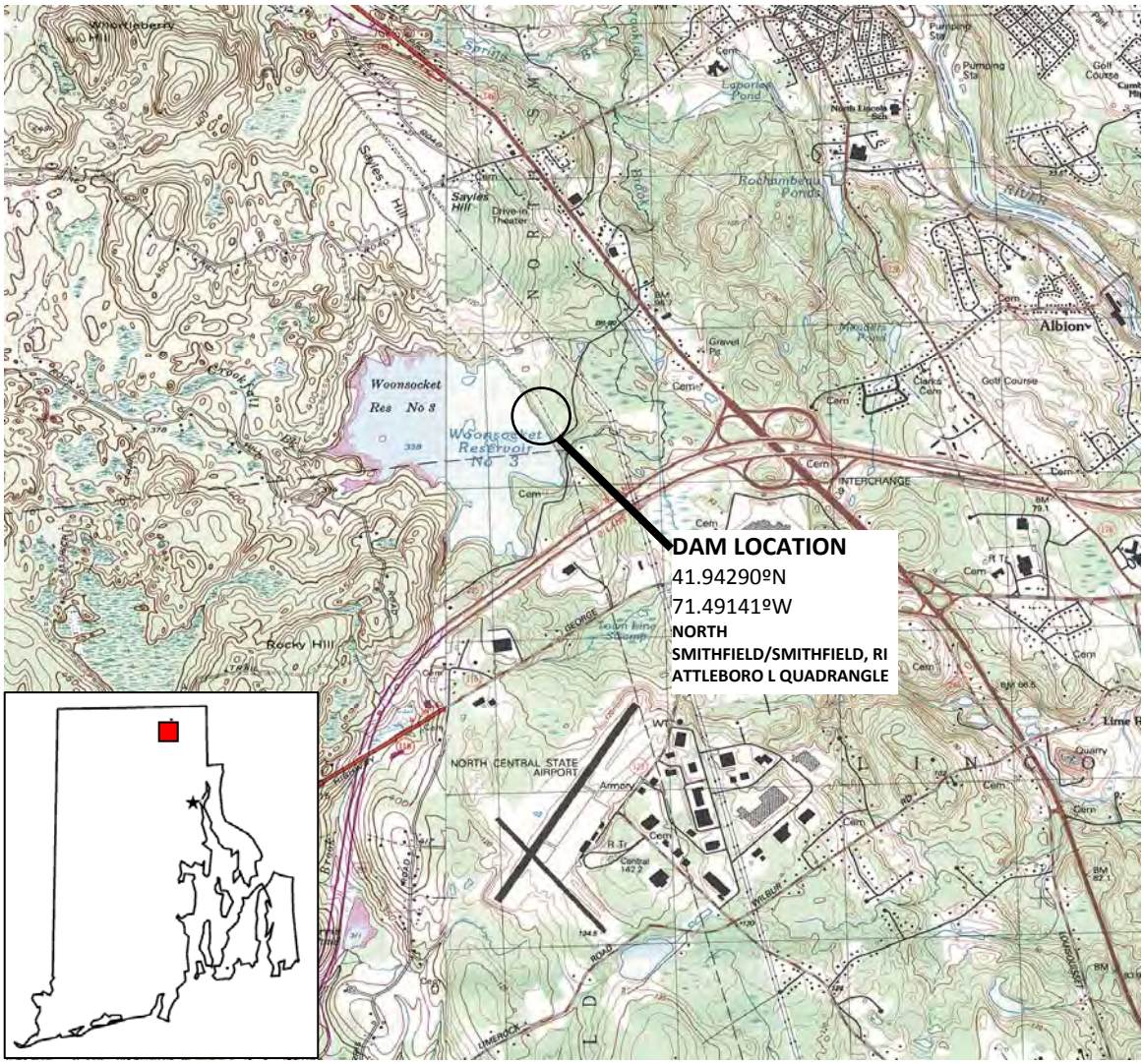
-- WOONSOCKET RESERVOIR #3 DAM --
VISUAL
INSPECTION / EVALUATION REPORT

Dam Name:	***Woonsocket Reservoir #3 Dam***
State Dam ID#:	***068***
Owner:	***City of Woonsocket***
Town:	***Smithfield/North Smithfield***
Consultant:	***Pare Corporation***
Date of Inspection:	***August 1, 2014***

PARE
CORPORATION

INSPECTION SUMMARY

Dam Name (No):	Woonsocket Reservoir #3 Dam (068)
Location:	Smithfield/North Smithfield
Hazard Classification:	High
Inspector:	David M. Matheson, P.E.
Inspection Date:	August 1, 2014



When describing the dam, "left" and "right" refer to the respective sides of the dam as viewed when facing downstream (with normal flow of water).

PREFACE

The assessment of the general condition of the dam reported herein was based upon available data and visual inspections. Detailed investigations and analyses involving topographic mapping, subsurface investigations, testing and detailed computational evaluations were beyond the scope of this report unless reported otherwise.

In reviewing this report, it should be realized that the reported condition of the dam was based on observations of field conditions at the time of inspection, along with data available to the inspection team.

It is critical to note that the condition of the dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the reported condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

J.Matthew Bellisle, P.E.
PARE CORPORATION
Senior Vice President

TABLE OF CONTENTS

1.0 DESCRIPTION OF PROJECT

1.1 General

1.1.1 Authority

The RIDEM Office of Compliance and Inspection has retained Pare Corporation of Foxboro, Massachusetts and Lincoln, Rhode Island to perform a visual inspection and develop a report of conditions for the Woonsocket Reservoir #3 Dam along the Crookfall Brook in Smithfield/North Smithfield, Rhode Island. This inspection and report were performed in accordance with current Rhode Island laws.

RIDEM will develop an overall condition rating based upon the data presented herein. It is understood that this rating will consider operational and structural deficiencies and will be presented under separate cover.

1.1.2 Purpose of Work

The purpose of this investigation was to inspect and evaluate the present condition of the dam and appurtenant structures in accordance with current dam safety regulations to provide information that will assist in both prioritizing dam repair needs and planning/conducting maintenance and operation.

The investigation was divided into three parts: 1) obtain and review reports, investigations, and data pertaining to the dam and appurtenant structures available within the Rhode Island Department of Environmental Management files; 2) perform a visual inspection of the site; and; 3) prepare and submit a final report presenting the evaluation of the structure, including recommendations and remedial actions.

1.1.3 Definitions

To provide the reader with a better understanding of the report, definitions of commonly used terms associated with dams are provided in Appendix B. Many of these terms may be included in this report. The terms are presented under common categories associated with dams which include: 1) orientation; 2) dam components; 3) hazard classification; 4) general; and 5) condition rating.

1.2 Description of Project

1.2.1 Location

The Woonsocket Reservoir #3 Dam is located in the Towns of Smithfield and North Smithfield, approximately 7.5 miles northwest of the City of Pawtucket and 4.0 miles south of Woonsocket. The dam impounds water along the Crookfall Brook to form Woonsocket Reservoir #3 and is situated along the eastern edge of the impoundment near coordinates 41.94290ºN/71.49141ºW. Please refer to the inspection summary for a locus plan depicting the area of the dam and its immediate surroundings.

To reach the dam from I-295, take exit 8B and merge onto RI-7 North/Douglas Pike/Douglas Turnpike toward North Smithfield. Turn right onto RI-116 North/George Washington Highway/Washington Highway after less than 1.0 miles. After 0.8 miles turn left onto West Reservoir Road. After 1.7 miles the dam and the impoundment will be on the left.

1.2.2 Owner/Caretaker

Woonsocket Reservoir #3 Dam was constructed in 1895 by the City of Woonsocket for water supply purposes. The City of Woonsocket has continually owned and operated the dam since that time. Operating and maintenance are the responsibility of the City of Woonsocket, Department of Public Works, Water Division. Mr. Mark Viggiani, Water Division Superintendent can be reached at 401-767-2619.

1.2.3 Purpose of the Dam

The water impounded by the dam is the primary water source for the City of Woonsocket. Water flow to Woonsocket Reservoir No. 1 and the City of Woonsocket Water Treatment Plant via Crookfall Brook and the Crookfall Brook Pipeline.

1.2.4 Description of the Dam and Appurtenances

As paraphrased from PARE's Inspection Report, dated May 2001 and updated from PARE's July 2012 Inspection report:

> The Woonsocket Reservoir #3 Dam is an earthen embankment approximately 2,225-ft. long, with a maximum height of approximately 31-ft. (dam crest to channel invert), and an average crest width of 15 ft. Record plans indicate that the dam was constructed with a stone masonry and concrete core wall. The upstream slope of the embankment is 2H to 1V and is protected by riprap. The downstream slope of the dam is 2.75H to 1V and is grassed. The crest of the dam is earthen with grass cover.
>
> The dam crest was raised 5 ft. to El. 345 in 1982 and the embankment slopes were flattened to their current configuration. Also part of the 1982 project was the addition of an emergency spillway, blanket drain, toe drain, raising the core wall, and longitudinal retaining walls adjacent to the spillway.
>
> The primary spillway is a 30-ft long uncontrolled broad crested weir with a cascaded drop. The spillway is constructed of stone masonry to approximately El. 336 with a concrete overlay to roughly El. 337 ft. The training walls are constructed of cast-in-place concrete extensions from El. 340 to 345 ft. (constructed in 1982) above stone masonry overlaid with 6 inches of shotcrete (sprayed on cementitious material). Discharges from the spillway flow into Crookfall Brook and pass beneath Reservoir Road approximately 200 ft. downstream of the spillway.
>
> The auxiliary spillway is 50 ft. long located to the right of the primary spillway. The auxiliary spillway channel is filled to about 2 feet below the dam crest elevation with what is described as random fill in the 1982 construction drawings. The surface of the fill supports a healthy turf cover. The overflow channel beneath the fill is protected by riprap at El. 341.
>
> The outlet works consists of two 20-inch diameter cast-iron pipes adjacent to the spillway. There are two gate valves on each of these pipes; controls are housed in a timber frame gatehouse at the downstream toe of the dam. Under normal operation both outlets feed the Crookfall Brook Pipeline. However, operation of two butterfly valves located downstream of the gatehouse can divert flow from one of the outlets directly to the spillway discharge channel.
>
> During the improvements in 1982, a blanket and toe drain system was installed along the downstream slope. The drainage system consists of a blanket drain laid on the original downstream slope of the dam and an 8 inch perforated pipe toe drain along the existing toe of the slope. The blanket drain consists of

one foot of crushed stone wrapped in a geotextile fabric. The blanket drain is tied to 8-inch diameter toe drain by 6-inch diameter transverse sub drains spaced at 10 to 20 foot intervals. Five manholes and clean-outs are located along the toe drain to provide access for inspection and cleaning.

1.2.5 Operations and Maintenance

The Woonsocket Water Division is responsible for operations and maintenance at the dam, including undertaking routine maintenance of vegetation along the length of the dam, completing regular inspection, and undertaking maintenance as required.

1.2.6 Hazard Potential Classification

In accordance with current classification procedures under State of Rhode Island dam safety rules and regulations, Woonsocket Reservoir #3 Dam has been classified as a High hazard potential dam by RIDEM.

2.0 INSPECTION

2.1 Visual Inspection

Woonsocket Reservoir #3 Dam was inspected on August 1, 2014. At the time of the inspection, the outside temperature was near 85°F with mostly cloudy skies. Photographs to document the current condition of the dam were taken during the inspection and are included at the end of this report. The level of the impoundment appeared to be about 12 inches below normal operating levels. Underwater areas were not inspected as part of the field activity.

For reference purposes, a baseline was established along the crest of the dam embankment. Station 0+00 was located at the left abutment and extended to Station 22+25 at the right abutment. Observations are reported in relation to their location along the baseline as noted herein.

2.1.1 General Findings

In general, Woonsocket Reservoir #3 Dam was found to have a deteriorated primary spillway with broken and missing shotcrete facing along its step and adjacent training walls below the normal waterline; minor plant growth within the main discharge channel; a drainage outlet at the primary spillway with stained flow areas; possible flow capacity impacts at the auxiliary spillway due to the presence of the security fencing; upstream slope areas with apparent sloughed and depressed riprap areas; erosion behind the left upstream training wall for the primary spillway; areas of thatched grass along the crest; and other dam safety deficiencies. The specific concerns are identified in more detail in the sections below:

2.1.2 Dam Embankment

The following was noted along the dam embankment during the inspection:

Upstream Slope

- The upstream slope is protected with stone riprap that appears to have an even coverage with recently trimmed vegetation growing within the stones.
- Apparent sloughing of the riprap has occurred along an approximate 10-foot wide area left and adjacent to the spillway.
- With the exception of sloughed area of riprap left of the primary spillway, no depressions, holes, animal activity, or unusual movement was observed along the upstream slope.
- An eroded area of about 12 inches deep is present where the upstream slope meets the left wing wall of the primary spillway.
- No cracks or unusual movement was observed at the remaining points of contact with the left abutment, the right side of the primary spillway, both sides of the auxiliary spillway, and right abutment.

Crest

- The crest is covered with a well-maintained healthy stand of grass with the exception of a few thatched grass areas along the crest between approximately stations 3+00 and 4+00.

- The alignment of the crest appeared regular.
- The stand pipes were noted along the crest and provide access to monitoring walls. The standpipes appear plumb with no indication of movement or rotation.
- No animal activity was observed.
- No cracks or unusual movement were observed at the contact areas with the left abutment, both sides of the primary spillway, both sides of the auxiliary spillway, and the right abutment.
- No holes or depressions, were along the crest surface.

Downstream Side

- The downstream slopes appear evenly graded.
- No depressions, sinkholes, leakage, seepage, or soft areas were observed along the slope and beyond its toe.
- The downstream side of the embankment to the right of the auxiliary spillway is supported by a short concrete wall which extends from the right training wall for the auxiliary spillway to the right abutment for the dam. This wall appears in good condition with a good alignment, no cracking, no depressions or sinkholes behind the wall, or signs of leakage or soft areas along the toe.
- No animal activity was observed.
- No cracks or signs of unusual movement were observed at the contact areas with the left abutment, both sides of the primary spillway, both sides of the auxiliary spillway, and the right abutment appear good.

2.1.3 Appurtenant Structures

Primary Spillway

- At the time of the inspection, the impoundment level was about 12 inches below the invert of spillway weir. Underwater areas were not inspected including the approach area, the lower sections of the concrete weir, and portions of the upstream wing walls.
- The concrete weir appeared sound with no cracking observed.
- The concrete training walls upstream of the weir appear vertical with no apparent settlement or cracking observed.
- The following was observed at the spillway steps and associated training walls:
    - The steps and walls are deteriorated with cracked and missing shotcrete facing with efflorescent staining.
    - No leakage or wet areas were noted; however, the Owner reported that leakage and wet areas develop in these areas during higher impoundment levels.
- The return walls that transition into the downstream sides of the embankment appear vertical with minor cracking with efflorescent staining.
- The approach area is clear of debris.
- The discharge channel spillway has minor water plant growth which is not expected to impact the discharge capacity.

Low Level Outlet

- The gates and associated controls to the low level outlet are located in an enclosed gatehouse left of the primary spillway.

- The gatehouse structure showed no signs of structural instability.
- The Owner's representative successfully demonstrated the operability of the low-level outlet gates. The gate operating mechanisms appeared well lubricated and opened with little resistance.
- Since the approach opening was underwater, an inspection was not possible to evaluate the condition of the trash rack and the culvert opening, and to inspect the approach bottom for sediment buildup.
- The downstream headwall at the low-level discharge appeared to have a good alignment, with no visible cracking, leakage, or stained areas.
- At the time of the inspection, the low level outlet's discharge pipe was about half underwater within the tailwater pool. The above-water sections appeared in satisfactory condition with minor surface rust.
- The discharge channel from the low-level outlet was clear of debris.

Auxiliary Spillway

- The auxiliary spillway is a grassed overflow channel protected with riprap at the waterline.
- Some gaps were observed within the riprap; however, no erosion or depressions were observed.
- The grassed areas appeared maintained with a few bare areas and no signs of erosion except for an area near the middle of the control section.
  - A thin strip of crushed stone is present along the center of the grassed approach, which appears to be a repair to an eroded area.
- The approach to the auxiliary spillway was clear of debris.
- A roughly 3 foot high chain-link security fence crosses the discharge channel directly downstream of the auxiliary spillway. As viewed from the approach, it appears that the top of fencing increases linearly in height from right to left with the left side approximately level with the control section's invert and the right side approximately level with the top of the flow opening (i.e., top of the left training wall). If the fence were to become clogged with debris during a high flow event, the presence of the fencing could impact the auxiliary spillway's designed hydraulic capacity.
- Beyond the security fencing, discharges flowing into the paved road that slopes towards the primary spillway discharge channel. These areas are clear of debris.
- An outlet located at the right wall of the channel below the primary spillway is flowing at a rate of less than 1 GPM with iron oxide staining present below the opening.

Toe Drain

- The outlet to the toe drains, discharging through the right and left walls of the downstream channel from the primary spillway, were flowing clearly at rates of about 2 and 5 GPM, respectively.

2.1.4 Downstream Area

Downstream of the dam is a primarily wooded area with RI-99 and RI-146 approximately 3,000 feet northeast of the crest of the dam. Roughly 1,300 feet from the crest of the dam high-voltage power lines traverse a cleared section of the wooded area parallel to the dam crest. Few structures exist between the dam and the above mentioned roadways, however, lining the roadways are light residential and commercial structures. In addition, the Eagle Nest Drive neighborhood exists

approximately 600 feet downstream (northeast) of RI-99 and RI-146. I-295 also runs roughly 1,300 feet southeast of the spillway.

2.1.5 Reservoir Area

The dam is along the eastern edge of the reservoir. The impoundment is approximately 2,500 feet wide (northeast to southwest) and 5,000 feet long (northwest to southeast). The perimeter of the impoundment is generally wooded with apparently stable slopes. Flows enter into the impoundment from its most westerly point via Crookfall Brook.

2.1.6 Caretaker Interview

Mr. Dan Darling, Master Maintenance Mechanic for the Woonsocket Water Division, was present during the inspection. Mr. Darling is primarily responsible for maintaining and performing operations at the dam. Information provided by Mr. Darling has been incorporated into this report.

2.2 Operation and Maintenance Procedures

An Operations and Maintenance (O&M) Manual was developed for the Owner by PARE in February 2002. The Operation and Maintenance Manual outlines the recommended inspection program and an overview of the maintenance tasks necessary to maintain the dam in an operable condition.

2.2.1 Operational Procedures

Woonsocket Reservoir No. 3 is the primary potable water supply for the City of Woonsocket in conjunction with Woonsocket Reservoir No. 1. Water is withdrawn from the reservoir via the Crookfall Brook Pipeline throughout the year on an as-needed basis.

Daily records are maintained at the Woonsocket Water Treatment Plant for this reservoir regarding discharges and water surface levels. The dam and its appurtenances are inspected weekly by the Caretaker and Water Division's operating staff.

2.2.2 Maintenance of Dam and Operating Facilities

Based on the observance of a well maintained structure, the Owner appears to be following the recommended procedures outlined in the O&M Manual. Observed maintenance includes regular mowing of the dam, rodent control, upkeep of the grass cover, and clearing of the approach and discharge channels at the spillway and outlet structures. The deteriorated spillway remains in a condition similar to that observed during the previous inspection. PARE is currently assisting the Owner with evaluating repair and/or rehabilitation alternatives for the primary spillway and evaluating the impacts of the security fencing at the auxiliary spillway.

3.0 ASSESSMENTS AND RECOMMENDATIONS

3.1 Assessments

The Woonsocket Reservoir #3 Dam was found to have the following deficiencies:

1. A deteriorated primary spillway with broken and missing shotcrete facing along the downstream face and adjacent training walls.
2. Minor plant growth within the discharge channel from the primary spillway.
3. A drainage outlet at the primary spillway with low flows.
4. The orientation of the security fencing across the discharge channel at the auxiliary spillway may partially obstruct flows if the fencing becomes clogged with debris.
5. An upstream slope with apparent sloughed and depressed riprap areas left of the primary spillway and near the right abutment, respectively.
6. An eroded area behind the left upstream training wall for the primary spillway.
7. Areas of thatched grass along the crest between approximately Stations 3+00 and 4+00.

PARE performed a previous visual inspection/evaluation of the dam on July 9, 2012 and prepared a Visual Inspection/Evaluation Report. The following table lists the major deficiencies and recommended repairs as stated within the 2012 PARE report and the current conditions of the associated deficiencies as observed by PARE during this 2014 inspection.

Previously Identified Deficiency/Recommendation	***Resolution or Current Condition***
Develop and implement a monitoring program and evaluation to further assess the stained flow at the outlet located at the right channel wall to the primary spillway.	Unknown at this time. Conditions appear to remain unchanged.
Perform an evaluation of the leakage observed at the primary spillway during higher impoundment elevations.	Under contract with the Owner, PARE will review alternatives to address the reported deterioration, cracking, displacement and leakage at the existing spillway.
Complete a video inspection and underwater inspection of the low level outlet pipe and internal components.	Unknown at this time. These routine inspections should be scheduled periodically.
Complete an underwater inspection of the upstream sides of the primary spillway.	Not completed.
Continue to clear the upstream rip rap slopes of emerging brush and weeds.	Completed and on-going
Fill the eroded areas near the right abutment and the depression behind the primary spillway's left upstream training wall.	Not completed
Reseed areas of thinning grass growth along the crest.	This is an on-going scheduled maintenance task.
Clear and maintain the emerging plant growth from the primary spillway's discharge area and from the crest of the auxiliary spillway to help maintain the hydraulic capacity of both structures.	Completed and on-going.
Complete repairs at the primary spillway.	Under contract with the Owner, PARE will review alternatives to address the reported deterioration, cracking, displacement and leakage at the existing spillway.

The following recommendations and remedial measures generally describe the recommended approach to address current deficiencies at the dam. Prior to undertaking recommended maintenance, repairs, or remedial measures, the applicability of environmental permits needs to be determined for activities that may occur within resource areas under the jurisdiction of RIDEM or other regulatory agencies.

3.2 Recommendations

The following present additional studies, routine and recurrent operations and maintenance activities, and repairs recommended to address deficiencies noted during the inspection and the completion of this report. The recommendations provided below should be implemented in accordance with general dam safety practice. Further, if left unaddressed, many of the conditions identified above will continue to deteriorate and could compromise the future safety of the dam and appurtenant structures.

1. At this time, the Owner is evaluating repair or replacement alternatives at the primary spillway with PARE's assistance. Until these repairs are completed, the Owner should have a program developed and initiated for recording observed flow rates at the observed leaks and within the adjacent drains. If observed during higher impoundment levels, relating flow rates to the level of the impoundment, and monitoring the discharge area for indications of sediment transport and volume of transported soil.

2. Complete an underwater inspection of the upstream sides of the primary spillway to evaluate the condition of the concrete, the approach and discharge channels, and the training walls. Because the leakage reportedly occurs during elevated pond levels, the underwater inspection along the upstream sides should be completed at this time to evaluate leakage sources through die testing.

3. Evaluate the potential hydraulic capacity impacts the security fencing may have on the auxiliary spillway and potential remedial measures if needed. At this time, it appears that portions of the fence's chain link mesh fall within the flow channel envelop. If this mesh were to become clogged with debris during a heavy flooding event, the capacity of the auxiliary spillway could be significantly reduced. *Note: PARE is currently working with the Owner on this potential issue.*

4. During subsequent inspections, complete video and underwater inspections of the low level outlet pipe and internal components to evaluate the condition of the culvert, intake and trash rack; and to inspect the submerged approach for sediment buildup. Depending on the results of these inspections, make repairs as necessary.

5. If not already completed, develop and implement a monitoring program and evaluation to further assess the flow at the outlet located at the right channel wall to the primary spillway. The program should include procedures for recording observed flow rates at various impoundment levels, and monitoring the discharge area for evidence and/or volume of sediment transport. At this time, conditions apparently have not changed since the previous inspection; however, the Owner should be aware that these conditions could change over time.

6. The continuation of scheduled clearing and mowing (i.e. late spring and fall) is recommended to keep the vegetation from returning along the entire dam embankment including the vegetation within the upstream riprap and within the primary spillway's discharge channel.

The clearing should extend to within or to 15 feet beyond the downstream toe. When brush is cut down, it should be removed from the dam to permit a clear view of the embankment.

7. Fill the eroded upstream area left of the primary spillway. Protect this area with rip rap to match the adjacent sections.

8. Reseed and fertilize the thatched areas along the crest to allow re-growth of grass.

9. Using riprap, fill the sloughed area along the upstream slope at the left side of the primary spillway and between the auxiliary spillway and the right abutment. Monitor the slope for horizontal and vertical movement using survey measurements performed at selected time intervals.

   If movement of the upstream slope is indicated during monitoring, the completion of a stability analysis of the upstream slope is recommended to help determine the cause of the movement. In order to complete these analyses, completion of subsurface investigations will likely be required to assess the current conditions of the embankment soils.

10. Implement a program of regular inspection and monitoring of the dam. As the dam is currently classified as a high hazard potential dam, the completion of a formal visual inspection by a RI registered professional engineer familiar with dam engineering is recommended every 2 years.

3.3 Alternatives

The following alternatives are presented based upon a conceptual review of the concerns. Additional studies and or considerations may indicate that some or all of the options presented below are not suitable for the conditions specific to this dam and dam site. In addition to the general activities, appropriate environmental permits will be required to complete many of the alternatives presented below.

Dam Removal/Breaching: As this is a major part of the water supply system to the City of Woonsocket, this alternative is likely not practical or feasible.

Lower the Dam: As this is a major part of the water supply system to the City of Woonsocket, this alternative is likely not practical or feasible.

COMMON DAM SAFETY DEFINITIONS

For a comprehensive list of dam engineering terminology and definitions refer to State of Rhode Island Rules and Regulations for Dam Safety, or other reference published by FERC, Dept. of the Interior Bureau of Reclamation, or FEMA.

Orientation

Upstream – Shall mean the side of the dam that borders the impoundment.
Downstream – Shall mean the high side of the dam, the side opposite the upstream side.
Right – Shall mean the area to the right when looking in the downstream direction.
Left – Shall mean the area to the left when looking in the downstream direction.

Dam Components

Dam – means any barrier made by humans, including appurtenant works that impounds or diverts water.
Embankment – means the fill material, including but not limited to rock or earth, placed to provide a permanent barrier that impounds water.
Crest – Shall mean the top of the dam, usually provides a road or path across the dam.
Abutment – Shall mean that part of a valley side against which a dam is constructed. An artificial abutment is sometimes constructed as a concrete gravity section, to take the thrust of an arch dam where there is no suitable natural abutment.
Appurtenant Works – means any ancillary feature of a dam including such structures as dikes, training walls, spillways, either in the dam or separate there from, low level outlet works, and water conduits such as tunnels, channels, pipelines or penstocks, either through the dam or its abutments.
Spillway – means a structure, a low area in natural grade or any part of the dam which has been designed or relied upon to allow normal flow or major flood flow to pass over or through while being discharged from a reservoir.

Hazard Classification

High Hazard – means a dam where failure or misoperation will result in probable loss of human life.
Significant Hazard – means a dam where failure or misoperation results in no probable loss of human life but can cause major economic loss, disruption of lifeline facilities or impact other concerns detrimental to the public's health, safety or welfare. Examples of major economic loss include but are not limited to washout of a state or federal highway, washout of two or more municipal roads, loss of vehicular access to residences, (e.g. a dead end road whereby emergency personnel could no longer access residences beyond the washout area) or damage to a few structures.
Low Hazard – means a dam where failure or misoperation results in no probable loss of human life and low economic losses.

General

EAP – Emergency Action Plan – Shall mean a predetermined (and properly documented) plan of action to be taken to reduce the potential for property damage and/or loss of life in an area affected by an impending dam failure.
O&M Manual – Operations and Maintenance Manual; Document identifying routine maintenance and operational procedures under normal and storm conditions.
Normal Pool – Shall mean the elevation of the impoundment during normal operating conditions.
Acre-foot – Shall mean a unit of volumetric measure that would cover one acre to a depth of one foot. It is equal to 43,560 cubic feet. One million U.S. gallons = 3.068 acre feet.

Height of Dam– means the vertical distance from the elevation of the uppermost surface of a dam to the lowest point of natural ground, including any stream channel, along the downstream toe of the dam.
Hydraulic Height – means the height to which water rises behind a dam and the difference between the lowest point in the original streambed at the axis of the dam and the maximum controllable water surface.
Maximum Water Storage Elevation – means the maximum elevation of water surface which can be contained by the dam without overtopping the embankment section.
Spillway Design Flood (SDF) – Shall mean the flood used in the design of a dam and its appurtenant works particularly for sizing the spillway and outlet works, and for determining maximum temporary storage and height of dam requirements.
Maximum Storage Capacity – The volume of water contained in the impoundment at maximum water storage elevation.
Normal Storage Capacity – The volume of water contained in the impoundment at normal water storage elevation.

Condition Rating

Unsafe – Means the condition of a regulated dam, as determined by the Director, is such that an unreasonable risk of failure exists that will result in a probable loss of human life or major economic loss. Among the conditions that would result in this determination are: excessive vegetation that does not allow the Director to perform a complete visual inspection of a dam, excessive seepage or piping, significant erosion problems, inadequate spillway capacity, inadequate capacity and/or condition of control structure(s) or serious structural deficiencies, including movement of the structure or major cracking.*
Poor – A component that has deteriorated beyond a maintenance issue and requires repair. the component no longer functions as it was originally intended.
Fair – Means a component that requires maintenance
Good – Meeting minimum guidelines where no irregularities are observed and the component appears to be maintained properly.

* Structural deficiencies include but are not limited to the following:

- Excessive uncontrolled seepage (e.g., upwelling of water, evidence of fines movement, flowing water, erosion, etc.)
- Missing riprap with resulting erosion of slope
- Sinkholes, particularly behind retaining walls and above outlet pipes, possibly indicating loss of soil due to piping, rather than animal burrows
- Excessive vegetation and tree growth, particularly if it obscures features of the dam and the dam cannot be fully inspected
- Deterioration of concrete structures (e.g., exposed rebar, tilted walls, large cracks with or without seepage, excessive spalling, etc.)
- Inoperable outlets (gates and valves that have not been operated for many years or are broken)

REFERENCES AND RESOURCES

The following reports were located during the file review completed at RIDEM Offices in Providence, Rhode Island:

1. "Notice of Violation (NOV)", RIDEM Office of Compliance & Inspection, January 9, 2014.

2. "Visual Inspection/Evaluation Report", Pare Corporation, July 9, 2012.

3. "Emergency Action Plan for Woonsocket Reservoir No. 3 Dam", Pare Engineering Corporation, May 2002.

4. "Operation and Maintenance Manual for Woonsocket Reservoir No. 3 Dam", Pare Engineering Corporation, February 2002.

5. "Dam Inspection Report, Woonsocket Reservoir No. 3 Dam", Rhode Island Department of Environmental Management Office of Compliance and Inspection, May 10, 2001.

6. "Phase I Dam Inspection Report, Woonsocket Reservoir No. 3 Dam", Pare Engineering Corporation, Inspected on April 3, 2001, Report Submitted May 2001.

7. "Dam Inspection Report, Woonsocket Reservoir No. 3 Dam", U.S. Army Corps of Engineers, February 24, 1994.

8. "Dam Inspection Report, Woonsocket Reservoir #3 Dam", State of Rhode Island and Providence Plantations Department of Environmental Management, April 8, 1993.

9. "Dam Inspection Report, Woonsocket Reservoir Dam #3", State of Rhode Island and Providence Plantations Department of Environmental Management, September 17, 1989.

10. "Special Inspection Report, Woonsocket Reservoir #3", Rhode Island Department of Public Works Office of Harbors and Rivers, August 8, 1947.

The following were referenced during the completion of the visual inspection and preparation of this report and the development of the recommendations presented herein:

1. "Design of Small Dams", United States Department of the Interior Bureau of Reclamation, 1987

2. "ER 110-2-106 - Recommended Guidelines for Safety Inspection of Dams", Department of the Army, September 26, 1979.

3. "Guidelines for Reporting the Performance of Dams" National Performance of Dams Program, August 1994.

The following provides an abbreviated list of resources for dam owners to locate additional information pertaining to dam safety, regulations, maintenance, operations, and other information relevant to the ownership responsibilities associated with their dam.

1. RIDEM Office of Compliance and Inspection Website: http://www.dem.ri.gov/programs/benviron/compinsp/

2. “Dam Owner’s Guide To Plant Impact On Earthen Dams” FEMA L-263,September 2005

3. “Technical Manual for Dam Owners: Impacts of Plants on Earthen Dams” FEMA 534, September 2005

4. “Dam Safety: An Owners Guidance Manual” FEMA 145,December 1986

5. Association of Dam Safety Officials – Website: www.asdso.org/

6. “Dam Ownership – Responsibility and Liability”, ASDSO

VISUAL DAM INSPECTION LIMITATIONS

Visual Inspection

1. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigations and analyses involving topographic mapping, subsurface investigations, testing and detailed computational evaluations are beyond the scope of this report.

2. In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection, along with data available to the inspection team. In cases where an impoundment is lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions, which might otherwise be detectable if inspected under the normal operating environment of the structure.

3. It is critical to note that the condition of the dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Use of Report

4. The applicability of environmental permits needs to be determined prior to undertaking maintenance activities that may occur within resource areas under the jurisdiction of any regulatory agency.

5. This report has been prepared for the exclusive use of the RIDEM for specific application to the referenced dam site in accordance with generally accepted engineering practices. No other warranty, expressed or implied, is made.

6. This report has been prepared for this project by PARE. This report is for preliminary evaluation purposes only and is not necessarily sufficient to support design of repairs or recommendations or to prepare an accurate bid.

Photo No. 1: Upstream slope as seen from the left abutment.

Photo No. 2: Upstream slope as seen from near station 3+00 looking towards the left abutment.

Photo No. 3: Upstream slope as viewed from near station 9+00 looking right.

Photo No. 4: Upstream slope near its contact with the auxiliary spillway. Note the potential downward shifting of the rip rap.

Photo No. 5: Eroded area left of the spillway at the transition between the upstream slope and the crest.

Photo No. 6: View of the upstream slope as seen from the primary spillway looking right.

Photo No. 7: The upstream slope right of the auxiliary spillway. Note the depressions and irregularities in this area.

Photo No. 8: Crest as seen from the left abutment.

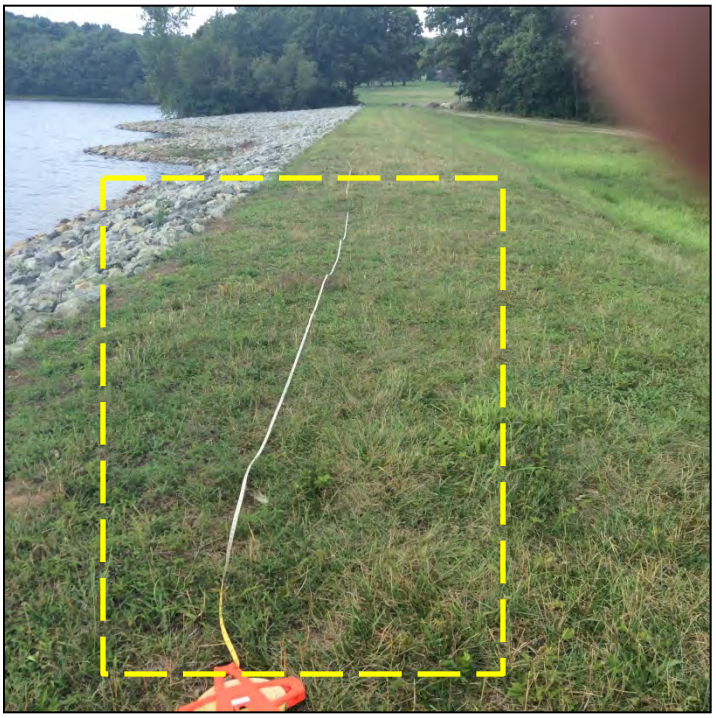


Photo No. 9: Overview of crest as seen from near station 4+00 looking right. Note the thatched areas of grass.

Photo No. 10: Historic monitoring point along the middle of the crest near station 10+40.

Photo No. 11: The crest as seen from near station 15+00 looking left. Note the series of monitoring wells along the upstream side of the crest.

Photo No. 12: View of the crest as seen from the primary spillway looking right.

Photo No. 13: The crest of the embankment right of the auxiliary spillway.

Photo No. 14: Downstream slope as seen from the left abutment.

Photo No. 15: Downstream slope as seen from near station 3+00 looking right.

Photo No. 16: Clean-out manhole for the toe drain as viewed from the crest near station 9+00 looking downstream and slightly left.

Photo No. 17: View of the downstream area from the crest near station 15+00 looking downstream and slightly right.

Photo No. 18: The downstream toe as viewed from the spillway channel looking left.

Photo No. 19: A view behind the spillway's left downstream return wall.

Photo No. 20: View of the downstream slope as seen from the spillway looking right.

Photo No. 21: Overview of the auxiliary spillway's downstream return wall as viewed from the right abutment.

Photo No. 22: The primary spillway's stepped spill area as seen from the crest looking downstream. Note the heavily deteriorated shotcrete facing along the steps and adjacent training wall.

Photo No. 23: The spillway's approach as viewed from the left looking slightly upstream.

Photo No. 24: Photo of the primary spillway's control weir as seen from the left.

Photo No. 25: The downstream side of the spillway as viewed from the downstream toe right of the gatehouse structure.

Photo No. 26: Discharge channel as seen from the primary spillway.

Photo No. 27: The toe drain discharge along the right side of the spillway channel is flowing at approximately 2 gallons per minute.

Photo No. 28: The toe drain discharge along the left side of the spillway channel is flowing at approximately 5 gallons per minute.

Photo No. 29: View of the gatehouse structure and spillway's discharge channel as seen from the crest looking slightly right and downstream. Note the drain outlet on the right side of the channel with the stained flow.

Photo No. 30: Photo from within the control structure looking upstream.The left two gates work in series to control the intake pipe that leads to the treatment plant located about 2 miles downstream. The right two gates work in series with the T-valve located outside and downstream of the gatehouse to operate the low level outlet. Presently the gates for the low level outlets are open to allow the required low flow downstream.

Photo No. 31: The low level outlet's discharge opening looking upstream towards the primary spillway. Note the location of the access to the T-valve.

Photo No. 32: Overview of the auxiliary spillway from the left. Note the crushed stone area.

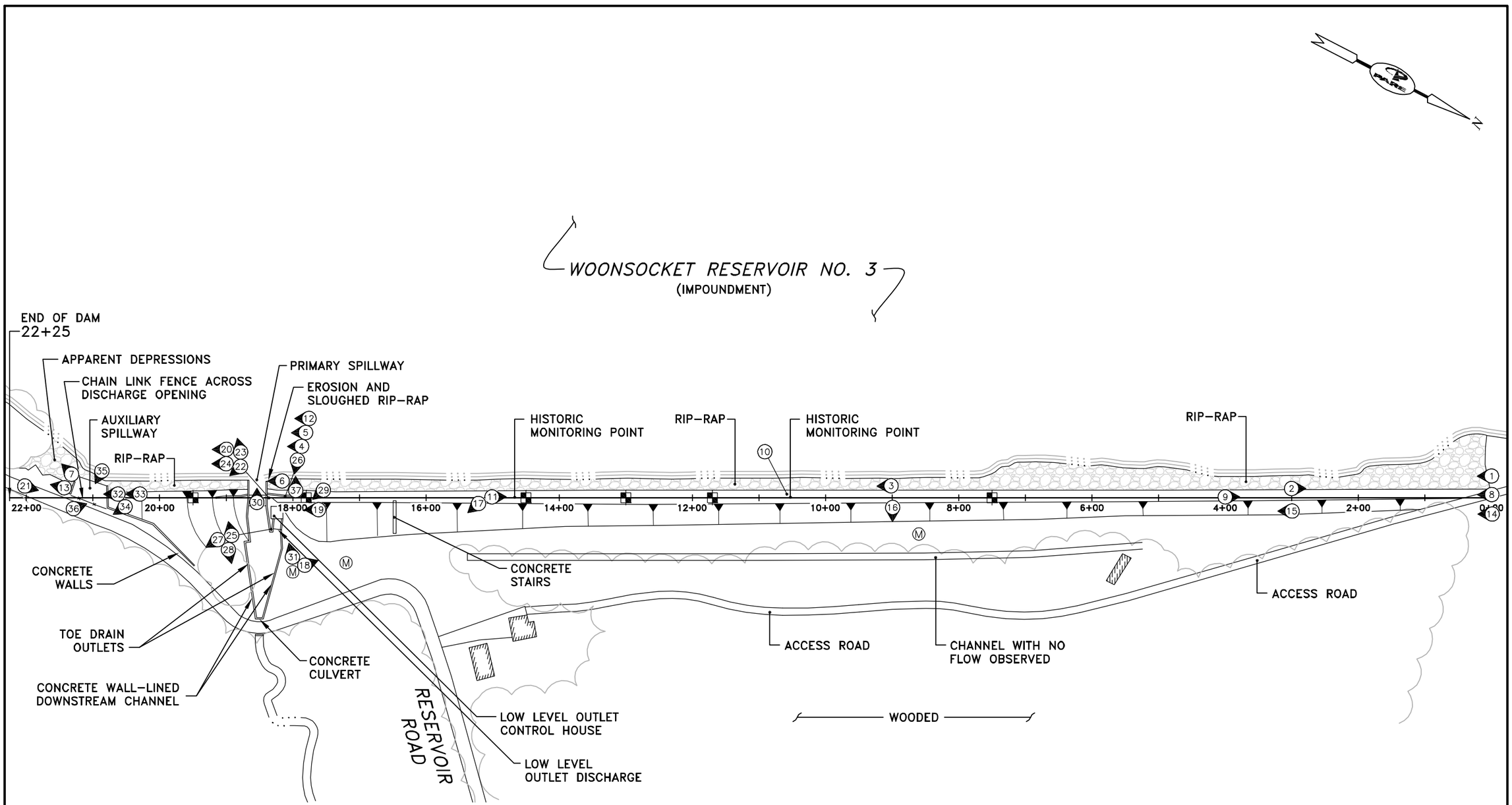
Photo No. 33: The approach to the auxiliary spillway as viewed from the left.

Photo No. 34: The downstream side of the auxiliary spillway as viewed from the left looking right and slightly downstream. Note the security fencing along its downstream side.

Photo No. 35: As seen from the upstream side of the auxiliary spillway looking downstream, the top elevation of the security fence increases linearly from left to right where the left side appears to match the elevation of the control section and the right side appears to match top of training wall elevation.

Photo No. 36: Close-up of a typical fencepost that is part of the security fencing that crosses the auxiliary spillway's downstream channel.

Photo No. 37: View of the impoundment from the crest from near station 18+00.



SITE SKETCH

SCALE: 1"=150'±

NOTES AND LEGEND

1. PLAN DEVELOPED FROM NOTES TAKEN DURING THE INSPECTION AND AVAILABLE AERIAL IMAGERY FROM RIGIS. INFORMATION IS PROVIDED FOR REFERENCE PURPOSES ONLY.

(#) DENOTES APPROXIMATE LOCATION AND DIRECTION OF PHOTOGRAPH.

0+00 BASELINE AND STATIONING

Ⓜ MANHOLE

MONITORING WELL

PARE CORPORATION
ENGINEERS - SCIENTISTS - PLANNERS
10 LINCOLN ROAD, SUITE 103
FOXBORO, MA 02035
508-543-1255

SCALE ADJUSTMENT GUIDE

0" 1"

BAR IS ONE INCH ON ORIGINAL DRAWING.

WOONSOCKET RESERVOIR DAM # 3
RI DAM No. 068
SMITHFIELD AND NORTH SMITHFIELD, RHODE ISLAND
OWNER: CITY OF WOONSOCKET

REVISIONS:

PROJECT NO.:	11130.03
DATE:	AUGUST 2014
SCALE:	AS NOTED
DESIGNED BY:	DMM
CHECKED BY:	DMM
DRAWN BY:	AWB/LMC
APPROVED BY:	JMB

SITE SKETCH

FIGURE NO.: 1

Z:\JOBS\11 Jobs\11130.03 Addendum 4 37 Dam Inspections\Inspections\Inspection Round 9\068 Woonsocket Reservoir No. 3 Dam\Dwgs\Fig 1 - Site Sketch.dwg

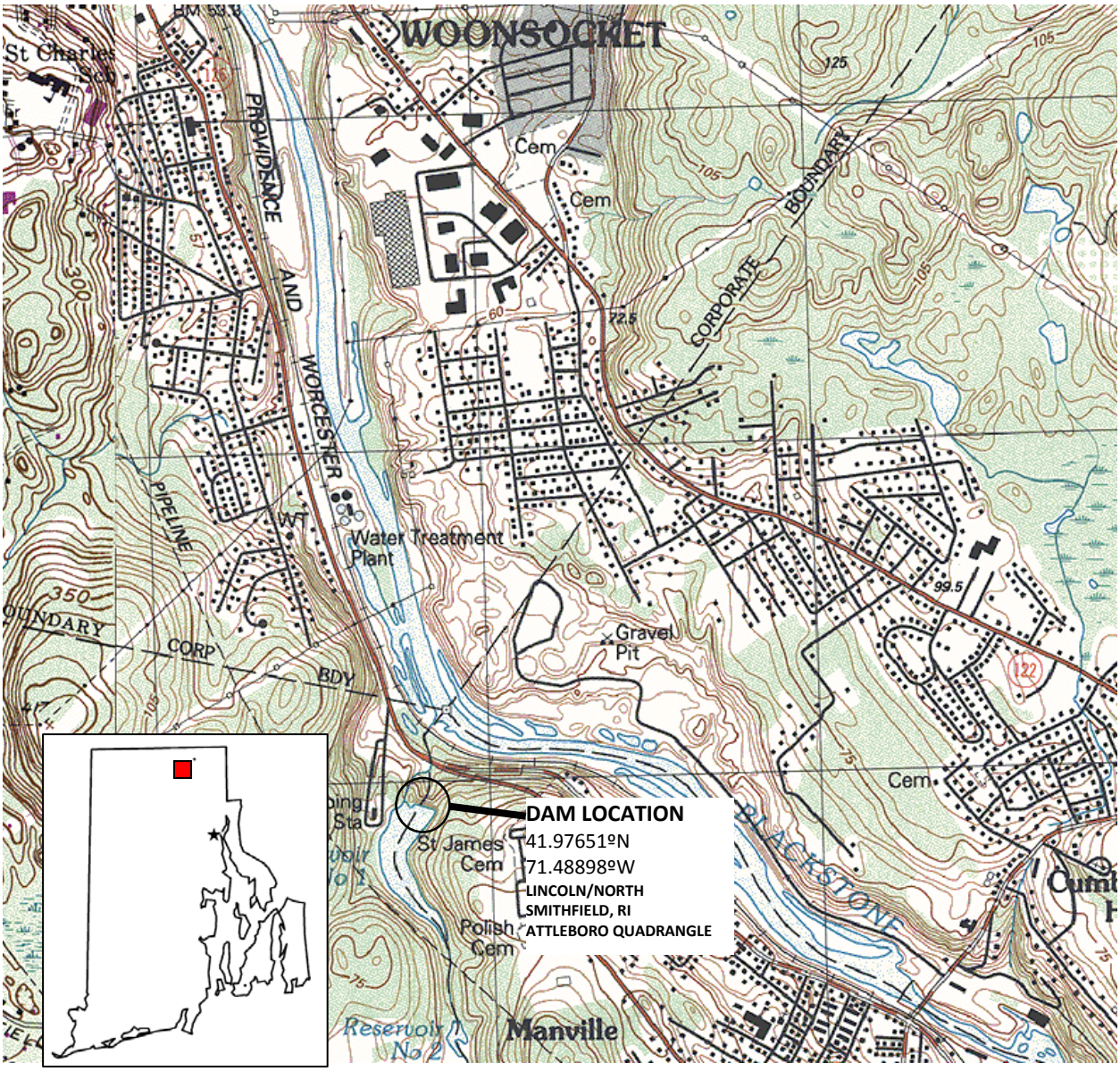
-- WOONSOCKET RESERVOIR #1 DAM --
VISUAL
INSPECTION / EVALUATION REPORT

Dam Name:	***Woonsocket Reservoir #1 Dam***
State Dam ID#:	***070***
Owner:	***City of Woonsocket***
Town:	***Lincoln/North Smithfield***
Consultant:	***Pare Corporation***
Date of Inspection:	***March 19, 2015 and April 6, 2015***

PARE
CORPORATION

INSPECTION SUMMARY

Dam Name (No):	Woonsocket Reservoir #1 Dam (070)
Location:	Lincoln/North Smithfield
Hazard Classification:	High
Inspector:	David M. Matheson, P.E.
Inspection Date:	March 19, 2015 and April 6, 2015



When describing the dam, "left" and "right" refer to the respective sides of the dam as viewed when facing downstream (with normal flow of water).

PREFACE

The assessment of the general condition of the dam reported herein was based upon available data and visual inspections. Detailed investigations and analyses involving topographic mapping, subsurface investigations, testing and detailed computational evaluations were beyond the scope of this report unless reported otherwise.

In reviewing this report, it should be realized that the reported condition of the dam was based on observations of field conditions at the time of inspection, along with data available to the inspection team.

It is critical to note that the condition of the dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the reported condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

J.Matthew Bellisle, P.E.
PARE CORPORATION
Senior Vice President

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1.0 DESCRIPTION OF PROJECT

1.1 General

1.1.1 Authority

The Woonsocket Water Division has retained Pare Corporation of Foxboro, Massachusetts and Lincoln, Rhode Island to perform a visual inspection and develop a report of conditions for the Woonsocket Reservoir #1 Dam along the Crookfall Brook in Lincoln/North Smithfield, Rhode Island. This inspection and report were performed in accordance with current Rhode Island laws.

This report is a supplement to the Inspection/Evaluation Report for the Woonsocket Reservoir No. 1 Dam, dated July 19, 2012. The work was completed in accordance with current Rhode Island dam safety regulations and the Notice of Violation (NOV), dated January 9, 2014 by the Rhode Island Department of Environmental Management Office of Compliance and Inspection (RIDEM).

RIDEM will develop an overall condition rating based upon the data presented herein. It is understood that this rating will consider operational and structural deficiencies and will be presented under separate cover.

1.1.2 Purpose of Work

The purpose of this investigation was to inspect and evaluate the present condition of the dam and appurtenant structures in accordance with current dam safety regulations to provide information that will assist in both prioritizing dam repair needs and planning/conducting maintenance and operation. The inspection

The investigation was divided into three parts: 1) obtain and review reports, investigations, and data pertaining to the dam and appurtenant structures available within the Rhode Island Department of Environmental Management files; 2) perform a visual inspection of the site; and; 3) prepare and submit a final report presenting the evaluation of the structure, including recommendations and remedial actions.

1.1.3 Definitions

To provide the reader with a better understanding of the report, definitions of commonly used terms associated with dams are provided in Appendix B. Many of these terms may be included in this report. The terms are presented under common categories associated with dams which include: 1) orientation; 2) dam components; 3) hazard classification; 4) general; and 5) condition rating.

1.2 Description of Project

1.2.1 Location

The Woonsocket Reservoir #1 Dam is located in the Towns of Lincoln and North Smithfield, approximately 2.3 miles southeast of the City of Woonsocket. The dam impounds water along Crookfall Brook to form Woonsocket Reservoir #1 and is situated at the southeastern end of the

impoundment area near coordinates 41.97651ºN/71.48898ºW. Please refer to the inspection summary for a locus plan depicting the area of the dam and its immediate surroundings.

To reach the dam from I-295, take exit 9B and head North on RI-146 toward Woonsocket for roughly 0.6 miles. Take a slight right onto RI-99 North and take the exit towards Lincoln after 1.1 miles. After 0.2 miles merge onto Sayles Hill Road and follow this road for 0.4 miles. Turn left onto RI-126 North/Old River Road. After roughly 0.8 miles, RI-126 will cross under a road bridge containing RI-99 and approximately 500 feet after the bridge the Woonsocket Reservoir #1 impoundment and dam will be on the left and can be accessed via a driveway through a locked gate.

1.2.2 Owner/Caretaker

Woonsocket Reservoir #3 Dam was constructed in 1883 by the City of Woonsocket for water supply purposes. The City of Woonsocket has continually owned and operated the dam since that time. Operating and maintenance are the responsibility of the City of Woonsocket, Department of Public Works, Water Division. Mr. Mark Viggiani, Water Division Superintendent can be reached at 401-767-2619.

1.2.3 Purpose of the Dam

The water impounded by the dam is the primary water source for the City of Woonsocket. Water is transmitted to the City of Woonsocket Water Treatment Plant via the Crookfall Brook Pipeline.

1.2.4 Description of the Dam and Appurtenances

As paraphrased from PARE's Inspection Report, dated May 2001:

> The Woonsocket Reservoir No. 1 Dam is an earthen embankment approximately 900-ft long with a maximum height of 50-ft (dam crest to toe of embankment), and has an average crest width of 15 ft. Record plans indicate that the dam was constructed with a stone masonry and concrete core wall. The upstream slope of the embankment is approximately 2.75H to 1V and is protected by riprap. The downstream slope of the dam is 2.75H to 1V and is grassed. The crest of the dam is earthen with grass cover.
>
> The dam crest was raised about 3.6 ft. to El. 179.6 in 1982 and the downstream slope was flattened to the current configuration. Raising the crest required construction of a new embankment to the left of the spillway. As part of the 1982 project, a blanket drain, and toe drain was installed on the main (right) embankment.
>
> The spillway is a 45-ft long uncontrolled trapezoidal weir with a cascaded drop. The spillway training walls are constructed of stone masonry to approximately El. 176 with concrete extensions to El. 180. According to design drawings the stone masonry is overlaid with 6 inches of shotcrete (sprayed on cementitious material). Discharges from the spillway flow into Crookfall Brook and pass beneath Manville Road approximately 500 ft. downstream of the spillway and beneath the Providence & Worcester Railroad (P&W) about 700 ft. downstream.
>
> The outlet works consist of a 30-inch diameter water supply intake through the left embankment, leading to the Crookfall Brook Pipeline. The controls for this intake are located at the Crookfall Brook Pipeline Blending Chamber, located approximately 200 ft. downstream of the dam.
>
> There are also three abandoned outlets through the embankments including a 24-inch and a 16-inch intake beneath the left embankment, passing through the abandoned pump station; and a 12-inch low-level outlet through the right embankment. The 12-inch pipe has reportedly been plugged at the upstream end. The outlet/termination locations for each of these pipes are unknown. There is reportedly

a tap on the 16-inch diameter line, inside the abandoned pump station, which is used as a piezometer to monitor the reservoir level and there is a butterfly valve near the toe drain outlet on the downstream end

The drainage system is made up of a blanket drain laid on the original downstream slope of the dam and an 8 inch perforated pipe toe drain from the existing toe of the slope to the new toe of the slope. Based on existing plans, the blanket drain consists of one foot of crushed stone wrapped in a geotextile fabric. The 8-inch perforated pipes join and outlet through a headwall downstream of the toe of the slope.

There is a pressure-relief blow-off structure from the Crookfall Brook Pipeline located on the reservoir edge, upstream of the left abutment. If the pressure in the Crookfall Brook Pipeline were to exceed the design criteria, water from the pipeline would be released into Woonsocket Reservoir No. 1.

1.2.5 Operations and Maintenance

The Woonsocket Water Division is responsible for operations and maintenance at the dam, including undertaking routine maintenance of vegetation along the length of the dam, completing regular inspection, and undertaking maintenance as required.

1.2.6 Hazard Potential Classification

In accordance with current classification procedures under State of Rhode Island dam safety rules and regulations, Woonsocket Reservoir #1 Dam has been classified as a High hazard potential structure dam by RIDEM.

2.0 INSPECTION

2.1 Visual Inspection

Woonsocket Reservoir #1 Dam was inspected on March 19, 2015 and April 6, 2015. At the time of the inspection, the temperature was near 30°F with clear skies. Photographs to document the current condition of the dam were taken during the inspection and are included in Appendix A. The level of the impoundment appeared to be near normal operating levels. Underwater areas were not inspected as part of the field activity.

For reference purposes, a baseline was established along the crest of the dam embankment. Station 0+00 was located at the left abutment and extended to Station 9+50 at the right abutment. Observations are reported in relation to their location along the baseline as noted herein.

2.1.1 General Findings

In general, Woonsocket Reservoir #1 Dam was found to have a failed shotcrete lining on the training walls for the primary spillway, small tree growth along the earthen areas downstream of the return walls to the primary spillway, a leaking abandoned outlet, and other dam safety deficiencies. The specific concerns are identified in more detail in the sections below:

2.1.2 Dam Embankment

The following was noted along the embankment of the dam:

Upstream Slope

- Since the last inspection performed by the Rhode Island Department of Environmental Management (RIDEM) on July 19, 2013, the upstream slopes have been completely cleared of unwanted vegetation including brush and small trees.
- No animal activity or burrows were observed.
- The abutment contacts look good with no cracks or discontinuities between the transition at the embankment and natural ground.
- The alignment of the upstream slope appeared regular.
- No erosion or scarping was noted along the water line.
- Right of the primary spillway, the shotcrete-covered riprap is eroded with undermining.

Crest

- The crest elevation appears even.
- The surface of the crest is clear of unwanted vegetation such as trees and brush.
- Thinning grass areas were observed along the crest between approximately 7+00 and 8+00.
- Two (2) monitoring wells are present at approximately 6+25 and 7+00, respectively.
- The top of the crest appears even.
- The abutment contacts at the crest showed no signs of cracking or discontinuities between the transition at the embankment and natural ground.
- No evidence of depressions, rutting, or puddling were observed along the crest.

- No animal burrows were observed.

Downstream Slope

- The surface of the downstream slope is covered with maintained grass.
- The downstream slope appears evenly graded with no steep sections.
- No irregularities were noted along the slopes.
- No indications of seepage were noted (i.e., wet areas, soft surfaces, staining).
- The abutment contacts looked good with no cracks or unusual movement observed between the embankment and natural ground.
- No animal activity was observed.
- The embankment in the area of the former Woonsocket Water Treatment Plant remains overgrown with small to medium trees and light brush. The ground surface is visible between the vegetation. No signs of seepage or wet areas were noted in this area.

2.1.3 Appurtenant Structures

Primary Spillway

The primary spillway consists of a sharp crested concrete weir that discharges to a granite block stepped section, followed by a steep discharge channel lined with boulders and/or rock outcrops. The following was observed during the inspection:

- The training walls and adjacent shotcrete-lined bench were observed with a regular alignment; however, areas of missing and cracked shotcrete that are stained with efflorescence is present at the flow line.
- No depressions were observed behind the right and left spillway training walls.
- Small trees are present along the earthen areas within 5 feet downstream of the right return wall. The previously observed thick brush has been removed.
- Since water was flowing over the spillway at the time of the inspection, the approach area, spillway crest, and downstream areas of the stepped section could not be viewed for evaluation including inspections for leakage, movement, and cracks.
- Water flows over the concrete weir appeared even with no signs of discontinuities.
- The spillway approach and discharge areas are clear of debris.

Concrete Pressure Relief Blowoff Structure:

- The concrete appears in good condition with a regular alignment and no cracking observed.
- The inlet chamber and discharge channel is clear of debris.

Abandoned Outlet Near Station 8+00:

- The discharge is flowing at about 5 gpm which is reportedly a result of a leaking value.

Blending Chamber Draw-off Structure:

- This structure, located about 200 feet downstream of the dam's left embankment (i.e., left of the primary spillway), is capable of drawing off water from the impoundment from about 5

feet below normal pool levels as approximated by the caretaker. The approach reportedly enters into the impoundment near the gated area of the dam left of the primary spillway. Since the approach was underwater, this could not be inspected. During the July 2012 Inspection, the caretaker stated that the draw off capacity is about 10 MGD. The inlet for this structure has been roughly located by Woonsocket Water. It should be noted that the abandoned valve vault is present midway up the downstream slope.

Low Level Outlet

- This dam does not have a low level drawdown system.

2.1.4 Downstream Area

Downstream of the dam is RI-126 followed by Railroad Street, Providence & Worcester Railroad, and Blackstone River Bikeway. A bridge, located about 600 feet northeast of the dam, carries RI-99 over RI-126, Railroad Street, and the Bikeway. Beginning about 2,000 feet to the northwest and 3,000 feet to the northeast are heavily populated residential neighborhoods. Roughly 2,700 to the northwest, along RI-126 is the Woonsocket Water Treatment Plant.

2.1.5 Reservoir Area

The dam is located along the northern end of the reservoir. The impoundment is shaped irregularly with approximately 1,400 feet separating the spillway crest and the southern-most point with a width of roughly 300 feet east to west. The perimeter of the impoundment is generally wooded. Flows enter into the impoundment at its southernmost point via Crookfall Brook.

2.2 Caretaker Interview

Mr. Mike Asselin, Woonsocket Water Distribution Supervisor, was present during the inspection. Information provided by Mr. Asselin has been incorporated into this report.

2.3 Operation and Maintenance Procedures

An Operations and Maintenance (O&M) Manual was developed for the Owner by PARE in February 2002. The Operation and Maintenance Manual outlines the recommended inspection program and an overview of the maintenance tasks necessary to maintain the dam in an operable condition.

2.3.1 Operational Procedures

Woonsocket Reservoir No. 1 is a primary potable water supply for the City of Woonsocket in conjunction with Woonsocket Reservoir No. 3. Water is withdrawn from the reservoir via the Crookfall Brook Pipeline throughout the year on an as-needed basis.

Daily records are maintained at the Woonsocket Water Treatment Plant for this reservoir regarding discharges and water surface levels. The dam and its appurtenances are inspected weekly by the Dam Caretaker and operating staff of the Woonsocket Water Division.

2.3.2 Maintenance of Dam and Operating Facilities

The Owner has an O&M Manual, developed in 2002 and appears to follow the recommended procedures with the exception of clearing and maintaining the upstream slope. Observed maintenance includes regular mowing of the dam, rodent control, upkeep of the grass cover, and clearing of the approach and discharge channels at the primary spillway.

3.0 ASSESSMENTS AND RECOMMENDATIONS

3.1 Assessments

The Woonsocket Reservoir No. 1 Dam was found to have the following deficiencies:

1. Some thinning and thatched areas of grass were observed along the embankment crest between 7+00 and 8+00.
2. Missing and cracked shotcrete at both primary spillway training walls.
3. Small trees were observed growing along the areas downstream of the return walls to the primary spillway which may impact the stability of the walls if allowed to grow.
4. This dam does not have a low level drawdown system.

The previous inspection was completed by PARE on July 19, 2012. Based upon a comparison to reported conditions, several deficiencies have been addressed; however, some still remain and have continued to deteriorate.

Previously Identified Deficiency/Recommendation	***Resolution or Current Condition***
Clear the dam embankment of brush, and trees, inclusive of the growth observed along the upstream rip rap slope and along the downstream slope right and left of the primary spillway.	Completed except for the small trees right and downstream of the spillway.
Locate and fill the abandoned outlets passing through the embankment to reduce the possibility of piping	Not completed.
During periods of low water, complete an underwater inspection of the upstream and downstream sides of the primary spillway.	Not completed.
Complete repairs at the primary spillway, including removing and replacing the shotcrete surface along the stepped spillway, repairing the cracks on the training walls, and repairing the concrete base.	Not completed
Evaluate means to provide low level outlet discharge capacity.	Not completed
Repair the shotcrete at the service spillway.	Not completed with continued deterioration.

The following recommendations and remedial measures generally describe the recommended approach to address current deficiencies at the dam. Prior to undertaking recommended maintenance, repairs, or remedial measures, the applicability of environmental permits needs to be determined for activities that may occur within resource areas under the jurisdiction of RIDEM or other regulatory agencies.

3.2 Recommendations

The following present additional studies, routine and recurrent operations and maintenance activities, and repairs recommended to address deficiencies noted during the inspection and the completion of

this report. The recommendations provided below should be implemented in accordance with general dam safety practice. Further, if left unaddressed, many of the conditions identified above will continue to deteriorate and could compromise the future safety of the dam and appurtenant structures.

Since the July 2012 inspection, the Owner has completed the clearing of all unwanted vegetation along the embankment with the exception of a few small trees immediately downstream of the primary spillway right return wall. The remaining deficiencies remain unchanged. Therefore, with the exception of the clearing of vegetation, the previous recommendations remain valid.

1. Locate and fill the abandoned outlets passing through the embankment to reduce the possibility of piping (i.e., loss of embankment soils) from occurring through deteriorated pipes. This includes the 24" and 16" outlets through the left abutment and the 12" outlet through the right abutment.

2. During periods of low water, complete an underwater inspection of the upstream and downstream sides of the primary spillway to evaluate the condition of the concrete and the associated approach and discharge channels and training walls.

3. Cut and remove trees within 15 feet downstream of the primary spillway right return wall.

4. Reseed areas of thinning grass growth along the crest.

5. Complete repairs at the primary spillway, including removing and replacing the shotcrete surface along the stepped spillway, repairing the cracks on the training walls, and repairing the concrete base.

6. Implement a program of regular inspection and monitoring of the dam. As the dam is currently classified as a high hazard potential dam, the completion of a formal visual inspection by a RI registered professional engineer familiar with dam engineering is recommended every 2 years.

7. Evaluate a means to provide low level outlet discharge capacity. Alternatives include installing a stop log controlled or gated outlet on either side of the primary spillway with a new channel joining with the main channel or retrofitting the primary spillway with a deeper stop log or gate controlled sluiceway, which would serve to both control water levels and capable of drawing down the impoundment for emergency or maintenance purposes.

3.3 Alternatives

The following alternatives are presented based upon a conceptual review of the concerns. Additional studies and or considerations may indicate that some or all of the options presented below are not suitable for the conditions specific to this dam and dam site. In addition to the general activities, appropriate environmental permits will be required to complete many of the alternatives presented below.

Dam Removal/Breaching: With this structure being a major part of the water supply for the City of Woonsocket, this alternative is likely not practical or feasible.

Lower the Dam: With this structure being a major part of the water supply for the City of Woonsocket, this alternative is likely not practical or feasible.

COMMON DAM SAFETY DEFINITIONS

For a comprehensive list of dam engineering terminology and definitions refer to State of Rhode Island Rules and Regulations for Dam Safety, or other reference published by FERC, Dept. of the Interior Bureau of Reclamation, or FEMA.

Orientation

Upstream – Shall mean the side of the dam that borders the impoundment.
Downstream – Shall mean the high side of the dam, the side opposite the upstream side.
Right – Shall mean the area to the right when looking in the downstream direction.
Left – Shall mean the area to the left when looking in the downstream direction.

Dam Components

Dam – means any barrier made by humans, including appurtenant works that impounds or diverts water.
Embankment – means the fill material, including but not limited to rock or earth, placed to provide a permanent barrier that impounds water.
Crest – Shall mean the top of the dam, usually provides a road or path across the dam.
Abutment – Shall mean that part of a valley side against which a dam is constructed. An artificial abutment is sometimes constructed as a concrete gravity section, to take the thrust of an arch dam where there is no suitable natural abutment.
Appurtenant Works – means any ancillary feature of a dam including such structures as dikes, training walls, spillways, either in the dam or separate there from, low level outlet works, and water conduits such as tunnels, channels, pipelines or penstocks, either through the dam or its abutments.
Spillway – means a structure, a low area in natural grade or any part of the dam which has been designed or relied upon to allow normal flow or major flood flow to pass over or through while being discharged from a reservoir.

Hazard Classification

High Hazard – means a dam where failure or misoperation will result in probable loss of human life.
Significant Hazard – means a dam where failure or misoperation results in no probable loss of human life but can cause major economic loss, disruption of lifeline facilities or impact other concerns detrimental to the public's health, safety or welfare. Examples of major economic loss include but are not limited to washout of a state or federal highway, washout of two or more municipal roads, loss of vehicular access to residences, (e.g. a dead end road whereby emergency personnel could no longer access residences beyond the washout area) or damage to a few structures.
Low Hazard – means a dam where failure or misoperation results in no probable loss of human life and low economic losses.

General

EAP – Emergency Action Plan – Shall mean a predetermined (and properly documented) plan of action to be taken to reduce the potential for property damage and/or loss of life in an area affected by an impending dam failure.
O&M Manual – Operations and Maintenance Manual; Document identifying routine maintenance and operational procedures under normal and storm conditions.
Normal Pool – Shall mean the elevation of the impoundment during normal operating conditions.
Acre-foot – Shall mean a unit of volumetric measure that would cover one acre to a depth of one foot. It is equal to 43,560 cubic feet. One million U.S. gallons = 3.068 acre feet.

Height of Dam– means the vertical distance from the elevation of the uppermost surface of a dam to the lowest point of natural ground, including any stream channel, along the downstream toe of the dam.
Hydraulic Height – means the height to which water rises behind a dam and the difference between the lowest point in the original streambed at the axis of the dam and the maximum controllable water surface.
Maximum Water Storage Elevation – means the maximum elevation of water surface which can be contained by the dam without overtopping the embankment section.
Spillway Design Flood (SDF) – Shall mean the flood used in the design of a dam and its appurtenant works particularly for sizing the spillway and outlet works, and for determining maximum temporary storage and height of dam requirements.
Maximum Storage Capacity – The volume of water contained in the impoundment at maximum water storage elevation.
Normal Storage Capacity – The volume of water contained in the impoundment at normal water storage elevation.

Condition Rating

Unsafe – Means the condition of a regulated dam, as determined by the Director, is such that an unreasonable risk of failure exists that will result in a probable loss of human life or major economic loss. Among the conditions that would result in this determination are: excessive vegetation that does not allow the Director to perform a complete visual inspection of a dam, excessive seepage or piping, significant erosion problems, inadequate spillway capacity, inadequate capacity and/or condition of control structure(s) or serious structural deficiencies, including movement of the structure or major cracking.*
Poor – A component that has deteriorated beyond a maintenance issue and requires repair. the component no longer functions as it was originally intended.
Fair – Means a component that requires maintenance
Good – Meeting minimum guidelines where no irregularities are observed and the component appears to be maintained properly.

* Structural deficiencies include but are not limited to the following:

- Excessive uncontrolled seepage (e.g., upwelling of water, evidence of fines movement, flowing water, erosion, etc.)
- Missing riprap with resulting erosion of slope
- Sinkholes, particularly behind retaining walls and above outlet pipes, possibly indicating loss of soil due to piping, rather than animal burrows
- Excessive vegetation and tree growth, particularly if it obscures features of the dam and the dam cannot be fully inspected
- Deterioration of concrete structures (e.g., exposed rebar, tilted walls, large cracks with or without seepage, excessive spalling, etc.)
- Inoperable outlets (gates and valves that have not been operated for many years or are broken)

REFERENCES AND RESOURCES

The following reports were located during the file review completed at RIDEM Offices in Providence, Rhode Island and within PARE's archive files:

1. "Visual Inspection/Evaluation Report for Woonsocket Reservoir No. 1 Dam", Pare Corporation, July 19, 2012.

2. "Operation and Maintenance Manual for Woonsocket Reservoir No. 1 Dam", Pare Engineering Corporation, February 2002.

3. "Emergency Action Plan for Woonsocket Reservoir No. 1 Dam", Pare Engineering Corporation, May 2002.

4. "Phase I Dam Inspection Report, Woonsocket Reservoir No. 1 Dam", Pare Engineering Corporation, Inspected on April 3, 2001, Report Submitted May 2001.

5. "Dam Inspection Report, Reservoir No. 1", Rhode Island Department of Environmental Management Office of Compliance and Inspection, March 16, 2000.

6. "Dam Inspection Report, Woonsocket Reservoir #1 Dam", State of Rhode Island and Providence Plantations Department of Environmental Management, April 8, 1993.

7. "Dam Inspection Report, Woonsocket Reservoir #1 Dam", State of Rhode Island and Providence Plantations Department of Environmental Management, October 25, 1985.

8. "Special Inspection Report, Woonsocket Water Works #1", Rhode Island Department of Public Works Division of Harbors and Rivers, July 30, 1947.

The following were referenced during the completion of the visual inspection and preparation of this report and the development of the recommendations presented herein:

1. "Design of Small Dams", United States Department of the Interior Bureau of Reclamation, 1987

2. "ER 110-2-106 - Recommended Guidelines for Safety Inspection of Dams", Department of the Army, September 26, 1979.

3. "Guidelines for Reporting the Performance of Dams" National Performance of Dams Program, August 1994.

The following provides an abbreviated list of resources for dam owners to locate additional information pertaining to dam safety, regulations, maintenance, operations, and other information relevant to the ownership responsibilities associated with their dam.

1. RIDEM Office of Compliance and Inspection Website: http://www.dem.ri.gov/programs/benviron/compinsp/

2. "Dam Owner's Guide To Plant Impact On Earthen Dams" *FEMA L-263,September 2005*

3. "Technical Manual for Dam Owners: Impacts of Plants on Earthen Dams" *FEMA 534, September 2005*

4. "Dam Safety: An Owners Guidance Manual" *FEMA 145,December 1986*

5. Association of Dam Safety Officials – Website: www.asdso.org/

6. "Dam Ownership – Responsibility and Liability", ASDSO

Photo No. 1: An overview of the dam from the left abutment.

Photo No. 2: A view of the upstream slope as viewed from near the left abutment.

Photo No. 3: The upstream slope as viewed from near Station 3+50 looking right.

Photo No. 4: The upstream side of the dam as viewed from left of the spillway looking right and upstream.

Photo No. 5: The upstream side of the dam as viewed from near Station 7+00 looking left.

Photo No. 6: The upstream side of the dam as viewed from near Station 7+00 looking right. Note the areas of cut vegetation.

Photo No. 7: The upstream side of the dam as viewed from the right abutment looking left.

Photo No. 8: The crest of the dam as viewed from near the left abutment looking right.

Photo No. 9: The crest of the dam as viewed from near Station 3+50 looking left.

Photo No. 10: The crest of the dam as viewed from near Station 3+50 looking right.

Photo No. 11: The crest of the dam as viewed from left of the primary spillway looking left.

Photo No. 12: The crest of the dam as viewed form near Station 7+00 looking right. Note the stand pipes for the monitoring wells.

Photo No. 13: Crest of the dam as viewed from near Station 7+00 looking right. Note the areas of thinning grass.

Photo No. 14: The right abutment along the crest (Looking right).

Photo No. 15: The crest of the dam as viewed from near the right abutment looking left.

Photo No. 16: The former water treatment plant located downstream of the left side of the dam (between Stations 1+00 and 3+00).

Photo No. 17: The downstream slope in the area of the former water treatment plant looking left from the access road/bench near the dam.

Photo No. 18: The downstream slope in the area of the former water treatment plant looking left from the access road/bench away from the dam.

Photo No. 19: The downstream side of the dam as viewed from right of the primary spillway looking left.

Photo No. 20: The downstream side of the dam as viewed from the left abutment along the crest looking left and dwonstream.

Photo No. 21: A panoramic of the dam as viewed from the toe near Station 8+00. Note the location of the abandoned outlet.

Photo No. 22: The primary spillway approach channel as viewed from right of the spillway.

Photo No. 23: The stepped section of the primary spillway as viewed from the left. Note the small trees growing behind the right return wall.

Photo No. 24: The primary spillway approach channel as viewed from left of the spillway.

Photo No. 25: The primary spillway weir as viewed from right of the spillway looking left and downstream.

Photo No. 26: The connection of the upstream riprapped slope with the primary spillway. Note the erosion and undermining.

Photo No. 27: The downstream side of the primary spillway right return wall is overgrown with small trees.

Photo No. 28: Primary spillway discharge channel as viewed from the crest of the dam left of the spillway.

Photo No. 29: Concrete pressure relief blowoff structure at the dam's left abutment (photo looking left).

Photo No. 30: Concrete pressure relief blowoff structure from Photo 29 looking downstream.

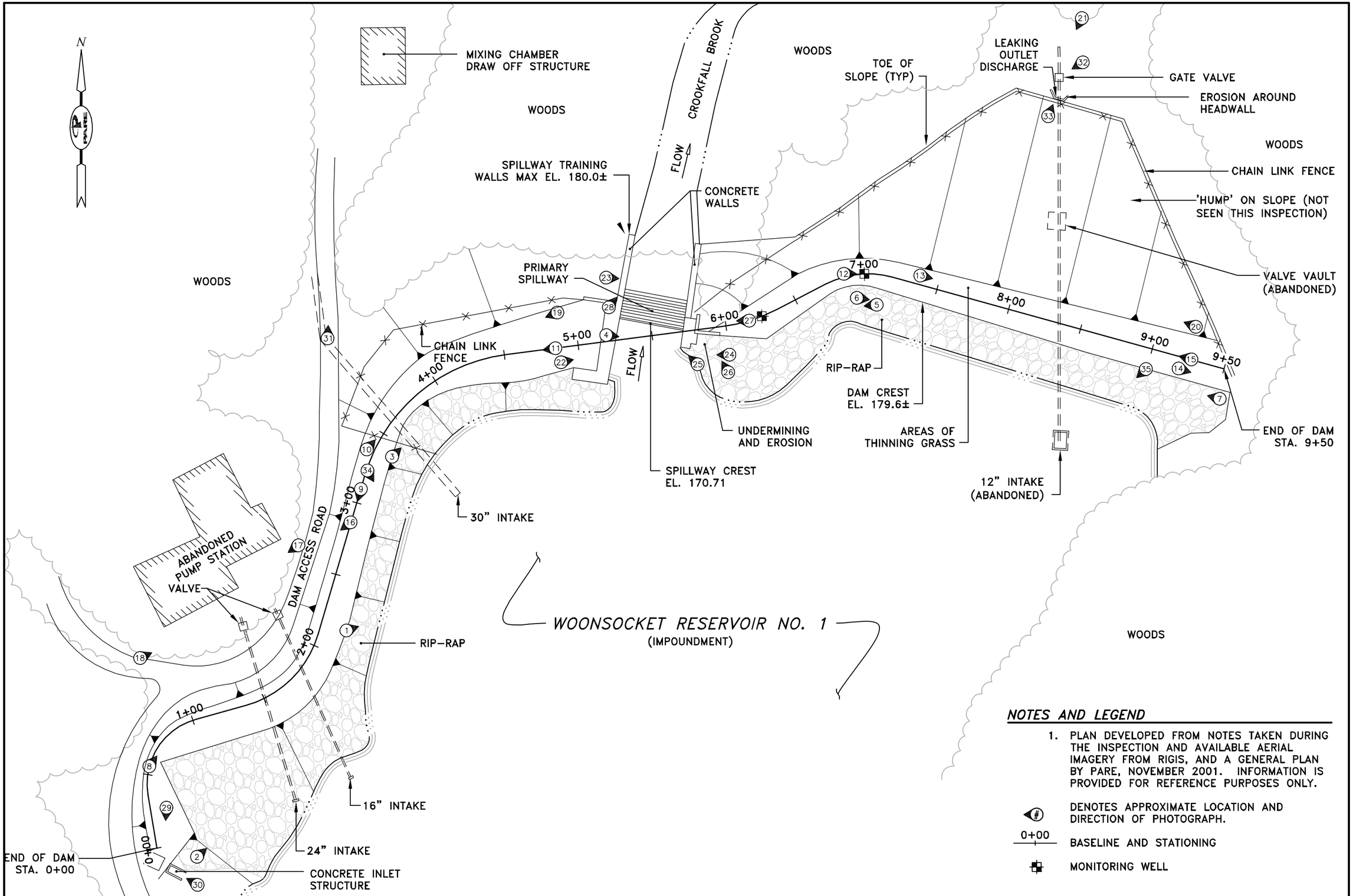
Photo No. 31: The Blending Chamber located downstream of the dam as viewed from the access road near Station 3+50.

Photo No. 32: The discharge to the abandoned outlet at the toe of the dam near Station 8+00 (photo looking upstream and right). Note active leakage from discharge pipe (similar to that observed during the last inspection)

Photo No. 33: Discharge channel from abandoned outlet shown in previous photo. Note active flow from the leaking channel.

Photo No. 34: Overview of the impoundment as viewed from near Station 3+40. the pipe protruding from the ground is a marker for the intake alignment.

Photo No. 35: Overview of the impoundment as viewed from near the right abutment.



NOTES AND LEGEND

1. PLAN DEVELOPED FROM NOTES TAKEN DURING THE INSPECTION AND AVAILABLE AERIAL IMAGERY FROM RIGIS, AND A GENERAL PLAN BY PARE, NOVEMBER 2001. INFORMATION IS PROVIDED FOR REFERENCE PURPOSES ONLY.

◀# DENOTES APPROXIMATE LOCATION AND DIRECTION OF PHOTOGRAPH.

0+00 BASELINE AND STATIONING

MONITORING WELL

SITE SKETCH

SCALE: 1"=60'±

PARE CORPORATION
ENGINEERS • SCIENTISTS • PLANNERS
10 LINCOLN ROAD, SUITE 103
FOXBORO, MA 02035
508-543-1755

SCALE ADJUSTMENT GUIDE
0" 1"
BAR IS ONE INCH ON ORIGINAL DRAWING.

WOONSOCKET RESERVOIR No. 1 DAM
RI DAM No. 070
LINCOLN, RHODE ISLAND
OWNER: CITY OF WOONSOCKET

REVISIONS:

PROJECT NO.:	14240.00
DATE:	APRIL 2015
SCALE:	AS NOTED
DESIGNED BY:	DMM
CHECKED BY:	DMM
DRAWN BY:	JHG
APPROVED BY:	JMB

SITE SKETCH

FIGURE NO.: 1

Z:\JOBS\14 Jobs\14240.00 Woonsocket Res No 1 – Updated Dam Insp\Drawings\Fig 1 – Site Sketch.dwg

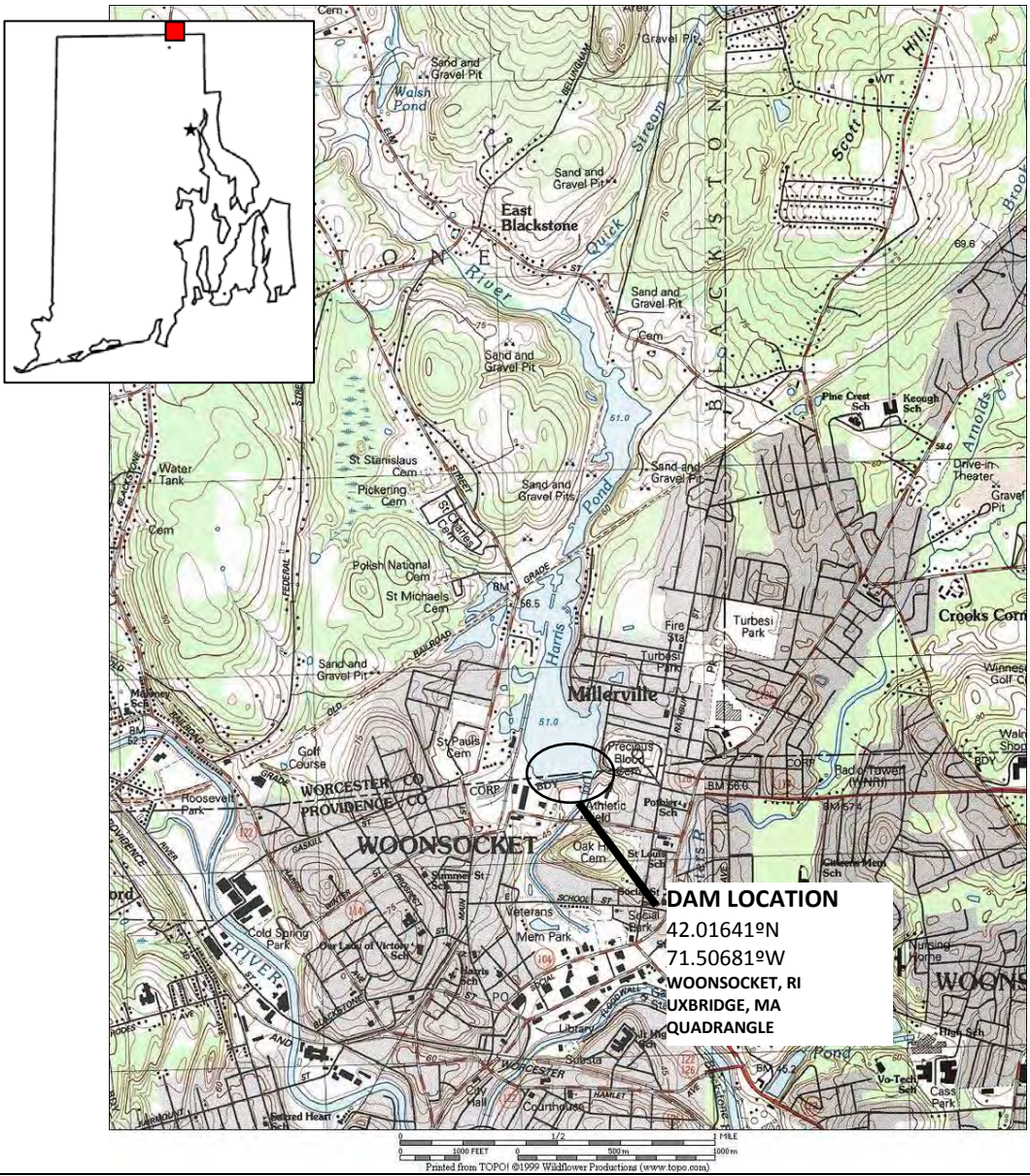
-- HARRIS POND DAM --
VISUAL
INSPECTION / EVALUATION REPORT

Dam Name:	***Harris Pond Dam***
State Dam ID#:	***073***
Owner:	***City of Woonsocket***
Town:	***Woonsocket***
Consultant:	***Pare Corporation***
Date of Inspection:	***February 3, 2016***

PARE CORPORATION

INSPECTION SUMMARY

Dam Name (No):	Harris Pond Dam (073)
Location:	Woonsocket
Hazard Classification:	High
Inspector:	David M. Matheson, P.E.
Inspection Date:	February 3, 2016



When describing the dam, "left" and "right" refer to the respective sides of the dam as viewed when facing downstream (with normal flow of water).

PREFACE

The assessment of the general condition of the dam reported herein was based upon available data and visual inspections. Detailed investigations and analyses involving topographic mapping, subsurface investigations, testing and detailed computational evaluations were beyond the scope of this report unless reported otherwise.

In reviewing this report, it should be realized that the reported condition of the dam was based on observations of field conditions at the time of inspection, along with data available to the inspection team.

It is critical to note that the condition of the dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the reported condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

J.Matthew Bellisle, P.E.
PARE CORPORATION
Senior Vice President

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1.0 DESCRIPTION OF PROJECT

1.1 General

1.1.1 Authority

The Woonsocket Water Division has retained Pare Corporation of Foxboro, Massachusetts and Lincoln, Rhode Island to perform a visual inspection and develop a report of conditions for the Harris Pond Dam along the along the Mill River in Woonsocket, Rhode Island. This inspection and report were performed in accordance with current Rhode Island laws.

This report is a supplement to the Inspection/Evaluation Report for the Harris Pond Dam, dated August 1, 2014. The work was completed in accordance with current Rhode Island dam safety regulations and the Notice of Violation (NOV), dated January 9, 2014 by the Rhode Island Department of Environmental Management Office of Compliance and Inspection (RIDEM).

RIDEM will develop an overall condition rating based upon the data presented herein. It is understood that this rating will consider operational and structural deficiencies and will be presented under separate cover.

1.1.2 Purpose of Work

The purpose of this investigation was to inspect and evaluate the present condition of the dam and appurtenant structures in accordance with current dam safety regulations to provide information that will assist in both prioritizing dam repair needs and planning/conducting maintenance and operation.

The investigation was divided into three parts: 1) obtain and review reports, investigations, and data pertaining to the dam and appurtenant structures available within the Rhode Island Department of Environmental Management files; 2) perform a visual inspection of the site; and; 3) prepare and submit a final report presenting the evaluation of the structure, including recommendations and remedial actions.

1.1.3 Definitions

To provide the reader with a better understanding of the report, definitions of commonly used terms associated with dams are provided in Appendix B. Many of these terms may be included in this report. The terms are presented under common categories associated with dams which include: 1) orientation; 2) dam components; 3) hazard classification; 4) general; and 5) condition rating.

1.2 Description of Project

1.2.1 Location

The Harris Pond Dam is located in the City of Woonsocket approximately 28.5 miles northwest of the City of Providence with the majority of the impoundment extending north into Blackstone, Massachusetts. The dam impounds water along Mill River to form Harris Pond. The dam is located at the southern end of the impoundment area near coordinates 42.01641ºN/71.50681ºW.

Please refer to the inspection summary for a locus plan depicting the area of the dam and its immediate surroundings.

To reach the dam from Providence, follow RI-146 North to RI-99 North. Follow RI-99 North for 2.8 miles and turn left onto Mendon Road. Continue 2.0 miles and turn right onto Clinton Street. Continue 0.6 miles and turn left onto Diamond Hill Road. After 0.3 miles, the gated roadway at the right end of the dam will be on the left immediately after a sharp curve in the roadway.

1.2.2 Owner/Caretaker

Harris Pond Dam is currently owned by the City of Woonsocket and operated by the Woonsocket Water Division. Mr. Mark Viggiani, Water Division Superintendent can be reached at 401-767-2619.

1.2.3 Purpose of the Dam

The dam, which was apparently originally constructed circa 1870 and rebuilt in 1969 after failure in 1955, currently impounds water as an auxiliary water supply source for the City of Woonsocket. No other purposes past or present were identified during the preparation of this report.

1.2.4 Description of the Dam and Appurtenances

The following description of the dam is from the February 1979 ACOE Phase I Inspection Report:

> "The present Harris Pond Dam was reconstructed in 1968-69 from the remains of an existing earth embankment, which was breached at its left end in 1955.
>
> The original dam was about 38 feet high and 500 feet long, closing off the valley between a right sloping abutment and a low knoll at the left abutment. The spillway for the original dam was located at a saddle about 200 feet to the left of the left end of the dam. During the 1955 failure, the main dam remained intact, but the spillway and saddle area were breached and eroded for about a 100 foot width to about 25 feet below the then-existing crest level of the dam.
>
> The 1969 reconstruction involved providing an outlet works conduit with a control shaft at approximately the level of the bottom of the breached area, refilling the gap to the same cross section as the main dam and constructing a new spillway at the knoll at the left abutment of the existing embankment. The main dam embankment was raised slightly and the slopes were reshaped. A low dike was constructed along the right abutment, sloping from the level of the right end of the dam to meet existing ground at a lower level about 300 feet to the right.
>
> The profile along the crest of the dam and dike is not horizontal, but ramped each way from the spillway to the dam abutments…The crest of the dam varies from elevation 180.3 to 177.3, and the crest of the dike varies from elevation 177.3 to 172.2, the lowest point being at the right abutment. The minimum freeboard above normal storage for the main dam embankment is 9.8 feet.

The typical reconstructed cross section in the area encompassing the original dam has a 2 ½ horizontal to 1 vertical upstream slope and a 2 to 1 downstream slope. The upstream slope basically consists of a sloping impervious earthfill blanket placed against the pre-existing earth dam, which is covered with a 12 inch layer of bank run gravel and a 6 inch layer of screened gravel. These layers are in turn overlain by an 18 inch thick layer of riprap over the entire upstream slope. The downstream slope consists of a pervious earthfill. The crest width is 35 feet and supports a partially paved access road. A stone gutter was incorporated along the toe of the downstream slope. A drain blanket and a toe drain collector system were installed at the toe of the downstream slope as shown on the contract drawings. The typical dam section in the east abutment breached area is a continuation of the typical embankment section previously described, except that a random pervious fill material was used to fill the breached gap.

A cut-off trench was provided beneath the impervious zone along the toe of the upstream slope of the embankment. This cut-off trench was extended either to bedrock or to a maximum depth of approximately 10 feet for the entire length of the dam. The dike from the right end of the dam apparently had no cut-off. Where the cut-off trench did not contact rock, a considerable thickness of natural granular soil overlies the rock. Seepage from the reservoir would, therefore, be expected to go through this layer. Analytical studies were made in 1968 by the dam engineer and seepage was predicted through this area. A toe drainage system was incorporated to intercept this seepage.

The spillway is located on the knoll between the main embankment to the right and the refilled breach gap to the left. The spillway channel is directed along the downstream face of the knoll, its centerline making an angle of about 69 degrees with the axis of the dam. The spillway has a 150 foot long ungated ogee crest converging to a 90 foot wide, three-stepped rectangular concrete-lined chute, and then to a trapezoidal riprap-lined stilling pool. The ogee crest is at elevation 167.3; the floor of the riprapped basin is at elevation 132. The total length of the concrete chute is about 250 feet. The spillway was designed for a normal capacity of 8,500 cfs at a surcharge head of about 6 feet, which is 1.3 feet higher than the low point on the dike. The spillway capacity when the dike would start to be overtopped is 5,500 cfs.

The spillway ogee crest structure, chute walls and floor slabs were placed on natural ground, with a gravel blanket and open-jointed vitrified pipe underdrainage system.

Outlet pipes at three selective levels are provided for releasing stored waters from the reservoir. Two 16 inch diameter cast iron inlet pipes, at elevations 160.5 and 153.0, lead into a wet well shaft where inflows are controlled by butterfly valves. A 20 inch diameter pipeline (also referend as a suction pipe) conveys these flows from the shaft to a pumping station situated to the right of the spillway. A 36 inch diameter low-level outlet pipe at elevation 144.5 leads from the reservoir to empty into a downstream channel, with control regulated by two, 24 inch diameter butterfly valves located in the wet well shaft."

1.2.5 Operations and Maintenance

The City of Woonsocket Water Division is primarily responsible for operations and maintenance at the dam, including undertaking routine maintenance of vegetation along the length of the dam, completing regular inspection, and completing other maintenance as required.

1.2.6 Hazard Potential Classification

In accordance with current classification procedures under State of Rhode Island dam safety rules and regulations, Harris Pond Dam has been classified as a High hazard potential dam by RIDEM.

2.0 INSPECTION

2.1 Visual Inspection

Harris Pond Dam was inspected on February 3, 2016. At the time of the inspection, the weather was near 40°F and overcast. Photographs to document the current condition of the dam were taken during the inspection and are included in Appendix A. The level of the impoundment appeared to be near normal operating levels. Underwater areas were not inspected as part of the field activity.

For reference purposes, a baseline was established along the crest of the dam embankment. Station 10+00 was located at the left abutment and extended to Station 20+50 at the right abutment. Observations are reported in relation to their location along the baseline as noted herein.

2.1.1 General Findings

In general, Harris Pond Dam was found to have cracked asphalt roadways and a low area along the crest, an irregular downstream slope left of the spillway, an eroded area behind the left training wall for the spillway, deterioration of concrete and joints within the spillway training walls, animal burrows, possible seepage along the toe, thinning riprap at the spillway approach, and other dam safety deficiencies. The specific concerns are identified in more detail in the sections below:

2.1.2 Dam Embankment

The following was noted along the embankment of the dam:

Upstream Side

- Since the previous inspection performed on August 1, 2014, the upstream has been cleared of unwanted vegetation as recommended in the August 2014 Inspection Report.
- The rip rap slope protection appears uniform and full except for thinner areas adjacent to both sides the primary spillway approach.
- No animal borrows, holes, depressions, or scarping was observed.
- The right abutment contact was found in satisfactory condition with no cracks or signs of unusual movement. Minor erosion from surface runoff is present along the fence line with exposed fence post foundations.
- The left abutment contact looked good with no deficiencies noted.

Crest

- The crest appeared in a similar condition to that observed during the August 2014 inspection with cracked and deteriorated asphalt along the access road; an apparent low area left of the primary spillway, and maintained grassed shoulders. The low area is an as-built condition.

Downstream Side

- Since the August 2014 inspection, the downstream toe left of the primary spillway has been cleared of vegetation as recommended in the August 2014 Inspection Report, allowing access and clear viewing for inspection.
- An approximate 20-foot diameter area at mid-slope near Station 15+00 has thinning grass cover with bare spots.
- The surface of the groin left of the low level discharge structure is wet and muddy with no flow observed. It appears that the wetness is sourced from areas beyond the dam.
- The previously observed irregular slopes left of the spillway remain unchanged including the eroded channel that has formed behind the training wall near the base of the slope. Part of the wall footing is exposed as a result of the erosion (See Photo No. 14).
- An animal burrow is present behind the low level outlet headwall at about 12-inches long, 5-inches wide, and was capable of being probed to 2 feet. *Between the time of the inspection and the writing of this report, the Owner has filled in the animal burrow.*
- An animal burrow is present near Station 17+00 about 15 feet from the toe. This hole was about 12 inches in diameter and up to 6 inches deep. *Between the time of the inspection and the writing of this report, the Owner has filled in the animal burrow.*

2.1.3 Appurtenant Structures

Primary Spillway

- The primary spillway was found in a similar condition to that observed during the previous August 2014 Inspection with minor cracking and efflorescence at the channel walls, missing sealant at the bridge deck joints, and erosion behind both the right and left walls of the main channel. It should be noted that water was flowing over the spillway at the time of the inspection limiting complete viewing.

Low Level Outlet

- The low level outlet valves were successfully operated during the August 2014 inspection and are reportedly exercised on a regular basis.
- The low level outlet discharges into a channel that carries flows along the toe towards the main channel. At the time of the inspection, the channel was flowing; however, the outlet pipe at the headwall was not. It appears that this channel also functions as an open toe drain. The accumulated discharge flow at the main channel was estimated at approximately 20 gallons per minute.
- The approach area was clear of surficial debris. Since the intake is submerged, an inspection for sedimentation buildup, blockage, or condition was not completed.
- The discharge channel was general clear of debris with a few saplings and 6” diameter trees present in the downstream channel near the outlet discharge. At this time, this vegetation is not expected to impact to the outlet’s discharge capacity.

- No erosion was noted in the immediate discharge area and along the channel banks above the waterline. Submerged areas were not inspected.

Drainage System

- At the time of the inspection, the discharge end of the toe drain left of the low level outlet discharge was not found with about 4 gpm of flow coming out of the rip rap followed by an approximate 3-inch thick buildup of iron flocculate. Based on past studies and existing drawings, it was assumed that the flow is sourced from a toe drain area and may be buried beneath the rip rap. This was confirmed by the Owner a few days after the inspection when Mr. Mike Bokoski of the Water Division uncovered the drain. The Pare inspector came back to the site with the Owner to document this. During Pare's visit, the drain appeared to be a 6-inch diameter vitrified clay (V.C.) pipe with a broken but open end. It appears that this toe drain has been backed up for some time as the pipe was flowing near full capacity (30 gallons per minute) with occasional discharges of viscous flocculate.
- A 6" diameter PVC toe drain outlet is present on the right side of the low level discharge structure with no flow.
- A gated drain was found at a concrete headwall along the outlet channel about half way between the low level outlet structure and the main channel. This structure is identified in historic drawings as 6" cast iron (C.I.) a blow off-pipe from a 20" C.I. suction pipe that conveys water from the gatehouse to the pump station. At the time of the inspection, the end of the blow-off pipe was submerged and buried with sediment and not viewable; therefore, inspections were limited to probing.
- As indicated on historic drawings, a toe drain discharge is located approximately 60 feet from the right abutment. An undefined flow channel that is overgrown with aquatic plants is present in this area; however, the toe drain outlet could not be located. Water within the channel is up to 6-inches deep no measurable flow. The flow area is near 80-feet wide near the toe of the dam and progressively narrows in the downstream direction. The toe left of this flow channel is well grassed with apparent spillage from the apparent toe drain flow channel.

2.1.4 Downstream Area

Immediately downstream of the dam is Menard Field, a maintained baseball field area. Further downstream, the downstream channel includes approximately 3,000 feet of trapezoidal channel constructed as part of a flood control system. The channel passes through a 1,000 foot long culvert beneath developed portion of Woonsocket before its confluence with the Blackstone River.

2.1.5 Reservoir Area

The dam is at the southern end of the impoundment. The shorelines surrounding the impoundment are generally steep and undeveloped with residential development at the top of the slopes.

2.2 Caretaker Interview

Mr. Mike Bokoski, Woonsocket Water Supply Inspector, was present during the inspection and Mr. Marc Viggiani Woonsocket Water Division Superintendent was contacted prior to the inspection. Information provided by Mr. Bokoski and Mr. Viggiani has been incorporated into this report.

2.3 Operation and Maintenance Procedures

An Operations and Maintenance (O&M) Manual was developed for the Owner by Pare in February 2002. The Operation and Maintenance Manual outlines the recommended inspection program and an overview of the maintenance tasks necessary to maintain the dam in an operable condition.

2.3.1 Operational Procedures

The O&M Manual includes a detailed protocol for providing a logical sequence for monitoring and controlling the water levels in the pond by regulating the flow through the outlets at the dam.

2.3.2 Maintenance of Dam and Operating Facilities

The Owner has an O&M Manual, developed in 2002 and appears to follow the recommended procedures. Observed maintenance includes regular mowing of the dam, rodent control, upkeep of the grass cover, and clearing of the approach and discharge channels at the primary spillway.

The Owner has retained the funds to address most of the deficiencies noted at the Harris Pond Dam and is in the process of retaining an engineering firm to perform evaluations and to help assemble the bid documents.

3.0 ASSESSMENTS AND RECOMMENDATIONS

3.1 Assessments

The Woonsocket Reservoir No. 1 Dam was found to have the following deficiencies:

1. An upstream slope with areas of thinning rip rap left and right of the spillway approach and minor erosion at the right abutment contact;
2. A crest with cracked asphalt within the roadway and an as-built low area left of the spillway;
3. An irregular downstream slope left of the spillway with deep erosion behind the spillway's left training wall;
4. The downstream slope right of the spillway near Station 15+00 has an approximate 20-foot diameter area of thinning grass and bare spots;
5. Two animal burrows were found; one behind the low level outlet discharge headwall and one on the lower third of the downstream slope near Station 17+00 *(the City reportedly has filled in these holes since the time of the inspection)*;
6. A saturated downstream toe right of the spillway (apparent overflow from the toe drain channel);
7. A primary spillway with cracks, efflourescent staining, and exposed joints on its concrete training walls;
8. Cracked asphalt on the spillway bridge deck with exposed joints;

The previous inspection was completed by Pare on August 1, 2014. Based upon a comparison to reported conditions, several deficiencies have been addressed; however, some remain and have continued to deteriorate.

Previously Identified Deficiency/Recommendation	***Resolution or Current Condition***
Complete a video inspection and underwater inspection of the low level outlet pipe and associated components.	Not completed*
Clear the upstream slope, downstream left abutment, and downstream area left of the spillway.	Completed
Evaluate the current status of the dike structure through a file review of information to verify if filling activities eliminated the presence of an embankment.	Not completed*
Evaluate the need for additional scour protection at the discharge area of the low level outlet pipe.	No erosion was noted along the above-water areas of the channel.
Complete a detailed inspection of the spillway structure in areas inaccessible during the current inspection.	Not completed*
Complete a video inspection of the toe drain outlet pipes.	Apparently not completed*
Develop and implement a monitoring program and evaluation to further assess the observed	Resolved by uncovering a functioning toe drain pipe.

seepage left of the low level outlet.	
Seal/repair the crack in the left training wall.	Not completed*
Seal/fill open construction joints in the spillway, including construction joints in the training walls as well as those on the spillway surfaces.	Not completed*
Repair/patch areas of concrete deterioration, including the apparent spall on the underside of the spillway bridge deck and the backside of the right training wall.	Not completed*
Fill area of erosion behind the left training wall and install a drainage swale.	Not completed*
A formalized Operations and Maintenance Manual should be developed for this structure.	The Operations and Maintenance Manual was developed by Pare in 2002.

* *The addressing of this deficiency/recommendation is anticipated in the upcoming repair project*

The following recommendations and remedial measures generally describe the recommended approach to address current deficiencies at the dam. Prior to undertaking recommended maintenance, repairs, or remedial measures, the applicability of environmental permits needs to be determined for activities that may occur within resource areas under the jurisdiction of RIDEM or other regulatory agencies.

3.2 Recommendations

The following presents additional studies, routine and recurrent operations and maintenance activities, and repairs recommended to address deficiencies noted during the inspection and the completion of this report. The recommendations provided below should be implemented in accordance with general dam safety practice. Further, if left unaddressed, many of the conditions identified above will continue to deteriorate and could compromise the future safety of the dam and appurtenant structures.

Since the August 2014 inspection, the Owner has completed the clearing of unwanted vegetation along the embankment, the water flowing from slope left of the low level outlet structure was found to be sourced from a toe drain; and Pare has verified that the outlet discharge channel has sufficient protection. The remaining deficiencies remain unchanged. Additional deficiencies were encountered during Pare's inspections the cleared areas. Therefore, with the exception of the above improvements and/or findings, the previous recommendations remain valid with a few added recommendations from uncovered findings during this inspection.

1. Biannual clearing (i.e. late spring and fall) is recommended to keep the vegetation from returning. When brush is cut down, it should be removed from the dam to permit a clear view of the embankment. Current procedures should be expanded to include all areas of the upstream slope and extending onto the abutments.

2. Complete a detailed inspection of the spillway structure in areas inaccessible during the current inspection. If possible, the inspection should be completed with the level of the impoundment below the spillway crest to allow for access to all areas of the spillway. Inspect and evaluate all drains within the spillway structure as well as the condition of all construction joints.

3. Perform a video inspection of the toe drain outlet pipes. Considering the size of the pipes, the use of a ROV camera will be required.

4. Seal/repair the crack in the left training wall.

5. Seal and fill open construction joints in the spillway, including construction joints in the training walls, the spillway surfaces, and within the bridge deck.

6. Repair/patch areas of concrete deterioration, including the spall on the underside of the spillway bridge deck and the backside of the right training wall.

7. Fill the eroded area behind the left training wall with compacted structural fill and install a riprap swale in this area to limit reoccurrence.

8. Provide additional rip rap to augment the thinning areas at the spillway approach. The rip rap should be designed to provide a stable matrix.

9. Continue regular maintenance activities to maintain a healthy grass cover and to control the growth of unwanted vegetation along the embankment slopes, crest, and upstream slope as outlined in the Owner's O&M Manual.

10. Implement a program of regular inspection and monitoring of the dam. As the dam is currently classified as a high hazard potential dam, the completion of a formal visual inspection by a RI registered professional engineer familiar with dam engineering is recommended every 2 years.

3.3 Alternatives

The following alternatives are presented based upon a conceptual review of the concerns. Additional studies and or considerations may indicate that some or all of the options presented below are not suitable for the conditions specific to this dam and dam site. In addition to the general activities, appropriate environmental permits will be required to complete many of the alternatives presented below.

Dam Removal/Breaching: Alternative to implementing any of the repairs noted above, breaching of the dam is a viable alternative for addressing safety and stability concerns at the dam. Due to the water supply purpose of this dam, this alternative is likely not practical or feasible.

COMMON DAM SAFETY DEFINITIONS

For a comprehensive list of dam engineering terminology and definitions refer to State of Rhode Island Rules and Regulations for Dam Safety, or other reference published by FERC, Dept. of the Interior Bureau of Reclamation, or FEMA.

Orientation

Upstream – Shall mean the side of the dam that borders the impoundment.
Downstream – Shall mean the high side of the dam, the side opposite the upstream side.
Right – Shall mean the area to the right when looking in the downstream direction.
Left – Shall mean the area to the left when looking in the downstream direction.

Dam Components

Dam – means any barrier made by humans, including appurtenant works that impounds or diverts water.
Embankment – means the fill material, including but not limited to rock or earth, placed to provide a permanent barrier that impounds water.
Crest – Shall mean the top of the dam, usually provides a road or path across the dam.
Abutment – Shall mean that part of a valley side against which a dam is constructed. An artificial abutment is sometimes constructed as a concrete gravity section, to take the thrust of an arch dam where there is no suitable natural abutment.
Appurtenant Works – means any ancillary feature of a dam including such structures as dikes, training walls, spillways, either in the dam or separate there from, low level outlet works, and water conduits such as tunnels, channels, pipelines or penstocks, either through the dam or its abutments.
Spillway – means a structure, a low area in natural grade or any part of the dam which has been designed or relied upon to allow normal flow or major flood flow to pass over or through while being discharged from a reservoir.

Hazard Classification

High Hazard – means a dam where failure or misoperation will result in probable loss of human life.
Significant Hazard – means a dam where failure or misoperation results in no probable loss of human life but can cause major economic loss, disruption of lifeline facilities or impact other concerns detrimental to the public's health, safety or welfare. Examples of major economic loss include but are not limited to washout of a state or federal highway, washout of two or more municipal roads, loss of vehicular access to residences, (e.g. a dead end road whereby emergency personnel could no longer access residences beyond the washout area) or damage to a few structures.
Low Hazard – means a dam where failure or misoperation results in no probable loss of human life and low economic losses.

General

EAP – Emergency Action Plan – Shall mean a predetermined (and properly documented) plan of action to be taken to reduce the potential for property damage and/or loss of life in an area affected by an impending dam failure.
O&M Manual – Operations and Maintenance Manual; Document identifying routine maintenance and operational procedures under normal and storm conditions.
Normal Pool – Shall mean the elevation of the impoundment during normal operating conditions.
Acre-foot – Shall mean a unit of volumetric measure that would cover one acre to a depth of one foot. It is equal to 43,560 cubic feet. One million U.S. gallons = 3.068 acre feet.

Height of Dam– means the vertical distance from the elevation of the uppermost surface of a dam to the lowest point of natural ground, including any stream channel, along the downstream toe of the dam.
Hydraulic Height – means the height to which water rises behind a dam and the difference between the lowest point in the original streambed at the axis of the dam and the maximum controllable water surface.
Maximum Water Storage Elevation – means the maximum elevation of water surface which can be contained by the dam without overtopping the embankment section.
Spillway Design Flood (SDF) – Shall mean the flood used in the design of a dam and its appurtenant works particularly for sizing the spillway and outlet works, and for determining maximum temporary storage and height of dam requirements.
Maximum Storage Capacity – The volume of water contained in the impoundment at maximum water storage elevation.
Normal Storage Capacity – The volume of water contained in the impoundment at normal water storage elevation.

Condition Rating

Unsafe – Means the condition of a regulated dam, as determined by the Director, is such that an unreasonable risk of failure exists that will result in a probable loss of human life or major economic loss. Among the conditions that would result in this determination are: excessive vegetation that does not allow the Director to perform a complete visual inspection of a dam, excessive seepage or piping, significant erosion problems, inadequate spillway capacity, inadequate capacity and/or condition of control structure(s) or serious structural deficiencies, including movement of the structure or major cracking.*
Poor – A component that has deteriorated beyond a maintenance issue and requires repair. the component no longer functions as it was originally intended.
Fair – Means a component that requires maintenance
Good – Meeting minimum guidelines where no irregularities are observed and the component appears to be maintained properly.

* Structural deficiencies include but are not limited to the following:

- Excessive uncontrolled seepage (e.g., upwelling of water, evidence of fines movement, flowing water, erosion, etc.)
- Missing riprap with resulting erosion of slope
- Sinkholes, particularly behind retaining walls and above outlet pipes, possibly indicating loss of soil due to piping, rather than animal burrows
- Excessive vegetation and tree growth, particularly if it obscures features of the dam and the dam cannot be fully inspected
- Deterioration of concrete structures (e.g., exposed rebar, tilted walls, large cracks with or without seepage, excessive spalling, etc.)
- Inoperable outlets (gates and valves that have not been operated for many years or are broken)

REFERENCES AND RESOURCES

The following reports were located during the file review completed at RIDEM Offices in Providence, Rhode Island and within PARE's archive files:

1. "Visual Inspection/Evaluation Report for Woonsocket Reservoir No. 1 Dam", Pare Corporation, August 1, 2014.

2. "Visual Inspection/Evaluation Report for Woonsocket Reservoir No. 1 Dam", Pare Corporation, July 19, 2012.

3. "Operation and Maintenance Manual for Woonsocket Reservoir No. 1 Dam", Pare Engineering Corporation, February 2002.

4. "Emergency Action Plan for Woonsocket Reservoir No. 1 Dam", Pare Engineering Corporation, May 2002.

5. "Phase I Dam Inspection Report, Woonsocket Reservoir No. 1 Dam", Pare Engineering Corporation, Inspected on April 3, 2001, Report Submitted May 2001.

6. "Dam Inspection Report, Reservoir No. 1", Rhode Island Department of Environmental Management Office of Compliance and Inspection, March 16, 2000.

7. "Dam Inspection Report, Woonsocket Reservoir #1 Dam", State of Rhode Island and Providence Plantations Department of Environmental Management, April 8, 1993.

8. "Dam Inspection Report, Woonsocket Reservoir #1 Dam", State of Rhode Island and Providence Plantations Department of Environmental Management, October 25, 1985.

9. "Special Inspection Report, Woonsocket Water Works #1", Rhode Island Department of Public Works Division of Harbors and Rivers, July 30, 1947.

The following were referenced during the completion of the visual inspection and preparation of this report and the development of the recommendations presented herein:

1. "Design of Small Dams", United States Department of the Interior Bureau of Reclamation, 1987

2. "ER 110-2-106 - Recommended Guidelines for Safety Inspection of Dams", Department of the Army, September 26, 1979.

3. "Guidelines for Reporting the Performance of Dams" National Performance of Dams Program, August 1994.

The following provides an abbreviated list of resources for dam owners to locate additional information pertaining to dam safety, regulations, maintenance, operations, and other information relevant to the ownership responsibilities associated with their dam.

1. RIDEM Office of Compliance and Inspection Website: http://www.dem.ri.gov/programs/benviron/compinsp/

2. "Dam Owner's Guide To Plant Impact On Earthen Dams" *FEMA L-263,September 2005*

3. "Technical Manual for Dam Owners: Impacts of Plants on Earthen Dams" *FEMA 534, September 2005*

4. "Dam Safety: An Owners Guidance Manual" *FEMA 145,December 1986*

5. Association of Dam Safety Officials – Website: www.asdso.org/

6. "Dam Ownership – Responsibility and Liability", ASDSO

Photo No. 1: Panoramic overview of the dam from the right abutment. The clearing of vegetation from the upstream slope has been completed.

Photo No. 2: The upstream side of the left abutment contact area as viewed from near Station 1+00.

Photo No. 3: Thinning areas of rip rap right of the primary spillway approach looking upstream from the crest. This is typical of the opposite side.

Photo No. 4: The right abutment contact at the upstream slope. Note erosion around fence line. .

Photo No. 5: Crest as viewed from the left abutment. Note the low area between the gatehouse and the primary spillway.

Photo No. 6: The crest as viewed from left of the primary spillway looking left.

Photo No. 7: Crest as viewed from right of the primary spillway looking right. Note the cracked asphalt pavement.

Photo No. 8: Crest as viewed from near Station 20+00 looking left.

Photo No. 9: Downstream slope and outlet discharge channel as viewed from the left abutment looking right.

Photo No. 10: Downstream toe and low level outlet discharge channel looking right from the outlet headwall. The stained water is sourced from the cleared toe drain located left of the headwall (arrow shows flow direction).

Photo No. 11: Animal Borrow behind the low level outlet discharge headwall.

Photo No. 12: The downstream slope left of the spillway as viewed from left of the primary spillway looking downstream. Note the irregular surfaces.

Photo No. 13: Deep erosion behind the spillway's left training wall looking downstream from mid-slope.

Photo No. 14: Erosion behind the spillway's left training wall looking upstream from the toe. Note the exposed wall footing.

Photo No. 15: Downstream slope as viewed from the right abutment looking left. Note the wide flow channel from the assumed toe drain outlet.

Photo No. 16: Primary spillway as viewed from the left side of the main channel looking upstream.

Photo No. 17: The primary spillway upstream weir looking right.

Photo No. 18: Open joint at the spillway's left training wall as viewed from the spillway bridge looking downstream.

Photo No. 19: The primary spillway approach as viewed from near the gatehouse looking right.

Photo No. 20: Overview of the primary spillway stepped section and downstream channel beyond..

Photo No. 21: The low level outlet discharge structure looking upstream and to the right from the discharge channel. Note the locations of the 2 toe drains.

Photo No. 22: The recently uncovered toe drain outlet on the left side of the low level outlet headwall. Note the broken end and stained flow.

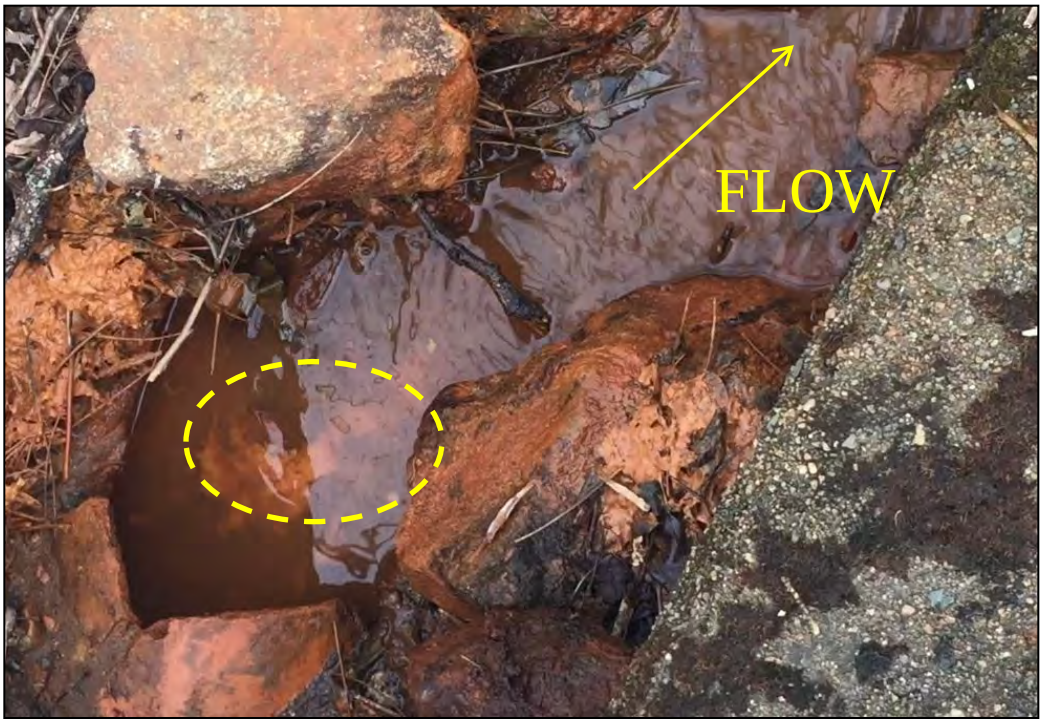


Photo No. 23: Close-up of Photo No. 22. Note the mass of iron flocculate within the discharge flows.

Photo No. 24: Low Level outlet discharge channel and wet area beyond the toe looking left. The wet area beyond the toe appears to be sourced from outside the dam limits.

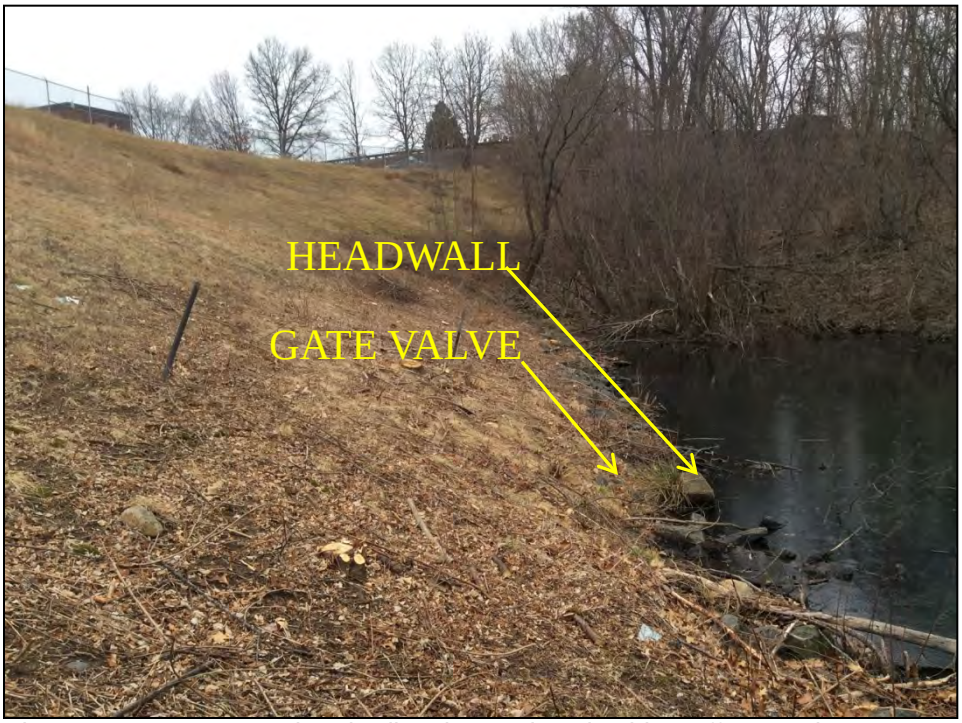
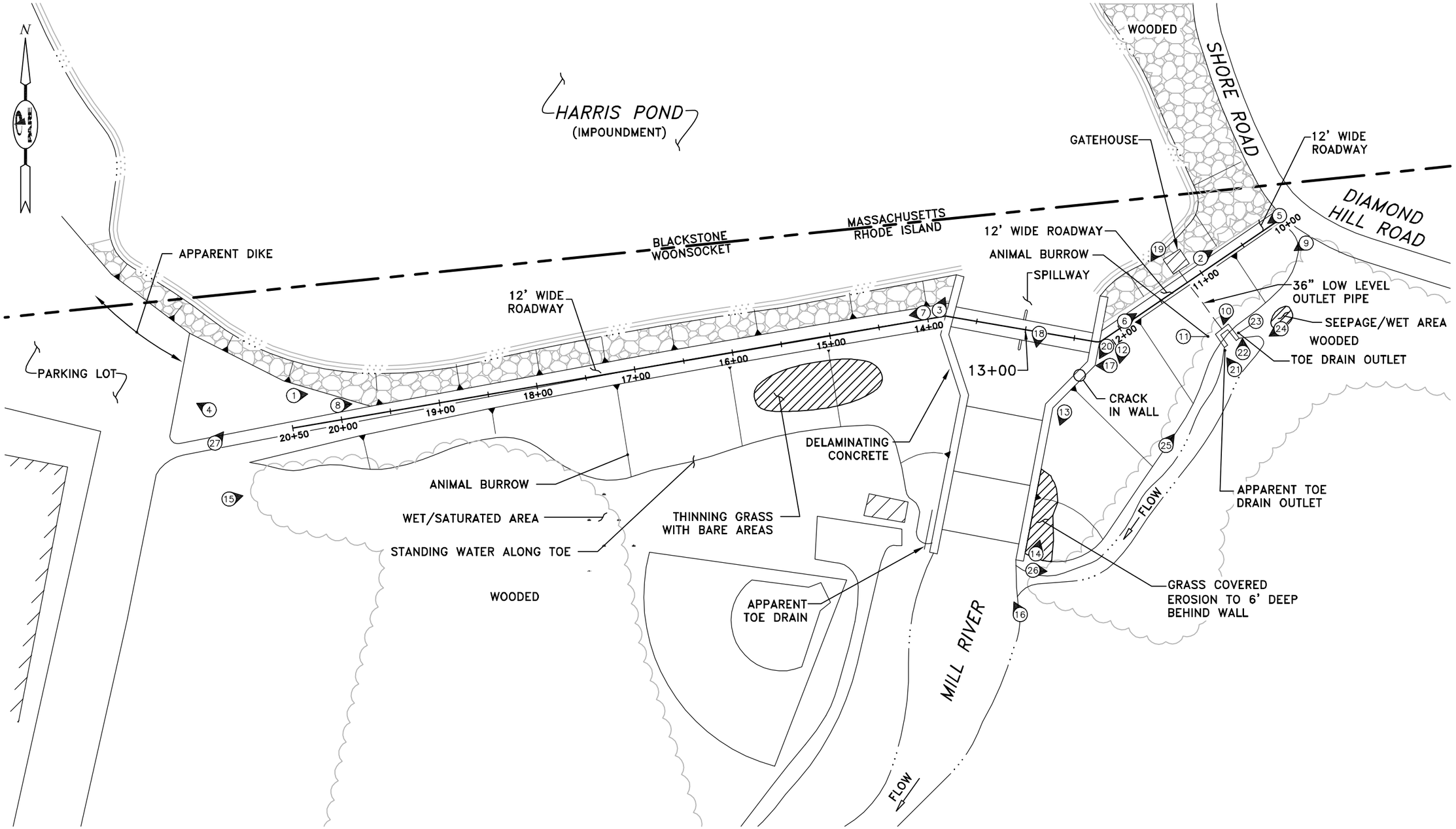


Photo No. 25: Concrete headwall at the suction pipe blow-off. Note the gate valve location.

Photo No. 26: Low level outlet discharge channel as viewed from the main channel looking right. Accumulated flows were estimated at 20 gallons per minute.

Photo No. 27: Panoramic view of the impoundment as viewed from the right abutment.



NOTES AND LEGEND

1. PLAN DEVELOPED FROM NOTES TAKEN DURING THE INSPECTION, PAST INSPECTIONS, AND AVAILABLE AERIAL IMAGERY FROM RIGIS. INFORMATION IS PROVIDED FOR REFERENCE PURPOSES ONLY.

(#) DENOTES APPROXIMATE LOCATION AND DIRECTION OF PHOTOGRAPH.

0+00 BASELINE AND STATIONING

SITE SKETCH

SCALE: 1"=100'±

PARE
PARE CORPORATION
ENGINEERS • SCIENTISTS • PLANNERS
10 LINCOLN ROAD, SUITE 103
FOXBORO, MA 02035
508-543-1755

SCALE ADJUSTMENT GUIDE
0" 1"
BAR IS ONE INCH ON ORIGINAL DRAWING.

HARRIS POND DAM

RI DAM No. 073
WOONSOCKET, RHODE ISLAND
OWNER: CITY OF WOONSOCKET

REVISIONS:

PROJECT NO.:	16111.00
DATE:	FEBRUARY 2016
SCALE:	AS NOTED
DESIGNED BY:	ARO/DMM
CHECKED BY:	DMM
DRAWN BY:	AWB/LMC
APPROVED BY:	JMB

SITE SKETCH

FIGURE NO.: 1

APPENDIX C

Tank Inspection Reports by Underwater Solutions, Inc.

UNDERWATER SOLUTIONS INC.

INSPECTION AND INTERIOR CLEANING (SEDIMENT REMOVAL) OF THE 500,000-GALLON WELDED STEEL CLEARWELL (WEST)

CITY OF WOONSOCKET WATER DIVISION
WOONSOCKET, RHODE ISLAND

APRIL 17, 2018

INSPECTION AND INTERIOR CLEANING (SEDIMENT REMOVAL) OF THE 500,000-GALLON WELDED STEEL CLEARWELL (WEST)

CITY OF WOONSOCKET WATER DIVISION
WOONSOCKET, RHODE ISLAND

APRIL 17, 2018

SCOPE:

On April 17, 2018, Underwater Solutions Inc. inspected the 500,000-gallon welded steel clearwell (West) to provide information regarding the overall condition and integrity and removed the sediment accumulation from the floor.

EXTERIOR INSPECTION:

The entire exterior of this clearwell was inspected, to include walls and coating, manway, foundation, overflows, roof, vent, and hatch.

Walls And Coating

The exterior steel wall panels and associated welds were inspected and were found appearing sound and free of obvious failures of the steel at this time.

The average dry film thickness of the protective coating system applied to the exterior welded steel wall panels were measured during this inspection. The dry film thickness of the coating system applied to the exterior wall surfaces was found as follows:

Row	***Mil Thickness***
1.	4.91 mils
2.	4.84 mils

The American Water Works Association (AWWA) recommends a dry film thickness of 7.0 to 10.0 mils of coating film thickness be applied to the exterior surfaces of welded steel potable water storage clearwells to provide adequate protection for welded steel structures.

The protective coating applied to these welded steel surfaces has an average dry film thickness that is below the AWWA's recommendations and has expired and no longer provides protection for the steel wall panels or welds.

Cracking and lifting of the protective coating was found throughout approximately 85% of these surfaces and was observed throughout all elevations of the exterior walls, causing mild surface corrosion (blotch rusting) to show through the coating. Secondary coating adhesion loss has resulted in exposure of the primary coating throughout approximately 10% of these surfaces, while complete coating loss has resulted in exposure of the underlying steel throughout approximately 5% of these surfaces at this time.

Corrosion of the exposed steel was evident within all areas of coating adhesion loss, while fatigue (pitting) of the steel having depths of barely detectable levels was observed within less than 5% of the areas of steel exposure at this time.

Ultrasonic metal thickness measurements of the steel wall panels of this clearwell were taken during this inspection. The average metal thickness of these surfaces were found as follows:

Lowest row of wall panels: .355"

Upper row of wall panels: .361"

It is the opinion of Underwater Solutions Inc. that these ultrasonic metal thickness measurements are uniform, while no abnormally high or low metal thickness measurements were observed during this inspection.

A non-uniform accumulation of mildew and corrosion staining from exposed steel exists throughout the exterior walls, causing declined aesthetics.

Manway

A 24" inside diameter manway penetrates the lowest wall panel on the south-westernmost side of the clearwell, located approximately 20" above the clearwell base and is securely installed and free of leakage at this time.

The protective coating applied to the steel manway lid, trunk and securing hardware has expired.

Secondary coating adhesion loss throughout all surfaces of the manway has resulted in exposure of the underlying primary coating throughout approximately 5% of these surfaces and adhesion loss of the primary coating throughout approximately 5% of these surfaces has resulted in exposure of the underlying steel.

No obvious fatigue (pitting) of the steel manway lid or trunk was evident within these areas of steel exposure and no obvious deterioration of the securing hardware was evident within these areas of steel exposure, rather mild surface corrosion exists at this time.

Ladders

This clearwell does not have a ladder and requires a ladder having a minimum length of 18' to gain access to the roof.

Foundation

The exposed surfaces of the 3" wide by 10" tall concrete foundation is not coated and was found having tight surface cracks throughout approximately 5% of these exposed concrete surfaces.

These cracks were sounded, and no obvious voids were evident, however numerous areas of concrete spall exist throughout approximately 5% of the circumference of the foundation, ranging in size from 6" long by 3" wide to 14' long by 8" wide. The surrounding and underlying concrete within these areas of spall appeared sound. No obvious exposure of the underlying reinforcement steel was evident within these areas of concrete spall at this time.

An elastomeric sealant has been applied throughout the circumference of the clearwell at the junction of where the foundation and tank base meet since a previous inspection completed by Underwater Solutions Inc. on May 9, 2013. This sealant was found having good adhesion value, preventing moisture from penetrating and accumulating beneath the clearwell.

Overflows

The overflow consists of thirty-six, 36" long by 3" wide cutouts evenly spaced throughout the circumference of the top of the top row of wall panels, located approximately 5" below the junction of where the roof and walls meet. Each overflow cutout was free of obvious obstructions, while the screen installed over each overflow cutout was found securely in-place, preventing access to the interior of the clearwell.

Roof

The steel panels and associated welds were inspected and were found appearing sound and free of obvious failures of the steel at this time.

The protective coating applied to these welded steel surfaces has an average dry film thickness of 2.62 mils and is below the AWWA's recommendations, and has expired and no longer provides protection for the steel.

Adhesion loss of both the primary and secondary coating was observed throughout approximately 75% of the roof, resulting in exposure of the underlying steel. No obvious fatigue (pitting) of the steel roof panels was evident within these areas of steel exposure and no obvious deterioration of the welds was evident within these areas of steel exposure, rather mild surface corrosion exists at this time.

A corrosion stain throughout the roof has declined the overall aesthetics.

Ultrasonic metal thickness measurements of the steel roof panels of this clearwell were taken during this inspection. The average metal thickness of these surfaces were found as follows:

Roof panels: .49".

It is the opinion of Underwater Solutions Inc. that these ultrasonic metal thickness measurements are uniform, while no abnormally high or low metal thickness measurements were observed during this inspection.

Vent

The vent is located within the center of the roof, having a 12" inside diameter and stands 26" tall. A 37" outside diameter cap and associated screen was found securely installed over the vent penetration in the roof, preventing access to the interior of the clearwell.

The protective coating applied to this steel vent assembly has expired and has caused steel exposure and corrosion throughout all surfaces of the vent, however this vent assembly remains sound and free of obvious fatigue/deterioration of the steel at this time.

Hatch

A 24" by 24" hatch provides good access to the clearwell interior through the roof dome.
This hatch remains in good working condition and was found secured with a lock, preventing unwanted access to the interior of the clearwell.

The protective coating applied to the interior and exterior surfaces of the hatch cover and hatch trunk has expired. This condition has caused steel exposure and corrosion, yet these steel surfaces remain sound and free of obvious fatigue/deterioration at this time.

INTERIOR INSPECTION:

The entire interior of this clearwell was inspected, to include sediment accumulations, floor, manway, piping, walls and coating, overhead, overflows, and aesthetic water quality.

Sediment Accumulations

A uniform layer of accumulated precipitate was found throughout the floor, ranging from 1/16" to 1/8" in depth.

After completing this inspection, all precipitate was removed (vacuumed) from the floor.

Floor

After removing the precipitate, the steel floor panels and associated welds were inspected and were found appearing sound and free of obvious failures of the steel at this time.

The protective coating applied to these welded steel surfaces has an average dry film thickness of 26.9 mils and appeared to have been applied uniformly and meets the AWWA's recommendation, however was found having poor adhesion value at this time.

Blistering of the protective coating was observed throughout approximately 35% of all surfaces. Approximately 50% of these coating blisters have ruptured and have resulted in exposure of the underlying steel.

No obvious fatigue (pitting) of the steel panels or deterioration of the welds was evident within these areas of steel exposure, rather mild surface corrosion exists at this time.

Mild to moderate staining remains throughout the entire floor due to accumulation of precipitate.

Manway

A 24" inside diameter manway penetrates the lowest wall panel on the south-westernmost side of the clearwell, located approximately 20" above the floor and is securely installed and free of obvious leakage.

The protective coating applied to the manway lid and trunk has an average dry film thickness of 52.4 mils and meets the AWWA's recommendations, however adhesion loss (cracking and blistering) of the protective coating has resulted in exposure of the underlying steel throughout approximately 25% of the surfaces of the manway lid and trunk.

Corrosion exists within all areas of the manway trunk and lid showing steel exposure and fatigue (pitting) of the steel was observed within approximately 15% of these areas of steel exposure.

These areas of fatigue (pitting) range in size from 1/4" in diameter by 1/8" in depth to 2" in diameter by 1/4" in depth.

The ultrasonic metal thickness of the steel manway lid and trunk was found to be .545".

Piping

Three pipes were inspected within this clearwell.

The first pipe inspected penetrates the floor 32" in from the wall on the easternmost side of the clearwell, having a 30" inside diameter and is flush in the floor. A 32" inside diameter by 6" tall riser is installed above this pipe, serving as a silt stop. This pipe was free of obvious obstructions and was without flow at the time of this inspection.

The protective coating applied to the steel silt stop riser was found having poor adhesion value and is blistering throughout approximately 25% of these surfaces, resulting in exposure of the underlying steel. No obvious fatigue/deterioration of this riser was evident within these areas of steel exposure, rather mild to moderate corrosion exists at this time.

The second pipe inspected penetrates the floor 38" in from the wall on the north-easternmost side of the clearwell, having a 23" inside diameter and stands 6" tall. This pipe was free of obvious obstructions and was without flow at the time of this inspection.

The protective coating applied to the steel pipe was found having poor adhesion value and is blistering throughout approximately 25% of these surfaces, resulting in exposure of the underlying steel. No obvious fatigue/deterioration of this pipe was evident within these areas of steel exposure, rather mild to moderate corrosion exists at this time.

The third pipe inspected penetrates the floor 30" in from the wall on the easternmost side of the clearwell, having a 28" inside diameter. This pipe extends up from the floor approximately 60" through a 90˚ elbow, directing the pipe across the floor and is supported in-place with twenty-five welded standoffs.

Approximately 38" from the wall on the easternmost side of the clearwell, this pipe extends through a second 90° elbow, directing this pipe up and terminates approximately 62" above the floor. This pipe was free of obvious obstructions and was without flow at the time of this inspection.

The protective coating applied to the surfaces of the metal pipe, pipe securing hardware and pipe support standoffs was found having poor adhesion value and is blistering throughout approximately 40% of these surfaces. Approximately 20% of these coating blisters have ruptured, resulting in exposure of the underlying metal. No obvious fatigue/deterioration of the pipe, pipe securing hardware or pipe support standoffs was evident within these areas of metal exposure, rather mild to moderate surface corrosion exists at this time.

Walls And Coating

The interior walls were inspected beginning at the floor and by spiraling the circumference of the clearwell up to the water surface.

These steel wall panels and associated welds appeared sound and free of obvious failures of the steel at this time.

The average dry film thickness of the protective coating system applied to the interior welded steel wall panels was measured during this inspection. The dry film thickness of the coating system applied to the interior wall surfaces was found as follows:

Row	***Mil Thickness***
1.	40.62 mils
2.	44.17 mils

The American Water Works Association (AWWA) recommends a dry film thickness of 10.5 to 15.5 mils of coating film thickness be applied to the interior surfaces of welded steel potable water storage clearwells to provide adequate protection for welded steel structures.

The protective coating applied to these welded steel surfaces appeared to have been applied uniformly and meets the AWWA's recommendations, however adhesion loss of the protective coating was observed throughout all elevations of the interior walls.

Blistering of the protective coating was observed throughout approximately 30-40% of these surfaces. Approximately 25% of these coating blisters have ruptured, resulting in exposure of the underlying steel.

Corrosion exists within all areas of the interior walls showing steel exposure and no obvious fatigue (pitting) of the steel was evident within these areas of steel exposure at this time.

Mild staining exists throughout all wall surfaces, beginning approximately 20" below overflow level and extends down to the floor.

Overhead

The entire overhead was inspected from the water surface.

These steel panels and associated welds appeared sound and free of obvious failures of the steel however deterioration of the angle iron overhead supports was observed at this time.

The protective coating applied to these surfaces has an average dry film thickness of 40.28 mils and appeared to have been applied uniformly and meets the AWWA's recommendations, however a decline in film thickness (thinning) of the protective coating and adhesion loss (peeling) of the protective coating has resulted in exposure of the underlying steel throughout approximately 50% of all overhead surfaces at this time.

No obvious fatigue (pitting) of the steel panels or deterioration of the welds was evident within these areas of steel exposure, rather mild to moderate surface corrosion exists at this time.

The angle iron supports appeared mostly sound, however adhesion loss of the protective coating throughout these support components has caused steel exposure and corrosion. Fatigue (deterioration) of these steel supports was observed at the location where these supports contact an angle iron flange that is welded throughout the circumference of the tank at the junction of where the walls and overhead meet.

The levels of fatigue (deterioration) of these supports is at minimum levels and causes no immediate concern for collapse (failure of the entire roof) at this time.

Overflows

The overflow consists of a series of thirty-six, 36" long by 3" wide cutouts evenly spaced throughout the circumference of the top of the top row of wall panels, each located approximately 5" below the junction of where the roof and walls meet.

Each overflow cutout was free of obvious obstructions at the time this inspection was completed.

Aesthetic Water Quality

The aesthetic water quality was found to be good throughout this entire clearwell, allowing unlimited visibility for this inspection.

RECOMMENDATIONS:

It is the opinion of Underwater Solutions Inc. that this welded steel clearwell appears mostly sound and free of obvious leakage at this time.

EXTERIOR:

The exterior steel wall panels and associated welds were found appearing sound and remain free of obvious failures of the steel at this time.

The protective coating applied to these welded steel surfaces has an average dry film thickness that is below the AWWA's recommendations and has expired and no longer provides protection for the steel wall panels or welds.

Cracking and lifting of the protective coating throughout approximately 85% of these surfaces and throughout all elevations of the exterior walls has caused mild surface corrosion (blotch rusting) to show through the coating. Secondary coating adhesion loss has resulted in exposure of the primary coating throughout approximately 10% of these surfaces, while complete coating loss has resulted in exposure of the underlying steel throughout approximately 5% of these surfaces at this time.

Corrosion of the exposed steel was evident within all areas of coating adhesion loss, and fatigue (pitting) of the steel having depths of barely detectable levels was observed within less than 5% of the areas of steel exposure at this time.

Ultrasonic metal thickness measurements of the steel wall panels of this clearwell were taken during this inspection, and no abnormally high or low metal thickness measurements were observed during this inspection.

A non-uniform accumulation of mildew and corrosion staining from exposed steel exists throughout the exterior walls, causing declined aesthetics.

The steel roof panels and associated welds were inspected and were found appearing sound and remain free of obvious failures of the steel at this time.

The protective coating applied to these welded steel surfaces has an average dry film thickness that is below the AWWA's recommendations and has expired and no longer provides protection for these welded steel surfaces.

Adhesion loss of both the primary and secondary coating was observed throughout approximately 75% of the roof, resulting in exposure of the underlying steel. No obvious fatigue (pitting) of the steel roof panels was evident within these areas of steel exposure and no obvious deterioration of the welds was evident within these areas of steel exposure, rather mild surface corrosion exists at this time.

Ultrasonic metal thickness measurements of the steel roof panels of this clearwell were taken during this inspection, and no abnormally high or low metal thickness measurements were observed during this inspection.

A corrosion stain throughout the roof has declined the overall aesthetics.

It is our recommendation to abrasive blast the exterior wall, manway, roof, vent assembly and exterior surfaces of the hatch to white or near white metal. We recommend then re-coating these surfaces in an effort to halt corrosion, prevent further steel fatigue (pitting) and to provide good protection for these welded steel surfaces, while improving the overall aesthetics.

The tight cracks found throughout the exposed surfaces of the concrete foundation were sounded and remain free of obvious voids. The areas of concrete spall found throughout these exposed concrete surfaces remain free of exposure of the underlying reinforcement steel and did not appear to have increased in length, width of depth since the previous inspection completed by Underwater Solutions Inc. on May 9, 2013.

It is our recommendation to pressure-wash the exposed surfaces of the foundation at 3,000 P.S.I. and at 3.0 G.P.M. to remove the soiling from these surfaces. We recommend then re-surfacing the areas of concrete spall using a suitable concrete repair material in an effort to prevent further concrete fatigue and the potential for exposure of the underlying reinforcement steel. We recommend then re-coating the exposed surfaces of the foundation using an epoxy/polyurethane flexible coating to seal all cracks, seal the areas of repair and to seal and protect these concrete surfaces.

The elastomeric sealant applied throughout the circumference of the clearwell at the junction of where the foundation and clearwell base meet was found having good adhesion value, preventing moisture from penetrating and accumulating beneath the clearwell.

All components affixed to this clearwell were found to be properly installed at this time.

A cap and associated screen installed over the vent penetration in the roof remains secure, preventing access to the interior of the clearwell.

The interior access hatch located on the roof was found secured with a lock, preventing unwanted access to the interior of the clearwell.

Each of the thirty-six overflow cutouts within the top row of wall panels were free of obvious obstructions, while the screen installed over each overflow cutout is secure, preventing access to the interior of the tank.

INTERIOR:

The steel floor panels and associated welds were found appearing sound and remain free of obvious failures of the steel at this time.

The protective coating applied to these welded steel surfaces appeared to have been applied uniformly and meets the AWWA's recommendation, however was found having poor adhesion value and is blistering throughout approximately 35% of all surfaces.

Approximately 50% of these coating blisters have ruptured, resulting in exposure of the underlying steel.

No obvious fatigue (pitting) of the steel panels or deterioration of the welds was evident within these areas of steel exposure, rather mild surface corrosion exists at this time.

The interior steel wall panels and associated welds appeared sound and remain free of obvious failures of the steel at this time.

The protective coating applied to these welded steel surfaces appeared to have been applied uniformly and meets the AWWA's recommendations, however adhesion loss (blistering) of the protective coating was observed throughout approximately 30-40% of all elevations of the interior walls.

Approximately 25% of these coating blisters have ruptured resulting in exposure of the underlying steel.

Corrosion exists within all areas of the interior walls showing steel exposure, and no obvious fatigue (pitting) of the steel was evident within these areas of steel exposure at this time.

These steel panels and associated welds appeared sound and free of obvious failures of the steel, however deterioration of the angle iron overhead supports was found throughout these angle supports.

The protective coating applied to these surfaces appeared to have been applied uniformly and meets the AWWA's recommendations, however a decline in film thickness (thinning) of the protective coating and adhesion loss (peeling) of the protective coating has resulted in exposure of the underlying steel throughout approximately 50% of all overhead surfaces at this time.

No obvious fatigue (pitting) of the steel panels or deterioration of the welds was evident within these areas of steel exposure, rather mild to moderate surface corrosion exists at this time.

The angle iron supports appeared mostly sound, however adhesion loss of the protective coating throughout these support components has caused steel exposure and corrosion. Fatigue (deterioration) of these steel supports was observed at the location where these supports contact an angle iron flange that is welded throughout the circumference of the tank at the junction where overhead meet.

The levels of fatigue (deterioration) of these supports is at minimum levels and causes no immediate concern for collapse (failure of the entire roof) at this time.

The protective coating applied to the interior surfaces of the manway lid and trunk meets the AWWA's recommendations, however is cracking and blistering. This condition has resulted in exposure of the underlying steel throughout approximately 25% of the surfaces of the manway lid and trunk.

Corrosion exists within all areas of the manway trunk and lid, which has resulted in steel exposure and fatigue of the steel (pitting). Approximately 15% the manway surfaces were found having steel exposure at the time of inspection.

These areas of fatigue (pitting) range from 1/4" in diameter by 1/8" in depth to 2" in diameter by 1/4" in depth at this time.

The ultrasonic metal thickness of the steel manway lid and trunk was found to be .545".

The protective coating applied to the metal surfaces of the pipes within this clearwell, to include the metal standoffs that support the 28" inside diameter pipe that penetrates the floor on the easternmost side of the clearwell (third pipe inspected), was found having poor adhesion value and is blistering, causing metal exposure and surface corrosion. However, these metal pipes, pipe support standoffs and pipe securing hardware remain sound and free of obvious fatigue/deterioration at this time.

It is our recommendation to abrasive blast all interior floor, piping, wall, manway, overhead panel and supports and interior surfaces of the access hatch to white or near white metal. We then recommend filling (welding over) the areas of steel fatigue (pitting) found throughout the interior surfaces of the manway lid and trunk in an effort to prevent leakage and to re-coat these surfaces using an A.N.S.I./N.S.F.61 approved coating for use in structures containing potable water in an effort to halt corrosion, prevent further fatigue of the steel and to provide good protection for the steel surfaces of the clearwell and steel components within this clearwell.

As always, we recommend that re-inspection and cleaning of all water storage facilities be performed in accordance with state and federal mandates, A.W.W.A. standards, and completed by an experienced and authorized inspection corporation.

UNDERWATER SOLUTIONS INC.
Christopher A. Cole, Project Manager

This report, the conclusions, recommendations and comments prepared by Underwater Solutions Inc. are based upon spot examination from readily accessible parts of the clearwell. Should latent defects or conditions which vary significantly from those described in the report be discovered at a later date, these should be brought to the attention of a qualified individual at that time. These comments and recommendations should be viewed as information to be used by the Owner in determining the proper course of action and not to replace a complete set of specifications. All repairs should be done in accordance with A.W.W.A. and/or other applicable standards.

1 *Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion*

2 *Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion*

3 *Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion*

4 *Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion*

5 *Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion*

6 *Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion*

7 ***Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion***

8 ***Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion***

9 ***Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion***

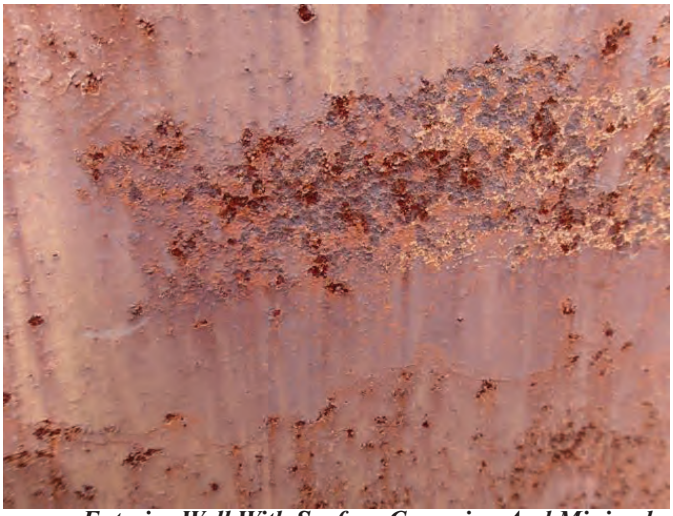
10 ***Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion***

11 ***Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion***

12 ***Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion***

13 *Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion*

14 *Exterior Wall With Surface Corrosion And Minimal Steel Fatigue (Pitting)*



15 *Exterior Wall With Surface Corrosion And Minimal Steel Fatigue (Pitting)*

16 *Exterior Wall With Surface Corrosion And Minimal Steel Fatigue (Pitting)*

17 *Exterior Weld Between Wall Panels With Surface Corrosion*

18 *Exterior Weld Between Wall Panels With Surface Corrosion*

19 *Exterior Weld Between Wall Panels With Surface Corrosion*

20 *Exterior Weld Between Wall Panels With Surface Corrosion*

21 *Exterior Weld Between Wall Panels With Surface Corrosion*

22 *Secure Manway With Secondary Coating Loss, Exposed Primary Coating, Exposed Underlying Steel And Mild Surface Corrosion*

23 *Ladder Utilized To Access The Roof*

24 *Concrete Foundation With Tight Surface Cracks And Spall*

25 ***Concrete Foundation With Tight Surface Cracks And Spall***

26 ***Concrete Foundation With Tight Surface Cracks And Spall***

27 ***Concrete Foundation With Tight Surface Cracks And Spall***

28 ***Concrete Foundation With Tight Surface Cracks***

29 ***Concrete Foundation With Spall***

30 ***Concrete Foundation With Spall***

31 ***Concrete Foundation With Spall***

32 ***Concrete Foundation With An Elastemeric Sealant Applied At The Tank Base And Foundation***

33 ***Concrete Foundation With An Elastemeric Sealant Applied At The Tank Base And Foundation***

34 ***Concrete Foundation With An Elastemeric Sealant Applied At The Tank Base And Foundation***

35 ***Concrete Foundation With An Elastemeric Sealant Applied At The Tank Base And Foundation***

36 ***Concrete Foundation With An Elastemeric Sealant Applied At The Tank Base And Foundation***

37 ***Secure Overflow Screen Cutouts***

38 ***Secure Overflow Screen Cutouts***

39 ***Secure Overflow Screen Cutouts***

40 ***Secure Overflow Screen Cutout***

41 ***Secure Overflow Screen Cutout***

42 ***Secure Overflow Screen Cutout***

43 ***Secure Overflow Screen Cutout***

44 ***Roof Panels With Coating Loss, Exposed Secondary/ Primary Coating, Exposed Underlying Steel, Mild Surface Corrosion And Steel Corrosion***

45 ***Roof Panels With Coating Loss, Exposed Secondary/ Primary Coating, Exposed Underlying Steel, Mild Surface Corrosion And Steel Corrosion***

46 ***Roof Panels With Coating Loss, Exposed Secondary/ Primary Coating, Exposed Underlying Steel, Mild Surface Corrosion And Steel Corrosion***

47 ***Roof Panels With Coating Loss, Exposed Secondary/ Primary Coating, Exposed Underlying Steel, Mild Surface Corrosion And Steel Corrosion***

48 ***Roof Panels With Coating Loss, Exposed Secondary/ Primary Coating, Exposed Underlying Steel, Mild Surface Corrosion And Steel Corrosion***

49 ***Roof Panels With Coating Loss, Exposed Secondary/ Primary Coating, Exposed Underlying Steel, Mild Surface Corrosion And Steel Corrosion***

50 ***Roof Panels With Coating Loss, Exposed Secondary/ Primary Coating, Exposed Underlying Steel, Mild Surface Corrosion And Steel Corrosion***

51 ***Roof Panels With Coating Loss, Exposed Secondary/ Primary Coating, Exposed Underlying Steel, Mild Surface Corrosion And Steel Corrosion***

52 ***Secure Vent Cap With Expired Coating, Exposed Steel And Corrosion***

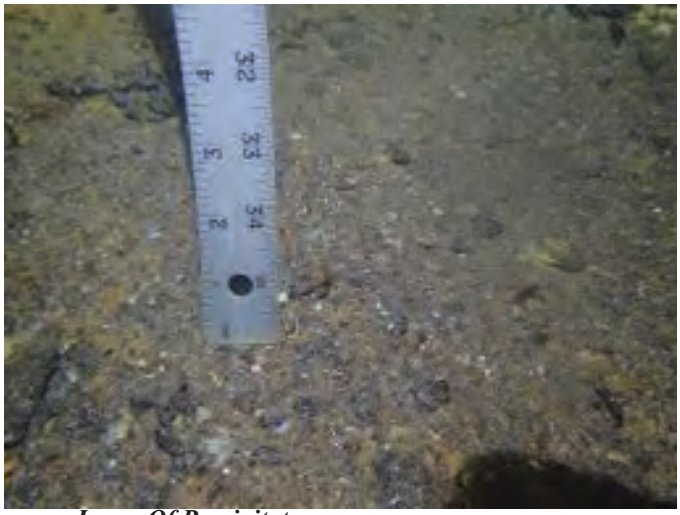
53 ***Secure Vent Screen***

54 ***Secure Vent Screen***

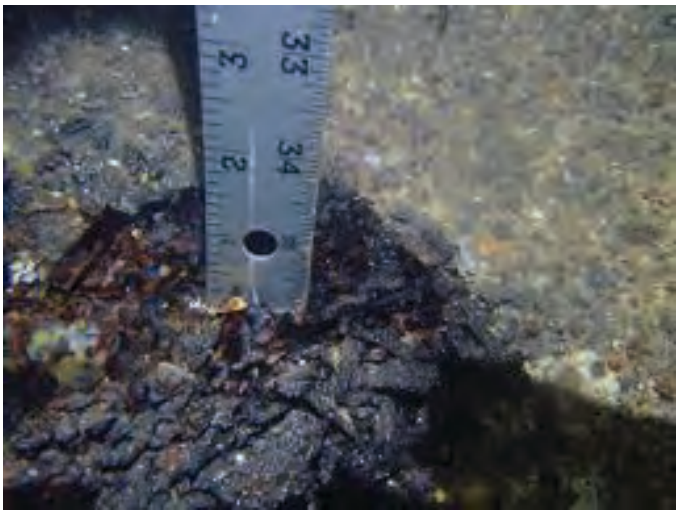
55 *Open Access Hatch With Expired Coating, Exposed Steel And Corrosion*

56 *Closed Access Hatch With Expired Coating, Exposed Steel And Corrosion*

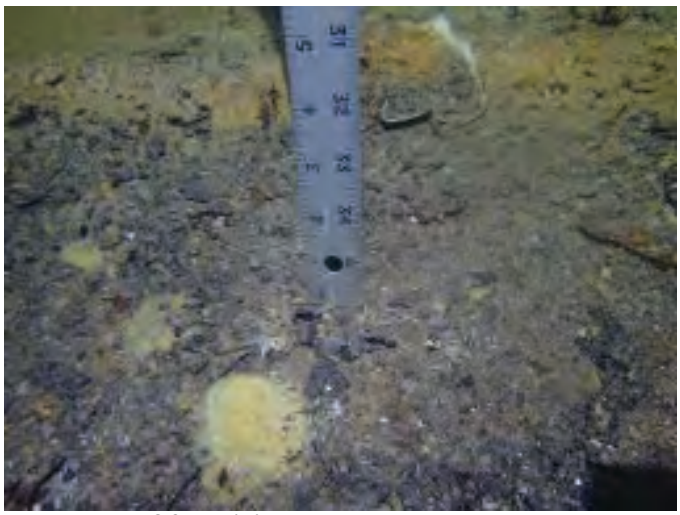
57 *Secure Access Hatch*



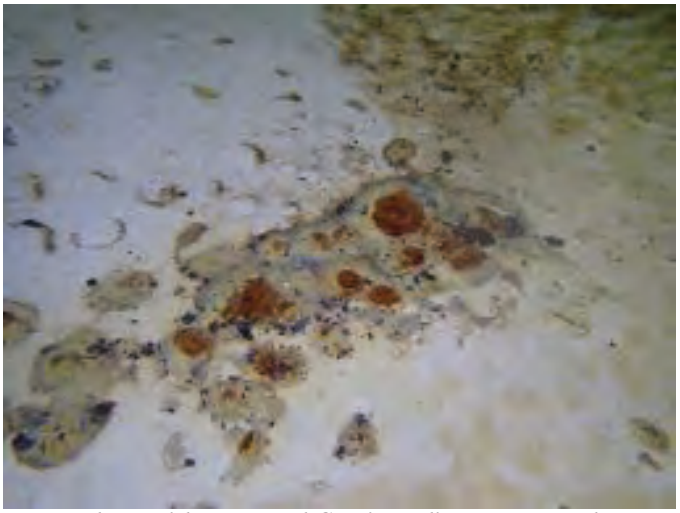
58 *Layer Of Precipitate*



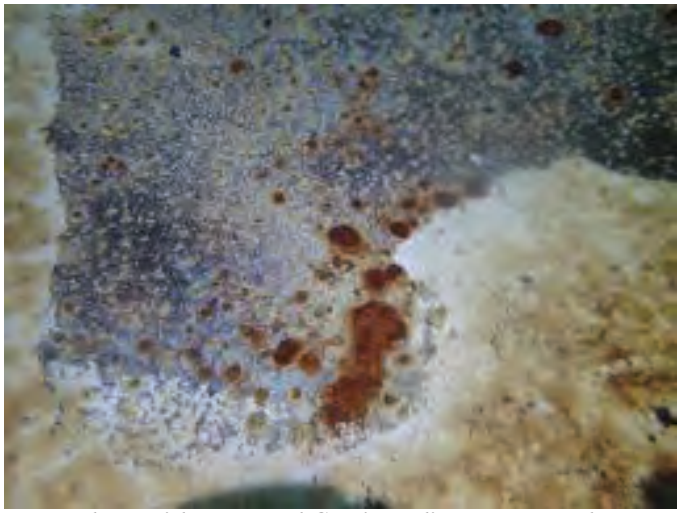
59 *Layer Of Precipitate*



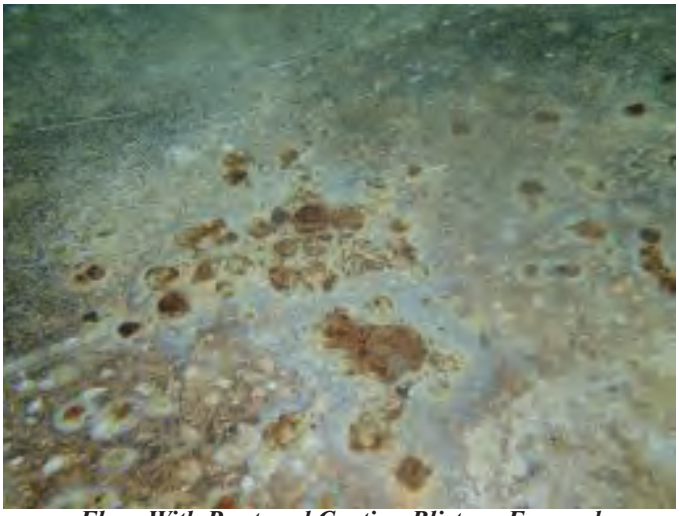
60 *Layer Of Precipitate*



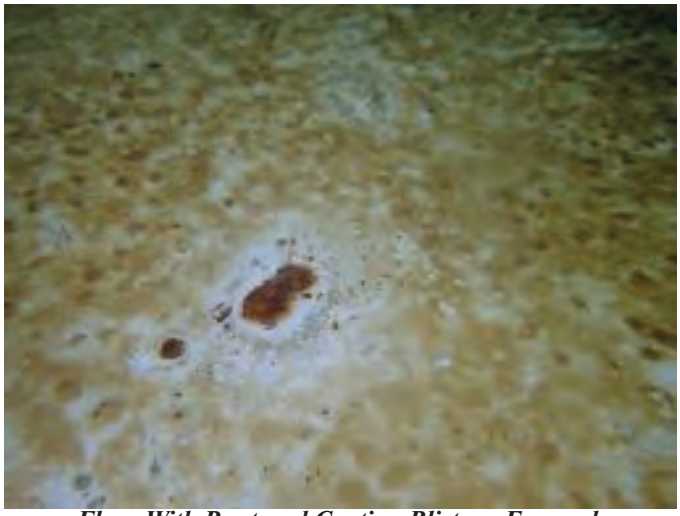
61 *Floor With Ruptured Coating Blisters, Exposed Underlying Steel, Mild Surface Corrosion And Mild To Moderate Staining*



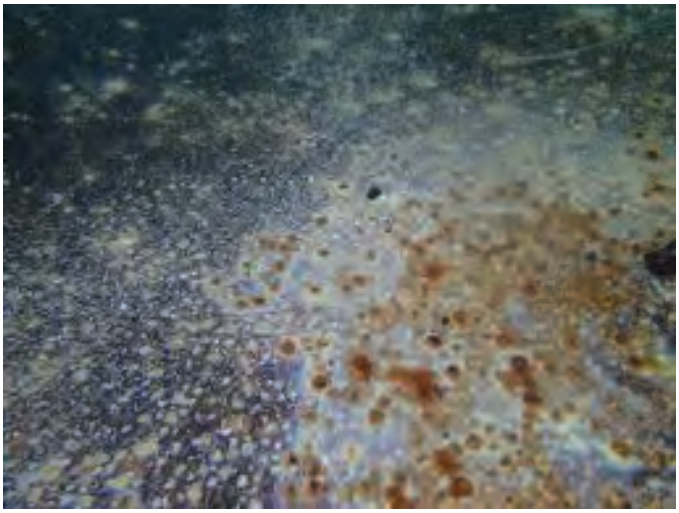
62 *Floor With Ruptured Coating Blisters, Exposed Underlying Steel, Mild Surface Corrosion And Mild To Moderate Staining*



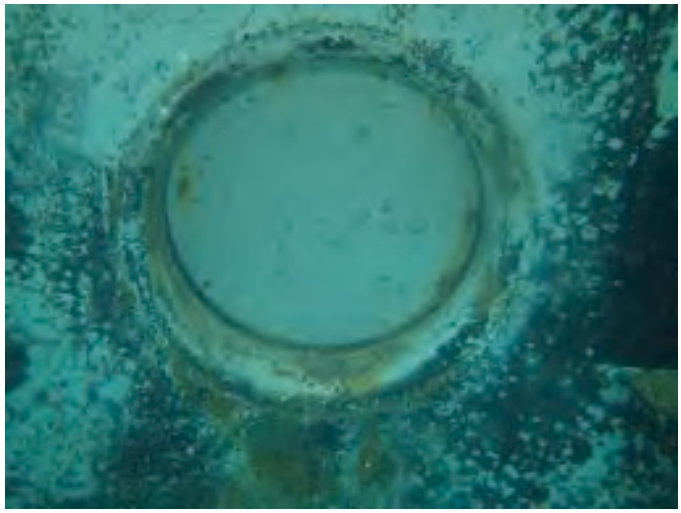
63 *Floor With Ruptured Coating Blisters, Exposed Underlying Steel, Mild Surface Corrosion And Mild To Moderate Staining*



64 *Floor With Ruptured Coating Blisters, Exposed Underlying Steel, Mild Surface Corrosion And Mild To Moderate Staining*



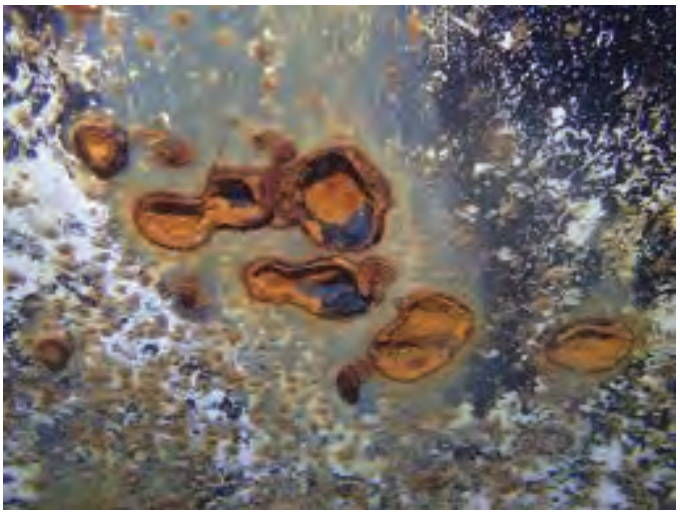
65 *Floor With Ruptured Coating Blisters, Exposed Underlying Steel, Mild Surface Corrosion And Mild To Moderate Staining*



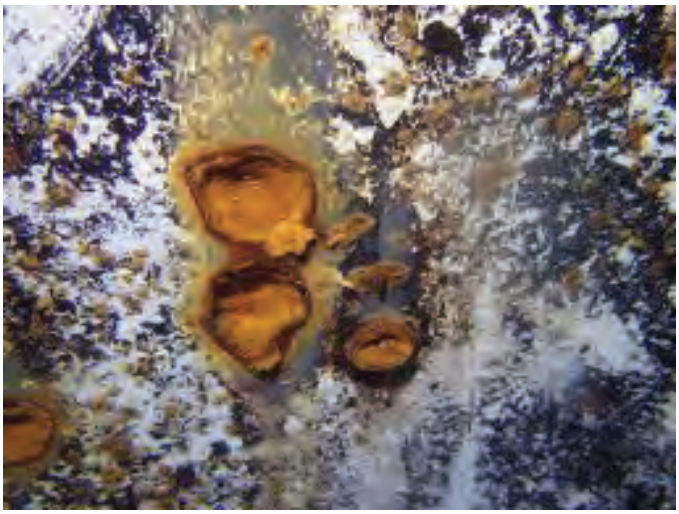
66 *Manway*

67 ***Manway Lid With Coating Loss/Blistering/Cracking, Exposed Underlying Steel, Corrosion And Fatigue (Pitting)***

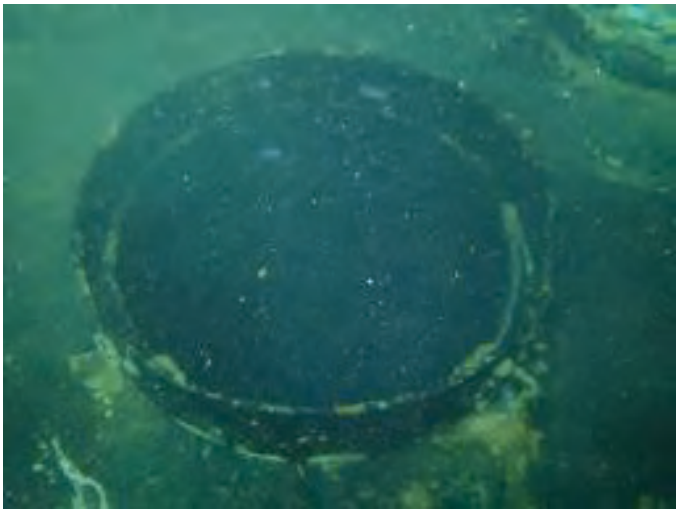
68 ***Manway Lid With Coating Loss/Blistering/Cracking, Exposed Underlying Steel, Corrosion And Fatigue (Pitting)***



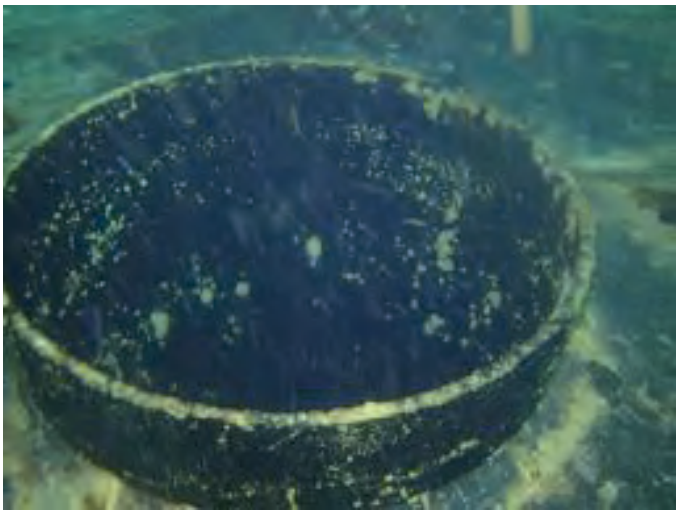
69 ***Manway Trunk With Coating Loss/Blistering/ Cracking, Exposed Underlying Steel, Corrosion And Fatigue (Pitting)***



70 ***Manway Trunk With Coating Loss/Blistering/ Cracking, Exposed Underlying Steel, Corrosion And Fatigue (Pitting)***



71 ***30” Inside Diameter Pipe - Flush Penetration Silt Stop With Coating Loss/Blistering, Exposed Underlying Steel And Mild To Moderate Corrosion***



72 ***23” Inside Diameter Pipe Penetrating The Tank Floor With Coating Loss/Blistering, Exposed Underlying Steel And Mild To Moderate Corrosion***

73 *28” Inside Diameter Pipe Penetrating The Tank Floor With Ruptured Coating Blisters, Exposed Underlying Metal And Mild To Moderate Surface Corrosion*

74 *28” Inside Diameter Pipe With Ruptured Coating Blisters, Exposed Underlying Metal And Mild To Moderate Surface Corrosion*

75 *28” Inside Diameter Pipe With Ruptured Coating Blisters, Exposed Underlying Metal And Mild To Moderate Surface Corrosion*

76 *28” Inside Diameter Pipe Standoff With Ruptured Coating Blisters, Exposed Underlying Metal And Mild To Moderate Surface Corrosion*

77 *28” Inside Diameter Pipe Standoff With Ruptured Coating Blisters, Exposed Underlying Metal And Mild To Moderate Surface Corrosion*

78 *28” Inside Diameter Pipe Turning 90° Up*

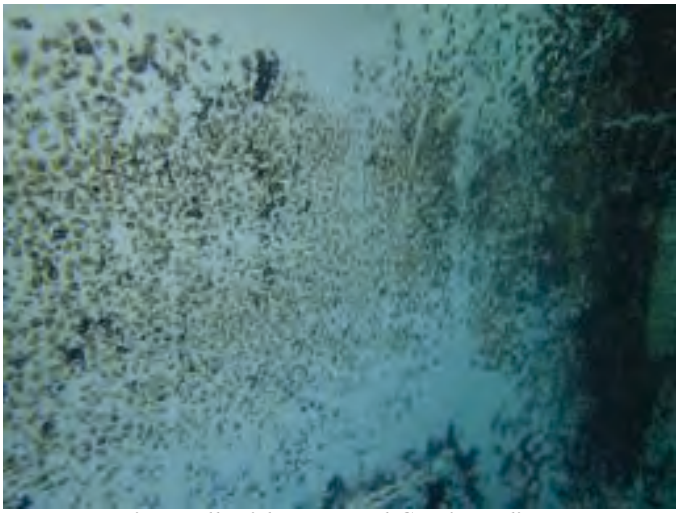
79 ***28" Inside Diameter Pipe With Ruptured Coating Blisters, Exposed Underlying Metal And Mild To Moderate Surface Corrosion***

80 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Fatigue (Pitting), Corrosion And Mild Staining***

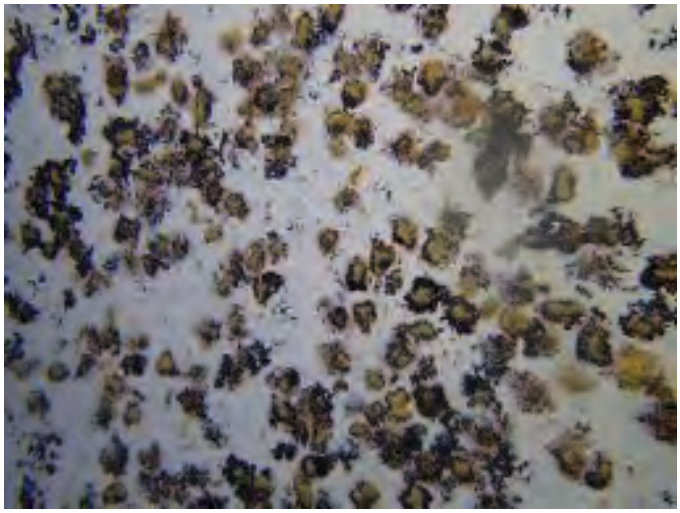
81 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Fatigue (Pitting), Corrosion And Mild Staining***

82 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Fatigue (Pitting), Corrosion And Mild Staining***

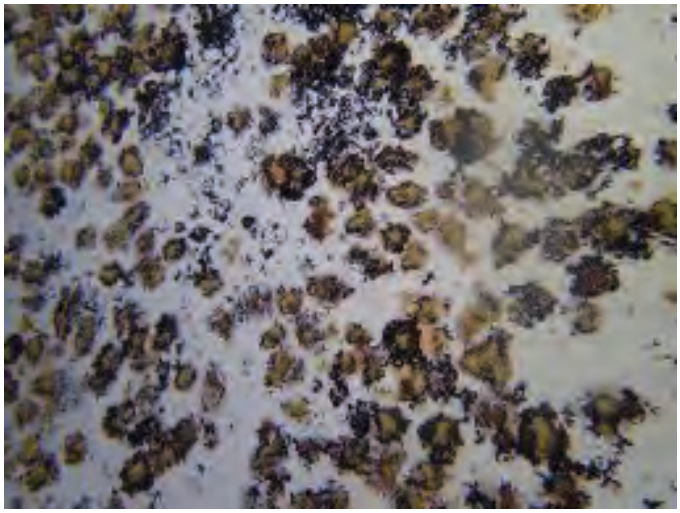
83 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Fatigue (Pitting), Corrosion And Mild Staining***



84 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Fatigue (Pitting), Corrosion And Mild Staining***

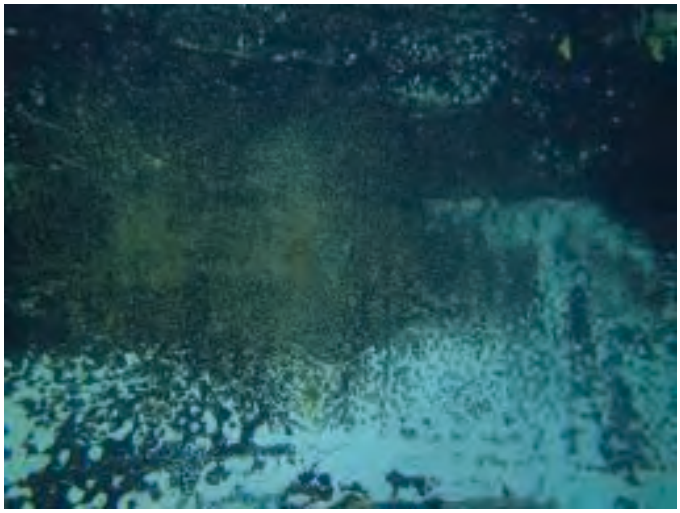


85 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Fatigue (Pitting), Corrosion And Mild Staining***



86 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Fatigue (Pitting), Corrosion And Mild Staining***

87 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Fatigue (Pitting), Corrosion And Mild Staining***



88 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Fatigue (Pitting), Corrosion And Mild Staining***

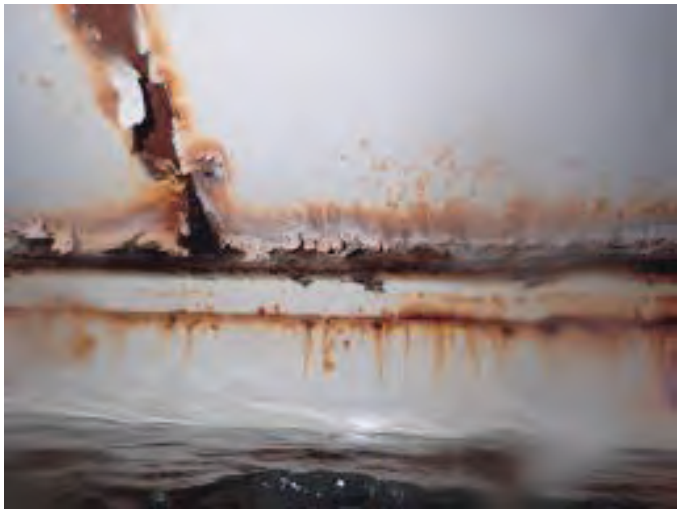
89 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Fatigue (Pitting), Corrosion And Mild Staining***

90 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Fatigue (Pitting), Corrosion And Mild Staining***

91 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Fatigue (Pitting), Corrosion And Mild Staining***

92 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Fatigue (Pitting), Corrosion And Mild Staining***

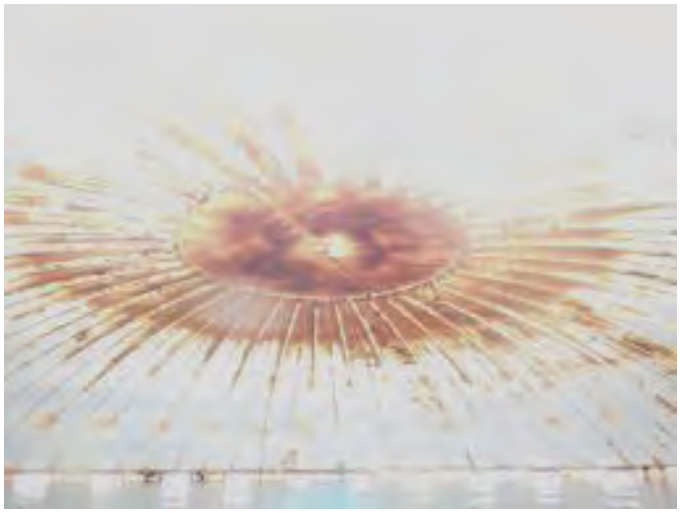
93 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Fatigue (Pitting), Corrosion And Mild Staining***



94 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Fatigue (Pitting), Corrosion And Mild Staining***

95 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Fatigue (Pitting), Corrosion And Mild Staining***

96 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Fatigue (Pitting), Corrosion And Mild Staining***



97 ***Overhead With Coating Thinning, Exposed Underlying Steel And Mild To Moderate Surface Corrosion***

98 ***Overhead With Coating Thinning, Exposed Underlying Steel And Mild To Moderate Surface Corrosion***

99 ***Overhead With Coating Loss, Exposed Steel And Surface Corrosion***

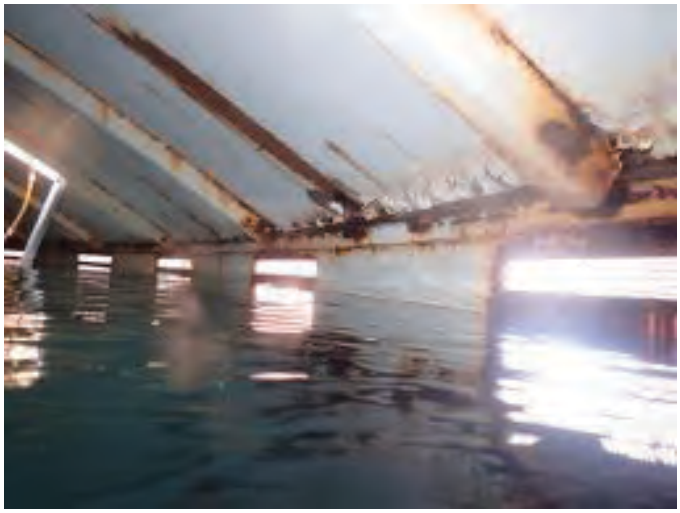
100 ***Overhead With Coating Loss, Exposed Steel And Surface Corrosion***

101 ***Overhead With Coating Loss, Exposed Steel And Surface Corrosion***

102 ***Overhead Angle Iron Supports With Coating Loss, Exposed Steel, Corrosion And Fatigue (Deterioration)***

103 ***Overhead Angle Iron Supports With Coating Loss, Exposed Steel, Corrosion And Fatigue (Deterioration)***

104 ***Overhead Angle Iron Supports With Coating Loss, Exposed Steel, Corrosion And Fatigue (Deterioration)***



105 ***Overflow Cutouts***

106 ***Overflow Cutout***

107 ***Overflow Cutouts***

108 ***Discharge During Cleaning***

UNDERWATER SOLUTIONS INC.

INSPECTION AND INTERIOR CLEANING (SEDIMENT REMOVAL) OF THE MOUNT ST. CHARLES 440,000-GALLON RIVETED STEEL WATER STORAGE TANK (#1)

CITY OF WOONSOCKET WATER DIVISION
WOONSOCKET, RHODE ISLAND

JUNE 7, 2018

INSPECTION AND INTERIOR CLEANING (SEDIMENT REMOVAL) OF THE MOUNT ST. CHARLES 440,000-GALLON RIVETED STEEL WATER STORAGE TANK (#1)

CITY OF WOONSOCKET WATER DIVISION WOONSOCKET, RHODE ISLAND

JUNE 7, 2018

SCOPE:

On June 7, 2018, Underwater Solutions Inc. inspected the Mount St. Charles 440,000-gallon riveted steel water storage tank (#1) to provide information regarding the overall condition and integrity of this structure and removed the sediment accumulation from the floor.

EXTERIOR INSPECTION:

The entire exterior of this water storage tank (and all components) was inspected to include walls and coating, manways, ladders, foundation, overflows, roof, vent, and hatch.

The exterior steel walls, roof and steel components affixed to the exterior of this tank have been re-coated since a previous inspection completed by Underwater Solutions Inc. on December 17-20, 2012.

Walls And Coating

The exterior steel wall panels and associated rivets were inspected and found appearing sound and remain free of obvious fatigue or failures at this time.

The average dry film thickness of the protective coating system applied to the exterior riveted steel wall panels was measured during this inspection. The dry film thickness of the coating system applied to the exterior wall surfaces was found as follows:

Row	***Mil Thickness***	***Row***	***Mil Thickness***
1.	26.0 mils	4.	16.2 mils
2.	11.0 mils	5.	15.5 mils
3.	13.8 mils	6.	15.6 mils

The American Water Works Association (AWWA) recommends a dry film thickness of 7.0 to 10.0 mils of coating film thickness be applied to the exterior surfaces of riveted steel potable water storage tanks to provide adequate protection for these structures.

The protective coating applied to the exterior walls appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value. However, one area of coating loss and exposed steel was observed on the northernmost side of the tank, located within one of the vertical lap joints within the fourth row of wall panels above the tank base. Corrosion of the exposed steel exists within this 1/4" diameter area of coating loss, yet no obvious fatigue (pitting) of the steel was evident at this time.

The protective coating applied to all remaining wall surfaces was found having good adhesion value, providing adequate protection for the steel panels and rivets.

Manways

Two, 24" inside diameter manways penetrate the lowest row of wall panels on easternmost and westernmost sides of the tank and are securely installed and free of obvious leakage.

The easternmost manway penetrates the wall panel 11" above the tank base and the westernmost most manway penetrates the lowest wall panel 22" above the tank base.

The protective coating applied to the easternmost manway has an average dry film thickness of 23.4 mils and was found having good adhesion value at this time.

The protective coating applied to the westernmost manway has an average dry film thickness of 16.3 mils and was found having good adhesion value at this time.

Ladders

A steel ladder extends from approximately 14' above the ground up to the roof, supported to the tank wall with four sets of riveted standoffs. This ladder has a fall prevention device installed throughout its length, providing safe access to the roof. The protective coating applied to the steel ladder and steel fall prevention device was found having good adhesion value at this time.

A ladder guard secured with a lock is installed at the base of the ladder, preventing unwanted access to the ladder/roof.

A second steel ladder extends from the edge of the roof up to the vent within the center of the roof, supported to the vent with one bolted bracket. Several sets of wheels are installed on this ladder, allowing this ladder to rotate throughout the circumference of the roof. This ladder remains in good condition, providing good access to the vent. The protective coating applied to this ladder was found having good adhesion value at this time.

Foundation

The granite block and mortar joint foundation ranges in height from 1" to 42" and was found appearing mostly sound, however tight cracks were observed throughout approximately 5% of the surfaces of the mortar placed between the granite blocks.

These tight cracks were sounded and no obvious voids or spalls were evident at the time of this inspection.

The concrete cap on the top face of the foundation is not coated and was found appearing mostly sound, however tight cracks were observed throughout approximately 15% of these surfaces.

These cracks were sounded and appeared to be limited to the surface of the concrete and were free of obvious voids or spalls at this time.

Overflows

The overflow consists of a series of five, 10' long by 6" wide cutouts evenly spaced throughout the circumference of the top of the top row of wall panels.

Each overflow cutout was free of obvious obstructions and was found securely screened, preventing access to the interior of the tank.

The protective coating applied to the metal screens and screen securing hardware was found having good adhesion value at this time.

Roof

The steel roof panels and associated welds were inspected and found appearing sound and free of obvious fatigue or failures.

The protective coating applied to these welded steel surfaces has an average dry film thickness of 18.5 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for these steel panels and welds. One of the wheels attached to the top of the vent access ladder has caused two, 2" long by 1/8" wide areas of damage to the secondary coating, causing exposure of the primary coating. The exposed primary coating within these two areas of exposure was found having good adhesion value at this time.

Twenty-eight, 2" diameter rigging hole penetrations within the roof were found sealed with threaded plugs, preventing access to the interior of the tank.

Vent

The vent is located within the center of the roof dome, having a 24" inside diameter, and stands 29" tall.

A 31" outside diameter steel cap and associated screen was found securely installed over the vent penetration in the roof, preventing access to the interior of the tank.

The protective coating applied to this steel vent assembly was found having good adhesion value at this time.

Hatch

One, 24" inside diameter hatch provides good access to the tank interior through the roof.

This hatch remains in good working condition and was found secured with a lock, preventing unwanted access to the interior of the tank.

The protective coating applied to this metal hatch was found having good adhesion value at this time.

INTERIOR INSPECTION:

The entire interior of this water storage tank (and components) was inspected to include sediment accumulations, floor, manways, piping, walls and coating, overhead, overflows, and aesthetic water quality.

The interior steel floor, walls, overhead and steel components affixed to the interior of this tank have been re-coated since a previous inspection completed by Underwater Solutions Inc. on December 17-20, 2012.

Sediment Accumulations

A non-uniform layer of accumulated precipitate was found on all floor surfaces, ranging from 3-3/4" to 4" in depth.

After completing this inspection, all precipitate was removed (vacuumed) from the floor.

Floor

After removing all precipitate, the steel floor panels and associated rivets were inspected and found appearing sound and free of obvious fatigue or failures.

The protective coating applied to the floor has an average dry film thickness of 41.9 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value; however, blistering of the protective coating was observed throughout approximately 10% of these surfaces, resulting in exposure of the underlying steel. No obvious fatigue/deterioration of the steel was evident within these 1/8" diameter areas of exposure, rather mild surface corrosion exists at this time.

Metal scale that appears to have entered the tank through the influent/effluent pipe was observed throughout a 5' radius around the influent/effluent pipe.

This metal scale has hardened to the floor and could not be removed with Underwater Solutions Inc.'s vacuum system.

Mild to moderate staining remains throughout the floor due to the accumulation of precipitate.

Manways

Two manways penetrate the lowest row of wall panels on the easternmost and westernmost sides of the tank.

The easternmost manway has a 24" outside diameter and penetrates the wall 11" above the floor. This manway is securely installed and free of obvious leakage.

The protective coating applied to the steel manway lid and trunk has an average dry film thickness of 55.2 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value at this time.

The westernmost manway has a 24" outside diameter and penetrates the wall 22" above the floor. This manway is securely installed and free of obvious leakage.

The westernmost manway lid is covered and sealed with a rubber gasket. The protective coating applied to the westernmost manway trunk has an average dry film thickness of 47.4 mils, meets the AWWA's recommendations and was found having good adhesion value at this time.

Moderate staining exists on the surfaces of each manway at this time.

Piping

Two pipes were inspected within this potable water storage tank.

The first pipe inspected penetrates the floor 25" in from the wall on the south-westernmost side of the tank, having a 14" inside diameter, and stands 6" tall. This pipe was free of obvious obstructions and flow was leaving the tank through this pipe at the time of this inspection.

The protective coating applied to this steel pipe was found having mostly good adhesion value, although blistering of the protective coating was observed throughout approximately 15% of these surfaces, causing steel exposure and corrosion. However, this pipe remains sound and free of obvious steel fatigue/deterioration at this time.

The second pipe inspected penetrates the center of a 16" outside diameter by 1/2" thick steel plate bolted to the floor, located 20" in from the wall on the easternmost side of the tank. This pipe has a 2-1/2" inside diameter and is flush within the steel plate. This pipe was free of obvious obstructions and was sealed with a cap on the exterior of the tank, eliminating this pipe from use.

The protective coating applied to this steel plate and pipe was found having good adhesion value at this time.

Walls And Coating

The interior walls were inspected beginning at the floor and by spiraling the circumference of the tank up to the water surface.

These steel wall panels and associated rivets appeared sound and remain free of obvious fatigue or failures.

The average dry film thickness of the protective coating system applied to the interior riveted steel wall panels was measured during this inspection. The dry film thickness of the coating system applied to the interior wall surfaces was found as follows:

Row	***Mil Thickness***	***Row***	***Mil Thickness***
1.	43.0 mils	4.	59.1 mils
2.	55.4 mils	5.	51.2 mils
3.	59.3 mils	6.	59.1 mils

The American Water Works Association (AWWA) recommends a dry film thickness of 10.5 to 15.5 mils of coating film thickness be applied to the interior surfaces of riveted steel potable water storage tanks to provide adequate protection for these structures.

The protective coating applied to the interior walls appears to have been applied uniformly, meets the AWWA's recommendations and the protective coating applied to the upper five rows of wall panels was found having good adhesion value, providing adequate protection for these steel panels and rivets. However, blistering of the protective coating was observed throughout approximately 5-10% of the lowest row of wall panels, resulting in exposure of the underlying steel. No obvious fatigue (pitting) of the steel panels or deterioration of the rivets was evident within these 1/16" to 1/4" diameter areas of steel exposure, rather mild corrosion exists at this time.

Moderate to heavy staining exists throughout the interior walls, beginning approximately 36" below overflow level and extending down to the floor.

Overhead

The entire overhead was inspected from the water surface.

These steel overhead panels and angle iron supports appeared sound and remain free of obvious fatigue or failures.

The protective coating applied to these surfaces has an average dry film thickness of 19.6 mils, and appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value, however minimal coating adhesion loss was observed throughout approximately 5% of these surfaces, resulting in exposure of the underlying steel. No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild surface corrosion exists at this time.

Overflows

The overflow consists of a series of five, 10' long by 6" wide cutouts evenly spaced throughout the circumference of the top of the top row of wall panels. Each overflow cutout was free of obvious obstructions at this time.

Aesthetic Water Quality

The aesthetic water quality was good throughout the tank, allowing unlimited visibility for this inspection.

RECOMMENDATIONS:

It is the opinion of Underwater Solutions Inc. that this riveted steel potable water storage tank appears mostly sound and free of obvious leakage.

EXTERIOR:

The exterior steel wall panels and associated rivets were found appearing sound and remain free of obvious fatigue or failures at this time.

The protective coating applied to the exterior walls appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value. However, one area of coating loss, exposed steel and corrosion was observed on the northernmost side of the tank, within one of the vertical lap joints within the fourth row of wall panels above the tank base. The protective coating applied to all remaining wall surfaces was found having good adhesion value, providing adequate protection for the steel panels and rivets.

It is our recommendation to power/hand-tool clean this area of steel exposure to remove all corrosion and to prepare the substrate. We then recommend re-coating this area to halt corrosion, prevent steel fatigue/deterioration and to provide good protection for the steel.

The steel roof panels and associated welds were found appearing sound and remain free of obvious fatigue or failures.

The protective coating applied to these welded steel surfaces appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for these welded steel surfaces. However, one of the wheels attached to the top of the vent access ladder has caused two, 2" long by 1/8" wide areas of damage to the secondary coating, causing exposure of the primary coating. The exposed primary coating within these two areas of exposure was found having good adhesion value at this time.

It is our recommendation to power/hand-tool clean these surfaces to prepare the substrate and to then re-coat this area to prevent steel exposure.

The protective coating applied to the steel components (manways, ladders, overflow screens and screen securing hardware, vent assembly and access hatch) affixed to the tank exterior was found having good adhesion value, providing adequate protection for the steel.

The granite block and mortar joint foundation was found appearing sound and requires no remedial action at this time.

The concrete cap on the top face of the foundation was found appearing mostly sound, however tight cracks were observed throughout approximately 15% of these surfaces.

These cracks were sounded and appeared to be limited to the surface of the concrete and were free of obvious voids or spalls at this time.

It is our recommendation to monitor the surfaces of the concrete cap on top of the foundation through future scheduled inspections to ensure that spall of this concrete cap does not occur.

All components affixed to this tank are properly installed at this time. A cap and associated screen was found securely installed over the vent penetration in the roof, preventing access to the interior of the tank. Each rigging hole penetration within the roof was found properly sealed, preventing access to the interior of the tank.

The access hatch located on the roof was found secured with a lock, preventing unwanted access to the interior of the tank.

A ladder guard that is secured with a lock is installed on the base of the ladder, preventing unwanted access to the ladder/roof.

A screen was found securely in-place over each of the five overflow cutouts, preventing access to the interior of the tank.

INTERIOR:

The steel floor panels and associated rivets were found appearing sound and remain free of obvious fatigue or failures. The protective coating applied to the floor appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value, however blistering of the protective coating was observed throughout approximately 10% of these surfaces, resulting in exposure of the underlying steel. No obvious fatigue/deterioration of the steel was evident within these 1/8" diameter areas of exposure, rather mild surface corrosion exists at this time.

Metal scale that appears to have entered the tank throughout the influent/effluent pipe was observed throughout a 5' radius around the influent/effluent pipe.

This metal scale has hardened to the floor and could not be removed with our vacuum system.

It is our recommendation that the next time this tank is removed from service and de-watered that the areas of steel exposure found throughout the floor be power tool cleaned to remove all corrosion and to re-coat these areas using an A.N.S.I./N.S.F.61 approved coating for use in structures containing potable water to halt corrosion, prevent steel fatigue/deterioration and to provide good protection for the steel.

We also recommend that when the tank is out of service and de-watered that the hardened metal scale found throughout the perimeter of the influent/effluent pipe be removed. If the removal of this hardened scale causes coating damage/steel exposure, it would be our recommendation to power tool clean these affected areas to prepare the substrate and to then re-coat these affected areas using an A.N.S.I./N.S.F.61 approved coating for use in structures containing potable water to provide good protection for the steel.

The protective coating applied to the interior steel surfaces of the easternmost manway and westernmost manway trunk was found having good adhesion value, while a rubber gasket covers and seals the steel lid of the westernmost manway.

The interior steel wall panels and associated rivets appeared sound and remain free of obvious fatigue or failures.

The protective coating applied to the interior walls appears to have been applied uniformly and meets the AWWA's recommendations. The protective coating applied to the upper five rows of wall panels was found having good adhesion value and requires no remedial action at this time.

The protective coating applied to the lowest row of wall panels was found having mostly good adhesion value, however blistering of the protective coating was observed throughout approximately 5-10% of this lowest row of wall panels, resulting in exposure of the underlying steel. No obvious fatigue (pitting) of the steel panels or deterioration of the rivets was evident within these 1/16" to 1/4" diameter areas of steel exposure, rather mild corrosion exist at this time.

It is our recommendation that while the tank is out of service and de-watered to complete the rehabilitation of the floor that the surfaces of the lowest row of wall panels showing steel exposure be power tool cleaned to remove all corrosion and to prepare the substrate. We then recommend re-coating these areas using an A.N.S.I./N.S.F.61 approved coating for use in structures containing potable water to halt corrosion, prevent steel fatigue/deterioration and to provide good protection for these steel panels and rivets.

These steel overhead panels and angle iron supports appeared sound and remain free of obvious fatigue or failures.

The protective coating applied to these overhead surfaces appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value, however minimal coating adhesion loss was observed throughout approximately 5% of these surfaces, resulting in exposure of the underlying steel. No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild surface corrosion exists at this time.

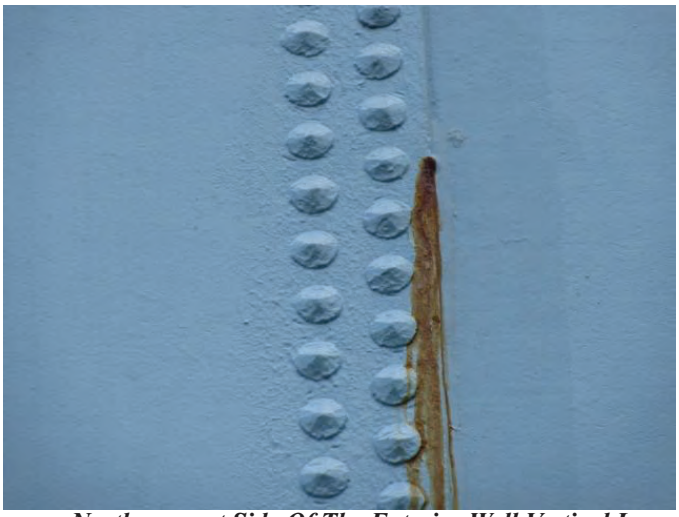
It is our recommendation that when the tank is out of service and de-watered to complete the rehabilitation of the floor and lowest row of wall panels, that the areas of steel exposure found throughout the overhead be power tool cleaned to remove all corrosion and to prepare the substrate. We then recommend re-coating these areas using an A.N.S.I./N.S.F.61 approved coating for use in structures containing potable water to halt corrosion, prevent steel fatigue/deterioration and to provide good protection for the steel.

As always, we recommend that re-inspection and cleaning of all water storage facilities be performed in accordance with state and federal mandates, A.W.W.A. standards, and completed by an experienced and authorized inspection corporation.

UNDERWATER SOLUTIONS INC.
Christopher A. Cole, Project Manager

This report, the conclusions, recommendations and comments prepared by Underwater Solutions Inc. are based upon spot examination from readily accessible parts of the tank. Should latent defects or conditions which vary significantly from those described in the report be discovered at a later date, these should be brought to the attention of a qualified individual at that time. These comments and recommendations should be viewed as information to be used by the Owner in determining the proper course of action and not to replace a complete set of specifications. All repairs should be done in accordance with A.W.W.A. and/or other applicable standards.

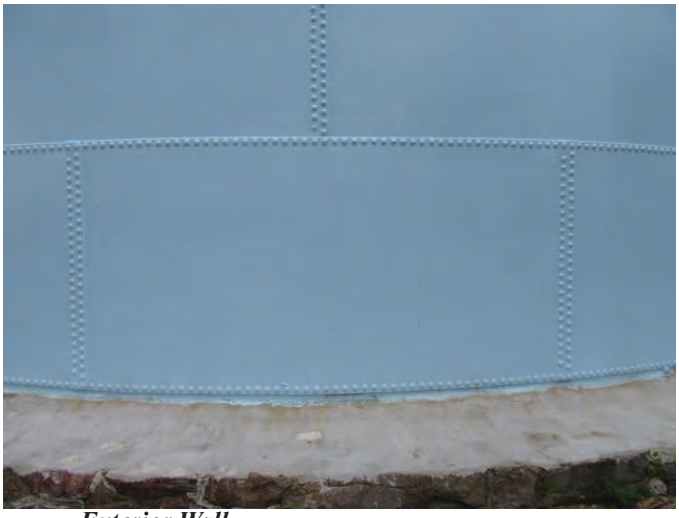
1 ***Northernmost Side Of The Exterior Wall Vertical Lap Joint Within The Fourth Row Having Coating Loss, Exposed Steel And Corrosion***



2 ***Northernmost Side Of The Exterior Wall Vertical Lap Joint Within The Fourth Row Having Coating Loss, Exposed Steel And Corrosion***

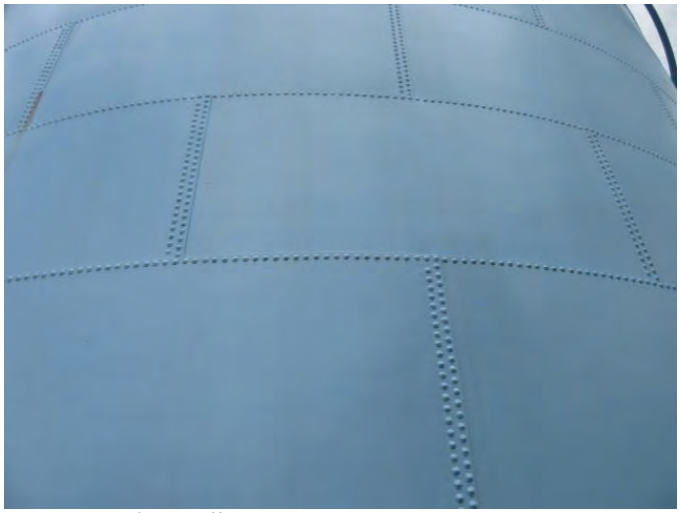
3 ***Exterior Wall***

4 ***Exterior Wall***



5 ***Exterior Wall***

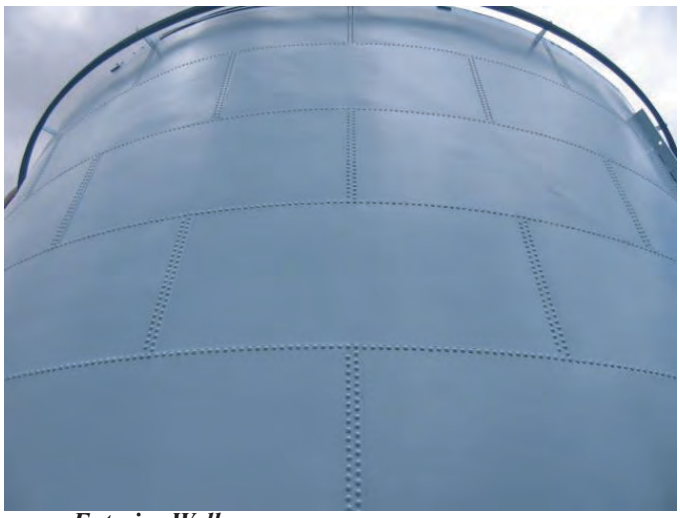
6 ***Exterior Wall***



7 ***Exterior Wall***

8 ***Exterior Wall***

9 ***Exterior Wall***



10 ***Exterior Wall***

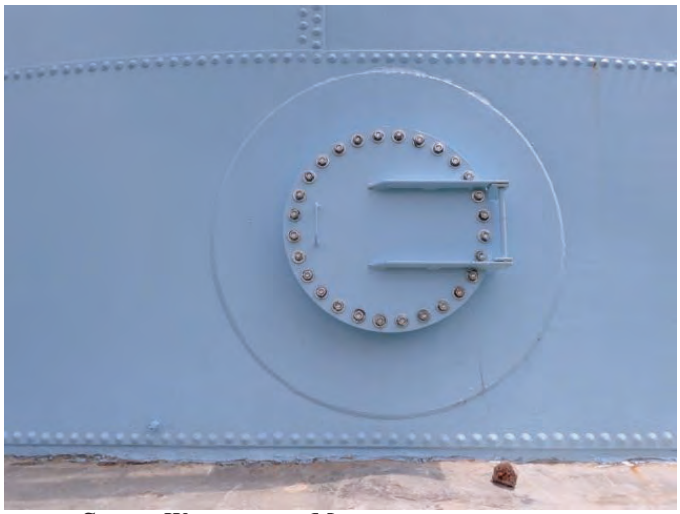
11 ***Exterior Wall***

12 ***Exterior Wall***

13 ***Exterior Wall***

14 ***Exterior Wall***

15 ***Secure Easternmost Manway***



16 ***Secure Westernmost Manway***

17 ***Ladder With Fall Prevention Device***

18 ***Ladder Guard Secured With A Lock***

19 ***Ladder Extending From Roof Edge To The Vent***

20 ***Ladder Extending From Roof Edge To The Vent***

21 ***Granite Block And Mortar Joint Foundation With Tight Cracks***

22 ***Granite Block And Mortar Joint Foundation With Tight Cracks***

23 ***Granite Block And Mortar Joint Foundation With Tight Cracks***

24 ***Granite Block And Mortar Joint Foundation With Tight Cracks***

25 ***Granite Block And Mortar Joint Foundation With Tight Cracks***

26 ***Concrete Foundation Cap With Tight Cracks***

27 ***Concrete Foundation Cap With Tight Cracks***

28 ***Concrete Foundation Cap With Tight Cracks***

29 ***Concrete Foundation Cap With Tight Cracks***

30 ***Secure Overflow Cutout Screen***

31 ***Secure Overflow Cutout Screen***

32 ***Secure Overflow Cutout Screen***

33 ***Secure Overflow Cutout Screen***

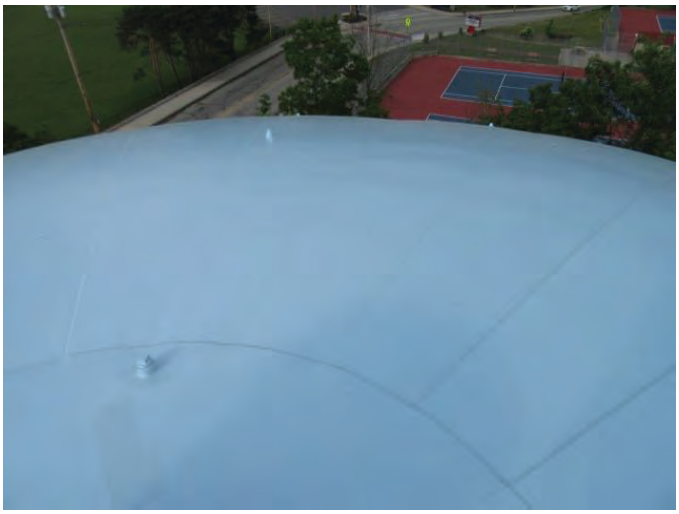
34 ***Vent Access Ladder Wheel Causing Secondary Coating Loss And Exposed Primary Coating***

35 ***Roof Panels***

36 ***Roof Panels***

37 ***Roof Panels***

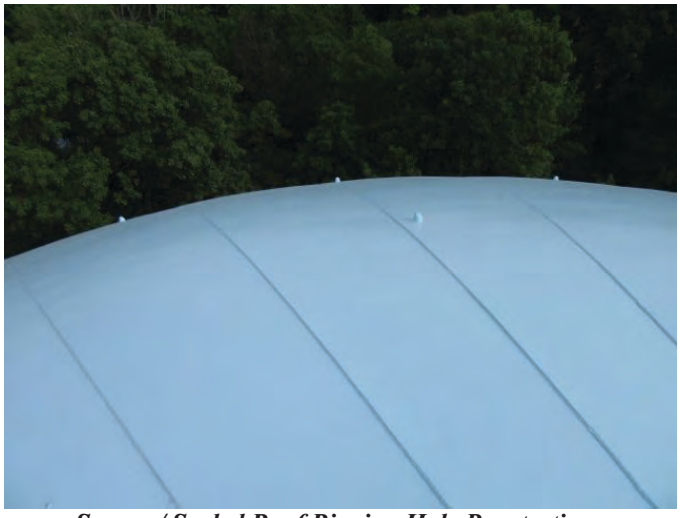
38 ***Roof Panels***



39 ***Roof Panels***

40 ***Roof Panels***

41 ***Secure / Sealed Roof Rigging Hole Penetration***



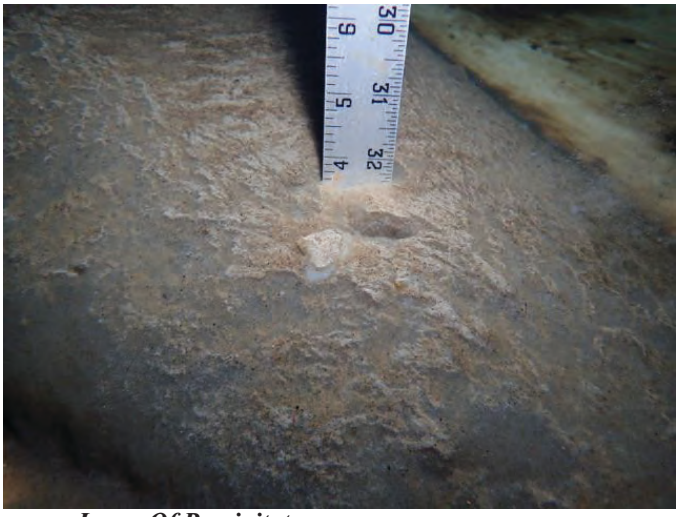
42 ***Secure / Sealed Roof Rigging Hole Penetrations***

43 ***Secure Vent Cap And Screen***

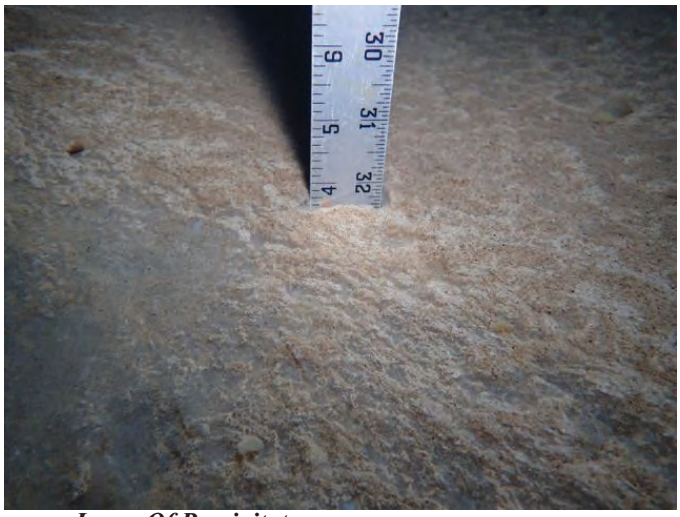
44 ***Open Access Hatch***

45 ***Closed Access Hatch***

46 ***Secure Access Hatch***

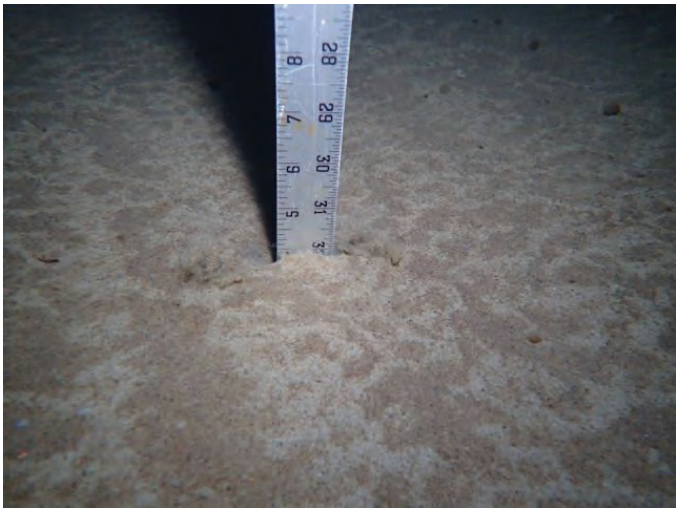


47 ***Layer Of Precipitate***



48 ***Layer Of Precipitate***

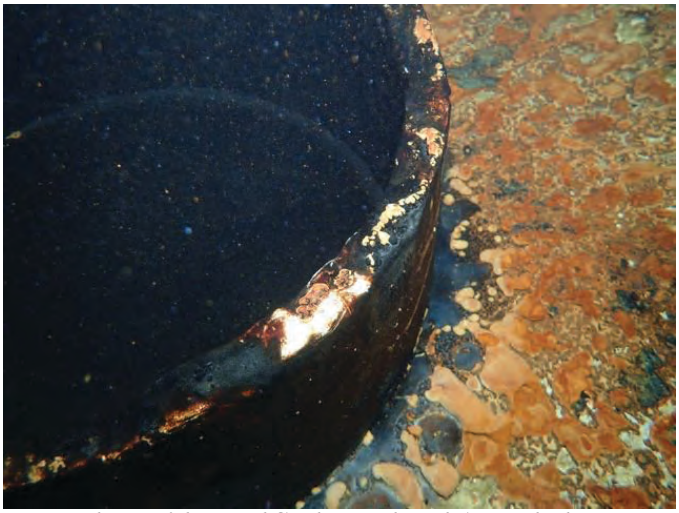
49 ***Layer Of Precipitate***



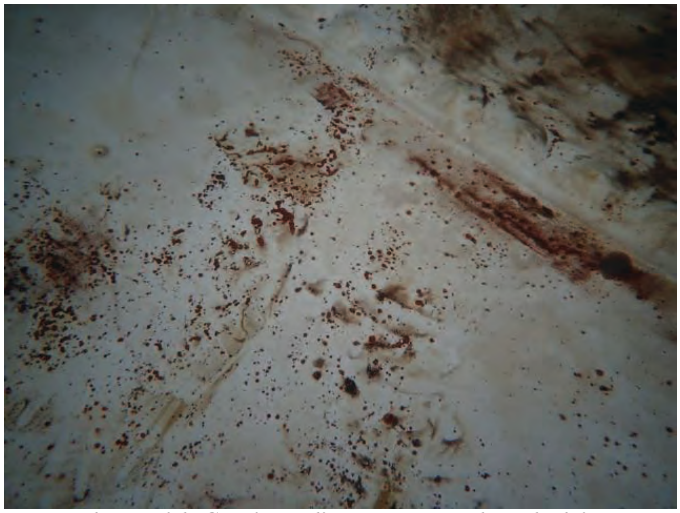
50 ***Layer Of Precipitate***

51 ***Floor With Metal Scale Hardened Around The Influent/Effluent Pipe***

52 ***Floor With Metal Scale Hardened Around The Influent/Effluent Pipe***

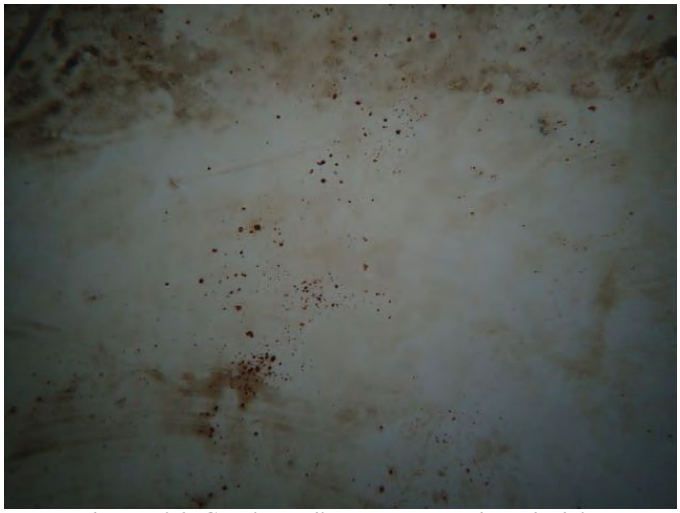


53 ***Floor With Metal Scale Hardened Around The Influent/Effluent Pipe***

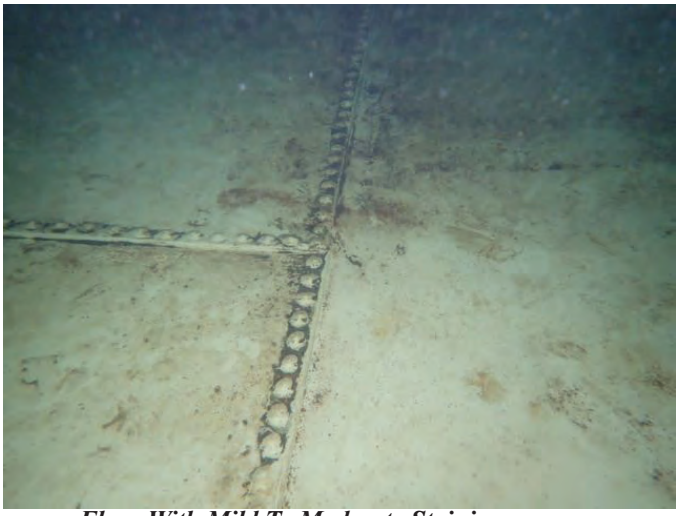


54 ***Floor With Coating Blisters, Exposed Underlying Steel, Mild Surface Corrosion And Mild To Moderate Staining***

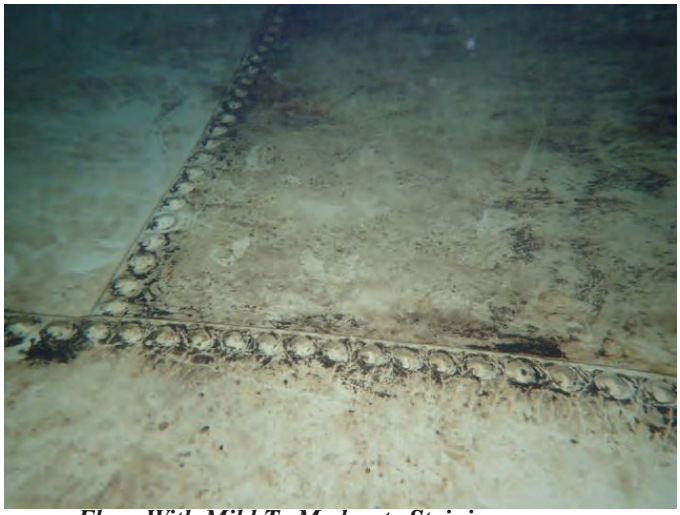
55 ***Floor With Coating Blisters, Exposed Underlying Steel, Mild Surface Corrosion And Mild To Moderate Staining***



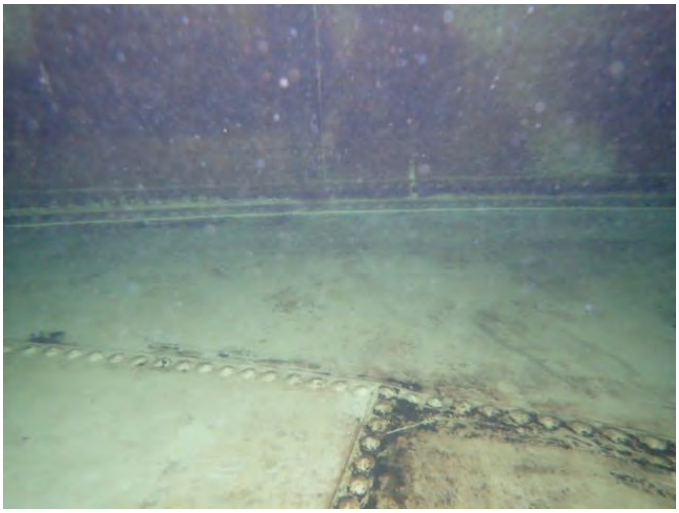
56 ***Floor With Coating Blisters, Exposed Underlying Steel, Mild Surface Corrosion And Mild To Moderate Staining***



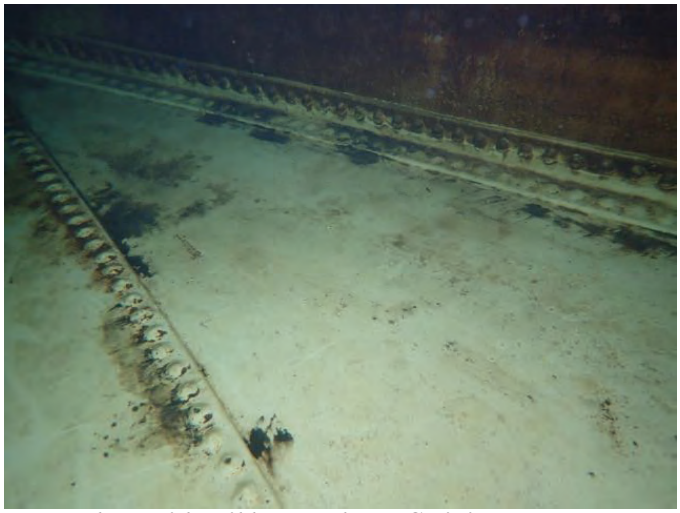
57 ***Floor With Mild To Moderate Staining***



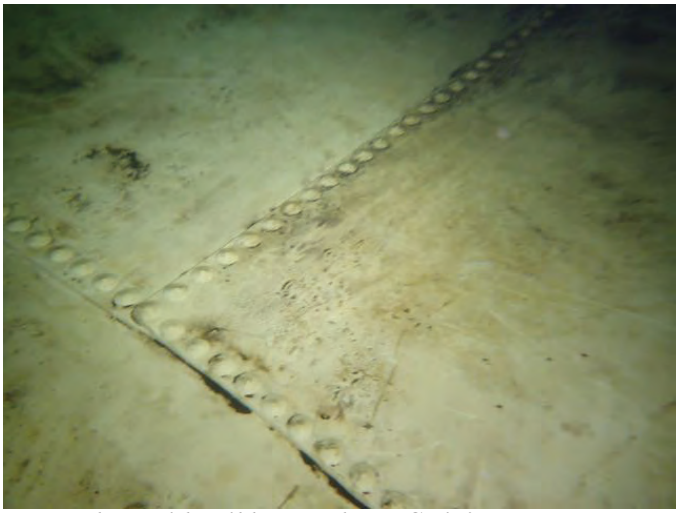
58 ***Floor With Mild To Moderate Staining***



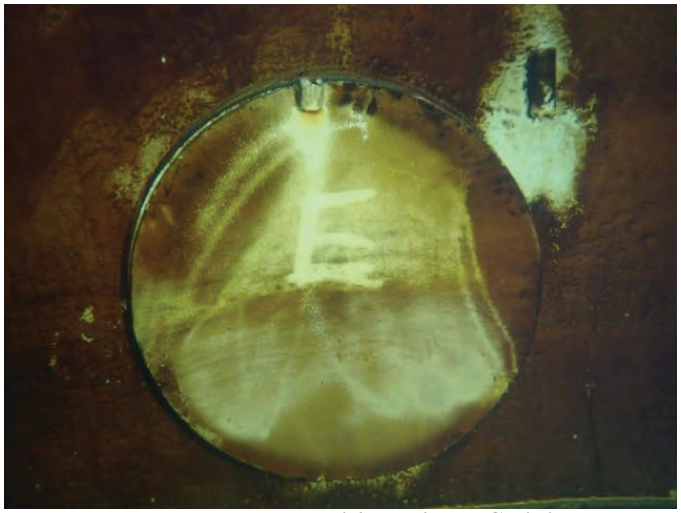
59 ***Floor With Mild To Moderate Staining***



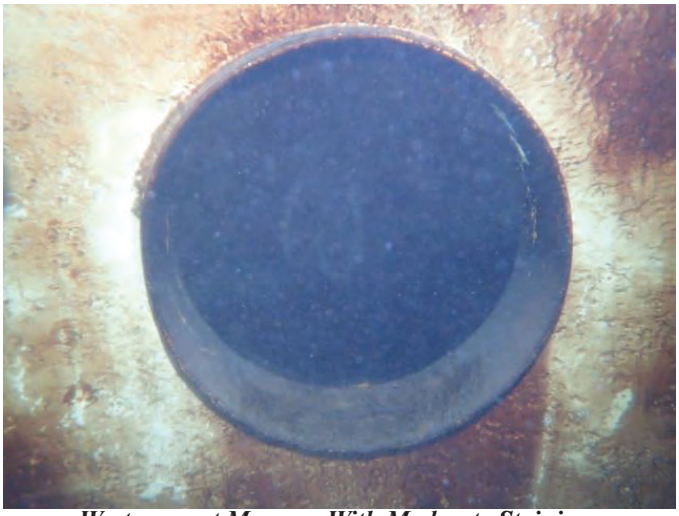
60 ***Floor With Mild To Moderate Staining***



61 *Floor With Mild To Moderate Staining*



62 *Easternmost Manway With Moderate Staining*

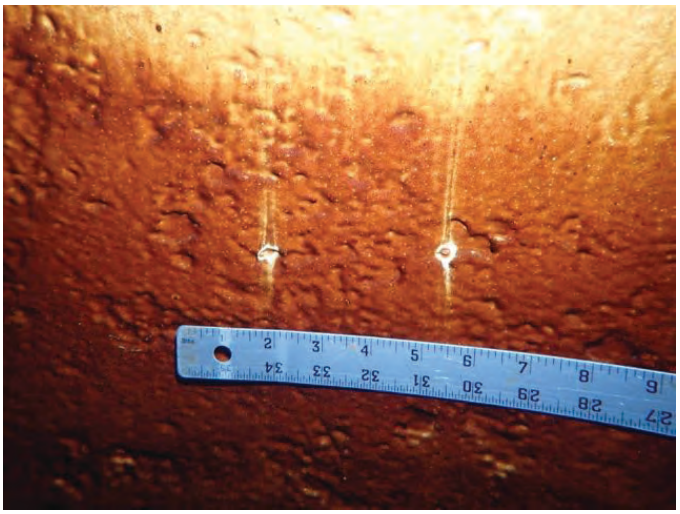


63 *Westernmost Manway With Moderate Staining*

64 *14” Inside Diameter Pipe With Coating Blisters, Exposed Steel And Corrosion*

65 *2 1/2” Inside Diameter Flush Capped Pipe Eliminating Pipe From Use*

66 *Interior Wall With Coating Blisters, Exposed Underlying Steel, Mild Corrosion And Moderate To Heavy Staining*



67 ***Interior Wall With Coating Blisters, Exposed Underlying Steel, Mild Corrosion And Moderate To Heavy Staining***

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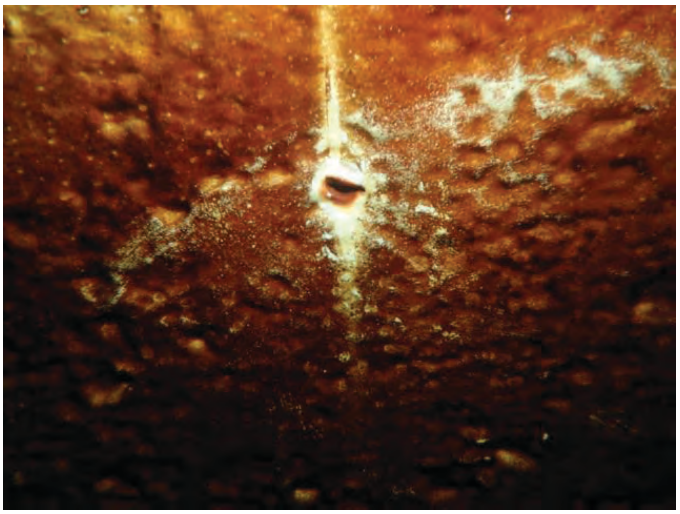
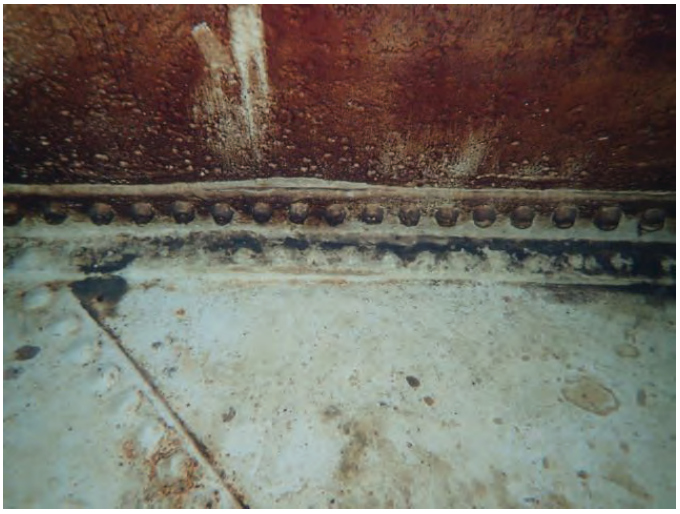


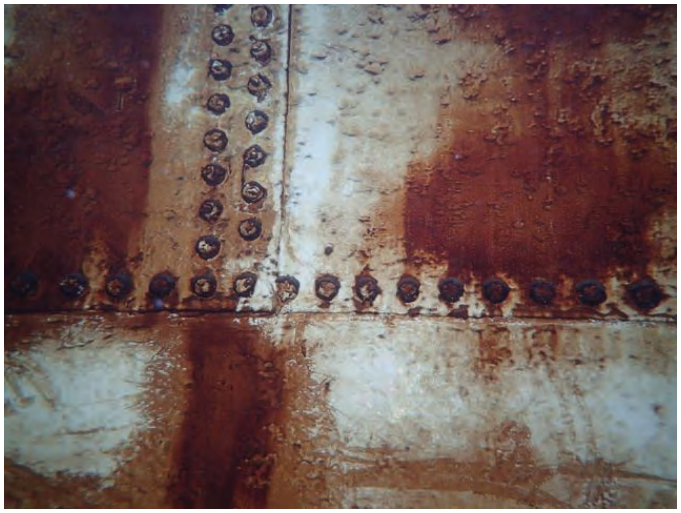
69 ***Interior Wall With Coating Blisters, Exposed Underlying Steel, Mild Corrosion And Moderate To Heavy Staining***

70 ***Interior Wall With And Moderate To Heavy Staining***

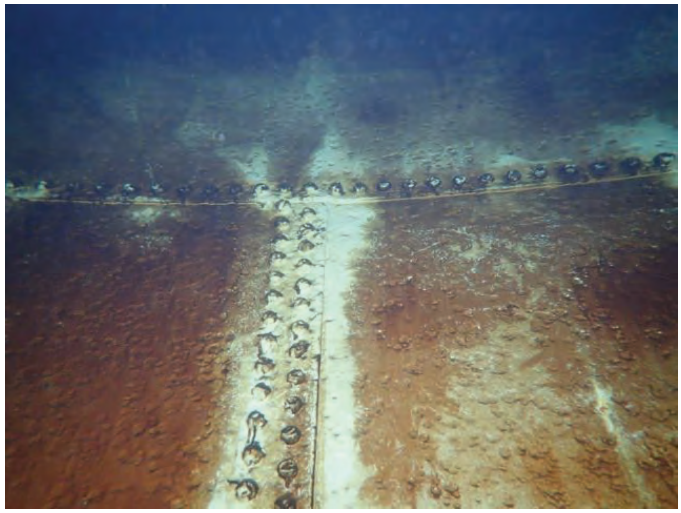


71 ***Interior Wall With And Moderate To Heavy Staining***

72 ***Interior Wall With Moderate To Heavy Staining***



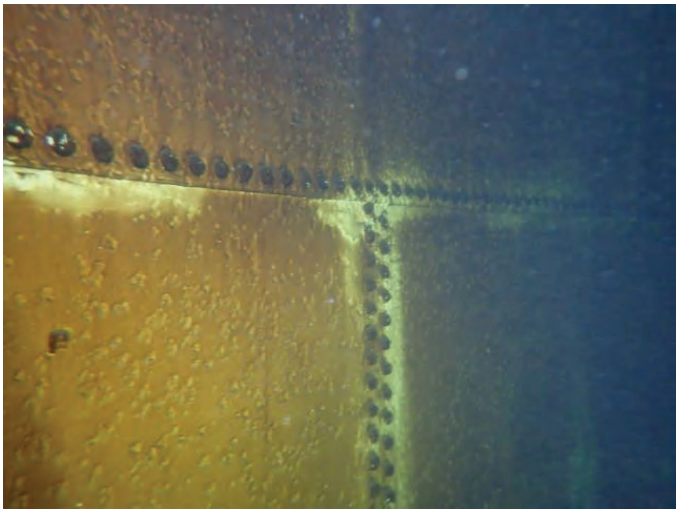
73 *Interior Wall With Moderate To Heavy Staining*



74 *Interior Wall With Moderate To Heavy Staining*

75 *Interior Wall With Moderate To Heavy Staining*

76 *Interior Wall With Moderate To Heavy Staining*



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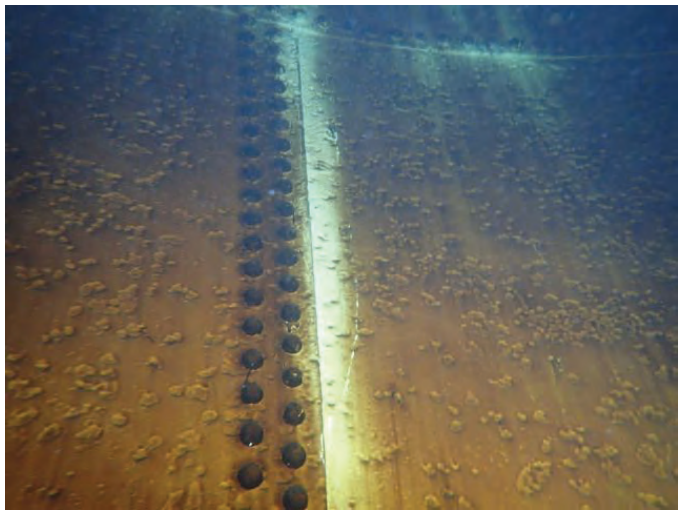
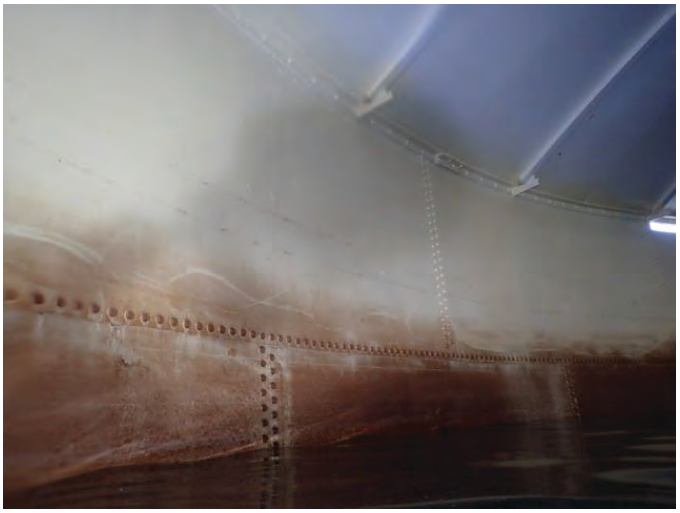


78 *Interior Wall With Moderate To Heavy Staining*

79 *Interior Wall With Moderate To Heavy Staining*



80 *Interior Wall With Moderate To Heavy Staining*

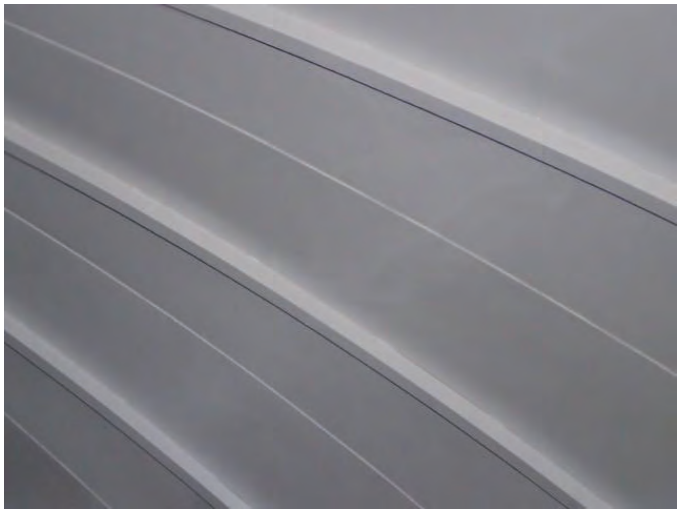
81 *Interior Wall With Moderate To Heavy Staining*

82 *Interior Wall With Moderate To Heavy Staining*

83 *Overhead With Minimal Coating Loss, Exposed Underlying Steel And Mild Surface Corrosion*

84 *Overhead With Minimal Coating Loss, Exposed Underlying Steel And Mild Surface Corrosion*

85 ***Overhead With Minimal Coating Loss, Exposed Underlying Steel And Mild Surface Corrosion***



86 ***Overhead***

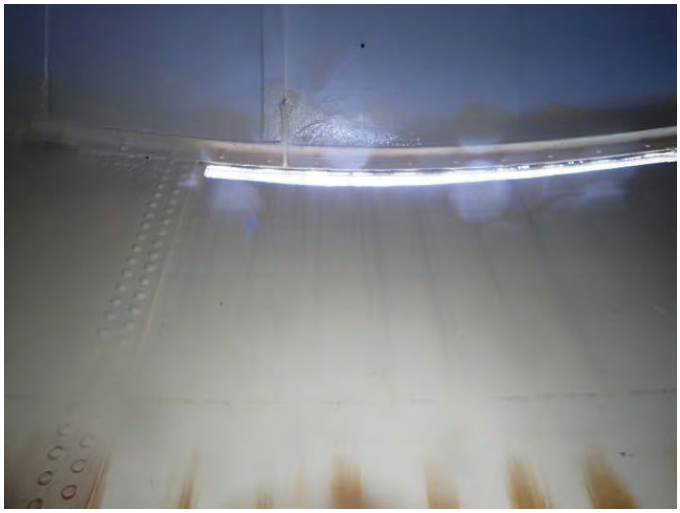
87 ***Overhead***

88 ***Overhead***

89 ***Overhead***

90 ***Overhead***

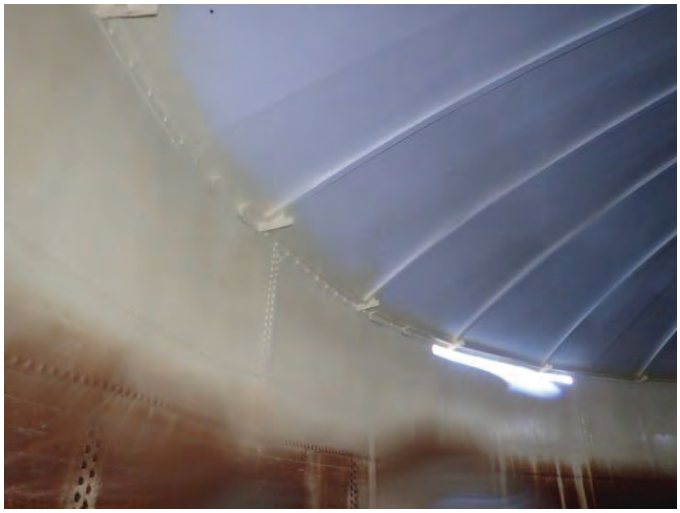
91 ***Overflow Cutout***



92 ***Overflow Cutout***

93 ***Overflow Cutout***

94 ***Overflow Cutout***



95 ***Overflow Cutout***

96 ***Discharge During Cleaning***

UNDERWATER SOLUTIONS INC.

INSPECTION AND INTERIOR CLEANING (SEDIMENT REMOVAL) OF THE MOUNT ST. CHARLES 2.95-MILLION GALLON CONCRETE WATER STORAGE TANK (#2)

CITY OF WOONSOCKET WATER DIVISION WOONSOCKET, RHODE ISLAND

MAY 29, JUNE 1-7, 2018

INSPECTION AND INTERIOR CLEANING (SEDIMENT REMOVAL) OF THE MOUNT ST. CHARLES 2.95-MILLION GALLON CONCRETE WATER STORAGE TANK (#2)

CITY OF WOONSOCKET WATER DIVISION WOONSOCKET, RHODE ISLAND

MAY 29, AND JUNE 1 THROUGH JUNE 7, 2018

SCOPE:

On May 29, and June 1 through 7, 2018, Underwater Solutions Inc. inspected the 2.95-million gallon concrete potable water storage tank (#2) to provide information regarding the overall condition and integrity of this structure and removed the sediment accumulation from the floor.

EXTEROR INSPECTION:

The entire exterior this water storage tank (and all components) was inspected to include walls and coating, manways, ladder, overflow, roof, vent, and hatch.

Walls And Coating

The exterior shotcrete coated concrete walls were inspected and were found appearing mostly sound, however tight shrinkage cracks were found throughout approximately 5% of these surfaces and were observed throughout all elevations of the exterior walls.

Efflorescence has accumulated within less than 5% of these cracks due to moisture penetration.

These cracks were sounded and appeared to be limited to the surface of the concrete and remain free of obvious voids or spalls at this time.

The protective coating applied to the exterior walls appears to have been applied uniformly and remains having good adhesion value, however no longer seals the shrinkage cracks.

A mild to moderate, non-uniform accumulation of mildew throughout the exterior walls causes declined aesthetics.

Manways

Two, 24-1/2" by 18-1/2" inside diameter, non-corrodible metal manways penetrate the wall on northernmost and southernmost sides of the tank, located approximately 21" above the ground, and are securely installed and free of obvious leakage. The securing bars for each manway were found secured with a lock, preventing unwanted access/opening.

Ladder

An aluminum ladder extends from approximately 8' above the ground up to the roof dome supported to the tank wall with seven sets of bolted standoffs. This ladder has a fall prevention device installed throughout its length. This ladder and fall prevention device were found in good sound condition, providing safe access to the roof.

A ladder guard secured with a lock is installed at the base of the ladder, preventing unwanted access to the ladder/roof.

Overflow

A 12" inside diameter overflow pipe penetrates the wall on the northernmost side of the tank, approximately 24" above the ground, and extends outward 23" to a bolted flange having a flap-valve installed at its end. A primary and secondary screen installed within the pipe remains secure, preventing access to the interior of the pipe/tank.

This overflow pipe was free of obvious obstructions at this time.

The protective coating applied to this metal overflow pipe and flap-valve was found to be peeling, causing metal exposure and corrosion. However, this metal pipe and flap-valve remain sound at this time.

The protective coating applied to the wall at the pipe penetration was found to be peeling, resulting in exposure of the metal sleeve that forms the overflow pipe penetration in the wall. Although mild corrosion exists on the surfaces of this exposed metal sleeve, no obvious fatigue or deterioration of this exposed metal was evident at this time.

Roof

The precast concrete roof panels and concrete-filled joints between panels were inspected and the pre-cast concrete roof panels appeared sound and remain free of obvious concrete fatigue at this time. The concrete-filled joints between the pre-cast concrete panels appeared mostly sound, however tight cracks were observed throughout approximately 70% of the surfaces of the concrete-filled joints.

These cracks were sounded and appeared to be limited to the surface of the concrete and remain free of obvious voids or spalls at this time.

The protective coating applied to these surfaces appears to have been applied uniformly and no longer seals the cracks within the concrete-filled joints, while declined film thickness of the protective coating has resulted in exposure of the underlying concrete throughout approximately 30% of these surfaces.

The 43" tall aluminum safety railings bolted to the roof at the location of the interior access hatch were found securely installed and free of obvious fatigue or failures at this time.

An accumulation of mildew throughout the roof also causes declined aesthetics.

Vent

The vent is located within the center of the roof dome, having a 48" inside diameter, and stands 24" tall.

A 76" outside diameter fiberglass cap and associated screen remains securely installed over the vent penetration in the roof, preventing access to the interior of the tank.

Hatch

One, 40" by 40" aluminum hatch provides access to the tank interior through the roof dome. This hatch remains in good condition and was found without a lock, however a series of stainless-steel pressure locks prevent accidental opening.

INTERIOR INSPECTION:

The entire interior of this water storage tank and components were inspected to include sediment accumulations, floor, piping, walls, interior ladder, overhead, overflow, and aesthetic water quality.

Sediment Accumulations

A non-uniform layer of accumulated precipitate was found on all floor surfaces, ranging from 24" to 28" in depth.

After completing this inspection, all precipitate was removed (vacuumed) from the floor.

Floor

After removing the accumulated precipitate, the concrete floor was inspected and was found to be un-coated, and appearing sound and remaining free of obvious cracks, spalls or settlement.

Mild staining remains throughout the entire floor due to the accumulation of precipitate.

Manways

Two, 24-1/2" by 18-1/2" inside diameter manways penetrate the walls on the northernmost and southernmost sides of the tank, approximately 5' above the floor. These manways were found securely installed and free of obvious leakage.

An aluminum ladder extends from the floor up to the base of each manway and are securely bolted in-place at this time.

Corrosion exists on the surfaces of each ladder and fatigue (pitting) of the aluminum, having depths of barely detectable levels, was observed throughout the surfaces of the northernmost manway access ladder. However, this ladder remains sound at this time.

The aluminum ladder that extends to the southernmost manway was found free of obvious fatigue/deterioration of the aluminum at this time.

The davit hinge welded to the northernmost manway lid and bolted to the wall adjacent to the manway was found securely installed and free of obvious fatigue or failures at this time.

The davit hinge welded to the southernmost manway lid and bolted to the wall adjacent to the manway was found in-place and without obvious fatigue of the weld, and three of the four bolts that secures the davit hinge to the wall were found secure (tight), while the top right bolt spins freely. However, this davit hinge appears sound and secure at this time.

An additional penetration having an approximate diameter of 1/2" and an approximate depth of 1-1/2" was observed adjacent to the bolt that spins freely and appears to be a mis-drilled/un-used bolt hole for this davit hinge mounting plate. No obvious indications of leakage were evident and no obvious leakage was observed through this mis-drilled/un-used bolt hole at this time.

Piping

Two pipes were inspected within this potable water storage tank.

The first pipe inspected, penetrates the floor of a 24" by 24" by 6" deep sump in the floor, approximately 18" in from the wall. This pipe has a 12" inside diameter and is flush in the sump floor. This pipe was free of obvious obstructions and was without flow at the time of this inspection.

The second pipe inspected penetrates the floor 20" in from the wall having a 16" inside diameter. This pipe extends up 8" though a 90° elbow to a four-way cross section of pipe. Each side of the four-way cross section of pipe extends approximately 4", having a rubber effluent check valve securely installed, and terminates approximately 16" above the floor, while the other end of this four-way cross section of pipe extends across the floor, supported with twelve concrete supports to a (T) that terminates approximately 35" from the opposite side of the tank. Each side of this (T) extends 8" to rubber influent check valves and terminates approximately 38" above the floor.

Each effluent opening and check valve within this water mixing pipe was free of obvious obstructions at this time. Each influent opening and check valve within this water mixing pipe was free of obvious obstructions at this time.

The protective coating applied to this metal water mixing pipe and pipe securing hardware appears to have been applied uniformly, however blistering of the coating was observed throughout approximately 80% of these surfaces, causing metal exposure and corrosion. However, this pipe and pipe securing hardware remain sound and free of obvious fatigue/deterioration at this time.

Walls

The interior walls were inspected beginning at the floor and by spiraling the circumference of the tank up to the water's surface.

These pre-cast concrete wall panels and concrete-filled wall slot panel joints are not coated and these concrete surfaces were found appearing mostly sound and remain free of obvious cracks. However, a band of concrete scour spans the circumference of the tank that appears to be the result of an ice cap formation.

This band of concrete scour begins approximately 5’ below the junction of where the roof and walls meet and extends down and terminates approximately 5’ above the floor. This concrete scour was found having an average maximum depth of 1/4" deep at this time.

The surrounding and underlying concrete within this band of concrete scour remains sound and with no obvious exposure of the underlying reinforcement steel at this time.

Moderate to heavy staining exists throughout all wall surfaces, beginning approximately 2’ below overflow level and extending down to the floor.

Interior Ladder

An aluminum ladder extends from the floor up to the access hatch, supported to the tank wall with ten sets of bolted standoffs. This ladder has a fall prevention device installed throughout its length, providing safe access and egress.

Corrosion exists throughout the entire length of this ladder and fatigue (pitting) of the aluminum, having depths from barely detectable levels to 1/8” deep and measuring up to 1/8” in diameter, was found within these areas of corrosion. However, this ladder remains secure and sound at this time.

The non-corrodible metal fall prevention device installed on this ladder was found appearing sound and without corrosion at this time.

Overhead

The entire overhead was inspected from the water surface.

These pre-cast concrete overhead panels and concrete-filled joints between panels are not coated and these concrete surfaces appeared sound. Although efflorescence has accumulated throughout the edges of approximately 50% of the pre-cast concrete panels, no obvious concrete fatigue was evident at this time.

Overflow

The overflow consists of a 12" inside diameter pipe cast within a 27" by 22" concrete box formed to the tank wall that begins approximately 5' above the floor and extends up and flares in size to a 40" x 36" concrete box, prior to terminating 11" below the junction of where the roof and walls meet.

This concrete overflow box is not coated and was found appearing mostly sound, however concrete scour similar to what was found throughout the interior walls was observed on the surfaces of the overflow box. The surrounding and underlying concrete within the areas of scour remains sound and with no obvious exposure of the underlying reinforcement steel at this time.

Aesthetic Water Quality

The aesthetic water quality was good throughout the entire tank allowing unlimited visibility for this inspection.

RECOMMENDATIONS:

It is the opinion of Underwater Solutions Inc. that this concrete potable water storage tank appears mostly sound and remains free of obvious leakage.

EXTERIOR:

The tight shrinkage cracks found throughout all elevations of the exterior walls were sounded and appeared to be limited to the surface of the shotcrete cover coating and remain free of obvious voids or spalls at this time. However, less than 5% of these cracks were found having accumulated efflorescence.

The protective coating applied to the exterior walls appears to have been applied uniformly and remains having good adhesion value, however no longer seals the shrinkage cracks.

The protective coating applied to the exterior wall surfaces at the overflow pipe penetration on the northernmost side of the tank was found to be peeling, resulting in exposure of the metal sleeve that forms the overflow pipe penetration in the wall.

Although mild corrosion exists on the surfaces of this exposed metal sleeve, no obvious fatigue or deterioration of this exposed metal was evident at this time.

The pre-cast concrete roof panels appeared sound and remain free of obvious concrete fatigue at this time. The concrete-filled joints between the pre-cast concrete panels appeared mostly sound, however tight cracks were observed throughout approximately 70% of the surfaces.

These cracks were sounded and appeared to be limited to the surface of the concrete and remain free of obvious voids or spalls at this time.

The protective coating applied to these surfaces appears to have been applied uniformly and no longer seals the cracks within the concrete-filled joints, while declined film thickness causes exposure of the underlying concrete throughout approximately 30% of these surfaces.

A mild to moderate, non-uniform accumulation of mildew throughout the exterior walls and roof dome causes declined aesthetics.

It is our recommendation to pressure-wash the exterior wall and roof surfaces at 3,500 P.S.I. and at 3.5 G.P.M. to remove the accumulated mildew from these surfaces and remove the accumulated efflorescence from the cracks and to then re-coat the exterior walls and roof dome using an epoxy/polyurethane flexible coating to seal all cracks and to seal and protect the concrete, while improving the overall aesthetics.

All components affixed to this tank were found properly installed at this time.

The cap and associated screen remains securely installed over the vent penetration in the roof, preventing access to the interior of the tank.

A flap-valve installed at the end of the overflow pipe and a primary and secondary screen installed within the overflow pipe are secure, preventing access to the interior of the tank.

The protective coating applied to the metal overflow pipe and flap-valve was found to be peeling, causing metal exposure and surface corrosion.

It is our recommendation to power tool clean the surfaces of the overflow pipe and flap-valve to remove all corrosion and to prepare the substrate. We then recommend re-coating these surfaces to halt corrosion, prevent metal fatigue/deterioration and to provide good protection for these metal surfaces.

The interior access hatch located on the roof was found without a lock, however a series of stainless steel pressure locks prevent accidental opening.

It is our recommendation to install a lock on this hatch to prevent unwanted access to the interior of the tank.

A ladder guard secured with a lock is installed at the base of the roof access ladder, preventing unwanted access to the ladder/roof.

INTERIOR:

The interior concrete floor surface appeared sound and remain free of obvious cracks, spalls or settlement and requires no remedial action at this time.

The interior pre-cast concrete wall panels and concrete-filled wall slot panel joints were found appearing mostly sound and remain free of obvious cracks, however a band of concrete scour spans the circumference of the tank that appears to be the result of an ice cap formation.

The surrounding and underlying concrete within this band of concrete scour remains sound and with no obvious exposure of the underlying reinforcement steel at this time.

It is our recommendation to monitor this band of concrete scour through future scheduled inspections to ensure that the depth of this scour does not increase and result in exposure of the underlying reinforcement steel.

The surfaces of the interior concrete overflow box was also found having concrete scour and without obvious exposure of the underlying reinforcement steel at this time.

It is our recommendation to monitor the concrete scour found on the concrete overflow box through future scheduled inspections to ensure that the depth of this scour does not increase and result in exposure of the underlying reinforcement steel.

The pre-cast concrete overhead panels and concrete-filled joints between panels appeared sound, and although efflorescence has accumulated throughout the edges of approximately 50% of the pre-cast concrete panels, no obvious concrete fatigue was evident at this time.

It is our recommendation to monitor the edges of the overhead panels through future scheduled inspections to ensure that concrete spall does not occur and result in exposure of the underlying reinforcement steel.

Corrosion exists on the surfaces of each manway access ladder. Fatigue (pitting) of the aluminum, having depths of barely detectable levels, was observed throughout the surfaces of the northernmost manway access ladder, Although corrosion exists on the surfaces of the southernmost manway access ladder, no obvious fatigue/deterioration of these aluminum surfaces was evident at this time.

It is our recommendation to remove these manway access ladders and to install a replacement Fiberglass reinforced plastic ladder at each manway to provide safe access and egress.

The davit hinge welded to the northernmost manway lid and bolted to the wall adjacent to the manway was found securely installed and free of obvious fatigue or failures and requires no remedial action at this time.

The davit hinge welded to the southernmost manway lid and bolted to the wall adjacent to the manway was found in-place and without obvious fatigue of the weld, and three of the four bolts that secures the davit hinge to the wall were found secure (tight), while the top right bolt spins freely. However, this davit hinge appears sound and secure at this time.

An additional penetration, having an approximate diameter of 1/2" and an approximate depth of 1-1/2", was observed adjacent to the bolt that spins freely and appears to be a mis-drilled/un-used bolt hole for this davit hinge mounting plate. No obvious indications of leakage were evident and no obvious leakage was observed through this mis-drilled/un-used bolt hole at this time.

It is our recommendation to monitor the surfaces of this davit hinge through future scheduled inspections to ensure that that mounting plate secured to the wall does not become loose/dislodged and that leakage does not occur through the mis-drilled/un-used bolt hole.

The aluminum ladder that extends from the floor up to the access hatch remains securely bolted in-place and appears sound, however corrosion exists throughout the entire length this ladder and fatigue (pitting) of the aluminum, having depths from barely detectable levels to 1/8" deep, was found within these areas of corrosion at this time.

It is our recommendation to remove this ladder and install a fiberglass reinforced plastic ladder having a non-corrodible metal fall prevention device installed throughout its length to allow for safe access and egress.

The protective coating applied to the metal water mixing pipe and pipe securing hardware was found to be blistering, causing metal exposure and corrosion. However, this pipe and pipe securing hardware remains sound at this time.

It is our recommendation that the next time this tank is removed from service and de-watered that the surfaces of this pipe showing metal exposure be power tool cleaned to remove all corrosion and to prepare the substrate. We then recommend re-coating these surfaces using an A.N.S.I./N.S.F.61 approved coating for use in structures containing potable water to halt corrosion, prevent metal fatigue/deterioration and to provide good protection for this metal pipe and pipe securing hardware.

As always, we recommend that re-inspection and cleaning of all water storage facilities be performed in accordance with state and federal mandates, A.W.W.A. standards, and completed by an experienced and authorized inspection corporation.

UNDERWATER SOLUTIONS INC.
Christopher A. Cole, Project Manager

This report, the conclusions, recommendations and comments prepared by Underwater Solutions Inc. are based upon spot examination from readily accessible parts of the tank. Should latent defects or conditions which vary significantly from those described in the report be discovered at a later date, these should be brought to the attention of a qualified individual at that time. These comments and recommendations should be viewed as information to be used by the Owner in determining the proper course of action and not to replace a complete set of specifications. All repairs should be done in accordance with A.W.W.A. and/or other applicable standards.

1 *Exterior Wall With Tight Shrinkage Cracks, Efflorescence And Mild To Moderate Mildew*

2 *Exterior Wall With Tight Shrinkage Cracks, Efflorescence And Mild To Moderate Mildew*

3 *Exterior Wall With Tight Shrinkage Cracks, Efflorescence And Mild To Moderate Mildew*

4 *Exterior Wall With Tight Shrinkage Cracks, Efflorescence And Mild To Moderate Mildew*

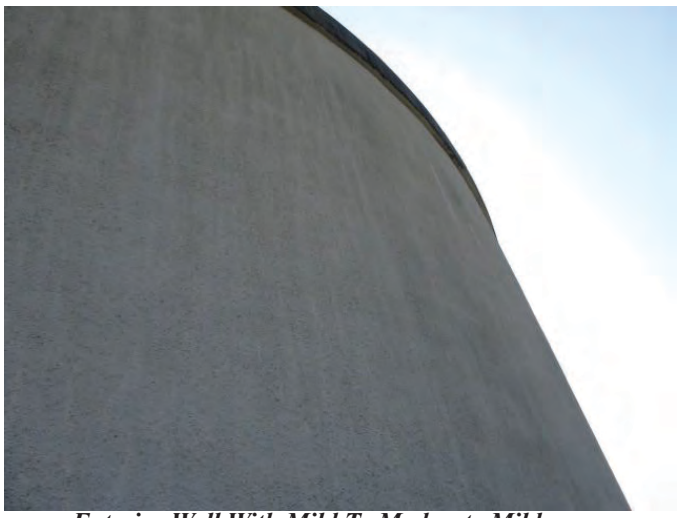
5 *Exterior Wall With Tight Shrinkage Cracks, Efflorescence And Mild To Moderate Mildew*

6 *Exterior Wall With Tight Shrinkage Cracks, Efflorescence And Mild To Moderate Mildew*

7 ***Exterior Wall With Tight Shrinkage Cracks, Efflorescence And Mild To Moderate Mildew***

8 ***Exterior Wall With Tight Shrinkage Cracks, Efflorescence And Mild To Moderate Mildew***

9 ***Exterior Wall With Mild To Moderate Mildew***



10 ***Exterior Wall With Mild To Moderate Mildew***

11 ***Exterior Wall With Mild To Moderate Mildew***

12 ***Exterior Wall With Adhesion Loss Resulting In Exposure Steel Sleeve That Forms The Overflow Pipe Penetration In The Tank Wall***

13 ***Secure Manway***

14 ***Secure Manway***

15 ***Ladder With Fall Prevention Device***

16 ***Ladder Guard Secured With A Lock***

17 ***Overflow Pipe And Flap-Valve With Coating Peeling, Exposed Metal And Mild Corrosion***

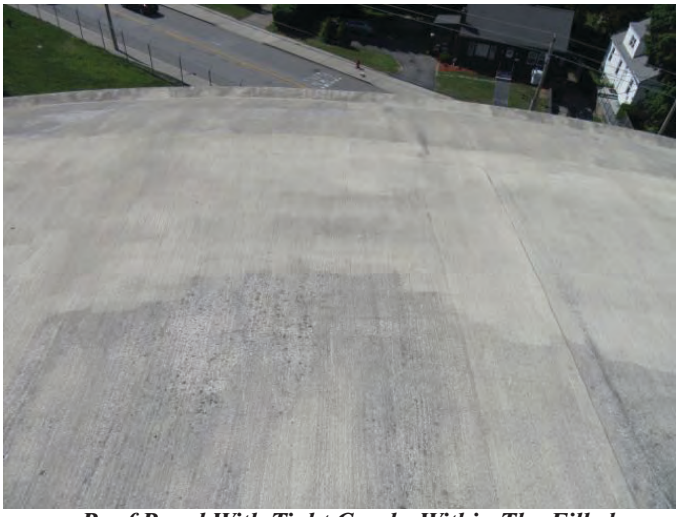
18 ***Secure Overflow Pipe Screen***

19 ***Roof Panel With Tight Cracks Within The Filled Panel Joints And Mildew***

20 ***Roof Panel With Tight Cracks Within The Filled Panel Joints And Mildew***

21 ***Roof Panel With Tight Cracks Within The Filled Panel Joints And Mildew***

22 ***Roof Panel With Tight Cracks Within The Filled Panel Joints And Mildew***



23 ***Roof Panel With Tight Cracks Within The Filled Panel Joints And Mildew***

24 ***Roof Panel With Tight Cracks Within The Filled Panel Joints And Mildew***

25 ***Roof Panel With Coating Loss, Exposed Underlying Concrete And Mildew***

26 ***Roof Panel With Coating Loss, Exposed Underlying Concrete And Mildew***

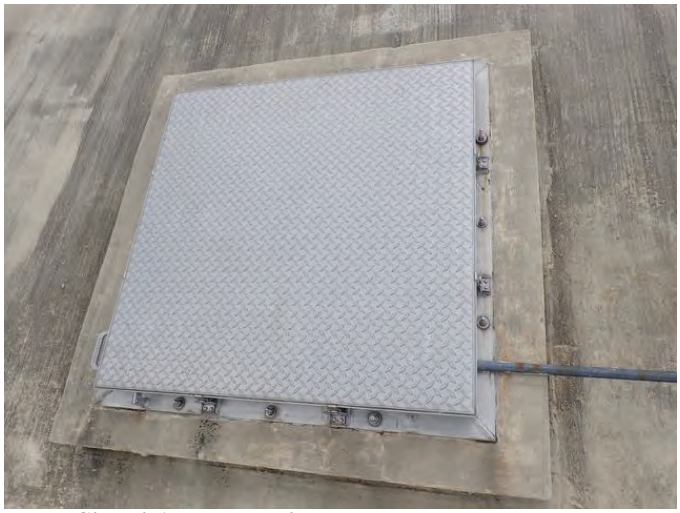
27 ***Roof Panel With Coating Loss, Exposed Underlying Concrete And Mildew***

28 ***Secure Roof Safety Railings***

29 ***Secure Vent Cap***

30 ***Secure Vent Screen***

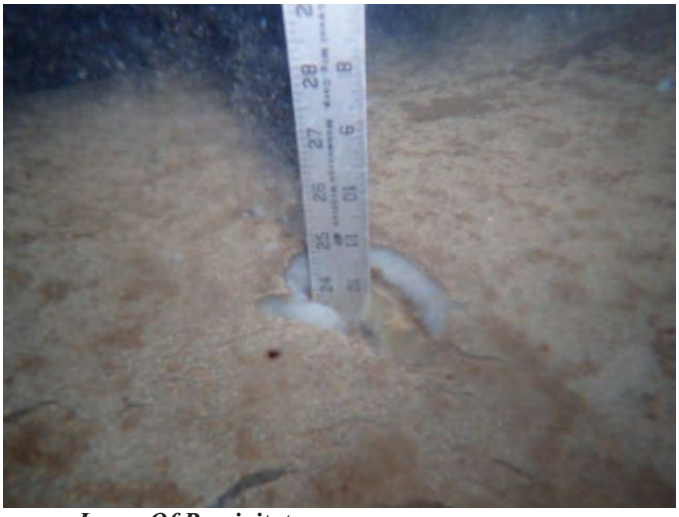
31 ***Open Access Hatch***



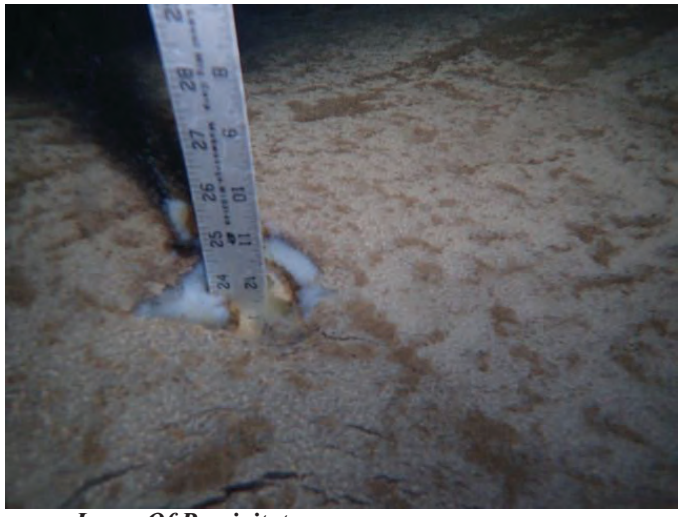
32 ***Closed Access Hatch***

33 ***Secure Stainless-Steel Pressure Lock***

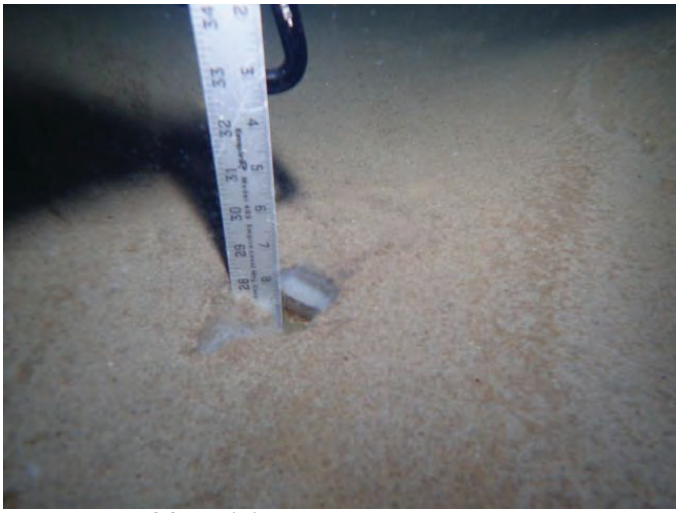
34 ***Secure Stainless-Steel Pressure Lock***



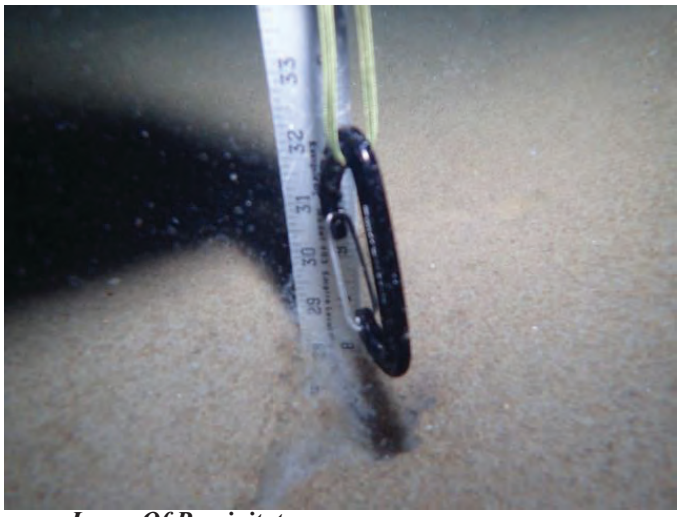
35 ***Layer Of Precipitate***



36 ***Layer Of Precipitate***

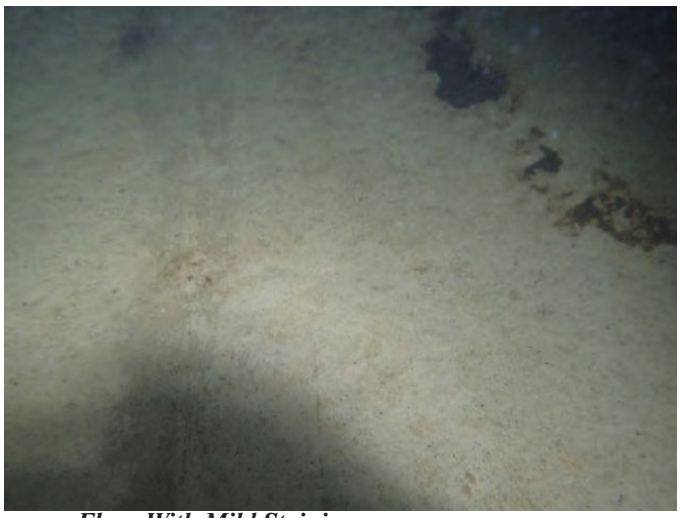


37 ***Layer Of Precipitate***



38 ***Layer Of Precipitate***

39 ***Floor With Mild Staining***



40 ***Floor With Mild Staining***

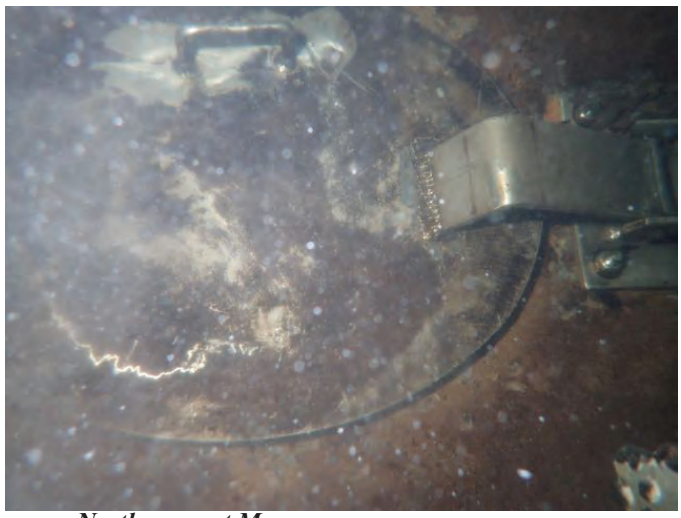
41 ***Floor With Mild Staining***

42 ***Floor With Mild Staining***

43 ***Floor With Mild Staining***

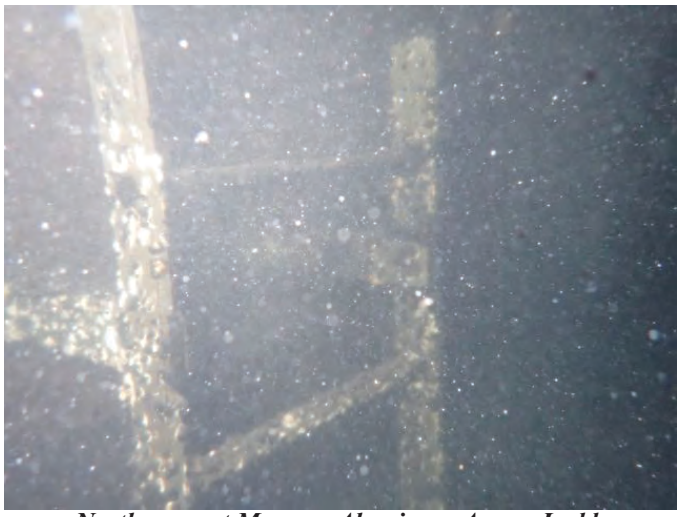
44 ***Floor With Mild Staining***

45 ***Floor With Mild Staining***

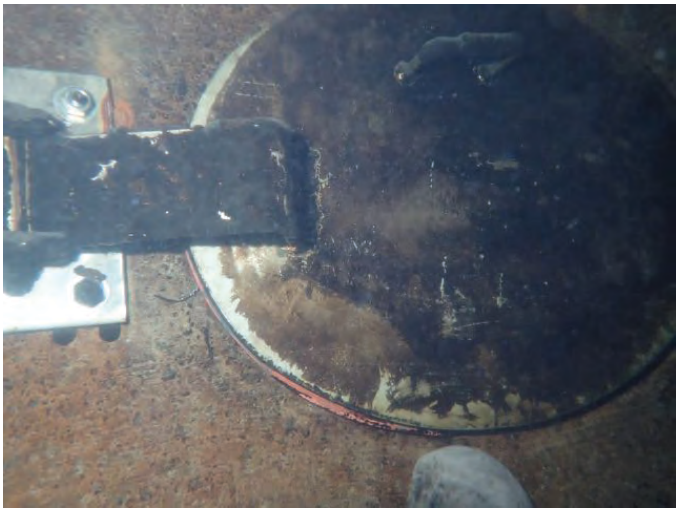


46 ***Northernmost Manway***

47 ***Northernmost Manway With Secure Davit Hinge***



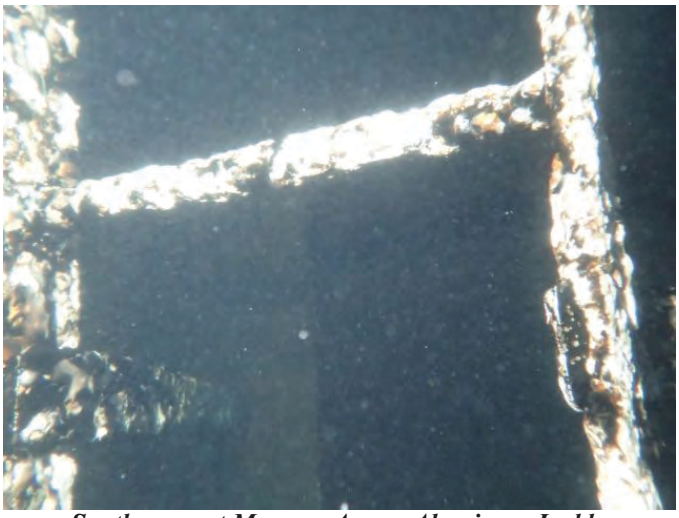
48 ***Northernmost Manway Aluminum Access Ladder With Fatigue (Pitting) And Corrosion***



49 ***Southernmost Manway***

50 ***Southernmost Manway With In-Place Davit Hinge***

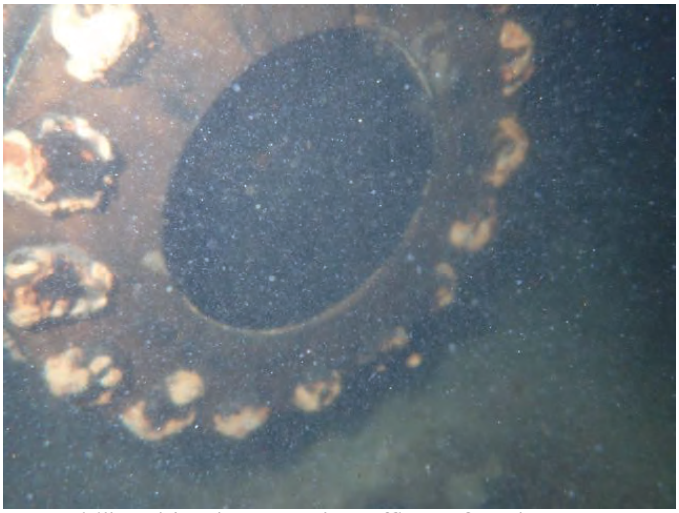
51 ***Southernmost Manway Davit Hinge With Free Spinning Bolt And Miss-Drilled/ Unused Bolt-hole***



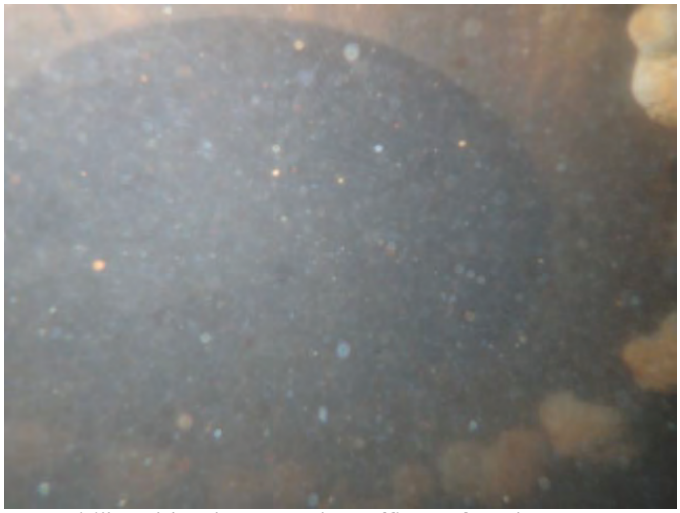
52 ***Southernmost Manway Access Aluminum Ladder With Corrosion***

53 ***12” Inside Diameter Flush Penetration Within The Sump Floor***

54 ***16” Inside Diameter Pipe Penetrating The Tank Floor***



55 *16” Inside Diameter Pipe Effluent Opening*

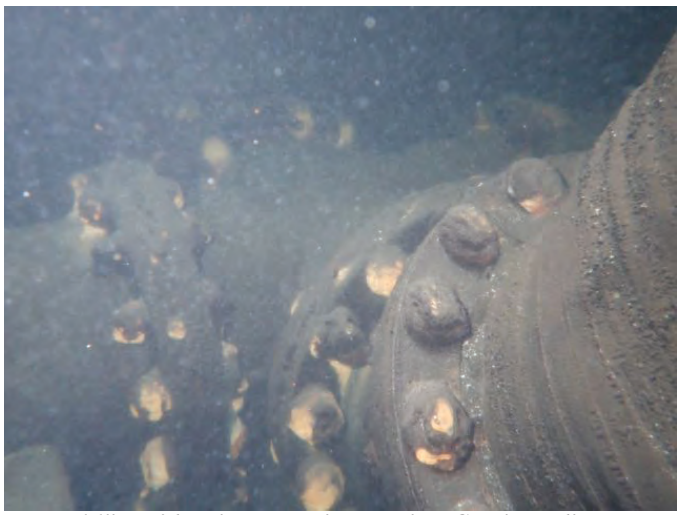


56 *16” Inside Diameter Pipe Effluent Opening*

57 *16” Inside Diameter Pipe Having Coating Blisters, Exposed Metal and Corrosion With Secure Hardware*

58 *16” Inside Diameter Pipe Having Coating Blisters, Exposed Metal and Corrosion With Secure Hardware*

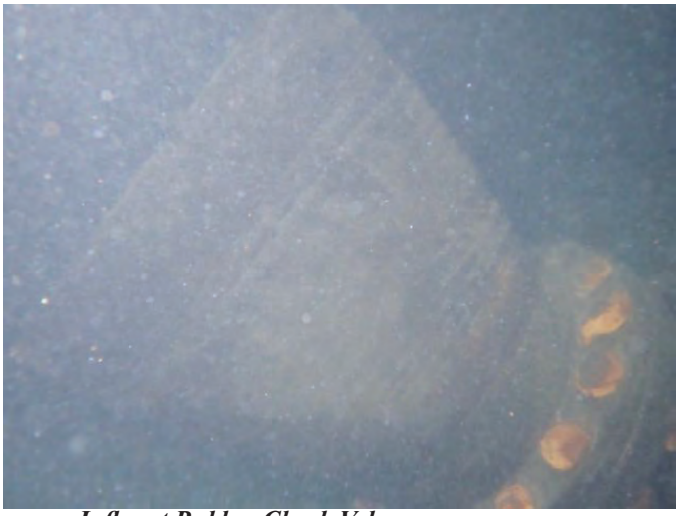
59 *16” Inside Diameter Pipe Having Coating Blisters, Exposed Metal and Corrosion With Secure Hardware*



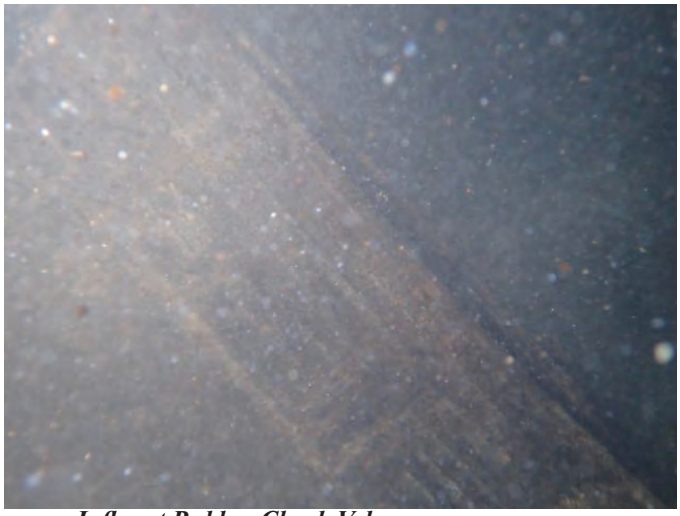
60 *16” Inside Diameter Pipe Having Coating Blisters, Exposed Metal and Corrosion With Secure Hardware*

61 ***Concrete Pipe Support***

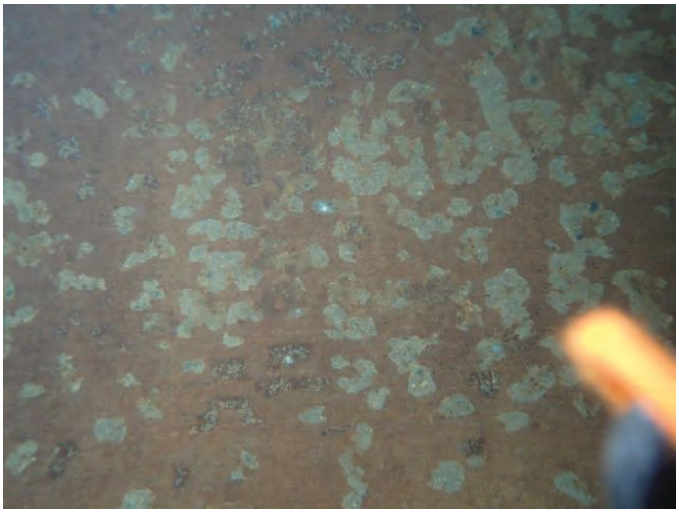
62 ***Concrete Pipe Support***



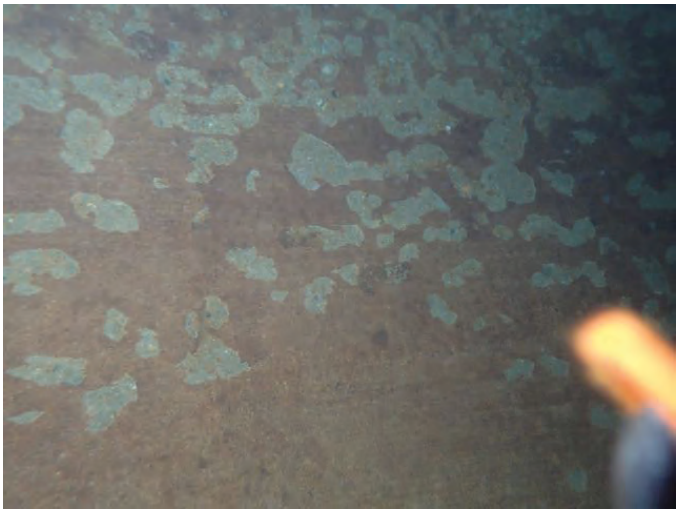
63 ***Influent Rubber Check Valve***



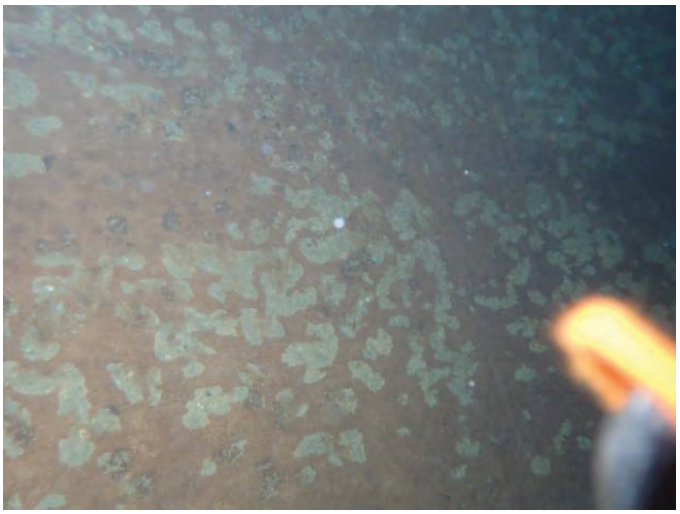
64 ***Influent Rubber Check Valve***



65 ***Interior Wall With Concrete Scour And Moderate To Heavy Staining***



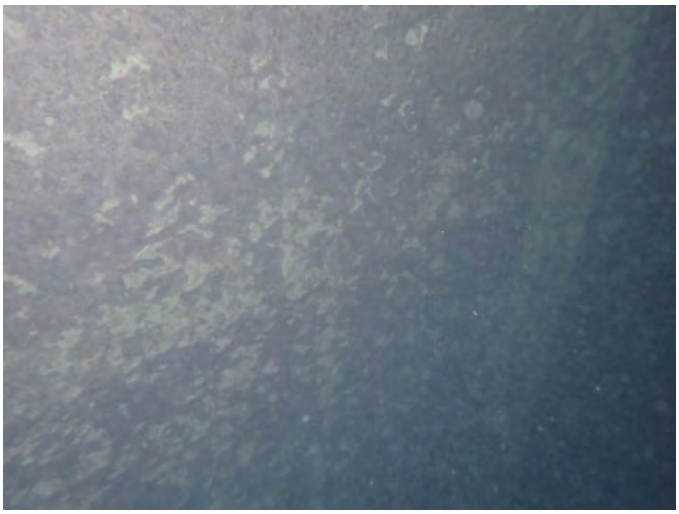
66 ***Interior Wall With Concrete Scour And Moderate To Heavy Staining***



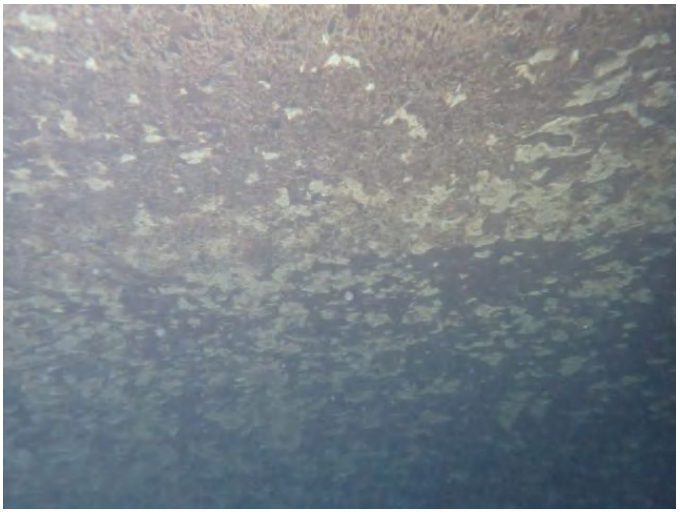
67 ***Interior Wall With Concrete Scour And Moderate To Heavy Staining***

68 ***Interior Wall With Concrete Scour And Moderate To Heavy Staining***

69 ***Interior Wall With Concrete Scour And Moderate To Heavy Staining***



70 ***Interior Wall With Concrete Scour And Moderate To Heavy Staining***



71 ***Interior Wall With Concrete Scour And Moderate To Heavy Staining***

72 ***Interior Wall With Moderate To Heavy Staining***

73 ***Interior Wall With Moderate To Heavy Staining***

74 ***Interior Wall With Moderate To Heavy Staining***

75 ***Interior Wall With Moderate To Heavy Staining***

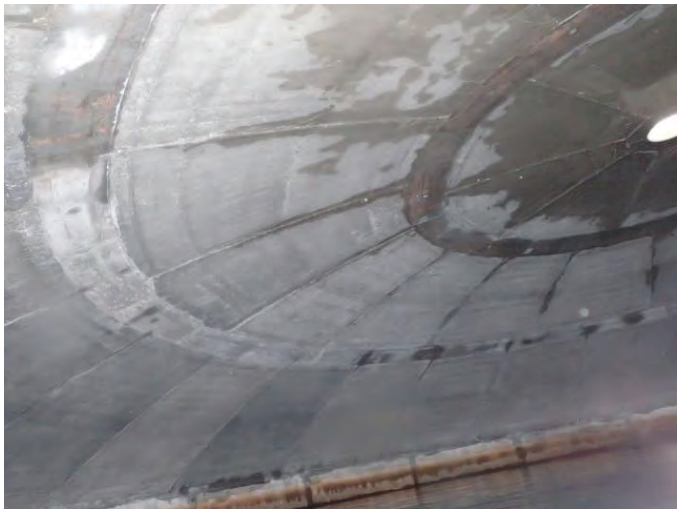
76 ***Interior Wall With Moderate To Heavy Staining***

77 ***Interior Wall With Moderate To Heavy Staining***

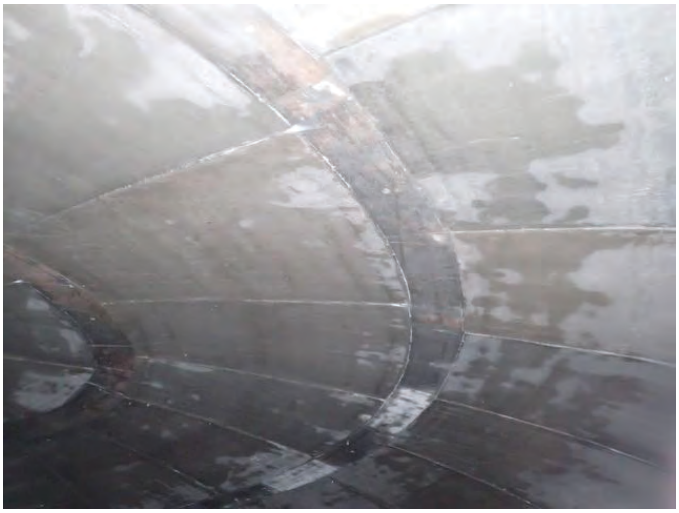
78 ***Interior Aluminum Ladder And Fall Prevention Device With Fatigue (Pitting) And Corrosion***

79 ***Interior Aluminum Ladder And Fall Prevention Device With Fatigue (Pitting) And Corrosion***

80 ***Interior Ladder And Fall Prevention Device With Corrosion***

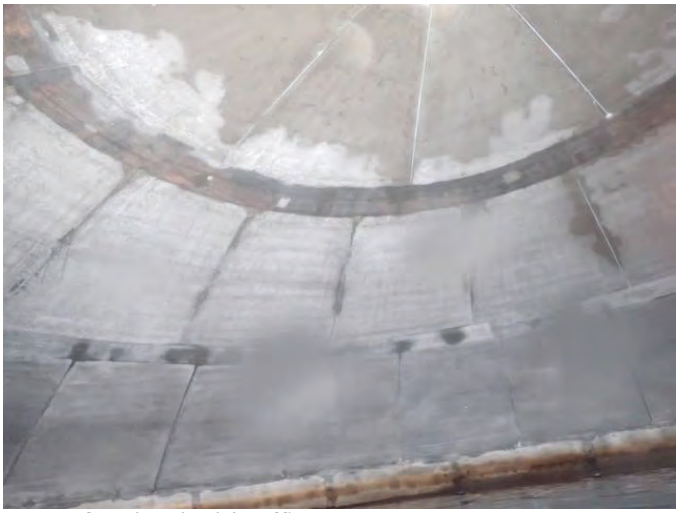


81 ***Overhead With Efflorescence***



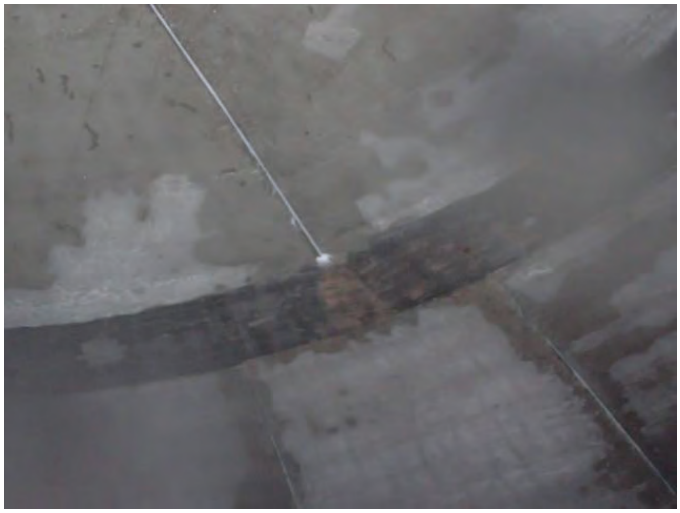
82 ***Overhead With Efflorescence***

83 ***Overhead With Efflorescence***



84 ***Overhead With Efflorescence***

85 ***Overhead With Efflorescence***



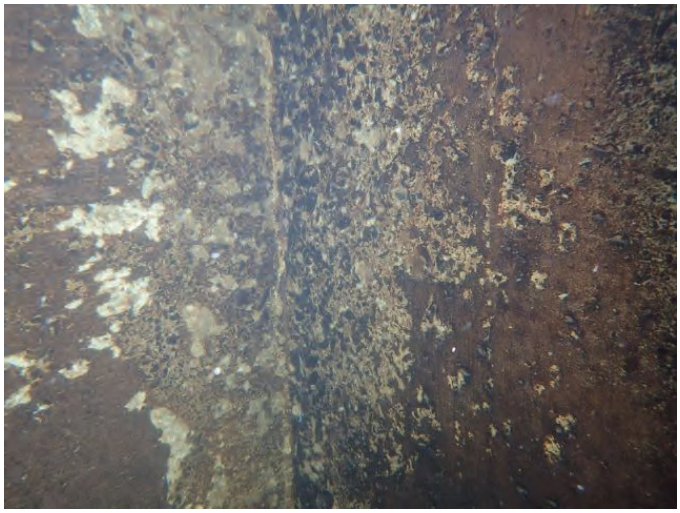
86 ***Overhead With Efflorescence***

87 ***Overhead And Vent Penetration***

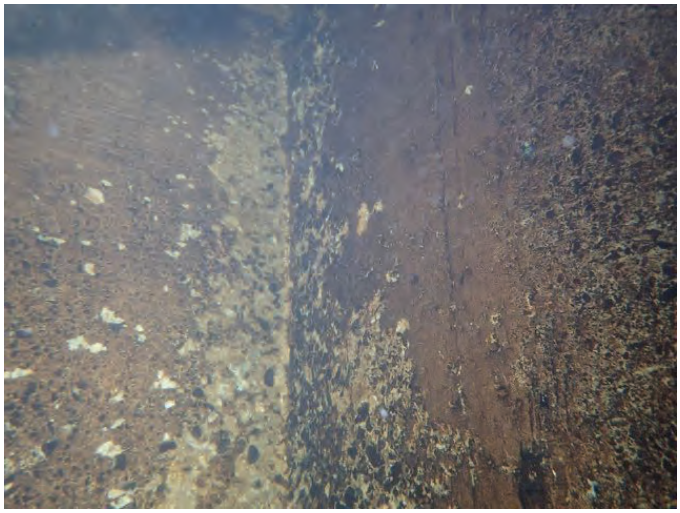
88 ***Concrete Overflow Box***

89 ***Concrete Overflow Box***

90 ***Concrete Overflow Box With Concrete Scour***



91 ***Concrete Overflow Box With Concrete Scour***



92 ***Concrete Overflow Box With Concrete Scour***

93 ***Interior Overflow Pipe***

94 ***Discharge During Cleaning***

UNDERWATER SOLUTIONS INC.

INSPECTION AND INTERIOR CLEANING (SEDIMENT REMOVAL) OF THE MOUNT ST. CHARLES 1.02-MILLION GALLON RIVETED STEEL WATER STORAGE TANK (#3)

CITY OF WOONSOCKET WATER DIVISION
WOONSOCKET, RHODE ISLAND

MAY 31, 2018

INSPECTION AND INTERIOR CLEANING (SEDIMENT REMOVAL) OF THE MOUNT ST. CHARLES 1.02-MILLION GALLON RIVETED STEEL WATER STORAGE TANK (#3)

CITY OF WOONSOCKET WATER DIVISION WOONSOCKET, RHODE ISLAND

MAY 31, 2018

SCOPE:

On May 31, 2018, Underwater Solutions Inc. inspected the Mount St. Charles1.02-million gallon riveted steel potable water storage tank (#3) to provide information regarding the overall condition and integrity of this structure and removed the sediment accumulation from the floor.

EXTERIOR INSPECTION:

The entire exterior of this water storage tank (and all components) was inspected to include walls and coating, manways, ladders, foundation, overflows, roof, vent, and hatch.

The exterior steel walls, roof and steel components affixed to the exterior of this tank have been re-coated since a previous inspection completed by Underwater Solutions Inc. on December 11-14, 2012.

Walls And Coating

The exterior steel wall panels and associated rivets were inspected and found appearing sound and remain free of obvious fatigue or failures at this time.

The average dry film thickness of the protective coating system applied to the exterior riveted steel wall panels was measured during this inspection. The dry film thickness of the coating system applied to the exterior wall surfaces was found as follows:

Row	***Mil Thickness***	***Row***	***Mil Thickness***
1.	11.6 mils	4.	24.1 mils
2.	16.7 mils	5.	18.0 mils
3.	19.0 mils	6.	16.0 mils

The American Water Works Association (AWWA) recommends a dry film thickness of 7.0 to 10.0 mils of coating film thickness be applied to the exterior surfaces of riveted steel potable water storage tanks to provide adequate protection for these structures.

The protective coating applied to the exterior walls appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for these steel panels and rivets.

A mild, non-uniform accumulation of mildew throughout the exterior walls causes declined aesthetics.

Manways

Two, 24" inside diameter manways penetrate the lowest row of wall panels on the northernmost and north-easternmost sides of the tank, located 22" above the tank base, and are securely installed and free of leakage.

The protective coating applied to the northernmost manway has an average dry film thickness of 12.9 mils, meets the AWWA's recommendations and was found having good adhesion value at this time.

The protective coating applied to the north-easternmost manway has an average dry film thickness of 21.9 mils, meets the AWWA's recommendations and was found having good adhesion value at this time.

One, 24" by 18" inside diameter manway penetrates the lowest wall panel on the southernmost side of the tank, located 24" above the tank base, and is securely installed and free of leakage.

The protective coating applied to this manway has an average dry film thickness of 18.5 mils, meets the AWWA's recommendations and was found having good adhesion value at this time.

One, 15" by 10-1/2" inside diameter manway penetrates the floor on the southernmost side of the tank, located 26" in from the wall, and is securely installed and free of leakage.

The protective coating applied to this manway has an average dry film thickness of 12.8 mils, meets the AWWA's recommendations and was found having good adhesion value at this time.

Ladders

A steel ladder extends from approximately 14' above the ground up to the roof, supported to the tank wall with four sets of bolted standoffs, and has a fall prevention device installed throughout its length, providing safe access to the roof. The protective coating applied to the steel ladder and steel fall prevention device was found having good adhesion value at this time.

A ladder guard secured with a lock is installed at the base of the ladder, preventing unwanted access to the ladder/roof.

A second steel ladder extends from the edge of the roof on the southernmost side of the tank up to the vent within the center of the roof, and is supported to the vent with one bolted bracket. Several sets of wheels are installed on this ladder, allowing this ladder to rotate throughout the circumference of the roof. This ladder remains in good condition, providing good access to the vent. The protective coating applied to this ladder was found having good adhesion value at this time.

Foundation

The exposed portion of the 24" wide granite block and mortar joint foundation ranges in height from 1" to 52" in height and was found appearing mostly sound, however tight cracks were observed throughout approximately 30% of the surfaces of the mortar placed between the granite blocks.

These tight cracks were sounded and no obvious voids were evident, while minimal spall of the mortar was observed throughout approximately 10% of these surfaces. However, all granite blocks remain in-place and are sound at this time.

The 24" wide concrete cap on the top face of the foundation is not coated and was found appearing mostly sound, however tight cracks were observed throughout approximately 15% of these surfaces.

These cracks were sounded and appeared to be limited to the surface of the concrete and were free of obvious voids or spalls at this time.

Overflows

The overflow consists of a series of five, 10' long by 6" wide cutouts evenly spaced throughout the circumference of the top of the top row of wall panels.

Each overflow cutout was free of obvious obstructions and was found securely screened, preventing access to the interior of the tank.

The protective coating applied to the metal screens and screen securing hardware was found having good adhesion value at this time.

Roof

The steel roof panels and associated welds were inspected and found appearing sound and free of obvious fatigue or failures.

The protective coating applied to these welded steel surfaces has an average dry film thickness of 16.2 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for these steel panels and welds.

One hundred-fourteen, 2" diameter rigging hole penetrations within the roof were found sealed with threaded plugs, preventing access to the interior of the tank.

Sixteen, 5" diameter rigging hole penetrations within the roof are sealed with 6" diameter cover plates that were found securely bolted in-place, preventing access to the interior of the tank.

Vent

The vent is located within the center of the roof, having a 24" inside diameter, and stands 30" tall.

A 31" outside diameter steel cap and associated screen was found securely installed over the vent penetration in the roof, preventing access to the interior of the tank.

The protective coating applied to this metal vent assembly was found having good adhesion value at this time.

Hatch

One, 24" inside diameter hatch provides good access to the tank interior through the roof, and is located on the southernmost side of the tank.

This hatch remains in good working condition and was found secured with a lock, preventing unwanted access to the interior of the tank.

The protective coating applied to this metal hatch was found having good adhesion value at this time.

INTERIOR INSPECTION:

The entire interior of this water storage tank (and components) was inspected to include sediment accumulations, floor, manways, piping, walls and coating, overhead, overflows, and aesthetic water quality.

The interior steel floor, walls, overhead and steel components affixed to the interior of this tank have been re-coated since a previous inspection completed by Underwater Solutions Inc. on December 11-14, 2012.

Sediment Accumulations

A non-uniform layer of accumulated precipitate was found on all floor surfaces, ranging from 3" to 4" in depth.

After completing this inspection, all precipitate was removed (vacuumed) from the floor.

Floor

After removing all precipitate, the steel floor panels and associated rivets were inspected and found appearing sound and free of obvious fatigue or failures.

The protective coating applied to the floor has an average dry film thickness of 52.9 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value. However, metal scale that appears to have entered the tank throughout the influent/effluent pipe was observed throughout a 6' radius around the influent/effluent pipe.

This metal scale has hardened to the floor and could not be removed with Underwater Solutions Inc.'s vacuum system.

Mild staining remains throughout the floor due to the accumulation of precipitate.

Manways

Two, 24" inside diameter manways penetrate the lowest row of wall panels on the northernmost and north-easternmost sides of the tank, located 22" above the tank base, and are securely installed and free of obvious leakage.

The northernmost manway lid is covered and sealed with a rubber gasket. The protective coating applied to the northernmost manway trunk has an average dry film thickness of 59.1 mils, meets the AWWA's recommendations and was found having good adhesion value at this time.

The north-easternmost manway lid is covered and sealed with a rubber gasket. The protective coating applied to the north-easternmost manway has an average dry film thickness of 53.0 mils, meets the AWWA's recommendations and was found having good adhesion value at this time.

One, 24" by 18" inside diameter manway penetrates the lowest wall panel on the southernmost side of the tank, located 24" above the tank base, and is securely installed and free of leakage.

The protective coating applied to this manway has an average dry film thickness of 59.1 mils, meets the AWWA's recommendations and was found having good adhesion value at this time.

One, 15" by 10-1/2" inside diameter manway penetrates the floor on the southernmost side of the tank, located 26" in from the wall, and is securely installed and free of leakage.

The protective coating applied to this manway has an average dry film thickness of 58.8 mils, meets the AWWA's recommendations and was found having good adhesion value at this time.

Piping

The influent/effluent pipe penetrates the floor on the southernmost side of the tank, having a 16" inside diameter, and stands 10" tall. This pipe was free of obvious obstructions and flow was entering the tank through this pipe at the time of this inspection.

The protective coating applied to this metal pipe was found having good adhesion value, while heavy staining exists throughout these surfaces at this time.

Walls And Coating

The interior walls were inspected beginning at the floor and by spiraling the circumference of the tank up to the water surface.

These steel wall panels and associated rivets appeared sound and remain free of obvious fatigue or failures.

The average dry film thickness of the protective coating system applied to the interior riveted steel wall panels was measured during this inspection. The dry film thickness of the coating system applied to the interior wall surfaces was found as follows:

Row	***Mil Thickness***	***Row***	***Mil Thickness***
1.	59.1 mils	4.	59.1 mils
2.	59.1 mils	5.	59.1 mils
3.	59.1 mils	6.	59.1 mils

The American Water Works Association (AWWA) recommends a dry film thickness of 10.5 to 15.5 mils of coating film thickness be applied to the interior surfaces of riveted steel potable water storage tanks to provide adequate protection for these structures.

The protective coating applied to the interior walls appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for these steel panels and rivets.

Moderate to heavy staining exists throughout the interior walls, beginning at overflow level and extending down to the floor.

Overhead

The entire overhead was inspected from the water surface.

These steel panels and I-beam supports appeared sound and remain free of obvious fatigue or failures.

The protective coating applied to these surfaces has an average dry film thickness of 22.4 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value. While a mild rust stain was observed throughout less than 5% of these surface, no obvious coating fatigue or steel exposure was evident at this time.

Overflows

The overflow consists of a series of five, 10' long by 6" wide cutouts evenly spaced throughout the circumference of the top of the top row of wall panels. Each overflow cutout was free of obvious obstructions at this time.

Aesthetic Water Quality

The aesthetic water quality was good throughout the tank, allowing unlimited visibility for this inspection.

RECOMMENDATIONS:

It is the opinion of Underwater Solutions Inc. that this riveted steel potable water storage tank appears sound and free of obvious leakage at this time.

EXTERIOR:

The exterior riveted steel walls appeared sound and are free of obvious fatigue or failures of the steel. The protective coating applied to the exterior walls appears to have been applied uniformly and was found having good adhesion value, however a mild non-uniform accumulation of mildew throughout the exterior walls causes declined aesthetics.

It is our recommendation to pressure-wash the exterior walls at 3,000 P.S.I. and at 2.5 G.P.M. to remove the accumulated mildew from these surfaces to improve the overall aesthetics and to preserve the adhesion value of the protective coating.

The steel roof panels and associated welds were found appearing sound and remain free of obvious fatigue or failures.

The protective coating applied to these welded steel surfaces appears to have been applied uniformly and was found having good adhesion value, providing adequate protection for these steel panels and welds and requires no remedial action at this time.

The protective coating applied to the steel components (manways, ladders, overflow screens and screen securing hardware, vent assembly and access hatch) affixed to the tank exterior was found having good adhesion value, providing adequate protection for the steel.

The granite block and mortar joint foundation was found appearing mostly sound, however tight cracks were observed throughout approximately 30% of the surfaces of the mortar placed between the granite blocks.

These tight cracks were sounded, and no obvious voids were evident, while minimal spall of the mortar was observed throughout approximately 10% of these surfaces. However, all granite blocks remain in-place and are sound at this time.

It is our recommendation to monitor the surfaces of the foundation, including the mortar-filled joints, through future scheduled inspections to ensure that further spall of the mortar does not cause the granite blocks to become dislodged.

The 24" wide concrete cap on the top face of the foundation was found appearing mostly sound, however tight cracks were observed throughout approximately 15% of these surfaces.

These cracks were sounded and appeared to be limited to the surface of the concrete and were free of obvious voids or spalls at this time.

It is our recommendation to monitor the surfaces of the concrete cap on top of the foundation through future scheduled inspections to ensure that spall of this concrete cap does not occur.

All components affixed to this tank are properly installed at this time. A cap and associated screen was found securely installed over the vent penetration in the roof, preventing access to the interior of the tank. Each rigging hole penetration within the roof was found properly sealed, preventing access to the interior of the tank.

The access hatch located on the roof was found secured with a lock, preventing unwanted access to the interior of the tank.

A ladder guard that is secured with a lock is installed on the base of the ladder, preventing unwanted access to the ladder/roof.

A screen was found securely in-place over each of the five overflow cutouts, preventing access to the interior of the tank.

INTERIOR:

The interior steel floor panels and associated rivets were found appearing sound and remain free of obvious fatigue or failures.

The protective coating applied to the floor appears to have been applied uniformly and was found having good adhesion value, however metal scale that appears to have entered the tank throughout the influent/effluent pipe was observed throughout a 6' radius around the influent/effluent pipe.

This metal scale has hardened to the floor and could not be removed with our vacuum system.

It is our recommendation that the next time this tank is removed from service and de-watered that this hardened metal scale be removed, and if the removal of this hardened scale causes coating damage/steel exposure, it would be our recommendation to power-tool clean these affected areas to prepare the substrate. We then recommend re-coating these affected areas using an A.N.S.I./N.S.F.61 approved coating for use in structures containing potable water to provide good protection for the steel.

The protective coating applied to the interior steel surfaces of each manway was found having good adhesion value, while a rubber gasket covers and seals the steel lid of the northernmost and north-easternmost manway.

The interior steel wall panels and associated rivets appeared sound and remain free of obvious fatigue or failures.

The protective coating applied to the interior walls appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for these steel panels and rivets and requires no remedial action at this time.

The steel overhead panels and I-beam supports appeared sound and remain free of obvious fatigue or failures.

The protective coating applied to these surfaces appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, although a mild rust stain was observed throughout less than 5% of these surfaces. However, no obvious coating fatigue or steel exposure was evident at this time.

It is our recommendation to monitor the areas of rust staining observed throughout the overhead through future scheduled inspections to ensure that coating adhesion loss does not occur and result in exposure of the underlying steel.

As always, we recommend that re-inspection and cleaning of all water storage facilities be performed in accordance with state and federal mandates, A.W.W.A. standards, and completed by an experienced and authorized inspection corporation.

UNDERWATER SOLUTIONS INC.
Christopher A. Cole, Project Manager

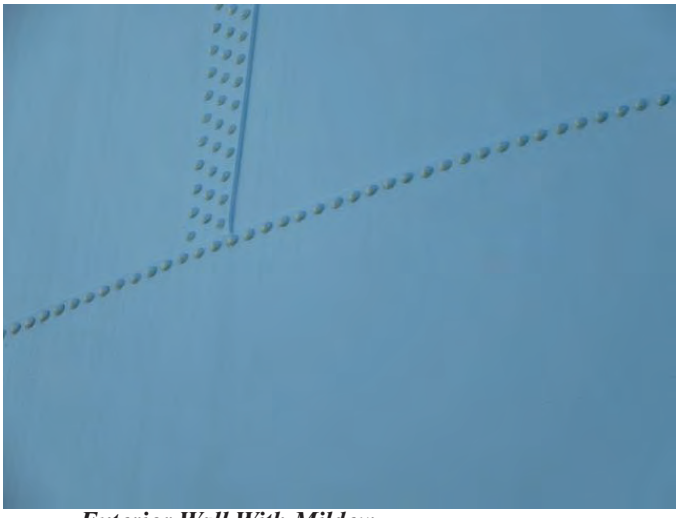
This report, the conclusions, recommendations and comments prepared by Underwater Solutions Inc. are based upon spot examination from readily accessible parts of the tank. Should latent defects or conditions which vary significantly from those described in the report be discovered at a later date, these should be brought to the attention of a qualified individual at that time. These comments and recommendations should be viewed as information to be used by the Owner in determining the proper course of action and not to replace a complete set of specifications. All repairs should be done in accordance with A.W.W.A. and/or other applicable standards.

1 ***Exterior Wall With Mildew***

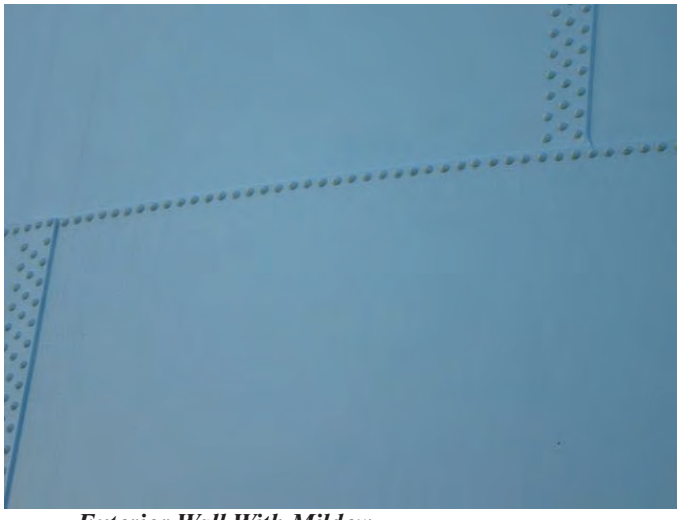
2 ***Exterior Wall With Mildew***

3 ***Exterior Wall With Mildew***

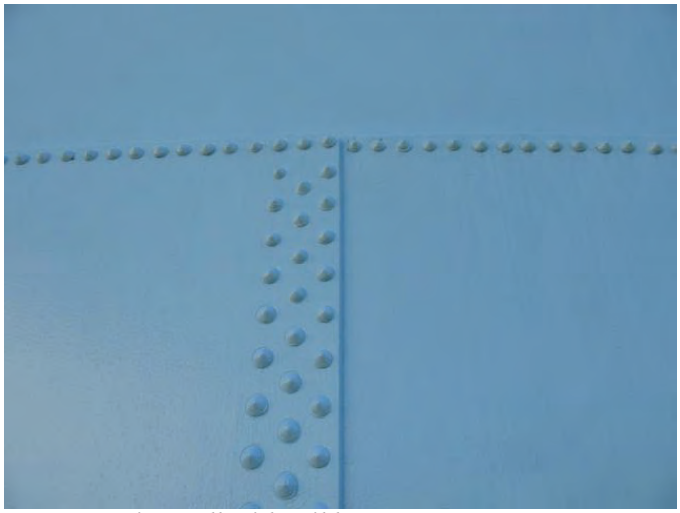
4 ***Exterior Wall With Mildew***



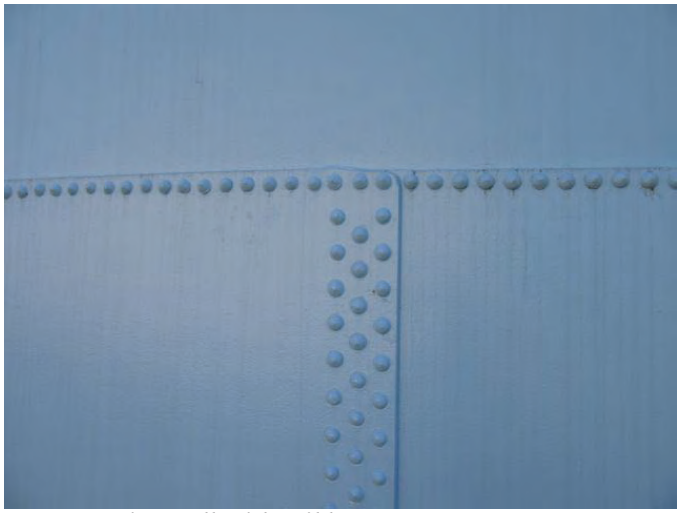
5 ***Exterior Wall With Mildew***



6 ***Exterior Wall With Mildew***



7 ***Exterior Wall With Mildew***



8 ***Exterior Wall With Mildew***

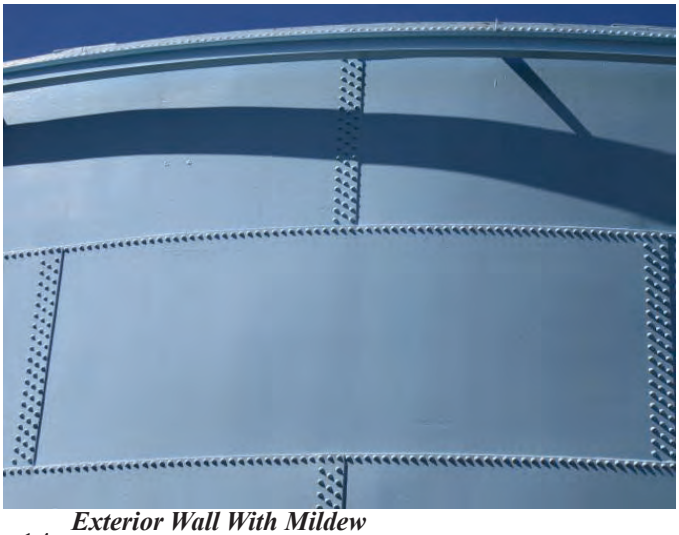
9 ***Exterior Wall With Mildew***

10 ***Exterior Wall With Mildew***

11 ***Exterior Wall With Mildew***

12 ***Exterior Wall With Mildew***

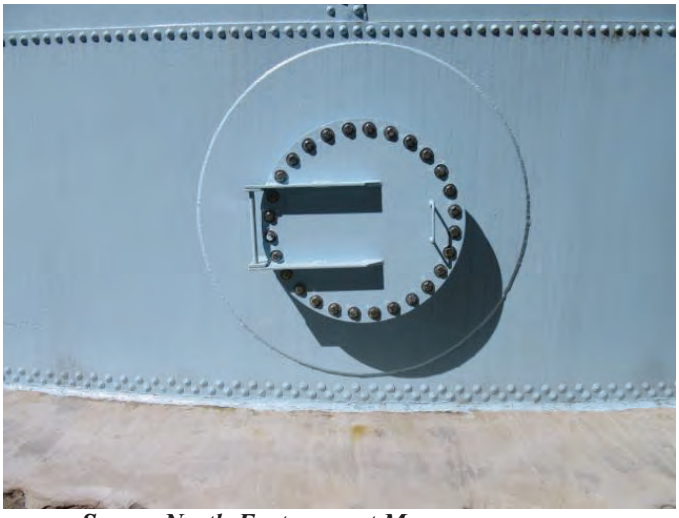
13 ***Exterior Wall With Mildew***



14 ***Exterior Wall With Mildew***

15 ***Exterior Wall With Mildew***

16 ***Secure Northernmost Manway***



17 ***Secure North-Easternmost Manway***

18 ***Secure Southernmost Manway***

19 *Manway Penetrating The Tank Floor On The South Side Of The Tank*

20 *Ladder With Fall Prevention Device*

21 *Ladder Guard Secured With A Lock*

22 *Ladder Extending From Roof Edge To The Vent*

23 *Granite Block Foundation With Tight Cracks And Minimal Mortar Spall*

24 *Granite Block Foundation With Tight Cracks And Minimal Mortar Spall*

25 ***Granite Block Foundation With Tight Cracks And Minimal Mortar Spall***

26 ***Granite Block Foundation With Tight Cracks And Minimal Mortar Spall***

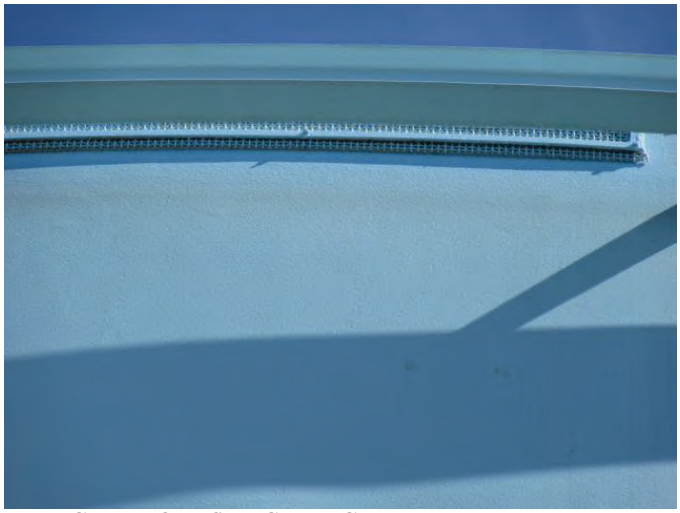
27 ***Granite Block Foundation With Tight Cracks And Minimal Mortar Spall***

28 ***Concrete Foundation Cap With Tight Cracks***

29 ***Concrete Foundation Cap With Tight Cracks***

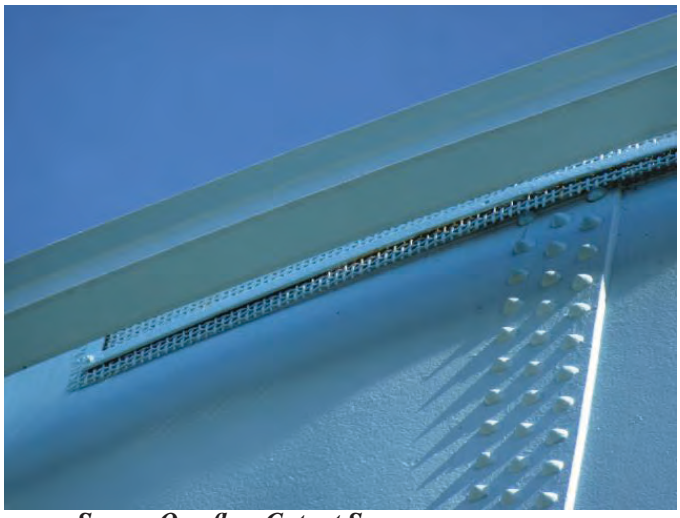
30 ***Concrete Foundation Cap With Tight Cracks***

31 ***Concrete Foundation Cap With Tight Cracks***



32 ***Secure Overflow Cutout Screen***

33 ***Secure Overflow Cutout Screen***



34 ***Secure Overflow Cutout Screen***

35 ***Roof Panel***

36 ***Roof Panel***

37 ***Roof Panel***

38 ***Roof Panel***

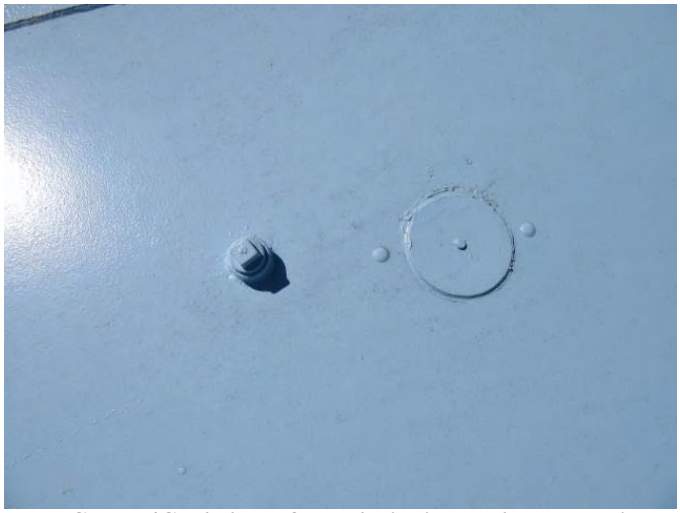
39 ***Roof Panel***

40 ***Roof Panel***

41 ***Roof Panel***

42 ***Roof Panel***

43 ***Secure/ Sealed Roof Panel Rigging Hole Penetration***



44 ***Secure/ Sealed Roof Panel Rigging Hole Penetration***

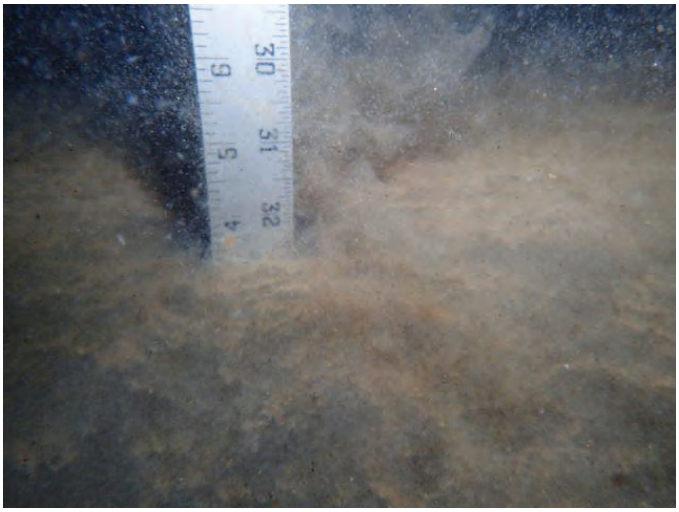
45 ***Secure Vent Cap And Screen***

46 ***Open Access Hatch***

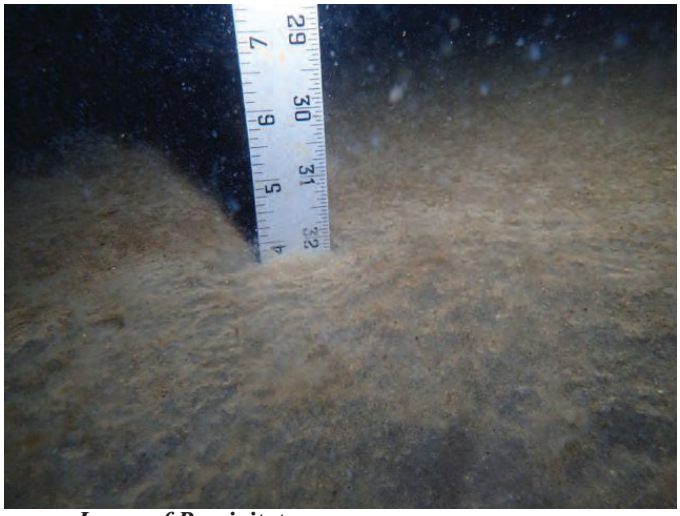
47 ***Closed Access Hatch***

48 ***Secure Access Hatch***

49 ***Layer of Precipitate***



50 ***Layer of Precipitate***

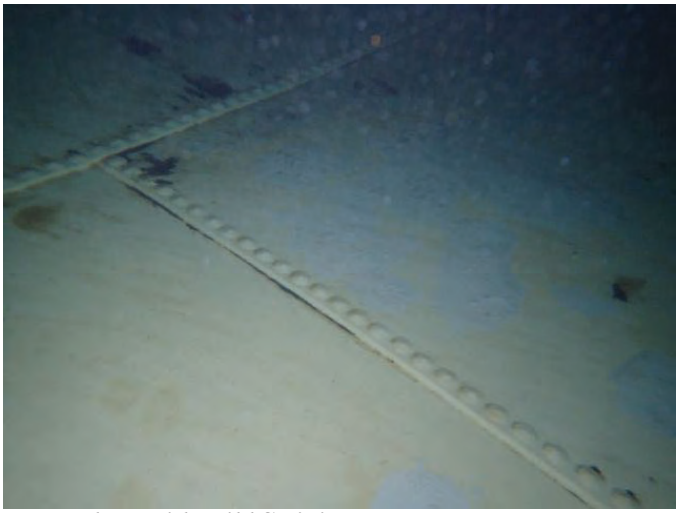


51 ***Layer of Precipitate***

52 ***Floor With Metal Scale Hardened Around The Influent/Effluent Pipe***

53 ***Floor With Metal Scale Hardened Around The Influent/Effluent Pipe***

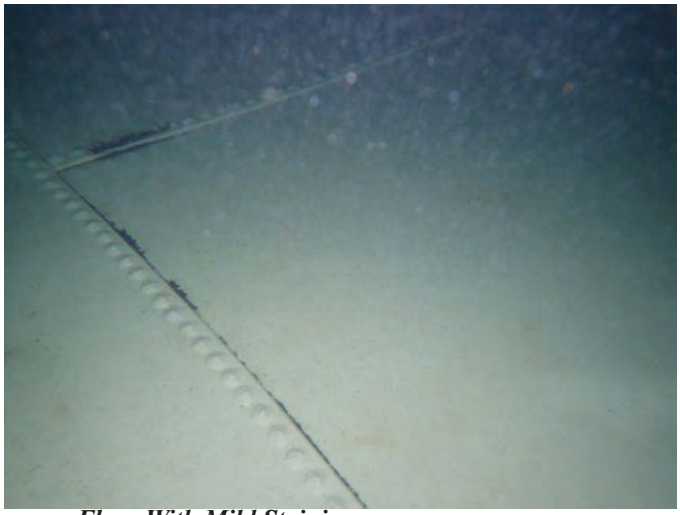
54 ***Floor With Metal Scale Hardened Around The Influent/Effluent Pipe***



55 ***Floor With Mild Staining***

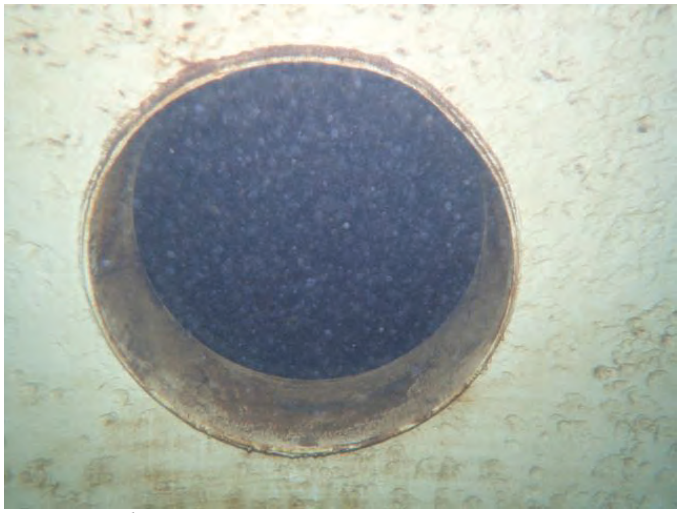
56 ***Floor With Mild Staining***

57 ***Floor With Mild Staining***

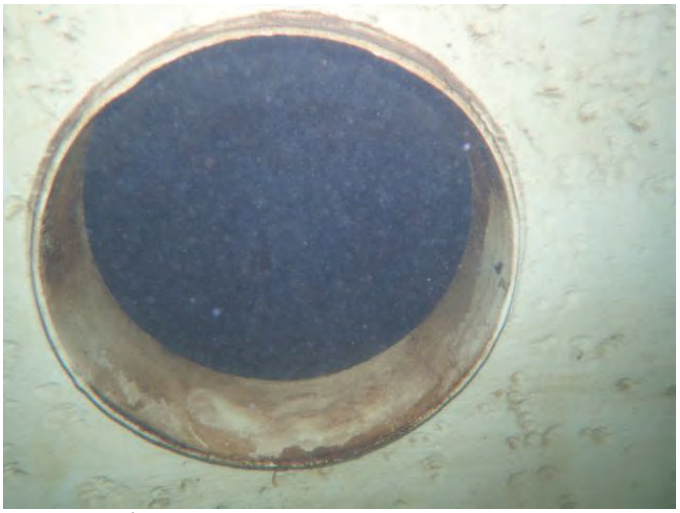


58 ***Floor With Mild Staining***

59 ***Floor With Mild Staining***

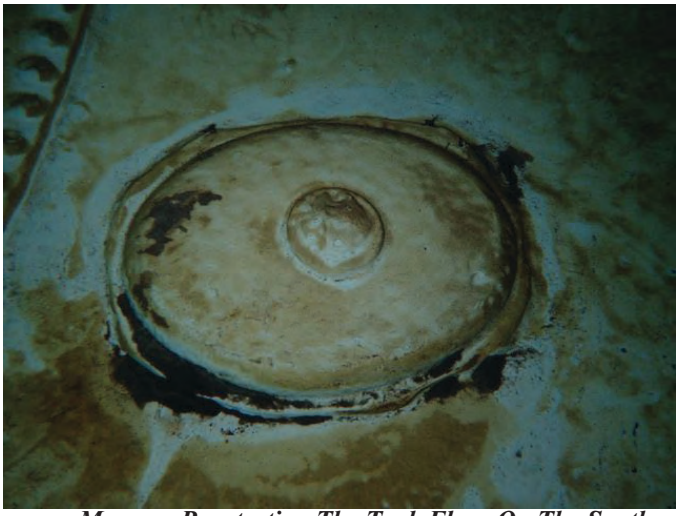


60 ***Northernmost Manway***



61 *North-Easternmost Manway*

62 *Secure Southernmost Manway*



63 *Manway Penetrating The Tank Floor On The South Side*

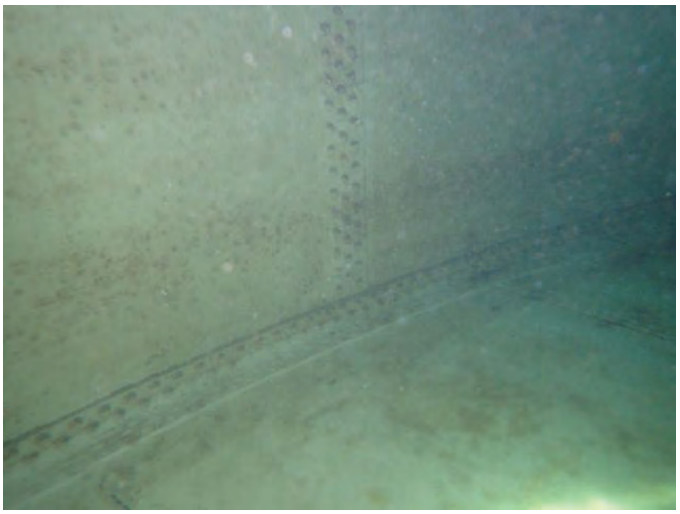
64 *Influent/Effluent Pipe Penetrating The Tank Floor With Heavy Staining*

65 *Interior Wall With Moderate To Heavy Staining*

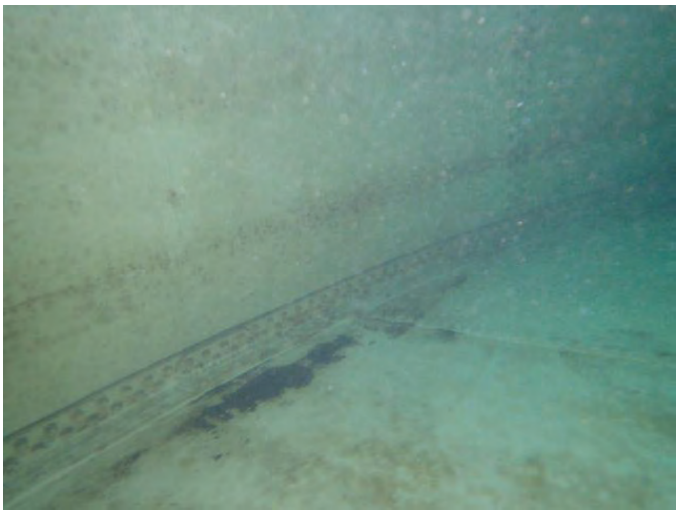
66 *Interior Wall With Moderate To Heavy Staining*

67 ***Interior Wall With Moderate To Heavy Staining***

68 ***Interior Wall With Moderate To Heavy Staining***



69 ***Interior Wall With Moderate To Heavy Staining***



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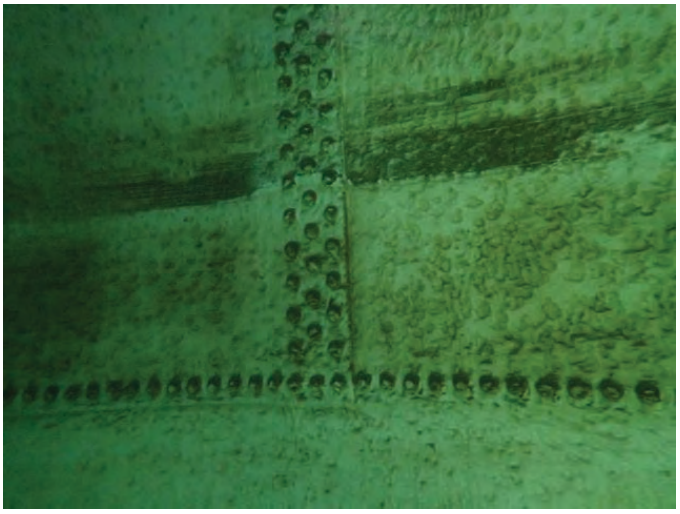

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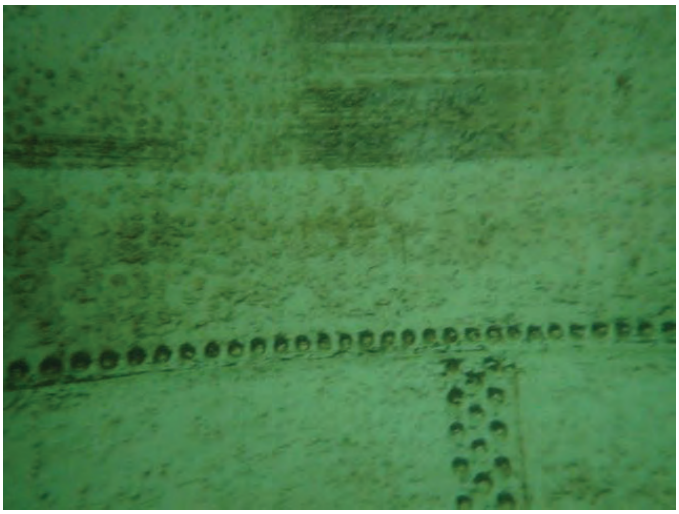
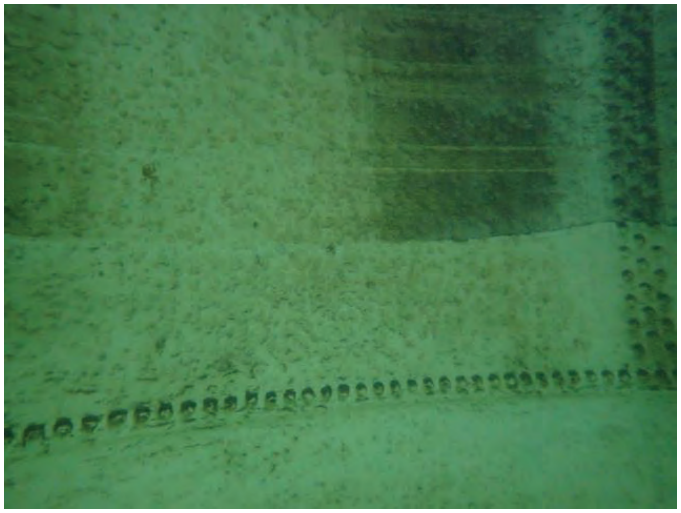
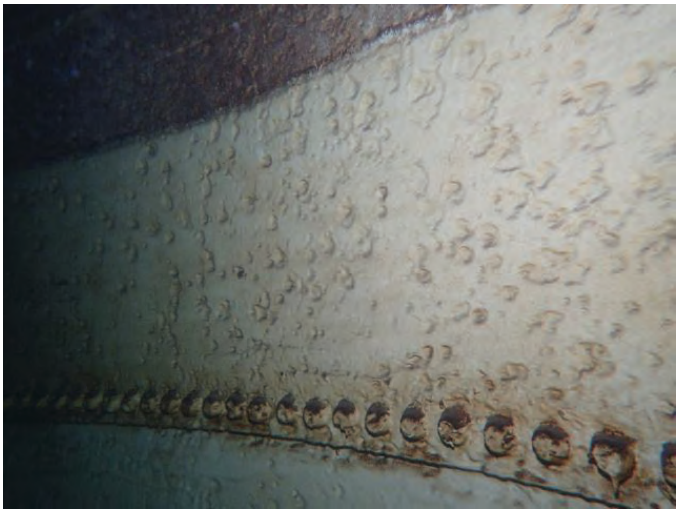


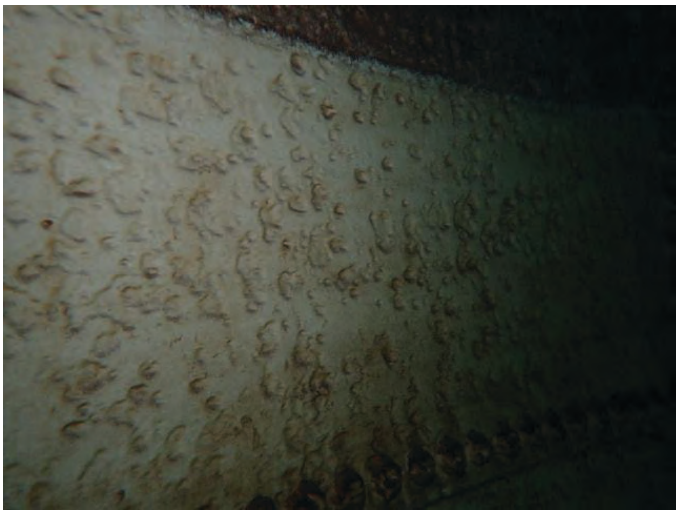
72 ***Interior Wall With Moderate To Heavy Staining***



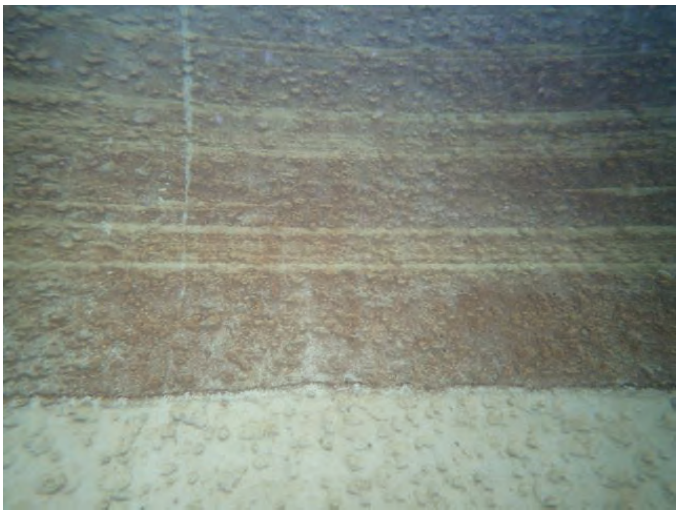
73 *Interior Wall With Moderate To Heavy Staining*



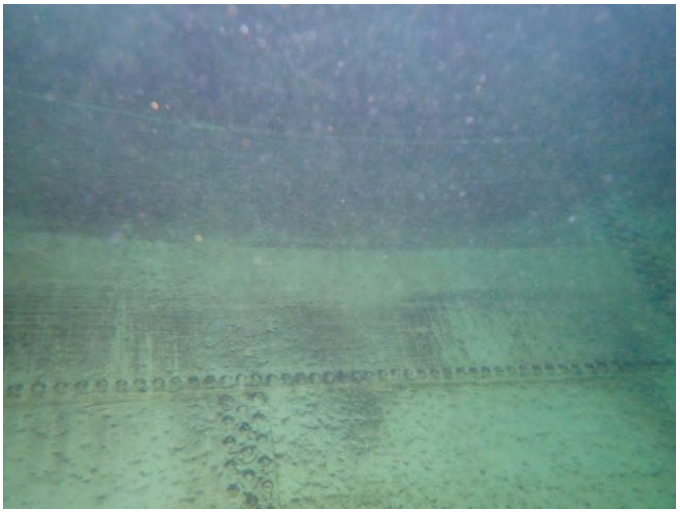
74 *Interior Wall With Moderate To Heavy Staining*



75 *Interior Wall With Moderate To Heavy Staining*



76 *Interior Wall With Moderate To Heavy Staining*



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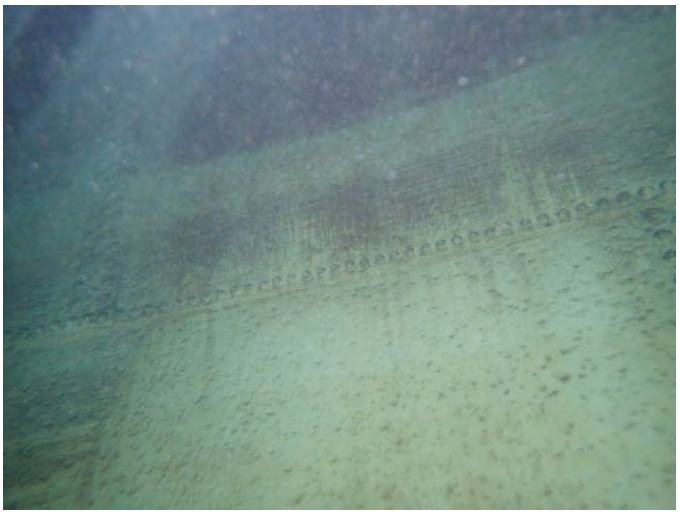
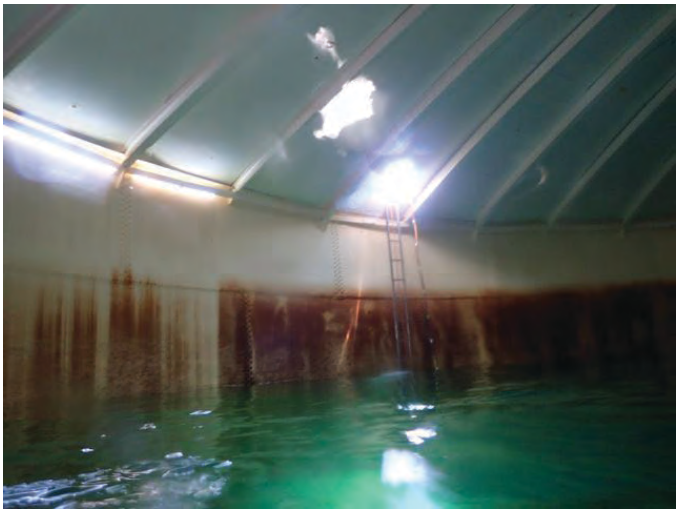
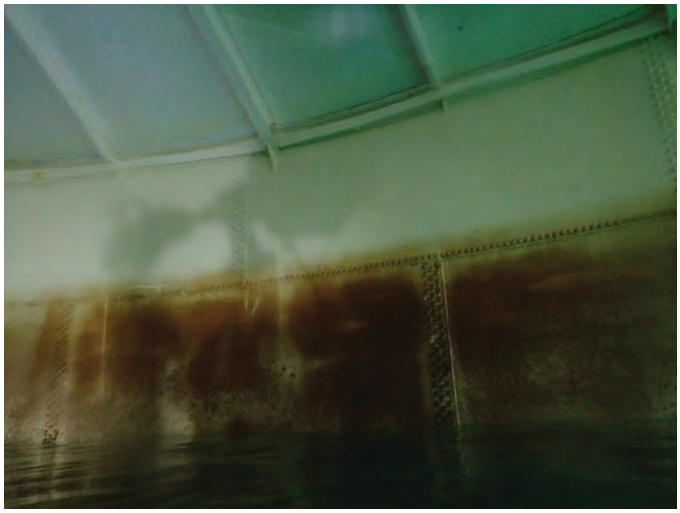


78 *Interior Wall With Moderate To Heavy Staining*



79 ***Interior Wall With Moderate To Heavy Staining***

80 ***Interior Wall With Moderate To Heavy Staining***



81 ***Interior Wall With Moderate To Heavy Staining***

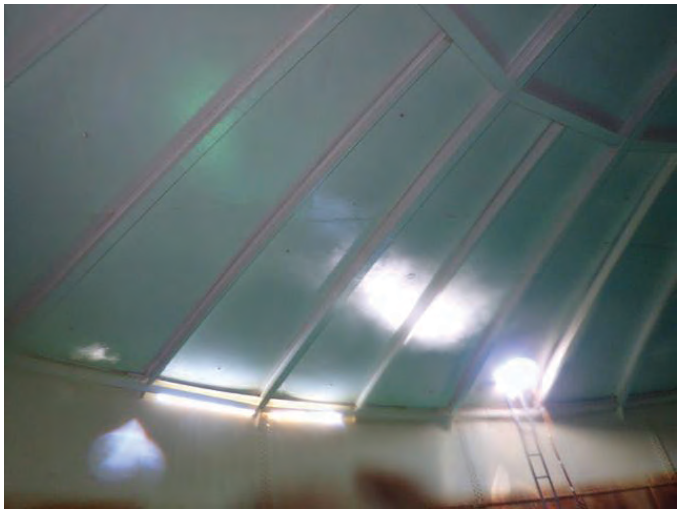
82 ***Interior Wall With Moderate To Heavy Staining***

83 ***Overhead***

84 ***Overhead***

85 ***Overhead***

86 ***Overhead***



87 ***Overhead***

88 ***Overhead With Mild Rust Staining***

89 ***Overhead With Mild Rust Staining***

90 ***Overhead With Mild Rust Staining***

91 ***Overflow Cutout***

92 ***Overflow Cutout***

93 ***Overflow Cutout***

94 ***Overflow Cutout***

95 ***Overflow Cutout***

96 ***Discharge During Cleaning***

UNDERWATER SOLUTIONS INC.

INSPECTION AND INTERIOR CLEANING (SEDIMENT REMOVAL) OF THE MOUNT ST. CHARLES 1.6-MILLION GALLON CONCRETE WATER STORAGE TANK (#4)

CITY OF WOONSOCKET WATER DIVISION WOONSOCKET, RHODE ISLAND

MAY 29 - 31, 2018

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CITY OF WOONSOCKET WATER DIVISION WOONSOCKET, RHODE ISLAND

MAY 29 - 31, 2018

SCOPE:

On May 29 through 31, 2018, Underwater Solutions Inc. inspected the Mount St. Charles 1.6-million gallon concrete potable water storage tank (#4) to provide information regarding the overall condition and integrity of this structure and removed the sediment accumulation from the floor.

EXTERIOR INSPECTION:

The entire exterior of this water storage tank (and components) was inspected to include walls and coating, manways, ladder, overflow, roof, vent, and Hatch.

Walls And Coating

The exterior shotcrete coated concrete walls were inspected and found appearing mostly sound, however numerous tight shrinkage cracks were found throughout approximately 25% of these surfaces and were observed throughout all elevations of the exterior walls.

Approximately 60-75% of these surface (shrinkage) cracks have accumulated efflorescence due to moisture penetration, yet when these cracks were sounded, no obvious voids or spalls were evident.

An area of concrete spall located on the northernmost side of the tank, below the northernmost manway, approximately 38" above the ground, that was found during a previous inspection performed by Underwater Solutions Inc. on December 3-10, 2012 appears to have since been repaired, and this area was found appearing sound at the time of this inspection.

The protective coating applied to the exterior walls appears to have been applied uniformly and remains having mostly good adhesion value, however this coating no longer seals the shrinkage cracks found throughout these surfaces.

Manways

Two, 24-1/2" by 18-1/2" inside diameter, non-corrodible metal manways penetrate the exterior walls on opposite sides of tank, approximately 37" above the ground. Each manway was found remaining securely and properly installed and free of obvious leakage at the time of this inspection. The securing bars for each manway were found secured with a lock, preventing unwanted access/opening.

Both manways were found having 100% efflorescence extending from the 6 o'clock position of the manway penetration and down over the exterior wall surfaces to the tank base. Approximately 25-30% of these surfaces having efflorescence were found with cracks. However, these cracks were sounded and found to be limited to the surface of the efflorescence itself, and the depth of these cracks did not appear to extend to the underlying concrete. Furthermore, no voiding or spalling of the underlying concrete was evident at the time of this inspection.

Ladder

An aluminum ladder extends from approximately 9' above the ground up to the roof dome. This ladder is securely supported to the tank wall with eight sets of bolted standoffs and has a fall prevention device installed throughout its length, allowing good access and egress.

This ladder was found to be sound and without any obvious fatigue or failures.

A ladder guard secured with a lock is installed at the base of the ladder, preventing unwanted access to the ladder/roof.

Overflow

A 12" inside diameter overflow pipe penetrates the wall approximately 31" above the ground, then extends 23" and terminates approximately 31" above a concrete splash pad with a flap-valve and screen securely installed over its end, preventing unwanted access to the tank interior. The flap-valve was found to be in proper working order, and all hardware associated with this pipe was found intact and secure.

The overflow pipe was otherwise found having no obvious obstructions at the time of this inspection.
The protective coating applied to this pipe was found having mostly good adhesion value, however this coating has failed throughout approximately 5-10% of these surfaces, resulting in exposure of the underlying metal and surface corrosion of these exposed metal surfaces.

Roof

The precast concrete roof panels and concrete-filled joints between panels were inspected and the pre-cast concrete roof panels appeared sound and remain free of obvious concrete fatigue at this time. The concrete-filled joints between the pre-cast concrete panels appeared mostly sound, however tight cracks were observed throughout approximately 40-50% of the surfaces of the concrete-filled joints.

These cracks were sounded and appeared to be limited to the surface of the concrete and remain free of obvious voids or spalls at this time.

The protective coating applied to these surfaces appears to have been applied uniformly, but no longer seals the cracks within the concrete-filled joints. Declined film thickness of the protective coating has resulted in exposure of the underlying concrete throughout approximately 15-20% of these surfaces, with these areas of exposed concrete measuring up to 4" in diameter.

Vent

The vent is located within the center of the roof dome, having a 40" inside diameter, and stands 24" tall. A 67" outside diameter cap with a screen placed around its outside circumference is securely and properly installed over the vent, preventing unwanted access to the interior of the tank.

This vent was found without any obvious obstructions at the time of this inspection.

Hatch

A 40” by 40” entry hatch provides access to the tank interior through the roof dome. This hatch remains in good working condition and with all hardware secure and intact, however was found without a lock installed at the time of this inspection.

INTERIOR INSPECTION:

The entire interior of this water storage tank (components) was inspected include sediment accumulations, floor, piping, walls, interior ladder, overhead, overflow, and aesthetic water quality.

Sediment Accumulations

A non-uniform layer of accumulated precipitate was found on all floor surfaces, with depths ranging from 7” to 32” deep.

Upon completing this inspection, all precipitate was removed (vacuumed) from the floor.

Floor

After removing all precipitate and exposing the entire floor, the concrete floor surfaces were found to be sound and free of obvious cracks, spall or settlement.

Mild staining exists throughout the entire floor due to the accumulation of precipitate.

Manways

Two, 26" x 20" outside diameter manways penetrate the interior walls on opposite sides of the tank, with each located 5’ feet above the floor and each found securely in place and free of obvious leakage.

An aluminum ladder extends from the floor up to the base of each manway and these ladders are securely bolted in-place at this time.

Corrosion exists on the surfaces of each ladder, although both ladders were found free of obvious fatigue (pitting) and/or deterioration of the aluminum at the time of this inspection.

The northeasternmost manway lid and associated hardware were found having a light stain, however these metal surfaces were found free of corrosion or other obvious fatigue or failures.

The southwesternmost manway lid and associated hardware were found having a mild stain, however these metal surfaces were also found free of corrosion or other obvious fatigue or failures.

Piping

Two pipes were inspected within this water tank.

The first pipe inspected penetrates the floor of a 24" x 24" x 6" deep sump in the floor, approximately 18” in from the wall. This pipe has a 12” inside diameter. This pipe was free of any obvious obstructions and was without flow at the time of this inspection.

The second pipe inspected penetrates the floor of a 24” by 24” by 6” deep sump in the floor, approximately 20” in from the wall, and has a 16” inside diameter. This pipe extends upward 8” though a 90° elbow to a four-way cross pipe. Each side of this four-way cross pipe extends approximately 4” having a rubber effluent check valve installed at the end and terminates approximately 16” above the floor. The other end of this four-way cross pipe extends across the floor, resting on nine concrete supports, to a (T) that terminates approximately 35” from the opposite side of the tank. Each side of the (T) extends 8” to a rubber influent check valve that ends approximately 38” above the floor.

Each effluent opening and check valve within this watermixing pipe was free of obvious obstructions at this time. Each influent opening and check valve within this water-mixing pipe was free of obvious obstructions at this time.

The protective coating applied to this metal water-mixing pipe and pipe-securing hardware appears to have been applied uniformly, however coating failure was observed throughout approximately 30% of these surfaces, causing metal exposure and corrosion. However, this pipe and pipe securing hardware remain sound and free of obvious fatigue/deterioration at this time.

The northernmost concrete support for this pipe as it extends across the floor was found with an area of spall measuring 2” long by 2” wide by 1/4” deep. However, the concrete surrounding and within this area of spall remains sound at this time.

Walls

All interior concrete walls were inspected beginning at the floor and by spiraling the circumference of the tank up to the water's surface.

These pre-cast concrete wall panels and concrete-filled wall slot panel joints are not coated and these concrete surfaces were found appearing mostly sound and remaining free of obvious cracks; however, a band of concrete scour spans the circumference of the tank and appears to be the result of an ice cap formation.

This band of concrete scour begins approximately 8’ below the junction of where the roof and walls meet, extends down and terminates approximately 10’ above the floor. The depth of this concrete scour was limited to the surface of the interior walls, and the surrounding and underlying concrete within this band of concrete scour remains sound and with no obvious exposure of the underlying reinforcement steel at this time.

Heavy staining exists throughout all wall surfaces beginning approximately 2’ below the junction of where the roof and walls meet and extending down to the floor.

Interior Ladder

An aluminum ladder located on the southwesternmost side of the tank extends from the floor up to the entry hatch and is supported in place with ten sets of bolted standoffs. This ladder has a fall prevention device installed throughout its length, providing safe access and egress.

Corrosion exists throughout the entire length of this ladder, and fatigue (pitting) of the aluminum was found throughout approximately 65% of these surfaces, with these areas of fatigue measuring up to 1/4” long by 1/4” wide by 1/8” deep.

The non-corrodible metal fall prevention device installed on this ladder was found appearing sound and without corrosion at this time.

Overhead

The entire overhead was inspected from the water surface.

These pre-cast concrete overhead panels and concrete-filled joints between panels are not coated and these concrete surfaces appeared sound. While efflorescence has accumulated throughout approximately 25-30% of the pre-cast concrete panel and concrete-filled joint surfaces, no obvious concrete fatigue was evident at the time of this inspection.

Overflow

The overflow consists of a 12" inside diameter pipe that is cast within a 27" by 22" concrete box formed to the tank wall that begins approximately 5' above the floor and extends up and flares in size to a 40" x 36" concrete box, prior to terminating 11" below the junction of where the roof and walls meet.

This concrete overflow box is not coated and was found appearing mostly sound. However, heavy staining and concrete scour similar to what was found throughout the interior walls was observed on the surfaces of the overflow box. The surrounding and underlying concrete within the areas of scour remains sound and with no obvious exposure of the underlying reinforcement steel at this time.

Aesthetic Water Quality

The aesthetic water quality was good throughout the entire tank, allowing unlimited visibility for this inspection.

RECOMMENDATIONS:

It is the opinion of Underwater Solutions Inc. that this concrete potable water storage tank appears mostly sound and remains free of obvious leakage.

EXTERIOR:

The tight shrinkage cracks found throughout all elevations of the exterior walls were sounded and appeared to be limited to the surface of the shotcrete cover coating and remain free of obvious voids or spalls at this time. However, approximately 60-75% of these cracks were found having accumulated efflorescence.

The protective coating applied to the exterior walls appears to have been applied uniformly and remains having good adhesion value, however no longer seals the shrinkage cracks.

The exterior wall surfaces below each manway were also found having accumulated efflorescence. Approximately 25-30% of these surfaces having efflorescence were found with cracks. However, these cracks were sounded and found to be limited to the surface of the efflorescence itself, and the depth of these cracks did not appear to extend to the underlying concrete. Furthermore, no voiding or spalling of the underlying concrete was evident at the time of this inspection.

The pre-cast concrete roof panels appeared sound and remain free of obvious concrete fatigue at this time. The concrete-filled joints between the pre-cast concrete panels appeared mostly sound, however tight cracks were observed throughout approximately 40-50% of these joint surfaces.

These cracks were sounded and appeared to be limited to the surface of the concrete and remain free of obvious voids or spalls at this time.

The protective coating applied to these surfaces appears to have been applied uniformly, but no longer seals the cracks within the concrete-filled joints. Declined film thickness of the protective coating has resulted in exposure of the underlying concrete throughout approximately 15-20% of the roof surfaces, with these areas of exposed concrete measuring up to 4" in diameter.

It is our recommendation to pressure-wash the exterior walls and roof surfaces at 3,500 P.S.I. and at 3.5 G.P.M. to remove the accumulated efflorescence from the cracks and wall surfaces below the manways and to then re-coat the exterior walls and roof dome using an epoxy/polyurethane flexible coating to seal all cracks and to seal and protect the concrete, while improving the overall aesthetics.

All components affixed to this tank were found properly installed at this time.

The cap and associated screen remains securely installed over the vent penetration in the roof, preventing access to the interior of the tank.

A flap-valve installed at the end of the overflow pipe and a screen installed within the overflow pipe are secure, preventing access to the interior of the tank.

The protective coating applied to the metal overflow pipe and flap-valve was found having coating failure throughout approximately 5-10% of these surfaces, causing metal exposure and surface corrosion.

It is our recommendation to power tool clean the surfaces of the overflow pipe and flap-valve to remove all corrosion and to prepare the substrate. We then recommend re-coating these surfaces to halt corrosion, prevent metal fatigue/deterioration and to provide good protection for these metal surfaces.

The interior access hatch located on the roof was found without a lock.

It is our recommendation to install a lock on this hatch to prevent unwanted access to the interior of the tank.

A ladder guard secured with a lock is installed at the base of the roof access ladder, preventing unwanted access to the ladder/roof.

INTERIOR:

The interior concrete floor surfaces appeared sound and remain free of obvious cracks, spalls or settlement and requires no remedial action at this time.

The interior pre-cast concrete wall panels and concrete-filled wall slot panel joints were found appearing mostly sound and remain free of obvious cracks, however a band of concrete scour spans the circumference of the tank that appears to be the result of an ice cap formation.

The surrounding and underlying concrete within this band of concrete scour remains sound and with no obvious exposure of the underlying reinforcement steel at this time.

It is our recommendation to monitor this band of concrete scour through future scheduled inspections to ensure that the depth of this scour does not increase and result in exposure of the underlying reinforcement steel.

The surfaces of the interior concrete overflow box was also found having concrete scour that was without obvious exposure of the underlying reinforcement steel at this time.

It is our recommendation to monitor the concrete scour found on the concrete overflow box through future scheduled inspections to ensure that the depth of this scour does not increase and result in exposure of the underlying reinforcement steel.

Efflorescence has accumulated throughout approximately 25-30% of the pre-cast concrete panel and concrete-filled joint surfaces within the overhead, however no obvious concrete fatigue was evident at the time of this inspection.

It is our recommendation to monitor the pre-cast concrete panel and concrete-filled joint surfaces found having efflorescence through future scheduled inspections to ensure that concrete spall does not occur and result in exposure of the underlying reinforcement steel.

Corrosion exists on the surfaces of each manway ladder, although both ladders were found free of obvious fatigue (pitting) and/or deterioration of the aluminum at the time of this inspection.

It is our recommendation to remove these manway access ladders and to install replacement fiberglass reinforced plastic ladders at each manway to provide safe access and egress.

The aluminum ladder that extends from the floor up to the access hatch remains securely bolted in-place and appears sound, however corrosion exists throughout the entire length of this ladder and fatigue (pitting) of the aluminum, having areas measuring 1/4" long by 1/4" wide by 1/8" deep, was found within these areas of corrosion at this time.

It is our recommendation to remove this ladder and install a fiberglass reinforced plastic ladder having a non-corrodible metal fall prevention device installed throughout its length to allow for safe access and egress.

The protective coating applied to the metal water mixing pipe and pipe securing hardware was found to be failing throughout approximately 30% of these surfaces causing metal exposure and corrosion; however, this pipe and pipe securing hardware remain sound at this time.

The northernmost concrete support for this pipe as it extends across the floor was found with an area of spall measuring 2" long by 2" wide by 1/4" deep. However, the concrete surrounding and within this area of spall remains sound at this time.

It is our recommendation that the next time this tank is removed from service and de-watered that the surfaces of this pipe showing metal exposure be power tool cleaned to remove all corrosion and to prepare the substrate. We then recommend re-coating these surfaces using an A.N.S.I./N.S.F.61 approved coating for use in structures containing potable water to halt corrosion, prevent metal fatigue/deterioration and to provide good protection for this metal pipe and pipe securing hardware.

We also recommend monitoring the area of spall found on the northernmost concrete support for this pipe through future scheduled inspections to ensure that the size/depth of this area of spall does not increase and result in failure of this support.

As always, we recommend that re-inspection and cleaning of all water storage facilities be performed in accordance with state and federal mandates, A.W.W.A. standards, and completed by an experienced and authorized inspection corporation.

UNDERWATER SOLUTIONS INC.
Christopher A. Cole, Project Manager

This report, the conclusions, recommendations and comments prepared by Underwater Solutions Inc. are based upon spot examination from readily accessible parts of the tank. Should latent defects or conditions which vary significantly from those described in the report be discovered at a later date, these should be brought to the attention of a qualified individual at that time. These comments and recommendations should be viewed as information to be used by the Owner in determining the proper course of action and not to replace a complete set of specifications. All repairs should be done in accordance with A.W.W.A. and/or other applicable standards.

1 *Exterior Wall With Coating Loss, Tight Shrinkage Cracks And Efflorescence*

2 *Exterior Wall With Coating Loss, Tight Shrinkage Cracks And Efflorescence*

3 *Exterior Wall Tight Shrinkage Cracks And Efflorescence*

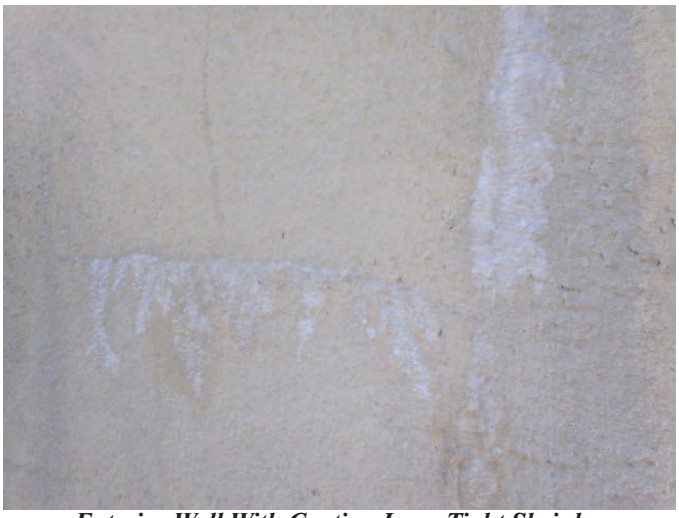
4 *Exterior Wall Tight Shrinkage Cracks And Efflorescence*

5 *Exterior Wall With Coating Loss, Tight Shrinkage Cracks And Efflorescence*

6 *Exterior Wall With Coating Loss, Tight Shrinkage Cracks And Efflorescence*

7 ***Exterior Wall With Coating Loss, Tight Shrinkage Cracks And Efflorescence***

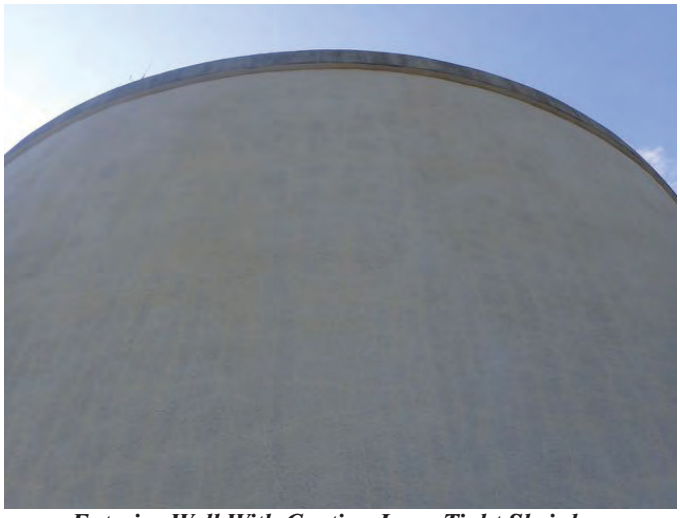
8 ***Exterior Wall With Coating Loss, Tight Shrinkage Cracks And Efflorescence***



9 ***Exterior Wall With Coating Loss, Tight Shrinkage Cracks And Efflorescence***

10 ***Exterior Wall With Coating Loss, Tight Shrinkage Cracks And Efflorescence***

11 ***Exterior Wall With Coating Loss, Tight Shrinkage Cracks And Efflorescence***



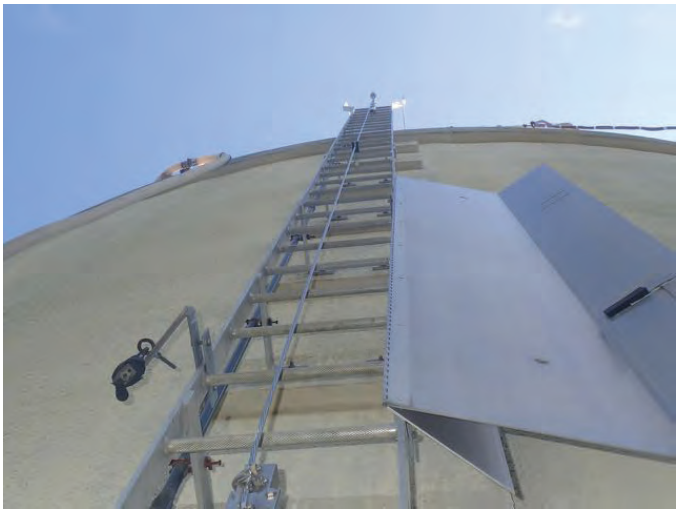
12 ***Exterior Wall With Coating Loss, Tight Shrinkage Cracks And Efflorescence***

13 *Exterior Wall With Coating Loss, Tight Shrinkage Cracks And Efflorescence*

14 *Exterior Wall With Coating Loss, Tight Shrinkage Cracks And Efflorescence*

15 *Secure Manway With Tight Cracks And Efflorescence*

16 *Secure Manway With Tight Cracks And Efflorescence*



17 *Ladder And Fall Prevention Device*

18 *Ladder Guard Secured With A Lock*

19 ***Overflow Pipe With A Flap-Valve***

20 ***Secure Overflow Pipe Screen***

21 ***Roof Panels With Coating Loss***

22 ***Roof Panels With Coating Loss***

23 ***Roof Panels With Coating Loss***

24 ***Roof Panels With Coating Loss***

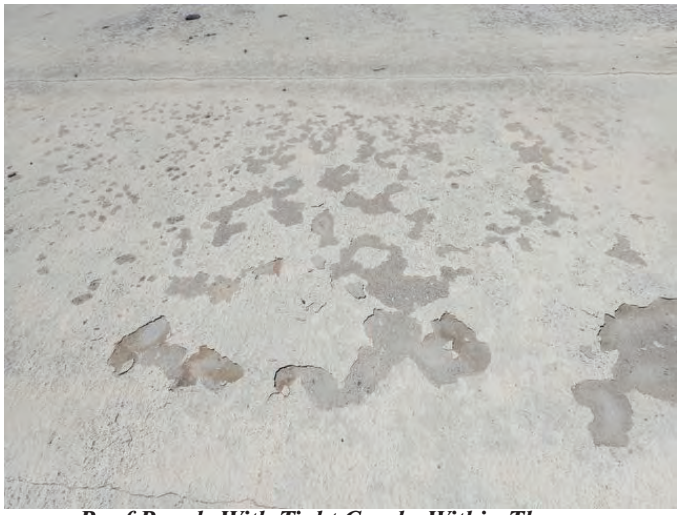
25 ***Roof Panels With Coating Loss***

26 ***Roof Panels With Tight Cracks Within The Concrete-Filled Joints Due To Coating Loss Resulting In Exposed Underlying Concrete***

27 ***Roof Panels With Tight Cracks Within The Concrete-Filled Joints Due To Coating Loss Resulting In Exposed Underlying Concrete***

28 ***Roof Panels With Tight Cracks Within The Concrete-Filled Joints Due To Coating Loss Resulting In Exposed Underlying Concrete***

29 ***Roof Panels With Tight Cracks Within The Concrete-Filled Joints Due To Coating Loss Resulting In Exposed Underlying Concrete***



30 ***Roof Panels With Tight Cracks Within The Concrete-Filled Joints Due To Coating Loss Resulting In Exposed Underlying Concrete***

31 ***Secure Roof Safety Railings***

32 ***Secure Vent Cap***

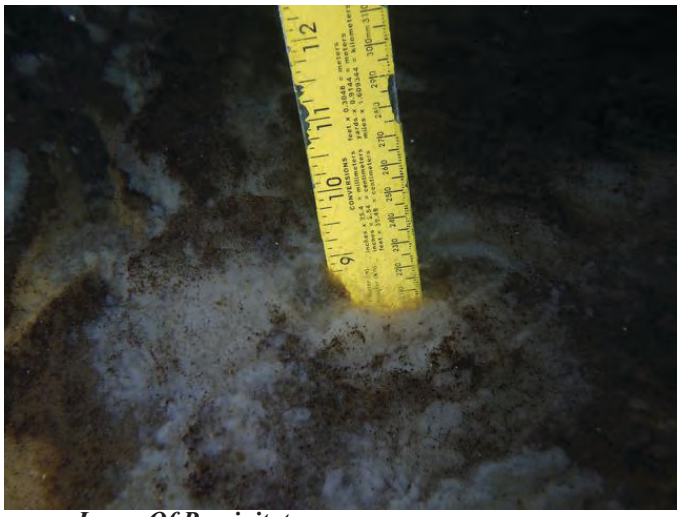
33 ***Secure Vent Screen***

34 ***Open Access Hatch***

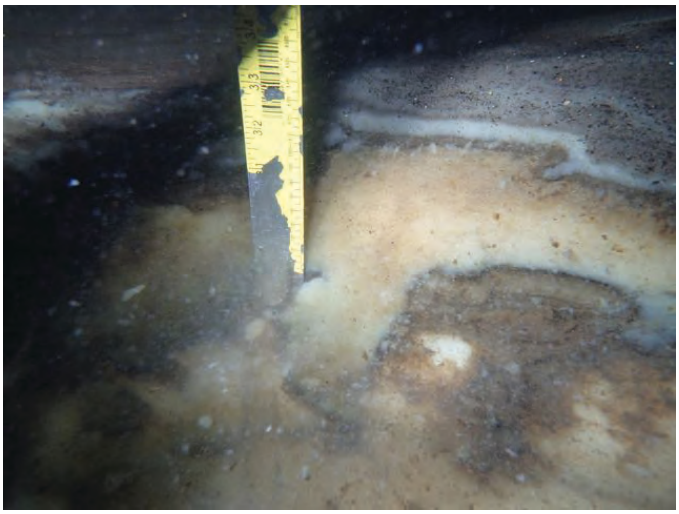
35 ***Closed Access Hatch***

36 ***Secure Stainless-Steel Pressure Locks***

37 ***Secure Stainless-Steel Pressure Locks***

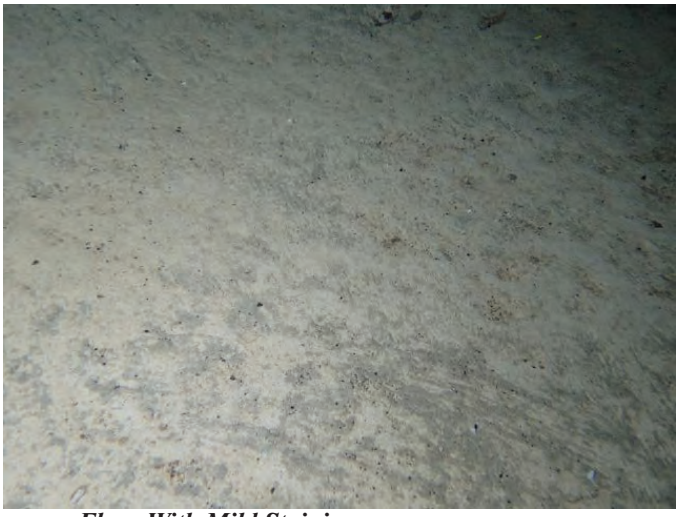


38 ***Layer Of Precipitate***



39 ***Layer Of Precipitate***

40 ***Floor With Mild Staining***



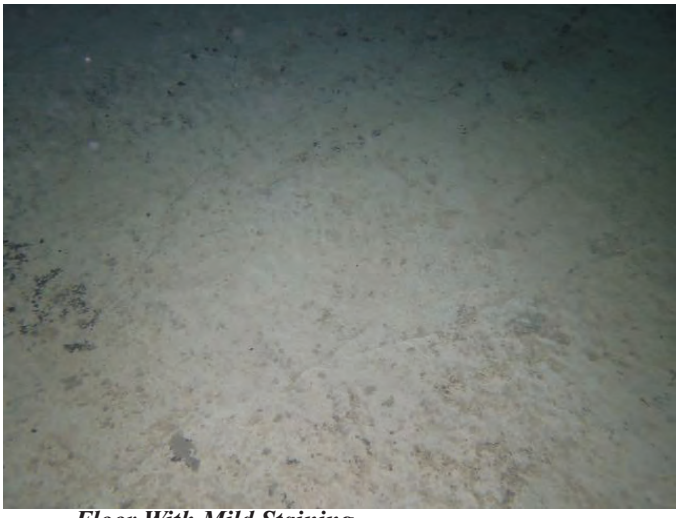
41 ***Floor With Mild Staining***

42 ***Floor With Mild Staining***

43 ***Floor With Mild Staining***

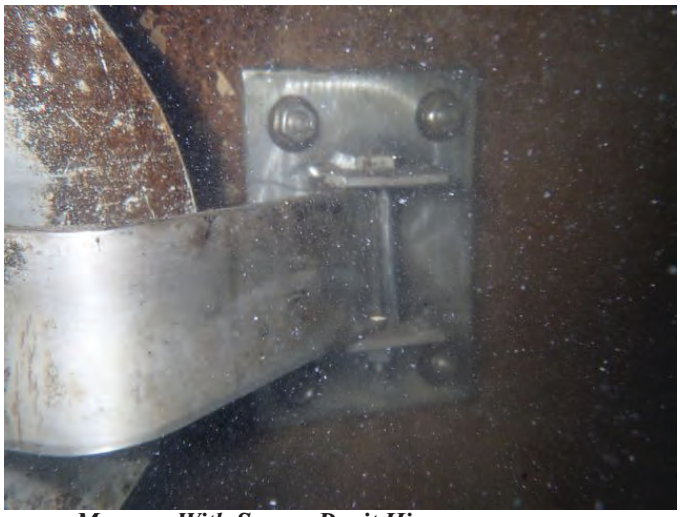
44 ***Floor With Mild Staining***

45 ***Floor With Mild Staining***

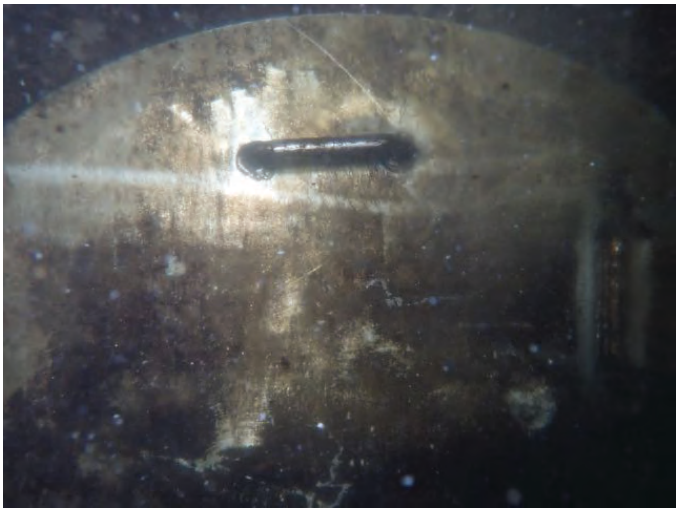


46 ***Floor With Mild Staining***

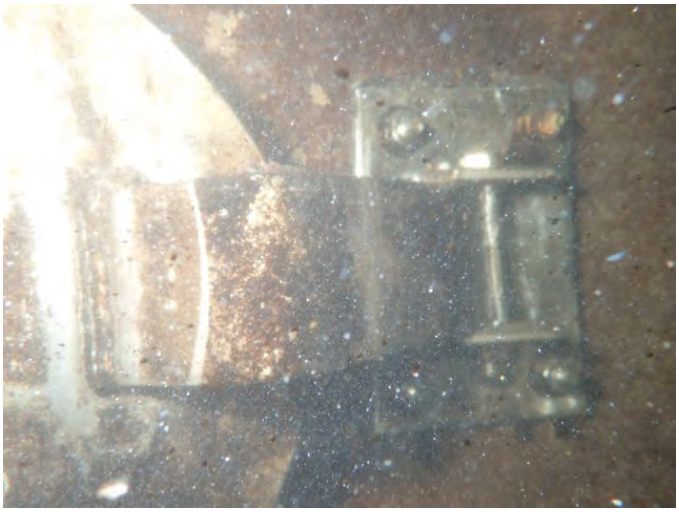
47 ***Manway***



48 ***Manway With Secure Davit Hinge***



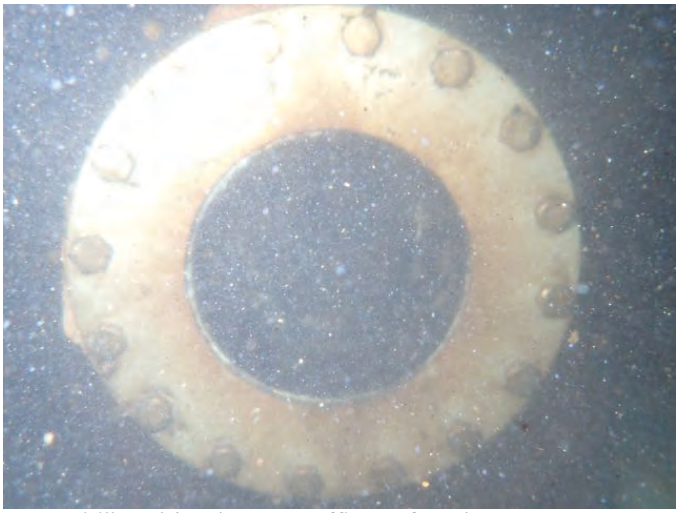
49 ***Manway***



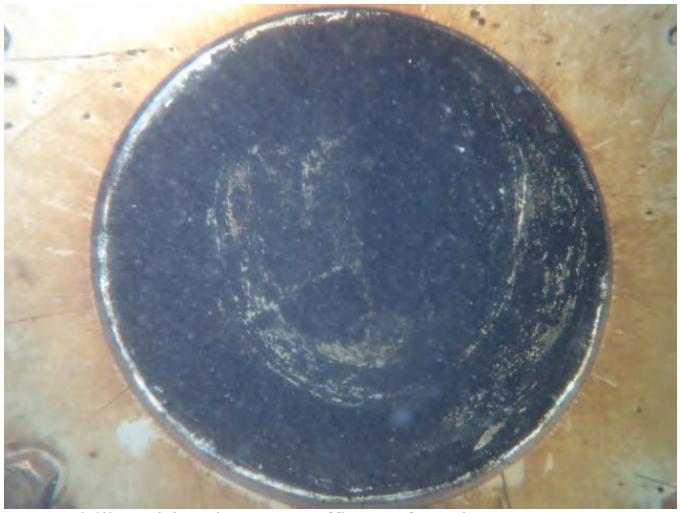
50 ***Manway With Secure Davit Hinge***

51 ***12” Inside Diameter Pipe***

52 ***16” Inside Diameter Flush Penetration Within The Sump***



53 ***16” Inside Diameter Effluent Opening***

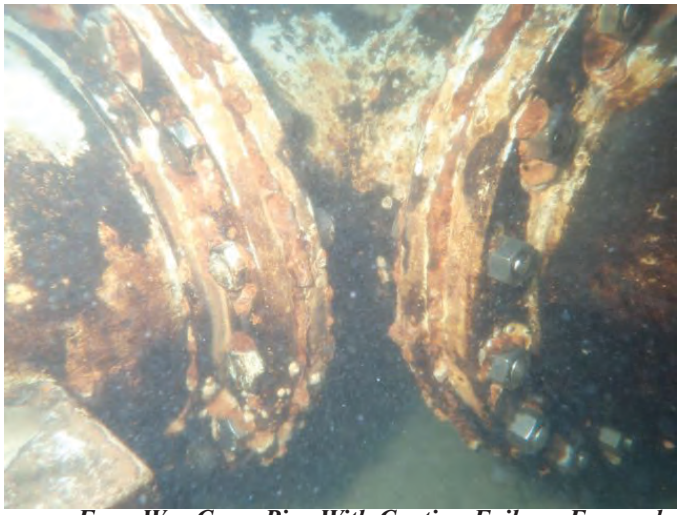


54 ***16” Inside Diameter Effluent Opening***

55 *Four-Way Cross Pipe With Coating Failure, Exposed Metal And Corrosion*

56 *Four-Way Cross Pipe With Coating Failure, Exposed Metal And Corrosion*

57 *Four-Way Cross Pipe With Coating Failure, Exposed Metal And Corrosion*

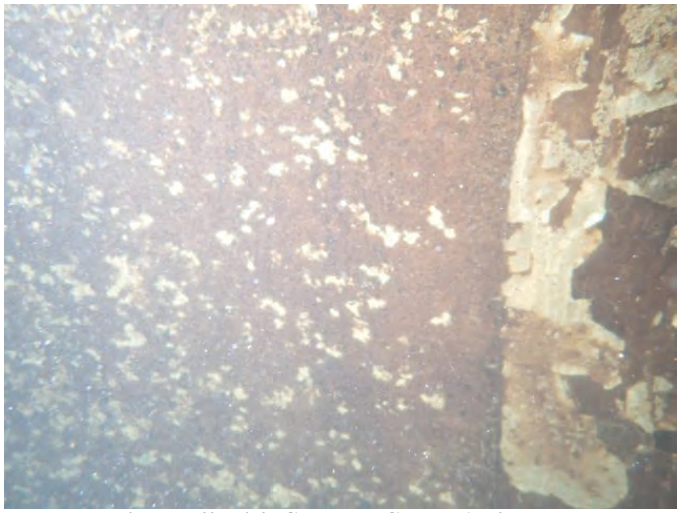


58 *Four-Way Cross Pipe With Coating Failure, Exposed Metal And Corrosion*

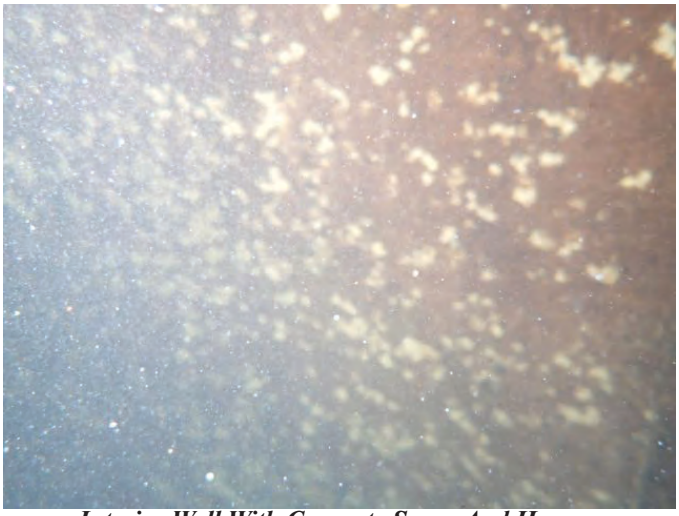
59 *Northernmost Concrete Support With Spall*

60 *Influent Rubber Check Valve*

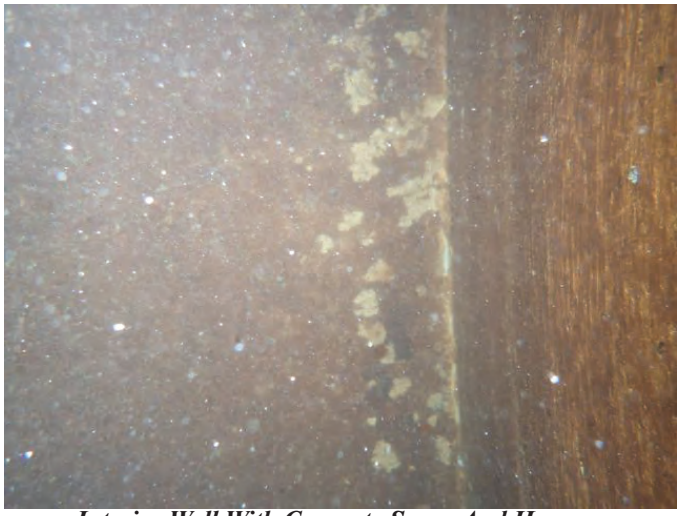
61 ***Influent Rubber Check Valve***



62 ***Interior Wall With Concrete Scour And Heavy Staining***



63 ***Interior Wall With Concrete Scour And Heavy Staining***



64 ***Interior Wall With Concrete Scour And Heavy Staining***

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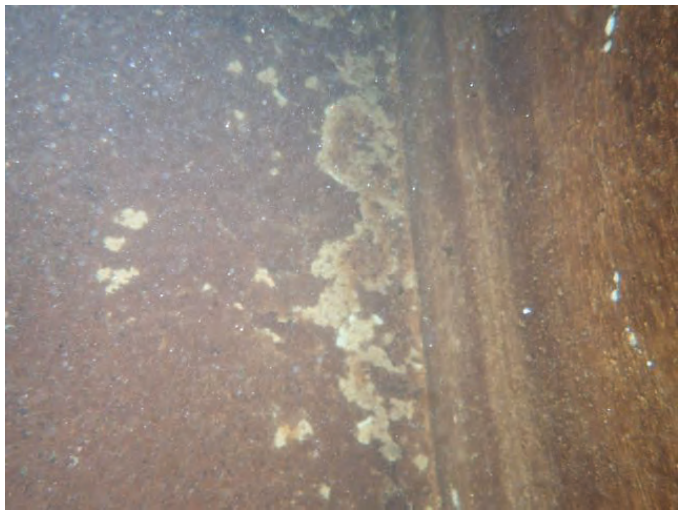
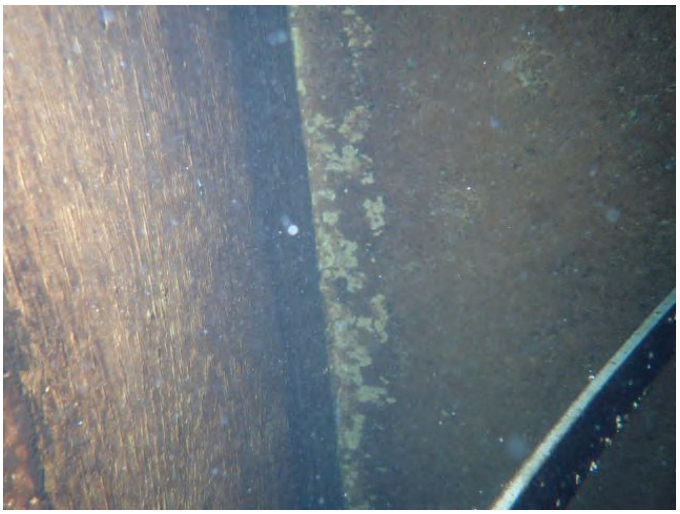
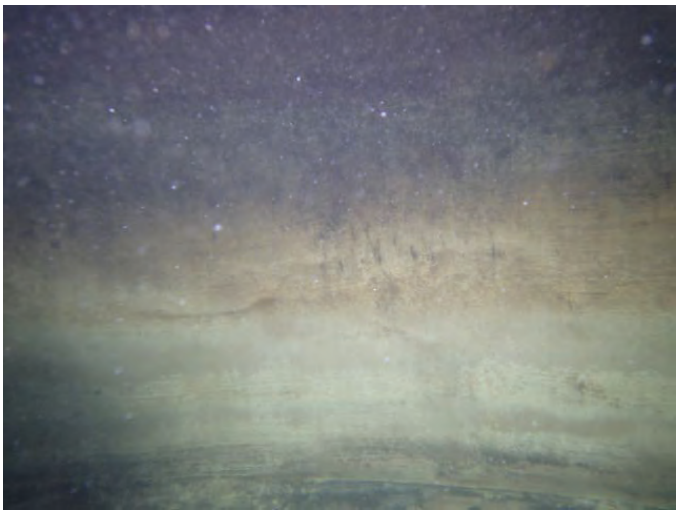


66 ***Interior Wall With Concrete Scour And Heavy Staining***

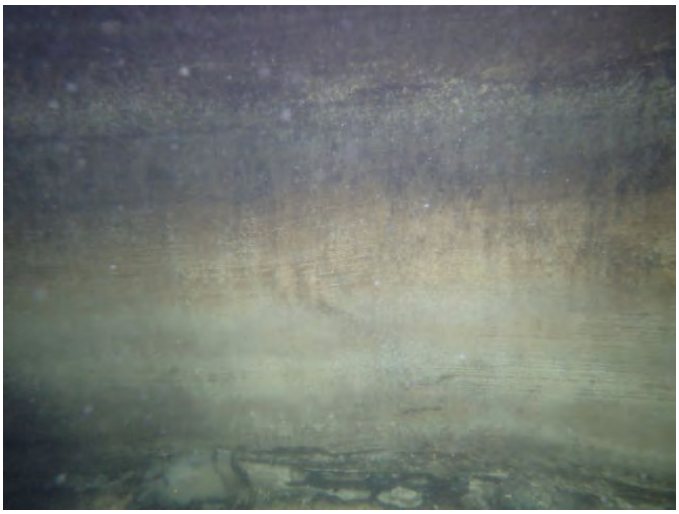


67 ***Interior Wall With Concrete Scour And Heavy Staining***

68 ***Interior Wall With Concrete Scour And Heavy Staining***



69 ***Interior Wall With Heavy Staining***



70 ***Interior Wall With Heavy Staining***

71 ***Interior Wall With Heavy Staining***

72 ***Interior Wall With Heavy Staining***

73 *Interior Wall With Heavy Staining*

74 *Interior Wall With Heavy Staining*

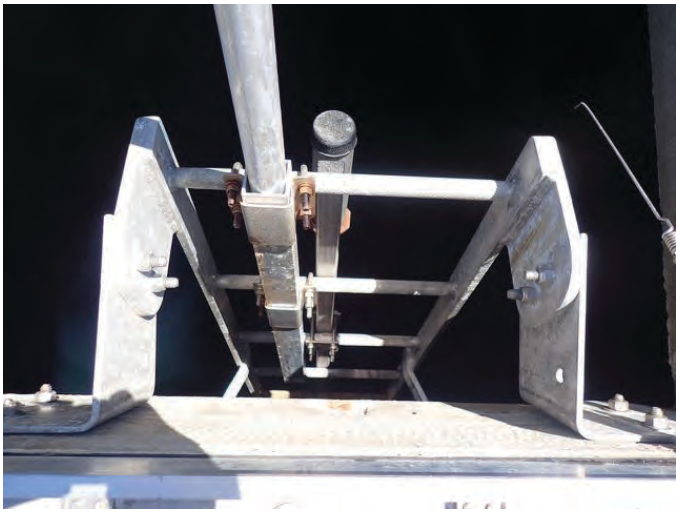
75 *Interior Wall With Heavy Staining*

76 *Interior Wall With Heavy Staining*

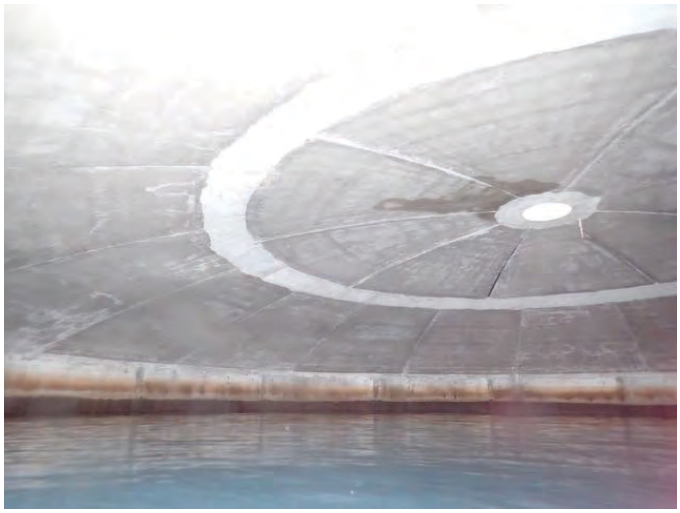
77 *Interior Wall With Heavy Staining*

78 *Interior Aluminum Ladder And Fall Prevention Device With Fatigue (Pitting) And Corrosion*

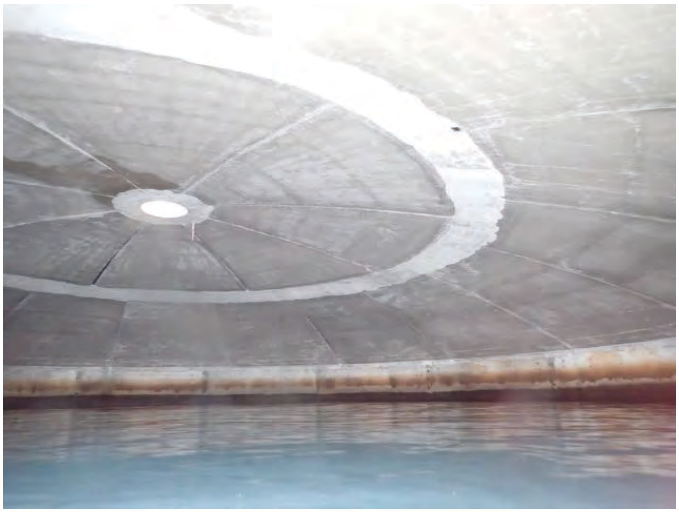
79 ***Interior Aluminum Ladder And Fall Prevention Device With Fatigue (Pitting) And Corrosion***



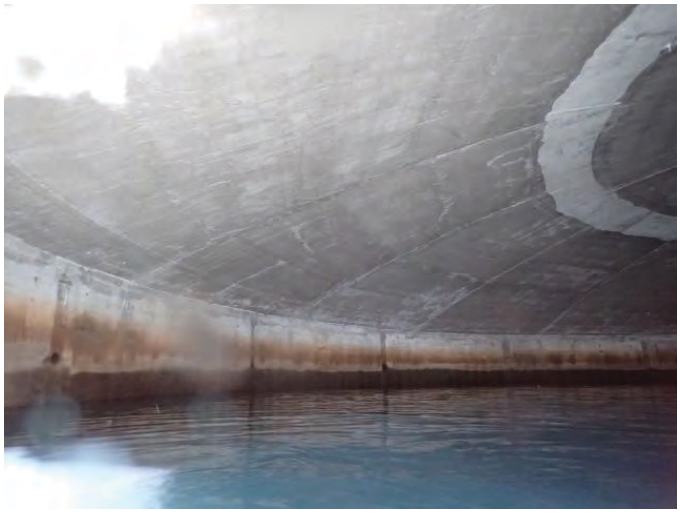
80 ***Interior Aluminum Ladder And Fall Prevention Device With Fatigue (Pitting) And Corrosion***



81 ***Overhead With Efflorescence***



82 ***Overhead With Efflorescence***



83 ***Overhead With Efflorescence***

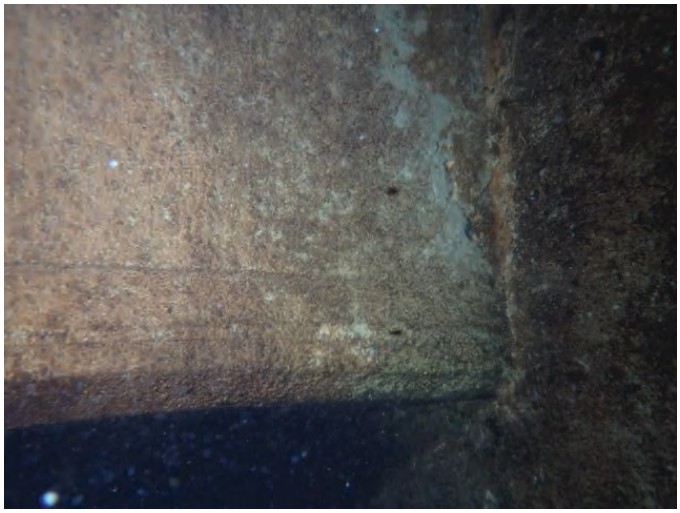
84 ***Overhead With Efflorescence***

85 ***Overhead With Efflorescence***

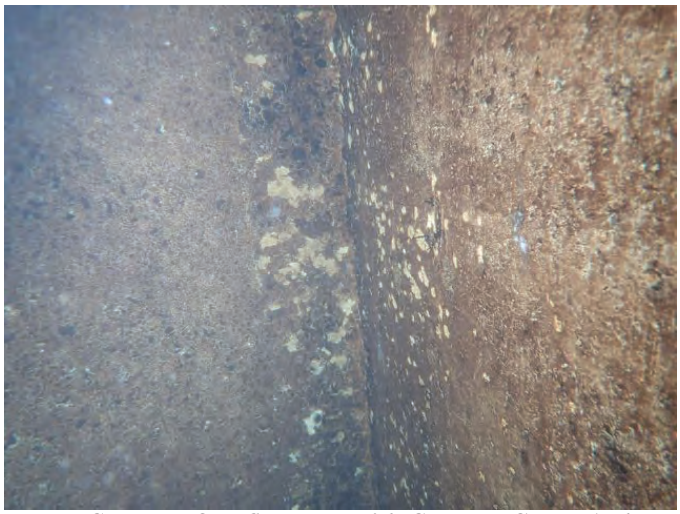
86 ***Overhead With Efflorescence***

87 ***Overhead With Vent Penetration***

88 ***Concrete Overflow Box With Heavy Staining***



89 ***Concrete Overflow Box With Heavy Staining***



90 ***Concrete Overflow Box With Concrete Scour And Heavy Staining***

91 ***Interior Overflow Pipe***

92 ***Discharge During Cleaning***

UNDERWATER SOLUTIONS INC.

INSPECTION AND INTERIOR CLEANING (SEDIMENT REMOVAL) OF THE MOUNT ST. CHARLES 750,000-GALLON WELDED STEEL ELEVATED WATER STORAGE TANK (#5)

CITY OF WOONSOCKET WATER DIVISON
WOONSOCKET, RHODE ISLAND

JUNE 1, 2018

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CITY OF WOONSOCKET WATER DIVISION WOONSOCKET, RHODE ISLAND

JUNE 1, 2018

SCOPE:

On June 1, 2018, Underwater Solutions Inc. inspected the Mount St. Charles 750,000-gallon welded steel elevated potable water storage tank (#5) to provide information regarding the overall condition and integrity of this structure and removed the sediment accumulation from the floor.

EXTERIOR INSPECTION:

The entire exterior of this water storage tank (and all components) was inspected to include support pedestal, walls and coating, anchor bolts, foundation, manway, ladders, center riser column, overflow, roof, vent and hatches.

Support Pedestal

The interior and exterior surfaces of the welded steel support pedestal were inspected and found appearing sound and remain free of obvious fatigue or failures.

The protective coating applied to the interior steel surfaces of the support pedestal has an average dry film thickness of 12.8 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for the steel.

The protective coating applied to the exterior steel surfaces of the support pedestal has an average dry film thickness of 11.0 mils, appears to have been applied uniformly, meets the AWWA's recommendations and remains having mostly good adhesion value, but has become chalky due to weathering. Adhesion loss of the protective coating was observed throughout approximately 10% of the steel floor extension, located and welded to the base of the support pedestal, resulting in exposure of the underlying steel. No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild corrosion exists at this time.

Several areas of coating damage were observed throughout approximately 5% of the lowest 10' of the exterior of the support pedestal, appearing to be the result of objects striking these surfaces and resulting in exposure of the underlying steel. No obvious fatigue/deterioration of the steel was evident within these 1/8" to 3" diameter areas of steel exposure, rather mild corrosion exists at this time.

A mild, non-uniform accumulation of mildew throughout the exterior surfaces of the support pedestal causes declined aesthetics.

Walls And Coating

The exterior steel wall panels and associated welds of the tank were inspected and found appearing sound and remain free of obvious fatigue or failures.

Although the protective coating applied to these welded steel surfaces has become chalky due to weathering, this coating appears to have been applied uniformly and remains having good adhesion value, providing adequate protection for these steel panels and welds.

A mild, non-uniform accumulation of mildew throughout the base of the tank also causes declined aesthetics.

Anchor Bolts

Thirty-seven, 1-1/2" diameter anchor bolts extend up from the concrete foundation through a 14" wide by 1" thick steel floor extension plate welded to the base of the support pedestal.

Each anchor bolt has one nut securely installed. The protective coating applied to this support hardware appears to have been applied uniformly and thirty-six of these anchor bolts and nuts were found having good adhesion value. While a mild rust stain was observed on this hardware, no obvious coating fatigue or steel exposure was evident at this time.

The final anchor bolt and nut located next the access door was found secure, although the protective coating applied to this nut and bolt has lost adhesion, resulting in steel exposure and corrosion. However, this anchor bolt and associated nut remains secure and these surfaces were without fatigue/deterioration at the time of this inspection.

Foundation

The exposed surfaces of the 23" wide by 3" tall concrete foundation are not coated and appeared mostly sound and free of obvious cracks; however, spall of the concrete, having depths up to 1/4" deep, was observed throughout approximately 5-10% of the outside edge of the foundation.

The surrounding and underlying concrete within these areas of spall remains sound and with no obvious exposure of the reinforcement steel at this time.

Manway

One 30" inside diameter manway penetrates the tank base approximately 12' in from the center riser column and is securely installed and free of obvious leakage.

The protective coating applied to this steel manway has an average dry film thickness of 17.5 mils, appears to have been applied uniformly, meets the AWWA's recommendations and remains having good adhesion value at this time.

A welded steel ladder extends up to this manway, having a fall prevention device installed throughout its length, providing safe access.

Ladders

Three welded steel ladders are located within the pedestal. These ladders extend up from the pedestal floor, each supported to the pedestal wall with four sets of welded standoffs, and continue to a walkway that leads to the center riser column.

The fourth (top) ladder extends from the base of the walkway up through the riser to the roof and is supported to the riser with eleven sets of welded standoffs.

Each ladder was found having a fall prevention device installed throughout its length, providing safe access.

The protective coating applied to each ladder was found having good adhesion value, while the non-corrodible metal fall prevention device installed on each ladder is not coated at this time.

Center Riser Column

The 60" diameter welded steel center riser column was inspected and found appearing sound and free of obvious fatigue or failures at this time.

The protective coating applied to these welded steel surfaces has an average dry film thickness of 11.2 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for the steel.

Overflow

An 8" inside diameter overflow pipe penetrates the tank base approximately 16" in from the center riser column. This steel pipe extends down through a series of elbows directing the pipe to the pedestal wall where it continues extending down, supported in place with two welded standoffs.

Approximately 24" above the pedestal floor, this pipe turns 90˚, penetrates the pedestal wall, continues 12" and terminates approximately 28" above a concrete splash pad. This pipe was free of obvious obstructions and the flap-valve installed at the end of this pipe is secure, preventing access to the interior of the tank.

The protective coating applied to this steel pipe has an average dry film thickness of 9.7 mils, appears to have been applied uniformly, meets the AWWA's recommendations and the protective coating applied to the pipe located within the pedestal remains having good adhesion value at this time. The protective coating applied to the exterior 12" long section of steel pipe and the flap-valve at the end of the pipe was found having mostly good adhesion value, however adhesion loss of the protective coating was found throughout approximately 5% of the surfaces of this pipe and the flap-valve. This coating adhesion loss has resulted in steel exposure and corrosion of these surfaces, however this steel pipe and flap-valve remain sound and free of obvious fatigue/deterioration at this time.

Roof

The steel roof panels and associated welds were inspected and found appearing sound and remain free of obvious fatigue or failures at this time.

The protective coating applied to these welded steel surfaces has an average dry film thickness of 10.7 mils and meets the AWWA's recommendations, however secondary coating adhesion loss has resulted in exposure of the underlying primary coating throughout approximately 35% of these surfaces. The exposed primary coating within these areas of secondary coating loss remains having good adhesion value at this time.

Seven, 2" diameter rigging hole penetrations within the roof are sealed with rubber caps that are secured in-place with hose clamps, preventing access to the interior of the tank.

The 45" tall steel safety railings welded to the roof around the hatches and vent were found securely installed and free of obvious fatigue or failures. The protective coating applied to these steel safety railings appears to have been applied uniformly, however secondary coating adhesion loss has resulted in exposure of the primary coating throughout approximately 25% of these surfaces. The exposed primary coating within these areas of secondary coating loss remains having good adhesion value at this time.

Vent

A vent is located within the center of the roof dome, having a 20" inside diameter, and stands 41" tall.

A 45" outside diameter aluminum cap and associated screen remains securely installed over the vent penetration in the roof, preventing access to the interior of the tank.

The vacuum release plate located on the underside of the vent was free of obvious obstructions and moves freely at this time.

This aluminum vent assembly is not coated, was found without corrosion and appeared sound at the time of this inspection.

Hatches

One, 30" inside diameter hatch provides good access to the interior of the tank through the roof dome and was found secured with a lock, preventing unwanted access to the interior of the tank.

This hatch was opened and remains in good working condition at this time. The protective coating applied to the exterior of this hatch appears to have been applied uniformly, however secondary coating adhesion loss throughout approximately 15% of these surfaces has resulted in exposure of the primary coating. The exposed primary coating within these areas of secondary coating adhesion loss was found having good adhesion value at this time. The protective coating applied to the interior surfaces of the hatch cover was found having good adhesion value at this time. The protective coating applied to the interior surfaces of the hatch trunk appears to have been applied uniformly and was found having mostly good adhesion value, however isolated areas of coating adhesion loss were observed throughout approximately 5% of these surfaces, resulting in exposure of the underlying steel. No obvious fatigue/deterioration of the steel trunk was evident within these areas of exposure, rather mild corrosion exists at this time.

One 20" inside diameter hatch provides access to the interior of the tank through the roof dome and was found secured with a lock, preventing unwanted access to the interior of the tank. This hatch was not opened or utilized at the time of this inspection. The protective coating applied to the exterior of this hatch appears to have been applied uniformly, however secondary coating adhesion loss throughout approximately 15% of these surfaces has resulted in exposure of the primary coating.

The primary coating within these areas of exposure was found having good adhesion value at this time.

The riser column access hatch has a 30" inside diameter and provides access to the roof from the center riser column. This hatch remains in good condition and is secured with a latch, preventing accidental opening. The protective coating applied to this steel hatch remains having good adhesion value.

INTERIOR INSPECTION:

The entire interior of this water storage tank (and components) was inspected to include sediment accumulations, floor, manway, piping, walls and coating, center riser column, overhead, overflow and aesthetic water quality.

Sediment Accumulations

A non-uniform layer of accumulated precipitate was found throughout all floor surfaces, ranging from 6" to 9" in depth.

After completing this inspection, all precipitate was removed (vacuumed) from the floor.

Floor

After removing all precipitate, the steel floor panels and associated welds were inspected and found appearing sound and remain free of obvious fatigue or failures.

The protective coating applied to these surfaces has an average dry film thickness of 23.1 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value, however blistering of the protective coating was observed throughout approximately 5% of these surfaces, resulting in exposure of the underlying steel.

No obvious fatigue/deterioration of the steel was evident within these 1/8" diameter areas of exposure, rather mild corrosion exists at this time.

Mild to moderate staining remains throughout the floor due to the accumulation of precipitate.

Manway

One, 36" outside diameter manway penetrates the floor (tank base) approximately 12' in from the center riser column and is securely installed and free of obvious leakage.

The protective coating applied to these steel surfaces was found having an average dry film thickness of 2.8 mils, which is below the 10.5 mils recommended by the AWWA. This coating was also found having poor adhesion value and is blistering throughout approximately 15% of these surfaces, resulting in exposure of the underlying steel.

No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild corrosion exists at this time.

Piping

Two pipes were inspected within this potable water storage tank.

The first pipe inspected penetrates the floor approximately 16" in from the center riser column, having a 12" inside diameter, and stands 20" tall.

This pipe was free of obvious obstructions and flow was leaving the tank through this pipe at the time of the inspection.

The protective coating applied to this metal pipe was found having good adhesion value at this time.

The second pipe inspected penetrates the floor approximately 16" in from the center riser column, having a 10" inside diameter. This metal pipe extends up, supported to the center riser column with one welded standoff, and terminates approximately 25' above the floor with a (T) installed at its end. Each side of the (T) extends approximately 10", and the rubber check valve installed at each end of the (T) remains secure.

Each rubber check valve was free of obvious obstructions and was without flow at the time of this inspection.

The protective coating applied to this metal pipe and pipe securing hardware appears to have been applied uniformly and was found having mostly good adhesion value, however adhesion loss of the protective coating was observed on the flanged sections of this pipe, at the locations where the flanges contact resulting in exposure of the underlying metal.

No obvious fatigue/deterioration of these metal flange surfaces was evident, rather mild to moderate corrosion exists at this time.

Walls And Coating

The interior walls were inspected beginning at the floor and by spiraling the circumference of the tank up to the water surface.

These steel wall panels and associated welds appeared sound and remain free of obvious fatigue or failures.

The protective coating applied to the interior wall surfaces has an average dry film thickness of 12.6 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for these welded steel surfaces.

The American Water Works Association (AWWA) recommends a dry film thickness of 10.5 to 15.5 mils of coating film thickness be applied to the interior surfaces of welded steel potable water storage tanks to provide adequate protection for welded steel structures.

Heavy staining exists throughout the interior walls, beginning approximately 24" below overflow level and extending down to the floor.

Center Riser Column

The 60" diameter welded steel center riser column was inspected and found appearing sound and remains free of obvious fatigue or failures.

The protective coating applied to these surfaces has an average dry film thickness of 8.4 mils and is below the AWWA's minimum recommended dry film thickness of 10.5 mils, however the protective coating applied to these surfaces appears to have been applied uniformly and remains having good adhesion value at this time.

A similar heavy stain as was found throughout the interior walls exists on the surfaces of the center riser column at this time.

Overhead

The entire overhead was inspected from the water surface.

These steel overhead panels and steel supports were found appearing sound and remain free of obvious fatigue or failures at this time.

The protective coating applied to these surfaces has an average dry film thickness of 8.7 mils and is below the AWWA's minimum recommended dry film thickness of 10.5 mils, however the protective coating applied to these surfaces appears to have been applied uniformly and the protective coating applied to the steel panels remains having good adhesion value, providing adequate protection for the surfaces of the steel panels.

The protective coating applied to the steel supports was found having mostly good adhesion value, however declined film thickness causes mild surface corrosion (blotch rusting) throughout approximately 5-10% of these surfaces.

Overflow

The overflow consists of a 36" by 24" by 12" tall welded steel weir box welded to the center riser column, located approximately 10' below the overhead. An 8" inside diameter pipe exits the base of the weir box and extends down and penetrates the floor (base) of the tank.

The protective coating applied to the steel overflow pipe and weir box has an average dry film thickness of 7.9 mils and is below the AWWA's minimum recommended dry film thickness of 10.5 mils, however the protective coating applied to these surfaces appears to have been applied uniformly and the protective coating applied to the steel overflow pipe remains having good adhesion value, providing adequate protection for the surfaces of this steel pipe.

The protective coating applied to the welded steel weir box was found having mostly good adhesion value, however blistering of the protective coating was observed throughout approximately 5% of these surfaces, resulting in exposure of the underlying steel.

No obvious fatigue (pitting) of the steel was evident within these areas of exposure, rather mild corrosion exists at this time.

The overflow weir box and the pipe that penetrates the base of the weir box was free of obvious obstructions at this time.

Aesthetic Water Quality

The aesthetic water quality was good throughout the tank, allowing unlimited visibility for this inspection.

RECOMMENDATIONS:

It is the opinion of Underwater Solutions Inc. that this elevated welded steel potable water storage tank appears mostly sound and free of obvious leakage.

EXTERIOR:

The interior and exterior surfaces of the welded steel support pedestal appeared sound and remain free of obvious fatigue or failures.

The protective coating applied to these surfaces remains having mostly good adhesion value, however the coating applied to the exterior steel surfaces of the support pedestal has become chalky due to weathering. Adhesion loss of the protective coating was also observed throughout approximately 10% of the exterior steel floor extension surfaces, resulting in exposure of the underlying steel.

Several areas of coating damage were observed throughout approximately 5% of the lowest 10' of the exterior of the support pedestal, appearing to be the result of objects striking these surfaces, and has resulted in exposure and corrosion of the underlying steel. No obvious fatigue/deterioration of the steel was evident within these areas of steel exposure, rather mild corrosion exists at this time.

The exterior steel wall panels and associated welds of the tank were found appearing sound and remain free of obvious fatigue or failures.

Although the protective coating applied to these welded steel surfaces has become chalky due to weathering, this coating appears to have been applied uniformly and was found having good adhesion value, providing adequate protection for these steel panels and welds.

A mild, non-uniform accumulation of mildew throughout the exterior surfaces of the support pedestal and tank base causes declined aesthetics.

It is our recommendation to pressure-wash the exterior surfaces of the support pedestal, tank walls and tank base at 3,000 P.S.I. and at 3.0 G.P.M. to remove the chalking and accumulated mildew from these surfaces, to preserve the adhesion value of the protective coating and to improve the overall aesthetics.

It is also our recommendation to power tool clean all areas of steel exposure found throughout the lower elevations of the exterior support pedestal to remove all corrosion and to prepare the substrate. We then recommend re-coating and to re-coat these areas to halt corrosion, prevent steel fatigue/deterioration and to provide good protection for the steel.

The steel roof panels and associated welds were found appearing sound and remain free of obvious fatigue or failures.

The protective coating applied to these welded steel roof surfaces has an average dry film thickness that meets the AWWA's recommendations, however secondary coating adhesion loss has resulted in exposure of the underlying primary coating throughout approximately 35% of these surfaces. The exposed primary coating within these areas of secondary coating loss remains having good adhesion value at this time.

The 45" tall steel safety railings welded to the roof were found securely installed and free of obvious fatigue or failures. The protective coating applied to these steel safety railings appears to have been applied uniformly, however secondary coating adhesion loss has resulted in exposure of the primary coating throughout approximately 25% of these surfaces. The exposed primary coating within these areas of secondary coating loss remains having good adhesion value at this time.

It is our recommendation to either high pressure-pressure wash (water jetting) or power tool clean the surfaces of the roof to remove all secondary coating that has lost adhesion and to prepare the substrate. We then recommend re-coating these surfaces to prevent steel exposure and to provide good protection for the surfaces of the steel roof and roof safety railing surfaces.

Each of the thirty-seven anchor bolts have one nut securely installed. The protective coating applied to thirty-six of these anchor bolts and nuts was found having good adhesion value, with no obvious coating fatigue or steel exposure evident, however a mild rust stain was observed on this hardware.

It is our recommendation to monitor the surfaces of these thirty-six anchor bolts/nuts through future scheduled inspections to ensure that adhesion loss of the protective coating does not occur and result in exposure of the underlying steel.

The final (thirty-seventh) anchor bolt and nut located next the access door was found secure, although the protective coating applied to this nut and bolt has lost adhesion, causing steel exposure and corrosion. However, this anchor bolt and associated nut remains secure and without fatigue/deterioration of the exposed steel surfaces at this time.

It is our recommendation to power/hand tool clean the surfaces of this anchor bolt and nut to remove all corrosion and to prepare the substrate. We then recommend re-coating these surfaces to halt corrosion, prevent metal fatigue/deterioration and to provide good protection for this metal support hardware.

The protective coating applied to the steel overflow pipe located within the pedestal remains having good adhesion value and requires no remedial action at this time.

The protective coating applied to the exterior 12" long section of steel pipe and the flap-valve at the end of the pipe was found having mostly good adhesion value, although adhesion loss of the protective coating throughout approximately 5% of these surfaces has resulted in steel exposure and corrosion of the steel. However, this steel pipe and flap-valve remain sound and free of obvious fatigue/deterioration at this time.

It is our recommendation to power tool clean the surfaces of this pipe and flap-vale showing steel exposure to remove all corrosion and to prepare the substrate. We then recommend re-coating these surfaces to halt corrosion, prevent steel fatigue and to provide good protection for this steel pipe and flap-valve.

The protective coating applied to the exterior of the 30" inside diameter access hatch appears to have been applied uniformly, however secondary coating adhesion loss throughout approximately 15% of these surfaces has resulted in exposure of the primary coating. The exposed primary coating within these areas of exposure was found having good adhesion value at this time.

It is our recommendation that the exterior surfaces of the hatch be rehabilitated at the same time the roof surfaces are rehabilitated, and utilizing the same method as recommended previously in this report.

The protective coating applied to the interior surfaces of the hatch cover was found having good adhesion value and requires no remedial action at this time.

The protective coating applied to the interior surfaces of the 30" inside diameter hatch trunk appears to have been applied uniformly and was found having mostly good adhesion value, however isolated areas of coating adhesion loss were observed throughout approximately 5% of these surfaces, resulting in exposure of the underlying steel.

It is our recommendation to hand-tool clean these areas of steel exposure to remove all corrosion and to prepare the substrate. We then recommend re-coating these areas using an A.N.S.I./N.S.F.61 approved coating for use in structures containing potable water to halt corrosion, prevent steel fatigue/deterioration and to provide good protection for the steel.

We recommend that when the interior surfaces of this hatch trunk are rehabilitated, that the tank interior is masked to prevent contaminates generated during the preparation and re-coating of these surfaces from entering the interior of the tank.

The protective coating applied to the exterior of the 20" inside diameter access hatch appears to have been applied uniformly, however secondary coating adhesion loss throughout approximately 15% of these surfaces has resulted in exposure of the primary coating.

The primary coating within these areas of exposure remains having good adhesion value at this time.

It is our recommendation that the exterior surfaces of this hatch be rehabilitated at the same time the roof surfaces are rehabilitated, and utilizing the same method as recommended previously in this report.

The protective coating applied to the 30" inside diameter steel riser column hatch remains having good adhesion value and requires no remedial action at this time.

The protective coating applied to the steel surfaces of the manway, each access ladder and center riser column was found having good adhesion value and requires no remedial action at this time.

The exposed surfaces of the concrete foundation appeared mostly sound and free of obvious cracks, however spall of the concrete, having depths up to 1/4" deep, was observed throughout approximately 5-10% of the outside edge of the foundation.

The surrounding and underlying concrete within these areas of spall remains sound and with no obvious exposure of the reinforcement steel at this time.

It is our recommendation to monitor the areas of concrete spall found throughout the edge of the exposed foundation surfaces through future scheduled inspections to ensure that an increase in the depth of this spall does not occur and result in exposure of the reinforcement steel.

All components affixed to the exterior of the tank are properly installed at this time.

A fail-safe (frost proof) vent and associated screen remains securely installed over the vent penetration in the roof, preventing access to the interior of the tank.

A flap-valve installed at the end of the overflow pipe remains secure, preventing access to the interior of the pipe/tank.

The 30" inside diameter and 20" inside diameter hatches that provide access to the tank interior were found secured with locks, preventing unwanted access to the interior of the tank.

Each rigging hole penetration within the roof was found sealed with a rubber cap, secured in-place with a hose clamp, preventing access to the interior of the tank.

INTERIOR:

The steel floor panels and associated welds were found appearing sound and remain free of obvious fatigue or failures.

The protective coating applied to these surfaces appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value, however blistering of the protective coating was observed throughout approximately 5% of these surfaces, resulting in exposure of the underlying steel.

No obvious fatigue/deterioration of the steel was evident within these 1/8" diameter areas of exposure, rather mild corrosion exists at this time.

It is our recommendation that the next time this tank is removed from service and de-watered that the surfaces of the floor showing steel exposure be power tool cleaned to remove all corrosion and to prepare the substrate. We then recommend re-coating these areas using an A.N.S.I./N.S.F.61 approved coating for use in structures containing potable water to halt corrosion, prevent steel fatigue/deterioration and to provide good protection for the steel.

The protective coating applied to the interior steel surfaces of the manway is below the AWWA's recommendations, was found having poor adhesion value and is blistering throughout approximately 15% of these surfaces, resulting in exposure of the underlying steel.

No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild corrosion exists at this time.

It is our recommendation that when the tank is removed from service and de-watered to complete the rehabilitation of the floor that the interior surfaces of the manway be power tool cleaned to bare metal to remove all corrosion and to prepare the substrate. We then recommend re-coating these surfaces in accordance with AWWA recommendations to halt corrosion, prevent steel fatigue/deterioration and to provide good protection for the steel.

The protective coating applied to the 10" inside diameter metal pipe and pipe securing hardware that extends up from the floor and stands approximately 25' tall (second pipe inspected) appears to have been applied uniformly and was found having mostly good adhesion value. However, adhesion loss of the protective coating was observed on the flanged sections of this pipe, at the locations where the flanges contact, resulting in exposure of the underlying metal.

No obvious fatigue/deterioration of these metal flange surfaces was evident, rather mild to moderate corrosion exists at this time.

It is our recommendation that when this tank is out of service and de-watered to complete the rehabilitation of the interior floor and manway surfaces that the flanges on this pipe be power tool cleaned to remove all corrosion. We then recommend re-coating these surfaces using an A.N.S.I./N.S.F.61 approved coating for use in structures containing potable water to halt corrosion, prevent metal fatigue and to provide good protection for these metal flanges.

The protective coating applied to the interior steel overflow pipe and weir box was found having an average dry film thickness that is below the AWWA's recommendations. However, the protective coating applied to these surfaces appears to have been applied uniformly and the protective coating applied to the steel overflow pipe remains having good adhesion value, and requires no remedial action at this time.

The protective coating applied to the welded steel weir box was found having mostly good adhesion value, however blistering of the protective coating was observed throughout approximately 5% of these surfaces, resulting in exposure of the underlying steel.

No obvious fatigue (pitting) of the steel was evident within these areas of exposure, rather mild corrosion exists at this time.

It is our recommendation that when the tank is out of service and de-watered to complete the rehabilitation of the interior floor, manway and pipe flanges, that the surfaces of the overflow weir box be power tool cleaned to remove all corrosion and to prepare the substrate. We then recommend re-coating these surfaces using an A.N.S.I./N.S.F.61 approved coating for use in structures containing potable water to halt corrosion, prevent steel fatigue/deterioration and to provide good protection for these steel surfaces.

The interior steel wall panels and associated welds appeared sound and remain free of obvious fatigue or failures.

The protective coating applied to the interior wall surfaces appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for these welded steel surfaces and requires no remedial action at this time.

The interior surfaces of the 60" diameter welded steel center riser column were found appearing sound and remain free of obvious fatigue or failures.

The protective coating applied to these surfaces has an average dry film thickness that is below the AWWA's recommendations, however the protective coating applied to these surfaces appears to have been applied uniformly and remains having good adhesion value at this time.

It is our recommendation to monitor the interior surfaces of the center riser column through future scheduled inspections to ensure that further decline in coating film thickness or coating adhesion loss does not occur and result in exposure of the underlying steel.

These steel overhead panels and steel supports were found appearing sound and remain free of obvious fatigue or failures at this time.

The protective coating applied to these surfaces has an average dry film thickness that is below the AWWA's recommendations, however the protective coating applied to these surfaces appears to have been applied uniformly and the protective coating applied to the steel panels remains having good adhesion value, providing adequate protection for the surfaces of the steel panels.

It is our recommendation to monitor the surfaces of the overhead panels through future scheduled inspections to ensure that further decline in coating film thickness or coating adhesion loss does not occur and result in exposure of the underlying steel.

The protective coating applied to the steel supports was found having mostly good adhesion value, however declined film thickness causes mild surface corrosion (blotch rusting) throughout approximately 5-10% of these surfaces.

It is our recommendation that when the tank is out of service and de-watered to complete the rehabilitation of the interior floor, manway, pipe flanges and overflow weir box that the surfaces of the overhead supports showing surface corrosion be power tool cleaned to remove all corrosion and to prepare the substrate. We then recommend re-coating these surfaces using an A.N.S.I./N.S.F.61 approved coating for use in structures containing potable water to halt corrosion, prevent steel fatigue/deterioration and to provide good protection for these steel supports.

As always, we recommend that re-inspection and cleaning of all water storage facilities be performed in accordance with state and federal mandates, A.W.W.A. standards, and completed by an experienced and authorized inspection corporation.

UNDERWATER SOLUTIONS INC.
Christopher A. Cole, Project Manager

This report, the conclusions, recommendations and comments prepared by Underwater Solutions Inc. are based upon spot examination from readily accessible parts of the tank. Should latent defects or conditions which vary significantly from those described in the report be discovered at a later date, these should be brought to the attention of a qualified individual at that time. These comments and recommendations should be viewed as information to be used by the Owner in determining the proper course of action and not to replace a complete set of specifications. All repairs should be done in accordance with A.W.W.A. and/or other applicable standards.

1 ***Support Pedestal Interior***

2 ***Support Pedestal Interior***

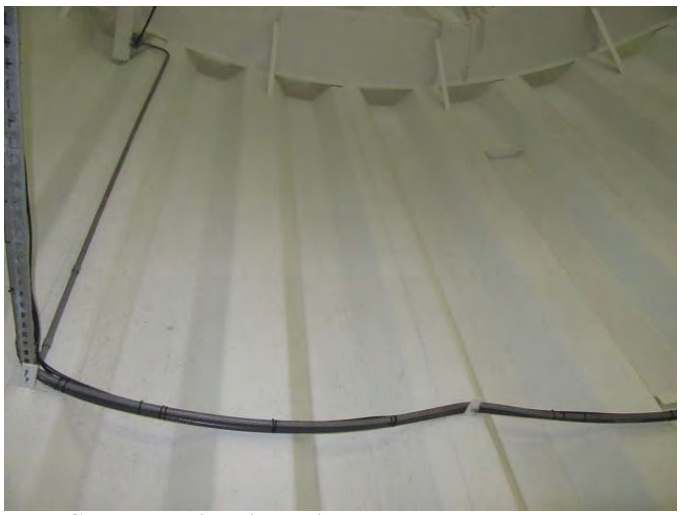
3 ***Support Pedestal Interior***

4 ***Support Pedestal Interior***

5 ***Support Pedestal Interior***

6 ***Support Pedestal Interior***

7 ***Support Pedestal Interior***



8 ***Support Pedestal Interior***

9 ***Support Pedestal Interior***

10 ***Support Pedestal Interior***

11 ***Support Pedestal Interior***

12 ***Support Pedestal Interior***

13 ***Support Pedestal Exterior With Adhesion Loss Exposed Underlying Steel, Mild Corrosion And Mild Mildew***

14 ***Support Pedestal Exterior With Adhesion Loss Exposed Underlying Steel, Mild Corrosion And Mild Mildew***

15 ***Support Pedestal Exterior With Coating Loss/ Chalking Exposed Underlying Steel, Mild Corrosion And Mild Mildew***

16 ***Support Pedestal Exterior With Coating Loss/ Chalking Exposed Underlying Steel, Mild Corrosion And Mild Mildew***

17 ***Support Pedestal Exterior With Coating Loss/ Chalking Exposed Underlying Steel, Mild Corrosion And Mild Mildew***

18 ***Support Pedestal Exterior With Coating Damage, Exposed Underlying Steel, Mild Corrosion And Mild Mildew***

19 ***Support Pedestal Exterior With Coating Damage, Exposed Underlying Steel, Mild Corrosion And Mild Mildew***

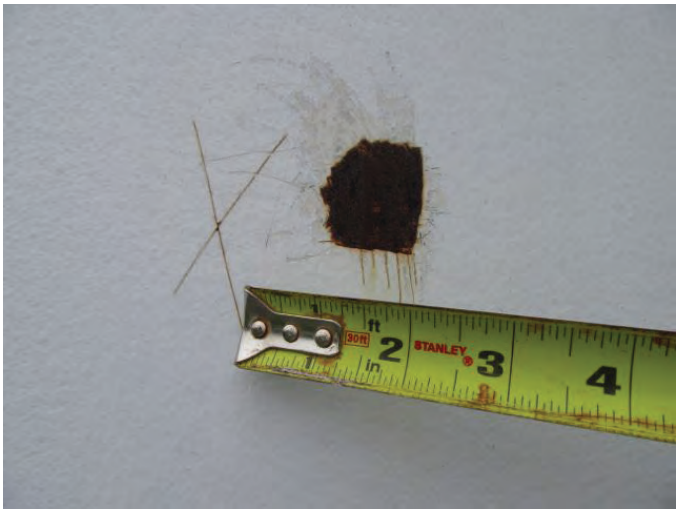
20 ***Support Pedestal Exterior With Coating Damage, Exposed Underlying Steel, Mild Corrosion And Mild Mildew***

21 ***Support Pedestal Exterior With Coating Damage, Exposed Underlying Steel, Mild Corrosion And Mild Mildew***

22 ***Support Pedestal Exterior With Coating Damage, Exposed Underlying Steel, Mild Corrosion And Mild Mildew***

23 ***Support Pedestal Exterior With Coating Damage, Exposed Underlying Steel, Mild Corrosion And Mild Mildew***

24 ***Support Pedestal Exterior With Coating Damage, Exposed Underlying Steel, Mild Corrosion And Mild Mildew***



25 ***Support Pedestal Exterior With Coating Damage, Exposed Underlying Steel, Mild Corrosion And Mild Mildew***

26 ***Support Pedestal Access Door With Coating Damage, Exposed Underlying Steel And Mild Corrosion***

27 ***Support Pedestal Exterior With Coating Loss/ Chalking With Mild Mildew***

28 ***Support Pedestal Exterior With Coating Loss/ Chalking With Mild Mildew***

29 ***Support Pedestal Exterior With Coating Loss/ Chalking With Mild Mildew***

30 ***Support Pedestal Exterior With Coating Loss/ Chalking With Mild Mildew***

31 ***Support Pedestal Exterior With Coating Loss/ Chalking With Mild Mildew***

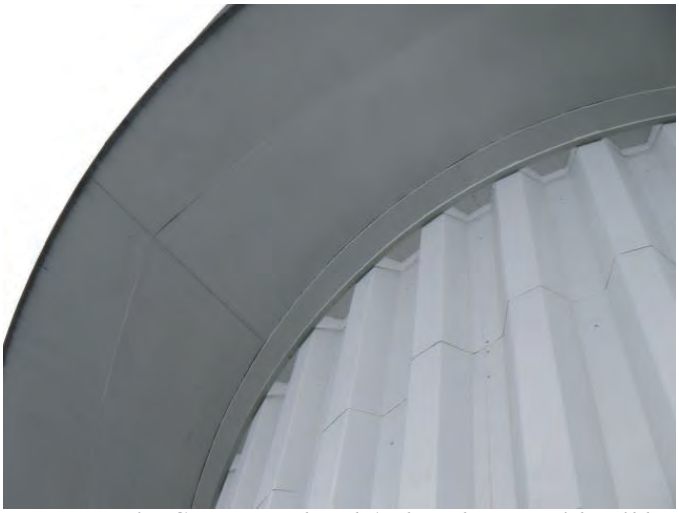
32 ***Support Pedestal Exterior With Coating Loss/ Chalking With Mild Mildew***

33 ***Support Pedestal Exterior With Coating Loss/ Chalking With Mild Mildew***

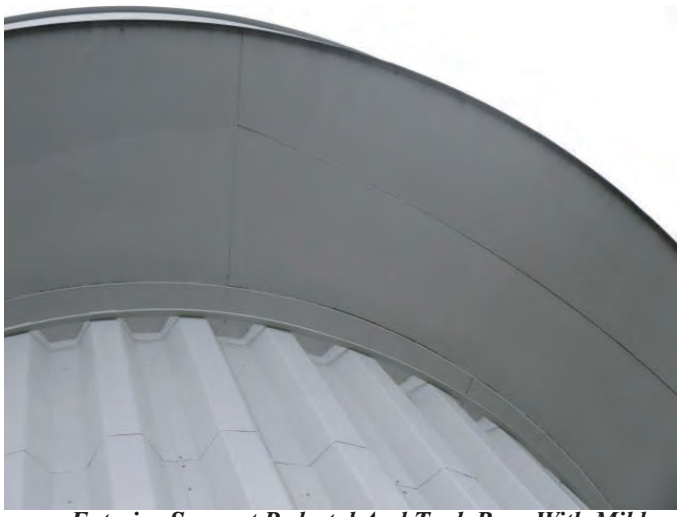
34 ***Support Pedestal Exterior With Coating Loss/ Chalking With Mild Mildew***

35 ***Support Pedestal Exterior With Coating Loss/ Chalking With Mild Mildew***

36 ***Support Pedestal Exterior With Coating Loss/ Chalking With Mild Mildew***

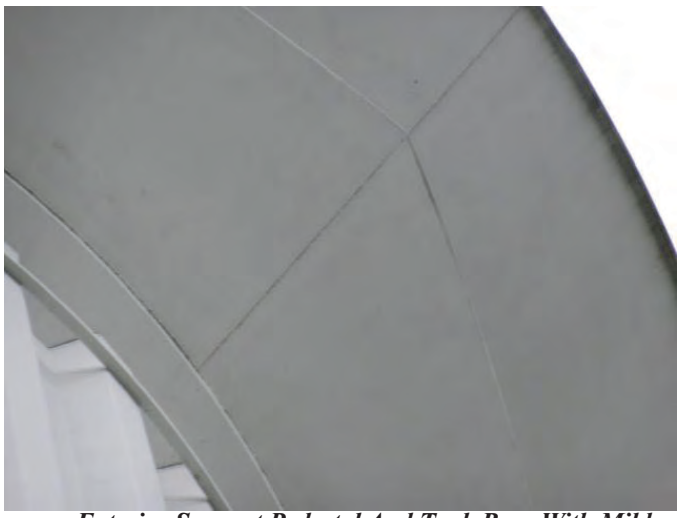


37 ***Exterior Support Pedestal And Tank Base With Mild Mildew***

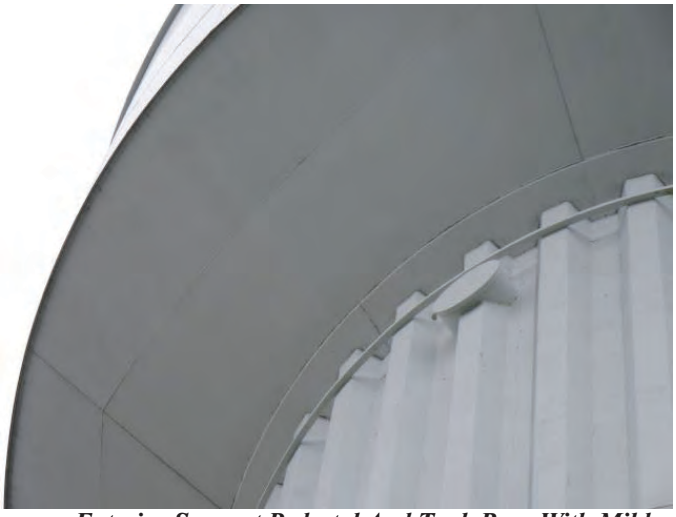


38 ***Exterior Support Pedestal And Tank Base With Mild Mildew***

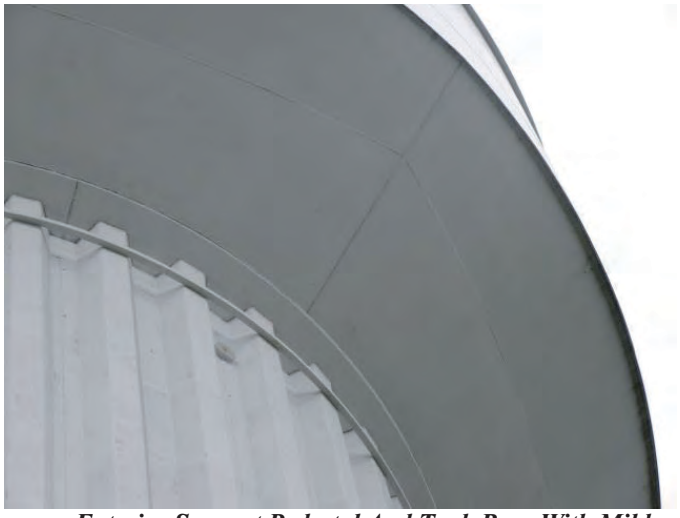
39 ***Exterior Support Pedestal And Tank Base With Mild Mildew***



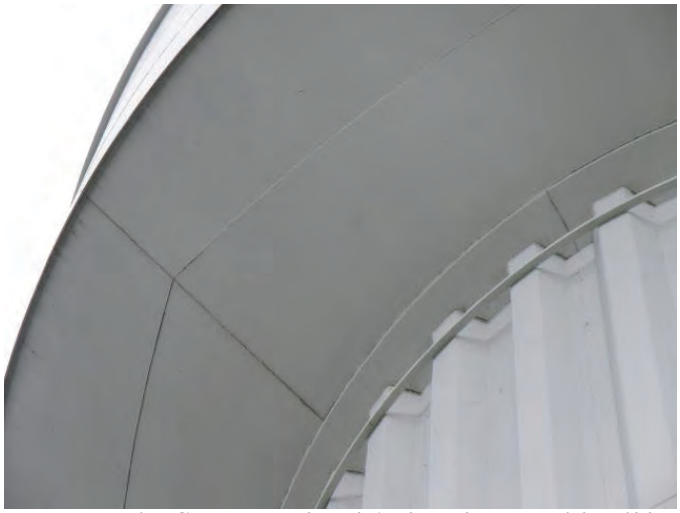
40 ***Exterior Support Pedestal And Tank Base With Mild Mildew***



41 ***Exterior Support Pedestal And Tank Base With Mild Mildew***

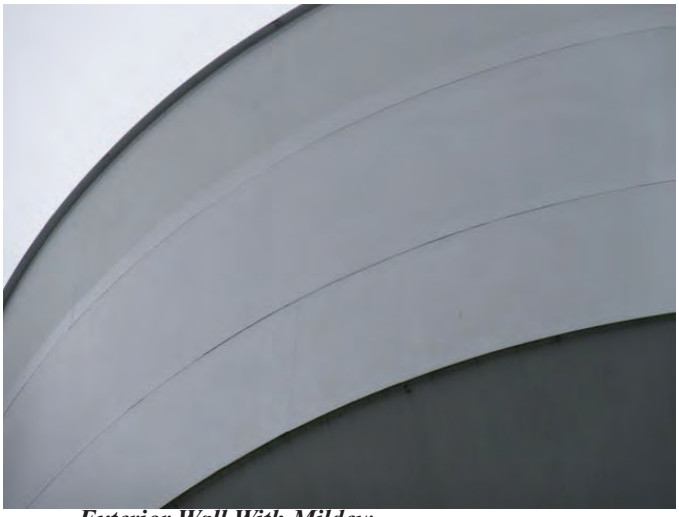


42 ***Exterior Support Pedestal And Tank Base With Mild Mildew***

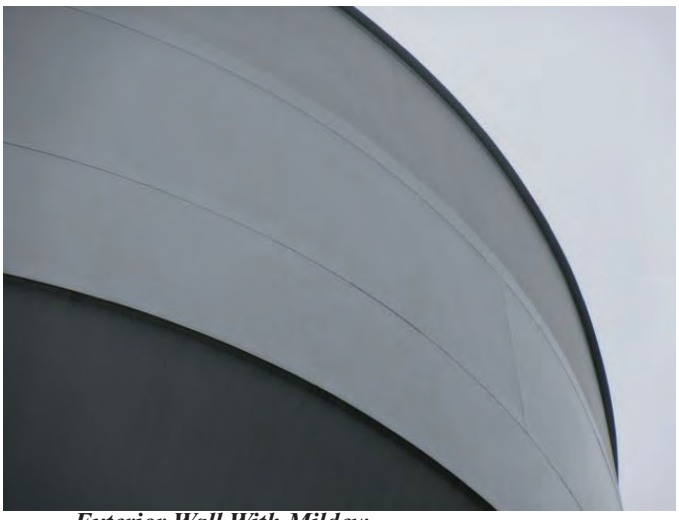


43 ***Exterior Support Pedestal And Tank Base With Mild Mildew***

44 ***Exterior Support Pedestal And Tank Base With Mild Mildew***



45 ***Exterior Wall With Mildew***



46 ***Exterior Wall With Mildew***

47 ***Exterior Wall With Mildew***

48 ***Anchor Bolt And Hardware With Mild Rust Staining***

49 ***Anchor Bolt And Hardware With Mild Rust Staining***

50 ***Anchor Bolt And Hardware With Mild Rust Staining***

51 ***Anchor Bolt And Hardware With Coating Loss, Exposed Steel And Corrosion***

52 ***Concrete Foundation With Spall***

53 ***Concrete Foundation With Spall***

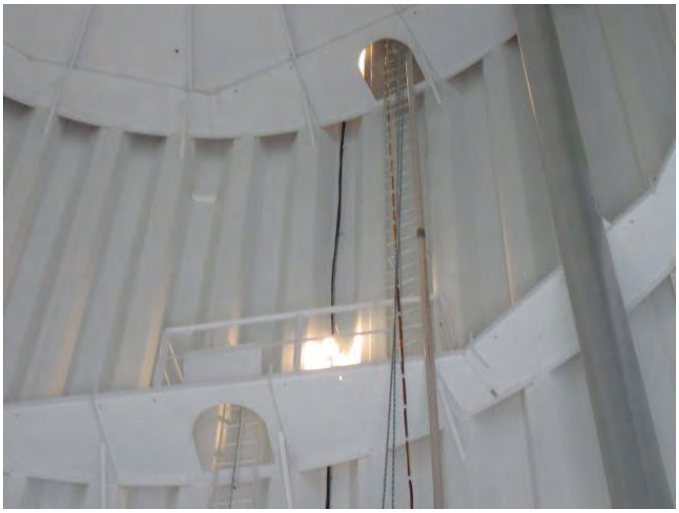
54 ***Concrete Foundation With Spall***

55 ***Secure Manway***

56 ***Manway Access Ladder With A Fall Prevention Device***

57 ***Ladder With A Fall Prevention Device***

58 ***Ladder With A Fall Prevention Device***



59 ***Ladder With A Fall Prevention Device***

60 ***Center Riser Column Walkway***

61 ***Ladder And Fall Prevention Device Extending Through The Center Riser Column***

62 ***Ladder And Fall Prevention Device Extending Through The Center Riser Column***

63 ***Overflow Pipe***

64 ***Overflow Pipe***

65 ***Overflow Pipe And Flap-Valve With Coating Loss, Exposed Steel And Corrosion***

66 ***Overflow Pipe And Flap-Valve With Coating Loss, Exposed Steel And Corrosion***

67 ***Overflow Pipe***

68 ***Roof Panels With Secondary Coating Loss And Exposed Underlying Primary Coating***

69 ***Roof Panels With Secondary Coating Loss And Exposed Underlying Primary Coating***

70 ***Roof Panels With Secondary Coating Loss And Exposed Underlying Primary Coating***

71 ***Roof Panels With Secondary Coating Loss And Exposed Underlying Primary Coating***

72 ***Roof Panels With Secondary Coating Loss And Exposed Underlying Primary Coating***

73 ***Roof Panels With Secondary Coating Loss And Exposed Underlying Primary Coating***

74 ***Roof Panels With Secondary Coating Loss And Exposed Underlying Primary Coating***

75 ***Roof Panels With Secondary Coating Loss And Exposed Underlying Primary Coating***

76 ***Secure / Sealed Roof Rigging Hole Penetrations***

77 ***Secure / Sealed Roof Rigging Hole Penetrations***

78 ***Secure / Sealed Roof Rigging Hole Penetrations***

79 ***Secure Roof Safety Railings With Secondary Coating Loss And Exposed Primary Coating***

80 ***Secure Roof Safety Railings With Secondary Coating Loss And Exposed Primary Coating***

81 ***Secure Roof Safety Railings With Secondary Coating Loss And Exposed Primary Coating***

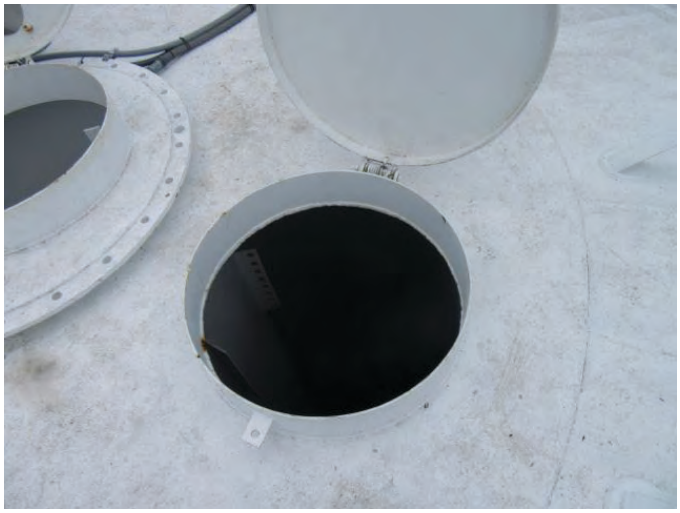
82 ***Secure Fail Safe (Frost Proof) Vent***

83 ***Secure Vent Screen***

84 ***Secure Vent Screen***

85 ***Free Moving Vacuum Release Plate***

86 ***Free Moving Vacuum Release Plate***



87 ***Open Access Hatch - 30” Inside Diameter***

88 ***Hatch Trunk With Coating Loss, Exposed Underlying Steel And Mild Corrosion***

89 ***Closed Access Hatch***

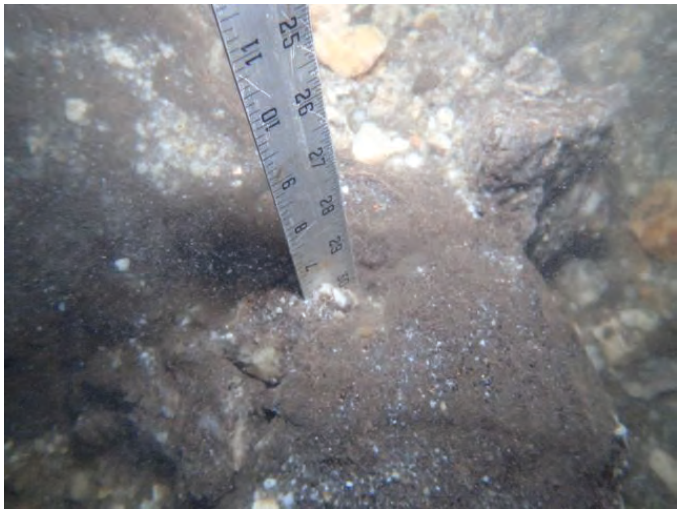
90 ***Secure Access Hatch***

91 ***Closed Access Hatch - 20” Inside Diameter***

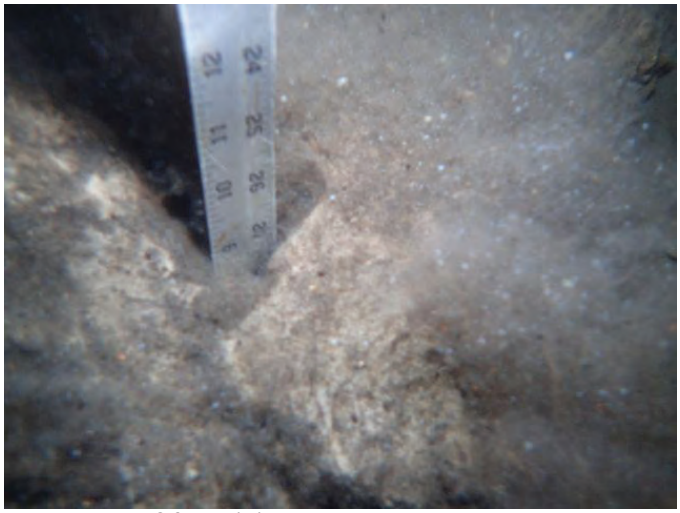
92 ***Secure Access Hatch***

93 ***Open Center Riser Column Access Hatch - 30” Inside Diameter***

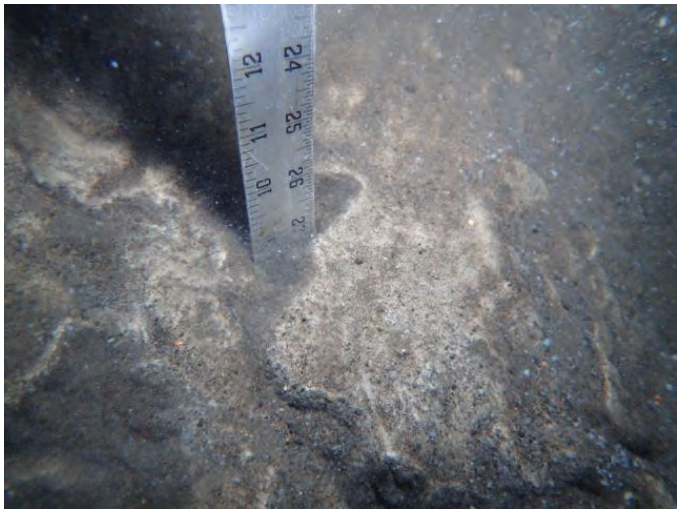
94 ***Closed/Latched Center Riser Column Access Hatch***



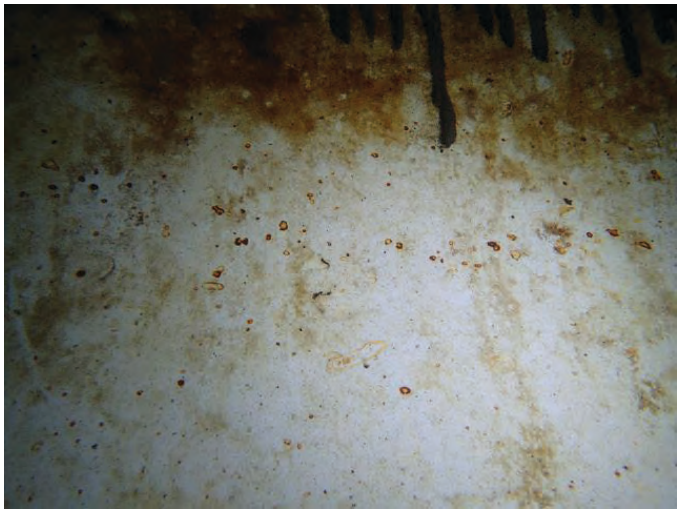
95 ***Layer Of Precipitate***



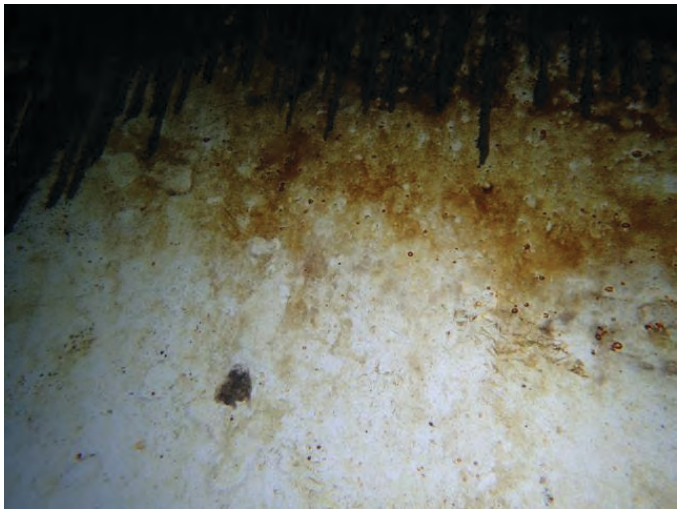
96 ***Layer Of Precipitate***



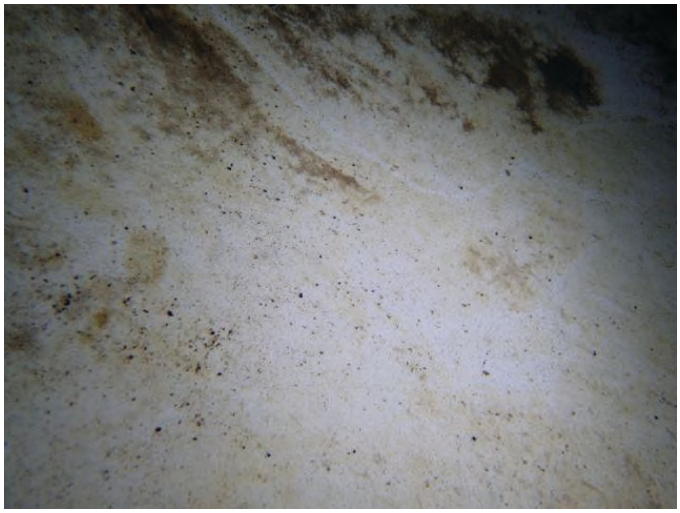
97 ***Layer Of Precipitate***



98 ***Floor With Coating Loss/Blisters, Exposed Underlying Steel, Mild Corrosion And Mild To Moderate Staining***



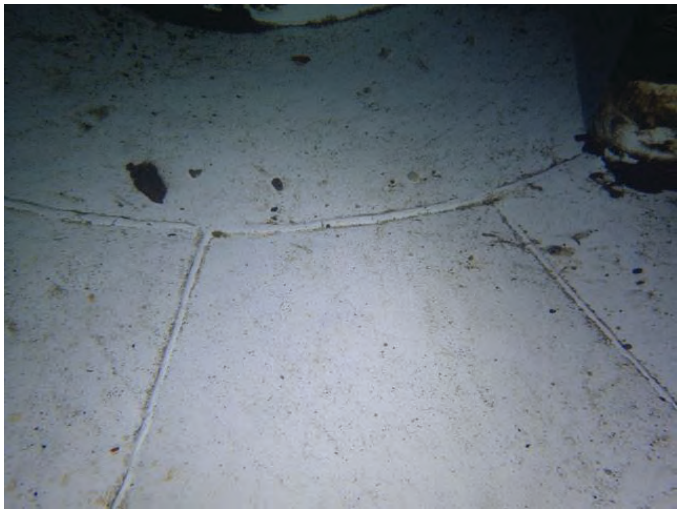
99 ***Floor With Coating Loss/Blisters, Exposed Underlying Steel, Mild Corrosion And Mild To Moderate Staining***



100 ***Floor With Coating Loss/Blisters, Exposed Underlying Steel, Mild Corrosion And Mild To Moderate Staining***

101 ***Floor With Mild To Moderate Staining***

102 ***Floor With Mild To Moderate Staining***



103 *Floor With Mild To Moderate Staining*

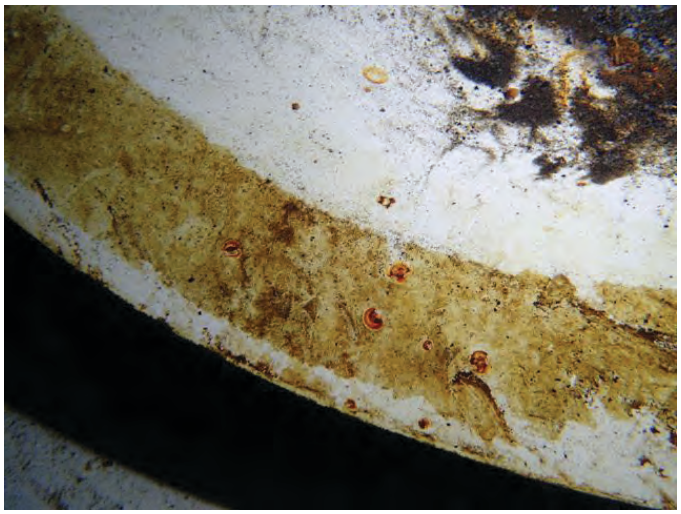
104 *Floor With Mild To Moderate Staining*

105 *Floor With Mild To Moderate Staining*

106 *Floor With Mild To Moderate Staining*

107 *Manway - 36” Outside Diameter*

108 *Manway With Coating Loss/Blisters, Exposed Underlying Steel And Mild Corrosion*



109 *Manway With Coating Loss/Blisters, Exposed Underlying Steel And Mild Corrosion*

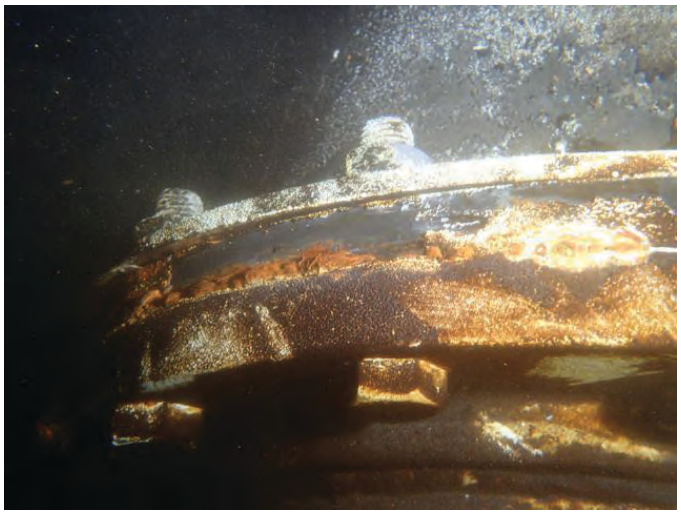
110 *Manway With Coating Loss/Blisters, Exposed Underlying Steel And Mild Corrosion*

111 *12” Inside Diameter Pipe*

112 *10” Inside Diameter Pipe Penetrating The Tank Floor*

113 *10” Inside Diameter Pipe Flange With Coating Loss, Exposed Underlying Metal And Mild To Moderate Corrosion*

114 *10” Inside Diameter Pipe Flange With Coating Loss, Exposed Underlying Metal And Mild To Moderate Corrosion*

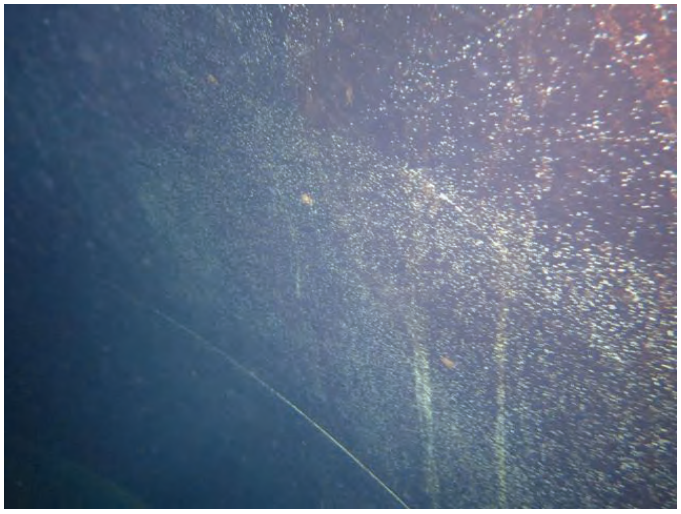


115 ***10” Inside Diameter Pipe Flange With Coating Loss, Exposed Underlying Metal And Mild To Moderate Corrosion***

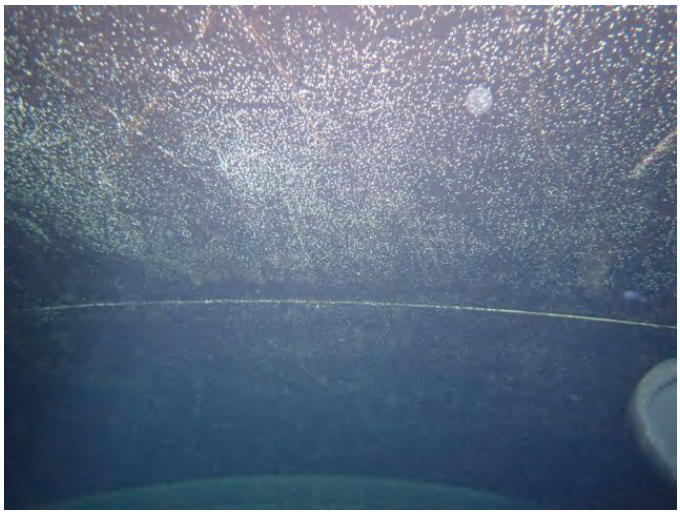
116 ***Rubber Check Valve***

117 ***Rubber Check Valve***

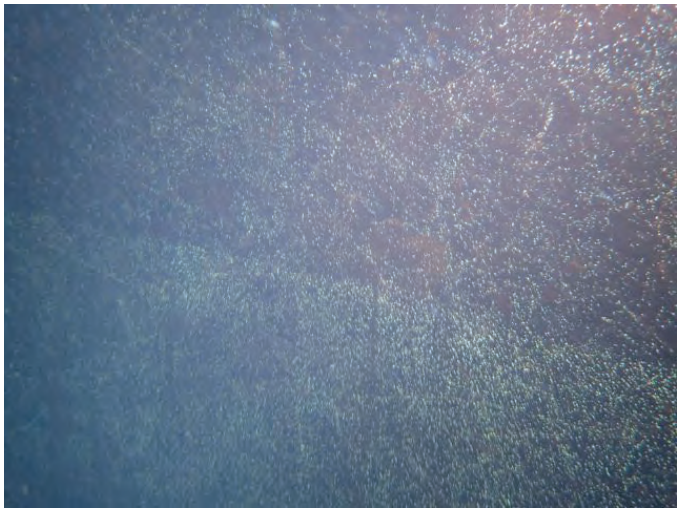
118 ***Interior Wall With Heavy Staining***



119 ***Interior Wall With Heavy Staining***



120 ***Interior Wall With Heavy Staining***

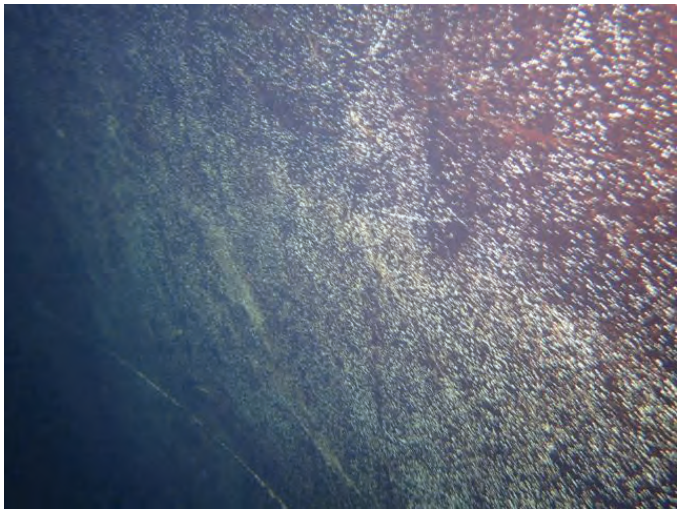


121 ***Interior Wall With Heavy Staining***

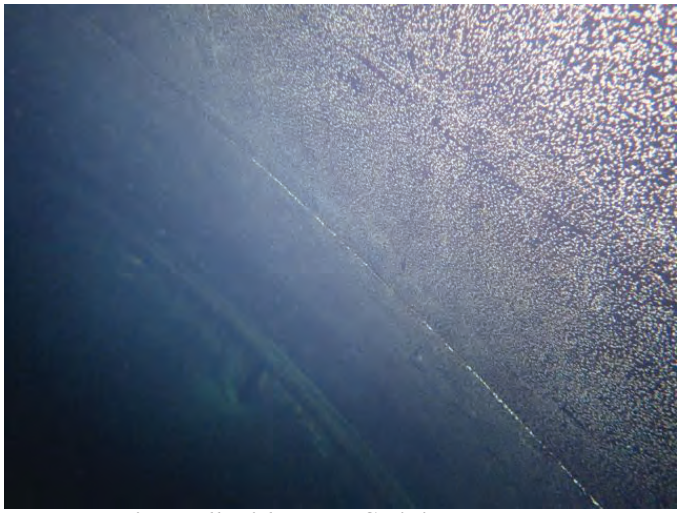
122 ***Interior Wall With Heavy Staining***

123 ***Interior Wall With Heavy Staining***

124 ***Interior Wall With Heavy Staining***



125 ***Interior Wall With Heavy Staining***



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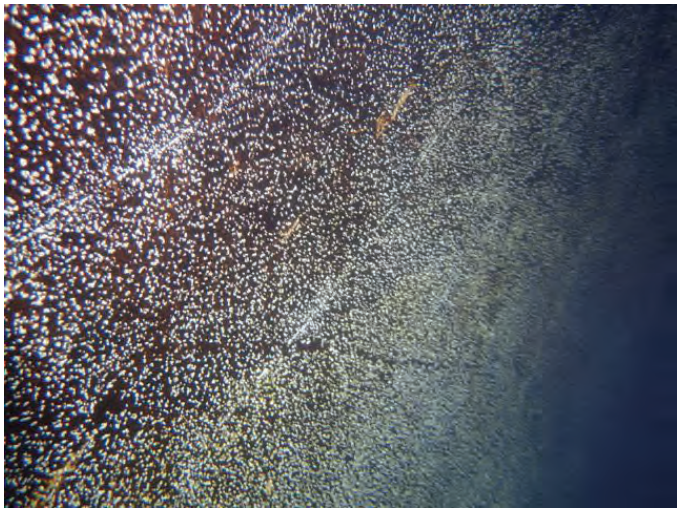
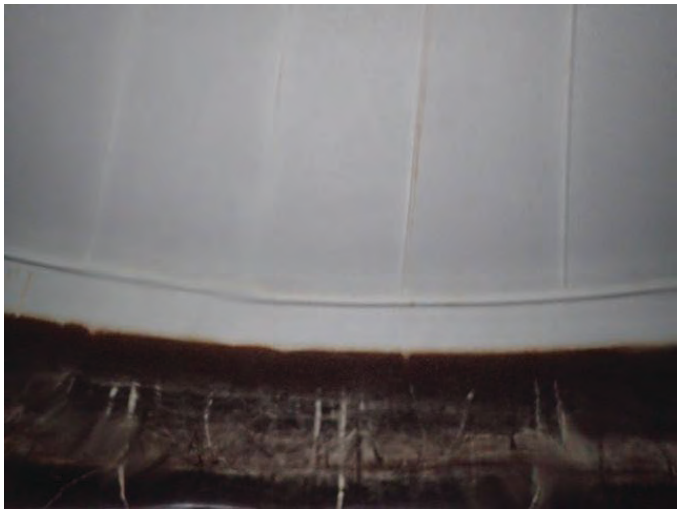


127 ***Interior Wall With Heavy Staining***

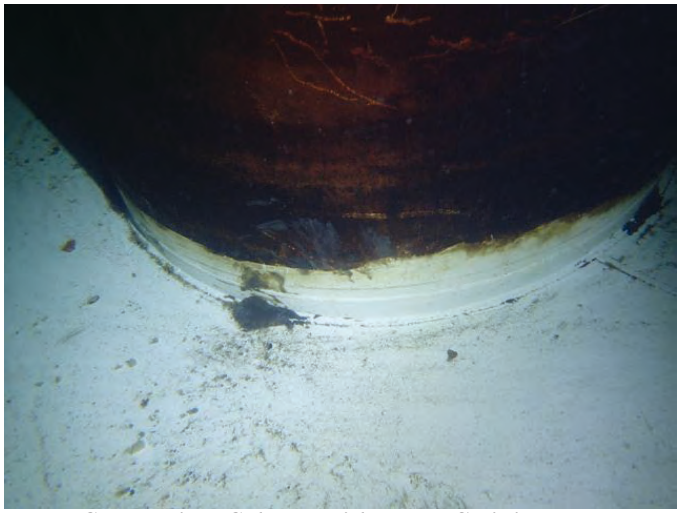
128 ***Interior Wall With Heavy Staining***

129 ***Interior Wall With Heavy Staining***

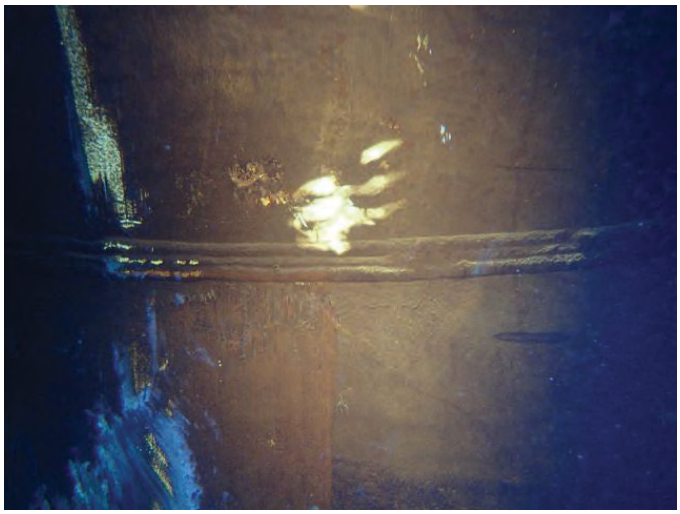
130 ***Interior Wall With Heavy Staining***



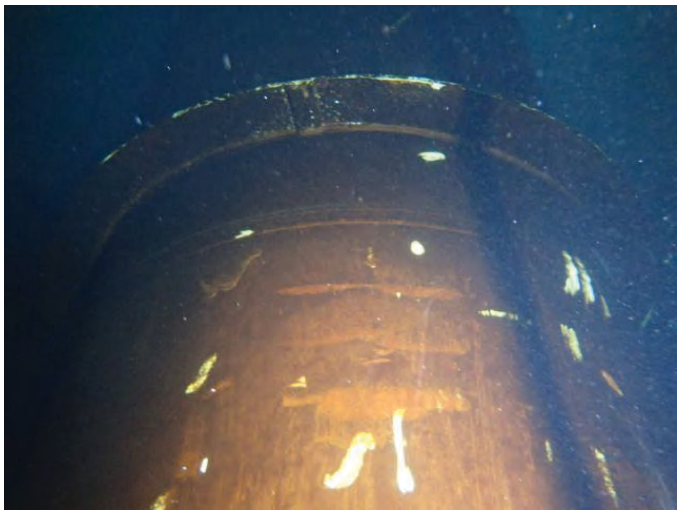
131 ***Interior Wall With Heavy Staining***



132 ***Center Riser Column With Heavy Staining***



133 ***Center Riser Column With Heavy Staining***



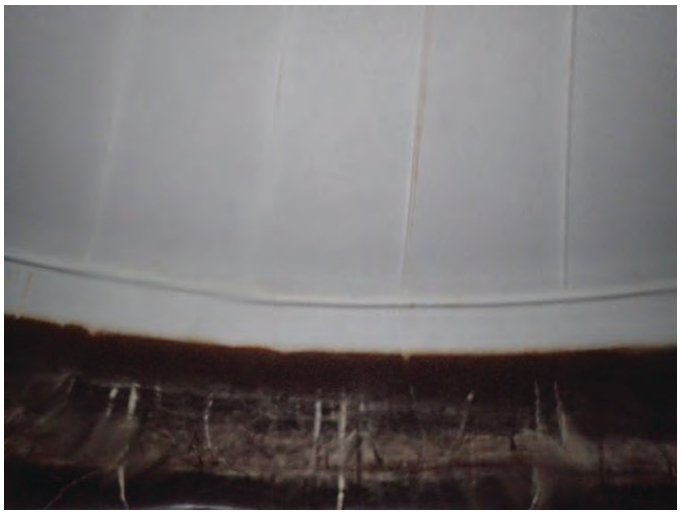
134 ***Center Riser Column With Heavy Staining***

135 ***Center Riser Column With Heavy Staining***

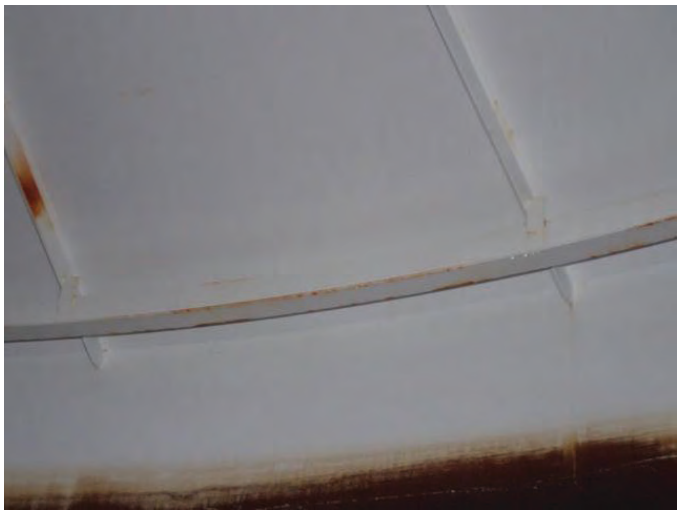
136 ***Center Riser Column With Heavy Staining***

137 ***Overhead Panels***

138 ***Overhead Panels***



139 ***Overhead Panels***



140 ***Overhead With Steel Supports Having Mild Surface Corrosion (Blotch Rusting)***

141 ***Overhead With Steel Supports Having Mild Surface Corrosion (Blotch Rusting)***

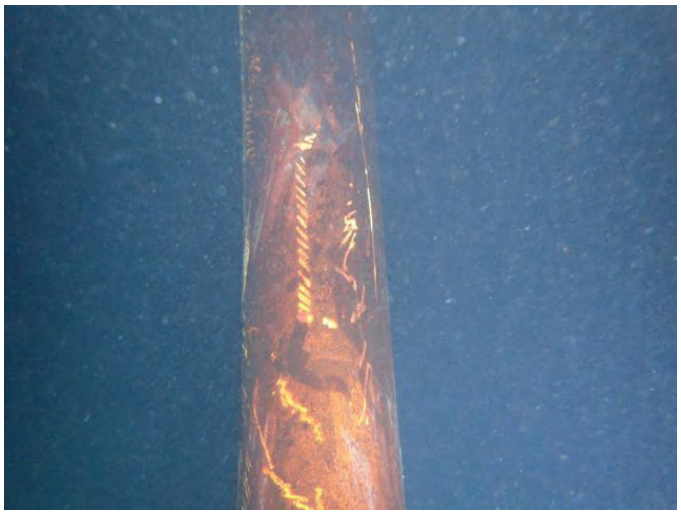
142 ***Overhead With Steel Supports Having Mild Surface Corrosion (Blotch Rusting)***

143 ***Overhead With Steel Supports Having Mild Surface Corrosion (Blotch Rusting)***

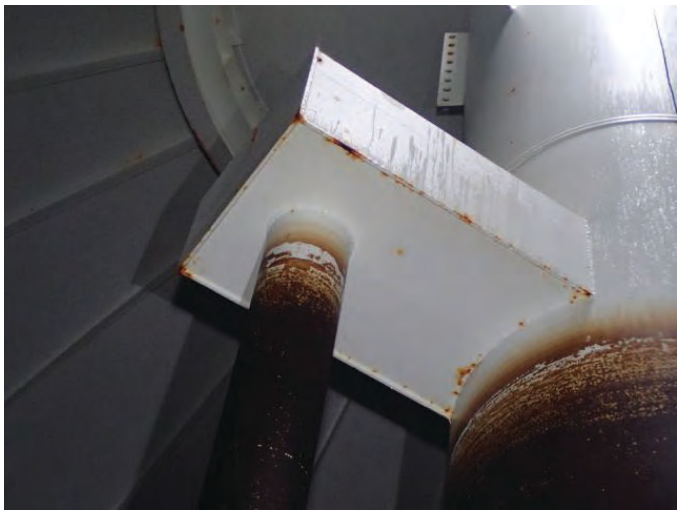
144 ***Overhead With Steel Supports Having Mild Surface Corrosion (Blotch Rusting)***

145 ***Overhead With Steel Supports Having Mild Surface Corrosion (Blotch Rusting)***

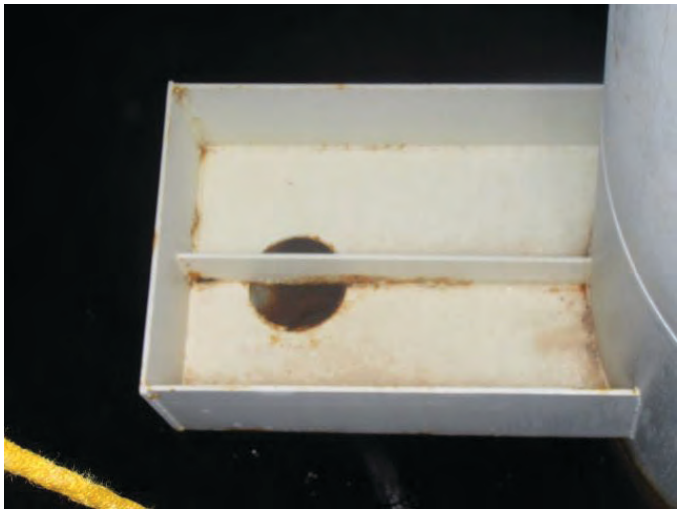
146 ***Overflow Pipe Penetrating The Tank Floor***



147 ***Overflow Pipe With Heavy Staining***



148 ***Overflow Pipe Weir Box With Coating Blisters, Exposed Underlying Steel And Mild Corrosion***



149 ***Overflow Pipe Weir Box With Coating Blisters, Exposed Underlying Steel And Mild Corrosion***

150 ***Discharge During Cleaning***

UNDERWATER SOLUTIONS INC.

INSPECTION AND INTERIOR CLEANING (SEDIMENT REMOVAL) OF THE COBBLE HILL 1-MILLION GALLON CONCRETE WATER STORAGE TANK

CITY OF WOONSOCKET WATER DIVISION
WOONSOCKET, RHODE ISLAND

JUNE 8, 2018

INSPECTION AND INTERIOR CLEANING (SEDIMENT REMOVAL) OF THE COBBLE HILL 1-MILLION GALLON CONCRETE WATER STORAGE TANK

CITY OF WOONSOCKET WATER DIVISION WOONSOCKET, RHODE ISLAND

JUNE 8, 2018

SCOPE:

On June 8, 2018, Underwater Solutions Inc. inspected the Cobble Hill 1-million gallon concrete potable water storage tank to provide information regarding the overall condition and integrity of this structure and removed the sediment accumulation from the floor.

EXTERIOR INSPECTION:

The entire exterior of this water storage tank (and all components) was inspected to include walls and coating, manways, ladder, overflow, roof, vent, and hatch.

Walls And Coating

The exterior shotcrete coated concrete walls were inspected and found appearing mostly sound, however tight shrinkage cracks were found throughout approximately 5-10% of these surfaces and were observed throughout all elevations of the exterior walls.

Efflorescence has accumulated within less than 25% of these cracks due to moisture penetration.

These cracks were sounded and appeared to be limited to the surface of the concrete and remain free of obvious voids or spalls at this time.

The protective coating applied to the exterior walls appears to have been applied uniformly and remains having good adhesion value, however no longer seals the shrinkage cracks.

A mild, non-uniform accumulation of mildew throughout the exterior walls causes declined aesthetics.

Manways

Two, 24" inside diameter, non-corrodible metal manways penetrate the walls on northernmost and southernmost sides of the tank, located approximately 24" above the ground, and are securely installed and free of obvious leakage.

The securing mechanism for each manway was found secured with a lock, preventing unwanted operation/opening.

Ladder

An aluminum ladder extends from approximately 9' above the ground up to the roof dome and is supported to the wall with nine sets of bolted standoffs, while having a fall prevention device installed throughout its length.

This ladder and fall prevention device were found in good sound condition, providing safe access to the roof.

A ladder guard secured with a lock is installed at the base of this ladder, preventing unwanted access to the ladder/roof.

Overflow

An 8" inside diameter overflow pipe penetrates the tank wall approximately 24" above the ground and extends outward 22" to a bolted flange. This pipe was found having a flap-valve installed at its end and a screen securely installed within this pipe, preventing access to the interior of the pipe/tank.

This overflow pipe was free of obvious obstructions at the time of this inspection.

The protective coating applied to this metal overflow pipe was found to be peeling, resulting in exposure of the primary coating and underlying metal. Mild corrosion exists on the surfaces of the exposed metal, however no obvious metal fatigue/deterioration was evident and the exposed primary coating remains having good adhesion value.

The non-corrodible metal flap-valve is not coated and was found appearing sound.

Roof

The precast panel concrete roof panels and concrete filled-joints between panels were inspected and the pre-cast concrete roof panels appeared sound and remain free of obvious concrete fatigue at this time. The concrete-filled joints between the pre-cast concrete panels appeared mostly sound, however tight cracks were observed throughout approximately 75% of the surfaces of the concrete-filled joints.

These cracks were sounded and appeared to be limited to the surface of the concrete and remain free of obvious voids or spalls at this time.

The protective coating applied to these surfaces appears to have been applied uniformly and remains having good adhesion value, however no longer seals the cracks within the concrete-filled roof panel joints.

The aluminum safety railings bolted to the roof at the location of the interior access hatch were found securely installed and free of obvious fatigue or failures at this time.

An accumulation of mildew throughout the roof also causes declined aesthetics.

Vent

The vent is located within the center of the roof dome, having a 40” inside diameter, and stands 32” tall.

A 66” outside diameter non-corrodible metal cap and associated non-corrodible metal screen remains securely installed over the vent penetration in the roof, preventing access to the interior of the tank.

Hatch

One, 42" by 42" aluminum hatch provides access to the tank interior through the roof dome. This hatch remains in good condition and was found secured with a lock and a series of stainless-steel pressure locks, preventing unwanted access to the interior of the tank.

INTERIOR INSPECTION:

The entire interior of this water storage tank and all components were inspected to include sediment accumulations, floor, piping, walls, interior ladder, overhead, overflow, and aesthetic water quality.

Sediment Accumulations

A non-uniform layer of accumulated precipitate was found on all floor surfaces, ranging from 1/2" to 10" in depth.

After completing this inspection, all precipitate was removed (vacuumed) from the floor.

Floor

After removing the accumulated precipitate, the concrete floor was inspected and was found to be un-coated, appearing sound and remaining free of obvious cracks, spalls or settlement.

Mild staining remains throughout the entire floor, while a film believed to be lime remains throughout approximately 50% of the floor due to the accumulation of precipitate.

Manways

Two, 24" inside diameter non-corrodible metal manways penetrate the walls on the northernmost and southernmost sides of the tank, each located approximately 82" above the floor, and were found securely installed and free of obvious leakage.

An aluminum ladder extends from the floor up to each manway, supported to both the floor and wall with two sets of standoffs. Mild surface corrosion exists throughout the surfaces of each ladder and the southernmost ladder was found without obvious fatigue/deterioration at this time, while fatigue (pitting) of the aluminum was observed throughout approximately 10% of the surfaces of the northernmost ladder, having depths ranging from barely detectable levels to 1/8" deep.

Piping

Two pipes were inspected within this potable water storage tank.

The first pipe inspected penetrates the floor of a 24" by 24" by 6" deep sump formed within the tank floor, located approximately 20" in from the wall and having a 10" inside diameter.

This pipe was free of obvious obstructions and was found without flow at the time of this inspection.

The protective coating applied to this metal pipe was found having poor adhesion value, causing metal exposure and corrosion throughout approximately 50% of these surfaces, while fatigue (pitting) of the metal, having depths from barely detectable levels to 1/32" deep, exists within all areas of corrosion at this time.

The second pipe inspected penetrates the floor of a 24" by 24" by 6" deep sump formed within the tank floor, located approximately 22" in from the wall and having a 14" inside diameter.

This metal pipe extends up 8" through a 90° elbow to a four-way section of a cross pipe.

Each side of the four-way section cross pipe extends approximately 24", having stainless steel grates securely installed approximately 10" above the floor. Each effluent grate was free of obvious obstructions and was without flow at the time of this inspection.

The other end of the four-way cross pipe extends across the floor, supported with eight concrete supports, to a (T) that terminates approximately 35" from the opposite side of the tank.

Each side of the (T) extends 10" to rubber influent check valves and terminate approximately 18" above the floor. Each rubber influent check valve was free of obvious obstructions and flow was entering the tank through each influent check valve at the time of this inspection.

The protective coating applied to this metal water mixing pipe and pipe securing hardware appears to have been applied uniformly, however blistering of the coating was observed throughout approximately 10%-15% of these surfaces, causing metal exposure and corrosion. However, this pipe and pipe securing hardware remain sound and free of obvious fatigue/deterioration at this time.

Walls

The interior concrete walls were inspected beginning at the floor and by spiraling the circumference of the tank up to the water surface.

These pre-cast concrete wall panels and concrete-filled wall slot panel joints are not coated, and these concrete surfaces were found appearing mostly sound, however several tight cracks were observed throughout less than 5% of these wall panel and concrete filled wall slot panel joint surfaces.

Two tight surface cracks were found on the easternmost side of the tank, approximately 5' above the floor.

Each crack measured approximately 48" in length, appeared to be limited to the surface of the concrete and remained free of obvious spalls, while no obvious leakage was evident or occurring through these cracks at the time of this inspection.

Additional cracks were observed on the southernmost side of the tank, approximately 12" below the junction of where the roof and walls meet. These tight cracks span a distance of approximately 45' and were evident within the wall panels and concrete-filled wall slot panel joints. No obvious spall of the concrete wall panels or concrete-filled wall slot panel joints was evident within these cracks at this time.

An 8" wide by 21" tall concrete curb spans the circumference of the tank, located at the base of the interior walls. This concrete curb is not coated and was found appearing sound and remains free of obvious concrete fatigue at this time.

Heavy staining exists throughout all wall surfaces, beginning approximately 10' below overflow level and extending down to the floor.

Interior Ladder

An aluminum ladder extends from the floor up to the access hatch, supported to the tank wall with twelve sets of bolted standoffs, and has a fall prevention device installed throughout its length, providing safe access and egress.

Corrosion exists throughout the length of this ladder and fatigue (pitting) of the aluminum, having depths from barely detectable levels to 1/4" in diameter by 1/32" deep, was found within these areas of corrosion. However, this ladder remains secure and sound at this time.

The non-corrodible metal fall prevention device installed on this ladder was found appearing sound and without corrosion at this time.

Overhead

The entire overhead was inspected from the water surface.

These pre-cast concrete overhead panels and concrete-filled joints between panels are not coated and these concrete surfaces appeared sound and remain free of cracks, spalls or other obvious fatigue of the concrete at this time.

Overflow

The overflow consists of an 8" inside diameter pipe cast within a 27" by 20" concrete box formed to the tank wall that begins approximately 12" below the junction of where the roof and walls meet and extends down and terminates approximately 8' above the floor.

This concrete overflow box is not coated and was found appearing mostly sound, however tight cracks were observed throughout approximately 15% of these surfaces, and at the junction of where the overflow box is formed to the wall. Efflorescence has accumulated within these cracks, however these cracks appeared to be limited to the surface of the concrete overflow box and were found free of obvious spalls.

Aesthetic Water Quality

The aesthetic water quality was good throughout the tank, allowing unlimited visibility for this inspection.

RECOMMENDATIONS:

It is the opinion of Underwater Solutions Inc. that this concrete potable water storage tank appears mostly sound and remains free of obvious leakage.

EXTERIOR:

The tight shrinkage cracks found throughout all elevations of the exterior walls were sounded and appeared to be limited to the surface of the shotcrete cover coating and remain free of obvious voids or spalls at this time.

The protective coating applied to the exterior walls appears to have been applied uniformly and remains having good adhesion value, however no longer seals the shrinkage cracks.

The pre-cast concrete roof panels appeared sound and remain free of obvious concrete fatigue at this time. The concrete-filled joints between the pre-cast concrete panels appeared mostly sound, however tight cracks were observed throughout approximately 75% of the surfaces.

These cracks were sounded and appeared to be limited to the surface of the concrete and remain free of obvious voids or spalls at this time.

The protective coating applied to these surfaces appears to have been applied uniformly and remains having good adhesion value, however no longer seals the cracks within the concrete-filled roof panel joints.

A mild, non-uniform accumulation of mildew throughout the exterior walls and roof dome causes declined aesthetics.

It is our recommendation to pressure-wash the exterior wall and roof surfaces at 3,500 P.S.I. and at 3.5 G.P.M. to remove the accumulated mildew from these surfaces and remove the accumulated efflorescence from the cracks. We then recommend re-coating the exterior walls and roof dome using an epoxy/polyurethane flexible coating to seal all cracks, seal and protect the concrete, while improving the overall aesthetics.

All components affixed to this tank are properly installed this time.

The cap and associated screen remains securely installed over the vent penetration in the roof, preventing access to the interior of the tank.

A flap-valve installed at the end of the overflow pipe and a screen installed within the overflow pipe are secure, preventing access to the interior of the tank.

The protective coating applied to the metal overflow pipe was found to be peeling, causing primary coating exposure, metal exposure and corrosion.

It is our recommendation to power tool clean the surfaces of the overflow pipe to remove all corrosion and to prepare the substrate. We then recommend re-coating these surfaces to halt corrosion, prevent metal fatigue/deterioration and to provide good protection for these metal surfaces.

The interior access hatch located on the roof was found secured with a lock and a series of stainless steel pressure locks, preventing unwanted access to the interior of the tank.

A ladder guard secured with a lock is installed at the base of the roof access ladder, preventing unwanted access to the ladder/roof.

The securing mechanism for each manway was found secured with a lock, preventing unwanted operation/opening.

INTERIOR:

The interior concrete floor surfaces appeared sound and remain free of obvious cracks, spalls or settlement and requires no remedial action at this time.

The interior pre-cast concrete wall panels and concrete-filled wall slot panel joints were found appearing mostly sound, however several tight cracks were observed throughout less than 5% of these surfaces at the time of this inspection.

Two tight surface cracks were found on the easternmost side of the tank, approximately 5’ above the floor.

Each crack measured approximately 48” in length and appeared to be limited to the surface of the concrete and was found free of obvious spalls, while no obvious leakage was evident or occurring through these cracks at the time of this inspection.

Additional cracks were observed on the southernmost side of the tank, approximately 12" below the junction of where the roof and walls meet. These tight cracks span a distance of approximately 45' and were evident within the wall panels and concrete-filled wall slot panel joints. No obvious spall of the concrete wall panels or concrete-filled wall slot panel joints was evident within these cracks at the time of this inspection.

It is our recommendation to monitor the tight cracks found throughout the interior walls through future scheduled inspections to ensure that concrete spall does not occur and result in exposure of the underlying reinforcement steel.

The interior concrete overflow box was found appearing mostly sound, however tight cracks were observed throughout approximately 15% of these surfaces at the junction of where the overflow box is formed to the wall. Efflorescence has accumulated within these cracks, however these cracks appeared to be limited to the surface of the concrete overflow box and were free of obvious spalls.

It is our recommendation to monitor the cracks through future scheduled inspections to ensure that concrete spall does not occur and result in exposure of the underlying reinforcement steel.

These pre-cast concrete overhead panels and concrete-filled joints between panels appeared sound and require no remedial action at this time.

Corrosion exists on the surfaces of each manway access ladder and fatigue (pitting) of the aluminum having depths ranging from barely detectable levels to 1/8" deep was observed throughout the surfaces of the northernmost manway access ladder, and although corrosion exists on the surfaces of the southernmost manway access ladder, no obvious fatigue/deterioration of these aluminum surfaces was evident at the time of this inspection.

It is our recommendation to remove these manway access ladders and to install a replacement Fiberglass reinforced plastic ladder at each manway to provide safe access and egress.

The aluminum ladder that extends from the floor up to the access hatch remains securely bolted in-place and appears sound, however corrosion exists throughout the entire length this ladder and fatigue (pitting) of the aluminum, having depths from barely detectable levels to 1/4" in diameter by 1/32" deep, was found within these areas of corrosion.

It is our recommendation to remove this ladder and to install a fiberglass reinforced plastic ladder having a non-corrodible metal fall prevention device installed throughout its length to allow for safe access and egress.

The protective coating applied to the metal water mixing pipe and pipe securing hardware was found to be blistering, causing metal exposure and corrosion. However, this pipe and pipe securing hardware remain sound at this time.

It is our recommendation that the next time this tank is removed from service and de-watered that the surfaces of this pipe showing metal exposure be power tool cleaned to remove all corrosion and to prepare the substrate. We then recommend re-coating these surfaces using an A.N.S.I.N.S.F.61 approved coating for use in structures containing potable water to halt corrosion, prevent metal fatigue/deterioration and to provide good protection for this metal pipe and pipe securing hardware.

As always, we recommend that re-inspection and cleaning of all water storage facilities be performed in accordance with state and federal mandates, A.W.W.A. standards, and completed by an experienced and authorized inspection corporation.

UNDERWATER SOLUTIONS INC.
Christopher A. Cole, Project Manager

This report, the conclusions, recommendations and comments prepared by Underwater Solutions Inc. are based upon spot examination from readily accessible parts of the tank. Should latent defects or conditions which vary significantly from those described in the report be discovered at a later date, these should be brought to the attention of a qualified individual at that time. These comments and recommendations should be viewed as information to be used by the Owner in determining the proper course of action and not to replace a complete set of specifications. All repairs should be done in accordance with A.W.W.A. and/or other applicable standards.

1 *Exterior Wall With Tight Shrinkage Cracks, Efflorescence And Mild Mildew*

2 *Exterior Wall With Tight Shrinkage Cracks, Efflorescence And Mild Mildew*

3 *Exterior Wall With Tight Shrinkage Cracks, Efflorescence And Mild Mildew*

4 *Exterior Wall With Tight Shrinkage Cracks, Efflorescence And Mild Mildew*

5 *Exterior Wall With Tight Shrinkage Cracks, Efflorescence And Mild Mildew*

6 *Exterior Wall With Tight Shrinkage Cracks, Efflorescence And Mild Mildew*

7 ***Exterior Wall With Tight Shrinkage Cracks, Efflorescence And Mild Mildew***

8 ***Exterior Wall With Tight Shrinkage Cracks, Efflorescence And Mild Mildew***

9 ***Exterior Wall With Tight Shrinkage Cracks, Efflorescence And Mild Mildew***

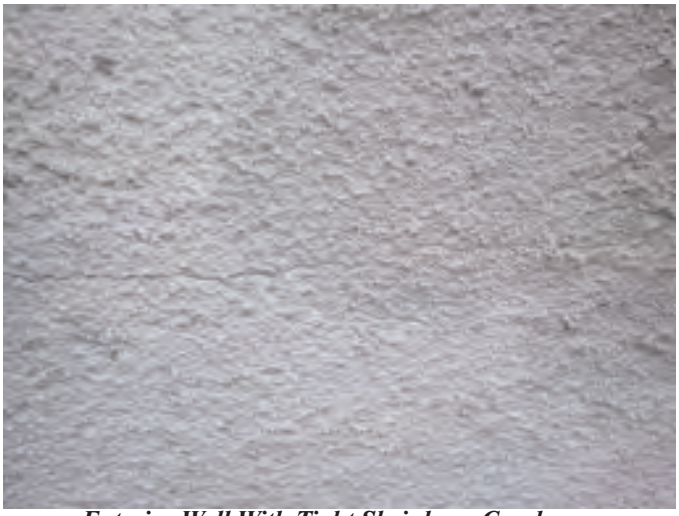
10 ***Exterior Wall With Tight Shrinkage Cracks, Efflorescence And Mild Mildew***

11 ***Exterior Wall With Tight Shrinkage Cracks, Efflorescence And Mild Mildew***

12 ***Exterior Wall With Tight Shrinkage Cracks, Efflorescence And Mild Mildew***

13 ***Exterior Wall With Tight Shrinkage Cracks, Efflorescence And Mild Mildew***

14 ***Exterior Wall With Tight Shrinkage Cracks, Efflorescence And Mild Mildew***

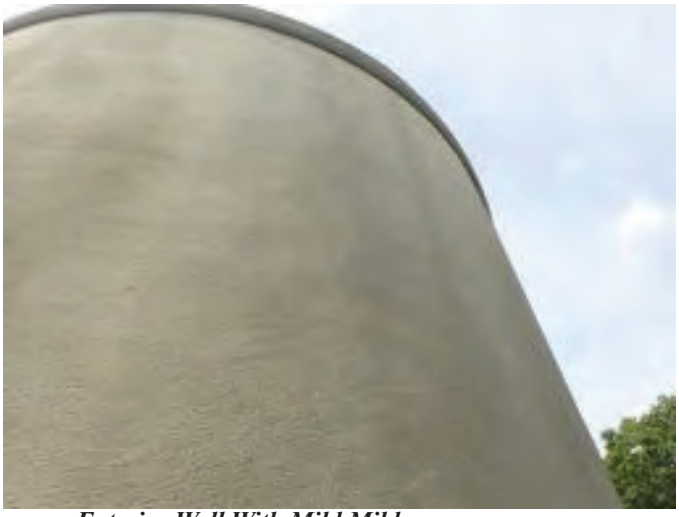


15 ***Exterior Wall With Tight Shrinkage Cracks, Efflorescence And Mild Mildew***

16 ***Exterior Wall With Mild Mildew***

17 ***Exterior Wall With Mild Mildew***

18 ***Exterior Wall With Mild Mildew***



19 ***Exterior Wall With Mild Mildew***

20 ***Exterior Wall With Mild Mildew***

21 ***Exterior Wall With Mild Mildew***

22 ***Exterior Wall With Mild Mildew***

23 ***Exterior Wall With Mild Mildew***

24 ***Secure Manway***

25 ***Secure Manway***

26 ***Ladder With A Fall Prevention Device***

27 ***Ladder Guard Secured With A Lock***

28 ***Overflow Pipe Having Coating Peeling, Exposed Primary Coating, Underlying Metal And Mild Corrosion With A Flap-Valve***

29 ***Secure Overflow Screen***

30 ***Roof Panels With Tight Cracks Within The Concrete-Filled Joints And Mildew***

31 ***Roof Panels With Tight Cracks Within The Concrete-Filled Joints And Mildew***

32 ***Roof Panels With Tight Cracks Within The Concrete-Filled Joints And Mildew***

33 ***Roof Panels With Tight Cracks Within The Concrete-Filled Joints And Mildew***

34 ***Roof Panels With Tight Cracks Within The Concrete-Filled Joints And Mildew***

35 ***Roof Panels With Tight Cracks Within The Concrete-Filled Joints And Mildew***

36 ***Roof Panels With Tight Cracks Within The Concrete-Filled Joints And Mildew***

37 ***Roof Panels With Tight Cracks Within The Concrete-Filled Joints And Mildew***

38 ***Secure Roof Safety Railings***

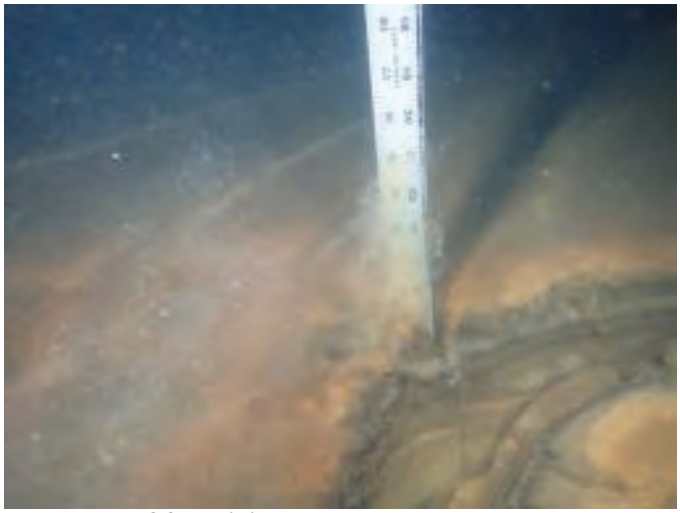
39 ***Secure Vent Cap***

40 ***Secure Vent Screen***

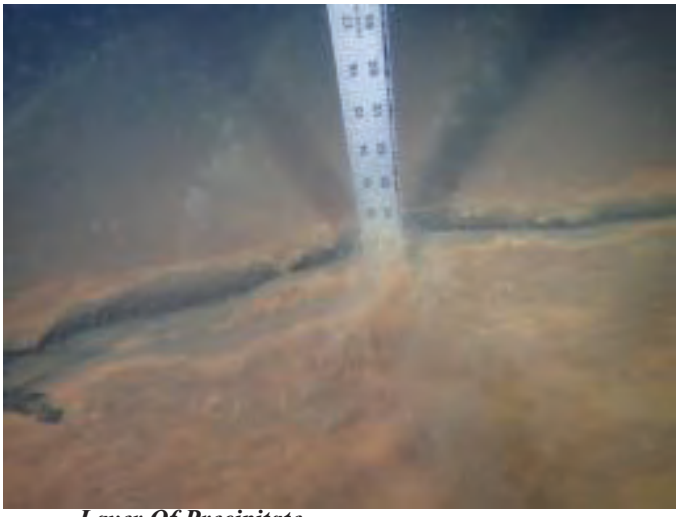
41 ***Open Access Hatch***

42 ***Closed Access Hatch***

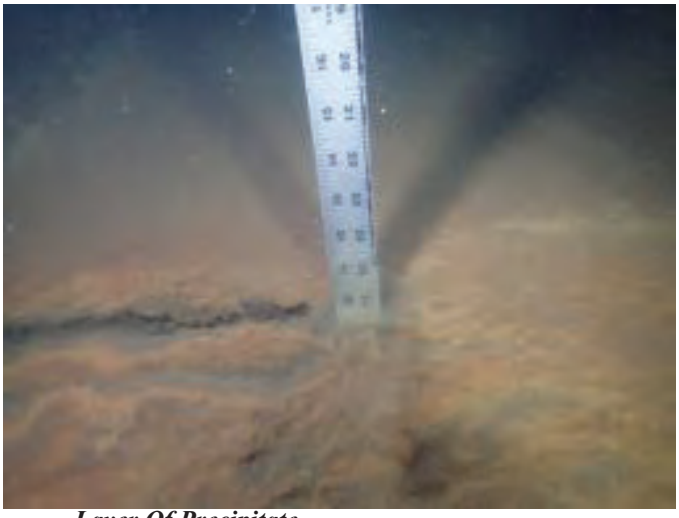
43 ***Secure Access Hatch***



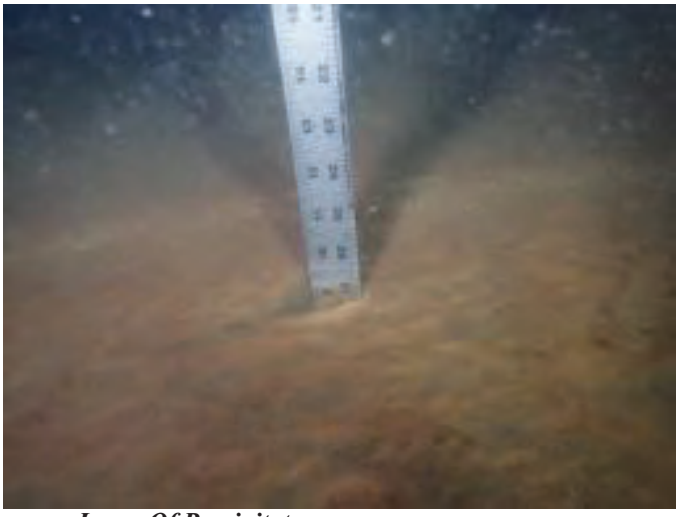
44 ***Layer Of Precipitate***



45 ***Layer Of Precipitate***



46 ***Layer Of Precipitate***



47 ***Layer Of Precipitate***

48 ***Floor With Mild Staining***

49 ***Floor With Mild Staining***

50 ***Floor With Mild Staining***

51 ***Floor With Mild Staining***

52 ***Floor With Mild Staining***

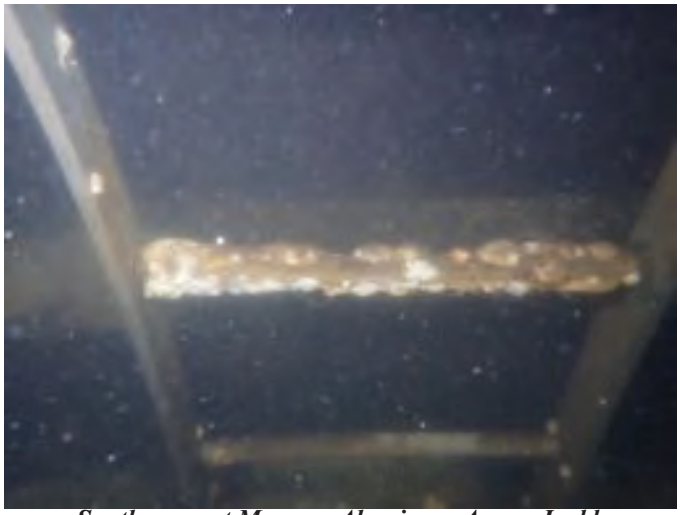
53 ***Floor With Mild Staining***

54 ***Northernmost Manway***

55 *Northernmost Manway Aluminum Access Ladder With Fatigue (Pitting) And Mild Corrosion*

56 *Northernmost Manway Aluminum Access Ladder With Fatigue (Pitting) And Mild Corrosion*

57 *Southernmost Manway*



58 *Southernmost Manway Aluminum Access Ladder With Fatigue (Pitting) And Mild Corrosion*

59 *Southernmost Manway Aluminum Access Ladder With Fatigue (Pitting) And Mild Corrosion*

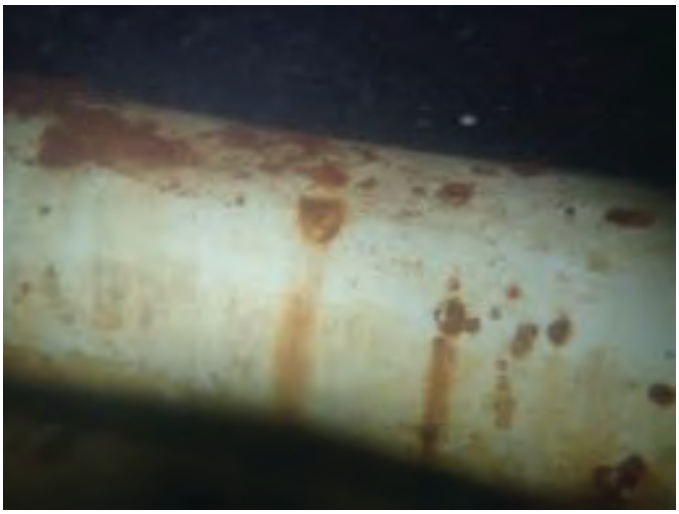
60 *10" Inside Diameter Pipe With Coating Loss, Exposed Metal, Fatigue (Pitting) And Corrosion*

61 ***14" Inside Diameter Flush Penetration Within A Sump Floor***

62 ***14" Inside Diameter Pipe With Coating Blisters, Exposed Metal And Corrosion***

63 ***Effluent Grate***

64 ***Effluent Grate***



65 ***14" Inside Diameter Pipe With Coating Blisters, Exposed Metal And Corrosion***

66 ***14" Inside Diameter Pipe With Coating Blisters, Exposed Metal And Corrosion***

67 ***Concrete Pipe Support***

68 ***Concrete Pipe Support***

69 ***Concrete Pipe Support***

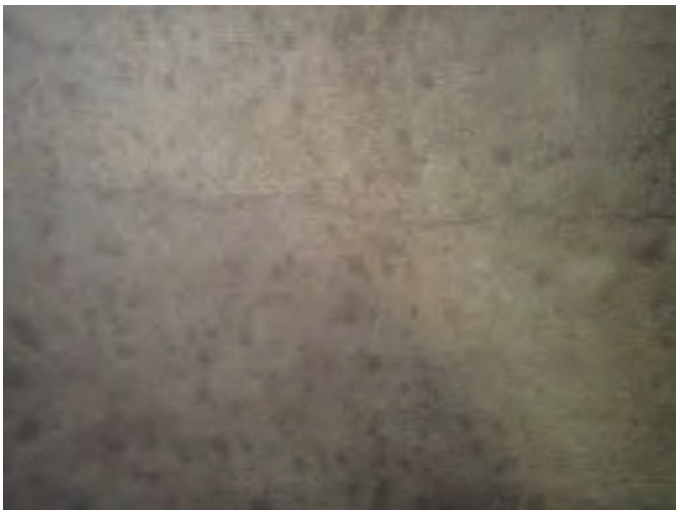
70 ***Concrete Pipe Support***

71 ***Concrete Pipe Support***

72 ***Influent Rubber Check Valve***

73 *Influent Rubber Check Valve*

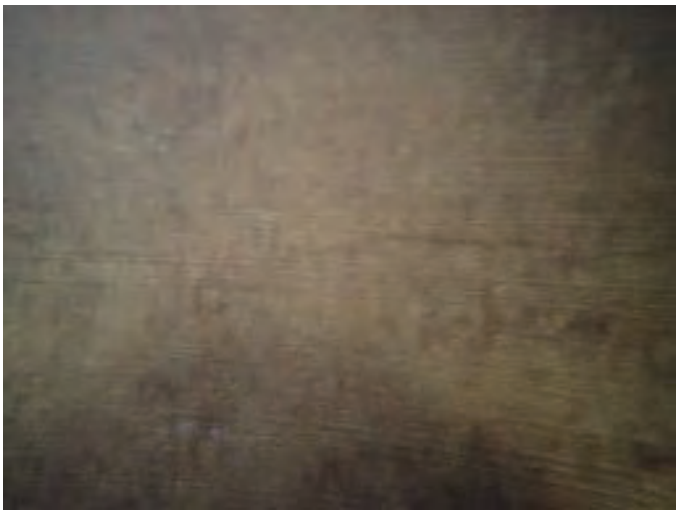
74 *Interior Wall With Tight Surface Cracks And Heavy Staining*



75 *Interior Wall With Tight Surface Cracks And Heavy Staining*

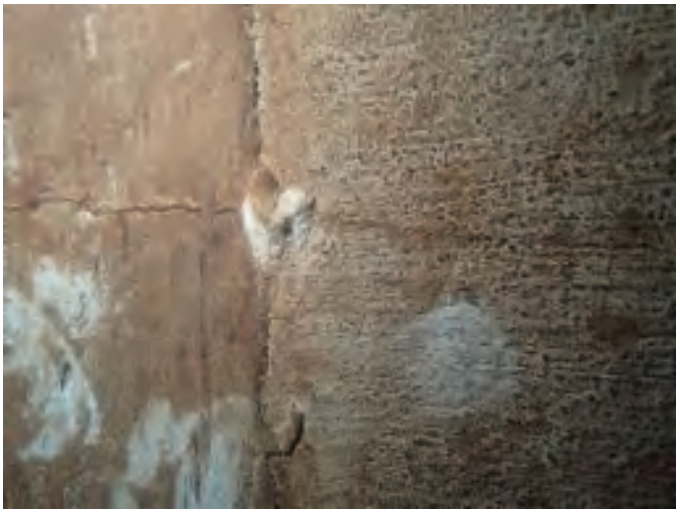
76 *Interior Wall With Tight Surface Cracks And Heavy Staining*

77 *Interior Wall With Tight Surface Cracks And Heavy Staining*



78 *Interior Wall With Tight Surface Cracks And Heavy Staining*

79 ***Interior Wall With Tight Surface Cracks And Heavy Staining***



80 ***Interior Wall With Tight Surface Cracks And Heavy Staining***

81 ***Interior Wall With Tight Surface Cracks And Heavy Staining***

82 ***Interior Wall With Tight Surface Cracks And Heavy Staining***

83 ***Interior Wall With Tight Cracks And Heavy Staining***

84 ***Interior Wall With Tight Cracks And Heavy Staining***

85 ***Interior Wall With Tight Cracks And Heavy Staining***

86 ***Interior Wall With Tight Cracks And Heavy Staining***

87 ***Interior Wall With Tight Cracks And Heavy Staining***

88 ***Interior Wall With Tight Cracks And Heavy Staining***

89 ***Interior Wall With Tight Cracks And Heavy Staining***

90 ***Interior Concrete Curb***

91 ***Interior Concrete Curb***

92 ***Interior Concrete Curb***

93 ***Interior Wall With Heavy Staining***

94 ***Interior Wall With Heavy Staining***

95 ***Interior Wall With Heavy Staining***

96 ***Interior Wall With Heavy Staining***

97 ***Interior Wall With Heavy Staining***

98 ***Interior Wall With Heavy Staining***

99 ***Interior Aluminum Ladder And Fall Prevention Device With Fatigue (Pitting) And Corrosion***

100 ***Interior Aluminum Ladder And Fall Prevention Device With Fatigue (Pitting) And Corrosion***

101 ***Interior Aluminum Ladder And Fall Prevention Device***

102 ***Interior Aluminum Ladder And Fall Prevention Device With Fatigue (Pitting) And Corrosion***

103 ***Interior Aluminum Ladder And Fall Prevention Device With Fatigue (Pitting) And Corrosion***

104 ***Overhead***

105 ***Overhead***

106 ***Overhead***

107 ***Overhead***

108 ***Overhead***

109 ***Concrete Overflow Box With Tight Cracks And Efflorescence***

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UNDERWATER SOLUTIONS INC.

INSPECTION AND INTERIOR CLEANING (SEDIMENT REMOVAL) OF THE DIAMOND HILL 750,000-GALLON ELEVATED WELDED STEEL WATER STORAGE TANK

CITY OF WOONSOCKET WATER DIVISION
WOONSOCKET, RHODE ISLAND

JUNE 11, 2018

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CITY OF WOONSOCKET WATER DIVISION WOONSOCKET, RHODE ISLAND

JUNE 11, 2018

SCOPE:

On June 11, 2018, Underwater Solutions Inc. inspected the Diamond Hill 750,000-gallon elevated welded steel potable water storage tank to provide information regarding the overall condition and integrity of this structure and removed the sediment accumulation from the floor.

EXTERIOR INSPECTION:

The entire exterior of this water storage tank (and all components) was inspected to include walls and coating, anchor bolts and concrete support pads, support components, center riser columns, support legs, manways, ladders, catwalk, overflow, roof, vent and hatch.

Walls And Coating

The exterior steel wall panels and associated welds were inspected and found appearing sound and remain free of obvious fatigue or failures.

The protective coating applied to the exterior walls and tank base has an average dry film thickness of 13.4 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value. However, damage to the protective coating was observed throughout approximately 5% of all elevations of the exterior walls, appearing to be the result of objects striking the tank, and cause exposure of the underlying steel. No obvious fatigue/deterioration of the steel was evident within these 2"-7" long areas of steel exposure, rather mild corrosion exists at this time.

A mild, non-uniform accumulation of mildew throughout the tank base causes declined aesthetics.

Anchor Bolts And Concrete Support Pads

Two, 1-1/2" diameter anchor bolts extend up from a concrete pad through a 40" diameter by 1-1/2" thick steel plate welded to the base of each of the ten, 30" outside diameter tower support legs.

Eight, 1-1/4" diameter anchor bolts extend up from a concrete support pad through a 9'9" diameter by 2" thick steel plate welded to the base of the 9' outside diameter (outer riser column) center riser column.

Four, 1-1/2" diameter anchor bolts extend up from a concrete support pad through a 69" by 3/4" thick steel plate welded to the base of the 60" outside diameter (inner riser column) center riser column.

Each anchor bolt has one nut properly and securely installed and the protective coating applied to this support hardware was found having good adhesion value at this time.

The concrete support pad located below the center riser columns is not coated and was found appearing mostly sound, however three areas of concrete spall were found throughout these surfaces at this time. The first area of concrete spall measures 30" in length by 4" in width and has an average maximum depth of 1/2" deep. The second area of concrete spall measures 7" in length by 6" in width and has an average maximum depth of 1" deep. The third area of concrete spall measures 6" in length by 4" in width and has an average maximum depth of 1/2" deep.

The surrounding and underlying concrete within each spall remains sound and with no obvious exposure of the underlying reinforcement steel at this time.

The concrete support pads located below each tower support leg are not coated and were found appearing mostly sound, however tight cracks were observed throughout approximately 5-10% of the surfaces of each concrete support pad. These cracks were sounded and appeared to be limited to the surface of the concrete and free of obvious voids or spalls at this time.

Support Components

Each of the twenty, 6" by 8" struts (cross members), thirty 1" diameter anti-sway rods and thirty sets of 2" diameter cross braces, to include all supporting hardware, appeared sound and properly installed.

The protective coating applied to the support components appears to have been applied uniformly and was found having good adhesion value. A mild rust stain was observed extending from the connecting plates and support component securing hardware, however no obvious coating fatigue or steel exposure was evident within these areas of rust staining.

A mild, non-uniform accumulation of mildew throughout the support component surfaces causes declined aesthetics.

Center Riser Columns And Support Legs

The 9' outside diameter outer center riser column surrounds and encases the 60" outside diameter inner center riser column. Each welded steel riser column appeared sound and remains free of obvious fatigue or failures.

The protective coating on each of these riser columns has good adhesion value throughout all surfaces and elevations.

The protective coating applied to the surfaces of the outer riser column has an average dry film thickness of 9.6 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for the steel.

The protective coating applied to the surfaces of the inner riser column has an average dry film thickness of 9.6 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for the steel.

Each of the ten, 30" outside diameter welded steel support legs appeared sound and remain free of obvious fatigue or failures.

The protective coating applied to each tower support leg has an average dry film thickness of 11.9 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for each welded steel support leg.

A mild, non-uniform accumulation of mildew throughout the outer center riser column and each support leg also causes declined aesthetics.

Manways

One, 24" inside diameter manway penetrates the outer center riser column 26" above the ground, providing access to the inner center riser column and was found secured with a lock, preventing unwanted access. The protective coating applied to this steel manway was found having good adhesion value at this time.

A 24" inside diameter manway penetrates the inner center riser column 24" above its base and is securely bolted in place and free of obvious leakage. The protective coating applied to this steel manway and associated securing hardware was found having good adhesion value at this time.

A 24" inside diameter manway penetrates the base of the tank within the outer center riser column, located approximately 12" in from the (inner) riser column, and is securely installed and free of obvious leakage. The protective coating applied to this steel manway and associated securing hardware was found having good adhesion value at this time.

Ladders

The first ladder inspected extends from approximately 22' above the ground up to the catwalk and is secured to the northernmost tower leg with nine sets of welded standoffs. This ladder has a fall prevention device installed throughout its length, providing safe access to the catwalk.

The protective coating applied to this steel ladder appears to have been applied uniformly and was found having mostly good adhesion value, however isolated areas of coating loss and exposed steel were observed throughout less than 5% of these surfaces. No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild surface corrosion exists at this time. The galvanized steel fall prevention device is not coated and was found appearing sound at this time.

The second ladder inspected extends from the catwalk up to the center of the roof dome, secured to the vent with one bolted support, and provides good access to the vent. The protective coating applied to this steel ladder appears to have been applied uniformly and was found having mostly good adhesion value, however isolated areas of coating loss and exposed steel were observed throughout less than 5% of these surfaces. No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild surface corrosion exists at this time.

The third ladder inspected extends from the base of the interior of the outer center riser column up to a walkway, which extends to the manway that penetrates the base of the bowl. This ladder is supported to the riser wall with eight sets of welded standoffs, providing good access. The protective coating applied to this steel ladder appears to have been applied uniformly and was found having good adhesion value at this time.

Catwalk

A 24" wide catwalk spans the circumference of the tank and is securely welded in-place. This ladder appeared sound and remains free of obvious fatigue or failures at this time.

The 42" tall angle iron safety railings bolted to and spanning the circumference of the catwalk were found securely installed and remain free of obvious fatigue or failures.

The protective coating applied to the welded steel catwalk and bolted steel safety railings appears to have been applied uniformly and was found having good adhesion value, providing adequate protection for these steel surfaces.

Overflow

A 6" inside diameter steel overflow pipe exits the base of a welded steel weir box and extends down, supported to the tank wall with one welded standoff and supported again to the westernmost tower leg with eleven welded standoffs. Approximately 40" above the ground this pipe turns 45˚ and extends into an 8" inside diameter pipe, supported within one concrete support, and penetrates the ground. Approximately 6' of the top of the 8" pipe is exposed prior to this pipe completely penetrating the ground, and a 4" long by 1/4" wide penetration was found within the top of the pipe that appears to be the result of an object striking the pipe. This penetration within the top of the pipe allows access to the interior of this pipe that extends to the tank interior.

The protective coating applied to the steel overflow weir box has an average dry film thickness of 16.0 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value, however several isolated areas of coating adhesion loss were observed throughout less than 5% of these surfaces, causing steel exposure and surface corrosion. However, no obvious fatigue/deterioration of the steel was evident within these areas of steel exposure at the time of this inspection.

The protective coating applied to the steel overflow pipe has an average dry film thickness of 16.0 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for the steel.

The surfaces of the exposed steel pipe located at ground level are not coated, and although corrosion exists on the surfaces of this pipe, no obvious fatigue/deterioration of the steel was evident.

Roof

The steel roof panels and associated welds were inspected and found appearing sound and remain free of obvious fatigue of failures.

The protective coating applied to these surfaces has an average dry film thickness of 19.7 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value, however secondary coating adhesion loss has resulted in exposure of the primary coating throughout approximately 5% of these surfaces. Adhesion loss of the protective coating has also resulted in exposure of the underlying steel throughout approximately 5% of these surfaces. No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild corrosion exists at this time.

The exposed primary coating within the areas of secondary coating adhesion loss remains having good adhesion value at this time.

Twenty-two, 5" inside diameter rigging hole penetrations are evenly-spaced throughout the roof, and a 6" diameter cover plate remains in-place over twenty-one of these penetrations, while one rigging hole penetration was found without a cover plate. Missing hardware adjacent to a properly installed cover plate causes a 1/4" diameter penetration that extends to the interior of the tank.

At the time of this inspection Underwater Solutions Inc. applied adhesive tape over the open 5" diameter rigging hole penetration to temporarily prevent access to the interior of the tank and applied an N.S.F.61-approved sealant over the 1/4" diameter penetration within the roof to prevent access to the interior of the tank.

While completing the interior inspection, daylight was observed shining into the tank around the circumference of four of the covered rigging hole penetrations; however, these four cover plates were found in-place and secure at this time.

A mild accumulation of mildew throughout the roof causes declined aesthetics.

Vent

The vent is located within the center of the roof dome, having a 26" inside diameter, and stands 28" tall.

A 32" outside diameter steel cap and associated screen remains securely installed over the vent penetration in the roof, preventing access to the interior of the tank.

The protective coating applied to this steel vent assembly has an average dry film thickness of 12.7 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value; however, isolated areas of coating adhesion loss throughout less than 5% of these surfaces has resulted in exposure of the underlying steel.

No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild corrosion exists at this time.

Hatch

One, 24" inside diameter hatch provides access to the tank interior through the roof dome.

This hatch remains in good working condition and was found secured with a lock, preventing unwanted access to the interior of the tank.

The protective coating applied to the exterior surfaces of the steel hatch lid and trunk appears to have been applied uniformly and was found having good adhesion value at this time.

The protective coating applied to the interior steel surfaces of the hatch lid and trunk appears to have been applied uniformly and was found having mostly good adhesion value, however minimal coating loss and steel exposure was observed on the top edge of the hatch trunk and inner surfaces of the hatch lid, at the location the hatch lid and trunk contact. No obvious fatigue/deterioration of either the steel hatch lid or trunk was evident within these areas of steel exposure, rather mild surface corrosion exists at this time.

INTERIOR INSPECTION:

The entire interior of this water storage tank (and components) was inspected to include sediment accumulations, floor, manway, piping, walls and coating, overhead, overflow and aesthetic water quality.

Sediment Accumulations

A uniform layer of accumulated precipitate was found throughout the floor having depths no greater than 1" deep.

After completing this inspection, all precipitate was removed (vacuumed) from the floor.

Floor

After removing the accumulated precipitate, the steel floor panels and associated welds were inspected and found appearing sound at this time.

The protective coating applied to these surfaces has an average dry film thickness of 32.0 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value; however, adhesion loss of the protective coating was observed throughout less than 5% of the floor on the easternmost side of the tank, resulting in exposure of the underlying steel. Corrosion exists within these areas of steel exposure and fatigue (pitting) of the steel, measuring 1" in diameter by 1/8" deep, was evident within these areas of exposed steel at the time of this inspection.

Mild staining remains throughout the floor due to the accumulation of precipitate.

Manway

A 24" inside diameter manway penetrates the floor (tank base) approximately 12" in from the center of the tank and is securely installed and free of obvious leakage. The protective coating applied to the steel manway lid and trunk has an average dry film thickness of 28.7 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value; however, adhesion loss of the protective coating was observed throughout approximately 10% of the outside edge of the manway lid and trunk, resulting in exposure of the underlying steel. No obvious fatigue/deterioration of either the steel manway lid or trunk was evident within these areas of steel exposure, rather mild corrosion exists at this time.

Piping

One pipe penetrates the floor in the center of the tank, having a 42" inside diameter, and is flush within the floor.

This pipe was free of obvious obstructions and was without flow at the time of this inspection.

A second pipe penetrates the floor approximately 25' in from the center of the tank, having a 3" inside diameter, and is flush with the floor. A plug is installed in this pipe eliminating it from use.

This pipe serves as the tank drain pipe, and the 3" inside diameter pipe that penetrates and extends from the base of the tank on the exterior was free of obvious obstructions at the time of this inspection.

The protective coating applied to this metal plug was found to be blistering, causing metal exposure and corrosion. However, this metal plug remains sound and free of obvious metal fatigue at this time.

Walls And Coating

The interior walls were inspected beginning at the floor and by spiraling the circumference of the tank up to the water surface.

These steel wall panels and associated welds appeared sound and remain free of obvious fatigue or failures.

The protective coating applied to these surfaces has an average dry film thickness of 13.4 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for the steel.

Mild staining exists throughout the interior walls, beginning approximately 24" below overflow level and extending down to the floor.

Overhead

The entire overhead was inspected from the water surface.

These steel overhead panels and channel iron supports appeared sound and remain free of obvious fatigue or failures.

The protective coating applied to these surfaces has an average dry film thickness of 31.3 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, while rust staining was observed throughout approximately 25% of the edges of the steel panels and edges of the channel iron supports. However, no obvious coating fatigue or steel exposure was evident at this time.

The vent penetration within the center of the overhead was free of obvious obstructions at this time.

Overflow

The overflow consists of a 24" wide by 4" tall cutout within the knuckle panel (top curved wall panel) and is located approximately 28" below the junction of where the roof and walls meet.

This overflow cutout was free of obvious obstructions at the time of this inspection.

Aesthetic Water Quality

The aesthetic water quality was good throughout the tank, allowing unlimited visibility for this inspection.

RECOMMENDATIONS:

It is the opinion of Underwater Solutions Inc. that this elevated welded steel potable water storage tank appears mostly sound and free of obvious leakage.

EXTERIOR:

The exterior welded steel surfaces of the tank and steel support components appeared sound and remain free of obvious fatigue or failures at this time.

The protective coating applied to the exterior tank walls and tank base appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value. However, damage to the protective coating was observed throughout approximately 5% of all elevations of the exterior walls, appearing to be the result of objects striking the tank, and cause exposure of the underlying steel. No obvious fatigue/deterioration of the steel was evident within these isolated areas of steel exposure, rather mild corrosion exists at this time.

The steel roof panels and associated welds were found appearing sound and remain free of obvious fatigue of failures.

The protective coating applied to these surfaces appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value. However, secondary coating adhesion loss has resulted in exposure of the primary coating throughout approximately 5% of these surfaces, while adhesion loss of the protective coating has resulted in exposure of the underlying steel throughout approximately 5% of these surfaces. No obvious fatigue/deterioration of the steel was evident within these areas of steel exposure, rather mild corrosion exists at this time.

The exposed primary coating within the areas of secondary coating adhesion loss remains having good adhesion value at this time.

A mild non-uniform accumulation of mildew throughout the exterior surfaces of the tank and associated support components causes declined aesthetics.

It is our recommendation to pressure-wash the exterior surfaces of the tank and associated support components at 3,000 P.S.I. and at 3.0 G.P.M. to remove the accumulated mildew from these surfaces to preserve the adhesion value of the protective coating and to improve the overall aesthetics.

We also recommend power tool cleaning the surfaces of the tank and roof showing steel exposure to remove all corrosion and to prepare the substrate, and to also power tool clean the surfaces of the roof showing primary coating exposure to prepare the substrate. We then recommend re-coating and these areas to halt corrosion, prevent steel fatigue/deterioration and to provide good protection for the steel.

Twenty-two, 5” inside diameter rigging hole penetrations are evenly spaced throughout the roof and a 6” diameter cover plate remains in-place over twenty-one of these penetrations, while one rigging hole penetration was found without a cover plate. Missing hardware adjacent to a properly installed cover plate also causes a 1/4" diameter penetration that extends to the interior of the tank.

At the time of this inspection Underwater Solutions Inc. applied adhesive tape over the open 5” diameter rigging hole penetration to temporarily prevent access to the interior of the tank and applied an N.S.F.61-approved sealant over the 1/4” diameter penetration within the roof to prevent access to the interior of the tank.

While completing the interior inspection, daylight was observed shining into the tank around the circumference of four of the covered rigging hole penetrations. However, these four cover plates were found in-place and secure at this time.

It is our recommendation to install a new cover plate over the rigging hole penetration that is temporarily sealed with adhesive tape utilizing an N.S.F.61-approved rubber gasket and N.S.F.61-approved sealant. We also recommend removing all existing cover plates and installing replacement N.S.F.61-approved gaskets, and that these be sealed in-place with an N.S.F.61-approved sealant, to prevent rainwater run-off and other contaminates from entering the interior of the tank.

The protective coating applied to the catwalk and catwalk safety railings, manways, anchor bolts, inner and outer center riser columns and tower support legs remains having good adhesion value, providing adequate protection for the steel and requires no remedial action at this time.

The protective coating applied to the support components appears to have been applied uniformly and was found having good adhesion value, while a mild rust stain was observed extending from the connecting plates and support component securing hardware. However, no obvious coating fatigue or steel exposure was evident within these areas of rust staining.

It is our recommendation to monitor the rust staining observed on the support component connecting plates and support component securing hardware through future scheduled inspections to ensure that coating adhesion loss does not occur and result in exposure of the underlying steel.

The protective coating applied to the steel overflow pipe that extends down, supported to the westernmost tower support leg, was found having good adhesion value and requires no remedial action at this time.

The protective coating applied to the welded steel overflow weir box appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value. However, several isolated areas of coating adhesion loss were observed throughout less than 5% of these surfaces, causing steel exposure and surface corrosion. However, no obvious fatigue/deterioration of the steel was evident within these areas of exposure at this time.

It is our recommendation to power tool clean the surfaces of the weir box showing steel exposure to remove all corrosion and to prepare the substrate. We then recommend re-coating areas to halt corrosion, prevent steel fatigue and to provide good protection for the steel.

An approximate 6' long section of the top of the 8" overflow pipe is exposed prior to this pipe completely penetrating the ground, and a 4" long by 1/4" wide penetration was found within the top of the pipe that appears to be the result of an object striking the pipe. This penetration allows access to the interior of this pipe, which extends to the tank interior. The surfaces of this exposed steel pipe located at ground level are not coated, and although corrosion exists on the surfaces of this pipe, no obvious fatigue/deterioration of the steel was evident.

It is our recommendation to weld a plate over this penetration to prevent access and to power tool clean the exposed steel surfaces of this overflow pipe to remove corrosion and to prepare the substrate. We then recommend re-coating these surfaces to halt corrosion, prevent steel fatigue and to provide good protection for the exposed surfaces of this pipe.

The protective coating applied to the steel ladder that provides access to the catwalk and the steel ladder that provides access to the roof/vent appears to have been applied uniformly and was found having mostly good adhesion value. However, isolated areas of coating loss and exposed steel were observed throughout less than 5% of the surfaces of each ladder. No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild surface corrosion exists at this time.

It is our recommendation to power tool clean the areas of steel exposure found throughout the surfaces of each ladder to remove all corrosion and to prepare the substrate. We then recommend re-coating these surfaces to halt corrosion, prevent steel fatigue/deterioration and to provide good protection for these steel surfaces.

The protective coating applied to the steel ladder located within the outer riser column appears to have been applied uniformly, was found having good adhesion value and requires no remedial action at this time.

The protective coating applied to the steel vent assembly appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value, however isolated areas of adhesion loss throughout less than 5% of these surfaces has resulted in exposure of the underlying steel.

No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild corrosion exists at this time.

It is our recommendation to power tool clean these areas showing steel exposure to remove all corrosion and to prepare the substrate. We then recommend re-coating these areas to halt corrosion, prevent steel fatigue and to provide good protection for the steel.

The protective coating applied to the exterior surfaces of the steel access hatch lid and trunk appears to have been applied uniformly, was found having good adhesion value and requires no remedial action at this time.

The protective coating applied to the interior steel surfaces of the hatch lid and trunk appears to have been applied uniformly and was found having mostly good adhesion value, however minimal coating loss and steel exposure was observed on the top edge of the hatch trunk and inner surfaces of the hatch lid, at the location the hatch lid and trunk contact. No obvious fatigue/deterioration of either the steel hatch lid or trunk was evident within these areas of exposure, rather mild surface corrosion exists at this time.

It is our recommendation to hand-tool clean the interior surfaces of the hatch trunk and hatch lid to remove all corrosion and to prepare the substrate. We then recommend re-coating these areas using an A.N.S.I./N.S.F.61 approved coating for use in structures containing potable to water to halt corrosion, prevent steel fatigue/deterioration and to provide good protection for the steel.

We recommend that when the interior surfaces of this hatch lid and trunk are rehabilitated that the interior of the tank be masked off to prevent the contaminates generated by the preparation of these surfaces from entering the tank interior.

The concrete support pad located below the center riser columns was found appearing mostly sound, however three areas of concrete spall were found throughout these surfaces at the time of inspection.

The surrounding and underlying concrete within each spall remains sound and with no obvious exposure of the underlying reinforcement steel at this time.

It is our recommendation to pressure-wash the exposed surfaces of this concrete pad at 2,500 P.S.I. and at 2.5 G.P.M. to remove all soiling and to remove any and all loose concrete from the areas of spall. We then recommend re-surfacing each area of spall using a suitable concrete repair material and re-coating these exposed concrete surfaces using an epoxy/polyurethane flexible coating to seal and protect the concrete.

The concrete support pads located below each tower support leg were found appearing mostly sound, however tight cracks were observed throughout approximately 5-10% of the surfaces of each concrete support pad. These cracks were sounded and appeared to be limited to the surface of the concrete and were free of obvious voids or spalls at the time of this inspection.

It is our recommendation to pressure-wash the exposed surfaces of each concrete pad at 2,500 P.S.I. and at 2.5 G.P.M. to remove all soiling from these surfaces and to coat these exposed concrete pads using an epoxy/polyurethane flexible coating to seal all cracks and to seal and protect the concrete.

The cap and associated screen installed over the vent penetration in the roof remains secure, preventing access to the interior of the tank.

The interior access hatch located on the roof was found secured with a lock, preventing unwanted access to the interior of the tank.

INTERIOR:

The interior steel floor panels and associated welds were found appearing sound at this time.

The protective coating applied to these surfaces appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value. However, adhesion loss of the protective coating was observed throughout less than 5% of the floor on the easternmost side of the tank, resulting in exposure of the underlying steel. Corrosion exists within these areas of steel exposure and fatigue (pitting) of the steel, measuring 1" in diameter by 1/8" deep, was evident within these areas of steel exposure at this time.

It is our recommendation that the next time this tank is removed from service and de-watered that the surfaces of the floor showing coating loss, steel exposure and steel fatigue (pitting) be power tool cleaned to remove all corrosion and to prepare the substrate. We then recommend re-coating these areas to halt corrosion, prevent further steel fatigue/deterioration and to provide good protection for the steel.

The protective coating applied to the interior steel surfaces of the manway lid and trunk appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value. However, adhesion loss of the protective coating was observed throughout approximately 10% of the outside edge of the manway lid and trunk, resulting in exposure of the underlying steel. No obvious fatigue/deterioration of either the steel manway lid or trunk was evident within these areas of exposure, rather mild corrosion exists at this time.

The protective coating applied to the metal plug installed within the 3" inside diameter pipe penetration in the floor (second pipe inspected) was found to be blistering, causing metal exposure and corrosion. However, this metal plug remains sound and free of obvious metal fatigue at this time.

It is our recommendation that when the tank is removed from service and de-watered to complete the rehabilitation of the floor that the surfaces of the manway showing steel exposure and the surfaces of the plug within the floor penetration be power tool cleaned to remove all corrosion. We then recommend re-coating these surfaces using an A.N.S.I./N.S.F.61 approved coating for use in structures containing potable water to halt corrosion, prevent metal fatigue and to provide good protection for the surfaces of the manway and plug.

The interior steel wall panels and associated welds appeared sound and remain free of obvious fatigue or failures.

The protective coating applied to these surfaces appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for the steel and requires no remedial action at this time.

The steel overhead panels and channel iron supports appeared sound and remain free of obvious fatigue or failures.

The protective coating applied to these surfaces appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, while rust staining was observed throughout approximately 25% of the edges of the steel panels and edges of the channel iron supports. However, no obvious coating fatigue or steel exposure was evident at this time.

It is our recommendation to monitor the overhead surfaces within the areas of rust staining through future scheduled inspections to ensure that adhesion loss of the protective coating does not occur and result in exposure of the underlying steel.

As always, we recommend that re-inspection and cleaning of all water storage facilities be performed in accordance with state and federal mandates, A.W.W.A. standards, and completed by an experienced and authorized inspection corporation.

UNDERWATER SOLUTIONS INC.
Christopher A. Cole, Project Manager

This report, the conclusions, recommendations and comments prepared by Underwater Solutions Inc. are based upon spot examination from readily accessible parts of the tank. Should latent defects or conditions which vary significantly from those described in the report be discovered at a later date, these should be brought to the attention of a qualified individual at that time. These comments and recommendations should be viewed as information to be used by the Owner in determining the proper course of action and not to replace a complete set of specifications. All repairs should be

1 *Exterior Tank Wall With Coating Damage, Exposed Underlying Steel And Mild Corrosion*

2 *Exterior Tank Wall With Coating Damage, Exposed Underlying Steel And Mild Corrosion*

3 *Exterior Tank Wall With Coating Damage, Exposed Underlying Steel And Mild Corrosion*

4 *Exterior Tank Wall With Coating Damage, Exposed Underlying Steel And Mild Corrosion*

5 *Exterior Tank Wall With Coating Damage, Exposed Underlying Steel And Mild Corrosion*

6 *Exterior Tank Wall With Coating Damage, Exposed Underlying Steel And Mild Corrosion*

7 ***Exterior Tank Wall With Coating Damage, Exposed Underlying Steel And Mild Corrosion***

8 ***Exterior Tank Wall With Coating Damage, Exposed Underlying Steel And Mild Corrosion***

9 ***Exterior Tank Wall With Coating Damage, Exposed Underlying Steel And Mild Corrosion***

10 ***Exterior Tank Wall***

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16 ***Exterior Tank Wall***

17 ***Exterior Tank Wall***

18 ***Exterior Tank Wall***

19 ***Exterior Tank Wall***

20 ***Exterior Tank Wall***

21 ***Tank Base With Mild Mildew***

22 ***Tank Base With Mild Mildew***

23 ***Tank Base With Mild Mildew***

24 ***Tower Support Leg With Secure Anchor Bolt***

UNDERWATER SOLUTIONS INC.

INSPECTION AND INTERIOR CLEANING (SEDIMENT REMOVAL) OF THE DIAMOND HILL 750,000-GALLON ELEVATED WELDED STEEL WATER STORAGE TANK

CITY OF WOONSOCKET WATER DIVISION
WOONSOCKET, RHODE ISLAND

JUNE 11, 2018

INSPECTION AND INTERIOR CLEANING (SEDIMENT REMOVAL) OF THE DIAMOND HILL 750,000-GALLON ELEVATED WELDED STEEL WATER STORAGE TANK

CITY OF WOONSOCKET WATER DIVISION WOONSOCKET, RHODE ISLAND

JUNE 11, 2018

SCOPE:

On June 11, 2018, Underwater Solutions Inc. inspected the Diamond Hill 750,000-gallon elevated welded steel potable water storage tank to provide information regarding the overall condition and integrity of this structure and removed the sediment accumulation from the floor.

EXTERIOR INSPECTION:

The entire exterior of this water storage tank (and all components) was inspected to include walls and coating, anchor bolts and concrete support pads, support components, center riser columns, support legs, manways, ladders, catwalk, overflow, roof, vent and hatch.

Walls And Coating

The exterior steel wall panels and associated welds were inspected and found appearing sound and remain free of obvious fatigue or failures.

The protective coating applied to the exterior walls and tank base has an average dry film thickness of 13.4 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value. However, damage to the protective coating was observed throughout approximately 5% of all elevations of the exterior walls, appearing to be the result of objects striking the tank, and cause exposure of the underlying steel. No obvious fatigue/deterioration of the steel was evident within these 2"-7" long areas of steel exposure, rather mild corrosion exists at this time.

A mild, non-uniform accumulation of mildew throughout the tank base causes declined aesthetics.

Anchor Bolts And Concrete Support Pads

Two, 1-1/2" diameter anchor bolts extend up from a concrete pad through a 40" diameter by 1-1/2" thick steel plate welded to the base of each of the ten, 30" outside diameter tower support legs.

Eight, 1-1/4" diameter anchor bolts extend up from a concrete support pad through a 9'9" diameter by 2" thick steel plate welded to the base of the 9' outside diameter (outer riser column) center riser column.

Four, 1-1/2" diameter anchor bolts extend up from a concrete support pad through a 69" by 3/4" thick steel plate welded to the base of the 60" outside diameter (inner riser column) center riser column.

Each anchor bolt has one nut properly and securely installed and the protective coating applied to this support hardware was found having good adhesion value at this time.

The concrete support pad located below the center riser columns is not coated and was found appearing mostly sound, however three areas of concrete spall were found throughout these surfaces at this time. The first area of concrete spall measures 30" in length by 4" in width and has an average maximum depth of 1/2" deep. The second area of concrete spall measures 7" in length by 6" in width and has an average maximum depth of 1" deep. The third area of concrete spall measures 6" in length by 4" in width and has an average maximum depth of 1/2" deep.

The surrounding and underlying concrete within each spall remains sound and with no obvious exposure of the underlying reinforcement steel at this time.

The concrete support pads located below each tower support leg are not coated and were found appearing mostly sound, however tight cracks were observed throughout approximately 5-10% of the surfaces of each concrete support pad. These cracks were sounded and appeared to be limited to the surface of the concrete and free of obvious voids or spalls at this time.

Support Components

Each of the twenty, 6" by 8" struts (cross members), thirty 1" diameter anti-sway rods and thirty sets of 2" diameter cross braces, to include all supporting hardware, appeared sound and properly installed.

The protective coating applied to the support components appears to have been applied uniformly and was found having good adhesion value. A mild rust stain was observed extending from the connecting plates and support component securing hardware, however no obvious coating fatigue or steel exposure was evident within these areas of rust staining.

A mild, non-uniform accumulation of mildew throughout the support component surfaces causes declined aesthetics.

Center Riser Columns And Support Legs

The 9' outside diameter outer center riser column surrounds and encases the 60" outside diameter inner center riser column. Each welded steel riser column appeared sound and remains free of obvious fatigue or failures.

The protective coating on each of these riser columns has good adhesion value throughout all surfaces and elevations.

The protective coating applied to the surfaces of the outer riser column has an average dry film thickness of 9.6 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for the steel.

The protective coating applied to the surfaces of the inner riser column has an average dry film thickness of 9.6 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for the steel.

Each of the ten, 30" outside diameter welded steel support legs appeared sound and remain free of obvious fatigue or failures.

The protective coating applied to each tower support leg has an average dry film thickness of 11.9 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for each welded steel support leg.

A mild, non-uniform accumulation of mildew throughout the outer center riser column and each support leg also causes declined aesthetics.

Manways

One, 24" inside diameter manway penetrates the outer center riser column 26" above the ground, providing access to the inner center riser column and was found secured with a lock, preventing unwanted access. The protective coating applied to this steel manway was found having good adhesion value at this time.

A 24" inside diameter manway penetrates the inner center riser column 24" above its base and is securely bolted in place and free of obvious leakage. The protective coating applied to this steel manway and associated securing hardware was found having good adhesion value at this time.

A 24" inside diameter manway penetrates the base of the tank within the outer center riser column, located approximately 12" in from the (inner) riser column, and is securely installed and free of obvious leakage. The protective coating applied to this steel manway and associated securing hardware was found having good adhesion value at this time.

Ladders

The first ladder inspected extends from approximately 22' above the ground up to the catwalk and is secured to the northernmost tower leg with nine sets of welded standoffs. This ladder has a fall prevention device installed throughout its length, providing safe access to the catwalk.

The protective coating applied to this steel ladder appears to have been applied uniformly and was found having mostly good adhesion value, however isolated areas of coating loss and exposed steel were observed throughout less than 5% of these surfaces. No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild surface corrosion exists at this time. The galvanized steel fall prevention device is not coated and was found appearing sound at this time.

The second ladder inspected extends from the catwalk up to the center of the roof dome, secured to the vent with one bolted support, and provides good access to the vent. The protective coating applied to this steel ladder appears to have been applied uniformly and was found having mostly good adhesion value, however isolated areas of coating loss and exposed steel were observed throughout less than 5% of these surfaces. No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild surface corrosion exists at this time.

The third ladder inspected extends from the base of the interior of the outer center riser column up to a walkway, which extends to the manway that penetrates the base of the bowl. This ladder is supported to the riser wall with eight sets of welded standoffs, providing good access. The protective coating applied to this steel ladder appears to have been applied uniformly and was found having good adhesion value at this time.

Catwalk

A 24" wide catwalk spans the circumference of the tank and is securely welded in-place. This ladder appeared sound and remains free of obvious fatigue or failures at this time.

The 42" tall angle iron safety railings bolted to and spanning the circumference of the catwalk were found securely installed and remain free of obvious fatigue or failures.

The protective coating applied to the welded steel catwalk and bolted steel safety railings appears to have been applied uniformly and was found having good adhesion value, providing adequate protection for these steel surfaces.

Overflow

A 6" inside diameter steel overflow pipe exits the base of a welded steel weir box and extends down, supported to the tank wall with one welded standoff and supported again to the westernmost tower leg with eleven welded standoffs. Approximately 40" above the ground this pipe turns 45˚ and extends into an 8" inside diameter pipe, supported within one concrete support, and penetrates the ground. Approximately 6' of the top of the 8" pipe is exposed prior to this pipe completely penetrating the ground, and a 4" long by 1/4" wide penetration was found within the top of the pipe that appears to be the result of an object striking the pipe. This penetration within the top of the pipe allows access to the interior of this pipe that extends to the tank interior.

The protective coating applied to the steel overflow weir box has an average dry film thickness of 16.0 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value, however several isolated areas of coating adhesion loss were observed throughout less than 5% of these surfaces, causing steel exposure and surface corrosion. However, no obvious fatigue/deterioration of the steel was evident within these areas of steel exposure at the time of this inspection.

The protective coating applied to the steel overflow pipe has an average dry film thickness of 16.0 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for the steel.

The surfaces of the exposed steel pipe located at ground level are not coated, and although corrosion exists on the surfaces of this pipe, no obvious fatigue/deterioration of the steel was evident.

Roof

The steel roof panels and associated welds were inspected and found appearing sound and remain free of obvious fatigue of failures.

The protective coating applied to these surfaces has an average dry film thickness of 19.7 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value, however secondary coating adhesion loss has resulted in exposure of the primary coating throughout approximately 5% of these surfaces. Adhesion loss of the protective coating has also resulted in exposure of the underlying steel throughout approximately 5% of these surfaces. No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild corrosion exists at this time.

The exposed primary coating within the areas of secondary coating adhesion loss remains having good adhesion value at this time.

Twenty-two, 5" inside diameter rigging hole penetrations are evenly-spaced throughout the roof, and a 6" diameter cover plate remains in-place over twenty-one of these penetrations, while one rigging hole penetration was found without a cover plate. Missing hardware adjacent to a properly installed cover plate causes a 1/4" diameter penetration that extends to the interior of the tank.

At the time of this inspection Underwater Solutions Inc. applied adhesive tape over the open 5" diameter rigging hole penetration to temporarily prevent access to the interior of the tank and applied an N.S.F.61-approved sealant over the 1/4" diameter penetration within the roof to prevent access to the interior of the tank.

While completing the interior inspection, daylight was observed shining into the tank around the circumference of four of the covered rigging hole penetrations; however, these four cover plates were found in-place and secure at this time.

A mild accumulation of mildew throughout the roof causes declined aesthetics.

Vent

The vent is located within the center of the roof dome, having a 26" inside diameter, and stands 28" tall.

A 32" outside diameter steel cap and associated screen remains securely installed over the vent penetration in the roof, preventing access to the interior of the tank.

The protective coating applied to this steel vent assembly has an average dry film thickness of 12.7 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value; however, isolated areas of coating adhesion loss throughout less than 5% of these surfaces has resulted in exposure of the underlying steel.

No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild corrosion exists at this time.

Hatch

One, 24" inside diameter hatch provides access to the tank interior through the roof dome.

This hatch remains in good working condition and was found secured with a lock, preventing unwanted access to the interior of the tank.

The protective coating applied to the exterior surfaces of the steel hatch lid and trunk appears to have been applied uniformly and was found having good adhesion value at this time.

The protective coating applied to the interior steel surfaces of the hatch lid and trunk appears to have been applied uniformly and was found having mostly good adhesion value, however minimal coating loss and steel exposure was observed on the top edge of the hatch trunk and inner surfaces of the hatch lid, at the location the hatch lid and trunk contact. No obvious fatigue/deterioration of either the steel hatch lid or trunk was evident within these areas of steel exposure, rather mild surface corrosion exists at this time.

INTERIOR INSPECTION:

The entire interior of this water storage tank (and components) was inspected to include sediment accumulations, floor, manway, piping, walls and coating, overhead, overflow and aesthetic water quality.

Sediment Accumulations

A uniform layer of accumulated precipitate was found throughout the floor having depths no greater than 1" deep.

After completing this inspection, all precipitate was removed (vacuumed) from the floor.

Floor

After removing the accumulated precipitate, the steel floor panels and associated welds were inspected and found appearing sound at this time.

The protective coating applied to these surfaces has an average dry film thickness of 32.0 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value; however, adhesion loss of the protective coating was observed throughout less than 5% of the floor on the easternmost side of the tank, resulting in exposure of the underlying steel. Corrosion exists within these areas of steel exposure and fatigue (pitting) of the steel, measuring 1" in diameter by 1/8" deep, was evident within these areas of exposed steel at the time of this inspection.

Mild staining remains throughout the floor due to the accumulation of precipitate.

Manway

A 24" inside diameter manway penetrates the floor (tank base) approximately 12" in from the center of the tank and is securely installed and free of obvious leakage. The protective coating applied to the steel manway lid and trunk has an average dry film thickness of 28.7 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value; however, adhesion loss of the protective coating was observed throughout approximately 10% of the outside edge of the manway lid and trunk, resulting in exposure of the underlying steel. No obvious fatigue/deterioration of either the steel manway lid or trunk was evident within these areas of steel exposure, rather mild corrosion exists at this time.

Piping

One pipe penetrates the floor in the center of the tank, having a 42" inside diameter, and is flush within the floor.

This pipe was free of obvious obstructions and was without flow at the time of this inspection.

A second pipe penetrates the floor approximately 25' in from the center of the tank, having a 3" inside diameter, and is flush with the floor. A plug is installed in this pipe eliminating it from use.

This pipe serves as the tank drain pipe, and the 3" inside diameter pipe that penetrates and extends from the base of the tank on the exterior was free of obvious obstructions at the time of this inspection.

The protective coating applied to this metal plug was found to be blistering, causing metal exposure and corrosion. However, this metal plug remains sound and free of obvious metal fatigue at this time.

Walls And Coating

The interior walls were inspected beginning at the floor and by spiraling the circumference of the tank up to the water surface.

These steel wall panels and associated welds appeared sound and remain free of obvious fatigue or failures.

The protective coating applied to these surfaces has an average dry film thickness of 13.4 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for the steel.

Mild staining exists throughout the interior walls, beginning approximately 24" below overflow level and extending down to the floor.

Overhead

The entire overhead was inspected from the water surface.

These steel overhead panels and channel iron supports appeared sound and remain free of obvious fatigue or failures.

The protective coating applied to these surfaces has an average dry film thickness of 31.3 mils, appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, while rust staining was observed throughout approximately 25% of the edges of the steel panels and edges of the channel iron supports. However, no obvious coating fatigue or steel exposure was evident at this time.

The vent penetration within the center of the overhead was free of obvious obstructions at this time.

Overflow

The overflow consists of a 24" wide by 4" tall cutout within the knuckle panel (top curved wall panel) and is located approximately 28" below the junction of where the roof and walls meet.

This overflow cutout was free of obvious obstructions at the time of this inspection.

Aesthetic Water Quality

The aesthetic water quality was good throughout the tank, allowing unlimited visibility for this inspection.

RECOMMENDATIONS:

It is the opinion of Underwater Solutions Inc. that this elevated welded steel potable water storage tank appears mostly sound and free of obvious leakage.

EXTERIOR:

The exterior welded steel surfaces of the tank and steel support components appeared sound and remain free of obvious fatigue or failures at this time.

The protective coating applied to the exterior tank walls and tank base appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value. However, damage to the protective coating was observed throughout approximately 5% of all elevations of the exterior walls, appearing to be the result of objects striking the tank, and cause exposure of the underlying steel. No obvious fatigue/deterioration of the steel was evident within these isolated areas of steel exposure, rather mild corrosion exists at this time.

The steel roof panels and associated welds were found appearing sound and remain free of obvious fatigue of failures.

The protective coating applied to these surfaces appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value. However, secondary coating adhesion loss has resulted in exposure of the primary coating throughout approximately 5% of these surfaces, while adhesion loss of the protective coating has resulted in exposure of the underlying steel throughout approximately 5% of these surfaces. No obvious fatigue/deterioration of the steel was evident within these areas of steel exposure, rather mild corrosion exists at this time.

The exposed primary coating within the areas of secondary coating adhesion loss remains having good adhesion value at this time.

A mild non-uniform accumulation of mildew throughout the exterior surfaces of the tank and associated support components causes declined aesthetics.

It is our recommendation to pressure-wash the exterior surfaces of the tank and associated support components at 3,000 P.S.I. and at 3.0 G.P.M. to remove the accumulated mildew from these surfaces to preserve the adhesion value of the protective coating and to improve the overall aesthetics.

We also recommend power tool cleaning the surfaces of the tank and roof showing steel exposure to remove all corrosion and to prepare the substrate, and to also power tool clean the surfaces of the roof showing primary coating exposure to prepare the substrate. We then recommend re-coating and these areas to halt corrosion, prevent steel fatigue/deterioration and to provide good protection for the steel.

Twenty-two, 5” inside diameter rigging hole penetrations are evenly spaced throughout the roof and a 6” diameter cover plate remains in-place over twenty-one of these penetrations, while one rigging hole penetration was found without a cover plate. Missing hardware adjacent to a properly installed cover plate also causes a 1/4" diameter penetration that extends to the interior of the tank.

At the time of this inspection Underwater Solutions Inc. applied adhesive tape over the open 5” diameter rigging hole penetration to temporarily prevent access to the interior of the tank and applied an N.S.F.61-approved sealant over the 1/4” diameter penetration within the roof to prevent access to the interior of the tank.

While completing the interior inspection, daylight was observed shining into the tank around the circumference of four of the covered rigging hole penetrations. However, these four cover plates were found in-place and secure at this time.

It is our recommendation to install a new cover plate over the rigging hole penetration that is temporarily sealed with adhesive tape utilizing an N.S.F.61-approved rubber gasket and N.S.F.61-approved sealant. We also recommend removing all existing cover plates and installing replacement N.S.F.61-approved gaskets, and that these be sealed in-place with an N.S.F.61-approved sealant, to prevent rainwater run-off and other contaminates from entering the interior of the tank.

The protective coating applied to the catwalk and catwalk safety railings, manways, anchor bolts, inner and outer center riser columns and tower support legs remains having good adhesion value, providing adequate protection for the steel and requires no remedial action at this time.

The protective coating applied to the support components appears to have been applied uniformly and was found having good adhesion value, while a mild rust stain was observed extending from the connecting plates and support component securing hardware. However, no obvious coating fatigue or steel exposure was evident within these areas of rust staining.

It is our recommendation to monitor the rust staining observed on the support component connecting plates and support component securing hardware through future scheduled inspections to ensure that coating adhesion loss does not occur and result in exposure of the underlying steel.

The protective coating applied to the steel overflow pipe that extends down, supported to the westernmost tower support leg, was found having good adhesion value and requires no remedial action at this time.

The protective coating applied to the welded steel overflow weir box appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value. However, several isolated areas of coating adhesion loss were observed throughout less than 5% of these surfaces, causing steel exposure and surface corrosion. However, no obvious fatigue/deterioration of the steel was evident within these areas of exposure at this time.

It is our recommendation to power tool clean the surfaces of the weir box showing steel exposure to remove all corrosion and to prepare the substrate. We then recommend re-coating areas to halt corrosion, prevent steel fatigue and to provide good protection for the steel.

An approximate 6' long section of the top of the 8" overflow pipe is exposed prior to this pipe completely penetrating the ground, and a 4" long by 1/4" wide penetration was found within the top of the pipe that appears to be the result of an object striking the pipe. This penetration allows access to the interior of this pipe, which extends to the tank interior. The surfaces of this exposed steel pipe located at ground level are not coated, and although corrosion exists on the surfaces of this pipe, no obvious fatigue/deterioration of the steel was evident.

It is our recommendation to weld a plate over this penetration to prevent access and to power tool clean the exposed steel surfaces of this overflow pipe to remove corrosion and to prepare the substrate. We then recommend re-coating these surfaces to halt corrosion, prevent steel fatigue and to provide good protection for the exposed surfaces of this pipe.

The protective coating applied to the steel ladder that provides access to the catwalk and the steel ladder that provides access to the roof/vent appears to have been applied uniformly and was found having mostly good adhesion value. However, isolated areas of coating loss and exposed steel were observed throughout less than 5% of the surfaces of each ladder. No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild surface corrosion exists at this time.

It is our recommendation to power tool clean the areas of steel exposure found throughout the surfaces of each ladder to remove all corrosion and to prepare the substrate. We then recommend re-coating these surfaces to halt corrosion, prevent steel fatigue/deterioration and to provide good protection for these steel surfaces.

The protective coating applied to the steel ladder located within the outer riser column appears to have been applied uniformly, was found having good adhesion value and requires no remedial action at this time.

The protective coating applied to the steel vent assembly appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value, however isolated areas of adhesion loss throughout less than 5% of these surfaces has resulted in exposure of the underlying steel.

No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild corrosion exists at this time.

It is our recommendation to power tool clean these areas showing steel exposure to remove all corrosion and to prepare the substrate. We then recommend re-coating these areas to halt corrosion, prevent steel fatigue and to provide good protection for the steel.

The protective coating applied to the exterior surfaces of the steel access hatch lid and trunk appears to have been applied uniformly, was found having good adhesion value and requires no remedial action at this time.

The protective coating applied to the interior steel surfaces of the hatch lid and trunk appears to have been applied uniformly and was found having mostly good adhesion value, however minimal coating loss and steel exposure was observed on the top edge of the hatch trunk and inner surfaces of the hatch lid, at the location the hatch lid and trunk contact. No obvious fatigue/deterioration of either the steel hatch lid or trunk was evident within these areas of exposure, rather mild surface corrosion exists at this time.

It is our recommendation to hand-tool clean the interior surfaces of the hatch trunk and hatch lid to remove all corrosion and to prepare the substrate. We then recommend re-coating these areas using an A.N.S.I./N.S.F.61 approved coating for use in structures containing potable to water to halt corrosion, prevent steel fatigue/deterioration and to provide good protection for the steel.

We recommend that when the interior surfaces of this hatch lid and trunk are rehabilitated that the interior of the tank be masked off to prevent the contaminates generated by the preparation of these surfaces from entering the tank interior.

The concrete support pad located below the center riser columns was found appearing mostly sound, however three areas of concrete spall were found throughout these surfaces at the time of inspection.

The surrounding and underlying concrete within each spall remains sound and with no obvious exposure of the underlying reinforcement steel at this time.

It is our recommendation to pressure-wash the exposed surfaces of this concrete pad at 2,500 P.S.I. and at 2.5 G.P.M. to remove all soiling and to remove any and all loose concrete from the areas of spall. We then recommend re-surfacing each area of spall using a suitable concrete repair material and re-coating these exposed concrete surfaces using an epoxy/polyurethane flexible coating to seal and protect the concrete.

The concrete support pads located below each tower support leg were found appearing mostly sound, however tight cracks were observed throughout approximately 5-10% of the surfaces of each concrete support pad. These cracks were sounded and appeared to be limited to the surface of the concrete and were free of obvious voids or spalls at the time of this inspection.

It is our recommendation to pressure-wash the exposed surfaces of each concrete pad at 2,500 P.S.I. and at 2.5 G.P.M. to remove all soiling from these surfaces and to coat these exposed concrete pads using an epoxy/polyurethane flexible coating to seal all cracks and to seal and protect the concrete.

The cap and associated screen installed over the vent penetration in the roof remains secure, preventing access to the interior of the tank.

The interior access hatch located on the roof was found secured with a lock, preventing unwanted access to the interior of the tank.

INTERIOR:

The interior steel floor panels and associated welds were found appearing sound at this time.

The protective coating applied to these surfaces appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value. However, adhesion loss of the protective coating was observed throughout less than 5% of the floor on the easternmost side of the tank, resulting in exposure of the underlying steel. Corrosion exists within these areas of steel exposure and fatigue (pitting) of the steel, measuring 1" in diameter by 1/8" deep, was evident within these areas of steel exposure at this time.

It is our recommendation that the next time this tank is removed from service and de-watered that the surfaces of the floor showing coating loss, steel exposure and steel fatigue (pitting) be power tool cleaned to remove all corrosion and to prepare the substrate. We then recommend re-coating these areas to halt corrosion, prevent further steel fatigue/deterioration and to provide good protection for the steel.

The protective coating applied to the interior steel surfaces of the manway lid and trunk appears to have been applied uniformly, meets the AWWA's recommendations and was found having mostly good adhesion value. However, adhesion loss of the protective coating was observed throughout approximately 10% of the outside edge of the manway lid and trunk, resulting in exposure of the underlying steel. No obvious fatigue/deterioration of either the steel manway lid or trunk was evident within these areas of exposure, rather mild corrosion exists at this time.

The protective coating applied to the metal plug installed within the 3" inside diameter pipe penetration in the floor (second pipe inspected) was found to be blistering, causing metal exposure and corrosion. However, this metal plug remains sound and free of obvious metal fatigue at this time.

It is our recommendation that when the tank is removed from service and de-watered to complete the rehabilitation of the floor that the surfaces of the manway showing steel exposure and the surfaces of the plug within the floor penetration be power tool cleaned to remove all corrosion. We then recommend re-coating these surfaces using an A.N.S.I./N.S.F.61 approved coating for use in structures containing potable water to halt corrosion, prevent metal fatigue and to provide good protection for the surfaces of the manway and plug.

The interior steel wall panels and associated welds appeared sound and remain free of obvious fatigue or failures.

The protective coating applied to these surfaces appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for the steel and requires no remedial action at this time.

The steel overhead panels and channel iron supports appeared sound and remain free of obvious fatigue or failures.

The protective coating applied to these surfaces appears to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, while rust staining was observed throughout approximately 25% of the edges of the steel panels and edges of the channel iron supports. However, no obvious coating fatigue or steel exposure was evident at this time.

It is our recommendation to monitor the overhead surfaces within the areas of rust staining through future scheduled inspections to ensure that adhesion loss of the protective coating does not occur and result in exposure of the underlying steel.

As always, we recommend that re-inspection and cleaning of all water storage facilities be performed in accordance with state and federal mandates, A.W.W.A. standards, and completed by an experienced and authorized inspection corporation.

UNDERWATER SOLUTIONS INC.
Christopher A. Cole, Project Manager

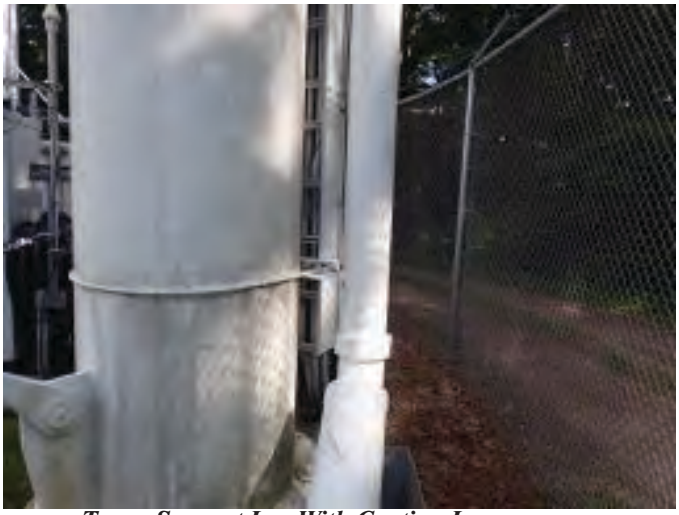
This report, the conclusions, recommendations and comments prepared by Underwater Solutions Inc. are based upon spot examination from readily accessible parts of the tank. Should latent defects or conditions which vary significantly from those described in the report be discovered at a later date, these should be brought to the attention of a qualified individual at that time. These comments and recommendations should be viewed as information to be used by the Owner in determining the proper course of action and not to replace a complete set of specifications. All repairs should be

25 *Tower Support Leg Having Coating Loss With The Concrete Support Pad Having Tight Surface Cracks And A Secure Anchor Bolt*

26 *Tower Support Leg Having Coating Loss With The Concrete Support Pad Having Tight Surface Cracks And A Secure Anchor Bolt*

27 *Tower Support Leg Having Coating Loss With The Concrete Support Pad Having Tight Surface Cracks And A Secure Anchor Bolt*

28 *Tower Support Leg Having Coating Loss With The Concrete Support Pad Having Tight Surface Cracks And A Secure Anchor Bolt*



29 *Tower Support Leg With Coating Loss*

30 *Outer Center Riser Column And Anchor Bolts*

31 ***Inner Center Riser Column And Anchor Bolts***

32 ***Center Riser Column Concrete Support Pad With Concrete Spall, Expose Underlying Concrete And Exposed Underlying Reinforcement Steel***

33 ***Center Riser Column Concrete Support Pad With Concrete Spall, Expose Underlying Concrete And Exposed Underlying Reinforcement Steel***

34 ***Center Riser Column Concrete Support Pad With Concrete Spall, Expose Underlying Concrete And Exposed Underlying Reinforcement Steel***

35 ***Secure Support Components***

36 ***Secure Support Components***

37 ***Secure Support Components***

38 ***Secure Support Components***

39 ***Secure Support Components***

40 ***Secure Support Components***

41 ***Secure Support Components***

42 ***Secure Support Components With Mild Rust Staining***

43 ***Outer Center Riser Column With Mild Mildew***

44 ***Outer Center Riser Column With Mild Mildew***

45 ***Outer Center Riser Column With Mild Mildew***

46 ***Outer Center Riser Column With Mild Mildew***

47 ***Inner Center Riser Column***

48 ***Inner Center Riser Column***

49 ***Inner Center Riser Column***

50 ***Inner Center Riser Column***

51 ***Tower Support Legs With Mild Mildew***

52 ***Tower Support Legs With Mild Mildew***

53 ***Tower Support Legs With Mild Mildew***

54 ***Tower Support Legs With Mild Mildew***

55 *Tower Support Legs With Mild Mildew*

56 *Tower Support Legs With Mild Mildew*

57 *Tower Support Legs With Mild Mildew*

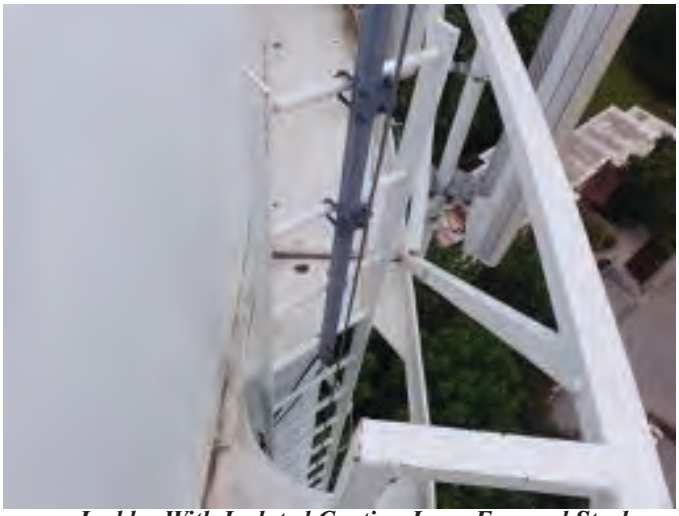
58 *Open Outer Riser Column Manway*

59 *Closed Outer Riser Column Manway*

60 *Secure Inner Riser Column Manway*

61 *Secure Manway Penetrating Tank Base*

62 *Ladder With Isolated Coating Loss, Exposed Steel, Mild Surface Corrosion And Fall Prevention Device*



63 *Ladder With Isolated Coating Loss, Exposed Steel, Mild Surface Corrosion And Fall Prevention Device*

64 *Vent Access Ladder With Isolated Coating Loss, Exposed Steel And Mild Surface Corrosion*

65 *Vent Access Ladder With Isolated Coating Loss, Exposed Steel And Mild Surface Corrosion*

66 *Vent Access Ladder With Isolated Coating Loss, Exposed Steel And Mild Surface Corrosion*

67 *Vent Access Ladder With Isolated Coating Loss, Exposed Steel And Mild Surface Corrosion*

68 *Interior Ladder Within The Outer Riser Column*

69 *Interior Ladder Within The Outer Riser Column*

70 *Catwalk And Secure Safety Railings*

71 *Catwalk And Secure Safety Railings*

72 *Catwalk And Secure Safety Railings*

73 *Catwalk And Secure Safety Railings*

74 *Catwalk And Secure Safety Railings*

75 *Catwalk And Secure Safety Railings*

76 *Overflow Pipe And Weir Box*

77 *Overflow Weir Box With Coating Loss, Exposed Steel And Surface Corrosion*

78 *Overflow Pipe*

79 ***Overflow Pipe Within A Concrete Support***

80 ***Exposed Overflow Pipe With Penetration And Corrosion***

81 ***Exposed Overflow Pipe At Ground Level Having a 4" Long By 1/4" Wide Open Penetration***

82 ***Roof Panels With Secondary Coating Loss And Exposed Primary Coating***

83 ***Roof Panels With Secondary Coating Loss And Exposed Primary Coating***

84 ***Roof Panels With Secondary Coating Loss, Exposed Primary Coating, Exposed Underlying Steel, Mild Corrosion And Mild Mildew***

85 ***Roof Panels With Secondary Coating Loss, Exposed Primary Coating, Exposed Underlying Steel, Mild Corrosion And Mild Mildew***

86 ***Roof Panels With Secondary Coating Loss, Exposed Primary Coating, Exposed Underlying Steel, Mild Corrosion And Mild Mildew***

87 ***Roof Panels With Coating Loss, Exposed Underlying Steel, Mild Corrosion And Mild Mildew***

88 ***Roof Panels With Coating Loss, Exposed Underlying Steel, Mild Corrosion And Mild Mildew***

89 ***Roof Panels With Coating Loss, Exposed Underlying Steel, Mild Corrosion And Mild Mildew***

90 ***Roof Panels With Coating Loss, Exposed Underlying Steel, Mild Corrosion And Mild Mildew***

91 ***Roof Panels With Mild Mildew***

92 ***Roof Panels With Mild Mildew***

93 ***Roof Panels With Mild Mildew***

94 ***Roof Panels With Mild Mildew***

95 ***Roof Panels With Mild Mildew***

96 ***Roof Panels With Mild Mildew***

97 ***Roof Rigging Hole Penetration Sealed With A Cover Plate***

98 ***Open Roof Rigging Hole Penetration***

99 ***Temporary Adhesive Tape Sealing The Open Roof Rigging Hole Penetration***

100 ***1/4" Diameter Penetration Wihin The Roof***

101 ***Roof Panel 1/4" Diameter Penetration Sealed With N.S.F.61 Approves Sealant***

102 ***Secure Vent Cap***

103 ***Secure Vent Screen With The Vent Assembly Having Isolated Coating Loss, Exposed Underlying Steel And Mild Corrosion***

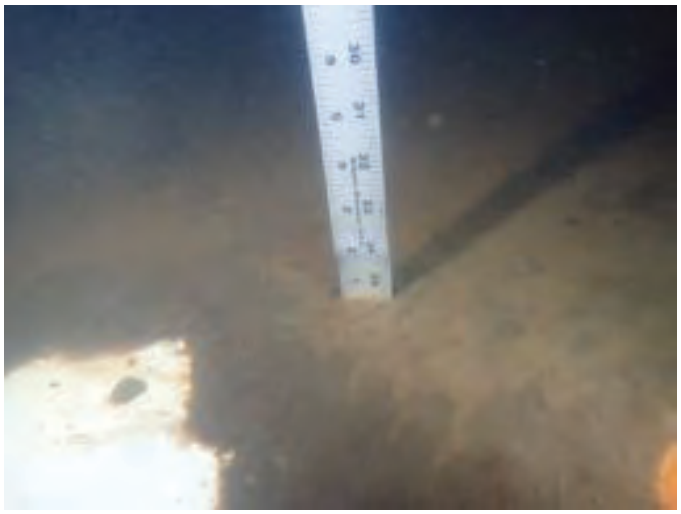
104 ***Open Interior Access Hatch***

105 ***Interior Surfaces Of The Access Hatch Trunk With Minimal Coating Loss, Exposed Steel And Mild Surface Corrosion***

106 ***Access Hatch Inner Lid With Minimal Coating Loss, Exposed Steel And Mild Surface Corrosion***

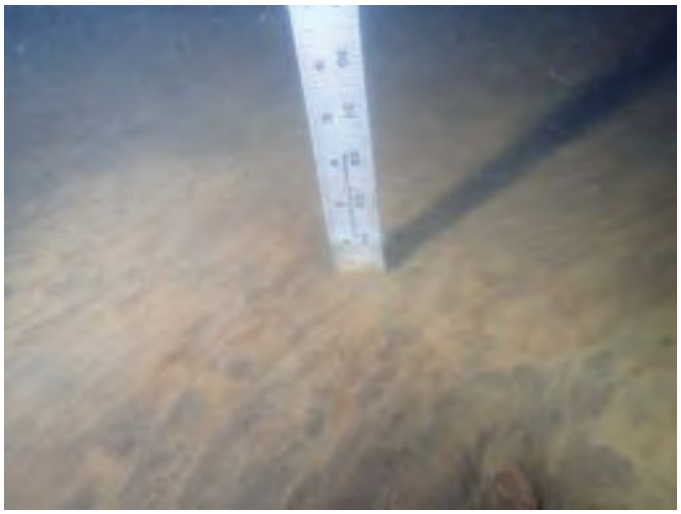
107 ***Closed Access Hatch***

108 ***Secure Access Hatch***

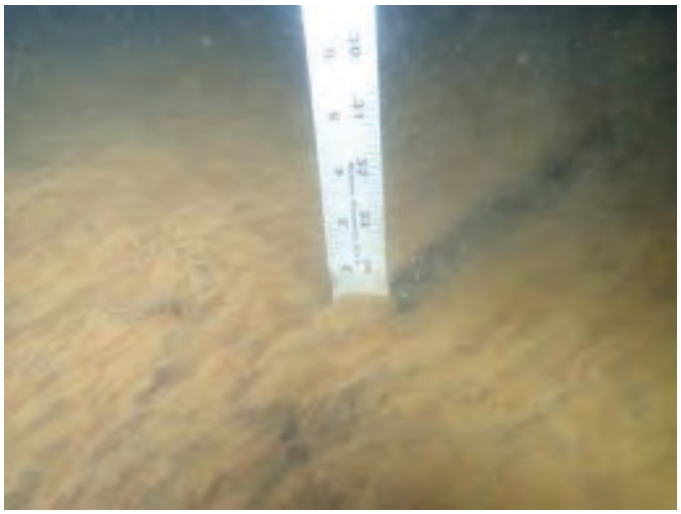


109 ***Layer Of Precipitate***

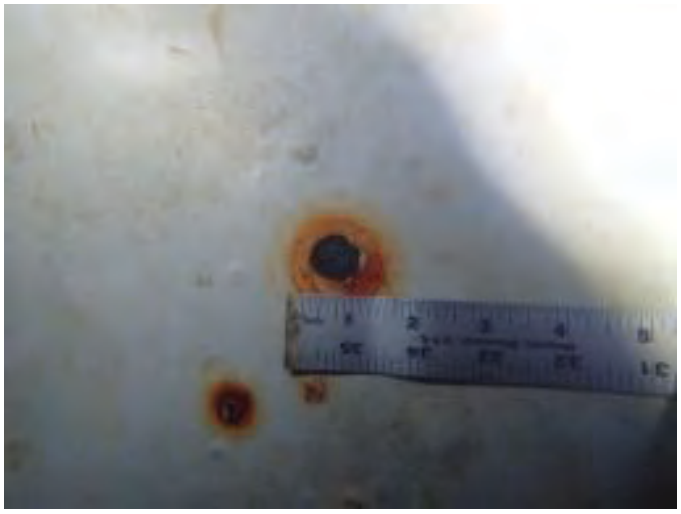
110 ***Layer Of Precipitate***



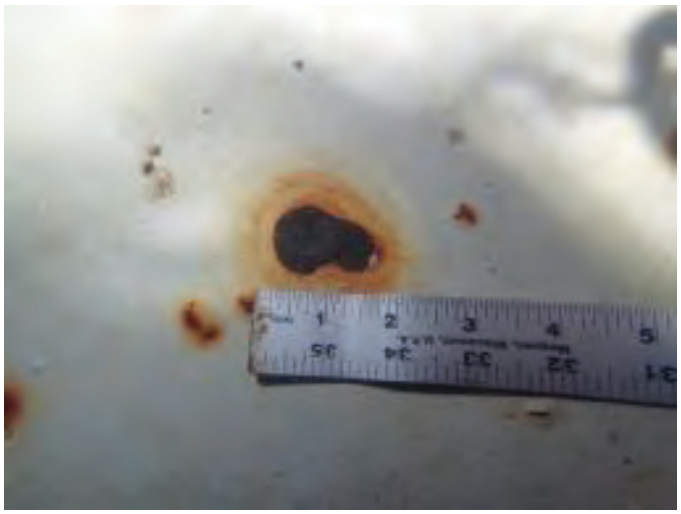
111 ***Layer Of Precipitate***



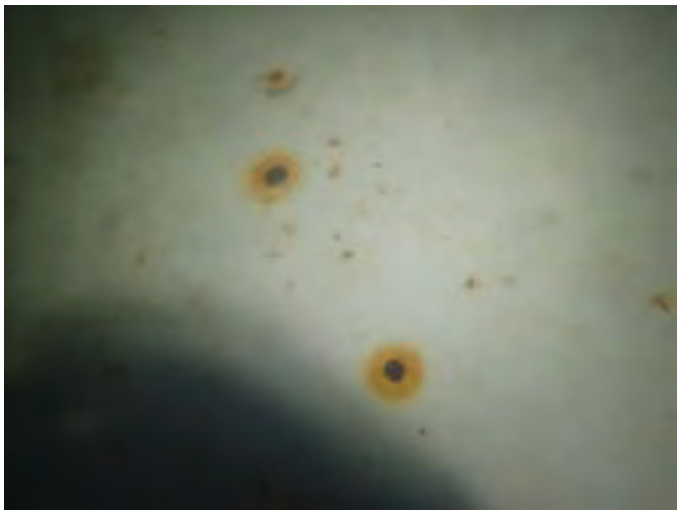
112 ***Layer Of Precipitate***



113 ***Floor With Coating Loss, Exposed Underlying Steel, Fatigue (Pitting), Corrosion And Mild Staining***



114 ***Floor With Coating Loss, Exposed Underlying Steel, Fatigue (Pitting), Corrosion And Mild Staining***



115 ***Floor With Coating Loss, Exposed Underlying Steel, Fatigue (Pitting), Corrosion And Mild Staining***

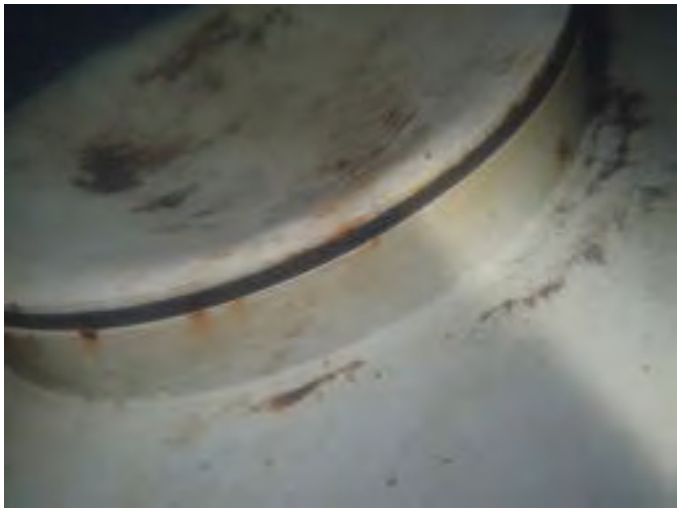
116 ***Floor With Mild Staining***

117 ***Floor With Mild Staining***

118 ***Floor With Mild Staining***

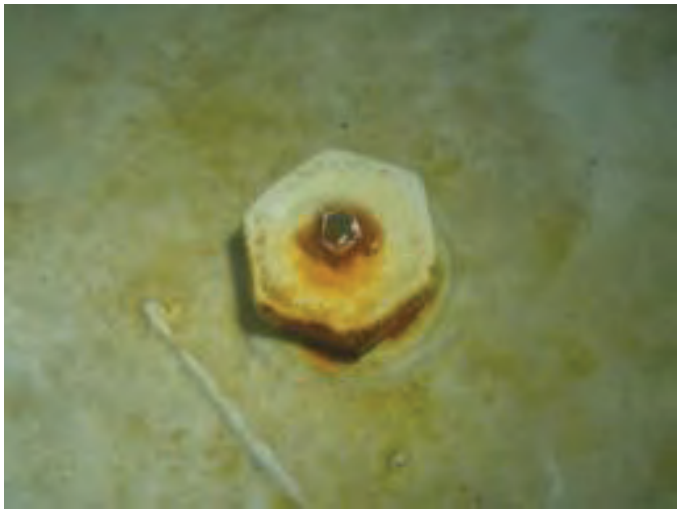
119 ***Manway***

120 ***Manway With Coating Loss, Exposed Underlying Steel And Mild Corrosion***



121 ***Manway With Coating Loss, Exposed Underlying Steel And Mild Corrosion***

122 ***42" Inside Diameter Flush Penetration***



123 ***3" Inside Diameter Penetration With A Plug Installed Having Coating Blisters, Exposed Metal And Corrosion***

124 ***3" Inside Diameter Pipe***

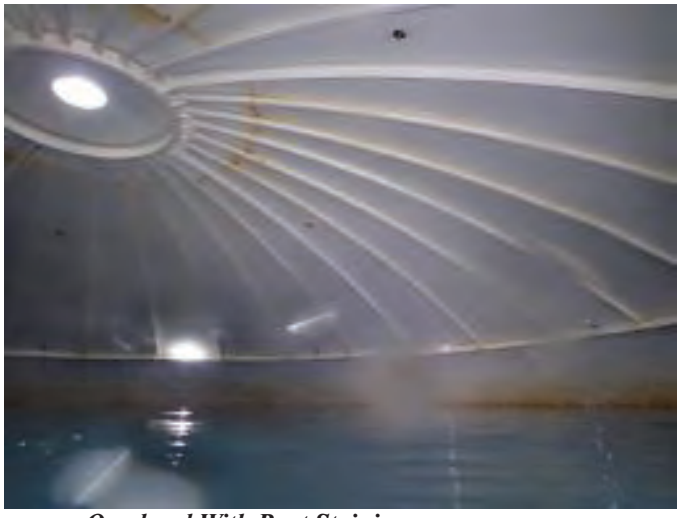
125 ***Interior Wall With Mild Staining***

126 ***Interior Wall With Mild Staining***

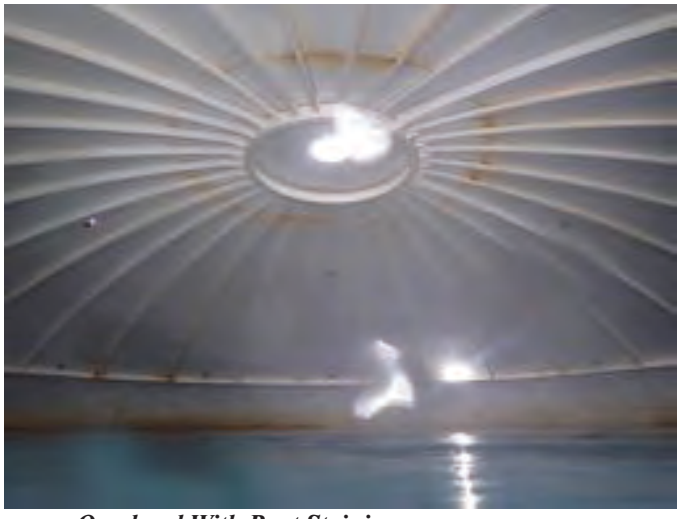
127 ***Interior Wall With Mild Staining***

128 ***Interior Wall With Mild Staining***

129 ***Overhead With Rust Staining***



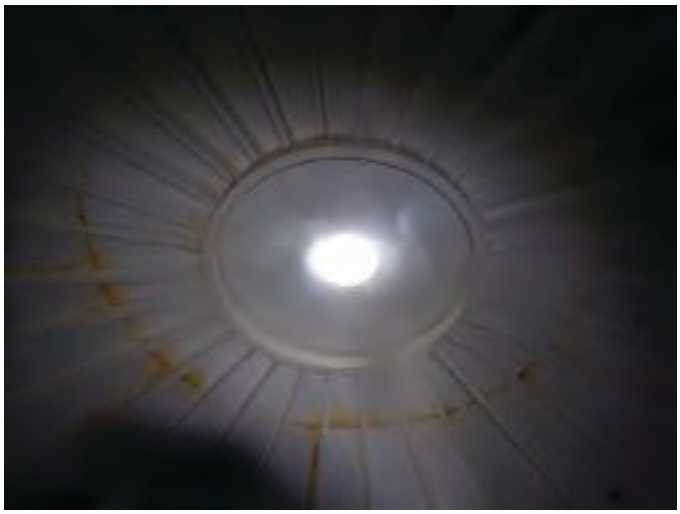
130 ***Overhead With Rust Staining***



131 ***Overhead With Rust Staining***

132 ***Overhead With Rust Staining***

133 ***Overhead With Rust Staining***



134 ***Overhead With Vent Penetration***

135 ***Overflow Cutout***

136 ***Discharge During Cleaning***

UNDERWATER SOLUTIONS INC.

INSPECTION AND INTERIOR CLEANING (SEDIMENT REMOVAL) OF THE 500,000-GALLON WELDED STEEL CLEARWELL (EAST)

CITY OF WOONSOCKET WATER DIVISION
WOONSOCKET, RHODE ISLAND

APRIL 16, 2018

INSPECTION AND INTERIOR CLEANING (SEDIMENT REMOVAL) OF THE 500,000-GALLON WELDED STEEL CLEARWELL (EAST)

CITY OF WOONSOCKET WATER DIVISION WOONSOCKET, RHODE ISLAND

APRIL 16, 2018

SCOPE:

On April 16, 2018, Underwater Solutions Inc. inspected the 500,000-gallon welded steel clearwell (East) to provide information regarding the overall condition and integrity and removed the sediment accumulation from the floor.

EXTERIOR INSPECTION:

The entire exterior of this clearwell was inspected, to include walls and coating, manway, foundation, overflows, roof, vent, and hatch.

Walls And Coating

The exterior steel wall panels and associated welds were inspected and were found appearing sound and free of obvious failures of the steel at this time.

The average dry film thickness of the protective coating system applied to the exterior welded steel wall panels were measured during this inspection. The dry film thickness of the coating system applied to the exterior wall surfaces was found as follows:

Row	***Mil Thickness***
1.	3.67 mils
2.	3.69 mils

The American Water Works Association (AWWA) recommends a dry film thickness of 7.0 to 10.0 mils of coating film thickness be applied to the exterior surfaces of welded steel potable water storage clearwells to provide adequate protection for welded steel structures.

The protective coating applied to these welded steel surfaces has an average dry film thickness that is below the AWWA's recommendations and has expired and no longer provides protection for the steel wall panels or welds.

Cracking and lifting of the protective coating was found throughout approximately 85% of these surfaces and was observed throughout all elevations of the exterior walls, causing mild surface corrosion (blotch rusting) to show through the coating. Secondary coating adhesion loss has resulted in exposure of the primary coating throughout approximately 10% of these surfaces, while complete coating loss has resulted in exposure of the underlying steel throughout approximately 60% of these surfaces at this time.

Corrosion of the exposed steel was evident within all areas of coating adhesion loss, while fatigue (pitting) of the steel having depths from barely detectable levels up to 1/32" was observed within approximately 5% of the areas of steel exposure at this time.

Ultrasonic metal thickness measurements of the steel wall panels of this clearwell were taken during this inspection. The average metal thickness of these surfaces were found as follows:

Lowest row of wall panels: .350"

Upper row of wall panels: .345"

It is the opinion of Underwater Solutions Inc. that these ultrasonic metal thickness measurements are uniform, while no abnormally high or low metal thickness measurements were observed during this inspection.

A non-uniform accumulation of mildew and corrosion staining from exposed steel exists throughout the exterior walls, causing declined aesthetics.

Manway

A 24" inside diameter manway penetrates the lowest wall panel on the south-westernmost side of the clearwell, located approximately 20" above the clearwell base and is securely installed and free of leakage at this time.

The protective coating applied to the steel manway lid, trunk and securing hardware has expired. Secondary coating adhesion loss throughout all surfaces of the manway has resulted in exposure of the underlying primary coating throughout all surfaces. Adhesion loss of the primary coating throughout approximately 5% of these surfaces has resulted in exposure of the underlying steel.

No obvious fatigue (pitting) of the steel manway lid or trunk was evident within these areas of steel exposure and no obvious deterioration of the securing hardware was evident within these areas of steel exposure, rather mild surface corrosion exists at this time.

Ladders

This clearwell does not have a ladder and requires a ladder having a minimum length of 18' to gain access to the roof.

Foundation

The exposed surfaces of the 3" wide by 12" tall concrete foundation is not coated and was found having tight surface cracks throughout approximately 5% of these exposed concrete surfaces.

These cracks were sounded, and no obvious voids were evident, however numerous areas of concrete spall exist throughout approximately 10% of the circumference of the foundation, ranging in size from 6" long by 2" wide to 19' long by 6" wide. The surrounding and underlying concrete within these areas of spall appeared sound. No obvious exposure of the underlying reinforcement steel was evident within these areas of concrete spall at this time.

An elastomeric sealant has been applied throughout the circumference of the clearwell since a previous inspection completed by Underwater Solutions Inc. on May 10, 2013. This sealant was found having good adhesion value, preventing moisture from penetrating and accumulating beneath the clearwell.

Overflows

The overflow consists of thirty-six, 36" long by 3" wide cutouts evenly spaced throughout the circumference of the top of the top row of wall panels, located approximately 5" below the junction of where the roof and walls meet. Each overflow cutout was free of obvious obstructions, while the screen installed over each overflow cutout was found securely in-place, preventing access to the interior of the clearwell.

Roof

The steel panels and associated welds were inspected and were found appearing sound and free of obvious failures of the steel at this time.

The protective coating applied to these welded steel surfaces has an average dry film thickness of 2.67 mils and is below the AWWA's recommendations; and has expired and no longer provides protection for the steel.

Adhesion loss of both the primary and secondary coating was observed throughout approximately 75% of the roof, resulting in exposure of the underlying steel. No obvious fatigue (pitting) of the steel roof panels was evident within these areas of steel exposure and no obvious deterioration of the welds was evident within these areas of steel exposure, rather mild surface corrosion exists at this time.

A corrosion stain throughout the roof has declined the overall aesthetics.

Ultrasonic metal thickness measurements of the steel roof panels of this clearwell were taken during this inspection. The average metal thickness of these surfaces were found as follows:

Roof panels: .49".

It is the opinion of Underwater Solutions Inc. that these ultrasonic metal thickness measurements are uniform, while no abnormally high or low metal thickness measurements were observed during this inspection.

Vent

The vent is located within the center of the roof, having a 12" inside diameter and stands 26" tall. A 37" outside diameter cap and associated screen was found securely installed over the vent penetration in the roof, preventing access to the interior of the clearwell.

The protective coating applied to this steel vent assembly has expired and has caused steel exposure and corrosion throughout all surfaces of the vent, however this vent assembly remains sound and free of obvious fatigue/deterioration of the steel at this time.

Hatch

A 24" by 24" hatch provides good access to the clearwell interior through the roof dome.

This hatch remains in good working condition and was found secured with a lock, preventing unwanted access to the interior of the clearwell.

The protective coating applied to the interior and exterior surfaces of the hatch cover and hatch trunk has expired. This condition has caused steel exposure and corrosion, yet these steel surfaces remain sound and free of obvious fatigue/deterioration at this time.

INTERIOR INSPECTION:

The entire interior of this clearwell was inspected, to include sediment accumulations, floor, manway, piping, walls and coating, overhead, overflows, and aesthetic water quality.

Sediment Accumulations

A uniform layer of accumulated precipitate was found throughout the floor, averaging 1/16" in depth.

After completing this inspection, all precipitate was removed (vacuumed) from the floor.

Floor

After removing the precipitate, the steel floor panels and associated welds were inspected and were found appearing sound and free of obvious failures of the steel at this time.

The protective coating applied to these welded steel surfaces has an average dry film thickness of 33.9 mils and appeared to have been applied uniformly and meets the AWWA's recommendation, however was found having poor adhesion value at this time.

Blistering of the protective coating was observed throughout approximately 35% of all surfaces. Approximately 5% of these coating blisters have ruptured and have resulted in exposure of the underlying steel.

No obvious fatigue (pitting) of the steel panels or deterioration of the welds was evident within these areas of steel exposure, rather mild surface corrosion exists at this time.

Mild staining remains throughout the entire floor due to accumulation of precipitate.

Manway

A 24" inside diameter manway penetrates the lowest wall panel on the south-westernmost side of the clearwell, located approximately 20" above the floor and is securely installed and free of obvious leakage.

The protective coating applied to the manway lid and trunk has an average dry film thickness of 16.6 mils and meets the AWWA's recommendations, however adhesion loss (blistering and peeling) of the protective coating has resulted in exposure of the underlying steel throughout approximately 30% these surfaces. No obvious fatigue/deterioration of the steel was evident within these areas of steel exposure, rather mild surface corrosion exists at this time.

Piping

Three pipes were inspected within this clearwell.

The first pipe inspected penetrates the floor 30" in from the wall on the westernmost side of the clearwell, having a 30" inside diameter and is flush in the floor. A 32" inside diameter by 6" tall riser is installed above this pipe, serving as a silt stop. This pipe was free of obvious obstructions and was without flow at the time of this inspection.

The protective coating applied to the steel silt stop riser was found having poor adhesion value and is blistering throughout approximately 20% of these surfaces, resulting in exposure of the underlying steel. No obvious fatigue/deterioration of this riser was evident within these areas of steel exposure, rather mild to moderate corrosion exists at this time.

The second pipe inspected penetrates the floor 38" in from the wall on the north-westernmost side of the clearwell, having a 23" inside diameter and stands 6" tall. This pipe was free of obvious obstructions and was without flow at the time of this inspection.

The protective coating applied to the steel pipe was found having poor adhesion value and is blistering throughout approximately 5% of these surfaces, resulting in exposure of the underlying steel. No obvious fatigue/deterioration of this pipe was evident within these areas of steel exposure, rather mild to moderate corrosion exists at this time.

The third pipe inspected penetrates the floor 30" in from the wall on the westernmost side of the clearwell, having a 28" inside diameter. This pipe extends up from the floor approximately 60" through a 90˚ elbow, directing the pipe across the floor and is supported in-place with twenty-five welded standoffs.

Approximately 44" from the wall on the easternmost side of the clearwell, this pipe extends through a second 90° elbow, directing this pipe up and terminates approximately 62" above the floor. This pipe was free of obvious obstructions and was without flow at the time of this inspection.

The protective coating applied to the surfaces of the metal pipe, pipe securing hardware and pipe support standoffs was found having poor adhesion value and is blistering throughout approximately 40% of these surfaces. Approximately 5% of these coating blisters have ruptured, resulting in exposure of the underlying metal. No obvious fatigue/deterioration of the pipe, pipe securing hardware or pipe support standoffs was evident within these areas of metal exposure, rather mild to moderate surface corrosion exists at this time.

Walls And Coating

The interior walls were inspected beginning at the floor and by spiraling the circumference of the clearwell up to the water surface.

These steel wall panels and associated welds appeared sound and free of obvious failures of the steel at this time.

The average dry film thickness of the protective coating system applied to the interior welded steel wall panels were measured during this inspection. The dry film thickness of the coating system applied to the interior wall surfaces was found as follows:

Row	***Mil Thickness***
1.	52.56 mils
2.	35.39 mils

The American Water Works Association (AWWA) recommends a dry film thickness of 10.5 to 15.5 mils of coating film thickness be applied to the interior surfaces of welded steel potable water storage clearwells to provide adequate protection for welded steel structures.

The protective coating applied to these welded steel surfaces appeared to have been applied uniformly and meets the AWWA's recommendations, however adhesion loss of the protective coating was observed throughout all elevations of the interior walls.

Blistering of the protective coating was observed throughout approximately 30-40% of these surfaces. Approximately 15-20% of these coating blisters have ruptured, resulting in exposure of the underlying steel.

Corrosion exists within all areas of the interior walls showing steel exposure and fatigue (pitting) of the steel remains within the lowest wall panel, located directly below the manway. Three areas of fatigue (pitting) of the steel are confined to a 6" long section of this wall panel and are located approximately 2" above the floor of the clearwell.

The first area of steel fatigue (pitting) measures 2-1/2" in length by 1/4" in width by 1/4" in depth.

The second area of steel fatigue (pitting) measures 1-1/2" in diameter by 1/4" in depth.

The third area of steel fatigue measures 1' in diameter by 1/8" in depth.

The ultrasonic metal thickness of this steel wall panel was found to be .350".

Mild staining exists throughout all wall surfaces, beginning approximately 20" below overflow level and extends down to the floor.

Overhead

The entire overhead was inspected from the water surface.

These steel panels, associated welds and angle iron supports appeared sound and free of obvious failures of the steel at this time.

The protective coating applied to these surfaces has an average dry film thickness of 34.71 mils and appeared to have been applied uniformly and meets the AWWA's recommendations, however a decline in film thickness (thinning) of the protective coating. Adhesion loss (peeling) of the protective coating has resulted in exposure of the underlying steel throughout approximately 50% of all overhead surfaces at this time.

No obvious fatigue (pitting) of the steel panels or deterioration of the welds or angle iron supports was evident within these areas of steel exposure, rather mild to moderate corrosion exists at this time.

Overflows

The overflow consists of a series of thirty-six, 36" long by 3" wide cutouts evenly spaced throughout the circumference of the top of the top row of wall panels, each located approximately 5" below the junction of where the roof and walls meet.

Each overflow cutout was free of obvious obstructions at the time this inspection was completed.

Aesthetic Water Quality

The aesthetic water quality was found to be good throughout this entire clearwell, allowing unlimited visibility for this inspection.

RECOMMENDATIONS:

It is the opinion of Underwater Solutions Inc. that this welded steel clearwell appeared mostly sound and free of obvious leakage at this time.

EXTERIOR:

The exterior steel wall panels and associated welds were found appearing sound and remain free of obvious failures of the steel at this time.

The protective coating applied to these welded steel surfaces has an average dry film thickness that is below the AWWA's recommendations and has expired and no longer provides protection for the steel wall panels or welds.

Cracking and lifting of the protective coating throughout approximately 85% of these surfaces and throughout all elevations of the exterior walls has caused mild surface corrosion (blotch rusting) to show through the coating. Secondary coating adhesion loss has resulted in exposure of the primary coating throughout approximately 10% of these surfaces, while complete coating loss has resulted in exposure of the underlying steel throughout approximately 60% of these surfaces at this time.

Corrosion of the exposed steel was evident within all areas of coating adhesion loss, and fatigue (pitting) of the steel having depths from barely detectable levels up to 1/32" was observed within approximately 5% of the areas of steel exposure at this time.

Ultrasonic metal thickness measurements of the steel wall panels of this clearwell were taken during this inspection, and no abnormally high or low metal thickness measurements were observed during this inspection.

A non-uniform accumulation of mildew and corrosion staining from exposed steel exists throughout the exterior walls, causing declined aesthetics.

The steel roof panels and associated welds were inspected and were found appearing sound and remain free of obvious failures of the steel at this time.

The protective coating applied to these welded steel surfaces has an average dry film thickness that is below the AWWA's recommendations and has expired and no longer provides protection for these welded steel surfaces.

Adhesion loss of both the primary and secondary coating was observed throughout approximately 75% of the roof, resulting in exposure of the underlying steel. No obvious fatigue (pitting) of the steel roof panels was evident within these areas of steel exposure and no obvious deterioration of the welds was evident within these areas of steel exposure, rather mild surface corrosion exists at this time.

Ultrasonic metal thickness measurements of the steel roof panels of this clearwell were taken during this inspection, and no abnormally high or low metal thickness measurements were observed during this inspection.

A corrosion stain throughout the roof has declined the overall aesthetics.

It is our recommendation to abrasive blast the exterior wall, manway, roof, vent assembly and exterior surfaces of the hatch to white or near white metal. We recommend then re-coating these surfaces in an effort to halt corrosion, prevent further steel fatigue (pitting) and to provide good protection for these welded steel surfaces, while improving the overall aesthetics.

The tight cracks found throughout the exposed surfaces of the concrete foundation were sounded and remain free of obvious voids. The areas of concrete spall found throughout these exposed concrete surfaces remain free of exposure of the underlying reinforcement steel and did not appear to have increased in length, width of depth since the previous inspection completed by Underwater Solutions Inc. on May 10, 2013.

It is our recommendation to pressure-wash the exposed surfaces of the foundation at 3,000 P.S.I. and at 3.0 G.P.M. to remove the soiling from these surfaces. We recommend then resurfacing the areas of concrete spall using a suitable concrete repair material in an effort to prevent further concrete fatigue and the potential for exposure of the underlying reinforcement steel. We recommend then recoating the exposed surfaces of the foundation using an epoxy/polyurethane flexible coating to seal all cracks, seal the areas of repair and to seal and protect these concrete surfaces.

The elastomeric sealant applied throughout the circumference of the clearwell at the junction of where the foundation and clearwell base meet was found having good adhesion value, preventing moisture from penetrating and accumulating beneath the clearwell.

All components affixed to this clearwell were found to be properly installed at the time of this inspection.

A cap and associated screen installed over the vent penetration in the roof remains secure, preventing access to the interior of the clearwell.

The interior access hatch located on the roof was found secured with a lock, preventing unwanted access to the interior of the clearwell.

Each of the thirty-six overflow cutouts within the top row of wall panels were free of obvious obstructions, while the screen installed over overflow cutout is secure, preventing access to the interior of the tank.

INTERIOR:

The steel floor panels and associated welds were found appearing sound and remain free of obvious failures of the steel at this time.

The protective coating applied to these welded steel surfaces appeared to have been applied uniformly and meets the AWWA's recommendation, however was found having poor adhesion value and is blistering throughout approximately 35% of all surfaces.

Approximately 5% of these coating blisters have ruptured, resulting in exposure of the underlying steel.

No obvious fatigue (pitting) of the steel panels or deterioration of the welds was evident within these areas of steel exposure, rather mild surface corrosion exists at this time.

The interior steel wall panels and associated welds appeared sound and remain free of obvious failures of the steel at this time.

The protective coating applied to these welded steel surfaces appeared to have been applied uniformly and meets the AWWA's recommendations, however adhesion loss (blistering) of the protective coating was observed throughout approximately 30-40% of all elevations of the interior walls.

Approximately 15-20% of these coating blisters have ruptured, resulting in exposure of the underlying steel.

Corrosion exists within all areas of the interior walls having steel exposure, and fatigue (pitting) of the steel remains within the lowest wall panel, located directly below the manway.

These three areas of steel fatigue (pitting) are confined to a 6" long section of this wall panel, located approximately 2" above the floor of the clearwell.

The first area of steel fatigue (pitting) measures 2-1/2" in length by 1/4" in width by 1/4" in depth.

The second area of steel fatigue (pitting) measures 1-1/2" in diameter by 1/4" in depth.

The third area of steel fatigue measures 1' in diameter by 1/8" in depth.

The ultrasonic metal thickness of this steel wall panel was found to be .350".

The steel overhead panels, associated welds and angle iron supports appeared sound and remain free of obvious failures of the steel at this time.

The protective coating applied to these surfaces appeared to have been applied uniformly and meets the AWWA's recommendations, however a decline in film thickness (thinning) of the protective coating and adhesion loss (peeling) of the protective coating has resulted in exposure of the underlying steel throughout approximately 50% of all overhead surfaces at this time.

No obvious fatigue (pitting) of the steel panels or deterioration of the welds or angle iron supports was evident within these areas of steel exposure, rather mild to moderate corrosion exists at this time.

The protective coating applied to the interior surfaces of the manway lid and trunk meets the AWWA's recommendations, however is blistering and peeling, resulting in exposure of the underlying steel throughout approximately 30% these surfaces. No obvious fatigue/deterioration of the steel was evident within these areas of steel exposure, rather mild surface corrosion exists at this time.

The protective coating applied to the metal surfaces of the pipes within this clearwell, to include the metal standoffs that support the 28" inside diameter pipe that penetrates the floor on the westernmost side of the clearwell (third pipe inspected) was found having poor adhesion value and is blistering. This condition has caused metal exposure and surface corrosion, yet these metal pipes and pipe support standoffs and pipe securing hardware remains sound and free of obvious fatigue/deterioration at this time.

It is our recommendation to abrasive blast all interior floor, piping, wall, manway, overhead panel and supports and interior surfaces of the access hatch to white or near white metal. We recommend then welding a steel plate over the areas of steel fatigue (pitting) found within the wall panel directly below the manway and to re-coat these surfaces using an A.N.S.I./N.S.F.61 approved coating for use in structures containing potable water in an effort to halt corrosion, prevent further fatigue of the steel and to provide good protection for the steel surfaces of the clearwell and steel components within this clearwell.

As always, we recommend that re-inspection and cleaning of all water storage facilities be performed in accordance with state and federal mandates, A.W.W.A. standards, and completed by an experienced and authorized inspection corporation.

UNDERWATER SOLUTIONS INC.
Christopher A. Cole, Project Manager

This report, the conclusions, recommendations and comments prepared by Underwater Solutions Inc. are based upon spot examination from readily accessible parts of the clearwell. Should latent defects or conditions which vary significantly from those described in the report be discovered at a later date, these should be brought to the attention of a qualified individual at that time. These comments and recommendations should be viewed as information to be used by the Owner in determining the proper course of action and not to replace a complete set of specifications. All repairs should be done in accordance with A.W.W.A. and/or other applicable standards.

1 *Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion*

2 *Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion*

3 *Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion*

4 *Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion*

5 *Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion*

6 *Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion*

7 ***Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion***

8 ***Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion***

9 ***Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion***

10 ***Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion***

11 ***Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion***

12 ***Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion***

13 *Exterior Wall With Expired Coating/Cracking/Lifting, Exposed Primary Coating, Exposed Underlying Steel, Mildew And Steel Corrosion*

14 *Exterior Wall With Surface Corrosion And Minimal Steel Fatigue (Pitting)*

15 *Exterior Wall With Surface Corrosion And Minimal Steel Fatigue (Pitting)*

16 *Exterior Wall With Surface Corrosion And Minimal Steel Fatigue (Pitting)*

17 *Exterior Wall With Surface Corrosion And Minimal Steel Fatigue (Pitting)*

18 *Exterior Weld Between Wall Panels With Surface Corrosion*

19 *Exterior Weld Between Wall Panels With Surface Corrosion*

20 *Exterior Weld Between Wall Panels With Surface Corrosion*

21 *Exterior Weld Between Wall Panels With Surface Corrosion*

22 *Secure Manway With Expired Coating, Exposed Underlying Primary Coating, Exposed Underlying Steel And Mild Surface Corrosion*

23 *Ladder Utilized To Access The Roof*

24 *Concrete Foundation With Tight Surface Cracks And Spall*

25 *Concrete Foundation With Tight Surface Cracks*

26 *Concrete Foundation With Tight Surface Cracks*

27 *Concrete Foundation With Tight Surface Cracks*

28 *Concrete Foundation With Tight Surface Cracks*

29 *Concrete Foundation With Spall*

30 *Concrete Foundation With Spall*

31 ***Concrete Foundation With Spall***

32 ***Concrete Foundation With Spall***

33 ***Concrete Foundation With An Elastemeric Sealant Applied***

34 ***Concrete Foundation With An Elastemeric Sealant Applied***

35 ***Concrete Foundation With An Elastemeric Sealant Applied At The Tank Base And Foundation***

36 ***Concrete Foundation With An Elastemeric Sealant Applied At The Tank Base And Foundation***

37 ***Concrete Foundation With An Elastemeric Sealant Applied At The Tank Base And Foundation***

38 ***Secure Overflow Screen Cutouts***

39 ***Secure Overflow Screen Cutouts***

40 ***Secure Overflow Screen Cutout***

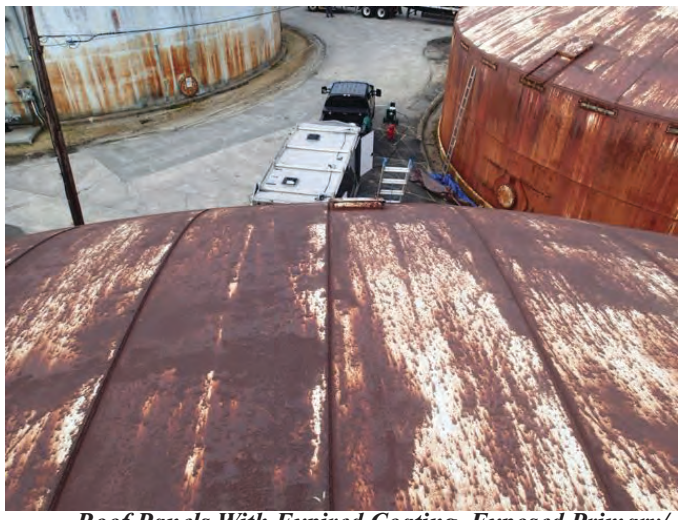
41 ***Secure Overflow Screen Cutout***

42 ***Secure Overflow Screen Cutout***

43 ***Secure Overflow Screen Cutout***

44 ***Roof Panels With Expired Coating, Exposed Primary/ Secondary Coating, Exposed Underlying Steel And Mild Surface Corrosion***

45 ***Roof Panels With Expired Coating, Exposed Primary/ Secondary Coating, Exposed Underlying Steel And Mild Surface Corrosion***

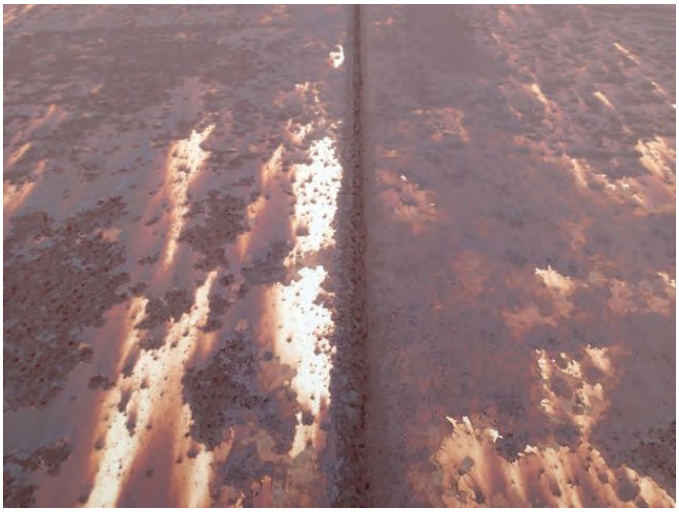


46 ***Roof Panels With Expired Coating, Exposed Primary/ Secondary Coating, Exposed Underlying Steel And Mild Surface Corrosion***

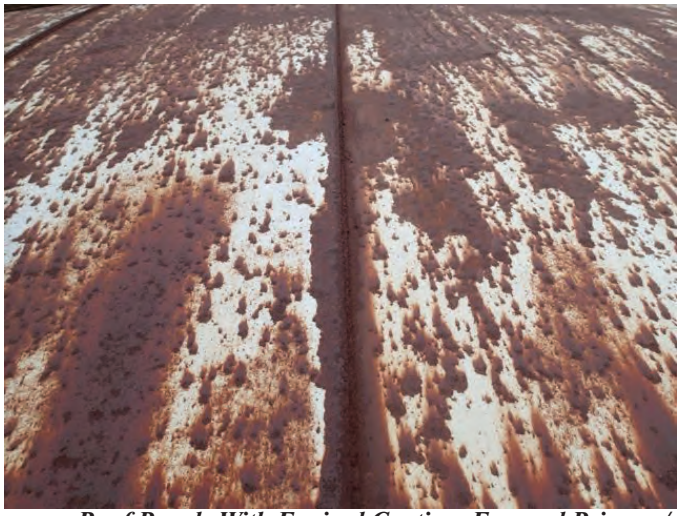
47 ***Roof Panels With Expired Coating, Exposed Primary/ Secondary Coating, Exposed Underlying Steel And Mild Surface Corrosion***

48 ***Roof Panels With Expired Coating, Exposed Primary/ Secondary Coating, Exposed Underlying Steel And Mild Surface Corrosion***

49 ***Roof Panels With Expired Coating, Exposed Primary/ Secondary Coating, Exposed Underlying Steel And Mild Surface Corrosion***

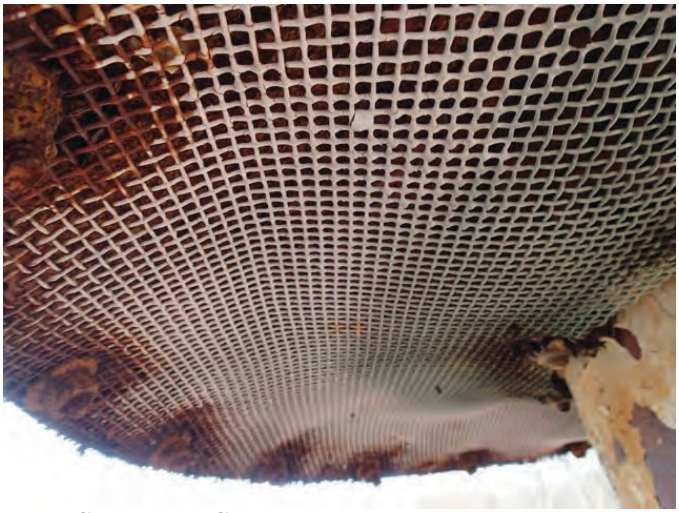


50 ***Roof Panels With Expired Coating, Exposed Primary/ Secondary Coating, Exposed Underlying Steel And Mild Surface Corrosion***



51 ***Roof Panels With Expired Coating, Exposed Primary/ Secondary Coating, Exposed Underlying Steel And Mild Surface Corrosion***

52 ***Secure Vent Cap With Expired Coating, Exposed Steel And Corrosion***

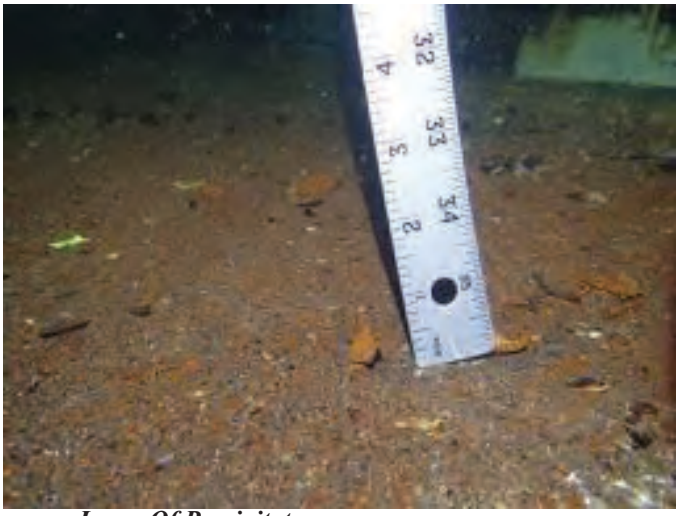


53 ***Secure Vent Screen***

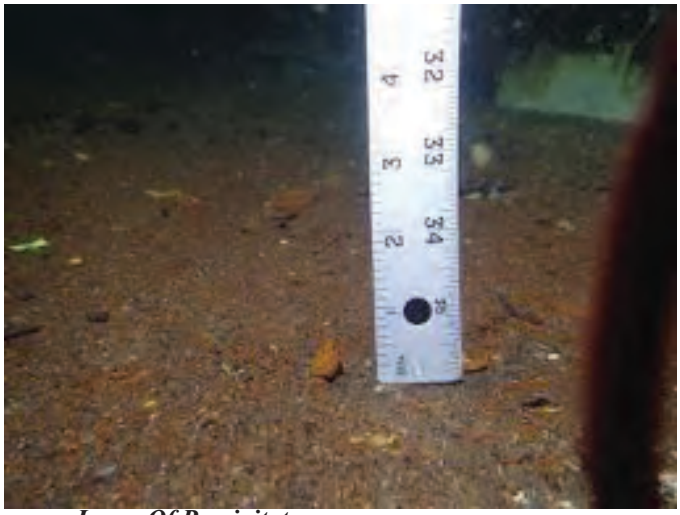
54 ***Secure Vent Screen***

55 ***Open Access Hatch With Expired Coating, Exposed Steel And Corrosion***

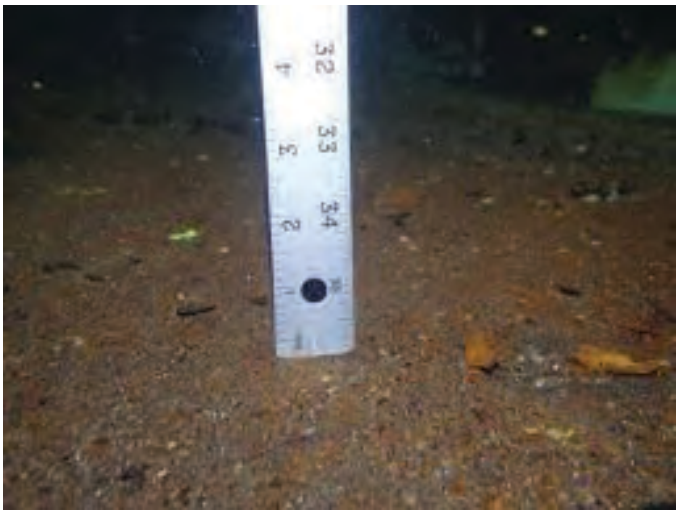
56 ***Closed Access Hatch With Expired Coating, Exposed Steel And Corrosion***



57 ***Layer Of Precipitate***



58 ***Layer Of Precipitate***



59 ***Layer Of Precipitate***

60 ***Floor With Ruptured Coating Blisters, Exposed Underlying Steel, Mild Surface Corrosion And Mild Staining***

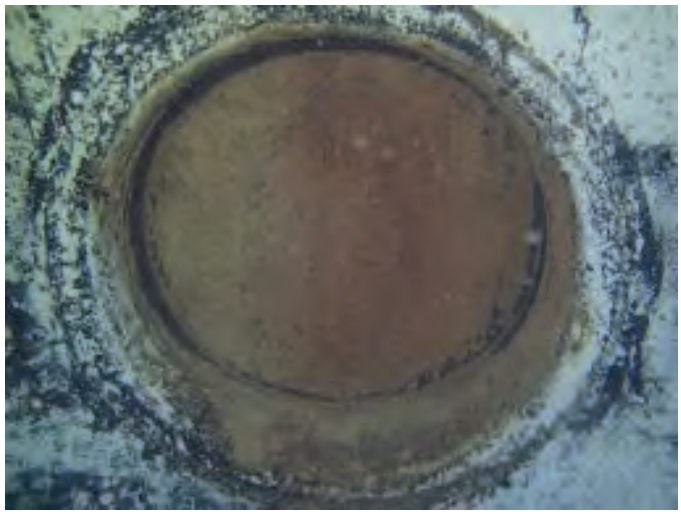
61 ***Floor With Ruptured Coating Blisters, Exposed Underlying Steel, Mild Surface Corrosion And Mild Staining***

62 ***Floor With Ruptured Coating Blisters, Exposed Underlying Steel, Mild Surface Corrosion And Mild Staining***

63 ***Floor With Ruptured Coating Blisters, Exposed Underlying Steel, Mild Surface Corrosion And Mild Staining***

64 ***Floor With Ruptured Coating Blisters, Exposed Underlying Steel, Mild Surface Corrosion And Mild Staining***

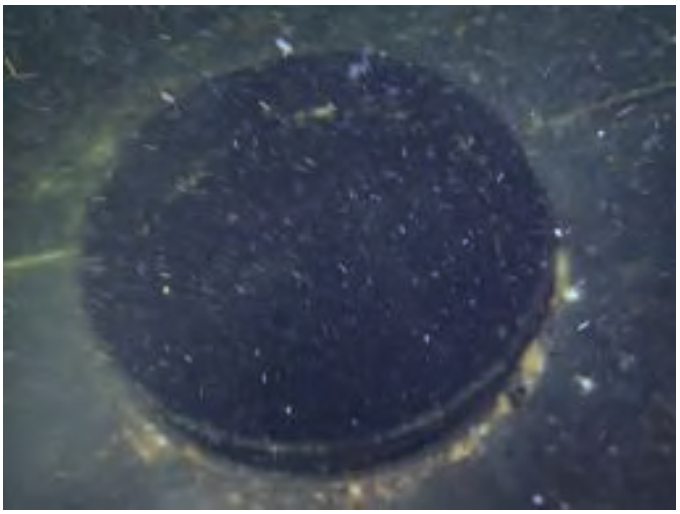
65 ***Floor With Ruptured Coating Blisters, Exposed Underlying Steel, Mild Surface Corrosion And Mild Staining***



66 ***Manway***

67 ***Manway With Coating Loss/Blistering/Peeling, Exposed Underlying Steel And Mild Surface Corrosion***

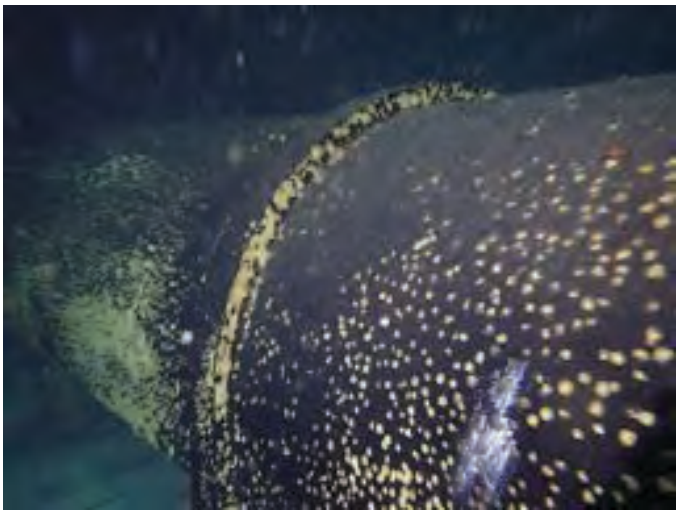
68 ***30” Inside Diameter Pipe - Flush Penetration Silt Stop With Coating Loss/Blistering, Exposed Underlying Steel And Mild To Moderate Corrosion***



69 ***23” Inside Diameter Pipe Penetrating With Coating Loss/Blistering, Exposed Underlying Steel And Mild To Moderate Surface Corrosion***

70 ***28” Inside Diameter Pipe Penetrating The Tank Floor With Ruptured Coating Blisters, Exposed Underlying Metal And Mild To Moderate Surface Corrosion***

71 ***28” Inside Diameter Pipe With Ruptured Coating Blisters, Exposed Underlying Metal And Mild To Moderate Surface Corrosion***



72 ***28” Inside Diameter Pipe With Ruptured Coating Blisters, Exposed Underlying Metal And Mild To Moderate Surface Corrosion***

73 *28” Inside Diameter Pipe With Ruptured Coating Blisters, Exposed Underlying Metal And Mild To Moderate Surface Corrosion*

74 *28” Inside Diameter Pipe With Ruptured Coating Blisters, Exposed Underlying Metal And Mild To Moderate Surface Corrosion*

75 *28” Inside Diameter Pipe Standoffs With Ruptured Coating Blisters, Exposed Underlying Metal And Mild To Moderate Surface Corrosion*

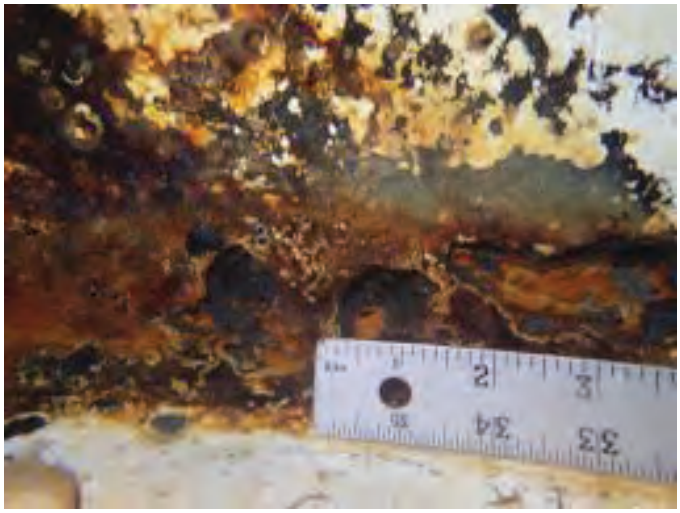
76 *28” Inside Diameter Pipe Standoffs With Ruptured Coating Blisters, Exposed Underlying Metal And Mild To Moderate Surface Corrosion*

77 *28” Inside Diameter Pipe Standoffs With Ruptured Coating Blisters, Exposed Underlying Metal And Mild To Moderate Surface Corrosion*

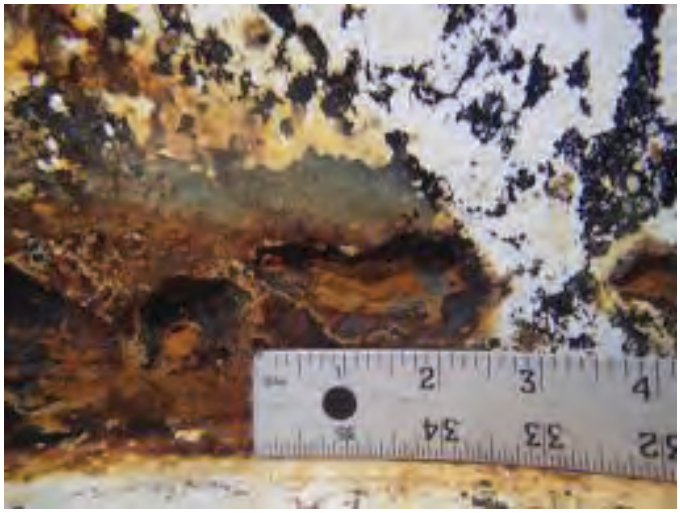
78 *28” Inside Diameter Pipe Standoffs With Ruptured Coating Blisters, Exposed Underlying Metal And Mild To Moderate Surface Corrosion*

79 ***28” Inside Diameter Pipe With Ruptured Coating Blisters, Exposed Underlying Metal And Mild To Moderate Surface Corrosion***

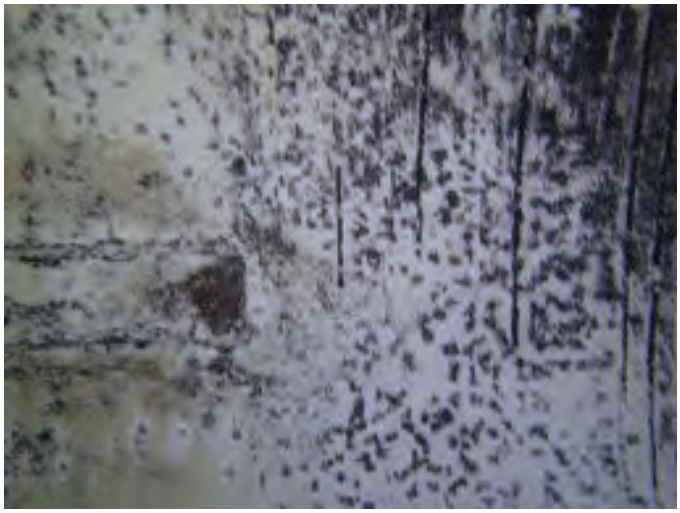
80 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Fatigue (Pitting), Corrosion And Mild Staining***



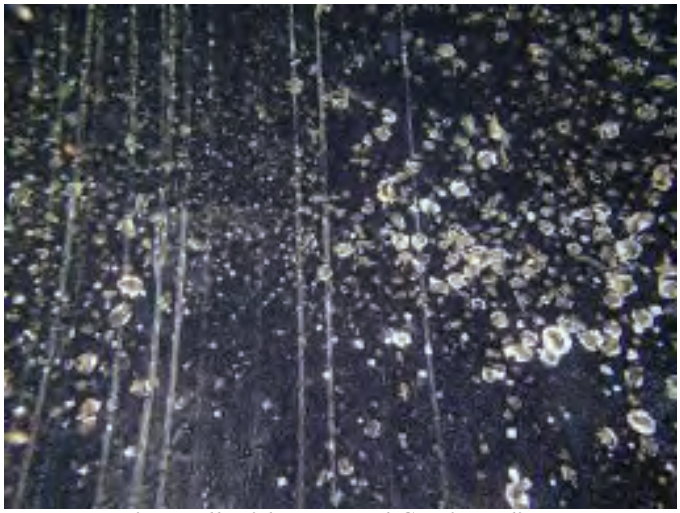
81 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Fatigue (Pitting), Corrosion And Mild Staining***



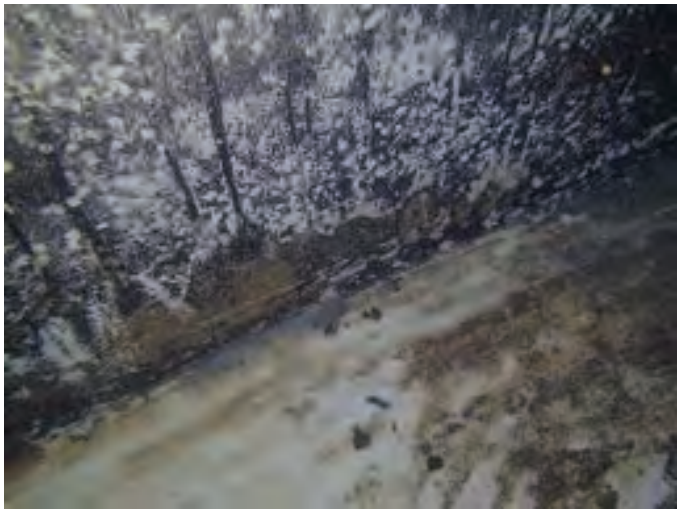
82 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Fatigue (Pitting), Corrosion And Mild Staining***



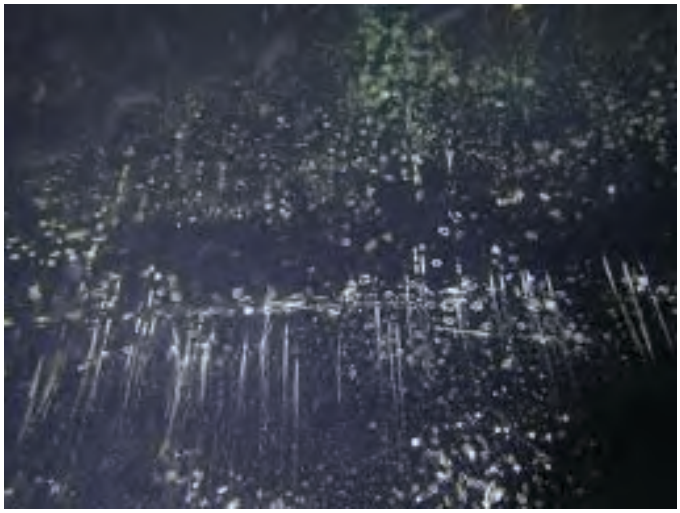
83 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Corrosion And Mild Staining***



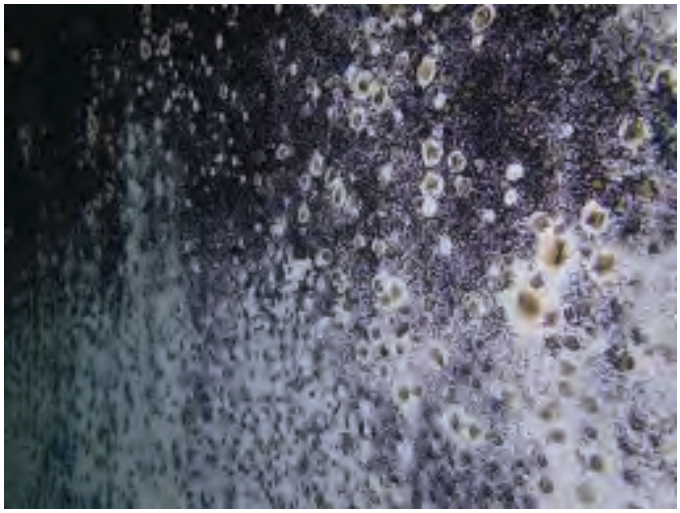
84 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Corrosion And Mild Staining***



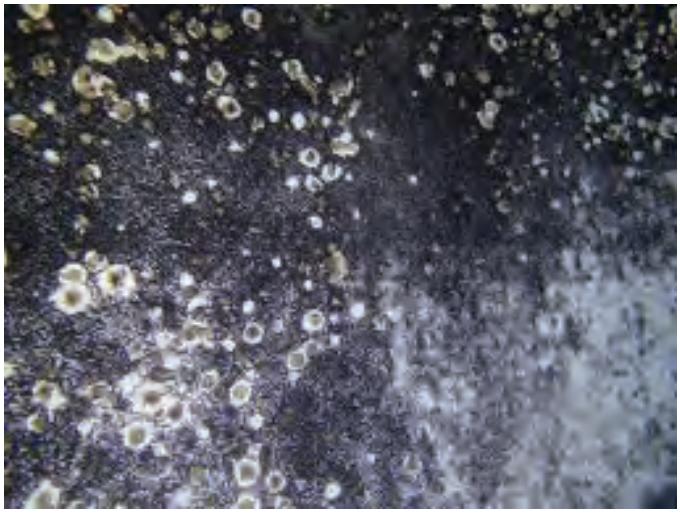
85 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Corrosion And Mild Staining***



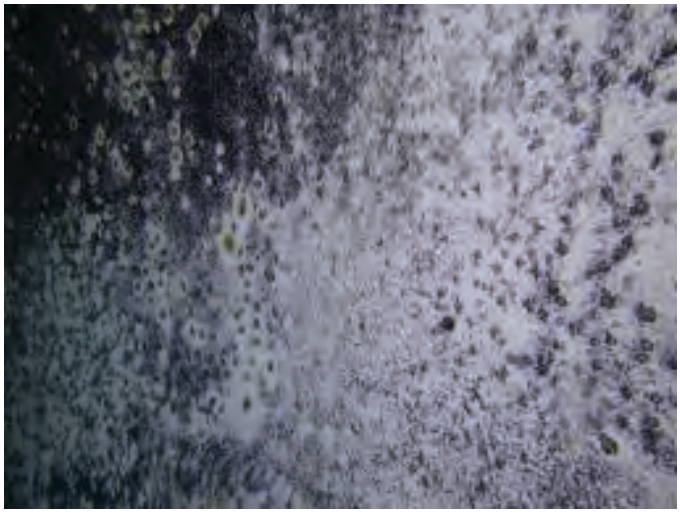
86 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Corrosion And Mild Staining***



87 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Corrosion And Mild Staining***

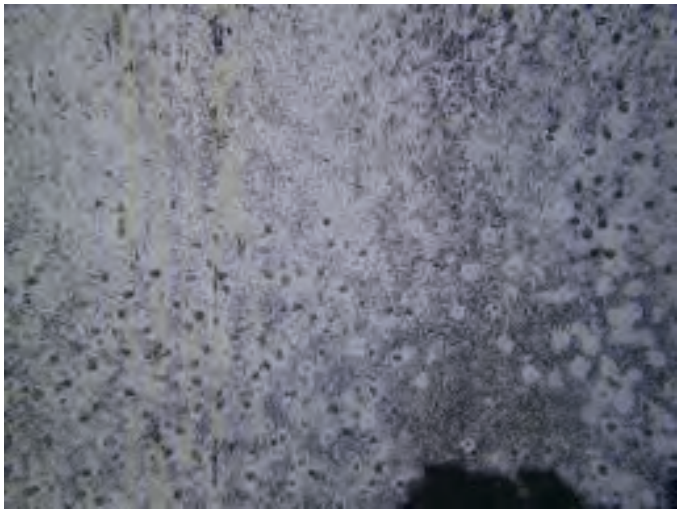


88 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Corrosion And Mild Staining***

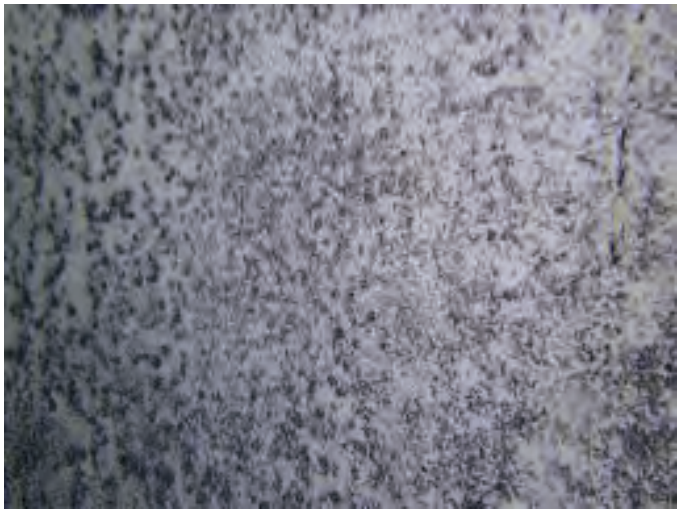


89 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Corrosion And Mild Staining***

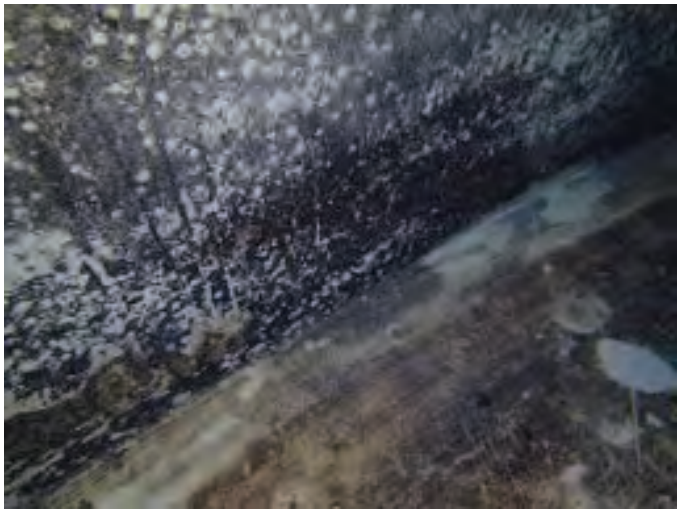
90 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Corrosion And Mild Staining***



91 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Corrosion And Mild Staining***



92 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Corrosion And Mild Staining***



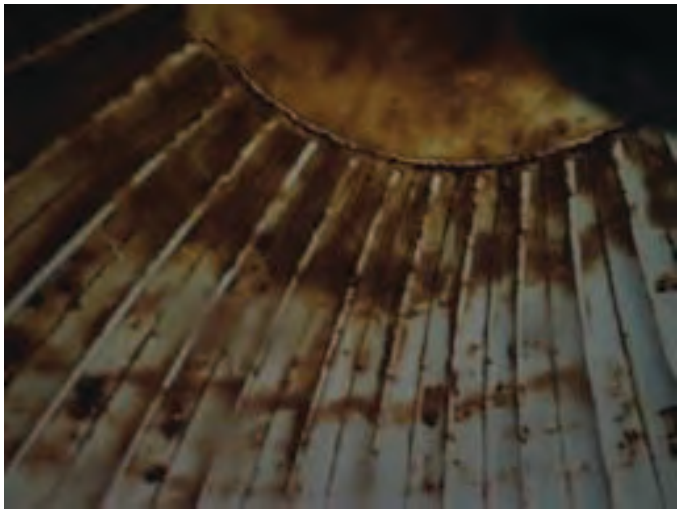
93 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Corrosion And Mild Staining***

94 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Corrosion And Mild Staining***

95 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Corrosion And Mild Staining***

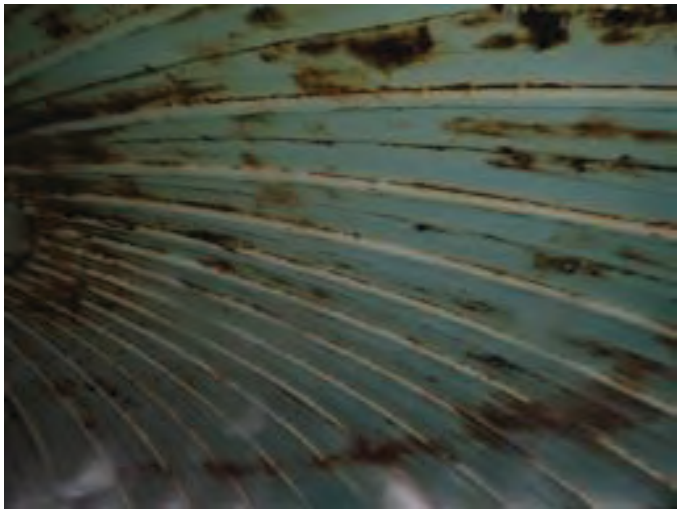
96 ***Interior Wall With Ruptured Coating Blisters, Exposed Underlying Steel, Corrosion And Mild Staining***

97 ***Overhead With Coating Thinning Exposed Underlying Steel And Mild To Moderate Corrosion***

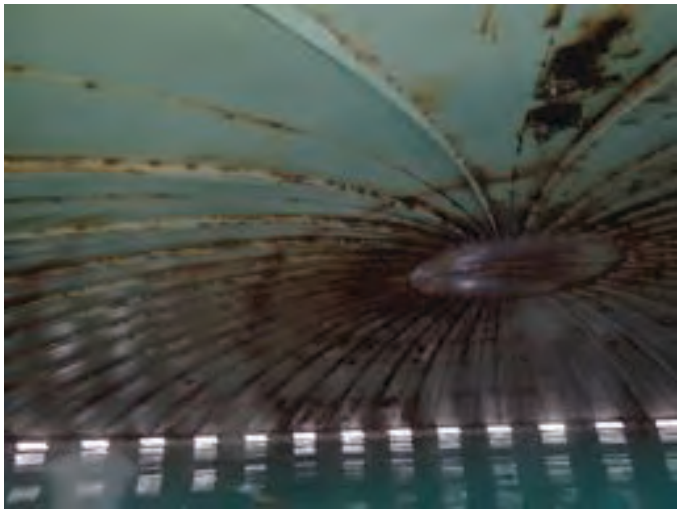


98 ***Overhead With Coating Thinning Exposed Underlying Steel And Mild To Moderate Corrosion***

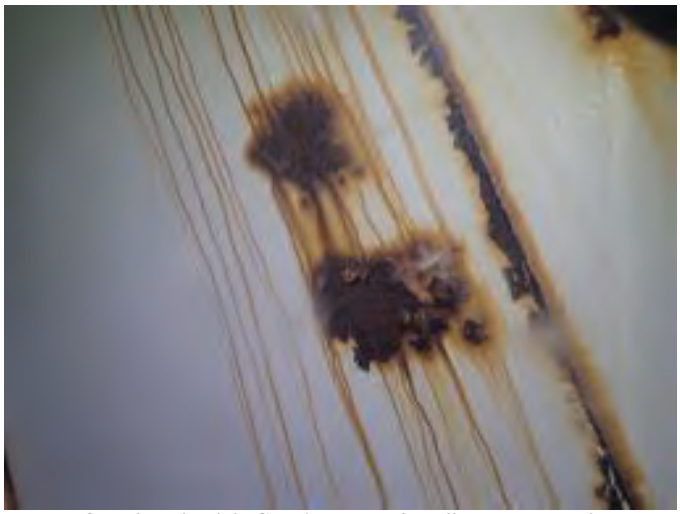
99 ***Overhead With Coating Thinning Exposed Underlying Steel And Mild To Moderate Corrosion***



100 ***Overhead With Coating Loss/Peeling, Exposed Underlying Steel And Mild To Moderate Corrosion***



101 ***Overhead With Coating Loss/Peeling, Exposed Underlying Steel And Mild To Moderate Corrosion***



102 ***Overhead With Coating Loss/Peeling, Exposed Underlying Steel And Mild To Moderate Corrosion***

103 ***Overhead With Coating Loss/Peeling, Exposed Underlying Steel And Mild To Moderate Corrosion***

104 ***Overhead With Coating Loss/Peeling, Exposed Underlying Steel And Mild To Moderate Corrosion***

105 ***Overflow***

106 ***Overflow***

107 ***Overflows***

108 ***Discharge During Cleaning***

UNDERWATER SOLUTIONS INC.

INSPECTION AND INTERIOR CLEANING (SEDIMENT REMOVAL) OF THE INDUSTRIAL PARK 1.8-MILLION GALLON WELDED STEEL WATER STORAGE TANK

CITY OF WOONSOCKET WATER DIVISION WOONSOCKET, RHODE ISLAND

JUNE 12, 13 & 14, 2018

INSPECTION AND INTERIOR CLEANING (SEDIMENT REMOVAL) OF THE INDUSTRIAL PARK 1.8-MILLION GALLON WELDED STEEL WATER STORAGE TANK

CITY OF WOONSOCKET WATER DIVISION WOONSOCKET, RHODE ISLAND

JUNE 12, 13 &14, 2018

SCOPE:

On June 12, 13 & 14, 2018, Underwater Solutions Inc. inspected the Industrial Park 1.8-million gallon welded steel potable water storage tank to provide information regarding the overall condition and integrity of this structure and removed the sediment accumulation from the floor.

EXTERIOR INSPECTION:

The entire exterior of this water storage tank (and all components) was inspected to include walls and coating, manways, ladders, foundation, overflow, roof, vent, and hatches.

Walls And Coating

The exterior steel wall panels and associated welds were inspected and found appearing sound and remain free of obvious fatigue or failures.

The average dry film thickness of the protective coating system applied to the exterior welded steel wall panels was measured during this inspection. The dry film thickness of the coating system applied to the exterior wall surfaces was found as follows:

Row	***Mil Thickness***	***Row***	***Mil Thickness***
1.	3.5 mils	7.	4.4 mils
2.	4.5 mils	8.	3.9 mils
3.	4.6 mils	9.	4.9 mils
4.	4.9 mils	10.	4.6 mils
5.	6.8 mils	11.	5.2 mils
6.	4.6 mils	12.	4.8 mils

The American Water Works Association (AWWA) recommends a dry film thickness of 7.0 to 10.0 mils of coating film thickness be applied to the exterior surfaces of welded steel potable water storage tanks to provide adequate protection for welded steel structures.

The protective coating applied to the exterior walls appears to have been applied uniformly, however the protective coating applied to these surfaces has declined in film thickness and is nearing expiration.

Adhesion loss of the protective coating was evident throughout approximately 15% of these surfaces and was observed throughout all elevations of the exterior walls, resulting in exposure of the underlying steel. No obvious fatigue (pitting) of the steel panels or deterioration of the welds was evident within these areas of exposure, rather mild surface corrosion exists at this time.

Numerous areas of coating damage (coating chips) were found throughout the lowest 40' of the exterior walls and appear to be the result of objects striking the tank. These areas of coating damage have caused exposure and corrosion of underlying steel. No obvious fatigue/deterioration of the steel was evident within these 1/8" to 3" diameter areas of exposure, rather mild to moderate corrosion exists at this time.

Chalking of the protective coating and rust staining throughout the exterior walls causes declined aesthetics.

Manways

Two, 24" inside diameter manways penetrate the lowest row of wall panels on the easternmost and westernmost sides of the tank, located approximately 27" above the tank base and 48" above the ground, and are securely installed and free of obvious leakage.

The protective coating applied to the easternmost manway has an average dry film thickness of 4.7 mils and is below the AWWA's recommendation. The protective coating was found having poor adhesion value and has lost adhesion throughout approximately 10% of the surfaces of the manway lid and throughout approximately 80% of the surfaces of the securing hardware, causing steel exposure and corrosion. However, the surfaces of the manway lid and trunk having steel exposure remain sound and free of obvious fatigue/deterioration, and the securing hardware remains sound and free of obvious fatigue/deterioration at this time.

The protective coating applied to the westernmost manway has an average dry film thickness of 4.9 mils and is below the AWWA's recommendation. The protective coating was found having poor adhesion value and has lost adhesion throughout approximately 5% of the surfaces of the manway lid and throughout approximately 80% of the surfaces of the securing hardware, causing steel exposure and corrosion. However, the surfaces of the manway lid and trunk having steel exposure remain sound and free of obvious fatigue/deterioration and the securing hardware remains sound and free of obvious fatigue/deterioration at this time.

Ladders

A steel ladder and safety cage extend from approximately 36" above the ground up to the roof dome. This ladder is supported to the tank wall with seventeen sets of welded standoffs and has a fall prevention device installed throughout its length, providing safe access to the roof.

The protective coating applied to the steel ladder, safety cage and fall prevention device has lost adhesion throughout approximately 15% of these surfaces, resulting in exposure of the underlying steel. No obvious fatigue or deterioration of the steel was evident within these areas of exposure, rather mild surface corrosion exists at this time.

A ladder guard secured with a lock is installed at the base of this ladder, preventing unwanted access to the ladder/roof. The protective coating applied to the steel ladder guard has lost adhesion throughout approximately 5% of these surfaces, resulting in exposure of the underlying steel. No obvious fatigue or deterioration of the exposed steel was evident within these areas of coating adhesion loss, rather mild surface corrosion exists at this time.

A second steel ladder extends from the edge of the roof dome on the westernmost side of the tank up to the vent and is secured to the roof with three sets of welded standoffs. This ladder remains in sound condition, providing good access to the center of the roof dome and vent.

The protective coating applied to this ladder has lost adhesion throughout approximately 10% of these surfaces, causing steel exposure and surface corrosion. However, this ladder remains sound and free of obvious fatigue/deterioration at this time.

Anchor Bolts

Thirty, 2" diameter anchor bolts extend up from the concrete foundation through steel support chairs that are welded to the lowest row of wall panels.

Each anchor bolt has one nut securely installed. The protective coating applied to this steel support hardware is nearing expiration and has become thin, causing steel exposure and surface corrosion throughout approximately 15%-20% of these surfaces. However, these steel support components remain free of obvious fatigue/deterioration of the steel at this time.

Foundation

The exposed surfaces of the 10" wide concrete foundation range from 4" to 18" tall, are not coated and were found having tight cracks throughout approximately 10% of these exposed surfaces.

These cracks were sounded and appeared to be limited to the surface of the concrete and remain free of obvious voids or spalls at this time.

Overflow

The 12" inside diameter overflow pipe exits the base of a welded steel weir box and extends down, supported to the tank wall with ten welded standoffs, and through a series of elbows before it penetrates the ground. Approximately 50' north of the tank this pipe penetrates the wall of a concrete vault. The outlet end of this pipe was free of obvious obstructions and the screen at the end of this pipe is secure, preventing access to the interior of the tank.

The protective coating applied to this steel pipe has lost adhesion and has become thin, causing steel exposure throughout approximately 25% of the surfaces of this pipe. No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild corrosion exists at this time.

Roof

The steel roof panels and associated welds were inspected and found appearing sound and remain free of obvious fatigue or failures.

The protective coating applied to the roof has an average dry film thickness of 4.3 mils, has declined in film thickness and has nearly expired at this time.

Thinning of the protective coating causes exposure of the primary coating throughout approximately 25% of these surfaces, while coating adhesion loss has resulted in exposure of the underlying steel throughout approximately 30% of these surfaces.

No obvious fatigue/deterioration of the steel was evident within these areas of steel exposure, rather mild corrosion exists at this time.

The welded steel safety railings that extend from the edge of the roof on the westernmost side of the tank up to the vent within the center of the roof remain securely welded in-place and free of fatigue or failures. The protective coating applied to these steel safety railings has declined in film thickness and has nearly expired, causing steel exposure and surface corrosion throughout all surfaces. However, these safety components remain sound and secure at this time, providing safe access to the vent.

Vent

The vent is located within the center of the roof dome, having a 24" inside diameter, and stands 19" tall.

A 48" outside diameter steel cap remains securely installed over the vent penetration in the roof, however the screen associated with the vent has failed due to corrosion.

Underwater Solutions Inc. installed a UV resistant, 24-mesh screen over the vent penetration in the roof to temporarily prevent access to the interior of the tank.

The protective coating applied to the steel vent cap has lost adhesion, resulting in exposure of the underlying steel throughout approximately 20% of these surfaces. No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild corrosion exists at this time.

Hatches

One, 24-1/2" hatch at the edge of the roof dome on the westernmost side of the tank provides good access to the tank interior. This hatch remains in good working condition and was found secured with a lock, preventing unwanted access to the interior of the tank.

The protective coating applied to the interior and exterior surfaces of the steel hatch lid and trunk has lost adhesion throughout approximately 5% of these surfaces, causing steel exposure and corrosion. However, these steel surfaces remain sound and free of obvious fatigue/deterioration at this time.

A second hatch having a 24" inside diameter is located in the center of the roof and is secured with nuts and bolts, preventing unwanted access to the interior of the tank. This hatch was not utilized or opened at the time of this inspection.

The protective coating applied to the interior and exterior surfaces of the steel hatch lid and trunk has lost adhesion throughout approximately 5-10% of these surfaces causing steel exposure and corrosion. However, these steel surfaces remain sound and free of obvious fatigue/deterioration at this time.

INTERIOR INSPECTION:

The entire interior of this water storage tank (and components) was inspected to include sediment accumulations, floor, manways, piping, walls and coating, overhead, overflow, and aesthetic water quality.

Sediment Accumulations

A non-uniform layer of accumulated precipitate was found throughout the floor ranging from 6" to 31" in depth.

After completing this inspection, all precipitate was removed (vacuumed) from the floor.

Floor

After removing the accumulated precipitate, the steel floor panels and associated welds were inspected and found appearing sound and free of obvious fatigue or failures.

The protective coating applied to these surfaces appears to have been applied uniformly, but has lost adhesion, resulting in exposure of the underlying steel throughout approximately 10% of these surfaces. No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild to moderate corrosion exists at this time.

Moderate to heavy staining remains throughout the floor due to an accumulation of precipitate.

Manways

Two, 24" inside diameter manways penetrate the lowest row of wall panels on the easternmost and westernmost sides of the tank, located approximately 27" above the floor, and are securely installed and free of leakage.

The protective coating applied to the easternmost manway lid and trunk has expired and has lost adhesion, resulting in exposure of the underlying steel surfaces of the manway lid and trunk.

Corrosion exists within these areas of steel exposure and fatigue (pitting) of the steel trunk, having depths from barely detectable levels to 1" in diameter by 1/8" deep, was observed within these areas of corrosion at this time.

The protective coating applied to the westernmost manway lid and trunk has expired and has lost adhesion, resulting in exposure of the underlying steel surfaces of the manway lid and trunk.

Corrosion exists within these areas of steel exposure and fatigue (pitting) of the weld at the junction of the steel trunk and wall panel, having depths from barely detectable levels to 1" in diameter by 1/8" deep, was observed throughout approximately 25% of the surfaces of this weld.

Piping

The influent/effluent pipe penetrates the floor approximately 24" in from the wall, having a 12" inside diameter, and stands 5" tall.

This pipe was free of obvious obstructions and flow was leaving the tank through this pipe at the time of this inspection.

The protective coating applied to this steel pipe was found having poor adhesion value and is blistering throughout approximately 75% of these surfaces. Approximately 5% of these coating blisters have ruptured, causing steel exposure and corrosion. However, this pipe remains sound and free of obvious fatigue/deterioration.

Walls And Coating

The interior walls were inspected beginning at the floor and by spiraling the circumference of the tank up to the water surface.

These steel wall panels and associated welds appeared sound, however the protective coating applied to these surfaces has expired and no longer provides protection for the steel panels or welds.

The protective coating applied to these welded steel surfaces appears to have been applied uniformly, however the protective coating has lost adhesion and is blistering throughout approximately 75-80% of all elevations of these surfaces.

Approximately 50% of these coating blisters have ruptured, resulting in exposure of the underlying steel. Moderate corrosion exists within all areas of steel exposure and fatigue (pitting) of the steel, having depths from barely detectable levels to 1" in diameter by 1/8" deep, exists within these areas of steel exposure at this time.

Moderate to heavy staining exists throughout the interior walls, beginning approximately 40" below overflow level and extending down to the floor.

Overhead

The entire overhead was inspected from the water surface.

These steel panels and channel iron supports appeared sound and remain free of obvious fatigue or failures.

The protective coating applied to these steel panels and supports has declined in film thickness and is nearing expiration, causing exposure of the underlying steel throughout approximately 30% of these surfaces.

No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild corrosion exists at this time.

The vent penetration within the center of the overhead was free of obvious obstructions at the time of this inspection.

Overflow

The overflow consists of a 36" long by 6" wide cutout within the top wall panel, located approximately 6" below the junction of where the roof and walls meet.

This overflow cutout was free of obvious obstructions at the time of this inspection.

Aesthetic Water Quality

The aesthetic water quality was good throughout the entire tank, allowing unlimited visibility for this inspection

RECOMMENDATIONS:

It is the opinion of Underwater Solutions Inc. that this welded steel potable water storage tank appears mostly sound and free of obvious leakage. However, rehabilitation is required within the near future as the protective coating applied to the exterior of the tank has nearly expired and the protective coating applied to the interior of the tank has expired.

EXTERIOR:

The exterior steel wall panels and exterior steel roof panels, including the welds associated with these steel panels, appeared sound at this time.

The protective coating applied to these welded steel surfaces appears to have been applied uniformly, however declined film thickness, coating adhesion loss and coating damage causes steel exposure and corrosion throughout the tank exterior. However, no obvious fatigue (pitting) of these steel panels or deterioration of the welds between panels was evident.

The protective coating applied to the steel components (manways, anchor bolts, nuts and support chairs, ladders and ladder components, overflow pipe, vent and hatches) has also nearly expired and has lost adhesion and no longer provides protection for these steel surfaces.

It is our recommendation to abrasive blast the exterior steel surfaces of the tank, including the surfaces of the steel components affixed to this tank, to white or near-white metal and to re-coat these surfaces within the next five years to halt corrosion, prevent steel fatigue/deterioration and to provide good protection for the steel surfaces of the tank and the steel components affixed to the exterior of the tank.

The tight surface cracks found throughout the exposed surfaces of the concrete foundation were sounded and appeared to be limited to the surface of the concrete and remain free of obvious voids or spalls at this time.

It is our recommendation to pressure-wash the exposed surfaces of the foundation at 3,000 P.S.I. and at 3.0 G.P.M. to remove the soiling from these surfaces. We then recommend re-coating the exposed surfaces of the foundation using an epoxy/polyurethane flexible coating to seal all cracks and to seal and protect these exposed concrete surfaces.

All components affixed to the exterior of this tank were found properly installed at this time.

A screen installed on the outlet end of the overflow pipe located within a vault was found secure, preventing access to the interior of then pipe/tank.

The vent is located within the center of the roof and was found having a secure cap, however the screen associated with the vent has failed due to corrosion.

Underwater Solutions Inc. installed a UV resistant, 24-mesh screen over the vent penetration in the roof to temporarily prevent access to the interior of the tank.

The protective coating applied to the steel vent cap has lost adhesion, causing steel exposure and corrosion.

It is our recommendation that when this tank is rehabilitated, that the existing vent be removed and a replacement AWWA compliant non-corrosive fail-safe (frost proof) vent be installed over the vent penetration in the roof to prevent access to the interior of the tank and allow for unobstructed ventilation.

The westernmost interior access hatch was found secured with a lock and the hatch within the center of the roof was found secured with nuts and bolts, preventing access to the interior of the tank.

INTERIOR:

The interior steel floor panels and associated welds were found appearing sound and remain free of obvious fatigue or failures.

The protective coating applied to these surfaces has lost adhesion, resulting in exposure of the underlying steel throughout approximately 10% of these surfaces. No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild to moderate corrosion exists at this time.

The interior steel wall panels and associated welds appeared sound, however the protective coating applied to these surfaces has expired and no longer provides protection for these welded steel surfaces.

The protective coating applied to these welded steel surfaces has lost adhesion and is blistering throughout approximately 75%-80% of all elevations of these surfaces.

Approximately 50% of these coating blisters have ruptured, resulting in exposure of the underlying steel. Moderate corrosion exists within all areas of steel exposure and fatigue (pitting) of the steel, having depths from barely detectable levels to 1" in diameter by 1/8" deep, exists within these areas of steel exposure at this time.

The protective coating applied to the easternmost manway lid and trunk has lost adhesion, resulting in exposure of the underlying steel surfaces of the manway lid and trunk.

Corrosion exists within these areas of steel exposure and fatigue (pitting) of the steel trunk, having depths from barely detectable levels to 1" in diameter by 1/8" deep, was observed within these areas of corrosion at this time.

The protective coating applied to the westernmost manway lid and trunk has lost adhesion, resulting in exposure of the underlying steel surfaces of the manway lid and trunk.

Corrosion exists within these areas of steel exposure and fatigue (pitting) of the weld at the junction of the steel trunk and wall panel, having depths from barely detectable levels to 1" in diameter by 1/8" deep, was observed throughout approximately 25% of the surfaces of this weld.

The steel overhead panels and channel iron supports appeared sound and remain free of obvious fatigue or failures.

The protective coating applied to these steel panels and supports has declined in film thickness and is nearing expiration, causing exposure of the underlying steel throughout approximately 30% of these surfaces.

No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild corrosion exists at this time.

It is our recommendation to abrasive blast the interior steel floor, wall, overhead and overhead supports, as well as all steel components within this tank, to white or near-white metal.

We then recommend re-evaluating the areas of steel fatigue (pitting) found throughout the interior walls and surfaces of the manway to conclude the extent of this metal fatigue and the most suitable means to re-surface these areas of fatigue. We then recommend re-coating all interior surfaces of the tank, including the steel components within this tank, using an A.N.S.I./N.S.F.61 approved coating for use in structures containing potable water to halt corrosion, prevent further steel fatigue/deterioration and to provide good protection for the interior surfaces and components of this potable water storage tank.

As always, we recommend that re-inspection and cleaning of all water storage facilities be performed in accordance with state and federal mandates, A.W.W.A. standards, and completed by an experienced and authorized inspection corporation.

UNDERWATER SOLUTIONS INC.
Christopher A. Cole, Project Manager

This report, the conclusions, recommendations and comments prepared by Underwater Solutions Inc. are based upon spot examination from readily accessible parts of the tank. Should latent defects or conditions which vary significantly from those described in the report be discovered at a later date, these should be brought to the attention of a qualified individual at that time. These comments and recommendations should be viewed as information to be used by the Owner in determining the proper course of action and not to replace a complete set of specifications. All repairs should be done in accordance with A.W.W.A. and/or other applicable standards.

1 *Exterior Wall With Coating Loss/Chalking, Exposed Underlying Steel, Mild Corrosion And Rust Staining*

2 *Exterior Wall With Coating Loss/Chalking, Exposed Underlying Steel, Mild Corrosion And Rust Staining*

3 *Exterior Wall With Coating Loss/Chalking, Exposed Underlying Steel, Mild Corrosion And Rust Staining*

4 *Exterior Wall With Coating Loss/Chalking, Exposed Underlying Steel, Mild Corrosion And Rust Staining*

5 *Exterior Wall With Coating Loss/Chalking, Exposed Underlying Steel, Mild Corrosion And Rust Staining*

6 *Exterior Wall With Coating Loss/Chalking, Exposed Underlying Steel, Mild Corrosion And Rust Staining*

7 ***Exterior Wall With Coating Damage, Coating Loss/ Chalking, Exposed Underlying Steel, Mild Corrosion And Rust Staining***

8 ***Exterior Wall With Coating Damage, Coating Loss/ Chalking, Exposed Underlying Steel, Mild Corrosion And Rust Staining***

9 ***Exterior Wall With Coating Loss/Chalking, Exposed Underlying Steel, Mild Corrosion And Rust Staining***

10 ***Exterior Wall With Coating Loss/Chalking, Exposed Underlying Steel, Mild Corrosion And Rust Staining***

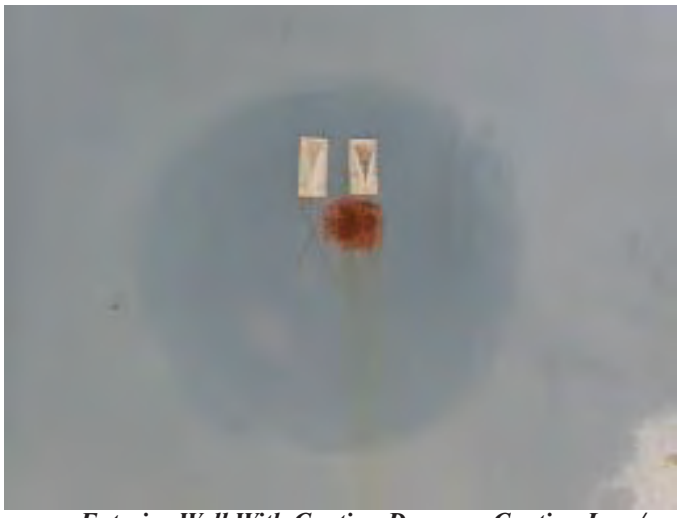
11 ***Exterior Wall With Coating Loss/Chalking, Exposed Underlying Steel, Mild Corrosion And Rust Staining***

12 ***Exterior Wall With Coating Damage, Coating Loss/ Chalking, Exposed Underlying Steel, Mild Corrosion And Rust Staining***

13 ***Exterior Wall With Coating Damage, Coating Loss/ Chalking, Exposed Underlying Steel, Mild Corrosion And Rust Staining***

14 ***Exterior Wall With Coating Damage, Coating Loss/ Chalking, Exposed Underlying Steel, Mild Corrosion And Rust Staining***

15 ***Exterior Wall With Coating Damage, Coating Loss/ Chalking, Exposed Underlying Steel, Mild Corrosion And Rust Staining***

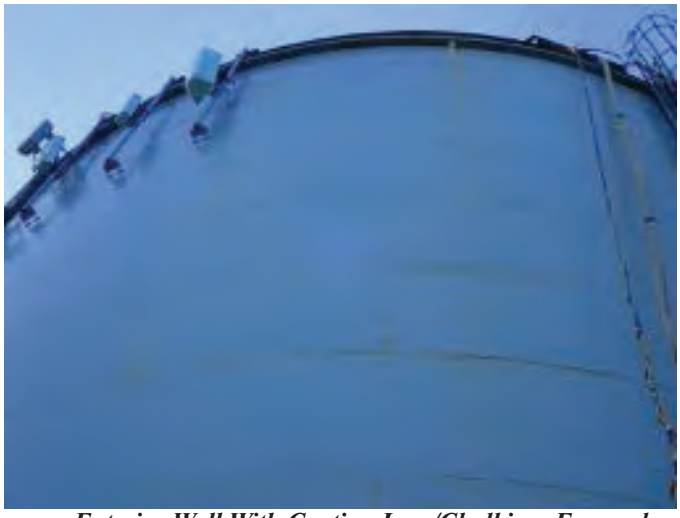


16 ***Exterior Wall With Coating Damage, Coating Loss/ Chalking, Exposed Underlying Steel, Mild Corrosion And Rust Staining***

17 ***Exterior Wall With Coating Damage, Coating Loss/ Chalking, Exposed Underlying Steel, Mild Corrosion And Rust Staining***

18 ***Exterior Wall With Coating Loss/Chalking, Exposed Underlying Steel, Mild Corrosion And Rust Staining***

19 ***Exterior Wall With Coating Loss/Chalking, Exposed Underlying Steel, Mild Corrosion And Rust Staining***



20 ***Exterior Wall With Coating Loss/Chalking, Exposed Underlying Steel, Mild Corrosion And Rust Staining***

21 ***Easternmost Manway With Securing Hardware Having Coating Loss, Exposed Steel And Corrosion***

22 ***Easternmost Manway With Securing Hardware Having Coating Loss, Exposed Steel And Corrosion***

23 ***Westernmost Manway With Securing Hardware Having Coating Loss, Exposed Steel And Corrosion***

24 ***Westernmost Manway With Securing Hardware Having Coating Loss, Exposed Steel And Corrosion***

25 ***Ladder With Safety Cage And Fall Prevention Device Having Coating Loss, Underlying Steel And Mild Corrosion***

26 ***Ladder Guard With Coating Loss, Exposed Underlying Steel and Mild Surface Corrosion***

27 ***Vent Access Ladder With Secure Roof Safety Railings Having Coating Loss (Nearing Expiration), Exposed Steel And Surface Corrosion***

28 ***Secure Anchor Bolt With Support Hardware Having Coating Loss (Nearing Expiration), Exposed Steel And Surface Corrosion***

29 ***Secure Anchor Bolt With Support Hardware Having Coating Loss (Nearing Expiration), Exposed Steel And Surface Corrosion***

30 ***Secure Anchor Bolt With Support Hardware Having Coating Loss (Nearing Expiration), Exposed Steel And Surface Corrosion***

31 ***Secure Anchor Bolt With Support Hardware Having Coating Loss (Nearing Expiration), Exposed Steel And Surface Corrosion***

32 ***Secure Anchor Bolt With Support Hardware Having Coating Loss (Nearing Expiration), Exposed Steel And Surface Corrosion***

33 ***Concrete Foundation With Tight Cracks***

34 ***Concrete Foundation With Tight Cracks***

35 ***Concrete Foundation With Tight Cracks***

36 ***Overflow Pipe With Coating Loss/Thinning, Exposed Steel And Mild Corrosion***

37 ***Overflow Pipe With Coating Loss/Thinning, Exposed Steel And Mild Corrosion***

38 ***Secure Overflow Screen***

39 ***Roof Panels With Coating Loss/Thinning, Exposed Primary Coating, Exposed Underlying Steel And Mild Corrosion***

40 ***Roof Panels With Coating Loss/Thinning, Exposed Primary Coating, Exposed Underlying Steel And Mild Corrosion***

41 ***Roof Panels With Coating Loss/Thinning, Exposed Primary Coating, Exposed Underlying Steel And Mild Corrosion***

42 ***Roof Panels With Coating Loss/Thinning, Exposed Primary Coating, Exposed Underlying Steel And Mild Corrosion***

43 ***Roof Panels With Coating Loss/Thinning, Exposed Primary Coating, Exposed Underlying Steel And Mild Corrosion***

44 ***Roof Panels With Coating Loss/Thinning, Exposed Primary Coating, Exposed Underlying Steel And Mild Corrosion***

45 ***Roof Panels With Coating Loss/Thinning, Exposed Primary Coating, Exposed Underlying Steel And Mild Corrosion***

46 ***Secure Roof Safety Railings With Coating Loss (Nearing Expiration), Exposed Steel And Surface Corrosion***

47 ***Secure Vent Cap With Coating Loss, Exposed Underlying Steel And Mild Corrosion***

48 ***Failed Vent Screen Due To Corrosion***

49 ***Failed Vent Screen Due To Corrosion***

50 ***Temporary Installed Vent Screen***

51 ***Temporary Installed Vent Screen***

52 ***Temporary Installed Vent Screen***

53 ***Temporary Installed Vent Screen***

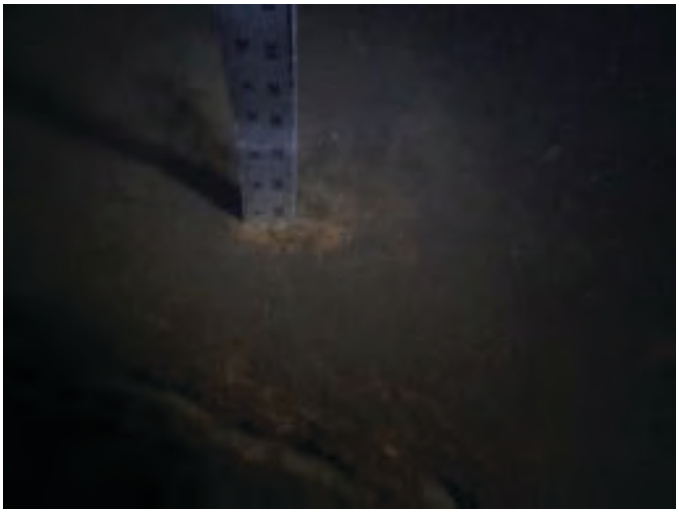
54 ***Temporary Installed Vent Screen***

55 *Open Westernmost Access Hatch*

56 *Closed Westernmost Access Hatch*

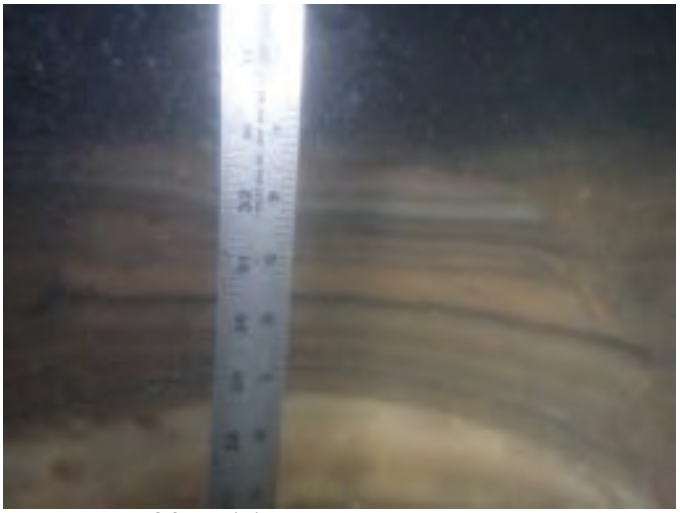
57 *Closed Access Hatch With Securing Nuts And Bolts Having Coating Loss, Exposed Steel And Corrosion*

58 *Layer Of Precipitate*



59 *Layer Of Precipitate*

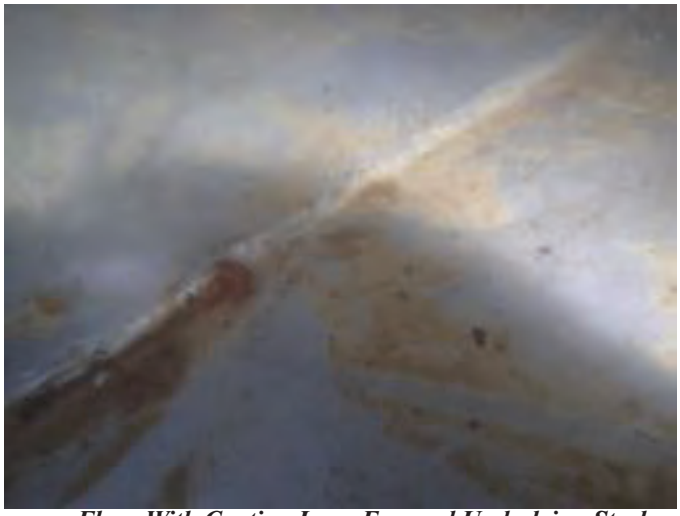
60 *Layer Of Precipitate*



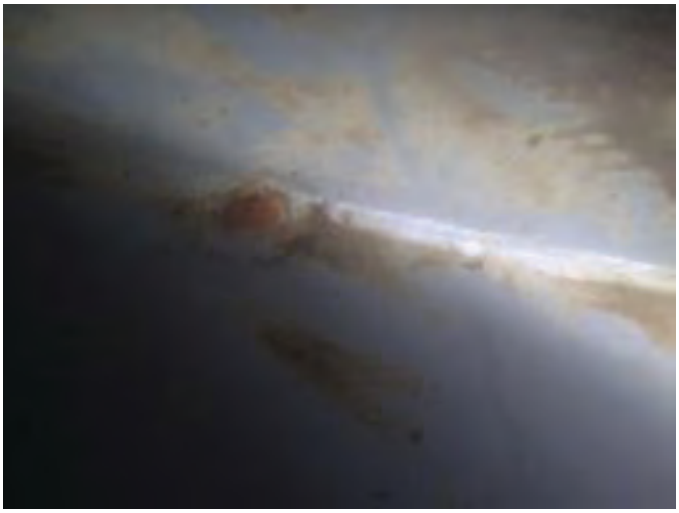
61 ***Layer Of Precipitate***

62 ***Floor With Coating Loss, Exposed Underlying Steel, Mild To Moderate Corrosion And Moderate To Heavy Staining***

63 ***Floor With Coating Loss, Exposed Underlying Steel, Mild To Moderate Corrosion And Moderate To Heavy Staining***



64 ***Floor With Coating Loss, Exposed Underlying Steel, Mild To Moderate Corrosion And Moderate To Heavy Staining***



65 ***Floor With Coating Loss, Exposed Underlying Steel, Mild To Moderate Corrosion And Moderate To Heavy Staining***

66 ***Floor With Moderate To Heavy Staining***

67 ***Floor With Moderate To Heavy Staining***

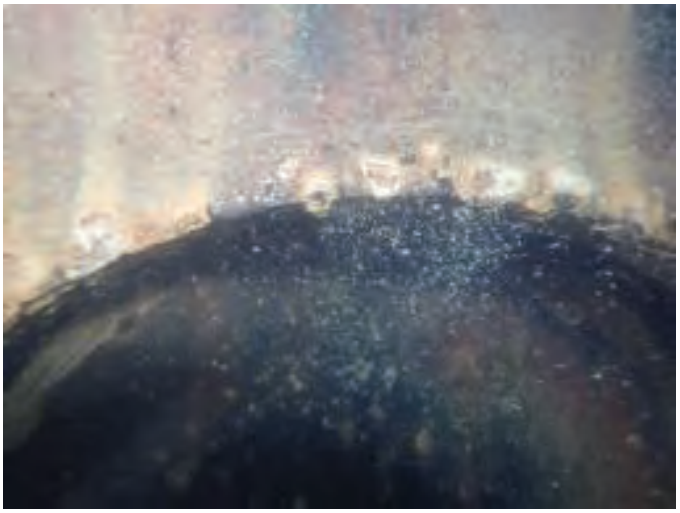
68 ***Floor With Moderate To Heavy Staining***

69 ***Floor With Moderate To Heavy Staining***

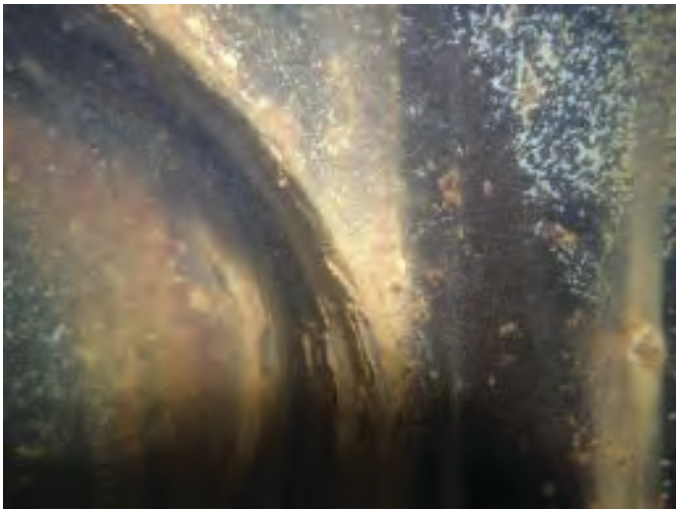
70 ***Easternmost Manway With Expired Coating, Fatigue (Pitting), Exposed Underlying Steel And Corrosion***

71 ***Easternmost Manway With Expired Coating, Fatigue (Pitting), Exposed Underlying Steel And Corrosion***

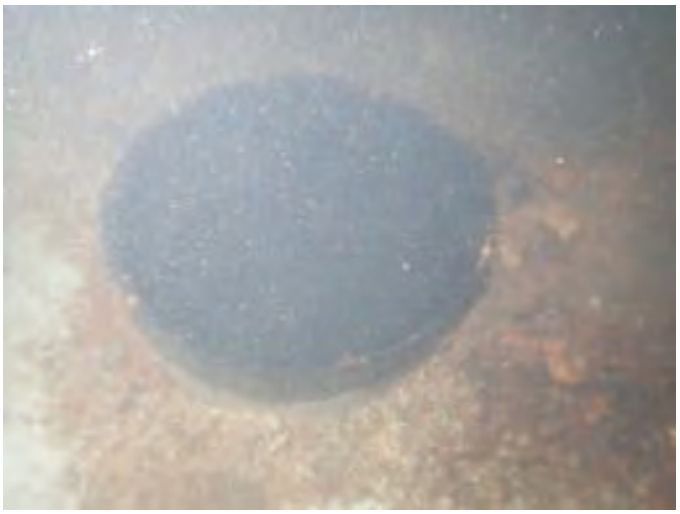
72 ***Westernmost Manway With Expired Coating, Fatigue (Pitting), Exposed Underlying Steel And Corrosion***



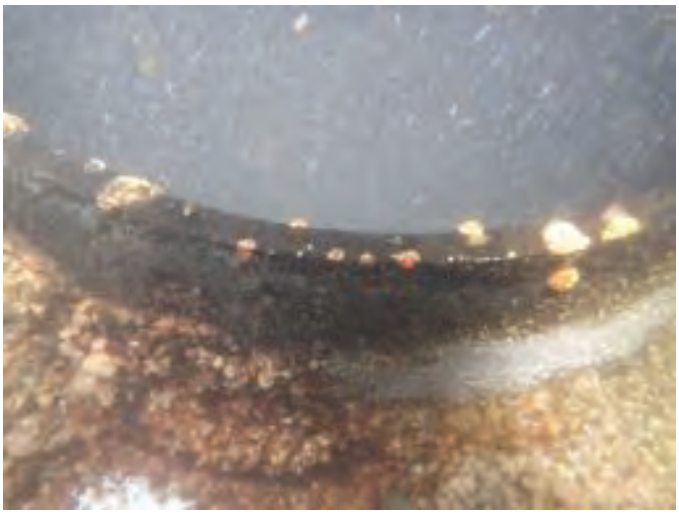
73 *Westernmost Manway With Expired Coating, Fatigue (Pitting), Exposed Underlying Steel And Corrosion*



74 *Westernmost Manway With Expired Coating, Fatigue (Pitting), Exposed Underlying Steel And Corrosion*

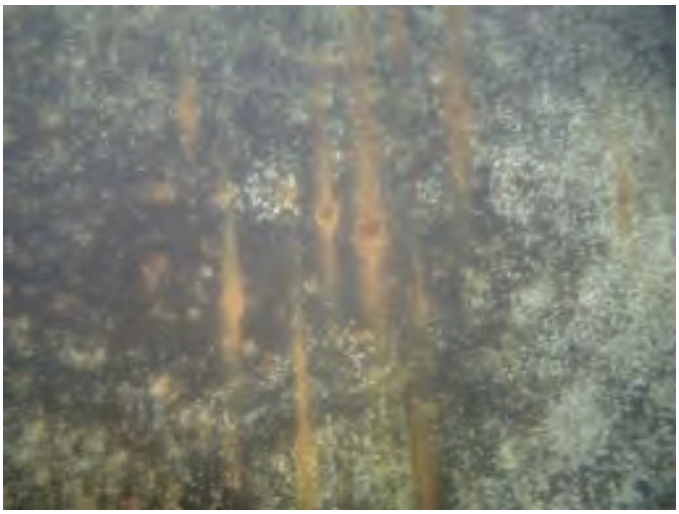


75 *12" Inside Diameter Influent/Effluent Flush Penetration*

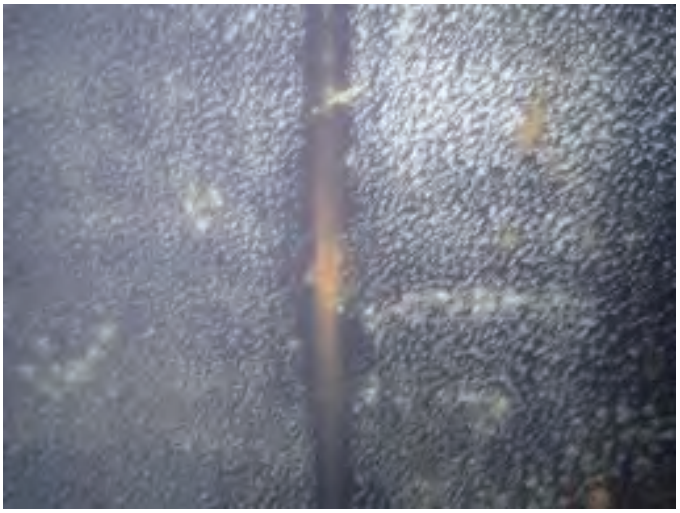


76 *12" Inside Diameter Influent/Effluent Flush Penetration With Coating Loss/ Ruptured Blisters, Exposed Steel And Corrosion*

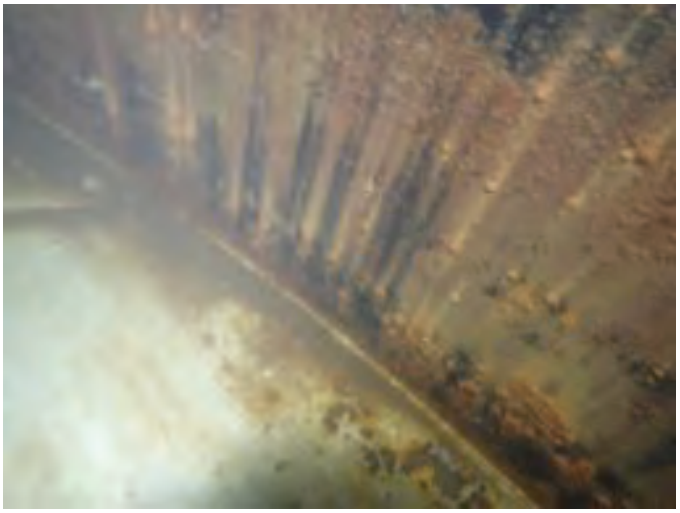
77 *Interior Wall With Expired Coating, Exposed Underlying Steel, Fatigue (Pitting), Moderate Corrosion And Moderate To Heavy Staining*



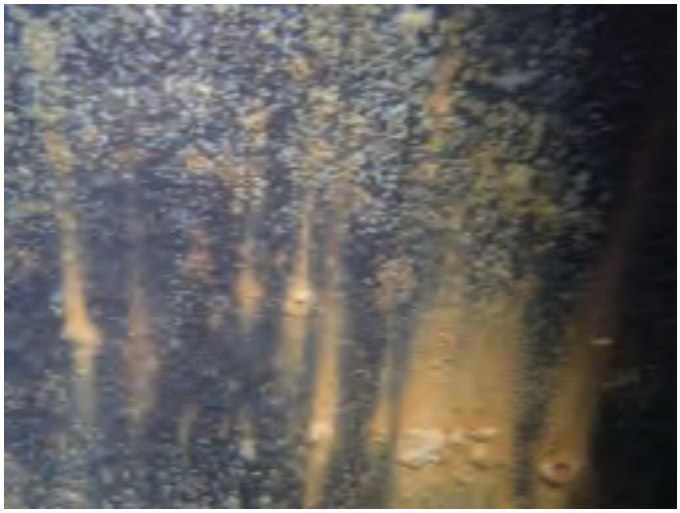
78 *Interior Wall With Expired Coating, Exposed Underlying Steel, Fatigue (Pitting), Moderate Corrosion And Moderate To Heavy Staining*



79 ***Interior Wall With Expired Coating, Exposed Underlying Steel, Fatigue (Pitting), Moderate Corrosion And Moderate To Heavy Staining***

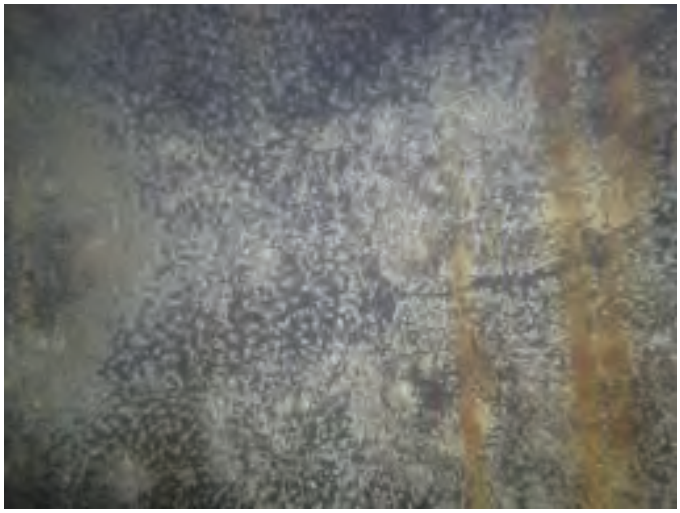


80 ***Interior Wall With Expired Coating, Exposed Underlying Steel, Moderate Corrosion And Moderate To Heavy Staining***



81 ***Interior Wall With Expired Coating, Exposed Underlying Steel, Moderate Corrosion And Moderate To Heavy Staining***

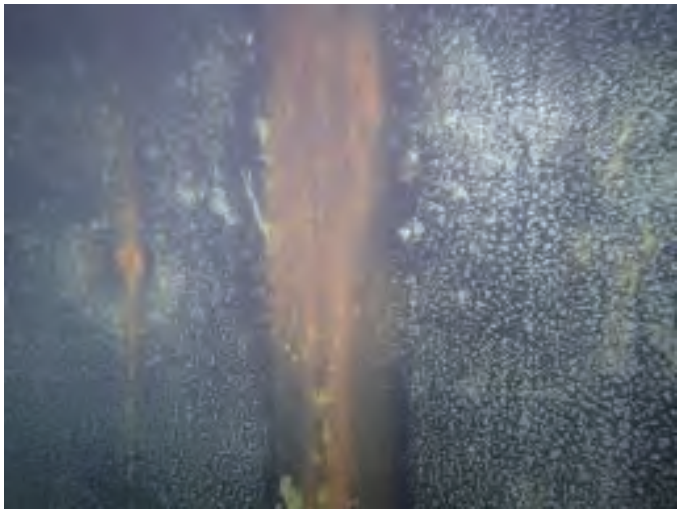
82 ***Interior Wall With Expired Coating, Exposed Underlying Steel, Moderate Corrosion And Moderate To Heavy Staining***



83 ***Interior Wall With Expired Coating, Exposed Underlying Steel, Moderate Corrosion And Moderate To Heavy Staining***

84 ***Interior Wall With Expired Coating, Exposed Underlying Steel, Moderate Corrosion And Moderate To Heavy Staining***

85 ***Interior Wall With Expired Coating, Exposed Underlying Steel, Moderate Corrosion And Moderate To Heavy Staining***



86 ***Interior Wall With Expired Coating, Exposed Underlying Steel, Moderate Corrosion And Moderate To Heavy Staining***

87 ***Interior Wall With Expired Coating, Exposed Underlying Steel, Moderate Corrosion And Moderate To Heavy Staining***

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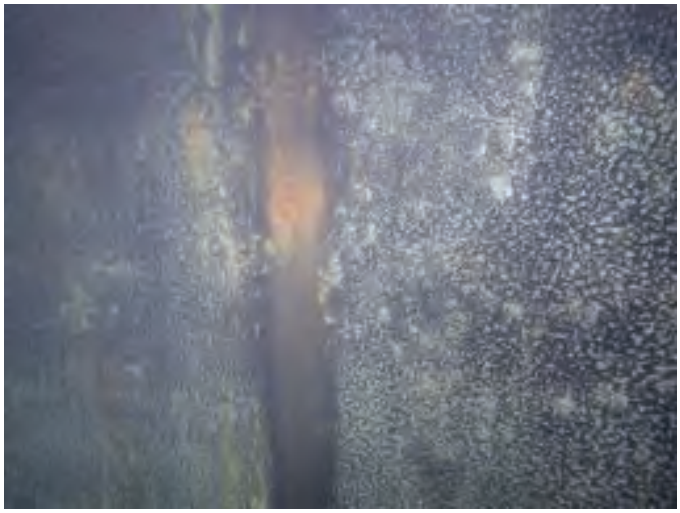

89 ***Interior Wall With Expired Coating, Exposed Underlying Steel, Moderate Corrosion And Moderate To Heavy Staining***

90 ***Interior Wall With Expired Coating, Exposed Underlying Steel, Moderate Corrosion And Moderate To Heavy Staining***

91 ***Interior Wall With Expired Coating, Exposed Underlying Steel, Moderate Corrosion And Moderate To Heavy Staining***

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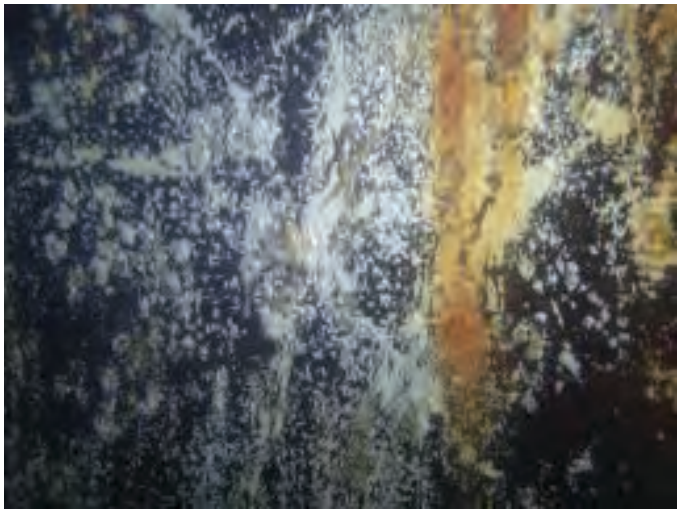
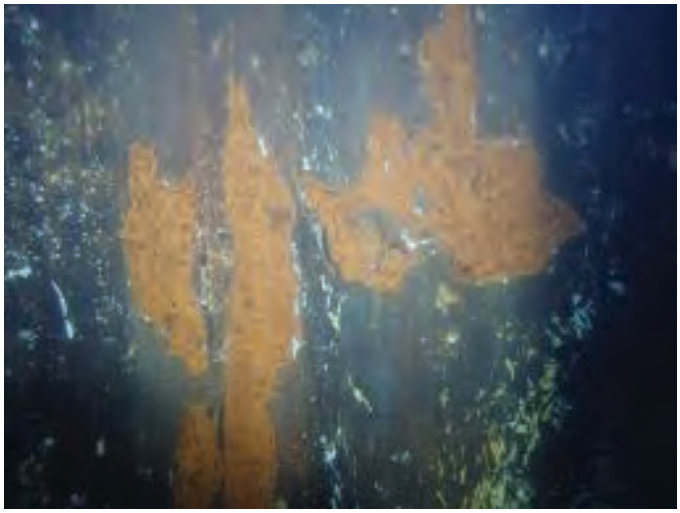


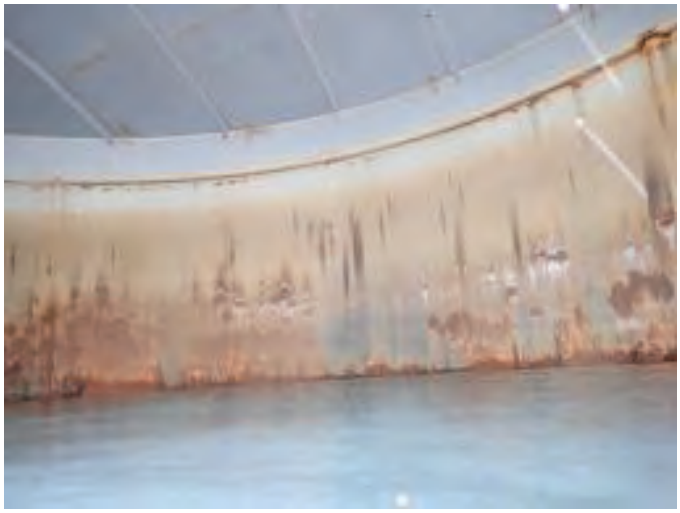
94 ***Interior Wall With Expired Coating, Exposed Underlying Steel, Moderate Corrosion And Moderate To Heavy Staining***



95 ***Interior Wall With Expired Coating, Exposed Underlying Steel, Moderate Corrosion And Moderate To Heavy Staining***

96 ***Interior Wall With Expired Coating, Exposed Underlying Steel, Moderate Corrosion And Moderate To Heavy Staining***

97 ***Interior Wall With Expired Coating, Exposed Underlying Steel, Moderate Corrosion And Moderate To Heavy Staining***



98 ***Interior Wall With Expired Coating, Exposed Underlying Steel, Moderate Corrosion And Moderate To Heavy Staining***

99 ***Interior Wall With Expired Coating, Exposed Underlying Steel, Moderate Corrosion And Moderate To Heavy Staining***

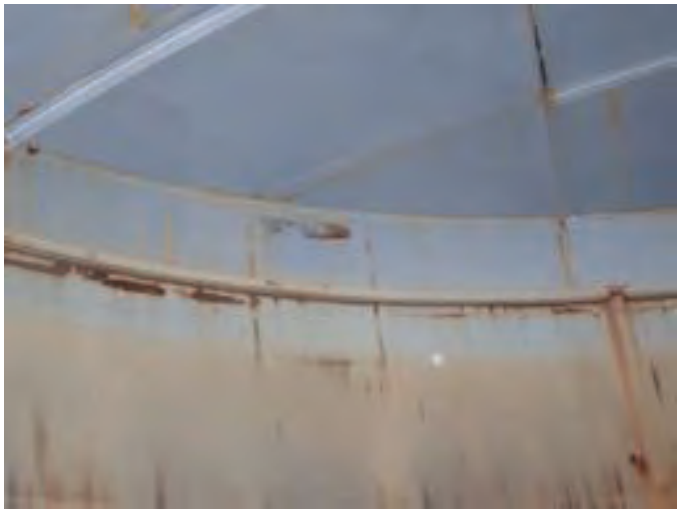
100 ***Interior Wall With Expired Coating, Exposed Underlying Steel, Moderate Corrosion And Moderate To Heavy Staining***

101 ***Overhead With Vent Penetration***

102 ***Overhead With Coating Loss (Nearing Expiration), Exposed Underlying Steel And Mild Corrosion***

103 ***Overhead With Coating Loss (Nearing Expiration), Exposed Underlying Steel And Mild Corrosion***

104 ***Overhead With Coating Loss (Nearing Expiration), Exposed Underlying Steel And Mild Corrosion***



105 ***Overflow Cutout***

106 ***Discharge During Cleaning***

UNDERWATER SOLUTIONS INC.

INSPECTION AND INTERIOR CLEANING (SEDIMENT REMOVAL) OF THE THE MANVILLE ROAD 500,000-GALLON WELDED STEEL WASH WATER STORAGE TANK

CITY OF WOONSOCKET WATER DIVISON
WOONSOCKET, RHODE ISLAND

APRIL 18, 2018

INSPECTION AND INTERIOR CLEANING (SEDIMENT REMOVAL) OF THE MANVILLE ROAD 500,000-GALLON WELDED STEEL WASH WATER STORAGE TANK

CITY OF WOONSOCKET WATER DIVISION WOONSOCKET, RHODE ISLAND

APRIL 18, 2018

SCOPE:

On April 18, 2018, Underwater Solutions Inc. inspected the Manville Road 500,000-gallon welded steel wash water storage tank to provide information regarding the overall condition and integrity and removed the sediment accumulation from the floor.

EXTERIOR INSPECTION:

The entire exterior of this water storage tank (and all components) was inspected to include walls and coating, manway, ladders, foundation, overflows, roof, vent, and hatch.

Walls And Coating

The exterior steel wall panels and associated welds were inspected and were found appearing sound, however six steel plates were found securely welded in-place over these steel wall panels, while no obvious failures of the steel was evident at this time.

One, 3” by 3” steel plate is welded to the second wall panel above the tank base on the easternmost side of the tank.

One, 3” wide by 6” long steel plate is welded over the horizontal weld between the third and fourth rows of wall panels above the tank base on the northernmost side of the tank.

One 3" by 3" steel plate is welded over the horizontal weld between the second and third rows of wall panels above the tank base on the westernmost side of the tank.

One 3" wide by 5" long steel plate is welded over the horizontal weld between the second and third rows of wall panels above the tank base on the south-westernmost side of the tank.

One, 2" wide by 5" long steel plate is welded over the horizontal weld between the second and third rows of wall panels above the tank base on the south-westernmost side of the tank.

One, 3" by 3" steel plate is welded over the horizontal weld between the second and third rows of wall panels above the tank base on the south-westernmost side of the tank.

These six steel plates appeared to be securely welded in-place and no obvious leakage was evident or occurring at the location of where these six steel plates are welded to the exterior wall panels at this time.

A protective coating applied to these steel plates was found having mostly good adhesion value, however a decline in film thickness of the protective coating applied to these welded repairs causes mild surface corrosion and corrosion staining (blotch rusting). However, no obvious fatigue/deterioration of the steel plates utilized to complete these repairs or fatigue/deterioration of the wall panels at the location of these repairs was evident at the time of inspection.

The average dry film thickness of the protective coating system applied to the exterior welded steel wall panels were measured during this inspection. The dry film thickness of the coating system applied to the exterior wall surfaces was found as follows:

Row	***Mil Thickness***	***Row***	***Mil Thickness***
1.	2.25 mils	4.	2.72 mils
2.	2.35 mils	5.	3.72 mils
3.	3.61 mils		

The American Water Works Association (AWWA) recommends a dry film thickness of 7.0 to 10.0 mils of coating film thickness be applied to the exterior surfaces of welded steel water storage tanks to provide adequate protection for welded steel structures.

The protective coating applied to these welded steel surfaces has an average dry film thickness that is below the AWWA's recommendations, and has expired and no longer provides protection for the steel wall panels or welds.

A decline in film thickness (thinning) of the protective coating was found throughout approximately 75% of these surfaces and was observed throughout all elevations of the exterior walls, causing mild surface corrosion (blotch rusting) to show through the coating, while complete coating loss has resulted in exposure of the underlying steel throughout approximately 25% of these surfaces at this time.

Corrosion of the exposed steel was evident within all areas of coating adhesion loss, however no obvious fatigue (pitting) of the steel panels or deterioration of the welds was evident at this time. Ultrasonic metal thickness measurements of the steel wall panels of this tank were taken during this inspection. The average metal thickness of these surfaces were found as follows:

Row	***Steel Thickness***	***Row***	***Steel Thickness***
1.	.375”	4.	.370”
2.	.351”	5.	.365”
3.	.300”		

It is the opinion of Underwater Solutions Inc. that these ultrasonic metal thickness measurements are uniform, while no abnormally high or low metal thickness measurements were observed during this inspection.

Tree branches were found to be in contact with the top row of wall panels on the southernmost side of the tank.

A non-uniform corrosion stain from exposed steel exists throughout the exterior walls causing declined aesthetics.

Manway

A 24” inside diameter manway penetrates the lowest wall panel on the north-easternmost side of the tank, located approximately 18” above the tank base and is securely installed and free of obvious leakage.

The protective coating applied to the steel manway lid, trunk and securing hardware has an average dry film thickness of 2.29 mils, is below the AWWA’s recommendation and has expired at this time.

A decline in the coating film thickness has caused corrosion (blotch rusting) to show throughout the coating throughout all surfaces of the manway at this time.

No obvious fatigue (pitting) of the steel manway lid or trunk was evident within these areas of steel exposure and no obvious deterioration of the securing hardware was evident within these areas of steel exposure, rather mild surface corrosion exists at this time.

Ladders

A welded steel ladder extends from 10' above the ground up to the roof dome supported to the wall with three sets of welded standoffs.

The protective coating applied to this steel ladder has an average dry film thickness of 2.69 mils, is below the AWWA's recommendations and has expired, causing corrosion (blotch rusting) to show through the coating throughout these surfaces. However, this ladder remains sound and free of obvious fatigue or failures and provides good access to the roof at this time.

An aluminum ladder guard, secured with a lock, is installed on the base of this ladder preventing unwanted access to the ladder/roof.

A second welded steel ladder extends from the edge of the roof dome up to the vent and is secured to the vent with one bolted support.

The protective coating applied to this ladder has completely expired and no longer provides protection for the steel. Although surface corrosion exists on all surfaces of this ladder, no obvious fatigue/deterioration of this ladder or support was evident, and this ladder provides good access to the vent/center of roof.

Foundation

The exposed surfaces of the 4" wide concrete foundation ranges from 6" to 12" in height, was found appearing sound and remains free of cracks, spalls or other obvious fatigue of the concrete at this time. The protective coating applied to the exposed surfaces of this foundation was found having good adhesion value, providing adequate protection for these exposed concrete surfaces.

An elastomeric sealant has been applied throughout the circumference of the tank at the junction of where the foundation and tank base meet since a previous inspection completed by Underwater Solutions Inc. on May 7 & 8, 2013. This sealant was found having good adhesion value, preventing moisture from penetrating and accumulating beneath the tank.

Overflows

The overflow consists of twenty, 36" long by 3" wide cutouts evenly spaced throughout the circumference of the top of the top row of wall panels, located approximately 6" below the junction of where the roof and walls meet. Each overflow cutout was free of obvious obstructions and the screen installed over each overflow cutout was found securely in-place, preventing access to the interior of the tank.

Roof

The steel roof panels and associated welds were inspected and were found appearing sound and remain free of obvious failures of the steel at this time.

The protective coating applied to these welded steel surfaces has an average dry film thickness of 4.15 mils and is below the AWWA's recommendations, and has expired and no longer provides protection for these welded steel surfaces.

A decline in the film thickness (thinning) of the protective coating has resulted in exposure of the underlying steel throughout approximately 80%-90% of the roof at this time. No obvious fatigue (pitting) of the steel panels or deterioration of the welds was evident within these areas of steel exposure, rather mild corrosion exists at this time.

Ultrasonic metal thickness measurements of the steel roof panels of this tank were taken during this inspection. The average metal thickness of these surfaces were found as follows:
Roof panels: .290".

It is the opinion of Underwater Solutions Inc. that these ultrasonic metal thickness measurements are uniform, while no abnormally high or low metal thickness measurements were observed during this inspection.

Each of the twenty-six, 5" inside diameter rigging hole penetrations in the roof were found covered with a 6" outside diameter aluminum plate that was secure, preventing access to the interior of the tank.

Vent

The vent is located within the center of the roof, having a 12" inside diameter, and stands 24" tall.

A 37" outside diameter cap and associated screen was found securely installed over the vent penetration in the roof preventing access to the interior of the tank.

The protective coating applied to this steel vent assembly has expired and causes steel exposure and corrosion throughout all surfaces of the vent cap, as well as exposure of the primary coating and underlying steel throughout the vent riser pipe. However, this vent assembly remains sound and free of obvious fatigue/deterioration of the steel at this time.

Hatch

A 24" by 24" hatch provides good access to the tank interior through the roof dome.
This hatch remains in good working condition and was found secured with a lock, preventing unwanted access to the interior of the tank.

The protective coating applied to the interior and exterior surfaces of the hatch cover and hatch trunk has expired, causing steel exposure and corrosion. However, these steel surfaces remain sound and free of obvious fatigue/deterioration at this time.

INTERIOR INSPECTION:

The entire interior of this water storage tank (and components) was inspected to include sediment accumulations, floor, manway, piping, walls and coating, overhead, overflows, and aesthetic water quality.

Sediment Accumulations

A non-uniform layer of accumulated precipitate was found throughout the floor, ranging from 1/2" to 3" in depth.

After completing this inspection, all precipitate was removed (vacuumed) from the floor.

Floor

After removing the precipitate, the steel floor panels and associated welds were inspected and were found appearing sound and free of obvious failures of the steel at this time.

The protective coating applied to these welded steel surfaces has an average dry film thickness of 36.4 mils, appears to have been applied uniformly and meets the AWWA's recommendation; however, this coating was found having poor adhesion value at this time.

Blistering of the protective coating was observed throughout approximately 25% of all surfaces. Approximately 10% of these coating blisters have ruptured and have resulted in exposure of the underlying steel.

No obvious fatigue (pitting) of the steel panels or deterioration of the welds was evident within these areas of steel exposure rather mild surface corrosion exists at this time.

Mild to moderate staining remains throughout the entire floor due to accumulation of precipitate.

Manway

A 24" inside diameter manway penetrates the lowest wall panel on the north-easternmost side of the tank, located approximately 18" above the floor, and is securely installed and free of leakage.

The protective coating applied to the manway lid and trunk has lost adhesion and is blistering, resulting in exposure of the underlying steel throughout approximately 30% of the surfaces of the manway lid and trunk.

Corrosion exists within all areas of the manway trunk and lid showing steel exposure, and fatigue (pitting) of the weld at the junction of where the manway trunk and wall panel meet was observed throughout less than 5% of this weld at this time.

These areas of fatigue (pitting) range in size from 1/4" in diameter by 1/8" in depth to 1" in length by 1/4" in width by 1/4" in depth.

The ultrasonic metal thickness of the steel manway trunk could not be obtained at the time of this inspection.

Piping

The influent/effluent pipe penetrates the floor on the northernmost side of the tank, located approximately 25" in from the wall, having a 40" inside diameter and is flush with the floor.

A 42" inside diameter by 3" tall riser is installed above this pipe serving as a silt stop.

This pipe was free of obvious obstructions and was without flow at the time of this inspection.

The protective coating applied to the steel silt stop riser was found having poor adhesion value and is blistering throughout less than 5% of these surfaces resulting in exposure of the underlying steel. No obvious fatigue/deterioration of this riser was evident within these areas of steel exposure, rather mild corrosion exists at this time.

Walls And Coating

The interior walls were inspected beginning at the floor and by spiraling the circumference of the tank up to the water surface.

These steel wall panels and associated welds appeared sound, however fatigue (pitting) of the steel was observed throughout these surfaces at this time.

The average dry film thickness of the protective coating system applied to the interior welded steel wall panels could not be obtained at the time of this inspection.

The protective coating applied to these welded steel surfaces appears to have been applied uniformly, however adhesion loss of the protective coating was observed throughout all elevations of the interior walls.

Blistering of the protective coating was observed throughout approximately 50% of these surfaces and approximately 75% of these coating blisters have ruptured, resulting in exposure of the underlying steel.

Corrosion exists within all areas of the interior walls showing steel exposure and fatigue (pitting) of the steel panels and welds was found within the majority of the wall surfaces having steel exposure. The depth of steel fatigue (pitting) found throughout these wall panels and welds ranges from barely detectable levels to 1/4" in depth, and the interior steel surfaces located opposite the exterior wall surfaces where steel plates were observed welded to the tank exterior were found with pit depths that extend through the steel; however, the steel plates welded to the tank exterior remain secure, preventing leakage at this time.

Moderate to heavy staining exists throughout all wall surfaces beginning approximately 20" below overflow level and extends down to the floor.

Overhead

The entire overhead was inspected from the water surface.

These steel panels and associated welds appeared sound and free of obvious failures of the steel at the time of inspection.

The protective coating applied to these surfaces has an average dry film thickness of 28.27 mils, appeared to have been applied uniformly and meets the AWWA's recommendations, however adhesion loss (peeling) of the protective coating has resulted in exposure of the underlying steel throughout approximately 10%-15% of the steel panels and throughout approximately 75% of the length of the weld between panels.

No obvious fatigue (pitting) of the steel panels or deterioration of the welds was evident within these areas of steel exposure, rather mild to moderate surface corrosion exists at this time.

Remnants of cables and securing hardware associated with a cathodic protection system that has been abandoned remain suspended from the overhead at this time.

Overflows

The overflow consists of a series of twenty, 36" long by 3" wide cutouts evenly spaced throughout the circumference of the top of the top row of wall panels, each located approximately 6" below the junction of where the roof and walls meet.

Each overflow cutout was free of obvious obstructions at the time this inspection was completed.

Aesthetic Water Quality

The aesthetic water quality was good throughout the tank allowing unlimited visibility for this inspection.

RECOMMENDATIONS:

It is the opinion of Underwater Solutions Inc. that this welded steel wash water storage tank appears mostly sound and free of obvious leakage at this time.

EXTERIOR:

The exterior steel wall panels and associated welds were found appearing sound, however six steel plates were found securely welded in-place over these steel wall panels, while no obvious failures of the steel was evident at this time.

These six steel plates appeared to be securely welded in-place and no obvious leakage was evident or occurring at the location of where these six steel plates are welded to the exterior wall panels at this time.

A protective coating applied to these steel plates was found having mostly good adhesion value, however a decline in film thickness of the protective coating applied to these welded repairs causes mild surface corrosion and corrosion staining. However, no obvious fatigue/deterioration of the steel plates utilized to complete these repairs or fatigue/deterioration of the wall panels at the location of these repairs was evident at the time of inspection.

The protective coating applied to these welded steel surfaces has an average dry film thickness that is below the AWWA's recommendations, and has expired and no longer provides protection for the steel wall panels or welds.

A decline in film thickness (thinning) of the protective coating throughout approximately 75% of all elevations of these surfaces causes mild surface corrosion (blotch rusting) to show through the coating, while complete coating loss has resulted in exposure of the underlying steel throughout approximately 25% of these surfaces at this time.

Corrosion of the exposed steel was evident within all areas of coating adhesion loss, however no obvious fatigue (pitting) of the steel panels or deterioration of the welds was evident at the time of inspection.

Ultrasonic metal thickness measurements of the steel wall panels were taken during this inspection and no abnormally high or low metal thickness measurements were observed.

Tree branches were found to be in contact with the top row of wall panels on the southernmost side of the tank.

A non-uniform corrosion stain from exposed steel exists throughout the exterior walls causing declined aesthetics.

The steel roof panels and associated welds were found appearing sound and remain free of obvious failures of the steel at this time.

The protective coating applied to these welded steel surfaces has an average dry film thickness that is below the AWWA's recommendations, and has expired and no longer provides protection for these welded steel surfaces.

A decline in the film thickness (thinning) of the protective coating has resulted in exposure of the underlying steel throughout approximately 80%-90% of the roof at this time. No obvious fatigue (pitting) of the steel panels or deterioration of the welds was evident within these areas of steel exposure, rather mild corrosion exists at this time.

Ultrasonic metal thickness measurements of the steel roof panels were taken during this inspection and no abnormally high or low metal thickness measurements were observed.

It is our recommendation to abrasive blast the exterior walls, manway, access ladders, roof, vent assembly and exterior surfaces of the hatch to white or near white metal and to re-coat these surfaces in an effort to halt corrosion, prevent further steel fatigue (pitting) and to provide good protection for these welded steel surfaces, while improving the overall aesthetics.

The exposed surfaces of the concrete foundation appeared sound and remains free of obvious fatigue of the concrete, while the protective coating applied to the exposed surfaces of this foundation was found having good adhesion value, providing adequate protection for these exposed concrete surfaces and requiring no remedial action at this time.

The elastomeric sealant applied throughout the circumference of the tank at the junction of where the foundation and tank base meet was found having good adhesion value, preventing moisture from penetrating and accumulating beneath the tank.

All components affixed to this tank were found to be properly installed at this time.

A cap and associated screen installed over the vent penetration in the roof remains secure, preventing access to the interior of the tank.

The interior access hatch located on the roof was found secured with a lock, preventing unwanted access to the interior of the tank.

A ladder guard secured with a lock is installed at the base of the ladder, preventing unwanted access to the ladder/roof.

Each of the twenty overflow cutouts within the top row of wall panels were free of obvious obstructions and the screen installed over each overflow cutout is secure, preventing access to the interior of the tank.

Each of the twenty-six rigging hole penetrations in the roof were found covered with an aluminum plate that was secure, preventing access to the interior of the tank.

It is our recommendation to cut back all tree branches that are within 25' of the tank to prevent these branches from contacting the tank.

INTERIOR:

The steel floor panels and associated welds were found appearing sound and remain free of obvious failures of the steel at this time.

The protective coating applied to these welded steel surfaces appears to have been applied uniformly and meets the AWWA's recommendation, however was found having poor adhesion value and is blistering throughout approximately 25% of all surfaces.

Approximately 10% of these coating blisters have ruptured resulting in exposure of the underlying steel.

No obvious fatigue (pitting) of the steel floor panels or deterioration of the welds was evident within these areas of steel exposure, rather mild surface corrosion exists at this time.

These steel wall panels and associated welds appeared sound, however fatigue (pitting) of the steel was observed throughout these surfaces at this time.

The protective coating applied to these welded steel surfaces appears to have been applied uniformly, however adhesion loss (blistering) of the protective coating was observed throughout approximately 50% of all elevations of the interior walls.

Approximately 75% of these coating blisters have ruptured resulting in exposure of the underlying steel.

Corrosion exists within all areas of the interior walls showing steel exposure, and fatigue (pitting) of the steel panels and welds was found within the majority of the wall surfaces having steel exposure. The depth of steel fatigue (pitting) found throughout these wall panels and welds ranges from barely detectable levels to 1/4" in depth, and the interior steel surfaces located opposite the exterior wall surfaces where steel plates were observed welded to the tank exterior were found with pit depths that extend through the steel; however, the steel plates welded to the tank exterior remain secure, preventing leakage at this time.

The protective coating applied to the interior surfaces of the manway lid and trunk is blistering, resulting in exposure of the underlying steel throughout approximately 30% of the surfaces of the manway lid and trunk.

Corrosion exists within all areas of the manway trunk and lid showing steel exposure, and fatigue (pitting) of the weld at the junction of where the manway trunk and wall panel meet was observed throughout less than 5% of this weld at the time of inspection.

These areas of fatigue (pitting) range in size from 1/4” in diameter by 1/8” in depth to 1” in length by 1/4” in width by 1/4" in depth.

The overhead steel panels and associated welds appeared sound and remain free of obvious failures of the steel at this time.

The protective coating applied to these surfaces appears to have been applied uniformly and meets the AWWA’s recommendations, however adhesion loss (peeling) of the protective coating has resulted in exposure of the underlying steel throughout approximately 10%-15% of the steel panels and throughout approximately 75% of the length of the welds between panels.

No obvious fatigue (pitting) of the steel panels or deterioration of the welds was evident within these areas of steel exposure, rather mild to moderate surface corrosion exists at this time.

Remnants of cables and securing hardware associated with a cathodic protection system that has been abandoned remain suspended from the overhead at this time.

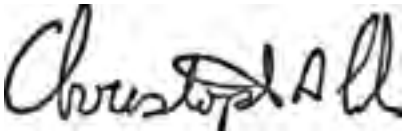
It is our recommendation to abrasive blast all interior floor, silt stop riser, wall, manway, overhead panels and interior surfaces of the access hatch to white or near white metal.

We then recommend re-evaluating the interior walls to conclude the extent of steel fatigue (pitting) and to determine the most suitable means to re-surface these areas of steel fatigue found throughout the interior walls and throughout the weld at the junction of where the manway trunk and wall panel meet, in an effort to prevent leakage. Once the areas of steel fatigue have been re-surfaced we then recommend re-coating these surfaces using an A.N.S.I./N.S.F.61 approved coating for use in structures containing potable water in an effort to halt corrosion, prevent further fatigue of the steel and to provide good protection for the steel surfaces of the tank and steel components within this tank.

During the interior rehabilitation we recommend removing the cables and hardware associated with an abandoned cathodic protection system.

It is also our recommendation to consider/compare the cost of replacing this wash water storage tank with the cost of rehabilitation.

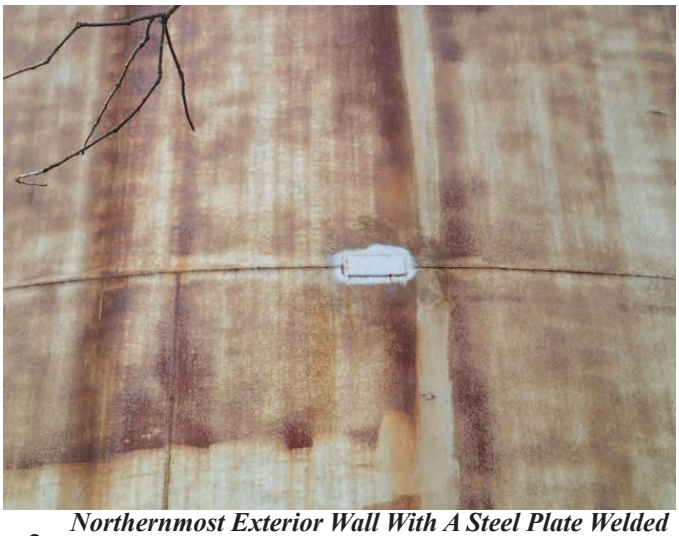
As always, we recommend that re-inspection and cleaning of all water storage facilities be performed in accordance with state and federal mandates, A.W.W.A. standards, and completed by an experienced and authorized inspection corporation.



UNDERWATER SOLUTIONS INC.
Christopher A. Cole, Project Manager

This report, the conclusions, recommendations and comments prepared by Underwater Solutions Inc. are based upon spot examination from readily accessible parts of the tank. Should latent defects or conditions which vary significantly from those described in the report be discovered at a later date, these should be brought to the attention of a qualified individual at that time. These comments and recommendations should be viewed as information to be used by the Owner in determining the proper course of action and not to replace a complete set of specifications. All repairs should be done in accordance with A.W.W.A. and/or other applicable standards.

1 *Easternmost Exterior Wall With A Steel Plate Welded To The Second Wall Panel Above The Tank Base*



2 *Northernmost Exterior Wall With A Steel Plate Welded To The Third And Fourth Rows Of Wall Panels Above The Tank Base*

3 *Westernmost Exterior Wall With A Steel Plate Welded To The Second And Third Rows Of Wall Panels Above The Tank Base*

4 *South-Westernmost Exterior Wall With Steel Plates Welded To The Second And Third Row Of Wall Panels Above The Tank Base*

5 *Exterior Wall With Expired Coating, Exposed Underlying Steel And Mild Surface Corrosion*

6 *Exterior Wall With Expired Coating, Exposed Underlying Steel And Mild Surface Corrosion*

7 ***Exterior Wall With Expired Coating, Exposed Underlying Steel And Mild Surface Corrosion***

8 ***Exterior Wall With Expired Coating, Exposed Underlying Steel And Mild Surface Corrosion***

9 ***Exterior Wall With Expired Coating, Exposed Underlying Steel And Mild Surface Corrosion***

10 ***Exterior Wall With Expired Coating, Exposed Underlying Steel And Mild Surface Corrosion***

11 ***Exterior Wall With Expired Coating, Exposed Underlying Steel And Mild Surface Corrosion***

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13 ***Exterior Wall With Expired Coating, Exposed Underlying Steel And Mild Surface Corrosion***

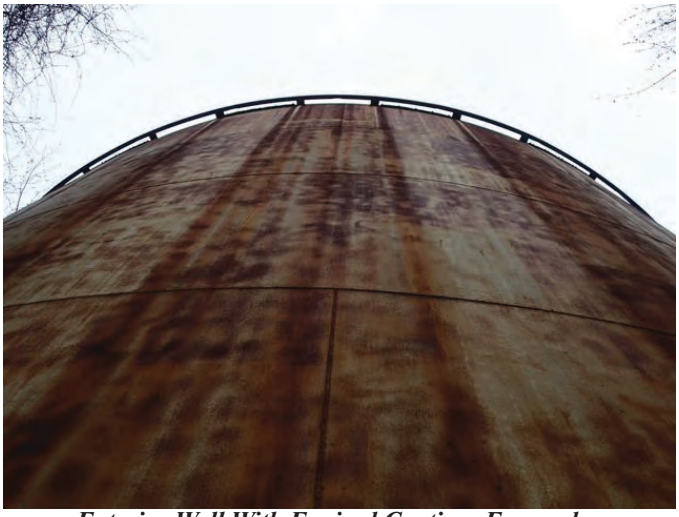
14 ***Exterior Wall With Expired Coating, Exposed Underlying Steel And Mild Surface Corrosion***

15 ***Exterior Wall With Expired Coating, Exposed Underlying Steel And Mild Surface Corrosion***

16 ***Exterior Wall With Expired Coating, Exposed Underlying Steel And Mild Surface Corrosion***

17 ***Exterior Wall With Expired Coating, Exposed Underlying Steel And Mild Surface Corrosion***

18 ***Exterior Wall With Expired Coating, Exposed Underlying Steel And Mild Surface Corrosion***



19 *Exterior Wall With Expired Coating, Exposed Underlying Steel And Mild Surface Corrosion*

20 *Southernmost Exterior Wall With Tree Branches Found In Contact With Top Row Of Wall Panels*

21 *Secure Manway With Expired Coating, Exposed Underlying Steel And Mild Surface Corrosion*

22 *Access Ladder With Expired Coating, Exposed Underlying Steel And Mild Surface Corrosion*

23 *Access Ladder With Ladder Guard And Securing Lock*

24 *Vent Access Ladder With Expired Coating And Surface Corrosion*

25 ***Vent Access Ladder Supported To The Vent***

26 ***Concrete Foundation With An Elastemeric Sealant Applied***

27 ***Concrete Foundation With An Elastemeric Sealant Applied***

28 ***Concrete Foundation With An Elastemeric Sealant Applied***

29 ***Concrete Foundation With An Elastemeric Sealant Applied***

30 ***Concrete Foundation With An Elastemeric Sealant Applied***

31 ***Concrete Foundation With An Elastemeric Sealant Applied***

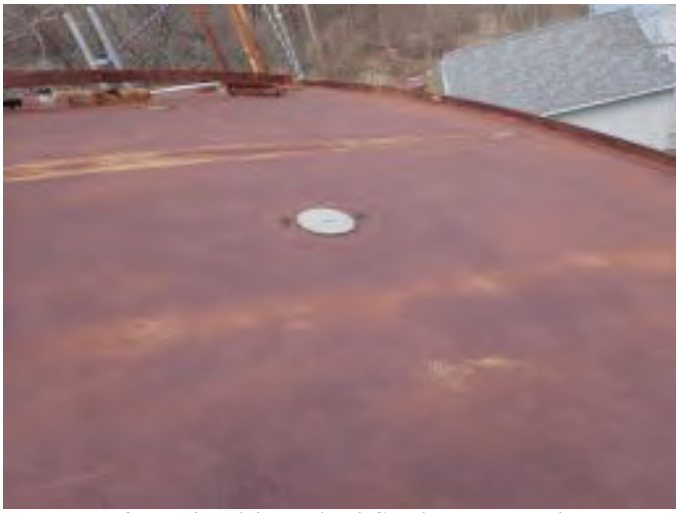
32 ***Secure Overflow Screen Cutout***

33 ***Secure Overflow Screen Cutout***

34 ***Secure Overflow Screen Cutout***

35 ***Secure Overflow Screen Cutout***

36 ***Roof Panels With Expired Coating, Exposed Underlying Steel And Mild Corrosion***



37 ***Roof Panels With Expired Coating, Exposed Underlying Steel And Mild Corrosion***

38 ***Roof Panels With Expired Coating, Exposed Underlying Steel And Mild Corrosion***

39 ***Roof Panels With Expired Coating, Exposed Underlying Steel And Mild Corrosion***

40 ***Roof Panels With Expired Coating, Exposed Underlying Steel And Mild Corrosion***

41 ***Roof Panels With Expired Coating, Exposed Underlying Steel And Mild Corrosion***

42 ***Rigging Hole Penetration With Secure Aluminum Cover Plate***

43 ***Rigging Hole Penetration With Secure Aluminum Cover Plate***

44 ***Rigging Hole Penetration With Secure Aluminum Cover Plate***

45 ***Rigging Hole Penetration With Secure Aluminum Cover Plate***

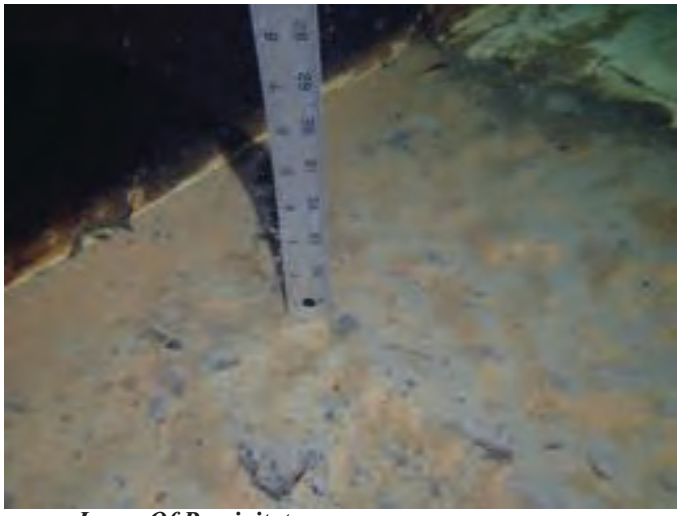
46 ***Secure Vent Cap With Expired Coating, Exposed Steel And Corrosion***

47 ***Secure Vent Screen***

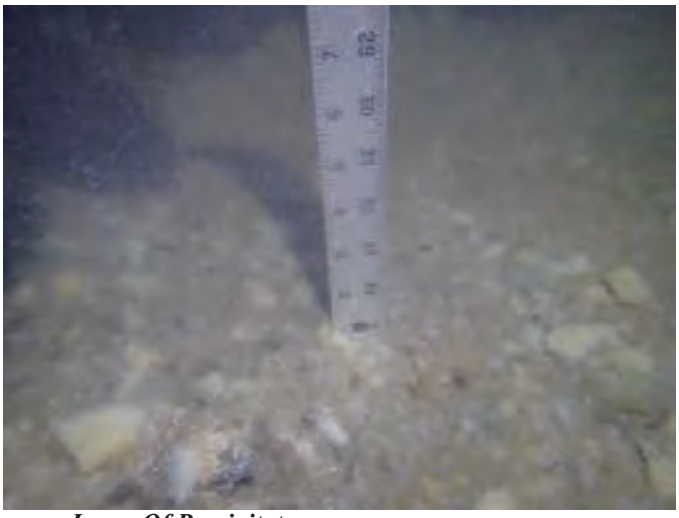
48 ***Secure Vent Screen***

49 ***Open Access Hatch***

50 ***Secure Access Hatch With Expired Coating, Exposed Underlying Steel And Mild Corrosion***



51 ***Layer Of Precipitate***



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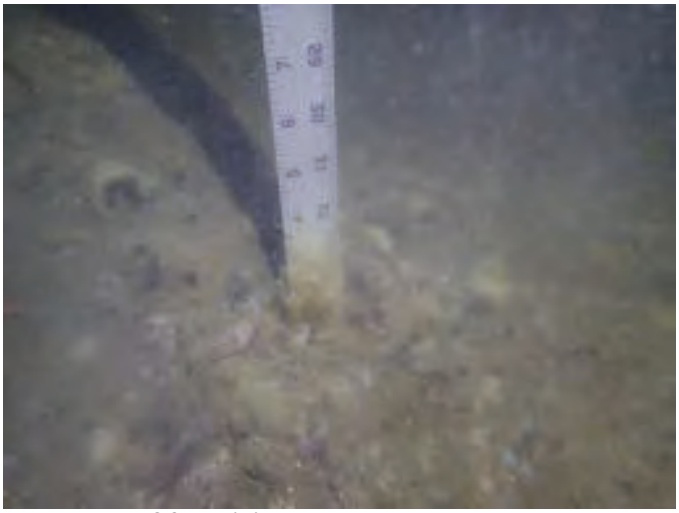
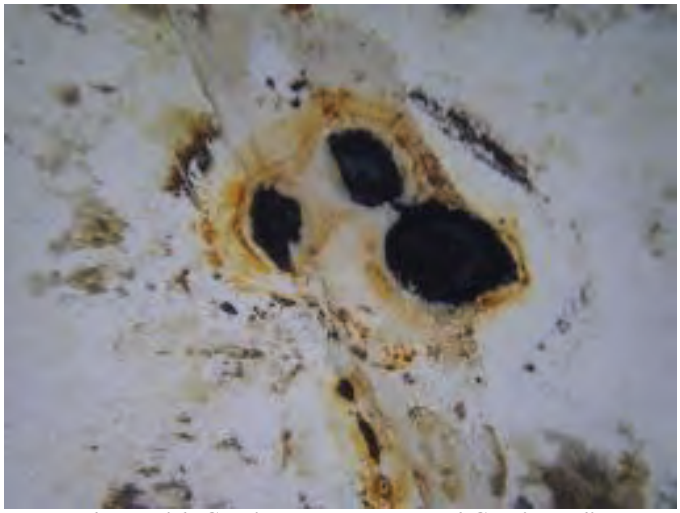


53 ***Layer Of Precipitate***



54 ***Floor With Coating Loss, Ruptured Coating Blisters, Exposed Underlying Steel And Mild To Moderate Staining***

55 ***Floor With Coating Loss, Ruptured Coating Blisters, Exposed Underlying Steel And Mild To Moderate Staining***

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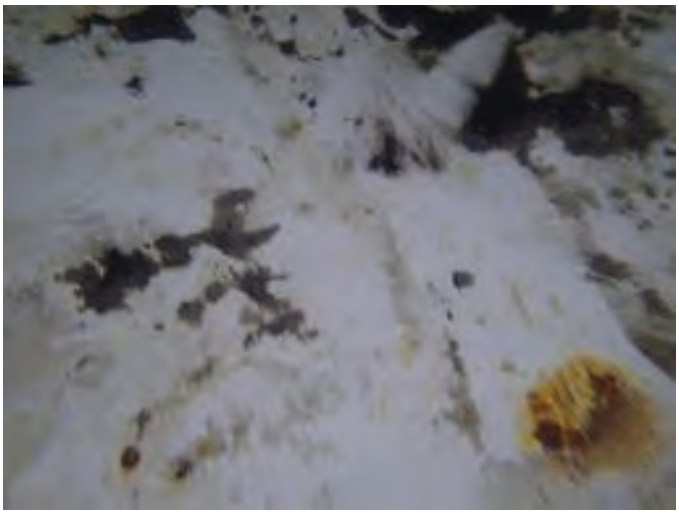
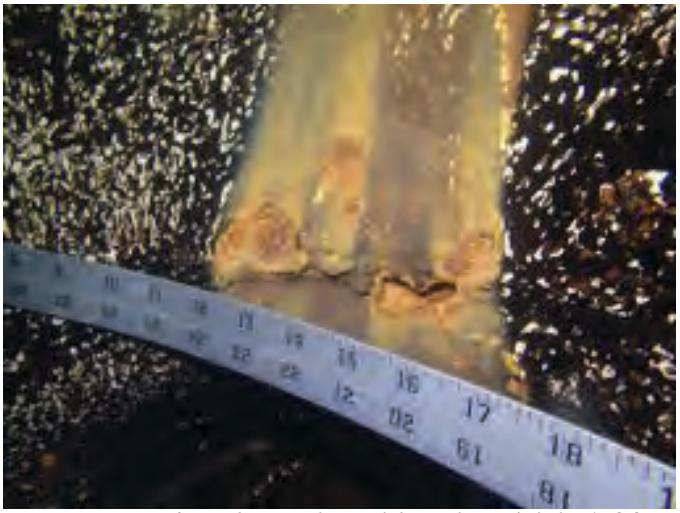
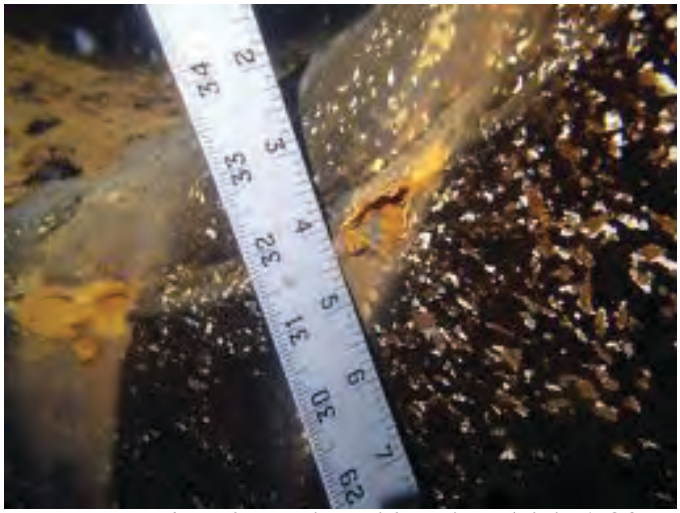


59 ***Floor With Coating Loss, Ruptured Coating Blisters, Exposed Underlying Steel And Mild To Moderate Staining***

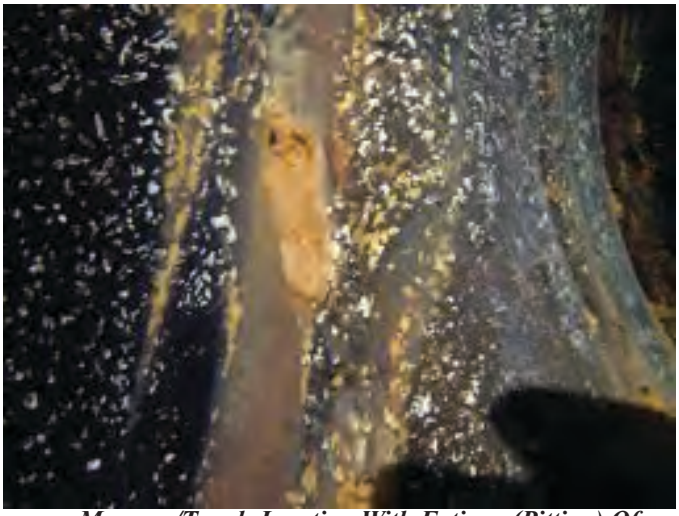
60 ***Manway With Coating Loss, Ruptured Coating Blisters, Exposed Underlying Steel And Corrosion***



61 *Manway/Trunk Junction With Fatigue (Pitting) Of The Weld*



62 *Manway/Trunk Junction With Fatigue (Pitting) Of The Weld*

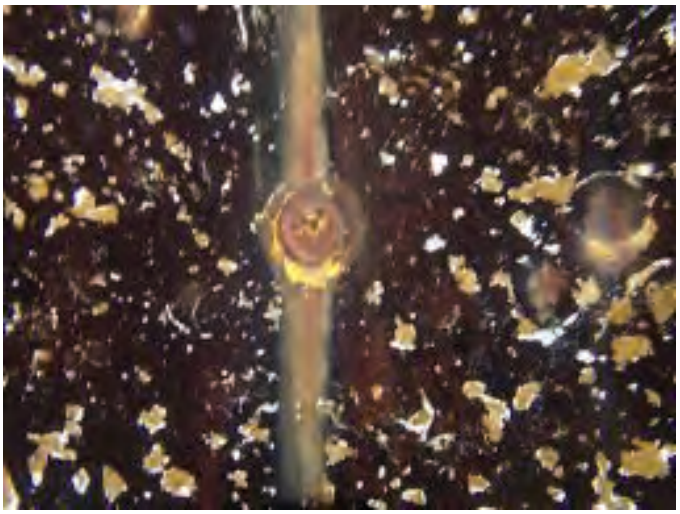


63 *Manway/Trunk Junction With Fatigue (Pitting) Of The Weld*

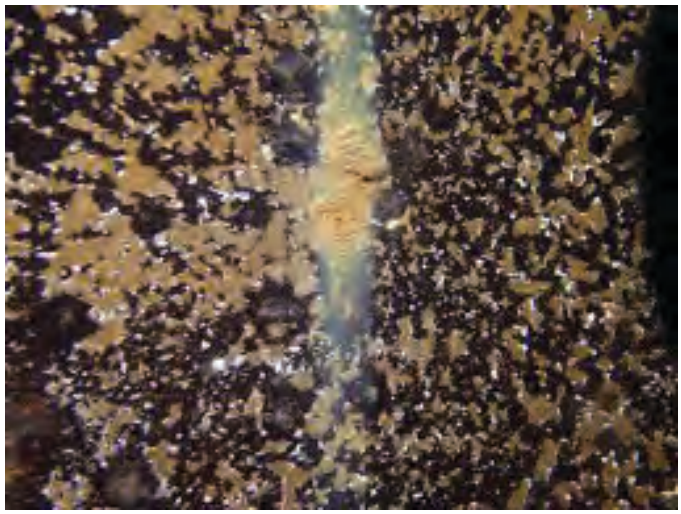
64 *Influent/Effluent Pipe Flush Penetration With Coating Loss/Blistering, Exposed Underlying Steel And Mild Corrosion*

65 *Interior Wall With Coating Loss, Ruptured Coating Blisters, Exposed Underlying Steel, Corrosion, Fatigue (Pitting) And Moderate To Heavy Staining*

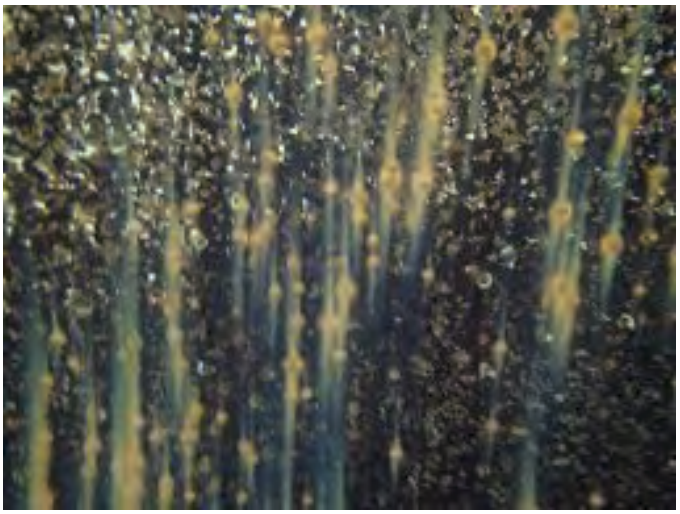
66 *Interior Wall With Coating Loss, Ruptured Coating Blisters, Exposed Underlying Steel, Corrosion, Fatigue (Pitting) And Moderate To Heavy Staining*



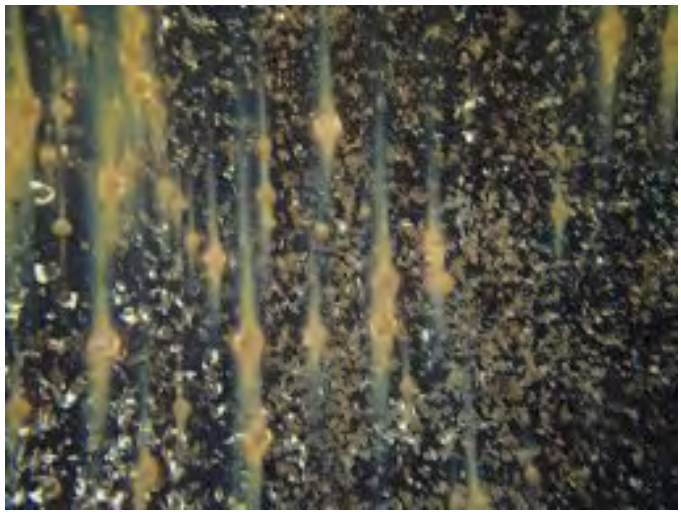
67 *Interior Wall With Coating Loss, Ruptured Coating Blisters, Exposed Underlying Steel, Corrosion, Fatigue (Pitting) And Moderate To Heavy Staining*



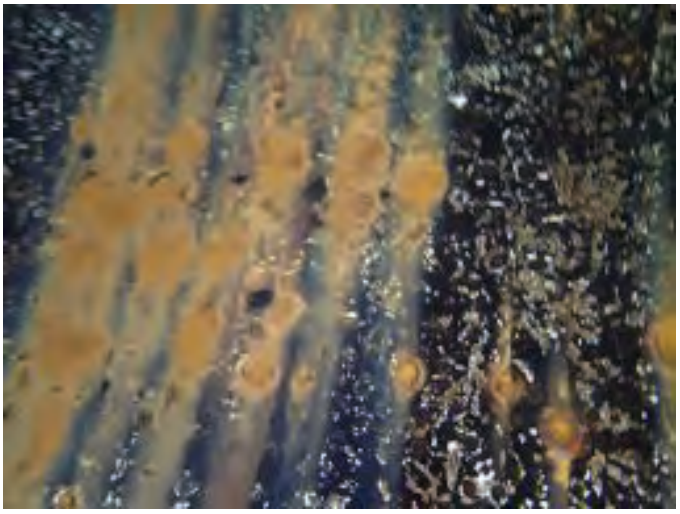
68 *Interior Wall With Coating Loss, Ruptured Coating Blisters, Exposed Underlying Steel, Corrosion, Fatigue (Pitting) And Moderate To Heavy Staining*



69 *Interior Wall With Coating Loss, Ruptured Coating Blisters, Exposed Underlying Steel, Corrosion, Fatigue (Pitting) And Moderate To Heavy Staining*



70 *Interior Wall With Coating Loss, Ruptured Coating Blisters, Exposed Underlying Steel, Corrosion, Fatigue (Pitting) And Moderate To Heavy Staining*



71 *Interior Wall With Coating Loss, Ruptured Coating Blisters, Exposed Underlying Steel, Corrosion, Fatigue (Pitting) And Moderate To Heavy Staining*

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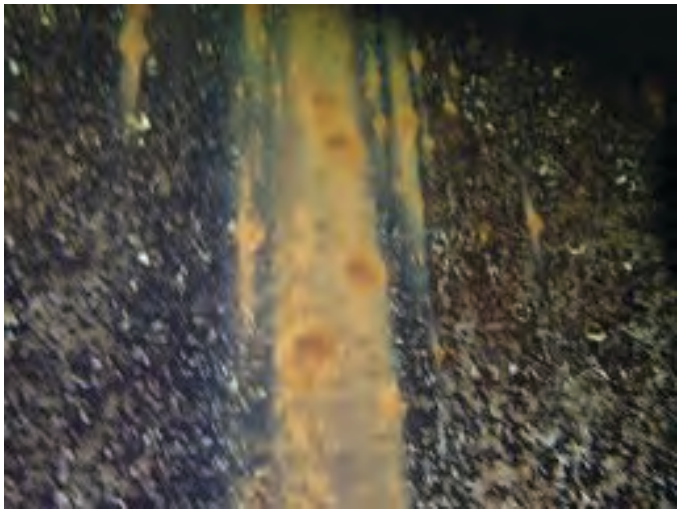

73 ***Interior Wall With Coating Loss, Ruptured Coating Blisters, Exposed Underlying Steel, Corrosion, Fatigue (Pitting) And Moderate To Heavy Staining***

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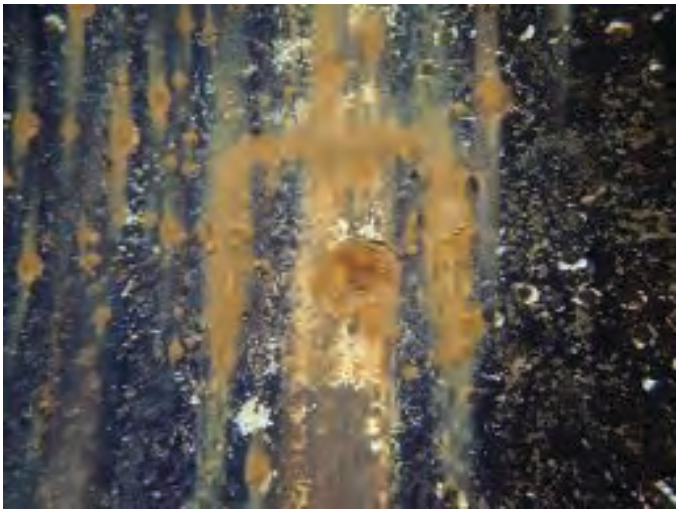


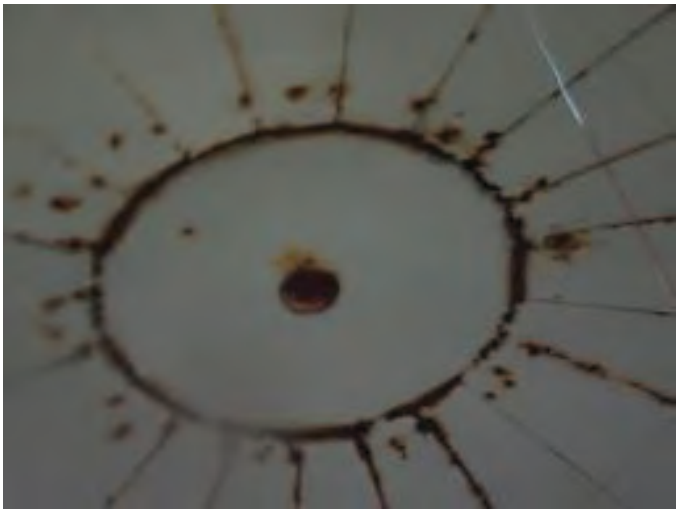
77 ***Interior Wall With Pitting Within The Wall Panel Where A Steel Plate Has Been Welded To The Tank Exterior***

78 ***Interior Wall With Heavy Staining***

79 ***Interior Wall With Heavy Staining***

80 ***Interior Wall With Heavy Staining***

81 ***Interior Wall With Heavy Staining***



82 ***Overhead With Coating Loss/Peeling, Exposed Underlying Steel And Mild To Moderate Surface Corrosion***

83 ***Overhead With Coating Loss/Peeling, Exposed Underlying Steel And Mild To Moderate Surface Corrosion***

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86 ***Overhead With Coating Loss/Peeling, Exposed Underlying Steel And Mild To Moderate Surface Corrosion***

87 ***Remnants Of Abandoned Cathodic Protection System Suspended From The Overhead***

88 ***Remnants Of Abandoned Cathodic Protection System Suspended From The Overhead***

89 ***Overflow Cutouts***

90 ***Discharge During Cleaning***

UNDERWATER SOLUTIONS INC.

INSPECTION AND INTERIOR CLEANING (SEDIMENT REMOVAL) OF THE RHODES 750,000-GALLON WELDED STEEL WATER STORAGE TANK

CITY OF WOONSOCKET WATER DIVISION WOONSOCKET, RHODE ISLAND

JUNE 14, 2018

INSPECTION AND INTERIOR CLEANING (SEDIMENT REMOVAL) OF THE RHODES 750,000-GALLON WELDED STEEL ELEVATED WATER STORAGE TANK

CITY OF WOONSOCKET WATER DIVISION WOONSOCKET, RHODE ISLAND

JUNE 14, 2018

SCOPE:

On June 14, 2018, Underwater Solutions Inc. inspected the Rhodes 750,000-gallon welded steel elevated potable water storage tank to provide information regarding the overall condition and integrity of this structure and removed the sediment accumulation from the floor.

EXTERIOR INSPECTION:

The entire exterior of this water storage tank was inspected, to include the support pedestal, walls and coating, anchor bolts, foundation, manway, ladders, center riser column, overflow, roof, vent and hatches.

Support Pedestal

The interior and exterior surfaces of the welded steel support pedestal were inspected and were found appearing sound and remain free of obvious fatigue or failures.

The protective coating applied to the interior steel surfaces of the support pedestal has an average dry film thickness of 19.1 mils and appeared to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for the steel.

The protective coating applied to the exterior steel surfaces of the support pedestal has an average dry film thickness of 19.1 mils and appeared to have been applied uniformly, meets the AWWA's recommendations and remains having mostly good adhesion value at this time.

Adhesion loss of the protective coating was observed throughout approximately 10% of the steel floor extension welded to the base of the support pedestal, resulting in exposure of the underlying steel. No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild corrosion exists at this time.

Two areas of coating adhesion loss were observed on the exterior of the pedestal, located approximately 5' above the ground, resulting in exposure of the underlying steel.

No obvious fatigue/deterioration of the steel was evident within these two, 1/2" diameter areas of steel exposure, rather mild corrosion exists at this time.

A mild, non-uniform accumulation of mildew throughout the exterior surfaces of the support pedestal has declined the overall aesthetics.

Walls And Coating

The exterior steel wall panels and associated welds of the tank were inspected and were found appearing sound and remain free of obvious fatigue or failures.

The protective coating applied to these welded steel surfaces appeared to have been applied uniformly and was found having good adhesion value, providing adequate protection for these steel panels and welds.

A mild, non-uniform accumulation of mildew throughout the base of the tank has declined the overall aesthetics.

Anchor Bolts

Thirty-nine, 1-1/2" diameter anchor bolts extend up from the concrete foundation through a 17" wide by 1" thick steel floor extension plate welded to the base of the support pedestal.

Each anchor bolt has one nut securely installed, while the protective coating applied to this support hardware appeared to have been applied uniformly and was found having good adhesion value. A mild rust stain was observed on this hardware, yet no obvious coating fatigue or steel exposure was evident at this time.

Foundation

The exposed surfaces of the 24" wide by 7" tall concrete foundation appeared sound and remain free of obvious fatigue or failures. The protective coating applied to these exposed concrete surfaces was found having good adhesion value at this time.

An accumulation of mildew throughout the foundation has declined the overall aesthetics.

Manway

One, 30" inside diameter manway penetrates the tank base approximately 12' in from the center riser column and is securely installed and free of obvious leakage.

The protective coating applied to this steel manway appeared to have been applied uniformly, meets the AWWA's recommendations and remains having good adhesion value at this time.

A welded steel ladder extends up to this manway, having a fall prevention device installed throughout its length and providing safe access. The protective coating applied to this ladder was found having good adhesion value, while the non-corrodible metal fall prevention device is not coated and was found appearing sound.

Ladders

Four welded steel ladders are located within the pedestal extend up from the pedestal floor, each supported to the pedestal wall with three sets of welded standoffs and continue to a walkway that leads to the center riser column.

The fifth, (top) ladder extends from the base of the walkway up through the riser to the roof and is supported to the riser with eleven sets of welded standoffs.

Each ladder was found having a fall prevention device installed throughout their lengths, providing safe access.

The protective coating applied to each ladder was found having good adhesion value, while the non-corrodible metal fall prevention device installed on each ladder are not coated at this time.

Center Riser Column

The 60" diameter welded steel center riser column was inspected and was found appearing sound and free of obvious fatigue or failures at this time.

The protective coating applied to these welded steel surfaces has an average dry film thickness of 9.1 mils and appeared to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for the steel.

Overflow

An 8" inside diameter overflow pipe penetrates the tank base approximately 36" in from the center riser column. This steel pipe extends down through a series of elbows, directing the pipe to the pedestal wall and extends down and is supported in place with four welded standoffs.

Approximately 23" above the pedestal floor, this pipe turns 90˚ and penetrates the pedestal wall and continues 28" and terminates approximately 28-1/2" above a concrete splash pad. This pipe was free of obvious obstructions and the flap-valve installed at the end of this pipe is secure, preventing access to the interior of the tank.

The protective coating applied to this steel pipe has an average dry film thickness of 15.6 mils and appeared to have been applied uniformly meets the AWWA's recommendations. The protective coating applied to the pipe located within the pedestal remains having good adhesion value at this time. The protective coating applied to the 28" long section of steel pipe and the flap-valve at the end of the pipe was found having mostly good adhesion value, however adhesion loss of the protective coating throughout less than 5% of the surfaces of this pipe and flap-vale has caused steel exposure and corrosion, however this steel pipe and flap-valve remain sound and free of obvious fatigue/deterioration at this time.

Roof

The steel roof panels and associated welds were inspected and were found appearing sound and remain free of obvious fatigue or failures at this time.

The protective coating applied to these welded steel surfaces has an average dry film thickness of 13.4 mils and appeared to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for the steel.

Three, 3" diameter rigging hole penetrations within the roof are sealed with threaded plugs, preventing access to the interior of the tank.

The steel safety railings welded to the roof around the hatches and vent were found securely installed and free of obvious fatigue or failures. The protective coating applied to these steel safety railings appeared to have been applied uniformly and was found having mostly good adhesion value, however isolated areas of coating loss were observed throughout approximately 5% of these surfaces, resulting in exposure of the underlying steel. No obvious fatigue/deterioration of these steel safety railings was evident within these isolated areas of steel exposure, rather mild corrosion exists at this time.

A mild, non-uniform accumulation of mildew throughout the roof has declined the overall aesthetics.

Vent

A vent is located within the center of the roof dome, having a 20" inside diameter and stands 41" tall.

A 45" outside diameter aluminum cap and associated screen remains securely installed over the vent penetration in the roof, preventing access to the interior of the tank.

The vacuum release plate located on the underside of the vent was free of obvious obstructions and moves freely at this time.

This aluminum vent assembly is not coated and was found without corrosion and appearing sound at this time.

Hatches

One, 30" inside diameter hatch provides good access to the interior of the tank through the roof dome and remains in good working condition and was found secured with a lock, preventing unwanted access to the interior of the tank.

The protective coating applied to the exterior of this steel hatch appeared to have been applied uniformly and was found having good adhesion value at this time.

The protective coating applied to the interior surfaces of the hatch lid and trunk appeared to have been applied uniformly and was found having mostly good adhesion value, however isolated areas of coating adhesion loss were observed throughout approximately 5% of these surfaces, resulting in exposure of the underlying steel. No obvious fatigue/deterioration of the steel trunk was evident within these areas of exposure, rather mild corrosion exists at this time.

One, 20" inside diameter hatch also provides access to the interior of the tank through the roof dome and is secured with a lock, preventing unwanted access to the interior of the tank. This hatch was not utilized at this time.

The protective coating applied to the interior and exterior surfaces of this steel hatch assembly appeared to have been applied uniformly and was found having good adhesion value at this time.

One, 30" wide by 48" tall door from a cupola installed on the roof provides access to the roof dome from the center riser column and was found in good condition. This hatch is not locked, however a latch prevents accidental opening.

INTERIOR INSPECTION:

The entire interior of this water storage tank was inspected, to include sediment accumulations, floor, manway, piping, walls and coating, center riser column, overhead, overflow and aesthetic water quality.

Sediment Accumulations

A uniform layer of accumulated precipitate was found throughout the floor, averaging 11-1/2" in depth.

After completing this inspection, all precipitate was removed (vacuumed) from the floor.

Floor

After removing the precipitate, the steel floor panels and associated welds were inspected and were found appearing sound at this time. The protective coating applied to these surfaces appeared to have been applied uniformly and was found having mostly good adhesion value, however adhesion loss of the protective coating was observed throughout less than 5% of these surfaces, resulting in exposure of the underlying steel. Corrosion exists within these areas of steel exposure and an area of fatigue (pitting) of the steel was found within the floor panel, located approximately 34" away from the manway. This area of fatigue (pitting) measures 2-1/2" in length by 1/4" in width by 1/4" in depth.

Mild to moderate staining remains throughout the flor due to the accumulation of precipitate.

Manway

One, 36" outside diameter manway penetrates the floor (tank base) approximately 12' in from the center riser column and is securely installed and free of obvious leakage.

The protective coating applied to these steel surfaces appeared to have been applied uniformly and was found having mostly good adhesion value, however adhesion loss was observed throughout approximately 10% of the surfaces of the hinge welded to the manway. This condition has caused steel exposure and corrosion, however no obvious fatigue/deterioration of this hinge mechanism was evident.

Adhesion loss was also observed throughout the outside edge of the manway lid, resulting in exposure of the underlying steel. Corrosion exists within these areas of steel exposure, and fatigue/deterioration of the steel was evident within one area of exposure, measuring 2” in length by 1/4" in width by 1/4" in depth.

Piping

Two pipes were inspected within this potable water storage tank.

The first pipe inspected penetrates the floor approximately 18” in from the center riser column, having an 18” inside diameter and stands 14” tall. This pipe was free of obvious obstructions and was without flow at the time of this inspection.

The protective coating applied to this metal pipe was found having good adhesion value, while a heavy stain exists throughout the surfaces of this pipe at this time.

The second pipe inspected penetrates the floor approximately 18” in from the center riser column, having a 12” inside diameter. This metal pipe extends up and is supported to the center riser with one welded standoff and terminates approximately 25’ above the floor with a (T) installed on its end. Each side of the (T) extends approximately 10” having a rubber influent check valve installed at each end.

Each rubber influent check valve was free of obvious obstructions and with flow entering the tank at the time of this inspection.

The protective coating applied to this metal pipe appeared to have been applied uniformly and was found having mostly good adhesion value, however adhesion loss of the protective coating was observed throughout approximately 50% of the surfaces of the hardware utilized to secure these flanged sections of pipe together, resulting in exposure of the underlying steel. Although corrosion exists on the surfaces of these nuts and bolts; this hardware remains secure and with no obvious fatigue/deterioration at this time.

Walls And Coating

The interior walls were inspected beginning at the floor and by spiraling the circumference of the tank up to the water surface.

These steel panels and associated welds were found appearing sound at this time.

The protective coating applied to these welded steel surfaces appeared to have been applied uniformly, however was found having poor adhesion value at this time.

Secondary coating adhesion loss was observed throughout approximately 10-15% of the vertical wall surfaces, resulting in exposure of the primary coating. The exposed primary coating within these areas of exposure appears to have good adhesion value at this time.

Blistering of the protective coating was also observed throughout approximately 25-30% of all wall surfaces and less than 5% of these coating blisters have ruptured, resulting in exposure of the underlying steel. Corrosion was evident within these areas of steel exposure, and fatigue (pitting) of the steel, measuring 1/2" in diameter by 1/8” deep exists within these areas of steel exposure at this time.

Heavy staining exists throughout the interior walls, beginning approximately 14” below overflow level and extends down to the floor.

Center Riser Column

The 60” inside diameter welded steel center riser column was inspected and was found appearing sound at the time.

The protective coating applied to these welded steel surfaces appeared to have been applied uniformly and was found having good adhesion value, providing adequate protection for the steel.

Heavy staining exists throughout the surfaces of the riser column, beginning approximately 14” below overflow level and extends down to the floor.

Overhead

The entire overhead was inspected from the water surface.

These steel overhead panels and steel supports were found appearing sound and remain free of obvious fatigue or failures at this time.

The protective coating applied to these surfaces appeared to have been applied uniformly. The protective coating applied to the steel panels remains having good adhesion value, providing adequate protection for the surfaces of the steel panels.

The protective coating applied to the steel supports was found having mostly good adhesion value, however declined film thickness has caused mild surface corrosion (blotch rusting) throughout approximately 5-10% of these surfaces.

Overflow

The overflow consists of a 36" by 24" by 12" tall welded steel weir box welded to the center riser column, located approximately 10' below the overhead. An 8" inside diameter steel pipe exits the base of the weir box and extends down and penetrates the floor.

The protective coating applied to the steel overflow pipe and weir box appeared to have uniformly. The protective coating applied to the steel overflow pipe was found having mostly good adhesion value, however secondary coating adhesion loss throughout approximately 80% of the upper 10' of the overflow pipe has resulted in exposure of the primary coating. The primary coating within these areas of exposure appeared to have good adhesion value at this time.

The protective coating applied to the welded steel weir box was found having mostly good adhesion value, however adhesion loss of the protective coating throughout approximately 30-35% of these surfaces has resulted in exposure of the underlying steel. No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild corrosion exists at this time.

Aesthetic Water Quality

The aesthetic water quality was found to be good throughout this tank, allowing unlimited visibility for this inspection.

RECOMMENDATIONS:

It is the opinion of Underwater Solutions Inc. that this elevated welded steel potable water storage tank appeared mostly sound and free of obvious leakage at this time.

EXTERIOR:

The interior and exterior surfaces of the welded steel support pedestal appeared sound and remain free of obvious fatigue or failures.

The protective coating applied to the interior steel surfaces of the support pedestal appeared to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for the steel and requires no remedial action at this time.

The protective coating applied to the exterior steel surfaces of the support pedestal also appeared to have been applied uniformly, meets the AWWA's recommendations and remains having mostly good adhesion value, however adhesion loss of the protective coating was observed throughout approximately 10% of the steel floor extension, resulting in exposure of the underlying steel.

Two additional areas of coating adhesion loss were observed on the exterior of the pedestal, located approximately 5' above the ground, resulting in exposure of the underlying steel.

No obvious fatigue/deterioration of the steel was evident within these two, 1/2" diameter areas of steel exposure, rather mild corrosion exists at this time.

The exterior steel wall panels and associated welds of the tank were found appearing sound and remain free of obvious fatigue or failures.

The protective coating applied to these welded steel surfaces appeared to have been applied uniformly and was found having good adhesion value, providing adequate protection for these steel panels and welds.

A mild, non-uniform accumulation of mildew throughout the exterior surfaces of the support pedestal and tank base has declined the overall aesthetics.

It is our recommendation to pressure-wash the exterior surfaces of the support pedestal, tank walls and tank base at 3,000 P.S.I. and at 3.0- G.P.M. to remove the accumulated mildew from these surfaces to preserve the adhesion value of the protective coating and to improve the overall aesthetics.

It is also our recommendation to power tool clean all areas of steel exposure found throughout the lower elevations of the exterior of the support pedestal to remove all corrosion and to prepare the substrate. We recommend then re-coating these areas to halt corrosion, prevent steel fatigue/deterioration and to provide good protection for the steel.

The steel roof panels and associated welds were found appearing sound and remain free of obvious fatigue or failures.

The protective coating applied to these welded steel surfaces appeared to have been applied uniformly, meets the AWWA's recommendations and was found having good adhesion value, providing adequate protection for the steel. A mild, non-uniform accumulation of mildew throughout the roof has declined the overall aesthetics.

The steel safety railings welded to the roof were found securely installed and free of obvious fatigue or failures. The protective coating applied to these steel safety railings appeared to have been applied uniformly and was found having mostly good adhesion value, however isolated areas of coating loss were observed throughout approximately 5% of these surfaces, resulting in exposure of the underlying steel. No obvious fatigue/deterioration of these steel safety railings was evident within these isolated areas of steel exposure, rather mild corrosion exists at this time.

It is our recommendation that when the exterior walls are pressure-washed that the surfaces of the roof be pressure-washed to remove the accumulated mildew and to preserve the adhesion value of the protective coating and improve the overall aesthetics.

It is also our recommendation to power tool clean the surfaces of the roof safety railings showing steel exposure to remove all corrosion and to prepare the substrate. We recommend then re-coating these surfaces to halt corrosion, prevent steel fatigue/deterioration and to provide good protection for the steel.

Each of the thirty-nine anchor bolts have one nut securely installed, while the protective coating applied to this support hardware appeared to have been applied uniformly and was found having good adhesion value. Although a mild rust stain was observed on this hardware, no obvious coating fatigue or steel exposure was evident at this time.

It is our recommendation to monitor the surfaces of these anchor bolts/nuts through future scheduled inspections to ensure that adhesion loss of the protective coating does not occur and result in exposure of the underlying steel.

The protective coating applied to the steel overflow pipe appeared to have been applied uniformly, meets the AWWA's recommendations and the protective coating applied to the pipe located within the pedestal remains having good adhesion value and requires no remedial action at this time.

The protective coating applied to the 28" long section of steel pipe and the flap-valve at the end of the pipe was found having mostly good adhesion value, however adhesion loss of the protective coating throughout less than 5% of the surfaces of this pipe and flap-valve has caused steel exposure and corrosion, however this steel pipe and flap-valve remain sound and free of obvious fatigue/deterioration at this time.

It is our recommendation to power tool clean the surfaces of this pipe and flap-valve showing steel exposure to remove all corrosion and to prepare the substrate. We recommend then re-coating these surfaces to halt corrosion, prevent steel fatigue and to provide good protection for this steel pipe and flap-valve.

The protective coating applied to the exterior surfaces of the 30" inside diameter steel hatch appeared to have been applied uniformly and was found having good adhesion value and requires no remedial action at this time.

The protective coating applied to the interior steel surfaces of the 30" inside diameter hatch lid and trunk appeared to have been applied uniformly and was found having mostly good adhesion value, however isolated areas of coating adhesion loss were observed throughout approximately 5% of these surfaces, resulting in exposure of the underlying steel. No obvious fatigue/deterioration of the steel lid or trunk was evident within these areas of exposure, rather mild corrosion exists at this time.

It is our recommendation to hand tool clean these areas of steel exposure to remove all corrosion and to prepare the substrate. We recommend then re-coating these areas using an A.N.S.I./N.S.F.61 approved coating for use in structures containing potable water to halt corrosion, prevent steel fatigue/deterioration and to provide good protection for the steel.

We recommend that when the interior surfaces of this hatch trunk are rehabilitated, that the tank interior be masked to prevent contaminates generated during the preparation and re-coating of these surfaces from entering the tank.

The protective coating applied to the interior and exterior surfaces of the 20" inside diameter steel hatch assembly appeared to have been applied uniformly and was found having good adhesion value and requires no remedial action at this time.

The protective coating applied to the steel surfaces of the manway, each access ladder and center riser column was found having good adhesion value and require no remedial action at this time.

All components affixed to the exterior of the tank are properly installed at this time.

A fail-safe (frost proof) vent and associated screen remains securely installed over the vent penetration in the roof, preventing access to the interior of the tank.

A flap-valve installed at the end of the overflow pipe remains secure, preventing access to the interior of the pipe/tank.

The 30” inside diameter and 20” inside diameter hatches that provide access to the tank interior were found secured with a lock, preventing unwanted access to the interior of the tank.

Each rigging hole penetration within the roof was found sealed with a threaded plug, preventing access to the interior of the tank.

INTERIOR:

The interior steel floor panels and associated welds were found appearing sound at this time. The protective coating applied to these surfaces appeared to have been applied uniformly and was found having mostly good adhesion value, however adhesion loss of the protective coating was observed throughout less than 5% of these surfaces, resulting in exposure of the underlying steel.

Corrosion exists within these areas of steel exposure, and an area of fatigue (pitting) of the steel was found within the floor panel, measuring 2-1/2” in length by 1/4" in width by 1/4" in depth.

The protective coating applied to the interior steel surfaces of the manway appeared to have been applied uniformly and was found having mostly good adhesion value, however adhesion loss was observed throughout approximately 10% of the surfaces of the hinge welded to the manway. This condition has caused steel exposure and corrosion, however no obvious fatigue/deterioration of this hinge mechanism was evident.

Adhesion loss of the protective coating was also observed throughout the outside edge of the manway lid, resulting in exposure of the underlying steel. Corrosion exists within these areas of steel exposure, and fatigue/deterioration of the steel was evident within one area of exposure, measuring 2” in length by 1/4" in width by 1/4" in depth.

The protective coating applied to the 12” inside diameter metal pipe that penetrates the floor and stands approximately 25’ tall appeared to have been applied uniformly and was found having mostly good adhesion value, however adhesion loss of the protective coating was observed throughout approximately 50% of the surfaces of the hardware utilized to secure these flanged sections of pipe together, resulting in exposure of the underlying steel. Although corrosion exists on the surfaces of these nuts and bolts; this hardware remains secure and with no obvious fatigue/deterioration at this time.

The protective coating applied to the interior welded steel wall surfaces appeared to have been applied uniformly, however was found having poor adhesion value at this time.

Secondary coating adhesion loss was observed throughout approximately 10-15% of the vertical wall surfaces, resulting in exposure of the primary coating. The exposed primary coating within these areas of exposure appeared to have good adhesion value at this time.

Blistering of the protective coating was also observed throughout approximately 25-30% of all wall surfaces and less than 5% of these coating blisters have ruptured, resulting in exposure of the underlying steel. Corrosion was evident within these areas of steel exposure, and fatigue (pitting) of the steel, measuring 1/2" in diameter by 1/8" deep exists within these areas of steel exposure at this time.

The protective coating applied to the steel overflow pipe and weir box appeared to have uniformly. The protective coating applied to the steel overflow pipe was found having mostly good adhesion value however secondary coating adhesion loss throughout approximately 80% of the upper 10' of the overflow pipe has resulted in exposure of the primary coating. The primary coating within these areas of exposure appeared to have good adhesion value at this time.

The protective coating applied to the welded steel weir box was found having mostly good adhesion value, however adhesion loss of the protective coating throughout approximately 30-35% of these surfaces has resulted in exposure of the underlying steel. No obvious fatigue/deterioration of the steel was evident within these areas of exposure, rather mild corrosion exists at this time.

It is our recommendation that the next time this tank is removed from service and de-watered, that the interior surfaces of the tank be pressure-washed at 3,000 P.S.I. and at 3.0 G.P.M. to remove the staining from the interior surfaces of the tank in an effort to prevent poor aesthetic water quality and to remove any and all coating that has lost adhesion from the floor, walls overflow pipe and overflow weir box.

It is also our recommendation to power tool clean the surfaces of the floor, manway, pipe securing hardware, interior walls, overflow pipe and overflow weir box to remove all corrosion and to prepare the substrate. We recommend then re-coating these surfaces using an A.N.S.I./N.S.F.61 approved coating for use in structures containing potable water to halt corrosion, prevent further steel fatigue/deterioration and to provide good protection for these steel surfaces.

The protective coating applied to the welded steel center riser column appeared to have been applied uniformly and was found having good adhesion value, providing adequate protection for the steel and requires no remedial action at this time.

The protective coating applied to the steel overhead panels and associated supports appeared to have been applied uniformly. The protective coating applied to the steel panels remains having good adhesion value, providing adequate protection for the surfaces of the steel panels.

The protective coating applied to the steel supports was found having mostly good adhesion value, however declined film thickness has caused mild surface corrosion (blotch rusting) throughout approximately 5-10% of these surfaces.

It is our recommendation to monitor all overhead surfaces through future scheduled inspections to ensure the coating adhesion loss does not occur and result in exposure of the underlying steel.

As always, we recommend that re-inspection and cleaning of all water storage facilities be performed in accordance with state and federal mandates, A.W.W.A. standards, and completed by an experienced and authorized inspection corporation.

UNDERWATER SOLUTIONS INC.
Christopher A. Cole, Project Manager

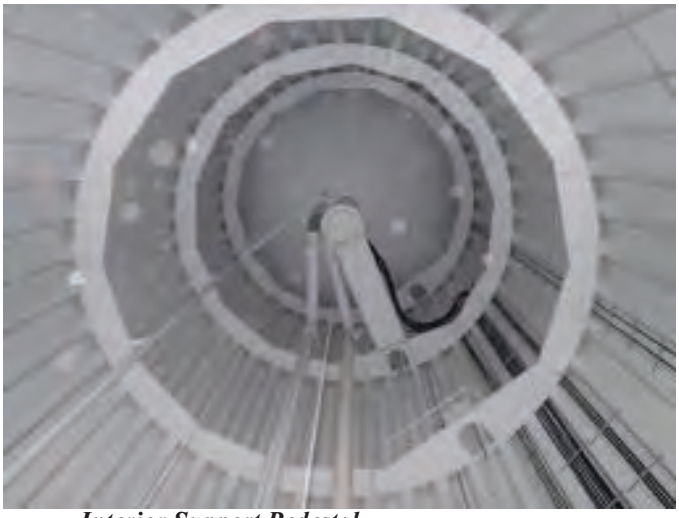
This report, the conclusions, recommendations and comments prepared by Underwater Solutions Inc. are based upon spot examination from readily accessible parts of the tank. Should latent defects or conditions which vary significantly from those described in the report be discovered at a later date, these should be brought to the attention of a qualified individual at that time. These comments and recommendations should be viewed as information to be used by the Owner in determining the proper course of action and not to replace a complete set of specifications. All repairs should be done in accordance with A.W.W.A. and/or other applicable standards.

1 ***Interior Support Pedestal***

2 ***Interior Support Pedestal***

3 ***Interior Support Pedestal***

4 ***Interior Support Pedestal***



5 ***Interior Support Pedestal***

6 ***Interior Support Pedestal***

7 ***Interior Support Pedestal***

8 ***Interior Support Pedestal***

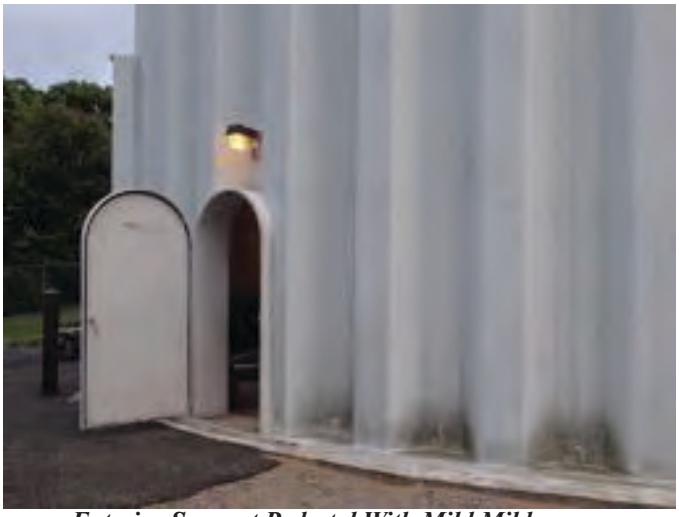
9 ***Interior Support Pedestal***

10 ***Support Pedestal Floor Extension With Coating Loss, Exposed Underlying Steel, Mild Corrosion And Mild Mildew***

11 ***Support Pedestal Floor Extension With Coating Loss, Exposed Underlying Steel, Mild Corrosion And Mild Mildew***

12 ***Support Pedestal Floor Extension With Coating Loss, Exposed Underlying Steel, Mild Corrosion And Mild Mildew***

13 ***Support Pedestal Floor Extension With Coating Loss, Exposed Underlying Steel, Mild Corrosion And Mild Mildew***

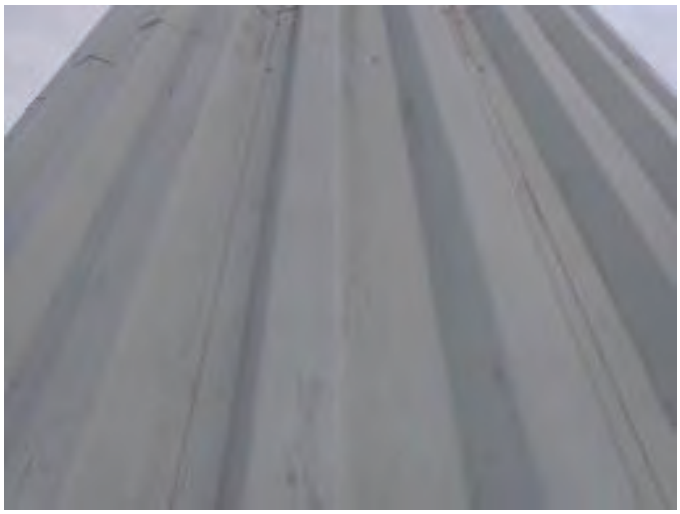


14 ***Exterior Support Pedestal With Mild Mildew***

15 ***Exterior Support Pedestal With Mild Mildew***

16 ***Exterior Support Pedestal With Mild Mildew***

17 ***Exterior Support Pedestal With Mild Mildew***



18 ***Exterior Support Pedestal With Mild Mildew***

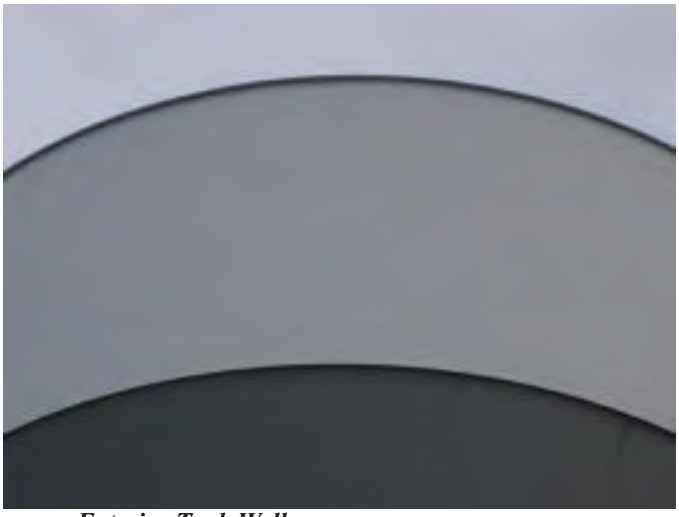
19 ***Exterior Support Pedestal With Mild Mildew***

20 ***Exterior Support Pedestal With Mild Mildew***

21 ***Exterior Support Pedestal With Mild Mildew***

22 ***Exterior Support Pedestal With Mild Mildew***

23 ***Exterior Tank Wall***



24 ***Exterior Tank Wall***

25 ***Exterior Tank Wall***

26 ***Exterior Tank Wall***

27 ***Exterior Tank Wall***

28 ***Exterior Tank Base With Mild Mildew***

29 ***Exterior Tank Base With Mild Mildew***

30 ***Exterior Tank Base With Mild Mildew***

31 ***Exterior Tank Base With Mild Mildew***

32 ***Secure Anchor Bolt With Hardware Having Mild Rust Staining***

33 ***Secure Anchor Bolt With Hardware Having Mild Rust Staining***

34 ***Secure Anchor Bolt With Hardware Having Mild Rust Staining***

35 ***Secure Anchor Bolt With Hardware Having Mild Rust Staining***

36 ***Concrete Foundation With Mildew***

37 ***Concrete Foundation With Mildew***

38 ***Concrete Foundation With Mildew***

39 ***Manway***

40 ***Manway Access Ladder And Fall Prevention Device***

41 ***Ladder And Fall Prevention Device***

42 ***Ladder And Fall Prevention Device***

43 ***Ladder And Fall Prevention Device***

44 ***Ladder And Fall Prevention Device***

45 ***Center Riser Column Walkway***

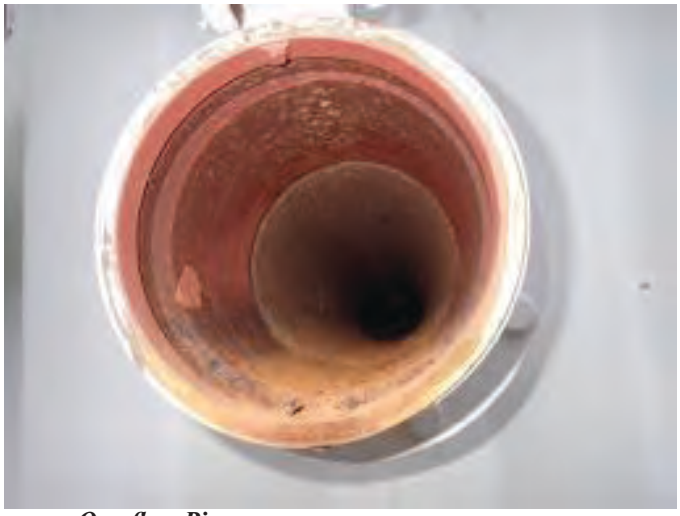
46 ***Center Riser Column Ladder And Fall Prevention Device***

47 ***Center Riser Column***

48 ***Overflow Pipe***

49 ***Overflow Pipe***

50 ***Overflow Pipe And Flap-Valve Having Coating Loss, Exposed Steel And Corrosion***



51 ***Overflow Pipe***

52 ***Roof Panels With Mild Mildew***

53 ***Roof Panels With Mild Mildew***

54 ***Roof Panels With Mild Mildew***

55 ***Roof Panels With Mild Mildew***

56 ***Roof Panels With Mild Mildew***

57 ***Roof Panels With Mild Mildew***

58 ***Secure Roof Rigging Hole Penetrations Sealed With Threaded Plug***

59 ***Secure Roof Safety Railings***

60 ***Secure Roof Safety Railings***

61 ***Secure Roof Safety Railings***

62 ***Secure Roof Safety Railings***

63 ***Secure Roof Safety Railings With Isolated Coating Loss, Exposed Underlying Steel And Mild Corrosion***

64 ***Secure Roof Safety Railings With Isolated Coating Loss, Exposed Underlying Steel And Mild Corrosion***

65 ***Secure Roof Safety Railings With Isolated Coating Loss, Exposed Underlying Steel And Mild Corrosion***

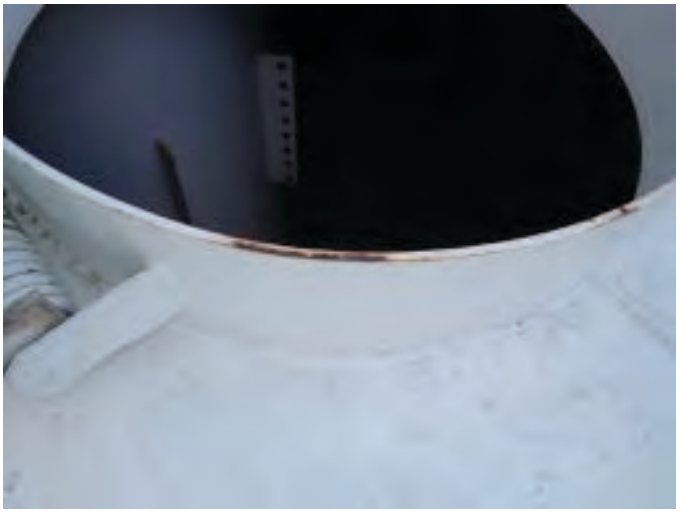
66 ***Secure Vent Cap***

67 ***Secure Vent Screen***

68 ***Secure Vacuum Release Plate***

69 ***Open Access Hatch***

70 ***Access Hatch Lid With Isolated Coating Loss, Exposed Underlying Steel And Mild Corrosion***



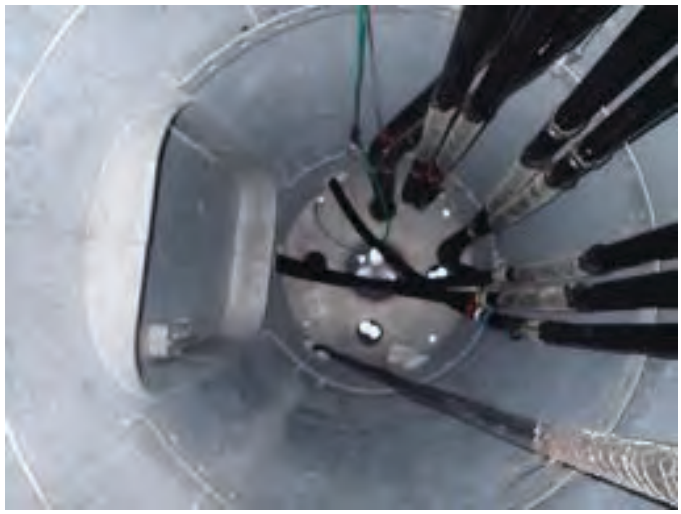
71 ***Access Hatch Trunk With Isolated Coating Loss, Exposed Underlying Steel And Mild Corrosion***

72 ***Closed Access Hatch***

73 ***Secure Access Hatch***

74 ***Closed Access Hatch***

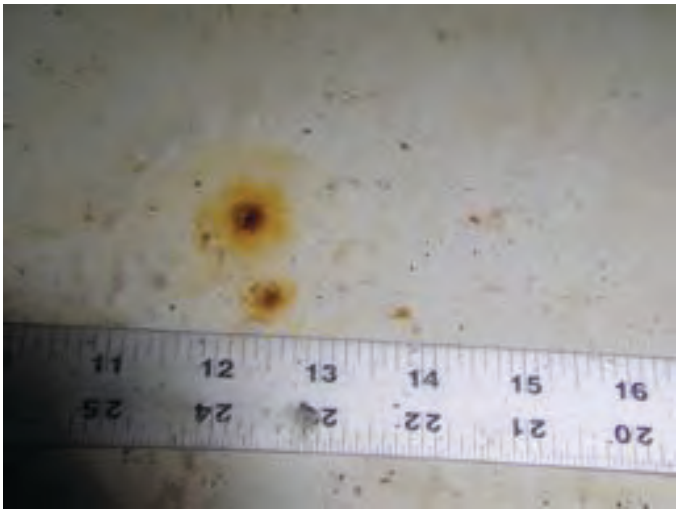
75 ***Open Center Riser Column Access Door***



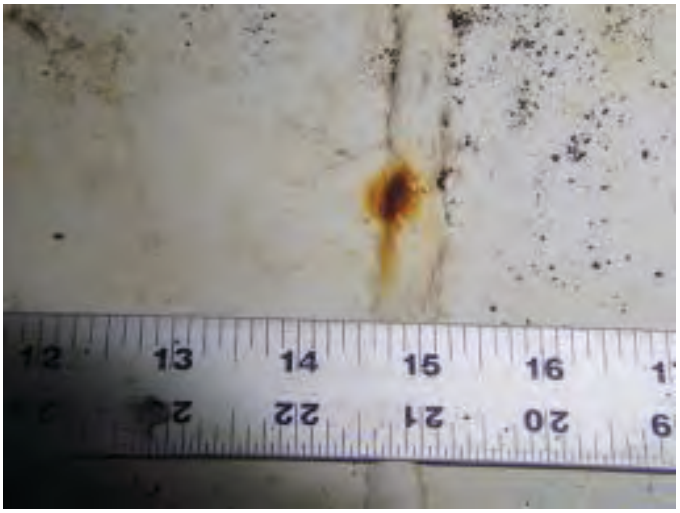
76 ***Closed Center Riser Column Access Door***

77 ***Layer Of Precipitate***

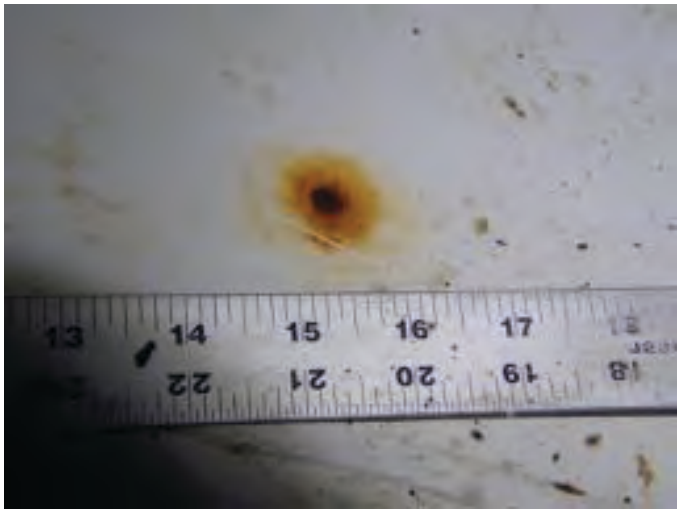
78 ***Layer Of Precipitate***



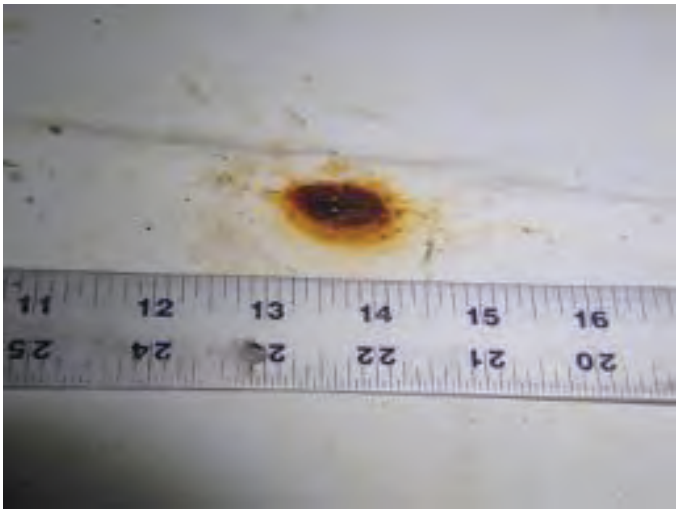
79 ***Floor With Coating Loss, Exposed Underlying Steel, Corrosion And Mild To Moderate Staining***



80 ***Floor With Coating Loss, Exposed Underlying Steel, Corrosion And Mild To Moderate Staining***



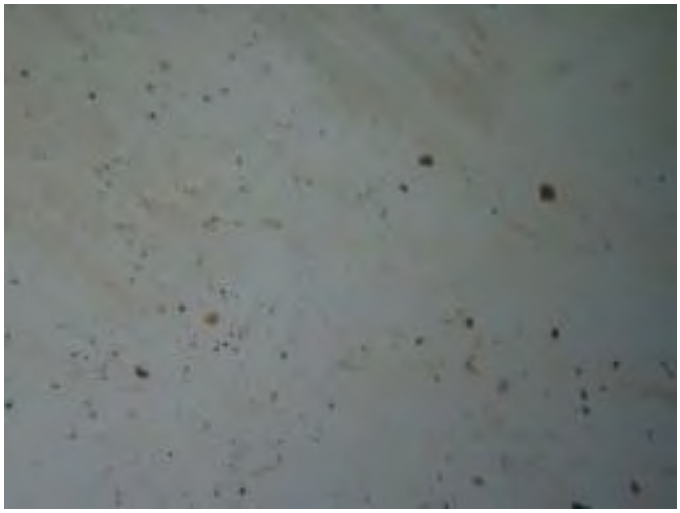
81 ***Floor With Coating Loss, Exposed Underlying Steel, Corrosion And Mild To Moderate Staining***



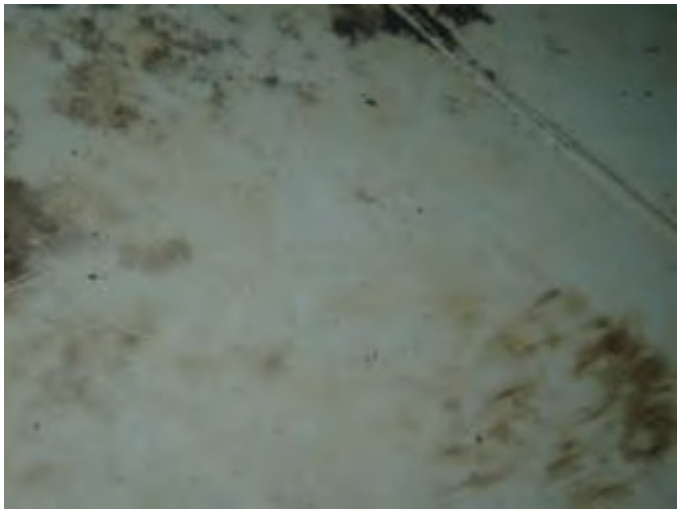
82 ***Floor With Coating Loss, Exposed Underlying Steel, Corrosion And Mild To Moderate Staining***

83 ***Floor With Coating Loss, Exposed Underlying Steel, Fatigue (Pitting), Corrosion And Mild To Moderate Staining***

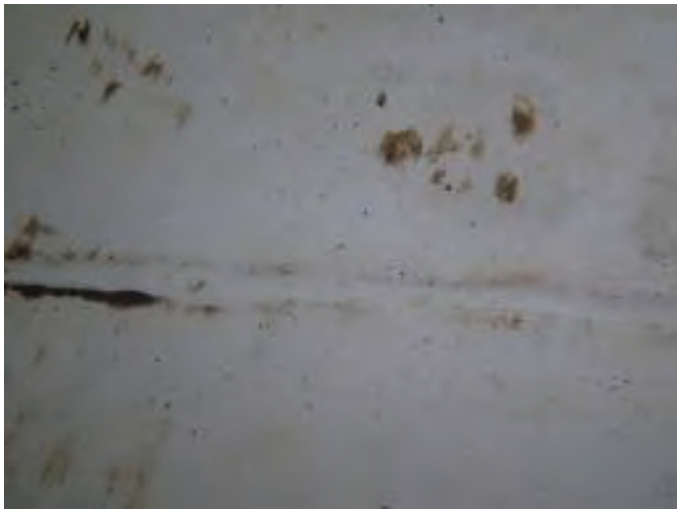
84 ***Floor With Mild To Moderate Staining***



85 ***Floor With Mild To Moderate Staining***



86 ***Floor With Mild To Moderate Staining***

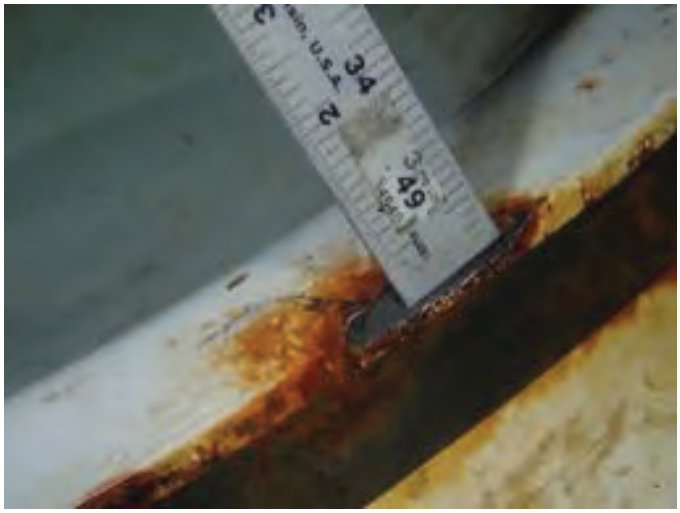


87 ***Floor With Mild To Moderate Staining***

88 ***Manway***

89 ***Manway Hinge With Coating Loss, Exposed Steel And Corrosion***

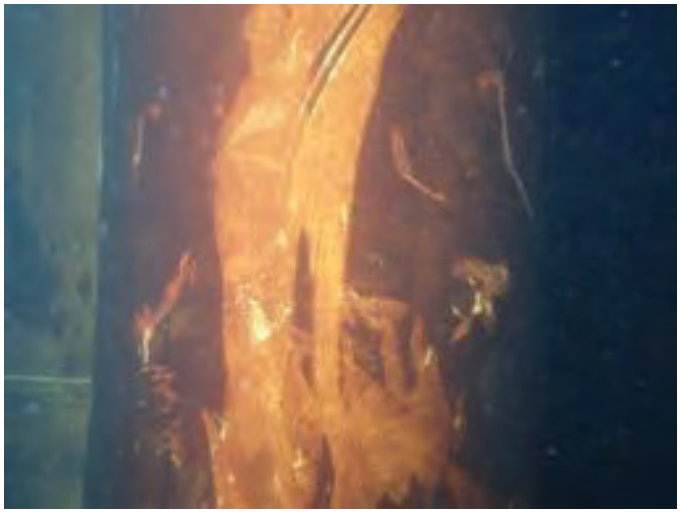
90 ***Manway Lid With Coating Loss, Exposed Underlying Steel And Corrosion***



91 ***Manway Lid With Coating Loss, Exposed Underlying Steel, Fatigue (Pitting) And Corrosion***

92 ***18” Inside Diameter Pipe With Heavy Staining***

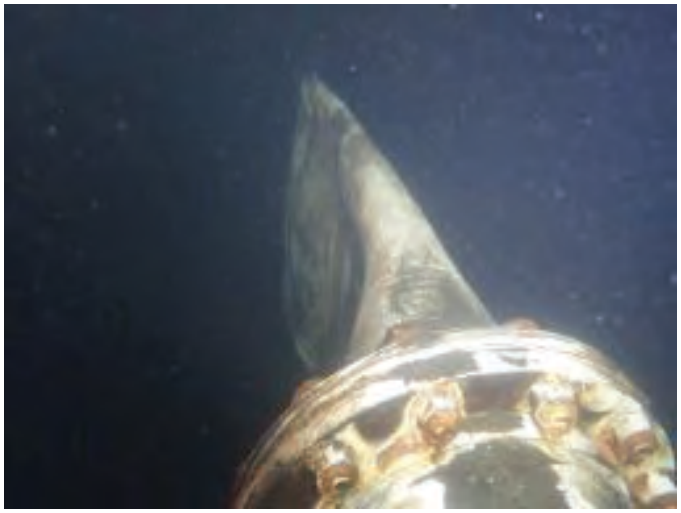
93 ***12” Inside Diameter Pipe Penetrating The Tank Floor***



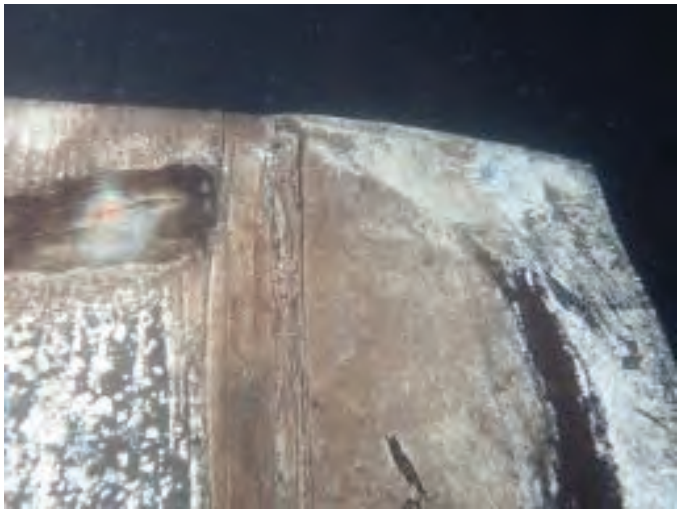
94 ***12” Inside Diameter Pipe With Heavy Staining***

95 ***Flange Hardware With Coating Loss, Exposed Underlying Steel And Corrosion***

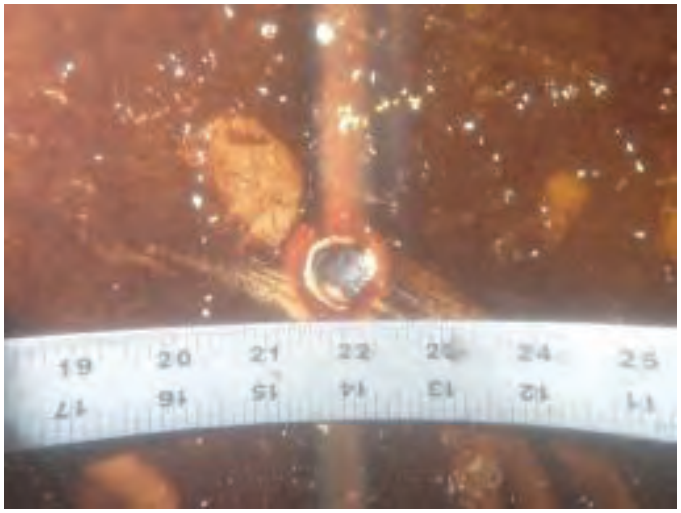
96 ***Flange Hardware With Coating Loss, Exposed Underlying Steel And Corrosion***



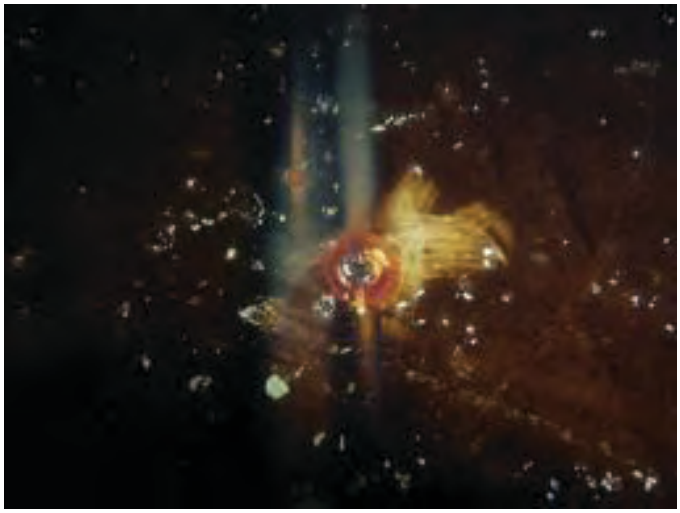
97 ***Rubber Influent Check Valve***



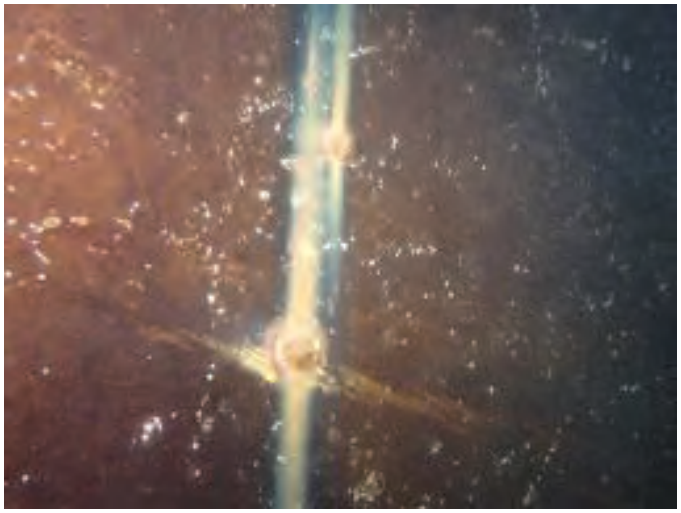
98 ***Rubber Influent Check Valve***



99 ***Interior Wall With Secondary Coating Loss, Exposed Primary Coating, Fatigue (Pitting), Exposed Steel, Corrosion And Heavy Staining***

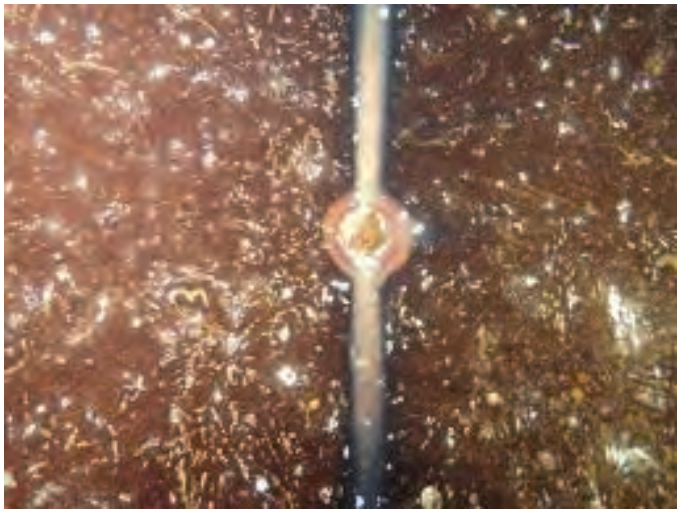


100 ***Interior Wall With Secondary Coating Loss, Exposed Primary Coating, Fatigue (Pitting), Exposed Steel, Corrosion And Heavy Staining***

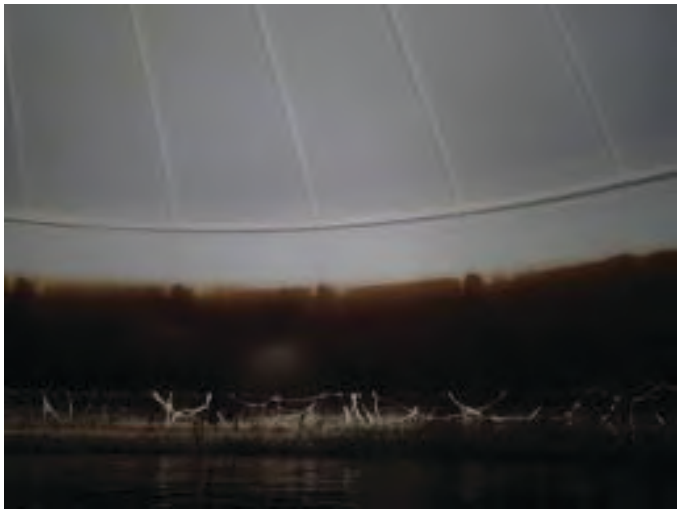


101 ***Interior Wall With Secondary Coating Loss, Exposed Primary Coating, Fatigue (Pitting), Exposed Steel, Corrosion And Heavy Staining***

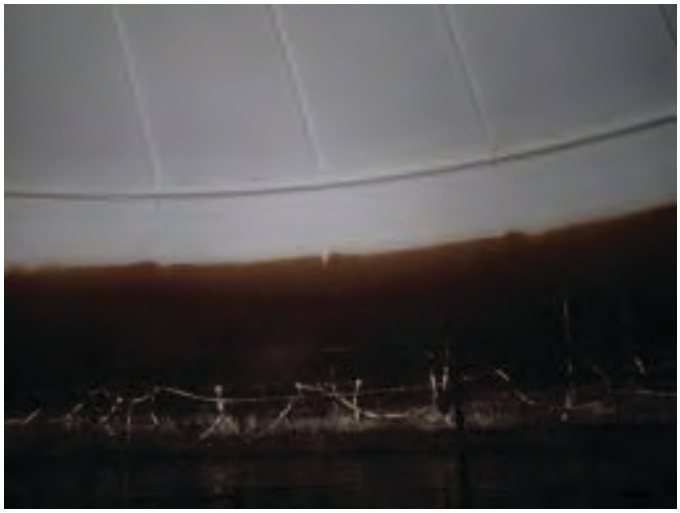
102 ***Interior Wall With Secondary Coating Loss, Exposed Primary Coating, Fatigue (Pitting), Exposed Steel, Corrosion And Heavy Staining***



103 ***Interior Wall With Secondary Coating Loss, Exposed Primary Coating, Fatigue (Pitting), Exposed Steel, Corrosion And Heavy Staining***

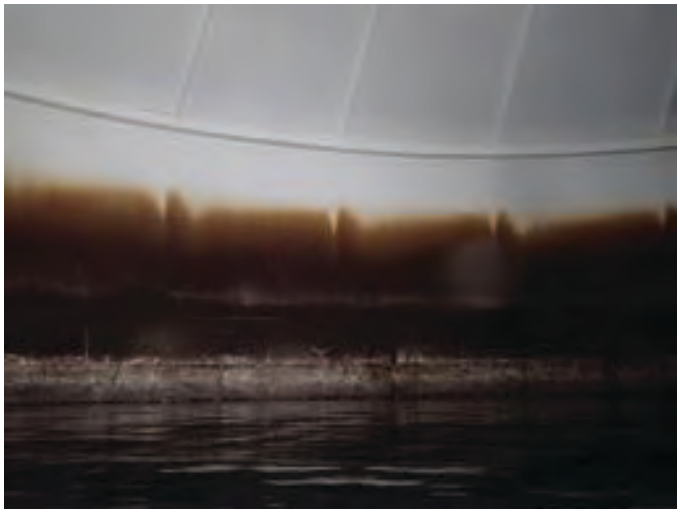


104 ***Interior Wall With Heavy Staining***

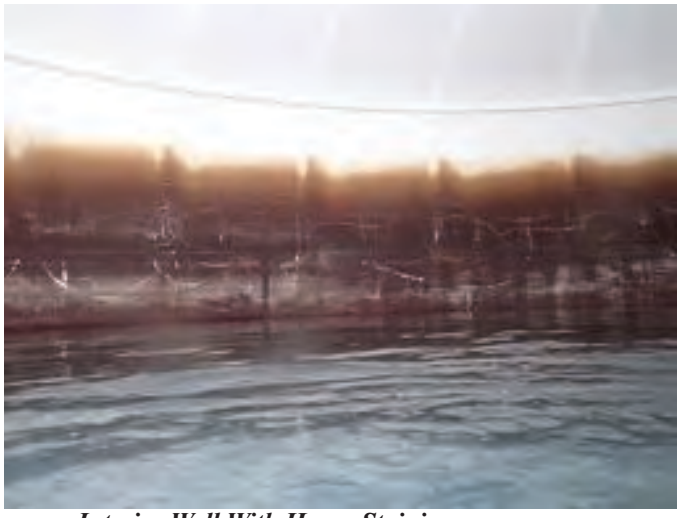


105 ***Interior Wall With Heavy Staining***

106 ***Interior Wall With Heavy Staining***



107 ***Interior Wall With Heavy Staining***



108 ***Interior Wall With Heavy Staining***

109 ***Center Riser Column With Heavy Staining***

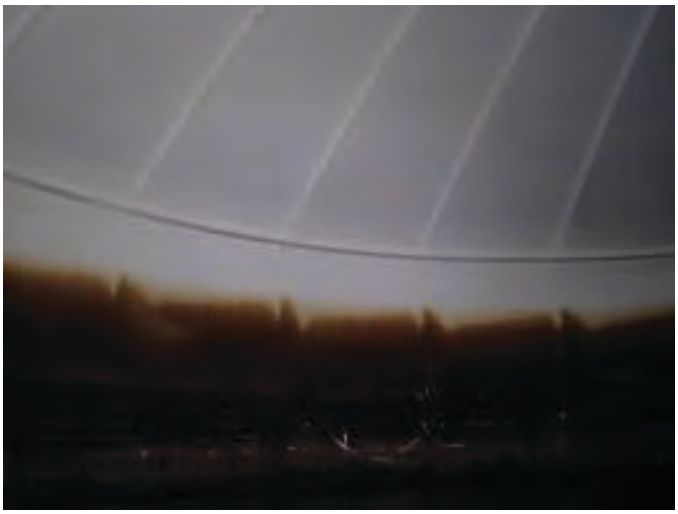
110 ***Center Riser Column With Heavy Staining***

111 ***Center Riser Column With Heavy Staining***

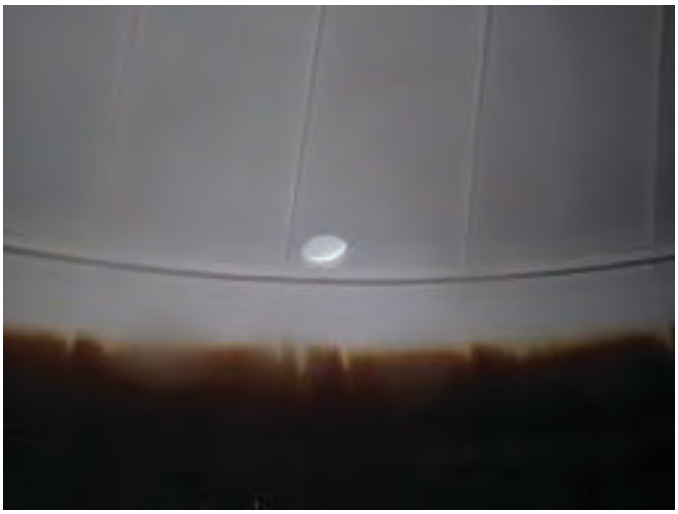
112 ***Center Riser Column With Heavy Staining***

113 ***Overhead With Coating Loss, Mild Surface Corrosion And Blotch Rusting***

114 ***Overhead With Coating Loss, Mild Surface Corrosion And Blotch Rusting***



115 ***Overhead With Coating Loss, Mild Surface Corrosion And Blotch Rusting***



116 ***Overhead With Coating Loss, Mild Surface Corrosion And Blotch Rusting***

117 ***Overflow Pipe With Secondary Coating Loss And Exposed Primary Coating***

118 ***Overflow Pipe With Secondary Coating Loss And Exposed Primary Coating***

119 ***Overflow Pipe Weir Box With Secondary Coating Loss, Exposed Underlying Steel And Mild Corrosion***

120 ***Discharge During Cleaning***

APPENDIX D

Pipe Replacement Priority List – Alphabetically

Appendix D
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Main Database Sorted Alphabetically

Pipe #	Street	Location	Town	Size (in)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments
10	16" TRANSMISSION	Hamman Plant to Mendon Rd	Woonsocket	16	CI	1948	2870	N	G5	L	WWD	
15	18" HARRIS POND LINE	Harris Pond to Reservoir 1	Woonsocket	18	AC	1960	18000	N	G5	RAW	WWD	
38	Access Road	Dump Road to Transfer Station	Woonsocket	8	AC	1960	2900	Y	D5	L	WWD	added to database
40	Achille Street		Woonsocket	8	DI	1965	650	N	A6	L	WWD	break 10/79
45	Adams Street		Woonsocket	4	CI	1893	180	N	A5	L	WWD	
50	Adams Street		Woonsocket	6	CI	1893	1420	N	A5	L	WWD	
55	Admiral Street		Woonsocket	8	DI	1974	400	Y	F3	H	WWD	
60	Albert		Woonsocket	8	DI	1966	275	N	A9	H	WWD	
70	Alice Avenue		Woonsocket	12	CI	1895	780	N	E1	L	WWD	
65	Alice Avenue		Woonsocket	8	DI	1979	480	Y	E1	L	WWD	
75	All Saints Street		Woonsocket	8	CI	1932	750	N	B6	L	WWD	break 1982 (St.Cecile to St. Louis)
80	Allen Street		Woonsocket	8	CI	1896	950	Y	D3	L	WWD	
85	Andrews Street		Woonsocket	6	CI	1890	780	N	E1	L	WWD	
90	Angell Street		Woonsocket	8	CI	1934	750	N	E3	H	WWD	
95	Annette Avenue		Woonsocket	8	CI	1953	1300	Y	C8	H	WWD	
100	Arland Court		Woonsocket	8	DI	1989	525	Y	B8	H	WWD	
105	Arlington Street		Woonsocket	8	CI	1941	475	N	C7	L	WWD	
103	Armand Street		Woonsocket	2	CT	1947	400	Y	E6	L	Wilfred Pelletier?	added to database
110	Arnold Avenue, NS		N. Smithfield	8	DI	2011	300	Y	F1	L	Joseph DiPardo	
115	Arnold Street	Railroad to Blackstone	Woonsocket	8	CI	1888	940	N	C3	L	WWD	
120	Arnold Street	Bentley to Main	Woonsocket	8	CI	1888	1400	N	C3	L	WWD	
125	Arona Street		Woonsocket	8	AC	1975	200	Y	B7	L	WWD	
130	Ascension Street		Woonsocket	4	CI	1887	370	N	C3	L	WWD	
135	Asylum Street		Woonsocket	6	CI	1894	1100	N	D2	L	WWD	break 1/85
140	Atlanta Street		Woonsocket	8	CI	1926	700	Y	A6	L	WWD	
145	Aubin Street		Woonsocket	8	DI	1979	320	Y	B6	L	WWD	
150	Avenue A		Woonsocket	6	CI	1889	340	N	E2	L	WWD	
155	Avenue A		Woonsocket	8	CI	1959	1120	N	F2	L	WWD	
160	Avenue B		Woonsocket	6	CI	1904	840	N	F2	L	WWD	break 1/94
165	Avenue C		Woonsocket	8	CI	1891	1380	N	E2	L	WWD	
170	Aylsworth Avenue		Woonsocket	8	CI	1914	3700	N	D6	L	WWD	
175	Bailey Street		Woonsocket	8	CI	1926	900	N	F3	L	WWD	
180	Ballou Street		Woonsocket	8	CI	1917	1720	N	E2	L	WWD	
185	Bamford Street, NS		N. Smithfield	6	CI	1941	280	N	F1	L	J.H. O'Donnell	
190	Bartlett Street		Woonsocket	12	CI	1947	380	Y	D7	L	WWD	
195	Barton Street		Woonsocket	6	CI	1890	370	N	A3	L	WWD	
200	Baxter Street		Woonsocket	6	CI	1915	240	N	F2	L	WWD	
205	Baxter Street		Woonsocket	8	DI	1997	240	N	F2	L	WWD	
210	Bayberry Road		Woonsocket	8	DI	1968	1540	N	C9	H	WWD	break 1/95
220	Beacon Avenue		Woonsocket	8	CI	1933	1480	N	C6	L	WWD	
215	Beacon Avenue	Poplar to Aubin	Woonsocket	8	DI	1980	960	N	B6	L	WWD	
225	Beausoleil Street		Woonsocket	12	CI	1929	600	Y	G7	L	WWD	
230	Beech Street		Woonsocket	8	CI	1924	380	N	E2	L	WWD	
235	Bellevue Avenue		Woonsocket	6	CI	1890	400	N	C4	L	WWD	

Appendix D
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Main Database Sorted Alphabetically

Pipe #	Street	Location	Town	Size (in)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments
240	Bellevue Avenue, NS		N. Smithfield	8	DI	1988	1140	Y	F1	L	Town of NS	
245	Bellingham Street		Woonsocket	6	CI	1897	590	Y	A5	L	WWD	
250	Benefit Street		Woonsocket	8	CI	1941	560	N	E3	L	WWD	
255	Benelli Street		Woonsocket	8	CI	1929	270	Y	A6	L	WWD	
265	Bennett Street		Woonsocket	6	CI	1909	1100	N	D4	L	WWD	
260	Bennett Street		Woonsocket	8	AC	1976	190	Y	D4	L	WWD	
270	Bentley Street		Woonsocket	4	CI	1922	280	Y	C3	L	WWD	
275	Berard Avenue		Woonsocket	8	DI	1979	460	Y	F4	H	WWD	
280	Berkley Street		Woonsocket	8	DI	1979	280	Y	F2	H	WWD	
285	Bernice Avenue		Woonsocket	8	CI	1891	1280	N	E2	L	WWD	
290	Bernon Street	at Truman Drive	Woonsocket	6	CI	1890	300	Y	D3	L	WWD	
310	Bernon Street		Woonsocket	6	CI	1893	1480	N	D4	L	WWD	
300	Bernon Street	Grove to Maple	Woonsocket	6	CI	1905	880	N	D4	H	WWD	
295	Bernon Street		Woonsocket	8	CI	1905	540	N	D4	H	WWD	
305	Bernon Street	Greene to Grove	Woonsocket	8	CI	1905	720	N	D4	L	WWD	
315	Bernon Street		Woonsocket	8	DI	1969	540	N	D5	L	WWD	
320	Bertenshaw Road		Woonsocket	8	CI	1908	1280	N	F5	L	WWD	
325	Bertha Avenue		Woonsocket	8	CI	1959	720	Y	F5	L	WWD	
330	Birch Hill Avenue, NS		N. Smithfield	4	AC	1953	880	Y	H2	H	Leo Laband	
335	Birch Street		Woonsocket	8	CI	1940	350	N	B5	L	WWD	
340	Blackstone Street		Woonsocket	4	CI	1893	1060	N	C3	L	WWD	
345	Blackstone Street		Woonsocket	12	CI	1889	3160	N	C3	L	WWD	
350	Blakeley Street		Woonsocket	6	CI	1891	320	N	E3	H	WWD	
355	Blue Stone Drive		Woonsocket	8	DI	1964	1020	Y	G5	L	WWD	
353	Blueberry Hill		Woonsocket	8	DI	1998	270	Y	C8	H	WWD	added to database
360	Bound Road	Diamond Hill to Glaude	Woonsocket	8	DI	1962	1340	N	A9	H	WWD	
365	Bound Road	Diamond Hill to Elder Ballou	Woonsocket	12	DI	1965	2300	N	B9	H	WWD	
370	Bourassa Avenue		Woonsocket	8	DI	1978	840	Y	C7	L	WWD	
375	Bourdon Boulevard		Woonsocket	8	DI	1963	2120	N	D1	L	Woon. Housing Authority	
380	Boyden Street		Woonsocket	6	CI	1889	1060	Y	C3	L	WWD	
385	Bozoian Street		Woonsocket	8	DI	1978	280	Y	E6	L	WWD	
390	Bradford Street		Woonsocket	4	CI	1890	420	N	E2	L	WWD	
395	Bradley Street		Woonsocket	8	DI	1963	540	Y	F4	H	WWD	
400	Breault Avenue		Woonsocket	8	CI	1935	480	N	E2	L	WWD	
405	Brien's Court		Woonsocket	8	DI	1968	200	Y	E5	L	WWD	
410	Broad Street		Woonsocket	8	CI	1908	700	N	E3	L	WWD	break 1/96
415	Brook Street		Woonsocket	8	CI	1891	440	Y	B5	L	WWD	
420	Brookhaven Lane		Woonsocket	12	DI	1987	1240	Y	C9	H	WWD	
425	Buell Avenue, NS	at Smithfield Road end	N. Smithfield	1.5	CT	1960	120	Y	F2	H	private-unknown	
430	Buell Avenue, NS		N. Smithfield	1	CT	1960	100	Y	G2	H	WWD	
440	Burnside Avenue		Woonsocket	6	CI	1902	1940	N	B5	L	WWD	
435	Burnside Avenue		Woonsocket	8	CI	1927	480	Y	A5	L	WWD	
	Burnside Avenue		Woonsocket	8	DI	2012	100		A5	L	WWD	
445	Burrington Street		Woonsocket	8	CI	1930	1460	N	G6	L	WWD	

Appendix D
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Main Database Sorted Alphabetically

Pipe #	Street	Location	Town	Size (in)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments
450	Buxton Street		Woonsocket	8	CI	1925	240	N	D2	L	WWD	
455	Cady Street		Woonsocket	8	CI	1937	720	Y	D6	L	WWD	extension 1988
	Cady Street		Woonsocket	8	DI	2012	710		D6	L	WWD	
460	Cambridge Court		Woonsocket	8	DI	1987	260	Y	C9	H	Brookhaven Estates	
465	Campeau Street		Woonsocket	8	CI	1954	720	N	C7	L	WWD	
470	Canal Street		Woonsocket	8	CI	1890	320	Y	C3	L	WWD	
475	Canal Street, NS		N. Smithfield	8	CI	1928	2180	Y	A1	L	WWD	
480	Capwell Avenue		Woonsocket	8	DI	1973	1260	N	E4	H	WWD	break 9/89, extension 1987
485	Carey Court		Woonsocket	8	DI	1973	520	Y	C8	H	WWD	
490	Carnation Street		Woonsocket	10	CI	1930	480	N	F3	H	WWD	parallel pipes
495	Carnation Street		Woonsocket	8	CI	1922	1680	N	F3	H	WWD	parallel pipes
505	Carrington Avenue		Woonsocket	6	CI	1895	1100	N	D5	L	WWD	break 1/96
500	Carrington Avenue		Woonsocket	12	DI	1974	320	N	D4	L	WWD	
520	Cass Avenue		Woonsocket	6	CI	1894	1080	N	C7	L	WWD	parallel pipes
515	Cass Avenue		Woonsocket	8	CI	1889	3180	N	C6	L	WWD	
510	Cass Avenue		Woonsocket	10	CI	1921	2160	N	C6	L	WWD	parallel pipes
525	Castle Heights Court		Woonsocket	8	DI	1959	460	Y	A3	L	WWD	
530	Cato Street		Woonsocket	6	CI	1885	1310	N	C3	L	WWD	break 11/92
535	Center Street		Woonsocket	8	CI	1889	1000	N	D3	L	WWD	
540	Century Drive	Park East to Springwater	Woonsocket	12	DI	1988	1000	N	E7	H	WWD	
545	Chalapa Avenue		Woonsocket	6	CI	1922	570	Y	B5	L	WWD	
550	Chapel Street		Woonsocket	6	CI	1942	240	N	D1	L	WWD	
555	Charles Street		Woonsocket	6	CI	1904	490	N	A5	L	WWD	
565	Cherry Hill Avenue		Woonsocket	8	CI	1921	440	Y	B2	H	WWD	
560	Cherry Hill Avenue		Woonsocket	8	DI	1985	840	N	B1	L	WWD	
570	Cherry Street		Woonsocket	8	CI	1957	280	N	C3	L	WWD	
575	Chester Street		Woonsocket	6	CI	1902	740	N	B5	L	WWD	
580	Chester Street, NS		N. Smithfield	1.5	CT	1949	240	Y	G3	H	private-unknown	
585	Chestnut Street		Woonsocket	6	CI	1886	260	N	C2	L	WWD	
590	Chestnut Street		Woonsocket	8	CI	1926	500	N	C2	L	WWD	
595	Church Street		Woonsocket	8	CI	1887	1240	N	C3	L	WWD	
600	Circle Street		Woonsocket	8	CI	1950	360	Y	E5	L	WWD	
	Circle Street		Woonsocket	8	DI	2014	680		E5	L	WWD	
605	Clark Court		Woonsocket	4	CI	1888	180	Y	C3	L	WWD	
615	Cleveland Street		Woonsocket	6	CI	1913	440	N	E4	H	WWD	
610	Cleveland Street		Woonsocket	8	CI	1921	400	N	E4	H	WWD	
620	Cliffe Avenue		Woonsocket	8	CI	1954	560	N	E7	L	WWD	
625	Clinton Street		Woonsocket	12	CI	1888	1900	N	C4	L	WWD	
630	Coe Street		Woonsocket	6	CI	1889	2720	N	E2	L	WWD	
635	Cold Spring Place		Woonsocket	4	CI	1893	240	Y	C2	L	WWD	
640	Collins Street		Woonsocket	6	CI	1902	690	N	E3	L	WWD	
	Colony Avenue		Woonsocket	8	DI	2017	365		C7	L	WWD	
645	Columbus Street		Woonsocket	8	DI	1977	180	Y	E6	L	WWD	
650	Congress Street		Woonsocket	8	CI	1930	800	Y	D6	L	WWD	

Appendix D
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Main Database Sorted Alphabetically

Pipe #	Street	Location	Town	Size (in)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments
655	Congress Street		Woonsocket	10	DI	1990	400	N	D6	L	WWD	
660	Conrad Street		Woonsocket	8	CI	1933	660	N	C7	L	WWD	
665	Coolidge Avenue		Woonsocket	8	DI	1960	540	N	B7	L	WWD	break 1/93
670	Cooper Avenue		Woonsocket	8	CI	1922	1080	N	F4	H	WWD	
675	Corsi Street		Woonsocket	12	DI	1985	400	Y	D7	L	WWD	
680	Cote Avenue		Woonsocket	6	CI	1914	890	N	C6	L	WWD	
685	Cottage Street		Woonsocket	6	CI	1891	1580	N	D4	H	WWD	break 12/95
690	Cottage Street		Woonsocket	8	CI	1960	980	Y	E3	H	WWD	break 12/95
695	Country Road		Woonsocket	8	DI	1970	1060	N	B9	H	WWD	
700	Craigie Avenue		Woonsocket	8	CI	1953	550	N	E6	L	WWD	
705	Cranston Street		Woonsocket	8	CI	1928	960	N	F3	H	WWD	
710	Cranston Street	Monty to Caron	Woonsocket	8	DI	1983	200	Y	G3	H	WWD	
720	Crawford Street		Woonsocket	6	CI	1920	360	N	E4	H	WWD	
715	Crawford Street		Woonsocket	8	CI	1905	300	N	E4	H	WWD	
725	Crest Road		Woonsocket	8	DI	1965	570	Y	B9	H	WWD	
730	Crest Road, NS	includes Greenwood and Golden	N. Smithfield	2	GI	1928	1000	Y	G2	H	WWD	
735	Crest Road, NS		N. Smithfield	6	CI	1928	500	N	G2	H	WWD	
740	Cross Street		Woonsocket	6	CI	1893	540	N	E3	L	WWD	
745	Cumberland Hill Road	Hamlet to Mendon	Woonsocket	12	CI	1902	6000	N	E6	L	WWD	
	Cumberland Interconnection	Park East to Brook Haven	Woonsocket	12	DI	2017	2000		C9	H	WWD	
755	Cumberland Street		Woonsocket	12	CI	1889	2260	N	C5	L	WWD	
750	Cumberland Street		Woonsocket	8	CI	1943	800	N	C5	L	WWD	
760	CVS Drive		Woonsocket	12	DI	1982	1080	Y	F7	H	WWD	
765	Cynthia Drive, NS		N. Smithfield	8	DI	1968	1880	Y	CNS	H	A.F. Pacheco	
770	Dana Street		Woonsocket	8	CI	1921	1360	N	C7	L	WWD	
	Danielle Drive		Woonsocket	8	DI	2007	475		G6	L	WWD	
	Danielle Drive		Woonsocket	8	DI	2015	925		G6	L	WWD	
775	Daniels Street		Woonsocket	4	CI	1893	280	N	B3	L	WWD	
780	Daniels Street		Woonsocket	8	CI	1892	230	N	B4	L	WWD	
785	Darwin Street		Woonsocket	8	CI	1946	420	N	E3	L	WWD	
790	Darwin Street		Woonsocket	8	DI	1990	270	Y	F3	L	WWD	
795	Davison Avenue		Woonsocket	12	CI	1916	1120	N	D5	L	WWD	parallel pipes
800	Davison Avenue		Woonsocket	12	CI	1916	1120	N	D5	L	WWD	parallel pipes
805	Dawn Boulevard		Woonsocket	8	DI	1962	540	N	A9	H	WWD	break 12/78
810	Dean Street		Woonsocket	6	CI	1905	460	N	A5	L	WWD	
815	Deborah Ave, NS		N. Smithfield	8	DI	1968	540	N	CNS	H	A.F. Pacheco	
820	Denby Street		Woonsocket	8	CI	1937	375	N	A6	L	WWD	
825	Desrochers Avenue		Woonsocket	8	CI	1936	240	Y	C6	L	WWD	
830	Dewey Street		Woonsocket	6	CI	1917	460	N	A5	L	WWD	
835	Dexter Street		Woonsocket	6	DI	1973	360	N	B3	L	WWD	
840	Diamond Hill Road		Woonsocket	6	CI	1891	3090	Y	A5	L	WWD	parallel pipes
855	Diamond Hill Road		Woonsocket	12	DI	1969	6080	N	A8	H	WWD	break 12/81,4/83
850	Diamond Hill Road		Woonsocket	12	CI	1925	7450	N	A7	L	WWD	parallel pipes
845	Diamond Hill Road		Woonsocket	8	DI	1963	320	N	A7	H	WWD	break 12/79

Appendix D
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Main Database Sorted Alphabetically

Pipe #	Street	Location	Town	Size (in)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments
860	Diana Drive		Woonsocket	8	DI	1967	760	N	B8	H WWD		
865	Dike Street		Woonsocket	8	DI	1974	240	N	F3	H WWD		
870	Division Street		Woonsocket	6	CI	1893	760	N	D4	H WWD		parallel pipes
880	Division Street		Woonsocket	12	CI	1902	520	N	E4	H WWD		
875	Division Street		Woonsocket	8	DI	1975	760	N	D4	H WWD		parallel pipes
885	Dulude Avenue		Woonsocket	6	CI	1904	2040	N	B5	L WWD		
890	Dunlap Street		Woonsocket	8	CI	1958	580	Y	B7	L WWD		break 12/91
895	Earle Street		Woonsocket	6	CI	1893	1020	N	B3	L WWD		
	Easement	Bonin Industries Easement	Woonsocket	8	DI	2016	800		D7	L WWD		
900	East Mill Street		Woonsocket	8	CI	1925	350	Y	A5	L WWD		
905	East Orchard Street		Woonsocket	6	CI	1912	680	N	E3	L WWD		
925	East School Street		Woonsocket	6	CI	1890	480	Y	B5	L WWD		easily looped
910	East School Street	N. Main to Pond	Woonsocket	12	CI	1889	470	N	B3	L WWD		
915	East School Street	Pond to meter pits	Woonsocket	8	CI	1895	1160	N	B3	L WWD		
920	East School Street	Meter Pits to	Woonsocket	12	CI	1889	1380	N	B4	L WWD		
930	East Street		Woonsocket	8	CI	1889	960	N	D3	L WWD		
935	Edgewood Avenue		Woonsocket	8	DI	1996	280	Y	C6	L WWD		
940	Edmund Street		Woonsocket	8	CI	1931	530	Y	A2	L WWD		break 1/90
950	Eighth Avenue	Fairmount to Chestnut	Woonsocket	6	CI	1901	520	N	C1	L WWD		
945	Eighth Avenue	Chestnut to Walnut	Woonsocket	8	CI	1917	340	Y	C1	L WWD		
955	Eighth Avenue	Mason to Fairmount	Woonsocket	8	CI	1924	860	N	D1	L WWD		
960	Elbow Street		Woonsocket	6	CI	1892	670	N	B4	L WWD		
965	Elder Ballou Meetinghouse Rd		Woonsocket	12	CI	1949	830	Y	C7	L WWD		
970	Elder Ballou Meetinghouse Rd		Woonsocket	12	CI	1949	320	Y	C8	H WWD		
975	Elder Ballou Meetinghouse Rd		Woonsocket	8	CI	1949	1060	N	C8	H WWD		
980	Elder Ballou Meetinghouse Rd		Woonsocket	12	DI	1971	1440	N	C9	H WWD		
985	Ella Avenue		Woonsocket	8	ci	1919	400	N	B6	L WWD		
990	Elm Street	Social to Wood	Woonsocket	8	CI	1886	1700	N	B5	L WWD		break 6/83
995	Elm Street		Woonsocket	6	CI	1886	360	N	C5	L WWD		parallel pipes
1000	Elm Street		Woonsocket	8	CI	1913	2900	N	C6	L WWD		parallel pipes
1005	Elm Street		Woonsocket	10	CI	1921	3500	N	C6	L WWD		parallel pipes
1015	Elmore Street		Woonsocket	6	CI	1927	120	Y	G3	H WWD		
1010	Elmore Street		Woonsocket	8	CI	1924	640	N	F3	H WWD		
1020	Emerson Street		Woonsocket	8	CI	1941	380	N	C5	L WWD		
1025	Erie Street		Woonsocket	6	CI	1902	260	N	E3	L WWD		
1035	Estes Street	Bellingham to Fulton	Woonsocket	6	CI	1905	1240	N	A5	L WWD		
1030	Estes Street	Bellingham to Social	Woonsocket	8	CI	1899	420	N	A5	L WWD		
1040	Ethel Street		Woonsocket	6	CI	1896	320	Y	A5	L WWD		
1045	Fabien Street		Woonsocket	8	CI	1939	380	Y	F2	H WWD		
1050	Fairfield Avenue		Woonsocket	8	CI	1939	1180	Y	F5	L WWD		
1055	Fairlawn Avenue		Woonsocket	8	CI	1924	520	N	A2	L WWD		
1065	Fairmount Street		Woonsocket	6	CI	1922	280	N	C2	L WWD		
1060	Fairmount Street		Woonsocket	8	CI	1897	1940	Y	C1	L WWD		
1070	Fairmount Street		Woonsocket	8	CI	1907	1700	N	C2	L WWD		

Appendix D
City of Woonsocket, Rhode Island
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Pipe #	Street	Location	Town	Size (in)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments
1075	Fairview Avenue, NS		N. Smithfield	2	CT	1953	530	Y	H2	H	private-unknown	
1080	Fall Street		Woonsocket	8	CI	1959	240	Y	B6	L	WWD	
1085	Farm Street		Woonsocket	6	CI	1891	610	N	A3	L	WWD	
1090	Farm Street		Woonsocket	8	CI	1905	640	N	A3	L	WWD	
1095	Federal Street		Woonsocket	6	CI	1910	600	N	C4	L	WWD	
	Fieldside Drive		Woonsocket	8	DI	2007	325		G6	L	WWD	
1100	Fifth Avenue		Woonsocket	8	CI	1912	1180	N	D2	L	WWD	
1105	First Avenue		Woonsocket	8	CI	1889	1300	N	C2	L	WWD	
1110	Fisher Street		Woonsocket	8	DI	1979	260	N	G6	L	WWD	
1115	Flora Avenue		Woonsocket	8	CI	1956	1280	N	G5	L	WWD	
1120	Florence Drive		Woonsocket	12	CI	1916	1100	N	C5	L	WWD	parallel pipes
1125	Florence Drive		Woonsocket	12	CI	1916	1100	N	C5	L	WWD	parallel pipes
1130	Florida Street		Woonsocket	8	CI	1925	440	N	B6	L	WWD	
1135	Fogarty Hospital Line, NS	continues Fournier St, Woon	N. Smithfield	10	DI	1965	520	Y	G3	H	Landmark Medical Ctr.	
1140	Fortin Drive		Woonsocket	12	DI	1970	570	N	F6	L	WWD	break 7/85
1145	Foster Street		Woonsocket	8	DI	1971	380	Y	F3	H	WWD	
1150	Founders Drive		Woonsocket	12	DI	1968	2320	N	F6	L	WWD	
1155	Foundry Street		Woonsocket	6	CI	1919	180	Y	D2	L	WWD	
1160	Fountain Street		Woonsocket	8	CI	1889	820	N	C3	L	WWD	
1170	Fournier Street		Woonsocket	8	CI	1930	800	N	G3	H	WWD	
1165	Fournier Street	Laflamme to NS	Woonsocket	10	DI	1965	460	N	G3	H	WWD	
1180	Fourth Avenue		Woonsocket	6	CI	1890	1300	N	C2	L	WWD	
1175	Fourth Avenue		Woonsocket	8	CI	1913	420	N	C2	L	WWD	
1185	Francis Street		Woonsocket	4	CI	1917	140	Y	C3	L	WWD	
1190	Francis Street		Woonsocket	6	CI	1917	220	N	C3	L	WWD	
1195	Franklin Street		Woonsocket	8	CI	1941	360	N	F2	L	WWD	
1205	Front Street		Woonsocket	6	CI	1887	2460	N	D3	L	WWD	
1200	Front Street		Woonsocket	12	CI	1891	320	N	D3	L	WWD	
1210	Fulton Street		Woonsocket	8	DI	1978	480	Y	A6	L	WWD	easily looped
1215	Gadoury Boulevard		Woonsocket	8	CI	1954	720	N	G5	L	WWD	
1220	Garden Street		Woonsocket	6	CI	1905	740	Y	A5	L	WWD	
1230	Gaskill Street	Edmund to N. Main	Woonsocket	6	CI	1892	2870	N	A2	L	WWD	
1225	Gaskill Street	Harris to Edmund	Woonsocket	8	CI	1926	700	N	A2	L	WWD	
1235	Gaulin Avenue		Woonsocket	6	CI	1888	1140	Y	B5	L	WWD	
1240	George Street		Woonsocket	8	CI	1902	440	N	A5	L	WWD	
1245	Getchell Avenue		Woonsocket	8	DI	1963	1600	Y	E4	H	WWD	
1250	Getchell Street, NS		N. Smithfield	6	CI	1947	110	Y	F1	L	J.H. O'Donnell	
1255	Gilbert Street		Woonsocket	6	CI	1899	620	N	F3	H	WWD	
1260	Gilfillan Road, NS	includes end of Homestead	N. Smithfield	6	CI	1959	740	Y	F1	L	J.H. O'Donnell	
1265	Glaude Lane		Woonsocket	8	DI	1962	1300	Y	A9	H	WWD	
1270	Glen Road		Woonsocket	6	CI	1906	1140	N	B3	L	WWD	
1275	Glendale Avenue		Woonsocket	8	CI	1934	1040	Y	F5	L	WWD	
1280	Goldstein Drive		Woonsocket	12	DI	1988	380	Y	E7	H	WWD	
1285	Grace Avenue		Woonsocket	8	CI	1985	290	Y	C6	L	WWD	both dead end?

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Pipe #	Street	Location	Town	Size (in)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments
1290	Grand Street		Woonsocket	6	CI	1891	1480	Y	E3	H	WWD	
1295	Grandview Avenue		Woonsocket	8	DI	1969	3140	N	B9	H	WWD	break 12/88
1300	Grange Avenue		Woonsocket	8	AC	1974	160	Y	A7	L	WWD	
1310	Great Road, NS	Lapre to Morse	N. Smithfield	6	CI	1928	1620	N	E1	L	WWD	
1315	Great Road, NS	S. Main to end	N. Smithfield	6	CI	1928	260	Y	F1	L	WWD	
1305	Great Road, NS	Morse to S. Main	N. Smithfield	8	CI	1928	1120	N	E1	L	WWD	
1320	Greene Street		Woonsocket	12	CI	1932	1020	N	D4	L	WWD	
1325	Greenville Road, NS		N. Smithfield	6	AC	1953	4160	Y	G2	H	Leo Cabana	
1345	Grove Street		Woonsocket	6	CI	1890	2120	N	E3	H	WWD	break 1/97
1330	Grove Street		Woonsocket	8	CI	1886	760	N	D4	H	WWD	
1335	Grove Street		Woonsocket	12	CI	1886	480	N	D4	L	WWD	
1340	Grove Street	Bernon to Carrington	Woonsocket	8	CI	1886	960	N	D4	L	WWD	
1350	Halsey Road		Woonsocket	8	CI	1958	1480	N	C8	H	WWD	break 1/97
1355	Hamilton Street		Woonsocket	6	CI	1921	620	N	E4	H	WWD	
1360	Hamilton Street		Woonsocket	12	CI	1930	960	N	E4	H	WWD	
1365	Hamlet Avenue		Woonsocket	6	CI	1889	2800	N	C4	L	WWD	break 11/89
1370	Hamlet Avenue	Florence to C-5-68	Woonsocket	12	CI	1916	380	N	C5	L	WWD	
1385	Harris Avenue	Winter to Lyman	Woonsocket	8	CI	1891	900	N	B3	L	WWD	
1375	Harris Avenue	Huntington to Fairlawn	Woonsocket	8	CI	1902	560	N	A2	L	WWD	
1380	Harris Avenue	Lyman to Blackstone	Woonsocket	12	CI	1911	560	N	B3	L	WWD	
1395	Harris Avenue	Blackstone to Verry	Woonsocket	8	CI	1905	330	N	C3	L	WWD	
1390	Harris Avenue	Fairlawn to Winter	Woonsocket	12	CI	1932	1700	N	B3	L	WWD	
1400	Harrison Avenue		Woonsocket	6	CI	1889	440	N	C4	L	WWD	
1405	Harrison Avenue		Woonsocket	8	CI	1892	680	N	C4	L	WWD	
1410	Hartford Avenue		Woonsocket	8	DI	1990	380	Y	D6	L	Oakland Grove Ass.	
1415	Hartford Avenue		Woonsocket	10	DI	1990	250	N	D6	L	Oakland Grove Ass.	
1420	Hartford Avenue		Woonsocket	10	DI	1990	300	N	D6	L	WWD	
1425	Harvard Court		Woonsocket	8	DI	1987	260	Y	C9	H	Brookhaven Estates	
1430	Havelock Street		Woonsocket	8	CI	1930	80	Y	A5	L	WWD	
	Havelock Street		Woonsocket	8	DI	2012	250		A5	L	WWD	
1435	Hawthorn Circle	north end to 8502	Woonsocket	8	DI	1978	620	N	H5	L	WWD	
1440	Hawthorn Circle	8502 to South end	Woonsocket	8	DI	1989	760	N	H5	L	WWD	
1445	Hayes Street		Woonsocket	8	CI	1949	1060	N	B6	L	WWD	
1450	Hazel Street		Woonsocket	8	CI	1905	940	N	B4	L	WWD	
1455	Heather Drive		Woonsocket	8	DI	1963	420	Y	C6	L	WWD	
1460	Hebert Avenue		Woonsocket	8	CI	1913	880	N	C6	L	WWD	
1465	Hemond Avenue		Woonsocket	8	CI	1924	1100	Y	G3	H	WWD	
1470	Henry Street		Woonsocket	8	CI	1908	380	Y	C6	L	WWD	
1475	Heroux Avenue		Woonsocket	6	CI	1913	400	N	C5	L	WWD	
1480	High School Street		Woonsocket	6	CI	1889	220	N	B3	L	WWD	break 9/96
1485	High School Street		Woonsocket	4	CI	1889	320	N	B3	L	WWD	
1490	High Street		Woonsocket	8	CI	1889	700	N	C3	L	WWD	
1495	Highland Street		Woonsocket	6	CI	1893	1140	N	B2	L	WWD	
1500	Hill Street		Woonsocket	6	CI	1920	540	Y	E3	H	WWD	

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Pipe #	Street	Location	Town	Size (in)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments
1505	Hillsdale Street		Woonsocket	8	DI	1964	300	Y	B7	L	WWD	
1510	Hillside Avenue		Woonsocket	8	DI	1978	290	Y	B9	H	WWD	easily looped
1515	Hillview Avenue, NS		N. Smithfield	4	CI	1940	980	Y	ENS	L	Chas. Bergesson	
1520	Holder Lane		Woonsocket	4	CI	1923	280	Y	C3	L	WWD	
1525	Holland Avenue		Woonsocket	8	DI	1963	440	N	C6	L	WWD	
1535	Holley Lane		Woonsocket	6	DI	1988	1880	Y	D7	H	Carron Associates	
1530	Holley Lane	supplies Wyndemere	Woonsocket	8	DI	1998	400	Y	C7	H	R. Raymond, Windemere Woods	
1540	Hollis Street		Woonsocket	8	DI	1939	570	N	E3	H	WWD	
1545	Homestead Avenue, NS		N. Smithfield	6	CI	1928	740	Y	F1	L	Robert Russel	
1550	Homestead Road		Woonsocket	6	CI	1923	200	Y	B3	L	WWD	
1555	Hope Street		Woonsocket	8	CI	1932	780	N	D3	L	WWD	
1565	Huntington Avenue		Woonsocket	6	CI	1905	920	N	A2	L	WWD	
1560	Huntington Avenue		Woonsocket	8	CI	1905	200	N	A2	L	WWD	
1570	Irene Boulevard		Woonsocket	8	DI	1960	760	N	E2	L	WWD	
1575	Island Place		Woonsocket	6	CI	1896	400	Y	D3	L	WWD	
1580	Jackson Street		Woonsocket	8	CI	1929	420	N	E4	H	WWD	
1585	Jacob Lane		Woonsocket	8	DI	1990	180	Y	A3	L	WWD	
1590	James Street		Woonsocket	6	CI	1900	260	N	C3	L	WWD	
1595	Janet Avenue		Woonsocket	8	CI	1948	340	Y	C6	L	WWD	
1600	Jeffers Street		Woonsocket	6	CI	1887	700	N	D3	L	WWD	
1605	Jenckes Street		Woonsocket	6	CI	1896	1340	N	E3	L	WWD	
1610	Jervis Street		Woonsocket	8	DI	1960	840	N	C6	L	WWD	
1615	Jillson Avenue		Woonsocket	8	CI	1956	3620	Y	F4	H	WWD	
1620	Joffre Avenue		Woonsocket	8	CI	1932	1320	Y	F5	L	WWD	
1625	John Street		Woonsocket	4	CI	1923	360	N	D2	L	WWD	
1635	Kendrick Avenue		Woonsocket	6	CI	1886	660	N	C5	L	WWD	parallel pipes
1640	Kendrick Avenue	incl. walkway	Woonsocket	12	CI	1889	960	N	C5	L	WWD	parallel pipes
1630	Kendrick Avenue	under river	Woonsocket	12	CI	1916	150	N	C5	L	WWD	parallel pipes
1645	Kennedy Street	includes part of Ward	Woonsocket	8	CI	1945	800	N	F3	H	WWD	
1650	Kenwood Street		Woonsocket	8	CI	1922	740	Y	D7	L	WWD	
1660	Kermit Street		Woonsocket	8	CI	1927	500	N	F3	H	WWD	
1655	Kermit Street	Mowry to Gilbert	Woonsocket	8	DI	1979	240	N	F3	H	WWD	
1665	Kindergarten Street		Woonsocket	6	CI	1902	660	N	C3	L	WWD	
1675	Knight Street		Woonsocket	8	CI	1910	2320	N	E4	H	WWD	
1670	Knight Street		Woonsocket	10	CI	1930	1880	N	E4	H	WWD	
1680	Knollwood Drive		Woonsocket	8	DI	1967	4200	Y	B8	H	WWD	
1690	Lafayette Street		Woonsocket	6	CI	1919	320	N	D6	L	WWD	
1685	Lafayette Street		Woonsocket	8	CI	1928	200	N	D6	L	WWD	
1695	Laflamme Avenue		Woonsocket	8	CI	1930	180	N	G3	H	WWD	
1700	Lambert Avenue		Woonsocket	8	CI	1941	740	N	C7	L	WWD	
1705	Lamoureux Boulvevard, NS		N. Smithfield	1	CT	1953	340	Y	H2	H	private-unknown	
1710	Langevin Street		Woonsocket	8	DI	1964	910	N	C7	L	WWD	
1715	Lapre Road, NS		N. Smithfield	6	AC	1951	2000	Y	ENS	L	Oscar Lapre & Wilfred Pelletier	
1720	Larch Street		Woonsocket	8	CI	1939	1560	N	G6	L	WWD	

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Pipe #	Street	Location	Town	Size (in)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments
1725	Laurier Street		Woonsocket	8	DI	1977	240	Y	B6	L	WWD	
1730	Laval Street		Woonsocket	6	CI	1917	480	N	D5	L	WWD	
1735	LeBrun Avenue		Woonsocket	8	CI	1927	680	N	C6	L	WWD	
1740	Ledgewood Lane		Woonsocket	8	DI	1988	680	Y	C8	H	WWD	
1745	Lefrancois Boulevard		Woonsocket	8	CI	1948	820	N	C7	L	WWD	
1750	Lemay Road		Woonsocket	8	DI	1961	1000	N	C8	H	WWD	break 2/85
1755	Leo Avenue, NS		N. Smithfield	6	AC	1953	480	N	H2	H	Leo Cabana	
1760	Lexington Street		Woonsocket	8	CI	1941	300	N	C7	L	WWD	
1765	Libbeus Street		Woonsocket	8	CI	1935	460	N	B3	L	WWD	
1770	Lilac Avenue		Woonsocket	8	CI	1933	980	N	F5	L	WWD	
1775	Lincoln Street		Woonsocket	6	CI	1891	1400	N	D3	L	WWD	
1780	Linden Avenue	up to B-6-11	Woonsocket	8	CI	1930	1350	N	A6	L	WWD	
1790	Logee Street	Grove to Park	Woonsocket	4	CI	1890	360	N	E3	H	WWD	
1785	Logee Street	Front to Cleveland	Woonsocket	12	CI	1908	1950	N	D3	L	WWD	break 4/83
1795	Logee Street	Maple to Ronian	Woonsocket	8	DI	1981	660	N	E4	H	WWD	
1800	Logee Street	Cotage to Maple	Woonsocket	12	DI	1981	1300	N	E4	H	WWD	
1805	Loring Street		Woonsocket	8	CI	1925	620	Y	D7	L	WWD	
1810	Louise Street		Woonsocket	8	CI	1942	1060	Y	G6	L	WWD	
	Louise Street		Woonsocket	8	DI	2007	400		G6	L	WWD	installed to connect to the new Daniel
1815	Lucille Street		Woonsocket	8	CI	1930	2080	Y	G6	L	WWD	both dead end?
1820	Lydia Avenue		Woonsocket	8	CI	1954	3360	Y	G5	L	WWD	break 10/90
1825	Lyman Street		Woonsocket	6	CI	1908	780	N	B3	L	WWD	
1830	Macarthur Road		Woonsocket	8	CI	1956	1080	N	C8	H	WWD	
1835	Madeleine Avenue		Woonsocket	8	CI	1955	1400	Y	C8	H	WWD	break 12/81, 2/94
1840	Mailloux Street		Woonsocket	8	CI	1924	330	Y	C5	L	WWD	
1845	Main Street		Woonsocket	12	CI	1889	2500	N	C3	L	WWD	
1850	Manila Avenue		Woonsocket	8	CI	1932	1060	Y	D7	L	WWD	
1855	Manville Road		Woonsocket	6	CI	1909	1220	N	D5	L	WWD	
1860	Manville Road	Bertenshaw to Gadoury Boulevard	Woonsocket	12	CI	1906	490	Y	G5	L	WWD	parallel pipes
	Manville Road	Gadoury Boulevard to Pump Station	Woonsocket	20	DI	2011	900		G5	L	WWD	12-inch was abandoned in place to th
1865	Maple Street		Woonsocket	8	DI	1980	400	Y	E4	H	WWD	
1870	Maple Street		Woonsocket	12	DI	1981	320	N	E4	H	WWD	
1875	Marian Lane		Woonsocket	8	AC	1974	240	N	F5	L	WWD	break 11/94
1880	Marian Lane		Woonsocket	8	DI	1995	400	N	F5	L	WWD	
1885	Marie-Ann Court		Woonsocket	8	DI	1961	90	Y	C7	L	WWD	
1890	Marshall Road		Woonsocket	8	CI	1956	1300	N	C8	H	WWD	
1895	Mason Street		Woonsocket	8	CI	1889	3080	N	D2	L	WWD	
1900	Meadow Road		Woonsocket	6	CI	1916	980	N	B3	L	WWD	
1905	Mechanic Avenue		Woonsocket	6	CI	1916	520	N	B3	L	WWD	
1910	Memorial Drive		Woonsocket	8	DI	1963	600	Y	D1	L	Woon. Housing Authority	
1920	Mendon Road	Diamond Hill to Cumberland line	Woonsocket	12	CI	1928	11500	N	A7	L	WWD	
1915	Mendon Road	Diamond Hill to Pine Crest	Woonsocket	8	DI	1963	760	N	A7	H	WWD	break 1/86
1925	Mendon Road	Arrow to Park East	Woonsocket	12	DI	1985	1060	N	B7	L	WWD	
1930	Mendon Road Driveway, NS		N. Smithfield	8	CI	1964	660	Y	CNS	H	A.F. Pacheco	

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Pipe #	Street	Location	Town	Size (in)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments
1935	Mendon Road, NS		N. Smithfield	8	CI	1964	800	N	CNS	H	A.F. Pacheco	
1940	Merida Avenue		Woonsocket	6	CI	1914	640	N	B5	L	WWD	break 3/95
1945	Merrill Court		Woonsocket	8	DI	1988	500	Y	F3	H	WWD	
1950	Merrimac Street, NS	includes 1"ct on Walsh	N. Smithfield	1	CT	1949	440	Y	G3	H	Donat Dubuc	
1955	Middle Street		Woonsocket	8	CI	1908	570	N	E2	L	WWD	
1960	Miles Avenue		Woonsocket	8	DI	1972	460	N	F5	L	WWD	break 1/85,1/97
1965	Miles Avenue		Woonsocket	8	DI	1994	260	N	F5	L	WWD	
1970	Mill Street		Woonsocket	6	CI	1921	610	N	A5	L	WWD	
1975	Mill Street		Woonsocket	8	DI	1991	420	N	B5	L	WWD	
1980	Mill Street, NS		N. Smithfield	8	CI	1926	280	Y	A1	L	WWD	
1985	Miller Lane		Woonsocket	8	DI	2012	275	Y	C3	L	WWD	
1990	Milton Avenue, NS		N. Smithfield	8	DI	1988	300	Y	F1	L	Town of NS	
2000	Minerva Street		Woonsocket	8	CI	1924	480	N	F3	H	WWD	
1995	Minerva Street		Woonsocket	8	DI	1990	120	Y	F3	H	WWD	
2005	Mitris Boulevard		Woonsocket	8	CI	1924	880	N	B7	L	WWD	
2010	Monroe Street		Woonsocket	12	CI	1924	1160	Y	E4	H	WWD	
2015	Montcalm Street		Woonsocket	8	CI	1928	200	Y	D5	L	WWD	
2020	Monty Avenue		Woonsocket	8	CI	1930	860	N	G3	H	WWD	break 1/87
2025	Moore Street		Woonsocket	6	CI	1919	160	Y	E4	H	WWD	break 11/93
2030	Morin Heights Boulevard		Woonsocket	8	DI	1982	2960	N	B6	L	Woon. Housing Authority	
2035	Morin Street		Woonsocket	8	CI	1957	1880	N	B7	L	WWD	
2040	Morris Street		Woonsocket	8	AC	1974	320	Y	A7	L	WWD	break 9/87
2055	Morse Avenue	between 8" sections	Woonsocket	6	CI	1954	340	N	E1	L	WWD	
2045	Morse Avenue	juts into NS	Woonsocket	8	CI	1954	160	Y	E1	L	WWD	
2050	Morse Avenue	Alice to Andrews	Woonsocket	8	DI	1966	260	N	E1	L	WWD	
	Morse Avenue	Between old dead ends	Woonsocket	8	DI	2013	140		E1	L	WWD	
2060	Morse Avenue, NS		N. Smithfield	8	CI	1928	480	Y	E1	L	WWD	
2065	Morton Avenue		Woonsocket	6	CI	1897	320	N	C4	L	WWD	
2070	Morton Avenue		Woonsocket	8	CI	1892	760	N	C4	L	WWD	
	Mount Saint Charles Avenue		Woonsocket	12	DI	2016	840	N	E5	L	WWD	
2075	Mount Saint Charles Avenue		Woonsocket	12	CI	1915	450	Y	E5	L	WWD	
2085	Mowry Avenue, NS		N. Smithfield	2	CT	1957	500	Y	F1	L	Doris Lefebvre/Joseph DiPardo	
2090	Mowry Street	Park to Kermit	Woonsocket	8	CI	1909	800	N	F3	H	WWD	break 12/92
2095	Mowry Street	Foster to Park	Woonsocket	8	CI	1934	1220	N	F3	H	WWD	
2100	Myette Street		Woonsocket	8	DI	1962	520	Y	F5	L	WWD	
2105	Nancy Court		Woonsocket	8	DI	1970	800	Y	E6	L	WWD	
2110	Napoleon Street		Woonsocket	6	CI	1900	260	N	F3	H	WWD	
2115	Napoleon Street		Woonsocket	8	CI	1921	320	N	F3	H	WWD	
2120	New Street	All New plus Globe	Woonsocket	8	DI	1988	660	Y	D3	L	WWD	
2125	Newbury Avenue		Woonsocket	8	CI	1929	1380	N	E6	L	WWD	
2135	Newland Avenue		Woonsocket	6	CI	1947	480	N	D6	L	WWD	
2130	Newland Avenue		Woonsocket	8	CI	1902	1340	Y	D6	L	WWD	
2140	Newport Street		Woonsocket	8	CI	1922	800	N	F3	H	WWD	
2145	Newton Street		Woonsocket	8	DI	1962	1040	N	C7	L	WWD	

Appendix D
City of Woonsocket, Rhode Island
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Pipe #	Street	Location	Town	Size (in)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments
2150	Nimitz Road		Woonsocket	8	CI	1956	1440	N	C8	H	WWD	
2155	Ninth Avenue		Woonsocket	6	CI	1907	850	N	D1	L	WWD	
2160	Norman Street		Woonsocket	8	CI	1942	280	N	F6	L	WWD	
2165	Norman Street		Woonsocket	8	CI	1949	600	N	F6	L	WWD	
2170	North Ballou Street		Woonsocket	8	CI	1900	280	N	E2	L	WWD	
2175	North Main Street		Woonsocket	6	CI	1890	2520	N	A3	L	WWD	
2180	North Main Street		Woonsocket	8	CI	1889	1400	N	B3	L	WWD	break 1/96
2185	Northeast Street		Woonsocket	6	DI	1978	420	N	C3	L	WWD	
2190	Norwood Road, NS		N. Smithfield	4	CI	1951	520	Y	ENS	L	private-unknown	
2195	Notheast Street		Woonsocket	8	CI	1945	170	Y	C3	L	WWD	
2200	Nursery Avenue		Woonsocket	8	CI	1928	1880	N	C7	L	WWD	
2205	Oak Hill Avenue, NS		N. Smithfield	4	AC	1953	1000	Y	H2	H	Leo Cabana	
2210	Oak Street	Mason to South	Woonsocket	8	CI	1896	820	N	D2	L	WWD	
2220	Oaklawn Road, NS		N. Smithfield	2	GI	1951	250	Y	ENS	L	private-unknown	
2215	Oaklawn Road, NS		N. Smithfield	6	AC	1951	480	Y	ENS	L	Oscar Lapre & Wilfred Pelletier	
2225	Oakley Road		Woonsocket	6	CI	1913	1360	N	B3	L	WWD	
2230	Oakton Street		Woonsocket	8	CI	1930	860	N	F3	H	WWD	
2235	O'Donnell Avenue, NS		N. Smithfield	6	CI	1950	840	N	F1	L	J.H. O'Donnell	
2240	Old Greenville Road, NS		N. Smithfield	6	AC	1953	720	Y	H2	H	private-unknown	
2250	Olive Street		Woonsocket	8	CI	1930	780	N	G6	L	WWD	
2245	Olive Street		Woonsocket	8	CI	1942	420	Y	F6	L	WWD	
2255	Olo Street	Third to Fourth	Woonsocket	6	CI	1890	240	N	D2	L	WWD	
2260	Olo Street	Center to Second	Woonsocket	6	CI	1892	1450	N	D2	L	WWD	
2265	Olo Street	East to Center	Woonsocket	8	CI	1932	440	N	D3	L	WWD	
2270	Olympia Avenue		Woonsocket	8	CI	1946	560	Y	D7	L	WWD	
2275	Orchard Street		Woonsocket	6	CI	1907	860	N	E2	L	WWD	
2280	Orchard Street	Ballou to Providence	Woonsocket	8	CI	1887	960	N	E2	L	WWD	
2285	Orchard Street		Woonsocket	8	CI	1988	360	N	F2	L	WWD	
2295	Oregon Avenue		Woonsocket	8	CI	1932	1200	Y	D7	L	WWD	
2300	Oregon Avenue	cul de sac to Holley Lane	Woonsocket	8	DI	1998	540	N	D7	H	R. Raymond, Windemere Woods	
2290	Oregon Avenue		Woonsocket	8	DI	1988	740	Y	D7	H	WWD	
2305	Oregon Avenue		Woonsocket	12	DI	1988	360	N	D8	H	WWD	
2310	Ormond Street		Woonsocket	8	CI	1927	240	N	F3	H	WWD	
2320	Oxford Avenue		Woonsocket	12	CI	1921	340	N	E4	H	WWD	
2315	Oxford Avenue		Woonsocket	8	DI	1973	180	N	E4	H	WWD	
2330	Papineau Avenue		Woonsocket	8	CI	1932	760	N	C7	L	WWD	
2325	Papineau Avenue		Woonsocket	8	DI	1978	400	Y	B7	L	WWD	
2340	Paradis Avenue		Woonsocket	4	CI	1896	160	N	D4	L	WWD	
2335	Paradis Avenue		Woonsocket	6	CI	1889	1660	Y	D4	L	WWD	
2345	Park Avenue	Hamlet to Carrington	Woonsocket	6	CI	1890	240	N	C4	L	WWD	
2350	Park Avenue	Carrington to Logee	Woonsocket	8	CI	1890	2380	N	D4	L	WWD	break 2/85
2355	Park Avenue	Logee to Smithfield	Woonsocket	8	CI	1890	4660	N	E3	H	WWD	
2360	Park East Drive	up to Cumberland border	Woonsocket	16	DI	1982	480	Y	D8	H	WWD	
2365	Park East Drive	all Park East plus tank	Woonsocket	12	DI	1982	6400	N	E8	H	WWD	

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Pipe #	Street	Location	Town	Size (in)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments
2370	Park Place		Woonsocket	4	CI	1896	320	N	C4	L	WWD	
2375	Park Place		Woonsocket	6	CI	1896	1440	N	C4	L	WWD	
2380	Parker Street		Woonsocket	8	CI	1925	580	Y	D3	L	WWD	
2385	Patton Road		Woonsocket	8	AC	1973	280	Y	B7	H	Woon. Housing Authority	
2390	Patton Road		Woonsocket	8	CI	1956	1400	N	B9	H	WWD	
2395	Pearl Street		Woonsocket	6	CI	1898	380	N	E2	L	WWD	
2400	Pelletier Avenue		Woonsocket	8	CI	1932	600	N	E1	L	WWD	
2405	Phebe Street		Woonsocket	8	CI	1913	460	N	A3	L	WWD	
2410	Phillips Street		Woonsocket	8	CI	1929	1380	N	G6	L	WWD	
2415	Pichette Boulevard		Woonsocket	8	CI	1959	400	Y	C7	L	WWD	
2420	Piedmont Street		Woonsocket	8	CI	1925	1220	N	F3	H	WWD	
2425	Pine Court, NS		N. Smithfield	6	AC	1954	240	Y	F1	L	private-unknown	
2430	Pine Street		Woonsocket	8	CI	1887	640	N	D3	L	WWD	
2435	Pine Swamp Road, Cumb		Cumberland	8	DI	1978	960	Y	B9	H	WWD	
2440	Pinecrest Drive		Woonsocket	8	DI	1963	1000	N	A7	H	WWD	
2445	Pleasant Street		Woonsocket	6	CI	1890	1000	N	D2	L	WWD	break 2/94
2450	Pond Street		Woonsocket	6	CI	1889	1440	N	A4	L	WWD	parallel pipes
2460	Pond Street	to transformers	Woonsocket	8	CI	1889	660	N	C4	L	Blackstone Valley Electric	
2455	Pond Street		Woonsocket	12	CI	1891	3180	N	B4	L	WWD	includes 18" parallel pipes
2465	Poplar Street		Woonsocket	8	CI	1935	1180	Y	B7	L	WWD	
2470	Pound Hill Road, NS		N. Smithfield	2	GI	1929	1080	Y	E1	L	Mary Slocomb	
2475	Prince Street		Woonsocket	8	DI	1986	450	Y	A6	L	WWD	
2480	Priscilla Road		Woonsocket	8	CI	1956	850	N	C8	H	WWD	break 12/78
2485	Priscilla Road		Woonsocket	6	CI	1949	280	N	C8	H	WWD	
2495	Privilege Street	to social st	Woonsocket	6	CI	1891	1490	N	A4	L	WWD	break 6/95
2505	Privilege Street	Winter to 8" section	Woonsocket	12	CI	1907	1160	N	A4	L	WWD	
2490	Privilege Street	to cul-de-sac	Woonsocket	8	DI	1983	300	Y	A4	L	WWD	
2500	Privilege Street	between 6" and 12"	Woonsocket	8	DI	1980	250	N	A4	L	WWD	
2515	Progresso Avenue		Woonsocket	8	CI	1922	1040	N	B5	L	WWD	
2510	Progresso Avenue	B-5-70 to dead end	Woonsocket	8	DI	1989	120	Y	B5	L	WWD	
2520	Prospect Street		Woonsocket	8	CI	1889	3020	Y	B3	L	WWD	break 1/93
2530	Providence Street		Woonsocket	6	CI	1891	1400	N	E2	L	WWD	
2525	Providence Street		Woonsocket	8	CI	1891	1320	Y	E2	L	WWD	
2535	Providence Street		Woonsocket	8	CI	1921	1280	N	F2	H	WWD	
2540	Rachel Street		Woonsocket	8	DI	1963	540	N	A3	L	WWD	
2545	Railroad Street		Woonsocket	12	CI	1894	1280	N	C3	L	WWD	
2550	Rathbun Street		Woonsocket	6	CI	1894	340	Y	A5	L	WWD	
2555	Rathbun Street		Woonsocket	12	CI	1887	2640	N	A5	L	WWD	
2560	Ray Avenue		Woonsocket	8	DI	1966	2000	N	D6	L	WWD	
2565	Read Avenue		Woonsocket	6	CI	1915	370	Y	C5	L	WWD	
2570	Rebekah Street		Woonsocket	6	CI	1892	300	N	A3	L	WWD	
2575	Rebekah Street		Woonsocket	8	CI	1913	720	N	A3	L	WWD	
2580	Redwood Street		Woonsocket	6	CI	1955	150	Y	F2	H	WWD	
2585	Reservoir Avenue		Woonsocket	12	CI	1919	2660	N	F5	L	WWD	break 5/78

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Pipe #	Street	Location	Town	Size (in)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments
2595	Rhode Island Avenue		Woonsocket	8	DI	2016	360	N	E5	L	WWD	
2590	Rhode Island Avenue		Woonsocket	8	CI	1915	560	Y	E5	L	WWD	
2605	Rhodes Avenue		Woonsocket	6	CI	1895	340	N	B2	L	WWD	break 5/95, parallel pipes
2600	Rhodes Avenue		Woonsocket	10	CI	1948	2300	N	B1	H	WWD	break 2/98
2610	Rhodes Avenue	up to 14" at River St.	Woonsocket	12	CI	1929	1100	N	B2	L	WWD	parallel pipes
2615	Ricard Street		Woonsocket	8	DI	1982	500	Y	C6	L	WWD	
2625	Richelieu Street		Woonsocket	8	CI	1917	380	N	D6	L	WWD	
2620	Richelieu Street		Woonsocket	6	DI	1973	140	N	D6	L	WWD	
2630	Ridge Street		Woonsocket	8	CI	1953	940	N	B7	L	WWD	
2640	River Street		Woonsocket	8	CI	1892	260	N	B2	L	WWD	
2635	River Street		Woonsocket	12	CI	1922	150	N	B2	L	WWD	
2645	Rivulet Street		Woonsocket	6	CI	1908	100	N	A3	L	WWD	
2650	Rivulet Street		Woonsocket	8	CI	1908	960	N	A3	L	WWD	
2660	Roberta Avenue		Woonsocket	6	CI	1911	440	Y	E2	L	WWD	
2655	Roberta Avenue	Andrews to Alice	Woonsocket	6	CI	1954	340	N	E1	L	WWD	
2670	Roberts Street		Woonsocket	6	CI	1909	960	N	D5	L	WWD	
2665	Roberts Street		Woonsocket	8	CI	1933	340	Y	D5	L	WWD	
2675	Robinson Street		Woonsocket	6	CI	1921	500	N	B5	L	WWD	
2685	Robinson Street	Winthrop to Morin Heights	Woonsocket	8	CI	1917	1200	N	B6	L	WWD	
2680	Robinson Street		Woonsocket	8	CI	1919	860	N	B5	L	WWD	
2690	Rock Ridge Drive		Woonsocket	6	DI	1973	340	Y	B7	H	Woon. Housing Authority	
2695	Rock Ridge Drive		Woonsocket	6	DI	1973	520	Y	B7	H	Woon. Housing Authority	
2700	Rock Ridge Drive		Woonsocket	8	DI	1973	1900	N	B7	H	WWD	
2705	Rockland Avenue		Woonsocket	6	CI	1905	1000	N	E2	L	WWD	
2710	Rodman Street		Woonsocket	8	CI	1931	800	Y	D7	L	WWD	
2715	Roland Street		Woonsocket	6	CI	1901	820	N	A5	L	WWD	
2720	Rome Avenue	Diamond Hill to end	Woonsocket	8	CI	1939	80	N	A6	L	WWD	
2725	Rome Avenue		Woonsocket	8	DI	1985	380	N	A6	L	WWD	
2730	Ronian Street		Woonsocket	8	DI	1981	360	N	E4	H	WWD	
2735	Roscoe Street		Woonsocket	8	CI	1958	240	N	B7	L	WWD	
2740	Rose Avenue		Woonsocket	8	DI	1962	460	Y	F3	H	WWD	
2745	Ross Street		Woonsocket	8	CI	1928	240	N	E3	L	WWD	
2750	Ruby Street		Woonsocket	4	CI	1908	300	N	D2	L	WWD	
2755	Ruskin Avenue		Woonsocket	8	CI	1953	670	N	E6	L	WWD	
2760	Rustic Drive		Woonsocket	8	DI	1968	860	N	B8	H	WWD	
2765	Ruth Street		Woonsocket	8	DI	1962	300	Y	B7	L	WWD	
2770	Rutland Street	Robinson to dead end	Woonsocket	8	CI	1935	600	Y	B6	L	WWD	
2775	Rutland Street	Elm to Robinson	Woonsocket	8	CI	1920	400	N	B6	L	WWD	
2780	Salisbury Street		Woonsocket	8	CI	1925	240	N	A5	L	WWD	
2785	Sayles Street		Woonsocket	8	CI	1885	360	N	C3	L	WWD	
2790	Sayles Street	Edwards to Dead End	Woonsocket	4	CI	1885	170	Y	D2	L	WWD	
2795	Sayles Street	River to Arnold	Woonsocket	4	CI	1885	280	Y	D3	L	WWD	
2800	Sayles Street		Woonsocket	6	CI	1885	480	N	D3	L	WWD	
2805	Scotia Street		Woonsocket	8	DI	1982	320	N	B1	L	WWD	

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Pipe #	Street	Location	Town	Size (in)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments
2810	Seamans Street		Woonsocket	8	CI	1930	580	Y	G6	L	WWD	
2815	Seamans Street		Woonsocket	8	DI	1993	300	N	G7	L	WWD	
2825	Second Avenue		Woonsocket	6	CI	1887	2380	N	C2	L	WWD	
2820	Second Avenue		Woonsocket	12	CI	1923	720	N	B2	L	WWD	
2835	Seventh Avenue		Woonsocket	6	CI	1911	1140	Y	C1	L	WWD	
2830	Seventh Avenue		Woonsocket	8	DI	1978	360	Y	B1	H	WWD	
2840	Sharon Parkway, NS		N. Smithfield	8	DI	1971	1720	Y	CNS	H	A.F. Pacheco	
2845	Short Street		Woonsocket	8	CI	1893	260	N	C2	L	WWD	
2850	Shove Street		Woonsocket	6	CI	1889	320	N	E2	L	WWD	
2855	Sidney Avenue		Woonsocket	8	CI	1953	680	N	E6	L	WWD	
2860	Singleton Street		Woonsocket	12	CI	1911	2040	N	B2	L	WWD	
2875	Sixth Avenue	Chapel to Fairmount	Woonsocket	6	CI	1910	380	N	C2	L	WWD	
2870	Sixth Avenue	Fairmount to Dead End	Woonsocket	8	CI	1910	280	Y	C2	L	WWD	
2880	Sixth Avenue	Mason to Chapel	Woonsocket	8	CI	1910	720	N	D2	L	WWD	
2865	Sixth Avenue	Rhodes to Sycamore	Woonsocket	8	CI	1920	450	N	B1	H	WWD	
2915	Smithfield Road, NS	White to end of Glen	N. Smithfield	1.25	GI	1928	220	Y	G3	H	private-unknown	
2885	Smithfield Road, NS		N. Smithfield	1	CT	1950	100	Y	F2	H	private-unknown	
2895	Smithfield Road, NS		N. Smithfield	2	CT	1950	220	N	F2	H	private-unknown	
2900	Smithfield Road, NS	Crest to Providence	N. Smithfield	6	CI	1928	420	N	F2	H	WWD	
2905	Smithfield Road, NS	Providence to White	N. Smithfield	8	CI	1928	880	N	G2	H	WWD	
2910	Smithfield Road, NS		N. Smithfield	8	CI	1928	440	Y	G3	H	WWD	SS#9470
2890	Smithfield Road, NS	Buell to Crest	N. Smithfield	8	CI	1940	150	Y	F2	H	WWD	
2920	Snow Street		Woonsocket	4	CI	1891	440	N	B3	L	WWD	
2925	Snow Street		Woonsocket	6	CI	1919	400	Y	B4	L	WWD	
2930	Social Street		Woonsocket	4	CI	1894	370	N	A5	L	WWD	
2940	Social Street		Woonsocket	6	CI	1897	1320	N	A5	L	WWD	
2945	Social Street		Woonsocket	8	CI	1890	2800	N	B4	L	WWD	break 12/85
2935	Social Street		Woonsocket	8	CI	1898	960	N	A5	L	WWD	
2950	Social Street		Woonsocket	12	CI	1885	820	N	B5	L	WWD	
2955	South Main Street	all 12" until 14"	Woonsocket	12	CI	1890	5940	N	D3	L	WWD	break 12/95
2965	South Street		Woonsocket	6	CI	1886	440	N	D3	L	WWD	break 9/81
2960	South Street		Woonsocket	8	CI	1886	360	N	D2	L	WWD	
2970	Spring Street		Woonsocket	8	CI	1899	1000	N	B3	L	WWD	
2975	Springwater Drive		Woonsocket	8	DI	1988	320	Y	D7	H	WWD	
2980	Springwater Drive	to Goldstein cul-de-sac	Woonsocket	12	DI	1988	1740	N	D7	H	WWD	
2985	St Agnes Avenue		Woonsocket	8	CI	1953	1120	N	A6	L	WWD	
2990	St Augustin Street		Woonsocket	8	AC	1975	180	Y	E6	L	WWD	
2995	St Augustin Street		Woonsocket	12	DI	1968	660	N	E6	L	WWD	
3000	St. Barnabe Street		Woonsocket	8	DI	2016	280	Y	E5	L	WWD	
3005	St. Barnabe Street		Woonsocket	8	DI	1949	1080	Y	E5	L	WWD	
3010	St. Cecile Avenue		Woonsocket	8	CI	1927	1140	N	A6	L	WWD	
3015	St. Hughes Street		Woonsocket	8	CI	1934	950	N	E5	L	WWD	
3020	St. Joseph Street		Woonsocket	12	DI	1987	100	N	E4	H	WWD	
3025	St. Joseph Street		Woonsocket	8	DI	1987	240	N	E4	H	WWD	

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Pipe #	Street	Location	Town	Size (in)	Type	Year	Length (feet)	Dead End	Grid	Zone		Owner	Comments
3030	St. Leon Avenue	up to jog	Woonsocket	8	CI	1932	1200	N	A6	L	WWD		break 1/93
3035	St. Louis Avenue		Woonsocket	8	CI	1949	1120	N	A6	L	WWD		
3040	St. Simon Street		Woonsocket	6	CI	1899	540	N	E5	LL	WWD		
3045	Star Avenue		Woonsocket	8	DI	1964	1220	Y	A9	H	WWD		
3050	State Street		Woonsocket	8	DI	1964	320	Y	A3	L	WWD		breaks 2/87,12/91,2/92
3055	Stoneham Drive		Woonsocket	8	DI	1971	890	N	B9	H	WWD		
3060	Summer Street		Woonsocket	8	CI	1889	1310	Y	A3	L	WWD		
3065	Summit Avenue, NS		N. Smithfield	8	CI	1928	880	N	G2	H	WWD		
3070	Summit Street		Woonsocket	6	CI	1893	800	N	E2	L	WWD		break 12/91
3075	Sunnyside Avenue		Woonsocket	8	CI	1898	1240	N	D2	L	WWD		
3080	Sunrise Avenue		Woonsocket	8	DI	1962	580	N	A9	H	WWD		
3085	Sunset Avenue		Woonsocket	8	DI	1963	560	Y	B9	H	WWD		
3090	Surrey Lane		Woonsocket	8	DI	1970	620	N	B9	H	WWD		
3095	Sweet Avenue		Woonsocket	6	CI	1898	780	N	C5	L	WWD		
3100	Sycamore Street		Woonsocket	8	DI	1981	680	N	B2	L	WWD		
3105	Tache Street		Woonsocket	8	CI	1930	480	N	G3	H	WWD		
3110	Talcott Street	Seamans to Olive	Woonsocket	12	CI	1931	1060	N	F6	L	WWD		
3115	Talcott Street		Woonsocket	8	CI	1948	760	N	G6	L	WWD		
3120	Tara Lane		Woonsocket	8	DI	1987	1150	Y	C8	H	WWD		
3125	Temple Street		Woonsocket	6	CI	1912	300	N	A3	L	WWD		
3130	Temple Street		Woonsocket	8	CI	1931	300	N	A3	L	WWD		
3135	Tenth Avenue		Woonsocket	8	CI	1937	480	N	D1	L	WWD		
3140	Theodore Street		Woonsocket	8	DI	1979	400	N	A6	L	WWD		
3145	Theresa Street		Woonsocket	8	CI	1955	1240	N	C7	L	WWD		
3160	Thibeault Avenue		Woonsocket	8	CI	1959	240	Y	G5	L	WWD		
3155	Thibeault Avenue		Woonsocket	8	DI	1965	280	N	F5	L	WWD		
3150	Thibeault Avenue		Woonsocket	8	DI	1995	160	N	F5	L	WWD		
3170	Third Avenue	8" to Laurel	Woonsocket	6	CI	1892	1180	N	B2	L	WWD		
3175	Third Avenue	Mason to Fairmount	Woonsocket	6	CI	1889	1300	N	C2	L	WWD		
3165	Third Avenue	Laurel to Scotia	Woonsocket	8	CI	1910	440	N	B2	L	WWD		
3180	Third Avenue	Fairmount to 6"	Woonsocket	8	CI	1900	1480	N	C2	L	WWD		
3185	Thomas Street		Woonsocket	6	CI	1902	590	N	E3	H	WWD		
3190	Transit Street		Woonsocket	8	CI	1891	1280	Y	E3	H	WWD		
3195	Transit Street		Woonsocket	12	CI	1889	1240	N	E3	L	WWD		
3200	Trent Street		Woonsocket	6	CI	1913	440	N	A3	L	WWD		
3205	Trent Street		Woonsocket	8	CI	1927	530	N	A3	L	WWD		
3210	Union Street		Woonsocket	8	CI	1889	580	N	D3	L	WWD		
3215	Unity Street		Woonsocket	6	CI	1890	440	N	D4	H	WWD		
3220	Upland Road		Woonsocket	6	CI	1921	640	N	B3	L	WWD		
3225	Valley Street		Woonsocket	6	CI	1894	100	Y	E3	L	WWD		
3230	Valley Street		Woonsocket	8	CI	1897	240	Y	E3	L	WWD		
3235	Verdun Street		Woonsocket	8	CI	1925	400	N	E5	L	WWD		
3240	Verry Street		Woonsocket	6	CI	1919	840	N	C3	L	WWD		
3245	Victor Street		Woonsocket	6	CI	1917	300	N	D6	L	WWD		

Appendix D
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Main Database Sorted Alphabetically

Pipe #	Street	Location	Town	Size (in)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments
3250	Victory Boulevard		Woonsocket	8	DI	1962	500	N	C7	L	WWD	
3255	Villa Nova Street		Woonsocket	8	CI	1901	740	N	C5	L	WWD	
3260	Village Road		Woonsocket	8	AC	1973	1080	Y	B7	H	Plaza Village Group	
3270	Vine Street		Woonsocket	6	CI	1905	440	N	A3	L	WWD	
3265	Vine Street		Woonsocket	8	CI	1905	200	N	A3	L	WWD	
3275	Virginia Avenue		Woonsocket	8	CI	1946	1360	Y	E6	L	WWD	
3280	Viva Way		Woonsocket	8	DI	1978	360	Y	C8	H	WWD	
3285	Vivian Street		Woonsocket	8	CI	1930	680	N	G6	L	WWD	
	Vivian Street		Woonsocket	8	DI	2007	560		G6	L	WWD	
3290	Vose Street		Woonsocket	6	CI	1896	760	Y	E3	L	WWD	break 6/83
3295	Vose Street		Woonsocket	6	CI	1896	500	N	E3	H	WWD	
3300	Vose Street		Woonsocket	8	CI	1890	980	N	E3	L	WWD	
3305	Wade Road		Woonsocket	8	CI	1959	600	Y	G5	L	WWD	
3310	Wagon Wheel Lane		Woonsocket	8	DI	1969	360	N	B9	H	WWD	
3315	Walnut Hill Road		Woonsocket	8	DI	1967	3480	N	B8	H	WWD	break 2/95
3320	Walsh Avenue, NS	Chester to Smithfield	N. Smithfield	2	CT	1949	540	N	G3	H	Donat Dubuc	
3325	Wanda Avenue		Woonsocket	8	CI	1956	260	N	G5	L	WWD	
3335	Ward Street	Kennedy to Transit	Woonsocket	6	CI	1920	560	N	E3	H	WWD	
3330	Ward Street	Transit to Vose	Woonsocket	8	CI	1941	680	Y	E3	L	WWD	
3340	Ward Street	Vose to Cross	Woonsocket	6	DI	1972	410	N	E3	L	WWD	
3345	Warner Street		Woonsocket	8	CI	1925	180	Y	A3	L	WWD	
3350	Warren Avenue		Woonsocket	8	CI	1932	520	N	E1	L	WWD	
3355	Warren Avenue, NS		N. Smithfield	6	CI	1928	380	Y	E1	L	WWD	
3360	Warwick Street		Woonsocket	8	CI	1921	880	N	F3	H	WWD	
3365	Washington Street		Woonsocket	8	DI	1981	280	N	E4	H	WWD	
3370	Washington Street		Woonsocket	12	DI	1981	340	N	E4	H	WWD	
3375	Water Street	Canal to Dead End	Woonsocket	4	CI	1891	200	Y	C3	L	WWD	has 6" hydrant on it
3380	Water Street		Woonsocket	8	CI	1891	420	N	C3	L	WWD	
3385	Watson Street		Woonsocket	8	CI	1889	420	N	D3	L	WWD	
3390	Wayne Road		Woonsocket	8	DI	1960	620	Y	B7	L	WWD	breaks 1/84,1/89
3395	Weeks Street, NS	includes some Buell Avenue	N. Smithfield	8	CI	1954	700	Y	G2	H	Francis Thayer	
3405	Welles Street		Woonsocket	6	CI	1891	720	N	D4	L	WWD	
3400	Welles Street		Woonsocket	12	DI	1975	420	N	D4	L	WWD	
3410	Welles Street		Woonsocket	12	DI	1974	560	N	E4	H	WWD	
3415	West Park Place		Woonsocket	4	CI	1890	480	Y	C4	L	WWD	
3420	West School Street		Woonsocket	8	CI	1896	1160	N	B3	L	WWD	
3425	West Street		Woonsocket	6	CI	1886	760	N	D2	L	WWD	break 2/93
3430	Westwood Road, NS		N. Smithfield	4	CI	1951	840	Y	ENS	L	WWD	
3435	White Parkway, NS		N. Smithfield	8	CI	1928	1540	Y	G2	H	WWD	
3440	Wilbur Avenue		Woonsocket	4	CI	1910	320	N	E2	L	WWD	
3445	Wilcox Street		Woonsocket	8	DI	1961	340	Y	A7	L	WWD	
3450	Williams Street		Woonsocket	6	CI	1916	760	N	F4	H	WWD	
3455	Willow Street		Woonsocket	4	CI	1890	700	N	D4	L	WWD	
3460	Willow Street		Woonsocket	6	CI	1893	700	N	D4	L	WWD	

Appendix D
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Main Database Sorted Alphabetically

Pipe #	Street	Location	Town	Size (in)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments
3465	Wilson Avenue		Woonsocket	8	CI	1890	540	Y	D4	L	WWD	
3475	Winter Street		Woonsocket	6	CI	1892	500	Y	A4	L	WWD	parallel pipes
3480	Winter Street		Woonsocket	12	CI	1891	860	N	A4	L	WWD	break 12/89, parallel to 6"
3470	Winter Street		Woonsocket	8	CI	1897	3050	N	A3	L	WWD	
3485	Winthrop Street		Woonsocket	8	CI	1917	1600	N	B6	L	WWD	
3495	Wood Avenue		Woonsocket	6	CI	1888	1960	N	B5	L	WWD	
3490	Wood Avenue		Woonsocket	12	CI	1894	1000	N	A5	L	WWD	
3500	Wood Avenue		Woonsocket	8	CI	1895	810	N	C5	L	WWD	
3505	Woodhaven Road		Woonsocket	8	DI	1971	1080	N	B9	H	WWD	breaks 1/85,12/87,12/94,1/96
3510	Woodland Road		Woonsocket	6	CI	1896	1680	N	B3	L	WWD	
3515	Woodland Road		Woonsocket	8	CI	1925	1140	N	A3	L	WWD	
3520	Woodlawn Road, NS		N. Smithfield	6	AC	1951	1040	Y	ENS	L	Oscar Lapre & Wilfred Pelletier	
3525	Woonsocket Hill Road, NS		N. Smithfield	2	GI	1928	1230	Y	F1	L	WWD	
3530	Woonsocket Hill Road, NS		N. Smithfield	6	CI	1928	2040	N	F1	L	WWD	
3535	Yolande Place		Woonsocket	8	CI	1922	345	N	B6	L	WWD	
	Second Ave	Rhodes Ave to River St.	Woonsocket	16	DI	2004	420				Woonsocket	
	River St.	Second Ave. to Blackstone River	Woonsocket	16	DI	2004	892				Woonsocket	
	River St.	Blackstone River to Market Square	Woonsocket	16	DI	2004	2994				Woonsocket	
	South Main St.	Market Square to Truman Dr.	Woonsocket	16	DI	2004	560				Woonsocket	
	Bernon St.	Market Square to Greene St.	Woonsocket	16	DI	2004	1152				Woonsocket	
	Greene St.	Bernon St. to Park Ave.	Woonsocket	16	DI	2004	718				Woonsocket	
	Park Ave.	Greene St. to Crawford St.	Woonsocket	16	DI	2004	290				Woonsocket	
	Crawford St.	Park Ave to Cleveland St.	Woonsocket	16	DI	2004	866				Woonsocket	
	Logee St.	Cleveland St. to Storage Tank / Wellos S	Woonsocket	16	DI	2004	1000				Woonsocket	
	Logee St.	Wellos St. to Cross Country	Woonsocket	30	DI	2004	504				Woonsocket	
	Cross Country	Logee St. to Reservior Ave.	Woonsocket	30	DI	2004	564				Woonsocket	
	Fairfield Ave.	Cross Country to Bertenshaw Rd.	Woonsocket	30	DI	2004	738				Woonsocket	
	Bertenshaw Rd.	Fairfield to Lilac Ave.	Woonsocket	30	DI	2004	756				Woonsocket	
	Lilac Ave.	Bertenshaw Rd. to Marrian Lane	Woonsocket	30	DI	2004	920				Woonsocket	
	Marian Lane	Lilac Ave to Flora Ave.	Woonsocket	30	DI	2004	136				Woonsocket	
	Flora Ave.	Lane to Wanda Ave.	Woonsocket	30	DI	2004	1174				Woonsocket	
	Wanda Ave.	Flora Ave. to Lydia Ave.	Woonsocket	30	DI	2004	200				Woonsocket	
	Lydia Ave.	Wanda Ave. to Blue Stone Dr.	Woonsocket	30	DI	2004	276				Woonsocket	
	Logee St.	Front St. to Park Ave.	Woonsocket	12	DI	2004	644				Woonsocket	
	Logee St.	Park Ave to Grove St.	Woonsocket	8	DI	2004	320				Woonsocket	
	Logee St.	Park Ave to Grove St.	Woonsocket	12	DI	2004	320				Woonsocket	
	Logee St.	Grove St. to Cottage St.	Woonsocket	12	DI	2004	340				Woonsocket	
	Logee St.	Cottage St. to Cleveland St.	Woonsocket	12	DI	2004	588				Woonsocket	
	Logee St.	St. Hughes St. to Reservior Ave.	Woonsocket	8	DI	2004	984				Woonsocket	
	Congress St.	Congress St. extension	Woonsocket	8	DI		1700			L	Woonsocket	
	Steve Lopes Way	Rhodes Ave. to end of Steve Lopes Wa	Woonsocket	8	DI	2004	550			H	Woonsocket	
	Gaulin Ave.	Elm St. to Locust St.	Woonsocket				1100			L	Woonsocket	
	Orchard St.		Woonsocket							L	Woonsocket	
	Chestnut St.		Woonsocket							L	Woonsocket	

Appendix D
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Main Database Sorted Alphabetically

Pipe #	Street	Location	Town	Size (in)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments
	Fourth Ave.		Woonsocket							L	Woonsocket	
	Bennett St.		Woonsocket							L	Woonsocket	
	Sixth Ave.		Woonsocket							L	Woonsocket	
	Cottage St.		Woonsocket								Woonsocket	
	Moore St.		Woonsocket							H	Woonsocket	
	Fairmount St.	Fairmount St. extension	Woonsocket							L	Woonsocket	
	Wanda Ave.	Wanda Ave. extension	Woonsocket	8	DI		2000			L	Woonsocket	
	High School St.		Woonsocket							L	Woonsocket	
	Stevens Way		Woonsocket							H	Woonsocket	
	Roberta Ave.		Woonsocket							L	Woonsocket	
	Greenville Rd.		N. Smithfield				1450			H	Woonsocket	
	Grace Ave.	Grace Ave. extension	Woonsocket							L	Woonsocket	
	Harris Ave.		Woonsocket	12	DI					L	Woonsocket	
	Railroad St.		Woonsocket							L	Woonsocket	
	Dulude Ave.	Birch St. to Mill St.	Woonsocket							L	Woonsocket	
	Elmore St.		Woonsocket							L	Woonsocket	
	Asylum St.		Woonsocket							L	Woonsocket	
		River Bend condominium										
		Lowe's complex / Diamond Hill Rd.				2001						
		CVS Fire Supplies				1999						

APPENDIX E

Pipe Replacement Priority List – Dead Ends

Appendix E
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Dead End Water Main Database

Pipe Ranking	Pipe Number	Street	Size (in)	Type	Year	Length (feet)	Rating Schedule 1 Size	2 Type	3 Age	4 Ownership	5 Breaks	6 Dead Ends	Total
232	80	Allen Street	8	CI	1896	950	0.00	0.63	1.25	0.00	0.00	Y	1.88
486	95	Annette Avenue	8	CI	1953	1300	0.00	0.63	0.50	0.00	0.00	Y	1.13
654	100	Arland Court	8	DI	1989	525	0.00	0.00	0.00	0.00	0.00	Y	0.00
47	103	Armand Street	2	CT	1947	400	1.25	0.38	0.50	0.63	0.00	Y	2.75
41	110	Arnold Avenue, NS	1.5	PVC	1929	300	1.25	0.25	0.75	0.63	0.00	Y	2.88
544	125	Arona Street	8	AC	1975	200	0.00	0.63	0.25	0.00	0.00	Y	0.88
371	140	Atlanta Street	8	CI	1926	700	0.00	0.63	0.75	0.00	0.00	Y	1.38
655	145	Aubin Street	8	DI	1979	320	0.00	0.00	0.00	0.00	0.00	Y	0.00
488	190	Bartlett Street	12	CI	1947	380	0.00	0.63	0.50	0.00	0.00	Y	1.13
374	225	Beausoleil Street	12	CI	1929	600	0.00	0.63	0.75	0.00	0.00	Y	1.38
575	240	Bellevue Avenue, NS	8	DI	1988	1140	0.00	0.00	0.00	0.63	0.00	Y	0.63
68	245	Bellingham Street	6	CI	1897	590	0.63	0.63	1.25	0.00	0.00	Y	2.50
376	255	Benelli Street	8	CI	1929	270	0.00	0.63	0.75	0.00	0.00	Y	1.38
547	260	Bennett Street	8	AC	1976	190	0.00	0.63	0.25	0.00	0.00	Y	0.88
56	270	Bentley Street	4	CI	1922	280	1.25	0.63	0.75	0.00	0.00	Y	2.63
658	275	Berard Avenue	8	DI	1979	460	0.00	0.00	0.00	0.00	0.00	Y	0.00
659	280	Berkley Street	8	DI	1979	280	0.00	0.00	0.00	0.00	0.00	Y	0.00
69	290	Bernon Street	6	CI	1890	300	0.63	0.63	1.25	0.00	0.00	Y	2.50
548	325	Bertha Avenue	8	CI	1959	720	0.00	0.63	0.25	0.00	0.00	Y	0.88
36	330	Birch Hill Avenue, NS	4	AC	1953	880	1.25	0.63	0.50	0.63	0.00	Y	3.00
591	355	Blue Stone Drive	8	DI	1964	1020	0.00	0.00	0.25	0.00	0.00	Y	0.25
660	353	Blueberry Hill	8	DI	1998	270	0.00	0.00	0.00	0.00	0.00	Y	0.00
594	370	Bourassa Avenue	8	DI	1978	840	0.00	0.00	0.25	0.00	0.00	Y	0.25
72	380	Boyden Street	6	CI	1889	1060	0.63	0.63	1.25	0.00	0.00	Y	2.50
595	385	Bozoian Street	8	DI	1978	280	0.00	0.00	0.25	0.00	0.00	Y	0.25
596	395	Bradley Street	8	DI	1963	540	0.00	0.00	0.25	0.00	0.00	Y	0.25
597	405	Brien's Court	8	DI	1968	200	0.00	0.00	0.25	0.00	0.00	Y	0.25
238	415	Brook Street	8	CI	1891	440	0.00	0.63	1.25	0.00	0.00	Y	1.88
661	420	Brookhaven Lane	12	DI	1987	1240	0.00	0.00	0.00	0.00	0.00	Y	0.00
73	425	Buell Avenue, NS	1.5	CT	1960	120	1.25	0.38	0.25	0.63	0.00	Y	2.50
239	430	Buell Avenue, NS	1	CT	1960	100	1.25	0.38	0.25	0.00	0.00	Y	1.88
378	435	Burnside Avenue	8	CI	1927	480	0.00	0.63	0.75	0.00	0.00	Y	1.38
381	455	Cady Street	8	CI	1937	720	0.00	0.63	0.75	0.00	0.00	Y	1.38
576	460	Cambridge Court	8	DI	1987	260	0.00	0.00	0.00	0.63	0.00	Y	0.63
240	470	Canal Street	8	CI	1890	320	0.00	0.63	1.25	0.00	0.00	Y	1.88
382	475	Canal Street, NS	8	CI	1928	2180	0.00	0.63	0.75	0.00	0.00	Y	1.38
598	485	Carey Court	8	DI	1973	520	0.00	0.00	0.25	0.00	0.00	Y	0.25
600	525	Castle Heights Court	8	DI	1959	460	0.00	0.00	0.25	0.00	0.00	Y	0.25

Appendix E
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Dead End Water Main Database

Pipe Ranking	Pipe Number	Street	Size (in)	Type	Year	Length (feet)	Rating Schedule 1 Size	2 Type	3 Age	4 Ownership	5 Breaks	6 Dead Ends	Total
202	545	Chalapa Avenue	6	CI	1922	570	0.63	0.63	0.75	0.00	0.00	Y	2.00
386	565	Cherry Hill Avenue	8	CI	1921	440	0.00	0.63	0.75	0.00	0.00	Y	1.38
48	580	Chester Street, NS	1.5	CT	1949	240	1.25	0.38	0.50	0.63	0.00	Y	2.75
493	600	Circle Street	8	CI	1950	360	0.00	0.63	0.50	0.00	0.00	Y	1.13
10	605	Clark Court	4	CI	1888	180	1.25	0.63	1.25	0.00	0.00	Y	3.13
11	635	Cold Spring Place	4	CI	1893	240	1.25	0.63	1.25	0.00	0.00	Y	3.13
601	645	Columbus Street	8	DI	1977	180	0.00	0.00	0.25	0.00	0.00	Y	0.25
389	650	Congress Street	8	CI	1930	800	0.00	0.63	0.75	0.00	0.00	Y	1.38
665	675	Corsi Street	12	DI	1985	400	0.00	0.00	0.00	0.00	0.00	Y	0.00
356	690	Cottage Street	8	CI	1960	980	0.00	0.63	0.25	0.00	0.63	Y	1.50
666	710	Cranston Street	8	DI	1983	200	0.00	0.00	0.00	0.00	0.00	Y	0.00
603	725	Crest Road	8	DI	1965	570	0.00	0.00	0.25	0.00	0.00	Y	0.25
57	730	Crest Road, NS	2	GI	1928	1000	1.25	0.63	0.75	0.00	0.00	Y	2.63
667	760	CVS Drive	12	DI	1982	1080	0.00	0.00	0.00	0.00	0.00	Y	0.00
552	765	Cynthia Drive, NS	8	DI	1968	1880	0.00	0.00	0.25	0.63	0.00	Y	0.88
668	790	Darwin Street	8	DI	1990	270	0.00	0.00	0.00	0.00	0.00	Y	0.00
395	825	Desrochers Avenue	8	CI	1936	240	0.00	0.63	0.75	0.00	0.00	Y	1.38
78	840	Diamond Hill Road	6	CI	1891	3090	0.63	0.63	1.25	0.00	0.00	Y	2.50
294	890	Dunlap Street	8	CI	1958	580	0.00	0.63	0.50	0.00	0.63	Y	1.75
397	900	East Mill Street	8	CI	1925	350	0.00	0.63	0.75	0.00	0.00	Y	1.38
81	925	East School Street	6	CI	1890	480	0.63	0.63	1.25	0.00	0.00	Y	2.50
669	935	Edgewood Avenue	8	DI	1996	280	0.00	0.00	0.00	0.00	0.00	Y	0.00
205	940	Edmund Street	8	CI	1931	530	0.00	0.63	0.75	0.00	0.63	Y	2.00
315	945	Eighth Avenue	8	CI	1917	340	0.00	0.63	1.00	0.00	0.00	Y	1.63
498	965	Elder Ballou Meetinghouse Road	12	CI	1949	830	0.00	0.63	0.50	0.00	0.00	Y	1.13
499	970	Elder Ballou Meetinghouse Road	12	CI	1949	320	0.00	0.63	0.50	0.00	0.00	Y	1.13
206	1015	Elmore Street	6	CI	1927	120	0.63	0.63	0.75	0.00	0.00	Y	2.00
85	1040	Ethel Street	6	CI	1896	320	0.63	0.63	1.25	0.00	0.00	Y	2.50
502	1045	Fabien Street	8	CI	1939	380	0.00	0.63	0.50	0.00	0.00	Y	1.13
503	1050	Fairfield Avenue	8	CI	1939	1180	0.00	0.63	0.50	0.00	0.00	Y	1.13
251	1060	Fairmount Street	8	CI	1897	1940	0.00	0.63	1.25	0.00	0.00	Y	1.88
49	1075	Fairview Avenue, NS	2	CT	1953	530	1.25	0.38	0.50	0.63	0.00	Y	2.75
557	1080	Fall Street	8	CI	1959	240	0.00	0.63	0.25	0.00	0.00	Y	0.88
558	1135	Fogarty Hospital Line, NS	10	DI	1965	520	0.00	0.00	0.25	0.63	0.00	Y	0.88
608	1145	Foster Street	8	DI	1971	380	0.00	0.00	0.25	0.00	0.00	Y	0.25
208	1155	Foundry Street	6	CI	1919	180	0.63	0.63	0.75	0.00	0.00	Y	2.00
43	1185	Francis Street	4	CI	1917	140	1.25	0.63	1.00	0.00	0.00	Y	2.88
611	1210	Fulton Street	8	DI	1978	480	0.00	0.00	0.25	0.00	0.00	Y	0.25

Appendix E
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Dead End Water Main Database

Pipe Ranking	Pipe Number	Street	Size (in)	Type	Year	Length (feet)	Rating Schedule 1 Size	2 Type	3 Age	4 Ownership	5 Breaks	6 Dead Ends	Total
164	1220	Garden Street	6	CI	1905	740	0.63	0.63	1.00	0.00	0.00	Y	2.25
90	1235	Gaulin Avenue	6	CI	1888	1140	0.63	0.63	1.25	0.00	0.00	Y	2.50
612	1245	Getchell Avenue	8	DI	1963	1600	0.00	0.00	0.25	0.00	0.00	Y	0.25
134	1250	Getchell Street, NS	6	CI	1947	110	0.63	0.63	0.50	0.63	0.00	Y	2.38
200	1260	Gilfillan Road, NS	6	CI	1959	740	0.63	0.63	0.25	0.63	0.00	Y	2.13
613	1265	Glaude Lane	8	DI	1962	1300	0.00	0.00	0.25	0.00	0.00	Y	0.25
405	1275	Glendale Avenue	8	CI	1934	1040	0.00	0.63	0.75	0.00	0.00	Y	1.38
671	1280	Goldstein Drive	12	DI	1988	380	0.00	0.00	0.00	0.00	0.00	Y	0.00
577	1285	Grace Avenue	8	CI	1985	290	0.00	0.63	0.00	0.00	0.00	Y	0.63
91	1290	Grand Street	6	CI	1891	1480	0.63	0.63	1.25	0.00	0.00	Y	2.50
561	1300	Grange Avenue	8	AC	1974	160	0.00	0.63	0.25	0.00	0.00	Y	0.88
210	1315	Great Road, NS	6	CI	1928	260	0.63	0.63	0.75	0.00	0.00	Y	2.00
135	1325	Greenville Road, NS	6	AC	1953	4160	0.63	0.63	0.50	0.63	0.00	Y	2.38
578	1410	Hartford Avenue	8	DI	1990	380	0.00	0.00	0.00	0.63	0.00	Y	0.63
580	1425	Harvard Court	8	DI	1987	260	0.00	0.00	0.00	0.63	0.00	Y	0.63
410	1430	Havelock Street	8	CI	1930	80	0.00	0.63	0.75	0.00	0.00	Y	1.38
615	1455	Heather Drive	8	DI	1963	420	0.00	0.00	0.25	0.00	0.00	Y	0.25
411	1465	Hemond Avenue	8	CI	1924	1100	0.00	0.63	0.75	0.00	0.00	Y	1.38
331	1470	Henry Street	8	CI	1908	380	0.00	0.63	1.00	0.00	0.00	Y	1.63
212	1500	Hill Street	6	CI	1920	540	0.63	0.63	0.75	0.00	0.00	Y	2.00
616	1505	Hillsdale Street	8	DI	1964	300	0.00	0.00	0.25	0.00	0.00	Y	0.25
617	1510	Hillside Avenue	8	DI	1978	290	0.00	0.00	0.25	0.00	0.00	Y	0.25
37	1515	Hillview Avenue, NS	4	CI	1940	980	1.25	0.63	0.50	0.63	0.00	Y	3.00
58	1520	Holder Lane	4	CI	1923	280	1.25	0.63	0.75	0.00	0.00	Y	2.63
484	1535	Holley Lane	6	DI	1988	1880	0.63	0.00	0.00	0.63	0.00	Y	1.25
581	1530	Holley Lane	8	DI	1998	400	0.00	0.00	0.00	0.63	0.00	Y	0.63
59	1545	Homestead Avenue, NS	6	CI	1928	740	0.63	0.63	0.75	0.63	0.00	Y	2.63
213	1550	Homestead Road	6	CI	1923	200	0.63	0.63	0.75	0.00	0.00	Y	2.00
94	1575	Island Place	6	CI	1896	400	0.63	0.63	1.25	0.00	0.00	Y	2.50
674	1585	Jacob Lane	8	DI	1990	180	0.00	0.00	0.00	0.00	0.00	Y	0.00
508	1595	Janet Avenue	8	CI	1948	340	0.00	0.63	0.50	0.00	0.00	Y	1.13
509	1615	Jillson Avenue	8	CI	1956	3620	0.00	0.63	0.50	0.00	0.00	Y	1.13
414	1620	Joffre Avenue	8	CI	1932	1320	0.00	0.63	0.75	0.00	0.00	Y	1.38
415	1650	Kenwood Street	8	CI	1922	740	0.00	0.63	0.75	0.00	0.00	Y	1.38
621	1680	Knollwood Drive	8	DI	1967	4200	0.00	0.00	0.25	0.00	0.00	Y	0.25
50	1705	Lamoureux Boulvevard, NS	1	CT	1953	340	1.25	0.38	0.50	0.63	0.00	Y	2.75
136	1715	Lapre Road, NS	6	AC	1951	2000	0.63	0.63	0.50	0.63	0.00	Y	2.38
623	1725	Laurier Street	8	DI	1977	240	0.00	0.00	0.25	0.00	0.00	Y	0.25

Appendix E
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Dead End Water Main Database

Pipe Ranking	Pipe Number	Street	Size (in)	Type	Year	Length (feet)	Rating Schedule 1 Size	2 Type	3 Age	4 Ownership	5 Breaks	6 Dead Ends	Total
676	1740	Ledgewood Lane	8	DI	1988	680	0.00	0.00	0.00	0.00	0.00	Y	0.00
424	1805	Loring Street	8	CI	1925	620	0.00	0.63	0.75	0.00	0.00	Y	1.38
515	1810	Louise Street	8	CI	1942	1060	0.00	0.63	0.50	0.00	0.00	Y	1.13
425	1815	Lucille Street	8	CI	1930	2080	0.00	0.63	0.75	0.00	0.00	Y	1.38
296	1820	Lydia Avenue	8	CI	1954	3360	0.00	0.63	0.50	0.00	0.63	Y	1.75
138	1835	Madeleine Avenue	8	CI	1955	1400	0.00	0.63	0.50	0.00	1.25	Y	2.38
426	1840	Mailloux Street	8	CI	1924	330	0.00	0.63	0.75	0.00	0.00	Y	1.38
427	1850	Manila Avenue	8	CI	1932	1060	0.00	0.63	0.75	0.00	0.00	Y	1.38
335	1860	Manville Road	12	CI	1906	5680	0.00	0.63	1.00	0.00	0.00	Y	1.63
679	1865	Maple Street	8	DI	1980	400	0.00	0.00	0.00	0.00	0.00	Y	0.00
624	1885	Marie-Ann Court	8	DI	1961	90	0.00	0.00	0.25	0.00	0.00	Y	0.25
563	1910	Memorial Drive	8	DI	1963	600	0.00	0.00	0.25	0.63	0.00	Y	0.88
359	1930	Mendon Road Driveway, NS	8	CI	1964	660	0.00	0.63	0.25	0.63	0.00	Y	1.50
683	1945	Merrill Court	8	DI	1988	500	0.00	0.00	0.00	0.00	0.00	Y	0.00
51	1950	Merrimac Street, NS	1	CT	1949	440	1.25	0.38	0.50	0.63	0.00	Y	2.75
429	1980	Mill Street, NS	8	CI	1926	280	0.00	0.63	0.75	0.00	0.00	Y	1.38
19	1985	Miller Lane	4	CI	1893	340	1.25	0.63	1.25	0.00	0.00	Y	3.13
582	1990	Milton Avenue, NS	8	DI	1988	300	0.00	0.00	0.00	0.63	0.00	Y	0.63
686	1995	Minerva Street	8	DI	1990	120	0.00	0.00	0.00	0.00	0.00	Y	0.00
432	2010	Monroe Street	12	CI	1924	1160	0.00	0.63	0.75	0.00	0.00	Y	1.38
433	2015	Montcalm Street	8	CI	1928	200	0.00	0.63	0.75	0.00	0.00	Y	1.38
61	2025	Moore Street	6	CI	1919	160	0.63	0.63	0.75	0.00	0.63	Y	2.63
362	2040	Morris Street	8	AC	1974	320	0.00	0.63	0.25	0.00	0.63	Y	1.50
519	2045	Morse Avenue	8	CI	1954	160	0.00	0.63	0.50	0.00	0.00	Y	1.13
434	2060	Morse Avenue, NS	8	CI	1928	480	0.00	0.63	0.75	0.00	0.00	Y	1.38
337	2075	Mount Saint Charles Avenue	12	CI	1915	450	0.00	0.63	1.00	0.00	0.00	Y	1.63
52	2085	Mowry Avenue, NS	2	CT	1957	500	1.25	0.38	0.50	0.63	0.00	Y	2.75
626	2100	Myette Street	8	DI	1962	520	0.00	0.00	0.25	0.00	0.00	Y	0.25
627	2105	Nancy Court	8	DI	1970	800	0.00	0.00	0.25	0.00	0.00	Y	0.25
687	2120	New Street	8	DI	1988	660	0.00	0.00	0.00	0.00	0.00	Y	0.00
338	2130	Newland Avenue	8	CI	1902	1340	0.00	0.63	1.00	0.00	0.00	Y	1.63
38	2190	Norwood Road, NS	4	CI	1951	520	1.25	0.63	0.50	0.63	0.00	Y	3.00
523	2195	Notheast Street	8	CI	1945	170	0.00	0.63	0.50	0.00	0.00	Y	1.13
39	2205	Oak Hill Avenue, NS	4	AC	1953	1000	1.25	0.63	0.50	0.63	0.00	Y	3.00
40	2220	Oaklawn Road, NS	2	GI	1951	250	1.25	0.63	0.50	0.63	0.00	Y	3.00
139	2215	Oaklawn Road, NS	6	AC	1951	480	0.63	0.63	0.50	0.63	0.00	Y	2.38
141	2240	Old Greenville Road, NS	6	AC	1953	720	0.63	0.63	0.50	0.63	0.00	Y	2.38
524	2245	Olive Street	8	CI	1942	420	0.00	0.63	0.50	0.00	0.00	Y	1.13

Appendix E
City of Woonsocket, Rhode Island
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Dead End Water Main Database

Pipe Ranking	Pipe Number	Street	Size (in)	Type	Year	Length (feet)	Rating Schedule 1 Size	2 Type	3 Age	4 Ownership	5 Breaks	6 Dead Ends	Total
525	2270	Olympia Avenue	8	CI	1946	560	0.00	0.63	0.50	0.00	0.00	Y	1.13
443	2295	Oregon Avenue	8	CI	1932	1200	0.00	0.63	0.75	0.00	0.00	Y	1.38
688	2290	Oregon Avenue	8	DI	1988	740	0.00	0.00	0.00	0.00	0.00	Y	0.00
630	2325	Papineau Avenue	8	DI	1978	400	0.00	0.00	0.25	0.00	0.00	Y	0.25
104	2335	Paradis Avenue	6	CI	1889	1660	0.63	0.63	1.25	0.00	0.00	Y	2.50
690	2360	Park East Drive	16	DI	1982	480	0.00	0.00	0.00	0.00	0.00	Y	0.00
447	2380	Parker Street	8	CI	1925	580	0.00	0.63	0.75	0.00	0.00	Y	1.38
363	2385	Patton Road	8	AC	1973	280	0.00	0.63	0.25	0.63	0.00	Y	1.50
566	2415	Pichette Boulevard	8	CI	1959	400	0.00	0.63	0.25	0.00	0.00	Y	0.88
142	2425	Pine Court, NS	6	AC	1954	240	0.63	0.63	0.50	0.63	0.00	Y	2.38
631	2435	Pine Swamp Road, Cumb	8	DI	1978	960	0.00	0.00	0.25	0.00	0.00	Y	0.25
451	2465	Poplar Street	8	CI	1935	1180	0.00	0.63	0.75	0.00	0.00	Y	1.38
1	2470	Pound Hill Road, NS	2	GI	1929	1080	1.25	0.63	0.75	0.63	0.00	Y	3.25
692	2475	Prince Street	8	DI	1986	450	0.00	0.00	0.00	0.00	0.00	Y	0.00
693	2490	Privilege Street	8	DI	1983	300	0.00	0.00	0.00	0.00	0.00	Y	0.00
695	2510	Progresso Avenue	8	DI	1989	120	0.00	0.00	0.00	0.00	0.00	Y	0.00
111	2520	Prospect Street	8	CI	1889	3020	0.00	0.63	1.25	0.00	0.63	Y	2.50
270	2525	Providence Street	8	CI	1891	1320	0.00	0.63	1.25	0.00	0.00	Y	1.88
113	2550	Rathbun Street	6	CI	1894	340	0.63	0.63	1.25	0.00	0.00	Y	2.50
183	2565	Read Avenue	6	CI	1915	370	0.63	0.63	1.00	0.00	0.00	Y	2.25
301	2580	Redwood Street	6	CI	1955	150	0.63	0.63	0.50	0.00	0.00	Y	1.75
343	2590	Rhode Island Avenue	8	CI	1915	560	0.00	0.63	1.00	0.00	0.00	Y	1.63
696	2615	Ricard Street	8	DI	1982	500	0.00	0.00	0.00	0.00	0.00	Y	0.00
186	2660	Roberta Avenue	6	CI	1911	440	0.63	0.63	1.00	0.00	0.00	Y	2.25
456	2665	Roberts Street	8	CI	1933	340	0.00	0.63	0.75	0.00	0.00	Y	1.38
364	2690	Rock Ridge Drive	6	DI	1973	340	0.63	0.00	0.25	0.63	0.00	Y	1.50
365	2695	Rock Ridge Drive	6	DI	1973	520	0.63	0.00	0.25	0.63	0.00	Y	1.50
458	2710	Rodman Street	8	CI	1931	800	0.00	0.63	0.75	0.00	0.00	Y	1.38
636	2740	Rose Avenue	8	DI	1962	460	0.00	0.00	0.25	0.00	0.00	Y	0.25
638	2765	Ruth Street	8	DI	1962	300	0.00	0.00	0.25	0.00	0.00	Y	0.25
460	2770	Rutland Street	8	CI	1935	600	0.00	0.63	0.75	0.00	0.00	Y	1.38
25	2790	Sayles Street	4	CI	1885	170	1.25	0.63	1.25	0.00	0.00	Y	3.13
26	2795	Sayles Street	4	CI	1885	280	1.25	0.63	1.25	0.00	0.00	Y	3.13
463	2810	Seamans Street	8	CI	1930	580	0.00	0.63	0.75	0.00	0.00	Y	1.38
190	2835	Seventh Avenue	6	CI	1911	1140	0.63	0.63	1.00	0.00	0.00	Y	2.25
639	2830	Seventh Avenue	8	DI	1978	360	0.00	0.00	0.25	0.00	0.00	Y	0.25
568	2840	Sharon Parkway, NS	8	DI	1971	1720	0.00	0.00	0.25	0.63	0.00	Y	0.88
348	2870	Sixth Avenue	8	CI	1910	280	0.00	0.63	1.00	0.00	0.00	Y	1.63

Appendix E
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Dead End Water Main Database

Pipe Ranking	Pipe Number	Street	Size (in)	Type	Year	Length (feet)	Rating Schedule 1 Size	2 Type	3 Age	4 Ownership	5 Breaks	6 Dead Ends	Total
2	2915	Smithfield Road, NS	1.25	GI	1928	220	1.25	0.63	0.75	0.63	0.00	Y	3.25
53	2885	Smithfield Road, NS	1	CT	1950	100	1.25	0.38	0.50	0.63	0.00	Y	2.75
467	2910	Smithfield Road, NS	8	CI	1928	440	0.00	0.63	0.75	0.00	0.00	Y	1.38
532	2890	Smithfield Road, NS	8	CI	1940	150	0.00	0.63	0.50	0.00	0.00	Y	1.13
220	2925	Snow Street	6	CI	1919	400	0.63	0.63	0.75	0.00	0.00	Y	2.00
701	2975	Springwater Drive	8	DI	1988	320	0.00	0.00	0.00	0.00	0.00	Y	0.00
569	2990	St Augustin Street	8	AC	1975	180	0.00	0.63	0.25	0.00	0.00	Y	0.88
192	3000	St. Barnabe Street	6	CI	1913	280	0.63	0.63	1.00	0.00	0.00	Y	2.25
587	3005	St. Barnabe Street	8	DI	1949	1080	0.00	0.00	0.50	0.00	0.00	Y	0.50
641	3045	Star Avenue	8	DI	1964	1220	0.00	0.00	0.25	0.00	0.00	Y	0.25
366	3050	State Street	8	DI	1964	320	0.00	0.00	0.25	0.00	1.25	Y	1.50
279	3060	Summer Street	8	CI	1889	1310	0.00	0.63	1.25	0.00	0.00	Y	1.88
644	3085	Sunset Avenue	8	DI	1963	560	0.00	0.00	0.25	0.00	0.00	Y	0.25
706	3120	Tara Lane	8	DI	1987	1150	0.00	0.00	0.00	0.00	0.00	Y	0.00
570	3160	Thibeault Avenue	8	CI	1959	240	0.00	0.63	0.25	0.00	0.00	Y	0.88
281	3190	Transit Street	8	CI	1891	1280	0.00	0.63	1.25	0.00	0.00	Y	1.88
125	3225	Valley Street	6	CI	1894	100	0.63	0.63	1.25	0.00	0.00	Y	2.50
284	3230	Valley Street	8	CI	1897	240	0.00	0.63	1.25	0.00	0.00	Y	1.88
367	3260	Village Road	8	AC	1973	1080	0.00	0.63	0.25	0.63	0.00	Y	1.50
537	3275	Virginia Avenue	8	CI	1946	1360	0.00	0.63	0.50	0.00	0.00	Y	1.13
648	3280	Viva Way	8	DI	1978	360	0.00	0.00	0.25	0.00	0.00	Y	0.25
31	3290	Vose Street	6	CI	1896	760	0.63	0.63	1.25	0.00	0.63	Y	3.13
571	3305	Wade Road	8	CI	1959	600	0.00	0.63	0.25	0.00	0.00	Y	0.88
539	3330	Ward Street	8	CI	1941	680	0.00	0.63	0.50	0.00	0.00	Y	1.13
478	3345	Warner Street	8	CI	1925	180	0.00	0.63	0.75	0.00	0.00	Y	1.38
225	3355	Warren Avenue, NS	6	CI	1928	380	0.63	0.63	0.75	0.00	0.00	Y	2.00
32	3375	Water Street	4	CI	1891	200	1.25	0.63	1.25	0.00	0.00	Y	3.13
368	3390	Wayne Road	8	DI	1960	620	0.00	0.00	0.25	0.00	1.25	Y	1.50
304	3395	Weeks Street, NS	8	CI	1954	700	0.00	0.63	0.50	0.63	0.00	Y	1.75
33	3415	West Park Place	4	CI	1890	480	1.25	0.63	1.25	0.00	0.00	Y	3.13
143	3430	Westwood Road, NS	4	CI	1951	840	1.25	0.63	0.50	0.00	0.00	Y	2.38
481	3435	White Parkway, NS	8	CI	1928	1540	0.00	0.63	0.75	0.00	0.00	Y	1.38
652	3445	Wilcox Street	8	DI	1961	340	0.00	0.00	0.25	0.00	0.00	Y	0.25
289	3465	Wilson Avenue	8	CI	1890	540	0.00	0.63	1.25	0.00	0.00	Y	1.88
129	3475	Winter Street	6	CI	1892	500	0.63	0.63	1.25	0.00	0.00	Y	2.50
144	3520	Woodlawn Road, NS	6	AC	1951	1040	0.63	0.63	0.50	0.63	0.00	Y	2.38
62	3525	Woonsocket Hill Road, NS	2	GI	1928	1230	1.25	0.63	0.75	0.00	0.00	Y	2.63

APPENDIX F

Hydrant Database

Appendix F
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Hydrant Database

Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
A - 1	0	1100	Canal St, NS	150' from N. Prop Line of Mill St	Chapman		4		8						private	N. Smithfield		
A - 2	0	1200	Harris Ave	20' from S. Prop Line of Huntingto Ave	Chapman		4		8	73					WWD	Woonsocket		
A - 2	1	1201	Edmund St	100' from MA border	RD Wood		6	1932	8	73	6	P&C			WWD	Woonsocket		
A - 2	2	1202	Harris Ave	at N. Prop Line of Fairlawn Ave	Fairmount		6	1950	8	73	6				WWD	Woonsocket		
A - 2	3	1203	Fairlawn Ave	170' from E Prop Line of Harris Ave	Kennedy		6	1978	8		6				WWD	Woonsocket		
A - 2	4	1204	Huntington Ave	300' from N prop line of Fairlawn Ave					6	73	6			Y	WWD	Woonsocket		
A - 2	5	1205	Fairlawn Ave	80' from W Prop Line of Huntington	Fairmount		6	1950	8	73	6				WWD	Woonsocket		
A - 2	6	1206	Huntington Ave	70' from S prop line of Fairlawn	Chapman		4		6	73					WWD	Woonsocket		
A - 2	7	1207	Edmund St	240' from N prop line of Huntington	RD Wood		6	1932	8	73	6				WWD	Woonsocket		
A - 2	8	1208	Gaskill St	20' from E prop line of Harris	Chapman		6	1950	8	73	6				WWD	Woonsocket		
A - 2	9	1209	Gaskill St	260' from E prop line of Harris	Chapman		6	1950	8	73	6				WWD	Woonsocket		
A - 2	10	1210	Gaskill St	130' from W prop line of Edmund			4		8	73	6			Y	WWD	Woonsocket		
A - 2	11	1211	Edmund St	10' from N prop line of Huntington			4		6	73	6			Y	WWD	Woonsocket		
A - 2	12	1212	Singleton St	700' from E prop line of River, then 140' N	Mueller		6	1960	12	75	2--6	Mueller			WWD	Woonsocket		
A - 2	13	1213	Harris Ave	500' from S prop line of Gaskill	Fairmount		6	1950	12	73	6				WWD	Woonsocket		
A - 2	14	1214	Edmund St	2' from N prop line of Huntington	Kennedy		6	1972	8		6	Kennedy	1972		WWD	Woonsocket		
A - 2	15	1215	Huntington Ave	290' from N prop line of Fairlawn	Kennedy		6	1972	6	69	6	Kennedy	1972		WWD	Woonsocket		
A - 2	16	1216												Y				no card
A - 3	0	1300	State St	280' from N prop line of Gaskill	US Pipe		6	1996	8	48	6	Mueller	1964		WWD	Woonsocket		
A - 3	1	1301	Summer St	160' from N prop line of Gaskill	Fairmount		6	1950	8	48	6				WWD	Woonsocket		
A - 3	2	1302	Warner St	140' from N prop line of Gaskill	Kennedy		6	1996	8	50	6				WWD	Woonsocket		
A - 3	3	1303	Gaskill St	10' from E prop line of Vine	Fairmount		4		6	56	6				WWD	Woonsocket		
A - 3	4	1304	Gaskill St	10' from W prop line of Temple	Chapman		4		6	56	6				WWD	Woonsocket		
A - 3	5	1305	N. Main St	150' from S prop line of Gaskill	Fairmount		4		6	84	6			Y	WWD	Woonsocket		
A - 3	6	1306	Prospect St	200' from N prop line of Gaskill	Chapman		4		8	61	6				WWD	Woonsocket		
A - 3	7	1307	Prospect St	10' from S prop line of Gaskill	APS		6	1963	8	65	6	APS	1963		WWD	Woonsocket		
A - 3	8	1308	Summer St	10' from S prop line of Gaskill	Chapman		4		8	56	6			Y	WWD	Woonsocket		
A - 3	9	1309	Vine St	at prop line of Rivulet	Chapman		4		6	69	6				WWD	Woonsocket		
A - 3	10	1310	Rivulet St	140' from E prop line of Vine	Fairmount		6	1950	8	69	6				WWD	Woonsocket		
A - 3	11	1311	Temple St	at S prop line of Rivulet	Chapman		4		6	73					WWD	Woonsocket		
A - 3	12	1312	Rivulet St	180' from E prop line of Temple	Fairmount		6	1950	8	76	6				WWD	Woonsocket		
A - 3	13	1313	Rivulet St	310' from W prop line of N Main	Chapman		4		8	77					WWD	Woonsocket		
A - 3	14	1314	N. Main St	10' from S prop line of Rivulet	US Pipe		6	1996	6	86	6		1996		WWD	Woonsocket		
A - 3	15	1315	Gaskill St	10' from E prop line of Woodland	Chapman		4		6	71					WWD	Woonsocket		
A - 3	16	1316	Woodland Rd.	at N line of Lawrence	US Pipe		6	1987	8	69	6			Y	WWD	Woonsocket	1	
A - 3	17	1317	Prospect St	80' from N prop line of Rachel	Darling		6	1957	8	70	6				WWD	Woonsocket		
A - 3	18	1318	Summer St	150' from N prop line of Trent	Chapman		4		8	72	6			Y	WWD	Woonsocket		
A - 3	19	1319	Farm St	10' from E prop line of Summer	RD Wood		6	1932	8	73	6				WWD	Woonsocket		
A - 3	20	1320	Farm St	40' from W prop line of Vine	Fairmount		6	1950	8	73	6				WWD	Woonsocket		
A - 3	21	1321	Farm St	80' from W prop line of Temple	Fairmount		6	1950	8	73	6				WWD	Woonsocket		
A - 3	22	1322	Temple St	110' from S prop line of Farm	Fairmount		6	1950	8	73	6				WWD	Woonsocket		
A - 3	23	1323	Farm St	210' from E prop line of Temple			4		6						WWD	Woonsocket		
A - 3	24	1324	Winter St	250' from E prop line of Temple	Fairmount		4		8	73					WWD	Woonsocket		
A - 3	25	1325	N. Main St	10' from S prop line of Farm					6					Y	WWD	Woonsocket		
A - 3	26	1326	N. Main St	20' from S prop line of Winter			4		6	81				Y	WWD	Woonsocket		
A - 3	27	1327	Woodland Rd.	50' from S prop line of Rachel	RD Wood		6	1932	8	69	6				WWD	Woonsocket		
A - 3	28	1328	Rachel St	230' from E prop line of Woodland	APS		6	1964	8	69	6	APS	1964		WWD	Woonsocket		
A - 3	29	1329	Trent St	140' from E prop line of Woodland	Kennedy		6	1996	8	70	6	Kennedy	1996		WWD	Woonsocket		
A - 3	30	1330	Trent St	120' from W prop line of Prospect	Kennedy		6	1996	8	70	6				WWD	Woonsocket		
A - 3	31	1331	Prospect St	10' from N prop line of Trent	Chapman		4		8	71					WWD	Woonsocket		
A - 3	32	1332	Winter St	10' from W prop line of Summer	Fairmount		4		6	73					WWD	Woonsocket		
A - 3	33	1333	Winter St	230' from E prop line of Summer	Chapman		4		8	73					WWD	Woonsocket		
A - 3	34	1334	Winter St	10' from W prop line of Temple	Chapman		4		8	73					WWD	Woonsocket		
A - 3	35	1335	Rebekah St	90' from N prop line of Phebe	Mueller		6	1978	8		6	Mueller	1978		WWD	Woonsocket		
A - 3	36	1336	Rebekah St	255' from W prop line of N Main	Mueller		6	1978	6		6	Mueller	1978		WWD	Woonsocket		
A - 3	37	1337	N. Main St	10' form N prop line of North			4		6	81				Y	WWD	Woonsocket		
A - 3	38	1338	Castle Heights Court	at N end of Castle Heights Court	APS		6	1960	8	50	6	APS	1960		WWD	Woonsocket		
A - 3	39	1339	Woodland Rd.	20' from S prop line of Trent	APS		6	1965	8	70	6				WWD	Woonsocket		
A - 3	40	1340	Winter St	40' from W prop line of Woodland	Chapman		4		8	66					WWD	Woonsocket		
A - 3	41	1341	Winter St	210' from E prop line of Woodland	Chapman		4		8	67					WWD	Woonsocket		
A - 3	42	1342	Winter St	10' from E prop line of Prospect	Fairmount		4		8					Y	WWD	Woonsocket		
A - 3	43	1343	Summer St	210' from N prop line of Rebekah	US Pipe		6	1996	8	73	6		1996		WWD	Woonsocket		
A - 3	44	1344	Summer St	200' from E prop line of Summer	US Pipe		6	1996	8		6	Mueller	1978		WWD	Woonsocket		
A - 3	45	1345	Phebe St	15' from E line of Rebekah	Mueller		6	1978	8		6	Mueller	1978		WWD	Woonsocket		
A - 3	46	1346	Barton St	50' from E line of Libbeus	APS		6	1968	6	83	6	APS	1968		WWD	Woonsocket		
A - 3	47	1347	Phebe St	125' from W line of N. Main	Mueller		6	1978	8		6	Mueller	1978		WWD	Woonsocket		
A - 3	48	1348	N. Main St	10' from S line of Rebekah	Chapman		4		6	81				Y	WWD	Woonsocket		
A - 3	49	1349	Summer St	240' from S line of Gaskill	Chapman		4		8	69				Y	WWD	Woonsocket		
A - 3	50	1350	Trent St	70' from W line of Summer	APS		6	1964	6	71	6	APS	1964		WWD	Woonsocket		
A - 3	51	1351	Winter St	20' from E line of Prospect	APS		6	1967	8	68	6	APS	1967		WWD	Woonsocket		
A - 3	52	1352	Barton St	15' from E line of Libbeus	Fairmount		4		6					Y	WWD	Woonsocket		
A - 3	53	1353	N. Main St	20' from S line of Rebekah & N. Main	APS		6	1969	6		6	APS	1969		WWD	Woonsocket		
A - 3	54	1354	N. Main St	22' from S line of Winter	US Pipe		6	1991	6		6	APS			WWD	Woonsocket		

Appendix F
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Hydrant Database

Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
A - 3	55	1355	N. Main St	111' from S line of Winter	APS		6	1960	6		6	APS			WWD	Woonsocket		
A - 3	56	1356	Gaskill St	10' from W line of Rayner (Blackstone)	Chapman		6	1950	6		6				WWD	Blackstone		
A - 3	57	1357	Gaskill St	at E line of N. Main					6						Blackstone	Blackstone		on Blackstone Water System
A - 3	58	1358	Farm St	29.5' from W line of N. Main	Kennedy		6	1972		65	6	Kennedy	1972		WWD	Woonsocket		
A - 3	59	1359	Farm St	207.5' from E line of Temple	Kennedy		6	1972	6	58	6	Kennedy	1972		WWD	Woonsocket		
A - 3	60	1360	Summer St	330' South of Gaskill	APS		6	1983	8		6		1983		WWD	Woonsocket		
A - 3	61	1361	Summer St	20' from S line of Gaskill	Darling		6	1984	8		6	Kennedy	1984		WWD	Woonsocket		
A - 3	62	1362	N. Main St	786 N. Main	US Pipe		6	1988	6		6	Mueller	1988		WWD	Woonsocket		
A - 3	63	1363	Jacob Ln											Y				no card
A - 3	64	1364	Prospect St	309 Prospect	US Pipe		6	1996	8		6		1996		WWD	Woonsocket		
A - 4	0	1400	Privilege St	210' from E line of Winter	APS		6	1960	12		6	APS			WWD	Woonsocket		
A - 4	1	1401	Winter St	at E line of Lawton	Darling		6	1957	12	84	6		1957		WWD	Woonsocket		
A - 4	2	1402	Pond St	at S line of Winter	Chapman		4		6	87				Y	WWD	Woonsocket		
A - 4	3	1403	Winter St	37' from S line of Privilege	APS		6	1960	12		6	APS			WWD	Woonsocket		
A - 4	4	1404	Privilege St	480' from E line of Winter	US Pipe		6	1992	12	86	6				WWD	Woonsocket		
A - 4	5	1405	Privilege St	730' from E line of Winter	APS		6	1960	12	98	6	APS	1960	Y	WWD	Woonsocket		
A - 4	6	1406	Pond St	abutting Mill River	Chapman		4		6	93				Y	WWD	Woonsocket		
A - 4	7	1407	Privilege St	280' from W line of Roland	Fairmount		4		6	92					WWD	Woonsocket		
A - 4	8	1408	Pond St	100' from N line of Laundry	US Pipe		6	1997	6		6	TSV	1997		WWD	Woonsocket		
A - 4	9	1409	Pond St	390' from N line of Laundry	US Pipe		6	1997	6	86	6	TSV	1997		WWD	Woonsocket		
A - 4	10	1410	Privilege St	40' from E line of Roland	Chapman		4		6	92					WWD	Woonsocket		
A - 4	11	1411	Privilege St	End of extension cul de sac	Kennedy		6	1983	8		6				WWD	Woonsocket		
A - 5	0	1500	Rathbun St	90' from N line of Adams	Fairmount		4		6	85				Y	WWD	Woonsocket		
A - 5	1	1501	Social St	70' from N line of Adams			4		4					Y	WWD	Woonsocket		
A - 5	2	1502	Estes St	40' from E line of Social	Fairmount		6	1950	8	74	6				WWD	Woonsocket		
A - 5	3	1503	Estes St	60' from W line of Bellingham St	APS		6	1966	8	77	6		1966		WWD	Woonsocket		
A - 5	4	1504	Bellingham St	113 Bellingham, 100' from N line of Estes	Kennedy		6	1993	6	77					WWD	Woonsocket		
A - 5	5	1505	Estes St	160' from W line of Salisbury	Chapman		4		6	78				Y	WWD	Woonsocket		
A - 5	6	1506	Garden St	160' from N line of Estes	Fairmount		4		6	69				Y	WWD	Woonsocket		
A - 5	7	1507	Roland St	100' from S line of Diamond Hill			4		6	85				Y	WWD	Woonsocket		
A - 5	8	1508	Diamond Hill Rd	150' from W line of Rathbun	APS		6	1962	6	84	6	APS	1962		WWD	Woonsocket		
A - 5	9	1509	Rathbun St	20' from S line of Diamond Hill	APS		6	1962	12	84	6	APS	1962		WWD	Woonsocket		
A - 5	10	1510	Diamond Hill Rd	210' from E line of Rathbun	Darling		6	1957	12	83	6		1957		WWD	Woonsocket		
A - 5	11	1511	Adams St	220' from W line of Social	Chapman		4		6	77				Y	WWD	Woonsocket		
A - 5	12	1512	Diamond Hill Rd	10' from W line of Social	Darling		6	1957	12		6		1957		WWD	Woonsocket		
A - 5	13	1513	Adams St	240' from E line of Social	Chapman		4		6	72				Y	WWD	Woonsocket		
A - 5	14	1514	Diamond Hill Rd	240' from W line of Bellingham St	Darling		6	1957	12	81	6		1957		WWD	Woonsocket		
A - 5	15	1515	Bellingham St	10' from S line of Adams	Kennedy		6	1981	6	83	6	APS	1963		WWD	Woonsocket		
A - 5	16	1516	Adams St	100' from W line of Salisbury	Chapman		4		6	82					WWD	Woonsocket		
A - 5	17	1517	Salisbury St	70' from S line of Estes	Kennedy		6	1998	8	83	6				WWD	Woonsocket		
A - 5	18	1518	Estes St	100' from E line of Salisbury	Kennedy		6	1995	6	74	6		1995		WWD	Woonsocket		
A - 5	19	1519	Garden St	10' from N line of Estes	APS		6	1968	6	69	6	APS	1968		WWD	Woonsocket		
A - 5	20	1520	Garden St	190' from S line of Estes	Chapman		4		6	68				Y	WWD	Woonsocket		
A - 5	21	1521	Dewey St	70' from S line of Estes	Fairmount		4		6	68					WWD	Woonsocket		
A - 5	22	1522	Garden St	180' from N line of Diamond Hill	Fairmount		4		6	68					WWD	Woonsocket		
A - 5	23	1523	Roland St	250' from N line of Privilege			4		6	90				Y	WWD	Woonsocket		
A - 5	24	1524	Rathbun St	150' from S line of Charles	Kennedy		6	1997	12	87	6				WWD	Woonsocket		
A - 5	25	1525	Charles St	10' from W line of Dean	Fairmount		4		6	85				Y	WWD	Woonsocket		
A - 5	26	1526	Charles St	10' from W line of Social			4		6	83				Y	WWD	Woonsocket		
A - 5	27	1527	Wood Ave	80' from S line of Diamond Hill	Fairmount		6	1950	12	78	6				WWD	Woonsocket		
A - 5	28	1528	Diamond Hill Rd	10' from E line of Bellingham St	Darling		6	1957	12	78	6		1957		WWD	Woonsocket		
A - 5	29	1529	Diamond Hill Rd	180' from W line of Salisbury	Darling		6	1957	12	78	6		1957		WWD	Woonsocket		
A - 5	30	1530	Diamond Hill Rd	90' from E line of Salisbury	Darling		6	1957	12	77	6		1957		WWD	Woonsocket		
A - 5	31	1531	Rathbun St	10' from N line of Charles			4		12					Y	WWD	Woonsocket		
A - 5	32	1532	Rathbun St	55' from S line of Privilege	Kennedy		6	1997	12	88	6				WWD	Woonsocket		
A - 5	33	1533	Rathbun St	70' from N line of Privilege	Kennedy		6	1997	12	88	6				WWD	Woonsocket		
A - 5	34	1534	Privilege St	at W line of Dean	Chapman		4		6	86					WWD	Woonsocket		
A - 5	35	1535	Dean St	210' from N line of Privilege	Chapman		4		6	85				Y	WWD	Woonsocket		
A - 5	36	1536	Social St	at N line of Privilege			4		6					Y	WWD	Woonsocket		
A - 5	37	1537	Burnside Ave	120' from S line of Havelock	Fairmount		6	1950	8	75	6				WWD	Woonsocket		
A - 5	38	1538	Wood Ave	110' from N line of Havelock	Fairmount		6	1950	12	82	6				WWD	Woonsocket		
A - 5	39	1539	Wood Ave	30' from S line of Havelock	APS		6	1960	12	82	6				WWD	Woonsocket		
A - 5	40	1540	Wood Ave	170' from N line of E. Mill	APS		6	1967	12	83	6				WWD	Woonsocket		
A - 5	41	1541	Rathbun St	70' from S line of George	APS		6	1963	12	90	6	APS	1963		WWD	Woonsocket		
A - 5	42	1542	George St	40' from E line of Chester	Chapman		4		8	88				Y	WWD	Woonsocket		
A - 5	43	1543	Burnside Ave	240' from N line of Mill	Kennedy		6		8	77	6			Y	WWD	Woonsocket		
A - 5	44	1544	Burnside Ave	40' from N line of Mill	Fairmount		6	1950	8	77	6				WWD	Woonsocket		
A - 5	45	1545	Mill St	60' from W line of Wood	Fairmount		4		6	77				Y	WWD	Woonsocket		
A - 5	46	1546	Wood Ave	at center line of E. Mill	Fairmount		6	1950	12	77	6				WWD	Woonsocket		
A - 5	47	1547	E. Mill St	120' from E line of Wood	APS		4	1964	6	77					WWD	Woonsocket		GRID SHOWS 6"
A - 5	48	1548	E. Mill St	40' from W line of Dulude	Mueller		6	1960	6	80	6				WWD	Woonsocket		
A - 5	49	1549	Social St	at N line of Privilege	APS		6	1967	6	84	6	APS	1967		WWD	Woonsocket		
A - 5	50	1550	Roland St	90' from S line of Diamond Hill	APS		6	1960	6		6	APS			WWD	Woonsocket		

Appendix F
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Hydrant Database

Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
A - 5	51	1551	Roland St	252' from N line of Privilege	APS		6	1960	6		6	APS			WWD	Woonsocket		
A - 5	52	1552	Charles St	39' from W line of Social	APS		6	1971	6		6	APS	1971		WWD	Woonsocket		
A - 5	53	1553	Adams St	20' from W line of Social	Kennedy		6	1972	6	60	6	Kennedy	1972		WWD	Woonsocket		
A - 5	54	1554	Garden St	186' from S line of Estes	Kennedy		6	1976	6	70	6	Kennedy	1976		WWD	Woonsocket		
A - 5	55	1555	Garden St	at end; 163' from N line of Estate	Kennedy		6	1988	6		6		1988		WWD	Woonsocket		
A - 5	56	1556	Adams St	218' from W line of Social	Kennedy	K 81 A	6	1989	6	77					WWD	Woonsocket		
A - 5	57	1557	Charles St	182' from Rathbun St, @ house 52	US Pipe		6	1989	6						WWD	Woonsocket		
A - 5	58	1558	Dean St	201' from Charles @ 39-41	Kennedy	K81A	6	1990	6	85			1990		WWD	Woonsocket		
A - 5	59	1559	Estes St	161' from W line of Salisbury	US Pipe		6	1990	6		6	Clow	1990		WWD	Woonsocket		
A - 5	60	1560	George St	at Social St	US Pipe		6	1992	8		6	Clow	1992		WWD	Woonsocket		
A - 5	61	1561	Adams St	at house 160, 280' from W line of Bellingham St	US Pipe		6	1994	6		6	Mueller	1994		WWD	Woonsocket		
A - 6	0	1600	Estes St	90' from E line of Dewey	Fairmount		4		6	68					WWD	Woonsocket		
A - 6	1	1601	St. Louis Ave	110' from N line of Achille	APS		6	1960	8	71	6	APS	1960		WWD	Woonsocket		
A - 6	2	1602	Benelli St	at Bellingham line	APS		6	1963	8	54	6	APS	1963		WWD	Woonsocket		
A - 6	3	1603	Atlanta St	70' from S line of Benelli	Mueller		6	1979	8	53	6	P&C			WWD	Woonsocket		
A - 6	4	1604	Atlanta St	110' from N line of Benelli	Mueller		6	1979	8		6	P&C			WWD	Woonsocket		
A - 6	5	1605	Diamond Hill Rd	40' from E line of Dewey	Darling		6	1957	12	75	6		1957		WWD	Woonsocket		
A - 6	6	1606	Diamond Hill Rd	10' from W line of Fulton	Darling		6	1957	12	77	6		1957		WWD	Woonsocket		
A - 6	7	1607	St. Leon Ave	10' from S line of Diamond Hill	Darling		6	1984	8	83	6				WWD	Woonsocket		
A - 6	8	1608	St. Cecile Ave	10' from S line of Diamond Hill	US Pipe		6	1996	8	74	6				WWD	Woonsocket		
A - 6	9	1609	St. Louis Ave	10' from S line of Diamond Hill	US Pipe		6	1994	8	69	6				WWD	Woonsocket		
A - 6	10	1610	St. Louis Ave	40' from S line of Prince	APS		6	1960	8	70	6	APS	1960		WWD	Woonsocket		
A - 6	11	1611	St. Agnes Ave	10' from S line of Diamond Hill	Kennedy		6	1998	8	66	6				WWD	Woonsocket		
A - 6	12	1612	St. Nicholas Ave	10' from S line of Diamond Hill	Fairmount		6	1950	8	63	6				WWD	Woonsocket		
A - 6	13	1613	Linden Ave	10' from S line of Diamond Hill	Kennedy		6	1979	8		6				WWD	Woonsocket		
A - 6	14	1614	Atlanta St	10' from N line of Diamond Hill	Mueller		6	1979	8	52	6				WWD	Woonsocket		
A - 6	15	1615	Diamond Hill Rd	260' from E line of Atlanta	Chapman		6	1950	12	49	6				WWD	Woonsocket		
A - 6	16	1616	St. Louis Ave	800' from S line of Diamond Hill	APS		6	1960	8	57	6	APS	1960		WWD	Woonsocket		
A - 6	17	1617	St. Leon Ave	490' from S line of Diamond Hill	RD Wood		6	1932	8	74	6				WWD	Woonsocket		
A - 6	18	1618	St. Leon Ave	230' from S line of Diamond Hill	Kennedy		6	1990	8	74	6				WWD	Woonsocket		
A - 6	19	1619	St. Cecile Ave	450' from S line of Diamond Hill	RD Wood		6	1932	8	65	6				WWD	Woonsocket		
A - 6	20	1620	St. Cecile Ave	230' from S line of Diamond Hill	RD Wood		6	1932	8	66	6				WWD	Woonsocket		
A - 6	21	1621	Linden Ave	20' from N line of Coolidge	RD Wood		6	1932	8		6				WWD	Woonsocket		
A - 6	22	1622	Linden Ave	200' from S line of Diamond Hill	RD Wood		6	1932	8	53	6				WWD	Woonsocket		
A - 6	23	1623	St. Leon Ave	750' from S line of Diamond Hill	RD Wood		6	1932	8	74	6				WWD	Woonsocket		
A - 6	24	1624	St. Cecile Ave	760' from S line of Diamond Hill	RD Wood		6	1932	8	68	6				WWD	Woonsocket		
A - 6	25	1625	St. Louis Ave	410' from S line of Diamond Hill	APS		6	1960	8	58	6	APS	1960		WWD	Woonsocket		
A - 6	26	1626	St. Agnes Ave	390' from S line of Diamond Hill	Mueller		6	1953	8	52	6				WWD	Woonsocket		
A - 6	27	1627	Linden Ave	10' from S line of Denby	RD Wood		6	1932	8	49	6				WWD	Woonsocket		
A - 6	28	1628	St. Agnes Ave	800' from S line of Diamond Hill	Mueller		6	1953	8	45	6				WWD	Woonsocket		
A - 6	29	1629	Atlanta St	200' from N line of Diamond Hill			6		8					Y	WWD	Woonsocket		
A - 6	30	1630	Achille St	200' from E line of St. Louis	Kennedy		6	1978	8		6	APS	1965		WWD	Woonsocket		
A - 6	31	1631	Denby St	270' from E line of Linden	Kennedy		6	1979	8		6	Kennedy	1979		WWD	Woonsocket		
A - 6	32	1632	Fulton St	at state line	Mueller		6	1985	8		6	Darling	1985		WWD	Woonsocket		
A - 6	33	1633	Fulton St	130' north of Diamond Hill	Mueller		6	1985	8		6	Kennedy	1985		WWD	Woonsocket		
A - 6	34	1634	Rome Ave	11' from S line of Prince	Mueller		6	1986			6	Mueller	1986		WWD	Woonsocket		
A - 6	35	1635	Prince St	380' from W line of Rome	US Pipe		6	1993	8		6	Kennedy	1993		WWD	Woonsocket		
A - 7	0	1700	Pine Crest Drive	West end	APS		6	1963	8	38	6	APS	1963		WWD	Woonsocket		
A - 7	1	1701	Mendon Rd	120' from N line of Pine Crest South	APS		6	1963	8	28	6	APS	1963		WWD	Woonsocket		
A - 7	2	1702	Mendon Rd	30' from N line of Diamond Hill	Kennedy		6	1977	8	42	6		1977		WWD	Woonsocket		
A - 7	3	1703	Morris St	20' from S line of Diamond Hill	Fairmount		6	1950	8	45	6				WWD	Woonsocket		
A - 7	4	1704	Mendon Rd	10' from S line of Grange	APS		6	1960	12	45	6	APS	1960		WWD	Woonsocket		
A - 7	5	1705	Diamond Hill Rd	280' from E line of Mendon	APS		6	1960	12	82	6	APS	1960		WWD	Woonsocket		
A - 7	6	1706	Diamond Hill Rd	520' from E line of Mendon	APS		6	1960	12	82	6	APS	1960		WWD	Woonsocket		
A - 7	7	1707	Diamond Hill Rd	250' east of 1706	APS		6	1960	12	86	6	APS	1960		WWD	Woonsocket		
A - 7	8	1708	Diamond Hill Rd	320' east of 1707	APS		6	1960	12	88	6	APS	1960		WWD	Woonsocket		
A - 7	9	1709	Diamond Hill Rd	270' east of 1708	Mueller		6	1980	12	96	6	APS	1960		WWD	Woonsocket		
A - 7	10	1710	Diamond Hill Rd	300' east of 1709	Kennedy		6	1960	12	100	6	APS	1960		WWD	Woonsocket		
A - 7	11	1711	Wilcox St	310' from W line of Mendon	APS		6	1960	8	47	6	APS	1960		WWD	Woonsocket		
A - 7	12	1712	Mendon Rd	90' from N line of Wilcox	APS		6	1960	12	47	6	APS	1960		WWD	Woonsocket		
A - 7	13	1713	Diamond Hill Rd	250' from W line of Morris	Fairmount		6	1950	12	49	6				WWD	Woonsocket		
A - 7	14	1714	Mendon Rd	at Cobble Hill Storage Tank	APS		6	1960	12	38	6	APS	1960		WWD	Woonsocket		
A - 7	15	1715	Diamond Hill Rd	300' from E line of Mendon	Kennedy		6	1974	12		6				WWD	Woonsocket		
A - 7	16	1716	Diamond Hill Rd	560' from E line of Mendon			6		12					Y	WWD	Woonsocket		
A - 7	17	1717	Diamond Hill Rd	45' east of 1707, opposite side			6		12					Y	WWD	Woonsocket		
A - 7	18	1718	Diamond Hill Rd	opposite 1708			6		12					Y	WWD	Woonsocket		
A - 7	19	1719	Diamond Hill Rd	opposite 1709			6		12					Y	WWD	Woonsocket		
A - 7	20	1720	Diamond Hill Rd	opposite 1710			6		12					Y	WWD	Woonsocket		
A - 7	21	1721	Rock Ridge Drive	corner of parking lot between bldg E2 and D1	APS		6	1974	6		6	US Pipe	1974		Casden	Woonsocket		
A - 7	22	1722	Morris St	27' from S line of Grange	Kennedy		6	1974	8		6	Met	1974		WWD	Woonsocket		
A - 8	0	1800	Diamond Hill Rd	420' east of pump station	APS		6	1960	12	96	6	APS	1960		WWD	Woonsocket		
A - 8	1	1801	Diamond Hill Rd	300' east of 1800			6	1960	12	98	6	APS	1960	Y	WWD	Woonsocket		
A - 8	2	1802	Diamond Hill Rd	300' east of 1801	APS		6	1960	12	97	6	APS	1960		WWD	Woonsocket		

Appendix F
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Hydrant Database

Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
A - 8	3	1803	Diamond Hill Rd	320' east of 1802	Kennedy		6	1978	12		6	APS	1960		WWD	Woonsocket		
A - 8	4	1804	Diamond Hill Rd	306' east of 1803	APS		6	1960	12	98	6	APS	1960		WWD	Woonsocket		
A - 8	5	1805	Diamond Hill Rd	120' east of pump station	APS		6	1960	12	100	6	APS	1960		WWD	Woonsocket		
A - 8	6	1806	Diamond Hill Rd	Woonsocket Plaza	APS		6	1960	10		6				Woonsocket Plaza	Woonsocket	28	
A - 8	7	1807	Diamond Hill Rd	Woonsocket Plaza	APS		6	1960	10		6				Woonsocket Plaza	Woonsocket	29	
A - 8	8	1808	Diamond Hill Rd	Woonsocket Plaza	APS		6	1960	10		6				Woonsocket Plaza	Woonsocket	30	
A - 8	9	1809	Diamond Hill Rd	Woonsocket Plaza	Kennedy		6	1960	10		6				Woonsocket Plaza	Woonsocket	31	
A - 8	10	1810	Diamond Hill Rd	Woonsocket Plaza	US Pipe		6	1960	10		6				Woonsocket Plaza	Woonsocket	32	
A - 8	11	1811	Diamond Hill Rd	Woonsocket Plaza	APS		6	1960	10		6				Woonsocket Plaza	Woonsocket	33	
A - 9	0	1900	Star Ave	110' off Sunrise Ave	APS		6	1960	8		6	A.P.S.	1964		WWD	Woonsocket		
A - 9	1	1901	Dawn Blvd	40' off Glaude Ln.	US Pipe		6	1988	8		6	A.P.S.	1964		WWD	Woonsocket		
A - 9	2	1902	Bound Rd	160' off Sunrise Ave	APS		6	1960	8		6	A.P.S.	1962		WWD	Woonsocket		
A - 9	3	1903	Dawn Blvd	20' off Sunrise Ave	APS		6	1960	8		6	A.P.S.	1962		WWD	Woonsocket		
A - 9	4	1904	Glaude Ln	200'off Albert St	APS		6	1960	8		6	A.P.S.	1966		WWD	Woonsocket		
A - 9	5	1905	Albert St	80' off Glaude Ln	APS		6	1960	8		6	A.P.S.	1966		WWD	Woonsocket		
A - 9	6	1906	Glaude Ln	240' off Albert St.	APS		6	1960	8		6	A.P.S.	1966		WWD	Woonsocket		
A - 9	7	1907	Star Ave	Southwesterly end of cul-de-sac	APS		6	1960	8		6	A.P.S.	1967		WWD	Woonsocket		
A - 9	8	1908	Glaude Ln	9' off Bound Rd	Kennedy		6	1979	8		6	Kennedy	1979		WWD	Woonsocket		
B - 1	0	2100	Scotia St	30' from E line of Elizabeth	Mueller		6	1961	8	66	6	APS	1961		WWD	Woonsocket		
B - 1	1	2101	Sixth Ave	30' from S line of Sycamore	Chapman		4		8	70				Y	WWD	Woonsocket		
B - 1	2	2102	Fifth Ave	30' from S line of Sycamore	Chapman		4		8	52				Y	WWD	Woonsocket		
B - 1	3	2103	Rhodes Ave	270' from W line of Comstock	Mueller		6	1984	10	73	6		1963		WWD	Woonsocket		
B - 1	4	2104	Rhodes Ave	110' from E line of Comstock	APS		6	1963	10	84	6	APS	1963		WWD	Woonsocket		
B - 1	5	2105	Rhodes Ave	10' from E line of Seventh	APS		6	1963	10	86	6	APS	1963		WWD	Woonsocket		
B - 1	6	2106	Sixth Ave	70' from N line of Rhodes	Chapman		4		8	96				Y	WWD	Woonsocket		
B - 1	7	2107	Rhodes Ave	80' from E line of Sixth	APS		6	1963	10	100	6	APS	1963		WWD	Woonsocket		
B - 1	8	2108	Seventh Ave	337' from N line of Rhodes	Kennedy		6	1978	8		6	Mueller	1978		WWD	Woonsocket		
B - 1	9	2109	Sixth Ave	34' from S line of Sycamore	Kennedy		6	1985	8		6	Clow	1985		WWD	Woonsocket		
B - 1	10	2110	Sixth Ave	77' from N line of Rhodes	Kennedy		6	1985	8		6	Clow	1985		WWD	Woonsocket		
B - 1	11	2111	Cherry Hill Ave	26.5' from S line of Sycamore	Kennedy		6	1985	8		6	Clow	1985		WWD	Woonsocket		
B - 1	12	2112	Cherry Hill Ave	250' from N line of Sycamore	Kennedy		6	1985	8		6				WWD	Woonsocket		
B - 1	13	2113	Cherry Hill Ave	605' from N line of Sycamore	Kennedy		6	1985	8		6				WWD	Woonsocket		
B - 2	0	2200	Third Ave	160' from S line of Scotia	APS		6	1961	8	85	6	APS	1961		WWD	Woonsocket		
B - 2	1	2201	Singleton St	50' from E line of River	Darling		6	1957	12	93	6		1957		WWD	Woonsocket		
B - 2	2	2202	Singleton St	610' from E line of River	Darling		6	1957	12	96	6				WWD	Woonsocket		
B - 2	3	2203	Harris Ave	50' from N line of Winter	Fairmount		6	1950	12	73	6				WWD	Woonsocket		
B - 2	4	2204	River St	350' from S line of Singleton	US Pipe		6	1992	12	93	6				WWD	Woonsocket		
B - 2	5	2205	Third Ave	170' from S line of Laurel	Chapman		4		6	78	6			Y	WWD	Woonsocket		
B - 2	6	2206	River St	570' from N line of Second	Mueller		6	1960	12	93	6				WWD	Woonsocket		
B - 2	7	2207	Highland St	380' from W line of Harris	Chapman		4		6	80				Y	WWD	Woonsocket		
B - 2	8	2208	Highland St	10' from W line of Harris	Chapman		4		6	69				Y	WWD	Woonsocket		
B - 2	9	2209	Harris Ave	190' from S line of Meadow	Mueller		6	1950	8	67	6				WWD	Woonsocket		
B - 2	10	2210	Third Ave	70' from S line of Sycamore	APS		6	1968	6	73	6	APS	1968		WWD	Woonsocket		
B - 2	11	2211	Rhodes Ave	60' from W line of Third	RD Wood		6	1932	12	64	6				WWD	Woonsocket		
B - 2	12	2212	Third Ave	40' from N line of Rhodes	US Pipe		6	1993	6	66	6				WWD	Woonsocket		
B - 2	13	2213	Rhodes Ave	70' from E line of Third	Darling		6	1957	12	70	6		1957		WWD	Woonsocket		
B - 2	14	2214	River St	10' from S line of Second	US Pipe		6	1997	14	93	6				WWD	Woonsocket		
B - 2	15	2215	Highland St	220' from N line of Lyman	Fairmount		4		6	75				Y	WWD	Woonsocket		
B - 2	16	2216	Lyman St	10' from E line of Highland	Chapman		4		6	66				Y	WWD	Woonsocket		wol
B - 2	17	2217	Fifth Ave	30' from N line of Rhodes	Chapman		4		8	51				Y	WWD	Woonsocket		
B - 2	18	2218	Rhodes Ave	20' from W line of Fourth	APS		6	1972	12		6				WWD	Woonsocket		
B - 2	19	2219	Third Ave	200' from S line of Rhodes	Chapman		4		6	65				Y	WWD	Woonsocket		
B - 2	20	2220	Second Ave	360' from S line of Rhodes	Darling		6	1957	12	86	6				WWD	Woonsocket		
B - 2	21	2221	Second Ave	265' from W line of River	US Metropolitan 250		6	2004	16		6				WWD	Woonsocket		
B - 2	22	2222	River St	330' from S line of Second	US Metropolitan 250		6	2004	16		6				WWD	Woonsocket		
B - 2	23	2223	Highland St	300' from S line of Lyman	Chapman		4		6	62					WWD	Woonsocket		
B - 2	24	2224	Singleton St	30' from E line of River			6		12					Y	WWD	Woonsocket		
B - 2	25	2225	Winter St	280' from E line of Harris	Fairmount		4	1950	8	75	6				WWD	Woonsocket		
B - 2	26	2226	Third Ave	31' from S line of Laurel	Kennedy		6	1976	6	82	6	Mueller	1976		WWD	Woonsocket		
B - 2	27	2227	Third Ave	200' from S line of Rhodes	Kennedy		6	1980	6		6	Mueller	1980		WWD	Woonsocket		
B - 2	28	2228	Cherry Hill Ave	67' from N line of Rhodes	Mueller		6	1985	8		6	Clow	1985		WWD	Woonsocket		
B - 2	29	2229	Highland St	211' from N line of Lyman	Mueller		6	1985	6		6	Clow	1985		WWD	Woonsocket		
B - 2	30	2230	Highland St	385' from W line of Harris	Mueller		6	1985	6		6	Clow	1985		WWD	Woonsocket		
B - 2	31	2231	Highland St	28' from W line of Harris	Mueller		6	1985	6		6	Clow	1985		WWD	Woonsocket		
B - 2	32	2232	Lyman St	at Highland	US Pipe		6	1991	6		6		1991		WWD	Woonsocket		
B - 3	0	2300	Winter St	at center line of Castle Heights Ct	Chapman		4		8	66					WWD	Woonsocket		
B - 3	1	2301	Meadow Rd	house #148, 230' from W line of Woodland	Kennedy		6	1995	6	63	6		1995		WWD	Woonsocket		
B - 3	2	2302	Woodland Rd	house # 263, 75' from N line of Meadow	Darling		6	1997	6	62	6		1997		WWD	Woonsocket		
B - 3	3	2303	Prospect St	340' from S line of Winter	US Pipe		6	1996	8		6		1996		WWD	Woonsocket		
B - 3	4	2304	Summer St	60' from N line of Libbeus	US Pipe		6	1996	8	67	6		1996		WWD	Woonsocket		
B - 3	5	2305	Libbeus St	10' from N line of Dexter	RD Wood		6	1932	8	74					WWD	Woonsocket		
B - 3	6	2306	Dexter St	130' from W line of N. Main			4		6	83				Y	WWD	Woonsocket		
B - 3	7	2307	N. Main St	at Aldrich			4		6					Y	WWD	Woonsocket		

Appendix F
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Hydrant Database

Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
B - 3	8	2308	N. Main St	10' from S line of E. School	Kennedy		6	1994	6	85	6		1994		WWD	Woonsocket		
B - 3	9	2309	Meadow Rd	at Oakley			4		6	70				Y	WWD	Woonsocket		
B - 3	10	2310	Oakley Rd	120' from S line of Meadow	Fairmount		4		6	66				Y	WWD	Woonsocket		
B - 3	11	2311	Upland Rd	house 38, 110' from W line of Glen	Kennedy		6	1995	6	60	6		1995		WWD	Woonsocket		
B - 3	12	2312	Upland Rd	60' from E line of Glen	Kennedy		6	1995	6	54	6		1995		WWD	Woonsocket		
B - 3	13	2313	Woodland Rd	80' from N line of Upland	Chapman		4		6	55				Y	WWD	Woonsocket		
B - 3	14	2314	Prospect St	650' from S line of Winter	Kennedy		6	1996	8	57	6		1996		WWD	Woonsocket		
B - 3	15	2315	Prospect St	320' south of 2314			4		8	64				Y	WWD	Woonsocket		
B - 3	16	2316	Summer St	290' from N line of Prospect	APS		6	1961	8	73	6		1996		WWD	Woonsocket		
B - 3	17	2317	N. Main St	190' from S line of E. School	Chapman		4		6	85				Y	WWD	Woonsocket		
B - 3	18	2318	N. Main St	at W. School	Darling		6	1957	8	86	6				WWD	Woonsocket		
B - 3	19	2319	Lyman St	10' from W line of Oakley	Fairmount		4		6	59					WWD	Woonsocket		
B - 3	20	2320	Oakley Rd	10' from S line of Upland	Chapman		4		6	63				Y	WWD	Woonsocket		
B - 3	21	2321	Glen Rd	house 190, 230' from S line of Upland	Kennedy		6	1995	6	53	6		1995		WWD	Woonsocket		
B - 3	22	2322	Woodland Rd	200' from S line of Upland	Chapman		4		6	53				Y	WWD	Woonsocket		
B - 3	23	2323	Woodland Rd	380' from W line of Spring	Kennedy		6	1997	6	57	6		1997		WWD	Woonsocket		
B - 3	24	2324	Spring St	120' from N line of Lewis	Chapman		4		6	67				Y	WWD	Woonsocket		
B - 3	25	2325	Prospect St	20' from E line of Spring	Chapman		4		8	70				Y	WWD	Woonsocket		
B - 3	26	2326	Prospect St	10' from W line of Summer	Darling		6	1957	8	75	6				WWD	Woonsocket		
B - 3	27	2327	W. School St	120' from S line of Prospect	Fairmount		4		8	79	6			Y	WWD	Woonsocket		
B - 3	28	2328	N. Main St	40' from N line of Gorman	Chapman		4		8	88				Y	WWD	Woonsocket		
B - 3	29	2329	Mechanic Ave	10' from E line of Earle	Chapman		4		6	94					WWD	Woonsocket		
B - 3	30	2330	Miller Ln	250' from E line of Blackstone	Chapman		4		4	90					WWD	Woonsocket		
B - 3	31	2331	Lyman St	10' from W line of Harris	Chapman		4		6	61					WWD	Woonsocket		
B - 3	32	2332	Harris Ave	190' from S line of Lyman	RD Wood		6	1932	12	62	6				WWD	Woonsocket		
B - 3	33	2333	Oakley Rd	220' from S line of Lyman	Kennedy		6		6	57					WWD	Woonsocket		
B - 3	34	2334	Oakley Rd	90' from E line of Homestead	APS		6	1960	6	57	6	APS			WWD	Woonsocket		
B - 3	35	2335	Glen Rd	120' from N line of Oakley, house 103	Kennedy		6	1995	6	55	6		1995		WWD	Woonsocket		
B - 3	36	2336	Glen Rd	house 46, 180' from W line of Spring	Kennedy		6	1995	6	64	6		1995		WWD	Woonsocket		
B - 3	37	2337	Spring St	90' from N line of Glen	Kennedy		6		8	70				Y	WWD	Woonsocket		
B - 3	38	2338	Spring St	20' from N line of Woodland	APS		6	1967	8	68	6	APS	1967		WWD	Woonsocket		
B - 3	39	2339	W. School St	10' from N line of Lewis	Darling		6	1957	8	77	6				WWD	Woonsocket		
B - 3	40	2340	Boyden St	190' from S line of Gorman	Chapman		4		6	76					WWD	Woonsocket		
B - 3	41	2341	N. Main St	10' from S line of Daniels	Chapman		4		8	74	none				WWD	Woonsocket		no gate
B - 3	42	2342	Earle St	10' from S line of Daniels	APS		6	1961	6	98	6	APS	1961		WWD	Woonsocket		
B - 3	43	2343	Blackstone St	120' from W line of Harris	Darling		6	1957	12	69	6		1957		WWD	Woonsocket		
B - 3	44	2344	Harris Ave	40' from N line of Homestead	RD Wood		6	1932	12	66	6				WWD	Woonsocket		
B - 3	45	2345	Homestead Rd	120' from E line of Harris	Kennedy		6	1989	6	62	6		1989		WWD	Woonsocket		
B - 3	46	2346	Blackstone St	10' from E line of Homestead	Kennedy		6	1978	12		6				WWD	Woonsocket		
B - 3	47	2347	Blackstone St	10' from W line of Kindergarten	Chapman		6	1950	12	71	6				WWD	Woonsocket		
B - 3	48	2348	Blackstone St	at W line of Spring	APS		6	1967	12	74	6				WWD	Woonsocket		
B - 3	49	2349	Blackstone St	at W line of W. School	US Pipe		6	1996	12	74	6		1996		WWD	Woonsocket		
B - 3	50	2350	Blackstone St	10' from E line of High School	Darling		6	1957	12	74	6		1991		WWD	Woonsocket		
B - 3	51	2351	High School St	190' from W line of Boyden	APS		6	1962	6	77	6	APS	1962		WWD	Woonsocket		
B - 3	52	2352	Boyden St	10' from W line of High School	Chapman		4		6	77					WWD	Woonsocket		
B - 3	53	2353	Blackstone St	at N line of Boyden	US Pipe		6	1996	12	80	6	APS	1989		WWD	Woonsocket		
B - 3	54	2354	N. Main St	210' from N line of Snow	Chapman		4		8	97					WWD	Woonsocket		
B - 3	55	2355	N. Main St	10' from N line of Snow	Chapman		4		8	97	4				WWD	Woonsocket	20	
B - 3	56	2356	Libbeus St	140' from S line of Dexter			6		8					Y	WWD	Woonsocket		
B - 3	57	2357	Arnold St	at N line of Church	Fairmount		4		8	77					WWD	Woonsocket		
B - 3	58	2358	W. School St	205' from N line of Prospect			4		8					Y	WWD	Woonsocket		
B - 3	59	2359	N. Main St	80' from S line of Barton	APS		6	1968	6	86	6	APS	1968		WWD	Woonsocket		
B - 3	60	2360	N. Main St	200' from S line of E. School	APS		6	1969	6	80	6	APS	1969		WWD	Woonsocket		
B - 3	61	2361	Meadow Rd	1' from W line of Oakley	APS		6	1960	6		6	Kennedy			WWD	Woonsocket		
B - 3	62	2362	Dexter St	125' from W line of N. Main	Kennedy		6	1973	6		6	MET	1973		WWD	Woonsocket		
B - 3	63	2363	Prospect St	54' from W line of N. Main	Kennedy		6	1976	6	80	6	Kennedy	1976		WWD	Woonsocket		
B - 3	64	2364	Spring St	125' from N line of Lewis	Kennedy		6	1983	8		6	Kennedy	1983		WWD	Woonsocket		
B - 3	65	2365	Oakley Rd	18' from S line of Upland	Kennedy		6	1989	6		6				WWD	Woonsocket		
B - 3	66	2366												Y				no card
B - 3	67	2367	Spring St	118' from Glen, house 56	Kennedy	K81A	6	1989	8		6				WWD	Woonsocket		
B - 3	68	2368	Woodland Rd	75' from N line of Upland	Kennedy	K10	6	1990	6		6				WWD	Woonsocket		
B - 3	69	2369	W. School St	at Prospect	US Pipe		6	1991	8		6				WWD	Woonsocket		
B - 3	70	2370	Summer St	at S corner of Rebekah	Kennedy		6	1996	8		6				WWD	Woonsocket		
B - 3	71	2371	Prospect St	at house 179	Kennedy		6	1996	8		6		1996		WWD	Woonsocket		
B - 3	72	2372	Woodland Rd	at house 123	Kennedy		6	1997	6		6		1997		WWD	Woonsocket		
B - 4	0	2400	Pond St	160' from N line of E. School	Fairmount		4		6	87				Y	WWD	Woonsocket		
B - 4	1	2401	Hazel St	210' from N line of E. School	Chapman		4		8	103	6			Y	WWD	Woonsocket		
B - 4	2	2402	Hazel St	120' from E end of Hazel	Mueller		6	1960	8	103	6				WWD	Woonsocket		
B - 4	3	2403	Pond St	10' from S line of E. School	US Pipe		6	1997	12	87	6				WWD	Woonsocket		
B - 4	4	2404	Pond St	80' from N line of Mechanic	Darling		6	1957	12	88	6				WWD	Woonsocket		
B - 4	5	2405	E. School St	260' from E line of Pond	Chapman		4		8	93					WWD	Woonsocket		
B - 4	6	2406	E. School St	340' east of 2405	Kennedy		6	1973	8	105	6				WWD	Woonsocket		
B - 4	7	2407	E. School St	210' east of 2406	Kennedy		6	1996	8	102	6	APS	1966		WWD	Woonsocket		

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B - 4	8	2408	E. School St	250' west of 2409	APS		6	1966	12	106	6				WWD	Woonsocket		
B - 4	9	2409	E. School St	200' from W line of Ives	Mueller		6	1932	12	106	6				WWD	Woonsocket		
B - 4	10	2410	E. School St	10' from E line of Ives	US Pipe		6	1992	12	106	6				WWD	Woonsocket		
B - 4	11	2411	E. School St	40' from W line of Elbow	US Pipe		6	1996	12	105	6				WWD	Woonsocket		
B - 4	12	2412	E. School St	180' from E line of Elbow	Chapman		6	1950	12	103	6				WWD	Woonsocket		
B - 4	13	2413	Rathbun St	10' from S line of E. School	Mueller		6	1991	12	99	6		1991		WWD	Woonsocket		
B - 4	14	2414	Daniels St	190' from W line of Pond	US Pipe		6	1992	8	95	6				WWD	Woonsocket		
B - 4	15	2415	Daniels St	10' from W line of Pond	APS		6	1964	12	95	6	APS	1964		WWD	Woonsocket	2	
B - 4	16	2416	Elbow St	270' from W line of Rathbun	Chapman		4		6	106				Y	WWD	Woonsocket		
B - 4	17	2417	Rathbun St	20' from S line of Elbow	Kennedy		6	1997	12	105	6				WWD	Woonsocket		
B - 4	18	2418	Earle St	230' from N line of Snow	Chapman		4		6	98					WWD	Woonsocket		
B - 4	19	2419	Pond St	250' from N line of Snow	Darling		6	1957	12	100	6				WWD	Woonsocket		
B - 4	20	2420	Pond St	10' from S line of Snow	Kennedy		6	1997	12	101	6		1997		WWD	Woonsocket		
B - 4	21	2421	Social St	120' from W line of Sampson	Kennedy		6	1997	8	103	6		1997		WWD	Woonsocket		
B - 4	22	2422	Social St	10' from E line of Sampson	Kennedy		6		8	104					WWD	Woonsocket		
B - 4	23	2423	Social St	at W line of Page	Kennedy		6		8	106					WWD	Woonsocket		
B - 4	24	2424	Social St	across from J.A. Cummings Way			4							Y	WWD	Woonsocket		see service 7785, 440 Social St
B - 4	25	2425	Social St	10' from W line of Gobeille	Mueller		6	1960	8	106	6				WWD	Woonsocket		
B - 4	26	2426	Social St	10' from W line of Cumberland	APS		6	1967	8	107	6	APS	1967	Y	WWD	Woonsocket		
B - 4	27	2427	Cumberland St	10' from S line of Social	Kennedy		6	1979	12		6			Y	WWD	Woonsocket		
B - 4	28	2428	Social St	10' from E line of Rathbun	Darling		6	1957	12	106	6				WWD	Woonsocket		
B - 4	29	2429	Snow St	240' from W line of Earle	US Pipe		6	1988	4		6		1988		WWD	Woonsocket		
B - 4	30	2430	Earle St	230' from W line of Earle	APS		6	1964	6	97	6	APS	1964		WWD	Woonsocket		
B - 4	31	2431	Social St	10' from E line of Earle	Kennedy		6	1950	8	98					WWD	Woonsocket		
B - 4	32	2432	Pond St	32' from N line of Social	Kennedy		6	1975	12	100	6		1964		WWD	Woonsocket	24	
B - 4	33	2433	Social St	10' from E line of Collier	Fairmount		4		8	104				Y	WWD	Woonsocket		
B - 4	34	2434	Nourse St	190' from S line of Social					8		6			Y	WWD	Woonsocket		SAC, out-cut at hyd branch, awaiting development
B - 4	35	2435	Social St	10' from E line of Nours	Chapman		4		8	104				Y	WWD	Woonsocket		
B - 4	36	2436	Social St	at bldg 263/287 Mill River Square	Kennedy		6	1975	8		6				private	Woonsocket	37	
B - 4	37	2437												Y				no card
B - 4	38	2438												Y				no card
B - 4	39	2439	Gobeille Ave	160' from E line of Page			4		6	106				R	WWD	Woonsocket		
B - 4	40	2440	Clinton St	260' from E line of Page	Kennedy		6	1996	12	106	6	APS	1960		WWD	Woonsocket		
B - 4	41	2441												Y				no card
B - 4	42	2442	Clinton St	220' east of 2440	Darling		6	1957	12	106	6				WWD	Woonsocket		
B - 4	43	2443	Clinton St	130' from W line of Cumberland	Fairmount		6	1950	12	106	6				WWD	Woonsocket		
B - 4	44	2444	Mechanic St	210' from W line of Pond	RD Wood		4		6	85					WWD	Woonsocket		
B - 4	45	2445	Social St	at Mill River Square	APS		6	1960	8		6				private	Woonsocket	38	
B - 4	46	2446	Clinton St	bldg 450 at Mill River Square	APS		6	1960	8		6				private	Woonsocket	34	
B - 4	47	2447	Cumberland St	43' south of Social	APS		6	1983	12		6		1983		WWD	Woonsocket		
B - 4	48	2448	Elbow St	60' from east corner of street line	US Pipe		6	1992	6		6	Clow	1992		WWD	Woonsocket		
B - 4	49	2449	Pond St	at house 429	US Pipe		6	1994	6		6	Mueller	1994		WWD	Woonsocket		
B - 5	0	2500	Rathbun St	10' from N line of Oak Hill	Kennedy		6	1997	12	93	6		1997		WWD	Woonsocket		
B - 5	1	2501	Rathbun St	300' from N line of Oak Hill	Darling		6	1957	12	90	6				WWD	Woonsocket		
B - 5	2	2502	Chester St	300' from S entrance of Chester	Chapman		4		6	90				Y	WWD	Woonsocket		
B - 5	3	2503	Social St	80' from N line of Mill	Fairmount		4		8	90				Y	WWD	Woonsocket		
B - 5	4	2504	Social St	80' from N line of Chester	US Pipe		6	1988	8	93	6				WWD	Woonsocket		
B - 5	5	2505	Mill St	120' from W line of Burnside	Chapman		4		6	81					WWD	Woonsocket		
B - 5	6	2506	Burnside Ave	130' from S line of Mill			4		6					Y	WWD	Woonsocket		
B - 5	7	2507	Wood Ave	160' from S line of Mill	Chapman		4		6	78					WWD	Woonsocket		
B - 5	8	2508	Wood Ave	280' from N line of Birch	APS		6	1964	6	78	6	APS	1964		WWD	Woonsocket		
B - 5	9	2509	Wood Ave	15' from S line of Birch	Darling		6	1984	6		6	Kennedy	1984		WWD	Woonsocket		
B - 5	10	2510	Social St	130' from S line of Chester	Fairmount		4		8	96				Y	WWD	Woonsocket		
B - 5	11	2511	Burnside Ave	364' from S line of Mill			4		6					Y	WWD	Woonsocket		
B - 5	12	2512	Wood Ave	10' from S line of Birch	Chapman		4		6	70				Y	WWD	Woonsocket		
B - 5	13	2513	Dulude Ave	40' from S line of Birch, house 390	Kennedy		6	1996	6	79	6		1996		WWD	Woonsocket		
B - 5	14	2514	Social St	170' from S line of E. School	Chapman		6	1950	12	100	6				WWD	Woonsocket		
B - 5	15	2515	E. School St	10' from N line of Social	RD Wood		6	1932	12	100	6				WWD	Woonsocket	3	
B - 5	16	2516	Elm St	30' from S line of Brook	APS		6	1964	8	102	6	APS	1964		WWD	Woonsocket		
B - 5	17	2517	Burnside Ave	404' from N line of Robinson			4		6					Y	WWD	Woonsocket		
B - 5	18	2518	Wood Ave	230' from S line of Birch	Fairmount		4		6	70				Y	WWD	Woonsocket		
B - 5	19	2519	Dulude Ave	220' from N line of Robinson, house 332	Kennedy		6	1996	6	77	6		1996		WWD	Woonsocket		
B - 5	20	2520	Progresso Ave	385' from N line of Robinson	Kennedy		6	1974	8		6				WWD	Woonsocket		
B - 5	21	2521	Progresso Ave	210' from N line of Robinson	RD Wood		6	1932	8	72	6				WWD	Woonsocket		
B - 5	22	2522	Social St	225' from E line of Rathbun	Chapman		6		12	106	6			R	WWD	Woonsocket		
B - 5	23	2523	Brook St	400' from E line of Cumberland St	Chapman		4		8	106				Y	WWD	Woonsocket		
B - 5	24	2524	Gaulin Ave	20' from W line of Elm	Fairmount		6	1950	6	91	6				WWD	Woonsocket		
B - 5	25	2525	Elm St	60' from N line of Gaulin	APS		6	1964	8	80	6	APS	1964		WWD	Woonsocket		
B - 5	26	2526	Robinson St	220' from E line of Elm	RD Wood		6	1932	8	78	6				WWD	Woonsocket		
B - 5	27	2527	Robinson St	175' from W line of Burnside	RD Wood		6	1932	8	70	6				WWD	Woonsocket		
B - 5	28	2528	Burrnside Ave	10' from S line of Robinson	Chapman		4		6	70				Y	WWD	Woonsocket		
B - 5	29	2529	Robinson St	80' from W line of Wood			6	1960	8	68	6				WWD	Woonsocket		
B - 5	30	2530	Wood Ave	95' from N line of Robinson	Fairmount		4		6	66				Y	WWD	Woonsocket		

Appendix F
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Hydrant Database

Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
B - 5	31	2531	Wood Ave	80' from S line of Robinson	Fairmount		4		6	67				Y	WWD	Woonsocket		
B - 5	32	2532	Robinson St	140' from E line of Wood	Kennedy		6	1997	8	68	6				WWD	Woonsocket		
B - 5	33	2533	Dulude Ave	40' from S line of Robinson	Kennedy		6	1996	6	73	6		1996		WWD	Woonsocket		
B - 5	34	2534	Progresso Ave	10' from N line of Robinson	RD Wood		6	1932	8	72	6				WWD	Woonsocket		
B - 5	35	2535	Progresso Ave	60' from S line of Robinson	Chapman		4		8	76				Y	WWD	Woonsocket		
B - 5	36	2536	Robinson St	20' from W line of Merida	Chapman		4		6	69				Y	WWD	Woonsocket		
B - 5	37	2537	Cumberland St	36' from N line of Clinton	Darling		6	1957	8	106	6				WWD	Woonsocket	59	
B - 5	38	2538	Cumberland St	130' from S line of Clinton	Kennedy		6	1982	12	106	6				WWD	Woonsocket		
B - 5	39	2539	Gaulin Ave	240' from N line of Locust	APS		6	1967	6	102	6				WWD	Woonsocket		
B - 5	40	2540	Gaulin Ave	60' from N line of Locust	Fairmount		4		6	102					WWD	Woonsocket		
B - 5	41	2541	Gaulin Ave	220' from W line of Elm	APS		6	1967	6	98	6	APS	1967		WWD	Woonsocket		
B - 5	42	2542	Elm St	100' from N line of Locust	APS		6	1964	8	83	6	APS	1964		WWD	Woonsocket		
B - 5	43	2543	Robinson St	80' from E line of Elm			6		8		6			Y	WWD	Woonsocket		
B - 5	44	2544	Elm St	10' from W line of Burnside			4		8					Y	WWD	Woonsocket		
B - 5	45	2545	Burnside Ave	340' from S line of Robinson			4		6	70				Y	WWD	Woonsocket		
B - 5	46	2546	Wood Ave	280' from S line of Robinson	Fairmount		4		6	68				Y	WWD	Woonsocket		
B - 5	47	2547	Wood Ave	260' from N line of Elm	Fairmount		4		6	68				Y	WWD	Woonsocket		
B - 5	48	2548	Dulude Ave	350' from S line of Robinson	Kennedy		6	1996	6	70	6		1996		WWD	Woonsocket		
B - 5	49	2549	Progresso Ave	350' from S line of Robinson	Chapman		4		8	75				Y	WWD	Woonsocket		
B - 5	50	2550	Merida Ave	245' from S line of Robinson	Mueller		6	1979	6		6	Mueller	1979		WWD	Woonsocket		
B - 5	51	2551	Yolande Place	14' from E line of Chalapa	Mueller		6	1979	8		6	Mueller	1979		WWD	Woonsocket		
B - 5	52	2552	Birch St	120' from W line of Dulude	RD Wood		6	1932	8	77	6				WWD	Woonsocket		
B - 5	53	2553	Burnside Ave	40' from E line of Elm	APS		6	1967	6	79	6	APS	1967		WWD	Woonsocket		
B - 5	54	2554	Burnside Ave	125' from S line of Mill	Kennedy		6	1974	6		6	MET	1974		WWD	Woonsocket		
B - 5	55	2555	Burnside Ave	360' from S line of Mill	Kennedy		6	1974	6		6	MET	1974		WWD	Woonsocket		
B - 5	56	2556	Burnside Ave	400' from N line of Robinson	Kennedy		6	1974	6		6	MET	1974		WWD	Woonsocket		
B - 5	57	2557	Chester St	300' from S line of George	Kennedy		6	1976	6	82	6	Kennedy			WWD	Woonsocket		
B - 5	58	2558	Burnside Ave	23' from S line of Robinson	Kennedy		6	1979	6		6	Kennedy	1979		WWD	Woonsocket		
B - 5	59	2559	Chalapa Ave	185' from S line of Yolande	Mueller		6	1979	6		6	Mueller	1979		WWD	Woonsocket		
B - 5	60	2560	Wood Ave	175' from N line of Robinson	Darling		6	1984	6		6	Kennedy	1984		WWD	Woonsocket		
B - 5	61	2561	Wood Ave	175' from S line of Robinson	Darling		6	1984	6		6	Kennedy	1984		WWD	Woonsocket		
B - 5	62	2562	Clinton St	340' east of Cumberland	Kennedy		6	1983	12		6		1983		WWD	Woonsocket		
B - 5	63	2563	Progresso Ave	239' from N line of Elm	Mueller		6	1986	8		6	Mueller	1986		WWD	Woonsocket		
B - 5	64	2564	Progresso Ave	68' from S line of Robinson	Mueller		6	1986	8		6	Mueller	1986		WWD	Woonsocket		
B - 5	65	2565	Social St	85' from N line of Mill, house 736	US Pipe		6	1988	8		6				WWD	Woonsocket		
B - 5	66	2566	Social St	135' from S line of Chester, house 836	US Pipe		6	1988	8		6				WWD	Woonsocket		
B - 5	67	2567	Robinson St	46' west of Merida on north side of Robinson	US Pipe		6	1990	6		6				WWD	Woonsocket		
B - 5	68	2568	Mill St	27' from southwest concrete end post of bridge	Kennedy		6	1991	8		6				WWD	Woonsocket		
B - 6	0	2600	Winthrop St	10' from S line of All Saints	RD Wood		6	1932	8	69	6				WWD	Woonsocket		
B - 6	1	2601	St. Leon Ave	130' from N line of All Saints	RD Wood		6	1932	8	70	6				WWD	Woonsocket		
B - 6	2	2602	All Saints St	100' from E line of St. Leon	APS		6	1976	8	43	6				WWD	Woonsocket		
B - 6	3	2603	St. Cecile Ave	100' from N line of All Saints	RD Wood		6	1932	8	65	6				WWD	Woonsocket		
B - 6	4	2604	All Saints St	50' from E line of St. Louis	Mueller		6	1960	8	59	6				WWD	Woonsocket		
B - 6	5	2605	Linden St	150' from S line of Fall	Mueller		6	1960	8	44	6				WWD	Woonsocket		
B - 6	6	2606	Linden St	10' from N line of Fall	RD Wood		6	1932	8	42	6				WWD	Woonsocket		
B - 6	7	2607	Linden St	at S line of Hayes	RD Wood		6	1932	8	44	6				WWD	Woonsocket		
B - 6	8	2608	Hayes	80' from E line of Theodore	Kennedy		6	1979	8		6	Kennedy	1979		WWD	Woonsocket		
B - 6	9	2609	Denby St	100' from W line of Coolidge	Darling		6	1957	8	50	6				WWD	Woonsocket		
B - 6	10	2610	Winthrop St	120' from N line of Birch, house 223	Kennedy		6	1995	8	76	6		1995		WWD	Woonsocket		
B - 6	11	2611	Winthrop St	10' from N line of Morin Heights	Mueller		6	1960	8	70	6				WWD	Woonsocket		
B - 6	12	2612	Morin Heights Blvd	280' from E line of Winthrop	Mueller		6	1982	8	70	6	January 1, 1982			WWD	Woonsocket		
B - 6	13	2613	Morin Heights Blvd	460' from S line of Linden	Mueller		6	1982	8	58	6	January 1, 1982			WWD	Woonsocket		
B - 6	14	2614	Winthrop St	80' from S line of Birch, house 186	Kennedy		6	1995	8	76	6		1995		WWD	Woonsocket		
B - 6	15	2615	Rutland St	420' from N line of Robinson	RD Wood		6		8	73	6			Y	WWD	Woonsocket		
B - 6	16	2616	Rutland St	570' from N line of Robinson	US Pipe		6	1991	8	73	6				WWD	Woonsocket		
B - 6	17	2617	Morin Heights Blvd	480' south of 2612	Mueller		6	1982	8	73	6	January 1, 1982			WWD	Woonsocket		
B - 6	18	2618	Winthrop St	20' from N line of Robinson	Chapman		4		8	73				Y	WWD	Woonsocket		BF 4/6/83, repaired 11/23/93
B - 6	19	2619	Winthrop St	230' from N line of Robinson	APS		6		8	76	6	APS			WWD	Woonsocket		
B - 6	20	2620	Robinson St	30' from W line of Rutland	Kennedy		6	1997	8	74	6				WWD	Woonsocket		
B - 6	21	2621	Rutland St	230' from N line of Robinson	US Pipe		6	1992	8	72	6				WWD	Woonsocket	4	
B - 6	22	2622	Robinson St	60' from W line of Milton	Kennedy		6	1997	8	76	6		1997		WWD	Woonsocket		
B - 6	23	2623	Robinson St	at W line of Florida	US Pipe		6	1995	8	78	6				WWD	Woonsocket		
B - 6	24	2624	Morin Heights Blvd	10' from N line of Robinson	Mueller		6	1982	8	74	6	January 1, 1982			WWD	Woonsocket		
B - 6	25	2625	Morin Heights Blvd	520' south of 2613	Mueller		6	1982	8	62	6	January 1, 1982			WWD	Woonsocket		
B - 6	26	2626	Yolande Place	80' from W line of Winthrop	Mueller		6	1982	8	80	6				WWD	Woonsocket		
B - 6	27	2627	Winthrop St	7' south of 2637			4		8					Y	WWD	Woonsocket		
B - 6	28	2628	Winthrop St	60' from N line of Yolande	Kennedy		6	1995	8	76	6		1995		WWD	Woonsocket		
B - 6	29	2629	Rutland St	10' from N line of Elm	Fairmount		6	1950	8	82	6				WWD	Woonsocket		
B - 6	30	2630	Florida St	45' from N line of Elm			4		6					Y	WWD	Woonsocket		
B - 6	31	2631	Florida St	at S line of Ella	Chapman		4		8	79					WWD	Woonsocket		
B - 6	32	2632	Ella Ave	150' from E line of Florida	Kennedy		6	1997	8	73	6		1997		WWD	Woonsocket		
B - 6	33	2633	Robinson St	division line of Robinson and Morin Heights	Mueller		6	1982	8	74	6				WWD	Woonsocket		
B - 6	34	2634	Poplar St	30' from W line of Laurier	Mueller		6	1960	8	60	6				WWD	Woonsocket		

Appendix F
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Hydrant Database

Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
B - 6	35	2635	Ridge St	40' from W line of Laurier	APS		6	1961	8	62	6	APS	1961		WWD	Woonsocket		
B - 6	36	2636	Rutland St	145' from S line of Robinson			6		8					Y	WWD	Woonsocket		
B - 6	37	2637	Winthrop St	100' from S line of Yolande	APS		6	1968	8	81	6	APS	1968		WWD	Woonsocket		
B - 6	38	2638	Beacon Ave	112' from S line of Morin St	Kennedy		6	1985	8	50	6	Kennedy	1976		WWD	Woonsocket		
B - 6	39	2639	Laurier St		Kennedy		6	1977	8		6	Kennedy	1977		WWD	Woonsocket		
B - 6	40	2640	Morin St	170' from E line of Beacon	Kennedy		6	1994	8		6	Kennedy	1979		WWD	Woonsocket		
B - 6	41	2641	Theodore St	40' from N line of Aubin	Kennedy		6	1979	8		6	Kennedy	1979		WWD	Woonsocket		
B - 6	42	2642	Hayes St	240' from E line of Linden	Kennedy		6	1979	8		6	Kennedy	1979		WWD	Woonsocket		
B - 6	43	2643	Beacon Ave	300' from N line of Poplar	Kennedy		6	1980	8		6	Kennedy	1980		WWD	Woonsocket		
B - 7	0	2700	Hayes St	at W line of Coolidge	Kennedy		6	1979	8		6	Kennedy	1979		WWD	Woonsocket		
B - 7	1	2701	Morin St	120' from W line of Mendon	Mueller		6	1960	8	34	6				WWD	Woonsocket	21	
B - 7	2	2702	Mendon Rd	30' from N line of Martineau	APS		6	1960	12	35	6	APS	1960		WWD	Woonsocket		
B - 7	3	2703	Morin St	60' from W line of Coolidge	APS		6	1962	8	50	6	APS	1962		WWD	Woonsocket		
B - 7	4	2704	Morin St	100' from W line of Ruth	Mueller		6	1960	8	40	6				WWD	Woonsocket		
B - 7	5	2705	Dunlap St	35' from E line of Roscoe	Darling		6	1979	8	35	6	Kennedy	1979		WWD	Woonsocket		
B - 7	6	2706	Dunlap St	10' from W line of Mendon	Darling		6	1957	8	44	6				WWD	Woonsocket		
B - 7	7	2707	Mendon Rd	360' from S line of Dunlap	Darling		6	1957	12	53	6				WWD	Woonsocket		
B - 7	8	2708	Mendon Rd	20' from S line of Hoover	RD Wood		6	1932	12	52	6				WWD	Woonsocket		
B - 7	9	2709	Poplar St	30' from E line of Blanche	Mueller		6	1960	8	58	6				WWD	Woonsocket		
B - 7	10	2710	Ridge St	250' from W line of Nursery	Mueller		6	1960	8	55	6				WWD	Woonsocket		
B - 7	11	2711	Nursery Ave	at S line of Poplar	RD Wood		6	1932	8	55	6				WWD	Woonsocket		
B - 7	12	2712	Nursery Ave	10' from N line of Ridge	US Pipe		6	1992	8	64	6				WWD	Woonsocket		
B - 7	13	2713	Mitris Blvd	240' from N line of Wayne	Darling		6	1959	8	65	6	Ludlow	1959		WWD	Woonsocket		
B - 7	14	2714	Papineau Ave	480' from N line of LeFrancois	RD Wood		6	1932	8	65	6		1963		WWD	Woonsocket		
B - 7	15	2715	Mendon Rd	240' from S line of Hoover	RD Wood		6	1932	12	53	6				WWD	Woonsocket		
B - 7	16	2716	Hillsdale St	275' from N line of Poplar	Kennedy		6	1973	8		6	MET	1973		WWD	Woonsocket		
B - 7	17	2717	Rock Ridge Dr	at the end of cul-de-sac	Kennedy		6	1973	8		6	Kennedy	1973		WWD	Woonsocket		
B - 7	18	2718	Rock Ridge Dr	510' north of 2717	Kennedy		6	1973	8		6	Kennedy	1973		WWD	Woonsocket		
B - 7	19	2719	Plaza Village Rd	370' east-north from E line of Mendon	Kennedy		6	1974	8		6		1974		WWD	Woonsocket		
B - 7	20	2720	Plaza Village Rd	770' east north-south from E line of Mendon	Kennedy		6	1974	8		6		1974		WWD	Woonsocket		
B - 7	21	2721	Plaza Village Rd	120' north from center of cul-de-sac	Kennedy		6	1974	8		6		1974		WWD	Woonsocket	23	
B - 7	22	2722	Arona St	190' north of Morin	Kennedy		6	1975	8		6		1975		WWD	Woonsocket		
B - 7	23	2723	Papineau Ave	290' north of 2714	Kennedy		6	1979	8		6	Kennedy	1979		WWD	Woonsocket		
B - 7	24	2724	Wayne Rd	30' from N line of Mitris	Kennedy		6	1979	8		6		1979		WWD	Woonsocket		
B - 7	25	2725	Ruth St	230' from N line of Morin	Kennedy		6	1979	8		6	Kennedy	1979		WWD	Woonsocket		
B - 7	26	2726	Village Rd	235' +/- north of Village Rd	Kennedy		6	1974	8		6		1974		private	Woonsocket		
B - 7	27	2727	Village Rd	470' +/- south of Village Rd cul-de-sac	Chapman		6	1974	8		6		1974		private	Woonsocket		
B - 8	0	2800	Diamond Hill Rd	300' west of 2801	APS		6	1960	12	54	6	APS	1960		WWD	Woonsocket		
B - 8	1	2801	Diamond Hill Rd	300' east of 2800	APS		6	1960	12	54	6	APS	1960		WWD	Woonsocket		
B - 8	2	2802	Diamond Hill Rd	300' east of 2801	APS		6	1960	12	54	6	APS	1960		WWD	Woonsocket		
B - 8	3	2803	MacArthur Rd	90' from S line of Patton	Darling		6	1956	8	99	6		1956		WWD	Woonsocket		
B - 8	4	2804	Patton Rd	185' from E line of MacArthur	Darling		6	1956	8	99	6				WWD	Woonsocket		
B - 8	5	2805	Patton Rd	170' from E line of Priscilla	APS		6	1960	8	94	6	APS	1960		WWD	Woonsocket		
B - 8	6	2806	MacArthur Rd	90' from S line of Nimitz	Darling		6	1956	8	99	6		1956		WWD	Woonsocket		
B - 8	7	2807	Marshall Rd	70' from E line of MacArthur	Darling		6	1956	8	99	6		1956		WWD	Woonsocket		
B - 8	8	2808	Nimitz Rd	240' from E line of MacArthur	Darling		6	1956	8	99	6		1956		WWD	Woonsocket		
B - 8	9	2809	Priscilla Rd	80' from N line of Nimitz	Darling		6	1956	8	99	6		1956		WWD	Woonsocket		
B - 8	10	2810	Nimitz Rd	290' from E line of Priscilla	Mueller		6	1958	8	94	6		1958		WWD	Woonsocket		
B - 8	11	2811	Patton Rd	170' from N line of Nimitz	APS		6	1960	8	87	6	APS	1960		WWD	Woonsocket		
B - 8	12	2812	Nimitz Rd	50' from E line of Patton	Mueller		6	1958	8	86	6		1958		WWD	Woonsocket		
B - 8	13	2813	Halsey Rd	183' from N line of Nimitz	APS		6	1968	8	86	6	APS	1968		WWD	Woonsocket		
B - 8	14	2814	Knollwood Dr	220' from E line of Halsey	APS		6	1968	8	85	6	APS	1968		WWD	Woonsocket		
B - 8	15	2815	Knollwood Dr	200' from W line of Walnut Hill	APS		6	1968	8	83	6	APS	1968		WWD	Woonsocket		
B - 8	16	2816	Walnut Hill Rd	120' from S line of Knollwood	APS		6	1968	8	85	6	APS	1968		WWD	Woonsocket		
B - 8	17	2817	Walnut Hill Rd	120' from S line of Knollwood	APS		6	1968	8	86	6	APS	1968		WWD	Woonsocket		
B - 8	18	2818	Walnut Hill Rd	70' from N line of Diana	APS		6	1968	8	86	6	APS	1968		WWD	Woonsocket		
B - 8	19	2819	Walnut Hill Rd	125' from N line of Rustic	APS		6	1968	8	87	6	APS	1968		WWD	Woonsocket		
B - 8	20	2820	Knollwood Dr	200' from W line of Walnut Hill	Kennedy		6	1973	8	87	6	APS	1968		WWD	Woonsocket		
B - 8	21	2821	Knollwood Dr	260' west of 2820	APS		6	1968	8	86	6	APS	1968		WWD	Woonsocket		
B - 8	22	2822	Knollwood Dr	283' south of 2821	APS		6	1968	8	85	6	APS	1968		WWD	Woonsocket		
B - 8	23	2823	Knollwood Dr	274' south of 2822	APS		6	1968	8	85	6	APS	1968		WWD	Woonsocket		
B - 8	24	2824	Knollwood Dr	220' from N line of Diana	APS		6	1968	8	86	6	APS	1968		WWD	Woonsocket		
B - 8	25	2825	Diana Dr	119' from E line of Knollwood	APS		6	1968	8	84	6	APS	1968		WWD	Woonsocket		
B - 8	26	2826	Rustic Dr	325' west of 2827	APS		6	1968	8	85	6	APS	1968		WWD	Woonsocket		
B - 8	27	2827	Rustic Dr	177' from W line of Walnut Hill	APS		6	1968	8	86	6	APS	1968		WWD	Woonsocket		
B - 8	28	2828	Diana Dr	160' from E line of Rustic	APS		6	1968	8	86	6	APS	1968		WWD	Woonsocket		
B - 8	29	2829	Knollwood Dr	at end of cul-de-sac	APS		6	1968	8	84	6	APS	1968		WWD	Woonsocket		
B - 8	30	2830	Knollwood Dr	40' from W line of Halsey	APS		6	1968	8	85	6	APS	1968		WWD	Woonsocket		
B - 8	31	2831	Walnut Hill Rd	120' from N line of Knollwood	APS		6	1968	8	86	6	APS	1968		WWD	Woonsocket		
B - 8	32	2832	Knollwood Dr	287' from E line of Walnut Hill	APS		6	1969	8		6	APS	1969		WWD	Woonsocket		
B - 8	33	2833	Knollwood Dr	200' from NE line of Knollwood	APS		6	1968	8		6	APS	1968		WWD	Woonsocket		
B - 8	34	2834	Rock Ridge Dr	570' northeast of 2718	Kennedy		6	1973	8		6	Kennedy	1973		WWD	Woonsocket		
B - 9	0	2900	Diamond Hill Rd	290' west of 2901	APS		6	1960	12	78	6	APS	1960		WWD	Woonsocket		

Appendix F
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Hydrant Database

Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
B - 9	1	2901	Diamond Hill Rd	290' east of 2900	APS		6	1960	12	70	6	APS	1960		WWD	Woonsocket		
B - 9	2	2902	Diamond Hill Rd	10' from E line of Hillside	Kennedy		6	1979	12		6	APS	1960		WWD	Woonsocket		
B - 9	3	2903	Crest Rd	40' from S line of Sunset	APS		6	1963	8	50	6	APS	1963		WWD	Woonsocket		
B - 9	4	2904	Dawn Blvd	375' from N line of Diamond Hill	Kennedy		6	1981	8		6	APS	1962		WWD	Woonsocket		
B - 9	5	2905	Bound Rd	385' from N line of Diamond Hill	APS		6	1962	8	44	6	APS	1962		WWD	Woonsocket		
B - 9	6	2906	Diamond Hill Rd	at Diamond Hill Storage Tank	APS		6	1960	12	40	6	APS	1960		WWD	Woonsocket		
B - 9	7	2907	Diamond Hill Rd	35' from E line of Crest	APS		6	1960	12	55	6	APS	1960		WWD	Woonsocket		
B - 9	8	2908	Diamond Hill Rd	260' from W line of Dawn	APS		6	1960	12	50	6	APS	1960		WWD	Woonsocket		
B - 9	9	2909	Diamond Hill Rd	80' from E line of Dawn	Kennedy		6	1977	12		6	APS	1960		WWD	Woonsocket		
B - 9	10	2910												Y				no card
B - 9	11	2911	Bound Rd	70' from S line of Stoneham	APS		6	1964	12	50	6	APS	1964		WWD	Woonsocket		
B - 9	12	2912	Bound Rd	320' south of 2911	APS		6	1964	12	50	6	APS	1964		WWD	Woonsocket		
B - 9	13	2913	Pine Swamp Rd	760' from E line of Bound	US Pipe		6	1995	8	55	6	APS	1964		WWD	Cumberland		
B - 9	14	2914	Knollwood Dr	87' from S line of Wagon Wheel Ln	APS		6	1969	8		6	APS	1969		WWD	Woonsocket		
B - 9	15	2915	Knollwood Dr	290' southeast of 2833	APS		6	1969	8		6	APS	1969		WWD	Woonsocket		
B - 9	16	2916	Grandview Ave	330' from W line of Country	APS		6	1969	8		6	APS	1969		WWD	Woonsocket		
B - 9	17	2917	Grandview Ave	265' from N line of Country	APS		6	1969	8		6	APS	1969		WWD	Woonsocket		
B - 9	18	2918	Grandview Ave	at W line of Country	APS		6	1969	8		6	APS	1969		WWD	Woonsocket		
B - 9	19	2919	Grandview Ave	352' from E line of Country	APS		6	1969	8		6	APS	1969		WWD	Woonsocket		
B - 9	20	2920	Grandview Ave	70' from W line of Bound	APS		6	1969	8		6	APS	1969		WWD	Woonsocket		
B - 9	21	2921	Stoneham Dr	60' from W line of Woodhaven	APS		6	1969	8		6	APS	1969		WWD	Woonsocket		
B - 9	22	2922	Stoneham Dr	286' from E line of Woodhaven	APS		6	1969	8		6	APS	1969		WWD	Woonsocket		
B - 9	23	2923	Woodhaven Rd	30 from E line of Grandview	APS		6	1969	8		6	APS	1969		WWD	Woonsocket		
B - 9	24	2924	Country Rd	100' from E line of Grandview	APS		6	1969	8		6	APS	1969		WWD	Woonsocket		
B - 9	25	2925	Woodhaven Rd	370' from E line of Grandview	APS		6	1969	8		6	APS	1969		WWD	Woonsocket		
B - 9	26	2926	Country Rd	180' from S line of Stoneham	APS		6	1969	8		6	APS	1969		WWD	Woonsocket		
B - 9	27	2927	Woodhaven Rd	57' from S line of Surrey	APS		6	1969	8		6	APS	1969		WWD	Woonsocket		
B - 9	28	2928	Surrey Ln	6' from E line of Walnut Hill	APS		6	1969	8		6	APS	1969		WWD	Woonsocket		
B - 9	29	2929	Hillside Ave	9' from S line of Sunset	Kennedy		6	1978	8		6	Kennedy	1978		WWD	Woonsocket		
B - 9	30	2930	Star Ave	at cul-de-sac	Kennedy		6	1977	8		6	Kennedy	1977		WWD	Woonsocket		
C - 1	0	3100	Eighth Ave	10' from S line of Walnut	RD Wood		6	1932	8	50	6				WWD	Woonsocket		
C - 1	1	3101	Eighth Ave	160' from S line of Walnut	RD Wood		6	1932	8	52	6				WWD	Woonsocket		
C - 1	2	3102	Eighth Ave	10' from N line of Chestnut	Chapman		4		6	52				Y	WWD	Woonsocket		
C - 1	3	3103	Eighth Ave	200' from N line of Fairmount	RD Wood		6	1932	6	52	6				WWD	Woonsocket		
C - 1	4	3104	Seventh Ave	160' from N line of Fairmount	Fairmount		4		6	63					WWD	Woonsocket		no gate
C - 1	5	3105	Fairmount St	10' from E line of Tenth	Mueller		6	1960	8	44	6				WWD	Woonsocket		
C - 1	6	3106	Fairmount St	10' from W line of Ninth	Fairmount		4		8	50					WWD	Woonsocket		
C - 1	7	3107	Fairmount St	20' from E line of Eighth	Chapman		4		8	54	6			Y	WWD	Woonsocket		
C - 1	8	3108	Mendon Rd, NS	at L'Hospice Ste Antoine	APS		6		8		6			R	L'Hospice	N. Smithfield		
C - 1	9	3109	Rhodes Ave	190' from N Smithfield line	APS		6	1963	10	30	6	APS	1963		WWD	Woonsocket		
C - 1	10	3110	Rhodes Ave	at storage tank	APS		6	1963	8	30	6	APS	1963		WWD	Woonsocket		
C - 1	11	3111	Seventh Ave	40' from S line of Fairmount	Kennedy		6	1992	6		6	Kennedy	1971		WWD	Woonsocket		
C - 1	12	3112	Fairmount St	18' from E line of Eighth	Kennedy		6	1976	8		6	Kennedy	1976		WWD	Woonsocket		
C - 1	13	3113	Mendon Rd, NS	at L'Hospice Ste Antoine	APS		6		8		6			R	L'Hospice	N. Smithfield		
C - 2	0	3200	Third Ave	190' from N line of Walnut	Darling		6	1957	8	64	6		1957		WWD	Woonsocket		
C - 2	1	3201	Second Ave	270' from N line of Walnut	Mueller		6	1960	8	87	6				WWD	Woonsocket		
C - 2	2	3202	River St	440' from W line of Angle	US Metropolitan 250		6	2004	16		6	APS	1962		WWD	Woonsocket	5	
C - 2	3	3203	Cold Spring Place	240' from N line of Blackstone St	Fairmount		4		4	72					WWD	Woonsocket		
C - 2	4	3204	Blackstone St	10' from W line of Cold Spring Place	Darling		6	1957	12	83	6		1957		WWD	Woonsocket		
C - 2	5	3205	Blackstone St	at W line of Highland	Darling		6	1957	12	69	6		1957		WWD	Woonsocket		
C - 2	6	3206	Second Ave	10' from N line of Walnut	Chapman		6	1950	12	85	6				WWD	Woonsocket		
C - 2	7	3207	River St	140' from S line of Blackstone St	US Metropolitan 250		6	2004	16		6				WWD	Woonsocket		
C - 2	8	3208	River St	10' from S line of Fairmount	US Metropolitan 250		6	2004	16		6				WWD	Woonsocket		
C - 2	9	3209	Chestnut St	70' from E line of Fourth	Fairmount		6	1950	8	78	6				WWD	Woonsocket		
C - 2	10	3210	Third Ave	140' from N line of Chestnut	APS		6	1959	8	79	6	APS	1959		WWD	Woonsocket		
C - 2	11	3211	Third Ave	110' from S line of Chestnut	Fairmount		4		8	73				Y	WWD	Woonsocket		wol
C - 2	12	3212	Chestnut St	70' from E line of Third	Mueller		6	1960	8	78	6				WWD	Woonsocket		
C - 2	13	3213	Second Ave	110' from S line of Chestnut	Chapman		4		6	75				Y	WWD	Woonsocket		
C - 2	14	3214	First Ave	10' from S line of Chestnut	Fairmount		4		8	86				Y	WWD	Woonsocket		
C - 2	15	3215	Fairmount St	at N line of Water	Darling		6	1957	8	92	6				WWD	Woonsocket		
C - 2	16	3216	Sixth Ave	270' from N line of Fairmount	Fairmount		6	1950	8	70	6				WWD	Woonsocket		
C - 2	17	3217	Fairmount St	55' from E line of Fifth	Chapman		4		8	72				Y	WWD	Woonsocket		
C - 2	18	3218	Fourth Ave	160' from S line of Chestnut	Kennedy		6	1997	8	77	6		1997		WWD	Woonsocket		
C - 2	19	3219	Fourth Ave	20' from N line of Fairmount	APS		6	1960	8	72	6				WWD	Woonsocket		
C - 2	20	3220	Fairmount St	100' from E line of Fourth			4		8	72				Y	WWD	Woonsocket		
C - 2	21	3221	Second Ave	10' from N line of Fairmount	Fairmount		4		6	74				Y	WWD	Woonsocket		
C - 2	22	3222	Fairmount St	10' from W line of First	Mueller		6	1960	8	83	6				WWD	Woonsocket		
C - 2	23	3223	Fairmount St	410' from E line of First	Darling		6	1957	8	90	6				WWD	Woonsocket		
C - 2	24	3224	Fairmount St	710' from E line of First	Kennedy		6	1990	8		6				WWD	Woonsocket		
C - 2	25	3225	Fairmount St	260' from S line of Water	Kennedy		6	1994	8		6				WWD	Woonsocket		
C - 2	26	3226	Fairmount St	10' from E line of Sixth	Chapman		4		8	70					WWD	Woonsocket		
C - 2	27	3227	Fifth Ave	145' from S line of Fairmount	Fairmount		6	1950	8	72	6				WWD	Woonsocket		
C - 2	28	3228	Fifth Ave	10' from N line of Chapel	Kennedy		6	1997	8	72	6				WWD	Woonsocket		

Appendix F
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Hydrant Database

Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
C - 2	29	3229	Fourth Ave	200' from S line of Fairmount	Chapman		4		6	72					WWD	Woonsocket		
C - 2	30	3230	Third Ave	160' from S line of Fairmount			4		6	72				Y	WWD	Woonsocket		
C - 2	31	3231	Second Ave	200' from S line of Fairmount	Fairmount		4		6	74					WWD	Woonsocket		
C - 2	32	3232	Short St	80' from E line of Second	RD Wood		6	1932	8	80	6				WWD	Woonsocket		
C - 2	33	3233	First Ave	260' from S line of Fairmount			4		8					Y	WWD	Woonsocket		
C - 2	34	3234	Fairmount St	100' from W line of Third	APS		6	1960	8		6	APS			WWD	Woonsocket		
C - 2	35	3235	Third Ave	165' from E line of Fourth	APS		6	1960	6		6	APS			WWD	Woonsocket		
C - 2	36	3236	First Ave	251' from S line of Fairmount	Kennedy		6	1972	8	70	6	APS	1972		WWD	Woonsocket		
C - 2	37	3237	Second Ave	150' south of Chestnut	Kennedy		6	1985	6		6	Clow	1985		WWD	Woonsocket		
C - 2	38	3238	First Ave	58' from N line of Chestnut	Mueller		6	1986	8		6	Mueller	1986		WWD	Woonsocket		
C - 2	39	3239	Third Ave	at house 320	US Pipe		6	1991	8		6	Clow	1991		WWD	Woonsocket		
C - 3	0	3300	Harris Ave	230' from S line of Blackstone St	Chapman		4		8	73					WWD	Woonsocket		
C - 3	1	3301	Kindergarten St	At N line of Francis	Chapman		4		6	75				Y	WWD	Woonsocket		
C - 3	2	3302	Francis St	320' from E line of Kindergarten	Chapman		4		4	78					WWD	Woonsocket		
C - 3	3	3303	Arnold St	140' from S line of Cato	US Pipe		6	1990	8	80	6	APS	1964		WWD	Woonsocket		
C - 3	4	3304	Cato St	10' from E line of Arnold	US Pipe		6	1995	6	78					WWD	Woonsocket		
C - 3	5	3305	Church St	10' from W line of Boyden	Fairmount		4		8	73				Y	WWD	Woonsocket		
C - 3	6	3306	Arnold St	at center line of Bentley	Chapman		4		8	76				Y	WWD	Woonsocket		
C - 3	7	3307	Church St	190' from E line of Boyden	Chapman		4		8	72				Y	WWD	Woonsocket		
C - 3	8	3308	Blackstone St	89' from Miller Ln, at bldg 80	Chapman		6	1950	12	85	6	APS	1989		WWD	Woonsocket		
C - 3	9	3309	Holder Ln	120' from W line of Joseph	Chapman		4		4	80					WWD	Woonsocket		
C - 3	10	3310	Blackstone St	80' from E line of Miller	RD Wood		6	1932	12	87	6				WWD	Woonsocket		
C - 3	11	3311	N. Main St	at S line of Corey	Chapman		4		8	94					WWD	Woonsocket		
C - 3	12	3312	Main St	at S line of Blackstone	Kennedy		6	1932	12	90	6				WWD	Woonsocket		
C - 3	13	3313	Verry St	300' west of 3314	Chapman		4		6	81					WWD	Woonsocket		
C - 3	14	3314	Verry St	280' from W line of Harris	Chapman		4		6	78					WWD	Woonsocket		
C - 3	15	3315	Harris Ave	at N line of Verry	Darling		6	1957	8	75	6				WWD	Woonsocket	6	
C - 3	16	3316	Railroad St	10' from W line of Arnold	Kennedy		6	1976	8		6				WWD	Woonsocket		
C - 3	17	3317	Cato St	20' from E line of Boyden	APS		6	1964	6	70	6	APS	1964		WWD	Woonsocket		
C - 3	18	3318	Cato St	at W line of Clarkin			4		6					Y	WWD	Woonsocket		
C - 3	19	3319	Cato St	200' from W line of James			4		6	80				Y	WWD	Woonsocket		
C - 3	20	3320	Church St	400' from W line of Main	US Pipe		6	1995	8	80	6				WWD	Woonsocket		
C - 3	21	3321	Main St	at S line of Social	US Pipe		6	1995	12	90	6				WWD	Woonsocket		
C - 3	22	3322	Main St	at N line of Church	Kennedy		6	1987	12	90	6				WWD	Woonsocket		
C - 3	23	3323	Main St	at S line of Cato	US Pipe		6	1995	12	96	6				WWD	Woonsocket		
C - 3	24	3324	Water St	200' from W line of Canal	Mueller		6	1960	8	93	6				WWD	Woonsocket		
C - 3	25	3325	River St	260' from S line of Water	US Metropolitan 250		6	2004	16		6				WWD	Woonsocket		
C - 3	26	3326	River St	190' from S line of Canal	US Metropolitan 250		6	2004	16		6				WWD	Woonsocket		
C - 3	27	3327	Bentley St	250' from W line of Arnold	Fairmount		4		4	71					WWD	Woonsocket		
C - 3	28	3328	High St	170' from W line of Arnold			4		8	74				Y	WWD	Woonsocket		
C - 3	29	3329	High St	70' from E line of Arnold	Fairmount		4		8	73					WWD	Woonsocket		
C - 3	30	3330	High St	10' from W line of Fountain	APS		6	1964	8	74	6	APS	1964		WWD	Woonsocket		
C - 3	31	3331	High St	150' from E line of Fountain	Chapman		4		8	73					WWD	Woonsocket		
C - 3	32	3332	Railroad St	400' from E line of Arnold	US Pipe		6	1993	12	85	6				WWD	Woonsocket		
C - 3	33	3333	Railroad St	340' from W line of James	Fairmount		6	1950	12	87					WWD	Woonsocket		
C - 3	34	3334	Railroad St	10' from W line of James	Chapman		6	1950	12	95	6				WWD	Woonsocket		
C - 3	35	3335	James St	90' from S line of Cato	Kennedy		6	1996	6	92	6				WWD	Woonsocket		
C - 3	36	3336	Cherry St	50' from S line of Cato	Kennedy		6	1996	8	93	6				WWD	Woonsocket		
C - 3	37	3337	Cherry St	70' from N line of Railroad	Kennedy		6	1996	8	94	6				WWD	Woonsocket		
C - 3	38	3338	Main St	20' from N line of Railroad	US Pipe		6	1995	12	98	6				WWD	Woonsocket		
C - 3	39	3339	Truman Dr	590' north of Bernon	Kennedy		6	1982	10		6		1982		WWD	Woonsocket		
C - 3	40	3340	Water St	200' from E line of Canal	US Pipe		6	1994	4	93	6				WWD	Woonsocket		
C - 3	41	3341	River St	at E line of High	US Metropolitan 250		6	2004	16		6				WWD	Woonsocket		
C - 3	42	3342	River St	220' from E line of High	US Metropolitan 250		6	2004	16		6				WWD	Woonsocket		
C - 3	43	3343	Arnold St	at S line of Clark	APS		6	1973	8	78	6	APS	1964		WWD	Woonsocket		
C - 3	44	3344	Fountain St	120' from S line of High	US Pipe		6	1993	8	75	6	APS	1962		WWD	Woonsocket		
C - 3	45	3345	Fountain St	10' from S line of Ascension	Chapman		4		8	75				Y	WWD	Woonsocket		
C - 3	46	3346	Ascension St	150' from E line of Fountain	Chapman		4		4	83					WWD	Woonsocket		
C - 3	47	3347	Main St	10' from E line of Cooks Hill	Kennedy		6	1996	12	92	6				WWD	Woonsocket		
C - 3	48	3348	Main St	190' from W line of High	RD Wood		6		12	90	8			R	WWD	Woonsocket	15	
C - 3	49	3349	Main St	40' from W line of Court St	Kennedy		6	1995	12	90	6				WWD	Woonsocket	7	
C - 3	50	3350	High St	30' from N line of Main	Kennedy		6	1995	8	90	6				WWD	Woonsocket		
C - 3	51	3351	Clinton St	10' from E line of Court	Kennedy		6	1996	12	93	6				WWD	Woonsocket		
C - 3	52	3352	Sayles St	11' from E line of Edwards	Mueller		6	1978	8		6	Mueller	1978		WWD	Woonsocket		
C - 3	53	3353	Northeast St	at N end of Northeast	Mueller		6	1960	6	93	6	Mueller			WWD	Woonsocket		
C - 3	54	3354	Northeast St	230' from N line of Sayles	APS		6	1971	6	93	6	Mueller	1971		WWD	Woonsocket		
C - 3	55	3355	River St	220' south of 3342	Chapman		6	1950	14	93	6				WWD	Woonsocket		
C - 3	56	3356	River St	340' south of 3355	APS		6	1962	14	94	6				WWD	Woonsocket		
C - 3	57	3357	Arnold St	170' from N line of Fountain			4		8	74				Y	WWD	Woonsocket		
C - 3	58	3358	Arnold St	at N line of Fountain			4		8	80				Y	WWD	Woonsocket		
C - 3	59	3359	Main St	150' from W line of Ascension	Kennedy		6	1995	12	93	6				WWD	Woonsocket		
C - 3	60	3360	Main St	10' from E line of Ascension	US Pipe		6	1991	12		6				WWD	Woonsocket		
C - 3	61	3361	Allen St	325' from E line of Buell	APS		6	1962	8	103	6	APS	1962		WWD	Woonsocket		

Appendix F
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Hydrant Database

Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
C - 3	62	3362	Arnold St	10' from S line of High	Fairmount		4		8	73				Y	WWD	Woonsocket		
C - 3	63	3363	Boyden St	90' from W line of Church	Chapman		4		6	73					WWD	Woonsocket		
C - 3	64	3364	Canal St	10' from E line of Water	Chapman		4		8	92				Y	WWD	Woonsocket		
C - 3	65	3365	Church St	160' from W line of Main			6		8		6			Y	WWD	Woonsocket		
C - 3	66	3366	Clinton St	240' from N line of Court			6		12					Y	WWD	Woonsocket		
C - 3	67	3367	Clark Ct	160' from E line of Arnold			4		4					Y	WWD	Woonsocket		
C - 3	68	3368	Arnold St	20' from N line of Cato	US Pipe		6		8						WWD	Woonsocket		
C - 3	69	3369	Arnold St	55' from S line of Ascension	APS		6	1968	8		6	APS	1968		WWD	Woonsocket		
C - 3	70	3370	High St	94' from W line of Arnold	Kennedy		6	1972	8	62	6	Kennedy	1972		WWD	Woonsocket		
C - 3	71	3371	Arnold St	102' from N line of Fountain	Kennedy		6	1972	8	63	6	Kennedy	1972		WWD	Woonsocket		
C - 3	72	3372	Cato St	10' from W line of Clarkin	Kennedy		6	1995	6	64	6	Kennedy	1972		WWD	Woonsocket		
C - 3	73	3373	Cato St	203' from W line of St. James	Kennedy		6	1972	6	72	6	Kennedy	1972		WWD	Woonsocket		
C - 3	74	3374	Francis St	20' from E line of Kindergarten	Kennedy		6	1976	6	75	6	Kennedy	1976		WWD	Woonsocket		
C - 3	75	3375	Arnold St	24' from S line of Bentley	Kennedy		6	1976	6	76	6	Kennedy	1976		WWD	Woonsocket		
C - 3	76	3376	Church St	9' from E line of Boyden	Darling		6	1976	8		6	Darling	1976		WWD	Woonsocket		
C - 3	77	3377	Church St	255' from E line of Boyden	Darling		6	1976	8		6	Darling	1976		WWD	Woonsocket		
C - 3	78	3378	Northeast St	110' west of 3353	Kennedy		6	1978	8		6	Mueller	1978		WWD	Woonsocket		
C - 3	79	3379	Truman Dr	780' north of Bernon	Kennedy		6	1982	10		6		1982		WWD	Woonsocket		
C - 3	80	3380	Water St	21' southwest of W line of Canal	Kennedy	K 81 A	6	1989	8		6	Kennedy	1989		WWD	Woonsocket		
C - 3	81	3381	Fountain St	between bldgs 76 & 92	US Pipe		6	1991	8		6	Kennedy			WWD	Woonsocket		
C - 4	0	3400	Worrall St	11' from S line of Social	APS		6	1962	8	94	6	APS	1962		WWD	Woonsocket	16	
C - 4	1	3401	Social St	150' from E line of Worrall	Chapman		4		8	95				Y	WWD	Woonsocket		
C - 4	2	3402	Pond St	240' from N line of Clinton	Kennedy		6	1974	12		6				WWD	Woonsocket		
C - 4	3	3403	Collier St	270' from N line of Clinton					8		6		1956	Y	WWD	Woonsocket		
C - 4	4	3404												?				no card
C - 4	5	3405	Clinton St	10' from E line of Norse	APS		6	1964	12	105	6				WWD	Woonsocket		
C - 4	6	3406	Clinton St	10' from E line of Sampson	Darling		6	1957	12	105	6				WWD	Woonsocket		
C - 4	7	3407	Federal St	310' from W line of Worrall	US Pipe		6		6	94				Y	WWD	Woonsocket		
C - 4	8	3408	Federal St	150' from W line of Worrall	Fairmount		4		6	94				Y	WWD	Woonsocket		
C - 4	9	3409	Federal St	10' from W line of Worrall	Fairmount		4		6	94				Y	WWD	Woonsocket		
C - 4	10	3410	Clinton St	at W line of Worrall			4		12	104				Y	WWD	Woonsocket		
C - 4	11	3411	Clinton St	at W line of Pond	Darling		6	1957	12	103	6				WWD	Woonsocket		
C - 4	12	3412	Clinton St	220' west of 3413	Mueller		6	1960	12	103	6				WWD	Woonsocket		
C - 4	13	3413	Clinton St	280' from W line of Worrall	Fairmount		4		12	103					WWD	Woonsocket		
C - 4	14	3414	Park Place	20' from W line of West Park Place			4		6	83				Y	WWD	Woonsocket		
C - 4	15	3415	Park Place	320' from W line of West Park Place	Chapman		4		6	85				Y	WWD	Woonsocket		
C - 4	16	3416	Park Place	at north east angle of Park Place	Chapman		4		6	88				Y	WWD	Woonsocket		
C - 4	17	3417	Morton Ave	50' from S line of Park Place	APS		6	1963	8	90	6	APS	1963		WWD	Woonsocket		
C - 4	18	3418	B.V.E. Substation	West Park Place in hose shed	Mueller		6	1960							B.V.E. & Co	Woonsocket		
C - 4	19	3419	West Park Place	360' from W line of Park Place	Chapman		4		4	85					WWD	Woonsocket		
C - 4	20	3420	Harrison Ave	60' from W line of Park Place	Chapman		4		6	87				Y	WWD	Woonsocket		
C - 4	21	3421	Park Place	220' from N line of Harrison	Chapman		4		6	83				Y	WWD	Woonsocket		
C - 4	22	3422	Bellevue Ave	60' from W line of Morton	Chapman		4		6	88				Y	WWD	Woonsocket		
C - 4	23	3423	Front St	69' from W line of Court	Kennedy		6	1974	6	88	6				WWD	Woonsocket	17	
C - 4	24	3424	Front St	30' from N line of Hamlet	Chapman		4		6	90				Y	WWD	Woonsocket		
C - 4	25	3425	Greene St	70' from SW line of Carrington	Kennedy		6	1974	12		6				WWD	Woonsocket		
C - 4	26	3426	Hamlet Ave	10' from W line of Greene	Chapman		4		6	88				Y	WWD	Woonsocket		
C - 4	27	3427	Hamlet Ave	10' from S line of Greene	Fairmount		4		6	88				Y	WWD	Woonsocket		
C - 4	28	3428	Hamlet Ave	10' from W line of Park Ave	Chapman		4		6	88					WWD	Woonsocket		
C - 4	29	3429	Hamlet Ave	160' from E line of Park Ave, at bldg 48	Kennedy		6	1997	6	88	6		1997		WWD	Woonsocket		
C - 4	30	3430	Hamlet Ave	10' from W line of Grove			4		6	88				Y	WWD	Woonsocket		
C - 4	31	3431	Hamlet Ave	10' from E line of Harrison	APS		6	1964	6	90	6	APS	1964		WWD	Woonsocket		
C - 4	32	3432	Harrison Ave	100' from E line of Bellevue	Chapman		4		8	88				Y	WWD	Woonsocket		
C - 4	33	3433	Morton Ave	20' from N line of Harrison	Chapman		4		8	88				Y	WWD	Woonsocket		
C - 4	34	3434	Hamlet Ave	at E line of Harrison			4		6					Y	WWD	Woonsocket		
C - 4	35	3435	Clinton St	at E line of Collier	Darling		6	1957	12	105	6				WWD	Woonsocket		
C - 4	36	3436	Clinton St	at N line of Page			6		12					Y	WWD	Woonsocket		
C - 4	37	3437	Clinton St	70' from S line of Worrall			4		12					Y	WWD	Woonsocket		
C - 4	38	3438	Worrall St	150' from N line of Clinton	APS		6	1971	6		6	APS	1971	Y	WWD	Woonsocket		
C - 4	39	3439	Park Place	64' from W line of West Park Pl	Kennedy		6	1971	6		6	APS	1971		WWD	Woonsocket		
C - 4	40	3440	Hamlet Ave	65' from W line of Greene	Kennedy		6	1974	6		6	MET	1974		WWD	Woonsocket		
C - 4	41	3441	Grove St	13' from S line of Hamlet	Kennedy		6	1974	12		6	MET	1974		WWD	Woonsocket		
C - 4	42	3442	Bellevue Ave	55' from W line of Morton	Kennedy		6	1983	6		6		1983		WWD	Woonsocket		
C - 4	43	3443	Park Place	190' from N line of SW section of Park Pl	Mueller		6	1985	6		6	Clow	1985		WWD	Woonsocket		
C - 4	44	3444	Harrison Ave	50' from E line of Park Place	Mueller		6	1985	8		6	Clow	1985		WWD	Woonsocket		
C - 4	45	3445	Park Place	35' from E line of NW section	Kennedy		6	1985	6		6	Clow	1985		WWD	Woonsocket		
C - 4	46	3446	Park Place	360' from N line of W Park Pl	Kennedy		6	1985	6		6	Clow	1985		WWD	Woonsocket		
C - 4	47	3447	Harrison Ave	104' from E line of Bellevue	Kennedy	K 81 A	6	1989	8	88	6				WWD	Woonsocket		
C - 4	48	3448	Morton Ave	at Harrison	US Pipe		6	1991	8		6		1991		WWD	Woonsocket		
C - 4	49	3449	Federal St	at YMCA	US Pipe		6	1996	6		6		1996		WWD	Woonsocket		
C - 4	50	3450	Federal St	at bldg 77	US Pipe		6	1996	6		6		1996		WWD	Woonsocket		
C - 4	51	3451	Federal St	at Worrall	US Pipe		6	1996	6		6		1996		WWD	Woonsocket		
C - 5	0	3500	Cumberland St	170' from N line of Locust	APS		6	1967	12	100	6			Y	WWD	Woonsocket	14	

Appendix F
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Hydrant Database

Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
C - 5	1	3501	Cumberland St	60' from S line of Locust	Mueller		6	1980	12	100	6				WWD	Woonsocket		
C - 5	2	3502	Wood Ave	385' from S line of Elm	Darling		6	1984	8		6	Kennedy	1984		WWD	Woonsocket		
C - 5	3	3503	Kendrick Ave	80' from E line of Gaulin	APS		6	1963	12	87	6	APS	1963		WWD	Woonsocket		
C - 5	4	3504	Kendrick Ave	160' from S line of Elm			4		6					Y	WWD	Woonsocket		
C - 5	5	3505	Elm St	10' from W line of Wood	APS		6	1963	10	70	6	APS	1963		WWD	Woonsocket		
C - 5	6	3506	Wood Ave	220' from S line of Elm	Chapman		4		8	71				Y	WWD	Woonsocket		
C - 5	7	3507	Elm St	at W line of Dulude	APS		6	1963	10	72	6	APS	1963		WWD	Woonsocket		
C - 5	8	3508	Dulude Ave	270' from S line of Elm, bldg 106	US Pipe		6	1996	6	72	6		1996		WWD	Woonsocket		
C - 5	9	3509	Read Ave	30' from S line of Elm	Chapman		4		6	77				Y	WWD	Woonsocket		
C - 5	10	3510	Elm St	90' from W line of Heroux	APS		6	1963	10	78	6	APS	1963		WWD	Woonsocket		
C - 5	11	3511	Merida Ave	15' from N line of Elm	Mueller		6	1979	6		6	Mueller	1979		WWD	Woonsocket		
C - 5	12	3512	Heroux Ave	200' from S line of Elm	Fairmount		6	1950	6	77	6				WWD	Woonsocket		
C - 5	13	3513	Elm St	at W line of Chalapa	APS		6	1963	10	80	6	APS	1963		WWD	Woonsocket		
C - 5	14	3514	Chalapa Ave	10' from N line of Elm	Chapman		4		6	78				Y	WWD	Woonsocket		
C - 5	15	3515	Cumberland St	40' from N line of Kendrick	Darling		6	1957	12	102	6				WWD	Woonsocket		
C - 5	16	3516	Cumberland St	165' from S line of Kendrick	Kennedy		6	1974	12		6				WWD	Woonsocket		
C - 5	17	3517	Kendrick Ave	95' from E line of Cumberland	APS		6	1963	12	93	6	APS	1963		WWD	Woonsocket		
C - 5	18	3518												?				no card
C - 5	19	3519												?				no card
C - 5	20	3520	Wood Ave	210' from N line of Cass	Chapman		4		8	80				Y	WWD	Woonsocket		
C - 5	21	3521	Mailloux St	300' from N line of Cass	RD Wood		6	1932	8	77	6				WWD	Woonsocket		
C - 5	22	3522	Dulude Ave	230' from N line of Cass			4		6	80				Y	WWD	Woonsocket		
C - 5	23	3523	Read Ave	350' from S line of Elm	APS		6	1961	6	80	6	APS	1961		WWD	Woonsocket		
C - 5	24	3524	Emerson St	70' from E line of Heroux	Mueller		6	1979	8	81	6				WWD	Woonsocket		
C - 5	25	3525	Sweet Ave	30' from N line of Emerson	Mueller		6	1979	6		6	Mueller	1979		WWD	Woonsocket		
C - 5	26	3526	Villa Nova St	390' from W line of Florence			4		8	108				Y	WWD	Woonsocket		
C - 5	27	3527	Villa Nova St	110' from W line of Florence			4		8	110				Y	WWD	Woonsocket		
C - 5	28	3528	Florence Dr	150' from S line of Villa Nova	Chapman		4		12	110				Y	WWD	Woonsocket		wol
C - 5	29	3529	Florence Dr	55' south of 3540			4		12					Y	WWD	Woonsocket		
C - 5	30	3530	Cumberland St	at N line of Cass	APS		6	1968	12	90	6				WWD	Woonsocket		
C - 5	31	3531	Cass Ave	90' from E line of Wood			4		8					Y	WWD	Woonsocket		
C - 5	32	3532	Mailloux St	50' from N line of Cass	Kennedy		6	1995	8	84	6				WWD	Woonsocket		
C - 5	33	3533	Dulude Ave	10' from N line of Cass	US Pipe		6	1996	6	84					WWD	Woonsocket		
C - 5	34	3534	Cass Ave	330' from W line of Sweet	Fairmount		4		8	86				Y	WWD	Woonsocket		
C - 5	35	3535	Cass Ave	at center line of Sweet, bldg 285	Chapman		4		8	87				Y	WWD	Woonsocket		
C - 5	36	3536	Cumberland St	520' from S line of Cass	Darling		6	1957	8	93	6				WWD	Woonsocket		
C - 5	37	3537	Hamlet Ave	350' from W line of Florence	Darling		6	1957	12	104	6				WWD	Woonsocket		
C - 5	38	3538	Hamlet Ave	300' from W line of Florence	Darling		6	1957	12	104	6				WWD	Woonsocket		
C - 5	39	3539	Sweet Ave	85' from S line of Elm	Mueller		6	1979	6		6	Mueller	1979		WWD	Woonsocket		
C - 5	40	3540	Florence Dr	300' from S line of Villa Nova	Kennedy	K 81 A	6	1989	12	106	6	APS	1989		WWD	Woonsocket		
C - 5	41	3541	Florence Dr	300' from N line of Hamlet	Kennedy		6	1963	12		6	APS	1963		WWD	Woonsocket		
C - 5	42	3542	Davison Ave	20' from S line of Hamlet	APS		6	1963	12	105	6	APS	1963		WWD	Woonsocket		
C - 5	43	3543	Kendrick Ave	25' from S line of Gaulin			4		6					Y	WWD	Woonsocket		
C - 5	44	3544	Elm St	80' from W line of Wood			4		8					Y	WWD	Woonsocket		
C - 5	45	3545	Elm St	30' from W line of Dulude			4		6					Y	WWD	Woonsocket		
C - 5	46	3546	Cass Ave	70' from W line of Mailloux	APS		6	1968	8	85	6	APS	1968		WWD	Woonsocket		
C - 5	47	3547	Villa Nova St	394' from W line of Florence	Mueller		6	1972	8		6	Kennedy	1972		WWD	Woonsocket		
C - 5	48	3548	Villa Nova St	104' from W line of Florence	Kennedy		6	1972	8		6	Kennedy	1972		WWD	Woonsocket		
C - 5	49	3549	Dulude Ave	225' from N line of Cass	Kennedy		6	1973	6		6	MET	1973		WWD	Woonsocket		
C - 5	50	3550	Read Ave	310' from Elm	Kennedy		6	1988	6		6		1988		WWD	Woonsocket		
C - 5	51	3551	Cass Ave	at bldg 219	US Pipe		6	1993	12		6		1993		WWD	Woonsocket		
C - 5	52	3552	Cass Ave	at center of Sweet, at bldg 285	US Pipe		6	1993	8		6		1993		WWD	Woonsocket		
C - 6	0	3600	Elm St	at W line of Hebert	APS		6	1963	10	83	6	APS	1963		WWD	Woonsocket		
C - 6	1	3601	Hebert Ave	50' from S line of Elm			4		8					Y	WWD	Woonsocket		
C - 6	2	3602	Cote Ave	30' from S line of Elm	Fairmount		4		6	83				Y	WWD	Woonsocket		
C - 6	3	3603	Cote Ave	310' from S line of Elm	Fairmount		4		6	83				Y	WWD	Woonsocket		
C - 6	4	3604	Elm St	50' from W line of Florida	APS		6	1963	10	83	6	APS	1963		WWD	Woonsocket		
C - 6	5	3605	Ella Ave	10' from W line of Henry	Kennedy		6	1972	8	72	6				WWD	Woonsocket		
C - 6	6	3606	Henry St	70' from N line of Elm	Fairmount		4		8	76				Y	WWD	Woonsocket		
C - 6	7	3607	Elm St	at center of Henry	APS		6	1963	10	78	6	APS	1963		WWD	Woonsocket		
C - 6	8	3608	Heather Dr	40' north of angle point on Heather	APS		6	1963	8	63	6	APS	1963		WWD	Woonsocket		
C - 6	9	3609	Beacon Ave	30' from N line of Campeau	APS		6	1963	8	58	6	APS	1963		WWD	Woonsocket		
C - 6	10	3610	Campeau St	120' from E line of Grace	Mueller		6	1986	8	58	6				WWD	Woonsocket		
C - 6	11	3611	Hebert Ave	360' from S line of Elm	Fairmount		4		8	83				Y	WWD	Woonsocket		
C - 6	12	3612	Hebert Ave	120' from N line of Cass			4		8	90				Y	WWD	Woonsocket		
C - 6	13	3613	Cote Ave	240' from N line of Cass	Chapman		4		6	87				Y	WWD	Woonsocket		
C - 6	14	3614	Jervis St	310' from S line of Elm	APS		6	1960	8	88	6	APS	1960		WWD	Woonsocket		
C - 6	15	3615	Lebrun Ave	220' from N line of Cass	Fairmount		6	1950	8	83	6				WWD	Woonsocket		
C - 6	16	3616	Lebrun Ave	200' from W line of Elm	Fairmount		6	1950	8	81	6				WWD	Woonsocket		
C - 6	17	3617	Desrochers Ave	200' from W line of Elm	RD Wood		6	1932	8	84	6				WWD	Woonsocket		
C - 6	18	3618	Elm St	at S line of Desrochers	APS		6	1963	10	90	6	APS	1963		WWD	Woonsocket		
C - 6	19	3619	Beacon Ave	50' from N line of Foch	US Pipe		6	1991	8	62	6				WWD	Woonsocket		
C - 6	20	3620	Cass Ave	90' from E line of Hebert	Chapman		4		8	93				Y	WWD	Woonsocket		

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Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
C - 6	21	3621	Cote Ave	10' from N line of Cass	Chapman		4		6	93				Y	WWD	Woonsocket		
C - 6	22	3622	Jervis St	30' from N line of Cass	APS		6	1963	8	94	6	APS	1963		WWD	Woonsocket		
C - 6	23	3623	Lebrun Ave	30' from N line of Cass	Fairmount		6	1950	8	95	6				WWD	Woonsocket		
C - 6	24	3624	Cass Ave	240' from W line of Elm	Chapman		4		8	86				Y	WWD	Woonsocket		
C - 6	25	3625	Elm St	160' from N line of Cass	APS		6	1963	10	88	6	APS	1963		WWD	Woonsocket		
C - 6	26	3626	Cass Ave	at E line of Elm	Darling		6	1957	10	88	6		1957		WWD	Woonsocket		
C - 6	27	3627	Beacon Ave	80' from N line of Edgewood	US Pipe		6	1996	8	65	6				WWD	Woonsocket		
C - 6	28	3628	Beacon Ave	110' from N line of Cass	Kennedy		6	1996	8	77	6				WWD	Woonsocket		
C - 6	29	3629	Holland Ave	10' from E line of Grace	APS		6	1960	8	70	6	APS	1960		WWD	Woonsocket		
C - 6	30	3630	Cass Ave	80' from W line of Beacon	Darling		6	1957	10	83	6		1957		WWD	Woonsocket		
C - 6	31	3631	Nursery Ave	150' from N line of Cass	RD Wood		6	1932	8	83	6				WWD	Woonsocket		
C - 6	32	3632	Cass Ave	10' from E line of Nursery	APS		6	1957	10	85	6	APS	1957		WWD	Woonsocket		
C - 6	33	3633	Elm St	at E line of Lebrun			4		8					Y	WWD	Woonsocket		
C - 6	34	3634	Elm St	230' from E line of Desrochers			6		8					Y	WWD	Woonsocket		
C - 6	35	3635	Elm St	15' form W line of Jervis			4		8					Y	WWD	Woonsocket		
C - 6	36	3636	Hebert Ave	115' from N line of Cass	APS		6	1971	8		6	APS	1971		WWD	Woonsocket		
C - 6	37	3637	Hebert Ave	47' from S line of Elm	Kennedy		6	1972	8	68	6	APS	1972		WWD	Woonsocket		
C - 6	38	3638	Cass Ave	NE front side of WHS	APS		6	1972	8		6	APS	1972		WWD	Woonsocket		
C - 6	39	3639	Cass Ave	E side of WHS	APS		6	1972	8		6	APS	1972		WWD	Woonsocket		
C - 6	40	3640	Cass Ave	SE rear side of WHS	APS		6	1972	8		6	APS	1972		WWD	Woonsocket		
C - 6	41	3641	Cass Ave	SW rear side of WHS	APS		6	1972	8		6	APS	1972		WWD	Woonsocket		
C - 6	42	3642	Cass Ave	NW front side of WHS	APS		6	1972	8		6	APS	1972		WWD	Woonsocket		
C - 6	43	3643	Henry St	80' from N line of Elm	Kennedy		6	1977	8		6	Kennedy	1977		WWD	Woonsocket		
C - 6	44	3644	Cote Ave	215' north of Cass	Darling		6	1984	6		6	Darling	1984		WWD	Woonsocket		
C - 6	45	3645	Cote Ave	220' south of Elm	Darling		6	1984	6		6	Darling	1984		WWD	Woonsocket		
C - 6	46	3646	Janet Ave	35' east of Grace	Mueller		6	1985	8		6	Clow	1985		WWD	Woonsocket		
C - 6	47	3647	Cass Ave	at bldg 394	US Pipe		6	1992			6				WWD	Woonsocket		
C - 6	48	3648	Cass Ave	at bldg 600	US Pipe		6	1993	8		6	Mueller	1993		WWD	Woonsocket		
C - 6	49	3649	Hebert Ave	at bldg 90-94, 328' from S line of Elm	US Pipe		6	1993	8		6	Mueller	1993		WWD	Woonsocket		
C - 6	50	3650	Edgewood Ave	SW corner of Edgewood & Beacon	Kennedy		6	1996	8		6		1996		WWD	Woonsocket		
C - 6	51	3651	Edgewood Ave	at cul-de-sac	Kennedy		6	1996	8		6		1996		WWD	Woonsocket		
C - 7	0	3700	Nursery Ave	100' from N line of Campeau	RD Wood		6	1932	8	65	6				WWD	Woonsocket		
C - 7	1	3701	Nursery Ave	55' from S line of Campeau	RD Wood		6	1932	8	70	6				WWD	Woonsocket		
C - 7	2	3702	Mitris Blvd	20' from N line of Campeau	Darling		6	1959	8	77	6	Ludlow	1959		WWD	Woonsocket		
C - 7	3	3703	Wayne Rd	200' from N line of Mitris	APS		6	1963	8	64	6	APS	1963		WWD	Woonsocket		
C - 7	4	3704	Papineau Ave	200' from N line of Lefrancois	Kennedy		6	1979	8		6				WWD	Woonsocket		
C - 7	5	3705	Mendon Rd	150' from N line of Elder Ballou	RD Wood		6	1932	12	56	6				WWD	Woonsocket		
C - 7	6	3706	Conrad St	10' from S line of Elder Ballou	Mueller		6	1960	8	51	6				WWD	Woonsocket		
C - 7	7	3707	Nursery Ave	bldg 185, 60' from N line of Colony	US Pipe		6	1990	8	72	6				WWD	Woonsocket		
C - 7	8	3708	Nursery Ave	90' from S line of Colony	US Pipe		6	1995	8	76	6				WWD	Woonsocket		
C - 7	9	3709	Dana St	260' from S line of Campeau	APS		6	1963	8	74	6	APS	1963		WWD	Woonsocket		
C - 7	10	3710	Lefrancois Blvd	145' from W line of Bourassa	Kennedy		6	1976	8		6				WWD	Woonsocket		
C - 7	11	3711	Lefrancois Blvd	20' from E line of Papineau	Kennedy		6	1976	8		6				WWD	Woonsocket		
C - 7	12	3712	Bourassa Ave	10' from N line of Langevin	APS		6	1964	8	68	6	APS	1964		WWD	Woonsocket		
C - 7	13	3713	Papineau Ave	135' from S line of Lefrancois	Kennedy		6	1976	8		6				WWD	Woonsocket		
C - 7	14	3714	Mendon Rd	10' from N line of Lefrancois	Mueller		6	1986	12		6				WWD	Woonsocket		
C - 7	15	3715	Mendon Rd	35' from N line of Conrad	RD Wood		6	1932	12	60	6				WWD	Woonsocket		
C - 7	16	3716	Conrad St	120' from N line of Conrad St angle point	RD Wood		6	1932	8	54	6				WWD	Woonsocket		
C - 7	17	3717	Theresa St	20' from S line of Elder Ballou	Mueller		6	1956	8	49	6		1956		WWD	Woonsocket		
C - 7	18	3718	MacArthur Rd	10' from N line of Elder Ballou	Mueller		6	1956	8	46	6		1956		WWD	Woonsocket		
C - 7	19	3719	Nursery Ave	at N line of Holland	RD Wood		6	1932	8	78	6				WWD	Woonsocket		
C - 7	20	3720	Nursery Ave	90' from S line of Victory	Kennedy		6	1997	8	80	6				WWD	Woonsocket		
C - 7	21	3721	Victory Blvd	130' from W line of Newton	APS		6	1962	8	83	6	APS	1962		WWD	Woonsocket		
C - 7	22	3722	Newton St	20' from S line of Colony	APS		6	1960	8	85	6	APS	1960		WWD	Woonsocket		
C - 7	23	3723	Newton St	130' from S line of Victory	APS		6	1960	8	85	6	APS	1960		WWD	Woonsocket		
C - 7	24	3724	Lambert Ave	320' from E line of Dana	APS		6	1961	8	65	6	APS	1961		WWD	Woonsocket		
C - 7	25	3725	Mendon Rd	60' from N line of Theresa	RD Wood		6	1932	12	60	6				WWD	Woonsocket		
C - 7	26	3726	Mendon Rd	110' from N line of Lambert	RD Wood		6	1932	12	60	6				WWD	Woonsocket		
C - 7	27	3727	Theresa St	20' from N line of Pichette	Darling		6	1956	8	60	6		1956		WWD	Woonsocket		
C - 7	28	3728	Marie Anne Ct	160' from N line of Pichette	APS		6	1960	8	49	6	APS	1960		WWD	Woonsocket		
C - 7	29	3729	Lexinton St	140' from N line of Cass	Mueller		6	1956	8	83	6				WWD	Woonsocket		
C - 7	30	3730	Arlington St	80' from E line of Lexington	Mueller		6	1956	8	83	6				WWD	Woonsocket		
C - 7	31	3731	Dana St	120' from S line of Lambert	APS		6	1961	8	65	6		1961		WWD	Woonsocket		
C - 7	32	3732	Dana St	at bldg 68, 40' from N line of Arlington	US Pipe		6	1997	8	65	6		1997		WWD	Woonsocket		
C - 7	33	3733	Mendon Rd	20' from S line of Lambert	RD Wood		6	1932	12	60	6				WWD	Woonsocket		
C - 7	34	3734	Rodman St	40' from S line of Cass	RD Wood		6	1932	8	78	6				WWD	Woonsocket		
C - 7	35	3735	Cass Ave	20' from E line of Rodman	Darling		6	1957	10	76	6		1957		WWD	Woonsocket		
C - 7	36	3736	Kenwood St	110' from S line of Cass	Chapman		6	1950	8	72	6				WWD	Woonsocket		
C - 7	37	3737	Cass Ave	80' from W line of Dana	Darling		6	1957	10	70	6				WWD	Woonsocket		
C - 7	38	3738	Dana St	at bldg 26, 110' from N line of Cass	US Pipe		6	1997	8	65	6		1997		WWD	Woonsocket		
C - 7	39	3739	Mendon Rd	30' from N line of Cass	RD Wood		6	1932	12	59	6				WWD	Woonsocket		
C - 7	40	3740	Mendon Rd	260' from N line of Cass	RD Wood		6	1932	12	58	6				WWD	Woonsocket		
C - 7	41	3741	Arlington St	65' from E line of Newton			6		8					Y	WWD	Woonsocket		

Appendix F
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Hydrant Database

Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
C - 7	42	3742	Theresa St	320' from E line of Mendon	APS		6	1965	8	59	6	APS	1965		WWD	Woonsocket		
C - 7	43	3743	Bourassa Ave	370' from N line of Lefrancois	Kennedy		6	1979	8		6	Kennedy	1979		WWD	Woonsocket		
C - 8	0	3800	Priscilla Rd	80' from S line of Marshall	Darling		6	1956	8	100	6		1956		WWD	Woonsocket		
C - 8	1	3801	Lemay Rd	420' from N line of Elder Ballou	Mueller		6	1961	8	90	6		1961		WWD	Woonsocket		
C - 8	2	3802	Marshall Rd	320' from E line of Priscilla	Mueller		6	1957	8	90	6		1957		WWD	Woonsocket		
C - 8	3	3803	Halsey Rd	20' from S line of Marshall	Mueller		6	1958	8	78	6		1958		WWD	Woonsocket		
C - 8	4	3804	Priscilla Rd	20' from N line of Elder Ballou	Mueller		6	1956	6	100	6		1956		WWD	Woonsocket		
C - 8	5	3805	Halsey Rd	160' from S line of Lemay	Mueller		6	1958	8	78	6		1958		WWD	Woonsocket		
C - 8	6	3806	Madeleine Ave	90' from S line of Elder Ballou	Mueller		6	1955	8	90	6	Mueller	1955		WWD	Woonsocket		
C - 8	7	3807	Elder Ballou Meetinghouse Rd	at centerline of Annette	RD Wood		6	1932	8	85	6				WWD	Woonsocket		
C - 8	8	3808	Annette Ave	290' from S line of Elder Ballou	Mueller		6	1954	8	90	6		1954		WWD	Woonsocket		
C - 8	9	3809	Elder Ballou Meetinghouse Rd	100' from W line of Halsey	Mueller		6	1961	8	76	6		1961		WWD	Woonsocket		
C - 8	10	3810	Elder Ballou Meetinghouse Rd	120' from E line of Halsey	APS		6	1964	12	76	6	APS	1964		WWD	Woonsocket		
C - 8	11	3811	Elder Ballou Meetinghouse Rd	300' east of 3810	Kennedy		6	1978	12		6	APS	1964		WWD	Woonsocket		
C - 8	12	3812	Elder Ballou Meetinghouse Rd	500' east of 3811	APS		6	1964	12	70	6	APS	1964		WWD	Woonsocket		
C - 8	13	3813	Elder Ballou Meetinghouse Rd	380' east of 3812	APS		6	1964	12	65	6	APS	1964		WWD	Woonsocket		
C - 8	14	3814	Madeleine Ave	510' from S line of Elder Ballou	Mueller		6	1961	8	95	6	Mueller			WWD	Woonsocket		
C - 8	15	3815	Madeleine Ave	480' south of 3814	APS		6	1962	8	95	6	APS	1962		WWD	Woonsocket		
C - 8	16	3816	Annette Ave	440' south of 3808	Darling		6	1956	8	95	6		1956		WWD	Woonsocket		
C - 8	17	3817	Grandview Ave	140' from N line of Elder Ballou	APS		6	1969	8		6	APS	1969		WWD	Woonsocket		
C - 8	18	3818	Grandview Ave	80' from N line of Bayberry	APS		6	1969	8		6	APS	1969		WWD	Woonsocket		
C - 8	19	3819	Carey Ct	320' from N line of Elder Ballou	Kennedy		6	1973	8		6	MET	1973		WWD	Woonsocket		
C - 8	20	3820	Viva Way	at cul-de-sac	Kennedy		6	1978	8		6	Kennedy	1977		WWD	Woonsocket		
C - 8	21	3821	Tara Lane	at N line of Ledgewood	US Pipe		6	1987	8		6	Waterest	1987		WWD	Woonsocket		
C - 8	22	3822	Ledgewood Ln	end of cul-de-sac	US Pipe		6	1988	8		6	Waterest	1987		WWD	Woonsocket		
C - 8	23	3823	Arland Ct	at sidewalk of cul-de-sac	Mueller		6	1989	8		6		1989		WWD	Woonsocket		
C - 9	0	3900	Bound Rd	330' north of 3901	APS		6	1964	12	55	6	APS	1964		WWD	Woonsocket		
C - 9	1	3901	Bound Rd	350' from N line of Elder Ballou	APS		6	1964	12	65	6	APS	1964		WWD	Woonsocket		
C - 9	2	3902	Elder Ballou Meetinghouse Rd	350' west of 3903	APS		6	1964	12	60	6	APS	1964		WWD	Woonsocket		
C - 9	3	3903	Elder Ballou Meetinghouse Rd	350' east of 3902	APS		6	1964	12	62	6	APS	1964		WWD	Woonsocket		
C - 9	4	3904	Elder Ballou Meetinghouse Rd	290' west of 3905	APS		6	1964	12	62	6	APS	1964		WWD	Woonsocket		
C - 9	5	3905	Elder Ballou Meetinghouse Rd	140' from W line of Bound	APS		6	1964	12	62	6	APS	1964		WWD	Woonsocket		
C - 9	6	3906	Walnut Hill Rd	117' from E line of Gradview	APS		6	1969	8		6	APS	1969		WWD	Woonsocket		
C - 9	7	3907	Walnut Hill Rd	18' from W line of Bayberry	APS		6	1969	8		6	APS	1969		WWD	Woonsocket		
C - 9	8	3908	Bayberry Rd	419' from S line of Walnut Hill	APS		6	1969	8		6	APS	1969		WWD	Woonsocket		
C - 9	9	3909	Bayberry Rd	400' east of 3910	APS		6	1969	8		6	APS	1969		WWD	Woonsocket		
C - 9	10	3910	Bayberry Rd	290' from E line of Grandview	APS		6	1969	8		6	APS	1969		WWD	Woonsocket		
C - 9	11	3911	Walnut Hill Rd	400' from E line of Bayberry	APS		6	1967	8		6	APS	1987		WWD	Woonsocket		
C - 9	12	3912	Brookhaven Ln	458' from Elder Ballou	US Pipe		6	1987	12		6		1987		Brookhaven	Woonsocket		
C - 9	13	3913	Harvard Ct	265' off Brookhaven Ln	US Pipe		6	1987	8		6		1987		Brookhaven	Woonsocket		
C - 9	14	3914	Brookhaven Ln	927' from Elder Ballou	US Pipe		6	1987	12		6		1987		Brookhaven	Woonsocket		
C - 9	15	3915	Cambridge Ct	483' off of Brookhaven Ln	US Pipe		6	1987	8		6		1987		Brookhaven	Woonsocket		
C - NS	0	3NS00	Rhodes Ave	350' east of Mendon Rd, NS	APS		6	1968	10		6	APS	1968		Pacheco	N. Smithfield		
C - NS	1	3NS01	Private Drive	in cul-de-sac	APS		6	1968	8		6	APS	1968		Pacheco	N. Smithfield		
C - NS	2	3NS02	Cynthia Dr	40' from E line of Deborah	APS		6	1968	8		6	APS	1968		Pacheco	N. Smithfield		
C - NS	3	3NS03	Cynthia Dr	55' from W line of Sharon	APS		6	1968	8		6	APS	1968		Pacheco	N. Smithfield		
C - NS	4	3NS04	Sharon Pkwy	at end of cul-de-sac	APS		6	1968	8		6	APS	1968		Pacheco	N. Smithfield		
C - NS	5	3NS05	Private Drive	200' from Mendon Rd	Kennedy		6	1978	6		6				private	Woonsocket		
D - 1	0	4100	Tenth Ave	10' from S line of Chapel	Mueller		6	1960	8	50	6				WWD	Woonsocket		
D - 1	1	4101	Ninth Ave	5' from N line of Chapel	Mueller		6	1979	6		6	Mueller	1979		WWD	Woonsocket		
D - 1	2	4102	Eighth Ave	10' from N line of Chapel	Darling		6	1957	8	52	6				WWD	Woonsocket		
D - 1	3	4103	Eighth Ave	250' from N line of Mason	Mueller		6	1960	8	64	6				WWD	Woonsocket	8	
D - 1	4	4104	Seventh Ave	10' from N line of Chapel	Chapman		4		6	65				Y	WWD	Woonsocket		
D - 1	5	4105	Tenth Ave	220' from N line of Mason	Mueller		6	1960	8	50	6				WWD	Woonsocket		
D - 1	6	4106	Tenth Ave	20' from N line of Mason	Mueller		6	1960	8	54	6				WWD	Woonsocket		
D - 1	7	4107	Ninth Ave	250' from N line of Mason	Mueller		6	1960	6	62	6				WWD	Woonsocket		
D - 1	8	4108	Ninth Ave	30' from N line of Mason	Darling		6	1957	6	62	6				WWD	Woonsocket		
D - 1	9	4109	Eighth Ave	30' from N line of Mason	Kennedy	K 81 A	6	1990	8	64	6		1990		WWD	Woonsocket		
D - 1	10	4110	Bourdon Blvd	20' from S line of cul-de-sac	Mueller		6	1953	8	59	6		1953		WWD	Woonsocket		
D - 1	11	4111	Bourdon Blvd	cul-de-sac, 240' from E line of Bourdon Blvd	Mueller		6	1953	6	52	6		1953		WWD	Woonsocket		
D - 1	12	4112	Bourdon Blvd	at south end of cul-de-sac	Mueller		6	1953	6	48	6		1953		WWD	Woonsocket		
D - 1	13	4113	Bourdon Blvd	480' south of 4110	Mueller		6	1953	8	50	6		1953		WWD	Woonsocket		
D - 1	14	4114	Bourdon Blvd	390' south of 4113	Mueller		6	1953	8	48	6		1953		WWD	Woonsocket		
D - 1	15	4115	Bourdon Blvd	430' east of 4114	Mueller		6	1953	8	46	6		1953		WWD	Woonsocket		
D - 1	16	4116	Seventh Ave	18' from N line of Chapel	Kennedy		6	1976	6	70	6	Kennedy	1976		WWD	Woonsocket		
D - 2	0	4200	Sixth Ave	10' from N line of Chapel	Mueller		6	1960	6	70	6				WWD	Woonsocket		
D - 2	1	4201	Sixth Ave	160' from S line of Chapel	Kennedy		6	1997	8	70	6		1997		WWD	Woonsocket		
D - 2	2	4202	Fifth Ave	200' from S line of Chapel	Kennedy		6	1994	8	70	6				WWD	Woonsocket		
D - 2	3	4203	Fourth Ave	220' from N line of Olo	Fairmount		4		6	65					WWD	Woonsocket		
D - 2	4	4204	Third Ave	bldg 136-139, 240' from N line of Olo	US Pipe		6	1997	6	73	6		1997		WWD	Woonsocket		
D - 2	5	4205	Second Ave	60' from S line of Short	Chapman		4		6	76					WWD	Woonsocket		
D - 2	6	4206	Olo St	10' from E line of Second			4		6					Y	WWD	Woonsocket		
D - 2	7	4207	First Ave	100' from S line of Short	Chapman		4		8	83					WWD	Woonsocket		

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Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
D - 2	8	4208	First Ave	10' from N line of Olo	Kennedy		6	1994	8	81	6		1994		WWD	Woonsocket		
D - 2	9	4209	Sayles St	at south end of Sayles	Chapman		4		4	83					WWD	Woonsocket		
D - 2	10	4210	Seventh Ave	240' from N line of Mason	Chapman		4		6	65				Y	WWD	Woonsocket		
D - 2	11	4211	Seventh Ave	10' from N line of Mason	Chapman		4		6	65				Y	WWD	Woonsocket		
D - 2	12	4212	Mason St	50' from W line of Sixth			4		8	65				Y	WWD	Woonsocket		
D - 2	13	4213	Sixth Ave	10' from N line of Olo	Kennedy		6	1997	8	70	6		1997		WWD	Woonsocket		
D - 2	14	4214	Fifth Ave	10' from S line of Olo	Kennedy		6	1997	8	58	6		1997		WWD	Woonsocket		
D - 2	15	4215	Olo St	30' from E line of Fourth	Mueller		6	1960	6	65	6				WWD	Woonsocket		
D - 2	16	4216	Third Ave	bldg 52-54, 140' from S line of Olo	Kennedy		6	1997	6		6		1997		WWD	Woonsocket		
D - 2	17	4217	Second Ave	240' from S line of Olo	Chapman		4		6	77				Y	WWD	Woonsocket		
D - 2	18	4218	Foundry St	160' from S line of Olo	Fairmount		4		6	80				Y	WWD	Woonsocket		
D - 2	19	4219	Olo St	380' from E line of Foundry			4		6	82				Y	WWD	Woonsocket		
D - 2	20	4220	Hope St	30' from E line of West	RD Wood		6	1932	8	78	6		1932	Y	WWD	Woonsocket		
D - 2	21	4221	West St	10' from S line of Olo	APS		6	1960	8	80	6	APS			WWD	Woonsocket		
D - 2	22	4222	Asylum St	10' from S line of Mason	Chapman		4		6	65					WWD	Woonsocket		
D - 2	23	4223	Mason St	100' from E line of Fifth	Mueller		6	1978	8		6	Mueller	1978		WWD	Woonsocket		
D - 2	24	4224	Sunnyside Ave	140' from S line of Mason	RD Wood		6	1932	8	77	6				WWD	Woonsocket		
D - 2	25	4225	Mason St	20' from E line of Sunnyside	Mueller		6	1978	8		6	Mueller	1978		WWD	Woonsocket		
D - 2	26	4226	Mason St	100' from E line of Third			4		8					Y	WWD	Woonsocket		
D - 2	27	4227	Second Ave	100' from N line of Mason	Mueller		6	1978	6	80	6	Mueller	1978		WWD	Woonsocket		
D - 2	28	4228	Mason St	140' from E line of Second	Mueller		6	1978	8		6	Mueller	1978		WWD	Woonsocket		
D - 2	29	4229	Oak St	at E line of Slocomb	APS		6	1960	8	83	6	APS			WWD	Woonsocket		
D - 2	30	4230	South St	10' from E line of West	Chapman		4		8	78				Y	WWD	Woonsocket		
D - 2	31	4231	John St	70' from S line of South	Fairmount		4		4	75					WWD	Woonsocket		
D - 2	32	4232	Center St	10' from N line of South	Fairmount		4		8	73				Y	WWD	Woonsocket		
D - 2	33	4233	Asylum St	270' from N line of Ruby	Chapman		4		6	64					WWD	Woonsocket		
D - 2	34	4234	Sunnyside Ave	340' from S line of Mason	RD Wood		6		8	75	6			Y	WWD	Woonsocket		
D - 2	35	4235	Sunnyside Ave	260' from N line of Ruby	US Pipe		6	1998	8	75	6				WWD	Woonsocket		
D - 2	36	4236	Mason St	at N line of Oak	Mueller		6	1960	8		6				WWD	Woonsocket		
D - 2	37	4237	Oak St	240' from E line of Mason	APS		6	1960	8	84	6	APS			WWD	Woonsocket		
D - 2	38	4238	Pleasant St	220' from E line of Mason	APS		6	1962	6	75	6	APS	1962		WWD	Woonsocket		
D - 2	39	4239	Pleasant St	at E line of Slocomb	Chapman		4		6	76				Y	WWD	Woonsocket		
D - 2	40	4240	S. Main St	100' from W line of Buxton	Chapman		6	1950	12	70	6				WWD	Woonsocket		
D - 2	41	4241	Pleasant St	at E line of John	Chapman		4		6	76					WWD	Woonsocket		
D - 2	42	4242	Asylum St	40' from S line of Ruby	Chapman		4		6	67				Y	WWD	Woonsocket		
D - 2	43	4243	Asylum St	60' from N line of Bourdon	Fairmount		6	1950	6	70	6				WWD	Woonsocket		
D - 2	44	4244	Sunnyside Ave	at E line of Asylum	Kennedy		6	1988	8		6		1975		WWD	Woonsocket		
D - 2	45	4245	Sunnyside Ave	100' from S line of Ruby	Kennedy		6	1976	8		6				WWD	Woonsocket		
D - 2	46	4246	Sunnyside Ave	55' from N line of Ruby			6		8					Y	WWD	Woonsocket		
D - 2	47	4247	S. Main St	30' from W line of Mason	RD Wood		6	1932	12	67	6				WWD	Woonsocket		
D - 2	48	4248	S. Main St	at E line of Providence	Kennedy		6	1974	12	65	6				WWD	Woonsocket		
D - 2	49	4249	Parker St	at west end of Parker	Chapman		4		8	70				Y	WWD	Woonsocket		
D - 2	50	4250	Parker St	40' from W line of Buxton	Chapman		4		8	75				Y	WWD	Woonsocket		
D - 2	51	4251	Mason St	140' from E line of Second			4		8					Y	WWD	Woonsocket		
D - 2	52	4252	Mason St	50' from E line of Third	APS		6	1969	8	80	6	APS	1969		WWD	Woonsocket		
D - 2	53	4253	Mason St	47' from W line of Sixth	Kennedy		6	1995	8		6	Kennedy	1972		WWD	Woonsocket		
D - 2	54	4254	Olo St	24' from E line of Second	Kennedy		6	1972	6		6	Kennedy	1972		WWD	Woonsocket		
D - 2	55	4255	Olo St	408' from E line of Foundry	Kennedy		6	1973	6		6	MET	1973		WWD	Woonsocket		
D - 2	56	4256	Pleasant St	at E line of Slocomb	Kennedy		6	1976	6	78	6	Kennedy	1976		WWD	Woonsocket		
D - 2	57	4257	South St	12' from E line of West	Kennedy		6	1976	8	75	6	Kennedy	1976		WWD	Woonsocket		
D - 2	58	4258	Seventh Ave	246' from N line of Mason	Kennedy		6	1976	6	75	6	Kennedy	1976		WWD	Woonsocket		
D - 2	59	4259	Seventh Ave	24' from N line of Mason	Kennedy		6	1976	6	67	6	Kennedy	1976		WWD	Woonsocket		
D - 2	60	4260	Center St	20' from N line of South	Darling		6	1976	8		6	Darling	1976		WWD	Woonsocket		
D - 2	61	4261	Second Ave	214' from S line of Olo	Kennedy		6	1980	6		6	Kennedy	1980		WWD	Woonsocket		
D - 2	62	4262	Foundry St	155' from S line of Olo	Kennedy		6	1983	6		6	Mueller	1983		WWD	Woonsocket		
D - 2	63	4263	First Ave	15' from N line of Olo	Mueller		6	1985	8		6	MET	1983		WWD	Woonsocket		
D - 2	64	4264	Parker St	137' southwest of W line of Buxton	Kennedy		6	1988	8	70	6		1988		WWD	Woonsocket		
D - 2	65	4265	West St	at bldg 70	US Pipe		6	1993	6		6	Clow	1993		WWD	Woonsocket		
D - 2	66	4266	Olo St	at bldg 100	US Pipe		6	1993	6		6	Clow	1993		WWD	Woonsocket		
D - 3	0	4300	Jeffers St	200' from W line of West	Mueller		6	1978	6		6	Mueller	1978		WWD	Woonsocket		
D - 3	1	4301	Center St	10' from N line of Jeffers	Fairmount		4		8	75				Y	WWD	Woonsocket		
D - 3	2	4302	Sayles St	at E line of Center	Chapman		4		6	84					WWD	Woonsocket		
D - 3	3	4303	Jeffers St	180' from W line of East					6					Y	WWD	Woonsocket		
D - 3	4	4304	Sayles St	10' from W line of East			4		6	90				Y	WWD	Woonsocket		
D - 3	5	4305	East St	10' from N line of Jeffers	Fairmount		4		8	82				Y	WWD	Woonsocket		
D - 3	6	4306	River St	30' from S line of Sayles	US Metropolitan 250		6	2004	16		6				WWD	Woonsocket		
D - 3	7	4307	Arnold St	130' from N line of Sayles	Chapman		4		8	83					WWD	Woonsocket		
D - 3	8	4308	Arnold St	10' from N line of Sayles			6		8	89	6			Y	WWD	Woonsocket		
D - 3	9	4309	Arnold St	75' from S line of Sayles	Fairmount		4		8	90				R	WWD	Woonsocket		
D - 3	10	4310	Main St	180' north of 4311	Fairmount		6		12	93	6			R	WWD	Woonsocket	19	
D - 3	11	4311	Main St	150' north of 4312	Kennedy		6	1995	12	93	6				WWD	Woonsocket		
D - 3	12	4312	Main St	130' from N line of Bernon	Kennedy		6	1995	12	93	6				WWD	Woonsocket		
D - 3	13	4313	Allen St	50' from E line of Buell	Chapman		6	1950	8		6				WWD	Woonsocket	25	

Appendix F
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Hydrant Database

Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
D - 3	14	4314	Bernon St	40' from E line of Buell	Kennedy		6	1979	14		6				WWD	Woonsocket		
D - 3	15	4315	Center St	20' from N line of Hope	Fairmount		4		8	73				Y	WWD	Woonsocket		
D - 3	16	4316	Center St	10' from N line of Olo	Fairmount		4		8	71				Y	WWD	Woonsocket		
D - 3	17	4317	Hope St	110' from E line of Center	RD Wood		6	1932	8	68	6		1932		WWD	Woonsocket		
D - 3	18	4318	Hope St	120' from W line of East	RD Wood		6	1932	8	70	6		1932		WWD	Woonsocket		
D - 3	19	4319	East St	10' from N line of Hope			4		8					Y	WWD	Woonsocket		
D - 3	20	4320	S. Main St	40' from S line of Bernon	Kennedy		6	1995	12	93	6				WWD	Woonsocket	27	
D - 3	21	4321	S. Main St	10' from S line of Armory	Darling		6		12	95	6	APS	1962	Y	WWD	Woonsocket		
D - 3	22	4322	Armory St	160' from E line of S. Main	RD Wood		6	1932	6	101	6			Y	WWD	Woonsocket		
D - 3	23	4323	Truman Dr	400' north of Bernon	Kennedy		6	1982	10		6		1982		WWD	Woonsocket		
D - 3	24	4324	Bernon St	80' west of Allen					14					Y	WWD	Woonsocket		
D - 3	25	4325	Bernon St	60' from W line of Front	US Metropolitan 250		6	2004	16		6			Y	WWD	Woonsocket		
D - 3	26	4326	Olo St	100' from E line of Center	RD Wood		6	1932	8	72	6				WWD	Woonsocket		
D - 3	27	4327	Olo St	100' from W line of East	RD Wood		6	1932	8	65	6				WWD	Woonsocket		
D - 3	28	4328	East St	30' from N line of Olo	Mueller		6	1960	8		6				WWD	Woonsocket		
D - 3	29	4329	South St	160' from N line of S. Main			4		6	73				Y	WWD	Woonsocket		
D - 3	30	4330	S. Main St	15' from W line of East	Chapman		6	1950	12	80	6				WWD	Woonsocket		
D - 3	31	4331	Front St	50' from S line of S. Main	Mueller		6	1960	12	84	6				WWD	Woonsocket		
D - 3	32	4332	S. Main St	10' from W line of Glenark	Kennedy		6	1971	12	90	6	Chapman	1971		WWD	Woonsocket		
D - 3	33	4333	S. Main St	10' from W line of Island Pl	Kennedy		6	1995	12	95	6				WWD	Woonsocket		
D - 3	34	4334	Island Pl	at east end of Island Pl	Kennedy		6	1994	6	100	6		1994		WWD	Woonsocket		
D - 3	35	4335	Front St	270' from N line of Pine	Kennedy		6	1996	6	92	6		1996	Y	WWD	Woonsocket		
D - 3	36	4336	Front St	10' from N line of Watson	Kennedy		6	1996	6	92	6		1996		WWD	Woonsocket		
D - 3	37	4337	Watson St	170' from E line of Front	Fairmount		4		8	82				Y	WWD	Woonsocket		
D - 3	38	4338	S. Main St	10' from E line of Pleasant	US Pipe		6	1992	12	74	6				WWD	Woonsocket		
D - 3	39	4339	S. Main St	20' from W line of South	Chapman		6	1950	12	77	6				WWD	Woonsocket		
D - 3	40	4340	Front St	10' from S line of Lincoln	APS		6	1960	12	88	6				WWD	Woonsocket		
D - 3	41	4341	Front St	20' from S line of Pine	APS		6	1964	6	92	6	APS	1964		WWD	Woonsocket		
D - 3	42	4342	Pine St	180' from E line of Front	Kennedy		6	1979	8		6				WWD	Woonsocket		
D - 3	43	4343	Union St	180' from N line of Pine	US Pipe		6	1996	8	71	6				WWD	Woonsocket		
D - 3	44	4344	Union St	80' from S line of Bell	US Pipe		6	1996	8	70	6				WWD	Woonsocket		
D - 3	45	4345	Lincoln St	240' from W line of Parker	Chapman		4		6	80				Y	WWD	Woonsocket		
D - 3	46	4346	Parker St	160' from E line of Buxton	Chapman		4		8	76				Y	WWD	Woonsocket		
D - 3	47	4347	Lincoln St	10' from E line of Parker			4		6	80				Y	WWD	Woonsocket		
D - 3	48	4348	Front St	520' from S line of New	Kennedy		6	1996	12	94	6				WWD	Woonsocket		
D - 3	49	4349	Front St	at S line of Logee	Darling		6	1957	12	80	6				WWD	Woonsocket		
D - 3	50	4350	Front St	200' from N line of Logee	Kennedy		6	1996	6	83	6		1996		WWD	Woonsocket		
D - 3	51	4351	Pine St	at center line of Union	Kennedy		6	1979	8		6				WWD	Woonsocket		
D - 3	52	4352	Pine St	40' from W line of Park	US Pipe		6	1991	8		6				WWD	Woonsocket		
D - 3	53	4353	Park Ave	70' from S line of Pine	Kennedy		6	1994	8	65	6		1994		WWD	Woonsocket		
D - 3	54	4354	Hope St	80' from W line of Center	RD Wood		6	1932	8	74	6		1932		WWD	Woonsocket		
D - 3	55	4355	Bernon St	at E line of River			6		14					Y	WWD	Woonsocket		
D - 3	56	4356	Bernon St	10' from W line of Arnold			6		12					Y	WWD	Woonsocket		
D - 3	57	4357	Bernon St	at W line of Allen			6		14					Y	WWD	Woonsocket		
D - 3	58	4358	S. Main St	65' from W line of Island Pl			6		12					Y	WWD	Woonsocket		
D - 3	59	4359	Front St	250' from S line of Lincoln			6		12					Y	WWD	Woonsocket		
D - 3	60	4360	Lincoln St	62' from E line of Parker	Kennedy		6	1972	6		6	Kennedy			WWD	Woonsocket		
D - 3	61	4361	Jeffers St	184' from W line of East	Kennedy		6	1972	6	64	6	Kennedy	1972		WWD	Woonsocket		
D - 3	62	4362	Sayles St	23' from W line of East	Kennedy		6	1972	6	71	6	Kennedy	1972		WWD	Woonsocket		
D - 3	63	4363	South St	204' from N line of S. Main	Kennedy		6	1972	6	62	6	Kennedy	1972		WWD	Woonsocket		
D - 3	64	4364	East St	24' from S line of Jeffers	Kennedy	K 81 A	6	1989	8	82	6	Kennedy	1976		WWD	Woonsocket		
D - 3	65	4365	Lincoln St	178' from W line of Parker	Kennedy		6	1972	6	82	6	Kennedy	1976		WWD	Woonsocket		
D - 3	66	4366	Center St	62' from N line of Jeffers	Darling		6	1976	8		6	Darling	1976		WWD	Woonsocket		
D - 3	67	4367	Center St	48' from N line of Olo	Darling		6	1976	8		6	Darling	1976		WWD	Woonsocket		
D - 3	68	4368	Center St	14' from N line of Hope	Darling		6	1976	8		6	Darling	1976		WWD	Woonsocket		
D - 3	69	4369	Truman Dr	40' north of Armory St	Kennedy		6	1982	10		6		1982		WWD	Woonsocket		
D - 3	70	4370	Truman Dr	200' north of Armory St	Kennedy		6	1982	10		6		1982		WWD	Woonsocket		
D - 3	71	4371	Parker St	148' northeast of E line of Buxton	Kennedy		6	1988	8	76	6				WWD	Woonsocket		
D - 3	72	4372	Globe St	20' form New St	Kennedy		6	1988	8		6		1988		WWD	Woonsocket		
D - 3	73	4373	Bernon St	135' from W line of Front	US Metropolitan 250		6	2004	16		6		1988		WWD	Woonsocket		
D - 3	74	4374	Watson St	at bldg 37	Kennedy	K 81 A	6	1989	8	82	6	Kennedy	1989		WWD	Woonsocket		
D - 3	75	4375												?				no card
D - 3	76	4376	Main St	across from bldg 55	Kennedy		6	1995	12		6	Mueller	1995		WWD	Woonsocket		
D - 3	77	4377	Arnold St	across corner of Main St	Kennedy		6	1995	8		6	Mueller	1995		WWD	Woonsocket		
D - 3	78	4378	S. Main St	at Market Square corner of Bernon	Kennedy		6	1995	12		6	Mueller	1995		WWD	Woonsocket		
D - 3	79	4379	Front St	at bldg 306	Kennedy		6	1996	6		6		1996		WWD	Woonsocket		
D - 4	0	4400	Front St	180' from N line of Bernon			4		6					Y	WWD	Woonsocket		
D - 4	1	4401	Front St	at N line of Central			4		6	88				Y	WWD	Woonsocket		
D - 4	2	4402	Greene St	20' from N line of Central	RD Wood		6	1932	12	88	6		1932		WWD	Woonsocket		
D - 4	3	4403	Greene St	170' from N line of Willow	RD Wood		6	1932	12	88	6		1932		WWD	Woonsocket		
D - 4	4	4404	Park Ave	200' from N line of Willow	Darling		6	1957	8	76	6		1957		WWD	Woonsocket		
D - 4	5	4405	Park Ave	20' from S line of Carrington	Darling		6	1957	8	77	6		1957		WWD	Woonsocket		
D - 4	6	4406	Grove St	160' from S line of Carrington	Fairmount		4		8	68					WWD	Woonsocket		

Appendix F
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Hydrant Database

Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
D - 4	7	4407	Grove St	50' from N line of Carrington	APS		6		4					R	WWD	Woonsocket		
D - 4	8	4408	Grove St	10' from N line of Carrington			4		4					R	WWD	Woonsocket		
D - 4	9	4409	Carrington Ave	185' from E line of Grove	Chapman		4		4					R	WWD	Woonsocket		
D - 4	10	4410	Carrington Ave	210' from W line of Welles	Chapman		4		4					R	WWD	Woonsocket		
D - 4	11	4411	Hamlet Ave	at W line of Welles			4		6					Y	WWD	Woonsocket		
D - 4	12	4412	Welles St	130' from N line of Carrington	Chapman		4		4					R	WWD	Woonsocket		
D - 4	13	4413	Hamlet Ave	20' from E line of Bennett					6					Y	WWD	Woonsocket		
D - 4	14	4414	Bernon St	at bldg 259	US Metropolitan 250		6	2004	16		6				WWD	Woonsocket		4" hydrant branch
D - 4	15	4415	Greene St	30' from N line of Bernon	RD Wood		6	1932	12	86	6		1932		WWD	Woonsocket		
D - 4	16	4416	Greene St	240' from E line of Bernon	Kennedy		6	1981	12	86	6		1932		WWD	Woonsocket		
D - 4	17	4417	Park Ave	210' from S line of Willow	Darling		6	1957	8	76	6		1957		WWD	Woonsocket		
D - 4	18	4418	Park Ave	20' from N line of Willow	Darling		6	1957	8	76	6		1957		WWD	Woonsocket		
D - 4	19	4419	Grove St	20' from S line of Willow	APS		6	1962	8	70	6	APS	1962		WWD	Woonsocket		
D - 4	20	4420	Welles St	65' from S line of Carrington	Chapman		4		6	75				Y	WWD	Woonsocket		
D - 4	21	4421	Carrington Ave	55' from W line of Bennett	Chapman		4		6	75					WWD	Woonsocket		
D - 4	22	4422	Watson St	30' from W line of Union	Fairmount		4		8	77				Y	WWD	Woonsocket		
D - 4	23	4423	Greene St	20' from N line of Watson	RD Wood		6	1932	14	79	6				WWD	Woonsocket		
D - 4	24	4424	Bernon St	180' from W line of Park	RD Wood		6	1932	8	89	6				WWD	Woonsocket		
D - 4	25	4425	Park Ave	50' from S line of Bernon	Darling		6	1957	8	76	6		1957		WWD	Woonsocket		
D - 4	26	4426	Bernon St	140' from W line of Grove	RD Wood		6	1932	8	65	6		1932		WWD	Woonsocket		
D - 4	27	4427	Grove St	100' from N line of Bernon	Chapman		4		8	65				Y	WWD	Woonsocket		
D - 4	28	4428	Wilson Ave	20' from S line of Paradis	Kennedy		6	1997	8	64	6		1997		WWD	Woonsocket		
D - 4	29	4429	Wilson Ave	60' from S line of Willow	Kennedy	K 81 A	6	1989	8	66	6				WWD	Woonsocket		
D - 4	30	4430	Willow St	90' from E line of Wilson	Mueller		6	1979	6		6	Mueller	1979		WWD	Woonsocket		
D - 4	31	4431	Willow St	20' from W line of Maple	Mueller		6	1979	6		6	Mueller	1979		WWD	Woonsocket		
D - 4	32	4432	Paradis Ave	30' from W line of Maple	Chapman		4		6	59					WWD	Woonsocket		
D - 4	33	4433	Welles St	5' from S line of Willow	US Pipe		6	1991	6		6	Mueller	1979		WWD	Woonsocket		
D - 4	34	4434	Bennett St	20' from N line of Willow	Mueller		6	1979	6		6	Mueller	1979		WWD	Woonsocket		
D - 4	35	4435	Willow St	130' from E line of Bennett	Mueller		6	1979	6		6	Mueller	1979		WWD	Woonsocket	26	
D - 4	36	4436	Park Ave	100' from S line of Bell	US Metropolitan 250		6	2004	16		6				WWD	Woonsocket		4" gate opens left
D - 4	37	4437	Park Ave	10' from N line of Bell	Darling		6	1957	8	76	6		1957		WWD	Woonsocket		
D - 4	38	4438	Grove St	180' from S line of Bernon	Kennedy		6	1994	8	83	6				WWD	Woonsocket		
D - 4	39	4439	Cottage St	10' from S line of Bernon	RD Wood		4		6	58				Y	WWD	Woonsocket		
D - 4	40	4440	Wilson Ave	at N line of Bernon	Kennedy		6	1997	8	54	6		1997		WWD	Woonsocket		
D - 4	41	4441	Bernon St	60' from E line of Division	Fairmount		4		6	48					WWD	Woonsocket		
D - 4	42	4442	Bernon St	20' from E line of Maple					6	44				Y	WWD	Woonsocket		
D - 4	43	4443	Paradis Ave	20' from W line of Welles	Chapman		4		6	60					WWD	Woonsocket		
D - 4	44	4444	Bernon St	10' from W line of Welles	Chapman		4		6	50					WWD	Woonsocket		
D - 4	45	4445	Bernon St	20' from W line of Bennett	Fairmount		4		6	46					WWD	Woonsocket		
D - 4	46	4446	Bennett St	10' from N line of Paradis	Chapman		4		6	68					WWD	Woonsocket		
D - 4	47	4447	Bernon St	140' from E line of Bennett	APS		6	1961	6	53	6	APS	1961		WWD	Woonsocket		
D - 4	48	4448	Crawford St	at E line of Park	RD Wood		6	1932	14	67	6				WWD	Woonsocket		
D - 4	49	4449	Crawford St	at W line of Grove	US Metropolitan 250		6	2004	16		6				WWD	Woonsocket		
D - 4	50	4450	Grove St	240' from N line of Crawford	Chapman		4		8	76					WWD	Woonsocket		
D - 4	51	4451	Cottage St	at S line of Unity	Chapman		4		6	64				Y	WWD	Woonsocket		
D - 4	52	4452	Cottage St	180' from N line of Unity	Fairmount		4		6	70					WWD	Woonsocket		
D - 4	53	4453	Unity St	200' from W line of Division	Chapman		4		6	56					WWD	Woonsocket		
D - 4	54	4454	Division St	100' from N line of St. Francis	Darling		6	1957	8	84	6		1957		WWD	Woonsocket		
D - 4	55	4455	Maple St	90' from N line of St. Francis	Kennedy		6	1997	8	66	6				WWD	Woonsocket		
D - 4	56	4456	Hamlet Ave	60' from W line of Bennett			4		6					Y	WWD	Woonsocket		
D - 4	57	4457	Front St	140' from N line of Bernon	APS		6	1965	6	91	6	APS	1965		WWD	Woonsocket		
D - 4	58	4458	Paradis Ave	130' from E line of Welles	Kennedy		6	1983	6	61	6				WWD	Woonsocket		
D - 4	59	4459	Bennett St	25' from S line of Manville	Kennedy		6	1973	6		6	MET	1973		WWD	Woonsocket		
D - 4	60	4460	Bernon St	33' from E line of Maple	Kennedy		6	1973	6		6	MET	1973		WWD	Woonsocket		
D - 4	61	4461	Carrington Ave	9' from E line of Maple	Kennedy		6	1984	12		6	APS	1974		WWD	Woonsocket		
D - 4	62	4462	Carrington Ave	40' from E line of Grove	Kennedy		6	1974	12		6	Chapman	1974		WWD	Woonsocket		
D - 4	63	4463	Grove St	125' from N line of Carrington	Kennedy		6	1974	12		6	MET	1974		WWD	Woonsocket		
D - 4	64	4464	Welles St	60' from N line of Carrington	Kennedy		6	1974	12		6	Kennedy	1974		WWD	Woonsocket		
D - 4	65	4465	Welles St	7' from S line of Hamlet	Kennedy		6	1975	12		6	Kennedy	1975		WWD	Woonsocket		
D - 4	66	4466	Bennett St	160' from S line of Bernon	Kennedy		6	1976	8	43	6	Kennedy	1976		WWD	Woonsocket		
D - 4	67	4467	Bernon St	148' from E line of Grove	Kennedy		6	1983	8		6	Smith-Metro	1983		WWD	Woonsocket		
D - 4	68	4468	Cottage St	at S line of Unity	US Pipe		6	1987	6		6	Mueller	1987		WWD	Woonsocket		
D - 4	69	4469	Welles St	at bldg 125, 62' from S line of Carrington	Kennedy		6	1988	6		6	Clow	1988		WWD	Woonsocket		
D - 4	70	4470	Watson St	35' from W line of Union	Kennedy	K 81 A	6	1989	8	77	6	Kennedy	1989		WWD	Woonsocket		
D - 5	0	4500	Manville Rd	440' from N line of Carrington	Fairmount		4		6	89	6				WWD	Woonsocket		
D - 5	1	4501	Hamlet Ave	310' from E line of Morton	Fairmount		4		6	102					WWD	Woonsocket		
D - 5	2	4502	Davison Ave	opposite 4525			6		12					Y	WWD	Woonsocket		
D - 5	3	4503	Cumberland Hill Rd	90' south of incinerator	APS		6	1957	12	102	6	APS	1957		WWD	Woonsocket		
D - 5	4	4504	Newland Ave	50' from N line of Laval	Mueller		6	1977	8		6	Mueller	1977		WWD	Woonsocket		
D - 5	5	4505	Roberts St	10' from S line of Carrington			4		6	80					WWD	Woonsocket		
D - 5	6	4506	Carrington Ave	50' from W line of Manville			4		6	85				Y	WWD	Woonsocket		
D - 5	7	4507	Davison Ave	on blow off line in well chamber #2	Darling		4	1958	6	90					WWD	Woonsocket		GRID SHOWS 6", Harris Pond?
D - 5	8	4508	Davison Ave	15' north of 4526, opposite side			6		12					Y	WWD	Woonsocket		

Appendix F
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Hydrant Database

Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
D - 5	9	4509	Cumberland Hill Rd	120' from W line of Newland	Kennedy	K 81 A	6	1989	12	94	6				WWD	Woonsocket		
D - 5	10	4510	Cumberland Hill Rd	120' from E line of Newland	APS		6	1967	12	91	6				WWD	Woonsocket		
D - 5	11	4511	Laval St	280' from E line of Newland	Chapman		4		6	74				Y	WWD	Woonsocket		
D - 5	12	4512	Roberts St	40' from S line of Willow	RD Wood		6	1932	6	73	6				WWD	Woonsocket		
D - 5	13	4513	Montcalm St	at south end of Montcalm	Kennedy		6	1976	8		6				WWD	Woonsocket		
D - 5	14	4514	Manville Rd	20' from N line of Willow	Chapman		6	1950	6	97	6				WWD	Woonsocket		
D - 5	15	4515	Manville Rd	200' from S line of Willow	US Pipe		6	1996	20	94	6				WWD	Woonsocket		
D - 5	16	4516	Cumberland Hill Rd	160' from W line of Aylsworth	Chapman		6	1950	12	86	6				WWD	Woonsocket		
D - 5	17	4517	Paradis Ave	10' from W line of Roberts	Chapman		4		6	72					WWD	Woonsocket		
D - 5	18	4518	Roberts St	30' from N line of Bernon	RD Wood		6	1932	6	80	6	RD Wood			WWD	Woonsocket		
D - 5	19	4519	Paradis Ave	at east end of Paradis	Chapman		4		6	72	6				WWD	Woonsocket		
D - 5	20	4520	Manville Rd	180' from N line of Bernon	Kennedy		6	1997	20	91	6				WWD	Woonsocket		
D - 5	21	4521	Roberts St	at south end of Roberts	RD Wood		6	1932	8	40	6				WWD	Woonsocket		
D - 5	22	4522	Bernon St	160' from E line of Roberts	Fairmount		4		6	72					WWD	Woonsocket		
D - 5	23	4523	Bernon St	380' from E line of Roberts	Fairmount		4		6	72					WWD	Woonsocket		
D - 5	24	4524	Manville Rd	60' from S line of Bernon	RD Wood		6	1932	20	91	6				WWD	Woonsocket	18	
D - 5	25	4525	Davison Ave	240' north of well chamber 2	APS		6	1963	12	110	6	APS	1963		WWD	Woonsocket		
D - 5	26	4526	Davison Ave	40' south of well chamber 2	APS		6	1963	12	110	6	APS	1963		WWD	Woonsocket		
D - 5	27	4527	Bernon St	200' from W line of Manville	APS		6	1969	8	80	6	APS	1969		WWD	Woonsocket		
D - 5	28	4528	Carrington Ave	bldg 499, 45' from W line of Manville	US Pipe		6	1992	6		6	MET	1973		WWD	Woonsocket		
D - 5	29	4529	Laval St	295' from E line of Newland	Kennedy		6	1979	6		6	Kennedy	1979		WWD	Woonsocket		
D - 5	30	4530	Willow St	220' from E line of Roberts	Mueller		6	1980	20		6	Mueller	1980		WWD	Woonsocket		
D - 5	31	4531	Willow St	175' from W line of Manville	Mueller		6	1979	20		6	Mueller	1979		WWD	Woonsocket		
D - 5	32	4532	Cumberland Hill Rd	rear of fire station 1, near dog pound	Kennedy	K 81 A	6	1989	6		6	Kennedy	1989		WWD	Woonsocket		
D - 5	33	4533	Cumberland Hill Rd - WWTP	north of administration bldg	Kennedy		6	1975	6		6		1975		Wastewater	Woonsocket	40	
D - 5	34	4534	Cumberland Hill Rd - WWTP	north of administration bldg	APS		6	1962	6		6		1962		Wastewater	Woonsocket	41	
D - 5	35	4535	Cumberland Hill Rd - WWTP	between sludge pump and screw pump	APS		6	1962	6		6		1962		Wastewater	Woonsocket	42	
D - 5	36	4536	Cumberland Hill Rd - WWTP	south of gas holding tank	Mueller		6	1975	6		6		1975		Wastewater	Woonsocket	43	
D - 5	37	4537	Cumberland Hill Rd - WWTP	in front of incinerator bldg	Kennedy		6	1975	6		6		1975		Wastewater	Woonsocket	44	
D - 5	38	4538	Cumberland Hill Rd - WWTP	between aeration and chlorination	Kennedy		6	1975			6		1975		Wastewater	Woonsocket	45	
D - 5	39	4539	Cumberland Hill Rd - WWTP	SE of chlorination bldg	APS		6	1975	6		6		1975		Wastewater	Woonsocket	46	
D - 5	40	4540	Cumberland Hill Rd - WWTP	rear of administration bldg	Murdock		1.5	1975	6		2		1975		Wastewater	Woonsocket	47	plant effluent
D - 5	41	4541	Cumberland Hill Rd - WWTP	SE corner of aeraion tanks	Murdock		1.5	1975	6		2		1975		Wastewater	Woonsocket	48	plant effluent
D - 5	42	4542	Cumberland Hill Rd - WWTP	SW end of aeration tanks	Murdock		1.5	1975	6		2		1975		Wastewater	Woonsocket	49	plant effluent
D - 5	43	4543	Cumberland Hill Rd - WWTP	E side of chlorination bldg	Murdock		1.5	1975	6		2		1975		Wastewater	Woonsocket	50	plant effluent
D - 5	44	4544	Cumberland Hill Rd - WWTP	W side of return sludge pump station	Murdock		1.5	1975	6		2		1975		Wastewater	Woonsocket	51	plant effluent
D - 5	45	4545	Cumberland Hill Rd - WWTP	between secondary settling tanks 2 & 3	Murdock		1.5	1975	6		2		1975		Wastewater	Woonsocket	52	plant effluent
D - 5	46	4546	Cumberland Hill Rd - WWTP	E of secondary settling tank 3	Murdock		1.5	1975	6		2		1975		Wastewater	Woonsocket	53	plant effluent
D - 5	47	4547	Cumberland Hill Rd - WWTP	S of secondary settling tank 1	Murdock		1.5	1975	6		2		1975		Wastewater	Woonsocket	54	plant effluent
D - 5	48	4548	Cumberland Hill Rd - WWTP	near secondary settling tank 1	Murdock		1.5	1975	6		2		1975		Wastewater	Woonsocket	55	plant effluent
D - 5	49	4549	Cumberland Hill Rd - WWTP	south side of incinerator bldg	Murdock		1.5	1975	6		2		1975		Wastewater	Woonsocket	56	plant effluent
D - 5	50	4550	Cumberland Hill Rd - WWTP	north of return sludge pump	Kennedy		6	1975	6		6		1975		Wastewater	Woonsocket	57	
D - 5	51	4551	Cumberland Hill Rd - WWTP	between aeration and settling tank 1	Murdock		1.5	1975	6		2		1975		Wastewater	Woonsocket	58	plant effluent
D - 6	0	4600	Newland Ave	45' from E line of Victor	Mueller		6	1977	8		6	Mueller	1977		WWD	Woonsocket		
D - 6	1	4601	Newland Ave	95' from E line of Richelieu	Mueller		6	1978	8		6	Mueller	1978		WWD	Woonsocket		
D - 6	2	4602	Newland Ave	190' from E line of Lafayette	Kennedy		6	1995	6	70	6				WWD	Woonsocket		
D - 6	3	4603	Victor St	160' from S line of Newland	Chapman		4		6	75				Y	WWD	Woonsocket		
D - 6	4	4604	Richelieu St	230' from N line of Aylsworth			4		8	70				Y	WWD	Woonsocket		
D - 6	5	4605	Lafayette St	170' from N line of Aylsworth	Mueller		6	1977	6		6	Mueller	1977		WWD	Woonsocket		
D - 6	6	4606	Rodman St	at south end of street	RD Wood		6	1932	8	77	6				WWD	Woonsocket		
D - 6	7	4607	Aylsworth Ave	30' from E line of Cumberland Hill	Kennedy		6	1996	8	78	6				WWD	Woonsocket		
D - 6	8	4608	Cumberland Hill Rd	at N line of Cady	Chapman		6	1950	12	75	6				WWD	Woonsocket		
D - 6	9	4609	Aylsworth Ave	150' from W line of Richelieu	Kennedy		6	1996	8	73	6				WWD	Woonsocket		
D - 6	10	4610	Cady St	150' from E line of Cumberland Hill	Fairmount		6	1950	8	68	6				WWD	Woonsocket		
D - 6	11	4611	Richelieu St	20' from N line of Aylsworth			4		8	68				Y	WWD	Woonsocket		
D - 6	12	4612	Cady St	180' east of 4610	Fairmount		6	1950	8	62	6				WWD	Woonsocket		
D - 6	13	4613	Aylsworth Ave	160' from E line of Richelieu	Kennedy	K 81 A	6	1989	8	61	6				WWD	Woonsocket		
D - 6	14	4614	Cady St	215' east of 4614	Kennedy		6	1996	8	54	6				WWD	Woonsocket		
D - 6	15	4615	Aylsworth Ave	120' from W line of Guertin	Kennedy		6	1979	8	56	6				WWD	Woonsocket		
D - 6	16	4616	Aylsworth Ave	80' from E line of Guertin	RD Wood		6	1932	8	51	6				WWD	Woonsocket		
D - 6	17	4617	Aylsworth Ave	200' east of 4616	RD Wood		6	1932	8	51	6				WWD	Woonsocket		
D - 6	18	4618	Aylsworth Ave	120' from W line of Vineyard	Kennedy		6	1997	8	51	6		1997		WWD	Woonsocket		
D - 6	19	4619	Aylsworth Ave	80' from W line of Cypress	Kennedy		6	1995	8	71	6		1955		WWD	Woonsocket		
D - 6	20	4620	Aylsworth Ave	120' from E line of Ray	Kennedy		6	1977	8		6	Mueller	1977		WWD	Woonsocket		
D - 6	21	4621	Congress St	20' from E line of Cumberland Hill			4		8					Y	WWD	Woonsocket		
D - 6	22	4622	Congress St	50' from W line of Hartford	Fairmount		6		8	58	6			Y	WWD	Woonsocket		
D - 6	23	4623	Congress St	105' from E line of Hartford	RD Wood		6	1932	8	50	6				WWD	Woonsocket		
D - 6	24	4624	Congress St	70' from E line of Guertin	APS		6	1976	8		6				WWD	Woonsocket		
D - 6	25	4625	Congress St	270' from E line of Guertin	RD Wood		6	1932	8	51	6				WWD	Woonsocket		
D - 6	26	4626	Congress St	100' from W line of Vineyard	RD Wood		6	1932	8	55	6				WWD	Woonsocket		
D - 6	27	4627	Cumberland Hill Rd	280' from S line of Congress	US Pipe		6	1997	12	68	6		1997		WWD	Woonsocket		
D - 6	28	4628	Ray Ave	440' from S line of Aylsworth	APS		6	1960	8		6	APS			WWD	Woonsocket		
D - 6	29	4629	Congress St	40' from E line of Cumberland Hill	Kennedy		6	1972	8		6	Kennedy	1972		WWD	Woonsocket		

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Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
D - 6	30	4630	Richelieu St	226' from N line of Aylsworth	Kennedy		6	1973	8		6	MET	1973		WWD	Woonsocket		
D - 6	31	4631	Richelieu St	38' from N line of Aylsworth	Kennedy		6	1973	6		6	MET			WWD	Woonsocket		
D - 6	32	4632	Ray Ave	865' from S line of Aylsworth	Kennedy		6	1977	8	80	6	Kennedy	1977		WWD	Woonsocket		
D - 6	33	4633	Victor St	167' from S line of Newland	Kennedy		6	1979	6		6	Kennedy	1979		WWD	Woonsocket		
D - 6	34	4634												?				no card
D - 6	35	4635												?				no card
D - 6	36	4636												?				no card
D - 6	37	4637												?				no card
D - 6	38	4638												?				no card
D - 6	39	4639	Hartford Ave	rear side of health center building	Kennedy		6	1990	10						private	Woonsocket		
D - 6	40	4640	Hartford Ave	front right corner of health center building	Kennedy		6	1990	8		6				private	Woonsocket		
D - 7	0	4700	Rodman St	200' south of 4701	US Pipe		6	1995	8	78	6				WWD	Woonsocket		
D - 7	1	4701	Rodman St	200' north of 4700	RD Wood		6	1932	8	78	6				WWD	Woonsocket		
D - 7	2	4702	Kenwood St	240' north of 4707	Darling		6	1957	8	70	6				WWD	Woonsocket		
D - 7	3	4703	Loring St	220' south of 4704	Fairmount		6	1950	8	66	6				WWD	Woonsocket		
D - 7	4	4704	Loring St	220' north of 4703	Kennedy		6	1977	8	48	6				WWD	Woonsocket		
D - 7	5	4705	Mendon Rd	130' from S line of Cass			6		12					Y	WWD	Woonsocket		
D - 7	6	4706	Mendon Rd	360' from S line of Cass	RD Wood		6	1932	12	65	6				WWD	Woonsocket		
D - 7	7	4707	Kenwood St	240' south of 4702	Darling		6	1957	8	70	6				WWD	Woonsocket		
D - 7	8	4708	Loring St	220' south of 4703	Fairmount		6	1950	8	70	6				WWD	Woonsocket		
D - 7	9	4709	Mendon Rd	20' from N line of Oregon	Kennedy		6	1977	12	70	6				WWD	Woonsocket		
D - 7	10	4710	Oregon Ave	155' from E line of Mendon			6		8					Y	WWD	Woonsocket		
D - 7	11	4711	Oregon Ave	400' from E line of Mendon	Mueller		6	1960	8		6				WWD	Woonsocket		
D - 7	12	4712	Aylsworth Ave	360' from W line of Mendon	Kennedy		6	1964	8	80	6	APS	1964		WWD	Woonsocket		
D - 7	13	4713	Mendon Rd	20' from S line of Aylsworth	APS		6	1970	12	72	6				WWD	Woonsocket		
D - 7	14	4714	Manila Ave	170' form E line of Mendon	Kennedy		6	1987	8	60	6				WWD	Woonsocket		
D - 7	15	4715	Manila Ave	270' east of 4714	APS		6	1968	8	55	6				WWD	Woonsocket		
D - 7	16	4716	Oregon Ave	230' from W line of Baltimore	Mueller		6	1960	8		6				WWD	Woonsocket		
D - 7	17	4717	Manila Ave	100' from W line of Baltimore	US Pipe		6	1995	8	54	6				WWD	Woonsocket		
D - 7	18	4718	Oregon Ave	10' from W line of Baltimore	Mueller		6	1977	8		6	Mueller	1977		WWD	Woonsocket		
D - 7	19	4719	Mendon Rd	50' from S line of Olympia	Kennedy		6	1977	12		6				WWD	Woonsocket		
D - 7	20	4720	Mendon Rd	35' from S line of Corsi	RD Wood		6	1932	12	72	6				WWD	Woonsocket		
D - 7	21	4721	Mendon Rd	200' from N line of Bartlett	RD Wood		6	1932	12	72	6				WWD	Woonsocket		
D - 7	22	4722	Mendon Rd	20' from N line of Bartlett	RD Wood		6	1932	12	72	6				WWD	Woonsocket		
D - 7	23	4723	Mendon Rd	150' form S line of Bartlett	RD Wood		6	1932	12	72	6				WWD	Woonsocket		
D - 7	24	4724	Bartlett St	160' from E line of Mendon	RD Wood		6	1932	12	69	6				WWD	Woonsocket		
D - 7	25	4725	Bartlett St	20' from W line of Dudley	US Pipe		6	1991	12	62	6				WWD	Woonsocket		
D - 7	26	4726	Olympia Ave	260' from E line of Mendon	APS		6	1960	8		6	APS			WWD	Woonsocket		
D - 7	27	4727	Olympia Ave	260' east of 4726	Kennedy		6	1988	8		6	APS			WWD	Woonsocket		
D - 7	28	4728	Ray Ave	347' from E line of Ray	Kennedy		6	1971	8		6	MET	1971		WWD	Woonsocket		
D - 7	29	4729	Ray Ave	386' south of 4728	Kennedy		6	1973	8		6	APS	1973		WWD	Woonsocket		
D - 7	30	4730	Corsi St	82' from E line of Mendon	Kennedy		6	1987	12		6		1987		WWD	Woonsocket		
D - 7	31	4731	Oregon Ave	575' west of Springwater Drive	Kennedy		6	1988	8	93	6		1988		WWD	Woonsocket		
D - 7	32	4732	Oregon Ave	130' west of Springwater Drive	Kennedy		6	1988	8		6		1988		WWD	Woonsocket		
D - 7	33	4733	Springwater Dr	130 south of Oregon Ave	Kennedy		6	1988			6		1988		WWD	Woonsocket		
D - 7	34	4734	Springwater Dr	510' south of Oregon Ave	Kennedy		6	1988			6		1988		WWD	Woonsocket		
D - 7	35	4735	Springwater Dr	at end of cul-de-sac	Kennedy		6	1988	8	70	6		1988		WWD	Woonsocket		
D - 7	36	4736	Holly Lane	119' SE of streetline of Mendon Rd	Kennedy	K 81 A	6	1988	8		6		1988		Holly Springs	Woonsocket		
D - 7	37	4737	Holly Lane	462' SE of streetline of Mendon Rd	Kennedy	K 81 A	6	1988	8		6		1988		Holly Springs	Woonsocket		
D - 7	38	4738	Holly Lane	814' SE of streetline of Mendon Rd	Kennedy	K 81 A	6	1988	8		6		1988		Holly Springs	Woonsocket		
D - 7	39	4739	Holly Lane	1093' from SE line of Mendon	Kennedy	K 81 A	6	1988	8		6		1988		Holly Springs	Woonsocket		
D - 7	40	4740	Holly Lane	1669' from SE line of Mendon	Kennedy	K 81 A	6	1988	8		6		1988		Holly Springs	Woonsocket		
D - 8	0	4800	Annette Ave	20' from N line of Cheryl Ann	APS		6	1962	8	45	6	APS	1962		WWD	Woonsocket		
D - 8	1	4801	Oregon Ave	at end of cul-de-sac	Kennedy		6	1988	12	85	6		1988		WWD	Woonsocket		
D - 8	2	4802	Tara Ln	at end of cul-de-sac	US Pipe		6	1988	8		6		1988		WWD	Woonsocket		
D - 8	3	4803	Highland II	1780' Century Dr	US Pipe		6	1995	12		6	Kennedy	1995		WWD	Woonsocket		
D - 8	4	4804	Highland II	2200' from Century Dr	US Pipe		6	1995	12		6	Mueller	1995		WWD	Woonsocket		
D - 8	5	4805	Highland II	2645' from Century Dr	US Pipe		6	1995	16		6	Kennedy	1995		WWD	Woonsocket		
D - 8	6	4806	Highland II	3010' from Century Dr	US Pipe		6	1995	16		6	Kennedy	1995		WWD	Woonsocket		
E - 1	0	5100	Roberta Ave	at E line of Alice	Mueller		6	1960	6	70	6				WWD	Woonsocket		
E - 1	1	5101	Roberta Ave	at E line of Andrews	Mueller		6	1960	6	70	6				WWD	Woonsocket		
E - 1	2	5102	Morse Ave	320' from W line of Alice	Darling		6	1954	6	65	6		1954		WWD	Woonsocket		
E - 1	3	5103	Alice Ave	at center line of Warren	Kennedy		6	1976	12	75	6				WWD	Woonsocket		
E - 1	4	5104	Andrews St	20' from S line of Morse			4		8	72					WWD	Woonsocket		
E - 1	5	5105	Warren Ave	20' from E line of Pelletier	RD Wood		6	1932	8	58	6				WWD	Woonsocket		
E - 1	6	5106	Warren Ave	190' from W line of Alice	RD Wood		6	1932	8	70	6				WWD	Woonsocket		
E - 1	7	5107	Alice Ave	at S line of Bernice	Kennedy		6	1976	6	65	6				WWD	Woonsocket		
E - 1	8	5108	Pelletier Ave	210' from S line of Warren	Fairmount		6	1950	8	60	6				WWD	Woonsocket		
E - 1	9	5109	Pelletier Ave	140' from W line of S. Main	Kennedy		6	1994	8	58	6				WWD	Woonsocket		
E - 1	10	5110	S. Main St	30' from E line of Pelletier	Fairmount		6	1950	12	55	6				WWD	Woonsocket		
E - 1	11	5111	S. Main St	at E line of Alice	Chapman		6	1950	12	60	6				WWD	Woonsocket		
E - 1	12	5112	Great Rd	at S line of Lapre	APS		6	1967	6	40	6				WWD	N. Smithfield		
E - 1	13	5113	Great Rd	80' from S line of Hillview	APS		6	1960	6	40	6	APS	1989		WWD	N. Smithfield		

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Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
E - 1	14	5114	Great Rd	300' from S line of Westwood	Chapman		4		6	40	6				WWD	N. Smithfield		
E - 1	15	5115	Great Rd, NS	40' from S line of Pound Hill	Kennedy		6	1976	6		6		1976		WWD	N. Smithfield		
E - 1	16	5116	Morse Ave	460' from E line of Great Rd	Chapman		4		8	45					WWD	N. Smithfield		
E - 1	17	5117	Warren Ave	290' from E line of Great Rd	Chapman		4		8	55					WWD	N. Smithfield		
E - 1	18	5118	Great Rd	at center line of Woonsocket Hill	RD Wood		6	1932	8	40	6				WWD	N. Smithfield		
E - 1	19	5119	Norwood Rd, NS	50' north of Westwood	Kennedy		6	1976	4		6	MET			private	N. Smithfield		
E - 2	0	5200	S. Main St	160' from N line of Wilbur	Chapman		6	1950	12	72	6				WWD	Woonsocket		
E - 2	1	5201	S. Main St	at bldg 409, 300' north of 5200	Kennedy		6	1997	12	72	6				WWD	Woonsocket		
E - 2	2	5202	Coe St	340' from W line of Providence	APS		6	1964	6	72	6	APS	1964		WWD	Woonsocket		
E - 2	3	5203	Providence St	200' from N line of Coe	Kennedy		6	1994	6	68	6				WWD	Woonsocket		
E - 2	4	5204	Coe St	10' from W line of Providence	Mueller		6	1985	6	72	6				WWD	Woonsocket	64	
E - 2	5	5205	Lincoln St	280' from E line of Providence	Fairmount		4		6	77				Y	WWD	Woonsocket		
E - 2	6	5206	Rockland Ave	30' from S line of Roberta	Chapman		4		6	70					WWD	Woonsocket		
E - 2	7	5207	N. Ballou St	at W line of Bernice			6		8		6			Y	WWD	Woonsocket		
E - 2	8	5208	S. Main St	100' from S line of Wilbur	Kennedy		6	1990	12	72	6				WWD	Woonsocket		
E - 2	9	5209	Coe St	80' from N line of Wilbur	APS		6	1964	6	70	6	APS	1964		WWD	Woonsocket		
E - 2	10	5210	Orchard St	40' from W line of Summit	RD Wood		6	1932	8	67	6				WWD	Woonsocket		
E - 2	11	5211	Orchard St	120' from E line of Summit	RD Wood		6	1932	8	70	6				WWD	Woonsocket		
E - 2	12	5212	Providence St	at S line of Orchard	Chapman		4		6	72					WWD	Woonsocket		
E - 2	13	5213	E. Orchard St	250' from E line of Providence	Chapman		4		6	73				Y	WWD	Woonsocket		
E - 2	14	5214	Pearl St	20' from E line of Andrews	Chapman		4		6	70				Y	WWD	Woonsocket		
E - 2	15	5215	Pearl St	30' from W line of Rockland	Fairmount		4		6	76				Y	WWD	Woonsocket		
E - 2	16	5216	Bernice Ave	at W line of Rockland	Kennedy		6	1974	8		6	Chapman	1974		WWD	Woonsocket		4x6 increaser
E - 2	17	5217	Bernice Ave	300' from S line of N. Ballou	Fairmount		4		8	72					WWD	Woonsocket		
E - 2	18	5218	S. Main St	310' from S line of N. Ballou	Mueller		6	1980	12		6				WWD	Woonsocket		
E - 2	19	5219	S. Main St	20' from S line of N. Ballou	Chapman		6	1950	12	72	6				WWD	Woonsocket		
E - 2	20	5220	Coe St	10' from N line of N. Ballou	US Pipe		6	1996	6	70					WWD	Woonsocket		
E - 2	21	5221	Coe St	150' from S line of Wilbur	US Pipe		6	1996	6	70					WWD	Woonsocket		
E - 2	22	5222	Orchard St	240' from S line of Summit	RD Wood		6	1932	8	65	6				WWD	Woonsocket		
E - 2	23	5223	Summit St	200' from E line of Orchard	RD Wood		6	1932	6	57	6				WWD	Woonsocket		
E - 2	24	5224	Providence St	30' from N line of Vose	Kennedy		6	1994	6	68	6		1994		WWD	Woonsocket		
E - 2	25	5225	Andrews St	at E line of Bernice	Fairmount		4		6	65					WWD	Woonsocket		
E - 2	26	5226	S. Main St	at N line of Shove	Chapman		6	1950	12	65	6				WWD	Woonsocket		
E - 2	27	5227	S. Main St	100' from N line of Rockland	Chapman		6	1950	12	72	6				WWD	Woonsocket		
E - 2	28	5228	Coe St	280' from N line of Shove	US Pipe		6	1996	6	70	6		1996		WWD	Woonsocket		
E - 2	29	5229	Coe St	170' from S line of Avenue C	US Pipe		6	1996	6	70	6		1996		WWD	Woonsocket		
E - 2	30	5230	Coe St	40' from N line of Avenue C	US Pipe		6	1996	6	70	6		1996		WWD	Woonsocket		
E - 2	31	5231	Avenue C	200' from E line of Coe	Kennedy		6	1996	8	68	6				WWD	Woonsocket		
E - 2	32	5232	Ballou St	220' from W line of Orchard										Y	WWD	Woonsocket		
E - 2	33	5233	Orchard St	130' from N line of Ballou	RD Wood		6	1932	8	66	6				WWD	Woonsocket		
E - 2	34	5234	Orchard St	30' from S line of Ballou	US Pipe		6	1996	6	66	6				WWD	Woonsocket		
E - 2	35	5235	Summit St	300' from N line of Ballou	APS		6	1950	6	57	6				WWD	Woonsocket		
E - 2	36	5236	Ballou St	at E line of Summit			4		8	64				Y	WWD	Woonsocket		
E - 2	37	5237	Providence St	at N line of Broad	APS		6	1964	6	68	6	APS	1964		WWD	Woonsocket		
E - 2	38	5238	Providence St	210' from S line of Broad	Kennedy		6	1994	8	68	6				WWD	Woonsocket		
E - 2	39	5239	Breault Ave	160' from E line of S. Main	RD Wood		6	1932	8	58	6				WWD	Woonsocket		
E - 2	40	5240	S. Main St	10' from E line of Andrews	US Pipe		6	1993	12	66	6				WWD	Woonsocket		
E - 2	41	5241	Bradford St	200' from E line of S. Main	Chapman		4		4	65					WWD	Woonsocket		
E - 2	42	5242	Coe St	20' from E line of Bradford	Fairmount		4		6	65				Y	WWD	Woonsocket		
E - 2	43	5243	Coe St	at N line of Avenue A	Chapman		4		6	67				Y	WWD	Woonsocket		
E - 2	44	5244	Irene Blvd	50' from N line of Ida	APS		6	1960	8	70	6	APS	1960		WWD	Woonsocket		
E - 2	45	5245	Avenue C	100' from E line of Irene	APS		6	1962	8	70	6				WWD	Woonsocket		
E - 2	46	5246	Avenue C	at W line of Orchard	APS		6	1982	8	70	6				WWD	Woonsocket		
E - 2	47	5247	Orchard St	120' from N line of Avenue C	Fairmount		4		6	70				Y	WWD	Woonsocket		
E - 2	48	5248	Middle St	230' from S line of Ballou	APS		6	1960	8	65	6	APS	1960		WWD	Woonsocket		
E - 2	49	5249	Providence St	at S line of Ballou	Chapman		4		8	65				Y	WWD	Woonsocket		
E - 2	50	5250	Providence St	250' from S line of Ballou	Kennedy		6	1994	8	65	6				WWD	Woonsocket		
E - 2	51	5251	Jenckes St	170' from S line of Ballou	Chapman		4		6	73					WWD	Woonsocket		
E - 2	52	5252	Ballou St	224' from W line of Orchard	Kennedy		6	1973	8		6	MET	1973		WWD	Woonsocket		
E - 2	53	5253	Ballou St	5' from E line of Summit	Kennedy		6	1973	8		6	MET	1973		WWD	Woonsocket		
E - 2	54	5254	Lincoln St	270' from E line of Providence	Kennedy		6	1976	6	85	6	Kennedy	1976		WWD	Woonsocket		
E - 2	55	5255	N. Ballou St	30' from S line of Bernice	Darling		6	1984	8		6	Kennedy	1984		WWD	Woonsocket		
E - 2	56	5256	Pearl St	36' from W line of Rockland	Kennedy		6	1986	6	76	6	Mueller	1986		WWD	Woonsocket		
E - 2	57	5257	Pearl St	18' from E line of Andrews	Kennedy		6	1986	6		6		1986		WWD	Woonsocket		
E - 2	58	5258	E. Orchard St	297' from E line of Providence	Kennedy		6	1988	6	73	6				WWD	Woonsocket		
E - 2	59	5259	Coe St	32' from N line of Bradford	US Pipe		6	1991	6		6	Clow	1991		WWD	Woonsocket		
E - 2	60	5260	Providence St	at Ballou	US Pipe		6	1992	8		6	Clow	1992		WWD	Woonsocket		
E - 2	61	5261	Coe St	at bldg 423-425	US Pipe		6	1996	6		6		1996		WWD	Woonsocket		
E - 3	0	5300	E. Orchard St	at W line of Erie	Chapman		4		6	73				Y	WWD	Woonsocket		
E - 3	1	5301	Transit St	20' from N line of Ross	RD Wood		6	1932	12	96	6				WWD	Woonsocket		
E - 3	2	5302	Front St	130' from E line of Transit	Kennedy		6	1996	12	90	6				WWD	Woonsocket		
E - 3	3	5303	Benefit St	250' from N line of Ross	Mueller		6	1960	8	90	6				WWD	Woonsocket		
E - 3	4	5304	Front St	420' from E line of Transit	Kennedy		6	1996	12	85	6				WWD	Woonsocket		

Appendix F
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Hydrant Database

Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
E - 3	5	5305	Grand St	40' from S line of Logee	Mueller		6	1985	6	104	6				WWD	Woonsocket		
E - 3	6	5306	Park Ave	at S line of Logee	Fairmount		4		8	95				Y	WWD	Woonsocket		
E - 3	7	5307	Park Ave	140' from N line of Logee	Chapman		4		8	50				Y	WWD	Woonsocket		
E - 3	8	5308	Collins St	250' from E line of Providence	Chapman		4		6	70					WWD	Woonsocket		
E - 3	9	5309	Collins St	50' from W line of Erie	Fairmount		4		6	72				Y	WWD	Woonsocket		
E - 3	10	5310	Vose St	60' from W line of Erie	Fairmount		6	1950	8	68	6				WWD	Woonsocket		
E - 3	11	5311	Vose St	80' from E line of Erie	RD Wood		6	1932	8	87	6				WWD	Woonsocket		
E - 3	12	5312	Transit St	at centerline of Cross	Mueller		6	1960	12	94	6				WWD	Woonsocket		
E - 3	13	5313	Transit St	40' from N line of Vose	Fairmount		6	1950	12	92	6				WWD	Woonsocket		
E - 3	14	5314	Ross St	at W line of Benefit	US Pipe		6	1993	8	92	6				WWD	Woonsocket		
E - 3	15	5315	Cross St	80' from W line of Ward	RD Wood		4		6	80				Y	WWD	Woonsocket		
E - 3	16	5316	Valley St	at N line of Cross	Chapman		4		6	67					WWD	Woonsocket		
E - 3	17	5317	Grand St	280' from S line of Hill					6					Y	WWD	Woonsocket		
E - 3	18	5318	Hill St	at E line of Grand	Chapman		4		6	96				Y	WWD	Woonsocket		
E - 3	19	5319	Park Ave	at N line of Hill			4		8	90				Y	WWD	Woonsocket		
E - 3	20	5320	Grove St	10' from N line of Logee	Chapman		4		6	83				Y	WWD	Woonsocket		
E - 3	21	5321	Vose St	110' from W line of Jenckes	Fairmount		4		8	68					WWD	Woonsocket		
E - 3	22	5322	Jenckes St	120' from N line of Broad	Fairmount		4		6	70					WWD	Woonsocket		
E - 3	23	5323	Vose St	40' from E line of Jenckes	RD Wood		6	1932	8	68	6				WWD	Woonsocket		
E - 3	24	5324	Transit St	300' from S line of Vose	Kennedy		6	1978	12	84	6				WWD	Woonsocket		
E - 3	25	5325	Transit St	80' from S line of Vose	Kennedy	K81A	6	1989	12	88	6				WWD	Woonsocket		
E - 3	26	5326	Vose St	150' from W line of Ward	Chapman		4		6	72				Y	WWD	Woonsocket		
E - 3	27	5327	Ward St	170' from N line of Vose	Mueller		6	1960	6	70	6				WWD	Woonsocket		
E - 3	28	5328	Valley St	160' from S line of Cross	RD Wood		6	1932	8	64	6				WWD	Woonsocket		
E - 3	29	5329	Grand St	120' from S line of Cross	Fairmount		4		6	94				Y	WWD	Woonsocket		
E - 3	30	5330	Park Ave	at N line of Smith	Kennedy		6	1994	8	85	6				WWD	Woonsocket		
E - 3	31	5331	Grove St	100' from S line of Smith	Chapman		4		6	83					WWD	Woonsocket		
E - 3	32	5332	Grove St	175' from N line of Smith	Fairmount		4		6	85					WWD	Woonsocket		
E - 3	33	5333	Jenckes St	at S line of Broad			4		6					Y	WWD	Woonsocket		
E - 3	34	5334	Jenckes St	160' from S line of Broad	Chapman		4		6	76					WWD	Woonsocket		
E - 3	35	5335	Broad St	30' from W line of Bailey	Fairmount		4		8	73					WWD	Woonsocket		
E - 3	36	5336	Bailey St	160' from S line of Broad	US Pipe		6	1990	8	73	6				WWD	Woonsocket		
E - 3	37	5337	Transit St	80' from N line of Broad	Fairmount		6	1950	12	75	6				WWD	Woonsocket		
E - 3	38	5338	Darwin St	10' from S line of Broad	Fairmount		6	1950	8	73	6				WWD	Woonsocket		
E - 3	39	5339	Vose St	at E line of Valley	Mueller		6	1986	6		6	Kennedy	1979		WWD	Woonsocket		
E - 3	40	5340	Thomas St	30' from S line of Vose	Chapman		4		6	110					WWD	Woonsocket		
E - 3	41	5341	Grand St	200' from N line of Vose	Kennedy		6	1996	8	98	6				WWD	Woonsocket		
E - 3	42	5342	Vose St	50' from E line of Grand	Kennedy		6	1979	6		6	Kennedy	1979		WWD	Woonsocket		
E - 3	43	5343	Park Ave	50' from S line of Blakeley	Kennedy		6	1994	8	94	6				WWD	Woonsocket		
E - 3	44	5344	Park Ave	160' from N line of Blakeley	Kennedy		6	1994	8	87	6				WWD	Woonsocket		
E - 3	45	5345	Grove St	160' from N line of Blakeley			4		8	83				Y	WWD	Woonsocket		
E - 3	46	5346	Cottage St	40' from S line of Smith	APS		6	1960	8	90	6	APS	1960		WWD	Woonsocket		
E - 3	47	5347	Cottage St	150' from N line of Blakeley	APS		6	1960	8	90	6	APS	1960		WWD	Woonsocket		
E - 3	48	5348	Bailey St	30' from N line of Ballou	Fairmount		6	1950	8	73	6				WWD	Woonsocket		
E - 3	49	5349	Darwin St	20' from N line of Ballou	Mueller		6	1960	8	70	6				WWD	Woonsocket		
E - 3	50	5350	Transit St	at W line of Minerva	Fairmount		4		8	113					WWD	Woonsocket		
E - 3	51	5351	Ballou St	45' from E line of Minerva	Fairmount		6	1950	8	108	6				WWD	Woonsocket		
E - 3	52	5352	Ward St	150' from N line of Transit	Mueller		6	1960	8	62	6				WWD	Woonsocket		
E - 3	53	5353	Transit St	15' from E line of Ward	Fairmount		4		8	105					WWD	Woonsocket		
E - 3	54	5354	Thomas St	210' from S line of Vose	Fairmount		4		6	110					WWD	Woonsocket		
E - 3	55	5355	Hollis St	160' from S line of Vose	Mueller		6	1955	8	94	6		1955		WWD	Woonsocket		
E - 3	56	5356	Park Ave	at N line of Vose	Fairmount		4		8	94				Y	WWD	Woonsocket		
E - 3	57	5357	Park Ave	240' from S line of Vose	Kennedy		6	1994	8	94	6				WWD	Woonsocket		
E - 3	58	5358	Williams St	100' from E line of Cottage	Kennedy		6	1981	6	90	6				WWD	Woonsocket		
E - 3	59	5359	Angell St	280' from E line of Cottage	RD Wood		6	1932	8	88	6				WWD	Woonsocket		
E - 3	60	5360	Angell St	130' from N line of Williams	RD Wood		6	1932	8	90	6				WWD	Woonsocket		
E - 3	61	5361	Bailey St	140' from S line of Ballou	RD Wood		6	1932	8	72	6				WWD	Woonsocket		
E - 3	62	5362	Ballou St	30' from E line of Jenckes	Kennedy		6	1996	8	74	6				WWD	Woonsocket		
E - 3	63	5363	Grove St	158' from N line of Blakeley	Kennedy		6	1971	8		6	Kennedy	1971		WWD	Woonsocket		
E - 3	64	5364	Grand St	285' from S line of Hill	Kennedy		6	1972	6	78	6	Kennedy	1972		WWD	Woonsocket		
E - 3	65	5365	Hill St	16' from W line of Park	Kennedy		6	1972	6	78	6	Mueller	1979		WWD	Woonsocket		
E - 3	66	5366	Vose St	162' from W line of Ward	Kennedy		6	1996	6	79	6	Kennedy	1976		WWD	Woonsocket		
E - 3	67	5367	Collins St	112' from W line of Erie	Kennedy		6	1976	6	72	6	Kennedy	1976		WWD	Woonsocket		
E - 3	68	5368	Grand St	122' from S line of Cross	Kennedy		6	1979	6		6	Kennedy	1979		WWD	Woonsocket		
E - 3	69	5369	Logee St	70' east of Park Ave	Darling		6	1983	12		6	Kennedy	1983		WWD	Woonsocket		
E - 3	70	5370	Cross St	65' west of Ward	Kennedy		6	1983	6		6		1983		WWD	Woonsocket		
E - 3	71	5371												?				no card
E - 3	72	5372	Ward St	bldg 136, 183' from S line of Vose	Kennedy		6	1988	8		6		1988		WWD	Woonsocket		
E - 3	73	5373	E. Orchard St	at W line of Erie	Kennedy		6	1989	6	73	6		1989		WWD	Woonsocket		
E - 3	74	5374	Hill St	15' from E line of Grand	Kennedy		6	1989	6		6	Kennedy	1989		WWD	Woonsocket		
E - 3	75	5375	Vose St	20' from W line of Park Ave	Kennedy		6	1994	6		6		1994		WWD	Woonsocket		
E - 4	0	5400	Grove St	300' from S line of Crawford	Fairmount		4		6	99					WWD	Woonsocket		
E - 4	1	5401	Cottage St	40' from S line of Moore	Chapman		4		6	94					WWD	Woonsocket		

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Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
E - 4	2	5402	Crawford St	at E line of Cleveland	Chapman		4		6	79					WWD	Woonsocket		
E - 4	3	5403	Division St	80' from N line of Monroe	Darling		6	1957	8	86	6		1957		WWD	Woonsocket		
E - 4	4	5404	Division St	20' from N line of Crawford	RD Wood		6	1932	12	87	6				WWD	Woonsocket		
E - 4	5	5405	Monroe St	30' from E line of Division	Kennedy		6	1978	12		6		1976		WWD	Woonsocket		
E - 4	6	5406	Monroe St	120' from W line of Maple	RD Wood		6	1932	12	78	6				WWD	Woonsocket		
E - 4	7	5407	St. Joseph St	at E line of Maple	Fairmount		6		8	78	6			Y	WWD	Woonsocket		
E - 4	8	5408	Monroe St	10' from E line of Maple	Kennedy		6	1978	12		6				WWD	Woonsocket		
E - 4	9	5409	St. Joseph St	90' from W line of Welles	APS		6	1964	8	75	6				WWD	Woonsocket		
E - 4	10	5410	Welles St	50' from S line of St Joseph	Kennedy		6	1987	12	75	6				WWD	Woonsocket		
E - 4	11	5411	Monroe St	10' from E line of Welles	Fairmount		6	1950	12	70	6				WWD	Woonsocket		
E - 4	12	5412	Knight St	at W line of Cottage	Chapman		4		6	87					WWD	Woonsocket		
E - 4	13	5413	Cottage St	160' from N line of Logee	Chapman		4		6	90					WWD	Woonsocket		
E - 4	14	5414	Jackson St	at S line of Logee			4		6	98					WWD	Woonsocket		
E - 4	15	5415	Cleveland St	20' from S line of Logee			4		6	93				Y	WWD	Woonsocket		
E - 4	16	5416	Division St	30' from S line of Washington	Kennedy	K 81 A	6	1989	12	86	6				WWD	Woonsocket		
E - 4	17	5417	Division St	10' from N line of Logee	RD Wood		6	1932	12	90	6				WWD	Woonsocket		
E - 4	18	5418	Maple St	at tank 4	Darling		6	1960	14	70	6		1960		WWD	Woonsocket		
E - 4	19	5419	Welles St	30' from N line of Washington	RD Wood		6	1932	12	67	6				WWD	Woonsocket		
E - 4	20	5420	Welles St	at tank 5 low pressure line			4							Y	WWD	Woonsocket		
E - 4	21	5421	Hamilton St	10' from W line of Jackson	Darling		6	1957	12	97	6		1957		WWD	Woonsocket		
E - 4	22	5422	Jackson St	190' from S line of Logee	RD Wood		6	1932	8	98	6				WWD	Woonsocket		
E - 4	23	5423	Cleveland St	180' from N line of Hamilton	RD Wood		6	1932	6	93	6				WWD	Woonsocket		
E - 4	24	5424	Hamilton St	20' from W line of Cleveland	Darling		6	1957	12	94	6				WWD	Woonsocket		
E - 4	25	5425	Hamilton St	140' from E line of Cleveland	RD Wood		6	1932	12	90	6				WWD	Woonsocket		
E - 4	26	5426	Oxford St	100' from N line of Hamilton	Kennedy		6	1972	12	90	6				WWD	Woonsocket		
E - 4	27	5427	Oxford St	20' from S line of Hamilton	Kennedy	K 81 A	6	1989	12	90	6				WWD	Woonsocket		
E - 4	28	5428	Logee St	at tank 3	Fairmount		6	1950		13					WWD	Woonsocket		
E - 4	29	5429	Logee St	60' from E line of Welles	Fairmount		6		14	70	6			Y	WWD	Woonsocket		
E - 4	30	5430	Reservoir Ave	at tank 1	Kennedy		6	1950	14	64	6				WWD	Woonsocket		
E - 4	31	5431	Hamilton St	10' from E line of Knight	Darling		6	1957	6	100	6				WWD	Woonsocket		
E - 4	32	5432	Knight St	50' from N line of Capwell	Chapman		4		8	100					WWD	Woonsocket		
E - 4	33	5433	Jillson Ave	60' from S line of Capwell	Darling		6	1955	8	87	6		1955		WWD	Woonsocket		
E - 4	34	5434	Getchell Ave	270' from E line of Jillson	Darling		6	1959	8	85	6		1959		WWD	Woonsocket		
E - 4	35	5435	Knight St	at N line of Getchell	Fairmount		4		8	100					WWD	Woonsocket		
E - 4	36	5436	Getchell Ave	400' from E line of Knight	APS		6	1964	8	100	6	APS	1964		WWD	Woonsocket		
E - 4	37	5437	Getchell Ave	280' from W line of Jillson	APS		6	1962	8	100	6	APS	1962		WWD	Woonsocket		
E - 4	38	5438	Jillson Ave	50' from S line of Irving	Darling		6	1955	8	87	6		1955		WWD	Woonsocket		
E - 4	39	5439	Cottage St	20' from S line of Crawford	Chapman		4		6	90					WWD	Woonsocket		
E - 4	40	5440	Capwell Ave	352' from E line of Knight	Kennedy		6	1973	8		6	APS	1972		WWD	Woonsocket		
E - 4	41	5441	Capwell Ave	252' from W line of Oxford	Kennedy		6	1973	8		6	APS	1972		WWD	Woonsocket		
E - 4	42	5442	Cleveland St	24' from S line of Logee	Kennedy		6	1973	6		6	MET	1973		WWD	Woonsocket		
E - 4	43	5443	Jillson Ave	30' from S line of Logee	Kennedy		6	1980	8		6	Kennedy	1980		WWD	Woonsocket		
E - 4	44	5444	Logee St	65' from E line of Cottage	Mueller		6	1980	12		6	Mueller	1980		WWD	Woonsocket		
E - 4	45	5445	Logee St	145' from W line of Welles	Mueller		6	1980	8		6	Mueller	1980		WWD	Woonsocket		
E - 4	46	5446	Logee St	16' from E line of Welles	Mueller		6	1980	8		6	Mueller	1980		WWD	Woonsocket		
E - 4	47	5447	Ronian St	110' from E line of Logee	Mueller		6	1981	8		6	Mueller	1981		WWD	Woonsocket		
E - 4	48	5448	Maple St	115' from N line of Logee	Mueller		6	1980	12		6	Mueller	1980		WWD	Woonsocket		
E - 4	49	5449	Maple St	7' from N line of Washington	Mueller		6	1980	12		6	Mueller	1980		WWD	Woonsocket		
E - 4	50	5450	Cleveland St	10' from N line of Moore	Mueller		6	1980	8		6	Mueller	1980		WWD	Woonsocket		
E - 4	51	5451	Washington St	43' from W line of Ronian St	Mueller		6	1981	8		6	Mueller	1981		WWD	Woonsocket		
E - 4	52	5452	Reservoir Ave	at Roberge	Kennedy		6	1988	12		6		1988		WWD	Woonsocket		
E - 5	0	5500	Verdun St	at E line of St Barnabe	Fairmount		6	1950	8	64	6				WWD	Woonsocket		
E - 5	1	5501	Verdun St	180' from E line of St Barnabe	Chapman		6	1950	8	68	6				WWD	Woonsocket		
E - 5	2	5502	Verdun St	20' from W line of Manville	RD Wood		6	1932	8	74	6				WWD	Woonsocket		
E - 5	3	5503	Mt. St. Charles Ave	140' from W line of St Barnabe	Fairmount		6	1950	6	59	6				WWD	Woonsocket		
E - 5	4	5504	Mt. St. Charles Ave	40' from E line of St Barnabe	Fairmount		6	1950	6	65	6				WWD	Woonsocket		
E - 5	5	5505	Mt. St. Charles Ave	200' from W line of Manville	Fairmount		6	1950	6	70	6				WWD	Woonsocket		
E - 5	6	5506	Mt. St. Charles Ave	at W line of Manville	RD Wood		6	1932	6	73	6				WWD	Woonsocket		
E - 5	7	5507	Mt. St. Charles Ave	30' from N line of Logee	RD Wood		6	1932	12	38	6				WWD	Woonsocket		
E - 5	8	5508	Mt. St. Charles Ave	160' from W line of Rhode Island	Fairmount		6	1950	12	50	6				WWD	Woonsocket		
E - 5	9	5509	Rhode Island Ave	10' from S line of Mt St Charles			4		6					Y	WWD	Woonsocket		
E - 5	10	5510	Rhode Island Ave	200' from S line of Mt St Charles			4		6	55				Y	WWD	Woonsocket		
E - 5	11	5511	St. Barnabe St	at N line of St Simon	Chapman		6	1950	8	70	6				WWD	Woonsocket		
E - 5	12	5512	St. Hughes St	60' from S line of St Simon	RD Wood		6	1932	8	73	6				WWD	Woonsocket		
E - 5	13	5513	St. Simon St	at W line of Manville	Kennedy	K81a	6	1990	6	72	6				WWD	Woonsocket		
E - 5	14	5514	Rhode Island Ave	10' from S line of Ohio	Fairmount		4		8	60					WWD	Woonsocket		
E - 5	15	5515	Rhode Island Ave	55' from S line of Vermont	Fairmount		4		8	63					WWD	Woonsocket		
E - 5	16	5516	St. Barnabe St	180' from S line of St Simon	US Pipe		6	1991	8	72	6				WWD	Woonsocket		
E - 5	17	5517	St. Barnabe St	st N line of St Marcel	Fairmount		6	1950	8	76	6				WWD	Woonsocket		
E - 5	18	5518	St. Hughes St	200' from N line of St Marcel	RD Wood		6	1932	8	75	6				WWD	Woonsocket		
E - 5	19	5519	St. Hughes St	at N line of St Marcel	RD Wood		6	1932	8	75	6				WWD	Woonsocket		
E - 5	20	5520	St. Marcel St	20' from W line of Manville	RD Wood		6	1932	8	72	6				WWD	Woonsocket		
E - 5	21	5521	Joffre Ave	30' from S line of Logee	RD Wood		6	1932	8	56	6				WWD	Woonsocket		

Appendix F
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Hydrant Database

Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
E - 5	22	5522	Joffre Ave	240' from S line of Logee	RD Wood		6	1932	8	62	6				WWD	Woonsocket		
E - 5	23	5523	Fairfield Ave	30' from S line of Logee	APS		6	1960	8	68	6				WWD	Woonsocket		
E - 5	24	5524	Rhode Island Ave	40' from N line of Logee	Fairmount		4		8	68					WWD	Woonsocket		
E - 5	25	5525	St. Hughes St	150' from S line of St Marcel	Mueller		6	1960	8	77	6				WWD	Woonsocket		
E - 5	26	5526	St. Hughes St	at E line of Logee			6		8					Y	WWD	Woonsocket		
E - 5	27	5527	Circle St	90' from E line of Brien's Ct	APS		6	1968	8	65	6	APS	1968		WWD	Woonsocket		
E - 5	28	5528	Brien's Ct	at north end of Briens Ct	APS		6	1968	8	65	6	APS	1968		WWD	Woonsocket		
E - 5	29	5529	Dump Rd	2.750' south of Davison	Kennedy		6	1975	8		6	Kennedy	1975		WWD	Woonsocket		
E - 5	30	5530												?				no card
E - 5	31	5531	Rhode Island Ave	167' south of Mt. St. Charles Ave	US Pipe		6	1988	6		6		1988		WWD	Woonsocket	60	
E - 6	0	5600	Cumberland Hill Rd	at centerline of Park Dr	RD Wood		6	1932	12	65	6				WWD	Woonsocket		
E - 6	1	5601	Cumberland Hill Rd	at centerline of Randall	RD Wood		6	1932	12	71	6				WWD	Woonsocket		
E - 6	2	5602	Virginia Ave	at E line of Craigie	APS		6	1971	8	68	6		1953		WWD	Woonsocket		
E - 6	3	5603	Virginia Ave	250' from W line of Cliffe	APS		6	1969	8	71	6		1969		WWD	Woonsocket		
E - 6	4	5604	Cumberland Hill Rd	120' from N line of Columbus	RD Wood		6	1932	12	70	6				WWD	Woonsocket		
E - 6	5	5605	Cumberland Hill Rd	40' from S line of Columbus			6		12					Y	WWD	Woonsocket		
E - 6	6	5606	Virginia Ave	at E line of Bozoian	Darling		6	1959	8	72	6	Ludlow	1959		WWD	Woonsocket		
E - 6	7	5607	Craigie Ave	20' from S line of Sidney	Mueller		6	1960	8	68	6				WWD	Woonsocket		
E - 6	8	5608	Ruskin Ave	200' from W line of Cliffe	Mueller		6	1960	8	68	6				WWD	Woonsocket		
E - 6	9	5609	Sidney Ave	120' from W line of Cliff	Mueller		6	1960	8	68	6				WWD	Woonsocket		
E - 6	10	5610	Cliffe Ave	50' from N line of Ruskin	Mueller		6	1960	8	64	6				WWD	Woonsocket		
E - 6	11	5611	Cumberland Hill Rd	30' from S line of Virginia	APS		6	1962	12	78	6				WWD	Woonsocket		
E - 6	12	5612	Cumberland Hill Rd	170' from N line of Newbury	Kennedy		6	1974	12	84	6				WWD	Woonsocket	22	
E - 6	13	5613	Newbury Ave	20' from E line of Cumberland Hill			6		8	82	6			Y	WWD	Woonsocket		
E - 6	14	5614	Newbury Ave	180' from E line of Cumberland Hill	Kennedy	K81a	6	1989	8		6				WWD	Woonsocket		
E - 6	15	5615	Newbury Ave	160' from W line of Craigie	Kennedy		6	1976	8	74	6				WWD	Woonsocket		
E - 6	16	5616	Craigie Ave	20' from N line of Newbury	Kennedy		6	1978	8	72	6				WWD	Woonsocket		
E - 6	17	5617	Bozoian St	250' from S line of Virginia	Kennedy		6	1978	8		6	Kennedy	1978		WWD	Woonsocket		
E - 6	18	5618	Newbury Ave	190' from W line of Cliffe	Kennedy		6	1978	8	68	6				WWD	Woonsocket		
E - 6	19	5619	Newbury Ave	50' from W line of Cliffe	RD Wood		6	1932	8	66	6				WWD	Woonsocket		
E - 6	20	5620												?				no card
E - 6	21	5621	Mendon Rd	140' from S line of Newbury	RD Wood		6	1932	12	65	6				WWD	Woonsocket		
E - 6	22	5622	Augustin St	100' from W line of Cumberland Hill	Kennedy		6	1979	12		6	RD Wood			WWD	Woonsocket	9	
E - 6	23	5623	Mendon Rd	240' from S line of Armand	RD Wood		6	1932	12	62	6				WWD	Woonsocket		
E - 6	24	5624	Mendon Rd	20' from S line of Armand	RD Wood		6	1932	12	65	6				WWD	Woonsocket		
E - 6	25	5625	Cumberland Hill Rd	70' from N line of Dawes			6		12					Y	WWD	Woonsocket		
E - 6	26	5626	Founders Drive	145' from S line of St Augustin	APS		6	1969	12	90	6	APS	1969		WWD	Woonsocket		
E - 6	27	5627	Nancy Ct	270' from N line of Virginia	APS		6	1960	8		6	APS			WWD	Woonsocket		
E - 6	28	5628	Nancy Ct	300' from 5627	APS		6	1960	8		6	APS			WWD	Woonsocket		
E - 6	29	5629	St. Augustin St	125' west of Founders Dr	APS		6	1975	8		6	MET	1975		WWD	Woonsocket		
E - 7	0	5700	Ford St	20' from E line of Mendon	RD Wood		6	1932	12	68	6				WWD	Woonsocket		
E - 7	1	5701	Virginia Ave	30' from W line of Mendon	RD Wood		6	1932	8	70	6				WWD	Woonsocket		
E - 7	2	5702	Mendon Rd	140' from S line of Virginia	Kennedy		6	1976	12	70	6				WWD	Woonsocket		
E - 7	3	5703	Bryant St	20' from E line of Mendon	APS		6	1983	12	67	6				WWD	Woonsocket		
E - 7	4	5704	Newbury Ave	10' from W line of Mendon	Kennedy		6	1978	8	65	6				WWD	Woonsocket		
E - 7	5	5705	Park East Dr	315' north of CVS drive	Mueller		6	1982	12		6	APS	1982		WWD	Woonsocket		
E - 7	6	5706	Park East Dr	800' north of CVS drive	Kennedy		6	1996	12		6	APS	1982		WWD	Woonsocket		
E - 7	7	5707	Park East Dr	1315' north of CVS drive	Mueller		6	1982	12		6	APS	1982		WWD	Woonsocket		
E - 7	8	5708	Park East Dr	1815' north of CVS Drive	Mueller		6	1982	12		6	APS	1982		WWD	Woonsocket		
E - 7	9	5709	Park East Dr	at Highland Park Water Tank	Mueller		6	1982	8		6	APS	1982		WWD	Woonsocket		
E - 7	10	5710	Goldstein Dr	200' from Park East	Mueller		6	1982	12		6	APS	1982		WWD	Woonsocket		
E - 7	11	5711	Goldstein Dr	at cul-de-sac	Mueller		6	1982	12		6	APS	1982		WWD	Woonsocket		
E - 7	12	5712	Century Dr	by cul-de-sac	US Pipe		6	1988	8		6		1988		WWD	Woonsocket		
E - 7	13	5713	Highland II	500' from century drive	US Pipe		6	1995	12		6	Mueller	1995		WWD	Woonsocket		
E - 8	0	5800	Highland II	900' from Century drive	US Pipe		6	1995	12		6	Kennedy	1995		WWD	Woonsocket		
E - 8	1	5801	Highland II	1370' from Century drive	US Pipe		6	1995	12		6	Kennedy	1995		WWD	Woonsocket		
E - NS	0	5NS00	Oaklawn Rd, NS	75' from S line of Lapre	Eddy		6	1951	6		6				Lapre & Pelletier	N. Smithfield		
E - NS	1	5NS01	Lapre Rd, NS	at Woodlawn and Oaklawn	Eddy		6	1951	8						Lapre & Pelletier	N. Smithfield		
E - NS	2	5NS02	Woodlawn Rd, NS	125' from N line of Spring	Eddy		4	1951	6						Lapre & Pelletier	N. Smithfield		
E - NS	3	5NSO3	Lapre Rd, NS	320' from N line of Spring	Eddy		4	1951	6						Lapre & Pelletier	N. Smithfield		
F - 1	0	6100	Getchell St, NS	50' west of O'Donnel Ave	Chapman		6	1950	6		6				private	N. Smithfield		
F - 1	1	6101	S. Main St	60' from N line of Great Rd	Chapman		6	1950	12	47	6				WWD	Woonsocket		
F - 1	2	6102	Bamford St, NS	at W line of Homestead	Fairmount		6	1950	6	42	6				private	N. Smithfield		
F - 1	3	6103	Woonsocket Hill Rd, NS	370' from N line of Pine Ct	RD Wood		4		6	40					WWD	N. Smithfield		
F - 1	4	6104	Pine Ct	220' from W line of Woonsocket Hill	Darling		6	1957	6	45	6				private	N. Smithfield		
F - 1	5	6105	Woonsocket Hill Rd, NS	520' from S line of Pine Ct	Chapman		4		6	48					WWD	N. Smithfield		
F - 1	6	6106	Bellevue Ave, NS	63.5' from S line of Woonsocket Hill	Kennedy		6	1988	8		6		1988		private	N. Smithfield	61	
F - 1	7	6107	Bellevue Ave, NS	6' from N line of Arnold	Kennedy		6	1988	8		6		1988		private	N. Smithfield	62	
F - 1	8	6108	Bellevue Ave, NS	192' from N line of Mulberry	Kennedy		6	1988	8		6		1988		private	N. Smithfield	63	
F - 1	9	6109	Milton Ave, NS	at bldg 45	Mueller		6	1990	8		6		1990		private	N. Smithfield		
F - 2	0	6200	Breault Ave	60' from W line of Coe	RD Wood		6	1932	8	60	6				WWD	Woonsocket		
F - 2	1	6201	Baxter St	31' from W line of Jenckes	Mueller		6	1986	6	68	6	Mueller	1986		WWD	Woonsocket		
F - 2	2	6202	Avenue A	70' from W line of Irene	RD Wood		6		6	66				Y	WWD	Woonsocket		

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Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
F - 2	3	6203	Avenue A	20' from W line of Orchard	Darling		6	1959	8	66	6		1959		WWD	Woonsocket		
F - 2	4	6204	Avenue B	25' from E line of Orchard	Fairmount		4		6	70					WWD	Woonsocket		
F - 2	5	6205	Orchard St	120' from S line of Avenue C	Fairmount		4		6	70					WWD	Woonsocket		
F - 2	6	6206	Avenue C	at W line of Middle	Fairmount		6	1950	8	68	6				WWD	Woonsocket		
F - 2	7	6207	Avenue C	80' from W line of Providence	Fairmount		6	1950	8	68	6				WWD	Woonsocket		
F - 2	8	6208	Providence St	at N line of Avenue C	Kennedy		6	1994	8	65	6			Y	WWD	Woonsocket		
F - 2	9	6209	Baxter St	10' from W line of Jenckes	Chapman		4		6	68				Y	WWD	Woonsocket		
F - 2	10	6210	Avenue A	at E line of Beech	Darling		6	1959	8	66	6		1959		WWD	Woonsocket		
F - 2	11	6211	Beech St	50' from N line of Avenue B	APS		6	1963	8	68	6	APS	1963		WWD	Woonsocket		
F - 2	12	6212	Avenue B	40' from W line of Franklin	Chapman		4		6	68					WWD	Woonsocket		
F - 2	13	6213	Providence St	at S line of Piedmont			4							Y	WWD	Woonsocket		
F - 2	14	6214	Piedmont St	20' from W line of Redwood	RD Wood		6	1932	8	110	6				WWD	Woonsocket		
F - 2	15	6215	Avenue A	at W line of Franklin	Darling		6	1959	8	66	6		1959		WWD	Woonsocket		
F - 2	16	6216	Franklin St	160' from N line of Avenue A	Mueller		6	1960	8	68	6				WWD	Woonsocket		
F - 2	17	6217	Providence St	130' from S line of Avenue B	Kennedy		6	1994	8	107	6				WWD	Woonsocket		
F - 2	18	6218	Piedmont St	50' from W line of Seabury	RD Wood		6	1932	8	110	6				WWD	Woonsocket		
F - 2	19	6219	Piedmont St	95' from E line of Seabury	RD Wood		6	1932	8	112	6				WWD	Woonsocket		
F - 2	20	6220	Providence St	10' from N line of Avenue A	Fairmount		6	1950	8	105	6				WWD	Woonsocket		
F - 2	21	6221	Smithfield Rd	110' from W line of Crest	APS		6	1964	8	75	6	APS	1964		WWD	Woonsocket		
F - 2	22	6222	Fabien St	20' from E line of Providence	US Pipe		6	1994	8	100	6				WWD	Woonsocket		
F - 2	23	6223	Berkeley St	240' from W line of Dike	Kennedy		6	1974	8		6	MET	1974		WWD	Woonsocket		
F - 2	24	6224	Fabien St	115' from E line of Endicott	Kennedy		6	1974	8		6	MET	1974		WWD	Woonsocket		
F - 2	25	6225	Providence St	55' from N line of Piedmont	Kennedy		6	1979	8		6	MET	1975		WWD	Woonsocket		
F - 2	26	6226	Orchard St	100' from SE line of Avenue B	Kennedy		6	1988	8		6		1988		WWD	Woonsocket		
F - 2	27	6227	Baxter St	85' from E line of Jenckes	Kennedy		6	1997	8		6		1997		WWD	Woonsocket		
F - 3	0	6300	Bailey St	110' from N line of Baxter	US Pipe		6	1994	8	68	6				WWD	Woonsocket		
F - 3	1	6301	Minerva St	280' from S line of Ballou	APS		6	1962	8	100	6	APS	1962		WWD	Woonsocket		
F - 3	2	6302	Ward St	200' from S line of Ballou	US Pipe		6	1995	6	100					WWD	Woonsocket		
F - 3	3	6303	Transit St	80' from E line of Thomas	Chapman		4		8	93					WWD	Woonsocket		
F - 3	4	6304	Park Ave	30' from N line of Gilbert	Fairmount		4		8	90				Y	WWD	Woonsocket		
F - 3	5	6305	Napoleon St	at N line of Gilbert	Chapman		4		6	86				Y	WWD	Woonsocket		
F - 3	6	6306	Williams St	at N line of Angell	Chapman		4		6	86				Y	WWD	Woonsocket		
F - 3	7	6307	Ward St	across from bldg 332	Kennedy		6	1997			6		1997		WWD	Woonsocket		
F - 3	8	6308	Ward St	at N line of Kennedy	RD Wood		6	1932	8	85	6				WWD	Woonsocket		
F - 3	9	6309	Kennedy St	230' from W line of Park Ave	Mueller		6	1960	8	86	6				WWD	Woonsocket		
F - 3	10	6310	Park Ave	40' from N line of Mowry	Chapman		4		8	86				Y	WWD	Woonsocket		
F - 3	11	6311	Mowry St	150' from W line of Napoleon	Fairmount		6	1950	8	85	6				WWD	Woonsocket		
F - 3	12	6312	Napoleon St	160' from N line of Mowry	US Pipe		6	1998	8	86	6				WWD	Woonsocket		
F - 3	13	6313	Mowry St	70' from E line of Napoleon	Chapman		6	1950	8	94	6				WWD	Woonsocket		
F - 3	14	6314	Mowry St	180' from W line of Kermit	Fairmount		6	1950	8	84	6				WWD	Woonsocket		
F - 3	15	6315	Napoleon St	at N line of Gilbert	Kennedy		6	1987	6	86	6				WWD	Woonsocket		
F - 3	16	6316	Mowry St	at W line of Kermit	Fairmount		6	1950	8	87	6				WWD	Woonsocket		
F - 3	17	6317	Piedmont St	40' from W line of Dike	RD Wood		6	1932	8	109	6				WWD	Woonsocket		
F - 3	18	6318	Piedmont St	160' from E line of Dike	RD Wood		6	1932	8	96	6				WWD	Woonsocket		
F - 3	19	6319	Mowry St	150' from W line of Piedmont	US Pipe		6	1993	8	96	6				WWD	Woonsocket		
F - 3	20	6320	Mowry St	20' from E line of Piedmont	RD Wood		6	1932	8	93	6				WWD	Woonsocket		
F - 3	21	6321	Admiral St	20' from S line of Mowry	RD Wood		6	1932	8	90	6				WWD	Woonsocket		
F - 3	22	6322	Mowry St	110' from W line of Elmore			6		8					Y	WWD	Woonsocket		
F - 3	23	6323	Mowry St	70' from E line of Elmore	RD Wood		6	1932	8	88	6				WWD	Woonsocket		
F - 3	24	6324	Oakton St	30' from E line of Park	APS		6	1960	8	82	6				WWD	Woonsocket		
F - 3	25	6325	Oakton St	170' from E line of Park	RD Wood		6	1932	8	82	6				WWD	Woonsocket		
F - 3	26	6326	Oakton St	350' from E line of Park	RD Wood		6	1932	8	82	6				WWD	Woonsocket		
F - 3	27	6327	Oakton St	160' from W line of Kermit	Fairmount		6	1950	8	82	6				WWD	Woonsocket		
F - 3	28	6328	Kermit St	50' from N line of Carnation	Kennedy		6	1979	8		6	Kennedy	1979		WWD	Woonsocket		
F - 3	29	6329	Elmore St	30' from S line of Carnation	Fairmount		6	1950	8	77	6				WWD	Woonsocket		
F - 3	30	6330	Elmore St	220' from S line of Carnation	Fairmount		6	1950	8	79	6				WWD	Woonsocket		
F - 3	31	6331	Carnation St	20' from W line of Park	Fairmount		6	1950	8	80	6				WWD	Woonsocket		
F - 3	32	6332	Park Ave	60' from N line of Warwick	Kennedy		6	1994	8	80	6				WWD	Woonsocket		
F - 3	33	6333	Park Ave	80' from N line of Newport			4		8					Y	WWD	Woonsocket		
F - 3	34	6334	Newport St	160' from E line of Park	Fairmount		6	1950	8	79	6				WWD	Woonsocket		
F - 3	35	6335	Carnation St	160' from E line of Park	Chapman		4		8	79				Y	WWD	Woonsocket		
F - 3	36	6336	Newport St	340' from W line of Cranston	US Pipe		6	1997	8	79	6	US Pipe	1997		WWD	Woonsocket		
F - 3	37	6337	Carnation St	220' from W line of Cranston	Kennedy		6	1995	8	79	6				WWD	Woonsocket		
F - 3	38	6338	Newport St	170' from W line of Cranston	Fairmount		6	1950	8	79	6				WWD	Woonsocket		
F - 3	39	6339	Newport St	at W line of Cranston	RD Wood		6	1932	8	79	6				WWD	Woonsocket		
F - 3	40	6340	Carnation St	at E line of Cranston	APS		6	1971	8	80	6	APS	1971		WWD	Woonsocket		
F - 3	41	6341	Carnation St	110' from E line of Kermit	RD Wood		6		8		6			Y	WWD	Woonsocket		
F - 3	42	6342	Carnation St	80' from E line of Rose	RD Wood		6	1932	8	90	6				WWD	Woonsocket		
F - 3	43	6343	Rose Ave	270' from S line of Carnation	APS		6	1962	8	90	6	APS	1962		WWD	Woonsocket		
F - 3	44	6344	Elmore St	150' from N line of Ormond	Fairmount		6	1950	8	79	6				WWD	Woonsocket		
F - 3	45	6345	Ormond St	50' from E line of Elmore	Fairmount		6	1950	8	80	6				WWD	Woonsocket		
F - 3	46	6346	Warwick St	160' from E line of Park	Kennedy		6	1987	8	80	6				WWD	Woonsocket		
F - 3	47	6347	Warwick St	370' from E line of Park	Fairmount		6	1950	8	77	6				WWD	Woonsocket		

Appendix F
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Hydrant Database

Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
F - 3	48	6348	Warwick St	240' from W line of Cranston	Fairmount		6	1950	8	77	6				WWD	Woonsocket		
F - 3	49	6349	Warwick St	at W line of Cranston	Fairmount		6	1950	8	77	6				WWD	Woonsocket		
F - 3	50	6350	Gilbert St	30' from W line of Kermit	Kennedy		6	1979	8		6	Kennedy	1979		WWD	Woonsocket		
F - 3	51	6351	Cranston St	50' from S line of Warwick	US Pipe		6	1991	8	77	6				WWD	Woonsocket		
F - 3	52	6352	Park Ave	15' from S line of Kennedy			4		8					Y	WWD	Woonsocket		
F - 3	53	6353	Kermit St	25' from N line of Oakton			6		8					Y	WWD	Woonsocket		
F - 3	54	6354	Foster St	25' from S line of Mowry	Kennedy		6	1971	8		6	Mueller	1971		WWD	Woonsocket		
F - 3	55	6355	Foster St	50' from S line of Niagara	Kennedy		6	1971	8		6	APS	1971		WWD	Woonsocket		
F - 3	56	6356	Kennedy St	30' from W line of Park	Kennedy		6	1973	8	95	6	MET	1973		WWD	Woonsocket		
F - 3	57	6357	Williams St	at N line of Angell	Kennedy		6	1976	6	88	6	Kennedy	1976		WWD	Woonsocket		
F - 3	58	6358	Hollis St	20' from E line of Transit	Kennedy		6	1979	6		6	Kennedy	1979		WWD	Woonsocket		
F - 3	59	6359	Merrill Ct	4' from W line of Napoleon	Kennedy		6	1988	8		6		1988		WWD	Woonsocket		
F - 3	60	6360	Merrill Ct	180' from E line of Napoleon	Kennedy		6	1988	8		6		1988		WWD	Woonsocket		
F - 3	61	6361	Darwin St	at dead end			6	1990	8		6		1990		WWD	Woonsocket		
F - 3	62	6362	Carnation St	at bldg 30, 160' from E line of Park	US Pipe		6	1991	8		6		1991		WWD	Woonsocket		
F - 3	63	6363	Mowry St	21' from E line of Park	Kennedy		6	1994	8		6		1994		WWD	Woonsocket		
F - 4	0	6400	Knight St	20' from S line of Williams	Fairmount		4		8	86				Y	WWD	Woonsocket		
F - 4	1	6401	Cooper Ave	100' from E line of Knight	Fairmount		6	1950	8	85	6				WWD	Woonsocket		
F - 4	2	6402	Cooper Ave	320' from E line of Knight	Fairmount		6	1950	8	79	6				WWD	Woonsocket		
F - 4	3	6403	Cooper Ave	520' from E line of Knight	RD Wood		6	1932	8	77	6				WWD	Woonsocket		
F - 4	4	6404	Cooper Ave	200' from W line of Bradley	Fairmount		6	1950	8	74	6				WWD	Woonsocket		
F - 4	5	6405	Bradley St	at S line of Cooper	Fairmount		6	1950	8	73	6				WWD	Woonsocket		
F - 4	6	6406	Knight St	200' from N line of Berard	RD Wood		6	1932	8	83	6				WWD	Woonsocket		
F - 4	7	6407	Bradley St	520' from S line of Cooper	US Pipe		6	1996	8	72	6	APS	1963		WWD	Woonsocket		
F - 4	8	6408	Jillson Ave	30' from S line of Sharkey	Darling		6	1955	8	73	6		1955		WWD	Woonsocket		
F - 4	9	6409	Knight St	at N line of Berard	RD Wood		6	1932	8	83	6				WWD	Woonsocket		
F - 4	10	6410	Knight St	40' from N line of Carnation	RD Wood		6	1932	8	86	6				WWD	Woonsocket		
F - 4	11	6411	Jillson Ave	260' from S line of Talbot	Kennedy		6	1996	8	76	6		1955		WWD	Woonsocket		
F - 4	12	6412	Jillson Ave	at SW line of Bradley	Darling		6	1955	8		6		1955		WWD	Woonsocket		
F - 4	13	6413	Knight St	29' from S line of Williams	US Pipe		6	1991	8	88	6	Kennedy	1976		WWD	Woonsocket		
F - 4	14	6414	Berard Ave	360' from E line of Knight	Kennedy		6	1979	8		6	Kennedy	1979		WWD	Woonsocket		
F - 5	0	6500	Joffre Ave	40' from S line of Reservoir	RD Wood		6	1932	8	57	6				WWD	Woonsocket		
F - 5	1	6501	Joffre Ave	260' from S line of Reservoir	RD Wood		6	1932	8	61	6				WWD	Woonsocket		
F - 5	2	6502	Fairfield Ave	150' from N line of Reservoir	RD Wood		6	1932	8	72	6				WWD	Woonsocket		
F - 5	3	6503	Fairfield Ave	50' from S line of Reservoir	RD Wood		6	1932	8	74	6				WWD	Woonsocket		
F - 5	4	6504	Logee St	220' from N line of Power	US Metropolitan 250		6	2004	8		6				WWD	Woonsocket		
F - 5	5	6505	Joffre Ave	450' from N line of Bertenshaw	US Pipe		6	1996	8	60	6				WWD	Woonsocket		
F - 5	6	6506	Joffre Ave	260' from N line of Bertenshaw	RD Wood		6	1932	8	55	6				WWD	Woonsocket		
F - 5	7	6507	Fairfield Ave	350' from N line of Bertenshaw	RD Wood		6	1932	8	70	6				WWD	Woonsocket		
F - 5	8	6508	Glendale Ave	50' from S line of Reservoir	RD Wood		6	1932	8	77	6				WWD	Woonsocket		
F - 5	9	6509	Logee St	at S line of Dodge	RD Wood		6	1932	8	76	6				WWD	Woonsocket		
F - 5	10	6510	Joffre Ave	100' from N line of Bertenshaw	RD Wood		6	1932	8	50	6				WWD	Woonsocket		
F - 5	11	6511	Bertenshaw Rd	90' from E line of Joffre	Fairmount		6	1950	8	55	6				WWD	Woonsocket		
F - 5	12	6512	Bertenshaw Rd	at E line of Miles	Fairmount		6	1950	8	63	6				WWD	Woonsocket		
F - 5	13	6513	Glendale Ave	120' from N line of Bertenshaw	RD Wood		6	1932	8	66	6				WWD	Woonsocket		
F - 5	14	6514	Bertenshaw Rd	100' from E line of Glendale	RD Wood		6	1932	8	70	6				WWD	Woonsocket		
F - 5	15	6515	Bertenshaw Rd	120' from W line of Lilac	RD Wood		6	1932	8	78	6				WWD	Woonsocket		
F - 5	16	6516	Lilac Ave	160' from S line of Bertenshaw	RD Wood		6	1932	8	73	6				WWD	Woonsocket		
F - 5	17	6517	Bertenshaw Rd	20' from E line of Lilac	US Pipe		6	1998	8	78	6				WWD	Woonsocket		
F - 5	18	6518	Bertenshaw Rd	at W line of Logee	RD Wood		6	1932	12	80	6				WWD	Woonsocket		
F - 5	19	6519	Myette St	120' from W line of Thibeault	APS		6	1962	8	72	6	APS	1962		WWD	Woonsocket		
F - 5	20	6520	Lilac Ave	120' from N line of Myette	RD Wood		6	1932	8	73	6				WWD	Woonsocket		
F - 5	21	6521	Lydia Ave	150' from N line of Myette	APS		6	1964	8	75	6	APS	1964		WWD	Woonsocket		
F - 5	22	6522	Lilac Ave	215' from S line of Myette	APS		6	1963	8	78	6	APS	1963		WWD	Woonsocket		
F - 5	23	6523	Lydia Ave	320' from S line of Myette	APS		6	1961	8	84	6	APS	1961		WWD	Woonsocket		
F - 5	24	6524	Bertha Ave	50' from S line of Myette	US Pipe		6	1995	8	72	6	APS	1959		WWD	Woonsocket		
F - 5	25	6525	Logee St	40' from S line of Power	US Metropolitan 250		6	2004	8		6			Y	WWD	Woonsocket		
F - 5	26	6526	Thibeault Ave	140' from S line of Myette	APS		6	1965	8	73	6	APS	1965		WWD	Woonsocket		
F - 5	27	6527	Glendale Ave	200' from N line of Reservoir	APS		6	1968	8	60	6	APS	1968		WWD	Woonsocket		
F - 5	28	6528	Miles Ave	420' from S line of Bertenshaw	Kennedy		6	1972	8		6	MET	1972		WWD	Woonsocket		
F - 5	29	6529	Marian Ln	at W line of Thibeault	Kennedy		6	1974	8		6	Mueller	1974	Y	WWD	Woonsocket		
F - 5	30	6530	Marian Ln	at Miles St	Kennedy		6	1994	8		6	Mueller	1994		WWD	Woonsocket		
F - 5	31	6531	Marian Ln	at W corner of Thibeault	Kennedy		6	1994	8		6	Mueller	1994		WWD	Woonsocket		
F - 6	0	6600	Cumberland Hill Rd	820' from N line of Carriage	RD Wood		6	1932	12	72	6				WWD	Woonsocket		
F - 6	1	6601	Cumberland Hill Rd	580' from N line of Carriere	RD Wood		6	1932	12	68	6				WWD	Woonsocket		
F - 6	2	6602	Mendon Rd	280' northeast from Cumberland Hill	Kennedy		6	1987	12	68	6				WWD	Woonsocket		
F - 6	3	6603	Cumberland Hill Rd	210' from N line of Carriere	RD Wood		6		12	70	6			Y	WWD	Woonsocket		
F - 6	4	6604	Mendon Rd	80' north from Cumberland Hill	RD Wood		6	1932	12	70	6				WWD	Woonsocket		
F - 6	5	6605	Cumberland Hill Rd	at S line of Carriere	Kennedy		6	1982	12	70	6				WWD	Woonsocket		
F - 6	6	6606	Talcott St	100' south of SW line of Cumberland Hill	Kennedy		6	1978	12		6				WWD	Woonsocket	10	
F - 6	7	6607	Mendon Rd	190' south from NE line of Talcott	RD Wood		6	1932	12	62	6				WWD	Woonsocket		
F - 6	8	6608	Talcott St	160' from N line of Norman	RD Wood		6	1932	12	60	6				WWD	Woonsocket		
F - 6	9	6609	Mendon Rd	200' south of 6607	RD Wood		6		12	58	6			Y	WWD	Woonsocket		

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Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
F - 6	10	6610	Mendon Rd	200' south of 6609	RD Wood		6	1932	12	54	6				WWD	Woonsocket		
F - 6	11	6611	Norman St	at E line of Louise	Mueller		6	1960	8	78	6				WWD	Woonsocket		
F - 6	12	6612	Norman St	260' from E line of Norman	Mueller		6	1960	8	72	6				WWD	Woonsocket		
F - 6	13	6613	Lucille St	30' from S line of Norman	Mueller		6	1960	8	68	6				WWD	Woonsocket		
F - 6	14	6614	Mendon Rd	190' south of 6610	RD Wood		6	1932	12	55	6				WWD	Woonsocket		
F - 6	15	6615												?				no card
F - 6	16	6616	Mendon Rd	220' north of 6602			6		12		6			Y	WWD	Woonsocket		
F - 6	17	6617	Talcott St	90' from S line of Norman	RD Wood		6	1932	12	57	6				WWD	Woonsocket		
F - 6	18	6618	Norman St	40' from E line of Olive	APS		6	1965	8	62	6	APS	1965		WWD	Woonsocket		
F - 6	19	6619	Cumberland Hill Rd	180' south of 6603			6		12					Y	WWD	Woonsocket		
F - 6	20	6620	Founders Drive	230' from W line of Fortin	APS		6	1969	12	87	6	APS	1969		WWD	Woonsocket		
F - 6	21	6621	Founders Drive	508' from S line of Fortin	Kennedy		6	1974	12		8	MET	1973		WWD	Woonsocket		replaces fire supply F-6-35
F - 6	22	6622	Founders Drive	240' from N line of Fortin	APS		6	1969	12	87	6	APS	1969		WWD	Woonsocket		
F - 6	23	6623	Fortin Dr	320' from E line of Founders	Kennedy		6	1995	12	87	6	APS	1969		WWD	Woonsocket		
F - 6	24	6624	Fortin Dr	330' from SE line of Founders	US Pipe		6	1998	12	87	6	APS	1969		WWD	Woonsocket		
F - 7	0	6700	Roadway A	400' east of Mendon Rd	Mueller		6	1981	12		6	APS	1981		WWD	Woonsocket		
F - 7	1	6701	Roadway A	880' east of Mendon	Mueller		6	1981	12		6	APS	1981		WWD	Woonsocket		
F - 7	2	6702	Roadway A	120' west of Roadway B	Mueller		6	1981	12		6	APS	1981		WWD	Woonsocket		
F - 7	3	6703	Roadway B	380' south of Roadway A	Mueller		6	1981	12		6	APS	1981		WWD	Woonsocket		
F - 7	4	6704	Roadway B	800' south of Roadway A	Mueller		6	1981	12		6	APS	1981		WWD	Woonsocket		
F - 7	5	6705	Roadway B	1070' south of Roadway A	Mueller		6	1981	12		6	APS	1981		WWD	Woonsocket		
F - 7	6	6706	CVS Drive	at driveway to rear of CVS bldg	Kennedy		6	1988	12		6		1988		WWD	Woonsocket		
G - 2	0	7200	Greenville Rd, NS	50' from S line of Smithfield Rd	Chapman		4		6	95					private	N. Smithfield		
G - 2	1	7201	Summit Ave, NS	20' from S line of Smithfield Rd	Fairmount		6	1950		83	6				private	N. Smithfield		
G - 2	2	7202	Smithfield Rd	60' from W line of White Pkwy	Fairmount		6	1950	8	83	6				WWD	N. Smithfield		
G - 2	3	7203	White Pkwy, NS	160' from S line of Smithfield Rd	Fairmount		6	1950	8	83	6				private	N. Smithfield		
G - 2	4	7204	Crest Rd	120' from N line of Weeks	Fairmount		4		6	70					WWD	N. Smithfield		
G - 2	5	7205	Weeks St	160' from W line of Buell	APS		6	1963	8	75	6	APS	1963		WWD	N. Smithfield		
G - 2	6	7206	Summit Ave, NS	35' from 7201	APS		6	1960	8		6	APS			private	N. Smithfield		
G - 2	7	7207	White Pkwy, NS	at Summit Ave	APS		6	1960	8		6	APS			private	N. Smithfield		
G - 2	8	7208	White Pkwy, NS	385' from S line of Summit Ave	APS		6	1960	8		6	APS			private	N. Smithfield		
G - 2	9	7209	White Pkwy, NS	at S line of Glen	APS		6	1960	8		6	APS			private	N. Smithfield		
G - 3	0	7300	Elmore St	at S end of street	Fairmount		6	1950	6	81	6				WWD	Woonsocket		
G - 3	1	7301	Park Ave	50' from N line of Hemond	APS		6	1967	8	81	6	APS	1967		WWD	Woonsocket		
G - 3	2	7302	Hemond Ave	130' from E line of Park	Fairmount		6	1950	8	81	6				WWD	Woonsocket		
G - 3	3	7303	Fournier St	Fogarty Hospital	Kennedy		6	1976	10		6				private	N. Smithfield	35	
G - 3	4	7304	Hemond Ave	360' from W line of Cranston	Kennedy		6	1976	8	60	6				WWD	Woonsocket		
G - 3	5	7305	Fournier St	Fogarty Hospital	Kennedy		6	1976	10		6				private	N. Smithfield	36	
G - 3	6	7306	Hemond Ave	10' from W line of Cranston	Kennedy		6	1976	8	68	6				WWD	Woonsocket		
G - 3	7	7307	Hemond Ave	135' from E line of Cranston	RD Wood		6	1932	8	74	6				WWD	Woonsocket		
G - 3	8	7308	Monty Ave	90' from W line of Cranston	Fairmount		6	1950	8	73	6				WWD	Woonsocket		
G - 3	9	7309	Park Ave	330' from S line of Hemond	Chapman		4		8	81				Y	WWD	Woonsocket		
G - 3	10	7310	Fournier St	130' from S line of Monty	RD Wood		6	1932	8	81	6				WWD	Woonsocket		
G - 3	11	7311	Monty Ave	100' from E line of Fournier	RD Wood		6	1932	8	82	6				WWD	Woonsocket		
G - 3	12	7312	Monty Ave	35' from W line of Tache	Kennedy		6	1977	8		6				WWD	Woonsocket		
G - 3	13	7313	Tache St	50' from N line of Caron	RD Wood		6	1932	8	79	6				WWD	Woonsocket		
G - 3	14	7314	Tache St	100' from N line of Laflamme	RD Wood		6	1932	8	81	6				WWD	Woonsocket		
G - 3	15	7315	Park Ave	200' from N line of Smithfield Rd	APS		6	1959	8	80	6	APS	1959		WWD	Woonsocket		
G - 3	16	7316	Fournier St	110' from N line of Laflamme	RD Wood		6	1932	8	80	6				WWD	Woonsocket		
G - 3	17	7317	Laflamme Ave	60' from E line of Fournier	Kennedy		6	1972	8		6	MET	1972		WWD	Woonsocket		
G - 3	18	7318	Fournier St	115' from N line of Monty			6		8					Y	WWD	Woonsocket		
G - 3	19	7319	Park Ave	10' from N line of Hemond			4		8					Y	WWD	Woonsocket		
G - 3	20	7320	Park Ave	320' from S line of Hemond	APS		6	1969	8	80	6	APS	1969		WWD	Woonsocket		
G - 3	21	7321	Eddie Dowling Hwy	350' east of Park Ave	Ludlow		6	1950	8		8		1950		private	N. Smithfield	39	
G - 3	22	7322	Smithfield Rd, NS	528' from WS#G2-NS-126-13035	Kennedy	K 81 A	6	1972	6						private	N. Smithfield		
G - 4	0	7400	Jillson Ave	260' from N line of Hillview	Darling		6	1955	8	90	6		1955		WWD	Woonsocket		
G - 4	1	7401	Jillson Ave	150' from S line of Hillview	Darling		6	1955	8	90	6		1955		WWD	Woonsocket		
G - 5	0	7500	Flora Ave	310' from N line of Gadoury	APS		6	1960	8	84	6	APS	1960		WWD	Woonsocket		
G - 5	1	7501	Gadoury Blvd	40' from E line of Lydia	Darling		6	1954	8	89	6		1954		WWD	Woonsocket		
G - 5	2	7502	Gadoury Blvd	50' from W line of Manville	Darling		6	1954	8	101	6		1954		WWD	Woonsocket		
G - 5	3	7503	Flora Ave	170' from S line of Gadoury	Darling		6	1956	8	84	6				WWD	Woonsocket		
G - 5	4	7504	Lydia Ave	380' from S line of Gadoury	Mueller		6	1954	8	84	6		1954		WWD	Woonsocket		
G - 5	5	7505	Thibeault Ave	60' from S line of Wade	APS		6	1959	8	78	6	APS	1959		WWD	Woonsocket		
G - 5	6	7506	Flora Ave	180' from N line of Wanda	Darling		6	1956	8	78	6		1956		WWD	Woonsocket		
G - 5	7	7507	Lydia Ave	50' from N line of Wanda	APS		6	1964	8	84	6	APS	1964		WWD	Woonsocket		
G - 5	8	7508	Lydia Ave	at N line of Blue Stone	Kennedy		6	1978	8		6	APS	1964		WWD	Woonsocket		
G - 5	9	7509	Manville Rd	opposite Hamman WTP	APS		6	1960	12	110	6	APS			WWD	Woonsocket	11	
G - 5	10	7510	Lydia Ave	50' from N line of Hawthorne	APS		6	1964	8	68	6	APS	1964		WWD	Woonsocket		
G - 5	11	7511	Hamman WTP	opposite clearwell no 1	US Pipe		6	1996	20	115	6	APS	1962		WWD	Woonsocket		
G - 5	12	7512	Blue Stone Dr	450' from W line of Lydia	APS		6	1964	8	70	6	APS	1964		WWD	Woonsocket		
G - 5	13	7513	Hamman WTP	opposite filter no 2	APS		6	1962	36	110	6	APS	1962		WWD	Woonsocket		
G - 5	14	7514	Hawthorne Circle	266' from W line of Lydia	Kennedy		6	1974	8	70	6	APS	1965		WWD	Woonsocket		
G - 5	15	7515	Manville Rd	at bldg 1507	Kennedy	K 81 A	6	1990	12		6	Kennedy	1990		WWD	Woonsocket		

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Grid #	Seq #	Hyd #	Street	Location of Hydrant	Hyd Make	Model	Hyd Size	Hyd Date	Main Size	Static psi	Gate Size	Gate Make	Gate Date	BF	Owner	City	SHF	Comments
G - 6	0	7600	Fisher St	600' from W line of Louise	APS		6	1962	16	90	6	APS	1962	Y	WWD	Woonsocket		
G - 6	1	7601	Fisher St	280' from E line of Louise	APS		6	1962	16	75	6	APS	1962		WWD	Woonsocket		
G - 6	2	7602	Phillips St	60' from E line of Louise	RD Wood		6	1932	8	75	6				WWD	Woonsocket		
G - 6	3	7603	Phillips St	300' from E line of Louise	RD Wood		6	1932	8	72	6				WWD	Woonsocket		
G - 6	4	7604	Phillips St	40' from W line of Lucille	RD Wood		6	1932	8	68	6				WWD	Woonsocket		
G - 6	5	7605	Lucille St	25' from S line of Fisher			6		8					Y	WWD	Woonsocket		
G - 6	6	7606	Phillips St	110' from E line of Lucille	RD Wood		6	1932	8	65	6				WWD	Woonsocket		
G - 6	7	7607	Phillips St	130' from W line of Olive	RD Wood		6	1932	8	64	6				WWD	Woonsocket		
G - 6	8	7608	Phillips St	20' from E line of Olive	RD Wood		6	1932	8	61	6				WWD	Woonsocket		
G - 6	9	7609	Talcott St	50' from S line of Fisher	US Pipe		6	1992	8	60	6				WWD	Woonsocket		
G - 6	10	7610	Phillips St	30' from W line of Talcott	RD Wood		6	1932	8	60	6				WWD	Woonsocket		
G - 6	11	7611	Mendon Rd	240' from N line of Arrow	RD Wood		6	1932	12	55	6				WWD	Woonsocket		
G - 6	12	7612	Mendon Rd	40' from N line of Arrow	Kennedy		6	1976	12	60	6				WWD	Woonsocket		
G - 6	13	7613	Burrington St	200' from E line of Louise	Darling		6	1956	8	77	6				WWD	Woonsocket		
G - 6	14	7614	Lucille St	40' from N line of Burrington	Kennedy		6	1976	8		6				WWD	Woonsocket		
G - 6	15	7615	Lucille St	80' from N line of Larch	APS		6	1967	8	65	6				WWD	Woonsocket		
G - 6	16	7616	Burrington St	160' from E line of Lucille	US Pipe		6	1991	8	62	6				WWD	Woonsocket		
G - 6	17	7617	Burrington St	80' from W line of Olive	Kennedy		6	1976	8		6				WWD	Woonsocket		
G - 6	18	7618	Olive St	70' from S line of Burrington	RD Wood		6	1932	8	60	6				WWD	Woonsocket		
G - 6	19	7619	Burrington St	20' from W line of Talcott	RD Wood		6	1932	8	59	6				WWD	Woonsocket		
G - 6	20	7620	Larch St	30' from E line of Louise	Mueller		6	1960	8	80	6				WWD	Woonsocket		
G - 6	21	7621	Larch St	220' from E line of Louise	Mueller		6	1960	8	75	6				WWD	Woonsocket		
G - 6	22	7622	Larch St	160' from W line of Lucille	Mueller		6	1960	8	70	6				WWD	Woonsocket	12	
G - 6	23	7623	Lucille St	70' from S line of Larch	RD Wood		6	1932	8	65	6				WWD	Woonsocket		
G - 6	24	7624	Larch St	80' from E line of Lucille	Mueller		6	1960	8	65	6				WWD	Woonsocket		
G - 6	25	7625	Seamans St	310' from W line of Olive	APS		6	1963	8	60	6	APS	1963		WWD	Woonsocket		
G - 6	26	7626	Larch St	140' from W line of Olive	Mueller		6	1960	8	65	6				WWD	Woonsocket		
G - 6	27	7627	Olive St	40' from S line of Larch	RD Wood		6	1932	8	60	6				WWD	Woonsocket		
G - 6	28	7628	Seamans St	20' from E line of Olive	RD Wood		6	1932	8	60	6				WWD	Woonsocket		
G - 6	29	7629	Larch St	160' from E line of Olive	Mueller		6	1960	8	60	6				WWD	Woonsocket		
G - 6	30	7630	Seamans St	200' from W line of Talcott	RD Wood		6		8	60	6			Y	WWD	Woonsocket		
G - 6	31	7631	Larch St	40' from W line of Talcott	US Pipe		6	1996	8	60	6				WWD	Woonsocket		
G - 6	32	7632	Seamans St	20' from W line of Talcott	RD Wood		6		8	60	6			Y	WWD	Woonsocket		
G - 6	33	7633	Lucille St	at S line of Seamans	RD Wood		6	1932	8	65	6				WWD	Woonsocket		
G - 6	34	7634	Lucille St	at S line of Vivian	RD Wood		6	1932	8	68	6				WWD	Woonsocket		
G - 6	35	7635	Vivian St	150' from E line of Lucille	APS		6	1964	8	65	6	APS	1964		WWD	Woonsocket		
G - 6	36	7636	Olive St	90' from S line of Seamans	RD Wood		6	1932	8	60	6				WWD	Woonsocket		
G - 6	37	7637	Vivian St	20' from W line of Talcott	RD Wood		6	1932	8	60	6				WWD	Woonsocket		
G - 6	38	7638	Lucille St	330' from S line of Vivian	APS		6	1964	8	72	6	APS	1964		WWD	Woonsocket		
G - 6	39	7639	Fisher St	20' from E line of Olive	APS		6	1965	8	65	6	APS	1965		WWD	Woonsocket		
G - 6	40	7640	Seamans St	across from bldg 43	Kennedy		6	1993	8		6		1993		WWD	Woonsocket		
G - 7	0	7700	Beausoleil St	at E line of Mendon	Kennedy		6	1988	12	48	6				WWD	Woonsocket		
G - 7	1	7701	Beausoleil St	310' from E line of Mendon	RD Wood		6	1932	8	32	6				WWD	Woonsocket		
G - 7	2	7702	Beausoleil St	560' from E line of Mendon	Kennedy		6	1976	12		6				WWD	Woonsocket		
G - 7	3	7703	Mendon Rd	at S line of Comet	RD Wood		6	1932	12	50	6				WWD	Woonsocket		
H - 2	0	8200	Greenville Rd, NS	200' from N line of Lamoureux	Kennedy		6	1976	6		6	Mueller			private	N. Smithfield		
H - 2	1	8201	Leo Ave, NS	from Birch Hill (NS)	Mueller		6	1953	6		6				private	N. Smithfield		
H - 5	0	8500	Lydia Ave	at S line of Hawthorne	APS		6	1964	8	50	6	APS	1964		WWD	Woonsocket		
H - 5	1	8501	Blue Stone Dr		APS		6	1974	8	70	6	APS	1974		WWD	Woonsocket		
H - 5	2	8502	Hawthorne Circle	620' from W line of Lydia	Kennedy		6	1979	8		6	Kennedy	1979		WWD	Woonsocket		
H - 5	3	8503	Hawthorne Circle	261' from Lydia			6	1989	8		6				WWD	Woonsocket		
SP	0	9100	Reservoir #1	at oil fire practice pit	US Pipe		6	1998	6	90	4				WWD	N. Smithfield	13	
SP	1	9101	Pump Station	west of pump station						100					WWD	N. Smithfield		
SP	2	9102	Reservoir #1	300' before aeration installation	Darling		6	1960	18	100					WWD	N. Smithfield		

APPENDIX G

Valve Database

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
A1	1	A1-1	CANAL ST, NS	1380' north of Singleton	6	GATE	KENNEDY	1981	20	PRIVATE	NS	OPEN	
A1	2	A1-2	CANAL ST, NS	at Canal St, NS	8	GATE		1928	27	PRIVATE	NS	OPEN	
A2	1	A2-1	HARRIS AVE	SOUTH PROPERTY LINE OF HUNTINGTON	8	GATE			26	WWD	WOONSOCKET	OPEN	
A2	2	A2-2	HUNTINGTON AVE, BLKSTN	EAST PROPERTY LINE	6	GATE			26	WWD	BLACKSTONE	OPEN	
A2	3	A2-3	SINGLETON ST	EASTERLY SIDE	8	GATE			26	WWD	WOONSOCKET	OPEN	
A2	4	A2-4	FAIRLAWN AVE	EAST PROPERTY LINE OF HARRIS AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
A2	5	A2-5	FAIRLAWN AVE	WEST PROPERTY LINE OF HUNTINGTON	8	GATE			26	WWD	WOONSOCKET	OPEN	
A2	6	A2-6	HUNTINGTON AVE	AT SOUTH PROPERTY LINE OF FAIRLAWN AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
A2	7	A2-7	SINGLETON ST	WEST PROPERTY LINE OF HARRIS	12	GATE			38	WWD	WOONSOCKET	OPEN	
A2	8	A2-8	HARRIS AVE	AT NORTH PROPERTY LINE OF GASKILL ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
A2	9	A2-9	HARRIS AVE	AT SOUTH LINE OF GASKILL	12	GATE			38	WWD	WOONSOCKET	OPEN	
A2	10	A2-10	GASKILL ST	AT EAST PROPERTY LINE OF HARRIS	8	GATE			26	WWD	WOONSOCKET	OPEN	
A2	11	A2-11	HUNTINGTON AVE	WEST PROPERTY LINE OF EDMUND ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
A2	12	A2-12	GASKILL ST	WEST PROPERTY LINE OF GASKILL	8	GATE			26	WWD	WOONSOCKET	OPEN	
A2	13	A2-13	EDMUND ST	NORTH PROPERTY LINE GASKILL ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
A2	14	A2-14	GASKILL ST	SOUTH PROPERTY LINE GASKILL ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
A2	15	A2-15	SINGLETON ST	WESTERLY SIDE OF SINGLETON	12	GATE			38	WWD	WOONSOCKET	OPEN	
A2	16	A2-16	SINGLETON ST	NORTHEASTERLY SIDE	12	GATE			38	WWD	WOONSOCKET	OPEN	
A2	17	A2-17	MAIN ST, BLKSTN	BLACKSTONE-END OF HARRIS	8	GATE			26	WWD	BLACKSTONE	CLOSED	
A3	1	A3-1	WARNER ST	NORTH PROPERTY LINE OF GASKILL ST	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	2	A3-2	GASKILL ST	EAST PROPERTY LINE OF VINE ST	6	GATE		1890	20	WWD	WOONSOCKET	OPEN	
A3	3	A3-3	PROSPECT ST	NORTH PROPERTY LINE OF GASKILL	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	4	A3-4	PROSPECT ST	SOUTH PROPERTY LINE OF GASKILL	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	5	A3-5	GASKILL ST	EAST PROPERTY LINE OF PROSPECT	6	GATE		1890	20	WWD	WOONSOCKET	OPEN	
A3	6	A3-6	STATE STREET	NORTH PROPERTY LINE OF GASKILL	8	GATE	M & H	1964	26	WWD	WOONSOCKET	OPEN	
A3	7	A3-7	SUMMER ST	NORTH PROPERTY LINE OF GASKILL	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	8	A3-8	SUMMER ST	SOUTH PROPERTY LINE OF GASKILL	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	9	A3-9	GASKILL ST	EAST PROPERTY LINE OF SUMMER	6	GATE		1890	20	WWD	WOONSOCKET	OPEN	
A3	10	A3-10	VINE ST	AT SOUTH PROPERTY LINE OF GASKILL	6	GATE		1890	20	WWD	WOONSOCKET	OPEN	
A3	11	A3-11	RIVULET ST	AT EAST PROPERTY LINE OF VINE ST	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	12	A3-12	RIVULET ST	AT WEST PROPERTY LINE OF TEMPLE ST	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	13	A3-13	TEMPLE ST	AT SOUTH PROPERTY LINE OF RIVULET	6	GATE		1890	20	WWD	WOONSOCKET	OPEN	
A3	14	A3-14	RIVULET ST	AT EAST PROPERTY LINE OF TEMPLE ST	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	15	A3-15	RIVULET ST	AT WEST PROPERTY LINE OF NORTH MAIN	6	GATE		1890	20	WWD	WOONSOCKET	OPEN	
A3	16	A3-16	WOODLAND RD	AT SOUTH PROPERTY LINE OF GASKILL	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	17	A3-17	RACHEL ST	AT WEST PROPERTY LINE OF PROSPECT	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	18	A3-18	TRENT ST	AT WEST PROPERTY LINE OF SUMMER	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	19	A3-19	SUMMER ST	AT NORTH PROPERTY LINE OF TRENT	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	20	A3-20	SUMMER ST	AT SOUTH PROPERTY LINE OF FARM	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	21	A3-21	FARM ST	AT EAST PROPERTY LINE OF SUMMER	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	22	A3-22	FARM ST	AT WEST PROPERTY LINE OF VINE	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	23	A3-23	VINE ST	AT NORTH PROPERTY LINE OF FARM	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	24	A3-24	FARM ST	AT EAST PROPERTY LINE OF VINE	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	25	A3-25	FARM ST	AT WEST PROPERTY LINE OF TEMPLE	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	26	A3-26	TEMPLE ST	AT NORTH PROPERTY LINE OF FARM	6	GATE		1890	20	WWD	WOONSOCKET	OPEN	
A3	27	A3-27	TEMPLE ST	AT SOUTH PROPERTY LINE OF FARM	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	28	A3-28	FARM ST	AT EAST PROPERTY LINE OF TEMPLE	6	GATE		1890	20	WWD	WOONSOCKET	OPEN	
A3	29	A3-29	TEMPLE ST	AT NORTH PROPERTY LINE OF WINTER ST	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	30	A3-30	FARM ST	AT EAST PROPERTY LINE OF NORTH MAIN	6	GATE		1890	20	WWD	WOONSOCKET	OPEN	
A3	31	A3-31	WINTER ST	AT WEST PROPERTY LINE OF NORTH MAIN	6	GATE		1890	20	WWD	WOONSOCKET	OPEN	
A3	32	A3-32	WINTER ST	AT WEST PROPERTY LINE OF NORTH MAIN	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	33	A3-33	NORTH MAIN ST	AT NORTH PROPERTY LINE OF WINTER	6	GATE		1890	20	WWD	WOONSOCKET	OPEN	
A3	34	A3-34	NORTH MAIN ST	AT SOUTH PROPERTY LINE OF WINTER	6	GATE		1890	20	WWD	WOONSOCKET	OPEN	
A3	35	A3-35	WINTER ST	AT EAST PROPERTY LINE OF NORTH MAIN	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	36	A3-36	WOODLAND RD	AT NORTH PROPERTY LINE OF RACHEL	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	37	A3-37	WOODLAND RD	AT SOUTH PROPERTY LINE OF RACHEL	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	38	A3-38	RACHEL ST	AT EAST PROPERTY LINE OF WOODLAND	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	39	A3-39	TRENT ST	AT WEST PROPERTY LINE OF PROSPECT	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	40	A3-40	TRENT ST	AT EAST PROPERTY LINE OF PROSPECT	6	GATE		1890	20	WWD	WOONSOCKET	OPEN	
A3	41	A3-41	WINTER ST	AT WEST PROPERTY LINE OF SUMMER ST	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	42	A3-42	SUMMER ST	AT NORTH PROPERTY LINE OF WINTER	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	43	A3-43	SUMMER ST	AT SOUTH PROPERTY LINE OF WINTER	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	44	A3-44	WINTER ST	AT EAST PROPERTY LINE OF SUMMER	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	45	A3-45	WINTER ST	AT EAST PROPERTY LINE OF TEMPLE	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	46	A3-46	REBEKAH ST	AT WEST PROPERTY LINE OF NORTH MAIN	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	47	A3-47	NORTH ST	AT EAST LINE OF NORTH MAIN	6	GATE		1890	20	WWD	WOONSOCKET	OPEN	
A3	48	A3-48	WOODLAND RD	AT NORTH LINE OF TRENT ST	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	49	A3-49	WOODLAND RD	AT SOUTH LINE OF TRENT	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	50	A3-50	TRENT ST	AT EAST LINE OF WOODLAND RD	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	51	A3-51	WINTER ST	AT WEST LINE OF WOODLAND RD	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	52	A3-52	WOODLAND RD	AT NORTH LINE OF WINTER	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	53	A3-53	WOODLAND RD	AT SOUTH LINE OF WINTER	6	GATE		1890	20	WWD	WOONSOCKET	OPEN	
A3	54	A3-54	WINTER ST	AT WEST LINE OF PROSPECT	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	55	A3-55	PROSPECT ST	AT NORTH LINE OF WINTER ST	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	56	A3-56	PROSPECT ST	AT SOUTH LINE OF WINTER	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	57	A3-57	WINTER ST	AT EAST LINE OF PROSPECT	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	58	A3-58	SUMMER ST	AT NORTH PROPERTY LINE OF REBEKAH	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	59	A3-59	REBEKAH ST	AT EAST PROPERTY LINE OF SUMMER ST	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	60	A3-60	REBEKAH ST	AT SOUTH PROPERTY LINE OF PHOEBE	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	61	A3-61	REBEKAH ST	AT NORTH PROPERTY LINE OF PHOEBE	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	62	A3-62	PHOEBE ST	AT EAST PROPERTY LINE OF REBEKAH	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	63	A3-63	LIBBEUS ST	AT SOUTH PROPERTY LINE OF BARTON	6	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	64	A3-64	BARTON ST	AT WEST PROPERTY LINE OF NORTH MAIN	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
A3	65	A3-65	PHOEBE ST	AT WEST PROPERTY LINE OF NORTH MAIN	8	GATE		1900	26	WWD	WOONSOCKET	OPEN	
A3	66	A3-66	TEMPLE ST	AT WEST PROPERTY LINE OF STREET	6	GATE		1900	20	WWD	WOONSOCKET	OPEN	
A3	67	A3-67	REBEKAH ST	AT EAST PROPERTY LINE	8	GATE		1900	26	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
A3	68	A3-68	LAWRENCE ST	AT EAST PROPERTY LINE OF WOODLAND	8	GATE		1900	26	WWD	WOONSOCKET	CLOSED	
A3	69	A3-69	TEMPLE ST	AT WEST PROPERTY LINE	6	GATE		1900	20	WWD	WOONSOCKET	OPEN	
A3	70	A3-70	WOODLAND RD	AT SOUTH PROPERTY LINE OF LAWRENCE	8	GATE		1900	26	WWD	WOONSOCKET	OPEN	
A3	71	A3-71	NORTH MAIN ST	110' FROM SOUTH PROPERTY LINE OF WINTER	6	GATE		1910	20	WWD	WOONSOCKET	OPEN	
A3	72	A3-72	NORTH MAIN ST	80' FROM NORTH PROPERTY LINE OF RIVULET	6	GATE		1913	20	WWD	WOONSOCKET	OPEN	
A3	73	A3-73	GASKILL ST	45' WEST PROPERTY LINE OF SUMMER	6	GATE	APS	1967	20	WWD	WOONSOCKET	OPEN	
A3	74	A3-74	GASKILL ST	145' FROM EAST PROPERTY LINE OF VINE	6	GATE	APS	1968	20	WWD	WOONSOCKET	OPEN	
A3	75	A3-75	GASKILL ST, BLKSTN	AT WEST PRPTY LINE OF N MAIN - BLACKSTONE	6	GATE		1926	20	WWD	BLACKSTONE	OPEN	
A3	76	A3-76	GASKILL ST, BLKSTN	AT EAST PRPTY LINE N.MAIN	6	GATE		1926		WWD	BLACKSTONE	CLOSED	
A3	77	A3-77	GASKILL ST, BLKSTN	AT EAST PRPTY LINE N MAIN	6	GATE		1926	20	WWD	BLACKSTONE	CLOSED	
A3	78	A3-78	JACOB LN	AT E LINE OF N. MAIN	8	GATE		1990		WWD	WOONSOCKET	OPEN	NO CARD
A3	79	A3-79	JACOB LN	160' FROM E LINE OF N. MAIN	8	GATE		1990		WWD	WOONSOCKET	OPEN	NO CARD
A4	1	A4-1	PRIVILEGE ST	650' WEST OF ROLAND ST	8	GATE		1983	27	WWD	WOONSOCKET	OPEN	
A4	2	A4-2	WINTER ST	AT WEST PROPERTY LINE OF POND	12	GATE		1891	38	WWD	WOONSOCKET	OPEN	
A4	3	A4-3	WINTER ST	AT WEST PROPERTY LINE OF POND	6	GATE		1891	20	WWD	WOONSOCKET	OPEN	
A4	4	A4-4	PRIVILEGE ST	200' EAST OF MILL RIVER	8	GATE	KENNEDY	1984	27	WWD	WOONSOCKET	OPEN	
A4	5	A4-5	PRIVILEGE ST	AT SOUTH PROPERTY LINE OF PRIVILEGE	6	GATE		1891	20	WWD	WOONSOCKET	OPEN	
A4	6	A4-6								WWD	WOONSOCKET		NO CARD
A4	7	A4-7	POND ST	AT EAST PROPERTY LINE OF POND	6	GATE		1891	20	WWD	WOONSOCKET	OPEN	
A4	8	A4-8	ROLAND ST	AT WEST PROPERTY LINE OF PRIVILEGE	6	GATE		1891	20	WWD	WOONSOCKET	OPEN	
A4	9	A4-9	POND ST	IN BACK YARD OF 589 POND	6	GATE		1891	20	WWD	WOONSOCKET	CLOSED	
A4	10	A4-10	POND ST	BACK YARD OF 589 POND	6	GATE		1891	20	WWD	WOONSOCKET	CLOSED	
A4	11	A4-11	WINTER ST	AT SOUTH SIDE OF WINTER	6	GATE		1921	20	WWD	WOONSOCKET	OPEN	
A4	12	A4-12	WINTER ST	AT NORTH SIDE OF ST	6	GATE		1921	20	WWD	WOONSOCKET	OPEN	
A4	13	A4-13	WINTER ST	AT PRIVILEGE STREET	8	GATE	KENNEDY	1985	27	WWD	WOONSOCKET	OPEN	TSV
A4	14	A4-14	PRIVILEGE ST	85' EAST OF EAST ST LINE OF WINTER	4	GATE		1921	15	WWD	WOONSOCKET	OPEN	
A4	15	A4-15	PRIVILEGE ST	AT SOUTH PROPERTY LINE OF ST (FS)	6	GATE	APS	1921	20	WWD	WOONSOCKET	OPEN	
A4	16	A4-16	18" HARRIS POND LINE	EAST OF HARRIS POND PUMP HOUSE	16	BUTTERFLY	P & C	1960	30	WWD	WOONSOCKET	OPEN	
A4	17	A4-17	18" HARRIS POND LINE	NORTH OF PRIVILEGE ST SOUTH OF PUMP	6	GATE		1960	20	WWD	WOONSOCKET	CLOSED	BLOWOFF
A4	18	A4-18	PRIVILEGE ST	SOUTH PROPERTY LINE OF PRIVILEGE	6	GATE		1960	20	WWD	WOONSOCKET	CLOSED	BLOWOFF
A4	19	A4-19	WINTER ST	AT NORTH PROPERTY LINE OF POND	12	GATE	APS	1960	38	WWD	WOONSOCKET	OPEN	
A4	20	A4-20	PRIVILEGE ST	AT SOUTH PROPERTY LINE OF PRIVILEGE	12	GATE	APS	1960	38	WWD	WOONSOCKET	OPEN	
A4	21	A4-21	20" LINE AT HARRIS POND	BETWEEN GATE HOUSE AND PUMP HOUSE	6	GATE		1960	20	WWD	WOONSOCKET	CLOSED	BLOWOFF
A4	22	A4-22	PRIVILEGE ST	30' EAST OF EAST PROPERTY LINE OF WINTER	10	GATE	APS	1960	32	WWD	WOONSOCKET	OPEN	
A4	23	A4-23	12" LINE AT HARRIS POND	NORTH OF PUMP HOUSE	12	BUTTERFLY	PRATT	1960	30	WWD	WOONSOCKET	OPEN	FLOOD CONTROL?
A4	24	A4-24	PRIVILEGE ST	300' EAST OF MILL RIVER BRIDGE - FS	6	GATE	MET	1973	20	WWD	WOONSOCKET	OPEN	
A5	1	A5-1	ADAMS ST	AT EAST PROPERTY LINE OF RATHBUN	6	GATE		1893	20	WWD	WOONSOCKET	OPEN	
A5	2	A5-2	ETHEL ST	AT WEST PROPERTY LINE OF SOCIAL	6	GATE		1893	20	WWD	WOONSOCKET	OPEN	
A5	3	A5-3	ESTES ST	AT EAST PROPERTY LINE OF SOCIAL ST	8	GATE		1893	26	WWD	WOONSOCKET	OPEN	
A5	4	A5-4	ESTES ST	WEST PROPERTY LINE OF BELLINGHAM ST	8	GATE		1893	26	WWD	WOONSOCKET	OPEN	
A5	5	A5-5	BELLINGHAM ST	AT NORTH PROPERTY LINE OF ESTES ST	6	GATE		1893	20	WWD	WOONSOCKET	OPEN	GATE BYPASS
A5	6	A5-6	ESTES ST	AT EAST PROPERTY LINE OF BELLINGHAM ST	6	GATE		1893	20	WWD	WOONSOCKET	OPEN	
A5	7	A5-7	BELLINGHAM ST	AT SOUTH PROPERTY LINE OF ESTES	6	GATE		1893	20	WWD	WOONSOCKET	OPEN	
A5	8	A5-8	DIAMOND HILL RD	AT WEST PROPERTY LINE OF ROLAND	6	GATE		1893	20	WWD	WOONSOCKET	OPEN	
A5	9	A5-9	DIAMOND HILL RD	AT EAST PROPERTY LINE OF ROLAND ST	6	GATE		1893	20	WWD	WOONSOCKET	OPEN	
A5	10	A5-10	ROLAND ST	AT SOUTH PROPERTY LINE OF DIAMOND HILL	6	GATE		1893	20	WWD	WOONSOCKET	OPEN	
A5	11	A5-11	DIAMOND HILL RD	AT WEST PROPERTY LINE OF RATHBUN	6	GATE		1893	20	WWD	WOONSOCKET	OPEN	
A5	12	A5-12	RATHBUN ST	AT NORTH PROPERTY LINE OF DIAMOND HILL	6	GATE		1893	20	WWD	WOONSOCKET	OPEN	
A5	13	A5-13	DIAMOND HILL RD	CENTER LINE OF DHR AND RATHBUN	12	GATE		1893	38	WWD	WOONSOCKET	OPEN	
A5	14	A5-14	DIAMOND HILL RD	AT EAST PROPERTY LINE OF RATHBUN ST	6	GATE		1893	20	WWD	WOONSOCKET	OPEN	
A5	15	A5-15	RATHBUN ST	SOUTH PROPERTY LINE OF DHR	12	GATE		1893	38	WWD	WOONSOCKET	OPEN	
A5	16	A5-16	DIAMOND HILL RD	AT WEST PROPERTY LINE OF SOCIAL	6	GATE		1893	20	WWD	WOONSOCKET	OPEN	
A5	17	A5-17	SOCIAL ST	AT NORTH PROPERTY LINE OF DHR	6	GATE		1893	20	WWD	WOONSOCKET	OPEN	
A5	18	A5-18	SOCIAL ST	AT NORTH PROPERTY LINE OF DHR	12	GATE		1893	38	WWD	WOONSOCKET	OPEN	
A5	19	A5-19	DIAMOND HILL RD	AT EAST PROPERTY LINE OF SOCIAL	6	GATE		1893	20	WWD	WOONSOCKET	OPEN	
A5	20	A5-20	SOCIAL ST	AT SOUTH PROPERTY LINE OF DIAMOND HILL RD	6	GATE		1893	20	WWD	WOONSOCKET	OPEN	
A5	21	A5-21	ADAMS ST	AT WEST PROPERTY LINE OF SOCIAL	6	GATE		1893	20	WWD	WOONSOCKET	OPEN	
A5	22	A5-22	ADAMS ST	AT EAST PROPERTY LINE OF SOCIAL	4	GATE		1893	14	WWD	WOONSOCKET	OPEN	
A5	23	A5-23	ADAMS ST	AT WEST PROPERTY LINE OF BELLINGHAM ST	6	GATE		1893	20	WWD	WOONSOCKET	OPEN	
A5	24	A5-24	BELLINGHAM ST	AT NORTH PROPERTY LINE OF ADAMS	6	GATE		1897	20	WWD	WOONSOCKET	OPEN	
A5	25	A5-25	ADAMS ST	AT EAST PROPERTY LINE OF BELLINGHAM ST	4	GATE		1893	4	WWD	WOONSOCKET	OPEN	
A5	26	A5-26	BELLINGHAM ST	AT SOUTH PROPERTY LINE OF ADAMS	6	GATE		1897	20	WWD	WOONSOCKET	OPEN	
A5	27	A5-27	ESTES ST	AT EAST PROPERTY LINE OF SALISBURY	6	GATE		1893	20	WWD	WOONSOCKET	OPEN	
A5	28	A5-28	SALISBURY ST	AT SOUTH PROPERTY LINE OF ESTES	8	GATE		1893	26	WWD	WOONSOCKET	OPEN	
A5	29	A5-29	SALISBURY ST	AT NORTH PROPERTY LINE OF ADAMS	8	GATE		1893	26	WWD	WOONSOCKET	OPEN	
A5	30	A5-30	ADAMS ST	AT WEST PROPERTY LINE OF SALISBURY	6	GATE		1893	20	WWD	WOONSOCKET	OPEN	
A5	31	A5-31	GARDEN ST	AT NORTH PROPERTY LINE OF ESTES	6	GATE		1897	20	WWD	WOONSOCKET	OPEN	
A5	32	A5-32	ESTES ST	AT EAST PROPERTY LINE OF GARDEN ST	6	GATE		1897	20	WWD	WOONSOCKET	OPEN	
A5	33	A5-33	GARDEN ST	AT SOUTH PROPERTY LINE OF ESTES	6	GATE		1897	20	WWD	WOONSOCKET	OPEN	
A5	34	A5-34	ESTES ST	AT WEST PROPERTY LINE OF DEWEY	6	GATE		1897	20	WWD	WOONSOCKET	OPEN	
A5	35	A5-35	RATHBUN ST	AT SOUTH PROPERTY LINE OF CHARLES	12	GATE		1897	38	WWD	WOONSOCKET	OPEN	
A5	36	A5-36	RATHBUN ST	AT NORTH PROPERTY LINE OF CHARLES ST	12	GATE		1897	20	WWD	WOONSOCKET	OPEN	
A5	37	A5-37	CHARLES ST	AT EAST PROPERTY LINE OF RATHBUN	6	GATE		1897	20	WWD	WOONSOCKET	OPEN	
A5	38	A5-38	DEAN ST	AT SOUTH PROPERTY LINE OF CHARLES	6	GATE		1897	20	WWD	WOONSOCKET	OPEN	
A5	39	A5-39	CHARLES ST	AT WEST PROPERTY LINE OF SOCIAL	6	GATE		1897	20	WWD	WOONSOCKET	OPEN	
A5	40	A5-40	DIAMOND HILL RD	AT SOUTHWEST PROPERTY LINE OF BELLINGHAM ST	6	GATE		1897	20	WWD	WOONSOCKET	OPEN	
A5	41	A5-41	DIAMOND HILL RD	AT NORTHWEST PROPERTY LINE OF BELLINGHAM ST	12	GATE		1897	38	WWD	WOONSOCKET	OPEN	
A5	42	A5-42	BELLINGHAM ST	AT NORTH PROPERTY LINE OF DIAMOND HILL RD	6	GATE		1897	20	WWD	WOONSOCKET	OPEN	
A5	43	A5-43	DIAMOND HILL RD	AT EAST PROPERTY LINE OF BELLINGHAM ST	12	GATE		1894	38	WWD	WOONSOCKET	OPEN	
A5	44	A5-44	WOOD AVE	AT SOUTH PROPERTY LINE OF DIAMOND HILL	12	GATE		1894	38	WWD	WOONSOCKET	OPEN	
A5	45	A5-45	WOOD AVE	NORTH OF BRIDGE BETWEEN HAVELOCK AND DHR	12	GATE		1894	38	WWD	WOONSOCKET	OPEN	
A5	46	A5-46	WOOD AVE	SOUTH OF BRIDGE - BETWEEN HAVELOCK AND DHRD	12	GATE		1894	38	WWD	WOONSOCKET	OPEN	
A5	47	A5-47	SALISBURY ST	AT NORTH PROPERTY LINE OF DIAMOND HILL RD	6	GATE		1894	20	WWD	WOONSOCKET	CLOSED	
A5	48	A5-48	DIAMOND HILL RD	AT EAST PROPERTY LINE OF SALISBURY ST	6	GATE		1894	20	WWD	WOONSOCKET	OPEN	
A5	49	A5-49	DIAMOND HILL RD	AT WEST PROPERTY LINE OF GARDEN ST	6	GATE		1894	20	WWD	WOONSOCKET	OPEN	
A5	50	A5-50	GARDEN ST	AT NORTH PROPERTY LINE OF DHROAD	6	GATE		1894	20	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
A5	51	A5-51	GARDEN ST	AT NORTHWEST PROPERTY LINE OF DHROAD	12	GATE		1894	38	WWD	WOONSOCKET	OPEN	
A5	52	A5-52	DIAMOND HILL RD	AT EAST PROPERTY LINE OF GARDEN ST	6	GATE		1894	20	WWD	WOONSOCKET	OPEN	
A5	53	A5-53	DIAMOND HILL RD	AT WEST PROPERTY LINE OF DEWEY ST	6	GATE		1894	20	WWD	WOONSOCKET	OPEN	
A5	54	A5-54	DEWEY ST	AT NORTH PROPERTY LINE OF DHRD	6	GATE		1917	20	WWD	WOONSOCKET	OPEN	
A5	55	A5-55	RATHBUN ST	AT SOUTH PROPERTY LINE OF PRIVILEGE	12	GATE		1925	38	WWD	WOONSOCKET	OPEN	
A5	56	A5-56	PRIVILEGE ST	AT WEST PROPERTY LINE OF RATHBUN	6	GATE		1925	20	WWD	WOONSOCKET	OPEN	
A5	57	A5-57	RATHBUN ST	AT NORTH PROPERTY LINE OF PRIVILEGE	12	GATE		1925	38	WWD	WOONSOCKET	OPEN	
A5	58	A5-58	PRIVILEGE ST	AT EAST PROPERTY LINE OF RATHBUN ST	6	GATE		1925	20	WWD	WOONSOCKET	OPEN	
A5	59	A5-59	DEAN ST	AT NORTH PROPERTY LINE OF PRIVILEGE	6	GATE		1925	20	WWD	WOONSOCKET	OPEN	
A5	60	A5-60	PRIVILEGE ST	AT WEST PROPERTY LINE OF SOCIAL	6	GATE		1925	20	WWD	WOONSOCKET	OPEN	
A5	61	A5-61	WOOD AVE	AT SOUTH PROPERTY LINE OF HAVELOCK ST	12	GATE		1925	38	WWD	WOONSOCKET	OPEN	
A5	62	A5-62	HAVELOCK ST	AT WEST PROPERTY LINE OF WOOD AVE	8	GATE		1930	26	WWD	WOONSOCKET	CLOSED	
A5	63	A5-63	WOOD AVE	AT NORTH PROPERTY LINE OF HAVELOCK	12	GATE		1930	38	WWD	WOONSOCKET	OPEN	
A5	64	A5-64	HAVELOCK ST	AT EAST PROPERTY LINE OF WOOD AVE	8	GATE		1930	26	WWD	WOONSOCKET	OPEN	
A5	65	A5-65	CHARLES ST	50' FROM WEST PROPERTY LINE OF SOCIAL	4	GATE		1938	18	WWD	WOONSOCKET	OPEN	
A5	66	A5-66	GEORGE ST	AT EAST PROPERTY LINE OF RATHBUN ST	8	GATE		1902	26	WWD	WOONSOCKET	OPEN	
A5	67	A5-67	CHESTER ST	AT SOUTH PROPERTY LINE OF GEORGE	6	GATE		1902	20	WWD	WOONSOCKET	OPEN	
A5	68	A5-68	SOCIAL ST	AT SOUTH PROPERTY LINE OF GEORGE	8	GATE		1902	26	WWD	WOONSOCKET	OPEN	
A5	69	A5-69	GEORGE ST	AT WEST PROPERTY LINE OF SOCIAL	8	GATE		1902	26	WWD	WOONSOCKET	OPEN	
A5	70	A5-70	SOCIAL ST	AT NORTH PROPERTY LINE OF GEORGE ST	6	GATE		1927	20	WWD	WOONSOCKET	OPEN	
A5	71	A5-71	BURNSIDE AVE	AT NORTH PROPERTY LINE OF MILL ST	8	GATE		1927	26	WWD	WOONSOCKET	OPEN	
A5	72	A5-72	MILL ST	AT EAST PROPERTY LINE OF BURNSIDE	6	GATE		1921	20	WWD	WOONSOCKET	OPEN	
A5	73	A5-73	MILL ST	AT WEST PROPERTY LINE OF WOOD AVE	6	GATE		1921	6	WWD	WOONSOCKET	OPEN	
A5	74	A5-74	WOOD AVE	AT NORTH PROPERTY LINE OF MILL ST	12	GATE		1921	38	WWD	WOONSOCKET	OPEN	
A5	75	A5-75	WOOD AVE	AT SOUTH PROPERTY LINE OF E. MILL ST	12	GATE		1921	38	WWD	WOONSOCKET	OPEN	
A5	76	A5-76	WOOD AVE	AT NORTH PROPERTY LINE OF E. MILL ST	12	GATE		1921	38	WWD	WOONSOCKET	OPEN	
A5	77	A5-77	EAST MILL ST	AT EAST PROPERTY LINE OF WOOD AVE	8	GATE		1925	26	WWD	WOONSOCKET	OPEN	
A5	78	A5-78	GARDEN ST, BELLINGHAM	#150 AT END OF MAIN ON EASTERLY SIDE OF ST	1	BLOW OFF		1940	1	WWD	BELLINGHAM	CLOSED	
A5	79	A5-79	BURNSIDE AVE	AT WEST SIDE OF ST. BETWEEN MILL AND HAVELOCK	8	GATE	MUELLER	1959	26	WWD	WOONSOCKET	OPEN	
A5	80	A5-80	BURNSIDE AVE	AT WEST SIDE OF STREET BETWEEN MILL AND HAVELOCK	8	GATE	APS	1959	26	WWD	WOONSOCKET	OPEN	
A5	81	A5-81	BURNSIDE AVE	AT WEST SIDE OF ST BETWEEN MILL AND HAVELOCK	4	GATE	APS	1966	14	WWD	WOONSOCKET	OPEN	
A5	82	A5-82	EAST MILL ST	AT NORTH SIDE OF ST	6	GATE		1970	20	WWD	WOONSOCKET	OPEN	
A5	83	A5-83	ETHEL ST, BLKSTN	AT EAST PROPERTY LINE OF MILLER ST	6	GATE		1970	20	WWD	BLACKSTONE	CLOSED	
A5	84	A5-84	PRIVILEGE ST	AT WEST PROPERTY LINE OF RATHBUN		AIR REL. VALVE		1970		WWD	WOONSOCKET		
A5	85	A5-85	EAST MILL ST	63' WEST OF HYDRAND # 1548	6	GATE	MET	1976	20	WWD	WOONSOCKET	OPEN	
A5	86	A5-86	SOCIAL ST	80' NORTH OF DIAMOND HILL RD STREET LINE	6	GATE		1907	21	WWD	WOONSOCKET	CLOSED	SPARE?-SERVICE#3032
A5	87	A5-87	ETHEL ST, BLKSTN	AT 3' OFF GV A-5-83 & 3' EAST OF PRPTY LINE OF MILLER	1	GATE		1997		WWD	BLACKSTONE	CLOSED	BLOWOFF
A6	1	A6-1	DEWEY ST	AT SOUTH PROPERTY LINE OF ESTES ST	6	GATE		1926	20	WWD	WOONSOCKET	OPEN	
A6	2	A6-2	ESTES ST	AT EAST PROPERTY LINE OF DEWEY	6	GATE		1926	20	WWD	WOONSOCKET	OPEN	
A6	3	A6-3	ESTES ST	AT WEST PROPERTY LINE OF FULTON	8	GATE		1926	26	WWD	WOONSOCKET	CLOSED	
A6	4	A6-4	ST LOUIS AVE	AT NORTH PROPERTY LINE OF PRINCE	8	GATE		1926	26	WWD	WOONSOCKET	OPEN	
A6	5	A6-5	ST LOUIS AVE	AT SOUTH PROPERTY LINE OF ACHILLE	8	GATE		1926	26	WWD	WOONSOCKET	OPEN	
A6	6	A6-6	ATLANTA AVE	AT SOUTH PROPERTY LINE OF BENELLI	8	GATE		1926	26	WWD	WOONSOCKET	OPEN	
A6	7	A6-7	BENELLI ST	AT WEST PROPERTY LINE OF ATLANTA	8	GATE	APS	1963	26	WWD	WOONSOCKET	OPEN	
A6	8	A6-8	ATLANTA AVE	AT NORTH PROPERTY LINE OF BENELLI	8	GATE		1926	26	WWD	WOONSOCKET	OPEN	
A6	9	A6-9	ATLANTA AVE	AT WESTERLY SIDE OF ST AFTER BENELLI	8	GATE		1926	26	WWD	WOONSOCKET	OPEN	
A6	10	A6-10	DIAMOND HILL RD	AT NORTH PROPERTY LINE OF FULTON	12	GATE		1926	38	WWD	WOONSOCKET	OPEN	
A6	11	A6-11	DIAMOND HILL RD	AT SOUTH PROPERTY LINE OF FULTON ST	12	GATE		1926	38	WWD	WOONSOCKET	OPEN	
A6	12	A6-12	DIAMOND HILL RD	AT NORTH SIDE OF ST IN FRONT OF # 754	12	GATE		1926	38	WWD	WOONSOCKET	OPEN	
A6	13	A6-13	ST LEON AVE	AT SOUTH PROPERTY LINE OF DHR	8	GATE		1926	26	WWD	WOONSOCKET	OPEN	
A6	14	A6-14	DIAMOND HILL RD	AT WEST PROPERTY LINE OF ST LEON	12	GATE		1926	38	WWD	WOONSOCKET	OPEN	
A6	15	A6-15	DIAMOND HILL RD	AT EAST PROPERTY LINE OF ST LEON AVE	12	GATE		1926	38	WWD	WOONSOCKET	OPEN	
A6	16	A6-16	ST CECILE AVE	AT SOUTH PROPERTY LINE OF DHRD	8	GATE		1926	26	WWD	WOONSOCKET	OPEN	
A6	17	A6-17	DIAMOND HILL RD	AT WEST PROPERTY LINE OF ST CECILE	12	GATE		1926	38	WWD	WOONSOCKET	OPEN	
A6	18	A6-18	DIAMOND HILL RD	AT EAST PROPERTY LINE OF ST CECILE	12	GATE		1926	38	WWD	WOONSOCKET	OPEN	
A6	19	A6-19	ST LOUIS AVE	AT SOUTH PROPERTY LINE OF DHR	8	GATE		1926	26	WWD	WOONSOCKET	OPEN	
A6	20	A6-20	DIAMOND HILL RD	AT WEST PROPERTY LINE OF ST LOUIS	12	GATE		1926	38	WWD	WOONSOCKET	OPEN	
A6	21	A6-21	ST LOUIS AVE	AT NORTH PROPERTY LINE OF DHR	8	GATE		1926	26	WWD	WOONSOCKET	OPEN	
A6	22	A6-22	DIAMOND HILL RD	AT EAST PROPERTY LINE OF ST LOUIS AVE	12	GATE		1926	38	WWD	WOONSOCKET	OPEN	
A6	23	A6-23	ST LOUIS AVE	AT SOUTH PROPERTY LINE OF PRINCE	8	GATE		1926	26	WWD	WOONSOCKET	OPEN	
A6	24	A6-24	ST AGNES AVE	AT SOUTH PROPERTY LINE OF DHR	8	GATE		1926	26	WWD	WOONSOCKET	OPEN	
A6	25	A6-25	DIAMOND HILL RD	AT WEST PROPERTY LINE OF ST AGNES	12	GATE		1926	38	WWD	WOONSOCKET	OPEN	
A6	26	A6-26	DIAMOND HILL RD	AT EAST PROPERTY LINE OF ST AGNES	12	GATE		1926	38	WWD	WOONSOCKET	OPEN	
A6	27	A6-27	ST NICHOLAS AVE	AT SOUTH PROPERTY LINE OF DHR	8	GATE		1926	26	WWD	WOONSOCKET	OPEN	
A6	28	A6-28	DIAMOND HILL RD	AT WEST PROPERTY LINE OF ST. NICHOLAS	12	GATE		1926	38	WWD	WOONSOCKET	OPEN	
A6	29	A6-29	DIAMOND HILL RD	AT EAST PROPERTY LINE OF ST NICHOLAS	12	GATE		1926	38	WWD	WOONSOCKET	OPEN	
A6	30	A6-30	LINDEN AVE	AT SOUTH PROPERTY LINE OF DHR	8	GATE		1926	26	WWD	WOONSOCKET	OPEN	
A6	31	A6-31	DIAMOND HILL RD	AT WEST PROPERTY LINE OF ROME AVE	12	GATE		1926	38	WWD	WOONSOCKET	OPEN	
A6	32	A6-32	DIAMOND HILL RD	AT WEST PROPERTY LINE OF ROME AVE	8	GATE		1926	26	WWD	WOONSOCKET	OPEN	
A6	33	A6-33	DIAMOND HILL RD	AT EAST PROPERTY LINE OF ROME	12	GATE		1926	38	WWD	WOONSOCKET	OPEN	
A6	34	A6-34	ATLANTA AVE	AT NORTH PROPERTY LINE OF DHR	8	GATE		1926	26	WWD	WOONSOCKET	OPEN	
A6	35	A6-35	DIAMOND HILL RD	AT EAST PROPERTY LINE OF ATLANTA	12	GATE		1926	38	WWD	WOONSOCKET	OPEN	
A6	36	A6-36	DIAMOND HILL RD	ON NORTHERLY SIDE	12	GATE		1926	38	WWD	WOONSOCKET	OPEN	
A6	37	A6-37	ST LEON AVE	ON WESTERLY SIDE OF ST	8	GATE		1932	26	WWD	WOONSOCKET	OPEN	
A6	38	A6-38	ST LOUIS AVE	ON WESTERLY SIDE	8	GATE		1949	26	WWD	WOONSOCKET	OPEN	
A6	39	A6-39	ST AGNES AVE	ON WESTERLY SIDE	8	GATE		1930	26	WWD	WOONSOCKET	OPEN	
A6	40	A6-40	LINDEN AVE	AT SOUTH PROPERTY LINE OF DENBY	8	GATE		1930	26	WWD	WOONSOCKET	OPEN	
A6	41	A6-41	LINDEN AVE	AT NORTH PROPERTY LINE OF DENBY	8	GATE		1930	26	WWD	WOONSOCKET	OPEN	
A6	42	A6-42	LINDEN AVE	AT SOUTH PROPERTY LINE OF COOLIDGE	8	GATE		1930	26	WWD	WOONSOCKET	OPEN	
A6	43	A6-43	LINDEN AVE	AT NORTH PROPERTY LINE OF COOLIDGE	8	GATE		1930	26	WWD	WOONSOCKET	OPEN	
A6	44	A6-44	DENBY ST	AT EAST PROPERTY LINE OF LINDEN AVE	8	GATE		1930	26	WWD	WOONSOCKET	OPEN	
A6	45	A6-45	ST CECILE AVE	AT WEST SIDE OF ST	8	GATE		1930	26	WWD	WOONSOCKET	OPEN	
A6	46	A6-46	ACHILLE ST	AT EAST PROPERTY LINE OF ST LOUIS	8	GATE		1965	26	WWD	WOONSOCKET	OPEN	
A6	47	A6-47	DIAMOND HILL RD	AT NORTH SIDE OF DHR FIRE SUPPLY LINE FOR #706	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
A6	48	A6-48	ST CECILE AVE	4' WEST OF HYD # 1624	8	GATE		1930	26	WWD	WOONSOCKET	OPEN	
A6	49	A6-49	ROME AVE	25' SOUTH OF SOUTH ST LINE OF ACHILLE	8	GATE	KENNEDY	1985	27	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
A6	50	A6-50	ACHILLE ST	220' WEST OF WEST STREET LINE OF ROME AVE	8	GATE	KENNEDY	1984	27	WWD	WOONSOCKET	OPEN	
A6	51	A6-51	FULTON ST	10' NORTH OF NORTH ST LINE OF ESTES	8	GATE	KENNEDY	1985	27	WWD	WOONSOCKET	OPEN	
A6	52	A6-52	FULTON ST	AT ESTES ST	8	GATE	KENNEDY	1985	27	WWD	WOONSOCKET	OPEN	
A6	53	A6-53	ACHILLE ST	WEST ST LINE OF ROME AVE	8	GATE	KENNEDY	1985	20	WWD	WOONSOCKET	OPEN	
A6	54	A6-54	PRINCE ST	AT WEST ST LINE OF ROME AVE	8	GATE	KENNEDY	1985	27	WWD	WOONSOCKET	OPEN	
A6	55	A6-55	PRINCE ST	430' WESTERLY OF WESTERLY ST LINE OF ROME	0.75	BLOW OFF	RED HED	1986		WWD	WOONSOCKET	CLOSED	
A6	56	A6-56	ROME AVE	AT SOUTHERLY ST LINE OF PRINCE	8	GATE	KENNEDY	1986	27	WWD	WOONSOCKET	OPEN	
A6	57	A6-57								WWD	WOONSOCKET		NO CARD
A7	1	A7-1	PINECREST DR	AT WEST PROPERTY LINE OF MENDON RD	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	
A7	2	A7-2	PINECREST DR	AT WESTERLY PROPERTY LINE OF MENDON RD	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	
A7	3	A7-3								WWD	WOONSOCKET		NO CARD
A7	4	A7-4	DIAMOND HILL RD	AT WEST PROPERTY LINE OF MORRIS ST	12	GATE		1960	38	WWD	WOONSOCKET	OPEN	
A7	5	A7-5	DIAMOND HILL RD	AT EAST PROPERTY LINE OF MORRIS	12	GATE		1960	38	WWD	WOONSOCKET	OPEN	
A7	6	A7-6	MORRIS ST	AT SOUTH PROPERTY LINE OF DHR	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
A7	7	A7-7	DIAMOND HILL RD	AT WEST PROPERTY LINE OF MENDON RD	12	GATE		1960	38	WWD	WOONSOCKET	OPEN	
A7	8	A7-8	DIAMOND HILL RD	AT EAST PROPERTY LINE OF MENDON RD	12	GATE		1960	38	WWD	WOONSOCKET	OPEN	
A7	9	A7-9	MENDON RD	AT SOUTH PROPERTY LINE OF DHR	12	GATE		1960	38	WWD	WOONSOCKET	OPEN	
A7	10	A7-10	DIAMOND HILL RD	AT NORTHERLY SIDE AT METER PIT FO WALNUT PLAZA	8	GATE	APS	1960	26	WWD	WOONSOCKET	OPEN	
A7	11	A7-11	DIAMOND HILL RD	AT NORTHERLY SIDE OF RD AT METR PIT FOR WALNUT PLAZA	8	GATE	APS	1960	26	WWD	WOONSOCKET	CLOSED	
A7	12	A7-12	DIAMOND HILL RD	AT EASTERLY SIDE OF METER PIT FOR WALNUT PLAZA	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
A7	13	A7-13	DIAMOND HILL RD	AT SOUTHERLY SIDE OF ROAD	12	GATE		1960	38	WWD	WOONSOCKET	OPEN	
A7	14	A7-14	DIAMOND HILL RD	AT NORTHERLY SIDE OF ROAD	12	GATE		1960	38	WWD	WOONSOCKET	OPEN	
A7	15	A7-15	WILCOX ST	AT WEST PROPERTY LINE OF MENDON RD	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
A7	16	A7-16	MENDON RD	AT SOUTH PROPERTY LINE OF WILCOX	12	GATE		1960	38	WWD	WOONSOCKET	OPEN	
A7	17	A7-17	MENDON RD	IN FRONT OF WATER TANK	12	GATE		1960	31.5	WWD	WOONSOCKET	OPEN	
A7	18	A7-18	COBBLE HILL TANK	AT NORTHERLY SIDE OF ALTITUDE VALVE CHAMBER	12	GATE		1960	38	WWD	WOONSOCKET	OPEN	
A7	19	A7-19	COBBLE HILL TANK	AT SOUTHERLY SIDE OF ALTITUDE VALVE CHAMBER	12	GATE		1960	38	WWD	WOONSOCKET	OPEN	
A7	20	A7-20	COBBLE HILL TANK	AT SOUTHEREASTERLY SIDE OF ALTITUDE VALVE CHAMBER	12	GATE		1960	38	WWD	WOONSOCKET	CLOSED	
A7	21	A7-21	MENDON RD	ELDER BALLOU HOME 25' SOUTH OF HYD #1701	4	GATE	APS	1967	14	WWD	WOONSOCKET	OPEN	TSV
A7	22	A7-22	MENDON RD	ELDER BALLOU HOME 25' SOUTH OF HYD # 1701	6	GATE	APS	1967	20	WWD	WOONSOCKET	OPEN	TSV
A7	23	A7-23								WWD	WOONSOCKET		NO CARD
A7	24	A7-24	DIAMOND HILL RD	SOUTH OF METER PIT FOR WALNUT PLAZA	8	GATE	APS	1960	26	WWD	WOONSOCKET	OPEN	
A7	25	A7-25	ROCK RIDGE DR	ON NW CORNER OF PARKING LOT BETWEE BLDG E-2 & D-1	6	GATE		1905	20	PRIVATE	WOONSOCKET	OPEN	
A7	26	A7-26	MORRIS ST	235' SOUTH FROM SOUTH PROPERTY LINE IN GRANGE AVE	0.75	BLOW OFF		1974		WWD	WOONSOCKET	CLOSED	
A7	27	A7-27	GRANGE ST	60' WEST OF WEST PROPERTY LINE OF SINCLAIR	0.75	BLOW OFF		1974		WWD	WOONSOCKET	CLOSED	
A7	28	A7-28	MORRIS ST	AT SOUTH PROPERTY LINE OF GRANGE	8	GATE	MET	1974	26	WWD	WOONSOCKET	OPEN	
A7	29	A7-29	GRANGE ST	AT EAST PROPERTY LINE OF MORRIS	8	GATE	MET	1974	26	WWD	WOONSOCKET	OPEN	
A7	30	A7-30	DIAMOND HILL RD	FOR WALNUT HILL BOWL	2	GATE		1975		WWD	WOONSOCKET		
A7	31	A7-31	MENDON RD	31' FROM NORTH PROPERTY LINE OF WILCOX	4	GATE	KENNEDY	1978	18	WWD	WOONSOCKET	OPEN	
A7	32	A7-32	DIAMOND HILL RD	SERVICE TO #1175	6	GATE	KENNEDY	1984	21	WWD	WOONSOCKET	OPEN	
A7	33	A7-33	MENDON RD	AT NORTH STREET LINE OF DIAMOND HILL	8	GATE		1905	26	WWD	WOONSOCKET	REMOVED	REMOVED DURING DIAMOND HILL RECONSTRUCTION
A7	34	A7-34	MENDON RD	AT NORTH STREET LINE OF DHR	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
A7	35	A7-35	MENDON RD	AT NORTH ST LINE OF DIAMOND HILL RD	8	GATE		1905		WWD	WOONSOCKET	CLOSED	
A7	36	A7-36	MENDON RD	APPROX 180' NORTH OF DHR	8	GATE		1905		WWD	WOONSOCKET	OPEN	
A8	1	A8-1	DIAMOND HILL RD	AT WESTERLY SIDE OF PUMPING STATION	10	GATE		1969	32	WWD	WOONSOCKET	OPEN	
A8	2	A8-2	DIAMOND HILL RD	AT NORTHERLY SIDE OF PUMPING STATION	12	GATE		1969	38	WWD	WOONSOCKET	CLOSED	
A8	3	A8-3	DIAMOND HILL RD	AT NORTHEASTERLY SIDE OF PUMPING STATION	10	GATE		1969	32	WWD	WOONSOCKET	OPEN	
A8	4	A8-4	DIAMOND HILL RD	AT CENTER OF ROAD IN FRONT OF PUMPING STATION	12	GATE		1969	38	WWD	WOONSOCKET	OPEN	
A8	5	A8-5	DIAMOND HILL RD	AT SOUTHERLY SIDE OF PUMPING STATION	10	GATE		1969	32	WWD	WOONSOCKET	OPEN	
A8	6	A8-6	DIAMOND HILL RD	AT NORTHERLY SIDE		BLOW OFF		1969		WWD	WOONSOCKET	CLOSED	
A8	7	A8-7	DIAMOND HILL RD	AT NORTHERLY SIDE	12	GATE		1969	38	WWD	WOONSOCKET	OPEN	
A8	8	A8-8	ROCK RIDGE DR	240' SOUTH FROM S PROPERTY LINE OF DHR	8	GATE	KENNEDY	1969	26	PRIVATE	WOONSOCKET	OPEN	
A8	9	A8-9	ROCK RIDGE DR	225 SOUTH FROM SOUTH PROPERTY LINJE OF DHR	8	GATE	KENNEDY	1969	26	PRIVATE	WOONSOCKET	CLOSED	
A8	10	A8-10	ROCK RIDGE DR	90' EAST OF HYD # 1800	8	GATE	KENNEDY	1969	26	PRIVATE	WOONSOCKET	OPEN	TSV
A8	11	A8-11	DIAMOND HILL RD	#2000 WOONSOCKET PLAZA	10	GATE		1969	32	WWD	WOONSOCKET	OPEN	
A8	12	A8-12	DIAMOND HILL RD	#2000 WOONSOCKET PLAZA METER PIT	10	GATE		1969	32	WOON PLAZA	WOONSOCKET	OPEN	
A8	13	A8-13	DIAMOND HILL RD	WOON PLAZA EXIT OF METER PIT	10	GATE		1969	32	WOON PLAZA	WOONSOCKET	OPEN	
A8	14	A8-14	DIAMOND HILL RD	WOON PLAZA NEAR EXIT FROM PLAZA	10	GATE		1969	32	WOON PLAZA	WOONSOCKET	OPEN	
A8	15	A8-15	DIAMOND HILL RD	WOON PLAZA NEAR EXIT OF PLAZA	10	GATE		1969	32	WOON PLAZA	WOONSOCKET	OPEN	
A8	16	A8-16	DIAMOND HILL RD	WOON PLAZA NEAR EXIT OF PLAZA	10	GATE		1969		WWD	WOONSOCKET	CLOSED	
A8	17	A8-17	DIAMOND HILL RD	WOON PLAZA SERVICE TO #1788 DHR	8	GATE		1969	26	WOON PLAZA	WOONSOCKET	OPEN	
A8	18	A8-18	DIAMOND HILL RD	WOON PLAZA SERVICE TO BUILDING #3	8	GATE		1969	26	WOON PLAZA	WOONSOCKET	OPEN	
A8	19	A8-19	DIAMOND HILL RD	WOON PLAZA SERVICE TO BLDG #3	8	GATE		1969	26	WWD	WOONSOCKET	OPEN	
A8	20	A8-20	DIAMOND HILL RD	WOON PLAZA SERVICE TO BLDG #4	8	GATE		1969	26	WOON PLAZA	WOONSOCKET	OPEN	
A8	21	A8-21	DIAMOND HILL RD	WOON PLAZA SERVICE TO BULDING #5	8	GATE		1969	26	WWD	WOONSOCKET	OPEN	
A8	22	A8-22	DIAMOND HILL RD	WOON PLAZA SERVICE TO BLDG #5	8	GATE		1969	26	WOON PLAZA	WOONSOCKET	OPEN	
A8	23	A8-23	DIAMOND HILL RD	WOON PLAZA SERVICE TO BLDGS #6 & 10	8	GATE		1969	26	WOON PLAZA	WOONSOCKET	OPEN	
A8	24	A8-24	DIAMOND HILL RD	WOON PLAZA SERVICE TO BLDG # 11	8	GATE		1969	26	WOON PLAZA	WOONSOCKET	OPEN	
A8	25	A8-25	DIAMOND HILL RD	WOON PLAZA REAR OF BLDG 11	10	GATE		1969	32	WOON PLAZA	WOONSOCKET	OPEN	
A8	26	A8-26	DIAMOND HILL RD	#2000 WOON PLAZA	8	GATE		1969	26	WWD	WOONSOCKET	OPEN	
A9	1	A9-1	GLAUDE LN	at west property line of Dawn Blvd	8	GATE	APS	1962	26	WWD	WOONSOCKET	OPEN	
A9	2	A9-2	DAWN BLVD	at south property line of Glaude Ln	8	GATE	APS	1962	26	WWD	WOONSOCKET	OPEN	
A9	3	A9-3	GLAUDE LN	at west property line of Bound Rd	8	GATE	APS	1962	26	WWD	WOONSOCKET	OPEN	
A9	4	A9-4	STAR AVE	NORTH SIDE OF STAR AVE	8	GATE		1962	26	WWD	WOONSOCKET	OPEN	
A9	5	A9-5	STAR AVE	AT NORTH LINE OF SUNRISE	8	GATE		1962	26	WWD	WOONSOCKET	OPEN	
A9	6	A9-6	SUNRISE AVE	AT EAST LINE OF STAR AVE	8	GATE	APS	1962	26	WWD	WOONSOCKET	OPEN	
A9	7	A9-7	DAWN BLVD	at north property line of Sunrise Ave	8	GATE		1962	26	WWD	WOONSOCKET	OPEN	
A9	8	A9-8	DAWN BLVD	at south property line of Sunrise Ave	8	GATE		1962	26	WWD	WOONSOCKET	OPEN	
A9	9	A9-9	SUNRISE AVE	AT EAST LINE OF DAWN BLVD	8	GATE		1962	26	WWD	WOONSOCKET	OPEN	
A9	10	A9-10	SUNRISE AVE	AT WEST LINE OF BOUND RD	8	GATE		1962	26	WWD	WOONSOCKET	OPEN	
A9	11	A9-11	GLAUDE LN	at west property line of Albert St	8	GATE	APS	1966	26	WWD	WOONSOCKET	OPEN	
A9	12	A9-12	ALBERT ST	at south property line of Glaude Lane	8	GATE	APS	1966	26	WWD	WOONSOCKET	OPEN	
A9	13	A9-13	STAR AVE	126' FROM SOUTH LINE OF SUNRISE	8	GATE		1977	26	WWD	WOONSOCKET	OPEN	
A9	14	A9-14	BOUND RD	at intersection of Sunrise Ave	8	GATE	MUELLER	1979	26	WWD	WOONSOCKET	OPEN	
B1	1	B1-1	SCOTIA ST	AT EAST PROPERTY LINE OF ELIZABETH AVE	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
B1	2	B1-2	SIXTH AVE	AT SOUTH PROPERTY LINE OF SYCAMORE ST	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
B1	3	B1-3	SYCAMORE ST	AT EAST PROPERTY LINE OF SIXTH AVE	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
B1	4	B1-4	SYCAMORE ST	AT WEST PROPERTY LINE OF FIFTH AVE	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
B1	5	B1-5	FIFTH AVE	AT SOUTH PROPERTY LINE OF SYCAMORE	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
B1	6	B1-6	SYCAMORE ST	AT EAST PROPERTY LINE OF FIFTH AVE	8	GATE		1960	26	WWD	WOONSOCKET	CLOSED	
B1	7	B1-7	COMSTOCK CT	AT NORTH PROPERTY LINE OF RHODES	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
B1	8	B1-8	RHODES AVE	AT EAST PROPERTY LINE OF COMSTOCK CT	10	GATE		1960	32	WWD	WOONSOCKET	OPEN	
B1	9	B1-9	SIXTH AVE	AT NORTH PROPERTY LNE OF RHODES AVE	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	OPENS LEFT
B1	10	B1-10	RHODES AVE	AT SOUTH WESTERLY SIDE OF PUMPING STATION	8	GATE		1960	26.75	WWD	WOONSOCKET	OPEN	
B1	11	B1-11	RHODES AVE	NORTHERLY SIDE FRONT OF PUMPING STATION	10	GATE		1960	32	WWD	WOONSOCKET	CLOSED	
B1	12	B1-12	RHODES AVE	SOUTHEASTERLY SIDE OF PUMPING STATION	8	GATE		1960	26.5	WWD	WOONSOCKET	OPEN	
B1	13	B1-13	SEVENTH AVE	AT NORTH PROPERTY LINE OF RHODES AVE	8	GATE		1978	26	WWD	WOONSOCKET	OPEN	
B1	14	B1-14	SYCAMORE ST	AT EAST STREET LINE OF FIFTH AVE	8	GATE	KENNEDY	1985	27	WWD	WOONSOCKET	OPEN	
B1	15	B1-15	ELIZABETH ST	SOUTH ST LINE OF SCOTIA ST	8	GATE		1985	27	WWD	WOONSOCKET	OPEN	
B2	1	B2-1	RIVER ST	AT NORTH PROPERTY LINE OF SINGLETON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B2	2	B2-2	SINGLETON ST	AT EAST PROPERTY LINE OF RIVER ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
B2	3	B2-3	SINGLETON ST	NORTHERLY SIDE	12	GATE			38	WWD	WOONSOCKET	OPEN	
B2	4	B2-4	THIRD AVE	AT NORTH PROPERTY LINE OF FOURTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
B2	5	B2-5	THIRD AVE	AT SOUTH PROPERTY LINE OF FOURTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
B2	6	B2-6	THIRD AVE	AT SOUTH PROPERTY LINE OF LAUREL ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B2	7	B2-7	RIVER ST	AT WEST SIDE	4	GATE			14	WWD	WOONSOCKET	OPEN	
B2	8	B2-8	RIVER ST	AT NORTH PROPERTY LINE OF OLD SINGLETON ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
B2	9	B2-9	SINGLETON ST	AT EAST PROPERTY LINE OF RIVER ST	12	GATE			38	WWD	WOONSOCKET	OPEN	OLD?
B2	10	B2-10	RIVER ST	AT SOUTH PROPERTY LINE OF OLD SINGLETON ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
B2	11	B2-11	HARRIS AVE	AT NORTH PROPERTY LINE OF WINTER ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
B2	12	B2-12	WINTER ST	AT EAST PROPERTY LINE OF WINTER ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B2	13	B2-13	HARRIS AVE	AT SOUTH PROPERTY LINE OF WINTER ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B2	14	B2-14	HIGHLAND ST	AT WEST PROPERTY LINE OF HARRIS AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
B2	15	B2-15	MEADOW RD	AT EAST PROPERTY LINE OF HARRIS AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
B2	16	B2-16	SYCAMORE ST	AT WEST PROPERTY LINE OF FOURTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
B2	17	B2-17	SYCAMORE ST	AT EAST PROPERTY LINE OF FOURTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
B2	18	B2-18	SYCAMORE ST	AT WEST PROPERTY LINE OF THIRD AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
B2	19	B2-19	RIVER ST	EAST SIDE	12	GATE			38	WWD	WOONSOCKET	OPEN	
B2	20	B2-20	HIGHLAND ST	AT SOUTHEAST ANLE LINE	6	GATE			20	WWD	WOONSOCKET	OPEN	
B2	21	B2-21	FOURTH AVE	AT SYCAMORE ST	8	GATE	KENNEDY	1985	27	WWD	WOONSOCKET	OPEN	
B2	22	B2-22	RHODES AVE	AT NORTHWEST PROPERTY LINE OF THIRD AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
B2	23	B2-23	RHODES AVE	AT SOUTHWEST PROPERTY LINE OF THIRD AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
B2	24	B2-24	THIRD AVE	AT NORTH PROPERTY LINE OF RHODES AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
B2	25	B2-25	RHODES AVE	AT EAST PROPERTY LINE OF THIRD AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
B2	26	B2-26	SECOND AVE	AT WEST PROPERTY LINE OF RIVER ST	14	GATE			44	WWD	WOONSOCKET	OPEN	
B2	27	B2-27	RIVER ST	AT NORTH PROPERTY LINE OF SECOND AVE	12	GATE		1988	38	WWD	WOONSOCKET	OPEN	REPLACED 11/88
B2	28	B2-28	RIVER ST	AT SOUTH PROPERTY LINE OF SECOND AVE	14	GATE			44	WWD	WOONSOCKET	OPEN	
B2	29	B2-29	HIGHLAND ST	AT NORTH PROPERTY LINE OF LYMAN ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
B2	30	B2-30	LYMAN ST	AT EAST PROPERTY LINE OF HIGHLAND	6	GATE			20	WWD	WOONSOCKET	OPEN	
B2	31	B2-31	RHODES AVE	AT WEST PROPERTY LINE OF FIFTH AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
B2	32	B2-32	FIFTH AVE	AT NORTH PROPERTY LINE OF RHODES	8	GATE			26	WWD	WOONSOCKET	CLOSED	
B2	33	B2-33	RHODES AVE	AT EAST PROPERTY LINE OF FIFTH AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
B2	34	B2-34	RHODES AVE	AT WEST PROPERTY LINE OF FOURTH AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
B2	35	B2-35	FOURTH AVE	AT NORTH PROPERTY LINE OF RHODES AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
B2	36	B2-36	RHODES AVE	AT EAST PROPERTY LINE OF FOURTH AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
B2	37	B2-37	FOURTH AVE	AT SOUTH PROPERTY LINE OF RHODES	8	GATE			26	WWD	WOONSOCKET	OPEN	
B2	38	B2-38	THIRD AVE	AT SOUTH PROPERTY LINE OF RHODES AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
B2	39	B2-39	THIRD AVE	AT WEST SIDE	6	GATE			20	WWD	WOONSOCKET	OPEN	
B2	40	B2-40	RHODES AVE	AT NORTH PROPERTY LINE OF SECOND AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
B2	41	B2-41	SECOND AVE	AT WEST SIDE BEFORE RHODES AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
B2	42	B2-42	SECOND AVE	AT SOUTH ANGLE LINE	12	GATE			38	WWD	WOONSOCKET	OPEN	
B2	43	B2-43	SINGLETON ST	AT NORTH SIDE OF ST, SUPPLY FOR FINKLESTEIN	8	GATE			26	WWD	WOONSOCKET	OPEN	
B2	44	B2-44	SINGLETON ST	AT EAST SIDE, SUPPLY FOR NYANZA	6	GATE			20	WWD	WOONSOCKET	OPEN	
B2	45	B2-45	SINGLETON ST	AT EAST SIDE, SUPPLY FOR NYANZA	6	GATE			20	WWD	WOONSOCKET	OPEN	
B2	46	B2-46	SINGLETON ST	AT WEST SIDE, SUPPLY FOR FINKLESTEIN	6	GATE			20	WWD	WOONSOCKET	OPEN	
B2	47	B2-47	SINGLETON ST	END OF OLD SINGLETON ST	12	GATE			38	WWD	WOONSOCKET	CLOSED	
B2	48	B2-48	HARRIS AVE	AT EAST SIDE, SUPPLY FOR #531 HARRIS	6	GATE	APS	1951	20	WWD	WOONSOCKET	OPEN	TSV
B2	49	B2-49	SINGLETON ST	AT EAST SIDE, SUPPLY FOR NYANZA	8	GATE			26	WWD	WOONSOCKET	OPEN	
B2	50	B2-50	HARRIS AVE	OPPOSITE #517 HARRIS AVE	6	GATE	MUELLER	1905	20	WWD	WOONSOCKET	OPEN	
B2	51	B2-51	WINTER COURT	AT NORTH PROPERTY LINE OF WINTER ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
B2	52	B2-52	RIVER ST	#943 - 380' NORTHWESTERLY OF SECOND AVE	8	GATE		1984	26	WWD	WOONSOCKET	OPEN	TSV
B3	1	B3-1	CASTLE HEIGHTS CT	AT NORTH PROPERTY OF WINTER ST	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	2	B3-2	WINTER ST	AT SOUTH PROPERTY LINE OF CASTLE HEIGHTS CT	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	3	B3-3	MEADOW RD	AT WEST PROPERTY LINE OF WOODLAND RD	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	4	B3-4	LIBBEUS ST	AT NORTH PROPERTY LINE OF DEXTER ST	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	5	B3-5	DEXTER ST	AT EAST PROPERTY LINE OF LIBBEUS ST	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	6	B3-6	LIBBEUS ST	AT SOUTH PROPERTY LINE OF DEXTER ST	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	7	B3-7	LIBBEUS ST	AT EAST PROPERTY LINE OF SUMMER ST	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	8	B3-8	DEXTER ST	AT WEST PROPERTY LINE OF N MAIN ST	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	9	B3-9	NORTH MAIN ST	AT NORTH PROPERTY LINE OF DEXTER	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	10	B3-10	EAST SCHOOL ST	AT EAST PROPERTY LINE OF NORTH MAIN ST	12	GATE		1905	38	WWD	WOONSOCKET	OPEN	
B3	11	B3-11	MEADOW RD	AT EAST PROPERTY LINE OF OAKLEY RD	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	12	B3-12	OAKLEY RD	AT SOUTH PROPERTY LINE OF MEADOW RD	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	13	B3-13	UPLAND RD	AT WEST PROPERTY LINE OF GLEN RD	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	14	B3-14	GLEN RD	AT SOUTH PROPERTY LINE OF UPLAND RD	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	15	B3-15	UPLAND RD	AT EAST PROPERTY LINE OF GLEN RD	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	16	B3-16	UPLAND RD	AT WEST PROPERTY LINE OF WOODLAND	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	17	B3-17	SUMMER ST	AT SOUTH PROPERTY LINE OF LIBBEUS	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	18	B3-18	WEST SCHOOL ST	AT WEST PROPERTY LINE OF N MAIN ST	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	19	B3-19	OAKLEY RD	AT NORTH PROPERTY LINE OF UPLAND RD	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	20	B3-20	UPLAND RD	AT EAST PROPERTY LINE OF OAKLEY RD	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	21	B3-21	OAKLEY RD	AT SOUTH PROPERTY LINE OF UPLAND	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
B3	22	B3-22	LYMAN ST	AT WEST PROPERTY LINE OF OAKLEY RD	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	23	B3-23	OAKLEY RD	AT NORTH PROPERTY LINE OF LYMAN ST	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	24	B3-24	OAKLEY RD	AT SOUTH PROPERTY LINE OF LYMAN	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	25	B3-25	PROSPECT ST	AT NORTH PROPERTY LINE OF SPRING ST	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	26	B3-26	SPRING ST	AT SOUTH PROPERTY LINE OF PROSPECT ST	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	27	B3-27	SPRING ST	AT EAST PROPERTY LINE OF PROSPECT ST	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	28	B3-28	SUMMER ST	AT NORTH PROPERTY LINE OF PROSPECT	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	29	B3-29	WEST SCHOOL ST	AT SOUTH PROPERTY LINE OF PROSPECT	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	30	B3-30	WEST SCHOOL ST	AT NORTH PROPERTY LINE OF PROSPECT	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	31	B3-31	PROSPECT ST	AT WEST PROPERTY LINE OF N MAIN	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	32	B3-32	NORTH MAIN ST	AT NORTH PROPERTY LINE OF PROSPECT ST	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	33	B3-33	NORTH MAIN ST	AT SOUTH PROPERTY LINE OF PROSPECT ST	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	34	B3-34	MECHANIC ST	AT EAST PROPERTY LINE OF EARLE ST	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	35	B3-35	LYMAN ST	AT WEST PROPERTY LINE OF HARRIS AVE	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	36	B3-36	HARRIS AVE	AT NORTH PROPERTY LINE OF LYMAN	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	37	B3-37	LYMAN ST	AT EAST PROPERTY LINE OF HARRIS AVE	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	38	B3-38	HARRIS AVE	AT SOUTH PROPERTY LINE OF LYMAN	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	39	B3-39	HOMESTEAD RD	AT SOUTHWEST PROPERTY LINE OF OAKLEY RD	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	40	B3-40	OAKLEY RD	AT WEST PROPERTY LINE OF GLEN RD	6	GATE	MUELLER	1989	20	WWD	WOONSOCKET	OPEN	REPLACED 4/89
B3	41	B3-41	GLEN RD	AT NORTH PROPERTY LINE OF OAKLEY RD	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	42	B3-42	GLEN RD	AT SOUTH PROPERTY LINE OF OAKLEY RD	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	43	B3-43	WOODLAND RD	AT WEST PROPERTY LINE OF SPRING ST	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	44	B3-44	SPRING ST	AT SOUTH PROPERTY LINE OF WOODLAND RD	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	45	B3-45	SPRING ST	AT EASTERLY PROPERTY LINE OF WOODLAND RD	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	46	B3-46	DANIELS ST	ON EAST PROPERTY LINE OF N MAIN ST	4	GATE		1905	14	WWD	WOONSOCKET	OPEN	
B3	47	B3-47	EARLE ST	ON NORTH PROPERTY LINE OF DANIELS ST	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	48	B3-48	DANIELS ST	ON EAST PROPERTY LINE OF EARLE ST	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	49	B3-49	DANIELS ST	AT WEST PROPERTY LINE OF EARLE ST	4	GATE		1905	14	WWD	WOONSOCKET	OPEN	
B3	50	B3-50	EARLE ST	AT SOUTH PROPERTY LINE OF DANIELS	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	51	B3-51	BOYDEN ST	26' SOUTH OF HYD # 2340	4	GATE		1905	14	WWD	WOONSOCKET	CLOSED	
B3	52	B3-52	HARRIS AVE	AT NORTH EAST PROPERTY LINE OF BLACKSTONE ST	12	GATE		1905	38	WWD	WOONSOCKET	OPEN	
B3	53	B3-53	HARRIS AVE	AT NORTHWEST PROPERTY LINE OF BLACKSTONE ST	4	GATE		1905	14	WWD	WOONSOCKET	CLOSED	
B3	54	B3-54	BLACKSTONE ST	AT NORTH PROPERTY LINE OF HOMESTEAD RD	12	GATE		1905	38	WWD	WOONSOCKET	OPEN	
B3	55	B3-55	HARRIS AVE	AT NORTH PROPERTY LINE OF BLACKSTONE ST	12	GATE		1905	38	WWD	WOONSOCKET	OPEN	
B3	56	B3-56	HARRIS AVE	AT NORTH PROPERTY LINE OF BLACKSTONE ST	12	GATE		1905	38	WWD	WOONSOCKET	OPEN	
B3	57	B3-57	BLACKSTONE ST	AT SOUTH WEST PROPERTY LINE OF HARRIS AVE	12	GATE		1905	38	WWD	WOONSOCKET	OPEN	
B3	58	B3-58	HARRIS AVE	AT SOUTH PROPERTY LINE OF BLACKSTONE ST	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	59	B3-59	KINDERGARTEN ST	AT SOUTH PROPERTY LINE	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	60	B3-60	BLACKSTONE ST	AT WEST PROPERTY LINE OF SPRING ST	12	GATE		1905	38	WWD	WOONSOCKET	OPEN	
B3	61	B3-61	SPRING ST	AT NORTH PROPERTY LINE OF BLACKSTONE ST	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	62	B3-62	BLACKSTONE ST	AT EAST PROPERTY LINE OF SPRING ST	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	63	B3-63	GLEN RD	AT WEST PROPERTY LINE OF SPRING ST	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	64	B3-64	SPRING ST	AT SOUTH PROPERTY LINE OF GLEN	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	65	B3-65	SPRING ST	AT NORTH PROPERTY LINE OF GLEN RD	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	66	B3-66	WEST SCHOOL ST	AT WEST SIDE OF STREET	12	GATE		1905	38	WWD	WOONSOCKET	OPEN	
B3	67	B3-67	WEST SCHOOL ST	AT NORTHWEST SIDE OF STREET	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	68	B3-68	BLACKSTONE ST	AT WEST PROPERTY LINE OF HIGH SCHOOL ST	12	GATE		1905	38	WWD	WOONSOCKET	OPEN	
B3	69	B3-69	ARNOLD ST	AT SOUTH PROPERTY LINE OF BLACKSTONE ST	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	70	B3-70	HIGH SCHOOL ST	AT NORTH PROPERTY LINE OF BLACKSTONE ST	4	GATE		1905	14	WWD	WOONSOCKET	OPEN	
B3	71	B3-71	BOYDEN ST	AT NORTH PROPERTY LINE OF BLACKSTONE ST	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	72	B3-72	BLACKSTONE ST	AT EAST PROPERTY LINE OF BOYDEN ST	12	GATE		1905	38	WWD	WOONSOCKET	OPEN	
B3	73	B3-73	BOYDEN ST	AT SOUTH PROPERTY LINE OF HIGH SCHOOL ST	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	74	B3-74	HIGH SCHOOL ST	AT EAST PROPERTY LINE OF BOYDEN ST	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	75	B3-75	BOYDEN ST	AT NORTH PROPERTY LINE OF HIGH SCHOOL ST	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	76	B3-76	SNOW STREET	AT EAST PROPERTY LINE OF NORTH MAIN ST	4	GATE		1905	14	WWD	WOONSOCKET	OPEN	
B3	77	B3-77	CHURCH ST	AT EAST PROPERTY LINE OF ARNOLD ST	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B3	78	B3-78	EARLE ST	SUPPLY LINE FOR ST. CHARLES SCHOOL	6	GATE	APS	1905	20	WWD	WOONSOCKET	OPEN	
B3	79	B3-79	WEST SCHOOL ST	AT NORTH PROPERTY LINE OF BLACKSTONE ST	8	GATE		1905	26	WWD	WOONSOCKET	CLOSED	
B3	80	B3-80	EARLE ST	SUPPLY LINE FOR ST. CHARLES SCHOOL	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	81	B3-81	NORTH MAIN ST	51' FROM SOUTH PROPERTY LINE OF E SCHOOL ST	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	82	B3-82	EAST SCHOOL ST	83' FROM EAST PROPERTY LINE OF NORTH MAIN ST	4	GATE		1905	14	WWD	WOONSOCKET	OPEN	
B3	83	B3-83	NORTH MAIN ST	AT SNOW ST	4	GATE		1905	14	WWD	WOONSOCKET	OPEN	
B3	84	B3-84	HIGH SCHOOL ST		4	GATE		1991	14	WWD	WOONSOCKET	OPEN	REPLACED 8/91
B3	85	B3-85	MECHANIC ST	35' FROM EAST PROPERTY LINE OF EARLE ST	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B3	86	B3-86	EAST SCHOOL ST	130' FROM WEST PROPERTY LINE OF POND ST	6	GATE		1905	20	WWD	WOONSOCKET		
B3	87	B3-87	HIGH SCHOOL ST	FS TO #167 BLACKSTONE ST	6	GATE	P & C	1932	28	WWD	WOONSOCKET	OPEN	
B3	88	B3-88								WWD	WOONSOCKET		NO CARD
B4	1	B4-1	EAST SCHOOL ST	AT WEST PROPERTY LINE OF POND ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
B4	2	B4-2	POND ST	AT SOUTH PROPERTY LINE OF E SCHOOL ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
B4	3	B4-3	POND ST	AT NORTH PROPERTY LINE OF E SCHOOL ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
B4	4	B4-4	EAST SCHOOL ST	AT NORTHEAST PROPERTY LINE OF POND ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B4	5	B4-5	EAST SCHOOL ST	AT EAST PROPERTY LINE OF POND ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B4	6	B4-6	HAZEL ST	AT WEST PROPERTY LINE OF STREET	8	GATE			26	WWD	WOONSOCKET	OPEN	
B4	7	B4-7	HAZEL ST	AT EAST PROPERTY LINE OF STREET	8	GATE			26	WWD	WOONSOCKET	OPEN	
B4	8	B4-8	MECHANIC ST	AT WEST PROPERTY LINE OF POND ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
B4	9	B4-9	EAST SCHOOL ST	AT NORTH SIDE OF STREET	8	GATE			26	WWD	WOONSOCKET	OPEN	
B4	10	B4-10	EAST SCHOOL ST	AT NORTH SIDE OF STREET	8	GATE			26	WWD	WOONSOCKET	OPEN	
B4	11	B4-11	EAST SCHOOL ST	AT WEST PROPERTY LINE OF HAZEL STREET	12	GATE			38	WWD	WOONSOCKET	OPEN	
B4	12	B4-12	HAZEL ST	AT NORTH PROPERTY LINE OF EAST SCHOOL ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B4	13	B4-13	IVES ST	AT SOUTH PROPERTY LINE OF EAST SCHOOL ST	4	GATE			14	WWD	WOONSOCKET	OPEN	
B4	14	B4-14	EAST SCHOOL ST	AT WEST PROPERTY LINE OF ELBOW ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
B4	15	B4-15	ELBOW ST	AT SOUTH PROPERTY LINE OF EAST SCHOOL ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
B4	16	B4-16	HAZEL ST	AT NORTH PROPERTY LINE OF EAST SCHOOL ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B4	17	B4-17	EAST SCHOOL ST	AT WEST PROPERTY LINE OF RATHBUN ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
B4	18	B4-18	RATHBUN ST	AT NORTH PROPERTY LINE OF EAST SCHOOL ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
B4	19	B4-19	EAST SCHOOL ST	AT EAST PROPERTY LINE OF RATHBUN ST	6	GATE			20	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
B4	20	B4-20	RATHBUN ST	AT SOUTH PROPERTY LINE OF EAST SCHOOL ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
B4	21	B4-21	DANIELS ST	AT WEST PROPERTY LINE OF POND ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B4	22	B4-22	POND ST	AT SOUTH PROPERTY LINE OF DANIELS ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
B4	23	B4-23	ELBOW ST	AT WEST PROPERTY LINE OF RATHBUN ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
B4	24	B4-24	SNOW STREET	AT WEST PROPERTY LINE OF POND ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
B4	25	B4-25	POND ST	AT SOUTH PROPERTY LINE OF SNOW ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
B4	26	B4-26	SNOW STREET	AT EAST PROPERTY LINE POND ST	6	GATE			20	WWD	WOONSOCKET	CLOSED	
B4	27	B4-27	SOCIAL ST	510' WEST OF CUMMINGS WAY	8	GATE			26	WWD	WOONSOCKET	OPEN	
B4	28	B4-28	SOCIAL ST	490' WEST OF CUMMINGS WAY	6	GATE			20	WWD	WOONSOCKET	OPEN	
B4	29	B4-29	CLINTON ST	NEAR CUMMINGS WAY	8	GATE		1979	26	WWD	WOONSOCKET	OPEN	
B4	30	B4-30	SOCIAL ST	235' EAST OF CUMMINGS WATY ON SOUTH ST LINE	6	GATE			20	WWD	WOONSOCKET	OPEN	
B4	31	B4-31	SOCIAL ST	235' EAST OF CUMMINGS WAY	8	GATE			26	WWD	WOONSOCKET	OPEN	
B4	32	B4-32	SOCIAL ST	AT WEST PROPERTY LINE OF RATHBUN ST	8	GATE			20	WWD	WOONSOCKET	OPEN	
B4	33	B4-33	RATHBUN ST	AT NORTH PROPERTY LINE OF SOCIAL ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
B4	34	B4-34	SOCIAL ST	AT EAST PROPERTY LINE OF RATHBUN ST	12	GATE		1993	38	WWD	WOONSOCKET	OPEN	REPLACED 9/1993
B4	35	B4-35	CUMBERLAND ST	AT SOUTH PROPERTY LINE OF SOCIAL ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
B4	36	B4-36	SNOW STREET	AT WEST PROPERTY LINE OF EARLE ST	4	GATE			14	WWD	WOONSOCKET	OPEN	
B4	37	B4-37	EARLE ST	AT NORTH PROPERTY LINE OF SNOW ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
B4	38	B4-38	SNOW STREET	AT EAST PROPERTY LINE OF EARLE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
B4	39	B4-39	EARLE ST	AT SOUTH PROPERTY LINE OF SNOW ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
B4	40	B4-40	EARLE ST	AT NORTH PROPERTY LINE OF SOCIAL ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
B4	41	B4-41	SOCIAL ST	AT WEST PROPERTY LINE OF POND ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B4	42	B4-42	POND ST	AT NORTH PROPERTY LINE OF SOCIAL ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
B4	43	B4-43	SOCIAL ST	AT EAST PROPERTY LINE OF POND ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B4	44	B4-44	MARQUETTE WAY	AT SOUTH PROPERTY LINE OF SOCIAL ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
B4	45	B4-45	COLLIER ST	AT SOUTH PROPERTY LINE OF SOCIAL ST	6	GATE			20	WWD	WOONSOCKET	CLOSED	
B4	46	B4-46	SOCIAL ST	480' EAST OF MARQUETTE WAY	6	GATE				WWD	WOONSOCKET	CLOSED	
B4	47	B4-47	SOCIAL ST	FIRE SUPPLY TO 263-287 SOCIAL (PRIVATE)	6	GATE		1905	20	PRIVATE	WOONSOCKET	OPEN	FIRE SUPPLY
B4	48	B4-48	CLINTON ST	AT LEFT SIDE OF KENNEDY MANOR	12	GATE			20	WWD	WOONSOCKET	OPEN	
B4	49	B4-49	CUMBERLAND ST	ABOUT 70' NORTH OF NORTH STREET LINE OF CLINTON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B4	50	B4-50	EAST SCHOOL ST	SUPPLY LINE	6	GATE			20	WWD	WOONSOCKET	OPEN	SUPPLY LINE
B4	51	B4-51	EAST SCHOOL ST	SUPPLY LINE FOR MILL	8	GATE		1946	26	WWD	WOONSOCKET	OPEN	SUPPLY LINE FOR MILL
B4	52	B4-52	EAST SCHOOL ST	SUPPLY LINE FOR MILL	8	GATE	APS	1946	26	WWD	WOONSOCKET	OPEN	SUPPLY LINE FOR MILL
B4	53	B4-53	EAST SCHOOL ST	SPARE SUPPLY LINE FOR MILL	8	GATE			26	WWD	WOONSOCKET	OPEN	SPARE SUPPLY LINE FOR MILL
B4	54	B4-54	EAST SCHOOL ST	SUPPLY LINE	8	GATE		1919	26	WWD	WOONSOCKET	OPEN	SUPPLY LINE
B4	55	B4-55	SOCIAL ST	AT NORTH SIDE LINE OF STREET	8	GATE			26	WWD	WOONSOCKET	OPEN	
B4	56	B4-56	SOCIAL ST	40' WEST OF CUMMINGS WAY	8	GATE			26	WWD	WOONSOCKET	OPEN	
B4	57	B4-57	CLINTON ST	AT SOUTH SIDE OF STREET	12	GATE			38	WWD	WOONSOCKET	OPEN	
B4	58	B4-58	CUMBERLAND ST	SUPPLY LINE	4	GATE			14	WWD	WOONSOCKET	OPEN	
B4	59	B4-59	EAST SCHOOL ST	WEST ABUTMENT OF BRIDGE	8	GATE	EDDY	1967	26	WWD	WOONSOCKET	OPEN	
B4	60	B4-60	CLINTON ST	BLDG 547, 413.5 FROM W LINE OF CUMBERLAND	4	GATE		1966	14	WWD	WOONSOCKET	OPEN	TSV
B4	61	B4-61	CLINTON ST	547 - 410' WEST FROM PROPERTY LINE OF CUMBERLAND ST	6	GATE		1966	20	WWD	WOONSOCKET	OPEN	TSV
B4	62	B4-62	SAMPSON ST	110' FROM SOUTH PROPERTY LINE OF SOCIAL ST	6	GATE	APS	1968	20	WWD	WOONSOCKET	OPEN	
B4	63	B4-63	EAST SCHOOL ST	15' FROM EAST PROPERTY LIJE OF HAZEL ST	6	GATE	APS	1970	20	WWD	WOONSOCKET	OPEN	
B4	64	B4-64	POND ST	304' FROM NORTH PROPERTY LINE OF SNOW ST	6	GATE	APS	1963	20	WWD	WOONSOCKET	OPEN	
B4	65	B4-65	POND ST	304' FROM NORTH PROPERTY LINE OF SNOW ST	6	GATE	APS	1963	20	WWD	WOONSOCKET	OPEN	
B4	66	B4-66	SNOW STREET	90' FROM WEST PROPERTY LINE OF EARLE ST	4	GATE		1905	14	WWD	WOONSOCKET	CLOSED	
B4	67	B4-67	MARQUETTE WAY	82' SOUTH FROM SOUTH PROPERTY LINE OF SOCIAL ST	6	GATE		1964		WWD	WOONSOCKET	CLOSED	
B4	68	B4-68	COLLIER ST	95 FROM SOUTH PROPERTY LINE OF SOCIAL ST	6	GATE		1974		WWD	WOONSOCKET		
B4	69	B4-69	SOCIAL ST	FIRE SUPPLY TO 293 SOCIAL ST	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B4	70	B4-70	SOCIAL ST	MILL RIVER SQUARE	8	GATE			26	WWD	WOONSOCKET	OPEN	
B4	71	B4-71	CLINTON ST	FIRE SUPPLY TO 490 CLINTON ST	6	GATE		1980		WWD	WOONSOCKET	OPEN	
B4	72	B4-72	SOCIAL ST	FIRE SUPPLY	6	GATE			20	WWD	WOONSOCKET	CLOSED	
B4	73	B4-73	SOCIAL ST	570' EAST POND ST	8	GATE		1921	27	WWD	WOONSOCKET	OPEN	
B4	74	B4-74	SOCIAL ST	470' WEST OF CUMMINGS WAY	6	GATE			21	WWD	WOONSOCKET	CLOSED	
B4	75	B4-75	SOCIAL ST	230' EAST OF CUMMINGS WAY AT REAR 55 CUMMINGS WAY	6	GATE		1998	21	WWD	WOONSOCKET	OPEN	
B4	76	B4-76	SOCIAL ST	150' EAST OF CUMMINGS WAY	6	GATE	APS	1949	21	WWD	WOONSOCKET	OPEN	
B4	77	B4-77	SOCIAL ST	150' EAST OF CUMMINGS WAY	6	GATE	MUELLER	1949	21	WWD	WOONSOCKET	OPEN	
B4	78	B4-78	SOCIAL ST	235' EAST OF CUMMINGS WAY, 10' SOUTH OF SOUTH STREET LINE	6	GATE		1977	20	WWD	WOONSOCKET	CLOSED	
B4	79	B4-79	SOCIAL ST	145' WEST OF WEST STREET LINE OF RATHBUN ST		BLOW OFF				WWD	WOONSOCKET	CLOSED	CHECK
B4	80	B4-80	HAZEL ST	AT WEST ANGLE IN STREET	6	GATE	P&C	1905	21	WWD	WOONSOCKET	OPEN	
B4	81	B4-81	HAZEL ST	AT WEST ANGLE IN STREET	4	GATE	APS	1962	17	WWD	WOONSOCKET	OPEN	
B4	82	B4-82	HAZEL ST	AT WEST ANGLE IN ST	4	GATE	APS	1962	17	WWD	WOONSOCKET	OPEN	
B5	1	B5-1	SOCIAL ST	ON SOUTH PROPERTY LINE OF MILL ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B5	2	B5-2	MILL ST	ON EAST PROPERTY LINE OF SOCIAL ST	8	GATE			20	WWD	WOONSOCKET	OPEN	
B5	3	B5-3	MILL ST	150' FROM WEST PROPERTY LINE OF BURNSIDE	6	GATE		1958	20	WWD	WOONSOCKET	OPEN	
B5	4	B5-4	MILL ST	ON WEST PROPERTY LINE OF BURNSIDE	6	GATE			20	WWD	WOONSOCKET	OPEN	
B5	5	B5-5	BURNSIDE AVE	ON SOUTH PROPERTY LINE OF MILL ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
B5	6	B5-6	WOOD AVE	ADJACENT TO 502 WOOD AVE 20 FEET SOUTH OF HYD 2507	6	GATE			20	WWD	WOONSOCKET	OPEN	
B5	7	B5-7	CHESTER ST	ON WEST PROPERTY LINE OF SOCIAL ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
B5	8	B5-8	SOCIAL ST	ON SOUTH PROPERTY LINE OF CHESTER ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B5	9	B5-9	WOOD AVE	ON SOUTH PROPERTY LINE OF BIRCH ST	6	GATE			26	WWD	WOONSOCKET	OPEN	
B5	10	B5-10	BIRCH ST	ON EAST PROPERTY LINE OF WOOD AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
B5	11	B5-11	BIRCH ST	ON WEST PROPERTY LINE OF DULUDE AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
B5	12	B5-12	DULUDE AVE	ON SOUTH PROPERTY LINE OF BIRCH ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
B5	13	B5-13	SOCIAL ST	405. SOUTH OF ELM AND 120' NORTH OF HYD #2522	12	GATE			38	WWD	WOONSOCKET	OPEN	
B5	14	B5-14	EAST SCHOOL ST	ON WEST PROPERTY LINE OF SOCIAL ST	6	GATE		1987	20	WWD	WOONSOCKET	OPEN	REPLACED 7/87
B5	15	B5-15	SOCIAL ST	AT NORTH PROPERTY LINE OF E SCHOOL ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B5	16	B5-16	SOCIAL ST	AT SOUTH PROPERTY LINE OF E SCHOOL ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
B5	17	B5-17	ELM ST	AT EAST PROPERTY LINE OF SOCIAL ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B5	18	B5-18	BROOK ST	AT SOUTH PROPERTY LINE OF ELM ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B5	19	B5-19	ELM ST	AT EAST PROPERTY LINE OF BROOK ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B5	20	B5-20	GAULIN AVE	AT SOUTH PROPERTY LINE OF ELM ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
B5	21	B5-21	ROBINSON ST	AT 155' NORTH OF HYD #2526 AND 35' FROM HYD #2527	8	GATE			26	WWD	WOONSOCKET	OPEN	
B5	22	B5-22	ROBINSON ST	200' WEST OF BURNSIDE AVE AND 25' FROM HYD #2527	8	GATE			26	WWD	WOONSOCKET	OPEN	
B5	23	B5-23	ROBINSON ST	AT WEST PROPERTY LINE OF BURNSIDE AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
B5	24	B5-24	BURNSIDE AVE	AT NORTH PROPERTY LINE OF ROBINSON ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
B5	25	B5-25	ROBINSON ST	AT EAST PROPERTY LINE OF BURNSIDE	8	GATE			26	WWD	WOONSOCKET	OPEN	
B5	26	B5-26	BURNSIDE AVE	AT SOUTH PROPERTY LINE OF ROBINSON	6	GATE			20	WWD	WOONSOCKET	OPEN	
B5	27	B5-27	ROBINSON ST	AT WEST PROPERTY LINE OF WOOD AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
B5	28	B5-28	WOOD AVE	AT NORTH PROPERTY LINE OF ROBINSON ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
B5	29	B5-29	ROBINSON ST	AT EAST PROPERTY LINE OF WOOD AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
B5	30	B5-30	WOOD AVE	AT SOUTH PROPERTY LINE OF ROBINSON	6	GATE			20	WWD	WOONSOCKET	OPEN	
B5	31	B5-31	ROBINSON ST	AT WEST PROPERTY LINE OF DULUDE	8	GATE			26	WWD	WOONSOCKET	OPEN	
B5	32	B5-32	DULUDE AVE	AT NORTH PROPERTY LINE OF ROBINSON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B5	33	B5-33	ROBINSON ST	AT EAST PROPERTY LINE OF DULUDE AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
B5	34	B5-34	DULUDE AVE	AT SOUTH PROPERTY LINE OF ROBINSON ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
B5	35	B5-35	ROBINSON ST	AT WEST PROPERTY LINE OF PROGRESSO	6	GATE			20	WWD	WOONSOCKET	OPEN	
B5	36	B5-36	PROGRESSO AVE	AT NORTH PROPERTY LINE OF ROBINSON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B5	37	B5-37	ROBINSON ST	AT EAST PROPERTY LINE OF PROGRESSO	6	GATE			20	WWD	WOONSOCKET	OPEN	
B5	38	B5-38	PROGRESSO AVE	AT SOUTH PROPERTY LINE OF ROBINSON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B5	39	B5-39	ROBINSON ST	AT WEST PROPERTY LINE OF MERIDA	6	GATE			20	WWD	WOONSOCKET	OPEN	
B5	40	B5-40	MERIDA AVE	AT SOUTH PROPERTY LINE OF ROBINSON	6	GATE			20	WWD	WOONSOCKET	OPEN	
B5	41	B5-41	CLINTON ST	AT SOUTH PROPERTY LINE OF CUMBERLAND ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
B5	42	B5-42	CUMBERLAND ST	AT EAST PROPERTY LINE OF CLINTON	12	GATE			38	WWD	WOONSOCKET	OPEN	
B5	43	B5-43	GAULIN AVE	15' EAST OF HYD #2539 AND TO E. P. LINE OF LOCUST ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
B5	44	B5-44	GAULIN AVE	145' TO NORTH HYD #2541 AND 15' TO EAST HYD #2539	6	GATE			20	WWD	WOONSOCKET	OPEN	
B5	45	B5-45	GAULIN AVE	20' TO EAST HYD #2540 AND 160' TO NORTH HYD # 2539	6	GATE			20	WWD	WOONSOCKET	OPEN	
B5	46	B5-46	ROBINSON ST	AT NORTH PROPERTY LINE OF ELM ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B5	47	B5-47	ELM ST	AT WEST PROPERTY LINE OF LOCUST ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B5	48	B5-48	YOLANDE PL	AT EAST PROPERTY LINE OF CHALAPA	8	GATE			26	WWD	WOONSOCKET	OPEN	
B5	49	B5-49	RATHBUN ST	180' TO S. P. LINE OF OAK HILL AND 115' TO NORTH HYD#2501	12	GATE			38	WWD	WOONSOCKET	OPEN	
B5	50	B5-50	CUMBERLAND ST	AT WEST PROPERTY LINE OF CLINTON ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
B5	51	B5-51	CUMBERLAND ST	AT WEST PROPERTY LINE OF CLINTON ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
B5	52	B5-52	ELM ST	65' FROM SOCIAL ST PROPERTY LINE	6	GATE			20	WWD	WOONSOCKET	OPEN	
B5	53	B5-53	ELM ST	25' FROM SOCIAL ST PROPERTY LINE FOR WHA	4	GATE			14	WWD	WOONSOCKET	OPEN	
B5	54	B5-54	ELM ST	AT WEST PROPERTY LINE OF GAULIN AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
B5	55	B5-55	ELM ST	AT WEST PROPERTY LINE OF LOCUST ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B5	56	B5-56	MILL ST	150' FROM WEST PROPERTY LINE OF BURNSIDE	6	GATE		1958		WWD	WOONSOCKET	OPEN	
B5	57	B5-57	MILL ST	300' FROM WEST PROPERTY LINE OF BURNSIDE	6	GATE		1922	20	WWD	WOONSOCKET	OPEN	
B5	58	B5-58	MILL ST	280' FROM EAST PROPERTY LINE OF SOCIAL ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
B5	59	B5-59	MILL ST	110' FROM EAST PROPERTY LINE OF SOCIAL ST	6	GATE		1918	20	WWD	WOONSOCKET	OPEN	
B5	60	B5-60	EAST SCHOOL ST	60' FROM WEST PROPERTY LINE OF SOCIAL ST	4	GATE		1905	14	WWD	WOONSOCKET	OPEN	
B5	61	B5-61	SOCIAL ST	65' FROM NORTH PROPERTY LINE OF CHESTER ST	6	GATE		1905	20	WWD	WOONSOCKET	OPEN	
B5	62	B5-62	SOCIAL ST	340' WEST OF WEST ST LINE OF ELM	4	GATE		1917	17	WWD	WOONSOCKET	CLOSED	SPARE-SERVICE#4482
B5	63	B5-63	CUMBERLAND ST	AT CLINTON ST	12	GATE		1905	39	WWD	WOONSOCKET	OPEN	
B5	64	B5-64	CLINTON ST	190' EAST OF CUMBERLAND ST (TO 30 CUMBERLAND ST)	6	GATE		1905	21	WWD	WOONSOCKET	OPEN	SERVICE#12979 PER WOL 1/29/85
B5	65	B5-65	SOCIAL ST	AT CLINTON ST	12	GATE		1905	39	WWD	WOONSOCKET	OPEN	
B5	66	B5-66	CLINTON ST	50' EAST OF EAST PROPERTY LINE OF CUMBERLAND ST	12	GATE		1905	39	WWD	WOONSOCKET	OPEN	
B5	67	B5-67	CLINTON ST	225' SOUTH OF SOUTH STREET LINE OF SOCIAL ST	12	GATE		1905	39	WWD	WOONSOCKET	OPEN	
B5	68	B5-68	CLINTON ST	100' NORTHERLY FROM CUMBERLAND ST (TO 68 CUMBERLAND ST)	6	GATE	KENNEDY	1986	21	WWD	WOONSOCKET	OPEN	TSV-SERVICE#13126
B5	69	B5-69	PROGRESSO AVE	8.6' TO CATCH BASIN LFT,70.8' TO CATCH BASIN RT		BLOW OFF		1989		WWD	WOONSOCKET	CLOSED	DEAD END
B5	70	B5-70	PROGRESSO AVE	39.3 FROM LEFT CORNER HOUSE #200 AND 31.5' FROM RIGHT CORNER	8	GATE		1989		WWD	WOONSOCKET		
B5	71	B5-71								WWD	WOONSOCKET		NO CARD
B5	72	B5-72								WWD	WOONSOCKET		NO CARD
B5	73	B5-73	MILL ST	AT E LINE OF SOCIAL	8	GATE				WWD	WOONSOCKET	OPEN	NO CARD
B6	1	B6-1	ST LEON AVE	AT SOUTH PROPERTY LINE OF ALL SAINTS	8	GATE			26	WWD	WOONSOCKET	OPEN	
B6	2	B6-2	ST LEON AVE	AT NORTH PROPERTY LINE OF ALL SAINTS	8	GATE			26	WWD	WOONSOCKET	OPEN	
B6	3	B6-3	ALL SAINTS ST	AT EAST PROPERTY LINE OF ST LEON	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
B6	4	B6-4	ALL SAINTS ST	AT WEST PROPERTY LINE OF ST CECILE	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
B6	5	B6-5	ST CECILE AVE	AT NORTH PROPERTY LINE OF ALL SAINTS	8	GATE			26	WWD	WOONSOCKET	OPEN	
B6	6	B6-6	ALL SAINTS ST	AT EAST PROPERTY LINE OF ST CECILE	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
B6	7	B6-7	ALL SAINTS ST	AT WEST PROPERTY LINE OF ST LOUIS	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
B6	8	B6-8	ST LOUIS AVE	AT NORTH PROPERTY LINE OF ALL SAINTS	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
B6	9	B6-9	ALL SAINTS ST	AT EAST PROPERTY LINE OF ST LOUIS	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
B6	10	B6-10	ST AGNES AVE	AT NORTH PROPERTY LINE OF ALL SAINTS	8	GATE			26	WWD	WOONSOCKET	OPEN	
B6	11	B6-11	MORIN HEIGHTS BLVD	EASTERLY SIDE OF BLVD, 170' FROM SOUTHERLY PROPERTY LINE OF FALL ST	8	GATE		1941	26	WWD	WOONSOCKET	OPEN	
B6	12	B6-12	MORIN HEIGHTS BLVD	AT SOUTH PROPERTY LINE OF FALL ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B6	13	B6-13	LINDEN AVE	AT NORTH PROPERTY LINE OF FALL ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B6	14	B6-14	FALL ST	AT EAST PROPERTY LINE OF LINDEN AVE	8	GATE	APS	1959	26	WWD	WOONSOCKET	OPEN	
B6	15	B6-15	LINDEN AVE	AAT SOUTH PROPERTY LINE OF HAYES ST	8	GATE		1959	26	WWD	WOONSOCKET	OPEN	
B6	16	B6-16	LINDEN AVE	AT NORTH PROPERTY LINE OF HAYES ST	8	GATE		1959	26	WWD	WOONSOCKET	OPEN	
B6	17	B6-17	HAYES ST	AT EAST PROPERTY LINE OF LINDEN AVE	8	GATE		1959	26	WWD	WOONSOCKET	OPEN	
B6	18	B6-18	FALL ST	210' FROM EASTERLY PROPERTY LINE OF LINDEN AVE	1	BLOW OFF		1959		WWD	WOONSOCKET	CLOSED	
B6	19	B6-19	HAYES ST	AT EAST PROPERTY LINE OF THEODORE	8	GATE		1959	26	WWD	WOONSOCKET	OPEN	
B6	20	B6-20	DENBY ST	AT WEST PROPERTY LINE OF COOLIDGE	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
B6	21	B6-21	COOLIDGE AVE	AT SOUTH PROPERTY LINE OF DENBY ST	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
B6	22	B6-22	WINTHROP ST	185' FROM SOUTHERLY PROPERTY LINE OF MORIN HEIGHTS BLVD	8	GATE			26	WWD	WOONSOCKET	OPEN	
B6	23	B6-23	ST LEON AVE	AT NORTH PROPERTY LINE OF MORIN HEIGHTS BLVD	8	GATE			26	WWD	WOONSOCKET	OPEN	
B6	24	B6-24	MORIN HEIGHTS BLVD	AT EAST PROPERTY LINE OF ST LEON	8	GATE		1983		WWD	WOONSOCKET	REMOVED	HIT AND REMOVED BY CONTRACTOR 11/12/93
B6	25	B6-25	MORIN HEIGHTS BLVD	AT EAST PROPERTY LINE OF ST LEON	8	GATE		1941	26	WWD	WOONSOCKET	OPEN	
B6	26	B6-26	MORIN HEIGHTS BLVD	110' FROM EASTERLY PROPERTY LINE OF ST. LEON AVE	8	GATE		1941	26	WWD	WOONSOCKET	OPEN	
B6	27	B6-27	MORIN HEIGHTS BLVD	230' FROM SOUTHERLY PROPERTY LINE OF FALL ST	8	GATE		1941	26	WWD	WOONSOCKET	OPEN	
B6	28	B6-28	MORIN HEIGHTS BLVD	620' FROM NORTHERLY PROPERTY LINE OF ROBINSON ST	8	GATE		1941	26	WWD	WOONSOCKET	OPEN	
B6	29	B6-29	MORIN HEIGHTS BLVD	258' SOUTHERLY FROM HYDRANT #2613	8	GATE		1941	26	WWD	WOONSOCKET	OPEN	
B6	30	B6-30	WINTHROP ST	AT SOUTH PROPERTY LINE OF ROBINSON ST	8	GATE		1941	26	WWD	WOONSOCKET	OPEN	
B6	31	B6-31	WINTHROP ST	AT NORTH PROPERTY LINE OF ROBINSON ST	8	GATE		1941	26	WWD	WOONSOCKET	OPEN	
B6	32	B6-32	ROBINSON ST	AT EAST PROPERTY LINE OF WINTHROP ST	6	GATE		1941	20	WWD	WOONSOCKET	OPEN	
B6	33	B6-33	ROBINSON ST	AT WEST PROPERTY LINE OF RUTLAND ST	8	GATE		1941	26	WWD	WOONSOCKET	OPEN	
B6	34	B6-34	RUTLAND ST	AT NORTH PROPERTY LINE OF ROBINSON	8	GATE		1941	26	WWD	WOONSOCKET	OPEN	
B6	35	B6-35	ROBINSON ST	AT EAST PROPERTY LINE OF RUTLAND ST	8	GATE		1941	26	WWD	WOONSOCKET	OPEN	
B6	36	B6-36	RUTLAND ST	AT SOUTH PROPERTY LINE OF ROBINSON	8	GATE		1941	26	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
B6	37	B6-37	ROBINSON ST	AT WEST PROPERTY LINE OF MORIN HEIGHTS BLVD	8	GATE		1941	26	WWD	WOONSOCKET	OPEN	
B6	38	B6-38	MORIN HEIGHTS BLVD	AT NORTH PROPERTY LINE OF ROBINSON ST	8	GATE		1941	26	WWD	WOONSOCKET	OPEN	
B6	39	B6-39	MORIN HEIGHTS BLVD	AT SOUTH PROPERTY LINE OF ROBINSON	8	GATE		1941	26	WWD	WOONSOCKET	OPEN	
B6	40	B6-40	YOLANDE PL	AT WEST PROPERTY LINE OF WINTHROP ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B6	41	B6-41	WINTHROP ST	AT NORTH PROPERTY LINE OF YOLANDE PL	8	GATE			26	WWD	WOONSOCKET	OPEN	
B6	42	B6-42	RUTLAND ST	AT NORTH PROPERTY LINE OF ELM	8	GATE			26	WWD	WOONSOCKET	OPEN	
B6	43	B6-43	ELM ST	AT RUTHLAND ST	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
B6	44	B6-44	ELM ST	AT WEST PROPERTY LINE OF COTE AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
B6	45	B6-45	ELM ST	SOUTH PROPERTY LINE OF ELM AT CENTER LINE OF COTE	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
B6	46	B6-46	ELM ST	AT EAST PROPERTY LINE OF COTE	8	GATE			26	WWD	WOONSOCKET	OPEN	
B6	47	B6-47	FLORIDA ST	AT SOUTH PROPERTY LINE OF ELLA	8	GATE			26	WWD	WOONSOCKET	OPEN	
B6	48	B6-48	FLORIDA ST	AT NORTH PROPERTY LINE OF ELLA AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
B6	49	B6-49	ELLA AVE	AT EAST PROPERTYLINE OF FLORIDA	8	GATE			26	WWD	WOONSOCKET	OPEN	
B6	50	B6-50	ROBINSON ST	AT WEST PROPERTYLINE OF FLORIDA ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
B6	51	B6-51	FLORIDA ST	AT SOUTH PROPERTY LINE OF ROBINSON	8	GATE			26	WWD	WOONSOCKET	OPEN	
B6	52	B6-52	ROBINSON ST	AT EAST PROPERTY LINE OF FLORIDA	8	GATE			26	WWD	WOONSOCKET	OPEN	
B6	53	B6-53	ROBINSON ST	DIVISION LINE OF ROBINSON AND MORIN HEIGHTS BLVD	8	GATE			26	WWD	WOONSOCKET	OPEN	
B6	54	B6-54	ROBINSON ST	30' EAST OF ROBINSON AND MORIN HEIGHTS BLVD	8	GATE		1941	26	WWD	WOONSOCKET	OPEN	
B6	55	B6-55	ROBINSON ST	70' EAST OF ROBINSON AND MORIN HEIGHTS BLVD. DIVISION LINE	8	GATE		1941	26	WWD	WOONSOCKET	OPEN	
B6	56	B6-56	POPLAR ST	AT EAST PROPERTY LINE OF BEACON AVE	8	GATE		1954	26	WWD	WOONSOCKET	OPEN	
B6	57	B6-57	RIDGE ST	AT EAST PROPERTY LINE OF BEACON AVE	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	
B6	58	B6-58	POPLAR ST	AT EAST PROPERTY LINE OF LAURIER	8	GATE		1954	26	WWD	WOONSOCKET	OPEN	
B6	59	B6-59	RIDGE ST	265' FROM EAST PROPERTY LINE OF BEACON AVE	8	GATE	APS	1961	26	WWD	WOONSOCKET	OPEN	
B6	60	B6-60	POPLAR ST	AT WEST PROPERTY LINE OF BEACON AVE	8	GATE	APS	1974	26	WWD	WOONSOCKET	OPEN	
B6	61	B6-61	MORIN ST	232' EAST FROM EAST PROPERTY LINE OF BEACON AVE	8	GATE	APS	1974	26	WWD	WOONSOCKET	OPEN	
B6	62	B6-62	MORIN ST	AT EAST PROPERTY LINE OF BEACON AVE	8	GATE	APS	1974	26	WWD	WOONSOCKET	OPEN	
B6	63	B6-63	BEACON AVE	AT SOUTH PROPERTY LINE OF MORIN ST	8	GATE	APS	1974		WWD	WOONSOCKET	OPEN	
B6	64	B6-64	BEACON AVE	77' SOUTH FROM SOUTH PROPERTY LINE OF MORIN ST	0.75	BLOW OFF		1974		WWD	WOONSOCKET	CLOSED	
B6	65	B6-65	HAYES ST	AT THEODORE ST	8	GATE	KENNEDY	1977	26	WWD	WOONSOCKET	OPEN	
B6	66	B6-66	LAURIER ST	AT NORTH PROPERTY LINE OF POPLAR ST	8	GATE	KENNEDY	1977	26	WWD	WOONSOCKET	OPEN	
B6	67	B6-67	THEORDORE ST	AT WEST PROPERTY LINE OF AUBIN ST	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B6	68	B6-68	BEACON AVE	AT NORTH PROPERTY LINE OF MORIN ST	8	GATE		1979	26	WWD	WOONSOCKET	OPEN	
B6	69	B6-69	BEACON AVE	AT NORTH PROPERTY LINE OF POPLAR ST	8	GATE	KENNEDY	1980	26	WWD	WOONSOCKET	OPEN	
B6	70	B6-70	BEACON AVE	125' FROM THE SOUTH PROP LINE OF MORIN ST	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B6	71	B6-71	DUNLAP ST	AT EAST PROPERTY LINE OF BEACON AVE	8	GATE		1905	26	WWD	WOONSOCKET	CLOSED	
B6	72	B6-72	BEACON AVE	AT SOUTH PROPERTY LINE OF DUNLAP ST	8	GATE		1905	26	WWD	WOONSOCKET	OPEN	
B6	73	B6-73	AUBIN ST	25' EAST OF EAST ST LINE OF THEODORE ST	8	GATE	KENNEDY	1985	27	WWD	WOONSOCKET	OPEN	
B6	74	B6-74	AUBIN ST	290' EAST OF EAST ST. LINE OF THEODORE ST	0.75	AIR REL. VALVE	RED HED	1985	1	WWD	WOONSOCKET	CLOSED	
B7	1	B7-1	HAYES ST	AT WEST PROPERTY LINE OF COOLIDGE AVE	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
B7	2	B7-2	COOLIDGE AVE	AT NORTH PROPERTY LINE OF HAYES ST	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
B7	3	B7-3	COOLIDGE AVE	AT SOUTH PROPERTY LINE OF HAYES ST	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
B7	4	B7-4	MORIN ST	AT WEST PROPERTY LINE OF ARONA ST	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
B7	5	B7-5	ROSCOE ST	AT SOUTH PROPERTY LINE OF MORIN ST	8	GATE		1958	26	WWD	WOONSOCKET	OPEN	
B7	6	B7-6	MORIN ST	AT EAST PROPERTY LINE OF ARONA ST	8	GATE		1959	26	WWD	WOONSOCKET	OPEN	
B7	7	B7-7	MORIN ST	AT WEST PROPERTY LINE OF MENDON RD	8	GATE		1959	26	WWD	WOONSOCKET	OPEN	
B7	8	B7-8	MENDON RD	AT NORTH PROPERTY LINE OF MORIN ST	12	GATE		1960	38	WWD	WOONSOCKET	OPEN	
B7	9	B7-9	MENDON RD	AT SOUTH PROPERTY LINE OF MORIN ST	12	GATE		1960	38	WWD	WOONSOCKET	OPEN	
B7	10	B7-10	MORIN ST	AT WEST PROPERTY LINE OF COOLIDGE ST	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
B7	11	B7-11	COOLIDGE AVE	AT N0RTH PROPERTY LINE OF MORIN ST	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
B7	12	B7-12	MORIN ST	AT EAST PROPERTY LINE OF COOLIDGE AVE	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
B7	13	B7-13	RUTH ST	AT NORTH PROPERTY LINE OF MORIN ST	8	GATE	APS	1962	26	WWD	WOONSOCKET	OPEN	
B7	14	B7-14	MORIN ST	AT EAST PROPERTY LINE OF RUTH ST	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
B7	15	B7-15	ROSCOE ST	AT NORTH PROPERTY LINE OF DUNLAP ST	8	GATE	LUDLOW	1958	26	WWD	WOONSOCKET	OPEN	
B7	16	B7-16	DUNLAP ST	AT EAST PROPERTY LINE OF ROSCOE ST	8	GATE	LUDLOW	1958	26	WWD	WOONSOCKET	OPEN	
B7	17	B7-17	DUNLAP ST	AT WEST PROPERTY LINE OF MENDON RD	8	GATE		1956	26	WWD	WOONSOCKET	OPEN	
B7	18	B7-18	MENDON RD	AT NORTH PROPERTY LINE OF DUNLAP ST	12	GATE		1960	38	WWD	WOONSOCKET	OPEN	
B7	19	B7-19	MENDON RD	AT SOUTH PROPERTY LINE OF DUNLAP ST	12	GATE		1960	38	WWD	WOONSOCKET	OPEN	
B7	20	B7-20	HOOVER ST	AT WEST PROPERTY LINE OF MENDON RD	8	GATE	APS	1962	26	WWD	WOONSOCKET	OPEN	
B7	21	B7-21	MENDON RD	AT NORTH PROPERTY LINE OF HOOVER ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
B7	22	B7-22	MENDON RD	AT SOUTH PROPERTYLINE OF HOOVER ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
B7	23	B7-23	MENDON RD	120' FROM SOUTHERLY PROPERTY LINE OF HOOVER	12	GATE			38	WWD	WOONSOCKET	OPEN	
B7	24	B7-24	MENDON RD	160' FROM SOUTHERLY PROPERTY LINE OF HOOVER ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
B7	25	B7-25	POPLAR ST	AT EAST PROPERTY LINE OF BLANCHE AVE	8	GATE		1954	26	WWD	WOONSOCKET	OPEN	
B7	26	B7-26	HILLSDALE AVE	AT NORTH PROPERTY LINE OF POPLAR ST	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
B7	27	B7-27	POPLAR ST	AT EAST PROPERTY LINE OF HILLSDALE ST	8	GATE		1954	26	WWD	WOONSOCKET	OPEN	
B7	28	B7-28	POPLAR ST	AT WEST PROPERTY LINE OF NURSERY AVE	8	GATE		1954	26	WWD	WOONSOCKET	OPEN	
B7	29	B7-29	NURSERY AVE	AT SOUTH PROPERTY LINE OF POPLAR S	8	GATE		1954	26	WWD	WOONSOCKET	OPEN	
B7	30	B7-30	RIDGE ST	AT WEST PROPERTY LINE OF NURSERY AVE	8	GATE		1953	26	WWD	WOONSOCKET	OPEN	
B7	31	B7-31	MITRIS BLVD	20' NORTH OF HYDRANT # 2713	8	GATE	LUDLOW	1959	26	WWD	WOONSOCKET	OPEN	
B7	32	B7-32	MITIRS BLVD	AT WEST PROPERTY LINE OF WAYNE RD	8	GATE	MUELLER	1959	26	WWD	WOONSOCKET	OPEN	
B7	33	B7-33	WAYNE RD	AT SOUTH PROPERTY LINE OF MITRIS BLVD	8	GATE	APS	1963	26	WWD	WOONSOCKET	OPEN	
B7	34	B7-34	VILLAGE RD	420' EAST OF MENDON RD	8	GATE		1974	27	PRIVATE	WOONSOCKET	OPEN	
B7	35	B7-35	PATTON RD	AT NORTH PROPERTY LINE OF PATTON RD AT EASEMENT TO ROCK RIDGE	8	GATE	MET	1973	26	PRIVATE	WOONSOCKET		
B7	36	B7-36	PATTON RD	130' FROM WEST PROPERTY LINE OF MACARTHUR RD	8	GATE	MET	1973	26	WWD	WOONSOCKET		
B7	37	B7-37	ROCK RIDGE DR	55' NORTH OF HYDRANT #2717	8	GATE	KENNEDY	1973	26	PRIVATE	WOONSOCKET	OPEN	
B7	38	B7-38	ROCK RIDGE DR	65' NORTH OF HYDRANT #2717	6	GATE	KENNEDY	1973	20	PRIVATE	WOONSOCKET	OPEN	
B7	39	B7-39	ROCK RIDGE DR	85' NORTH OF HYDRANT #2718	8	GATE	KENNEDY	1973	26	PRIVATE	WOONSOCKET		
B7	40	B7-40	ROCK RIDGE DR	125' NORTH OF HYDRANT # 2718	6	GATE	KENNEDY	1973	20	PRIVATE	WOONSOCKET		
B7	41	B7-41	VILLAGE RD	16' WEST FROM S. HYDRANT #F-2721-23	8	GATE		1974		PRIVATE	WOONSOCKET	OPEN	
B7	42	B7-42	ARONA ST	AT NORTH PROPERTY LINE OF MORIN ST	8	GATE	EDDY	1975		WWD	WOONSOCKET	OPEN	
B7	43	B7-43	PAPINEAU AVE	IN GATE BOX AT END OF WATER MAIN	0.75	BLOW OFF		1978		WWD	WOONSOCKET	CLOSED	
B7	44	B7-44	PAPINEAU AVE	IN FRONT OF HOUSE 210	8	GATE	KENNEDY	1978	26	WWD	WOONSOCKET	OPEN	
B7	45	B7-45	BOURASSA AVE	ON 152 & DEAD END OF BOURASSA AVE	0.75	BLOW OFF		1990		WWD	WOONSOCKET	CLOSED	
B8	1	B8-1	MACARTHUR RD	AT SOUTH PROPERTY LINE OF PATTON RD	8	GATE		1955	26	WWD	WOONSOCKET	OPEN	
B8	2	B8-2	PATTON RD	AT EAST PROPERTY LINE OF MACARTHUR RD	8	GATE		1955	26	WWD	WOONSOCKET	OPEN	
B8	3	B8-3	PATTON RD	AT WEST PROPERTY LINE OF PRISCILLA	8	GATE		1955	26	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
B8	4	B8-4	PATTON RD	AT EAST PROPERTY LINE OF PRISCILLA RD	8	GATE	APS	1960	26	WWD	WOONSOCKET	OPEN	
B8	5	B8-5	PRISCILLA RD	AT SOUTH PROPERTY LINE OF PATTON RD	8	GATE		1955	26	WWD	WOONSOCKET	OPEN	
B8	6	B8-6	MACARTHUR RD	AT NORTH PROPERTY LINE OF NIMITZ RD	8	GATE		1955	26	WWD	WOONSOCKET	OPEN	
B8	7	B8-7	NIMITZ RD	AT EAST PROPERTY LINE OF MACARTHUR RD	8	GATE		1955	26	WWD	WOONSOCKET	OPEN	
B8	8	B8-8	MACARTHUR RD	AT SOUTH PROPERTY LINE OF NIMITZ	8	GATE		1955	26	WWD	WOONSOCKET	OPEN	
B8	9	B8-9	MACARTHUR RD	AT NORTH PROPERTY LINE OF MARSHALL RD	8	GATE		1955	26	WWD	WOONSOCKET	OPEN	
B8	10	B8-10	MARSHALL RD	AT EAST PROPERTY LINE OF MACARTHUR RD	8	GATE		1955	26	WWD	WOONSOCKET	OPEN	
B8	11	B8-11	MACARTHUR RD	AT SOUTH PROPERTY LINE OF MARSHALL RD	8	GATE		1955	26	WWD	WOONSOCKET	OPEN	
B8	12	B8-12	NIMITZ RD	AT WEST PROPERTY LINE OF PRISCILLA RD	8	GATE		1955	26	WWD	WOONSOCKET	OPEN	
B8	13	B8-13	PRISCILLA RD	AT NORTH PROPERTY LINE OF NIMITZ RD	8	GATE		1955	26	WWD	WOONSOCKET	OPEN	
B8	14	B8-14	NIMITZ RD	AT EAST PROPERTY LINE OF PRISCILLA RD	8	GATE	MUELLER	1955	26	WWD	WOONSOCKET	OPEN	
B8	15	B8-15	PRISCILLA RD	AT SOUTH PROPERTY LINE OF NIMITZ RD	8	GATE		1955	26	WWD	WOONSOCKET	OPEN	
B8	16	B8-16	NIMITZ RD	AT WEST PROPERTY LINE OF PATTON RD	8	GATE	MUELLER	1955	26	WWD	WOONSOCKET	OPEN	
B8	17	B8-17	HALSEY RD	AT NORTH PROPERTY LINE OF NIMITZ RD	8	GATE		1955	26	WWD	WOONSOCKET	OPEN	
B8	18	B8-18	PATTON RD	AT NORTH PROPERTY LINE OF NIMITZ RD	8	GATE		1965	26	WWD	WOONSOCKET	OPEN	
B8	19	B8-19	KNOLLWOOD DR	AT WEST PROPERTY LINE OF WALNUT HILL RD	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B8	20	B8-20	DIANA DR	AT WEST PROPERTY LINE OF WALNUT HILL RD	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B8	21	B8-21	RUSTIC DR	AT WEST PROPERTY LINE OF WALNUT HILL RD	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B8	22	B8-22	KNOLLWOOD DR	AT WEST PROPERTY LINE OF WALNUT HILL RD	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B8	23	B8-23	KNOLLWOOD DR	AT NORTH PROPERTY LINE OF DIANA DR	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B8	24	B8-24	DIANA DR	AT NORTH PROPERTY LINE OF KNOLLWOOD DR	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B8	25	B8-25	RUSTIC DR	AT NORTH PROPERTY LINE OF DIANA DR	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B8	26	B8-26	HALSEY RD	AT SOUTH PROPERTY LINE OF KNOLLWOOD DR	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B8	27	B8-27	WALNUT HILL RD	AT NORTH PROPERTY LINE OF KNOLLWOOD DR - SOUTH END	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B8	28	B8-28	WALNUT HILL RD	AT NORTH PROPERTY LINE OF RUSTIC DR	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B8	29	B8-29	DIAMOND HILL RD	AT WALNUT HILL ROAD	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B8	30	B8-30	WALNUT HILL RD	AT APARTMENT BUILDINGS	6	GATE	APS		20	WWD	WOONSOCKET	OPEN	
B8	31	B8-31	WALNUT HILL RD	AT APARTMENT BUILDINGS	6	GATE	APS		20	WWD	WOONSOCKET	OPEN	
B8	32	B8-32	ARLAND COURT	AT SOUTH PROPERTY LINE OF KNOLLWOOD DR	8	GATE	APS	1989	26	WWD	WOONSOCKET	CLOSED	
B8	33	B8-33	KNOLLWOOD DR	AT EAST PROPERTY LINE OF WALNUT HILL RD - SOUTH END	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B8	34	B8-34	KNOLLWOOD DR	AT EAST PROPERTY LINE OF WALNUT HILL RD - NORTH END	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B8	35	B8-35	WALNUT HILL RD	AT NORTH PROPERTY LINE OF THE BEGINNING OF KNOLLWOOD DR	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B8	36	B8-36	PATTON RD	AT MACARTHUR RD	8	GATE	MET	1973	26	WWD	WOONSOCKET		TSV
B8	37	B8-37								WWD	WOONSOCKET		NO CARD
B8	38	B8-38	ROCK RIDGE DR	47' EAST OF HYDRANT # 2834	8	GATE	KENNEDY	1973	26	PRIVATE	WOONSOCKET	CLOSED	
B8	39	B8-39	ROCK RIDGE DR	ON DRIVEWAY BETWEEN BLDG B-5 & E-3	6	GATE		1974		PRIVATE	WOONSOCKET	CLOSED	
B8	40	B8-40	DIAMOND HILL RD	15' WEST OF WEST STREET LINE OF WALNUT HILL RD	6	GATE	CLOW	1985	21	WWD	WOONSOCKET	OPEN	
B9	1	B9-1	DIAMOND HILL RD	AT WATER TANK	12	GATE		1960	38	WWD	WOONSOCKET	OPEN	
B9	2	B9-2	DIAMOND HILL RD	78' FROM WEST PROPERTY LINE OF HILLSDALE AVE	12	GATE		1960	38	WWD	WOONSOCKET	OPEN	
B9	3	B9-3	SUNSET AVE	AT WEST PROPERTY LINE OF CREST RD	8	GATE	MUELLER	1963	26	WWD	WOONSOCKET	OPEN	
B9	4	B9-4	CREST RD	AT SOUTH PROPERTY LINE OF SUNSET AVE	8	GATE	CRANE	1963	26	WWD	WOONSOCKET	OPEN	
B9	5	B9-5	SUNSET AVE	AT EAST PROPERTY LINE OF CREST RD	8	GATE	CRANE	1963	26	WWD	WOONSOCKET	OPEN	
B9	6	B9-6	DIAMOND HILL RD	AT WATER TANK	12	GATE		1960	38	WWD	WOONSOCKET	OPEN	
B9	7	B9-7	DIAMOND HILL RD	AT WATER TANK	12	GATE		1960	38	WWD	WOONSOCKET	OPEN	
B9	8	B9-8	DIAMOND HILL RD	AT WATER TANK	12	GATE		1960	38	WWD	WOONSOCKET	OPEN	
B9	9	B9-9	CREST RD	AT NORTH PROPERTY LINE OF DIAMOND HILL RD	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	
B9	10	B9-10	DAWN BLVD	AT NORTH PROPERTY LINE OF DIAMOND HILL RD	8	GATE		1962	26	WWD	WOONSOCKET	OPEN	
B9	11	B9-11	BOUND RD	AT NORTH PROPERTY LINE OF DIAMOND HILL RD	8	GATE	APS	1962	26	WWD	WOONSOCKET	OPEN	
B9	12	B9-12	BOUND RD	AT PINE SWAMP RD	12	GATE		1964	36	WWD	WOONSOCKET	OPEN	
B9	13	B9-13	BOUND RD	40' NORTH OF HYDRANT #2912	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
B9	14	B9-14	PINE SWAMP RD	AT BOUND RD	8	GATE		1965	26	WWD	WOONSOCKET	OPEN	
B9	15	B9-15	WAGON WHEEL LANE	AT WEST PROPERTY LINE OF BOUND RD	8	GATE	APS	1971	26	WWD	WOONSOCKET	OPEN	
B9	16	B9-16	WALNUT HILL RD	AT NORTH PROPERTY LINE OF WAGON WHEEL LANE	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B9	17	B9-17	WAGON WHEEL LANE	AT EAST PROPERTY LINE OF WALNUT HILL RD	8	GATE	APS	1971	26	WWD	WOONSOCKET	OPEN	
B9	18	B9-18	GRANDVIEW AVE	AT NORTH PROPERTY LINE OF WALNUT HILL	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B9	19	B9-19	WALNUT HILL RD	AT WEST PROPERTY LINE OF GRANDVIEW AVE	8	GATE	APS	1971	26	WWD	WOONSOCKET	OPEN	
B9	20	B9-20	GRANDVIEW AVE	AT EAST PROPERTY LINE OF COUNTRY RD	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B9	21	B9-21	COUNTRY RD	AT SOUTH PROPERTY LINE OF GRANDVIEW	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B9	22	B9-22	GRANDVIEW AVE	AT WEST PROPERTY LINE OF BOUND RD	8	GATE	APS		20	WWD	WOONSOCKET	OPEN	
B9	23	B9-23	STONEHAM DR	AT EAST PROPERTY LINE OF COUNTRY RD	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B9	24	B9-24	COUNTRY RD	AT SOUTH PROPERTY LINE OF STONEHAM DR	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B9	25	B9-25	STONEHAM DR	AT EAST PROPERTY LINE OF WOODHAVEN RD	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B9	26	B9-26	WOODHAVEN RD	AT SOUTH PROPERTY LINE OF STONEHAM DR	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B9	27	B9-27	STONEHAM DR	AT WEST PROPERTY LINE OF BOUND RD	8	GATE			26	WWD	WOONSOCKET	OPEN	
B9	28	B9-28	GRANDVIEW AVE	AT NORTH PROPERTY LINE OF COUNTRY RD	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B9	29	B9-29	COUNTRY RD	AT EAST PROPERTY LINE OF GRANDVIEW AVE	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B9	30	B9-30	GRANDVIEW AVE	AT NORTH PROPERTY LINE OF WOODHAVEN	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B9	31	B9-31	WOODHAVEN RD	AT WEST PROPERTY LINE OF GRANDVIEW AVE	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B9	32	B9-32	SURREY LANE	AT EAST PROPERTY LINE OF WOODHAVEN	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B9	33	B9-33	WOODHAVEN RD	AT SOUTH PROPERTY LINE OF SURREY LANE	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B9	34	B9-34	SURREY LANE	AT EAST PROPERTY LINE OF WALNUT HILL RD	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B9	35	B9-35	WALNUT HILL RD	AT SOUTH PROPERTY LINE OF SURREY LANE	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B9	36	B9-36	SURREY LANE	AT WEST PROPERTY LINE OF BOUND RD	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
B9	37	B9-37	PINE SWAMP RD, CUMBERLAND	AT SOUTH PROPERTY LINE OF PINE SWAMP RD	0.75	BLOW OFF				WWD	CUMBERLAND	CLOSED	
B9	38	B9-38	SUNSET AVE	100' WEST FOR WEST PROPERTY LINE OF HILLSDALE AVE	0.75	BLOW OFF	RED HED	1974		WWD	WOONSOCKET	CLOSED	
B9	39	B9-39	SUNSET AVE	AT EAST PROPERTY LINE OF HILLSDALE	8	GATE	MET	1974		WWD	WOONSOCKET	OPEN	
B9	40	B9-40	HILLSDALE AVE	AT SOUTH PROPERTY LINE OF SUNSET AVE	8	GATE	KENNEDY	1978	26	WWD	WOONSOCKET	OPEN	
B9	41	B9-41	HILLSDALE AVE	25' FROM THE NORTH PROPERTY LINE OF DIAMOND HILL RD		AIR REL. VALVE		1979		WWD	WOONSOCKET	OPEN	
B9	42	B9-42	HILLSDALE AVE	125' FROM SOUTH PROPERTY LINE OF SUNSET AVE	8	GATE	MUELLER	1979	26	WWD	WOONSOCKET	OPEN	
B9	43	B9-43	BOUND RD	IN FRONT OF #536	8	GATE	KENNEDY	1979	26	WWD	WOONSOCKET	OPEN	
B9	44	B9-44	BOUND RD	123' LEFT FRONT CORNER #2581, 132' LEFT CORNER DOORWAY #2573	12	GATE				WWD	WOONSOCKET		
B9	45	B9-45	DIAMOND HILL RD	28.5 OFF CATCH BASIN ON CURVE RT. 27.3' OFF CENTER SMH IN DHR	12	GATE				WWD	WOONSOCKET		
C1	1	C1-1	EIGHTH AVE	AT SOUTH PROPERTYLINE OF WALNUT ST	8	GATE			26	WWD	WOONSOCKET	CLOSED	
C1	2	C1-2	EIGHTH AVE	AT SOUTH PROPERTY LINE OF CHESTNUT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C1	3	C1-3	FAIRMOUNT ST	AT EAST PROPERTY LINE OF ELEVENTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C1	4	C1-4	FAIRMOUNT ST	AT WEST PROPERTY LINE OF TENTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
C1	5	C1-5	FAIRMOUNT ST	AT EAST PROPERTY LINE OF TENTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C1	6	C1-6	FAIRMOUNT ST	23' FROM WEST PROPERTY LINE OF NINTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C1	7	C1-7	NINTH AVE	AT SOUTH PROPERTY LINE OF FAIRMOUNT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C1	8	C1-8	FAIRMOUNT ST	AT WEST PROPERTY OF EIGHTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C1	9	C1-9	EIGHTH AVE	AT NORTH PROPERTY LINE OF FAIRMOUNT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C1	10	C1-10	EIGHTH AVE	AT SOUTH PROPERTY LINE OF FAIRMOUNT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C1	11	C1-11	FAIRMOUNT ST	AT WEST PROPERTY LINE OF SEVENTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C1	12	C1-12	SEVENTH AVE	AT NORTH PROPERTY LINE OF FAIRMOUNT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C1	13	C1-13	FAIRMOUNT ST	AT EAST PROPERTY LINE OF SEVENTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C1	14	C1-14	SEVENTH AVE	AT SOUTH PROPERTY LINE OF FAIRMOUNT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C1	15	C1-15	RHODES AVE	AT WATER TANK	10	GATE		1963	32	WWD	WOONSOCKET	OPEN	
C1	16	C1-16	RHODES AVE	L'HOSPICE ST. ANTOINE SUPPLY LINE OFF THE RHODES AVE STAND PIPE	6	GATE			20	WWD	WOONSOCKET	OPEN	
C1	17	C1-17	RHODES AVE	L'HOSPICE ST. ANTOINE SUPPLY LINE OFF THE RHODES AVE STAND PIPE	6	GATE		1963	20	WWD	WOONSOCKET	OPEN	
C1	18	C1-18	RHODES AVE	AT WATER TANK	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	
C1	19	C1-19	RHODES AVE	AT WATER TANK	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	
C1	20	C1-20	RHODES AVE	AT WATER TANK	8	GATE		1963	26	WWD	WOONSOCKET	CLOSED	
C2	1	C2-1	RIVER ST	30' SOUTH OF HYDRANT #3202	14	GATE			44	WWD	WOONSOCKET	OPEN	
C2	2	C2-2	RIVER ST	AT WEST PROPERTY LINE OF ANGLE ST	14	GATE			44	WWD	WOONSOCKET	OPEN	
C2	3	C2-3	BLACKSTONE ST	AT NORTH PROPERTY LINE OF RIVER ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
C2	4	C2-4	BLACKSTONE ST	AT NORTH PROPERTY LINE OF RIVER ST	12	GATE			36	WWD	WOONSOCKET	OPEN	
C2	5	C2-5	COLD SPRING PLACE	AT NORTH PROPERTY LINE OF BLACKSTONE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C2	6	C2-6	HIGHLAND ST	AT NORTH PROPERTY LINE OF BLACKSTONE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C2	7	C2-7	THIRD AVE	AT NORTH PROPERTY LINE OF WALNUT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	8	C2-8	WALNUT ST	AT WEST PROPERTY LINE OF SECOND AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	9	C2-9	WALNUT ST	AT EAST PROPERTY LINE OF SECOND AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	10	C2-10	RIVER ST	AT SOUTH PROPERTY LINE OF VERRY ST	14	GATE			44	WWD	WOONSOCKET	OPEN	
C2	11	C2-11	VERRY ST	AT NORTH PROPERTY LINE OF RIVER ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C2	12	C2-12	RIVER ST	AT WEST PROPERTY LINE OF FAIRMOUNT S	14	GATE			44	WWD	WOONSOCKET	OPEN	
C2	13	C2-13	FAIRMOUNT ST	AT NORTH PROPERTY LINE OF RIVER ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	14	C2-14	RIVER ST	AT EAST PROPERTY LINE OF FAIRMOUNT ST	14	GATE			44	WWD	WOONSOCKET	OPEN	
C2	15	C2-15	FOURTH AVE	AT SOUTH PROPERTY LINE OF CHESTNUT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	16	C2-16	CHESTNUT ST	AT EAST PROPERTY LINE OF FOURTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	17	C2-17	CHESTNUT ST	AT WEST PROPERTY LINE OF THIRD AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	18	C2-18	THIRD AVE	AT NORTH PROPERTY LINE OF CHESTNUT ST	8	GATE			26	WWD	WOONSOCKET	CLOSED	
C2	19	C2-19	CHESTNUT ST	AT EAST PROPERTY LINE OF THIRD AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
C2	20	C2-20	THIRD AVE	AT SOUTH PROPERTY LINE OF CHESTNUT ST	8	GATE			20	WWD	WOONSOCKET	OPEN	
C2	21	C2-21	CHESTNUT ST	AT WEST PROPERTY LINE OF SECOND AVE	6	GATE		1987	20	WWD	WOONSOCKET	OPEN	REPLACED 10/87
C2	22	C2-22	SECOND AVE	AT NORTH PROPERTY LINE OF CHESTNUT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C2	23	C2-23	CHESTNUT ST	AT EAST PROPERTY LINE OF SECOND AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
C2	24	C2-24	CHESTNUT ST	AT WEST PROPERTY LINE OF FIRST AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
C2	25	C2-25	FIRST AVE	AT SOUTH PROPERTY LINE OF CHESTNUT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	26	C2-26	WATER ST	AT EAST PROPERTY LINE OF FAIRMOUNT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	27	C2-27	FAIRMOUNT ST	AT WEST PROPERTY LINE OF FOURTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	28	C2-28	FOURTH AVE	AT NORTH PROPERTY LINE OF FAIRMOUNT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	29	C2-29	FAIRMOUNT ST	AT EAST PROPERTY LINE OF FOURTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	30	C2-30	FOURTH AVE	AT SOUTH PROPERTY LINE OF FAIRMOUNT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C2	31	C2-31	FAIRMOUNT ST	AT WEST PROPERTY LINE OF THIRD AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	32	C2-32	THIRD AVE	AT NORTH PROPERTY LINE OF FAIRMOUNT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	33	C2-33	THIRD AVE	AT SOUTH PROPERTY LINE OF FAIRMOUNT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C2	34	C2-34	FAIRMOUNT ST	AT WEST PROPERTY LINE OF SECOND AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
C2	35	C2-35	SECOND AVE	AT SOUTH PROPERTY LINE OF FAIRMOUNT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C2	36	C2-36	FAIRMOUNT ST	AT EAST PROPERTY LINE OF SECOND AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	37	C2-37	FAIRMOUNT ST	AT WEST PROPERTY LINE OF FIRST AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	38	C2-38	FIRST AVE	AT NORTH PROPERTY LINE OF FAIRMOUNT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	39	C2-39	FAIRMOUNT ST	AT EAST PROPERTY LINE OF FIRST AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	40	C2-40	FIRST AVE	AT SOUTH PROPERTY LINE OF FAIRMOUNT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	41	C2-41	FAIRMOUNT ST	83' FROM EAST PROPERTY LINE OF FIRST AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	42	C2-42	FAIRMOUNT ST	20' WEST OF HYDRANT #3223	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	43	C2-43	FAIRMOUNT ST	40' SOUTH OF HYDRANT #3225	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	44	C2-44	FAIRMOUNT ST	AT WEST PROPERTY LINE OF SIXTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	45	C2-45	SIXTH AVE	AT NORTH PROPERTY LINE OF FAIRMOUNT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	46	C2-46	FAIRMOUNT ST	AT EAST PROPERTY LINE OF SIXTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	47	C2-47	SIXTH AVE	AT SOUTH PROPERTY LINE OF FAIRMOUNT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C2	48	C2-48	FAIRMOUNT ST	AT WEST PROPERTY LIN OF FIFTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	49	C2-49	FAIRMOUNT ST	AT EAST PROPERTY LINE OF FIFTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	50	C2-50	FIFTH AVE	AT SOUTH PROPERTY LINE OF FAIRMOUNT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	51	C2-51	FIFTH AVE	AT NORTH PROPERTY LINE OF CHAPEL ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	52	C2-52	SECOND AVE	AT NORTH PROPERTY LINE OF SHORT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C2	53	C2-53	SECOND AVE	AT SOUTH PROPERTY LINE OF SHORT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C2	54	C2-54	FIRST AVE	AT NORTH PROPERTY LINE OF SHORT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	55	C2-55	FIRST AVE	AT SOUTH PROPERTY LINE OF SHORT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	56	C2-56	SHORT ST	AT EAST PROPERTY LINE OF SECOND AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	57	C2-57	SHORT ST	AT WEST PROPERTY LINE OF FIRST AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C2	58	C2-58	SECOND AVE	AT SOUTH PROPERTY LINE OF CHESTNUT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C2	59	C2-59	FAIRMOUNT ST	80' FROM LAST PROPERTY LINE OF FIRST AVE	4	GATE		1922	14	WWD	WOONSOCKET	CLOSED	
C2	60	C2-60	FAIRMOUNT ST	5' SOUTH OF SOUTH PROPERTY LINE OF WATER ST	8	GATE	MET	1973		WWD	WOONSOCKET		TSV
C2	61	C2-61	SECOND AVE	350' NORTH OF NORTH ST LINE WALNUT ST	6	GATE		1923	21	WWD	WOONSOCKET	CLOSED	
C2	62	C2-62	SECOND AVE	140' NORTH OF NORTH ST LINE WALNUT ST	6	GATE		1923	21	WWD	WOONSOCKET	CLOSED	
C2	63	C2-63	SECOND AVE	450' NORTH OF NORTH ST LINE WALNUT ST	8	GATE		1923	27	WWD	WOONSOCKET	CLOSED	
C2	64	C2-64	SECOND AVE	SERVICE FOR #525	8	GATE	KENNEDY	1984	27	WWD	WOONSOCKET	OPEN	
C2	65	C2-65	SECOND AVE	IN FRONT OF #520	4	GATE	KENNEDY	1984	17	WWD	WOONSOCKET	OPEN	
C3	1	C3-1	FRANCIS ST	AT EAST PROPERTY LINE OF KINDERGARTEN ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C3	2	C3-2	ARNOLD ST	AT SOUTH PROPERTY LINE OF CATO ST	8	GATE		1888	26	WWD	WOONSOCKET	OPEN	
C3	3	C3-3	CATO ST	AT EAST PROPERTY LINE OF ARNOLD ST	8	GATE			20	WWD	WOONSOCKET	OPEN	
C3	4	C3-4	CATO ST	AT EAST PROPERTY LINE OF BOYDEN ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C3	5	C3-5	BOYDEN ST	AT NORTH PROPERTY LINE OF CATO ST	6	GATE			20	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
C3	6	C3-6	BOYDEN ST	AT SOUTH PROPERTY LINE OF CHURCH ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C3	7	C3-7	BOYDEN ST	AT NORTH PROPERTY LINE OF CHURCH ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C3	8	C3-8	CHURCH ST	AT EAST PROPERTY LINE OF BOYDEN ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C3	9	C3-9	BOYDEN ST	AT SOUTH PROPERTY LINE OF BLACKSTONE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C3	10	C3-10	CATO ST	10' SOUTH OF HYDRANT #3317	6	GATE	APS	1946	20	WWD	WOONSOCKET	OPEN	
C3	11	C3-11	MILLER LANE	AT NORTH PROPERTY LINE OF BLACKSTONE ST	4	GATE			14	WWD	WOONSOCKET	OPEN	
C3	12	C3-12	BLACKSTONE ST	AT WEST PROPERTY LINE OF HOLDERS LANE	6	GATE			20	WWD	WOONSOCKET	OPEN	
C3	13	C3-13	HOLDER LANE	AT SOUTH PROPERTY LINE OF BLACKSTONE ST	4	GATE			14	WWD	WOONSOCKET	OPEN	
C3	14	C3-14	NORTH MAIN ST	AT NORTH PROPERTY LINE OF BLACKSTONE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C3	15	C3-15	BLACKSTONE ST	AT WEST PROPERTY LINE OF NORTH MAIN ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
C3	16	C3-16	SOCIAL ST	AT EAST PROPERTY LINE OF MAIN ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C3	17	C3-17	MAIN ST	AT SOUTH PROPERTY LINE OF SOCIAL ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
C3	18	C3-18	VERRY ST	AT WEST PROPERTY LINE OF HARRIS AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
C3	19	C3-19	HARRIS AVE	AT NORTH PROPERTY LINE OF VERRY ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C3	20	C3-20	KINDERGARTEN ST	AT EAST PROPERTY LINE OF HARRIS AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
C3	21	C3-21	ARNOLD ST	AT NORTH PROPERTY LINE OF RAILROAD ST	8	GATE		1888	26	WWD	WOONSOCKET	OPEN	
C3	22	C3-22	RAILROAD ST	AT EAST PROPERTY LINE OF ARNOLD ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
C3	23	C3-23	JAMES ST	AT SOUTH PROPERTY LINE OF CATO ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C3	24	C3-24	CHERRY ST	AT SOUTH PROPERTY LINE OF CATO ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C3	25	C3-25	CHURCH ST	AT WEST PROPERTY LINE OF MAIN ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C3	26	C3-26	CATO ST	AT WEST PROPERTY LINE OF MAIN ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C3	27	C3-27	FEDERAL ST	AT EAST PROPERTY LINE OF MAIN ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C3	28	C3-28	WATER ST	AT WEST PROPERTY LINE OF CANAL ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C3	29	C3-29	CANAL ST	AT NORTH PROPERTY LINE OF WATER ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C3	30	C3-30	WATER ST	AT EAST PROPERTY LINE OF CANAL ST	4	GATE			14	WWD	WOONSOCKET	OPEN	
C3	31	C3-31	CANAL ST	AT SOUTH PROPERTY LINE OF RIVER ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C3	32	C3-32	RIVER ST	70' WEST OF HIGH ST PROPERTY LINE 7' OFF WESTERLY CURB LINE	2	GATE			8	WWD	WOONSOCKET	CLOSED	
C3	33	C3-33	RIVER ST	70' WEST OF HIGH ST PROPERTY	14	GATE			44	WWD	WOONSOCKET	OPEN	
C3	34	C3-34	HIGH ST	AT NORTH PROPERTY LINE OF RIVER ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C3	35	C3-35	BENTLEY ST	AT WEST PROPERTY LINE OF ARNOLD ST	4	GATE		1922	14	WWD	WOONSOCKET	OPEN	
C3	36	C3-36	HIGH ST	AT WEST PROPERTY LINE OF ARNOLD ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C3	37	C3-37	ARNOLD ST	AT NORTH PROPERTY LINE OF HIGH ST	8	GATE		1888	26	WWD	WOONSOCKET	OPEN	
C3	38	C3-38	HIGH ST	AT EAST PROPERTY LINE OF ARNOLD ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C3	39	C3-39	ARNOLD ST	AT SOUTH PROPERTY LINE OF HIGH ST	8	GATE		1888	26	WWD	WOONSOCKET	OPEN	
C3	40	C3-40	HIGH ST	AT WEST PROPERTY LINE OF FOUNTAIN ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C3	41	C3-41	HIGH ST	AT EAST PROPERTY LINE OF FOUNTAIN ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C3	42	C3-42	FOUNTAIN ST	AT SOUTH PROPERTY LINE OF HIGH ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C3	43	C3-43	HIGH ST	200' EAST OF HYDRANT #3331	8	GATE			26	WWD	WOONSOCKET	OPEN	NEW 4" PER WOL 7/28/92
C3	44	C3-44	RAILROAD ST	30' EAST OF HYDRAND #3333	12	GATE			38	WWD	WOONSOCKET	OPEN	
C3	45	C3-45	JAMES ST	AT NORTH PROPERTY LINE OF RAILROAD ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C3	46	C3-46	CHERRY ST	AT NORTH PROPERTY LINE OF RAILROAD ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C3	47	C3-47	RAILROAD ST	AT WEST PROPERTY LINE OF MAIN ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
C3	48	C3-48	RIVER ST	AT EAST PROPERTY LINE OF HIGH ST	14	GATE			44	WWD	WOONSOCKET	OPEN	
C3	49	C3-49	CLARK CT	AT EAST PROPERTY LINE OF ARNOLD ST	4	GATE			14	WWD	WOONSOCKET	OPEN	
C3	50	C3-50	FOUNTAIN ST	15' SOUTH OF HYDRANT #3344	6	GATE			20	WWD	WOONSOCKET	CLOSED	
C3	51	C3-51	FOUNTAIN ST	AT NORTH PROPERTY LINE OF ASCENSION ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C3	52	C3-52	ASCENSION ST	AT EAST PROPERTY LINE OF FOUNTAIN ST	8	GATE		1887	26	WWD	WOONSOCKET	OPEN	
C3	53	C3-53	FOUNTAIN ST	AT SOUTH PROPERTY LINE OF ASCENSION ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C3	54	C3-54	COOKS HILL	AT NORTH PROPERTY LINE OF MAIN ST	4	GATE			14	WWD	WOONSOCKET	OPEN	
C3	55	C3-55	MAIN ST	150' EAST OF HYDRANT #3347	6	GATE			20	WWD	WOONSOCKET	OPEN	
C3	56	C3-56	RIVER ST	110' FROM EAST PROPERTY LINE OF CANAL ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C3	57	C3-57	MAIN ST	150' EAST OF HYDRANT # 3347	6	GATE			20	WWD	WOONSOCKET	OPEN	
C3	58	C3-58	MAIN ST	160' FROM WEST PROPERTY LINE OF HIGH ST	6	CUT IN VALVE	APS	1974	20	WWD	WOONSOCKET	OPEN	
C3	59	C3-59	MAIN ST	AT WEST PROPERTY LINE OF HIGH ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
C3	60	C3-60	HIGH ST	AT NORTH PROPERTY LINE OF MAIN ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C3	61	C3-61	CLINTON ST	AT CENTER LINE OF HIGH ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
C3	62	C3-62	COURT ST	AT SOUTH PROPERTY LINE OF MAIN ST	20	GATE			62	WWD	WOONSOCKET	OPEN	
C3	63	C3-63	COURT ST	AT SOUTH PROPERTY LINE OF MAIN ST	6	GATE			8	WWD	WOONSOCKET	CLOSED	
C3	64	C3-64	MAIN ST	80' FROM EAST PROPERTY LINE OF HIGH ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
C3	65	C3-65	ARNOLD ST	AT SOUTH PROPERTY LINE OF FOUNTAIN ST	8	GATE		1888	26	WWD	WOONSOCKET	OPEN	
C3	66	C3-66	FOUNTAIN ST	AT EAST PROPERTY LINE OF ARNOLD ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C3	67	C3-67	ASCENSION ST	AT NORTH PROPERTY LINE OF MAIN ST	4	GATE		1887	14	WWD	WOONSOCKET	OPEN	
C3	68	C3-68	MAIN ST	AT EAST PROPERTY LINE OF ASCENSION	12	GATE			38	WWD	WOONSOCKET	OPEN	
C3	69	C3-69	MAIN ST	#75 SAME AS SERVICE #6403	6	GATE		1924	20	WWD	WOONSOCKET	OPEN	
C3	70	C3-70	CATO ST	10' SOUTH OF HYDRANT # 3317	6	GATE			20	WWD	WOONSOCKET	OPEN	
C3	71	C3-71	RIVER ST	120' EAST OF HYDRANT #3326	4	GATE			14	WWD	WOONSOCKET	OPEN	
C3	72	C3-72	MAIN ST	AT NORTH PROPERTY LINE OF RAILROAD ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C3	73	C3-73	MAIN ST	AT NORTH PROPERTY LINE OF RAILROAD ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C3	74	C3-74	RAILROAD ST	40' EAST OF HYDRANT #3333	6	GATE			20	WWD	WOONSOCKET	CLOSED	
C3	75	C3-75	RIVER ST	87' FROM EAST PROPERTY LINE OF CANAL ST	6	GATE		1957	20	WWD	WOONSOCKET	OPEN	TSV
C3	76	C3-76	HIGH ST	45' FROM EAST PROPERTY LINE OF ARNOLD ST	6	GATE	APS	1969	20	WWD	WOONSOCKET	OPEN	
C3	77	C3-77	MAIN ST	#75 SAME AS SERVICE #6403	6	GATE		1924	20	WWD	WOONSOCKET	ABANDONED	BF 11/27/1995
C3	78	C3-78	CANAL ST	25' SOUTH OF WATER ST	8	GATE	APS	1971	26	WWD	WOONSOCKET	OPEN	
C3	79	C3-79	ASCENSION ST	20' FROM WEST PROPERTY LINE OF MAIN ST	6	GATE		1887	20	WWD	WOONSOCKET	OPEN	
C3	80	C3-80	ASCENSION ST	20' FROM WEST PROPERTY LINE OF MAIN ST	6	GATE		1887	20	WWD	WOONSOCKET	OPEN	
C3	81	C3-81	MAIN ST	35' FROM NORTH PROPERTY LINE OF CATO STREET	4	GATE			14	WWD	WOONSOCKET	OPEN	
C3	82	C3-82	MAIN ST	130' FROM WEST PROPERTY LINE OF COURT ST	6	GATE	RENSSALAER	1925	18	WWD	WOONSOCKET	CLOSED	TSV
C3	83	C3-83	MAIN ST	130' FROM WEST PROPERTY LINE OF COURT ST	6	GATE		1925	18	WWD	WOONSOCKET	CLOSED	
C3	84	C3-84	MAIN ST	50' FROM WEST PROPERTY LINE OF COURT ST	4	GATE		1925	14	WWD	WOONSOCKET	CLOSED	
C3	85	C3-85	MAIN ST	AT 169 MAIN ST 115' FROM SHF 3349	4	GATE		1892	14	WWD	WOONSOCKET	OPEN	
C3	86	C3-86	MAIN ST	102' NORTH FROM NORTH PROPERTY LINE OF RAILROAD ST	6	GATE	EDDY	1974	20	WWD	WOONSOCKET	OPEN	TSV
C3	87	C3-87	SAYLES ST	16' FROM HYD # 3352	4	GATE	KENNEDY	1978	15	WWD	WOONSOCKET	OPEN	
C3	88	C3-88	RAILROAD ST	100' WEST OF JAMES ST	4	GATE			14	WWD	WOONSOCKET	REMOVED	REPLACED BY C3-95
C3	89	C3-89	CLINTON ST	80' EAST OF COURT ST	6	GATE		1952	20	WWD	WOONSOCKET	OPEN	
C3	90	C3-90	CLINTON ST	80' EAST OF COURT ST	6	GATE	CHAPMAN	1952	20	WWD	WOONSOCKET	OPEN	
C3	91	C3-91	MAIN ST	AT CLINTON ST	6	GATE		1964	21	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
C3	92	C3-92	MAIN ST	AT CLINTON ST	6	GATE		1964	21	WWD	WOONSOCKET	OPEN	
C3	93	C3-93	ALLEN ST	FS TO # 156	6	GATE		1911	21	WWD	WOONSOCKET	OPEN	FS TO # 156
C3	94	C3-94	NORTHEAST ST	SUPPLIES 120 NORTHEAST STREET	4	GATE		1979	14	WWD	WOONSOCKET	OPEN	
C3	95	C3-95	RAILROAD ST	100' WEST OF JAMES ST	4	GATE	KENNEDY	1989		WWD	WOONSOCKET	OPEN	NO CARD-REPLACED C3-88
C4	1	C4-1	WORRALL ST	AT SOUTH PROPERTY LINE OF SOCIAL ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C4	2	C4-2	SOCIAL ST	AT EAST PROPERTY LINE OF WORRALL ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C4	3	C4-3	COLLIER ST	AT NORTH PROPERTY LINE OF CLINTON ST	6	GATE				WWD	WOONSOCKET	CLOSED	
C4	4	C4-4	CLINTON ST	AT THE OLD SOCIAL DEPT STORE	6	GATE			12	WWD	WOONSOCKET	CLOSED	
C4	5	C4-5	CLINTON ST	AT EAST PROPERTY LINE OF NOURSE ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
C4	6	C4-6	SAMPSON ST	AT NORTH PROPERTY LINE OF CLINTON ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C4	7	C4-7	PAGE ST	AT NORTH PROPERTY LINE OF CLINTON ST	6	GATE			20	WWD	WOONSOCKET	ABANDONED	
C4	8	C4-8	CLINTON ST	15' FROM EAST PROPERTY LINE OF PAGE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C4	9	C4-9	FEDERAL ST	AT WEST PROPERTY LINE OF WORRALL ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C4	10	C4-10	WORRALL ST	AT NORTH PROPERTYLINE OF CLINTON ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C4	11	C4-11	CLINTON ST	AT WEST PROPERTY LINE OF POND ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C4	12	C4-12	POND ST	AT NORTH PROPERTY LINE OF CLNTON ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
C4	13	C4-13	CLINTON ST	AT EAST PROPERTY LINE OF POND ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
C4	14	C4-14	PARK PLACE	20' NORTH OF HYDRANT #3416	6	GATE			20	WWD	WOONSOCKET	OPEN	
C4	15	C4-15	CLINTON ST	170' WEST OF HYDRANT #3412	12	GATE			38	WWD	WOONSOCKET	OPEN	
C4	16	C4-16	PARK PLACE	35' WEST OF HYDRANT 3439	4	GATE			14	WWD	WOONSOCKET	OPEN	
C4	17	C4-17	MORTON AVE	AT SOUTH PROPERTY LNE OF PARK PLACE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C4	18	C4-18	VILLA NOVA ST	AT EAST PROPERTY LINE OF MORTON AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C4	19	C4-19	WEST PARK PLACE	AT WEST PROPERTY LINE OF PARK PLACE	4	GATE			14	WWD	WOONSOCKET	OPEN	
C4	20	C4-20	HARRISON AVE	70' SOUTH OF HYDRANT #3420	6	GATE			20	WWD	WOONSOCKET	OPEN	
C4	21	C4-21	HARRISON AVE	AT EAST PROPERTY LINE OF PARK PLACE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C4	22	C4-22	PARK PLACE	80' NORTH OF HYDRANT #3420	4	GATE			14	WWD	WOONSOCKET	OPEN	
C4	23	C4-23	PARK PLACE	170' SOUTH OF HYDRANT #3421	6	GATE			20	WWD	WOONSOCKET	OPEN	
C4	24	C4-24	BELLEVUE AVE	AT NORTH PROPERTY LINE OF HARRISON AVE	6	GATE		1890	20	WWD	WOONSOCKET	OPEN	
C4	25	C4-25	BELLEVUE AVE	AT WEST PROPERTY LINE OF MORTON AVE	6	GATE		1890	20	WWD	WOONSOCKET	OPEN	
C4	26	C4-26	MORTON AVE	AT NORTH PROPERTY LINE OF BELLEVUE AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C4	27	C4-27	COURT ST	AT WEST PROPERTY LINE OF FRONT ST	20	GATE			63	WWD	WOONSOCKET	OPEN	
C4	28	C4-28	COURT ST	AT WEST PROPERTY LINE OF FRONT ST	6	GATE			11	WWD	WOONSOCKET	CLOSED	
C4	29	C4-29	FRONT ST	AT SOUTH PROPERTY LINE OF COURT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C4	30	C4-30	FRONT ST	AT SOUTH PROPERTY LINE OF CARRINGTON AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
C4	31	C4-31	FRONT ST	AT NORTH PROPERTY LINE OF HAMLET AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
C4	32	C4-32	FRONT ST	20' EAST OF HYDRANT #3424	6	GATE			20	WWD	WOONSOCKET	CLOSED	
C4	33	C4-33	GREENE ST	AT SOUTH PROPERTY LINE OF CARRINGTON AVE	10	GATE			32	WWD	WOONSOCKET	OPEN	
C4	34	C4-34	CARRINGTON AVE	AT EAST PROPERTY LINE OF GREENE ST	4	GATE			14	WWD	WOONSOCKET	CLOSED	
C4	35	C4-35	HAMLET AVE	AT EAST PROPERTY LINE OF GREENE ST	6	GATE			29	WWD	WOONSOCKET	OPEN	
C4	36	C4-36	PARK AVE	AT SOUTH PROPERTY LINE OF HAMLET AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
C4	37	C4-37	GROVE ST	AT SOUTH PROPERTY LINE OF HAMLET AVE						WWD	WOONSOCKET	ABANDONED	PLUGGED 1975
C4	38	C4-38	HAMLET AVE	AT EAST PROPERTY LINE OF GROVE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C4	39	C4-39	HARRISON AVE	AT NORTH PROPERTY LINE OF HAMLET AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
C4	40	C4-40	MORTON AVE	AT NORTH PROPERTY LINE OF HARRISON AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C4	41	C4-41	HARRISON AVE	AT WEST PROPERTY LINE OF MORTON AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C4	42	C4-42	CLINTON ST	AT WEST PROPERTY LINE OF POND ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C4	43	C4-43	18" HARRIS POND LINE	SOUTH OF BLACKSTONE RIVER & WEST OF GOV'T BLDG		AIR REL. VALVE		1960		WWD	WOONSOCKET	OPEN	?
C4	44	C4-44	WORRALL ST	AT WEST PROPERTY LINE OF WORRALL ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C4	45	C4-45	FEDERAL ST	148' FROM WEST PROPERTY LINE OF WORRALL ST	6	GATE			20	WWD	WOONSOCKET	CLOSED	
C4	46	C4-46	MAIN ST BY-PASS	AT EAST PROPERTY LINE OF CLINTON ST	8	GATE		1921	26	WWD	WOONSOCKET	CLOSED	
C4	47	C4-47	MAIN ST BY-PASS	AT EAST PROPERTY LINE OF CLINTON ST	6	GATE			20	WWD	WOONSOCKET	CLOSED	
C4	48	C4-48	HAMLET AVE	30' FROM PROPERTY LINE OF GROVE ST	6	GATE		1924	20	WWD	WOONSOCKET	CLOSED	
C4	49	C4-49	PARK PLACE	AT MORTON AVE	6	GATE		1927	20	WWD	WOONSOCKET	OPEN	
C4	50	C4-50	PARK PLACE	AT GYMNASIUM	4	GATE		1950	14	WWD	WOONSOCKET	OPEN	
C4	51	C4-51	CLINTON ST	AT LIBRARY GATE ON PRIVATE PROPERTY	4	GATE	KENNEDY	1973	14	WWD	WOONSOCKET	OPEN	
C4	52	C4-52	CLINTON ST	FOR 8' WATER LINE GOING UNDER THE BLACKSTONE RIVER	8	CUT IN VALVE	APS	1974		WWD	WOONSOCKET	OPEN	
C4	53	C4-53	POND ST	78.5 NORTH FROM NORTH PROPERTY LINE OF CLINTON ST	4	GATE	MUELLER	1974	14	WWD	WOONSOCKET	OPEN	TSV
C4	54	C4-54	SOCIAL ST	300' NORTH FROM NORTH PROPERTY LINE OF CLINTON ST	6	GATE	APS	1974	22	WWD	WOONSOCKET	OPEN	TSV
C4	55	C4-55	HAMLET AVE	80' EAST FROM EAST PROPERTY LINE OF PARK AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
C4	56	C4-56	HAMLET AVE	AT WESTERLY PROPERTY LINE OF GROVE ST	6	GATE		1975		WWD	WOONSOCKET	OPEN	
C4	57	C4-57	18" HARRIS POND LINE	SOUTH OF BLACKSTONE RIVER & WEST OF GOV'T BLDG	6	BLOW OFF		1900		WWD	WOONSOCKET	OPEN	?
C4	58	C4-58	SOCIAL ST	OPPOSITE WEST STREET LINE OF WORRALL ST	6	GATE		1926	21	WWD	WOONSOCKET	CLOSED	
C4	59	C4-59	SOCIAL ST	280' EAST OF EAST ST LINE WORRALL ST	6	GATE			20	WWD	WOONSOCKET	CLOSED	
C4	60	C4-60	WEST PARK PLACE	350 WEST OF PARK PLACE	4	GATE	KENNEDY	1985	15	WWD	WOONSOCKET	OPEN	
C5	1	C5-1	CUMBERLAND ST	AT CENTER LINE OF LOCUST ST	6	GATE			20	WWD	WOONSOCKET	CLOSED	TSV
C5	2	C5-2	LOCUST ST	AT EAST PROPERTY LINE OF CUMBERLAND ST	6	GATE			20	WWD	WOONSOCKET	CLOSED	
C5	3	C5-3	GAULIN AVE	AT NORTH PROPERTY LINE OF LOCUST ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C5	4	C5-4	GAULIN AVE	AT NORTH PROPERTY LINE OF KENDRICK AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
C5	5	C5-5	GAULIN AVE	AT SOUTH PROPERTY LINE OF KENDRICK AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
C5	6	C5-6	GAULIN AVE	AT SOUTH PROPERTY LINE OF KENDRICK AVE	6	GATE		1963	20	WWD	WOONSOCKET	OPEN	TSV
C5	7	C5-7	BURNSIDE AVE	AT EAST PROPERTY LINE OF ELM ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C5	8	C5-8	ELM ST	AT NORTH PROPERTY LINE OF KENDRICK AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C5	9	C5-9	KENDRICK AVE	AT SOUTH PROPERTY LINE OF ELM ST	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	TSV
C5	10	C5-10	KENDRICK AVE	AT WEST PROPERTY LINE OF ELM ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C5	11	C5-11	ELM ST	AT EAST PROPERTY LINE OF KENDRICK AVE	10	GATE		1963	32	WWD	WOONSOCKET	OPEN	
C5	12	C5-12	ELM ST	AT EAST PROPERTY LINE OF KENDRICK AVE	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	
C5	13	C5-13	WOOD AVE	AT NORTH PROPERTY LINE OF ELM ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C5	14	C5-14	WOOD AVE	AT SOUTH PROPERTY LINE OF ELM ST	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	TSV
C5	15	C5-15	WOOD AVE	SOUTH PROPERTY LINE OF ELM ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C5	16	C5-16	ELM ST	AT WEST PROPERTY LINE OF DULUDE AVE	6	GATE		1963	20	WWD	WOONSOCKET	OPEN	TSV
C5	17	C5-17	DULUDE AVE	AT NORTH PROPERTY LINE OF ELM ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C5	18	C5-18	DULUDE AVE	AT SOUTH PROPERTY LINE OF ELM ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C5	19	C5-19	ELM ST	AT EAST PROPERTY LINE OF DULUDE AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C5	20	C5-20	ELM ST	40' FROM EAST PROPERTY LINE OF DULUDE AVE	10	GATE			32	WWD	WOONSOCKET	OPEN	
C5	21	C5-21	ELM ST	AT WEST PROPERTY LINE OF PROGRESSO	8	GATE			26	WWD	WOONSOCKET	OPEN	
C5	22	C5-22	ELM ST	AT WEST PROPERTY LINE OF READ AVE	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	TSV

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
C5	23	C5-23	PROGRESSO AVE	AT NORTH PROPERTY LINE OF ELM ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C5	24	C5-24	READ AVE	AT SOUTH PROPERTY LINE OF ELM ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C5	25	C5-25	ELM ST	AT EAST PROPERTY LINE OF READ AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C5	26	C5-26	ELM ST	AT WEST PROPERTY LINE OF MERIDA AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C5	27	C5-27	MERIDA AVE	AT NORTH PROPERTY LINE OF ELM ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C5	28	C5-28	ELM ST	AT CENTER LINE OF MERIDA AVE	6	GATE		1963	20	WWD	WOONSOCKET	OPEN	TSV
C5	29	C5-29	HEROUX AVE	AT SOUTH PROPERTY LINE OF ELM ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C5	30	C5-30	ELM ST	AT EAST PROPERTY LINE OF HEROUX AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C5	31	C5-31	ELM ST	AT WEST PROPERTY LINE OF CHALAPA	8	GATE			26	WWD	WOONSOCKET	OPEN	
C5	32	C5-32	CHALAPA AVE	AT NORTH PROPERTY LINE OF ELM ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C5	33	C5-33	ELM ST	AT CENTER LINE OF CHALAPA AVE	6	GATE		1963	20	WWD	WOONSOCKET	OPEN	TSV
C5	34	C5-34	ELM ST	AT EAST PROPERTY LINE OF CHALAPA	8	GATE			26	WWD	WOONSOCKET	OPEN	
C5	35	C5-35	ELM ST	AT EAST PROPERTY LINE OF SWEET AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C5	36	C5-36	SWEET AVE	AT SOUTH PROPERTY LINE OF ELM ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C5	37	C5-37	ELM ST	AT EAST PROPERTY LINE OF SWEET AVE	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	TSV
C5	38	C5-38	ELM ST	AT EAST PROPERTY LINE OF SWEET AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C5	39	C5-39	VILLA NOVA ST	AT WEST PROPERTY LINE OF FLORENCE DR	8	GATE			26	WWD	WOONSOCKET	OPEN	
C5	40	C5-40	FLORENCE DR	AT CENTER LINE OF VILLA NOVA ST		AIR REL. VALVE		1957		WWD	WOONSOCKET	CLOSED	
C5	41	C5-41	CUMBERLAND ST	AT EAST PROPERTY LINE OF KENDRICK AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
C5	42	C5-42	CUMBERLAND ST	AT WEST PROPERTY LINE OF KENDRICK AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
C5	43	C5-43	KENDRICK AVE	AT EAST PROPERTY LINE OF CUMBERLAND ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C5	44	C5-44	CUMBERLAND ST	AT EAST PROPERTY LINE OF KENDRICK AVE	12	GATE		1963	38	WWD	WOONSOCKET	OPEN	TSV
C5	45	C5-45	CUMBERLAND ST	AT EAST PROPERTY LINE OF KENDRICK AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
C5	46	C5-46	CUMBERLAND ST	50.4 SE FROM SE PROPERTY LINE OF KENDRICK AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
C5	47	C5-47	EMERSON ST	AT WEST PROPERTY LINE OF SWEET AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C5	48	C5-48	CUMBERLAND ST	AT NORTH PROPERTY LINE OF CASS AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
C5	49	C5-49	CUMBERLAND ST	AT SOUTH PROPERTY LINE OF CASS AVE	12	GATE		1959	38	WWD	WOONSOCKET	OPEN	TSV
C5	50	C5-50	CUMBERLAND ST	AT SOUTH PROPERTY LINE OF CASS AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
C5	51	C5-51	CASS AVE	AT EAST PROPERTY LINE OF CUMBERLAND ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
C5	52	C5-52	CASS AVE	AT EAST PROPERTY LINE OF CUMBERLAND ST	8	GATE		1959	26	WWD	WOONSOCKET	OPEN	TSV
C5	53	C5-53	CASS AVE	100' WEST FROM WEST PROPERTY LINE OF WOOD AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
C5	54	C5-54	CASS AVE	90' WEST FROM WEST PROPERTY LINE OF WOOD AVE	6	GATE		1959	20	WWD	WOONSOCKET	OPEN	TSV
C5	55	C5-55	CASS AVE	AT WEST PROPERTY LINE OF WOOD AVE	8	GATE		1959	26	WWD	WOONSOCKET	OPEN	TSV
C5	56	C5-56	WOOD AVE	AT NORTH PROPERTY LINE OF CASS AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C5	57	C5-57	CASS AVE	AT WEST PROPERTY LINE OF MAILLOUX ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C5	58	C5-58	MAILLOUX ST	AT NORTH PROPERTY LINE OF CASS AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C5	59	C5-59	CASS AVE	40' FROM EAST PROPERTY LINE OF MAILLOUX ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C5	60	C5-60	DULUDE AVE	AT NORTH PROPERTY LINE OF CASS AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
C5	61	C5-61	CASS AVE	AT EAST PROPERTY LINE OF DULUDE AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C5	62	C5-62	CASS AVE	AT WEST PROPERTY LINE OF SWEET AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C5	63	C5-63	SWEET AVE	AT NORTH PROPERTY LINE OF CASS AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
C5	64	C5-64	CUMBERLAND ST	20' NORTH OF HYDRANT #3536	8	GATE			26	WWD	WOONSOCKET	OPEN	TSV
C5	65	C5-65	CUMBERLAND ST	20' NORTH OF HYDRANT #3536	8	GATE			26	WWD	WOONSOCKET	OPEN	
C5	66	C5-66	HAMLET AVE	58' WEST OF HYDRANT #3537	6	GATE			20	WWD	WOONSOCKET	OPEN	
C5	67	C5-67	HAMLET AVE	40' WEST OF HYDRANT #3537 ON SOUTH PROPERTY LINE	4	GATE			14	WWD	WOONSOCKET	OPEN	
C5	68	C5-68	HAMLET AVE	20' WEST OF HYDRANT # 3537 ON SOUTH PROPERTY LINE	12	GATE			38	WWD	WOONSOCKET	OPEN	
C5	69	C5-69	HAMLET AVE	160' FROM W. P. L. OF FLORENCE DR AT N. P. L.	10	GATE			32	WWD	WOONSOCKET	OPEN	
C5	70	C5-70	HAMLET AVE	135' FROM W. P. L. OF FLORENCE DR AT N. P. L.	4	GATE			14	WWD	WOONSOCKET	OPEN	
C5	71	C5-71	FLORENCE DR	AT SOUTH PROPERTY LINE OF VILLA NOVA ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
C5	72	C5-72	FLORENCE DR	40' FROM NORTH PROPERTY LINE OF HAMLET	12	GATE			38	WWD	WOONSOCKET	OPEN	
C5	73	C5-73	HAMLET AVE	AT EAST PROPERTY LINE OF FLORENCE DR (BURIED- NOT IN SERVICE)						WWD	WOONSOCKET	ABANDONED	BURIED-NOT IN SERVICE
C5	74	C5-74	HAMLET AVE	AT E. P. L. OF FLORENCE DR - GATE VALVE BURIED (NOT IN SERVICE)						WWD	WOONSOCKET	ABANDONED	BURIED-NOT IN SERVICE
C5	75	C5-75	HAMLET AVE	AT WEST PROPERTY LINE OF DAVISON AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
C5	76	C5-76	CUMBERLAND HILL RD	40' SOUTH OF HAMLET AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C5	77	C5-77	EMERSON ST	AT EAST PROPERTY LINE OF HEROUX AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C5	78	C5-78	FLORENCE DR	AT CENTER LINE OF VILLA NOVA ST	12	GATE		1963	38	WWD	WOONSOCKET	OPEN	
C5	79	C5-79	FLORENCE DR	AT SOUTH PROPERTY LINE OF VILLA NOVA ST	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	TSV
C5	80	C5-80	FLORENCE DR	120' NORTH OF HYDRANT #3541	12	GATE		1963	38	WWD	WOONSOCKET	OPEN	TSV
C5	81	C5-81	VILLA NOVA ST	AT NORTH PROPERTY LINE OF FLORENCE DR	18	BUTTERFLY	PRATT		40	WWD	WOONSOCKET	OPEN	
C5	82	C5-82	HAMLET AVE	AT 148 HAMLET AVE	4	GATE	KENNEDY	1972	14	WWD	WOONSOCKET	OPEN	
C5	83	C5-83	KENDRICK AVE	45' FROM NORTHEAST PROPERTY LINE OF GAULIN AVE	4	GATE		1926	14	WWD	WOONSOCKET	OPEN	
C5	84	C5-84	18" MILL SUPPLY LINE	GIRARD AVE	4	BLOW OFF		1960	14	PRIVATE	WOONSOCKET	CLOSED	
C5	85	C5-85	CASS AVE	28.2' FROM THE WEST PROPERTY LINE OF MAILLOUX ST	8	GATE	MUELLER	1980	26	WWD	WOONSOCKET	OPEN	
C5	86	C5-86	GAULIN AVE	IN EASEMENT, 165' EAST OF LOCUST ST (VILLAGE WEST APT)	4	GATE	MUELLER	1981	14	WWD	WOONSOCKET	OPEN	
C5	87	C5-87	FLORENCE DR	380' NORTH OF HAMLET AVE	4	GATE			14	PRIVATE	WOONSOCKET	CLOSED	MILL SUPPLY LINE
C5	88	C5-88	FLORENCE DR	340' NORTH OF HAMLET AVE	12	GATE			38	PRIVATE	WOONSOCKET	OPEN	MILL SUPPLY LINE
C5	89	C5-89	FLORENCE DR	170' SOUTH OF VILLA NOVA (FS SERV. # 4638)	8	GATE		1916	27	WWD	WOONSOCKET	OPEN	
C5	90	C5-90	CUMBERLAND ST	IN FRONT OF 181 CUMBERLAND ST (SEE WS# 12870)	4	GATE		1980		WWD	WOONSOCKET		(SEE WS# 12870)
C6	1	C6-1	ELM ST	120' FROM WEST PROPERTY LINE OF HEBERT AVE	10	GATE		1963	32	WWD	WOONSOCKET	OPEN	
C6	2	C6-2	WINTHROP ST	AT NORTH PROPERTY LINE OF ELM ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C6	3	C6-3	ELM ST	AT EAST PROPERTY LINE OF WINTHROP ST	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	TSV
C6	4	C6-4	ELM ST	AT WEST PROPERTY LINE OF HEBERT AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C6	5	C6-5	HEBERT AVE	AT SOUTH PROPERTY LINE OF ELM ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C6	6	C6-6	HEBERT AVE	AT SOUTH PROPERTY LINE OF ELM ST	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	TSV
C6	7	C6-7	ELM ST	AT EAST PROPERTY LINE OF HEBERT AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C6	8	C6-8	COTE AVE	AT SOUTH PROPERTY LINE OF ELM ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C6	9	C6-9	ELM ST	AT WEST PROPERTY LINE OF FLORIDA AVE	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	TSV
C6	10	C6-10	FLORIDA ST	AT NORTH PROPERTY LINE OF ELM ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C6	11	C6-11	ELM ST	AT EAST PROPERTY LINE OF FLORIDA AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C6	12	C6-12	ELLA AVE	AT WEST PROPERTY LINE OF HENRY ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C6	13	C6-13	JERVIS ST	AT SOUTH PROPERTYLINE OF ELM ST	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	TSV
C6	14	C6-14	JERVIS ST	AT SOUTH PROPERTY LINE OF ELM	8	GATE	APS	1960	26	WWD	WOONSOCKET	OPEN	
C6	15	C6-15	ELM ST	AT EAST PROPERTY LINE OF JERVIS ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C6	16	C6-16	ELM ST	AT EAST PROPERTY LINE OF JERVIS ST	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	TSV
C6	17	C6-17	HENRY ST	AT NORTH PROPERTY LINE OF ELM ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C6	18	C6-18	ELM ST	70' FROM EAST PROPERTY LINE OF HENRY	10	GATE		1963	32	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
C6	19	C6-19	BEACON AVE	AT SOUTH PROPERTY LINE OF RIDGE ST	8	GATE	APS	1963	26	WWD	WOONSOCKET	OPEN	
C6	20	C6-20	CAMPEAU ST	AT EAST PROPERTY LINE OF BEACON AVE	8	GATE	APS	1961	26	WWD	WOONSOCKET	OPEN	
C6	21	C6-21	BEACON AVE	AT SOUTH PROPERTY LINE OF CAMPEAU ST	8	GATE	APS	1963	26	WWD	WOONSOCKET	OPEN	
C6	22	C6-22	HEATHER DR	AT WEST PROPERTY LINE OF BEACON AVE	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	
C6	23	C6-23	ELM ST	AT NORTH PROPERTY LINE OF LEBRUN AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C6	24	C6-24	LEBRUN AVE	AT WEST PROPERTY LINE OF ELM ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C6	25	C6-25	LEBRUN AVE	AT WEST PROPERTY LINE OF ELM ST	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	TSV
C6	26	C6-26	ELM ST	AT SOUTH PROPERTY LINE OF LEBRUN AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C6	27	C6-27	ELM ST	AT NORTH PROPERTY LINE OF DESROCHERS AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C6	28	C6-28	DESROCHERS AVE	AT WEST PROPERTY LINE OF ELM ST	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	TSV
C6	29	C6-29	DESROCHERS AVE	AT WEST PROPERTY LINE OF ELM ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C6	30	C6-30	CASS AVE	AT WEST PROPERTY LINE OF HEBERT AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C6	31	C6-31	HEBERT AVE	AT NORTH PROPERTY LINE OF CASS AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C6	32	C6-32	COTE AVE	AT NORTH PROPERTY LINE OF CASS AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
C6	33	C6-33	JERVIS ST	AT NORTH PROPERTY LINE OF CASS AVE	8	GATE	APS	1960	26	WWD	WOONSOCKET	OPEN	
C6	34	C6-34	CASS AVE	AT CENTER LINE OF JERVIS ST	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	TSV
C6	35	C6-35	LEBRUN AVE	AT NORTH PROPERTY LINE OF CASS AVE	6	GATE			20	WWD	WOONSOCKET	ABANDONED	ABANDONED 8/1993
C6	36	C6-36	CASS AVE	AT WEST PROPERTY LINE OF ELM ST	10	GATE		1963	32	WWD	WOONSOCKET	OPEN	
C6	37	C6-37	ELM ST	AT NORTH PROPERTY LINE OF CASS AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C6	38	C6-38	CASS AVE	60' WEST OF HYDRANT # 3626	10	GATE		1957	32	WWD	WOONSOCKET	OPEN	
C6	39	C6-39	CASS AVE	65' WEST OF HYDRANT # 3626	8	GATE		1957	26	WWD	WOONSOCKET	OPEN	TSV
C6	40	C6-40	CASS AVE	30' WEST OF HYDRANT # 3626	6	GATE			20	WWD	WOONSOCKET	OPEN	
C6	41	C6-41	HOLLAND AVE	AT EAST PROPERTY LINE OF GRACE AVE	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
C6	42	C6-42	BEACON AVE	AT NORTH PROPERTY LINE OF CASS AVE	8	GATE		1933	26	WWD	WOONSOCKET	OPEN	
C6	43	C6-43	CASS AVE	AT EAST PROPERTY LINE OF BEACON AVE	8	GATE		1957	26	WWD	WOONSOCKET	OPEN	TSV
C6	44	C6-44	CASS AVE	AT EAST PROPERTY LINE OF BEACON AVE	10	GATE		1957	32	WWD	WOONSOCKET	OPEN	
C6	45	C6-45	CASS AVE	AT EAST PROPERTY LINE OF BEACON AVE	6	GATE			20	WWD	WOONSOCKET	ABANDONED	
C6	46	C6-46	JANET AVE	AT WEST PROPERTY LINE OF NURSERY AVE	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	
C6	47	C6-47	BEACON AVE	AT NORTH PROPERTY LINE OF EDGEWOOD AVE	8	GATE		1933	26	WWD	WOONSOCKET	OPEN	
C6	48	C6-48	CASS AVE	AT WEST PROPERTY LINE OF NURSERY AVE	10	GATE			32	WWD	WOONSOCKET	OPEN	
C6	49	C6-49	NURSERY AVE	AT NORTH PROPERTY LINE OF CASS AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C6	50	C6-50	NURSERY AVE	AT NORTH PROPERTY LINE OF CASS AVE	8	GATE		1957	26	WWD	WOONSOCKET	OPEN	TSV
C6	51	C6-51	CASS AVE	AT EAST PROPERTY LINE OF NURSERY AVE	10	GATE			32	WWD	WOONSOCKET	OPEN	
C6	52	C6-52	CASS AVE	AT WEST PROPERTY LINE OF RICARD ST	8	GATE	APS	1960	26	WWD	WOONSOCKET	OPEN	TSV
C6	53	C6-53	CASS AVE	SOUTH PROPERTY LINE OF CASS AVE LINE NOT IN SERVICE	6	GATE		1957	20	WWD	WOONSOCKET	CLOSED	TSV
C6	54	C6-54	RICARD ST	AT SOUTH PROPERTY LINE OF CASS AVE	8	GATE	MUELLER	1960	26	WWD	WOONSOCKET	OPEN	
C6	55	C6-55	CASS AVE	AT EAST PROPERTY LINE OF RICARD ST	6	BLOW OFF			20	WWD	WOONSOCKET	CLOSED	
C6	56	C6-56	RICARD ST	AT SOUTH PROPERTY LINE OF CASS AVE LINE NOT IN SERVICE	6	GATE			20	WWD	WOONSOCKET	CLOSED	
C6	57	C6-57	BEACON AVE	AT SOUTH PROPERTY LINE OF EDGEWOOD AVE	8	GATE		1933	26	WWD	WOONSOCKET	OPEN	
C6	58	C6-58	BEACON AVE	AT SOUTH PROPERTY LINE OF FOCH AVE	8	GATE		1933	26	WWD	WOONSOCKET	OPEN	
C6	59	C6-59	BEACON AVE	AT NORTH PROPERTY LINE OF FOCH AVE	8	GATE		1933	26	WWD	WOONSOCKET	OPEN	
C6	60	C6-60	CASS AVE	70' WEST OF WEST PROPERTY LINE OF GRACE AVE	8	GATE		1971	26	WWD	WOONSOCKET	OPEN	
C6	61	C6-61	WOONSOCKET HIGH SCHOOL	REAR SIDE OF SCHOOL (GATE SETS IN LAWN FACING AYLSWORTH AVE)	6	GATE	MET	1974	20	WHS	WOONSOCKET	OPEN	TSV
C6	62	C6-62	CASS AVE	WOONSOCKET HIGH SCHOOL GATE SETS IN LAWN FACING CASS AVE	8	GATE	APS	1972		WHS	WOONSOCKET	OPEN	WHS GATE SETS IN LAWN FACING CASS AVE
C6	63	C6-63	CASS AVE	WOONSOCKET HIGH SCHOOL GATE SETS IN LAWN FACING CASS AVE	8	GATE	APS	1972		WHS	WOONSOCKET	OPEN	WHS GATE SETS IN LAWN FACING CASS AVE
C6	64	C6-64	CASS AVE	WOONSOCKET HIGH SCHOOL GATE SETS IN LAWN FACING RICARD ST	8	GATE	APS	1972		WHS	WOONSOCKET	OPEN	WHS GATE SETS IN LAWN FACING RICARD ST
C6	65	C6-65	CASS AVE	WOONSOCKET HIGH SCHOOL GATE SETS IN LAWN FACIN AYLSWORTH AVE	8	GATE	APS	1972		WHS	WOONSOCKET	OPEN	WHS GATE SETS IN LAWN FACIN AYLSWORTH AVE
C6	66	C6-66	CASS AVE	WOONSOCKET HIGH SCHOOL GATE SETS IN LAWN AT NORTHWEST SIDE OF SCHOOL	8	GATE	APS	1972		WHS	WOONSOCKET	OPEN	WHS GATE SETS IN LAWN AT NW SIDE OF SCHOOL
C6	67	C6-67	CASS AVE	WOONSOCKET HIGH SCHOOL GATE SETS IN LAWN AT NORTHWEST SIDE OF SCHOOL	8	GATE	APS	1972		WHS	WOONSOCKET	OPEN	WHS GATE SETS IN LAWN AT NW SIDE OF SCHOOL
C6	68	C6-68	CASS AVE	WOONSOCKET HIGH SCHOOL GATE SETS IN LAWN AT NORTHWEST SIDE OF SCHOOL	4	GATE	APS	1972		WHS	WOONSOCKET	OPEN	WHS GATE SETS IN LAWN AT NW SIDE OF SCHOOL
C6	69	C6-69	CASS AVE	WOONSOCKET HIGH SCHOOL GATE SETS IN LAWN AT NORTHWEST SIDE OF SCHOOL	8	GATE	APS	1972		WHS	WOONSOCKET	OPEN	WHS GATE SETS IN LAWN AT NW SIDE OF SCHOOL
C6	70	C6-70	CASS AVE	AT WEST PROPERTY LINE OF LEBRUN AVE	8	GATE		1993		WWD	WOONSOCKET		
C6	71	C6-71	LEBRUN AVE	AT NORTH PROPERTY LINE OF CASS AVE	8	GATE		1993		WWD	WOONSOCKET		
C6	72	C6-72	CASS AVE	AT EAST PROPERTY LINE OF LEBRUN AVE	8	GATE		1993		WWD	WOONSOCKET		
C6	73	C6-73	CASS AVE	AT WEST PROPERTY LINE OF ELM ST	8	GATE		1993		WWD	WOONSOCKET		
C6	74	C6-74	ELM ST	AT NORTH PROPERTY LINE OF CASS AVE	8	GATE		1993		WWD	WOONSOCKET		
C6	75	C6-75	CASS AVE	NEXT TO IN FRONT OF LEFT CORNER OF 480 CASS AVE	8	GATE		1993		WWD	WOONSOCKET		
C6	76	C6-76	CASS AVE	IN FRONT OF LEFT CORNER OF 480 CASS AVE	8	GATE		1993		WWD	WOONSOCKET		
C6	77	C6-77	EDGEWOOD AVE	TAKES FROM BEACON	8	GATE	MUELLER	1996		WWD	WOONSOCKET		
C7	1	C7-1	CAMPEAU ST	AT WEST PROPERTY LINE OF NURSERY AVE	8	GATE		1954	26	WWD	WOONSOCKET	OPEN	
C7	2	C7-2	NURSERY AVE	AT NORTH PROPERTY LINE OF CAMPEAU ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C7	3	C7-3	CAMPEAU ST	AT EAST PROPERTY LINE OF NURSERY AVE	8	GATE		1954	26	WWD	WOONSOCKET	OPEN	
C7	4	C7-4	NURSERY AVE	AT SOUTH PROPERTY LINE OF CAMPEAU ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C7	5	C7-5	WAYNE RD	AT EAST PROPERTY LINE OF MITRIS BLVD	8	GATE	LUDLOW	1963	26	WWD	WOONSOCKET	OPEN	
C7	6	C7-6	MENDON RD	AT NORTH PROPERTYLINE OF EBMH RD	12	GATE	P & C		38	WWD	WOONSOCKET	OPEN	
C7	7	C7-7	MENDON RD	AT SOUTH PROPERTY LINE OF EBMH RD	12	GATE			38	WWD	WOONSOCKET	OPEN	
C7	8	C7-8	ELDER BALLOU MEETINGHOUSE RD	AT EAST PROPERTY LINE OF MENDON RD	12	GATE			38	WWD	WOONSOCKET	OPEN	
C7	9	C7-9	ELDER BALLOU MEETINGHOUSE RD	AT WEST PROPERTY LINE OF CONRAD ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
C7	10	C7-10	ELDER BALLOU MEETINGHOUSE RD	AT EAST PROPERTY LINE OF CONRAD ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
C7	11	C7-11	CONRAD ST	AT SOUTH PROPERTY LINE OF EBMH RD	8	GATE			26	WWD	WOONSOCKET	OPEN	
C7	12	C7-12	CAMPEAU ST	AT WEST PROPERTY LINE OF NEWTON ST	8	GATE		1954	26	WWD	WOONSOCKET	OPEN	
C7	13	C7-13	NEWTON ST	AT SOUTH PROPERTY LINE OF CAMPEAU ST	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	
C7	14	C7-14	CAMPEAU ST	AT EAST PROPERTY LINE OF NEWTON ST	8	GATE		1954	26	WWD	WOONSOCKET	OPEN	
C7	15	C7-15	MITRIS BLVD	AT NORTH PROPERTY LINE OF CAMPEAU ST	8	GATE	LUDLOW	1959	26	WWD	WOONSOCKET	OPEN	
C7	16	C7-16	CAMPEAU ST	AT EAST PROPERTY LINE OF MITRIS BLVD	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	
C7	17	C7-17	DANA ST	AT SOUTH PROPERTY LINE OF CAMPEAU ST	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	
C7	18	C7-18	LEFRANCOIS BLVD	AT WEST PROPERTY LINE OF BOURASSA AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C7	19	C7-19	BOURASSA AVE	AT NORTH PROPERTY LINE OF LEFRANCOIS BLVD	8	GATE			26	WWD	WOONSOCKET	OPEN	
C7	20	C7-20	LEFRANCOIS BLVD	AT EAST PROPERTY LINE OF BOURASSA AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C7	21	C7-21	BOURASSA AVE	AT SOUTH PROPERTY LINE OF LEFRANCOIS BLVD	8	GATE		1953	26	WWD	WOONSOCKET	OPEN	
C7	22	C7-22	LEFRANCOIS BLVD	AT WEST PROPERTY LINE OF PAPINEAU AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C7	23	C7-23	PAPINEAU AVE	AT NORTH PROPERTY LINE OF LEFRANCOIS BLVD	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
C7	24	C7-24	LEFRANCOIS BLVD	AT EAST PROPERTY LINE OF PAPINEAU AVE	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
C7	25	C7-25	PAPINEAU AVE	AT SOUTH PROPERTY LINE OF LEFRANCOIS BLVD	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
C7	26	C7-26	LEFRANCOIS BLVD	AT WEST PROPERTY LINE OF MENDON RD	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
C7	27	C7-27	MENDON RD	AT NORTH PROPERTY LINE OF LEFRANCOIS BLVD	12	GATE	P & C		38	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
C7	28	C7-28	MENDON RD	AT SOUTH PROPERTY LINE OF LEFRANCOIS BLVD	12	GATE	P & C		38	WWD	WOONSOCKET	OPEN	
C7	29	C7-29	MENDON RD	AT NORTH PROPERTY LINE OF CONRAD ST	12	GATE	P & C		38	WWD	WOONSOCKET	OPEN	
C7	30	C7-30	CONRAD ST	AT EAST PROPERTY LINE OF MENDON RD	8	GATE			26	WWD	WOONSOCKET	OPEN	
C7	31	C7-31	ELDER BALLOU MEETINGHOUSE RD	AT WEST PROPERTY LINE OF THERESA ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
C7	32	C7-32	THERESA ST	AT SOUTH PROPERTY LINE OF EBMH RD	8	GATE			26	WWD	WOONSOCKET	OPEN	
C7	33	C7-33	ELDER BALLOU MEETINGHOUSE RD	AT EAST PROPERTY LINE OF THERESA ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
C7	34	C7-34	ELDER BALLOU MEETINGHOUSE RD	AT WEST PROPERTY LINE OF MACARTHUR RD	12	GATE			38	WWD	WOONSOCKET	CLOSED	
C7	35	C7-35	MACARTHUR RD	AT NORTH PROPERTY LINE OF EBMH RD	8	GATE		1956	26	WWD	WOONSOCKET	OPEN	
C7	36	C7-36	HOLLAND AVE	AT WEST PROPERTY LINE OF NURSERY AVE	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
C7	37	C7-37	VICTORY BLVD	AT EAST PROPERTY LINE OF NURSERY AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
C7	38	C7-38	NEWTON ST	AT SOUTH PROPERTY LINE OF COLONY AVE	8	GATE	APS	1962	26	WWD	WOONSOCKET	OPEN	
C7	39	C7-39	VICTORY BLVD	AT WEST PROPERTY LINE OF NEWTON ST	8	GATE	APS	1962	26	WWD	WOONSOCKET	OPEN	
C7	40	C7-40	NEWTON ST	AT NORTH PROPERTY LINE OF VICTORY BLVD	8	GATE	APS	1962	26	WWD	WOONSOCKET	OPEN	
C7	41	C7-41	NEWTON ST	AT SOUTH PROPERTY LINE OF VICTORY BLVD	8	GATE	APS	1962	26	WWD	WOONSOCKET	OPEN	
C7	42	C7-42	DANA ST	AT SOUTH PROPERTY LINE OF LAMBERT AVE	8	GATE	APS	1963	26	WWD	WOONSOCKET	OPEN	
C7	43	C7-43	LAMBERT AVE	AT EAST PROPERTY LINE OF DANA ST	8	GATE	APS	1961	26	WWD	WOONSOCKET	OPEN	
C7	44	C7-44	BOURASSA AVE	AT NORTH PROPERTY LINE OF LANGEVIN ST	8	GATE	APS	1964	26	WWD	WOONSOCKET	OPEN	
C7	45	C7-45	LANGEVIN ST	AT WEST PROPERTY LINE OF PAPINEAU ST	8	GATE	APS	1964	26	WWD	WOONSOCKET	OPEN	
C7	46	C7-46	PAPINEAU AVE	AT NORTH PROPERTY LINE OF LANGEVIN ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C7	47	C7-47	LANGEVIN ST	AT WEST PROPERTY LINE OF MENDON RD	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
C7	48	C7-48	MENDON RD	AT SOUTH PROPERTY LINE OF LANGEVIN ST	12	GATE	P & C		38	WWD	WOONSOCKET	OPEN	
C7	49	C7-49	THERESA ST	AT EAST PROPERTY LINE OF MENDON RD	8	GATE	MUELLER		26	WWD	WOONSOCKET	OPEN	
C7	50	C7-50	CONRAD ST	SOUTHWEST PROPERTY LINE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C7	51	C7-51	CONRAD ST	NORTH PROPERTY LINE OF CONRAD ST OFF MENDON RD	8	GATE			26	WWD	WOONSOCKET	OPEN	
C7	52	C7-52	THERESA ST	AT NORTH PROPERTY LINE OF PICHETTE BLVD	8	GATE	MUELLER	1958	26	WWD	WOONSOCKET	OPEN	
C7	53	C7-53	PICHETTE BLVD	AT EAST PROPERTY LINE OF THERESA ST	8	GATE	MUELLER	1958	26	WWD	WOONSOCKET	OPEN	
C7	54	C7-54	LEXINGTON ST	AT SOUTH PROPERTY LINE OF ARLINGTON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C7	55	C7-55	ARLINGTON ST	AT EAST PROPERTY LINE OF LEXINGTON ST	8	GATE		1941	26	WWD	WOONSOCKET	OPEN	
C7	56	C7-56	ARLINGTON ST	AT WEST PROPERTY LINE OF NEWTON ST	8	GATE		1941	26	WWD	WOONSOCKET	OPEN	
C7	57	C7-57	NEWTON ST	AT NORTH PROPERTY LINE OF ARLINGTON ST	8	GATE		1960	26	WWD	WOONSOCKET	OPEN	
C7	58	C7-58	ARLINGTON ST	AT EAST PROPERTY LINE OF NEWTON ST	8	GATE		1941	26	WWD	WOONSOCKET	OPEN	
C7	59	C7-59	ARLINGTON ST	AT WEST PROPERTY LINE OF DANA ST	8	GATE		1941	26	WWD	WOONSOCKET	OPEN	
C7	60	C7-60	DANA ST	AT NORTH PROPERTY LINE OF ARLINGTON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C7	61	C7-61	DANA ST	AT SOUTH PROPERTY LINE OF ARLINGTON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
C7	62	C7-62	LAMBERT AVE	AT WEST PROPERTY LINE OF MENDON RD	8	GATE	APS	1961	26	WWD	WOONSOCKET	OPEN	
C7	63	C7-63	MENDON RD	AT CENTER LINE OF LAMBERT AVE	8	GATE	APS	1963	26	WWD	WOONSOCKET	OPEN	TSV
C7	64	C7-64	MARIE ANN CT	AT NORTH PROPERTY LINE OF PICHETTE BLVD	8	GATE	APS	1963	26	WWD	WOONSOCKET	OPEN	
C7	65	C7-65	PICHETTE BLVD	60' FROM EAST PROPERTY LINE OF MARIE ANN CT	1	BLOW OFF		1958	1	WWD	WOONSOCKET	CLOSED	
C7	66	C7-66	CASS AVE	130' FROM WEST PROPERTY LINE OF LEXINGTON ST	10	GATE			32	WWD	WOONSOCKET	OPEN	
C7	67	C7-67	CASS AVE	40' FROM WEST PROPERTY LINE OF LEXINGTON ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
C7	68	C7-68	LEXINGTON ST	AT NORTH PROPERTY LINE OF CASS AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
C7	69	C7-69	LEXINGTON ST	AT NORTH PROPERTY LINE OF CASS AVE	6	GATE		1957	20	WWD	WOONSOCKET	OPEN	TSV
C7	70	C7-70	CASS AVE	AT CENTER LINE OF RODMAN ST	6	GATE		1957	20	WWD	WOONSOCKET	OPEN	TSV
C7	71	C7-71	RODMAN ST	AT SOUTH PROPERTY LINE OF CASS AVE	6	GATE	CHAPMAN		20	WWD	WOONSOCKET	OPEN	
C7	72	C7-72	CASS AVE	AT WEST PROPERTY LINE OF KENWOOD ST	6	GATE			20	WWD	WOONSOCKET	OPEN	TSV
C7	73	C7-73	KENWOOD ST	AT SOUTH PROPERTY LINE OF CASS AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
C7	74	C7-74	DANA ST	AT NORTH PROPERTY LINE OF CASS AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
C7	75	C7-75	CASS AVE	NORTH PROPERTY LINE OF CASS AVE AT CENTER LINE OF DANA ST	6	GATE		1957	20	WWD	WOONSOCKET	OPEN	TSV
C7	76	C7-76	CASS AVE	AT CENTER LINE OF LORING ST	6	GATE		1957	20	WWD	WOONSOCKET	OPEN	TSV
C7	77	C7-77	LORING ST	AT SOUTH PROPERTY LINE OF CASS AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
C7	78	C7-78	CASS AVE	AT WEST PROPERTY LINE OF MENDON RD	12	GATE		1957	38	WWD	WOONSOCKET	OPEN	
C7	79	C7-79	MENDON RD	AT NORTH PROPERTY LINE OF CASS AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
C7	80	C7-80	MENDON RD	80' FROM NORTH PROPERTY LINE OF CASS AVE	6	GATE			20	WWD	WOONSOCKET	CLOSED	TSV
C7	81	C7-81	MENDON RD	80' FROM NORTH PROPERTY LINE OF CASS AVE	6	GATE			20	WWD	WOONSOCKET	CLOSED	
C7	82	C7-82	MADELEINE AVE	230' SOUTH OF HYDRANT #3815	8	GATE	APS	1962	26	WWD	WOONSOCKET	OPEN	
C7	83	C7-83	MENDON RD	10' NORTH OF HYDRANT #3715	6	GATE	APS	1965	20	WWD	WOONSOCKET	CLOSED	TSV
C7	84	C7-84	NURSERY AVE	AT SOUTH PROPERTY LINE OF VICTORY BLVD	8	GATE			26	WWD	WOONSOCKET	OPEN	
C7	85	C7-85	CASS AVE	10' EAST OF HYDRANT #3735	10	GATE		1957	32	WWD	WOONSOCKET	OPEN	
C7	86	C7-86	LANGEVIN ST	AT EAST PROPERTY LINE OF DANA ST	8	GATE	APS	1967	26	WWD	WOONSOCKET	OPEN	
C7	87	C7-87	MENDON RD	15' FROM SOUTH PROPERTY LINE OF LAMBERT AVE	4	GATE	MUELLER	1966	14	WWD	WOONSOCKET	OPEN	TSV
C7	88	C7-88	MENDON RD	15' FROM SOUTH PROPERTY LINE OF LAMBERT AVE	4	GATE	CHAPMAN	1966	14	WWD	WOONSOCKET	OPEN	
C7	89	C7-89	LANGEVIN ST	AT WEST PROPERTY LINE OF BOURASSA AVE	8	GATE	APS	1967	26	WWD	WOONSOCKET	OPEN	
C7	90	C7-90	LEFRANCOIS BLVD	40' FROM WEST PROPERTY LINE OF MENDON RD	6	GATE	APS	1967	20	WWD	WOONSOCKET	OPEN	TSV
C7	91	C7-91	MENDON RD	FROM NORTH PROPERTY LINE OF CASS AVE	8	GATE		1987	26	WWD	WOONSOCKET	CLOSED	TSV
C7	92	C7-92	CASS AVE	AT WEST PROPERTY LINE OF MENDON RD	6	GATE		1993		WWD	WOONSOCKET		
C8	1	C8-1	MARSHALL RD	AT WEST PROPERTY LINE OF PRISCILLA RD	8	GATE		1956	26	WWD	WOONSOCKET	OPEN	
C8	2	C8-2	PRISCILLA RD	AT NORTH PROPERTY LINE OF MARSHALL RD	8	GATE		1956	26	WWD	WOONSOCKET	OPEN	
C8	3	C8-3	MARSHALL RD	AT EAST PROPERTY LINE OF PRISCILLA RD	8	GATE		1956	26	WWD	WOONSOCKET	OPEN	
C8	4	C8-4	PRISCILLA RD	AT SOUTH PROPERTY LINE OF MARSHALL RD	8	GATE		1956	26	WWD	WOONSOCKET	OPEN	
C8	5	C8-5	NIMITZ RD	AT WEST PROPERTY LINE OF HALSEY RD	8	GATE	MUELLER	1958	26	WWD	WOONSOCKET	OPEN	
C8	6	C8-6	ANNETTE AVE	170' NORTH OF HYDRANT #3816	8	GATE		1954	26	WWD	WOONSOCKET	OPEN	
C8	7	C8-7	HALSEY RD	AT SOUTH PROPERTY LINE OF NIMITZ RD	8	GATE	MUELLER	1958	26	WWD	WOONSOCKET	OPEN	
C8	8	C8-8	MARSHALL RD	AT WEST PROPERTY LINE OF HALSEY RD	8	GATE		1958	26	WWD	WOONSOCKET	OPEN	
C8	9	C8-9	HALSEY RD	AT NORTH PROPERTY LINE OF MARSHALL RD	8	GATE		1958	26	WWD	WOONSOCKET	OPEN	
C8	10	C8-10	HALSEY RD	AT SOUTH PROPERTY LINE OF MARSHALL RD	8	GATE		1958	26	WWD	WOONSOCKET	OPEN	
C8	11	C8-11	ELDER BALLOU MEETINGHOUSE RD	AT WEST PROPERTY LINE OF PRISCILLA RD	12	GATE			38	WWD	WOONSOCKET	OPEN	
C8	12	C8-12	PRISCILLA RD	AT NORTH PROPERTY LINE OF EBMH RD	8	GATE		1956	26	WWD	WOONSOCKET	OPEN	
C8	13	C8-13	ELDER BALLOU MEETINGHOUSE RD	AT EAST PROPERTY LINE OF PRISCILLA RD	12	GATE			38	WWD	WOONSOCKET	OPEN	
C8	14	C8-14	LEMAY RD	AT NORTH PROPERTY LINE OF EBMH RD	8	GATE		1961	26	WWD	WOONSOCKET	OPEN	
C8	15	C8-15	MADELEINE AVE	AT SOUTH PROPERTY LINE OF EBMH RD	8	GATE	MUELLER	1955	26	WWD	WOONSOCKET	OPEN	
C8	16	C8-16	LEMAY RD	AT WEST PROPERTY LINE OF HALSEY RD	8	GATE		1961	26	WWD	WOONSOCKET	OPEN	
C8	17	C8-17	HALSEY RD	AT NORTH PROPERTY LINE OF LEMAY RD	8	GATE		1961	26	WWD	WOONSOCKET	OPEN	
C8	18	C8-18	HALSEY RD	AT SOUTH PROPERTY LINE OF LEMAY RD	8	GATE		1961	26	WWD	WOONSOCKET	OPEN	CHECK STREET
C8	19	C8-19	ANNETTE AVE	AT SOUTH PROPERTY LINE OF EBMH RD	8	GATE		1954	26	WWD	WOONSOCKET	OPEN	
C8	20	C8-20	ELDER BALLOU MEETINGHOUSE RD	AT WEST PROPERTY LINE OF HALSEY RD	8	GATE		1961	26	WWD	WOONSOCKET	OPEN	
C8	21	C8-21	HALSEY RD	AT NORTH PROPERTY LINE OF EBMH RD	8	GATE		1958	26	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
C8	22	C8-22	ELDER BALLOU MEETINGHOUSE RD	AT EAST PROPERTY LINE OF HALSEY RD	12	GATE		1964	38	WWD	WOONSOCKET	OPEN	
C8	23	C8-23	ANNETTE AVE	40' SOUTH OF HYDRANT # 3816	8	GATE	APS	1962	26	WWD	WOONSOCKET	OPEN	
C8	24	C8-24	ELDER BALLOU MEETINGHOUSE RD	AT EAST PROPERTY LINE OF MACARTHUR RD	12	GATE			38	WWD	WOONSOCKET	OPEN	
C8	25	C8-25	PRISCILLA RD	150' SOUTH OF HYDRANT #3800	6	GATE		1956	20	WWD	WOONSOCKET	OPEN	
C8	26	C8-26	GRANDVIEW AVE	AT NORTH PROPERTY LINE OF EBMH RD	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
C8	27	C8-27	BAYBERRY RD	AT EAST PROPERTY LINE OF GRANDVIEW AVE	8	GATE	APS	1968	26	WWD	WOONSOCKET	OPEN	
C8	28	C8-28	GRANDVIEW AVE	AT NORTH PROPERTY LINE OF BAYBERRY RD	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
C8	29	C8-29	CAREY CT	AT 8" MAIN IN EBMH RD	8	GATE	MET	1973	27	WWD	WOONSOCKET	OPEN	TSV
C8	30	C8-30	CAREY CT	AT THE BEGINNING OF THE CUL-DE-SAC	0.75	BLOW OFF		1975		WWD	WOONSOCKET	CLOSED	
C8	31	C8-31	CAREY CT	340' NORTH OF EBMH RD	8	GATE	MET	1975		WWD	WOONSOCKET	OPEN	TSV
C8	32	C8-32	VIVA WAY	OFF ELDER BALLOU	8	GATE	KENNEDY	1978	26	WWD	WOONSOCKET	OPEN	
C8	33	C8-33	TARA LANE	AT NORTHERLY STREET LINE OF LEDGEWOOD LANE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C8	34	C8-34	TARA LANE	AT SOUTHERLY STREET LINE OF LEDGEWOOD	8	GATE			26	WWD	WOONSOCKET	CLOSED	
C8	35	C8-35	LEDGEWOOD LANE	AT STREET LINE OF TARA LANE	8	GATE			26	WWD	WOONSOCKET	OPEN	
C8	36	C8-36	ELDER BALLOU MEETINGHOUSE RD	OPPOSITE TARA LANE	12	GATE			38	WWD	WOONSOCKET	OPEN	
C8	37	C8-37	TARA LANE	117' FROM SOUTH STREET LINE OF LEDGEWOOD LANE	8	GATE		1988	26	WWD	WOONSOCKET	OPEN	
C9	1	C9-1	ELDER BALLOU MEETINGHOUSE RD	155' EAST OF HYDRANT # 3902	12	GATE		1964	38	WWD	WOONSOCKET	OPEN	
C9	2	C9-2	BOUND RD	AT NORTH PROPERTY LINE OF EBMH RD	12	GATE		1964	38	WWD	WOONSOCKET	OPEN	
C9	3	C9-3	WALNUT HILL RD	AT EAST PROPERTY LINE OF BAYBERRY RD	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
C9	4	C9-4	BAYBERRY RD	AT SOUTH PROPERTY LINE OF WALNUT HILL	8	GATE	APS	1968	26	WWD	WOONSOCKET	OPEN	
C9	5	C9-5	WALNUT HILL RD	AT EAST PROPERTY LINE OF GRANDVIEW AVE	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
C9	6	C9-6								WWD	WOONSOCKET		NO CARD
C9	7	C9-7								WWD	WOONSOCKET		NO CARD
C9	8	C9-8								WWD	WOONSOCKET		NO CARD
C9	9	C9-9								WWD	WOONSOCKET		NO CARD
C9	10	C9-10	ELDER BALLOU MEETINGHOUSE RD	127' FROM HYDRANT #3905 AND 59.5 OFF BACKEDGE CATCH BASIN	12	GATE				WWD	WOONSOCKET		
C9	11	C9-11	BROOKHAVEN LANE	92' FROM FRONT LEFT PORCH UNIT 102 AND 73.8 FROM FRONT PORCH UNIT 101	6	GATE				BROOKHAVEN	WOONSOCKET		PRIVATE?
C-NS	1	C-NS-1	RHODES AVE, NS	320' EAST OF HYDRANT # 3NS00	10	GATE	APS		32	PACHECO	NS	OPEN	
C-NS	2	C-NS-2	MENDON RD, NS	SOUTH PROPERTY LINE OF RHODES AVE	8	GATE	APS		26	PACHECO	NS	OPEN	
C-NS	3	C-NS-3	MENDON RD, NS	DRIVEWAY IN PACHECO PLAT AT NORTH PROPERTY LINE OF MENDON RD	8	GATE	APS		26	PACHECO	NS	OPEN	
C-NS	4	C-NS-4	CYNTHIA DR, NS	250' SOUTH OF DEBORAH AVE	8	GATE	APS		26	PACHECO	NS	OPEN	
C-NS	5	C-NS-5	DEBORAH AVE, NS	AT EAST PROPERTY LINE OF CYNTHIA DR	8	GATE	APS		26	PACHECO	NS	OPEN	
C-NS	6	C-NS-6	SHARON PARKWAY, NS	AT NORTH PROPERTY LINE OF CYNTHIA DR	8	GATE	APS		26	PACHECO	NS	OPEN	
C-NS	7	C-NS-7	SHARON PARKWAY, NS	AT EAST PROPERTY LINE OF SHARON PARKWAY	8	GATE	APS		26	PACHECO	NS	OPEN	
C-NS	8	C-NS-8	MENDON RD, NS	#401	6	GATE		1976	21	PACHECO	NS	OPEN	
C-NS	9	C-NS-9	DEBORAH AVE, NS	AT MENDON RD	8	GATE				PACHECO	NS	OPEN	
C-NS	10	C-NS-10	MENDON RD, NS	AT DEBORAH , 33.5' FROM POLE #41, 85' FROM CORNER HOUSE #431	8	GATE				PACHECO	NS	OPEN	
D1	1	D1-1								WWD	WOONSOCKET		NO CARD
D1	2	D1-2	TENTH AVE	AT SOUTH PROPERTY LINE OF CHAPEL ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D1	3	D1-3	CHAPEL ST	AT EAST PROPERTY LINE OF TENTH AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
D1	4	D1-4	CHAPEL ST	AT WEST PROPERTY LINE OF NINTH AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
D1	5	D1-5	NINTH AVE	AT NORTH PROPERTY LINE OF CHAPEL ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D1	6	D1-6	NINTH AVE	AT SOUTH PROPERTY LINE OF CHAPEL ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D1	7	D1-7	EIGHTH AVE	AT NORTH PROPERTY LINE OF CHAPEL ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D1	8	D1-8	EIGHTH AVE	AT SOUTH PROPERTY LINE OF CHAPEL ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D1	9	D1-9								WWD	WOONSOCKET		NO CARD
D1	10	D1-10	SEVENTH AVE	AT NORTH PROPERTY LINE OF CHAPEL ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D1	11	D1-11	BOURDON BLVD	AT SOUTH PROPERTY LINE OF MASON ST	8	GATE		1952	26	WWD	WOONSOCKET	OPEN	
D1	12	D1-12	MASON ST	AT WEST PROPERTY LINE OF TENTH AVE	8	GATE		1952	26	WWD	WOONSOCKET	OPEN	
D1	13	D1-13	TENTH AVE	AT NORTH PROPERTY LINE OF MASON ST	8	GATE		1952	26	WWD	WOONSOCKET	OPEN	
D1	14	D1-14	MASON ST	AT EAST PROPERTY LINE OF TENTH AVE	8	GATE		1952	26	WWD	WOONSOCKET	OPEN	
D1	15	D1-15	MASON ST	AT WEST PROPERTY LINE OF NINTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D1	16	D1-16	NINTH AVE	AT NORTH PROPERTY LINE OF MASON ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D1	17	D1-17	MASON ST	AT EAST PROPERTY LINE OF NINTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D1	18	D1-18	MASON ST	AT WEST PROPERTY LINE OF EIGHTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D1	19	D1-19	EIGHTH AVE	AT NORTH PROPERTY LINE OF MASON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D1	20	D1-20	MASON ST	AT EAST PROPERTY LINE OF EIGHTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D1	21	D1-21	BOURDON BLVD	65' FROM SOUTH PROPERTY LINE OF MASON ST	8	GATE		1953	26	WWD	WOONSOCKET	OPEN	
D1	22	D1-22	BOURDON BLVD	25' NORTH OF HYDRANT #4110	8	GATE		1953	26	WWD	WOONSOCKET	OPEN	
D1	23	D1-23	BOURDON BLVD	30' NORTH OF HYDRANT #4112	6	GATE			20	WWD	WOONSOCKET	OPEN	
D1	24	D1-24	BOURDON BLVD	20' EAST OF HYDRANT #4114	8	GATE		1953	26	WWD	WOONSOCKET	OPEN	
D1	25	D1-25	BOURDON BLVD	AT MEMORIAL DR	6	GATE		1953	20	WWD	WOONSOCKET	OPEN	
D2	1	D2-1	SIXTH AVE	AT NORTH PROPERTY LINE OF CHAPEL ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	2	D2-2	SIXTH AVE	AT SOUTH PROPERTY LINE OF CHAPEL ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	3	D2-3	FIFTH AVE	AT SOUTH PROPERTY LINE OF CHAPEL ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	4	D2-4	FIFTH AVE	75' FROM NORTH PROPERTY LINE OF OLO ST	4	GATE		1992	14	WWD	WOONSOCKET	OPEN	REPLACED 7/92
D2	5	D2-5	SECOND AVE	AT SOUTH PROPERTY LINE OF OLO ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D2	6	D2-6	OLO ST	AT WEST PROPERTY LINE OF FIRST AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
D2	7	D2-7	FIRST AVE	AT NORTH PROPERTY LINE OF OLO ST	8	GATE			26	WWD	WOONSOCKET	OPEN	CHK
D2	8	D2-8	FOUNDRY ST	AT SOUTH PROPERTY LINE OF OLO ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D2	9	D2-9	HOPE ST	AT EAST PROPERTY LINE OF WEST ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
D2	10	D2-10	MASON ST	AT WEST PROPERTY LINE OF SEVENTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	11	D2-11	SEVENTH AVE	AT NORTH PROPERTY LINE OF MASON ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D2	12	D2-12	MASON ST	AT EAST PROPERTY LINE OF SEVENTH AVE	8	GATE		1900		WWD	WOONSOCKET	OPEN	
D2	13	D2-13	SIXTH AVE	AT NORTH PROPERTY LINE OF OLO ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	14	D2-14	SIXTH AVE	AT SOUTH PROPERTY LINE OF OLO ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	15	D2-15	MASON ST	AT WEST PROPERTY LINE OF SIXTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	16	D2-16	SIXTH AVE	AT NORTH PROPERTY LINE OF MASON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	17	D2-17	MASON ST	AT EAST PROPERTY LINE OF SIXTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	18	D2-18	FOURTH AVE	AT NORTH PROPERTY LINE OF OLO ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D2	19	D2-19	OLO ST	AT EAST PROPERTY LINE OF FOURTH AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
D2	20	D2-20	FOURTH AVE	AT SOUTH PROPERTY LINE OF OLO ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D2	21	D2-21	OLO ST	AT WEST PROPERTY LINE OF THIRD AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
D2	22	D2-22	THIRD AVE	AT NORTH PROPERTY LINE OF OLO ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D2	23	D2-23	THIRD AVE	AT SOUTH PROPERTY LINE OF OLO ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D2	24	D2-24	OLO ST	AT WEST PROPERTY LINE OF WEST ST	6	GATE			20	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
D2	25	D2-25	WEST ST	AT NORTH PROPERTY LINE OF OLO ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D2	26	D2-26	OLO ST	AT EAST PROPERTY LINE OF WEST ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D2	27	D2-27	WEST ST	AT SOUTH PROPERTY LINE OF OLO ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D2	28	D2-28	MASON ST	AT WEST PROPERTY LINE OF ASYLUM ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	29	D2-29	ASYLUM ST	AT SOUTH PROPERTY LINE OF MASON ST	6	GATE		1894	20	WWD	WOONSOCKET	OPEN	
D2	30	D2-30	MASON ST	AT EAST PROPERTY LINE OF ASYLUM ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	31	D2-31	FIFTH AVE	AT NORTH PROPERTY LINE OF MASON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	32	D2-32	MASON ST	AT EAST PROPERTY LINE OF FIFTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	33	D2-33	MASON ST	AT WEST PROPERTY LINE OF FOURTH AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	34	D2-34	MASON ST	AT NORTH PROPERTY LINE OF MASON ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D2	35	D2-35	MASON ST	AT WEST PROPERTY LINE OF SUNNYSIDE AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	36	D2-36	SUNNYSIDE AVE	AT SOUTH PROPERTY LINE OF MASON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	37	D2-37	MASON ST	AT WEST PROPERTY LINE OF THIRD AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	38	D2-38	THIRD AVE	AT NORTH PROPERTY LINE OF MASON ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D2	39	D2-39	MASON ST	AT EAST PROPERTY LINE OF THIRD AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	40	D2-40	MASON ST	AT WEST PROPERTY LINE OF SECOND AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	41	D2-41	SECOND AVE	AT NORTH PROPERTY LINE OF MASON ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D2	42	D2-42	SECOND AVE	10' FROM NORTH PROPERTY LINE OF MASON ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D2	43	D2-43	WEST ST	AT SOUTH PROPERTY LINE OF SOUTH ST	8	GATE			26	WWD	WOONSOCKET	OPEN	CHK DATE
D2	44	D2-44	WEST ST	AT NORTH PROPERTY LINE OF SOUTH ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D2	45	D2-45	SOUTH ST	AT EAST PROPERTY LINE OF WEST ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	46	D2-46	JOHN ST	AT SOUTH PROPERTY LINE OF SOUTH ST	4	GATE			14	WWD	WOONSOCKET	OPEN	
D2	47	D2-47	SOUTH ST	AT WEST PROPERTY LINE OF CENTER ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	48	D2-48	CENTER ST	AT NORTH PROPERTY LINE OF SOUTH ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	49	D2-49	RUBY ST	AT EAST PROPERTY LINE OF ASYLUM ST	4	GATE			14	WWD	WOONSOCKET	OPEN	
D2	50	D2-50	SUNNYSIDE AVE	35' SOUTH OF HYDRANT #4234	6	GATE	APS	1944	20	WWD	WOONSOCKET	OPEN	TSV
D2	51	D2-51	SUNNYSIDE AVE	35' SOUTH OF HYDRANT #4234	6	GATE	MUELLER	1944	20	WWD	WOONSOCKET	OPEN	
D2	52	D2-52	MASON ST	120' SOUTH OF HYDRANT # 4228	6	GATE		1919	20	WWD	WOONSOCKET	OPEN	
D2	53	D2-53	MASON ST	90' SOUTH OF HYDRANT # 4228	6	GATE		1921	20	WWD	WOONSOCKET	OPEN	
D2	54	D2-54	OAK ST	AT EAST PROPERTY LINE OF MASON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	55	D2-55	PLEASANT ST	AT WEST PROPERTY LINE OF JOHN ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D2	56	D2-56	JOHN ST	AT NORTH PROPERTY LINE OF PLEASANT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D2	57	D2-57	BUXTON ST	AT SOUTH PROPERTY LINE OF SOUTH MAIN ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D2	58	D2-58	BOURDON BLVD	AT WEST PROPERTY LINE OF ASYLUM ST	8	GATE		1953	26	WWD	WOONSOCKET	OPEN	
D2	59	D2-59	ASYLUM ST	AT NORTH PROPERTY LINE OF BOURDON BLVD	6	GATE		1953	20	WWD	WOONSOCKET	OPEN	
D2	60	D2-60	SUNNYSIDE AVE	AT EAST PROPERTY LINE OF ASYLUM ST	8	GATE		1953	26	WWD	WOONSOCKET	OPEN	
D2	61	D2-61	SUNNYSIDE AVE	AT SOUTH PROPERTY LINE OF RUBY ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	62	D2-62	RUBY ST	AT WEST PROPERTY LINE OF SUNNYSIDE AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	63	D2-63	SUNNYSIDE AVE	AT NORTH PROPERTY LINE OF RUBY ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	64	D2-64	SUNNYSIDE AVE	20' FROM SOUTH PROPERTY LINE OF RUBY ST	6	GATE	APS	1989	21	WWD	WOONSOCKET	OPEN	
D2	65	D2-65	PLEASANT ST	AT EAST PROPERTY LINE OF MASON ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D2	66	D2-66	SOUTH MAIN ST	AT WEST PROPERTY LINE OF MASON ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
D2	67	D2-67	MASON ST	AT NORTH PROPERTY LINE OF SOUTH MAIN ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D2	68	D2-68	SOUTH MAIN ST	AT EAST PROPERTY LINE OF MASON ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
D2	69	D2-69	SOUTH MAIN ST	AT WEST PROPERTY LINE OF PROVIDENCE ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
D2	70	D2-70	SOUTH MAIN ST	AT EAST PROPERTYL INE OF PROVIDENCE ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
D2	71	D2-71	PROVIDENCE ST	AT SOUTH PROPERTYLINE OF SOUTH MAIN ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
D2	72	D2-72	SECOND AVE	70' FROM SOUTH PROPERTY LINE OF SHORT ST	4	GATE		1992	14	WWD	WOONSOCKET	OPEN	REPLACED 7/92
D2	73	D2-73	MASON ST	165' SOUTH OF HYDRANT #4228	8	GATE	MET	1973	26	WWD	WOONSOCKET	OPEN	
D3	1	D3-1	JEFFERS ST	AT EAST PROPERTY LINE OF WEST ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D3	2	D3-2	SAYLES ST	AT WEST PROPERTY LINE OF CENTER ST	4	GATE			14	WWD	WOONSOCKET	OPEN	
D3	3	D3-3	CENTER ST	AT SOUTH PROPERTY LINE OF SAYLES ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	4	D3-4	JEFFERS ST	AT WEST PROPERTY LINE OF CENTER ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	5	D3-5	CENTER ST	AT NORTH PROPERTY LINE OF JEFFERS ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	6	D3-6	JEFFERS ST	AT EAST PROPERTY LINE OF CENTER ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	7	D3-7	CENTER ST	AT SOUTH PROPERTY LINE OF JEFFERS ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	8	D3-8	SAYLES ST	24.3 FROM HYD ON SAYLES ST AND 15' FROM CORNER SAYLES ST AND EAST ST	6	GATE		1978	20	WWD	WOONSOCKET	OPEN	
D3	9	D3-9	EAST ST	AT SOUTH PROPERTY LINE OF SAYLES ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	10	D3-10	SAYLES ST	AT EAST PROPERTY LINE OF EAST ST	6	GATE			20	WWD	WOONSOCKET	CLOSED	
D3	11	D3-11	SAYLES ST	AT WEST PROPERTY LINE OF RIVER ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D3	12	D3-12	RIVER ST	AT NORTH PROPERTY LINE OF SAYLES ST	14	GATE			44	WWD	WOONSOCKET	OPEN	
D3	13	D3-13	SAYLES ST	AT EAST PROPERTY LINE OF RIVER ST	4	GATE			14	WWD	WOONSOCKET	CLOSED	
D3	14	D3-14	ARNOLD ST	AT CENTER LINE OF SAYLES ST	4	GATE		1888	14	WWD	WOONSOCKET	OPEN	
D3	15	D3-15	MAIN ST	15' NORTH OF HYDRANT #4310	6	GATE			20	WWD	WOONSOCKET	OPEN	
D3	16	D3-16	MAIN ST	10' NORTH OF HYDRANT #4310	4	GATE			14	WWD	WOONSOCKET	OPEN	
D3	17	D3-17	MAIN ST	15' NORTH OF HYDRANT #4310	6	GATE			20	WWD	WOONSOCKET	OPEN	
D3	18	D3-18	BERNON ST	60' EAST OF HYDRANT #4314	14	GATE		1885	44	WWD	WOONSOCKET	ABANDONED	
D3	19	D3-19	HOPE ST	AT WEST PROPERTY LINE OF CENTER ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	20	D3-20	CENTER ST	AT NORTH PROPERTY LINE OF HOPE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	21	D3-21	HOPE ST	AT EAST PROPERTY LINE OF CENTER ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	22	D3-22	CENTER ST	AT SOUTH PROPERTY LINE OF HOPE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	23	D3-23	OLO ST	AT WEST PROPERTY LINE OF CENTER ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	24	D3-24	CENTER ST	AT NORTH PROPERTY LINE OF OLO ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	25	D3-25	OLO ST	AT EAST PROPERTY LINE OF CENTER ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	26	D3-26	CENTER ST	AT SOUTH PROPERTY LINE OF OLO ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	27	D3-27	HOPE ST	75 EAST OF HYDRANT #4317	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
D3	28	D3-28	JEFFERS ST	AT WEST PROPERTY LINE OF EAST ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	29	D3-29	EAST ST	AT SOUTH PROPERTY LINE OF JEFFERS ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	30	D3-30	HOPE ST	AT WEST PROPERTY LINE OF EAST ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	31	D3-31	EAST ST	AT SOUTH PROPERTY LINE OF HOPE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	32	D3-32	ARNOLD ST	AT NORTH PROPERTY LINE OF BERNON ST	14	GATE		1888	44	WWD	WOONSOCKET	OPEN	
D3	33	D3-33	ARNOLD ST	AT WEST PROPERTY LINE OF MAIN ST	8	GATE		1888	26	WWD	WOONSOCKET	OPEN	
D3	34	D3-34	MAIN ST	AT WEST PROPERTY LINE OF ARNOLD ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
D3	35	D3-35	BERNON ST	AT EAST PROPERTY LINE OF MAIN ST	14	GATE		1885	44	WWD	WOONSOCKET	OPEN	
D3	36	D3-36	SOUTH MAIN ST	AT SOUTH PROPERTY LINE OF BERNON ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
D3	37	D3-37	ALLEN ST	AT NORTH PROPERTY LINE OF BERNON ST	8	GATE		1896	26	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
D3	38	D3-38	ARMORY ST	AT EAST PROPERTY LINE OF ALLEN ST	6	GATE		1900	20	WWD	WOONSOCKET	OPEN	ARMORY=BERNON ON GRIDS
D3	39	D3-39	BERNON ST	NORTHEASTERLY SIDE OF BRIDGE, NEAR PRIVATE PASSWAY	14	GATE		1885	44	WWD	WOONSOCKET	CLOSED	
D3	40	D3-40	FRONT ST	AT NORTH PROPERTY LINE OF BERNON ST	6	GATE	MUELLER	1989	20	WWD	WOONSOCKET	OPEN	
D3	41	D3-41	FRONT ST	AT SOUTH PROPERTY LINE OF BERNON ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D3	42	D3-42	OLO ST	85' WEST OF HYDRANT #4327	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	43	D3-43	OLO ST	AT WEST PROPERTY LINE OF EAST ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	44	D3-44	EAST ST	AT SOUTH PROPERTY LINE OF OLO ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	45	D3-45	EAST ST	AT NORTH PROPERTY LINE OF SOUTH MAIN ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	46	D3-46	SOUTH MAIN ST	AT WEST PROPERTY LINE OF EAST ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
D3	47	D3-47	FRONT ST	AT SOUTH PROPERTY LINE OF SOUTH MAIN	12	GATE			38	WWD	WOONSOCKET	OPEN	
D3	48	D3-48	SOUTH MAIN ST	40' FROM EAST PROPERTY LINE OF GLENMARK ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
D3	49	D3-49	SOUTH MAIN ST	70' WEST OF HYDRANT # 4333	12	GATE			38	WWD	WOONSOCKET	OPEN	
D3	50	D3-50	SOUTH MAIN ST	25' WEST OF HYDRANT # 4333	6	GATE			20	WWD	WOONSOCKET	OPEN	
D3	51	D3-51	SOUTH MAIN ST	40' WEST OF HYDRANT # 4333	6	GATE			20	WWD	WOONSOCKET	CLOSED	
D3	52	D3-52	ISLAND PLACE	AT SOUTH PROPERTY LINE OF SOUTH MAIN ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D3	53	D3-53	ISLAND PLACE	40' FROM SOUTH PROPERTY LINE OF SOUTH MAIN ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D3	54	D3-54	WATSON ST	AT EAST PROPERTY LINE OF FRONT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	55	D3-55	SOUTH MAIN ST	AT WEST PROPERTY LINE OF PLEASANT ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
D3	56	D3-56	PLEASANT ST	AT NORTH PROPERTY LINE OF SOUTH MAIN ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D3	57	D3-57	SOUTH MAIN ST	AT WEST PROPERTYLINE OF SOUTH ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
D3	58	D3-58	SOUTH ST	AT NORTH PROPERTY LINE OF SOUTH MAIN	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	59	D3-59	LINCOLN ST	AT WEST PROPERTY LINE OF FRONT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D3	60	D3-60	FRONT ST	35' FROM SOUTH PROPERTY LINE OF PINE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D3	61	D3-61	PINE ST	AT EAST PROPERTY LINE OF FRONT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	62	D3-62	PINE ST	AT WEST PROPERTY LINE OF UNION ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	63	D3-63	UNION ST	AT NORTH PROPERTY LINE OF PINE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	64	D3-64	PINE ST	AT EAST PROPERTY LINE OF UNION ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	65	D3-65	BUXTON ST	AT NORTH PROPERTY LINE OF PARKER ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	66	D3-66	PARKER ST	AT WEST PROPERTYLINE OF BUXTON ST	8	GATE		1997	26	WWD	WOONSOCKET	OPEN	REPLACED
D3	67	D3-67	PARKER ST	AT EAST PROPERTY LINE OF BUXTON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	68	D3-68	PARKER ST	AT NORTH PROPERTY LINE OF LINCOLN ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	69	D3-69	FRONT ST	AT NORTH PROPERTY LINE OF LOGEE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D3	70	D3-70	LOGEE ST	AT EAST PROPERTY LINE OF FRONT ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
D3	71	D3-71	PINE ST	AT WEST PROPERTY LINE OF PARK AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	72	D3-72	BERNON ST	25' FROM EAST PROPERTY LINE OF RIVER ST	6	GATE		1926	20	WWD	WOONSOCKET	CLOSED	
D3	73	D3-73	SOUTH MAIN ST	45' SOUTH OF HYDRANT #4321	6	GATE	APS	1964	20	WWD	WOONSOCKET	OPEN	TSV
D3	74	D3-74	SOUTH MAIN ST	45' SOUTH OF HYDRANT # 4321	6	GATE		1964	20	WWD	WOONSOCKET	OPEN	
D3	75	D3-75	EAST ST	70' FROM SOUTH PROPERTY LINE OF HOPE ST	6	GATE		1920		WWD	WOONSOCKET	CLOSED	
D3	76	D3-76	FRONT ST	160' FROM SOUTH PROPERTY LINE OF NEW ST	6	GATE			20	WWD	WOONSOCKET	CLOSED	
D3	77	D3-77	ISLAND PLACE	160' FROM S. MAIN ST.	6	GATE		1919	20	WWD	WOONSOCKET	OPEN	FIRE SUPPLY 5021
D3	78	D3-78	BERNON ST	46' FROM WEST PROPERTY LINE OF SOUTH MAIN	6	GATE		1923	20	WWD	WOONSOCKET	OPEN	FIRE SUPPLY
D3	79	D3-79	HOPE ST	48' FROM EAST PROPERTY LINE OF CENTER ST	4	GATE		1926	14	WWD	WOONSOCKET	CLOSED	FIRE SUPPLY NOT IN USE
D3	80	D3-80	PARK AVE	54' SOUTH OF HYD # 4353	4	GATE		1926	14	WWD	WOONSOCKET	CLOSED	FIRE SUPPLY NOT IN USE
D3	81	D3-81	HOPE ST	210' FROM WEST PROPERTY LINE OF EAST ST	4	GATE		1926	14	WWD	WOONSOCKET	OPEN	FIRE SUPPLY
D3	82	D3-82	EAST ST	AT SOUTH PROPERTY LINE OF SAYLES ST	8	GATE		1974	26	WWD	WOONSOCKET	OPEN	
D3	83	D3-83	BERNON ST	42.5' EAST OF HYD #4314	6	GATE	RENSELLAER	1905	20	WWD	WOONSOCKET	CLOSED	
D3	84	D3-84	BERNON ST	147' FROM PROPERTY LINE AT RIVER ST	14	GATE		1977	50	WWD	WOONSOCKET	OPEN	GATE BUTTERFLY
D3	85	D3-85	MAIN ST	IN FRONT OF #1 MAIN ST MILL WATER SUPPLY LINE	14	GATE			44	WWD	WOONSOCKET	OPEN	
D3	86	D3-86	MARKET SQUARE	ON MILL SUPPLY LINE	16	GATE			50	PRIVATE	WOONSOCKET	OPEN	ON MILL SUPPLY LINE
D3	87	D3-87	MAIN ST	ON MILL WATER SUPPLY LINE IN FRONT OF #1 MAIN ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
D3	88	D3-88	RIVER ST	IN BACK OF SOUTH MAIN DAM	18	GATE		1982	56	WWD	WOONSOCKET	OPEN	LOCATION CHANGED 1982
D3	89	D3-89	BERNON ST		8	GATE		1947		WWD	WOONSOCKET		
D3	90	D3-90	BERNON ST	FIRE SUPPLY (SAME AS SERV # 8729)	8	GATE		1947		WWD	WOONSOCKET		(SAME AS SERV # 8729)
D3	91	D3-91	MAIN ST	#65 SAME AS SERV# 6434	6	GATE		1924	20	WWD	WOONSOCKET	OPEN	
D3	92	D3-92	MAIN ST	#65 (SAME AS SERVICE # 6434)	6	GATE		1924	20	WWD	WOONSOCKET	OPEN	
D3	93	D3-93	BERNON ST	EASEMENT - 140' EAST OF EAST ST LINE OF MAIN ST	8	GATE			26	WWD	WOONSOCKET	CLOSED	SPARE
D3	94	D3-94	CENTER ST	AT SAYLES ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D3	95	D3-95	TRUMAN DR	AT ARMORY ST	10	GATE		1982	33	WWD	WOONSOCKET	OPEN	
D3	96	D3-96	FRONT ST	AT STREET LINE OF NEW ST	8	GATE		1988	26	WWD	WOONSOCKET	OPEN	TSV
D3	97	D3-97	NEW STREET	NEAR STREET LINE OF NEW & GLOBE ST	6	GATE	KENNEDY	1988	20	WWD	WOONSOCKET	CLOSED	
D3	98	D3-98	ALLEN ST	IN SIDEWALK ON WESTERLY STREET SIDE	14	GATE		1988	44	WWD	WOONSOCKET	OPEN	TSV
D3	99	D3-99	BERNON ST	OFF BERNON ST NEAR DRIVEWAY OF #208 BERNON ST	14	GATE		1988	44	WWD	WOONSOCKET	OPEN	
D4	1	D4-1	FRONT ST	AT THE LEFT SIDE OF BLDG #107	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	2	D4-2	FRONT ST	AT 100 FRONT ST	6	GATE	P & C		20	WWD	WOONSOCKET	OPEN	TSV
D4	3	D4-3	FRONT ST	AT EAST PROPERTY LINE OF FRONT ST	12	GATE			38	WWD	WOONSOCKET	CLOSED	
D4	4	D4-4	GREENE ST	AT WEST PROPERTY LINE OF GREENE ST	12	GATE			38	WWD	WOONSOCKET	ABANDONED	
D4	5	D4-5	GREENE ST	AT NORTH PROPERTY LINE OF CENTRAL AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
D4	6	D4-6	WILLOW ST	AT EAST PROPERTY LINE OF GREENE ST	4	GATE			14	WWD	WOONSOCKET	OPEN	
D4	7	D4-7	PARK AVE	AT NORTH PROPERTY LINE OF CARRINGTON AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	8	D4-8	CARRINGTON AVE	40' NORTH OF HYDRANT #4405	8	GATE		1956	26	WWD	WOONSOCKET	OPEN	TSV
D4	9	D4-9	PARK AVE	AT SOUTH PROPERTY LINE OF CARRINGTON AVE	8	GATE		1956	26	WWD	WOONSOCKET	OPEN	
D4	10	D4-10	CARRINGTON AVE	AT EAST PROPERTY LINE OF PARK AVE	4	GATE			14	WWD	WOONSOCKET	CLOSED	
D4	11	D4-11	CARRINGTON AVE	AT EAST PROPERTY LINE OF PARK AVE	20	GATE			62	WWD	WOONSOCKET	OPEN	
D4	12	D4-12	GROVE ST	AT SOUTH PROPERTY LINE OF CARRINGTON AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D4	13	D4-13	GROVE ST	AT SOUTH PROPERTY LINE OF CARRINGTON AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D4	14	D4-14	GROVE ST	AT NORTH PROPERTY LINE OF CARRINGTON AVE						WWD	WOONSOCKET	ABANDONED	PLUGGED ABANDONED MAIN 1975
D4	15	D4-15	CARRINGTON AVE	AT EAST PROPERTY LINE OF GROVE ST						WWD	WOONSOCKET	ABANDONED	PLUGGED ABANDONED MAIN 1975
D4	16	D4-16	HAMLET AVE	AT WEST PROPERTY LINE OF WELLES ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	17	D4-17	WELLES ST	AT SOUTH PROPERTY LINE OF HAMLET AVE						WWD	WOONSOCKET	ABANDONED	PLUGGED ABANDONED MAIN 1975
D4	18	D4-18	BENNETT ST	AT SOUTH PROPERTY LINE OF HAMLET AVE	6	GATE		1909	20	WWD	WOONSOCKET	OPEN	
D4	19	D4-19	MANVILLE RD	AT EAST PROPERTY LINE OF BENNETT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	20	D4-20	HAMLET AVE	AT EAST PROPERTY LINE OF BENNETT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	21	D4-21	BERNON ST	AT WEST PROPERTY LINE OF GREENE ST	14	GATE			44	WWD	WOONSOCKET	OPEN	
D4	22	D4-22	GREENE ST	AT NORTH PROPERTY LINE OF BERNON ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
D4	23	D4-23	BERNON ST	AT EAST PROPERTY LINE OF GREENE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D4	24	D4-24	WILLOW ST	AT WEST PROPERTY LINE OF PARK AVE	4	GATE			14	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
D4	25	D4-25	PARK AVE	AT NORTH PROPERTY LINE OF WILLOW ST	8	GATE		1956	26	WWD	WOONSOCKET	OPEN	
D4	26	D4-26	WILLOW ST	AT EAST PROPERTY LINE OF PARK AVE	4	GATE			14	WWD	WOONSOCKET	OPEN	
D4	27	D4-27	PARK AVE	AT SOUTH PROPERTY LINE OF WILLOW ST	8	GATE		1956	26	WWD	WOONSOCKET	OPEN	
D4	28	D4-28	GROVE ST	AT SOUTH PROPERTY LINE OF WILLOW ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D4	29	D4-29	WILLOW ST	AT WEST PROPERTY LINE OF GROVE ST	4	GATE			14	WWD	WOONSOCKET	OPEN	
D4	30	D4-30	GROVE ST	AT NORTH PROPERTY LINE OF WILLOW ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D4	31	D4-31	WILLOW ST	AT EAST PROPERTY LINE OF GROVE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	32	D4-32	CARRINGTON AVE	AT WEST PROPERTY LINE OF WELLES ST						WWD	WOONSOCKET	ABANDONED	PLUGGED ABANDONED MAIN 1975
D4	33	D4-33	WELLES ST	AT NORTH PROPERTY LINE OF CARRINGTON AVE						WWD	WOONSOCKET	ABANDONED	PLUGGED ABANDONED MAIN 1975
D4	34	D4-34	CARRINGTON AVE	AT EAST PROPERTY LINE OF WELLES ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	35	D4-35	WELLES ST	AT SOUTH PROPERTY LINE OF CARRINGTON AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	36	D4-36	BENNETT ST	AT NORTH PROPERTY LINE OF CARRINGTON AVE	6	GATE		1909	20	WWD	WOONSOCKET	OPEN	
D4	37	D4-37	BENNETT ST	AT S LINE OF CARRINGTON	6	GATE		1909		WWD	WOONSOCKET	OPEN	NO CARD
D4	38	D4-38	WATSON ST	AT WEST PROPERTY LINE OF UNION ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D4	39	D4-39	UNION ST	AT SOUTH PROPERTY LINE OF WATSON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D4	40	D4-40	WATSON ST	AT EAST PROPERTY LINE OF UNION ST	8	GATE			26	WWD	WOONSOCKET	CLOSED	
D4	41	D4-41	BERNON ST	AT WEST PROPERTY LINE OF PARK AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D4	42	D4-42	PARK AVE	AT NORTH PROPERTY LINE OF BERNON ST	8	GATE		1956	26	WWD	WOONSOCKET	OPEN	
D4	43	D4-43	BERNON ST	AT EAST PROPERTY LINE OF PARK AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D4	44	D4-44	PARK AVE	AT SOUTH PROPERTY LINE OF BERNON ST	8	GATE		1956	26	WWD	WOONSOCKET	OPEN	
D4	45	D4-45	GROVE ST	AT SOUTH PROPERTY LINE OF BERNON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D4	46	D4-46	BERNON ST	AT WEST PROPERTY LINE OF GROVE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D4	47	D4-47	BERNON ST	AT WEST PROPERTY LINE OF GROVE ST	8	GATE		1957	26	WWD	WOONSOCKET	CLOSED	
D4	48	D4-48	GROVE ST	AT CENTER LINE OF BERNON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D4	49	D4-49	GROVE ST	AT NORTH PROPERTY LINE OF BERNON ST	8	GATE			26	WWD	WOONSOCKET	CLOSED	
D4	50	D4-50	GROVE ST	AT NORTH PROPERTY LINE OF BERNON ST	8	GATE		1957	26	WWD	WOONSOCKET	OPEN	TSV
D4	51	D4-51	BERNON ST	AT EAST PROPERTY LINE OF GROVE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	52	D4-52	WILSON AVE	AT SOUTH PROPERTY LINE OF WILLOW ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D4	53	D4-53	WILSON AVE	AT NORTH PROPERTY LINE OF PARADIS AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D4	54	D4-54	PARADIS AVE	AT EAST PROPERTY LINE OF WILSON AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D4	55	D4-55	WILSON AVE	AT SOUTH PROPERTY LINE OF PARADIS AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D4	56	D4-56	WILLOW ST	AT WEST PROPERTY LINE OF MAPLE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	57	D4-57	MAPLE ST	AT NORTH PROPERTY LINE OF WILLOW ST	20	GATE			62	WWD	WOONSOCKET	OPEN	
D4	58	D4-58	WILLOW ST	AT EAST PROPERTY LINE OF MAPLE ST	20	GATE			62	WWD	WOONSOCKET	OPEN	
D4	59	D4-59	MAPLE ST	AT SOUTH PROPERTY LINE OF WILLOW ST	20	GATE			62	WWD	WOONSOCKET	OPEN	
D4	60	D4-60	PARADIS AVE	AT WEST PROPERTY LINE OF MAPLE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	61	D4-61	PARADIS AVE	AT EAST PROPERTY LINE OF MAPLE ST	4	GATE			14	WWD	WOONSOCKET	OPEN	
D4	62	D4-62	WELLES ST	AT NORTH PROPERTY LINE OF WILLOW ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	63	D4-63	WELLES ST	AT SOUTH PROPERTY LINE OF WILLOW ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	64	D4-64	BENNETT ST	AT NORTH PROPERTY LINE OF WILLOW ST	6	GATE		1909	20	WWD	WOONSOCKET	OPEN	
D4	65	D4-65	WILLOW ST	AT EAST PROPERTY LINE OF BENNETT	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	66	D4-66	BENNETT ST	AT SOUTH PROPERTY LINE OF WILLOW ST	6	GATE		1909	20	WWD	WOONSOCKET	OPEN	
D4	67	D4-67	WILLOW ST	10' WEST OF HYDRANT # 4435	4	GATE			14	WWD	WOONSOCKET	CLOSED	
D4	68	D4-68	UNION ST	AT NORTH PROPERTY LINE OF BELL ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D4	69	D4-69	BELL ST	AT EAST PROPERTY LINE OF UNION ST	8	GATE		1889	26	WWD	WOONSOCKET	CLOSED	
D4	70	D4-70	PARK AVE	AT EAST PROPERTY LINE OF GREENE ST	8	GATE		1956	26	WWD	WOONSOCKET	OPEN	
D4	71	D4-71	PARK AVE	AT EAST PROPERTY LINE OF GREENE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	TSV
D4	72	D4-72	BERNON ST	AT WEST PROPERTY LINE OF COTTAGE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	73	D4-73	BERNON ST	AT CENTER LINE OF COTTAGE ST	6	GATE		1957	20	WWD	WOONSOCKET	OPEN	
D4	74	D4-74	BERNON ST	AT WEST PROPERTY LINE OF COTTAGE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	75	D4-75	COTTAGE ST	AT SOUTH PROPERTY LINE OF BERNON ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	76	D4-76	WILSON AVE	NORTH PROPERTY LINE OF BERNON ST	8	GATE			26	WWD	WOONSOCKET	CLOSED	
D4	77	D4-77	DIVISION ST	AT SOUTH PROPERTY LINE OF BERNON ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	78	D4-78	BERNON ST	AT CENTER LINE OF DIVISION ST	8	GATE		1957	26	WWD	WOONSOCKET	OPEN	
D4	79	D4-79	BERNON ST	AT EAST PROPERTY LINE OF DIVISION ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	80	D4-80	BERNON ST	AT WEST PROPERTY LINE OF MAPLE ST	6	GATE			20	WWD	WOONSOCKET	CLOSED	
D4	81	D4-81	BERNON ST	AT EAST PROPERTY LINE OF MAPLE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	82	D4-82	PARADIS AVE	AT WEST PROPERTY LINE OF WELLES ST	6	GATE	CLOW	1993	20	WWD	WOONSOCKET	OPEN	
D4	83	D4-83	PARADIS AVE	AT EAST PROPERTY LINE OF WELLES ST	6	GATE			52	WWD	WOONSOCKET	OPEN	
D4	84	D4-84	BERNON ST	AT WEST PROPERTY LINE OF WELLES ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	85	D4-85	BERNON ST	AT EAST PROPERTY LINE OF WELLES ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	86	D4-86	PARADIS AVE	AT WEST PROPERTY LINE OF BENNETT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	87	D4-87	BENNETT ST	AT NORTH PROPERTY LINE OF PARADIS AVE	6	GATE		1909	20	WWD	WOONSOCKET	OPEN	
D4	88	D4-88	BERNON ST	AT WEST PROPERTY LINE OF BENNETT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	89	D4-89	BERNON ST	AT EAST PROPERTY LINE OF BENNETT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	90	D4-90	PARK AVE	AT SOUTH PROPERTYLINE OF CRAWFORD ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D4	91	D4-91	CRAWFORD ST	AT EAST PROPERTY LINE OF PARK AVE	14	GATE			44	WWD	WOONSOCKET	OPEN	
D4	92	D4-92	GROVE ST	AT SOUTH PROPERTY LINE OF CRAWFORD ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D4	93	D4-93	GROVE ST	AT S LINE OF CRAWFORD	6	GATE				WWD	WOONSOCKET	CLOSED	NO CARD
D4	94	D4-94	GROVE ST	AT NORTH PROPERTY LINE OF CRAWFORD ST	8	GATE			26	WWD	WOONSOCKET	CLOSED	
D4	95	D4-95	GROVE ST	AT NORTH PROPERTY LINE OF CRAWFORD ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D4	96	D4-96	UNITY ST	AT EAST PROPERTY LINE OF COTTAGE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	97	D4-97	UNITY ST	AT WEST PROPERTY LINE OF DIVISION ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	98	D4-98	DIVISION ST	AT NORTH PROPERTY LINE OF UNITY ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D4	99	D4-99	MAPLE ST	10' NORTH OF HYDRANT #4455	6	GATE			20	WWD	WOONSOCKET	CLOSED	
D4	100	D4-100	MAPLE ST	5' NORTH OF HYDRANT # 4455	8	GATE			26	WWD	WOONSOCKET	OPEN	
D4	101	D4-101	MAPLE ST	AT NORTH PROPERTY LINE OF ST. FRANCIS ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D4	102	D4-102	MAPLE ST	AT SOUTH PROPERTY LINE OF ST. FRANCIS	8	GATE			26	WWD	WOONSOCKET	OPEN	
D4	103	D4-103	PARK AVE	EASTERLY SIDE OF PARK AVE 20' NORTH OF HYDRANT #4436	4	GATE			14	WWD	WOONSOCKET	CLOSED	
D4	104	D4-104	GREENE ST	AT SOUTH PROPERTY LINE OF CENTRAL AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
D4	105	D4-105	GREENE ST	75' FROM SOUTH PROPERTY LINE OF WILLOW ST	6	GATE	APS	1967	20	WWD	WOONSOCKET	OPEN	TSV
D4	106	D4-106	GREENE ST	70' FROM NORTH PROPERTY LINE OF WILLOW ST	6	GATE	APS		20	WWD	WOONSOCKET	OPEN	IN MANHOLE
D4	107	D4-107	FRONT ST	AT 100 FRONT ST	6	GATE	MUELLER	1952	20	WWD	WOONSOCKET	CLOSED	TSV, FIRE SUPPLY NOT IN USE
D4	108	D4-108	FRONT ST	AT 100 FRONT ST	6	GATE	MUELLER	1952	20	WWD	WOONSOCKET	CLOSED	FIRE SUPPLY NOT IN USE
D4	109	D4-109	GROVE ST	105' FROM SOUTH PROPERTY LINE OF BERNON ST	6	GATE		1930	20	WWD	WOONSOCKET	OPEN	FIRE SUPPLY
D4	110	D4-110	PARK AVE	160' FROM SOUTH PROPERTY LINE OF CARRINGTON AVE	6	GATE	MET	1974	20	WWD	WOONSOCKET	OPEN	FIRE SUPPLY,TSV

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
D4	111	D4-111	GREENE ST	165' SOUTHWEST FROM SOUTH WEST STREET LINE OF CARRINGTON AVE	6	GATE		1911		WWD	WOONSOCKET	CLOSED	CLOSED 01-31-1975
D4	112	D4-112	WELLES ST	AT SOUTH PROPERTY LINE OF HAMLET AVE	6	GATE		1975		WWD	WOONSOCKET	OPEN	
D4	113	D4-113	CARRINGTON AVE	AT WESTERLY PROPERTY LINE OF WELLES ST	6	GATE		1975		WWD	WOONSOCKET	OPEN	
D4	114	D4-114	CARRINGTON AVE	AT EASTERLY PROPERTY LINE OF MAPLE ST	12	GATE		1975		WWD	WOONSOCKET	OPEN	
D4	115	D4-115	GROVE ST	AT SOUTHERLY PROPERTY LINE OF CARRINGTON AVE	8	GATE		1975		WWD	WOONSOCKET	OPEN	
D4	116	D4-116	BERNON ST	AT SOUTH PROPERTY LINE OF BENNETT ST	6	GATE	KENNEDY	1976	8	WWD	WOONSOCKET	OPEN	
D4	117	D4-117	BENNETT ST	AT WILLOW ST	6	GATE		1909	26	WWD	WOONSOCKET	OPEN	
D4	118	D4-118	MAPLE ST	AT PARADIS AVE	4	GATE				WWD	WOONSOCKET		NO CARD-GATE FOUND 10/93
D5	1	D5-1	MORTON AVE	AT NORTH PROPERTY LINE OF HAMLET AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
D5	2	D5-2	HAMLET AVE	150' FROM EAST PROPERTY LINE OF MORTON AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
D5	3	D5-3	CUMBERLAND HILL RD	170' NORTH OF HYDRANT #4503	6	GATE			20	WWD	WOONSOCKET	OPEN	THIS GATE FEEDS SEWAGE TREATMENT PLANT
D5	4	D5-4	CUMBERLAND HILL RD	130' NORTH OF HYDRANT #4503	8	GATE			26	WWD	WOONSOCKET	OPEN	
D5	5	D5-5	CUMBERLAND HILL RD	70' NORTH OF HYDRANT #4503	8	GATE			26	WWD	WOONSOCKET	OPEN	
D5	6	D5-6	LAVAL ST	AT EAST PROPERTY LINE OF NEWLAND AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
D5	7	D5-7	ROBERTS ST	AT SOUTH PROPERTY LINE OF CARRINGTON AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
D5	8	D5-8	MONTCALM ST	AT SOUTH PROPERTY LINE OF CARRINGTON AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D5	9	D5-9	CARRINGTON AVE	AT WEST PROPERTY LINE OF MANVILLE RD	6	GATE			20	WWD	WOONSOCKET	OPEN	
D5	10	D5-10	MANVILLE RD	AT SOUTH PROPERTY LINE OF CARRINGTON AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
D5	11	D5-11	DAVISON ST	10' WEST OF HYDRANT #4507	6	GATE		1959	20	WWD	WOONSOCKET	CLOSED	
D5	12	D5-12	DAVISON ST	15' EAST OF HYDRANT #4507	6	GATE		1959	20	WWD	WOONSOCKET	CLOSED	
D5	13	D5-13	CUMBERLAND HILL RD	AT WEST PROPERTY LINE OF NEWLAND AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
D5	14	D5-14	CUMBERLAND HILL RD	AT EAST PROPERTY LINE OF NEWLAND AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
D5	15	D5-15	NEWLAND AVE	AT NORTH PROPERTY LINE OF CUMBERLAND HILL RD	8	GATE			26	WWD	WOONSOCKET	OPEN	
D5	16	D5-16	ROBERT ST	AT NORTH PROPERTY LINE OF WILLOW ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D5	17	D5-17	ROBERTS ST	AT SOUTH PROPERTY LINE OF WILLOW ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D5	18	D5-18	MANVILLE RD	AT SOUTH PROPERTY LINE OF WILLOW ST	3	GATE			11	WWD	WOONSOCKET	CLOSED	
D5	19	D5-19	MANVILLE RD	AT SOUTH PROPERTY LINE OF WILLOW ST	20	GATE			62	WWD	WOONSOCKET	OPEN	
D5	20	D5-20	MANVILLE RD	AT NORTH PROPERTY LINE OF WILLOW ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D5	21	D5-21	DAVISON ST	AT EAST PROPERTY LINE OF MANVILLE RD	12	GATE			38	WWD	WOONSOCKET	OPEN	
D5	22	D5-22	DAVISON ST	80' FROM EAST PROPERTY LINE OF MANVILLE RD	12	GATE			38	WWD	WOONSOCKET	OPEN	
D5	23	D5-23	DAVISON ST	160' FROM EAST PROPERTY LINE OF MANVILLE RD	12	GATE			38	WWD	WOONSOCKET	OPEN	
D5	24	D5-24	CUMBERLAND HILL RD	AT WEST PROPERTY LINE OF AYLSWORTH AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
D5	25	D5-25	PARADIS AVE	AT WEST PROPERTY LINE OF ROBERTS ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D5	26	D5-26	ROBERTS ST	AT NORTH PROPERTY LINE OF PARADIS AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
D5	27	D5-27	RAY AVE	AT SOUTH PROPERTY LINE OF AYSLWORTH AVE	8	GATE	APS	1966	26	WWD	WOONSOCKET	OPEN	
D5	28	D5-28	RAY AVE	AT SOUTH PROPERTY LINE OF VIV AVE	8	GATE	APS	1966	26	WWD	WOONSOCKET	OPEN	
D5	29	D5-29	ROBERTS ST	AT N LINE OF BERNON	6	GATE			20	WWD	WOONSOCKET	OPEN	
D5	30	D5-30	BERNON ST	AT EAST PROPERTY LINE OF ROBERTS ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D5	31	D5-31	ROBERTS ST	AT SOUTH PROPERTY LINE OF BERNON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D5	32	D5-32	ROBERTS ST	100' SOUTH OF HYDRANT # 4521	6	GATE	APS		20	WWD	WOONSOCKET	OPEN	TSV
D5	33	D5-33	ROBERTS ST	100' SOUTH OF HYDRANT # 4521	6	GATE	APS		20	WWD	WOONSOCKET	OPEN	
D5	34	D5-34	MANVILLE RD	40' FROM SOUTH PROPERTY LINE OF VERDUN ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D5	35	D5-35	CUMBERLAND HILL RD	60' SOUTH OF HYDRANT #4503	6	GATE			20	WWD	WOONSOCKET	OPEN	
D5	36	D5-36	MANVILLE RD	20' FROM SOUTH PROPERTY LINE OF WILLOW ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
D5	37	D5-37	DAVISON ST	10' NORTH OF HYDRANT # 4507	4	GATE			14	WWD	WOONSOCKET	CLOSED	
D5	38	D5-38	BERNON ST	3' EAST OF HYDRANT # 4523	6	GATE	APS		20	WWD	WOONSOCKET	OPEN	
D5	39	D5-39	BERNON ST	AT WEST PROPERTY LINE OF MANVILLE RD	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	OPENS LEFT
D5	40	D5-40	MANVILLE RD	FROM BERNON ST FOR #413 MANVILLE RD	6	GATE	APS		20	WWD	WOONSOCKET	OPEN	
D5	41	D5-41	DUMP ROAD	AT SOUTH PROPERTY LINE OF DAVISON ST	8	GATE	RENSAELLAER	1975		WWD	WOONSOCKET	OPEN	TSV
D5	42	D5-42	DAVISON ST	280' SOUTH OF HAMLET AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
D5	43	D5-43	CUMBERLAND HILL RD	40' SOUTH OF FIRE STATION #2	6	GATE	KENNEDY	1984	21	WWD	WOONSOCKET	OPEN	SERVICES SE SERV# 12706 AND VALVE D-5-3
D5	44	D5-44	WASTEWATER TREATMENT PLANT	OPERATIONS BUILDING	2	GATE		1962		WASTEWATER	WOONSOCKET	CLOSED	WASTEWATER TREATMENT PLANT
D5	45	D5-45	WASTEWATER TREATMENT PLANT	OPERATIONS BUILDING	4	GATE		1975	14	WASTEWATER	WOONSOCKET	OPEN	WASTEWATER TREATMENT PLANT
D5	46	D5-46	WASTEWATER TREATMENT PLANT	BETWEEN OPERATIONS BUILDING AND PRIMARY SET. TANK #1	6	GATE		1975	20	WASTEWATER	WOONSOCKET	OPEN	WASTEWATER TREATMENT PLANT
D5	47	D5-47	WASTEWATER TREATMENT PLANT	PRIMARY SLUDGE PUMP STATION	2	GATE		1962		WASTEWATER	WOONSOCKET	OPEN	WASTEWATER TREATMENT PLANT
D5	48	D5-48	WASTEWATER TREATMENT PLANT	SERVICE TO SLUDGE DEWATERING BUILDING	4	GATE		1975	14	WASTEWATER	WOONSOCKET	OPEN	WASTEWATER TREATMENT PLANT
D5	49	D5-49	WASTEWATER TREATMENT PLANT	SLUDGE DEWATERING BUILDING	6	GATE		1975	20	WASTEWATER	WOONSOCKET	OPEN	WASTEWATER TREATMENT PLANT
D5	50	D5-50	WASTEWATER TREATMENT PLANT	SERVICE TO INCINERATOR BUILDING	2	GATE		1975		WASTEWATER	WOONSOCKET	OPEN	WASTEWATER TREATMENT PLANT
D5	51	D5-51	WASTEWATER TREATMENT PLANT	SERVICE TO RETURN SLUDGE PUMP STATION	4	GATE		1975	14	WASTEWATER	WOONSOCKET	OPEN	WASTEWATER TREATMENT PLANT
D5	52	D5-52	WASTEWATER TREATMENT PLANT	BETWEEN AERATION TANKS AND CHLORINATION BUILDING	6	GATE		1975	20	WASTEWATER	WOONSOCKET	OPEN	WASTEWATER TREATMENT PLANT
D5	53	D5-53	WASTEWATER TREATMENT PLANT	BETWEEN AERATION TANKS AND CHLORINATION BUILDING	4	GATE		1975	14	WASTEWATER	WOONSOCKET	OPEN	WASTEWATER TREATMENT PLANT
D5	54	D5-54	WASTEWATER TREATMENT PLANT	BETWEEN OPERATIONS BLDG AND GRID CHAMBERS	6	GATE		1975	20	WASTEWATER	WOONSOCKET	OPEN	WWTP PLANT EFFLUENT
D5	55	D5-55	WASTEWATER TREATMENT PLANT	SOUTHWEST OF PRIM SETTLING TANK #2	2	GATE		1975		WASTEWATER	WOONSOCKET	OPEN	WASTEWATER TREATMENT PLANT
D5	56	D5-56	WASTEWATER TREATMENT PLANT	BETWEEN AERATION TANKS AND CHLORINATION BUILDING	6	GATE		1975	20	WASTEWATER	WOONSOCKET	OPEN	WWTP PLANT EFFLUENT
D5	57	D5-57	WASTEWATER TREATMENT PLANT	BETWEEN AERATION TANKS AND CHLORINATION BUILDING	6	GATE		1975	20	WASTEWATER	WOONSOCKET	OPEN	WASTEWATER TREATMENT PLANT
D5	58	D5-58	WASTEWATER TREATMENT PLANT	WEST SIDE OF RETURN SLUDGE PUMPING STATION	6	GATE		1975	20	WASTEWATER	WOONSOCKET	OPEN	WWTP PLANT EFFLUENT
D5	59	D5-59	WASTEWATER TREATMENT PLANT	SOUTH OF SECONDARY SETTLING TANK #3	6	GATE		1975	20	WASTEWATER	WOONSOCKET	OPEN	WASTEWATER TREATMENT PLANT
D5	60	D5-60	HAMLET AVE	230' EAST OF MORTON AVE	4	GATE		1913	16	WWD	WOONSOCKET	CLOSED	SAME AS SERVICE #2709
D6	1	D6-1	VICTOR ST	AT SOUTH PROPERTY LINE OF NEWLAND AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
D6	2	D6-2	NEWLAND AVE	AT WEST PROPERTY LINE OF RICHELIEU ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D6	3	D6-3	RICHELIEU ST	AT SOUTH PROPERTY LINE OF NEWLAND AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D6	4	D6-4	LAFAYETTE ST	AT SOUTH PROPERTY LINE OF NEWLAND AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
D6	5	D6-5	NEWLAND AVE	40' FROM EAST PROPERTY LINE OF LAFAYETTE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D6	6	D6-6	NEWLAND AVE	140' EAST OF HYDRANT #4602	6	GATE			20	WWD	WOONSOCKET	OPEN	
D6	7	D6-7	RICARD ST	5' FROM SOUTH END OF STREET LINE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D6	8	D6-8	LAVAL ST	AT WEST PROPERTY LINE OF VICTOR ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
D6	9	D6-9	AYLSWORTH AVE	AT EAST PROPERTY LINE OF CUMBERLAND HILL RD	8	GATE		1914	26	WWD	WOONSOCKET	OPEN	
D6	10	D6-10	CUMBERLAND HILL RD	AT SOUTH PROPERTY LINE OF CADY ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
D6	11	D6-11	CADY ST	AT EAST PROPERTY LINE OF CUMBERLAND HILL RD	6	GATE			20	WWD	WOONSOCKET	OPEN	
D6	12	D6-12	AYLSWORTH AVE	AT WEST PROPERTY LINE OF RICHELIEU	8	GATE		1914	26	WWD	WOONSOCKET	OPEN	
D6	13	D6-13	RICHELIEU ST	AT NORTH PROPERTY LINE OF AYLSWORTH AVE	6	GATE			26	WWD	WOONSOCKET	OPEN	
D6	14	D6-14	AYLSWORTH AVE	AT EAST PROPERTY LINE OF RICHELIEU	8	GATE		1914	26	WWD	WOONSOCKET	OPEN	
D6	15	D6-15	CADY ST	10' WEST OF HYDRANT #4612	8	GATE			26	WWD	WOONSOCKET	OPEN	
D6	16	D6-16	AYLSWORTH AVE	AT WEST PROPERTY LINE OF GUERTIN ST	8	GATE	P & C	1914	26	WWD	WOONSOCKET	OPEN	
D6	17	D6-17	AYLSWORTH AVE	AT EAST PROPERTY LINE OF GUERTIN ST	8	GATE		1914	26	WWD	WOONSOCKET	OPEN	
D6	18	D6-18	AYLSWORTH AVE	AT WEST PROPERTY LINE OF VINEYARD ST	8	GATE		1914	26	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
D6	19	D6-19	AYLSWORTH AVE	AT EAST PROPERTY LINE OF VINEYARD ST	8	GATE		1914	26	WWD	WOONSOCKET	OPEN	
D6	20	D6-20	AYLSWORTH AVE	AT WEST PROPERTY LINE OF CYPRESS ST	8	GATE		1914	26	WWD	WOONSOCKET	OPEN	
D6	21	D6-21	CUMBERLAND HILL RD	AT SOUTH PROPERTY LINE OF CONGRESS ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
D6	22	D6-22	CONGRESS ST	AT EAST PROPERTY LINE OF CUMBERLAND HILL RD	6	GATE			20	WWD	WOONSOCKET	OPEN	
D6	23	D6-23	CONGRESS ST	AT WEST PROPERTY LINE OF HARTFORD AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
D6	24	D6-24	CONGRESS ST	AT EAST PROPERTY LINE OF HARTFORD AVE	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
D6	25	D6-25	CONGRESS ST	AT WEST PROPERTY LINE OF GUERTIN ST	8	GATE			26	WWD	WOONSOCKET	REMOVED	REMOVED 6/6/91
D6	26	D6-26	CONGRESS ST	AT EAST PROPERTY LINE OF GUERTIN ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
D6	27	D6-27	RAY AVE	AT SOUTH PROPERTY LINE OF AYLSWORTH AVE	8	GATE	APS	1966	26	WWD	WOONSOCKET	OPEN	
D6	28	D6-28	RAY AVE	AT SOUTH PROPERTY LINE OF VIV AVE	8	GATE	APS	1966	26	WWD	WOONSOCKET	OPEN	
D6	29	D6-29	RAY AVE	AT EAST PROPERTY LINE OF RAY AVE	8	GATE	APS	1966	26	WWD	WOONSOCKET	OPEN	
D6	30	D6-30	NEWLAND AVE	135' EAST OF HYDRANT #4602	6	GATE	APS		20	WWD	WOONSOCKET	OPEN	
D6	31	D6-31	RAY AVE	62' SOUTH OF HYD #4729	8	GATE	APS	1973	26	WWD	WOONSOCKET		
D6	32	D6-32	RAY AVE	13' SOUTH OF HYDRANT #4628	8	GATE	KENNEDY	1977	26	WWD	WOONSOCKET	OPEN	
D6	33	D6-33	CADY ST	70' WEST OF GUERTIN ST STREETLINE	8	GATE		1988	26	WWD	WOONSOCKET	OPEN	
D6	34	D6-34	CADY ST	IN SIDEWALK AT CORNER OF GUERTIN ST	1	BLOW OFF		1988		WWD	WOONSOCKET	CLOSED	STOP AND WASTE
D6	35	D6-35	HARTFORD AVE	AT S LINE OF ARTHUR	10	GATE				WWD	WOONSOCKET	OPEN	NO CARD
D6	36	D6-36	CONGRESS ST	ON CONGRESS ST AT HARTFORD AVE	8	GATE		1988		WWD	WOONSOCKET		
D6	37	D6-37	HARTFORD AVE	ON CONGRESS ST AT HARTFORD AVE	10	GATE		1988		WWD	WOONSOCKET		
D6	38	D6-38	CONGRESS ST	ON CONGRESS AT HARTFORD AVE	10	GATE		1988		WWD	WOONSOCKET		
D6	39	D6-39	CONGRESS ST	ON CUMBERLAND HILL RD AT CONGRESS ST	10	GATE		1988		WWD	WOONSOCKET		
D7	1	D7-1	RODMAN ST	80' SOUTH OF HYDRANT #4701	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
D7	2	D7-2	MENDON RD	AT SOUT PROPERTY LINE OF CASS AVE	12	GATE	CHAPMAN		38	WWD	WOONSOCKET	OPEN	
D7	3	D7-3	MENDON RD	50' NORTH OF HYDRANT #4706	6	GATE	APS	1960	20	WWD	WOONSOCKET	OPEN	TSV
D7	4	D7-4	MENDON RD	50' NORTH OF HYDRANT #4706	6	GATE	APS	1960	20	WWD	WOONSOCKET	OPEN	
D7	5	D7-5	KENWOOD ST	100' SOUTH OF HYDRANT #4707	1.5	BLOW OFF			3.5	WWD	WOONSOCKET	CLOSED	
D7	6	D7-6	MENDON RD	135' SOUTH OF HYDRANT #4706	12	GATE			38	WWD	WOONSOCKET	OPEN	
D7	7	D7-7	MENDON RD	145' SOUTH OF HYDRANT #4706	8	GATE			26	WWD	WOONSOCKET	OPEN	
D7	8	D7-8	MENDON RD	145' SOUTH OF HYDRANT #4706	8	GATE			26	WWD	WOONSOCKET	OPEN	TSV
D7	9	D7-9	OREGON AVE	AT EAST PROPERTY LINE OF MENDON RD	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
D7	10	D7-10	OREGON AVE	10' EAST OF HYDRANT #4711	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
D7	11	D7-11	AYLSWORTH AVE	AT WEST PROPERTY LINE OF MENDON RD	8	GATE	APS	1964	26	WWD	WOONSOCKET	OPEN	
D7	12	D7-12	MENDON RD	AT CENTER LINE OF MANILA AVE	8	GATE	APS	1962	26	WWD	WOONSOCKET	OPEN	TSV
D7	13	D7-13	MENDON RD	AT SOUTH PROPERTY LINE OF MANILA AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
D7	14	D7-14	MANILA AVE	AT EAST PROPERTY LINE OF MENDON RD	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
D7	15	D7-15	OREGON AVE	AT WEST PROPERTY LINE OF BALTIMORE ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
D7	16	D7-16	OREGON AVE	AT EAST PROPERTY LINE OF BALTIMORE ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
D7	17	D7-17	MANILA AVE	AT WEST PROPERTY LINE OF BALTIMORE ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
D7	18	D7-18	MANILA AVE	AT EAST PROPERTY LINE OF BALTIMORE ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
D7	19	D7-19	OLYMPIA AVE	AT EAST PROPERTY LINE OF MENDON RD	8	GATE	APS	1962	26	WWD	WOONSOCKET	CLOSED	
D7	20	D7-20	MENDON RD	AT NORTH PROPERTY LINE OF CORSI ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
D7	21	D7-21	CORSI ST	AT EAST PROPERTY LINE OF MENDON RD	12	GATE			38	WWD	WOONSOCKET	OPEN	
D7	22	D7-22	MENDON RD	AT SOUTH PROPERTY LINE OF CORSI ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
D7	23	D7-23	MENDON RD	AT NORTH PROPERTY LINE OF BARTLETT ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
D7	24	D7-24	BARTLETT ST	AT EAST PROPERTY LINE OF MENDON RD	12	GATE		1947	38	WWD	WOONSOCKET	OPEN	
D7	25	D7-25	MENDON RD	AT SOUTH PROPERTY LINE OF BARTLETT ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
D7	26	D7-26	BARTLETT ST	AT WEST PROPERTY LINE OF DUDLEY ST	12	GATE		1947	38	WWD	WOONSOCKET	OPEN	
D7	27	D7-27	CORSI ST	AT MENDON RD	1		RED HED	1943		WWD	WOONSOCKET	OPEN	
D7	28	D7-28	OREGON AVE		8	GATE		1988	26	WWD	WOONSOCKET	CLOSED	
D7	29	D7-29	OREGON AVE	AT WEST PROPERTY LINE OF SPRINGWATER DR	8	GATE		1988	26	WWD	WOONSOCKET	OPEN	
D7	30	D7-30	OREGON AVE	AT EAST PROPERTY LINE OF SPRINGWATER DR	12	GATE		1988	38	WWD	WOONSOCKET	OPEN	
D7	31	D7-31	OREGON AVE	AT THE CENTERLINE OF SPRINGWATER DR	12	GATE		1988	38	WWD	WOONSOCKET	OPEN	
D7	32	D7-32	SPRINGWATER DR	2' EAST OF GUTTERLINE	12	GATE		1988	38	WWD	WOONSOCKET	OPEN	
D7	33	D7-33	SPRINGWATER DR	2' EAST OF GUTTERLINE	8	GATE		1988	26	WWD	WOONSOCKET	OPEN	
D7	34	D7-34	SPRINGWATER DR	SOUTH OF OREGON AVE PROPERTY LINE	12	GATE		1988	38	WWD	WOONSOCKET	OPEN	
D7	35	D7-35	SPRINGWATER DR	OFF SPRINGWATER DR AT REAR OF 88 CENTURY DR		AIR REL. VALVE	EMPIRE	1988		WWD	WOONSOCKET		
D7	36	D7-36	HOLLY LN							PRIVATE	WOONSOCKET		NO CARD
D7	37	D7-37	HOLLY LN							PRIVATE	WOONSOCKET		NO CARD
D7	38	D7-38	HOLLY LN							PRIVATE	WOONSOCKET		NO CARD
D7	39	D7-39	HOLLY LN		8	GATE		1998		PRIVATE	WOONSOCKET		NO CARD
D8	1	D8-1	OREGON AVE	AT END OF CUL-DE-SAC	12	GATE		1988	38	WWD	WOONSOCKET	REMOVED	REMOVED 12/97
D8	2	D8-2	HIGHLAND II	186' TO THE 4TH HYD OF HIGHLAND II	12	GATE	CLOW	1995		WWD	WOONSOCKET	OPEN	
D8	3	D8-3	HIGHLAND II	131' TO THE 4TH HYD OF HIGHLAND II	12	GATE	CLOW	1995		WWD	WOONSOCKET	CLOSED	
D8	4	D8-4	HIGHLAND II	174' TO THE 5TH HYD OF HIGHLAND II	12	GATE	CLOW	1995		WWD	WOONSOCKET	CLOSED	
D8	5	D8-5	HIGHLAND II	70' TO THE 5TH HYD OF HIGHLAND II	12	GATE	CLOW	1995		WWD	WOONSOCKET	CLOSED	
D8	6	D8-6	HIGHLAND II	88' TO THE 6TH HYD OF HIGHLAND II	12	GATE	CLOW	1995		WWD	WOONSOCKET	CLOSED	
D8	7	D8-7	HIGHLAND II	78' TO THE 6TH HYD OF HIGHLAND II	12	GATE	CLOW	1995		WWD	WOONSOCKET	CLOSED	
D8	8	D8-8	OREGON AVE	HEAD OF OREGON / HOLLY CONNECTION	8	GATE		1998		WYNDEMERE	WOONSOCKET	OPEN	NO CARD
E1	1	E1-1	ROBERTA AVE	AT WEST PROPERTY LINE OF ANDREWS ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E1	2	E1-2	ROBERTA AVE	AT EAST PROPERTY LINE OF ANDREWS ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E1	3	E1-3	ALICE AVE	AT SOUTH PROPERTY LINE OF MORSE AVE	12	GATE		1900	38	WWD	WOONSOCKET	OPEN	
E1	4	E1-4	MORSE AVE	AT EAST PROPERTY LINE OF ALICE AVE	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
E1	5	E1-5	ANDREWS ST	AT SOUTH PROPERTY LINE OF MORSE AVE	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
E1	6	E1-6	WARREN AVE	AT WEST PROPERTY LINE OF ALICE AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
E1	7	E1-7	ALICE AVE	AT NORTH PROPERTY LINE OF WARREN AVE	12	GATE		1900	38	WWD	WOONSOCKET	OPEN	
E1	8	E1-8	ALICE AVE	AT SOUTH PROPERTY LINE OF WARREN AVE	12	GATE		1900	38	WWD	WOONSOCKET	OPEN	
E1	9	E1-9	PELLETIER AVE	AT SOUTH PROPERTY LINE OF WARREN AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
E1	10	E1-10	ALICE AVE	AT NORTH PROPERTY LINE OF BERNICE AVE	12	GATE		1900		WWD	WOONSOCKET	OPEN	
E1	11	E1-11	BERNICE AVE	AT EAST PROPERTY LINE OF ALICE AVE	8	GATE		1891	26	WWD	WOONSOCKET	OPEN	
E1	12	E1-12	ALICE AVE	AT SOUTH PROPERTY LINE OF BERNICE AVE	12	GATE		1900	38	WWD	WOONSOCKET	OPEN	
E1	13	E1-13	PELLETIER AVE	AT WEST PROPERTY LINE OF SOUTH MAIN ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E1	14	E1-14	ALICE AVE	AT WEST PROPERTY LINE OF SOUTH MAIN ST	12	GATE		1900	38	WWD	WOONSOCKET	OPEN	
E1	15	E1-15	SOUTH MAIN ST	AT EAST PROPERTY LINE OF ALICE AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
E1	16	E1-16	ANDREWS ST	AT NORTH PROPERTY LINE OF PEARL ST	8	GATE		1890	26	WWD	WOONSOCKET	OPEN	
E1	17	E1-17	ANDREWS ST	60' FROM SOUTH PROPERTY LINE OF PEARL ST	4	GATE		1890	14	WWD	WOONSOCKET	OPEN	
E1	18	E1-18	GREAT RD, NS	AT CENTER LINE OF LAPRE RD	6	GATE			20	WWD	NS	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
E1	19	E1-19	GREAT RD, NS	85' FROM NORTH PROPERTY LINE OF POUND HILL RD	6	GATE			20	WWD	NS	OPEN	
E1	20	E1-20	MORSE AVE, NS	AT EAST PROPERTY LINE OF GREAT ROAD	8	GATE			26	WWD	NS	OPEN	
E1	21	E1-21	WARREN AVE	AT EAST PROPERTY LINE OF GREAT RD	6	GATE			20	WWD	WOONSOCKET	OPEN	
E1	22	E1-22	WARREN AVE	70' EAST OF HYDRANT #5117	1.5	BLOW OFF			3.5	WWD	WOONSOCKET	CLOSED	
E1	23	E1-23	HOMESTEAD AVE, NS	AT WEST PROPERTY LINE OF GREAT RD	6	GATE			20	ROBERT RUSSELL	NS	OPEN	
E1	24	E1-24	WOONSOCKET HILL RD, NS	AT WEST PROPERTY LINE OF GREAT RD	6	GATE			20	WWD	NS	OPEN	
E1	25	E1-25	WARREN AVE	AT EAST PROPERTY LINE OF PELLETIER AVE	8	GATE				WWD	WOONSOCKET	OPEN	
E1	26	E1-26	HILLVIEW AVE, NS	AT SOUTH PROPERTY LINE OF GREAT RD	4	GATE			14	CHAS. BERGESSON	NS	OPEN	SAME AS SERVICE # 8267
E1	27	E1-27	GREAT RD, NS	AT WESTWOOD ROAD	6	GATE		1951	21	WWD	NS	OPEN	
E1	28	E1-28	NORWOOD RD, NS	IN FRONT OF HOUSE #31	0.75	BLOW OFF	RED HED			PRIVATE	NS	CLOSED	
E1	29	E1-29	WESTWOOD ROAD NS	AT SOUTH PROPERTY LINE OF GREAT RD, NS	4	GATE		1951	14	WWD	NS	OPEN	
E1	30	E1-30	ROBERTA AVE	45' LEFT OF HYD # 5100	8	GATE	MUELLER	1979	26	WWD	WOONSOCKET	OPEN	
E1	31	E1-31	POUND HILL RD, NS	AT SOUTH PROPERTY LINE OF GREAT RD NS	2	EDDY				MARY SLOCOMB	NS	OPEN	
E1	32	E1-32	ALICE AVE	AT CORNER OF MORSE AVE	8	GATE		1988	26	WWD	WOONSOCKET	OPEN	TSV, ROAD IMPROV III INSTALLED BY V. PATE
E1	33	E1-33	ALICE AVE	AT CORNER OF ROBERTA AVE	8	GATE		1988	26	WWD	WOONSOCKET	OPEN	TSV
E1	34	E1-34	GREAT RD, NS	41' FROM CORNER OF HOUSE #231 & 53' FROM RIGHT CONER OF HOUSE #231	4	GATE				WWD	NS		
E2	1	E2-1	SOUTH MAIN ST	20' SOUTH OF HYDRANT #5201	12	GATE			38	WWD	WOONSOCKET	OPEN	
E2	2	E2-2	COE ST	AT WEST PROPERTY LINE OF PROVIDENCE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	3	E2-3	LINCOLN ST	AT EAST PROPERTY LINE OF PROVIDENCE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	4	E2-4	PROVIDENCE ST	80' FROM NORTH PROPERTY LINE OF EAST ORCHARD ST		BLOW OFF				WWD	WOONSOCKET	CLOSED	
E2	5	E2-5	ROBERTA AVE	AT WEST PROPERTY LINE OF ROCKLAND AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	6	E2-6	ROCKLAND AVE	AT SOUTH PROPERTY LINE OF ROBERTA AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	7	E2-7	ROBERTA AVE	AT EAST PROPERTY LINE OF ROCKLAND AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	8	E2-8								WWD	WOONSOCKET		NO CARD
E2	9	E2-9	FARNUMS LANE	AT WEST PROPERTY LINE OF SOUTH MAIN ST	6	GATE			20	WWD	WOONSOCKET	CLOSED	
E2	10	E2-10	SOUTH MAIN ST	AT SOUTH PROPERTY LINE OF WILBUR ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E2	11	E2-11	WILBUR ST	AT EAST PROPERTY LINE OF SOUTH MAIN ST	4	GATE			14	WWD	WOONSOCKET	OPEN	
E2	12	E2-12	WILBUR ST	AT WEST PROPERTY LINE OF COE ST	4	GATE			14	WWD	WOONSOCKET	OPEN	
E2	13	E2-13	ORCHARD ST	AT SOUTH PROPERTY LINE OF SUMMIT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E2	14	E2-14	SUMMIT ST	AT EAST PROPERTY LINE OF ORCHARD ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E2	15	E2-15	ORCHARD ST	AT NORTH PROPERTY LINE OF SUMMIT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E2	16	E2-16	ORCHARD ST	AT WEST PROPERTY LINE OF PROVIDENCE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E2	17	E2-17	PROVIDENCE ST	AT ENTER LINE OF ORCHARD ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	18	E2-18	EAST ORCHARD ST	AT EAST PROPERTY LINE OF PROVIDENCE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	19	E2-19	COLLINS ST	AT EAST PROPERTY LINE OF PROVIDENCE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	20	E2-20	PEARL ST	AT EAST PROPERTY LINE OF ANDREWS ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	21	E2-21	ROCKLAND AVE	AT NORTH PROPERTY LINE OF PEARL ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	22	E2-22	PEARL ST	AT WEST PROPERTY LINE OF ROCKLAND AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	23	E2-23	ROCKLAND AVE	AT SOUTH PROPERTY LINE OF PEARL ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	24	E2-24	BERNICE AVE	AT WEST PROPERTY LINE OF ROCKLAND AVE	8	GATE		1891	26	WWD	WOONSOCKET	OPEN	
E2	25	E2-25	ROCKLAND AVE	AT NORTH PROPERTY LINE OF BERNICE AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	26	E2-26	BERNICE AVE	AT EAST PROPERTY LINE OF ROCKLAND AVE	8	GATE		1891	26	WWD	WOONSOCKET	OPEN	
E2	27	E2-27	ROCKLAND AVE	AT SOUTH PROPERTY LINE OF BERNICE AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	28	E2-28	SOUTH MAIN ST	AT SOUTH PROPERTY LINE OF NORTH BALLOU ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E2	29	E2-29	NORTH BALLOU ST	AT WEST PROPERTY LINE OF SOUTH MAIN ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E2	30	E2-30	SOUTH MAIN ST	AT NORTH PROPERTY LINE OF NORTH BALLOU ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E2	31	E2-31	BALLOU ST	AT EAST PROPERTY LINE OF SOUTH MAIN ST	8	GATE		1917	26	WWD	WOONSOCKET	OPEN	
E2	32	E2-32	COE ST	AT SOUTH PROPERTY LINE OF BALLOU ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	33	E2-33	BALLOU ST	AT WEST PROPERTY LINE OF COE ST	8	GATE		1917	26	WWD	WOONSOCKET	OPEN	
E2	34	E2-34	COE ST	AT NORTH PROPERTY LINE OF BALLOU ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	35	E2-35	BALLOU ST	AT EAST PROPERTY LINE OF COE ST	8	GATE		1917	26	WWD	WOONSOCKET	OPEN	
E2	36	E2-36	PROVIDENCE ST	AT NORTH PROPERTY LINE OF VOSE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	37	E2-37	VOSE ST	AT EAST PROPERTY LINE OF PROVIDENCE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E2	38	E2-38	BERNICE AVE	AT WEST PROPERTY LINE OF ANDREWS ST	8	GATE		1891	26	WWD	WOONSOCKET	OPEN	
E2	39	E2-39	BERNICE AVE	AT EAST PROPERTY LINE OF ANDREWS ST	8	GATE		1891	26	WWD	WOONSOCKET	OPEN	
E2	40	E2-40	SOUTH MAIN ST	AT NORTH PROPERTY LINE OF SHOVE ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E2	41	E2-41	ROCKLAND AVE	AT WEST PROPERTY LINE OF SOUTH MAIN ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	42	E2-42	SOUTH MAIN ST	AT NORTH PROPERTY LINE OF ROCKLAND AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
E2	43	E2-43	AVENUE C	AT EAST PROPERTY LINE OF COE ST	8	GATE		1891	26	WWD	WOONSOCKET	OPEN	
E2	44	E2-44	BALLOU ST	AT WEST PROPERTY LINE OF ORCHARD ST	8	GATE		1917	26	WWD	WOONSOCKET	OPEN	
E2	45	E2-45	ORCHARD ST	AT NORTH PROPERTY LINE OF BALLOU ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E2	46	E2-46	BALLOU ST	AT EAST PROPERTY LINE OF ORCHARD ST	8	GATE		1917	26	WWD	WOONSOCKET	OPEN	
E2	47	E2-47	ORCHARD ST	AT SOUTH PROPERTY LINE OF BALLOU ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	48	E2-48	SUMMIT ST	AT NORTH PROPERTY LINE OF BALLOU ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	49	E2-49	PROVIDENCE ST	AT NORTH PROPERTY LINE OF BROAD ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	50	E2-50	BROAD ST	AT EAST PROPERTY LINE OF PROVIDENCE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E2	51	E2-51	BREAULT AVE	AT EAST PROPERTY LINE OF SOUTH MAIN ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	52	E2-52	ANDREWS ST	AT NORTH PROPERTY LINE OF SOUTH MAIN ST	6	GATE		1890	20	WWD	WOONSOCKET	OPEN	
E2	53	E2-53	SOUTH MAIN ST	AT EAST PROPERTY LINE OF ANDREWS ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E2	54	E2-54	BRADFORD ST	AT SOUTH PROPERTY LINE OF SOUTH MAIN ST	4	GATE		1989	14	WWD	WOONSOCKET	OPEN	REPLACED 4/13/89
E2	55	E2-55	SHOVE ST	AT SOUTH PROPERTY LINE OF SOUTH MAIN ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	56	E2-56	COE ST	AT WEST PROPERTY LINE OF SHOVE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	57	E2-57	SHOVE ST	AT NORTH PROPERTY LINE OF COE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	58	E2-58	COE ST	AT EAST PROPERTY LINE OF SHOVE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	59	E2-59	AVENUE A	AT SOUTH PROPERTY LINE OF COE ST	6	GATE		1900		WWD	WOONSOCKET	OPEN	
E2	60	E2-60	IRENE BLVD	AT EAST PROPERTY LINE OF IDA LANE	8	GATE	APS	1960	26	WWD	WOONSOCKET	OPEN	
E2	61	E2-61	IRENE BLVD	AT WEST PROPERTY LINE OF AVENUE C	8	GATE	APS	1960	26	WWD	WOONSOCKET	OPEN	
E2	62	E2-62	AVENUE C	AT WEST PROPERTY LINE OF ORCHARD ST	8	GATE		1891	26	WWD	WOONSOCKET	OPEN	
E2	63	E2-63	ORCHARD ST	AT NORTH PROPERTY LINE OF AVENUE C	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	64	E2-64	AVENUE C	AT EAST PROPERTY LINE OF ORCHARD ST	8	GATE		1891	26	WWD	WOONSOCKET	OPEN	
E2	65	E2-65	MIDDLE ST	AT SOUTH PROPERTY LINE OF BALLOU ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	66	E2-66	BALLOU ST	AT WEST PROPERTY LINE OF PROVIDENCE ST	8	GATE		1917	26	WWD	WOONSOCKET	OPEN	
E2	67	E2-67	PROVIDENCE ST	60' FROM SOUTH PROPERTY LINE OF BALLOU ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E2	68	E2-68	JENCKES ST	AT NORTH PROPERTY LINE OF BALLOU ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E2	69	E2-69	BALLOU ST	AT EAST PROPERTY LINE OF JENCKES ST	8	GATE		1917	26	WWD	WOONSOCKET	OPEN	
E2	70	E2-70	JENCKES ST	AT SOUTH PROPERTY LINE OF BALLOU ST	6	GATE			20	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
E2	71	E2-71	AVENUE C	18' EAST OF HYD # 5245	6	GATE		1930	8	WWD	WOONSOCKET	OPEN	FIRE SUPPLY
E2	72	E2-72	BALLOU ST	ON WEST PROPERTY LINE OF PROVIDENCE ST	8	GATE		1917		WWD	WOONSOCKET		
E3	1	E3-1	EAST ORCHARD ST	AT WEST PROPERTY LINE OF ERIE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E3	2	E3-2	FRONT ST	AT NORTH PROPERTY LINE OF GLOBE ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E3	3	E3-3	FRONT ST	AT SOUTH PROPERTY LINE OF GLOBE ST	6	GATE			20	WWD	WOONSOCKET	CLOSED	
E3	4	E3-4	TRANSIT ST	AT SOUTH PROPERTY LINE OF FRONT ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E3	5	E3-5	TRANSIT ST	AT NORTH PROPERTY LINE OF ROSS ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E3	6	E3-6	TRANSIT ST	AT SOUTH PROPERTY LINE OF ROSS ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E3	7	E3-7	ROSS ST	AT EAST PROPERTY LINE OF TRANSIT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E3	8	E3-8	ROSS ST	AT WEST PROPERTY LINE OF BENEFIT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E3	9	E3-9	BENEFIT ST	AT NORTH PROPERTY LINE OF ROSS ST	8	GATE		1941	26	WWD	WOONSOCKET	OPEN	
E3	10	E3-10	FRONT ST	AT WEST PROPERTY LINE OF BENEFIT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	TSV
E3	11	E3-11	BENEFIT ST	AT SOUTH PROPERTY LINE OF FRONT ST	8	GATE		1941	26	WWD	WOONSOCKET	OPEN	
E3	12	E3-12	HILL ST	AT WEST PROPERTY LINE OF GRAND ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E3	13	E3-13	GRAND ST	AT NORTH PROPERTY LINE OF HILL ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E3	14	E3-14	HILL ST	AT EAST PROPERTY LINE OF GRAND ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E3	15	E3-15	GRAND ST	AT SOUTH PROPERTY LINE OF HILL ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E3	16	E3-16	LOGEE ST	AT WEST PROPERTY LINE OF PARK AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
E3	17	E3-17	PARK AVE	AT NORTH PROPERTY LINE OF LOGEE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E3	18	E3-18	PARK AVE	AT NORTH PROPERTY LINE OF LOGEE ST	8	GATE			26	WWD	WOONSOCKET	CLOSED	
E3	19	E3-19	LOGEE ST	AT EAST PROPERTY LINE OF PARK AVE	4	GATE			14	WWD	WOONSOCKET	CLOSED	
E3	20	E3-20	LOGEE ST	AT EAST PROPERTY LINE OF PARK AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
E3	21	E3-21	LOGEE ST	AT EAST PROPERTY LINE OF PARK AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
E3	22	E3-22	PARK AVE	AT SOUTH PROPERTY LINE OF LOGEE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E3	23	E3-23	PARK AVE	AT SOUTH PROPERTY LINE OF LOGEE ST	8	GATE			26	WWD	WOONSOCKET	CLOSED	
E3	24	E3-24	COLLINS ST	AT WEST PROPERTY LINE OF ERIE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E3	25	E3-25	VOSE ST	AT WEST PROPERTY LINE OF BAILEY ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E3	26	E3-26	VOSE ST	AT EAST PROPERTY LINE OF BAILEY ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E3	27	E3-27	VOSE ST	AT WEST PROPERTY LINE OF TRANSIT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E3	28	E3-28	VOSE ST	AT WEST PROPERTY LINE OF TRANSIT ST	6	GATE			20	WWD	WOONSOCKET	CLOSED	
E3	29	E3-29	TRANSIT ST	AT NORTH PROPERTY LINE OF VOSE ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E3	30	E3-30	VOSE ST	AT EAST PROPERTY LINE OF TRANSIT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E3	31	E3-31	TRANSIT ST	AT SOUTH PROPERTY LINE OF VOSE ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E3	32	E3-32	TRANSIT ST	AT SOUTH PROPERTY LINE OF CROSS ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E3	33	E3-33	TRANSIT ST	AT NORTH PROPERTY LINE OF CROSS ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E3	34	E3-34	CROSS ST	AT EAST PROPERTY LINE OF TRANSIT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E3	35	E3-35	WARD ST	AT SOUTH PROPERTY LINE OF CROSS ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E3	36	E3-36	CROSS ST	AT WEST PROPERTY LINE OF VALLEY ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E3	37	E3-37	VALLEY ST	AT SOUTH PROPERTY LINE OF CROSS ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E3	38	E3-38	HILL ST	AT WEST PROPERTY LINE OF PARK AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
E3	39	E3-39	PARK AVE	AT SOUTH PROPERTY LINE OF HILL ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E3	40	E3-40	LOGEE ST	AT WEST PROPERTY LINE OF GROVE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E3	41	E3-41	GROVE ST	AT NORTH PROPERTY LINE OF LOGEE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E3	42	E3-42	LOGEE ST	AT WEST PROPERTY LINE OF GROVE ST	4	GATE			14	WWD	WOONSOCKET	CLOSED	
E3	43	E3-43	GROVE ST	AT NORTH PROPERTY LINE OF LOGEE ST	6	GATE			20	WWD	WOONSOCKET	?	
E3	44	E3-44	GROVE ST	AT SOUTH PROPERTY LINE OF LOGEE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E3	45	E3-45	GROVE ST	AT SOUTH PROPERTY LINE OF LOGEE ST	6	GATE			20	WWD	WOONSOCKET	CLOSED	
E3	46	E3-46	LOGEE ST	AT EAST PROPERTY LINE OF GROVE ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E3	47	E3-47	VOSE ST	AT WEST PROPERTY LINE OF JENCKES ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E3	48	E3-48	JENCKES ST	AT SOUTH PROPERTY LINE OF VOSE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E3	49	E3-49	VOSE ST	AT EAST PROPERTY LINE OF JENCKES ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E3	50	E3-50	WARD ST	AT NORTH PROPERTY LINE OF VOSE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E3	51	E3-51	WARD ST	AT SOUTH PROPERTY LINE OF VOSE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E3	52	E3-52	GRAND ST	AT SOUTH PROPERTY LINE OF CROSS ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E3	53	E3-53	PARK AVE	AT NORTH PROPERTY LINE OF SMITH ST	8	GATE		1994	26	WWD	WOONSOCKET	OPEN	REPLACED 6/7/1994
E3	54	E3-54	GROVE ST	AT SOUTH PROPERTY LINE OF SMITH ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E3	55	E3-55	COTTAGE ST	AT NORTH PROPERTY LINE OF SMITH ST	8	GATE	APS	1960	26	WWD	WOONSOCKET	OPEN	
E3	56	E3-56	BROAD ST	AT WEST PROPERTY LINE OF JENCKES ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E3	57	E3-57	JENCKES ST	AT NORTH PROPERTY LINE OF BROAD ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E3	58	E3-58	BROAD ST	AT EAST PROPERTY LINE OF JENCKES ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E3	59	E3-59	JENCKES ST	AT SOUTH PROPERTY LINE OF BROAD ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E3	60	E3-60	BAILEY ST	AT SOUTH PROPERTY LINE OF BROAD ST	8	GATE		1926	26	WWD	WOONSOCKET	OPEN	
E3	61	E3-61	BROAD ST	AT WEST PROPERTY LINE OF TRANSIT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E3	62	E3-62	TRANSIT ST	AT NORTH PROPERTY LINE OF BROAD ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E3	63	E3-63	TRANSIT ST	AT EAST PROPERTY LINE OF DARWIN ST	8	GATE			26	WWD	WOONSOCKET	CLOSED	
E3	64	E3-64	DARWIN ST	AT SOUTH PROPERTY LINE OF BROAD ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E3	65	E3-65	VOSE ST	AT WEST PROPERTY LINE OF THOMAS ST	6	GATE			20	WWD	WOONSOCKET	CLOSED	
E3	66	E3-66	THOMAS ST	AT SOUTH PROPERTY LINE OF VOSE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E3	67	E3-67	GRAND ST	AT NORTH PROPERTY LINE OF VOSE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E3	68	E3-68	PARK AVE	70' SOUTH OF HYDRANT #5343	8	GATE			26	WWD	WOONSOCKET	OPEN	
E3	69	E3-69	BLAKELY ST	AT EAST PROPERTY LINE OF PARK AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
E3	70	E3-70	COTTAGE ST	AT SOUTH PROPERTY LINE OF ANGELL ST	8	GATE	APS	1960	26	WWD	WOONSOCKET	OPEN	
E3	71	E3-71	ANGELL ST	AT SOUTH PROPERTY LINE OF COTTAGE ST	8	GATE		1934	26	WWD	WOONSOCKET	OPEN	
E3	72	E3-72	BALLOU ST	AT WEST PROPERTY LINE OF BAILEY ST	8	GATE		1917	26	WWD	WOONSOCKET	OPEN	
E3	73	E3-73	BAILEY ST	AT NORTH PROPERTY LINE OF BALLOU ST	8	GATE		1926	26	WWD	WOONSOCKET	OPEN	
E3	74	E3-74	BAILEY ST	AT SOUTH PROPERTY LINE OF BALLOU ST	8	GATE		1926	26	WWD	WOONSOCKET	OPEN	
E3	75	E3-75	DARWIN ST	AT NORTH PROPERTY LINE OF BALLOU ST	8	GATE	MUELLER	1990		WWD	WOONSOCKET	OPEN	
E3	76	E3-76	MINERVA ST	AT SOUTH PROPERTY LINE OF BALLOU ST	8	GATE	MUELLER	1962	26	WWD	WOONSOCKET	OPEN	
E3	77	E3-77	WARD ST	AT NORTH PROPERTY LINE OF TRANSIT ST	8	GATE			26	WWD	WOONSOCKET	CLOSED	
E3	78	E3-78	WARD ST	AT SOUTH PROPERTY LINE OF TRANSIT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E3	79	E3-79	BALLOU ST	AT WEST PROPERTY LINE OF WARD ST	8	GATE		1917	26	WWD	WOONSOCKET	OPEN	
E3	80	E3-80	HOLLIS ST	AT SOUTH PROPERTY LINE OF VOSE ST	8	GATE		1955	26	WWD	WOONSOCKET	OPEN	
E3	81	E3-81	VOSE ST	AT WEST PROPERTY LINE OF PARK AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
E3	82	E3-82	FRONT ST	100' SOUTH OF HYDRANT # 5302	12	GATE			38	WWD	WOONSOCKET	OPEN	
E3	83	E3-83	COTTAGE ST	AT NORTH PROPERTY LINE OF BLAKELY ST	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	
E3	84	E3-84	WILLIAMS ST	AT EAST PROPERTY LINE OF COTTAGE ST	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
E3	85	E3-85	FRONT ST	AT WEST PROPERTY LINE OF BENEFIT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E3	86	E3-86	BENEFIT ST	140' FROM NORTH PROPERTY LINE OF HILL ST	6	GATE	APS	1935	20	WWD	WOONSOCKET	OPEN	TSV
E3	87	E3-87	PARK AVE	AT SOUTH PROPERTY LINE OF VOSE ST	4	BLOW OFF			14	WWD	WOONSOCKET	CLOSED	
E3	88	E3-88	DARWIN ST	AT REAR SOUTH PROPERTY LINE OF BALLOU ST	8	GATE	MUELLER	1989		WWD	WOONSOCKET	OPEN	
E4	1	E4-1	COTTAGE ST	AT NORTH PROPERTY LINE OF CRAWFORD ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E4	2	E4-2	COTTAGE ST	AT SOUTH PROPERTY LINE OF CRAWFORD ST	6	GATE			20	WWD	WOONSOCKET	CLOSED	
E4	3	E4-3	COTTAGE ST	AT SOUTH PROPERTY LINE OF CRAWFORD ST	6	GATE			20	WWD	WOONSOCKET	CLOSED	
E4	4	E4-4	COTTAGE ST	AT SOUTH PROPERTY LINE OF CRAWFORD ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E4	5	E4-5	MOORE ST	AT LEAST PROPERTY LINE OF COTTAGE ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E4	6	E4-6	MOORE ST	120' FROM EAST PROPERTY LINE OF COTTAGE ST	1.5	BLOW OFF			3.5	WWD	WOONSOCKET	CLOSED	
E4	7	E4-7	CRAWFORD ST	AT CENTER LINE OF CLEVELEND ST	6	GATE	APS		20	WWD	WOONSOCKET	OPEN	TSV
E4	8	E4-8	CRAWFORD ST	AT EAST PROPERTY LINE OF CLEVELAND ST	6	GATE			20	WWD	WOONSOCKET	CLOSED	
E4	9	E4-9	DIVISION ST	AT NORTH PROPERTY LINE OF MONROE ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	10	E4-10	DIVISION ST	AT NORTH PROPERTY LINE OF MONROE ST	8	GATE		1957	26	WWD	WOONSOCKET	OPEN	
E4	11	E4-11	DIVISION ST	AT SOUTH PROPERTY LINE OF MONROE ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	12	E4-12	MONROE ST	AT EAST PROPERTY LINE OF DIVISION ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	13	E4-13	MAPLE ST	AT CENTER LINE OF ST JOSEPH ST	8	GATE			26	WWD	WOONSOCKET	CLOSED	TSV
E4	14	E4-14	ST JOSEPH ST	AT EAST PROPERTY LINE OF MAPLE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E4	15	E4-15	MONROE ST	AT WEST PROPERTY LINE OF MAPLE ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	16	E4-16	MAPLE ST	AT NORTH PROPERTY LINE OF MONROE ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	17	E4-17	MAPLE ST	AT SOUTH PROPERTY LINE OF MONROE ST	12	GATE			38	WWD	WOONSOCKET	CLOSED	
E4	18	E4-18	MAPLE ST	AT SOUTH PROPERTY LINE OF MONROE ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	19	E4-19	MAPLE ST	AT SOUTH PROPERTY LINE OF MONROE ST		PRV				WWD	WOONSOCKET	OPEN	
E4	20	E4-20	MONROE ST	AT EAST PROPERTY LINE OF MAPLE ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	21	E4-21	MAPLE ST	AT CENTER LINE OF MONROE ST	12	GATE			38	WWD	WOONSOCKET	CLOSED	
E4	22	E4-22	MONROE ST	AT EAST PROPERTY LINE OF MAPLE ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	23	E4-23	MONROE ST	AT EAST PROPERTY LINE OF MAPLE ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	24	E4-24	ST JOSEPH ST	AT WEST PROPERTY LINE OF WELLES ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	25	E4-25	WELLES ST	AT SOUTH PROPERTY LINE OF ST. JOSEPH ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	26	E4-26	MONROE ST	AT WEST PROPERTY LINE OF WELLES ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	27	E4-27	WELLES ST	AT NORTH PROPERTY LINE OF MONROE ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	28	E4-28	MONROE ST	AT EAST PROPERTY LINE OF WELLES ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	29	E4-29	WELLES ST	AT SOUTH PROPERTY LINE OF MONROE ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	30	E4-30	KNIGHT ST	15' NORTH OF HYDRANT # 5412	6	GATE			20	WWD	WOONSOCKET	OPEN	
E4	31	E4-31	KNIGHT ST	AT SOUTH PROPERTY LINE OF LOGEE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E4	32	E4-32	COTTAGE ST	AT NORTH PROPERTY LINE OF LOGEE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E4	33	E4-33	COTTAGE ST	AT NORTH PROPERTY LINE OF LOGEE ST	6	GATE			20	WWD	WOONSOCKET	CLOSED	
E4	34	E4-34	JACKSON ST	AT SOUTH PROPERTY LINE OF JACKSON ST	6	GATE			20	WWD	WOONSOCKET	CLOSED	
E4	35	E4-35	CLEVELAND ST	AT NORTH PROPERTY LINE OF LOGEE ST	14	GATE			44	WWD	WOONSOCKET	OPEN	
E4	36	E4-36	LOGEE ST	AT CENTER LINE OF CLEVELAND ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	37	E4-37	CLEVELAND ST	AT SOUTH PROPERTY LINE OF LOGEE ST	6	GATE			20	WWD	WOONSOCKET	CLOSED	
E4	38	E4-38	DIVISION ST	AT NORTH PROPERTY LINE OF CRAWFORD ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	39	E4-39	CRAWFORD ST	AT WEST PROPERTY LINE OF DIVISION ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E4	40	E4-40	DIVISION ST	AT SOUTH PROPERTY LINE OF CRAWFORD ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	41	E4-41	WASHINGTON ST	AT EAST PROPERTY LINE OF DIVISION ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	42	E4-42	DIVSION ST	AT SOUTH PROPERTY LINE OF WASHINGTON ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	43	E4-43	DIVISION ST	AT NORTH PROPERTY LINE OF LOGEE ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	44	E4-44	OXFORD ST	AT SOUTH PROPERTY LINE OF LOGEE ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	45	E4-45	LOGEE ST	AT CENTER LINE OF OXFORD ST	6	GATE			20	WWD	WOONSOCKET	CLOSED	BURIED?, TSV
E4	46	E4-46	MAPLE ST	AT CENTER LINE OF WASHINGTON ST	30	GATE			93	WWD	WOONSOCKET	OPEN	TSV
E4	47	E4-47	WASHINGTON ST	AT EAST PROPERTY LINE OF MAPLE ST	30	GATE			93	WWD	WOONSOCKET	OPEN	
E4	48	E4-48	WASHINGTON ST	AT EAST PROPERTY LINE OF MAPLE ST	3	GATE			11	WWD	WOONSOCKET	CLOSED	
E4	49	E4-49	MAPLE ST	40' FROM SOUTH PROPERTY LINE OF WASHINGTON ST	20	GATE			63	WWD	WOONSOCKET	OPEN	TSV
E4	50	E4-50	MAPLE ST	45' FROM SOUTH PROPERTY LINE OF WASHINGTON ST	20	GATE			63	WWD	WOONSOCKET	CLOSED	
E4	51	E4-51	MAPLE ST	60' FROM SOUTH PROPERTY LINE OF WASHINGTON ST	1.5	BLOW OFF			1.5	WWD	WOONSOCKET	CLOSED	
E4	52	E4-52	MAPLE ST	FROM SOUTH PROPERTY LINE OF WASHINGTON ST	14	GATE			44	WWD	WOONSOCKET	OPEN	
E4	53	E4-53	MAPLE ST	70' FROM SOUTH PROPERTY LINE OF WASHINGTON ST	20	GATE			63	WWD	WOONSOCKET	OPEN	
E4	54	E4-54	MAPLE ST	70' FROM SOUTH PROPERTY LINE OF WASHINGTON ST	20	GATE			63	WWD	WOONSOCKET	OPEN	
E4	55	E4-55	WASHINGTON ST	90' FROM WEST PROPERTY LINE OF WELLES ST		AIR REL. VALVE				WWD	WOONSOCKET	CLOSED	
E4	56	E4-56	WELLES ST	AT NORTH PROPERTY LINE OF WASHINGTON ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	57	E4-57	WELLES ST	AT NORTH PROPERTY LINE OF WASHINGTON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E4	58	E4-58	WELLES ST	CENTER LINE OF WELLES AND WASHINGTON ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	59	E4-59	WELLES ST	AT SOUTH PROPERTY LINE OF WASHINGTON ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	60	E4-60	WELLES ST	20' FROM SOUTH PROPERTY LINE OF WASHINGTON ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	61	E4-61	WELLES ST	30' FROM SOUTH PROPERTY LINE OF WASHINGTON ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	62	E4-62	WELLES ST	40' FROM SOUTH PROPERTY LINE OF WASHINGTON ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	63	E4-63	WELLES ST	50' FROM SOUTH PROPERTY LINE OF WASHINGTON ST	4	GATE			14	WWD	WOONSOCKET	CLOSED	
E4	64	E4-64	MONROE ST	110' FROM EAST PROPERTY LINE OF DORAN ST	10	GATE			32	WWD	WOONSOCKET	OPEN	IN PIT, PRIVATE (MSC HIGH)
E4	65	E4-65	COTTAGE ST	AT WEST PROPERTY LINE OF KNIGHT ST	8	GATE		1958	26	WWD	WOONSOCKET	OPEN	
E4	66	E4-66	KNIGHT ST	AT NORTH PROPERTY LINE OF HAMILTON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E4	67	E4-67	HAMILTON ST	AT EAST PROPERTY LINE OF KNIGHT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E4	68	E4-68	KNIGHT ST	AT SOUTH PROPERTY LINE OF HAMILTON ST	8	GATE		1957	26	WWD	WOONSOCKET	OPEN	TSV
E4	69	E4-69	KNIGHT ST	AT SOUTH PROPERTY LINE OF HAMILTON ST	10	GATE			32	WWD	WOONSOCKET	OPEN	
E4	70	E4-70	KNIGHT ST	AT SOUTH PROPERTY LINE OF HAMILTON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E4	71	E4-71	HAMILTON ST	AT WEST PROPERTY LINE OFJACKSON ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E4	72	E4-72	JACKSON ST	AT NORTH PROPERTY LINE OF HAMILTON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E4	73	E4-73	HAMILTON ST	AT WEST PROPERTY LINE OF CLEVELAND ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	74	E4-74	HAMILTON ST	AT WEST PROPERTY LINE OF CLEVELAND ST	12	GATE		1957	38	WWD	WOONSOCKET	OPEN	TSV
E4	75	E4-75	CLEVELAND ST	AT NORTH PROPERTY LINE OF HAMILTON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E4	76	E4-76	HAMILTON ST	AT EAST PROPERTY LINE OF CLEVLAND ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	77	E4-77	HAMILTON ST	AT WEST PROPERTY LINE OF OXFORD ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	78	E4-78	OXFORD ST	AT NORTH PROPERTY LINE OF HAMILTON ST	12	GATE		1900		WWD	WOONSOCKET	OPEN	
E4	79	E4-79	OXFORD ST	AT SOUTH PROPERTY LINE OF HAMILTON ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	80	E4-80	LOGEE ST	130' FROM WEST PROPERTY LINE OF WELLES ST	14	GATE			44	WWD	WOONSOCKET	OPEN	TSV
E4	81	E4-81	LOGEE ST	120' FROM WEST PROPERTY LINE OF WELLES ST	14	GATE			44	WWD	WOONSOCKET	CLOSED	
E4	82	E4-82	LOGEE ST	100' FROM WEST PROPERTY LINE OF WELLES ST	14	GATE			44	WWD	WOONSOCKET	OPEN	TSV

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
E4	83	E4-83	LOGEE ST	50' FROM WEST PROPERTY LINE OF WELLES ST	20	GATE			63	WWD	WOONSOCKET	OPEN	
E4	84	E4-84	LOGEE ST	70' FROM WEST PROPERTY LINE OF WELLES ST	20	GATE			63	WWD	WOONSOCKET	OPEN	
E4	85	E4-85	LOGEE ST	60' FROM WEST PROPERTY LINE OF WELLES ST	20	GATE			63	WWD	WOONSOCKET	OPEN	
E4	86	E4-86	RONIAN ST	AT NORTH PROPERTY LINE OF LOGEE ST	30	GATE			93	WWD	WOONSOCKET	OPEN	
E4	87	E4-87	RONIAN ST	AT NORTH PROPERTY LINE OF LOGEE ST	3	GATE			11	WWD	WOONSOCKET	CLOSED	
E4	88	E4-88	LOGEE ST	AT CENTER LINE OF RESERVOIR AVE	14	GATE			44	WWD	WOONSOCKET	OPEN	TSV
E4	89	E4-89	LOGEE ST	AT EAST PROPERTY LINE OF RESERVOIR AVE	14	GATE			44	WWD	WOONSOCKET	OPEN	
E4	90	E4-90	LOGEE ST	AT EAST PROPERTY LINE OF RESERVOIR AVE	3	GATE			11	WWD	WOONSOCKET	CLOSED	
E4	91	E4-91	RESERVOIR AVE	80' FROM SOUTH PROPERTY LINE OF LOGEE ST	14	GATE			44	WWD	WOONSOCKET	OPEN	
E4	92	E4-92	RESERVOIR AVE	100' FROM SOUTH PROPERTY LINE OF LOGEE ST	14	GATE			44	WWD	WOONSOCKET	OPEN	
E4	93	E4-93	RESERVOIR AVE	110' FROM SOUTH PROPERTY LINE OF LOGEE ST	14	GATE			44	WWD	WOONSOCKET	OPEN	
E4	94	E4-94	RESERVOIR AVE	120' FROM SOUTH PROPERTY LINE OF LOGEE ST	14	GATE			44	WWD	WOONSOCKET	OPEN	
E4	95	E4-95	RESERVOIR AVE	140' FROM SOUTH PROPERTY LINE OF LOGEE ST	14	GATE			44	WWD	WOONSOCKET	OPEN	
E4	96	E4-96	KNIGHT ST	AT NORTH PROPERTY LINE OF CAPWELL AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
E4	97	E4-97	RESERVOIR AVE	110' FROM SOUTH PROPERTY LINE OF ROBERGE AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
E4	98	E4-98	GETCHELL AVE	AT EAST PROPERTY LINE OF KNIGHT ST	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
E4	99	E4-99	GETCHELL AVE	AT WEST PROPERTY LINE OF JILLSON AVE	8	GATE		1962		WWD	WOONSOCKET	OPEN	
E4	100	E4-100	GETCHELL AVE	AT EAST PROPERTY LINE OF JILLSON AVE	8	GATE		1959	26	WWD	WOONSOCKET	OPEN	
E4	101	E4-101	GETCHELL AVE	AT THE END OF GETCHELL AVE TOWARDS BERNON SCHOOL	8	GATE			26	WWD	WOONSOCKET	OPEN	
E4	102	E4-102	CAPWELL AVE	AT THE EAST PROPERTY LINE OF KNIGHT ST	8	GATE	APS	1968	26	WWD	WOONSOCKET	OPEN	
E4	103	E4-103	OXFORD ST	AT NORTH PROPERTY LINE OF CAPWELL AVE	8	GATE	APS	1972	26	WWD	WOONSOCKET	OPEN	
E4	104	E4-104	JILLSON AVE	125' FROM SOUTH PROPERTY LINE OFJILLSON AVE	8	GATE		1979	26	WWD	WOONSOCKET	OPEN	
E4	105	E4-105	JILLSON AVE	AT LOGEE ST		AIR REL. VALVE		1980		WWD	WOONSOCKET		
E4	106	E4-106	MAPLE ST	AT ST. JOSEPH ST	8	GATE	MUELLER	1980	26	WWD	WOONSOCKET	OPEN	
E4	107	E4-107	MAPLE ST	70' SOUTH OF WASHINGTON ST	1	AIR REL. VALVE	RED HED	1980		WWD	WOONSOCKET	CLOSED	
E4	108	E4-108	MAPLE ST	AT LOGEE ST	12	GATE	MUELLER	1980	38	WWD	WOONSOCKET	OPEN	
E4	109	E4-109	COTTAGE ST	AT LOGEE ST	6	GATE	MUELLER	1980	20	WWD	WOONSOCKET	OPEN	
E4	110	E4-110	JACKSON ST	15' SOUT OF LOGEE ST	8	GATE	MUELLER	1980	26	WWD	WOONSOCKET	OPEN	
E4	111	E4-111	LOGEE ST	AT JACKSON ST	12	GATE	MUELLER	1980		WWD	WOONSOCKET	OPEN	
E4	112	E4-112	CLEVELAND ST	AT LOGEE ST	6	GATE	MUELLER	1980	20	WWD	WOONSOCKET	OPEN	
E4	113	E4-113	LOGEE ST	AT CLEVELAND ST	12	GATE	MUELLER	1980	38	WWD	WOONSOCKET	OPEN	
E4	114	E4-114	LOGEE ST	AT DIVISION ST	12	GATE	MUELLER	1981	38	WWD	WOONSOCKET	OPEN	
E4	115	E4-115	LOGEE ST	AT DIVISION ST	12	GATE	MUELLER	1981	38	WWD	WOONSOCKET	OPEN	
E4	116	E4-116	LOGEE ST	AT JILLSON AVE	12	GATE	MUELLER	1980	38	WWD	WOONSOCKET	OPEN	
E4	117	E4-117	LOGEE ST	AT MAPLE ST	8	GATE	MUELLER	1980	26	WWD	WOONSOCKET	OPEN	
E4	118	E4-118	LOGEE ST	AT WELLES ST	1	AIR REL. VALVE	RED HED	1980		WWD	WOONSOCKET	CLOSED	
E4	119	E4-119	LOGEE ST	AT RONIAN ST	8	GATE	MUELLER	1980	26	WWD	WOONSOCKET	CLOSED	
E4	120	E4-120	CLEVELAND ST	AT EAST STREET LINE OF LOGEE ST	8	GATE	MUELLER	1980	26	WWD	WOONSOCKET	OPEN	
E4	121	E4-121	CLEVELAND ST	AT CRAWFORD ST	8	GATE	MUELLER	1980	26	WWD	WOONSOCKET	OPEN	
E4	122	E4-122	CRAWFORD ST	AT CLEVELAND ST	1	AIR REL. VALVE	RED HED	1980		WWD	WOONSOCKET	CLOSED	
E4	122	E4-122	CRAWFORD ST	AT CLEVELEND ST	1	AIR REL. VALVE	RED HED	1980		WWD	WOONSOCKET	CLOSED	
E4	123	E4-123	CRAWFORD ST	AT EAST STREET LINE OF CLEVELAND ST	6	GATE	MUELLER	1980	20	WWD	WOONSOCKET	OPEN	
E4	124	E4-124	CRAWFORD ST	AT COTTAGE ST	6	GATE	MUELLER	1980	20	WWD	WOONSOCKET	OPEN	
E4	125	E4-125	RONIAN ST	AT NORTH STREET LINE OF LOGEE ST	8	GATE	MUELLER	1980	26	WWD	WOONSOCKET	OPEN	
E4	126	E4-126	RONIAN ST	AT SOUTH STREET LINE OF WASHINGTON ST	8	GATE	MUELLER	1980	26	WWD	WOONSOCKET	OPEN	
E4	127	E4-127	WASHINGTON ST	AT WELLES ST AND PUMPING STATION	12	GATE	MUELLER	1981	38	WWD	WOONSOCKET	OPEN	
E4	128	E4-128	WASHINGTON ST	75' WEST OF WELLES ST	1	AIR REL. VALVE	RED HED	1981		WWD	WOONSOCKET	CLOSED	
E4	129	E4-129	WASHINGTON ST	AT EAST STREET LINE OF MAPLE ST	12	GATE	MUELLER	1980	38	WWD	WOONSOCKET	OPEN	
E4	130	E4-130	JILLSON AVE	EAST SIDE OF JILLSON AT CAPWELL AVE	8	GATE		1987	26	WWD	WOONSOCKET	OPEN	
E4	131	E4-131	ST JOSEPH ST	AT WELLE ST	6	GATE	MUELLER	1987	20	WWD	WOONSOCKET	OPEN	SAME AS WS # 13190
E5	1	E5-1	ST BARNABE ST	AT SOUTH PROPERTY LINE OF VERDUN ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
E5	2	E5-2	VERDUN ST	AT EAST PROPERTY LINE OF ST BARNABE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E5	3	E5-3	VERDUN ST	AT WEST PROPERTY LINE OF MANVILLE RD	8	GATE			26	WWD	WOONSOCKET	OPEN	
E5	4	E5-4	MANVILLE RD	17' OFF SOUTH PROPERTY LINE OF VERDUN ST	8	GATE	RENSELLAER		26	WWD	WOONSOCKET	OPEN	TSV
E5	5	E5-5	MOUNT SAINT CHARLES AVE	AT WEST PROPERTY LINE OF ST BARNABE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E5	6	E5-6	ST BARNABE ST	AT NORTH PROPERTY LINE OF MSC AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
E5	7	E5-7	MOUNT SAINT CHARLES AVE	AT E LINE OF ST BARNABE	6	GATE			20	WWD	WOONSOCKET	OPEN	
E5	8	E5-8	ST BARNABE ST	AT SOUTH PROPERTY LINE OF MSC AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
E5	9	E5-9	MOUNT SAINT CHARLES AVE	AT WEST PROPERTY LINE OF MANVILLE RD	6	GATE			20	WWD	WOONSOCKET	OPEN	
E5	10	E5-10	MANVILLE RD	17' OFF SOUTH PROPERTY LINE OF MSC AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	TSV
E5	11	E5-11	MOUNT SAINT CHARLES AVE	AT WEST PROPERTY LINE OF RHODE ISLAND AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
E5	12	E5-12	RHODE ISLAND AVE	AT SOUTH PROPERTY LINE OF MSC AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
E5	13	E5-13	ST BARNABE ST	AT NORTH PROPERTY LINE OF ST. SIMON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E5	14	E5-14	ST SIMON ST	AT EAST PROPERTY LINE OF ST BARNABE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E5	15	E5-15	ST BARNABE ST	AT SOUTH PROPERTY LINE OF ST SIMON	8	GATE			26	WWD	WOONSOCKET	OPEN	
E5	16	E5-16	ST HUGHES ST	AT SOUTH PROPERTY LINE OF ST SIMON ST	8	GATE			26	WWD	WOONSOCKET	ABANDONED	THIS GV REPLACED BY GV# E-5-49 12-17-96
E5	17	E5-17	ST SIMON ST	AT WEST PROPERTY LINE OF MANVILLE RD	6	GATE			20	WWD	WOONSOCKET	OPEN	
E5	18	E5-18	MOUNT SAINT CHARLES AVE	AT EAST PROPERTY LINE OF LOGEE ST	12	GATE			38	WWD	WOONSOCKET	CLOSED	
E5	19	E5-19	LOGEE ST	AT SOUTH PROPERY LINE OF MSC AVE	3	GATE			11	WWD	WOONSOCKET	CLOSED	
E5	20	E5-20	LOGEE ST	AT SOUTH PROPERTY LINE OF MSC AVE	30	GATE			93	WWD	WOONSOCKET	OPEN	
E5	21	E5-21	RHODE ISLAND AVE	AT NORTH PROPERTY LINE OF OHIO AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
E5	22	E5-22	RHODE ISLAND AVE	AT SOUTH PROPERTY LINE OF OHIO AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
E5	23	E5-23	RHODE ISLAND AVE	AT NORTH PROPERTY LINE OF VERMONT AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
E5	24	E5-24	RHODE ISLAND AVE	AT SOUTH PROPERTY LINE OF VERMONT AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
E5	25	E5-25	ST BARNABE ST	AT NORTH PROPERTY LINE OF ST MARCEL ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E5	26	E5-26	ST MARCEL ST	AT EAST PROPERTY LINE OF ST BARNABE	8	GATE			26	WWD	WOONSOCKET	OPEN	
E5	27	E5-27	ST BARNABE ST	AT SOUTH PROPERTY LINE OF ST MARCEL ST	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	
E5	28	E5-28	ST HUGHES ST	AT NORTH PROPERTY LINE OF ST MARCEL	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
E5	29	E5-29	ST MARCEL ST	AT WEST PROPERTY LINE OF ST HUGHES	8	GATE			26	WWD	WOONSOCKET	OPEN	
E5	30	E5-30	ST HUGHES ST	AT SOUTH PROPERTY LINE OF ST MARCEL ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
E5	31	E5-31	ST MARCEL ST	AT WEST PROPERTY LINE OF MANVILLE RD	8	GATE			26	WWD	WOONSOCKET	OPEN	
E5	32	E5-32	MANVILLE RD	17' OFF NORTH PROPERTY LINE OF ST MARCEL ST	8	GATE			26	WWD	WOONSOCKET	OPEN	TSV
E5	33	E5-33	JOFFRE AVE	10 NORTH OF HYDRANT # 5522	8	GATE			26	WWD	WOONSOCKET	OPEN	
E5	34	E5-34	RHODE ISLAND AVE	AT NORTH PROPERTY LINE OF LOGEE ST	8	GATE			26	WWD	WOONSOCKET	CLOSED	
E5	35	E5-35	LOGEE ST	AT EAST PROPERTY LINE OF ST BARNABE ST	8	GATE			26	WWD	WOONSOCKET	CLOSED	
E5	36	E5-36	ST BARNABE ST	AT NORTH PROPERTY LINE OF LOGEE ST	8	GATE			26	WWD	WOONSOCKET	CLOSED	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
E5	37	E5-37	LOGEE ST	AT WEST PROPERTY LINE OF ST HUGHES ST	8	GATE			26	WWD	WOONSOCKET	CLOSED	
E5	38	E5-38	ST HUGHES ST	AT WEST PROPERTY LINE OF ST HUGHES ST	8	GATE			26	WWD	WOONSOCKET	CLOSED	
E5	39	E5-39	LOGEE ST	AT WEST PROPERTY LINE OF ST HUGHES	3	GATE			11	WWD	WOONSOCKET	CLOSED	
E5	40	E5-40	LOGEE ST	AT WEST PROPERTY LINE OF ST HUGHES ST	30	GATE			93	WWD	WOONSOCKET	OPEN	
E5	41	E5-41	ST HUGHES ST	AT SOUTH PROPERTY LINE OF LOGEE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
E5	42	E5-42	MANVILLE RD	230' FROM SOUTH PROPERTY LINE OF ST MARCEL ST	3	GATE			11	WWD	WOONSOCKET	CLOSED	
E5	43	E5-43	MANVILLE RD	230' FROM SOUTH PROPERTY LINE OF ST MARCEL ST	30	GATE			93	WWD	WOONSOCKET	OPEN	
E5	44	E5-44	MANVILLE RD	15' FROM NORTH PROPERTY LINE OF ST SIMON ST		AIR REL. VALVE				WWD	WOONSOCKET	CLOSED	
E5	45	E5-45	GLENDALE AVE	AT SOUTH PROPERTY LINE OF LOGEE ST	8	GATE	APS	1968	26	WWD	WOONSOCKET	OPEN	
E5	46	E5-46	MANVILLE RD	AT THE CENTER LINE OF CIRCLE ST	8	GATE		1968	26	WWD	WOONSOCKET	OPEN	TSV
E5	47	E5-47	ST SIMON ST	AT WEST PROPERTY LINE OF ST HUGHES ST	6	GATE		1972		WWD	WOONSOCKET		
E5	48	E5-48	ST HUGHES ST		4	GATE	KENNEDY	1975		WWD	WOONSOCKET	OPEN	TSV
E5	49	E5-49	ST HUGHES ST	10' SOUTH PROPERTY LINE OF ST SIMON ST	8	GATE	MUELLER	1996		WWD	WOONSOCKET	OPEN	THIS GATE VALVE REPLACED GV# E-5-16
E6	1	E6-1	NEWBURY AVE	20' EAST OF HYDRANT #5618	8	GATE			26	WWD	WOONSOCKET	OPEN	
E6	2	E6-2	CUMBERLAND HILL RD	AT NORTH PROPERTY LINE OF DAWES ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E6	3	E6-3	CUMBERLAND HILL RD	17' OFF NORTH PROPERTY LINE OF DAWES ST	8	GATE			26	WWD	WOONSOCKET	CLOSED	TSV
E6	4	E6-4	CUMBERLAND HILL RD	AT SOUTH PROPERTY LINE OF DAWES ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E6	5	E6-5	CUMBERLAND HILL RD	AT NORTH PROPERTY LINE OF PARK DRIVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
E6	6	E6-6	CUMBERLAND HILL RD	17' OFF NORTH PROPERTY LINE OF PARK DRIVE	8	GATE			26	WWD	WOONSOCKET	CLOSED	TSV
E6	7	E6-7	CUMBERLAND HILL RD	AT SOUTH PROPERTY LINE OF PARK DRIVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
E6	8	E6-8	CUMBERLAND HILL RD	AT NORTH PROPERTY LINE OF RANDALL ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E6	9	E6-9	CUMBERLAND HILL RD	17' OFF NORTH PROPERTY LINE OF RANDALL ST	8	GATE			26	WWD	WOONSOCKET	CLOSED	TSV
E6	10	E6-10	CUMBERLAND HILL RD	AT SOUTH PROPERTY LINE OF RANDALL ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E6	11	E6-11	VIRGINIA AVE	AT WEST PROPERTY LINE OF CRAIGIE AVE	8	GATE		1953	26	WWD	WOONSOCKET	OPEN	
E6	12	E6-12	CRAIGIE AVE	AT SOUTH PROPERTY LINE OF VIRGINIA AVE	8	GATE		1954	26	WWD	WOONSOCKET	OPEN	
E6	13	E6-13	VIRGINIA AVE	AT EAST PROPERTY LINE OF CRAIGIE AVE	8	GATE		1963	26	WWD	WOONSOCKET	OPEN	
E6	14	E6-14	CLIFFE AVE	AT SOUTH PROPERTY LINE OF VIRGINIA AVE	8	GATE		1953	26	WWD	WOONSOCKET	OPEN	
E6	15	E6-15	VIRGINIA AVE	AT EAST PROPERTY LINE OF CLIFFE AVE	8	GATE		1953	26	WWD	WOONSOCKET	OPEN	
E6	16	E6-16	CUMBERLAND HILL RD	AT NORTH PROPERTY LINE OF COLUMBUS ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E6	17	E6-17	COLUMBUS ST	AT WEST PROPERTY LINE OF CUMBERLAND HILL RD	8	GATE			26	WWD	WOONSOCKET	OPEN	
E6	18	E6-18	CUMBERLAND HILL RD	AT SOUTH PROPERTY LINE OF COLUMBUS ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E6	19	E6-19	VIRGINIA AVE	AT WEST PROPERTY LINE OF BOZONIAN ST	8	GATE	LUDLOW	1959	26	WWD	WOONSOCKET	OPEN	
E6	20	E6-20	VIRGINIA AVE	AT EAST PROPERTY LINE OF BOZOIAN ST	8	GATE	LUDLOW	1959	26	WWD	WOONSOCKET	OPEN	
E6	21	E6-21	CRAIGIE AVE	AT NORTH PROPERTY LINE OF SIDNEY AVE	8	GATE		1954	26	WWD	WOONSOCKET	OPEN	
E6	22	E6-22	SIDNEY AVE	AT EAST PROPERTY LINE OF CRAIGIE AVE	8	GATE		1953	26	WWD	WOONSOCKET	OPEN	
E6	23	E6-23	CRAIGIE AVE	AT NORTH PROPERTY LINE OF RUSKIN AVE	8	GATE		1954	26	WWD	WOONSOCKET	OPEN	
E6	24	E6-24	RUSKIN AVE	AT EAST PROPERTY LINE OF CRAIGIE AVE	8	GATE		1953	26	WWD	WOONSOCKET	OPEN	
E6	25	E6-25	SIDNEY AVE	AT WEST PROPERTY LINE OF CLIFFE AVE	8	GATE		1953	26	WWD	WOONSOCKET	OPEN	
E6	26	E6-26	CLIFFE AVE	AT SOUTH PROPERTY LINE OF SIDNEY AVE	8	GATE		1953	26	WWD	WOONSOCKET	OPEN	
E6	27	E6-27	RUSKIN AVE	AT WEST PROPERTY LINE OF CLIFFE AVE	8	GATE		1953	26	WWD	WOONSOCKET	OPEN	
E6	28	E6-28	CUMBERLAND HILL RD	AT NORTH PROPERTY LINE OF VIRGINIA AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
E6	29	E6-29	CUMBERLAND HILL RD	AT SOUTH PROPERTY LINE OF VIRGINIA AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
E6	30	E6-30	CUMBERLAND HILL RD	160' NORTH FROM NORTH PROPERTY LINE OF NEWBURY AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
E6	31	E6-31	BERWICK ST	AT W. P. L. OF CUMBERLAND HILL RD, 260' N. FORM N. P. L. OF ST. AUGUSTINE ST	8	GATE			26	WWD	WOONSOCKET	ABANDONED	
E6	32	E6-32	CUMBERLAND HILL RD	120' NORTH FROM NORTH PROPERTY LINE OF NEWBURY AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
E6	33	E6-33	CUMBERLAND HILL RD	AT NORTH PROPERTY LINE OF NEWBURY AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
E6	34	E6-34	CUMBERLAND HILL RD	AT SOUTH PROPERTY LINE OF NEWBURY AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
E6	35	E6-35	NEWBURY AVE	AT EAST PROPERTY LINE OF CUMBERLAND HILL RD	8	GATE			26	WWD	WOONSOCKET	OPEN	
E6	36	E6-36	NEWBURY AVE	AT WEST PROPERTY LINE OF CRAIGIE AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
E6	37	E6-37	CRAIGIE AVE	AT NORTH PROPERTY LINE OF NEWBURY AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
E6	38	E6-38	NEWBURY AVE	AT EAST PROPERTY LINE OF CRAIGIE AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
E6	39	E6-39	NEWBURY AVE	AT WEST PROPERTY LINE OF CLIFFE AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
E6	40	E6-40	CLIFFE AVE	AT NORTH PROPERTY LINE OF NEWBURY AVE	8	GATE		1953	26	WWD	WOONSOCKET	OPEN	
E6	41	E6-41	NEWBURY AVE	AT WEST PROPERTY LINE OF MENDON RD	8	GATE			26	WWD	WOONSOCKET	OPEN	
E6	42	E6-42	CUMBERLAND HILL RD	50' SOUTH OF HYDRANT # 5622	12	GATE			38	WWD	WOONSOCKET	OPEN	
E6	43	E6-43	CUMBERLAND HILL RD	95' SOUTH OF HYDRANT # 5622	12	GATE			38	WWD	WOONSOCKET	OPEN	
E6	44	E6-44	MENDON RD	15' SOUTH OF HYDRANT # 5623	6	GATE		1934	20	WWD	WOONSOCKET	OPEN	
E6	45	E6-45	MENDON RD	15' SOUTH OF HYDRANT # 5623	6	GATE	RENSELLAER	1934	20	WWD	WOONSOCKET	OPEN	TSV
E6	46	E6-46	MENDON RD	30' SOUTH OF HYDRANT # 5623	12	GATE			38	WWD	WOONSOCKET	OPEN	
E6	47	E6-47	ST AUGUSTIN ST	AT EAST PROPERTY LINE OF FOUNDER DRIVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
E6	48	E6-48	ST AUGUSTIN ST	BEHIND #895 CUMBERLAND HILL ROAD	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
E6	49	E6-49	ST AUGUSTIN ST	WEST PROPERTY LINE OF CUMBERLAND HILL RD	12	GATE			38	WWD	WOONSOCKET	OPEN	
E6	50	E6-50	NANCY COURT	AT NORTH PROPERTY LINE OF VIRGINIA AVE	8	GATE	MET		26	WWD	WOONSOCKET	OPEN	
E6	51	E6-51	ARMAND ST	AT EAST PROPERTY LINE OF MENDON RD	2	S/W	RED HED			WWD	WOONSOCKET	OPEN	
E6	52	E6-52	CUMBERLAND HILL RD	145' NORTH OF NORTH PROPERTY LINE OF NEWBURY AVE	8	GATE	MET	1973	26	WWD	WOONSOCKET	OPEN	
E6	53	E6-53	ST AUGUSTIN ST	APPROX. CENTERLINE OF FOUNDERS DR	8	GATE	MET	1975		WWD	WOONSOCKET	OPEN	TSV
E6	54	E6-54	ST AUGUSTIN ST		6	GATE	DARLING	1975		WWD	WOONSOCKET	OPEN	FIRE SUPPLY
E6	55	E6-55	BOZOIAN ST	30.4 FROM HYDR # 5606 VIRGINIA AVE	8	GATE		1978	26	WWD	WOONSOCKET	OPEN	
E7	1	E7-1	MENDON RD	AT NORTH PROPERTY LINE OF FORD ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E7	2	E7-2	FORD ST	AT EAST PROPERTY LINE OF MENDON RD	12	GATE			38	WWD	WOONSOCKET	OPEN	
E7	3	E7-3	VIRGINIA AVE	AT WEST PROPERTY LINE OF MENDON RD	8	GATE			26	WWD	WOONSOCKET	OPEN	
E7	4	E7-4	MENDON RD	AT SOUTH PROPERTY LINE OF VIRGINIA AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
E7	5	E7-5	MENDON RD	AT NORTH PROPERTY LINE OF BRYANT ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
E7	6	E7-6	BRYANT ST	AT EAST PROPERTY LINE OF MENDON RD	12	GATE			38	WWD	WOONSOCKET	OPEN	
E7	7	E7-7	MENDON RD	AT NORTH PROPERTY LINE OF NEWBURY AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
E7	8	E7-8	MENDON RD	AT SOUTH PROPERTY LINE OF NEWBURY AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
E7	9	E7-9	VIRGINIA AVE	AT EAST PROPERTY LINE OF CLIFFE AVE	8	GATE		1953	26	WWD	WOONSOCKET	OPEN	
E7	10	E7-10	CLIFFE AVE	AT SOUTH PROPERTY LINE OF SIDNEY AVE	8	GATE		1953	26	WWD	WOONSOCKET	OPEN	
E7	11	E7-11	NEWBURY AVE	AT WEST PROPERTY LINE OF MENDON RD	8	GATE			26	WWD	WOONSOCKET	OPEN	
E7	12	E7-12	CLIFFE AVE	AT SOUTH PROPERTY LINE OF VIRGINIA AVE	8	GATE		1953	26	WWD	WOONSOCKET	OPEN	
E7	13	E7-13	PARK EAST DR	400' EAST OF CVS DRIVE	8	GATE		1982	26	WWD	WOONSOCKET	OPEN	SERVICES 369 PARK EAST DRIVE
E7	14	E7-14	PARK EAST DR	820' NORTH OF CVS DRIVE	8	GATE	APS	1982	26	WWD	WOONSOCKET	OPEN	
E7	15	E7-15	PARK EAST DR	850 NORTH OF CVS DRIVE	12	GATE	APS	1982	38	WWD	WOONSOCKET	OPEN	
E7	16	E7-16	PARK EAST DR	930 NORTH OF CVS DRIVE	8	GATE	APS	1982	26	WWD	WOONSOCKET	CLOSED	
E7	17	E7-17	PARK EAST DR	1330' NORTH OF CVS DR	8	GATE	APS	1982	26	WWD	WOONSOCKET	CLOSED	
E7	18	E7-18	PARK EAST DR	1535 NORTH OF CVS DRIVE	8	GATE	APS	1982	26	WWD	WOONSOCKET	CLOSED	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
E7	19	E7-19	PARK EAST DR	1645' NORTH OF CVS DRIVE	12	GATE	APS	1982	38	WWD	WOONSOCKET	OPEN	
E7	20	E7-20	PARK EAST DR	1845' NORTH OF CVS DR	8	GATE	APS	1982	26	WWD	WOONSOCKET	CLOSED	
E7	21	E7-21	PARK EAST DR	2020' NORTH OF CVS DRIVE	12	GATE	APS	1982	38	WWD	WOONSOCKET	OPEN	
E7	22	E7-22	PARK EAST DR	BYPASS FOR ALTITUDE VALVE CHAMBER AT TANK	8	GATE	APS	1982	26	WWD	WOONSOCKET	CLOSED	
E7	23	E7-23	PARK EAST DR	BYPASS FOR ALTITUDE VALVE CHAMBER AT TANK	8	GATE	APS	1982	26	WWD	WOONSOCKET	CLOSED	
E7	24	E7-24	PARK EAST DR	550' NORTH OF CVS DRIVE	8	GATE	APS	1982	26	WWD	WOONSOCKET	CLOSED	
E7	25	E7-25	PARK EAST DR	1520 ' NORTH OF CVS DRIVE	6	GATE	MUELLER	1986	21	WWD	WOONSOCKET	OPEN	TSV
E7	26	E7-26	GOLDSTEIN DR	AT ENTRANCE TO CUL-DE-SAC	8	GATE		1982	26	WWD	WOONSOCKET	OPEN	
E7	27	E7-27	GOLDSTEIN DR	AT ENTRANCE TO CUL-DE-SAC	8	GATE		1982	26	WWD	WOONSOCKET	CLOSED	
E7	28	E7-28	GOLDSTEIN DR	AT ENTRANCE TO CUL-DE-SAC	8	GATE		1982	26	WWD	WOONSOCKET	OPEN	BY D'AMBRA
E7	29	E7-29	GOLDSTEIN DR	IN DRIVEWAY ON RIGHT SIDE OF CUL-DE-SAC	8	GATE		1982	26	WWD	WOONSOCKET	CLOSED	BY D'AMBRA
E7	30	E7-30	GOLDSTEIN DR	IN DRIVEWAY ON RIGHT SIDE OF CUL-DU-SAC	12	GATE	CLOW	1988	38	WWD	WOONSOCKET	OPEN	BY PHILLIPS CONSTRUCTION
E7	31	E7-31	GOLDSTEIN DR	IN DRIVEWAY ON RIGHT SIDE OF CUL-DU-SAC	12	GATE		1982	38	WWD	WOONSOCKET	OPEN	BY D'AMBRA
E7	32	E7-32	GOLDSTEIN DR	IN DRIVEWAY ON RIGHT SIDE OF CUL-DU-SAC	6	GATE		1988	20	WWD	WOONSOCKET	OPEN	
E7	33	E7-33	CENTURY DR	AT PARK EAST DR WATER TANK AND HIGHLAND II	12	GATE		1989		WWD	WOONSOCKET		
E7	34	E7-34	CENTURY DR	AT CUL-DE-SAC	8	GATE				WWD	WOONSOCKET	CLOSED	NO CARD
E7	35	E7-35	CENTURY DR	AT PARK EAST DR AND HIGHLAND II	12	GATE		1995		WWD	WOONSOCKET		
E7	36	E7-36	HIGHLAND II	AT CENTURY DR INTERSECTION OF PARK EAST DR	12	GATE		1995		WWD	WOONSOCKET		
E8	1	E8-1	HIGHLAND II	120' FROM THE 2ND HYD OF HIGHLAND II	12	GATE	CLOW	1995		WWD	WOONSOCKET	CLOSED	
E-NS	1	E-NS-1	LAPRE RD, NS	AT OAKLAWN RD, NS	2	EDDY				O. LAPRE & W. PELLETIER	NS	OPEN	
F1	1	F1-1	GREAT RD, NS	AT WEST PROPERTY LINE OF SOUTH MAIN ST	8	GATE			26	WWD	NS	OPEN	
F1	2	F1-2	SOUTH MAIN ST	AT NORTH PROPERTY LINE OF GREAT ROAD	12	GATE			38	WWD	WOONSOCKET	OPEN	
F1	3	F1-3	SMITHFIELD RD, NS	AT EAST PROPERTY ILNE OF SOUTH MAIN ST	6	GATE			20	WWD	NS	OPEN	
F1	4	F1-4	HOMESTEAD AVE, NS	220' FROM SOUTH PROPERTY LINE OF BAMFORD ST	1.5	BLOW OFF			3.5	ROBERT RUSSELL	NS	CLOSED	
F1	5	F1-5	WOONSOCKET HILL RD, NS	10' SOUTH OF HYDRANT # 6103	6	GATE			20	PRIVATE	NS	OPEN	
F1	6	F1-6	PINE COURT	AT WEST PROPERTY LINE OF WOONSOCKET HILL ROAD	6	GATE		1954	20	WWD	WOONSOCKET	OPEN	
F1	7	F1-7	BAMFORD ST, NS	AT WEST PROPERTY LINE OF HOMESTEAD AVE	6	GATE		1941	20	J.H. O'DONNELL	NS	OPEN	
F1	8	F1-8	O'DONNELL AVE, NS	NS AT SOUTHH PROPERTY LINE OF BAMFORD ST	6	GATE			20	J.H. O'DONNELL	NS	OPEN	
F1	9	F1-9	GETCHELL ST, NS	NS AT WEST PROPERTY LINE OF O'DONNELL AVE	6	GATE			20	J.H. O'DONNELL	NS	OPEN	
F1	10	F1-10	BELLEVUE AVE, NS	NS AT WOONSOCKET HILL ROAD	1		MUELLER	1934		PRIVATE	NS	OPEN	
F1	11	F1-11	BELLEVUE AVE, NS	NS AT WOOSOCKET HILL ROAD	1		MUELLER	1934		PRIVATE	NS	OPEN	
F1	12	F1-12	BELLEVUE AVE, NS	NS AT STREETLINE OF WOONSOCKET HILL ROAD	6	GATE	CLOW	1988	20	PRIVATE	NS	OPEN	PRIVATE 8' MAIN
F1	13	F1-13	BELLEVUE AVE, NS	NS AT NORTHERLY STREETLINE OF ARNOLD ST	8	GATE		1988	26	PRIVATE	NS	OPEN	
F1	14	F1-14	BELLEVUE AVE, NS	NS AT 188' FROM NORTHERLY STREETLINE OF MULLBERRY ST	8	GATE		1988	26	PRIVATE	NS	OPEN	
F1	15	F1-15	GREAT RD, NS	NS 61.6' OFF FRONT L. CORNER OF HOUSE # 19 GREAT ROAD AND 22' OFF POLE #447	8	GATE	CLOW	1989		WWD	NS		TSV
F1	16	F1-16	MILTON AVE, NS	NS 78.9 OFF FRONT CORNER HOUSE #1 MILTON AVE AND 58' OFF FRONT RIGHT CORNER	8	GATE	CLOW	1989		PRIVATE	NS	OPEN	
F2	1	F2-1	BREAULT AVE	AT NORTH PROPERTY LINE OF COE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F2	2	F2-2	COE ST	AT EAST PROPERTY LINE OF BREAULT AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
F2	3	F2-3	COE ST	AT WEST PROPERTY LINE OF BRADFORD ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
F2	4	F2-4	BRADFORD ST	AT NORTH PROPERTY LINE OF COE ST	4	GATE			14	WWD	WOONSOCKET	OPEN	
F2	5	F2-5	COE ST	AT EAST PROPERTY LINE OF BRADFORD ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
F2	6	F2-6	AVENUE A	AT WEST PROPERTY LINE OF IRENE BLVD	8	GATE		1959	26	WWD	WOONSOCKET	OPEN	
F2	7	F2-7	IRENE BLVD	AT NORTH PROPERTY LINE OF AVE A	8	GATE	APS	1960	26	WWD	WOONSOCKET	OPEN	
F2	8	F2-8	AVENUE A	AT EAST PROPERTY LINE OF IRENE BLVD	8	GATE		1959	26	WWD	WOONSOCKET	OPEN	
F2	9	F2-9	AVENUE B	AT EAST PROPERTY LINE OF ORCHARD ST	6	GATE		1904	20	WWD	WOONSOCKET	OPEN	
F2	10	F2-10	MIDDLE ST	AT NORTH PROPERTY LINE OF AVENUE C	8	GATE	APS	1960	26	WWD	WOONSOCKET	OPEN	
F2	11	F2-11	BEECH ST	AT SOUTH PROPERTY LINE OF AVE C	8	GATE	APS	1963	26	WWD	WOONSOCKET	OPEN	
F2	12	F2-12	BAXTER ST	AT EAST PROPERTY LINE OF PROVIDENCE ST	6	GATE		1915	20	WWD	WOONSOCKET	OPEN	
F2	13	F2-13	BAXTER ST	AT WEST PROPERTY LINE OF JENCKES ST	8	GATE		1997		WWD	WOONSOCKET	OPEN	
F2	14	F2-14	JENCKES ST	AT NORTH PROPERTY LINE OF BAXTER ST	8	GATE		1997		WWD	WOONSOCKET	OPEN	
F2	15	F2-15	AVENUE A	AT WEST PROPERTY LINE OF ORCHARD ST	8	GATE		1959	26	WWD	WOONSOCKET	OPEN	
F2	16	F2-16	AVENUE A	AT EAST PROPERTY LINE OF ORCHARD ST	8	GATE		1959	26	WWD	WOONSOCKET	OPEN	
F2	17	F2-17	AVENUE A	AT WEST PROPERTY LINE OF BEECH ST	8	GATE		1959	26	WWD	WOONSOCKET	OPEN	
F2	18	F2-18	AVENUE A	AT EAST PROPERTY LINE OF BEECH ST	8	GATE		1959	26	WWD	WOONSOCKET	OPEN	
F2	19	F2-19	BEECH ST	AT NORTH PROPERTY LINE OF AVENUE B	8	GATE	APS	1963	26	WWD	WOONSOCKET	OPEN	
F2	20	F2-20	FRANKLIN ST	AT SOUTH PROPERTY LINE OF AVE B	8	GATE			26	WWD	WOONSOCKET	OPEN	
F2	21	F2-21	PROVIDENCE ST	AT NORTH PROPERTY LINE OF PIEDMONT ST	8	GATE	APS		26	WWD	WOONSOCKET	CLOSED	
F2	22	F2-22	PROVIDENCE ST	AT SOUTH PROPERTY LINE OF PIEDMONT ST	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
F2	23	F2-23	PROVIDENCE ST	17' OFF NORTH PROPERTY LINE OF PIEDMONT ST	8	GATE	RENSAELLAER		26	WWD	WOONSOCKET	OPEN	TSV
F2	24	F2-24	PIEDMONT ST	AT EAST PROPERTY LINE OF PROVIDENCE ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F2	25	F2-25	AVENUE B	AT WEST PROPERTY LINE OF PROVIDENC ST	6	GATE		1904	20	WWD	WOONSOCKET	CLOSED	
F2	26	F2-26	PROVIDENCE ST	AT SOUTH PROPERTY LINE OF AVENUE B	8	GATE			26	WWD	WOONSOCKET	OPEN	
F2	27	F2-27	PIEDMONT ST	AT WEST PROPERTY LNE OF REDWOOD ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F2	28	F2-28	REDWOOD ST	AT NORTH PROPERTY LINE OF PIEDMONT ST	6	GATE	MUELLER	1955	20	WWD	WOONSOCKET	OPEN	
F2	29	F2-29	PIEDMONT ST	AT EAST PROPERTY LINE OF REDWOOD ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F2	30	F2-30	AVENUE A	AT WEST PROPERTY LINE OF FRANKLIN ST	8	GATE		1959	26	WWD	WOONSOCKET	OPEN	
F2	31	F2-31	PIEDMONT ST	AT WEST PROPERTY LINE OF SEABURY ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F2	32	F2-32	PIEDMONT ST	AT EAST PROPERTY LINE OF SEABURY ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F2	33	F2-33	SMITHFIELD RD, NS	AT WEST PROPERTY LINE OF CREST RD	8	GATE	APS	1964	26	WWD	NS	OPEN	
F2	34	F2-34	SMITHFIELD RD, NS	AT WEST PROPERTY LINE OF PROVIDENCE ST	6	GATE			20	WWD	NS	OPEN	
F2	35	F2-35	PROVIDENCE ST	AT SOUTH PROPERTY LINE OF FABIEN ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F2	36	F2-36	FABIEN ST	AT EAST PROPERTY LINE OF PROVIDENCE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F2	37	F2-37	FABIEN ST	AT WEST PROPERTY LINE OF ENDICOTT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F2	38	F2-38	AVENUE C	AT WEST PROPERTY LINE OF PROVIDENCE ST	8	GATE		1891	26	WWD	WOONSOCKET	OPEN	
F2	39	F2-39	PIEDMONT ST	20' FROM WEST PROPERTY LINE OF SEABURY ST	6	BLOW OFF			20	WWD	WOONSOCKET	CLOSED	
F2	40	F2-40	FRANKLIN ST	AT NORTH PROPERTY LINE OF AVE A	8	GATE			26	WWD	WOONSOCKET	OPEN	
F2	41	F2-41	FABIEN ST	110' FROM EAST PROPERTY LINE OF ENDICOTT ST	4	GATE	KENNEDY	1974	14	WWD	WOONSOCKET	OPEN	TSV
F2	42	F2-42	SMITHFIELD RD, NS	NS APPROX 120' WEST OF ST. LINE CREST RD	2		RED HED	1976		WWD	NS	OPEN	
F2	43	F2-43	SMITHFIELD RD, NS	NS AT BUELL AVE	1			1976		WWD	NS	OPEN	BURIED
F2	44	F2-44	SMITHFIELD RD, NS	NS AT BUELL AVE	1.5			1976		WWD	NS	OPEN	BURIED
F2	45	F2-45	AVENUE A	NEAR STREETLINE OF AVENUE A NEAR ORCHARD ST	8	GATE		1988	26	WWD	WOONSOCKET	OPEN	TSV
F2	46	F2-46	ORCHARD ST	CENTERLINE OF AVE B	6	GATE		1988	20	WWD	WOONSOCKET	OPEN	TSV
F2	47	F2-47	BAXTER ST	AT E LINE OF JENCKES	8	GATE		1998		WWD	WOONSOCKET	OPEN	NO CARD
F3	1	F3-1	BAILEY ST	AT NORTH PROPERTY LINE OF BAXTER ST	8	GATE		1926	26	WWD	WOONSOCKET	OPEN	
F3	2	F3-2	TRANSIT ST	AT WEST PROPERTY LINE OF THOMAS ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	3	F3-3	THOMAS ST	AT NORTH PROPERTY LINE OF TRANSIT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
F3	4	F3-4	TRANSIT ST	AT WEST PROPERTY LINE OF PARK AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	5	F3-5	PARK AVE	AT NORTH PROPERTY LINE OF GILBERT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	6	F3-6	GILBERT ST	AT EAST PROPERTY LINE OF PARK AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
F3	7	F3-7	PARK AVE	AT SOUTH PROPERTY LINE OF GILBERT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	8	F3-8	GILBERT ST	AT WEST PROPERTY LINE OF NAPOLEAN ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
F3	9	F3-9	NAPOLEAN ST	AT NORTH PROPERTY LINE OF GILBERT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
F3	10	F3-10	GILBERT ST	AT EAST PROPERTY LINE OF NAPOLEAN ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
F3	11	F3-11	NAPOLEAN ST	AT SOUTH PROPERTY LINE OF GILBERT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	12	F3-12	WILLIAMS ST	AT WEST PROPERTY LINE OF ANGELL ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
F3	13	F3-13	ANGELL ST	AT NORTH PROPERTY LINE OF WILLIAMS ST	8	GATE		1934	26	WWD	WOONSOCKET	OPEN	
F3	14	F3-14	WARD ST	10' SOUTH OF HYDRANT #6307	6	GATE			20	WWD	WOONSOCKET	OPEN	
F3	15	F3-15	WARD ST	AT NORTH PROPERTY LINE OF KENNEDY ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	16	F3-16	KENNEDY ST	AT EAST PROPERTY LINE OF WARD ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	17	F3-17	KENNEDY ST	AT WEST PROPERTY LINE OF PARK AVE	6	GATE			20	WWD	WOONSOCKET	OPEN	
F3	18	F3-18	MOWRY ST	AT WEST PROPERTY LINE OF NAPOLEAN ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	19	F3-19	NAPOLEAN ST	AT NORTH PROPERTY LINE OF MOWRY ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	20	F3-20	MOWRY ST	AT EAST PROPERTY LINE OF NAPOLEAN ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	21	F3-21	MOWRY ST	AT WEST PROPERTY LINE OF KERMIT AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	22	F3-22	KERMIT ST	AT NORTH PROPERTY LINE OF MOWRY ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	23	F3-23	KERMIT ST	AT SOUTH PROPERTY LINE OF MOWRY ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	24	F3-24	PIEDMONT ST	AT WEST PROPERTY LINE OF FOSTER ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F3	25	F3-25	PIEDMONT ST	AT EAST PROPERTY LINE OF FOSTER ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F3	26	F3-26	PIEDMONT ST	AT WEST PROPERTY LINE OF PIKE ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F3	27	F3-27	PIEDMONT ST	AT EAST PROPERTY LINE OF PIKE ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F3	28	F3-28	MOWRY ST	AT WEST PROPERTY LINE OF PIEDMONT ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F3	29	F3-29	PIEDMONT ST	AT SOUTH PROPERTY LINE OF MOWRY ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F3	30	F3-30	MOWRY ST	AT EAST PROPERTY LINE OF PIEDMONT ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F3	31	F3-31	MOWRY ST	AT WEST PROPERTY LINE OF NIAGARA ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F3	32	F3-32	MOWRY ST	AT WEST PROPERTY LINE OF ADMIRAL ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F3	33	F3-33	ADMIRAL ST	AT SOUTH PROPERTY LINE OF MOWRY ST	8	GATE	P & C	1974	26	WWD	WOONSOCKET	OPEN	
F3	34	F3-34	MOWRY ST	AT WEST PROPERTY LINE OF GOFF ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F3	35	F3-35	GOFF ST	AT NORTH PROPERTY LINE OF MOWRY ST	8	GATE	P & C		26	WWD	WOONSOCKET	CLOSED	
F3	36	F3-36	ELMORE ST	AT SOUTH PROPERTY LINE OF MOWRY ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F3	37	F3-37	MOWRY ST	AT EAST PROPERTY LINE OF ELMORE ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F3	38	F3-38	MOWRY ST	AT WEST PROPERTY LINE OF PARK AVE	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F3	39	F3-39	MOWRY ST	AT EAST PROPERTY LINE OF PARK AVE	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F3	40	F3-40	PARK AVE	AT NORTH PROPERTY LINE OF OAKTON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	41	F3-41	PARK AVE	AT SOUTH PROPERTY LINE OF OAKTON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	42	F3-42	OAKTON ST	AT EAST PROPERTY LINE OF PARK AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	43	F3-43	OAKTON ST	AT WEST PROPERTY LINE OF KERMIT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	44	F3-44	KERMIT ST	AT NORTH PROPERTY LINE OF OAKTON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	45	F3-45	KERMIT ST	AT SOUTH PROPERTY LINE OF OAKTON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	46	F3-46	ELMORE ST	AT SOUTH PROPERTY LINE OF CARNATION ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	47	F3-47	CARNATION ST	AT EAST PROPERTY LINE OF ELMORE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	48	F3-48	CARNATION ST	AT WEST PROPERTY LINE OF PARK AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	49	F3-49	PARK AVE	AT NORTH PROPERTY LINE OF CARNATION ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	50	F3-50	CARNATION ST	AT EAST PROPERTY LINE OF PARK AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	51	F3-51	PARK AVE	AT SOUTH PROPERTY LINE OF CARNATION ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	52	F3-52	PARK AVE	AT SOUTH PROPERTY LINE OF NEWPORT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	53	F3-53	NEWPORT ST	AT EAST PROPERTY LINE OF PARK AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	54	F3-54	NEWPORT ST	10' EAST OF HYDRANT #6336	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	55	F3-55	CARNATION ST	AT WEST PROPERTY LINE OF CRANSTON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	56	F3-56	CARNATION ST	AT EAST PROPERTY LINE OF CRANSTON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	57	F3-57	CRANSTON ST	AT SOUTH PROPERTY LINE OF CARNATION ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	58	F3-58	NEWPORT ST	AT WEST PROPERTY LINE OF CRANSTON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	59	F3-59	CRANSTON ST	AT NORTH PROPERTY LINE OF NEWPORT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	60	F3-60	CRANSTON ST	AT SOUTH PROPERTY LINE OF NEWPORT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	61	F3-61	KERMIT ST	AT NORTH PROPERTY LINE OF CARNATION ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	62	F3-62	CARNATION ST	17' OFF EAST PROPERTY LINE OF KERMIT ST	8	GATE		1957	26	WWD	WOONSOCKET	OPEN	TSV
F3	63	F3-63	CARNATION ST	AT EAST PROPERTY LINE OF KERMIT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	64	F3-64	ROSE AVE	AT SOUTH PROPERTY LINE OF CARNATION ST	8	GATE	CRANE	1962	26	WWD	WOONSOCKET	OPEN	
F3	65	F3-65	ELMORE ST	AT NORTH PROPERTY LINE OF ORMOND ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	66	F3-66	ELMORE ST	AT SOUTH PROPERTY LINE OF ORMOND ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	67	F3-67	ORMOND ST	AT EAST PROPERTY LINE OF ELMORE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	68	F3-68	ORMOND ST	AT WEST PROPERTY LINE OF PARK AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	69	F3-69	PARK AVE	AT SOUTH PROPERTY LINE OF ORMOND ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	70	F3-70	WARWICK ST	AT EAST PROPERTY LINE OF PARK AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	71	F3-71	WARWICK ST	AT WEST PROPERTY LINE OF CRANSTON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	72	F3-72	CRANSTON ST	AT NORTH PROPERTY LINE OF WARWICK ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	73	F3-73	CRANSTON ST	AT SOUTH PROPERTY LINE OF WARWICK ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	74	F3-74	FOSTER ST	AT NORTH PROPERTY LINE OF PIEDMONT ST	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
F3	75	F3-75	MOWRY ST	AT EAST PROPERTY LINE OF FOSTER ST	8	GATE	MET		26	WWD	WOONSOCKET	OPEN	
F3	76	F3-76	OAKTON ST	5' EAST OF HYDRANT #6326	8	GATE			26	WWD	WOONSOCKET	OPEN	
F3	77	F3-77	CRANSTON ST	(204 WARWICK ST) 10' SOUTH FROM SOUTH PROPERTY LINE OF WARWICK ST	6	GATE	APS	1965		WWD	WOONSOCKET		FIRE SUPPLY
F3	78	F3-78	DIKE ST	AT PIEDMONT ST	8	GATE	APS	1974		WWD	WOONSOCKET		TSV
F3	79	F3-79	BERKLEY ST	AT WEST PROPERTY LINE OF DIKE ST	8	GATE	MET	1974		WWD	WOONSOCKET		
F3	80	F3-80	ADMIRAL ST	332.5' WEST OF HYDRANT # 6321	1	BLOW OFF		1974		WWD	WOONSOCKET	CLOSED	
F3	81	F3-81	TRANSIT ST	AT HOLLIS ST	8	GATE		1979	26	WWD	WOONSOCKET	OPEN	TSV
F3	82	F3-82	GILBERT ST	24' FROM THE WEST PROP. LINE OF KERMIT ST	8	GATE		1979	26	WWD	WOONSOCKET	OPEN	
F3	83	F3-83	PARK AVE	AT MERRILL CT	8	GATE		1988	26	WWD	WOONSOCKET	OPEN	TSV
F3	84	F3-84	MERRILL CT	WESTERLY STREETLINE OF NAPOLEON ST	8	GATE		1988	26	WWD	WOONSOCKET	OPEN	
F3	85	F3-85	NAPOLEON ST	SOUTHERLY STREETLINE OF MERRILL CT	8	GATE		1988	26	WWD	WOONSOCKET	OPEN	
F3	86	F3-86	NAPOLEON ST	98' FROM SOUTHERLY STREETLINE OF MERRILL CT	8	GATE		1988	26	WWD	WOONSOCKET	OPEN	
F3	87	F3-87	MINERVA ST	IN FORNT OF HOUSE # 136	8	GATE	CLOW	1991		WWD	WOONSOCKET		
F3	88	F3-88	BAXTER ST	AT W LINE OF BAILEY	8	GATE		1998		WWD	WOONSOCKET	OPEN	NO CARD
F3	89	F3-89	MINERVA ST	CUL-DE-SAC OF MINERVA ST	0.75	BLOW OFF		1991		WWD	WOONSOCKET	CLOSED	

Appendix G
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Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
F4	1	F4-1	KNIGHT ST	AT NORTH PROPERTY LINE OF COOPER AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F4	2	F4-2	COOPER AVE	AT EAST PROPERTY LINE OF KNIGHT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F4	3	F4-3	KNIGHT ST	AT SOUTH PROPERTY LINE OF COOPER AVE	8	GATE		1957	26	WWD	WOONSOCKET	OPEN	TSV
F4	4	F4-4	KNIGHT ST	AT NORTH PROPERTY LINE OF WILLIAMS ST	10	GATE		1957	32	WWD	WOONSOCKET	OPEN	
F4	5	F4-5	WILLIAMS ST	AT WEST PROPERTY LINE OF KNIGHT ST	6	GATE			20	WWD	WOONSOCKET	OPEN	
F4	6	F4-6	KNIGHT ST	AT NORTH PROPERTY LINE OF WILLIAMS ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F4	7	F4-7	KNIGHT ST	AT SOUTH PROPERTY LINE OF WILLIAMS ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F4	8	F4-8	COOPER AVE	20' WEST OF HYDRANT # 6403	8	GATE			26	WWD	WOONSOCKET	OPEN	
F4	9	F4-9	COOPER AVE	AT WEST PROPERTY LINE OF BRADLEY ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F4	10	F4-10	BRADLEY ST	AT SOUTH PROPERTY LINE OF COOPER AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F4	11	F4-11	COOPER AVE	AT EAST PROPERTY LINE OF BRADLEY ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F4	12	F4-12	COOPER AVE	AT WEST PROPERTY LINE OF JILLSON AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F4	13	F4-13	JILLSON AVE	AT NORTH PROPERTY LINE OF COOPER AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F4	14	F4-14	JILLSON AVE	AT SOUTH PROPERTY LINE OF COOPER AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F4	15	F4-15	BRADLEY ST	AT NORTH PROPERTY LINE OF SHARKEY AVE	8	GATE	APS	1963	26	WWD	WOONSOCKET	OPEN	
F4	16	F4-16	JILLSON AVE	AT SOUTH PROPERTY LINE OF SHARKEY AVE	8	GATE		1955	26	WWD	WOONSOCKET	OPEN	
F4	17	F4-17	KNIGHT ST	AT NORTH PROPERTY LINE OF BERARD AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F4	18	F4-18	BERARD AVE	AT EAST PROPERTY LINE OF KNIGHT ST	8	GATE		1910	26	WWD	WOONSOCKET	OPEN	
F4	19	F4-19	KNIGHT ST	AT SOUTH PROPERTY LINE OF BERARD AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F4	20	F4-20	KNIGHT ST	AT NORTH PROPERTY LINE OF CARNATION ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F4	21	F4-21	KNIGHT ST	AT CENTER LINE OF CARNATION ST	8	GATE		1957	26	WWD	WOONSOCKET	OPEN	
F4	22	F4-22	JILLSON AVE	AT SOUTH PROPERTY LINE OF BRADLEY ST	8	GATE		1955	26	WWD	WOONSOCKET	OPEN	
F4	23	F4-23	KNIGHT ST	15' FROM EAST PROPERTY LINE OF BERARD AVE	8	GATE		1979	26	WWD	WOONSOCKET	OPEN	
F4	24	F4-24	BERARD AVE	AT DEAD-END OF STREET		AIR REL. VALVE		1979		WWD	WOONSOCKET		
F5	1	F5-1	RESERVOIR AVE	AT WEST PROPERTY LINE OF JOFFRE AVE	12	GATE	P & C		38	WWD	WOONSOCKET	OPEN	
F5	2	F5-2	JOFFRE AVE	AT NORTH PROPERTY LINE OF RESERVOIR AVE	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F5	3	F5-3	JOFFRE AVE	AT SOUTH PROPERTY LINE OF RESERVOIR AVE	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F5	4	F5-4	RESERVOIR AVE	AT EAST PROPERTY LINE OF JOFFRE AVE	12	GATE	P & C		38	WWD	WOONSOCKET	OPEN	
F5	5	F5-5	FAIRFIELD AVE	AT NORTH PROPERTY LINE OF RESERVOIR AVE	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F5	6	F5-6	RESERVOIR AVE	14' OFF EAST PROPERTY LINE OF FAIRFIELD AVE	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	TSV
F5	7	F5-7	RESERVOIR AVE	14' OFF EAST PROPERTY LINE OF FAIRFIELD AVE	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	TSV
F5	8	F5-8	FAIRFIELD AVE	AT SOUTH PROPERTY LINE OF RESERVOIR AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F5	9	F5-9	RESERVOIR AVE	60' FROM EAST PROPERTY LINE OF FAIRFIELD AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
F5	10	F5-10	GLENDALE AVE	AT NORTH PROPERTY LINE OF RESERVOIR AVE	8	GATE	P & C		26	WWD	WOONSOCKET	CLOSED	
F5	11	F5-11	RESERVOIR AVE	14' OFF EAST PROPERTY LINE OF GLENDALE AVE	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F5	12	F5-12	RESERVOIR AVE	14' OFF EAST PROPERTY LINE OF GLENDALE AVE	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	TSV
F5	13	F5-13	GLENDALE AVE	AT SOUTH PROPERTY LINE OF RESERVOIR AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F5	14	F5-14	LOGEE ST	AT NORTH PROPERTY LINE OF POWER ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F5	15	F5-15	LOGEE ST	AT SOUTH PROPERTY LINE OF POWER ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F5	16	F5-16	LOGEE ST	AT NORTH PROPERTY LINE OF DODGE ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F5	17	F5-17	LOGEE ST	AT SOUTH PROPERTY LIINE OF DODGE ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F5	18	F5-18	BERTENSHAW RD	AT WEST PROPERTY LINE OF JOFFRE AVE	8	GATE			26	WWD	WOONSOCKET	CLOSED	
F5	19	F5-19	JOFFRE AVE	AT NORTH PROPERTY LINE OF BERTENSHAW RD	8	GATE			26	WWD	WOONSOCKET	OPEN	
F5	20	F5-20	BERTENSHAW RD	AT EAST PROPERTY LINE OF JOFFRE AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F5	21	F5-21	BERTENSHAW RD	AT WEST PROPERTY LINE OF FAIRFIELD AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F5	22	F5-22	FAIRFIELD AVE	AT NORTH PROPERTY LINE OF BERTENSHAW RD	8	GATE			26	WWD	WOONSOCKET	OPEN	
F5	23	F5-23	BERTENSHAW RD	AT EAST PROPERTY LINE OF FAIRFIELD AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F5	24	F5-24	BERTENSHAW RD	AT WEST PROPERTY LINE OF GLENDALE AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F5	25	F5-25	GLENDALE AVE	AT NORTH PROPERTY LINE OF BERTENSHAW RD	8	GATE			26	WWD	WOONSOCKET	OPEN	
F5	26	F5-26	BERTENSHAW RD	AT EAST PROPERTY LINE OF GLENDALE AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F5	27	F5-27	BERTENSHAW RD	AT WEST PROPERTY LINE OF FUGERE AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F5	28	F5-28	BERTENSHAW RD	AT EAST PROPERTY LINE OF FUGERE AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F5	29	F5-29	BERTENSHAW RD	AT WEST PROPERTY LINE OF LILAC ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F5	30	F5-30	LILAC AVE	AT SOUTH PROPERTY LINE OF BERTENSHAW RD	8	GATE			26	WWD	WOONSOCKET	OPEN	
F5	31	F5-31	BERTENSHAW RD	AT EAST PROPERTY LINE OF LILAC ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F5	32	F5-32	LOGEE ST	AT NORTH PROPERTY LINE OF RESERVOIR AVE	6	BLOW OFF	P & C		20	WWD	WOONSOCKET	CLOSED	
F5	33	F5-33	RESERVOIR AVE	AT WEST PROPERTY LINE OF LOGEE ST	4	BLOW OFF	P & C		14	WWD	WOONSOCKET	CLOSED	
F5	34	F5-34	BERTENSHAW RD	AT SOUTH PROPERTY LINE OF RESERVOIR AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	TSV
F5	35	F5-35	BERTENSHAW RD	AT WEST PROPERTY LINE OF LOGEE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F5	36	F5-36	LOGEE ST	AT SOUTH PROPERTY LINE OF BERTENSHAW RD	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
F5	37	F5-37	LOGEE ST	AT SOUTH PROPERTY LINE OF BERTENSHAW RD	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	TSV
F5	38	F5-38	LOGEE ST	AT SOUTH PROPERTY LINE OF BERTENSHAW RD	3	GATE	P & C		11	WWD	WOONSOCKET	CLOSED	
F5	39	F5-39	LOGEE ST	AT SOUTH PROPERTY LINE OF BERTENSHAW RD	30	GATE	P & C		92	WWD	WOONSOCKET	OPEN	
F5	40	F5-40	LYDIA AVE	AT SOUTH PROPERTY LINE OF BERTENSHAW RD	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	TSV
F5	41	F5-41	LYDIA AVE	AT SOUTH PROPERTY LINE OF BERTENSHAW RD	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
F5	42	F5-42	LOGEE ST	60' FROM EAST PROPERTY LINE OF LYDIA AVE		AIR REL. VALVE				WWD	WOONSOCKET	CLOSED	
F5	43	F5-43	MYETTE ST	AT WEST PROPERTY LINE OF THIBEAULT AVE	8	GATE		1962	26	WWD	WOONSOCKET	OPEN	
F5	44	F5-44	MYETTE ST	AT WEST PROPERTY LINE OF LILAC AVE	8	GATE	APS	1962	26	WWD	WOONSOCKET	OPEN	
F5	45	F5-45	LILAC AVE	AT NORTH PROPERTY LINE OF MYETTE ST	8	GATE	APS	1962	26	WWD	WOONSOCKET	OPEN	
F5	46	F5-46	LILAC AVE	AT SOUTH PROPERTY LINE OF MYETTE ST	8	GATE	M & H	1963	26	WWD	WOONSOCKET	OPEN	
F5	47	F5-47	LYDIA AVE	AT SOUTH PROPERTY LINE OF MYETTE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F5	48	F5-48	BERTHA AVE	190' FROM WEST PROPERTY LINE OF MANVILLE RD	8	GATE		1959	26	WWD	WOONSOCKET	OPEN	
F5	49	F5-49	FLORA AVE	AT EAST PROPERTY LINE OF LILAC AVE	8	GATE	M & H	1963	26	WWD	WOONSOCKET	OPEN	
F5	50	F5-50	MYETTE ST	AT WEST PROPERTY LINE OF BERTHA AVE	8	GATE			26	WWD	WOONSOCKET	CLOSED	
F5	51	F5-51	BERTHA AVE	AT NORTH PROPERTY LINE OF MYETTE ST	8	GATE		1959	26	WWD	WOONSOCKET	OPEN	
F5	52	F5-52	BERTHA AVE	AT SOUTH PROPERTY LINE OF MYETTE ST	8	GATE		1959	26	WWD	WOONSOCKET	OPEN	
F5	53	F5-53	BERTHA AVE	105' SOUTH OF HYDRANT # 6524	1.5	BLOW OFF		1959	3.5	WWD	WOONSOCKET	CLOSED	
F5	54	F5-54	MANVILLE RD	220' FROM NORTH PROPERTY LINE OF GADOURY BLVD.	12	GATE			38	WWD	WOONSOCKET	OPEN	
F5	55	F5-55	THIBEAULT AVE	AT SOUTH PROPERTY LINE OF MYETTE ST	8	GATE	APS	1965	26	WWD	WOONSOCKET	OPEN	
F5	56	F5-56	MILES AVE	AT SOUTH PROPERTY LINE OF BERTENSHAW RD	8	GATE	APS	1972	26	WWD	WOONSOCKET	OPEN	TSV
F5	57	F5-57	MYETTE ST	171.6' FROM WEST PROPERTY LINE OF THIBEAULT AVE	8	GATE	APS	1972	26	WWD	WOONSOCKET	OPEN	
F5	58	F5-58	MYETTE ST	AT END OF MYETTE ST	0.75	BLOW OFF	RED HED	1972		WWD	WOONSOCKET	CLOSED	
F5	59	F5-59	MARIAN LANE	AT WEST PROPERTY LINE OF LILAC AVE	8	GATE	MET	1974	26	WWD	WOONSOCKET	OPEN	
F5	60	F5-60	THIBEAULT AVE	AT NORTH PROPERTY LINE OF MARIAN LANE	8	GATE	MET	1974	26	WWD	WOONSOCKET	OPEN	
F5	61	F5-61	MARIAN LANE	AT WEST PROPERTY LINE OF THIBEAULT AVE	8	GATE	MUELLER	1994	26	WWD	WOONSOCKET	OPEN	
F5	62	F5-62	THIBEAULT AVE	145' FROM NORTH PROPERTY LINE OF MARIAN LANE	8	GATE	MET	1980	26	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
F5	63	F5-63	MILES AVE	200' NORTH OF MARIAN	8	GATE				WWD	WOONSOCKET	OPEN	NO CARD
F6	1	F6-1	CUMBERLAND HILL RD	90' SOUTH OF HYDRANT # 6600	12	GATE			38	WWD	WOONSOCKET	OPEN	
F6	2	F6-2	MENDON RD	INDUSTRIAL PARK EAST- TAPPING VALVE	12	GATE	APS	1981	38	WWD	WOONSOCKET	OPEN	
F6	3	F6-3								WWD	WOONSOCKET		NO CARD
F6	4	F6-4	CUMBERLAND HILL RD	30' FROM SOUTH PROPERTY LINE OF CARRIERE AVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
F6	5	F6-5	MENDON RD	AT EAST PROPERTY LINE OF CUMBERLAND HILL RD	12	GATE			38	WWD	WOONSOCKET	OPEN	
F6	6	F6-6	TALCOTT ST	AT WEST PROPERTY LINE OF MENDON RD	12	GATE	APS		38	WWD	WOONSOCKET	OPEN	
F6	7	F6-7	MENDON RD	AT EAST PROPERTY LINE OF TALCOTT ST	12	GATE	P & C		38	WWD	WOONSOCKET	OPEN	
F6	8	F6-8	LOUISE ST	AT NORTH PROPERTY LINE OF NORMAN ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F6	9	F6-9	LOUISE ST	AT SOUTH PROPERTY LINE OF NORMAN ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F6	10	F6-10	NORMAN ST	AT EAST PROPERTY LINE OF LOUISE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F6	11	F6-11	LUCILLE ST	AT NORTH PROPERTY LINE OF NORMAN ST	8	GATE	APS	1962	26	WWD	WOONSOCKET	OPEN	
F6	12	F6-12	LUCILLE ST	AT SOUTH PROPERTY LINE OF NORMAN ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
F6	13	F6-13	NORMAN ST	AT WEST PROPERTY LINE OF TALCOTT ST	8	GATE	APS	1964	26	WWD	WOONSOCKET	OPEN	
F6	14	F6-14	TALCOTT ST	AT NORTH PROPERTY LINE OF NORMAN ST	12	GATE	P & C		38	WWD	WOONSOCKET	OPEN	
F6	15	F6-15	TALCOTT ST	AT SOUTH PROPERTY LINE OF NORMAN ST	12	GATE	P & C		38	WWD	WOONSOCKET	OPEN	
F6	16	F6-16	MENDON RD	100' SOUTH OF HYDRANT # 6610	12	GATE			38	WWD	WOONSOCKET	OPEN	
F6	17	F6-17	NORMAN ST	AT W LINE OF LUCILLE	8	GATE			26	WWD	WOONSOCKET	OPEN	
F6	18	F6-18	NORMAN ST	AT EAST PROPERTY LINE OF OLIVE ST	8	GATE		1965	26	WWD	WOONSOCKET	OPEN	
F6	19	F6-19	OLIVE ST	AT SOUTH PROPERTY LINE OF NORMAN ST	8	GATE		1965	26	WWD	WOONSOCKET	OPEN	
F6	20	F6-20	OLIVE ST	100' FROM NORTH PROPERTY LINE OF NORMAN ST	1	BLOW OFF				WWD	WOONSOCKET	CLOSED	
F6	21	F6-21	FOUNDERS DRIVE	AT WEST PROPERTY LINE OF CUMBERLAND HILL RD	12	GATE			38	WWD	WOONSOCKET	OPEN	
F6	22	F6-22	FOUNDERS DRIVE	AT WEST PROPERTY LINE OF FORTIN DR	12	GATE			38	WWD	WOONSOCKET	OPEN	
F6	23	F6-23	FOUNDERS DRIVE	AT WEST PROPERTY LINE OF FORTIN DR	12	GATE			38	WWD	WOONSOCKET	OPEN	
F6	24	F6-24	FOUNDERS DRIVE	AT PROPERTY LINE OF 400 FOUNDERS DRIVE	10	GATE			32	WWD	WOONSOCKET	OPEN	
F6	25	F6-25	FOUNDERS DRIVE	AT SOUTH PROPERTY LINE OF FORTIN DRIVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
F6	26	F6-26	FOUNDERS DRIVE	AT NORTH PROPERTY LINE OF FORTIN DRIVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
F6	27	F6-27	FORTIN DRIVE	AT EAST PROPERTY LINE OF FOUNDERS DRIVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
F6	28	F6-28	FORTIN DRIVE	AT NORTH PROPERTY LINE OF FOUNDERS DRIVE	12	GATE			38	WWD	WOONSOCKET	OPEN	
F6	29	F6-29	FORTIN DRIVE	BLDG 114, 165' SOUTHEAST OF HDRANT # 6623	8	GATE	MET	1973		WWD	WOONSOCKET		FIRE SUPPLY
F6	30	F6-30	FORTIN DRIVE	BLDG 194, 115' SOUTHEAST OF HYDRANT # 6624	8	GATE	MET	1973		WWD	WOONSOCKET		FIRE SUPPLY
F6	31	F6-31	FOUNDERS DRIVE	BLDG 100,150' EAST OF HYDRANT #6620	8	GATE	MET	1973		WWD	WOONSOCKET		FIRE SUPPLY
F6	32	F6-32	FOUNDERS DRIVE	94.2 WEST OF HYDRANT #6620	8	GATE				WWD	WOONSOCKET		FIRE SUPPLY
F6	33	F6-33	FOUNDERS DRIVE	BLDG 200, 230' WEST OF HYDRANT #6620	8	GATE	MET	1973		WWD	WOONSOCKET		FIRE SUPPLY
F6	34	F6-34	FOUNDERS DRIVE	280' WEST OF HYDRANT # 6621	8	GATE				WWD	WOONSOCKET		FIRE SUPPLY
F6	35	F6-35	FOUNDERS DRIVE	690' WEST FROM WEST PROPERTY LINE OF FORTIN DRIVE	6	GATE	APS	1969		WWD	WOONSOCKET	OPEN	09-21-1974 REMOVED HYD #6621 TO BE THIS WAT SER
F6	36	F6-36	FOUNDERS DRIVE	(#55 FORTIN DRIVE) 58.1' NORTH OF HYDRANT #6622	8	GATE	MET	1973		WWD	WOONSOCKET		
F6	37	F6-37	FORTIN DRIVE	BLDG 50, 170' WEST OF HYDRANT #6623	8	GATE	MET	1973		WWD	WOONSOCKET		
F6	38	F6-38	FOUNDERS DRIVE	13.4' FROM GV ON HYDRANT # 6621	12	GATE	MUELLER	1976	38	WWD	WOONSOCKET	OPEN	
F7	1	F7-1	ROADWAY A	200' EAST OF MENDON RD	12	GATE	APS	1981	38	WWD	WOONSOCKET	OPEN	
F7	2	F7-2	ROADWAY A	AT PUMPING STATION	12	GATE	APS	1981	38	WWD	WOONSOCKET	OPEN	
F7	3	F7-3	ROADWAY A	AT PUMPING STATION	12	GATE	APS	1981	38	WWD	WOONSOCKET	OPEN	
F7	4	F7-4	ROADWAY A	815' EAST OF MENDON RD	12	GATE	APS	1981	38	WWD	WOONSOCKET	OPEN	
F7	5	F7-5	PARK EAST DR	250' WEST OF CVS DRIVE	8	GATE	APS	1981	26	WWD	WOONSOCKET	OPEN	
F7	6	F7-6	ROADWAY A	AT ROADWAY B	12	GATE	APS	1981	38	WWD	WOONSOCKET	OPEN	
F7	7	F7-7	ROADWAY A	AT ROADWAY B	12	GATE	APS	1981	38	WWD	WOONSOCKET	OPEN	
F7	8	F7-8	ROADWAY A	AT ROADWAY B	12	GATE	APS	1981	38	WWD	WOONSOCKET	OPEN	
F7	9	F7-9	PARK EAST DR	IN FRONT OF PUMPING STATION	12	GATE	APS	1981	38	WWD	WOONSOCKET	CLOSED	
F7	10	F7-10	PARK EAST DR	350' WEST OF CVS DRIVE	8	GATE	APS	1981	26	WWD	WOONSOCKET	OPEN	S.O. FOR 300 PARK EAST DRIVE
F7	11	F7-11	CVS DRIVE	95' EAST OF CUL-DE-SAC	8	GATE	APS	1981	26	WWD	WOONSOCKET	OPEN	
F7	12	F7-12	CVS DRIVE	10' WEST OF CUL-DE-SAC	8	GATE	APS	1981	26	WWD	WOONSOCKET	OPEN	
F7	13	F7-13	CVS DRIVE	100' WEST OF PARK EAST DRIVE	8	GATE	APS	1981	26	WWD	WOONSOCKET	CLOSED	
G2	1	G2-1	GREENVILLE RD, NS	AT SOUTH PROPERTY LINE OF SMITHFIELD RD	6	GATE			20	LEO CABANA	NS	OPEN	
G2	2	G2-2	SMITHFIELD RD, NS	AT EAST PROPERTY LINE OF GREENVILLE RD	8	GATE			26	WWD	NS	OPEN	
G2	3	G2-3	ENDICOTT ST	AT NORTH PROPERTY LINE OF SMITHFIELD RD	8	GATE			26	WWD	WOONSOCKET	OPEN	
G2	4	G2-4	SMITHFIELD RD, NS	AT WEST PROPERTY LINE OF SUMMIT AVE, NS	8	GATE			26	WWD	NS	OPEN	
G2	5	G2-5	SUMMIT AVE, NS	NS, AT SOUTH PROPERTY LINE OF SMITHFIELD RD	8	GATE			26	WWD	NS	OPEN	
G2	6	G2-6	SMITHFIELD RD, NS	AT WEST PROPERTY LINE OF WHITE PARKWAY	8	GATE			26	WWD	NS	OPEN	
G2	7	G2-7	WHITE PARKWAY, NS	AT SOUTH PROPERTY LINE OF SMITHFIELD RD	8	GATE			26	WWD	NS	OPEN	
G2	8	G2-8	SMITHFIELD RD, NS	AT WHITE PARKWAY	1.25					WWD	WOONSOCKET	OPEN	
G2	9	G2-9	GREENVILLE RD, NS	510' SOUTH OF HDYRANT # 7200	6	GATE			20	LEO CABANA	NS	OPEN	
G2	10	G2-10	WEEKS ST, NS	AT EAST PROPERTY LINE OF BUELL AVE	8	GATE	APS	1963	26	FRANCIS THAYER	NS	OPEN	
G2	11	G2-11	WEEKS ST, NS	AT WEST PROPERTY LINE OF CREST RD	8	GATE	APS	1963	26	FRANCIS THAYER	NS	OPEN	
G2	12	G2-12	SMITHFIELD RD, NS	AT EAST PROPERTY LINE OF SUMMIT AVE, NS	8	GATE			26	WWD	NS	OPEN	
G2	13	G2-13	SUMMIT AVE, NS	AT WEST PROPERTY LINE OF WHITE PARKWAY	8	GATE	APS		26	WWD	NS	OPEN	
G2	14	G2-14	WHITE PARKWAY, NS	AT NORTH PROPERTY LINE OF SUMMIT AVE, NS	8	GATE	APS		26	WWD	NS	OPEN	
G2	15	G2-15	SMITHFIELD RD, NS	AT WHITE PARKWAY	0.75		RED HED			WWD	NS	OPEN	
G2	16	G2-16		AT BUSHEE SCHOOL	2.5					WWD	NS	REMOVED	NO CARD
G2	17	G2-17	WHITE PARKWAY, NS	AT SMITHFIELD RD	6	GATE	KENNEDY	1984	21	WWD	NS	OPEN	
G3	1	G3-1	PARK AVE	AT SOUTH PROPERTY LINE OF HEMOND AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
G3	2	G3-2	HEMOND AVE	AT EAST PROPERTY LINE OF FOURNIER	8	GATE			26	WWD	WOONSOCKET	OPEN	
G3	3	G3-3	HEMOND AVE	AT EAST PROPERTY LINE OF FOURNIER ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G3	4	G3-4	FOURNIER ST	AT SOUTH PROPERTY LINE OF HEMOND AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
G3	5	G3-5	FOURNIER ST	AT SOUTH PROPERTY LINE OF TARDIVEL AVE	10	GATE		1965	32	WWD	WOONSOCKET	OPEN	
G3	6	G3-6	HEMOND AVE	AT WEST PROPERTY LINE OF CRANSTON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G3	7	G3-7	CRANSTON ST	AT NORTH PROPERTY LINE OF HEMOND AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
G3	8	G3-8	HEMOND AVE	AT EAST PROPERTY LINE OF CRANSTON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G3	9	G3-9	CRANSTON ST	AT SOUTH PROPERTY LINE OF HEMOND AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
G3	10	G3-10	MONTY AVE	AT WEST PROPERTY LINE OF CRANSTON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G3	11	G3-11	CRANSTON ST	AT NORTH PROPERTY LINE OF MONTY AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
G3	12	G3-12	FOURNIER ST	AT NORTH PROPERTY LINE OF MONTY AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
G3	13	G3-13	FOURNIER ST	AT SOUTH PROPERTY LINE OF MONTY AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
G3	14	G3-14	MONTY AVE	AT EAST PROPERTY LINE OF FOURNIER ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G3	15	G3-15	MONTY AVE	AT WEST PROPERTY LINE OF TACHE ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
G3	16	G3-16	TACHE ST	AT SOUTH PROPERTY LINE OF MONTY AVE	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
G3	17	G3-17	MONTY AVE	AT EAST PROPERTY LINE OF TACHE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
G3	18	G3-18	TACHE ST	AT NORTH PROPERTY LINE OF CARON AVE	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
G3	19	G3-19	TACHE ST	AT SOUTH PROPERTY LINE OF CARON AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
G3	20	G3-20	PARK AVE	10' NORTH OF HYDRANT # 7315	6	GATE			20	WWD	WOONSOCKET	OPEN	
G3	21	G3-21	PARK AVE, NS	AT NORTH PROPERTY LINE OF SMITHFIELD RD FOR SERVICE # 7674	1.5		EDDY	1940		WWD	NS	OPEN	FORMERLY BLOW OFF
G3	22	G3-22	PARK AVE, NS	AT CENTER LINE OF SMITHFIELD RD	8	GATE			26	WWD	NS	OPEN	
G3	23	G3-23	PARK AVE, NS	AT CENTER LINE OF SMITHFIELD RD	8	GATE			26	WWD	NS	OPEN	
G3	24	G3-24	EDDIE DOWLING HIGHWAY, NS	AT SMITHFIELD RD , NS FOR SERVICE # 10542	8	GATE			26	WWD	NS	OPEN	
G3	25	G3-25	FOURNIER ST	AT NORTH PROPERTY LINE OF LAFLAMME AVE	8	GATE			26	WWD	WOONSOCKET	OPEN	
G3	26	G3-26	LAFLAMME AVE	AT EAST PROPERTY LINE OF FOURNIER ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
G3	27	G3-27	TACHE ST	AT NORTH PROPERTY LINE OF LAFLAMME ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
G3	28	G3-28	LAFLAMME AVE	AT WEST PROPERTY LINE OF TACHE ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
G3	29	G3-29	FOURNIER ST	END OF STREET AT NS TOWN LINE	10	GATE	CHAPMAN	1965	32	WWD	WOONSOCKET	OPEN	
G3	30	G3-30	GLEN AVE, NS	AT SMITHFIELD RD	1					WILLIS WHITE & SONS	NS	OPEN	MAY BE CONNECTED TO WS# 13035
G3	31	G3-31	SMITHFIELD RD, NS	200' EAST OF PARK AVENUE	2					WWD	NS	OPEN	
G3	32	G3-32	SMITHFIELD RD, NS	AT PARK AVE ST. SERVICE # 10644	2	T-HEAD	CHAPMAN	1957		WWD	NS	OPEN	OPENS LEFT, T-HEAD?
G3	33	G3-33	FOURNIER ST	NEAR LAFLAMME AVE	6	GATE	KENNEDY	1982	21	WWD	WOONSOCKET	OPEN	
G3	34	G3-34	CRANSTON ST	AT SOUTH STREET LINE OF MONTY AVE	8	GATE		1983	27	WWD	WOONSOCKET	OPEN	
G3	35	G3-35								WWD	WOONSOCKET		NO CARD
G4	1	G4-1	JILLSON AVE	AT N LINE OF HILLVIEW	8	GATE		1956	26	WWD	WOONSOCKET	OPEN	NO CARD
G5	1	G5-1	FLORA AVE	AT SOUTH PROPERTY LINE OF GADOURY BLVD	8	GATE		1956	26	WWD	WOONSOCKET	OPEN	
G5	2	G5-2	FLORA AVE	AT NORTH PROPERTY LINE OF GADOURY BLVD	8	GATE	APS	1960	26	WWD	WOONSOCKET	OPEN	
G5	3	G5-3	GADOURY BLVD	AT EAST PROPERTY LINE OF FLORA AVE	8	GATE		1954	26	WWD	WOONSOCKET	OPEN	
G5	4	G5-4	LYDIA AVE	40' FROM NORTH PROPERTY LINE OF GADOURY BLVD	30	GATE			92	WWD	WOONSOCKET	OPEN	
G5	5	G5-5	LYDIA AVE	40' FROM NORTH PROPERTY LINE OF GADOURY BLVD	3	GATE			11	WWD	WOONSOCKET	CLOSED	
G5	6	G5-6	GADOURY BLVD	AT WEST PROPERTY LINE OF LYDIA AVE	8	GATE		1954	26	WWD	WOONSOCKET	OPEN	
G5	7	G5-7	LYDIA AVE	AT NORTH PROPERTYLINE OF GADOURY BLVD	8	GATE		1954	26	WWD	WOONSOCKET	OPEN	
G5	8	G5-8	GADOURY BLVD	AT EAST PROPERTY LINE OF LYDIA AVE	8	GATE		1954	26	WWD	WOONSOCKET	OPEN	
G5	9	G5-9	LYDIA AVE	AT SOUTH PROPERTY LINE OF GADOURY BLVD	8	GATE		1954	26	WWD	WOONSOCKET	OPEN	
G5	10	G5-10	GADOURY BLVD	AT WEST PROPERTY LINE OF MANVILLE RD	8	GATE		1954	26	WWD	WOONSOCKET	OPEN	
G5	11	G5-11	GADOURY BLVD	AT WEST PROPERTY LINE OF MANVILLE RD	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	TSV
G5	12	G5-12	MANVILLE RD	80' FROM SOUTH PROPERTY LINE OF GADOURY BLVD	8	BLOW OFF			26	WWD	WOONSOCKET	CLOSED	
G5	13	G5-13	MANVILLE RD	80' FROM SOUTH PROPERTY LINE OF GADOURY BLVD	8	BLOW OFF			26	WWD	WOONSOCKET	CLOSED	
G5	14	G5-14	MANVILLE RD	70' FROM SOUTH PROPERTY LINE OF GADOURY BLVD	4	BLOW OFF			14	WWD	WOONSOCKET	CLOSED	
G5	15	G5-15	WADE RD	AT WEST PROPERTY LINE OF FLORA AVE	8	GATE		1959	26	WWD	WOONSOCKET	OPEN	
G5	16	G5-16	FLORA AVE	AT NORTH PROPERTY LINE OF WADE RD	8	GATE		1956	26	WWD	WOONSOCKET	OPEN	
G5	17	G5-17	FLORA AVE	AT SOUTH PROPERTY LINE OF WADE RD	8	GATE		1956	26	WWD	WOONSOCKET	OPEN	
G5	18	G5-18	HAMMAN TREATMENT PLANT	490' FROM CLEARWELL #1 , 280' FROM EAST PROPERTY LINE OF MANVILLE RD	16	GATE		1959	50	WWD	WOONSOCKET	OPEN	
G5	19	G5-19	THIBEAULT AVE	AT NORTH PROPERTY LINE OF WADE RD	8	GATE		1959	26	WWD	WOONSOCKET	OPEN	
G5	20	G5-20	THIBEAULT AVE	AT SOUTH PROPERTY LINE OF WADE RD	8	GATE		1959	26	WWD	WOONSOCKET	OPEN	
G5	21	G5-21	FLORA AVE	AT NORTH PROPERTY LINE OF WANDA AVE	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
G5	22	G5-22	WANDA AVE	AT WEST PROPERTY LINE OF LYDIA AVE	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
G5	23	G5-23	LYDIA AVE	AT NORTH PROPERTY LINE OF WANDA AVE	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
G5	24	G5-24	LYDIA AVE	40' FROM NORTH PROPERTY LINE OF BLUE STONE DR	3	GATE			11	WWD	WOONSOCKET	CLOSED	
G5	25	G5-25	LYDIA AVE	40' FROM NORTH PROPERTY LINE OF BLUE STONE DRIVE	30	GATE			92	WWD	WOONSOCKET	OPEN	
G5	26	G5-26	BLUE STONE DR	AT WEST PROPERTY LINE OF LYDIA AVE	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
G5	27	G5-27	LYDIA AVE	AT NORTH PROPERTY LINE OF BLUE STONE DRIVE	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
G5	28	G5-28	LYDIA AVE	WASH WATER TANK	8	GATE		1959	26	WWD	WOONSOCKET	CLOSED	
G5	29	G5-29	LYDIA AVE	WASH WATER TANK	8	GATE		1959	26	WWD	WOONSOCKET	OPEN	
G5	30	G5-30	LYDIA AVE	WASH WATER TANK	42	GATE		1959		WWD	WOONSOCKET	OPEN	
G5	31	G5-31	MANVILLE RD	80' NORTH OF HYDRANT # 7509	20	GATE		1959	62	WWD	WOONSOCKET	OPEN	
G5	32	G5-32	MANVILLE RD	40' NORTH OF HDYRANT # 7509	20	GATE		1959	62	WWD	WOONSOCKET	CLOSED	CLOSED 11-0-82
G5	33	G5-33	MANVILLE RD	CENTER LINE 40' NORTHOF HYDRANT # 7509	24	GATE			74	WWD	WOONSOCKET		OPENS COUNTER CLOCKWISE
G5	34	G5-34	MANVILLE RD	CENTERLINE OF RD, 30' NORTH OF HYDRANT # 7509	30	AIR REL. VALVE				WWD	WOONSOCKET	CLOSED	
G5	35	G5-35	HAMMAN TREATMENT PLANT	120' EST OF HYDRANT # 7511	20	GATE		1959	62	WWD	WOONSOCKET	OPEN	
G5	36	G5-36	HAMMAN TREATMENT PLANT	105' WEST OF HYDRANT # 7511	16	GATE		1959	50	WWD	WOONSOCKET	OPEN	
G5	37	G5-37	HAMMAN TREATMENT PLANT	95' WEST OF HYDRANT # 7511	20	GATE		1959	62	WWD	WOONSOCKET	OPEN	
G5	38	G5-38	HAMMAN TREATMENT PLANT	110' WEST OF HYDRANT # 7511	20	GATE		1959	62	WWD	WOONSOCKET	OPEN	
G5	39	G5-39	LYDIA AVE	110' NORTH OF HYD # 7510 AT NORTH PROPERTY LINE OF HAWTHORNE CIRCLE	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
G5	40	G5-40	HAMMAN TREATMENT PLANT	30' FROM EAST PROPERTY LINE OF MANVILLE RD	18	GATE	APS	1965	56	WWD	WOONSOCKET	CLOSED	CLOSED 09-10-1975, TSV
G5	41	G5-41	HAMMAN TREATMENT PLANT	30' FROM EAST PROPERTY LINE OF MANVILLE RD	18	BUTTERFLY	LUKENHIMER	1965	56	WWD	WOONSOCKET	CLOSED	CLOSED 09-10-75
G5	42	G5-42	HAWTHORNE CIRCLE	AT WEST PROPERTY LINE OF LYDIA AVE	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
G5	43	G5-43	HAMMAN TREATMENT PLANT	ENTRANCE IN M H	6	FLOWMETER			18	WWD	WOONSOCKET	OPEN	ENTRANCE IN M H
G5	44	G5-44	LYDIA AVE	WASH WATER TANK	8	GATE			26	WWD	WOONSOCKET	OPEN	
G6	1	G6-1	FISHER ST	15' WEST OF HYDRANT # 7600	16	GATE		1959	50	WWD	WOONSOCKET	OPEN	
G6	2	G6-2	LOUISE ST	AT NORTH PROPERTY LINE OF PHILLIPS ST	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
G6	3	G6-3	PHILLIPS ST	AT EAST PROPERTY LINE OF LOUISE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G6	4	G6-4	LUCILLE ST	AT NORTH PROPERTY LINE OF FISHER ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G6	5	G6-5	LUCILLE ST	AT SOUTH PROPERTY LINE OF FISHER ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G6	6	G6-6	PHILLIPS ST	AT WEST PROPERTY LNE OF LUCILLE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G6	7	G6-7	LUCILLE ST	AT NORTH PROPERTY LINE OF PHILLIPS ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G6	8	G6-8	LUCILLE ST	AT SOUTH PROPERTY LINE OF PHILLIPS ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G6	9	G6-9	PHILLIPS ST	AT EAST PROPERTY LINE OF LUCILLE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G6	10	G6-10	PHILLIPS ST	AT WEST PROPERTY LINE OF OLIVE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G6	11	G6-11	PHILLIPS ST	AT EAST PROPERTY LINE OF OLIVE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G6	12	G6-12	TALCOTT ST	AT NORTH PROPERTY LINE OF FISHER ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
G6	13	G6-13	FISHER ST	AT WEST PROPERTY LINE OF TALCOTT ST	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
G6	14	G6-14	TALCOTT ST	AT SOUTH PROPERTY LINE OF FISHER ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
G6	15	G6-15	TALCOTT ST	AT NORTH PROPERTY LINE OF PHILLIPS ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
G6	16	G6-16	PHILLIPS ST	AT WEST PROPERTY LINE OF TALCOTT ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
G6	17	G6-17	TALCOTT ST	AT SOUTH PROPERTY LINE OF PHILLIPS ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G6	18	G6-18	MENDON RD	AT SOUTH PROPERTY LINE OF ARROW ST	12	GATE			38	WWD	WOONSOCKET		
G6	19	G6-19	MENDON RD	AT SOUTH PROPERTY LINE OF ARROW ST	8	GATE		1959	26	WWD	WOONSOCKET	OPEN	
G6	20	G6-20	BURRINGTON ST	AT EAST PROPERTY LINE OF LOUISE ST	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
G6	21	G6-21	BURRINGTON ST	AT WEST PROPERTY LINE OF LUCILLE ST	8	GATE	LUDLOW		26	WWD	WOONSOCKET	OPEN	
G6	22	G6-22	LUCILLE ST	AT NORTH PROPERTY LINE OF BURRINGTON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G6	23	G6-23	LUCILLE ST	AT SOUTH PROPERTY LINE OF BURRINGTON ST	8	GATE			26	WWD	WOONSOCKET	OPEN	

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
G6	24	G6-24	BURRINGTON ST	AT EAST PROPERTY LINE OF LUCILLE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G6	25	G6-25	BURRINGTON ST	AT WEST PROPERTY LINE OF OLIVE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G6	26	G6-26	OLIVE ST	AT SOUTH PROPERTY LINE OF BURRINGTON ST	8	GATE	CHAPMAN		26	WWD	WOONSOCKET	OPEN	
G6	27	G6-27	BURRINGTON ST	AT EAST PROPERTY LINE OF OLIVE ST	8	GATE	CRANE	1960	26	WWD	WOONSOCKET	OPEN	
G6	28	G6-28	BURRINGTON ST	AT WEST PROPERTY LINE OF TALCOTT ST	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
G6	29	G6-29	TALCOTT ST	AT NORTH PROPERTY LINE OF BURRINGTON ST	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
G6	30	G6-30	LOUISE ST	AT NORTH PROPERTY LINE OF LARCH ST	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
G6	31	G6-31	LARCH ST	AT EAST PROPERTY LINE OF LOUISE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G6	32	G6-32	LARCH ST	AT WEST PROPERTY LINE OF LUCILLE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G6	33	G6-33	LUCILLE ST	AT NORTH PROPERTY LINE OF LARCH ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G6	34	G6-34	LUCILLE ST	AT SOUTH PROPERTY LINE OF LARCH ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G6	35	G6-35	LARCH ST	AT EAST PROPERTY LINE OF LUCILLE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G6	36	G6-36	LUCILLE ST	AT NORTH PROPERTY LINE OF SEAMANS ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G6	37	G6-37	LUCILLE ST	AT SOUTH PROPERTY LINE OF SEAMAN ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G6	38	G6-38	LARCH ST	AT WEST PROPERTY LINE OF OLIVE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G6	39	G6-39	OLIVE ST	AT NORTH PROPERTY LINE OF LARCH ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
G6	40	G6-40	OLIVE ST	AT SOUTH PROPERTY LINE OF LARCH ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
G6	41	G6-41	LARCH ST	AT EAST PROPERTY LINE OF OLIVE ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G6	42	G6-42	SEAMANS ST	AT WEST PROPERTY LINE OF OLIVE ST	8	GATE	APS	1963	26	WWD	WOONSOCKET	OPEN	
G6	43	G6-43	OLIVE ST	AT NORTH PROPERTY LINE OF SEAMANS ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
G6	44	G6-44	OLIVE ST	AT SOUTH PROPERTY LINE OF SEAMANS ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
G6	45	G6-45	SEAMANS ST	AT EAST PROPERTY LINE OF OLIVE ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
G6	46	G6-46	LARCH ST	AT WEST PROPERTY LINE OF TALCOTT ST	8	GATE			26	WWD	WOONSOCKET	OPEN	
G6	47	G6-47	TALCOTT ST	AT NORTH PROPERTY LINE OF LARCH ST	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
G6	48	G6-48	LUCILLE ST	AT NORTH PROPERTY LINE OF VIVIAN ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
G6	49	G6-49	LUCILLE ST	AT SOUTH PROPERTY LINE OF VIVIAN ST	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
G6	50	G6-50	VIVIAN ST	AT EAST PROPERTY LINE OF LUCILLE ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
G6	51	G6-51	VIVIAN ST	AT WEST PROPERTY LINE OF OLIVE ST	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
G6	52	G6-52	OLIVE ST	AT NORTH PROPERTY LINE OF VIVIAN ST	8	GATE	P & C		26	WWD	WOONSOCKET	OPEN	
G6	53	G6-53	FISHER ST	AT EAST PROPERTY LINE OF OLIVE ST	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
G6	54	G6-54	OLIVE ST	AT NORTH PROPERTY LINE OF FISHER ST	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
G6	55	G6-55	MENDON RD	AT NORTH PROPERTY LINE OF ARROW ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
G6	56	G6-56	MENDON RD	14' OFF NORTH PROPERTY LINE OF ARROW ST	12	GATE			38	WWD	WOONSOCKET	OPEN	TSV
G6	57	G6-57	MENDON RD	OPPOSITE ARROW ST - TAPPED INTO 16" main	12	GATE	APS	1981	38	WWD	WOONSOCKET	OPEN	
G6	58	G6-58	SEAMANS ST	190' FROM E LINE OF OLIVE	8	GATE		1993	26	WWD	WOONSOCKET	OPEN	NO CARD
G6	59	G6-59	OLIVE ST	170' FROM S LINE OF SEAMANS	8	GATE		1993	26	WWD	WOONSOCKET	OPEN	NO CARD
G7	1	G7-1	MENDON RD	AT NORTH PROPERTY LINE OF BEAUSOLEIL ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
G7	2	G7-2	BEAUSOLEIL ST	AT EAST PROPERTY LINE OF MENDON RD	12	GATE		1929	38	WWD	WOONSOCKET	OPEN	
G7	3	G7-3	BEAUSOLEIL ST	20' WEST OF HYDRANT #7702		BLOW OFF		1929		WWD	WOONSOCKET	CLOSED	
G7	4	G7-4	MENDON RD	AT NORTH PROPERTY LINE OF COMET ST	12	GATE			38	WWD	WOONSOCKET	OPEN	
G7	5	G7-5	COMET ST	AT EAST PROPERTY LINE OF MENDON RD	12	GATE			38	WWD	WOONSOCKET	OPEN	
G7	6	G7-6	TALCOTT ST	AT NORTH PROPERTY LINE OF SEAMANS ST	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
G7	7	G7-7	SEAMANS ST	AT WEST PROPERTY LINE OF TALCOTT ST	8	GATE	APS		26	WWD	WOONSOCKET	OPEN	
G7	8	G7-8	MENDON RD	ACROSS FROM HIGHLAND II		GATE				WWD	WOONSOCKET	CLOSED	NO CARD
H2	1	H2-1	GREENVILLE RD, NS	570' FROM NORTH PROPERTY LINE OF LAMOUREUX BLVD	6	GATE			19	LEO CABANA	NS	OPEN	
H2	2	H2-2	BIRCH HILL AVE, NS	NS, 150' WEST OF ROBERT ST	1	BLOW OFF		1979		LEO CABANA	NS	CLOSED	
H5	1	H5-1	MANVILLE RD	540' SOUTH OF HYD 7509	4	GATE			14	WWD	WOONSOCKET	CLOSED	REMOVED 1991
H5	2	H5-2	MANVILLE RD	560' SOUTH OF HYD 7509	8	GATE		1959	26	WWD	WOONSOCKET	CLOSED	BLOWOFF
H5	3	H5-3	MANVILLE RD	560' SOUTH OF HYD 7509	8	GATE		1959	26	WWD	WOONSOCKET	CLOSED	BLOWOFF
H5	4	H5-4								WWD	WOONSOCKET		NO CARD
H5	5	H5-5	LYDIA AVE	AT N LINE OF HAWTHORNE CIRCLE	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
H5	6	H5-6	HAWTHORNE CIRCLE	AT W LINE OF LYDIA	8	GATE		1964	26	WWD	WOONSOCKET	CLOSED	
H5	7	H5-7	BLUE STONE DR	AT N LINE OF DOGWOOD	8	GATE		1964	26	WWD	WOONSOCKET	OPEN	
H5	8	H5-8	DOGWOOD LN	AT W LINE OF BLUE STONE	8	GATE		1964	26	WWD	WOONSOCKET	CLOSED	
H5	9	H5-9	HAWTHORNE CIRCLE	58' FROM FRONT RIGHT CORNER OF #249, 47.4' FROM LEFT CORNER OF #633	8	GATE		1989		WWD	WOONSOCKET	OPEN	
H5	10	H5-10	HAWTHORNE CIRCLE	91' FROM LEFT CORNER OF #165, 54.5' FROM POLE 7	8	GATE		1989		WWD	WOONSOCKET	OPEN	
H5	11	H5-11	MANVILLE RD	AT BLDG 1613	4	GATE	KENNEDY	1991	12	WWD	WOONSOCKET	CLOSED	BLOWOFF
SP	1	SP-1	MANVILLE RD	900' FROM WOONSOCKET LINCOLN TOWN LINE	30	AIR REL. VALVE		1959		WWD	WOONSOCKET	CLOSED	
SP	2	SP-2	MANVILLE RD	830 ' FROM WOON LINCOLN LINE	18	AIR REL. VALVE		1959		WWD	WOONSOCKET	CLOSED	
SP	3	SP-3	MANVILLE RD	120' FROM NORTH PROPERTY LINE OF ENTRANCT TO PUMPING STATION	6	BLOW OFF			12	WWD	WOONSOCKET	CLOSED	
SP	4	SP-4	MANVILLE RD	120' FROM NORTH PROPERTY LINE OF ENTRANCE TO PUMPING STATIOM	12	GATE			38	WWD	WOONSOCKET	OPEN	
SP	5	SP-5	MANVILLE RD	90' FROM NORTH PROPERTY LINE OF ENTRANCE TO PUMPING STATION	20	BLOW OFF			62	WWD	WOONSOCKET	CLOSED	
SP	6	SP-6	MANVILLE RD	125' FRON NORTH PROPERTY LINE OF ENTRANCE TO PUMPING STATION	20	GATE			62	WWD	WOONSOCKET	OPEN	
SP	7	SP-7	MANVILLE RD	120' FROM WOON LINCOLN TOWN LINE	8	BLOW OFF		1959		WWD	WOONSOCKET	CLOSED	
SP	8	SP-8	MANVILLE RD	120' FROM WOONSOCKET LINCOLN LINE	30	BLOW OFF		1959		WWD	WOONSOCKET	CLOSED	
SP	9	SP-9	MANVILLE RD, NS	AT WOONSOCKET LINCOLN LINE	20	GATE			62	WWD	NS	ABANDONED	
SP	10	SP-10	MANVILLE RD, NS	AT WOON LINCOLN LINE	10	GATE			32	WWD	NS	CLOSED	CLOSED 1988
SP	11	SP-11	MANVILLE RD, NS	AT WOON LINCOLN LINE	12	GATE			38	WWD	NS	CLOSED	CLOSED 1988
SP	12	SP-12	ROAD TO PUMPING STATION	280' WEST OF HYDRANT # 9100	30	GATE		1958	62	WWD	NS	OPEN	
SP	13	SP-13	ROAD TO PUMPING STATION	240' WEST OF HYDRANT # 9101 NOT IN SERVICE	12	GATE			38	WWD	NS	CLOSED	
SP	14	SP-14	ROAD TO PUMPING STATION	140' WEST OF HYDRANT # 9101	12	GATE			38	WWD	NS	CLOSED	
SP	15	SP-15								WWD	NS		NO CARD
SP	16	SP-16	PUMPING STATION		30	GATE			92	WWD	NS	ABANDONED	
SP	17	SP-17	RESERVOIR #1	IN VAULT NEAR SPILLWAY (MUD VALVE)	12	GATE				WWD	NS	ABANDONED	BURIED IN OPEN POSITION UNDER DAM EMBANKMENT
SP	18	SP-18	PUMPING STATION		20	GATE			62	WWD	NS	CLOSED	
SP	19	SP-19	PUMPING STATION		16	GATE			50	WWD	NS	CLOSED	
SP	20	SP-20	PUMPING STATION		16	GATE			50	WWD	NS	CLOSED	
SP	21	SP-21	PUMPING STATION		30	GATE			62	WWD	NS	CLOSED	
SP	22	SP-22	PUMPING STATION		16	GATE			50	WWD	NS	CLOSED	
SP	23	SP-23	PUMPING STATION		24	GATE			74	WWD	NS	CLOSED	
SP	24	SP-24	PUMPING STATION		16	GATE			50	WWD	NS	CLOSED	
SP	25	SP-25	LYDIA AVE	ON 30" LINE NOT IN USE						WWD	WOONSOCKET	ABANDONED	ON ABANDONED 30"
SP	26	SP-26	LYDIA AVE	ON 30" LINE NOT IN USE						WWD	WOONSOCKET	ABANDONED	ON ABANDONED 30"
SP	27	SP-27	LYDIA AVE	ON 30" LINE NOT IN USE						WWD	WOONSOCKET	ABANDONED	ON ABANDONED 30"
SP	28	SP-28	LYDIA AVE, NS	ON 30" LINE NOT IN USE						WWD	NS	ABANDONED	ON ABANDONED 30"
SP	29	SP-29	LYDIA AVE, NS	ON 30" LINE NOT IN USE						WWD	NS	ABANDONED	ON ABANDONED 30"

Appendix G
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Valve Database

Grid #	Seq #	Gate #	Street	Location	Size	Type	Make	Date	Turns-Main	Owner	Town	Norm Pos	Comments
SP	30	SP-30	RESERVOIR ROAD	240' SOUT OF HYDRANT # 9102	18	AIR REL. VALVE		1957		WWD	NS	CLOSED	
SP	31	SP-31	RESERVOIR #1	NEAR HEADWALL AT BOTTOM OF DAM	12	GATE	KENNEDY	1983	39	WWD	NS	CLOSED	MUD VALVE FOR RESERVOIR - OPENS LEFT
SP	32	SP-32	RESERVOIR AVE	10' SOUTH OF HYDRANT # 9102	6	BLOW OFF		1957	20	WWD	NS	CLOSED	
SP	33	SP-33	RESERVOIR ROAD	AERATION INSTALLATION	8	GATE		1957	26	WWD	NS	CLOSED	
SP	34	SP-34	RESERVOIR ROAD	AERATION INSTALLATION	8	GATE		1957	26	WWD	NS	CLOSED	

APPENDIX H

RIDOH Rules and Regulations for Clean Water Infrastructure Plans

RULES AND REGULATIONS FOR CLEAN WATER INFRASTRUCTURE PLANS

[R46-15.6-INFRA]

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATION

Department of Health

October 1994

AS AMENDED
January 1995
January 2002 (re-filing in accordance with the provisions of section 42-35-4.1 of the Rhode Island General Laws, as amended)

INTRODUCTION

The waters of this state are a critical renewable resource which must be protected to insure the continued availability of safe and potable drinking water for present and future needs. It is a paramount policy of the state to protect the purity of present and future drinking water supplies by protecting the infrastructure of potable water, including sources, treatment plants and distribution systems. The decay of water supply infrastructure due to deterioration or functional obsolescence can threaten the quality of water supplies and therefore can endanger public health. Therefore, it is necessary to take timely and continuing steps to repair and replace the infrastructure used to treat and deliver drinking water from public water suppliers. By planning and funding for future infrastructure replacement, unexpected large capital expenditures causing sudden increases in water rates can hopefully be avoided. The intent of this Infrastructure Replacement Plan is to provide a planning and funding mechanism to insure that infrastructure replacement programs are carried out by each municipality, district, agency, authority, or other entity engaged in the supply, treatment, transmission, and/or distribution of drinking water. Goals of the plan include the justification of a facility replacement program, the provision of a dedicated and sufficient funding mechanism, the prioritization of infrastructure replacement, and the prevention of the erosion of drinking water infrastructure.

These rules and regulations are promulgated pursuant to the requirements and provisions of RIGL Chapter 46-15.6 Clean Water Infrastructure of the General Laws of Rhode Island, as amended.

The terms and provisions of the rules and regulations shall be liberally construed to allow the Department of Health to effectuate the purposes of the state law, goals and policies consistent with the Clean Water Infrastructure Act, Chapter 46-15.6 of the General Laws of Rhode Island, as amended.

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SECTION 1.0 DEFINITIONS

Wherever used in these rules and regulations the following terms shall be construed as follows:

1.1 Audit--the annual formal examination of the water supplier's financial statements including all investments, interest, expenditures, and operating costs.

1.2 Commission--the Public Utilities Commission (PUC) of the State of Rhode Island.

1.3 Comprehensive Plan--the Comprehensive Plan adopted and approved in accordance with RIGL Chapter 45-22.2, the RI Comprehensive Planning and Land Use Regulation Act. A document prepared by each local municipality which contains the planning and implementation program for land use, housing, economic development, natural and cultural resources, services and facilities, open space and recreation, and circulation.

1.4 Department--the Department of Health (DOH), Division of Drinking Water Quality.

1.5 Distribution facilities--the pipes and appurtenant facilities employed specifically to deliver, to dispense, to render or to circulate potable water directly to the consumer.

1.6 Drinking Water--potable water served to the public.

1.7 Economic life--the expected financial lifespan of a component of a public water system which is used to depreciate the capital expense of the component.

1.8 Eligible expenditures--those costs and expenses necessary to fund, manage, and implement the infrastructure replacement plan, only. This may include associated accounting fees, consulting fees, replacement construction, etc.

1.9 Infrastructure--the permanent underlying framework of the public water system, including but not limited to, supplies, transmission, storage, distribution, pumping, and treatment facilities.

1.10 Life expectancy--the expected physical lifespan of a component of a public water system.

1.11 Maintenance--a planned program of inspection, adjustment, exercise, lubrication, etc. which allows the maximum continuous service of the equipment in the system at the lowest possible cost to the utility as required in the Department of Environmental Management's Water Supply Management Planning Section 8.07(c). Routine maintenance expenditures are not eligible for funding from the Infrastructure Replacement Plan.

1.12 Rate fee--the charge per unit for public water based upon a ratio, scale, or standard relative to the cost of supplying potable drinking water.

1.13 Rehabilitation--rehabilitation which restores existing facilities or components to a condition which extends the physical and economic life of the component. Rehabilitation is an eligible expenditure under the Infrastructure Replacement Plan.

1.14 Repair--expenditures to return into service a component of the infrastructure that has failed is not an eligible expenditure under the Infrastructure Replacement Plan.

1.15 Replacement--new construction to substitute for existing facilities or components which can not be rehabilitated or repaired cost effectively is an eligible expenditure under the Infrastructure Replacement Plan.

1.16 Special account--an account established by physically opening an account designated as the "Infrastructure Replacement Fund" that is acceptable under this Act. This account shall be self-contained in that deposits and withdrawals are recorded by the financial institution through a fiduciary relationship with the utility. This special account shall be a restricted receipt account dedicated solely for funding of eligible expenditures from the infrastructure replacement program and be administered by the general manager of the water supplier or his designee. All receipts, income, and interest earned on these funds shall be accrued within this special account.

1.17 Surcharge--a fee charged in addition to normal system rate fees which is used to fund extraordinary or special conditions of the water system.

1.18 Transmission facilities--shall mean the pipes, pumping stations, and storage facilities required to carry raw and/or potable water from a water source to or throughout an area served or to be served by a water supply system for the specific purpose of supplying water to support a general population.

1.19 Water supplier--any municipality, municipal department, agency, district, authority, or other entity engaged in or authorized to engage in the supply, treatment, transmission, or distribution of drinking water on a wholesale or retail sales basis.

1.20 Water supply sources--are Department of Health approved sources of supply connected to a water supply system and available for distribution. These sources may be surface waters or groundwater wells.

1.21 Water supply management plan--a plan prepared by applicable public water suppliers which plans and implements effective and efficient conservation, development, utilization, and protection of water supply resources consistent with the present and future needs of the State and its people as defined in RIGL 46-15.4.

SECTION 2.0 APPLICABILITY - PREPARATION OF PLANS

2.1 All water suppliers which supply, obtain, transport, distribute, purchase, and/or sell on a wholesale or retail basis, more than fifty million (50,000,000) gallons of water per year shall be required to prepare, maintain, and carry out a clean water infrastructure replacement plan as described in these regulations.

SECTION 3.0 CONFORMITY WITH OTHER LEGISLATION

3.1 The clean water infrastructure replacement plans shall be in conformity with all applicable provisions of state and federal laws including the federal Safe Drinking Water Act (42 USC Section 300f et seq.); Chapter 46-13 of the General Laws of Rhode Island, Public Drinking Water Supply. Infrastructure replacement plans must be consistent with the Comprehensive

Plan for the community or communities associated with the water system. Infrastructure replacement plans shall also be consistent with the Water Supply Management plans required under Chapter 46-15.4.

SECTION 4.0 CONTENTS OF PLANS

4.1 Clean water infrastructure replacement plans shall be prepared in the format, and shall address each of the topics listed in this section, to the extent that each is relevant to the water supplier, the water source, the water system, and the transmission/distribution/storage system. Systems which currently have an infrastructure replacement plan may review the existing plan and utilize existing information to the extent that it is consistent with the intent of the infrastructure replacement plan outlined below. The initial plan may include a schedule for the completion of the evaluation of major components or items which require detailed investigation. The schedule must demonstrate an expeditious, responsible, and reasonable time period for compliance.

4.2 All principal components of the water system such as sources, reservoirs, dams, spillways, intakes, treatment plants, pump stations, storage facilities, pumping and well equipment, shall be listed and evaluated. Relatively small and numerous components of the system such as water mains, distribution piping, valves, hydrants, and interconnections may be evaluated as a group. This evaluation shall consider the following:

a. A brief description of the system with a schematic of the process flow will be included in the plan. This description of the system may be taken directly from the Water Supply Management Plan where relevant and is not intended as a duplicate effort but to facilitate the evaluation of individual components. Age and condition of the existing component and the necessity for replacement of the component within a twenty (20) year time frame shall be evaluated. Specific components may be in need of immediate replacement while others may extend well beyond the twenty year time frame. Replacement should be evaluated and prioritized over a minimum of five (5) year intervals. The level of detail in the analysis of the component should reflect the priority of the component to the proper operation of the system as well as the age and known condition of the component. A detailed schedule for the initial five year interval must be included. No infrastructure replacement construction is required to take place within any time interval if demonstrated to not be necessary.

b. Life expectancy of the component shall be determined. Life expectancy shall be determined by design criteria, specific site conditions, maintenance records, manufacturer's documentation, engineering evaluation, physical inspection, invasive and/ or non-destructive integrity testing, or a combination of all of the above. Records of inspection and maintenance may be reviewed when determining the life expectancy of the component. The attached Guideline, Appendix 1, is intended to serve as a general rule of thumb for component life expectancy and actual life expectancy within an individual system may be demonstrated to be significantly more or less than the Guideline value.

c. Consideration shall be given to the public water system's ability to meet current and future requirements of the Safe Drinking Water Act. Treatment requirements should be analyzed to the extent possible to insure that infrastructure replacement and/or rehabilitation will comply with mandated requirements consistent with the Safe Drinking

Water Act.

d. A financial forecast shall be based on the analysis of the condition and life expectancy of the existing facilities, prioritized needed repairs and replacements and amortize proportionally such improvement requirements on an annual basis over the next twenty years consistent with their respective life expectancy. The forecast shall include contingency costs, range of construction costs, and/or confidence limits of the financial forecast.

e. Infrastructure replacement shall meet the needs of the water suppliers, however priority of anticipated replacement and grouping of replacement projects by time of replacement, similarity of projects, and importance of the component to the system shall be considered when establishing the schedule. Priority should be given to components which have a known need for replacement and less detailed analysis given to relatively new infrastructure items.

4.3 When planning infrastructure replacement, the water supplier shall consider sizing facilities to meet the approved local comprehensive plans for existing or proposed service areas. The existing or proposed service area shall be defined consistent with that described in the supplier's most recent Water Supply Management Plan. Funding for proposed expansion shall come from the capital improvement program utilizing new capital rather than from replacement funding. It is intended that the infrastructure replacement plan evolve from the Water Supply Management Plan and expand the concepts of capital improvement planning initiated in the Water Supply Management Plan. The infrastructure replacement plan shall be consistent with sound waterworks practice.

4.4 The infrastructure replacement plan must recognize and maintain existing fiscal controls and accounting standards in accordance with Generally Accepted Government Accounting Principles sufficient to ensure fiscal responsibility for the evaluation and implementation of the infrastructure replacement. These fiscal controls and accounting standards must be established where none currently exist. The financial requirements of the plan shall conform to those outlined in Section 6.0 of these regulations.

4.5 Funds from the watershed protection fund may be used for the preparation of clean water infrastructure replacement plans up to fifty (50) percent of the cost of the plan. Disbursements from the fund shall be in accordance with Chapter 46-15.3-11 of the Public Drinking Water Resources Board Operating Fund. The remaining costs are eligible for funding through the Safe Drinking Water Revolving Loan Fund. The plan shall incorporate the proposed rate structure impacts, schedule of proposed rate changes, and schedule for full funding consistent with the funding requirements for scheduled infrastructure replacement.

SECTION 5.0 REVIEW OF PLANS

5.1 Water suppliers subject to the requirements of this chapter shall file six copies of the clean water infrastructure plan with the Division of Drinking Water Quality of the Department of Health (the Department). Plans must be submitted no later than one year subsequent to the date the system's water supply management plan is due in accordance with RIGL Section 46-15.4-4.

5.2 The Department shall coordinate review of the plan with the Department of Environmental Management's Division of Water Supply Management, the Department of Administration's Division of Planning, the Water Resources Board, and the Public Utilities Commission. The PUC shall only review Plans for those systems which are regulated by the PUC. Each Department shall have 120 days to review the plan and submit comments to the Department of Health. Upon consideration of the comments, the Department shall determine if the plan complies with the requirements of these regulations within two hundred forty days (240) of the initial submission. A thirty day public comment period is inclusive in this two hundred forty day (240) review period.

5.3 Water suppliers shall review and update their infrastructure replacement plans at a minimum frequency of every five years. Major modifications or revisions to the infrastructure replacement plan shall be submitted for review more frequently as necessary.

5.4 Water suppliers shall implement the infrastructure replacement plan according to the approved plan. On-site review of facility components may be conducted by the Department when appropriate and/or applicable. The responsible official of the water supply system shall be required to verify that construction expenditures are consistent with the plan.

SECTION 6.0 FINANCING INFRASTRUCTURE IMPROVEMENTS

6.1 Each water supplier subject to the requirements of this chapter shall establish a separate special account designated as the Infrastructure Replacement Fund to be held as a restricted receipt account and to be administered by the water supplier solely to implement and carry out the replacement or rehabilitation of infrastructure in accordance with the approved plan. The dedicated account should be invested in accordance with the standards established for the agency, municipality, or water supplier.

6.2 The costs of programs to implement infrastructure replacement shall be paid by the users of the water system at a rate directly proportional to the users' consumption of water. Charges shall be limited to those necessary and reasonable for implementation of the plan. These charges shall be based upon the annual funding requirements of the facility improvements necessitated over each successive twenty year period.

6.3 Interest earned on this account shall be credited to this account only. Accumulated funds in excess of that estimated to be necessary to implement the plan shall revert to the rate payers of the system on a biannual basis. Funds will be allowed to accumulate with the intent to build sufficient capital to finance the estimated costs of major projects. It is understood that annual investments may be necessary over many years to fund major projects. Funds accumulated that are in excess of that estimated to implement the plan will cause the water supplier to reduce the future charges for infrastructure replacement.

6.4 Water suppliers may alternatively fund the infrastructure replacement program through partial or complete external funding at the option of the water supply system. Debt service and debt service issuance costs for any and all funding shall be an eligible expense as part of the program's funding requirements.

6.5 The Public Utilities Commission, as to water suppliers within its jurisdiction, shall permit an increase for just and reasonable infrastructure replacement in the portion of the water

suppliers' rate structure to comply with this chapter and shall allow the water supplier to add this required funding to its rate base in accordance with this chapter. Proposed increases in rates by regulated water utilities to finance infrastructure improvements shall be filed and reviewed in conformance with Chapter 39 of the RI General Laws.

6.6 The applicable section of the water supplier's annual audit shall be submitted to the Department to verify compliance with the funding intentions of the infrastructure replacement plan. The dedicated fund for infrastructure replacement will be a separate line item in the audit. Financial and summary status reports shall be submitted for each on-going project which outlines funds spent on the project, funds remaining, percentage of completion, and a brief description of work completed and work remaining. Project expenditures must be consistent with the plan and be eligible expenditures under the plan. Audits shall be submitted within 180 days from the end of the water suppliers fiscal year. Extensions will be allowed for reasonable cause.

SECTION 7.0 SEVERABILITY

7.1 If any provision of these rules and regulations or the application thereof to any person or circumstance is held invalid by a court of competent jurisdiction, the remainder of the rules and regulations shall not be affected thereby. The invalidity of any section or sections or parts of any section or sections shall not affect the validity of the remainder of these rules and regulations.

APPENDIX 1

TYPICAL LIFE EXPECTANCY

EQUIPMENT	YEARS
Source of supply plant	
Structures and improvements	35-40
Collecting/impounding reservoirs	50-75
Intake structures	35-45
Wells and springs	25-35
Galleries and tunnels	25-50
Supply mains	50-75
Pumping plant	
Structures	35-40
Pumping equipment	10-15
Other pumping plant	20
Water treatment plant	
Structures	35-40
Water treatment equipment	15-20
Transmission/Distribution	
Structures	35-40
Reservoirs and tanks	30-60
Mains	50-75
Services	30-50
Meters	15
Hydrants	40-60
General plant	
Structures	35-40
Furniture/equipment	15-20
Transportation equipment	7
Stores equipment	10
Tools, shop equipment	7-10
Laboratory equipment	10-15
Power operated equipment	10
Communication equipment	10

APPENDIX I

Raw Water Pump Station Technical Memorandum dated July 28, 2015

Technical Memorandum

To: *Michael Annarummo, P.E., Administrative Assistant to the Mayor*
Marc Viggiani, Water Superintendent
Steven D'Agostino, Director of Public Works

From: *Jack Keaney, P.E., Senior Project Manager*
Douglas Martin, P.E., Project Engineer

Date: *July 28, 2015*

Subject: *Proposed Raw Water Pumping Station for the New Woonsocket Water Treatment Plant*

I. Purpose of Memorandum

CDM Smith has prepared this memorandum to present general requirements for the location and design of the Raw Water Pumping Station (RWPS) for the new Woonsocket Water Treatment Plant (WTP).

The recommendations for the RWPS will be incorporated into the City's upcoming Request for Proposal (RFP) for Design-Build-Operate (DBO) Contractors. This memorandum will be appended to the RFP.

II. Pumping Station Site

As shown on the attached site plan, the proposed site for the RWPS is located on Manville Road (Assessor's Map 34, Lot 23) along the west side of the driveway entrance to the existing water treatment plant. CDM Smith has recommended this site for the proposed RWPS for two major reasons. First, the proposed site allows for the gravity flow of raw water from the blending chamber, which is located just down gradient of Reservoir No. 1. Secondly, the proposed RWPS site is located within Woonsocket's corporate boundaries and is located on City-owned land.

III. Raw Water Pumping Capacity

The new Woonsocket WTP will be sized for an initial net capacity of 7.0 mgd expandable to 10.5 mgd, to accommodate a small amount of waste that is anticipated to occur at the WTP. CDM Smith recommends that the new raw water pumping facilities include, at a minimum, three identical pumps initially, with provisions for a fourth future pump, each sized such that, with one pump as a standby, the remaining two or three pumps together could deliver capacity in excess of 7.0 mgd initially (7.1 mgd) and 10.5 mgd in the future (10.65 mgd) to meet the net WTP capacity stated above. Also, the pumps are to be equipped with variable frequency drives (VFD) with each pump having a minimum operating capacity of 2.0 mgd.

CDM Smith has developed and attached a preliminary and feasibility layout of the proposed RWPS to give the DBO Team insight as to how the site may accommodate the facility. The layout is a guide

and by no means represents the required design. The Contractor is encouraged to develop a design that is innovative and makes good use of the site.

IV. Standby Power

Furnish and install a standby engine generator system with automatic transfer switch to operate the motor control centers at the RWPS. The standby generator shall be sized to handle the maximum capacity of the station at full buildout with fourth future pump installed.

The fuel type, sound attenuation requirements, indoor vs. outdoor mounting, and standby power rating for the generator shall be determined by the DBO Team in coordination with Owner and the power company. The standby generator shall be equipped an exhaust silencer, duct silencers, noise control louvers and similar devices designed to minimize noise emissions during operation. Critical equipment shall be designed to automatically re-start in a defined sequence upon transfer to standby power. All equipment shall automatically resume operation under normal conditions upon resumption of normal power.

The generator shall conform to current standards applicable to standby power systems, including NFPA 110, to provide non life-safety standby power, ASCE 7 seismic design requirements, NEC 701 - Legally Required Standby Power Systems, NFPA 37 - Standard for Installation and Use of Stationary Combustion Engines and Gas Turbines, and UL 2200, Stationary Engine Generator Assemblies. The fuel storage tank (if required) shall conform to NFPA 30 and UL 142

V. Redundant Raw Water Supply Main

To ensure reliable and consistent raw water supply to the new pumping station, CDM Smith has prepared plans and details for construction of a new 30-inch redundant raw water supply main. The new pipe will follow the alignment of an abandoned 20-inch cast iron main in Manville Road, which extends from the entrance to the existing WTP, south to the abandoned Station One Pumping Station, which is located adjacent the Reservoir No. 1. The new main will extend to the north of the proposed RWPS. **RFP Appendix J** includes plans showing the alignment, utility crossings, and details for the proposed redundant raw water transmission main. This main is required to allow the existing facilities to remain operational during construction of the new facilities, as well as to provide full redundancy to the new facilities.

When the RWPS and new WTP are complete, tested, accepted, and operational, the DBO Team shall remove the existing 30-inch cast iron raw water supply main from the existing blending chamber to the existing WTP and install a new 30-inch ductile iron “Primary” raw water supply main in the same trench. This new primary raw water main supply main shall connect to the raw water suction main at the south end of the new RWPS. CDM Smith recommends installing motorized butterfly valves at the north and south ends of the pumping station suction header, and at each main at the blending chamber to properly isolate and select the various raw water supply mains while supplying the raw water pump station. Attached is site plan showing the location of the blending chamber and a plan of the blending chamber piping layout.

The DBO Team shall include the operation of these valves and the RWPS in the proposed SCADA system at the new WTP. CDM Smith has presented a Suggested Sequence of Construction for work at the RWPS in Section VI of this memorandum.

VI. Other Issues to be Addressed in RFP

The RWPS will face several residential houses along the west side of Manville Road and the City has mandated that the architectural finish of the pumping station blend in as "another residential house" in the area. The site access and landscaping should reflect this theme as well.

The RWPS is also located adjacent to a Providence and Worcester (P&W) Railroad right of way. The section of track is an active Rail Line and track speed here is 40 mph. Any use of the RR ROW will require an access agreement and a flagman. Attached are P&W's specification for work within, adjacent to, and above the railroad right-of-way, fencing specification, insurance requirements, and flagging request form. The DBO Team will be responsible for obtaining design and construction approvals from P&W. In addition, the DBO team will be responsible for securing an access agreement and a flagman as required by P&W.

As previously discussed, the proposed RWPS would be supplied via a new 30-inch raw water supply main while the existing raw water main that currently supplies the existing WTP is still operational. The DBO Team will need to make raw piping improvement to allow both the new RWPS and the existing WTP to operate simultaneously during acceptance testing and initial operation of the new WTP. The new 30-inch raw water main in Manville Road will initially serve as the primary supply main to facilitate acceptance testing of the pumping station and the new WTP without affecting either the existing raw water supply main or operation of the existing WTP.

For the RWPS to be fully operational, the DBO Team will need to provide a raw water discharge main to the new WTP. **Figure 1**, attached shows two existing finished water mains that flow from the existing WTP to the Logee Street Storage Tanks. Currently, the city only uses the newer 30-inch main as the finished water supply main and the other main has been turned off. The DBO team will need to reactive this main to serve as the raw water discharge main from the new RWPS to the new WTP. Once the new WTP is operational, the existing 30-inch finished water main from the existing WTP to the Logee Street storage tanks will need to be converted to a redundant raw water discharge main from the new RWPS to the new WTP.

The City currently has two utility easements, which the DBO Team may consider and investigate as a corridor to extend the raw water supply main from the new pumping station to the existing abandoned 30-inch transmission main in Lydia Avenue. **Figure 2** provides the locations of these utility easements and potential connections can be made to the existing 30-inch abandoned transmission main. CDM Smith has described briefly below two potential alternatives for using these utility easements connecting the pumping station to the existing transmission main in Lydia Avenue while maintaining operation of the existing WTP.

1. For an alternative backwashing operation, the DBO Team could provide temporary pumps at the existing WTP to facilitate backwashing of the existing perifilters. With this operational change, the DBO team could demolish the existing washwater tank and remove the 42-inch washwater main to provide a route within the existing easement (Map 34, Lot 22) for the new raw water discharge main. CDM Smith has attached information pertaining to this existing water utility easement. The DBO Team will be required to submit documentation (calculations, pump layout, electrical needs and all other information) to support the feasibility to pursue this alternative and resulting route for the new raw water transmission main.

2. The DBO Team can also consider using the sewer utility easement (Map 34, Lot 19 at 1507 Manville Road), which is located near the south side of the washwater easement. This existing utility easement may accommodate the installation of the new raw water discharge main. Information pertaining to the easement is attached. The DBO Team is required to verify if the existing utility easement is useable and provide any permitting and legal services as required.

The DBO Team may investigate and propose optional routes for the new pumping station discharge main with supporting documentation (e.g., plans, utility information, profiles and details) for consideration, review and approval by the Evaluation Team. The DBO Team will be responsible for the hydraulic analysis as needed to size and select the new raw water pumps. Therefore, the RFP will provide information about the existing raw water blending chamber and transmission facilities that will be retained with the new raw water pumping station. This will include available design information for the blending chamber as well as information about the existing distribution mains to be used for the pumping station to deliver raw water to the new WTP.

VII. Construction Sequencing

Construction of the new RWPS will involve work adjacent to and connection to existing utilities. Work at the station must proceed in a timely manner without impact to the continued operation of the existing WTP and reach a fully operational state to facilitate the acceptance testing of the pumping station and the new WTP. Therefore, the following suggested sequence of Construction is provided as a guide to the Contractor for a seamless transition for the operation of the RWPS and new WTP.

Suggested Sequence:

1. Locate and field mark all existing utilities

2. Relocate the existing 20-inch distribution main as shown in **Figure 3**; protect the 20 and 30-inch mains that cross the site and railroad ROW

3. Meet with the City and WTP Operators to coordinate all work with the operation of the existing WTP prior to construction of the new RWPS and associated raw water transmission mains

4. Proceed with the construction of the RWPS

5. Minimize any impact on existing utilities and defer the construction of the stations raw water supply and discharge mains until the construction of the RWPS nears completion

6. Construct the new 30-inch D.I. raw water supply main in Manville Road (within the existing 20-inch abandoned CI pipe trench) as discussed under Section IV and connect to the suction header at the north end of the RWPS as shown in **Figure 4.**

7. Construct the new raw water force main from the pumping station through the DBO Team's preferred existing utility easement or alternate route.

8. Disconnect the existing 30-inch finished water transmission main from the distribution system. Following proper isolation of the finished main from the distribution system, connect the new raw water force main to the existing 30-inch transmission main as shown in **Figure 2**. Proceed with caution when constructing new facilities near the existing 20- and 30-inch finished water transmission mains, as they are critical components in maintaining finished water supply to the City's water customers.

9. Construct a new raw water force main from the existing inactive 30-inch main in Logee Street, south on Joffre Avenue, north west on Reservoir Avenue, and south on Acre Avenue into the new WTP site. As shown on **Figure 5**.

10. Construct a new finished water force main from the new WTP to the existing inactive 30-inch main in Logee Street, south on Joffre Avenue, north west on Reservoir Avenue, and south on Acre Avenue into the new WTP site. As shown on **Figure 5**.

11. Complete all work at the pumping station and prepare for startup testing of the RWPS and the new WTP when ready.

12. Meet with the City and WTP Operators to coordinate the timing and testing of their facilities with the operation of the existing WTP prior to performing startup and acceptance testing of the raw water pump station and WTP

13. Complete acceptance testing of the RWPS and new WTP.

14. Place the new RWPS and WTP online and operate for the stipulated period of time stated in the agreement prior to decommissioning the existing WTP.

15. Isolate and dewater the existing, 30-inch finished water main from the decommissioned WTP and connect the second redundant raw water force main to the existing 30-inch main, as shown in **Figure 2**. Proceed with caution around the 20-inch main.

16. Operate the redundant force main while supplying the new WTP

17. Remove the existing 30-inch cast iron raw water supply main that fed the now decommissioned WTP and install a new 30-inch ductile iron "primary" raw water supply suction main at the south end of the pumping station, as shown in **Figure 5.**

18. Connect the main to the raw water pumping station.

19. Transfer the raw water supply to the pumping station from the redundant main to the primary main.

VIII. Project Constraints

The DBO Team will be required to determine in accordance with RFP Section 11 the requirements for the operation of the existing WTP in conjunction with the construction and operation of the new RWPS and transmission mains. The DBO Team shall submit a plan to the City Advisor for review and approval.

Attachments included herein:

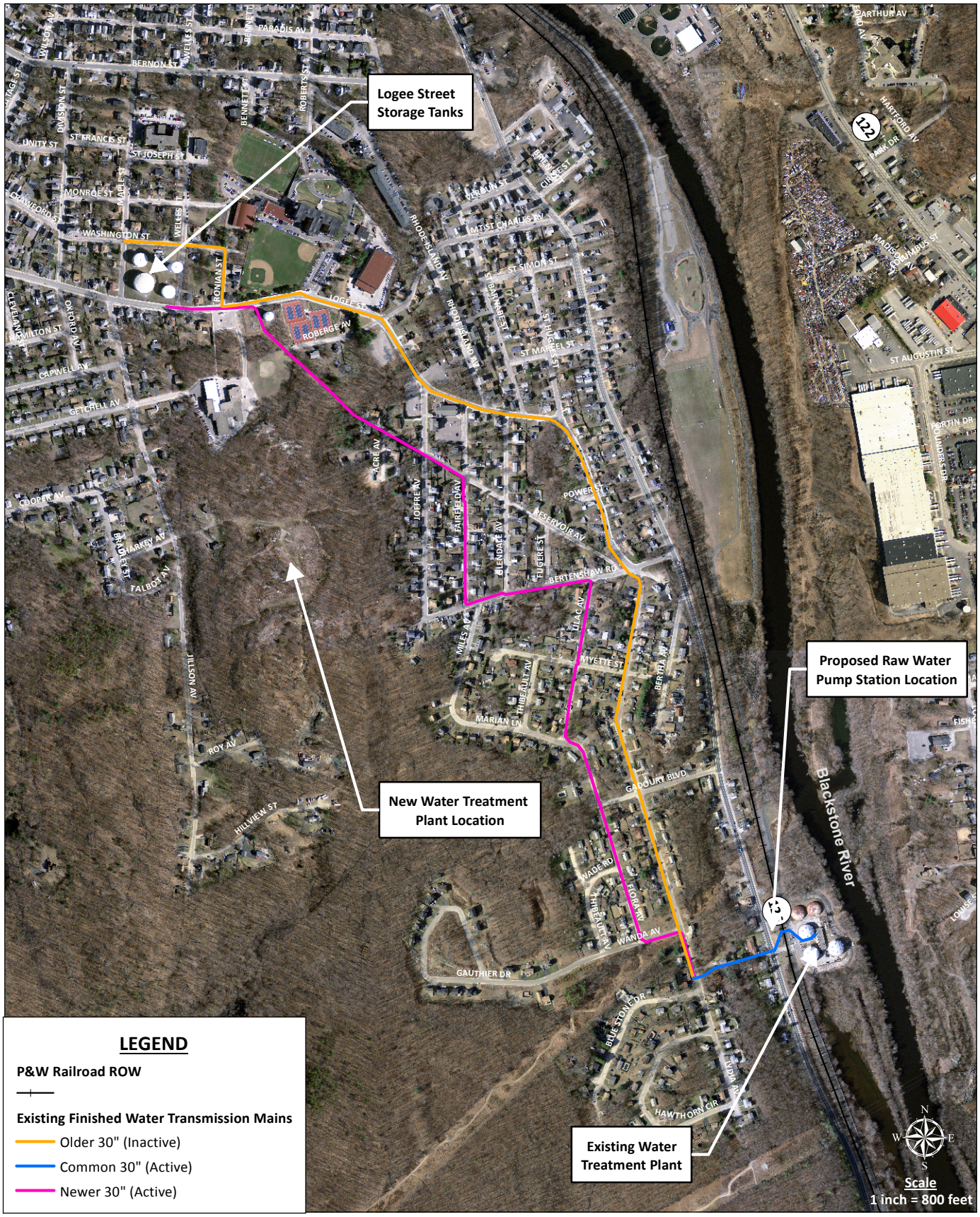
- Figures
- Blending chamber site plan and piping layout plan.
- Washwater easement Plan and Description
- Sewer utility easement plan and description
- Railroad requirements

Attachments included in RFP Volume III

- Survey including site and existing distribution mains for raw water supply to the new WTP
- Preliminary Architectural Plans, Sections and Elevations
- Conceptual RWPS Plan and Elevations
- Raw Water and Finished Water Transmission Main Design

cc: Bob Otoski, Chuck Adelsberger, Jessica Lynch, Michael Walsh-CDM Smith

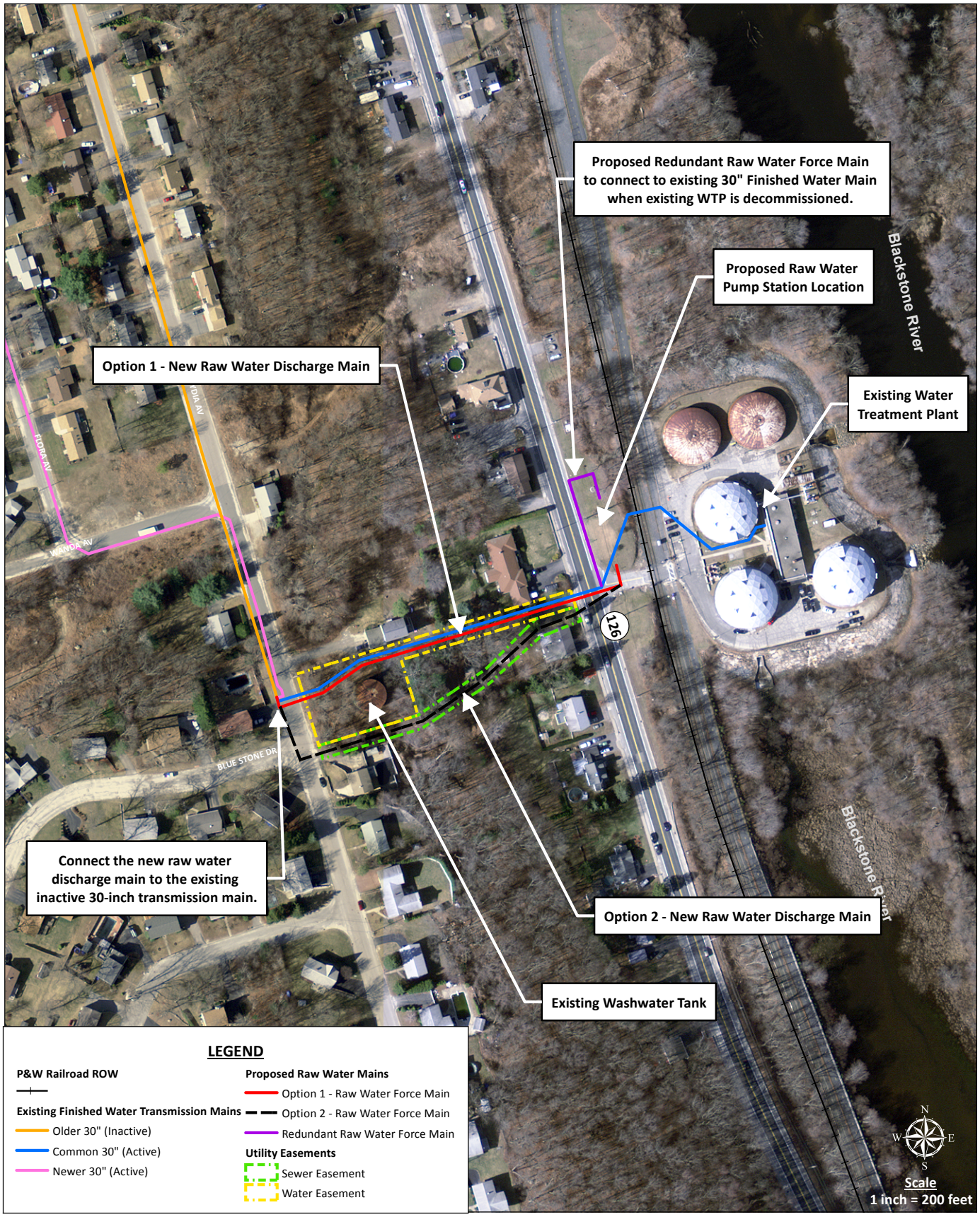
FIGURES



CDM Smith

Existing Finished Water Transmission Mains

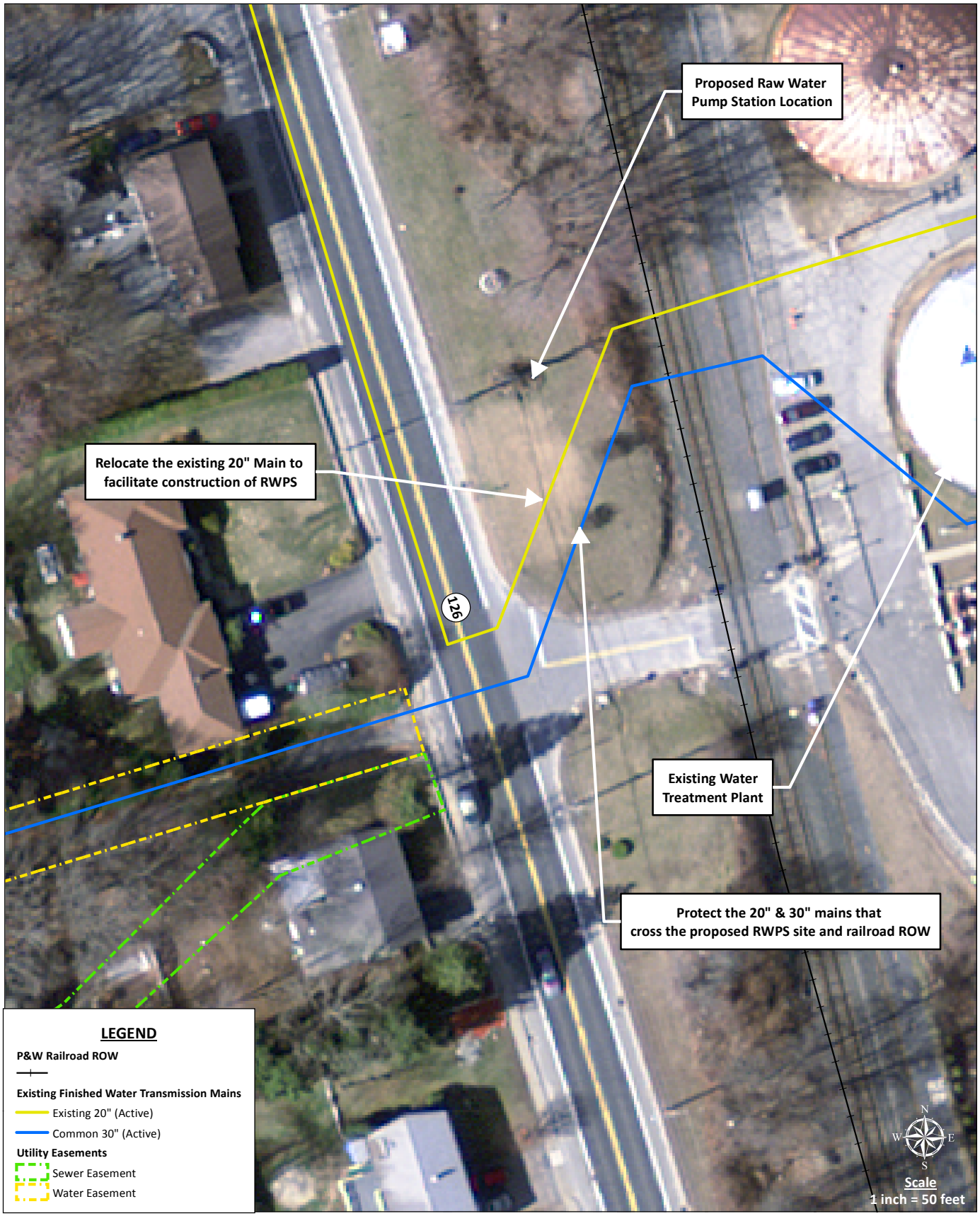
FIGURE 1



CDM Smith

Existing Utility Easements and Raw Water Force Mains

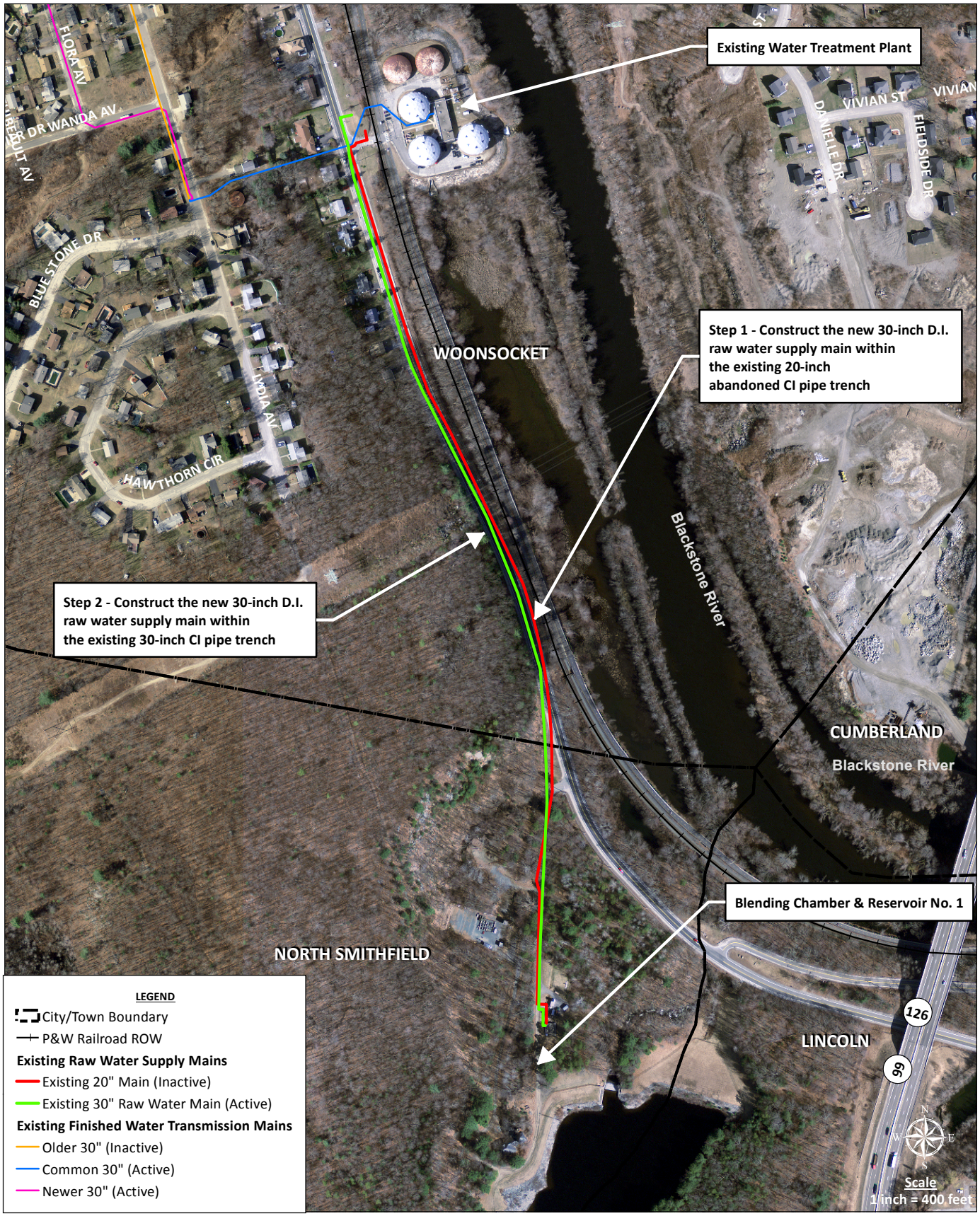
FIGURE 2



CDM Smith

Relocation of 20-inch Distribution Main

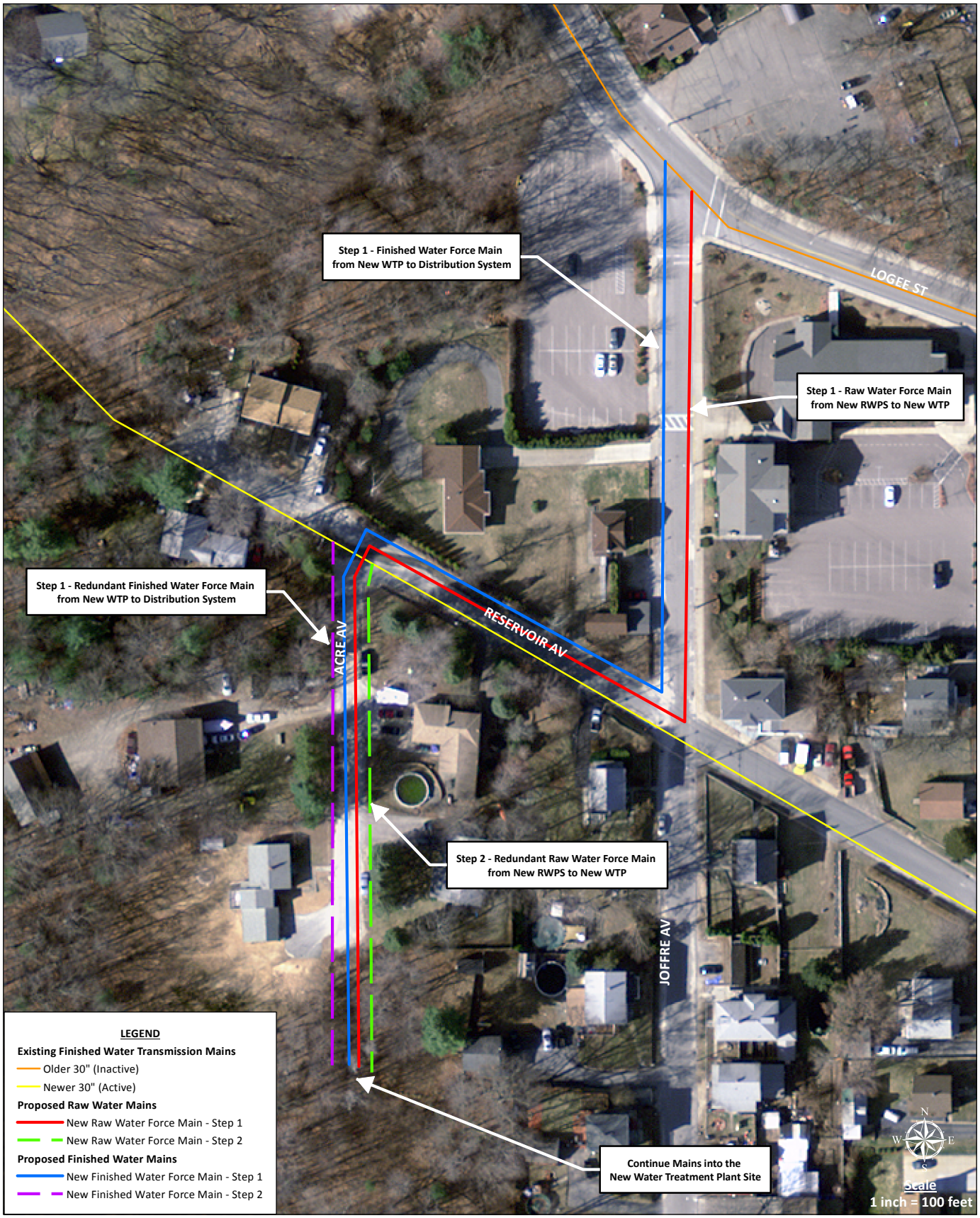
FIGURE 3



CDM Smith

New Raw Water Supply Mains

FIGURE 4

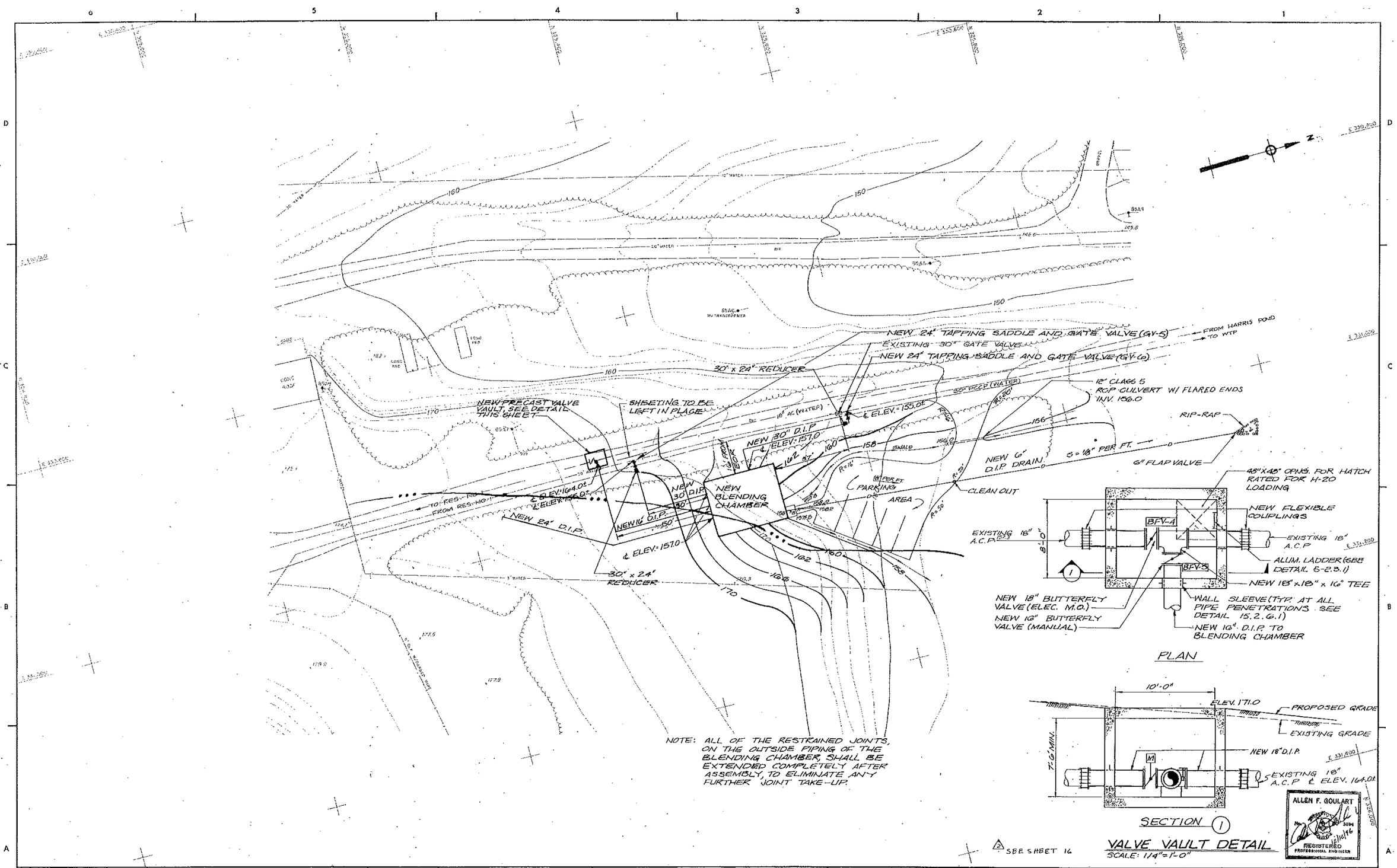


CDM Smith

New Raw & Finished Water Force Mains

FIGURE 5

BLENDING CHAMBER SITE PLAN AND PIPING LAYOUT



NUMBER	DATE	MADE BY	CHECKED BY	DESCRIPTION
2	8/16/02	GBS	WJB	REVISED FOR RECORD DRAWING
1	12/16/96	RCP	PCA	CHANGES AS PER JUNE 3, 1996 LETTER FROM R.I.D.E.M.

REVISIONS

DRAWN BY K. LETCH
DEPT. CHECK
PROJ. CHECK

ROBERT L. SCARPA CIVIL No. 30998 REGISTERED PROFESSIONAL ENGINEER

METCALF & EDDY

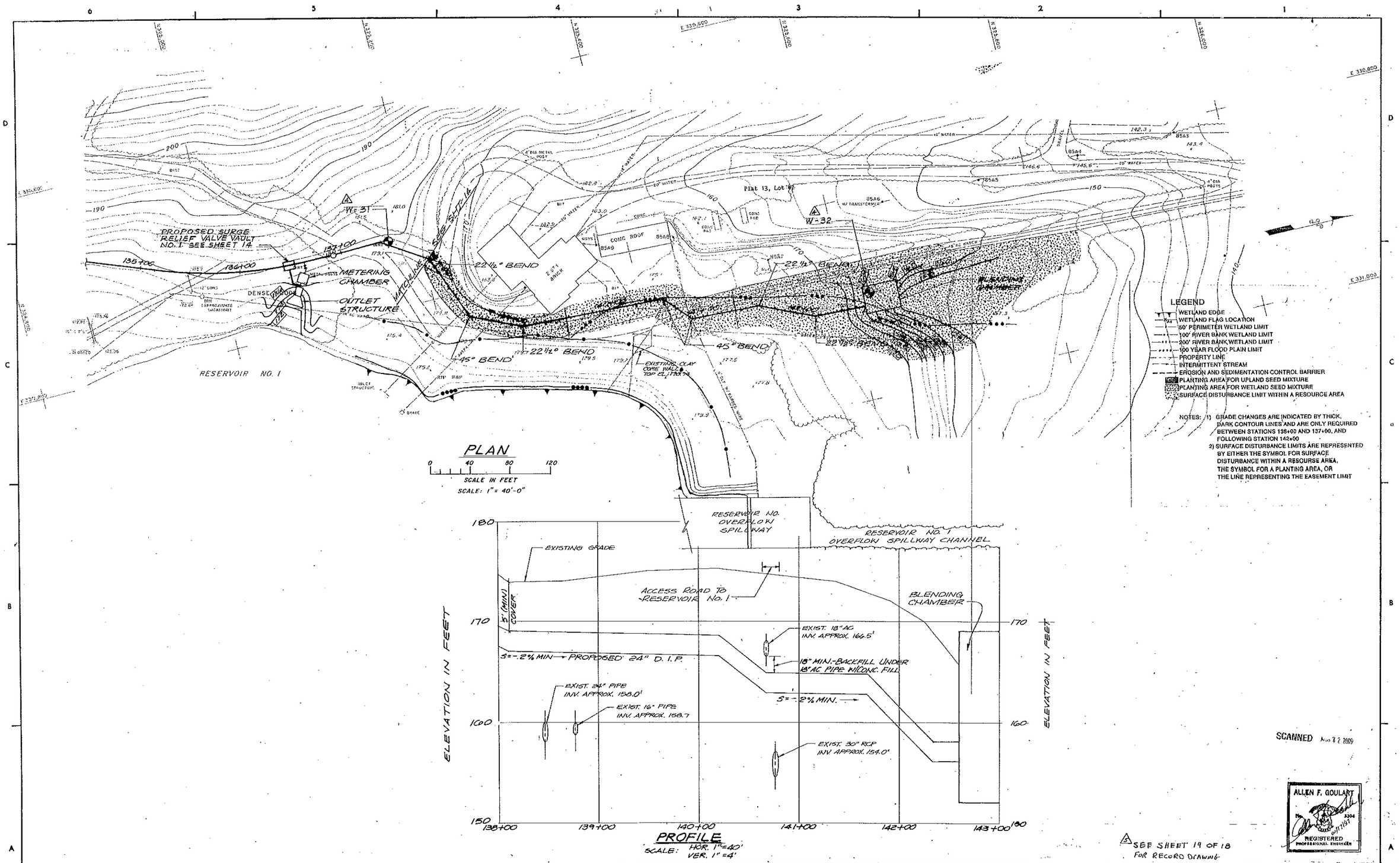
Robert L Scarpa 10/29/91
REG. PROF. ENGR. NO. 30998 DATE

SCALE:
0 20 40 60
SCALE IN FEET
SCALE: 1" = 20'-0"
UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

WOONSOCKET CROOKFALL BROOK PIPELINE
BLENDING CHAMBER
PLAT 13, LOT 47
NORTH SMITHFIELD, RHODE ISLAND
DECEMBER 1996
METCALF & EDDY, INC.

SCANNED AUG 2 2 2005

JOB 005668
FILE NO. 005668-91-15
SHEET 15 OF 16



SCANNED Nov 2 2 2009

ALLEN F. GOULART No. 3304 REGISTERED PROFESSIONAL ENGINEER

SEE SHEET 19 OF 18 FOR RECORD DRAWING

NUMBER	DATE	MADE BY	CHECKED BY	DESCRIPTION
5	8/16/02	GRS	WTB	REVISED FOR RECORD DRAWING
4	01/15/97	SPM	PCA	FINAL REVISIONS
3	12/16/96	RCP	PCA	CHANGES AS PER JUNE 3, 1996 LETTER FROM R.I.D.E.M.
2	2/14/92	JMS	SJD	CHANGES AS PER DEC. 31, 1991 LETTER FROM R.I.D.E.M.
1	10/24/91	KJL	SJD	CHANGES AS PER AUG. 22, 1991 LETTER FROM R.I.D.E.M.

REVISIONS

DRAWN BY: R. PARRIS
DEPT. CHECK: S. DeFrancesco
PROJ. CHECK: S. DeFrancesco

ROBERT L. BOMPA CIVIL No. 30990

METCALF & EDDY

Robert L. Bompa
REG. PROF. ENGR. DATE

SCALE: AS SHOWN

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

CITY OF WOONSOCKET, RHODE ISLAND
CROOKFALL BROOK PIPELINE AND BLENDING CHAMBER
CONTRACT 1991-1
REVISED JANUARY 1997

PROPOSED PIPELINE—STATION 138+00 TO 142+60

CIVIL

JOB 006062
FILE NO. 006062-91-1-15
15

DWG. ABBREV.	ITEM	SYMBOL
	GATE VALVE	
	BUTTERFLY VALVE	
	BALL VALVE	
	POLY JET VALVE	
	PIPE: 8" & SMALLER	
	PIPE: 10" & LARGER	
	FLANGE	
MJ	MECHANICAL JOINT	
	SLEEVE COUPLING	
	WELDED	
	EXISTING PIPE & FACILITIES	
	PROPOSED PIPE & FACILITIES	
	DIRECTION OF FLOW	
	CONCENTRIC REDUCER	
	LIMITS OF WORK (TRADE, CONTRACT, ETC.)	
	POINT OF CONNECTION NEW WORK TO EXISTING WORK	
	MOTOR OPERATED	M
	VENTURI FLOW ELEMENT	
	FLOW SWITCH	FS

GENERAL NOTES

1. THE CONTRACTOR SHALL MAKE ALL REQUIRED FIELD MEASUREMENTS TO VERIFY EXISTING AND CONTRACT INTERFACE DIMENSIONS, LOCATIONS, ELEVATIONS AND OTHER CONDITIONS.
2. THE CONTRACTOR SHALL RE-USE ANY SUITABLE SALVAGED EXISTING PIPING, VALVES, AND FITTINGS AS DIRECTED BY THE ENGINEER. ALL EXISTING EQUIPMENT, PIPING, VALVES, FITTINGS, ACCESSORIES, AND APPURTENANCES SYMBOLED FOR REMOVAL WILL ALSO BE RECOGNIZED AS MATERIALS TO BE SALVAGED. SEE SPECIFICATION 02050.
3. WHEN MAKING NEW CONNECTIONS TO EXISTING PIPING, THE CONTRACTOR MAY, AT HIS OPTION:
   A. REPLACE PIPING BACK TO NEAREST FITTING.
   B. USE GROOVED COUPLINGS, PROVIDED EXISTING PIPE WALL THICKNESS COMPLIES WITH SPECIFIED LIMITS.
4. REFER TO STRUCTURAL DRAWINGS FOR COVER PLATES, HATCHES, GRATING, AND RAILING DETAILS.
5. ALL DIMENSIONS LOCATING EQUIPMENT ARE FROM FINISHED WALL SURFACES OR COLUMN CENTERLINES.
6. REFER TO INSTRUMENTATION DRAWINGS FOR INSTRUMENTATION AND CONTROL SYSTEMS. INSTRUMENT LOCATIONS ARE INDICATED ON MECHANICAL-PROCESS DRAWINGS IN APPROXIMATE LOCATION ONLY.
7. IN-LINE INSTRUMENTAION SHALL BE PROVIDED WITH ISOLATED PRESSURE TAPS.
8. FOR CONTINUATION OF PIPING OUTSIDE STRUCTURES, SEE CIVIL DRAWINGS.
9. SLEEVE OR GROOVED COUPLINGS MAY BE USED WHERE NECESSARY, AND AS APPROVED, TO FACILITATE PIPING INSTALLATION.
10. ALL FLEXIBLE CONNECTORS, INCLUDING EXPANSION JOINTS AND SLEEVE COUPLINGS SUBJECT TO PRESSURE SHALL BE RESTRAINED AS INDICATED OR AS REQUIRED FOR EXPANSION AND FOR FLEXIBILITY.
11. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF ALL INTERIOR PIPE SUPPORTS AND HANGERS. THE CONTRACTOR SHALL SUBMIT DRAWINGS, SIGNED AND STAMPED BY PROFESSIONAL ENGINEER, REGISTERED IN THE STATE OF RHODE ISLAND, SHOWING THE LOCATION AND TYPE OF EACH SUPPORT AND HANGER.

VALVE SCHEDULE

TAG NO.	NO. REQ'D	SERVICE	LOCATION	TYPE	SIZE (IN)	MAX. FLOW (MGD)	MAX. PD (PSIG)	OPERATOR	ELECTRICAL REQUIREMENTS	OPERATION	ENDS	REMARKS
BFV-1	1	RAW WATER FROM RESERVOIR 1	BLENDING CHAMBER	BUTTERFLY	30	14.0	79	ELECTRIC MOTOR	240V, 1PH	OPEN/CLOSE	FLANGED	
BFV-2	1	RAW WATER FROM HARRIS POND	BLENDING CHAMBER	BUTTERFLY	12	4.5	79	ELECTRIC MOTOR	240V, 1PH	OPEN/CLOSE	FLANGED	
BFV-3A,3B	2	RAW WATER FROM RESERVOIR 3	BLENDING CHAMBER	BUTTERFLY	18	14.0	79	ELECTRIC MOTOR	240V, 1PH	SEE REMARKS	FLANGED	BFV-3A: MODULATING BFV-3B OPEN/CLOSE
BFV-4	1	RAW WATER FROM HARRIS POND	VALVE VAULT	BUTTERFLY	18	4.5	65	ELECTRIC MOTOR	240V, 1PH	OPEN/CLOSE	FLANGED	
BFV-5	1	RAW WATER FROM HARRIS POND	VALVE VAULT	BUTTERFLY	16	4.5	65	MANUAL	–	OPEN/CLOSE	FLANGED	SUPPLY HANDWHEEL
BFV-6A, 6B	2	RAW WATER FROM RESERVOIR 3	METER VAULT	BUTTERFLY	18	14.0	72	ELECTRIC MOTOR	240V, 1PH	MODULATING	FLANGED	
BLV-1	1	RAW WATER FROM RESERVOIR 1	BLENDING CHAMBER	BALL	30	14.0	7	ELECTRIC MOTOR	240V, 1PH	OPEN/CLOSE	FLANGED	
BLV-2	1	RAW WATER FROM HARRIS POND	BLENDING CHAMBER	BALL	16	4.5	90	ELECTRIC MOTOR	240V, 1PH	OPEN/CLOSE	FLANGED	
BLV-3	1	RAW WATER FROM RESERVOIR 3	BLENDING CHAMBER	BALL	24	14.0	79	ELECTRIC MOTOR	240V, 1PH	OPEN/CLOSE	FLANGED	
GV-1, 2, 3 & 4	4	RAW WATER FROM RESERVOIR 3	GATEHOUSE	O,S & Y GATE	20	14.0	12	ELECTRIC MOTOR	240V, 1PH	OPEN/CLOSE	FLANGED	
GV-5	1	RAW WATER FROM RESERVOIR 1	OUTSIDE OF BLENDING CHAMBER	NON-RISING STEM GATE	24	14.0	7	MANUAL	–	OPEN/CLOSE	MECHANICAL JOINT	SUPPLY WITH ADJUSTABLE VALVE BOX
GV-6	1	RAW WATER FROM BLENDING CHAMBER	OUTSIDE OF BLENDING CHAMBER	NON-RISING STEM GATE	24	14.0	79	MANUAL	–	OPEN/CLOSE	MECHANICAL JOINT	SUPPLY WITH ADJUSTABLE VALVE BOX
BBFV-1 & 2	2	RAW WATER FROM RESERVOIR 3	OUTSIDE OF GATEHOUSE	BURIED BUTTERFLY	20	14.0	12	MANUAL	–	OPEN/CLOSE	FLANGED	SUPPLY WITH ADJUSTABLE VALVE BOX
BBFV-3-9	7	RAW WATER FROM RESERVOIR 3	ALONG PIPE LINE	BURIED BUTTERFLY	24	14.0	29-72	MANUAL	–	OPEN/CLOSE	MECHANICAL JOINT	SUPPLY WITH ADJUSTABLE VALVE BOX
BBFV-10	1	RAW WATER FROM RESERVOIR 3	ADJACENT TO METER VAULT	BURIED BUTTERFLY	18	14.0	72	MANUAL	–	OPEN/CLOSE	MECHANICAL JOINT	SUPPLY WITH ADJUSTABLE VALVE BOX
PV-2	1	RAW WATER FROM HARRIS POND	BLENDING CHAMBER	POLY JET TYPE	12	4.5	65	ELECTRIC MOTOR	240V, 1PH	MODULATING	FLANGED	
PV-3	1	RAW WATER FROM RESERVOIR 3	BLENDING CHAMBER	POLY JET TYPE	12	14.0	79	ELECTRIC MOTOR	240V, 1PH	MODULATING	FLANGED	

DEHUMIDIFIER SCHEDULE

TAG NO.	LOCATION	AIR FLOW (CFM)	MOISTURE REMOVAL* (LB/DAY)	REFRIGERANT	COMPRESSOR HP	ELECTRICAL REQUIREMENTS	KW/HR.	REMARKS
DH-1	BLENDING CHAMBER	480	150	R-22	1	115/1/60	1.73	FLOOR MOUNTED W/REMOTE HUMIDISTAT

* @ 80° F AND 60% RH

ALLEN F. GOULART
1/17/97
REGISTERED PROFESSIONAL ENGINEER

NUMBER	DATE	MADE BY	CHECKED BY	DESCRIPTIONS
2	8/16/02	GRS	WJB	RECORD DRAWING
1	01/15/97	SPM	PCA	FINAL REVISIONS

602043 REVISIONS

DRAWN BY C. DION
DEPT. CHECK P. Moith
PROJ. CHECK S. D'Innocenzo

FRANK M. GUNDY, JR. No. 8781 REGISTERED PROFESSIONAL ENGINEER
ROBERT L. SCARPA CIVIL No. 30940 REGISTERED PROFESSIONAL ENGINEER

METCALF & EDDY

REG. PROF. ENGR. MA. NO. 30940 — DATE 5-3-91
REG. PROF. ENGR. MA. NO. 8781 — DATE 4/29/91

SCALE: NONE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

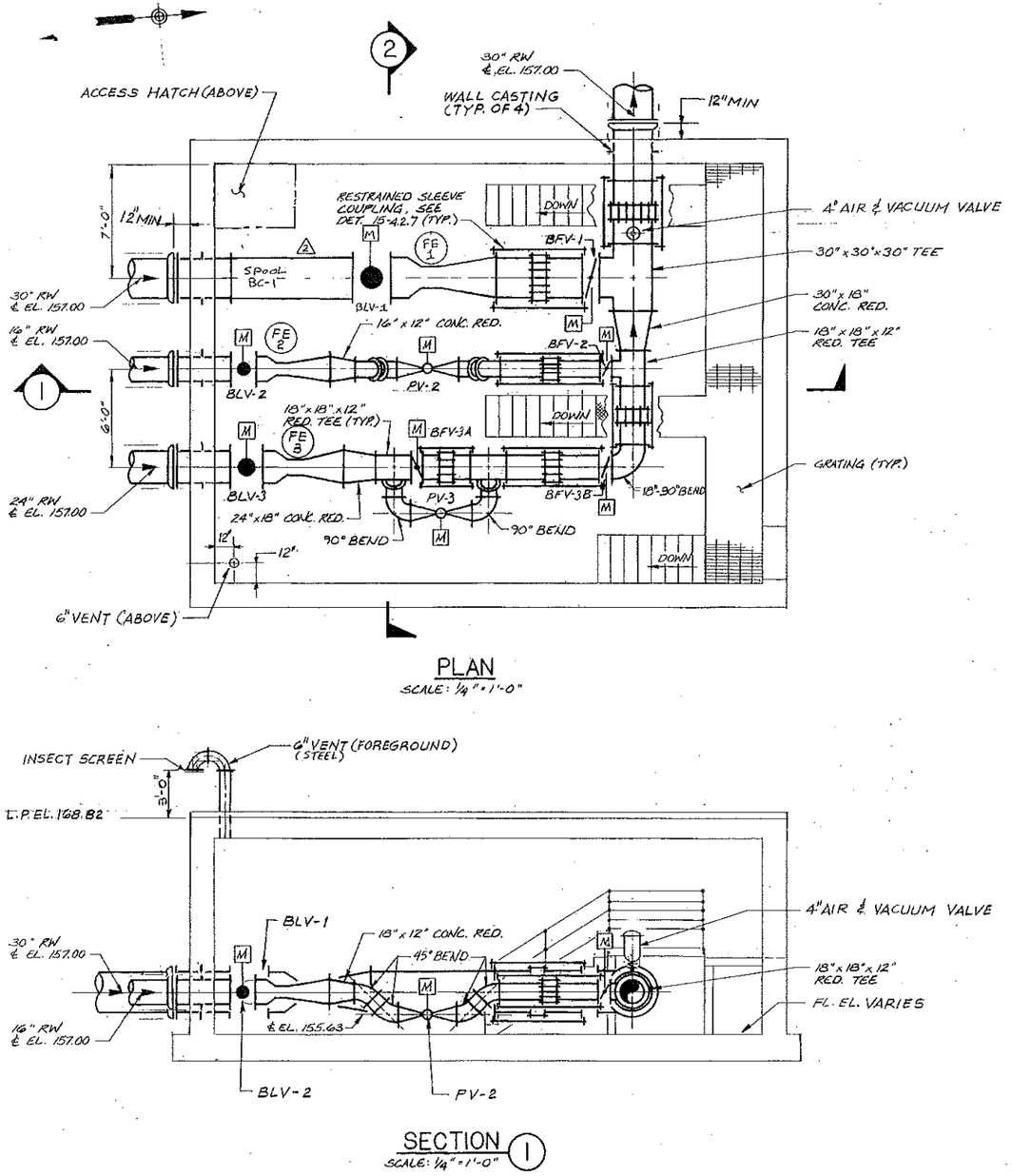
CITY OF WOONSOCKET, RHODE ISLAND
CROOKFALL BROOK PIPELINE AND BLENDING CHAMBER
CONTRACT 1991-1
REVISED JANUARY 1997

SCHEDULES, SYMBOLS AND GENERAL NOTES

SCANNED

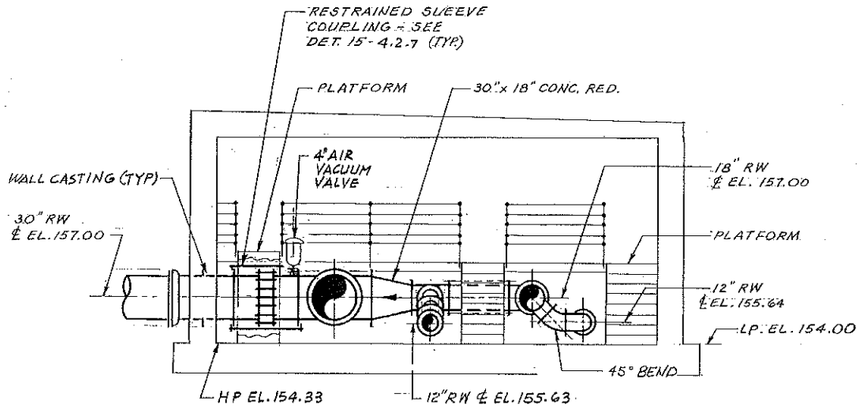
MECHANICAL

JOB 006062
FILE NO. 006062-91-1-19
SHEET 19



PLAN

SCALE: 1/4" = 1'-0"



SECTION (2)

SECTION (1)

SCALE: 1/4" = 1'-0"

ALLEN F. GOULART
No. 7777
11/7/97
REGISTERED PROFESSIONAL ENGINEER

NUMBER	DATE	MADE BY	CHECKED BY	DESCRIPTION
2	9/16/02	GRS	WJB	REVISED FOR RECORD DRAWING
1	01/13/97	SPM	PCA	FINAL REVISIONS

REVISIONS

DRAWN BY: S. COOK
DEPT. CHECK: P. Mowitt
PROJ. CHECK: S DiZinno

FRANK M. GUNDY, JR. No. 8781 REGISTERED PROFESSIONAL ENGINEER
ROBERT L. SCARPA CIVIL No. 30940 REGISTERED PROFESSIONAL ENGINEER

METCALF & EDDY

Robert L. Scarpa — 5-2-97
REG. PROF. ENGR. MA. NO. 30940 — DATE

Frank M. Gundy — 4/22/97
REG. PROF. ENGR. MA. NO. 8781 — DATE

SCALE: AS SHOWN

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

CITY OF WOONSOCKET, RHODE ISLAND
CROOKFALL BROOK PIPELINE AND BLENDING CHAMBER
CONTRACT 1991-1
REVISED JANUARY 1997

PROPOSED BLENDING CHAMBER

MECHANICAL

SCANNED APR 27 2005

JOB 006062
FILE NO. 006062-91-1-20
SHEET 20

WASHWATER EASEMENT
PLAN AND DESCRIPTION


Manistee Rd
34-79
20454 sf
30' S.W.D. EASEMENT
34-78
24375 sf
34-80
625 sf
34-26
20454 sf
34-19
24810 sf
34-22
23068 sf
34-18
10436 sf
34-35
14792 sf
34-77
31363 sf
34-16
10000 sf
34-36
223.36
223.36
90.00
125
175
25
25'
225.07
425+/-
269
92.00
85
110
155+/-
157.71
110.00
93.00
100
10.00
100.00
94.5
95
193.01
49.37
31.42

G-5

34 / 22

Property Details

Number of records found: 1

One record is displayed for each address found at the selected property. Multiple addresses may occur in the case of condominiums.

MANVILLE ROAD
ID: **34-22**

View Property Record Card
Open for Printing

PARCEL ID: **34-22**
LOCATION: **MANVILLE ROAD**
LAST SALE DATE:
CO-OWNER:
MAILING ADDRESS LINE 2:
MAILING ADDRESS CITY: **WOONSOCKET**
MAILING ADDRESS ZIP: **02895-6623**
ROOF STRUCTURE:
HEAT TYPE:
BUILDING STYLE:
LANDUSE DESCRIPTION: **MUNICIPAL M00**
NEIGHBORHOOD:
LAND ASSESSMENT: **90400**
EXTRA FEATURES ASSESSMENT: **0**
BOOK / PAGE: **/**
APPROXIMATE YEAR BUILT: **0**
NUMBER OF ROOMS: **0**
NUMBER FULL BATHS: **0**
BUILDING AREA EFFECTIVE: **0**

ACCOUNT NUMBER: **27006500**
LAND AREA: **0.52957**
OWNER: **WATER TREATMENT PLANT**
MAILING ADDRESS LINE 1: **1500 MANVILLE ROAD**
MAILING ADDRESS LINE 3:
MAILING ADDRESS STATE: **RI**
MAILING ADDRESS COUNTRY: **USA**
ROOF COVERING:
HEAT FUEL:
LANDUSE CODE: **903V**
ZONING: **R2**
BUILDING ASSESSMENT: **0**
OTHER BUILDING ASSESSMENT: **68800**
TOTAL ASSESSMENT: **159200**
LAST SALE VALUE: **0**
NUMBER OF STORIES: **0**
NUMBER OF BEDROOMS: **0**
NUMBER OF HALF BATHS: **0**
BUILDING AREA GROSS: **0**

STATUTORY FORM OF

QUITCLAIM DEED

I, Angelina Fugere, of Woonsocket, Providence County, State of Rhode Island, for consideration paid in the amount of -----TWO THOUSAND THREE HUNDRED SEVENTY-SEVEN (2,377) DOLLARS----- grant to City of Woonsocket, a municipal corporation of the State of Rhode Island, with QUITCLAIM COVENANTS, the following-described tract of land, viz:

Beginning at a stone bound located on the westerly line of Manville Road and approximately eight hundred (800) feet from the southerly line of Gadoury Boulevard. Thence southerly in line with another stone bound in the westerly line of Manville Road and approximately fourteen hundred (1400) feet from the southerly line of Gadoury Boulevard, for a distance of two hundred ninety and 00/100 (290.00) feet along said westerly line of Manville Road to the point of beginning. Said point is on the property line of land now or lately of Angelina L. Fugere, said land is shown in the Records of Land Evidence in the City of Woonsocket in Plat Book 34, Lot 2 in Deed Book 235, Page 481 and land now or lately of Joseph R. and Margaret M. Fugere, said land is shown in the Records of Land Evidence in Plat Book 34, Lot 14, in Deed Book 235, Page 486. Said point is shown on a plan titled "CITY OF WOONSOCKET, R. I., PROPERTY TAKING WATER TREATMENT PLANT ACCESS ROAD AND WASHWATER TANK AND MANVILLE ROAD SEWAGE PUMPING STATION." Scale 1" = 40', June, 1958.

THENCE Westerly turning an interior angle of 90°-00' along the property line between land of said Angelina L. Fugere and land of said Joseph R. and Margaret M. Fugere for a distance of approximately four hundred and twenty four (424) feet to the easterly line of Lydia Avenue.

The other boundaries shall be as follows: From the point of beginning of the land hereby conveyed turning an angle of 180°-00' from the first mentioned stone bound and along the westerly line of Manville Road for a distance of twenty five and 00/100 (25.00) feet to an angle point.

THENCE Westerly turning an interior angle of 90°-00' for a distance of two hundred and sixty nine and 00/100 (269.00) feet to an angle point.

THENCE Southerly turning an interior angle of 270°-00' for a distance of eighty five and 00/100 (85.00) feet to an angle point.

THENCE Westerly turning an interior angle of 90°-00' for a distance of approximately one hundred and fifty five (155) feet to the easterly line of Lydia Avenue.

The remaining boundary of the property hereby conveyed is the easterly line of Lydia Avenue.

The tract of land hereby conveyed contains approximately 23,775 square feet.

I, Angelina Fugere, hereby covenant that I am unmarried.

WITNESS my hand this 25th day of September, 1959.

In the presence of
Walter H. Shankey

Angelina Fugere

STATE OF RHODE ISLAND, Etc.
County of Providence

In Woonsocket, on the 25th day of September, 1959, before me personally appeared Angelina Fugere, to me known and known by me to be the party executing the foregoing instrument, and she acknowledged said instrument, by her executed, to be her free act and deed.

Walter H. Shankey
NOTARY PUBLIC

Received for record September 25, 1959 at 3:10 P.M.

SEWER UTILITY EASEMENT
PLAN AND DESCRIPTION

PERMANENT EASEMENT

I, ANGELINA L. FUGERE, of the City of Woonsocket, County of Providence, State of Rhode Island, hereinafter called the Grantor, for consideration paid by the City of Woonsocket, a municipal corporation in the State of Rhode Island, hereinafter called the Grantee, the receipt whereof is hereby acknowledged, do hereby grant and convey to the said Grantee, its successors and assigns, a permanent easement in that certain hereinafter described parcel of land, owned by the said Grantor, for the purpose of laying, construction, using, operating, repairing, reconstructing and forever maintaining a pipe line therein, the said parcel of land being situated westerly from Manville Road in said City of Woonsocket, State of Rhode Island, bounded and described as follows:

Beginning at a point in the westerly line of Manville Road, said point of beginning being the most southeasterly corner of land now or formerly City of Woonsocket, with the most northwesterly corner of land now or formerly of this Grantor.

Thence; S 3° - 47' E bounding easterly by said Manville Road, twenty (20) feet for a corner.

Thence; S 86° - 13' W one hundred two and 64/100 (102.64) feet for an angle.

Thence; S 56° - 13' W one hundred seventy (170) feet for an angle.

Thence; S 86° - 13' W nineteen and 08/100 (19.08) feet for an angle.

These last three mentioned courses bounding southerly and easterly by land of this Grantor.

Thence; N 3° - 58' W bounding westerly by land now or formerly Mitris Const. Co., Inc. twenty (20) feet for a corner.

Thence; N 86° - 13' E thirteen and 78/100 (13.78) feet for an angle.

Thence; N 56° - 13' E one hundred seventy (170) feet for an angle.

These last two mentioned courses bounding northerly and westerly by land of this Grantor.

Thence; N 86° - 13' E bounding northerly by land now or formerly the City of Woonsocket one hundred eight (108) feet to the place and point of beginning.

The herein above described easement contains 5833 square feet more or less.

Together with the right of ingress thereto and egress therefrom along and within the said easement for any and all purposes connected with the proper maintenance, use, operation, repair, reconstruction of said pipe line, and for any of the purposes and uses hereinbefore specified.

The Grantor reserves for herself, her successors and assigns, the right to use the said abovedescribed tract or parcel of land for any purpose, provided however, that no such intended use of said tract or parcel of land shall interfere with the easement herein granted, now weaken nor endanger the said pipe line.

The rights and privileges hereinabove granted or reserved shall run with and bind the said abovedescribed parcel of land.

I, Angelina L. Fugere, hereby covenant that I am now unmarried IN WITNESS WHEREOF I have hereunto set my hand this 12th day of August 1964.

In the presence of
Walter H. Sharkey

Angelina L. Fugere

The consideration for this conveyance is such that no documentary stamps are necessary.

STATE OF RHODE ISLAND
COUNTY OF PROVIDENCE

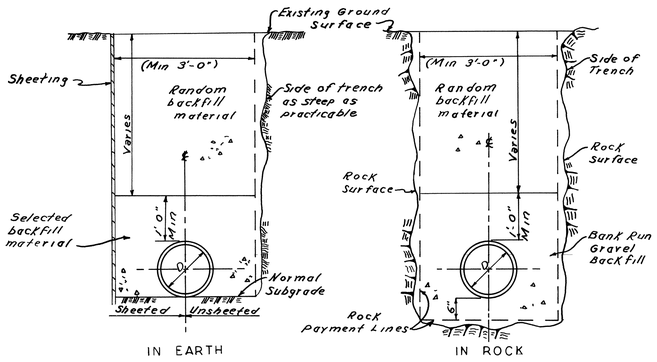
In the City of Woonsocket, on the 12th day of August A. D. 1964, before me personally appeared Angelina L. Fugere, to me known and known by me to be the party executing the foregoing instrument and she acknowledged said instrument, by her executed, to be her free act and deed.

Walter H. Sharkey
Notary Public

Received for record August 19, 1964
at 11:00 A. M.

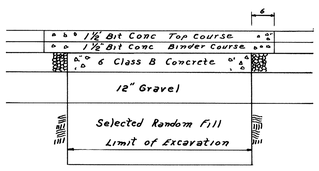
Gustave A. LaBreche
CITY CLERK

Compared



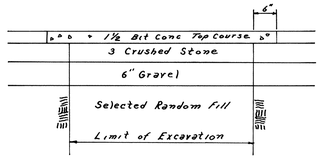
TYPICAL TRENCH SECTIONS

NOT TO SCALE



ROADWAY PATCH

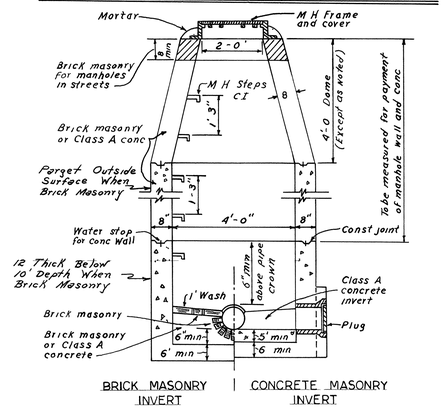
NO SCALE



SIDEWALK PATCH

NO SCALE

CITY OF WOONSOCKET STANDARD

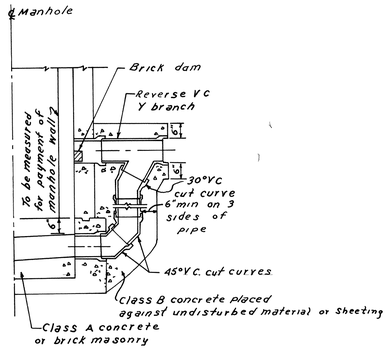


BRICK OR CONCRETE MASONRY MANHOLE

SCALE $\frac{1}{2}$" = 1'-0"

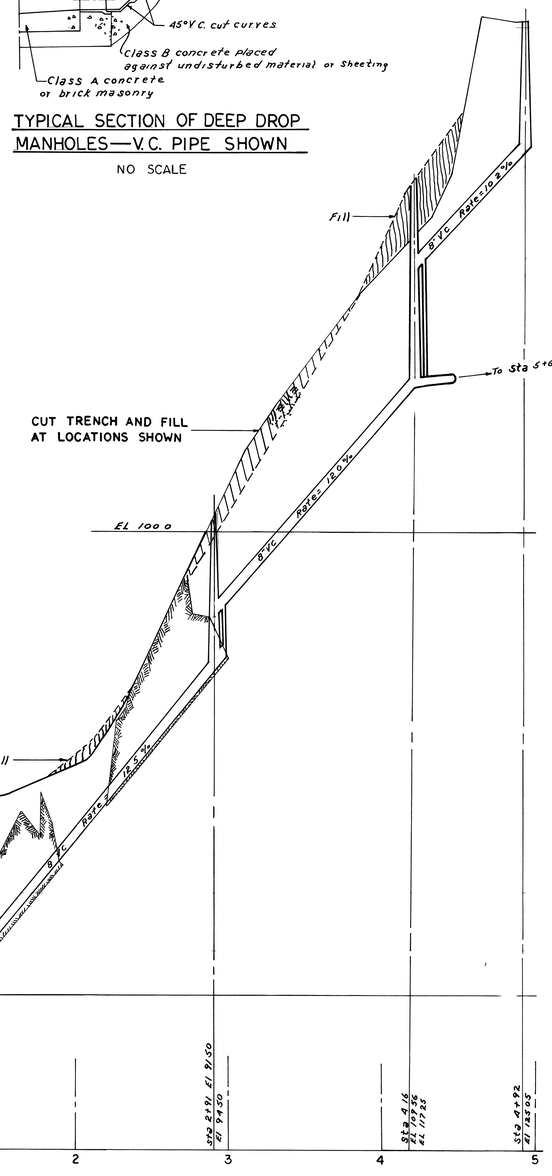
NOTES TO CONTRACTORS

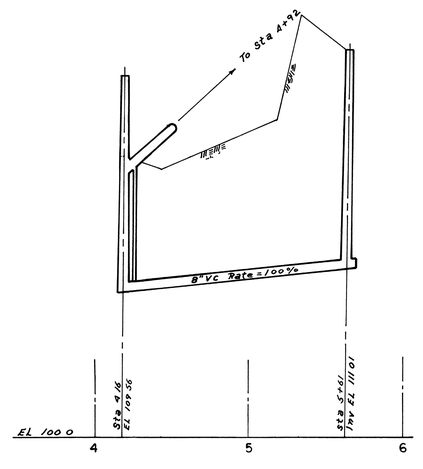
1) All pipe shall be 8" VC extra strength ASTM C 200-59T.
2) Pavement on Manville Road shall be cut with a pavement breaker prior to excavation.
3) All ledge must be removed from the site
4) An excavation permit must be obtained from the city of Woonsocket, licensing clerk prior to the start of excavation
5) A blasting permit must be obtained from the office of the Director of Public Works prior to the start of blasting operations

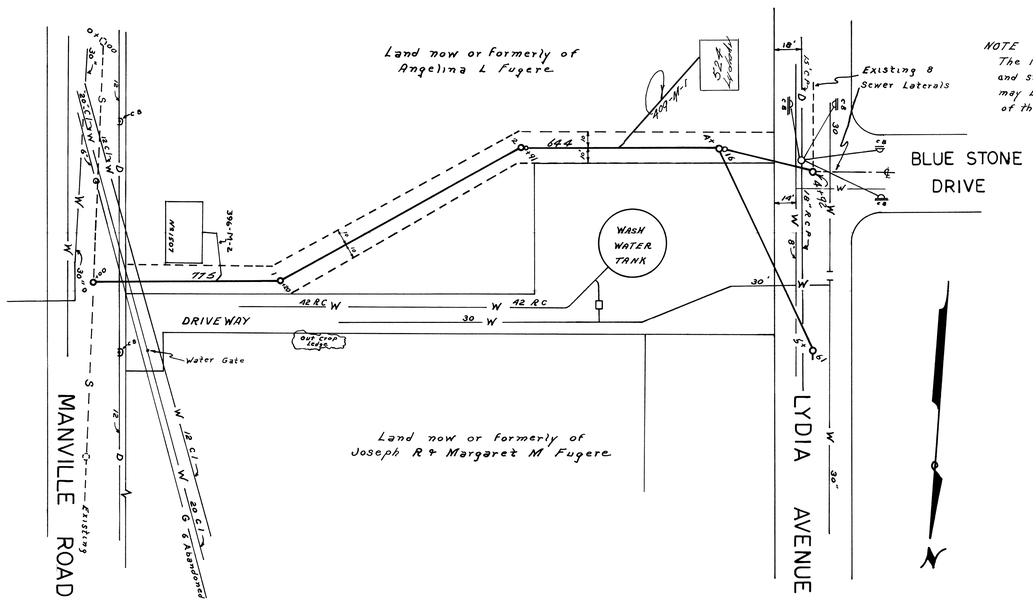


TYPICAL SECTION OF DEEP DROP MANHOLES—V.C. PIPE SHOWN

NO SCALE







SCALES { HORIZONTAL 1" = 40'
VERTICAL 1" = 4

CROSS COUNTRY
MANVILLE RD. TO LYDIA AVE.

P&W RAILROAD REQUIREMENTS

March 4, 2015

WORK WITHIN, ADJACENT TO, AND ABOVE THE RAILROAD RIGHT-OF-WAY

PROVIDENCE AND WORCESTER RAILROAD COMPANY

1. Definitions:

Whenever in these specifications the following words are used, they shall mean unless otherwise noted:

"Railroad" or "Railroad Company" – the Providence and Worcester Railroad Company

"Contractor" – The person(s), party(s), partnership(s), company, corporation and their subcontractors who are under contract to perform work on the Railroad right-of-way.

"Hazard" – the Railroad has furnished the statements quoted below explaining when they consider a hazard to operations exists.

Protection services will be required whenever the Contractor is performing work over, under or adjacent to the Railroad tracks or right-of-way, such as excavating, sheeting, shoring, erection and removal of forms, handling material, using equipment which by swinging or by failure could foul the track, and when any other type of work being performed, in the opinion of the Railroad Company, requires such service.

2. General:

Railroad traffic shall be maintained at all times with safety and continuity, and the Contractor shall conduct all of his operations on or over the Railroad's right-of-way fully within these rules, regulations, and requirements of the Railroad.

The Railroad may provide the Contractor with a schedule of track occupancy, if available, before proceeding with any construction or demolition work over, under, within, or adjacent to the Railroad's right-of-way. The Contractor shall submit for the approval of the Director of Engineering for the Railroad, plans and a detailed description of the method of procedure which will be followed for work within these areas. The work in the field shall not proceed until the plans and method of procedure have been approved by the Director of Engineering or his authorized representative.

All work to be done under, upon, or over the Railroad's right-of-way shall be performed by the Contractor in a manner satisfactory to the Director of

Engineering or his authorized representatives, and shall be performed at such times and in such manner, as not to interfere with the safe movement of trains or traffic upon the tracks of the Railroad.

The Contractor will note that the proposed work involves construction operations on, over or adjacent to property owned by the Railroad. The Contractor must exercise great care in the vicinity of the Railroad's tracks, structures and other facilities and must strictly observe those clearances and other instructions when performing his construction operations near the Railroad's facilities, and he shall use all necessary care and precaution in order to avoid accidents, damage or interference with the Railroad's trains or other property. Any violation of these requirements may be considered cause for the Railroad to take action including stopping work by the Contractor or his subcontractors and preventing their access to the Railroad right-of-way.

3. Plan Approvals:

All applicable plans for demolition, erection, sheeting, shoring or other construction activities on Railroad property shall be submitted to the Railroad for review and approval no less than sixty (60) days prior to the performance of any work covered by those plans. The Railroad shall approve or reject with comment all plans submitted for review within thirty (30) days of receipt of submission and prior to any work on, over or under the Railroad right-of-way.

4. Clearances:

Minimum clearances of twenty-five (25) feet vertical (above top of rail) and fifteen (15) feet horizontal (from track centerline) shall be maintained at all times during construction. If the Contractor wishes a deviation from this requirement, he shall submit a written request for approval of such deviation to the Railroad's Director of Engineering at least twenty-one (21) days prior to the day(s) such deviation is required.

The Contractor shall give written notice to Bernard A. Cartier, Director of Engineering, Providence and Worcester Railroad Company, 75 Hammond Street, Worcester, MA, 01610, telephone number (508) 755-4000, at least twenty-one (21) days in advance of the time the contractor's operations necessitate the fouling of an operated track or that arrangements can be made for proper protection.

Equipment of the Contractor to be used adjacent to the tracks shall be in first-class condition as to fully prevent failures of defective equipment that might cause delay in the operations of trains or damage to the Railroad's facilities.

Cranes, excavators, and any other equipment shall be considered as fouling a track when located in such a position that failure of same, with or without load, would bring any part of the equipment or load within fifteen (15) feet of the

center line of the nearest track. A lesser distance may be allowed if approved in advance by the Railroad.

Critical construction operations must be contained to limited periods, determined by the Railroad, when such work can be accomplished without interference with train schedules. It may be necessary that this work or a portion thereof, be performed during evening hours, night-time hours, Saturdays or Sundays. The Contractor will not be allowed additional compensation for working during these evening, night-time, and early morning hours, Saturdays and Sundays.

5. Interruption of Traffic:

When work on the Project is to be within, adjacent to or above the Railroad's tracks, railroad traffic shall be maintained without interruption, except those approved by the Railroad's Director of Engineering and subject to the following requirements:

Any request for the interruption shall be submitted to the Railroad for review and approval no less than sixty (60) days prior to the start of traffic interruption. The Railroad shall review and approve or reject with comment all interruption and requires within thirty (30) days after the receipt of a request.

If track outages are required for some construction work, some delay may be encountered in obtaining those outages from the Railroad. The Railroad will not be responsible for any extra costs resulting from these delays.

6. Protection:

An Access Agreement is required before any work or right of entry will be permitted on Railroad's right-of-way. There is a processing/application fee for all Access Agreements which must be prepaid by check or electronic funds transfer. To obtain a copy of an Access Agreement, please contact Wendy Lavely at (508) 755-4000, ext. 365 or via email at wlavely@pwrr.com.

Once an Access Agreement has been obtained, a Flagging Request Form must be completed. To obtain a copy, visit the Railroad's website, www.pwrr.com.

The Contractor shall notify the Railroad's Director of Engineering or his authorized representative at least 21 days before flagmen will be required; this applies at the initial start of work, and after any long term break in the work. With the exception of the aforementioned, a minimum of two full working days of notification will be required. The Railroad may employ a conductor or one or more flagmen, at the contractor's expense, to ensure safe train operations through the Project construction area.

The Railroad may furnish and assign an engineer and inspector to the Project, at the contractor's expense, for general inspection purposes or for general protection of the Railroad's property and operations during construction.

The providing of such watchmen, and other precautionary measures shall not, however, relieve the Contractor from liability for payment of damages caused by his operations.

7. Demolition:

Before proceeding with any construction or demolition work, on, over or adjacent to the Railroad's property, a pre-construction meeting shall be held at which time the Contractor shall submit for approval of the Railroad's Director of Engineering, plans, computations, and a detailed description of his method of procedure for accomplishing the construction work required, including methods of protecting the Railroad traffic; however, such approval shall not serve in any way to relieve the Contractor of his complete responsibility for the adequacy and safety of his methods of procedure.

Demolition plans shall be submitted to the Railroad for review and approval no less than sixty (60) days prior to the performance of any demolition work covered by those plans. The Railroad shall approve or reject with comments all demolition plans within thirty (30) days of receipt of submission and prior to any work on, over or under Railroad right-of-way.

During any demolition procedure, the Contractor must provide an approved shield to prohibit all debris from falling onto the Railroad right-of-way. A temporary protective barrier must be provided if the existing protective barrier is removed during the demolition procedure. In addition, any openings above or adjacent to the Railroad right-of-way must be adequately secured and protected to prohibit trespassers from falling or entering into the unprotected area of the tracks.

8. Storage:

Materials and equipment belonging to the Contractor shall not be stored on the Railroad property without first having obtained permission from the Railroad's Director of Engineering and such permission will be on the condition that the Railroad will not be liable for damage to such material and equipment from any cause. The Contractor shall keep the tracks adjacent to the site clear of all refuse and debris that may accumulate from his operations, and shall leave the Railroad property in the condition existing before the start of his operations.

9. Endangerments:

If any project work endangers the Railroad's tracks or facilities, the contractor shall immediately do such work as necessary to restore safety. If the Contractor fails to carry out such orders immediately, the Railroad may take whatever steps are necessary to restore safe conditions. The cost and expense to the Railroad of restoring safe conditions or correcting any damage to the Railroad tracks or other facilities caused by the Contractor's operations shall be billed to the Contractor.

Any maintenance work carried out by the Railroad which was caused by the Contractor's negligence shall be charged to the Contractor. The Contractor shall reimburse the Railroad for all such work.

10. Final Acceptance:

Upon completion of the work the Contractor shall remove from within the limits of the Railroad's right-of-way, all machinery, equipment, surplus materials, falsework, rubbish and temporary building, and other property of the Contractor or any subcontractor and shall leave the right-of-way in a condition equal to that prior to the start of construction.

11. Blasting:

No blasting will be permitted adjacent to or on the Railroad property without written consent from the Railroad's Director of Engineering.

12. Crossings:

The Contractor will not be allowed to construct or use any temporary grade crossings on the Railroad property without written consent from the Railroad's Director of Engineering. Where such consent has been given, only rubber tired equipment shall be allowed to cross over the railroad tracks at an approved crossing. If it is necessary to cross the tracks with non-rubber tired equipment (e.g.- excavators, bulldozers, etc.) it must be done under the supervision of a qualified Railroad employee and in such a way that the rails are protected by the use of wood planking or other approved means.

13. Coordination:

The Contractor shall be responsible for the coordination of the work of his various subcontractors who, in turn, shall cooperate with the Railroad in carrying out his work.

(REV. 10/23/2013

PROVIDENCE AND WORCESTER RAILROAD COMPANY
INSURANCE REQUIREMENTS

Each policy of insurance must be satisfactory to Providence and Worcester Railroad Company ("P&W"), the said policies to be taken out in the name of Contractor, and naming P&W as additional insured, with such insurer(s) as is satisfactory to P&W from time to time and, in any event, with a rating by A.M. Best Company of not less than A- at the time of issuance of any certificate and from time to time thereafter.

A. General Liability Insurance:

On all work to be done, the Contractor or subcontractors engaged in the work shall take out before work is commenced, and keep in effect until the work is completed and accepted, the following type of liability insurance, in addition to any other forms of insurance or bonds required under the terms of the contract specification.

a. Contractor's Comprehensive Public Liability and Property Damage Liability Insurance.

The Contractor shall furnish evidence to the P&W, that with respect to the operations he/she performs, he/she carries regular Contractor's Public Liability and Property Damage Insurance (Railroad Protective Liability Insurance) providing for limits of not less than Five Million ($5,000,000) dollars combined single limit for all damages arising out of bodily injuries to or death of one or more persons in any one occurrence and for all damages arising out of injury to or destruction of property in any one occurrence. Said policy shall contain an endorsement indicating that all railroad exclusions have been removed from said policy. Said policy shall name P&W as an additional insured party.

If any part of the work is sublet, similar insurance shall be provided by or in behalf of the subcontractors to cover their operations.

The insurance company shall agree to investigate and defend all claims and suits against the Insured for the damages covered, even if groundless, until the insurance company shall elect to effect settlement.

The cost of such insurance shall be distributed over the various prices submitted in the Proposal.

Certificate of Insurance (2 copies) shall be furnished prior to award of contract and attached to copies of the contract when executed. A copy of the policy together with all endorsements shall be delivered to P&W.

The Contractor shall not cause any policy to be cancelled or permit them to lapse and the policy shall not be subject to cancellation or a reduction in the required limits of liability or amounts of insurance until written notice has been mailed by registered mail to P&W stating when, not less than thirty (30) days thereafter, such cancellation or reduction shall be effective. The protection shall be renewed before further work will be permitted at the site by the Contractor.

B. Railroad Protective Liability Insurance (To be required where no endorsement removing railroad exclusion is available):

Railroad Protective Liability Insurance shall conform to the Standard Provisions for General Liability Policies, Railroad Protective Liability Form (State or Federal Highway Projects). These provisions may not be amended and no part may be omitted. Limits of policies to be $2,000,000 for Bodily Injury per occurrence and $2,000,000 Property Damage per occurrence, covering the work of the Contractor and all subcontractors.

A Railroad Protective Liability Policy shall be issued with the name of the insured being the Providence and Worcester Railroad Company ("P&W"). Such a policy shall be furnished by the Contractor covering his own employees as well as those of all subcontractors and those employees of P&W having occasion to work at the project site.

Railroad Protective Liability Insurance Policy must be endorsed to the effect that for the purpose of this insurance, the employees of P&W as listed below shall be considered the same as regular employees of the Contractor.

a. Any watchman, flagman, inspector, engineer, maintenance of way employee or similar employee who is employed by P&W and is specifically assigned or furnished by P&W for work in connection with the project.

b. Any employee of P&W while operating the work trains or other equipment assigned to the project by P&W and while engaged in the performance of work directly chargeable to the Contractor.

The original of this policy shall be sent to Bernard A. Cartier, Director of Engineering, Providence and Worcester Railroad Company, 75 Hammond Street, Worcester, MA 01610.

The Contractor shall not cause any policy to be cancelled or permit them to lapse and the policy shall not be subject to cancellation or a reduction in the required limits of liability or amounts insurance until written notice has been mailed by registered mail to P&W stating when, not less than thirty (30) days thereafter, such cancellation or reduction shall be effective.

Equipment of the Contractor to be used adjacent to tracks shall be in first-class condition, so as to fully prevent any failures that would cause delay in the construction of the project or damage P&W facilities.

Contractor’s equipment shall not be placed or put in operation adjacent to tracks without first obtaining permission from P&W.

Critical construction operations must be confined to limited periods, determined by P&W, when such work can be accomplished with minimum interference with train schedules. The Contractor shall abide by P&W's schedule.

C. Workman's Compensation Insurance:

The Contractor shall provide adequate Workman's Compensation Insurance for all employed on the project who may come within the protection of such laws. Said insurance shall be written with such company as may be acceptable to P&W and the policy shall be submitted to P&W for examination. Satisfactory certificates of said insurance shall be filed with P&W prior to the commencement of operations by the Contractor. The Contractor will be charged with the responsibility for proper and adequate Workman's Compensation coverage for all his subcontractor operations, and in the event the Contractor's policy does not cover each and every subcontractor, certificates of insurance issued on policies by companies that may be acceptable to the P&W covering each and every subcontractor shall be filed with P&W prior to the commencement of such subcontract operations.

D. Automobile Liability Insurance

The Contractor shall provide Automobile Liability Insurance, with coverage in the amount of $5,000,000.00 for all automobiles including, without limitation, owned, hired, and non-owned automobiles, with evidence on the certificate of insurance that the MCS-90 endorsement is included.

E. Certificates of Insurance:

The attached Certificate of Insurance (Page 4) must be completed and signed by an authorized representative of the broker and submitted along with the customary insurance certificates to insure compliance with the above requirements.

(REV. 10/23/2013

CERTIFICATE OF INSURANCE

Date of issue:

Broker (Producer): Name:
Address:
Phone Number:

Insured: Name:
Address:
Phone Number:

This is to certify that policies of insurance listed below have been issued to the named insured for the policy period indicated.

Type of Insurance	Liability Limit	Company and Policy Number	Policy Period
Comprehensive General Liability With all railroad exclusions removed from contractual liability provisions of policy.	$5 Million per occurrence (BI/PD)		
Broad Form (RIMA/ISO or AASHTO) Railroad Protective Policy. Insured: Providence and Worcester Railroad Company	$2 Million per occurrence (BI/PD)		
Workmen' Compensation			
Automobile Liability	$5 Million per occurrence		

Description of Operations:

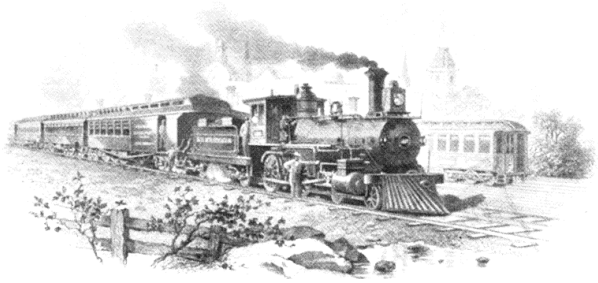
_____

_____

Certificate Holder: Providence and Worcester Railroad Company, 75 Hammond Street, Worcester, MA. 01610. This certificates holder must be named as an additional insured.

Should any of the above described policies be cancelled before the expiration date thereof, this issuing company will mail 30 days prior written notice of such cancellation to the certificate holder.

Authorized Representative
By: _____
Title: _____



FOUNDED 1844

Providence and Worcester Railroad
Fencing Specification

FABRIC:

Galvanized	
Gauge:	9ga
Height:	6’
Pattern:	2”

FRAME WORK

Galvanized	
Line Posts:	2-1/2” - Heavy Weight
Terminal Posts:	3” - Heavy Weight
Rail:	Top Tension Wire; Bottom Heavy Weight
Bracing:	Midrail
Barbed Wire	No

GATES

None Required

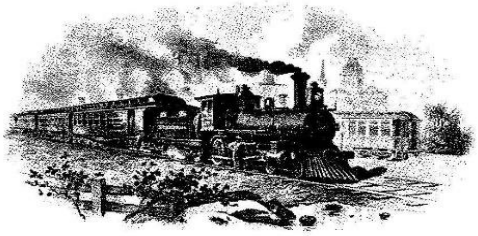
FOOTINGS

Concrete

PROVIDENCE AND WORCESTER RAILROAD COMPANY
75 HAMMOND STREET, WORCESTER, MA 01610
TELEPHONE (508) 755-4000

PROVIDENCE & WORCESTER RAILROAD

TRANSPORTATION DEPARTMENT- FLAGGING REQUEST FORM



FOUNDED 1844

1.) Company Name: _____

2.) Billing Address: _____

3.) Requestors Name: _____
Email Address: _____
Phone Number: _____

4.) Jobsite Contact: _____
Cell Number: _____

5.) Dates Requested: _____ Report Time: _____

6.) Specific Railroad Location and Crossing Streets: _____
_____

7.) Are you requesting the use of on-track equipment? YES _____ NO _____
*Note: All on-track equipment will require approval by P&W Engineering Department and comply with FRA Part 214.523

Providence and Worcester Railroad requires a prepayment amount of *$948.55* per day for all flagging. An additional charge may be applied due to the distance of flagging request. All cancellations must be made in writing twenty four (24) hours prior to the scheduled flagging date, or a daily charge will apply. Flagging dates are not made official until approved and contacted by Train Masters.

** $948.55 is based on a 12 hour shift, all requests for more than 12 hours will result in a second Flagman, and a second charge of $948.55*

ANY ISSUES OR EMERGENCIES ON TRACK, CONTACT DISPATCHER IMMEDIATELY AT DISPATCHER PHONE NUMBER: (800) 447-2003ex400

***By signing the following, you agree to pay $948.55 per day (12 hrs) for a scheduled Flagman.**

Contractor Signature: _____
Printed Name: _____
Date: _____

Upon Completion of this form, send via email to Flagging@PWRR.com

A response should be expected within a resonable amount of time.

Flagging requests by phone or any other means will not be fulfilled.

PROVIDENCE AND WORCESTER RAILROAD COMPANY
75 HAMMOND STREET, WORCESTER, MA 01610

APPENDIX J

Pipe Replacement Priority List – Ranking

Appendix J
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Main Database Sorted by Total Rating

												Rating Schedule					
Pipe Rank	Street	Location	City/Town	Size (in.)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments	1 Size	2 Type	3 Age	4 Ownership	5 Breaks	Total
1	Greenville Road, NS		N. Smithfield	6	AC	1953	4160	Y	G2	H	Leo Cabana	breaks 4/12, 8/12	0.63	0.63	0.75	0.63	1.25	3.88
2	Hamlet Avenue		Woonsocket	6	CI	1889	2800	N	C4	L	WWD	break 11/89, 1/08	0.63	0.63	1.25	0.00	1.25	3.75
3	Avenue B		Woonsocket	6	CI	1904	840	N	F2	L	WWD	breaks 1/94, 1/13, 1/16	0.63	0.63	1.25	0.00	1.25	3.75
4	Cato Street		Woonsocket	6	CI	1885	1310	N	C3	L	WWD	breaks 11/92, 12/16	0.63	0.63	1.25	0.00	1.25	3.75
5	Summit Street		Woonsocket	6	CI	1893	800	N	E2	L	WWD	breaks 12/91, 3/06	0.63	0.63	1.25	0.00	1.25	3.75
6	Great Road, NS	Lapre to Morse	N. Smithfield	6	CI	1928	1620	N	E1	L	WWD	break 3/06, 2/16	0.63	0.63	1.00	0.00	1.25	3.50
7	Pound Hill Road, NS		N. Smithfield	2	GI	1929	1080	Y	E1	L	Mary Slocomb		1.25	0.63	1.00	0.63	0.00	3.50
8	Smithfield Road, NS	White to end of Glen	N. Smithfield	1.25	GI	1928	220	Y	G3	H	private-unknown		1.25	0.63	1.00	0.63	0.00	3.50
9	Oaklawn Road, NS		N. Smithfield	2	GI	1951	250	Y	ENS	L	private-unknown	break 1/17	1.25	0.63	0.75	0.63	0.00	3.25
10	Hillview Avenue, NS		N. Smithfield	4	CI	1940	980	Y	ENS	L	Chas. Bergesson		1.25	0.63	0.75	0.63	0.00	3.25
11	Oak Hill Avenue, NS		N. Smithfield	4	AC	1953	1000	Y	H2	H	Leo Cabana		1.25	0.63	0.75	0.63	0.00	3.25
12	Birch Hill Avenue, NS		N. Smithfield	4	AC	1953	880	Y	H2	H	Leo Laband		1.25	0.63	0.75	0.63	0.00	3.25
13	Norwood Road, NS		N. Smithfield	4	CI	1951	520	Y	ENS	L	private-unknown		1.25	0.63	0.75	0.63	0.00	3.25
14	Asylum Street		Woonsocket	6	CI	1894	1100	N	D2	L	WWD	break 1/85	0.63	0.63	1.25	0.00	0.63	3.13
15	Prospect Street		Woonsocket	8	CI	1889	3020	Y	B3	L	WWD	break 1/93, 1/08	0.00	0.63	1.25	0.00	1.25	3.13
16	Carrington Avenue		Woonsocket	6	CI	1895	1100	N	D5	L	WWD	break 1/96	0.63	0.63	1.25	0.00	0.63	3.13
17	Grove Street		Woonsocket	6	CI	1890	2120	N	E3	H	WWD	break 1/97	0.63	0.63	1.25	0.00	0.63	3.13
18	Cold Spring Place		Woonsocket	4	CI	1893	240	Y	C2	L	WWD	break 12/07	1.25	0.63	1.25	0.00	0.00	3.13
19	Cottage Street		Woonsocket	6	CI	1891	1580	N	D4	H	WWD	break 12/95	0.63	0.63	1.25	0.00	0.63	3.13
20	South Main Street	all 12" until 14"	Woonsocket	12	CI	1890	5940	N	D3	L	WWD	break 12/95, 4/09	0.00	0.63	1.25	0.00	1.25	3.13
21	West Street		Woonsocket	6	CI	1886	760	N	D2	L	WWD	break 2/93	0.63	0.63	1.25	0.00	0.63	3.13
22	Pleasant Street		Woonsocket	6	CI	1890	1000	N	D2	L	WWD	break 2/94	0.63	0.63	1.25	0.00	0.63	3.13
23	Merida Avenue		Woonsocket	6	CI	1914	640	N	B5	L	WWD	break 3/95	0.63	0.63	1.25	0.00	0.63	3.13
24	Rhodes Avenue		Woonsocket	6	CI	1895	340	N	B2	L	WWD	break 5/95, parallel pipes	0.63	0.63	1.25	0.00	0.63	3.13
25	Vose Street		Woonsocket	6	CI	1896	760	Y	E3	L	WWD	break 6/83	0.63	0.63	1.25	0.00	0.63	3.13
26	Privilege Street	to social st	Woonsocket	6	CI	1891	1490	N	A4	L	WWD	break 6/95	0.63	0.63	1.25	0.00	0.63	3.13
27	South Street		Woonsocket	6	CI	1886	440	N	D3	L	WWD	break 9/81	0.63	0.63	1.25	0.00	0.63	3.13
28	High School Street		Woonsocket	6	CI	1889	220	N	B3	L	WWD	break 9/96	0.63	0.63	1.25	0.00	0.63	3.13
29	Park Avenue	Carrington to Logee	Woonsocket	8	CI	1890	2380	N	D4	L	WWD	breaks 2/85,11/09, 12/09	0.00	0.63	1.25	0.00	1.25	3.13
30	Privilege Street	Winter to 8" section	Woonsocket	12	CI	1907	1160	N	A4	L	WWD	breaks 4/06, 3/07	0.00	0.63	1.25	0.00	1.25	3.13
31	Elm Street	Social to Wood	Woonsocket	8	CI	1886	1700	N	B5	L	WWD	breaks 6/83, 2/17	0.00	0.63	1.25	0.00	1.25	3.13
32	Water Street	Canal to Dead End	Woonsocket	4	CI	1891	200	Y	C3	L	WWD	has 6" hydrant on it	1.25	0.63	1.25	0.00	0.00	3.13
33	Sayles Street	Edwards to Dead End	Woonsocket	4	CI	1885	170	Y	D2	L	WWD		1.25	0.63	1.25	0.00	0.00	3.13
34	Sayles Street	River to Arnold	Woonsocket	4	CI	1885	280	Y	D3	L	WWD		1.25	0.63	1.25	0.00	0.00	3.13
35	Ascension Street		Woonsocket	4	CI	1887	370	N	C3	L	WWD		1.25	0.63	1.25	0.00	0.00	3.13
36	Clark Court		Woonsocket	4	CI	1888	180	Y	C3	L	WWD		1.25	0.63	1.25	0.00	0.00	3.13
37	High School Street		Woonsocket	4	CI	1889	320	N	B3	L	WWD		1.25	0.63	1.25	0.00	0.00	3.13
38	Bradford Street		Woonsocket	4	CI	1890	420	N	E2	L	WWD		1.25	0.63	1.25	0.00	0.00	3.13
39	West Park Place		Woonsocket	4	CI	1890	480	Y	C4	L	WWD		1.25	0.63	1.25	0.00	0.00	3.13
40	Willow Street		Woonsocket	4	CI	1890	700	N	D4	L	WWD		1.25	0.63	1.25	0.00	0.00	3.13
41	Snow Street		Woonsocket	4	CI	1891	440	N	B3	L	WWD		1.25	0.63	1.25	0.00	0.00	3.13
42	Adams Street		Woonsocket	4	CI	1893	180	N	A5	L	WWD		1.25	0.63	1.25	0.00	0.00	3.13
43	Blackstone Street		Woonsocket	4	CI	1893	1060	N	C3	L	WWD		1.25	0.63	1.25	0.00	0.00	3.13
44	Daniels Street		Woonsocket	4	CI	1893	280	N	B3	L	WWD		1.25	0.63	1.25	0.00	0.00	3.13
45	Social Street		Woonsocket	4	CI	1894	370	N	A5	L	WWD		1.25	0.63	1.25	0.00	0.00	3.13
46	Paradis Avenue		Woonsocket	4	CI	1896	160	N	D4	L	WWD		1.25	0.63	1.25	0.00	0.00	3.13
47	Park Place		Woonsocket	4	CI	1896	320	N	C4	L	WWD		1.25	0.63	1.25	0.00	0.00	3.13
48	Ruby Street		Woonsocket	4	CI	1908	300	N	D2	L	WWD		1.25	0.63	1.25	0.00	0.00	3.13
49	Wilbur Avenue		Woonsocket	4	CI	1910	320	N	E2	L	WWD		1.25	0.63	1.25	0.00	0.00	3.13
50	Mendon Road, NS		N. Smithfield	8	CI	1964	800	N	CNS	H	A.F. Pacheco	2 breaks 1/07, 12/07	0.00	0.63	0.50	0.63	1.25	3.00
51	Armand Street		Woonsocket	2	CT	1947	400	Y	E6	L	Wilfred Pelletier?	added to database	1.25	0.38	0.75	0.63	0.00	3.00
52	Merrimac Street, NS	includes 1"ct on Walsh	N. Smithfield	1	CT	1949	440	Y	G3	H	Donat Dubuc		1.25	0.38	0.75	0.63	0.00	3.00
53	Walsh Avenue, NS	Chester to Smithfield	N. Smithfield	2	CT	1949	540	N	G3	H	Donat Dubuc		1.25	0.38	0.75	0.63	0.00	3.00
54	Mowry Avenue, NS		N. Smithfield	2	CT	1957	500	Y	F1	L	Doris Lefebvre/Joseph DiPardo		1.25	0.38	0.75	0.63	0.00	3.00
55	Chester Street, NS		N. Smithfield	1.5	CT	1949	240	Y	G3	H	private-unknown		1.25	0.38	0.75	0.63	0.00	3.00
56	Smithfield Road, NS		N. Smithfield	1	CT	1950	100	Y	F2	H	private-unknown		1.25	0.38	0.75	0.63	0.00	3.00
57	Smithfield Road, NS		N. Smithfield	2	CT	1950	220	N	F2	H	private-unknown		1.25	0.38	0.75	0.63	0.00	3.00
58	Lamoureux Boulvevard, NS		N. Smithfield	1	CT	1953	340	Y	H2	H	private-unknown		1.25	0.38	0.75	0.63	0.00	3.00
59	Fairview Avenue, NS		N. Smithfield	2	CT	1953	530	Y	H2	H	private-unknown		1.25	0.38	0.75	0.63	0.00	3.00
60	Moore Street		Woonsocket	6	CI	1919	160	Y	E4	H	WWD	break 11/93	0.63	0.63	1.00	0.00	0.63	2.88
61	Edmund Street		Woonsocket	8	CI	1931	530	Y	A2	L	WWD	breaks 1/90, 1/13	0.00	0.63	1.00	0.00	1.25	2.88
62	Summit Avenue, NS		N. Smithfield	8	CI	1928	880	N	G2	H	WWD	breaks 2/12, 1/14, 1/15	0.00	0.63	1.00	0.00	1.25	2.88
63	Homestead Avenue, NS		N. Smithfield	6	CI	1928	740	Y	F1	L	Robert Russel		0.63	0.63	1.00	0.63	0.00	2.88
64	Francis Street		Woonsocket	4	CI	1917	140	Y	C3	L	WWD		1.25	0.63	1.00	0.00	0.00	2.88
65	Bentley Street		Woonsocket	4	CI	1922	280	Y	C3	L	WWD		1.25	0.63	1.00	0.00	0.00	2.88
66	Holder Lane		Woonsocket	4	CI	1923	280	Y	C3	L	WWD		1.25	0.63	1.00	0.00	0.00	2.88
67	John Street		Woonsocket	4	CI	1923	360	N	D2	L	WWD		1.25	0.63	1.00	0.00	0.00	2.88

Appendix J
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Main Database Sorted by Total Rating

Pipe Rank	Street	Location	City/Town	Size (in.)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments	Rating Schedule 1 Size	2 Type	3 Age	4 Ownership	5 Breaks	Total
68	Crest Road, NS	includes Greenwood and Golden	N. Smithfield	2	GI	1928	1000	Y	G2	H	WWD		1.25	0.63	1.00	0.00	0.00	2.88
69	Woonsocket Hill Road, NS		N. Smithfield	2	GI	1928	1230	Y	F1	L	WWD		1.25	0.63	1.00	0.00	0.00	2.88
70	Buell Avenue, NS	at Smithfield Road end	N. Smithfield	1.5	CT	1960	120	Y	F2	H	private-unknown		1.25	0.38	0.50	0.63	0.00	2.75
71	Madeleine Avenue		Woonsocket	8	CI	1955	1400	Y	C8	H	WWD	break 12/81, 2/94	0.00	0.63	0.75	0.00	1.25	2.63
72	Westwood Road, NS		N. Smithfield	4	CI	1951	840	Y	ENS	L	WWD	break 2/09	1.25	0.63	0.75	0.00	0.00	2.63
73	Rhodes Avenue		Woonsocket	10	CI	1948	2300	N	B1	H	WWD	break 2/98, 1/08, 1/09, 11/13	0.00	0.63	0.75	0.00	1.25	2.63
74	Lapre Road, NS		N. Smithfield	6	AC	1951	2000	Y	ENS	L	Oscar Lapre & Wilfred Pelletier	break 9/10	0.63	0.63	0.75	0.63	0.00	2.63
75	Woodlawn Road, NS		N. Smithfield	6	AC	1951	1040	Y	ENS	L	Oscar Lapre & Wilfred Pelletier	break 9/16	0.63	0.63	0.75	0.63	0.00	2.63
76	Bamford Street, NS		N. Smithfield	6	CI	1941	280	N	F1	L	J.H. O'Donnell		0.63	0.63	0.75	0.63	0.00	2.63
77	Getchell Street, NS		N. Smithfield	6	CI	1947	110	Y	F1	L	J.H. O'Donnell		0.63	0.63	0.75	0.63	0.00	2.63
78	O'Donnell Avenue, NS		N. Smithfield	6	CI	1950	840	N	F1	L	J.H. O'Donnell		0.63	0.63	0.75	0.63	0.00	2.63
79	Leo Avenue, NS		N. Smithfield	6	AC	1953	480	N	H2	H	Leo Cabana		0.63	0.63	0.75	0.63	0.00	2.63
80	Oaklawn Road, NS		N. Smithfield	6	AC	1951	480	Y	ENS	L	Oscar Lapre & Wilfred Pelletier		0.63	0.63	0.75	0.63	0.00	2.63
81	Old Greenville Road, NS		N. Smithfield	6	AC	1953	720	Y	H2	H	private-unknown		0.63	0.63	0.75	0.63	0.00	2.63
82	Pine Court, NS		N. Smithfield	6	AC	1954	240	Y	F1	L	private-unknown		0.63	0.63	0.75	0.63	0.00	2.63
83	Providence Street		Woonsocket	6	CI	1891	1400	N	E2	L	WWD	break 1/08	0.63	0.63	1.25	0.00	0.00	2.50
84	Highland Street		Woonsocket	6	CI	1893	1140	N	B2	L	WWD	break 1/14	0.63	0.63	1.25	0.00	0.00	2.50
85	Rockland Avenue		Woonsocket	6	CI	1905	1000	N	E2	L	WWD	break 1/15	0.63	0.63	1.25	0.00	0.00	2.50
86	North Main Street		Woonsocket	8	CI	1889	1400	N	B3	L	WWD	break 1/96	0.00	0.63	1.25	0.00	0.63	2.50
87	Broad Street		Woonsocket	8	CI	1908	700	N	E3	L	WWD	break 1/96	0.00	0.63	1.25	0.00	0.63	2.50
88	Olo Street	Third to Fourth	Woonsocket	6	CI	1890	240	N	D2	L	WWD	break 11/11	0.63	0.63	1.25	0.00	0.00	2.50
89	Front Street		Woonsocket	6	CI	1887	2460	N	D3	L	WWD	break 12/08	0.63	0.63	1.25	0.00	0.00	2.50
90	Oakley Road		Woonsocket	6	CI	1913	1360	N	B3	L	WWD	break 12/09	0.63	0.63	1.25	0.00	0.00	2.50
91	Social Street		Woonsocket	8	CI	1890	2800	N	B4	L	WWD	break 12/85	0.00	0.63	1.25	0.00	0.63	2.50
92	Winter Street		Woonsocket	12	CI	1891	860	N	A4	L	WWD	break 12/89, parallel to 6"	0.00	0.63	1.25	0.00	0.63	2.50
93	Mowry Street	Park to Kermit	Woonsocket	8	CI	1909	800	N	F3	H	WWD	break 12/92	0.00	0.63	1.25	0.00	0.63	2.50
94	Orchard Street		Woonsocket	6	CI	1907	860	N	E2	L	WWD	break 2/07	0.63	0.63	1.25	0.00	0.00	2.50
95	Sayles Street		Woonsocket	6	CI	1885	480	N	D3	L	WWD	break 2/09	0.63	0.63	1.25	0.00	0.00	2.50
96	Woodland Road		Woonsocket	6	CI	1896	1680	N	B3	L	WWD	break 7/13	0.63	0.63	1.25	0.00	0.00	2.50
97	East School Street		Woonsocket	6	CI	1890	480	Y	B5	L	WWD	easily looped	0.63	0.63	1.25	0.00	0.00	2.50
98	Kendrick Avenue		Woonsocket	6	CI	1886	660	N	C5	L	WWD	parallel pipes	0.63	0.63	1.25	0.00	0.00	2.50
99	Pond Street		Woonsocket	6	CI	1889	1440	N	A4	L	WWD	parallel pipes	0.63	0.63	1.25	0.00	0.00	2.50
100	Diamond Hill Road		Woonsocket	6	CI	1891	3090	Y	A5	L	WWD	parallel pipes	0.63	0.63	1.25	0.00	0.00	2.50
101	Winter Street		Woonsocket	6	CI	1892	500	Y	A4	L	WWD	parallel pipes	0.63	0.63	1.25	0.00	0.00	2.50
102	Division Street		Woonsocket	6	CI	1893	760	N	D4	H	WWD	parallel pipes	0.63	0.63	1.25	0.00	0.00	2.50
103	Cass Avenue		Woonsocket	6	CI	1894	1080	N	C7	L	WWD	parallel pipes, break 12/07	0.63	0.63	1.25	0.00	0.00	2.50
104	Elm Street		Woonsocket	6	CI	1886	360	N	C5	L	WWD	parallel pipes, break 2/17	0.63	0.63	1.25	0.00	0.00	2.50
105	Pond Street	to transformers	Woonsocket	8	CI	1889	660	N	C4	L	Blackstone Valley Electric		0.00	0.63	1.25	0.63	0.00	2.50
106	Chestnut Street		Woonsocket	6	CI	1886	260	N	C2	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
107	Jeffers Street		Woonsocket	6	CI	1887	700	N	D3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
108	Second Avenue		Woonsocket	6	CI	1887	2380	N	C2	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
109	Gaulin Avenue		Woonsocket	6	CI	1888	1140	Y	B5	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
110	Wood Avenue		Woonsocket	6	CI	1888	1960	N	B5	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
111	Avenue A		Woonsocket	6	CI	1889	340	N	E2	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
112	Boyden Street		Woonsocket	6	CI	1889	1060	Y	C3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
113	Coe Street		Woonsocket	6	CI	1889	2720	N	E2	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
114	Harrison Avenue		Woonsocket	6	CI	1889	440	N	C4	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
115	Paradis Avenue		Woonsocket	6	CI	1889	1660	Y	D4	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
116	Shove Street		Woonsocket	6	CI	1889	320	N	E2	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
117	Third Avenue	Mason to Fairmount	Woonsocket	6	CI	1889	1300	N	C2	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
118	Andrews Street		Woonsocket	6	CI	1890	780	N	E1	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
119	Barton Street		Woonsocket	6	CI	1890	370	N	A3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
120	Bellevue Avenue		Woonsocket	6	CI	1890	400	N	C4	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
121	Bernon Street	at Truman Drive	Woonsocket	6	CI	1890	300	Y	D3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
122	Fourth Avenue		Woonsocket	6	CI	1890	1300	N	C2	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
123	North Main Street		Woonsocket	6	CI	1890	2520	N	A3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
124	Park Avenue	Hamlet to Carrington	Woonsocket	6	CI	1890	240	N	C4	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
125	Unity Street		Woonsocket	6	CI	1890	440	N	D4	H	WWD		0.63	0.63	1.25	0.00	0.00	2.50
126	Blakeley Street		Woonsocket	6	CI	1891	320	N	E3	H	WWD		0.63	0.63	1.25	0.00	0.00	2.50
127	Farm Street		Woonsocket	6	CI	1891	610	N	A3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
128	Grand Street		Woonsocket	6	CI	1891	1480	Y	E3	H	WWD		0.63	0.63	1.25	0.00	0.00	2.50
129	Lincoln Street		Woonsocket	6	CI	1891	1400	N	D3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
130	Welles Street		Woonsocket	6	CI	1891	720	N	D4	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
131	Elbow Street		Woonsocket	6	CI	1892	670	N	B4	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
132	Gaskill Street	Edmund to N. Main	Woonsocket	6	CI	1892	2870	N	A2	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
133	Olo Street	Center to Second	Woonsocket	6	CI	1892	1450	N	D2	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
134	Rebekah Street		Woonsocket	6	CI	1892	300	N	A3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
135	Third Avenue	8" to Laurel	Woonsocket	6	CI	1892	1180	N	B2	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50

Appendix J
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Main Database Sorted by Total Rating

Pipe Rank	Street	Location	City/Town	Size (in.)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments	Rating Schedule 1 Size	2 Type	3 Age	4 Ownership	5 Breaks	Total
136	Adams Street		Woonsocket	6	CI	1893	1420	N	A5	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
137	Bernon Street		Woonsocket	6	CI	1893	1480	N	D4	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
138	Cross Street		Woonsocket	6	CI	1893	540	N	E3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
139	Earle Street		Woonsocket	6	CI	1893	1020	N	B3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
140	Willow Street		Woonsocket	6	CI	1893	700	N	D4	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
141	Rathbun Street		Woonsocket	6	CI	1894	340	Y	A5	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
142	Valley Street		Woonsocket	6	CI	1894	100	Y	E3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
143	Ethel Street		Woonsocket	6	CI	1896	320	Y	A5	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
144	Island Place		Woonsocket	6	CI	1896	400	Y	D3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
145	Jenckes Street		Woonsocket	6	CI	1896	1340	N	E3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
146	Park Place		Woonsocket	6	CI	1896	1440	N	C4	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
147	Vose Street		Woonsocket	6	CI	1896	500	N	E3	H	WWD		0.63	0.63	1.25	0.00	0.00	2.50
148	Bellingham Street		Woonsocket	6	CI	1897	590	Y	A5	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
149	Morton Avenue		Woonsocket	6	CI	1897	320	N	C4	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
150	Social Street		Woonsocket	6	CI	1897	1320	N	A5	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
151	Pearl Street		Woonsocket	6	CI	1898	380	N	E2	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
152	Sweet Avenue		Woonsocket	6	CI	1898	780	N	C5	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
153	Gilbert Street		Woonsocket	6	CI	1899	620	N	F3	H	WWD		0.63	0.63	1.25	0.00	0.00	2.50
154	St. Simon Street		Woonsocket	6	CI	1899	540	N	E5	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
155	James Street		Woonsocket	6	CI	1900	260	N	C3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
156	Napoleon Street		Woonsocket	6	CI	1900	260	N	F3	H	WWD		0.63	0.63	1.25	0.00	0.00	2.50
157	Eighth Avenue	Fairmount to Chestnut	Woonsocket	6	CI	1901	520	N	C1	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
158	Roland Street		Woonsocket	6	CI	1901	820	N	A5	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
159	Burnside Avenue		Woonsocket	6	CI	1902	1940	N	B5	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
160	Chester Street		Woonsocket	6	CI	1902	740	N	B5	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
161	Collins Street		Woonsocket	6	CI	1902	690	N	E3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
162	Erie Street		Woonsocket	6	CI	1902	260	N	E3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
163	Kindergarten Street		Woonsocket	6	CI	1902	660	N	C3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
164	Thomas Street		Woonsocket	6	CI	1902	590	N	E3	H	WWD		0.63	0.63	1.25	0.00	0.00	2.50
165	Charles Street		Woonsocket	6	CI	1904	490	N	A5	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
166	Dulude Avenue		Woonsocket	6	CI	1904	1100	N	B5	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
167	Bernon Street	Grove to Maple	Woonsocket	6	CI	1905	880	N	D4	H	WWD		0.63	0.63	1.25	0.00	0.00	2.50
168	Dean Street		Woonsocket	6	CI	1905	460	N	A5	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
169	Estes Street	Bellingham to Fulton	Woonsocket	6	CI	1905	1240	N	A5	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
170	Garden Street		Woonsocket	6	CI	1905	740	Y	A5	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
171	Huntington Avenue		Woonsocket	6	CI	1905	920	N	A2	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
172	Vine Street		Woonsocket	6	CI	1905	440	N	A3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
173	Glen Road		Woonsocket	6	CI	1906	1140	N	B3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
174	Ninth Avenue		Woonsocket	6	CI	1907	850	N	D1	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
175	Lyman Street		Woonsocket	6	CI	1908	780	N	B3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
176	Rivulet Street		Woonsocket	6	CI	1908	100	N	A3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
177	Bennett Street		Woonsocket	6	CI	1909	1100	N	D4	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
178	Manville Road		Woonsocket	6	CI	1909	1220	N	D5	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
179	Roberts Street		Woonsocket	6	CI	1909	960	N	D5	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
180	Federal Street		Woonsocket	6	CI	1910	600	N	C4	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
181	Sixth Avenue	Chapel to Fairmount	Woonsocket	6	CI	1910	380	N	C2	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
182	Roberta Avenue		Woonsocket	6	CI	1911	440	Y	E2	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
183	Seventh Avenue		Woonsocket	6	CI	1911	1140	Y	C1	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
184	East Orchard Street		Woonsocket	6	CI	1912	680	N	E3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
185	Temple Street		Woonsocket	6	CI	1912	300	N	A3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
186	Cleveland Street		Woonsocket	6	CI	1913	440	N	E4	H	WWD		0.63	0.63	1.25	0.00	0.00	2.50
187	Heroux Avenue		Woonsocket	6	CI	1913	400	N	C5	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
188	St. Barnabe Street		Woonsocket	6	CI	1913	280	Y	E5	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
189	Trent Street		Woonsocket	6	CI	1913	440	N	A3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
190	Cote Avenue		Woonsocket	6	CI	1914	890	N	C6	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
191	Baxter Street		Woonsocket	6	CI	1915	240	N	F2	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
192	Read Avenue		Woonsocket	6	CI	1915	370	Y	C5	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
193	Rhode Island Avenue		Woonsocket	6	CI	1915	360	N	E5	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
194	Meadow Road		Woonsocket	6	CI	1916	980	N	B3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
195	Mechanic Avenue		Woonsocket	6	CI	1916	520	N	B3	L	WWD		0.63	0.63	1.25	0.00	0.00	2.50
196	Williams Street		Woonsocket	6	CI	1916	760	N	F4	H	WWD		0.63	0.63	1.25	0.00	0.00	2.50
197	Gilfillan Road, NS	includes end of Homestead	N. Smithfield	6	CI	1959	740	Y	F1	L	J.H. O'Donnell		0.63	0.63	0.50	0.63	0.00	2.38
198	Dewey Street		Woonsocket	6	CI	1917	460	N	A5	L	WWD	break 1/15	0.63	0.63	1.00	0.00	0.00	2.25
199	Monty Avenue		Woonsocket	8	CI	1930	860	N	G3	H	WWD	break 1/87	0.00	0.63	1.00	0.00	0.63	2.25
200	St. Leon Avenue	up to jog	Woonsocket	8	CI	1932	1200	N	A6	L	WWD	break 1/93	0.00	0.63	1.00	0.00	0.63	2.25
201	All Saints Street		Woonsocket	8	CI	1932	750	N	B6	L	WWD	break 1982 (St.Cecile to St. Louis)	0.00	0.63	1.00	0.00	0.63	2.25
202	Hamilton Street		Woonsocket	6	CI	1921	620	N	E4	H	WWD	break 2/14	0.63	0.63	1.00	0.00	0.00	2.25
203	Reservoir Avenue		Woonsocket	12	CI	1919	2660	N	F5	L	WWD	break 5/78	0.00	0.63	1.00	0.00	0.63	2.25

Appendix J
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Main Database Sorted by Total Rating

Pipe Rank	Street	Location	City/Town	Size (in.)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments	Rating Schedule 1 Size	2 Type	3 Age	4 Ownership	5 Breaks	Total
204	Warren Avenue, NS		N. Smithfield	6	CI	1928	380	Y	E1	L	WWD	break 7/07	0.63	0.63	1.00	0.00	0.00	2.25
205	Francis Street		Woonsocket	6	CI	1917	220	N	C3	L	WWD		0.63	0.63	1.00	0.00	0.00	2.25
206	Laval Street		Woonsocket	6	CI	1917	480	N	D5	L	WWD		0.63	0.63	1.00	0.00	0.00	2.25
207	Victor Street		Woonsocket	6	CI	1917	300	N	D6	L	WWD		0.63	0.63	1.00	0.00	0.00	2.25
208	Foundry Street		Woonsocket	6	CI	1919	180	Y	D2	L	WWD		0.63	0.63	1.00	0.00	0.00	2.25
209	Lafayette Street		Woonsocket	6	CI	1919	320	N	D6	L	WWD		0.63	0.63	1.00	0.00	0.00	2.25
210	Snow Street		Woonsocket	6	CI	1919	400	Y	B4	L	WWD		0.63	0.63	1.00	0.00	0.00	2.25
211	Verry Street		Woonsocket	6	CI	1919	840	N	C3	L	WWD		0.63	0.63	1.00	0.00	0.00	2.25
212	Crawford Street		Woonsocket	6	CI	1920	360	N	E4	H	WWD		0.63	0.63	1.00	0.00	0.00	2.25
213	Hill Street		Woonsocket	6	CI	1920	540	Y	E3	H	WWD		0.63	0.63	1.00	0.00	0.00	2.25
214	Ward Street	Kennedy to Transit	Woonsocket	6	CI	1920	560	N	E3	H	WWD		0.63	0.63	1.00	0.00	0.00	2.25
215	Mill Street		Woonsocket	6	CI	1921	610	N	A5	L	WWD		0.63	0.63	1.00	0.00	0.00	2.25
216	Robinson Street		Woonsocket	6	CI	1921	500	N	B5	L	WWD		0.63	0.63	1.00	0.00	0.00	2.25
217	Upland Road		Woonsocket	6	CI	1921	640	N	B3	L	WWD		0.63	0.63	1.00	0.00	0.00	2.25
218	Chalapa Avenue		Woonsocket	6	CI	1922	570	Y	B5	L	WWD		0.63	0.63	1.00	0.00	0.00	2.25
219	Fairmount Street		Woonsocket	6	CI	1922	280	N	C2	L	WWD		0.63	0.63	1.00	0.00	0.00	2.25
220	Homestead Road		Woonsocket	6	CI	1923	200	Y	B3	L	WWD		0.63	0.63	1.00	0.00	0.00	2.25
221	Elmore Street		Woonsocket	6	CI	1927	120	Y	G3	H	WWD		0.63	0.63	1.00	0.00	0.00	2.25
222	Crest Road, NS		N. Smithfield	6	CI	1928	500	N	G2	H	WWD		0.63	0.63	1.00	0.00	0.00	2.25
223	Great Road, NS	S. Main to end	N. Smithfield	6	CI	1928	260	Y	F1	L	WWD		0.63	0.63	1.00	0.00	0.00	2.25
224	Smithfield Road, NS	Crest to Providence	N. Smithfield	6	CI	1928	420	N	F2	H	WWD		0.63	0.63	1.00	0.00	0.00	2.25
225	Woonsocket Hill Road, NS		N. Smithfield	6	CI	1928	2040	N	F1	L	WWD		0.63	0.63	1.00	0.00	0.00	2.25
226	Buell Avenue, NS		N. Smithfield	1	CT	1960	100	Y	G2	H	WWD		1.25	0.38	0.50	0.00	0.00	2.13
227	Lydia Avenue		Woonsocket	8	CI	1954	3360	Y	G5	L	WWD	break 10/90	0.00	0.63	0.75	0.00	0.63	2.00
228	Priscilla Road		Woonsocket	8	CI	1956	850	N	C8	H	WWD	break 12/78	0.00	0.63	0.75	0.00	0.63	2.00
229	Roberta Avenue	Andrews to Alice	Woonsocket	6	CI	1954	340	N	E1	L	WWD	break 3/17	0.63	0.63	0.75	0.00	0.00	2.00
230	Morse Avenue	between 8" sections	Woonsocket	6	CI	1954	340	N	E1	L	WWD	should be looped	0.63	0.63	0.75	0.00	0.00	2.00
231	Weeks Street, NS	includes some Buell Avenue	N. Smithfield	8	CI	1954	700	Y	G2	H	Francis Thayer		0.00	0.63	0.75	0.63	0.00	2.00
232	Chapel Street		Woonsocket	6	CI	1942	240	N	D1	L	WWD		0.63	0.63	0.75	0.00	0.00	2.00
233	Newland Avenue		Woonsocket	6	CI	1947	480	N	D6	L	WWD		0.63	0.63	0.75	0.00	0.00	2.00
234	Priscilla Road		Woonsocket	6	CI	1949	280	N	C8	H	WWD		0.63	0.63	0.75	0.00	0.00	2.00
235	Redwood Street		Woonsocket	6	CI	1955	150	Y	F2	H	WWD		0.63	0.63	0.75	0.00	0.00	2.00
236	Harrison Avenue		Woonsocket	8	CI	1892	680	N	C4	L	WWD	break 1/09	0.00	0.63	1.25	0.00	0.00	1.88
237	Hazel Street		Woonsocket	8	CI	1905	940	N	B4	L	WWD	break 11/10	0.00	0.63	1.25	0.00	0.00	1.88
238	Fourth Avenue		Woonsocket	8	CI	1913	420	N	C2	L	WWD	break 12/14	0.00	0.63	1.25	0.00	0.00	1.88
239	Clinton Street		Woonsocket	12	CI	1888	1900	N	C4	L	WWD	break 2/08	0.00	0.63	1.25	0.00	0.00	1.88
240	Bertenshaw Road		Woonsocket	8	CI	1908	1280	N	F5	L	WWD	break 2/09	0.00	0.63	1.25	0.00	0.00	1.88
241	Rathbun Street		Woonsocket	12	CI	1887	2640	N	A5	L	WWD	break 6/10	0.00	0.63	1.25	0.00	0.00	1.88
242	Water Street		Woonsocket	8	CI	1891	420	N	C3	L	WWD	break 6/11	0.00	0.63	1.25	0.00	0.00	1.88
243	Cumberland Hill Road	Hamlet to Mendon	Woonsocket	12	CI	1902	6000	N	E6	L	WWD	break 7/13	0.00	0.63	1.25	0.00	0.00	1.88
244	Pond Street		Woonsocket	12	CI	1891	3180	N	B4	L	WWD	includes 18" parallel pipes	0.00	0.63	1.25	0.00	0.00	1.88
245	Kendrick Avenue	incl. walkway	Woonsocket	12	CI	1889	960	N	C5	L	WWD	parallel pipes	0.00	0.63	1.25	0.00	0.00	1.88
246	Manville Road	Bertenshaw to Gadoury Blvd.	Woonsocket	12	CI	1906	490	Y	G5	L	WWD	parallel pipes	0.00	0.63	1.25	0.00	0.00	1.88
247	Elm Street		Woonsocket	8	CI	1913	2900	N	C6	L	WWD	parallel pipes	0.00	0.63	1.25	0.00	0.00	1.88
248	Davison Avenue		Woonsocket	12	CI	1916	1120	N	D5	L	WWD	parallel pipes	0.00	0.63	1.25	0.00	0.00	1.88
249	Davison Avenue		Woonsocket	12	CI	1916	1120	N	D5	L	WWD	parallel pipes	0.00	0.63	1.25	0.00	0.00	1.88
250	Florence Drive		Woonsocket	12	CI	1916	1100	N	C5	L	WWD	parallel pipes	0.00	0.63	1.25	0.00	0.00	1.88
251	Florence Drive		Woonsocket	12	CI	1916	1100	N	C5	L	WWD	parallel pipes	0.00	0.63	1.25	0.00	0.00	1.88
252	Kendrick Avenue	under river	Woonsocket	12	CI	1916	150	N	C5	L	WWD	parallel pipes	0.00	0.63	1.25	0.00	0.00	1.88
253	Sayles Street		Woonsocket	8	CI	1885	360	N	C3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
254	Social Street		Woonsocket	12	CI	1885	820	N	B5	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
255	Grove Street		Woonsocket	8	CI	1886	760	N	D4	H	WWD		0.00	0.63	1.25	0.00	0.00	1.88
256	Grove Street	Bernon to Carrington	Woonsocket	8	CI	1886	960	N	D4	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
257	South Street		Woonsocket	8	CI	1886	360	N	D2	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
258	Grove Street		Woonsocket	12	CI	1886	480	N	D4	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
259	Church Street		Woonsocket	8	CI	1887	1240	N	C3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
260	Orchard Street	Ballou to Providence	Woonsocket	8	CI	1887	960	N	E2	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
261	Pine Street		Woonsocket	8	CI	1887	640	N	D3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
262	Arnold Street	Railroad to Blackstone	Woonsocket	8	CI	1888	940	N	C3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
263	Arnold Street	Bentley to Main	Woonsocket	8	CI	1888	1400	N	C3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
264	Cass Avenue		Woonsocket	8	CI	1889	3180	N	C6	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
265	Center Street		Woonsocket	8	CI	1889	1000	N	D3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
266	East Street		Woonsocket	8	CI	1889	960	N	D3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
267	First Avenue		Woonsocket	8	CI	1889	1300	N	C2	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
268	Fountain Street		Woonsocket	8	CI	1889	820	N	C3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
269	High Street		Woonsocket	8	CI	1889	700	N	C3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
270	Mason Street		Woonsocket	8	CI	1889	3080	N	D2	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
271	Summer Street		Woonsocket	8	CI	1889	1310	Y	A3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88

Appendix J
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Main Database Sorted by Total Rating

													Rating Schedule					
Pipe Rank	Street	Location	City/Town	Size (in.)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments	1 Size	2 Type	3 Age	4 Ownership	5 Breaks	Total
272	Union Street		Woonsocket	8	CI	1889	580	N	D3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
273	Watson Street		Woonsocket	8	CI	1889	420	N	D3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
274	Blackstone Street		Woonsocket	12	CI	1889	3160	N	C3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
275	Cumberland Street		Woonsocket	12	CI	1889	2260	N	C5	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
276	East School Street	N. Main to Pond	Woonsocket	12	CI	1889	470	N	B3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
277	East School Street	Meter Pits to	Woonsocket	12	CI	1889	1380	N	B4	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
278	Main Street		Woonsocket	12	CI	1889	2500	N	C3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
279	Transit Street		Woonsocket	12	CI	1889	1240	N	E3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
280	Canal Street		Woonsocket	8	CI	1890	320	Y	C3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
281	Park Avenue	Logee to Smithfield	Woonsocket	8	CI	1890	4660	N	E3	H	WWD		0.00	0.63	1.25	0.00	0.00	1.88
282	Vose Street		Woonsocket	8	CI	1890	980	N	E3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
283	Wilson Avenue		Woonsocket	8	CI	1890	540	Y	D4	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
284	Avenue C		Woonsocket	8	CI	1891	1380	N	E2	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
285	Bernice Avenue		Woonsocket	8	CI	1891	1280	N	E2	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
286	Brook Street		Woonsocket	8	CI	1891	440	Y	B5	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
287	Harris Avenue	Winter to Lyman	Woonsocket	8	CI	1891	900	N	B3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
288	Providence Street		Woonsocket	8	CI	1891	1320	Y	E2	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
289	Transit Street		Woonsocket	8	CI	1891	1280	Y	E3	H	WWD		0.00	0.63	1.25	0.00	0.00	1.88
290	Front Street		Woonsocket	12	CI	1891	320	N	D3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
291	Daniels Street		Woonsocket	8	CI	1892	230	N	B4	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
292	Morton Avenue		Woonsocket	8	CI	1892	760	N	C4	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
293	River Street		Woonsocket	8	CI	1892	260	N	B2	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
294	Short Street		Woonsocket	8	CI	1893	260	N	C2	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
295	Railroad Street		Woonsocket	12	CI	1894	1280	N	C3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
296	Wood Avenue		Woonsocket	12	CI	1894	1000	N	A5	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
297	East School Street	Pond to meter pits	Woonsocket	8	CI	1895	1160	N	B3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
298	Wood Avenue		Woonsocket	8	CI	1895	810	N	C5	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
299	Alice Avenue		Woonsocket	12	CI	1895	780	N	E1	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
300	Allen Street		Woonsocket	8	CI	1896	950	Y	D3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
301	Oak Street	Mason to South	Woonsocket	8	CI	1896	820	N	D2	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
302	West School Street		Woonsocket	8	CI	1896	1160	N	B3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
303	Fairmount Street		Woonsocket	8	CI	1897	1940	Y	C1	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
304	Valley Street		Woonsocket	8	CI	1897	240	Y	E3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
305	Winter Street		Woonsocket	8	CI	1897	3050	N	A3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
306	Social Street		Woonsocket	8	CI	1898	960	N	A5	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
307	Sunnyside Avenue		Woonsocket	8	CI	1898	1240	N	D2	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
308	Estes Street	Bellingham to Social	Woonsocket	8	CI	1899	420	N	A5	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
309	Spring Street		Woonsocket	8	CI	1899	1000	N	B3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
310	North Ballou Street		Woonsocket	8	CI	1900	280	N	E2	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
311	Third Avenue	Fairmount to 6"	Woonsocket	8	CI	1900	1480	N	C2	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
312	Villa Nova Street		Woonsocket	8	CI	1901	740	N	C5	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
313	George Street		Woonsocket	8	CI	1902	440	N	A5	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
314	Harris Avenue	Huntington to Fairlawn	Woonsocket	8	CI	1902	560	N	A2	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
315	Newland Avenue		Woonsocket	8	CI	1902	1340	Y	D6	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
316	Division Street		Woonsocket	12	CI	1902	520	N	E4	H	WWD		0.00	0.63	1.25	0.00	0.00	1.88
317	Bernon Street		Woonsocket	8	CI	1905	540	N	D4	H	WWD		0.00	0.63	1.25	0.00	0.00	1.88
318	Bernon Street	Greene to Grove	Woonsocket	8	CI	1905	720	N	D4	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
319	Crawford Street		Woonsocket	8	CI	1905	300	N	E4	H	WWD		0.00	0.63	1.25	0.00	0.00	1.88
320	Farm Street		Woonsocket	8	CI	1905	640	N	A3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
321	Harris Avenue	Blackstone to Verry	Woonsocket	8	CI	1905	330	N	C3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
322	Huntington Avenue		Woonsocket	8	CI	1905	200	N	A2	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
323	Vine Street		Woonsocket	8	CI	1905	200	N	A3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
324	Fairmount Street		Woonsocket	8	CI	1907	1700	N	C2	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
325	Henry Street		Woonsocket	8	CI	1908	380	Y	C6	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
326	Middle Street		Woonsocket	8	CI	1908	570	N	E2	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
327	Rivulet Street		Woonsocket	8	CI	1908	960	N	A3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
328	Knight Street		Woonsocket	8	CI	1910	2320	N	E4	H	WWD		0.00	0.63	1.25	0.00	0.00	1.88
329	Sixth Avenue	Fairmount to Dead End	Woonsocket	8	CI	1910	280	Y	C2	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
330	Sixth Avenue	Mason to Chapel	Woonsocket	8	CI	1910	720	N	D2	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
331	Third Avenue	Laurel to Scotia	Woonsocket	8	CI	1910	440	N	B2	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
332	Harris Avenue	Lyman to Blackstone	Woonsocket	12	CI	1911	560	N	B3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
333	Singleton Street		Woonsocket	12	CI	1911	2040	N	B2	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
334	Fifth Avenue		Woonsocket	8	CI	1912	1180	N	D2	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
335	Hebert Avenue		Woonsocket	8	CI	1913	880	N	C6	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
336	Phebe Street		Woonsocket	8	CI	1913	460	N	A3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
337	Rebekah Street		Woonsocket	8	CI	1913	720	N	A3	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
338	Aylsworth Avenue		Woonsocket	8	CI	1914	3700	N	D6	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88

Appendix J
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Main Database Sorted by Total Rating

Pipe Rank	Street	Location	City/Town	Size (in.)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments	Rating Schedule 1 Size	2 Type	3 Age	4 Ownership	5 Breaks	Total
339	Rhode Island Avenue		Woonsocket	8	CI	1915	560	Y	E5	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
340	Mount Saint Charles Avenue		Woonsocket	12	CI	1915	450	Y	E5	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
341	Hamlet Avenue	Florence to C-5-68	Woonsocket	12	CI	1916	380	N	C5	L	WWD		0.00	0.63	1.25	0.00	0.00	1.88
342	Glaude Lane		Woonsocket	8	DI	1962	1300	Y	A9	H	WWD	break 1/07, 1/14	0.00	0.00	0.50	0.00	1.25	1.75
343	Miles Avenue		Woonsocket	8	DI	1972	460	N	F5	L	WWD	break 1/85,1/97, 10/10	0.00	0.00	0.50	0.00	1.25	1.75
344	Halsey Road		Woonsocket	8	CI	1958	1480	N	C8	H	WWD	break 1/97	0.00	0.63	0.50	0.00	0.63	1.75
345	Marian Lane		Woonsocket	8	AC	1974	240	N	F5	L	WWD	break 11/94	0.00	0.63	0.50	0.00	0.63	1.75
346	Dawn Boulevard		Woonsocket	8	DI	1962	540	N	A9	H	WWD	break 12/78, 12/08, 1/11	0.00	0.00	0.50	0.00	1.25	1.75
347	Diamond Hill Road		Woonsocket	12	DI	1969	6080	N	A8	H	WWD	break 12/81,4/83	0.00	0.00	0.50	0.00	1.25	1.75
348	Dunlap Street		Woonsocket	8	CI	1958	580	Y	B7	L	WWD	break 12/91	0.00	0.63	0.50	0.00	0.63	1.75
349	Cottage Street		Woonsocket	8	CI	1960	980	Y	E3	H	WWD	break 12/95	0.00	0.63	0.50	0.00	0.63	1.75
350	Morris Street		Woonsocket	8	AC	1974	320	Y	A7	L	WWD	break 9/87	0.00	0.63	0.50	0.00	0.63	1.75
351	Stoneham Drive		Woonsocket	8	DI	1971	890	N	B9	H	WWD	breaks 1/07, 3/17	0.00	0.00	0.50	0.00	1.25	1.75
352	Knollwood Drive		Woonsocket	8	DI	1967	4200	Y	B8	H	WWD	breaks 1/11, 2/17	0.00	0.00	0.50	0.00	1.25	1.75
353	Wayne Road		Woonsocket	8	DI	1960	620	Y	B7	L	WWD	breaks 1/84,1/89	0.00	0.00	0.50	0.00	1.25	1.75
354	Woodhaven Road		Woonsocket	8	DI	1971	1080	N	B9	H	WWD	breaks 1/85,12/87,12/94,1/96	0.00	0.00	0.50	0.00	1.25	1.75
355	Coolidge Avenue		Woonsocket	8	DI	1960	540	N	B7	L	WWD	breaks 1/93, 11/15	0.00	0.00	0.50	0.00	1.25	1.75
356	Bayberry Road		Woonsocket	8	DI	1968	1540	N	C9	H	WWD	breaks 1/95, 10/07	0.00	0.00	0.50	0.00	1.25	1.75
357	Grandview Avenue		Woonsocket	8	DI	1969	3140	N	B9	H	WWD	breaks 12/88, 12/07, 1/09, 2/13, 1/14, 2/14	0.00	0.00	0.50	0.00	1.25	1.75
358	Country Road		Woonsocket	8	DI	1970	1060	N	B9	H	WWD	breaks 2/07, 2/14, 1/17	0.00	0.00	0.50	0.00	1.25	1.75
359	Lemay Road		Woonsocket	8	DI	1961	1000	N	C8	H	WWD	breaks 2/85, 2/14, 1/15	0.00	0.00	0.50	0.00	1.25	1.75
360	State Street		Woonsocket	8	DI	1964	320	Y	A3	L	WWD	breaks 2/87,12/91,2/92	0.00	0.00	0.50	0.00	1.25	1.75
361	Mendon Road Driveway, NS		N. Smithfield	8	CI	1964	660	Y	CNS	H	A.F. Pacheco		0.00	0.63	0.50	0.63	0.00	1.75
362	Village Road		Woonsocket	8	AC	1973	1080	Y	B7	H	Plaza Village Group		0.00	0.63	0.50	0.63	0.00	1.75
363	Patton Road		Woonsocket	8	AC	1973	280	Y	B7	H	Woon. Housing Authority		0.00	0.63	0.50	0.63	0.00	1.75
364	Rock Ridge Drive		Woonsocket	6	DI	1973	340	Y	B7	H	Woon. Housing Authority		0.63	0.00	0.50	0.63	0.00	1.75
365	Rock Ridge Drive		Woonsocket	6	DI	1973	520	Y	B7	H	Woon. Housing Authority		0.63	0.00	0.50	0.63	0.00	1.75
366	Lucille Street		Woonsocket	8	CI	1930	2080	Y	G6	L	WWD	both dead end?	0.00	0.63	1.00	0.00	0.00	1.63
367	Ballou Street		Woonsocket	8	CI	1917	1720	N	E2	L	WWD	break 2/07	0.00	0.63	1.00	0.00	0.00	1.63
368	Cady Street		Woonsocket	8	CI	1937	720	Y	D6	L	WWD	extension 1988	0.00	0.63	1.00	0.00	0.00	1.63
369	Cass Avenue		Woonsocket	10	CI	1921	2160	N	C6	L	WWD	parallel pipes	0.00	0.63	1.00	0.00	0.00	1.63
370	Elm Street		Woonsocket	10	CI	1921	3500	N	C6	L	WWD	parallel pipes	0.00	0.63	1.00	0.00	0.00	1.63
371	Carnation Street		Woonsocket	8	CI	1922	1680	N	F3	H	WWD	parallel pipes	0.00	0.63	1.00	0.00	0.00	1.63
372	Rhodes Avenue	up to 14" at River St.	Woonsocket	12	CI	1929	1100	N	B2	L	WWD	parallel pipes	0.00	0.63	1.00	0.00	0.00	1.63
373	Carnation Street		Woonsocket	10	CI	1930	480	N	F3	H	WWD	parallel pipes	0.00	0.63	1.00	0.00	0.00	1.63
374	Diamond Hill Road		Woonsocket	12	CI	1925	7450	N	A7	L	WWD	parallel pipes, break 12//07	0.00	0.63	1.00	0.00	0.00	1.63
375	Smithfield Road, NS		N. Smithfield	8	CI	1928	440	Y	G3	H	WWD	SS#9470	0.00	0.63	1.00	0.00	0.00	1.63
376	Eighth Avenue	Chestnut to Walnut	Woonsocket	8	CI	1917	340	Y	C1	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
377	Richelieu Street		Woonsocket	8	CI	1917	380	N	D6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
378	Robinson Street	Winthrop to Morin Heights	Woonsocket	8	CI	1917	1200	N	B6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
379	Winthrop Street		Woonsocket	8	CI	1917	1600	N	B6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
380	Robinson Street		Woonsocket	8	CI	1919	860	N	B5	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
381	Ella Avenue		Woonsocket	8	CI	1919	400	N	B6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
382	Rutland Street	Elm to Robinson	Woonsocket	8	CI	1920	400	N	B6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
383	Sixth Avenue	Rhodes to Sycamore	Woonsocket	8	CI	1920	450	N	B1	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
384	Cherry Hill Avenue		Woonsocket	8	CI	1921	440	Y	B2	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
385	Cleveland Street		Woonsocket	8	CI	1921	400	N	E4	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
386	Dana Street		Woonsocket	8	CI	1921	1360	N	C7	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
387	Napoleon Street		Woonsocket	8	CI	1921	320	N	F3	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
388	Providence Street		Woonsocket	8	CI	1921	1280	N	F2	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
389	Warwick Street		Woonsocket	8	CI	1921	880	N	F3	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
390	Oxford Avenue		Woonsocket	12	CI	1921	340	N	E4	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
391	Cooper Avenue		Woonsocket	8	CI	1922	1080	N	F4	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
392	Kenwood Street		Woonsocket	8	CI	1922	740	Y	D7	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
393	Newport Street		Woonsocket	8	CI	1922	800	N	F3	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
394	Progresso Avenue		Woonsocket	8	CI	1922	1040	N	B5	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
395	Yolande Place		Woonsocket	8	CI	1922	345	N	B6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
396	River Street		Woonsocket	12	CI	1922	150	N	B2	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
397	Second Avenue		Woonsocket	12	CI	1923	720	N	B2	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
398	Beech Street		Woonsocket	8	CI	1924	380	N	E2	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
399	Eighth Avenue	Mason to Fairmount	Woonsocket	8	CI	1924	860	N	D1	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
400	Elmore Street		Woonsocket	8	CI	1924	640	N	F3	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
401	Fairlawn Avenue		Woonsocket	8	CI	1924	520	N	A2	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
402	Hemond Avenue		Woonsocket	8	CI	1924	1100	Y	G3	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
403	Mailloux Street		Woonsocket	8	CI	1924	330	Y	C5	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
404	Minerva Street		Woonsocket	8	CI	1924	480	N	F3	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
405	Mitris Boulevard		Woonsocket	8	CI	1924	880	N	B7	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
406	Monroe Street		Woonsocket	12	CI	1924	1160	Y	E4	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
407	Buxton Street		Woonsocket	8	CI	1925	240	N	D2	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63

Appendix J
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Main Database Sorted by Total Rating

Pipe Rank	Street	Location	City/Town	Size (in.)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments	Rating Schedule 1 Size	2 Type	3 Age	4 Ownership	5 Breaks	Total
408	East Mill Street		Woonsocket	8	CI	1925	350	Y	A5	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
409	Florida Street		Woonsocket	8	CI	1925	440	N	B6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
410	Loring Street		Woonsocket	8	CI	1925	620	Y	D7	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
411	Parker Street		Woonsocket	8	CI	1925	580	Y	D3	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
412	Piedmont Street		Woonsocket	8	CI	1925	1220	N	F3	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
413	Salisbury Street		Woonsocket	8	CI	1925	240	N	A5	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
414	Verdun Street		Woonsocket	8	CI	1925	400	N	E5	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
415	Warner Street		Woonsocket	8	CI	1925	180	Y	A3	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
416	Woodland Road		Woonsocket	8	CI	1925	1140	N	A3	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
417	Atlanta Street		Woonsocket	8	CI	1926	700	Y	A6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
418	Bailey Street		Woonsocket	8	CI	1926	900	N	F3	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
419	Chestnut Street		Woonsocket	8	CI	1926	500	N	C2	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
420	Gaskill Street	Harris to Edmund	Woonsocket	8	CI	1926	700	N	A2	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
421	Mill Street, NS		N. Smithfield	8	CI	1926	280	Y	A1	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
422	Burnside Avenue		Woonsocket	8	CI	1927	480	Y	A5	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
423	Kermit Street		Woonsocket	8	CI	1927	500	N	F3	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
424	LeBrun Avenue		Woonsocket	8	CI	1927	680	N	C6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
425	Ormond Street		Woonsocket	8	CI	1927	240	N	F3	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
426	St. Cecile Avenue		Woonsocket	8	CI	1927	1140	N	A6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
427	Trent Street		Woonsocket	8	CI	1927	530	N	A3	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
428	Canal Street, NS		N. Smithfield	8	CI	1928	2180	Y	A1	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
429	Cranston Street		Woonsocket	8	CI	1928	960	N	F3	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
430	Great Road, NS	Morse to S. Main	N. Smithfield	8	CI	1928	1120	N	E1	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
431	Lafayette Street		Woonsocket	8	CI	1928	200	N	D6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
432	Montcalm Street		Woonsocket	8	CI	1928	200	Y	D5	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
433	Morse Avenue, NS		N. Smithfield	8	CI	1928	480	Y	E1	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
434	Nursery Avenue		Woonsocket	8	CI	1928	1880	N	C7	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
435	Ross Street		Woonsocket	8	CI	1928	240	N	E3	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
436	Smithfield Road, NS	Providence to White	N. Smithfield	8	CI	1928	880	N	G2	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
437	White Parkway, NS		N. Smithfield	8	CI	1928	1540	Y	G2	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
438	Mendon Road	Diamond Hill to Cumberland line	Woonsocket	12	CI	1928	11500	N	A7	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
439	Benelli Street		Woonsocket	8	CI	1929	270	Y	A6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
440	Jackson Street		Woonsocket	8	CI	1929	420	N	E4	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
441	Newbury Avenue		Woonsocket	8	CI	1929	1380	N	E6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
442	Phillips Street		Woonsocket	8	CI	1929	1380	N	G6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
443	Beausoleil Street		Woonsocket	12	CI	1929	600	Y	G7	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
444	Burrington Street		Woonsocket	8	CI	1930	1460	N	G6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
445	Congress Street		Woonsocket	8	CI	1930	800	Y	D6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
446	Fournier Street		Woonsocket	8	CI	1930	800	N	G3	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
447	Havelock Street		Woonsocket	8	CI	1930	80	Y	A5	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
448	Laflamme Avenue		Woonsocket	8	CI	1930	180	N	G3	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
449	Linden Avenue	up to B-6-11	Woonsocket	8	CI	1930	1350	N	A6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
450	Oakton Street		Woonsocket	8	CI	1930	860	N	F3	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
451	Olive Street		Woonsocket	8	CI	1930	780	N	G6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
452	Seamans Street		Woonsocket	8	CI	1930	580	Y	G6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
453	Tache Street		Woonsocket	8	CI	1930	480	N	G3	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
454	Vivian Street		Woonsocket	8	CI	1930	680	N	G6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
455	Knight Street		Woonsocket	10	CI	1930	1880	N	E4	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
456	Hamilton Street		Woonsocket	12	CI	1930	960	N	E4	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
457	Rodman Street		Woonsocket	8	CI	1931	800	Y	D7	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
458	Temple Street		Woonsocket	8	CI	1931	300	N	A3	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
459	Talcott Street	Seamans to Olive	Woonsocket	12	CI	1931	1060	N	F6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
460	Hope Street		Woonsocket	8	CI	1932	780	N	D3	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
461	Joffre Avenue		Woonsocket	8	CI	1932	1320	Y	F5	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
462	Manila Avenue		Woonsocket	8	CI	1932	1060	Y	D7	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
463	Olo Street	East to Center	Woonsocket	8	CI	1932	440	N	D3	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
464	Oregon Avenue		Woonsocket	8	CI	1932	1200	Y	D7	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
465	Papineau Avenue		Woonsocket	8	CI	1932	760	N	C7	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
466	Pelletier Avenue		Woonsocket	8	CI	1932	600	N	E1	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
467	Warren Avenue		Woonsocket	8	CI	1932	520	N	E1	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
468	Greene Street		Woonsocket	12	CI	1932	1020	N	D4	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
469	Harris Avenue	Fairlawn to Winter	Woonsocket	12	CI	1932	1700	N	B3	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
470	Beacon Avenue		Woonsocket	8	CI	1933	1480	N	C6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
471	Conrad Street		Woonsocket	8	CI	1933	660	N	C7	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
472	Lilac Avenue		Woonsocket	8	CI	1933	980	N	F5	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
473	Roberts Street		Woonsocket	8	CI	1933	340	Y	D5	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
474	Angell Street		Woonsocket	8	CI	1934	750	N	E3	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
475	Glendale Avenue		Woonsocket	8	CI	1934	1040	Y	F5	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63

Appendix J
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Main Database Sorted by Total Rating

													Rating Schedule					
Pipe Rank	Street	Location	City/Town	Size (in.)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments	1 Size	2 Type	3 Age	4 Ownership	5 Breaks	Total
476	Mowry Street	Foster to Park	Woonsocket	8	CI	1934	1220	N	F3	H	WWD		0.00	0.63	1.00	0.00	0.00	1.63
477	St. Hughes Street		Woonsocket	8	CI	1934	950	N	E5	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
478	Breault Avenue		Woonsocket	8	CI	1935	480	N	E2	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
479	Libbeus Street		Woonsocket	8	CI	1935	460	N	B3	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
480	Poplar Street		Woonsocket	8	CI	1935	1180	Y	B7	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
481	Rutland Street	Robinson to dead end	Woonsocket	8	CI	1935	600	Y	B6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
482	Desrochers Avenue		Woonsocket	8	CI	1936	240	Y	C6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
483	Denby Street		Woonsocket	8	CI	1937	375	N	A6	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
484	Tenth Avenue		Woonsocket	8	CI	1937	480	N	D1	L	WWD		0.00	0.63	1.00	0.00	0.00	1.63
485	Holley Lane		Woonsocket	6	DI	1988	1880	Y	D7	H	Carron Associates		0.63	0.00	0.25	0.63	0.00	1.50
486	Flora Avenue		Woonsocket	8	CI	1956	1280	N	G5	L	WWD	break 1/10	0.00	0.63	0.75	0.00	0.00	1.38
487	Hayes Street		Woonsocket	8	CI	1949	1060	N	B6	L	WWD	break 1/17	0.00	0.63	0.75	0.00	0.00	1.38
488	Annette Avenue		Woonsocket	8	CI	1953	1300	Y	C8	H	WWD	break 1/17	0.00	0.63	0.75	0.00	0.00	1.38
489	Elder Ballou Meetinghouse Rd		Woonsocket	12	CI	1949	830	Y	C7	L	WWD	break 10/09	0.00	0.63	0.75	0.00	0.00	1.38
490	Elder Ballou Meetinghouse Rd		Woonsocket	8	CI	1949	1060	N	C8	H	WWD	break 2/10	0.00	0.63	0.75	0.00	0.00	1.38
491	Morse Avenue	juts into NS	Woonsocket	8	CI	1954	160	Y	E1	L	WWD	should be looped	0.00	0.63	0.75	0.00	0.00	1.38
492	Fabien Street		Woonsocket	8	CI	1939	380	Y	F2	H	WWD		0.00	0.63	0.75	0.00	0.00	1.38
493	Fairfield Avenue		Woonsocket	8	CI	1939	1180	Y	F5	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
494	Larch Street		Woonsocket	8	CI	1939	1560	N	G6	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
495	Rome Avenue	Diamond Hill to end	Woonsocket	8	CI	1939	80	N	A6	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
496	Birch Street		Woonsocket	8	CI	1940	350	N	B5	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
497	Smithfield Road, NS	Buell to Crest	N. Smithfield	8	CI	1940	150	Y	F2	H	WWD		0.00	0.63	0.75	0.00	0.00	1.38
498	Arlington Street		Woonsocket	8	CI	1941	475	N	C7	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
499	Benefit Street		Woonsocket	8	CI	1941	560	N	E3	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
500	Emerson Street		Woonsocket	8	CI	1941	380	N	C5	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
501	Franklin Street		Woonsocket	8	CI	1941	360	N	F2	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
502	Lambert Avenue		Woonsocket	8	CI	1941	740	N	C7	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
503	Lexington Street		Woonsocket	8	CI	1941	300	N	C7	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
504	Ward Street	Transit to Vose	Woonsocket	8	CI	1941	680	Y	E3	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
505	Louise Street		Woonsocket	8	CI	1942	1060	Y	G6	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
506	Norman Street		Woonsocket	8	CI	1942	280	N	F6	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
507	Olive Street		Woonsocket	8	CI	1942	420	Y	F6	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
508	Cumberland Street		Woonsocket	8	CI	1943	800	N	C5	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
509	Kennedy Street	includes part of Ward	Woonsocket	8	CI	1945	800	N	F3	H	WWD		0.00	0.63	0.75	0.00	0.00	1.38
510	Notheast Street		Woonsocket	8	CI	1945	170	Y	C3	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
511	Darwin Street		Woonsocket	8	CI	1946	420	N	E3	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
512	Olympia Avenue		Woonsocket	8	CI	1946	560	Y	D7	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
513	Virginia Avenue		Woonsocket	8	CI	1946	1360	Y	E6	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
514	Bartlett Street		Woonsocket	12	CI	1947	380	Y	D7	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
515	Janet Avenue		Woonsocket	8	CI	1948	340	Y	C6	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
516	Lefrancois Boulevard		Woonsocket	8	CI	1948	820	N	C7	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
517	Talcott Street		Woonsocket	8	CI	1948	760	N	G6	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
518	16" TRANSMISSION	Hamman Plant to Mendon Rd	Woonsocket	16	CI	1948	2870	N	G5	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
519	Norman Street		Woonsocket	8	CI	1949	600	N	F6	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
520	St. Louis Avenue		Woonsocket	8	CI	1949	1120	N	A6	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
521	Elder Ballou Meetinghouse Rd		Woonsocket	12	CI	1949	320	Y	C8	H	WWD		0.00	0.63	0.75	0.00	0.00	1.38
522	Circle Street		Woonsocket	8	CI	1950	360	Y	E5	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
523	Craigie Avenue		Woonsocket	8	CI	1953	550	N	E6	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
524	Ridge Street		Woonsocket	8	CI	1953	940	N	B7	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
525	Ruskin Avenue		Woonsocket	8	CI	1953	670	N	E6	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
526	Sidney Avenue		Woonsocket	8	CI	1953	680	N	E6	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
527	St Agnes Avenue		Woonsocket	8	CI	1953	1120	N	A6	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
528	Campeau Street		Woonsocket	8	CI	1954	720	N	C7	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
529	Cliffe Avenue		Woonsocket	8	CI	1954	560	N	E7	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
530	Gadoury Boulevard		Woonsocket	8	CI	1954	720	N	G5	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
531	Theresa Street		Woonsocket	8	CI	1955	1240	N	C7	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
532	Jillson Avenue		Woonsocket	8	CI	1956	3620	Y	F4	H	WWD		0.00	0.63	0.75	0.00	0.00	1.38
533	Macarthur Road		Woonsocket	8	CI	1956	1080	N	C8	H	WWD		0.00	0.63	0.75	0.00	0.00	1.38
534	Marshall Road		Woonsocket	8	CI	1956	1300	N	C8	H	WWD		0.00	0.63	0.75	0.00	0.00	1.38
535	Nimitz Road		Woonsocket	8	CI	1956	1440	N	C8	H	WWD		0.00	0.63	0.75	0.00	0.00	1.38
536	Patton Road		Woonsocket	8	CI	1956	1400	N	B9	H	WWD		0.00	0.63	0.75	0.00	0.00	1.38
537	Wanda Avenue		Woonsocket	8	CI	1956	260	N	G5	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
538	Cherry Street		Woonsocket	8	CI	1957	280	N	C3	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
539	Morin Street		Woonsocket	8	CI	1957	1880	N	B7	L	WWD		0.00	0.63	0.75	0.00	0.00	1.38
540	Asylum Street		Woonsocket	8	DI	2007	565		D2	L	WWD	breaks 3/14, 7/17	0.00	0.00	0.00	0.00	1.25	1.25
541	Access Road	Dump Road to Transfer Station	Woonsocket	8	AC	1960	2900	Y	D5	L	WWD	added to database	0.00	0.63	0.50	0.00	0.00	1.13
542	Mendon Road	Diamond Hill to Pine Crest	Woonsocket	8	DI	1963	760	N	A7	H	WWD	break 1/86	0.00	0.00	0.50	0.00	0.63	1.13
543	Achille Street		Woonsocket	8	DI	1965	650	N	A6	L	WWD	break 10/79	0.00	0.00	0.50	0.00	0.63	1.13
544	Deborah Ave, NS		N. Smithfield	8	DI	1968	540	N	CNS	H	A.F. Pacheco	break 12/07	0.00	0.00	0.50	0.63	0.00	1.13

Appendix J
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Main Database Sorted by Total Rating

													Rating Schedule					
Pipe Rank	Street	Location	City/Town	Size (in.)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments	1 Size	2 Type	3 Age	4 Ownership	5 Breaks	Total
545	Diamond Hill Road		Woonsocket	8	DI	1963	320	N	A7	H	WWD	break 12/79	0.00	0.00	0.50	0.00	0.63	1.13
546	Walnut Hill Road		Woonsocket	8	DI	1967	3480	N	B8	H	WWD	break 2/95	0.00	0.00	0.50	0.00	0.63	1.13
547	Fortin Drive		Woonsocket	12	DI	1970	570	N	F6	L	WWD	break 7/85	0.00	0.00	0.50	0.00	0.63	1.13
548	Capwell Avenue		Woonsocket	8	DI	1973	1260	N	E4	H	WWD	break 9/89, extension 1987	0.00	0.00	0.50	0.00	0.63	1.13
549	Cynthia Drive, NS		N. Smithfield	8	DI	1968	1880	Y	CNS	H	A.F. Pacheco		0.00	0.00	0.50	0.63	0.00	1.13
550	Sharon Parkway, NS		N. Smithfield	8	DI	1971	1720	Y	CNS	H	A.F. Pacheco		0.00	0.00	0.50	0.63	0.00	1.13
551	Fogarty Hospital Line, NS	continues Fournier St, Woon	N. Smithfield	10	DI	1965	520	Y	G3	H	Landmark Medical Ctr.		0.00	0.00	0.50	0.63	0.00	1.13
552	Bourdon Boulevard		Woonsocket	8	DI	1963	2120	N	D1	L	Woon. Housing Authority		0.00	0.00	0.50	0.63	0.00	1.13
553	Memorial Drive		Woonsocket	8	DI	1963	600	Y	D1	L	Woon. Housing Authority		0.00	0.00	0.50	0.63	0.00	1.13
554	Roscoe Street		Woonsocket	8	CI	1958	240	N	B7	L	WWD		0.00	0.63	0.50	0.00	0.00	1.13
555	Avenue A		Woonsocket	8	CI	1959	1120	N	F2	L	WWD		0.00	0.63	0.50	0.00	0.00	1.13
556	Bertha Avenue		Woonsocket	8	CI	1959	720	Y	F5	L	WWD		0.00	0.63	0.50	0.00	0.00	1.13
557	Fall Street		Woonsocket	8	CI	1959	240	Y	B6	L	WWD		0.00	0.63	0.50	0.00	0.00	1.13
558	Pichette Boulevard		Woonsocket	8	CI	1959	400	Y	C7	L	WWD		0.00	0.63	0.50	0.00	0.00	1.13
559	Thibeault Avenue		Woonsocket	8	CI	1959	240	Y	G5	L	WWD		0.00	0.63	0.50	0.00	0.00	1.13
560	Wade Road		Woonsocket	8	CI	1959	600	Y	G5	L	WWD		0.00	0.63	0.50	0.00	0.00	1.13
561	18" HARRIS POND LINE	Harris Pond to Reservoir 1	Woonsocket	18	AC	1960	18000	N	G5	RAW	WWD		0.00	0.63	0.50	0.00	0.00	1.13
562	Ward Street	Vose to Cross	Woonsocket	6	DI	1972	410	N	E3	L	WWD		0.63	0.00	0.50	0.00	0.00	1.13
563	Dexter Street		Woonsocket	6	DI	1973	360	N	B3	L	WWD		0.63	0.00	0.50	0.00	0.00	1.13
564	Richelieu Street		Woonsocket	6	DI	1973	140	N	D6	L	WWD		0.63	0.00	0.50	0.00	0.00	1.13
565	Grange Avenue		Woonsocket	8	AC	1974	160	Y	A7	L	WWD		0.00	0.63	0.50	0.00	0.00	1.13
566	Arona Street		Woonsocket	8	AC	1975	200	Y	B7	L	WWD		0.00	0.63	0.50	0.00	0.00	1.13
567	St Augustin Street		Woonsocket	8	AC	1975	180	Y	E6	L	WWD		0.00	0.63	0.50	0.00	0.00	1.13
568	Bennett Street		Woonsocket	8	AC	1976	190	Y	D4	L	WWD		0.00	0.63	0.50	0.00	0.00	1.13
569	Grace Avenue		Woonsocket	8	CI	1985	290	Y	C6	L	WWD	both dead end?	0.00	0.63	0.25	0.00	0.00	0.88
570	Morin Heights Boulevard		Woonsocket	8	DI	1982	2960	N	B6	L	Woon. Housing Authority	break 10/16	0.00	0.00	0.25	0.63	0.00	0.88
571	Cambridge Court		Woonsocket	8	DI	1987	260	Y	C9	H	Brookhaven Estates		0.00	0.00	0.25	0.63	0.00	0.88
572	Harvard Court		Woonsocket	8	DI	1987	260	Y	C9	H	Brookhaven Estates		0.00	0.00	0.25	0.63	0.00	0.88
573	Hartford Avenue		Woonsocket	8	DI	1990	380	Y	D6	L	Oakland Grove Ass.		0.00	0.00	0.25	0.63	0.00	0.88
574	Hartford Avenue		Woonsocket	10	DI	1990	250	N	D6	L	Oakland Grove Ass.		0.00	0.00	0.25	0.63	0.00	0.88
575	Bellevue Avenue, NS		N. Smithfield	8	DI	1988	1140	Y	F1	L	Town of NS		0.00	0.00	0.25	0.63	0.00	0.88
576	Milton Avenue, NS		N. Smithfield	8	DI	1988	300	Y	F1	L	Town of NS		0.00	0.00	0.25	0.63	0.00	0.88
577	Northeast Street		Woonsocket	6	DI	1978	420	N	C3	L	WWD		0.63	0.00	0.25	0.00	0.00	0.88
578	Orchard Street		Woonsocket	8	CI	1988	360	N	F2	L	WWD		0.00	0.63	0.25	0.00	0.00	0.88
579	Hollis Street		Woonsocket	8	DI	1939	570	N	E3	H	WWD		0.00	0.00	0.75	0.00	0.00	0.75
580	St. Barnabe Street		Woonsocket	8	DI	1949	1080	Y	E5	L	WWD		0.00	0.00	0.75	0.00	0.00	0.75
581	Arnold Avenue, NS		N. Smithfield	8	DI	2011	300	Y	F1	L	Joseph DiPardo		0.00	0.00	0.00	0.63	0.00	0.63
582	Holley Lane	supplies Wyndemere	Woonsocket	8	DI	1998	400	Y	C7	H	R. Raymond, Windemere Woods		0.00	0.00	0.00	0.63	0.00	0.63
583	Oregon Avenue	cul de sac to Holley Lane	Woonsocket	8	DI	1998	540	N	D7	H	R. Raymond, Windemere Woods		0.00	0.00	0.00	0.63	0.00	0.63
584	Star Avenue		Woonsocket	8	DI	1964	1220	Y	A9	H	WWD	break 1/06	0.00	0.00	0.50	0.00	0.00	0.50
585	Ray Avenue		Woonsocket	8	DI	1966	2000	N	D6	L	WWD	break 1/08	0.00	0.00	0.50	0.00	0.00	0.50
586	Surrey Lane		Woonsocket	8	DI	1970	620	N	B9	H	WWD	break 1/09	0.00	0.00	0.50	0.00	0.00	0.50
587	Rustic Drive		Woonsocket	8	DI	1968	860	N	B8	H	WWD	break 1/11	0.00	0.00	0.50	0.00	0.00	0.50
588	Newton Street		Woonsocket	8	DI	1962	1040	N	C7	L	WWD	break 1/12	0.00	0.00	0.50	0.00	0.00	0.50
589	Blue Stone Drive		Woonsocket	8	DI	1964	1020	Y	G5	L	WWD	break 11/14	0.00	0.00	0.50	0.00	0.00	0.50
590	Albert Street		Woonsocket	8	DI	1966	275	N	A9	H	WWD	break 2/14	0.00	0.00	0.50	0.00	0.00	0.50
591	Division Street		Woonsocket	8	DI	1975	760	N	D4	H	WWD	parallel pipes	0.00	0.00	0.50	0.00	0.00	0.50
592	Morse Avenue	Alice to Andrews	Woonsocket	8	DI	1966	260	N	E1	L	WWD	should be looped	0.00	0.00	0.50	0.00	0.00	0.50
593	Castle Heights Court		Woonsocket	8	DI	1959	460	Y	A3	L	WWD		0.00	0.00	0.50	0.00	0.00	0.50
594	Irene Boulevard		Woonsocket	8	DI	1960	760	N	E2	L	WWD		0.00	0.00	0.50	0.00	0.00	0.50
595	Jervis Street		Woonsocket	8	DI	1960	840	N	C6	L	WWD		0.00	0.00	0.50	0.00	0.00	0.50
596	Marie-Ann Court		Woonsocket	8	DI	1961	90	Y	C7	L	WWD		0.00	0.00	0.50	0.00	0.00	0.50
597	Wilcox Street		Woonsocket	8	DI	1961	340	Y	A7	L	WWD		0.00	0.00	0.50	0.00	0.00	0.50
598	Bound Road	Diamond Hill to Glaude	Woonsocket	8	DI	1962	1340	N	A9	H	WWD		0.00	0.00	0.50	0.00	0.00	0.50
599	Myette Street		Woonsocket	8	DI	1962	520	Y	F5	L	WWD		0.00	0.00	0.50	0.00	0.00	0.50
600	Rose Avenue		Woonsocket	8	DI	1962	460	Y	F3	H	WWD		0.00	0.00	0.50	0.00	0.00	0.50
601	Ruth Street		Woonsocket	8	DI	1962	300	Y	B7	L	WWD		0.00	0.00	0.50	0.00	0.00	0.50
602	Sunrise Avenue		Woonsocket	8	DI	1962	580	N	A9	H	WWD		0.00	0.00	0.50	0.00	0.00	0.50
603	Victory Boulevard		Woonsocket	8	DI	1962	500	N	C7	L	WWD		0.00	0.00	0.50	0.00	0.00	0.50
604	Bradley Street		Woonsocket	8	DI	1963	540	Y	F4	H	WWD		0.00	0.00	0.50	0.00	0.00	0.50
605	Getchell Avenue		Woonsocket	8	DI	1963	1600	Y	E4	H	WWD		0.00	0.00	0.50	0.00	0.00	0.50
606	Heather Drive		Woonsocket	8	DI	1963	420	Y	C6	L	WWD		0.00	0.00	0.50	0.00	0.00	0.50
607	Holland Avenue		Woonsocket	8	DI	1963	440	N	C6	L	WWD		0.00	0.00	0.50	0.00	0.00	0.50
608	Pinecrest Drive		Woonsocket	8	DI	1963	1000	N	A7	H	WWD		0.00	0.00	0.50	0.00	0.00	0.50
609	Rachel Street		Woonsocket	8	DI	1963	540	N	A3	L	WWD		0.00	0.00	0.50	0.00	0.00	0.50
610	Sunset Avenue		Woonsocket	8	DI	1963	560	Y	B9	H	WWD		0.00	0.00	0.50	0.00	0.00	0.50
611	Hillsdale Street		Woonsocket	8	DI	1964	300	Y	B7	L	WWD		0.00	0.00	0.50	0.00	0.00	0.50
612	Langevin Street		Woonsocket	8	DI	1964	910	N	C7	L	WWD		0.00	0.00	0.50	0.00	0.00	0.50

Appendix J
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Main Database Sorted by Total Rating

													Rating Schedule					
Pipe Rank	Street	Location	City/Town	Size (in.)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments	1 Size	2 Type	3 Age	4 Ownership	5 Breaks	Total
613	Crest Road		Woonsocket	8	DI	1965	570	Y	B9	H	WWD		0.00	0.00	0.50	0.00	0.00	0.50
614	Thibeault Avenue		Woonsocket	8	DI	1965	280	N	F5	L	WWD		0.00	0.00	0.50	0.00	0.00	0.50
615	Fournier Street	Laflamme to NS	Woonsocket	10	DI	1965	460	N	G3	H	WWD		0.00	0.00	0.50	0.00	0.00	0.50
616	Bound Road	Diamond Hill to Elder Ballou	Woonsocket	12	DI	1965	2300	N	B9	H	WWD		0.00	0.00	0.50	0.00	0.00	0.50
617	Diana Drive		Woonsocket	8	DI	1967	760	N	B8	H	WWD		0.00	0.00	0.50	0.00	0.00	0.50
618	Brien's Court		Woonsocket	8	DI	1968	200	Y	E5	L	WWD		0.00	0.00	0.50	0.00	0.00	0.50
619	Founders Drive		Woonsocket	12	DI	1968	2320	N	F6	L	WWD		0.00	0.00	0.50	0.00	0.00	0.50
620	St Augustin Street		Woonsocket	12	DI	1968	660	N	E6	L	WWD		0.00	0.00	0.50	0.00	0.00	0.50
621	Bernon Street		Woonsocket	8	DI	1969	540	N	D5	L	WWD		0.00	0.00	0.50	0.00	0.00	0.50
622	Wagon Wheel Lane		Woonsocket	8	DI	1969	360	N	B9	H	WWD		0.00	0.00	0.50	0.00	0.00	0.50
623	Nancy Court		Woonsocket	8	DI	1970	800	Y	E6	L	WWD		0.00	0.00	0.50	0.00	0.00	0.50
624	Foster Street		Woonsocket	8	DI	1971	380	Y	F3	H	WWD		0.00	0.00	0.50	0.00	0.00	0.50
625	Elder Ballou Meetinghouse Rd		Woonsocket	12	DI	1971	1440	N	C9	H	WWD		0.00	0.00	0.50	0.00	0.00	0.50
626	Carey Court		Woonsocket	8	DI	1973	520	Y	C8	H	WWD		0.00	0.00	0.50	0.00	0.00	0.50
627	Oxford Avenue		Woonsocket	8	DI	1973	180	N	E4	H	WWD		0.00	0.00	0.50	0.00	0.00	0.50
628	Rock Ridge Drive		Woonsocket	8	DI	1973	1900	N	B7	H	WWD		0.00	0.00	0.50	0.00	0.00	0.50
629	Admiral Street		Woonsocket	8	DI	1974	400	Y	F3	H	WWD		0.00	0.00	0.50	0.00	0.00	0.50
630	Dike Street		Woonsocket	8	DI	1974	240	N	F3	H	WWD		0.00	0.00	0.50	0.00	0.00	0.50
631	Carrington Avenue		Woonsocket	12	DI	1974	320	N	D4	L	WWD		0.00	0.00	0.50	0.00	0.00	0.50
632	Welles Street		Woonsocket	12	DI	1974	560	N	E4	H	WWD		0.00	0.00	0.50	0.00	0.00	0.50
633	Welles Street		Woonsocket	12	DI	1975	420	N	D4	L	WWD		0.00	0.00	0.50	0.00	0.00	0.50
634	Columbus Street		Woonsocket	8	DI	1977	180	Y	E6	L	WWD		0.00	0.00	0.50	0.00	0.00	0.50
635	Laurier Street		Woonsocket	8	DI	1977	240	Y	B6	L	WWD		0.00	0.00	0.50	0.00	0.00	0.50
636	Bourassa Avenue		Woonsocket	8	DI	1978	840	Y	C7	L	WWD	break 1/17	0.00	0.00	0.25	0.00	0.00	0.25
637	Beacon Avenue	Poplar to Aubin	Woonsocket	8	DI	1980	960	N	B6	L	WWD	break 10/07	0.00	0.00	0.25	0.00	0.00	0.25
638	Berkley Street		Woonsocket	8	DI	1979	280	Y	F2	H	WWD	break 11/07	0.00	0.00	0.25	0.00	0.00	0.25
639	Fulton Street		Woonsocket	8	DI	1978	480	Y	A6	L	WWD	easily looped	0.00	0.00	0.25	0.00	0.00	0.25
640	Hillside Avenue		Woonsocket	8	DI	1978	290	Y	B9	H	WWD	easily looped, break 12/07	0.00	0.00	0.25	0.00	0.00	0.25
641	Bozoian Street		Woonsocket	8	DI	1978	280	Y	E6	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
642	Hawthorn Circle	north end to 8502	Woonsocket	8	DI	1978	620	N	H5	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
643	Papineau Avenue		Woonsocket	8	DI	1978	400	Y	B7	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
644	Pine Swamp Road, Cumb		Cumberland	8	DI	1978	960	Y	B9	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
645	Seventh Avenue		Woonsocket	8	DI	1978	360	Y	B1	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
646	Viva Way		Woonsocket	8	DI	1978	360	Y	C8	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
647	Alice Avenue		Woonsocket	8	DI	1979	480	Y	E1	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
648	Aubin Street		Woonsocket	8	DI	1979	320	Y	B6	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
649	Berard Avenue		Woonsocket	8	DI	1979	460	Y	F4	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
650	Fisher Street		Woonsocket	8	DI	1979	260	N	G6	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
651	Kermit Street	Mowry to Gilbert	Woonsocket	8	DI	1979	240	N	F3	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
652	Theodore Street		Woonsocket	8	DI	1979	400	N	A6	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
653	Maple Street		Woonsocket	8	DI	1980	400	Y	E4	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
654	Privilege Street	between 6" and 12"	Woonsocket	8	DI	1980	250	N	A4	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
655	Logee Street	Maple to Ronian	Woonsocket	8	DI	1981	660	N	E4	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
656	Ronian Street		Woonsocket	8	DI	1981	360	N	E4	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
657	Sycamore Street		Woonsocket	8	DI	1981	680	N	B2	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
658	Washington Street		Woonsocket	8	DI	1981	280	N	E4	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
659	Maple Street		Woonsocket	12	DI	1981	320	N	E4	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
660	Washington Street		Woonsocket	12	DI	1981	340	N	E4	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
661	Ricard Street		Woonsocket	8	DI	1982	500	Y	C6	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
662	Scotia Street		Woonsocket	8	DI	1982	320	N	B1	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
663	CVS Drive		Woonsocket	12	DI	1982	1080	Y	F7	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
664	Park East Drive	all Park East plus tank	Woonsocket	12	DI	1982	6400	N	E8	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
665	Park East Drive	up to Cumberland border	Woonsocket	16	DI	1982	480	Y	D8	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
666	Cranston Street	Monty to Caron	Woonsocket	8	DI	1983	200	Y	G3	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
667	Privilege Street	to cul-de-sac	Woonsocket	8	DI	1983	300	Y	A4	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
668	Cherry Hill Avenue		Woonsocket	8	DI	1985	840	N	B1	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
669	Rome Avenue		Woonsocket	8	DI	1985	380	N	A6	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
670	Corsi Street		Woonsocket	12	DI	1985	400	Y	D7	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
671	Mendon Road	Arrow to Park East	Woonsocket	12	DI	1985	1060	N	B7	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
672	Prince Street		Woonsocket	8	DI	1986	450	Y	A6	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
673	St. Joseph Street		Woonsocket	8	DI	1987	240	N	E4	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
674	Tara Lane		Woonsocket	8	DI	1987	1150	Y	C8	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
675	Brookhaven Lane		Woonsocket	12	DI	1987	1240	Y	C9	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
676	St. Joseph Street		Woonsocket	12	DI	1987	100	N	E4	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
677	Ledgewood Lane		Woonsocket	8	DI	1988	680	Y	C8	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
678	Merrill Court		Woonsocket	8	DI	1988	500	Y	F3	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
679	New Street	All New plus Globe	Woonsocket	8	DI	1988	660	Y	D3	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
680	Oregon Avenue		Woonsocket	8	DI	1988	740	Y	D7	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25

Appendix J
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Main Database Sorted by Total Rating

Pipe Rank	Street	Location	City/Town	Size (in.)	Type	Year	Length (feet)	Dead End	Grid	Zone	Owner	Comments	Rating Schedule 1 Size	2 Type	3 Age	4 Ownership	5 Breaks	Total
681	Springwater Drive		Woonsocket	8	DI	1988	320	Y	D7	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
682	Century Drive	Park East to Springwater	Woonsocket	12	DI	1988	1000	N	E7	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
683	Goldstein Drive		Woonsocket	12	DI	1988	380	Y	E7	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
684	Oregon Avenue		Woonsocket	12	DI	1988	360	N	D8	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
685	Springwater Drive	to Goldstein cul-de-sac	Woonsocket	12	DI	1988	1740	N	D7	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
686	Arland Court		Woonsocket	8	DI	1989	525	Y	B8	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
687	Hawthorn Circle	8502 to South end	Woonsocket	8	DI	1989	760	N	H5	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
688	Progresso Avenue	B-5-70 to dead end	Woonsocket	8	DI	1989	120	Y	B5	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
689	Darwin Street		Woonsocket	8	DI	1990	270	Y	F3	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
690	Jacob Lane		Woonsocket	8	DI	1990	180	Y	A3	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
691	Minerva Street		Woonsocket	8	DI	1990	120	Y	F3	H	WWD		0.00	0.00	0.25	0.00	0.00	0.25
692	Congress Street		Woonsocket	10	DI	1990	400	N	D6	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
693	Hartford Avenue		Woonsocket	10	DI	1990	300	N	D6	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
694	Mill Street		Woonsocket	8	DI	1991	420	N	B5	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
695	Seamans Street		Woonsocket	8	DI	1993	300	N	G7	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
696	Miles Avenue		Woonsocket	8	DI	1994	260	N	F5	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
697	Marian Lane		Woonsocket	8	DI	1995	400	N	F5	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
698	Thibeault Avenue		Woonsocket	8	DI	1995	160	N	F5	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
699	Edgewood Avenue		Woonsocket	8	DI	1996	280	Y	C6	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
700	Baxter Street		Woonsocket	8	DI	1997	240	N	F2	L	WWD		0.00	0.00	0.25	0.00	0.00	0.25
701	Blueberry Hill		Woonsocket	8	DI	1998	270	Y	C8	H	WWD	added to database	0.00	0.00	0.00	0.00	0.00	0.00
702	Louise Street		Woonsocket	8	DI	2007	400	N	G6	L	WWD	installed to connect to the new Danielle Drive	0.00	0.00	0.00	0.00	0.00	0.00
703	Dulude Avenue	Birch St. to Mill St.	Woonsocket	8	DI	2001	815		B5	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
704	Logee Street	Park Ave to Grove St.	Woonsocket	8	DI	2004	320	N	E3	HSMSC	WWD		0.00	0.00	0.00	0.00	0.00	0.00
705	Logee Street	St. Hughes St. to Reservior Ave.	Woonsocket	8	DI	2004	984	N	F5	HSMSC	WWD		0.00	0.00	0.00	0.00	0.00	0.00
706	Steve Lopes Way	From Rhodes Avenue	Woonsocket	8	DI	2004	550	Y	C1	H	WWD		0.00	0.00	0.00	0.00	0.00	0.00
707	Greenville Road, NS		N. Smithfield	12	DI	2004	1450		G2	H	WWD		0.00	0.00	0.00	0.00	0.00	0.00
708	Logee Street	Park Ave to Grove St.	Woonsocket	12	DI	2004	320	N	E3	HSMSC	WWD		0.00	0.00	0.00	0.00	0.00	0.00
709	Logee Street	Grove St. to Cottage St.	Woonsocket	12	DI	2004	340	N	E3	HSMSC	WWD		0.00	0.00	0.00	0.00	0.00	0.00
710	Logee Street	Cottage St. to Cleveland St.	Woonsocket	12	DI	2004	588	N	E4	HSMSC	WWD		0.00	0.00	0.00	0.00	0.00	0.00
711	Logee Street	Front St. to Park Ave.	Woonsocket	12	DI	2004	644	N	D3	HSMSC	WWD		0.00	0.00	0.00	0.00	0.00	0.00
712	Bernon Street	Market Square to Greene St.	Woonsocket	16	DI	2004	1152		D3	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
713	Crawford Street	Park Ave to Cleveland St.	Woonsocket	16	DI	2004	866	N	E4	H	WWD		0.00	0.00	0.00	0.00	0.00	0.00
714	Greene Street	Bernon St. to Park Ave.	Woonsocket	16	DI	2004	718	N	D4	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
715	Logee Street	Cleveland St. to Storage Tank / Wellos St.	Woonsocket	16	DI	2004	1000	N	E4	HSMSC	WWD		0.00	0.00	0.00	0.00	0.00	0.00
716	Park Avenue	Greene St. to Crawford St.	Woonsocket	16	DI	2004	290	N	D4	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
717	River Street	Blackstone River to Market Square	Woonsocket	16	DI	2004	2994	N	B2	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
718	River Street	Second Ave. to Blackstone River	Woonsocket	16	DI	2004	892	N	B2	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
719	Second Ave	Rhodes Ave to River St.	Woonsocket	16	DI	2004	420	N	B2	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
720	South Main Street	Market Square to Bernon Street	Woonsocket	16	DI	2004	560		D3	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
721	Bertenshaw Road	Fairfield to Lilac Ave.	Woonsocket	30	DI	2004	756		F5	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
722	Cross Country	Logee St. to Reservior Ave.	Woonsocket	30	DI	2004	564	N	E4	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
723	Fairfield Avenue	Cross Country to Bertenshaw Rd.	Woonsocket	30	DI	2004	738	N	F5	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
724	Flora Avenue	Marian Lane to Wanda Ave.	Woonsocket	30	DI	2004	1174		G5	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
725	Lilac Avenue	Bertenshaw Rd. to Marrian Lane	Woonsocket	30	DI	2004	920	N	F5	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
726	Logee Street	Welles St. to Cross Country	Woonsocket	30	DI	2004	504	N	E4	HSMSC	WWD		0.00	0.00	0.00	0.00	0.00	0.00
727	Lydia Avenue	Wanda Ave. to Blue Stone Dr.	Woonsocket	30	DI	2004	276	N	G5	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
728	Marian Lane	Lilac Ave to Flora Ave.	Woonsocket	30	DI	2004	136	N	F6	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
729	Wanda Avenue	Flora Ave. to Lydia Ave.	Woonsocket	30	DI	2004	200	N	G5	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
730	Danielle Drive		Woonsocket	8	DI	2007	475		G6	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
731	Fieldside Drive		Woonsocket	8	DI	2007	325		G6	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
732	Stevens Way		Cumberland	8	DI	2007	640	Y	A9	H	WWD		0.00	0.00	0.00	0.00	0.00	0.00
733	Vivian Street		Woonsocket	8	DI	2007	560		G6	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
734	Wanda Avenue	Wanda Ave. extension	Woonsocket	8	DI	2007	2000	N	G5	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
735	Manville Road	Gadoury Blvd. to Pump Station	Woonsocket	20	DI	2011	900	N	G5	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
736	Burnside Avenue		Woonsocket	8	DI	2012	100		A5	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
737	Cady Street		Woonsocket	8	DI	2012	710		D6	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
738	Havelock Street		Woonsocket	8	DI	2012	250	N	A5	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
739	Miller Lane		Woonsocket	8	DI	2012	275	Y	C3	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
740	Morse Avenue	Between old dead ends	Woonsocket	8	DI	2013	140		E1	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
741	Circle Street		Woonsocket	8	DI	2014	680		E5	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
742	Danielle Drive		Woonsocket	8	DI	2015	925		G7	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
743	Easement	Bonin Industries Easement	Woonsocket	8	DI	2016	800		D7	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
744	Mount Saint Charles Avenue		Woonsocket	12	DI	2016	840	N	E5	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
745	Colony Avenue		Woonsocket	8	DI	2017	365		C7	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00
746	Congress Street	Congress St. extension	Woonsocket	8	DI	2007	1700	Y	D6	L	WWD		0.00	0.00	0.00	0.00	0.00	0.00

APPENDIX K

20-Year IRP Piping Improvements

Appendix K
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Main Database Sorted by Total Rating

Pipe Rank	Street	Size (in.)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
1	Greenville Road, NS	6	AC	1953	4160	3.88	$ 894,400	Water Main Replacement	$ 894,400
2	Hamlet Avenue	6	CI	1889	2800	3.75	$ 602,000	Water Main Replacement	$ 1,496,400
3	Avenue B	6	CI	1904	840	3.75	$ 180,600	Water Main Replacement	$ 1,677,000
4	Cato Street	6	CI	1885	1310	3.75	$ 281,650	Water Main Replacement	$ 1,958,650
5	Summit Street	6	CI	1893	800	3.75	$ 172,000	Water Main Replacement	$ 2,130,650
6	Great Road, NS	6	CI	1928	1620	3.50	$ 348,300	Water Main Replacement	$ 2,478,950
7	Pound Hill Road, NS	2	GI	1929	1080	3.50	$ 232,200	Water Main Replacement	$ 2,711,150
8	Smithfield Road, NS	1.25	GI	1928	220	3.50	$ 47,300	Water Main Replacement	$ 2,758,450
9	Oaklawn Road, NS	2	GI	1951	250	3.25	$ 53,750	Water Main Replacement	$ 2,812,200
10	Hillview Avenue, NS	4	CI	1940	980	3.25	$ 210,700	Water Main Replacement	$ 3,022,900
11	Oak Hill Avenue, NS	4	AC	1953	1000	3.25	$ 215,000	Water Main Replacement	$ 3,237,900
12	Birch Hill Avenue, NS	4	AC	1953	880	3.25	$ 189,200	Water Main Replacement	$ 3,427,100
13	Norwood Road, NS	4	CI	1951	520	3.25	$ 111,800	Water Main Replacement	$ 3,538,900
14	Asylum Street	6	CI	1894	1100	3.13	$ 236,500	Water Main Replacement	$ 3,775,400
15	Prospect Street	8	CI	1889	3020	3.13	$ 649,300	Water Main Replacement	$ 4,424,700
16	Carrington Avenue	6	CI	1895	1100	3.13	$ 236,500	Water Main Replacement	$ 4,661,200
17	Grove Street	6	CI	1890	2120	3.13	$ 455,800	Water Main Replacement	$ 5,117,000
18	Cold Spring Place	4	CI	1893	240	3.13	$ 51,600	Water Main Replacement	$ 5,168,600
19	Cottage Street	6	CI	1891	1580	3.13	$ 339,700	Water Main Replacement	$ 5,508,300
20	South Main Street	12	CI	1890	5940	3.13	$ 891,000	Cleaning and Lining	$ 6,399,300
21	West Street	6	CI	1886	760	3.13	$ 163,400	Water Main Replacement	$ 6,562,700
22	Pleasant Street	6	CI	1890	1000	3.13	$ 215,000	Water Main Replacement	$ 6,777,700
23	Merida Avenue	6	CI	1914	640	3.13	$ 137,600	Water Main Replacement	$ 6,915,300
24	Rhodes Avenue	6	CI	1895	340	3.13	$ 73,100	Water Main Replacement	$ 6,988,400
25	Vose Street	6	CI	1896	760	3.13	$ 163,400	Water Main Replacement	$ 7,151,800
26	Privilege Street	6	CI	1891	1490	3.13	$ 320,350	Water Main Replacement	$ 7,472,150
27	South Street	6	CI	1886	440	3.13	$ 94,600	Water Main Replacement	$ 7,566,750
28	High School Street	6	CI	1889	220	3.13	$ 47,300	Water Main Replacement	$ 7,614,050
29	Park Avenue	8	CI	1890	2380	3.13	$ 511,700	Water Main Replacement	$ 8,125,750
30	Privilege Street	12	CI	1907	1160	3.13	$ 174,000	Cleaning and Lining	$ 8,299,750
31	Elm Street	8	CI	1886	1700	3.13	$ 365,500	Water Main Replacement	$ 8,665,250
32	Water Street	4	CI	1891	200	3.13	$ 43,000	Water Main Replacement	$ 8,708,250
33	Sayles Street	4	CI	1885	170	3.13	$ 36,550	Water Main Replacement	$ 8,744,800
34	Sayles Street	4	CI	1885	280	3.13	$ 60,200	Water Main Replacement	$ 8,805,000

Appendix K
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Pipe Rank	Street	Size (in.)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
35	Ascension Street	4	CI	1887	370	3.13	$ 79,550	Water Main Replacement	$ 8,884,550
36	Clark Court	4	CI	1888	180	3.13	$ 38,700	Water Main Replacement	$ 8,923,250
37	High School Street	4	CI	1889	320	3.13	$ 68,800	Water Main Replacement	$ 8,992,050
38	Bradford Street	4	CI	1890	420	3.13	$ 90,300	Water Main Replacement	$ 9,082,350
39	West Park Place	4	CI	1890	480	3.13	$ 103,200	Water Main Replacement	$ 9,185,550
40	Willow Street	4	CI	1890	700	3.13	$ 150,500	Water Main Replacement	$ 9,336,050
41	Snow Street	4	CI	1891	440	3.13	$ 94,600	Water Main Replacement	$ 9,430,650
42	Adams Street	4	CI	1893	180	3.13	$ 38,700	Water Main Replacement	$ 9,469,350
43	Blackstone Street	4	CI	1893	1060	3.13	$ 227,900	Water Main Replacement	$ 9,697,250
44	Daniels Street	4	CI	1893	280	3.13	$ 60,200	Water Main Replacement	$ 9,757,450
45	Social Street	4	CI	1894	370	3.13	$ 79,550	Water Main Replacement	$ 9,837,000
46	Paradis Avenue	4	CI	1896	160	3.13	$ 34,400	Water Main Replacement	$ 9,871,400
47	Park Place	4	CI	1896	320	3.13	$ 68,800	Water Main Replacement	$ 9,940,200
48	Ruby Street	4	CI	1908	300	3.13	$ 64,500	Water Main Replacement	$ 10,004,700
49	Wilbur Avenue	4	CI	1910	320	3.13	$ 68,800	Water Main Replacement	$ 10,073,500
50	Mendon Road, NS	8	CI	1964	800	3.00	$ 172,000	Water Main Replacement	$ 10,245,500
51	Armand Street	2	CT	1947	400	3.00	$ 86,000	Water Main Replacement	$ 10,331,500
52	Merrimac Street, NS	1	CT	1949	440	3.00	$ 94,600	Water Main Replacement	$ 10,426,100
53	Walsh Avenue, NS	2	CT	1949	540	3.00	$ 116,100	Water Main Replacement	$ 10,542,200
54	Mowry Avenue, NS	2	CT	1957	500	3.00	$ 107,500	Water Main Replacement	$ 10,649,700
55	Chester Street, NS	1.5	CT	1949	240	3.00	$ 51,600	Water Main Replacement	$ 10,701,300
56	Smithfield Road, NS	1	CT	1950	100	3.00	$ 21,500	Water Main Replacement	$ 10,722,800
57	Smithfield Road, NS	2	CT	1950	220	3.00	$ 47,300	Water Main Replacement	$ 10,770,100
58	Lamoureux Boulvevard, NS	1	CT	1953	340	3.00	$ 73,100	Water Main Replacement	$ 10,843,200
59	Fairview Avenue, NS	2	CT	1953	530	3.00	$ 113,950	Water Main Replacement	$ 10,957,150
60	Moore Street	6	CI	1919	160	2.88	$ 34,400	Water Main Replacement	$ 10,991,550
61	Edmund Street	8	CI	1931	530	2.88	$ 113,950	Water Main Replacement	$ 11,105,500
62	Summit Avenue, NS	8	CI	1928	880	2.88	$ 189,200	Water Main Replacement	$ 11,294,700
63	Homestead Avenue, NS	6	CI	1928	740	2.88	$ 159,100	Water Main Replacement	$ 11,453,800
64	Francis Street	4	CI	1917	140	2.88	$ 30,100	Water Main Replacement	$ 11,483,900
65	Bentley Street	4	CI	1922	280	2.88	$ 60,200	Water Main Replacement	$ 11,544,100
66	Holder Lane	4	CI	1923	280	2.88	$ 60,200	Water Main Replacement	$ 11,604,300
67	John Street	4	CI	1923	360	2.88	$ 77,400	Water Main Replacement	$ 11,681,700
68	Crest Road, NS	2	GI	1928	1000	2.88	$ 215,000	Water Main Replacement	$ 11,896,700
69	Woonsocket Hill Road, NS	2	GI	1928	1230	2.88	$ 264,450	Water Main Replacement	$ 12,161,150

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Pipe Rank	Street	Size (in.)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
70	Buell Avenue, NS	1.5	CT	1960	120	2.75	$ 25,800	Water Main Replacement	$ 12,186,950
71	Madeleine Avenue	8	CI	1955	1400	2.63	$ 301,000	Water Main Replacement	$ 12,487,950
72	Westwood Road, NS	4	CI	1951	840	2.63	$ 180,600	Water Main Replacement	$ 12,668,550
73	Rhodes Avenue	10	CI	1948	2300	2.63	$ 552,000	Water Main Replacement	$ 13,220,550
74	Lapre Road, NS	6	AC	1951	2000	2.63	$ 430,000	Water Main Replacement	$ 13,650,550
75	Woodlawn Road, NS	6	AC	1951	1040	2.63	$ 223,600	Water Main Replacement	$ 13,874,150
76	Bamford Street, NS	6	CI	1941	280	2.63	$ 60,200	Water Main Replacement	$ 13,934,350
77	Getchell Street, NS	6	CI	1947	110	2.63	$ 23,650	Water Main Replacement	$ 13,958,000
78	O'Donnell Avenue, NS	6	CI	1950	840	2.63	$ 180,600	Water Main Replacement	$ 14,138,600
79	Leo Avenue, NS	6	AC	1953	480	2.63	$ 103,200	Water Main Replacement	$ 14,241,800
80	Oaklawn Road, NS	6	AC	1951	480	2.63	$ 103,200	Water Main Replacement	$ 14,345,000
81	Old Greenville Road, NS	6	AC	1953	720	2.63	$ 154,800	Water Main Replacement	$ 14,499,800
82	Pine Court, NS	6	AC	1954	240	2.63	$ 51,600	Water Main Replacement	$ 14,551,400
83	Providence Street	6	CI	1891	1400	2.50	$ 301,000	Water Main Replacement	$ 14,852,400
84	Highland Street	6	CI	1893	1140	2.50	$ 245,100	Water Main Replacement	$ 15,097,500
85	Rockland Avenue	6	CI	1905	1000	2.50	$ 215,000	Water Main Replacement	$ 15,312,500
86	North Main Street	8	CI	1889	1400	2.50	$ 301,000	Water Main Replacement	$ 15,613,500
87	Broad Street	8	CI	1908	700	2.50	$ 150,500	Water Main Replacement	$ 15,764,000
88	Olo Street	6	CI	1890	240	2.50	$ 51,600	Water Main Replacement	$ 15,815,600
89	Front Street	6	CI	1887	2460	2.50	$ 528,900	Water Main Replacement	$ 16,344,500
90	Oakley Road	6	CI	1913	1360	2.50	$ 292,400	Water Main Replacement	$ 16,636,900
91	Social Street	8	CI	1890	2800	2.50	$ 602,000	Water Main Replacement	$ 17,238,900
92	Winter Street	12	CI	1891	860	2.50	$ 129,000	Cleaning and Lining	$ 17,367,900
93	Mowry Street	8	CI	1909	800	2.50	$ 172,000	Water Main Replacement	$ 17,539,900
94	Orchard Street	6	CI	1907	860	2.50	$ 184,900	Water Main Replacement	$ 17,724,800
95	Sayles Street	6	CI	1885	480	2.50	$ 103,200	Water Main Replacement	$ 17,828,000
96	Woodland Road	6	CI	1896	1680	2.50	$ 361,200	Water Main Replacement	$ 18,189,200
97	East School Street	6	CI	1890	480	2.50	$ 103,200	Water Main Replacement	$ 18,292,400
98	Kendrick Avenue	6	CI	1886	660	2.50	$ 141,900	Water Main Replacement	$ 18,434,300
99	Pond Street	6	CI	1889	1440	2.50	$ 309,600	Water Main Replacement	$ 18,743,900
100	Diamond Hill Road	6	CI	1891	3090	2.50	$ 664,350	Water Main Replacement	$ 19,408,250
101	Winter Street	6	CI	1892	500	2.50	$ 107,500	Water Main Replacement	$ 19,515,750
102	Division Street	6	CI	1893	760	2.50	$ 163,400	Water Main Replacement	$ 19,679,150
103	Cass Avenue	6	CI	1894	1080	2.50	$ 232,200	Water Main Replacement	$ 19,911,350

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Pipe Rank	Street	Size (in.)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
104	Elm Street	6	CI	1886	360	2.50	$ 77,400	Water Main Replacement	$ 19,988,750
105	Pond Street	8	CI	1889	660	2.50	$ 141,900	Water Main Replacement	$ 20,130,650
106	Chestnut Street	6	CI	1886	260	2.50	$ 55,900	Water Main Replacement	$ 20,186,550
107	Jeffers Street	6	CI	1887	700	2.50	$ 150,500	Water Main Replacement	$ 20,337,050
108	Second Avenue	6	CI	1887	2380	2.50	$ 511,700	Water Main Replacement	$ 20,848,750
109	Gaulin Avenue	6	CI	1888	1140	2.50	$ 245,100	Water Main Replacement	$ 21,093,850
110	Wood Avenue	6	CI	1888	1960	2.50	$ 421,400	Water Main Replacement	$ 21,515,250
111	Avenue A	6	CI	1889	340	2.50	$ 73,100	Water Main Replacement	$ 21,588,350
112	Boyden Street	6	CI	1889	1060	2.50	$ 227,900	Water Main Replacement	$ 21,816,250
113	Coe Street	6	CI	1889	2720	2.50	$ 584,800	Water Main Replacement	$ 22,401,050
114	Harrison Avenue	6	CI	1889	440	2.50	$ 94,600	Water Main Replacement	$ 22,495,650
115	Paradis Avenue	6	CI	1889	1660	2.50	$ 356,900	Water Main Replacement	$ 22,852,550
116	Shove Street	6	CI	1889	320	2.50	$ 68,800	Water Main Replacement	$ 22,921,350
117	Third Avenue	6	CI	1889	1300	2.50	$ 279,500	Water Main Replacement	$ 23,200,850
118	Andrews Street	6	CI	1890	780	2.50	$ 167,700	Water Main Replacement	$ 23,368,550
119	Barton Street	6	CI	1890	370	2.50	$ 79,550	Water Main Replacement	$ 23,448,100
120	Bellevue Avenue	6	CI	1890	400	2.50	$ 86,000	Water Main Replacement	$ 23,534,100
121	Bernon Street	6	CI	1890	300	2.50	$ 64,500	Water Main Replacement	$ 23,598,600
122	Fourth Avenue	6	CI	1890	1300	2.50	$ 279,500	Water Main Replacement	$ 23,878,100
123	North Main Street	6	CI	1890	2520	2.50	$ 541,800	Water Main Replacement	$ 24,419,900
124	Park Avenue	6	CI	1890	240	2.50	$ 51,600	Water Main Replacement	$ 24,471,500
125	Unity Street	6	CI	1890	440	2.50	$ 94,600	Water Main Replacement	$ 24,566,100
126	Blakeley Street	6	CI	1891	320	2.50	$ 68,800	Water Main Replacement	$ 24,634,900
127	Farm Street	6	CI	1891	610	2.50	$ 131,150	Water Main Replacement	$ 24,766,050
128	Grand Street	6	CI	1891	1480	2.50	$ 318,200	Water Main Replacement	$ 25,084,250
129	Lincoln Street	6	CI	1891	1400	2.50	$ 301,000	Water Main Replacement	$ 25,385,250
130	Welles Street	6	CI	1891	720	2.50	$ 154,800	Water Main Replacement	$ 25,540,050
131	Elbow Street	6	CI	1892	670	2.50	$ 144,050	Water Main Replacement	$ 25,684,100
132	Gaskill Street	6	CI	1892	2870	2.50	$ 617,050	Water Main Replacement	$ 26,301,150
133	Olo Street	6	CI	1892	1450	2.50	$ 311,750	Water Main Replacement	$ 26,612,900
134	Rebekah Street	6	CI	1892	300	2.50	$ 64,500	Water Main Replacement	$ 26,677,400
135	Third Avenue	6	CI	1892	1180	2.50	$ 253,700	Water Main Replacement	$ 26,931,100
136	Adams Street	6	CI	1893	1420	2.50	$ 305,300	Water Main Replacement	$ 27,236,400
137	Bernon Street	6	CI	1893	1480	2.50	$ 318,200	Water Main Replacement	$ 27,554,600

Appendix K
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Main Database Sorted by Total Rating

Pipe Rank	Street	Size (in.)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
138	Cross Street	6	CI	1893	540	2.50	$ 116,100	Water Main Replacement	$ 27,670,700
139	Earle Street	6	CI	1893	1020	2.50	$ 219,300	Water Main Replacement	$ 27,890,000
140	Willow Street	6	CI	1893	700	2.50	$ 150,500	Water Main Replacement	$ 28,040,500
141	Rathbun Street	6	CI	1894	340	2.50	$ 73,100	Water Main Replacement	$ 28,113,600
142	Valley Street	6	CI	1894	100	2.50	$ 21,500	Water Main Replacement	$ 28,135,100
143	Ethel Street	6	CI	1896	320	2.50	$ 68,800	Water Main Replacement	$ 28,203,900
144	Island Place	6	CI	1896	400	2.50	$ 86,000	Water Main Replacement	$ 28,289,900
145	Jenckes Street	6	CI	1896	1340	2.50	$ 288,100	Water Main Replacement	$ 28,578,000
146	Park Place	6	CI	1896	1440	2.50	$ 309,600	Water Main Replacement	$ 28,887,600
147	Vose Street	6	CI	1896	500	2.50	$ 107,500	Water Main Replacement	$ 28,995,100
148	Bellingham Street	6	CI	1897	590	2.50	$ 126,850	Water Main Replacement	$ 29,121,950
149	Morton Avenue	6	CI	1897	320	2.50	$ 68,800	Water Main Replacement	$ 29,190,750
150	Social Street	6	CI	1897	1320	2.50	$ 283,800	Water Main Replacement	$ 29,474,550
151	Pearl Street	6	CI	1898	380	2.50	$ 81,700	Water Main Replacement	$ 29,556,250
152	Sweet Avenue	6	CI	1898	780	2.50	$ 167,700	Water Main Replacement	$ 29,723,950
153	Gilbert Street	6	CI	1899	620	2.50	$ 133,300	Water Main Replacement	$ 29,857,250
154	St. Simon Street	6	CI	1899	540	2.50	$ 116,100	Water Main Replacement	$ 29,973,350
155	James Street	6	CI	1900	260	2.50	$ 55,900	Water Main Replacement	$ 30,029,250
156	Napoleon Street	6	CI	1900	260	2.50	$ 55,900	Water Main Replacement	$ 30,085,150
157	Eighth Avenue	6	CI	1901	520	2.50	$ 111,800	Water Main Replacement	$ 30,196,950
158	Roland Street	6	CI	1901	820	2.50	$ 176,300	Water Main Replacement	$ 30,373,250
159	Burnside Avenue	6	CI	1902	1940	2.50	$ 417,100	Water Main Replacement	$ 30,790,350
160	Chester Street	6	CI	1902	740	2.50	$ 159,100	Water Main Replacement	$ 30,949,450
161	Collins Street	6	CI	1902	690	2.50	$ 148,350	Water Main Replacement	$ 31,097,800
162	Erie Street	6	CI	1902	260	2.50	$ 55,900	Water Main Replacement	$ 31,153,700
163	Kindergarten Street	6	CI	1902	660	2.50	$ 141,900	Water Main Replacement	$ 31,295,600
164	Thomas Street	6	CI	1902	590	2.50	$ 126,850	Water Main Replacement	$ 31,422,450
165	Charles Street	6	CI	1904	490	2.50	$ 105,350	Water Main Replacement	$ 31,527,800
166	Dulude Avenue	6	CI	1904	1100	2.50	$ 236,500	Water Main Replacement	$ 31,764,300
167	Bernon Street	6	CI	1905	880	2.50	$ 189,200	Water Main Replacement	$ 31,953,500
168	Dean Street	6	CI	1905	460	2.50	$ 98,900	Water Main Replacement	$ 32,052,400
169	Estes Street	6	CI	1905	1240	2.50	$ 266,600	Water Main Replacement	$ 32,319,000
170	Garden Street	6	CI	1905	740	2.50	$ 159,100	Water Main Replacement	$ 32,478,100
171	Huntington Avenue	6	CI	1905	920	2.50	$ 197,800	Water Main Replacement	$ 32,675,900
172	Vine Street	6	CI	1905	440	2.50	$ 94,600	Water Main Replacement	$ 32,770,500

Appendix K
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Main Database Sorted by Total Rating

Pipe Rank	Street	Size (in.)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
173	Glen Road	6	CI	1906	1140	2.50	$ 245,100	Water Main Replacement	$ 33,015,600
174	Ninth Avenue	6	CI	1907	850	2.50	$ 182,750	Water Main Replacement	$ 33,198,350
175	Lyman Street	6	CI	1908	780	2.50	$ 167,700	Water Main Replacement	$ 33,366,050
176	Rivulet Street	6	CI	1908	100	2.50	$ 21,500	Water Main Replacement	$ 33,387,550
177	Bennett Street	6	CI	1909	1100	2.50	$ 236,500	Water Main Replacement	$ 33,624,050
178	Manville Road	6	CI	1909	1220	2.50	$ 262,300	Water Main Replacement	$ 33,886,350
179	Roberts Street	6	CI	1909	960	2.50	$ 206,400	Water Main Replacement	$ 34,092,750
180	Federal Street	6	CI	1910	600	2.50	$ 129,000	Water Main Replacement	$ 34,221,750
181	Sixth Avenue	6	CI	1910	380	2.50	$ 81,700	Water Main Replacement	$ 34,303,450
182	Roberta Avenue	6	CI	1911	440	2.50	$ 94,600	Water Main Replacement	$ 34,398,050
183	Seventh Avenue	6	CI	1911	1140	2.50	$ 245,100	Water Main Replacement	$ 34,643,150
184	East Orchard Street	6	CI	1912	680	2.50	$ 146,200	Water Main Replacement	$ 34,789,350
185	Temple Street	6	CI	1912	300	2.50	$ 64,500	Water Main Replacement	$ 34,853,850
186	Cleveland Street	6	CI	1913	440	2.50	$ 94,600	Water Main Replacement	$ 34,948,450
187	Heroux Avenue	6	CI	1913	400	2.50	$ 86,000	Water Main Replacement	$ 35,034,450
188	St. Barnabe Street	6	CI	1913	280	2.50	$ 60,200	Water Main Replacement	$ 35,094,650
189	Trent Street	6	CI	1913	440	2.50	$ 94,600	Water Main Replacement	$ 35,189,250
190	Cote Avenue	6	CI	1914	890	2.50	$ 191,350	Water Main Replacement	$ 35,380,600
191	Baxter Street	6	CI	1915	240	2.50	$ 51,600	Water Main Replacement	$ 35,432,200
192	Read Avenue	6	CI	1915	370	2.50	$ 79,550	Water Main Replacement	$ 35,511,750
193	Rhode Island Avenue	6	CI	1915	360	2.50	$ 77,400	Water Main Replacement	$ 35,589,150
194	Meadow Road	6	CI	1916	980	2.50	$ 210,700	Water Main Replacement	$ 35,799,850
195	Mechanic Avenue	6	CI	1916	520	2.50	$ 111,800	Water Main Replacement	$ 35,911,650
196	Williams Street	6	CI	1916	760	2.50	$ 163,400	Water Main Replacement	$ 36,075,050
197	Gilfillan Road, NS	6	CI	1959	740	2.38	$ 159,100	Water Main Replacement	$ 36,234,150
198	Dewey Street	6	CI	1917	460	2.25	$ 98,900	Water Main Replacement	$ 36,333,050
199	Monty Avenue	8	CI	1930	860	2.25	$ 184,900	Water Main Replacement	$ 36,517,950
200	St. Leon Avenue	8	CI	1932	1200	2.25	$ 258,000	Water Main Replacement	$ 36,775,950
201	All Saints Street	8	CI	1932	750	2.25	$ 161,250	Water Main Replacement	$ 36,937,200
202	Hamilton Street	6	CI	1921	620	2.25	$ 133,300	Water Main Replacement	$ 37,070,500
203	Reservoir Avenue	12	CI	1919	2660	2.25	$ 399,000	Cleaning and Lining	$ 37,469,500
204	Warren Avenue, NS	6	CI	1928	380	2.25	$ 81,700	Water Main Replacement	$ 37,551,200
205	Francis Street	6	CI	1917	220	2.25	$ 47,300	Water Main Replacement	$ 37,598,500
206	Laval Street	6	CI	1917	480	2.25	$ 103,200	Water Main Replacement	$ 37,701,700
207	Victor Street	6	CI	1917	300	2.25	$ 64,500	Water Main Replacement	$ 37,766,200

Appendix K
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
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Pipe Rank	Street	Size (in.)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
208	Foundry Street	6	CI	1919	180	2.25	$ 38,700	Water Main Replacement	$ 37,804,900
209	Lafayette Street	6	CI	1919	320	2.25	$ 68,800	Water Main Replacement	$ 37,873,700
210	Snow Street	6	CI	1919	400	2.25	$ 86,000	Water Main Replacement	$ 37,959,700
211	Verry Street	6	CI	1919	840	2.25	$ 180,600	Water Main Replacement	$ 38,140,300
212	Crawford Street	6	CI	1920	360	2.25	$ 77,400	Water Main Replacement	$ 38,217,700
213	Hill Street	6	CI	1920	540	2.25	$ 116,100	Water Main Replacement	$ 38,333,800
214	Ward Street	6	CI	1920	560	2.25	$ 120,400	Water Main Replacement	$ 38,454,200
215	Mill Street	6	CI	1921	610	2.25	$ 131,150	Water Main Replacement	$ 38,585,350
216	Robinson Street	6	CI	1921	500	2.25	$ 107,500	Water Main Replacement	$ 38,692,850
217	Upland Road	6	CI	1921	640	2.25	$ 137,600	Water Main Replacement	$ 38,830,450
218	Chalapa Avenue	6	CI	1922	570	2.25	$ 122,550	Water Main Replacement	$ 38,953,000
219	Fairmount Street	6	CI	1922	280	2.25	$ 60,200	Water Main Replacement	$ 39,013,200
220	Homestead Road	6	CI	1923	200	2.25	$ 43,000	Water Main Replacement	$ 39,056,200
221	Elmore Street	6	CI	1927	120	2.25	$ 25,800	Water Main Replacement	$ 39,082,000
222	Crest Road, NS	6	CI	1928	500	2.25	$ 107,500	Water Main Replacement	$ 39,189,500
223	Great Road, NS	6	CI	1928	260	2.25	$ 55,900	Water Main Replacement	$ 39,245,400
224	Smithfield Road, NS	6	CI	1928	420	2.25	$ 90,300	Water Main Replacement	$ 39,335,700
225	Woonsocket Hill Road, NS	6	CI	1928	2040	2.25	$ 438,600	Water Main Replacement	$ 39,774,300
226	Buell Avenue, NS	1	CT	1960	100	2.13	$ 21,500	Water Main Replacement	$ 39,795,800
227	Lydia Avenue	8	CI	1954	3360	2.00	$ 722,400	Water Main Replacement	$ 40,518,200
228	Priscilla Road	8	CI	1956	850	2.00	$ 182,750	Water Main Replacement	$ 40,700,950
229	Roberta Avenue	6	CI	1954	340	2.00	$ 73,100	Water Main Replacement	$ 40,774,050
230	Morse Avenue	6	CI	1954	340	2.00	$ 73,100	Water Main Replacement	$ 40,847,150
231	Weeks Street, NS	8	CI	1954	700	2.00	$ 150,500	Water Main Replacement	$ 40,997,650
232	Chapel Street	6	CI	1942	240	2.00	$ 51,600	Water Main Replacement	$ 41,049,250
233	Newland Avenue	6	CI	1947	480	2.00	$ 103,200	Water Main Replacement	$ 41,152,450
234	Priscilla Road	6	CI	1949	280	2.00	$ 60,200	Water Main Replacement	$ 41,212,650
235	Redwood Street	6	CI	1955	150	2.00	$ 32,250	Water Main Replacement	$ 41,244,900
236	Harrison Avenue	8	CI	1892	680	1.88	$ 146,200	Water Main Replacement	$ 41,391,100
237	Hazel Street	8	CI	1905	940	1.88	$ 202,100	Water Main Replacement	$ 41,593,200
238	Fourth Avenue	8	CI	1913	420	1.88	$ 90,300	Water Main Replacement	$ 41,683,500
239	Clinton Street	12	CI	1888	1900	1.88	$ 285,000	Cleaning and Lining	$ 41,968,500
240	Bertenshaw Road	8	CI	1908	1280	1.88	$ 275,200	Water Main Replacement	$ 42,243,700
241	Rathbun Street	12	CI	1887	2640	1.88	$ 396,000	Cleaning and Lining	$ 42,639,700

Appendix K
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Main Database Sorted by Total Rating

Pipe Rank	Street	Size (in.)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
242	Water Street	8	CI	1891	420	1.88	$ 90,300	Water Main Replacement	$ 42,730,000
243	Cumberland Hill Road	12	CI	1902	6000	1.88	$ 900,000	Cleaning and Lining	$ 43,630,000
244	Pond Street	12	CI	1891	3180	1.88	$ 477,000	Cleaning and Lining	$ 44,107,000
245	Kendrick Avenue	12	CI	1889	960	1.88	$ 144,000	Cleaning and Lining	$ 44,251,000
246	Manville Road	12	CI	1906	490	1.88	$ 73,500	Cleaning and Lining	$ 44,324,500
247	Elm Street	8	CI	1913	2900	1.88	$ 623,500	Water Main Replacement	$ 44,948,000
248	Davison Avenue	12	CI	1916	1120	1.88	$ 168,000	Cleaning and Lining	$ 45,116,000
249	Davison Avenue	12	CI	1916	1120	1.88	$ 168,000	Cleaning and Lining	$ 45,284,000
250	Florence Drive	12	CI	1916	1100	1.88	$ 165,000	Cleaning and Lining	$ 45,449,000
251	Florence Drive	12	CI	1916	1100	1.88	$ 165,000	Cleaning and Lining	$ 45,614,000
252	Kendrick Avenue	12	CI	1916	150	1.88	$ 22,500	Cleaning and Lining	$ 45,636,500
253	Sayles Street	8	CI	1885	360	1.88	$ 77,400	Water Main Replacement	$ 45,713,900
254	Social Street	12	CI	1885	820	1.88	$ 123,000	Cleaning and Lining	$ 45,836,900
255	Grove Street	8	CI	1886	760	1.88	$ 163,400	Water Main Replacement	$ 46,000,300
256	Grove Street	8	CI	1886	960	1.88	$ 206,400	Water Main Replacement	$ 46,206,700
257	South Street	8	CI	1886	360	1.88	$ 77,400	Water Main Replacement	$ 46,284,100
258	Grove Street	12	CI	1886	480	1.88	$ 72,000	Cleaning and Lining	$ 46,356,100
259	Church Street	8	CI	1887	1240	1.88	$ 266,600	Water Main Replacement	$ 46,622,700
260	Orchard Street	8	CI	1887	960	1.88	$ 206,400	Water Main Replacement	$ 46,829,100
261	Pine Street	8	CI	1887	640	1.88	$ 137,600	Water Main Replacement	$ 46,966,700
262	Arnold Street	8	CI	1888	940	1.88	$ 202,100	Water Main Replacement	$ 47,168,800
263	Arnold Street	8	CI	1888	1400	1.88	$ 301,000	Water Main Replacement	$ 47,469,800
264	Cass Avenue	8	CI	1889	3180	1.88	$ 683,700	Water Main Replacement	$ 48,153,500
265	Center Street	8	CI	1889	1000	1.88	$ 215,000	Water Main Replacement	$ 48,368,500
266	East Street	8	CI	1889	960	1.88	$ 206,400	Water Main Replacement	$ 48,574,900
267	First Avenue	8	CI	1889	1300	1.88	$ 279,500	Water Main Replacement	$ 48,854,400
268	Fountain Street	8	CI	1889	820	1.88	$ 176,300	Water Main Replacement	$ 49,030,700
269	High Street	8	CI	1889	700	1.88	$ 150,500	Water Main Replacement	$ 49,181,200
270	Mason Street	8	CI	1889	3080	1.88	$ 662,200	Water Main Replacement	$ 49,843,400
271	Summer Street	8	CI	1889	1310	1.88	$ 281,650	Water Main Replacement	$ 50,125,050
272	Union Street	8	CI	1889	580	1.88	$ 124,700	Water Main Replacement	$ 50,249,750
273	Watson Street	8	CI	1889	420	1.88	$ 90,300	Water Main Replacement	$ 50,340,050
274	Blackstone Street	12	CI	1889	3160	1.88	$ 474,000	Cleaning and Lining	$ 50,814,050
275	Cumberland Street	12	CI	1889	2260	1.88	$ 339,000	Cleaning and Lining	$ 51,153,050
276	East School Street	12	CI	1889	470	1.88	$ 70,500	Cleaning and Lining	$ 51,223,550

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Pipe Rank	Street	Size (in.)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
277	East School Street	12	CI	1889	1380	1.88	$ 207,000	Cleaning and Lining	$ 51,430,550
278	Main Street	12	CI	1889	2500	1.88	$ 375,000	Cleaning and Lining	$ 51,805,550
279	Transit Street	12	CI	1889	1240	1.88	$ 186,000	Cleaning and Lining	$ 51,991,550
280	Canal Street	8	CI	1890	320	1.88	$ 68,800	Water Main Replacement	$ 52,060,350
281	Park Avenue	8	CI	1890	4660	1.88		2018 Replacement	$ 52,060,350
282	Vose Street	8	CI	1890	980	1.88	$ 210,700	Water Main Replacement	$ 52,271,050
283	Wilson Avenue	8	CI	1890	540	1.88	$ 116,100	Water Main Replacement	$ 52,387,150
284	Avenue C	8	CI	1891	1380	1.88	$ 296,700	Water Main Replacement	$ 52,683,850
285	Bernice Avenue	8	CI	1891	1280	1.88	$ 275,200	Water Main Replacement	$ 52,959,050
286	Brook Street	8	CI	1891	440	1.88	$ 94,600	Water Main Replacement	$ 53,053,650
287	Harris Avenue	8	CI	1891	900	1.88	$ 193,500	Water Main Replacement	$ 53,247,150
288	Providence Street	8	CI	1891	1320	1.88	$ 283,800	Water Main Replacement	$ 53,530,950
289	Transit Street	8	CI	1891	1280	1.88	$ 275,200	Water Main Replacement	$ 53,806,150
290	Front Street	12	CI	1891	320	1.88	$ 48,000	Cleaning and Lining	$ 53,854,150
291	Daniels Street	8	CI	1892	230	1.88	$ 49,450	Water Main Replacement	$ 53,903,600
292	Morton Avenue	8	CI	1892	760	1.88	$ 163,400	Water Main Replacement	$ 54,067,000
293	River Street	8	CI	1892	260	1.88	$ 55,900	Water Main Replacement	$ 54,122,900
294	Short Street	8	CI	1893	260	1.88	$ 55,900	Water Main Replacement	$ 54,178,800
295	Railroad Street	12	CI	1894	1280	1.88	$ 192,000	Cleaning and Lining	$ 54,370,800
296	Wood Avenue	12	CI	1894	1000	1.88	$ 150,000	Cleaning and Lining	$ 54,520,800
297	East School Street	8	CI	1895	1160	1.88	$ 249,400	Water Main Replacement	$ 54,770,200
298	Wood Avenue	8	CI	1895	810	1.88	$ 174,150	Water Main Replacement	$ 54,944,350
299	Alice Avenue	12	CI	1895	780	1.88	$ 117,000	Cleaning and Lining	$ 55,061,350
300	Allen Street	8	CI	1896	950	1.88	$ 204,250	Water Main Replacement	$ 55,265,600
301	Oak Street	8	CI	1896	820	1.88	$ 176,300	Water Main Replacement	$ 55,441,900
302	West School Street	8	CI	1896	1160	1.88	$ 249,400	Water Main Replacement	$ 55,691,300
303	Fairmount Street	8	CI	1897	1940	1.88	$ 417,100	Water Main Replacement	$ 56,108,400
304	Valley Street	8	CI	1897	240	1.88	$ 51,600	Water Main Replacement	$ 56,160,000
305	Winter Street	8	CI	1897	3050	1.88	$ 655,750	Water Main Replacement	$ 56,815,750
306	Social Street	8	CI	1898	960	1.88	$ 206,400	Water Main Replacement	$ 57,022,150
307	Sunnyside Avenue	8	CI	1898	1240	1.88	$ 266,600	Water Main Replacement	$ 57,288,750
308	Estes Street	8	CI	1899	420	1.88	$ 90,300	Water Main Replacement	$ 57,379,050
309	Spring Street	8	CI	1899	1000	1.88	$ 215,000	Water Main Replacement	$ 57,594,050
310	North Ballou Street	8	CI	1900	280	1.88	$ 60,200	Water Main Replacement	$ 57,654,250

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Pipe Rank	Street	Size (in.)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
311	Third Avenue	8	CI	1900	1480	1.88	$ 318,200	Water Main Replacement	$ 57,972,450
312	Villa Nova Street	8	CI	1901	740	1.88	$ 159,100	Water Main Replacement	$ 58,131,550
313	George Street	8	CI	1902	440	1.88	$ 94,600	Water Main Replacement	$ 58,226,150
314	Harris Avenue	8	CI	1902	560	1.88	$ 120,400	Water Main Replacement	$ 58,346,550
315	Newland Avenue	8	CI	1902	1340	1.88	$ 288,100	Water Main Replacement	$ 58,634,650
316	Division Street	12	CI	1902	520	1.88	$ 78,000	Cleaning and Lining	$ 58,712,650
317	Bernon Street	8	CI	1905	540	1.88	$ 116,100	Water Main Replacement	$ 58,828,750
318	Bernon Street	8	CI	1905	720	1.88	$ 154,800	Water Main Replacement	$ 58,983,550
319	Crawford Street	8	CI	1905	300	1.88	$ 64,500	Water Main Replacement	$ 59,048,050
320	Farm Street	8	CI	1905	640	1.88	$ 137,600	Water Main Replacement	$ 59,185,650
321	Harris Avenue	8	CI	1905	330	1.88	$ 70,950	Water Main Replacement	$ 59,256,600
322	Huntington Avenue	8	CI	1905	200	1.88	$ 43,000	Water Main Replacement	$ 59,299,600
323	Vine Street	8	CI	1905	200	1.88	$ 43,000	Water Main Replacement	$ 59,342,600
324	Fairmount Street	8	CI	1907	1700	1.88	$ 365,500	Water Main Replacement	$ 59,708,100
325	Henry Street	8	CI	1908	380	1.88	$ 81,700	Water Main Replacement	$ 59,789,800
326	Middle Street	8	CI	1908	570	1.88	$ 122,550	Water Main Replacement	$ 59,912,350
327	Rivulet Street	8	CI	1908	960	1.88	$ 206,400	Water Main Replacement	$ 60,118,750
328	Knight Street	8	CI	1910	2320	1.88	$ 498,800	Water Main Replacement	$ 60,617,550
329	Sixth Avenue	8	CI	1910	280	1.88	$ 60,200	Water Main Replacement	$ 60,677,750
330	Sixth Avenue	8	CI	1910	720	1.88	$ 154,800	Water Main Replacement	$ 60,832,550
331	Third Avenue	8	CI	1910	440	1.88	$ 94,600	Water Main Replacement	$ 60,927,150
332	Harris Avenue	12	CI	1911	560	1.88	$ 84,000	Cleaning and Lining	$ 61,011,150
333	Singleton Street	12	CI	1911	2040	1.88	$ 306,000	Cleaning and Lining	$ 61,317,150
334	Fifth Avenue	8	CI	1912	1180	1.88	$ 253,700	Water Main Replacement	$ 61,570,850
335	Hebert Avenue	8	CI	1913	880	1.88	$ 189,200	Water Main Replacement	$ 61,760,050
336	Phebe Street	8	CI	1913	460	1.88	$ 98,900	Water Main Replacement	$ 61,858,950
337	Rebekah Street	8	CI	1913	720	1.88	$ 154,800	Water Main Replacement	$ 62,013,750
338	Aylsworth Avenue	8	CI	1914	3700	1.88	$ 795,500	Water Main Replacement	$ 62,809,250
339	Rhode Island Avenue	8	CI	1915	560	1.88	$ 120,400	Water Main Replacement	$ 62,929,650
340	Mount Saint Charles Avenue	12	CI	1915	450	1.88	$ 67,500	Cleaning and Lining	$ 62,997,150
341	Hamlet Avenue	12	CI	1916	380	1.88	$ 57,000	Cleaning and Lining	$ 63,054,150
342	Glaude Lane	8	DI	1962	1300	1.75	$ 279,500	Water Main Replacement	$ 63,333,650
343	Miles Avenue	8	DI	1972	460	1.75	$ 98,900	Water Main Replacement	$ 63,432,550
344	Halsey Road	8	CI	1958	1480	1.75	$ 318,200	Water Main Replacement	$ 63,750,750
345	Marian Lane	8	AC	1974	240	1.75	$ 51,600	Water Main Replacement	$ 63,802,350

Appendix K
City of Woonsocket, Rhode Island
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Pipe Rank	Street	Size (in.)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
346	Dawn Boulevard	8	DI	1962	540	1.75	$ 116,100	Water Main Replacement	$ 63,918,450
347	Diamond Hill Road	12	DI	1969	6080	1.75	$ 912,000	Cleaning and Lining	$ 64,830,450
348	Dunlap Street	8	CI	1958	580	1.75	$ 124,700	Water Main Replacement	$ 64,955,150
349	Cottage Street	8	CI	1960	980	1.75	$ 210,700	Water Main Replacement	$ 65,165,850
350	Morris Street	8	AC	1974	320	1.75	$ 68,800	Water Main Replacement	$ 65,234,650
351	Stoneham Drive	8	DI	1971	890	1.75	$ 191,350	Water Main Replacement	$ 65,426,000
352	Knollwood Drive	8	DI	1967	4200	1.75	$ 903,000	Water Main Replacement	$ 66,329,000
353	Wayne Road	8	DI	1960	620	1.75	$ 133,300	Water Main Replacement	$ 66,462,300
354	Woodhaven Road	8	DI	1971	1080	1.75	$ 232,200	Water Main Replacement	$ 66,694,500
355	Coolidge Avenue	8	DI	1960	540	1.75	$ 116,100	Water Main Replacement	$ 66,810,600
356	Bayberry Road	8	DI	1968	1540	1.75	$ 331,100	Water Main Replacement	$ 67,141,700
357	Grandview Avenue	8	DI	1969	3140	1.75	$ 675,100	Water Main Replacement	$ 67,816,800
358	Country Road	8	DI	1970	1060	1.75	$ 227,900	Water Main Replacement	$ 68,044,700
359	Lemay Road	8	DI	1961	1000	1.75	$ 215,000	Water Main Replacement	$ 68,259,700
360	State Street	8	DI	1964	320	1.75	$ 68,800	Water Main Replacement	$ 68,328,500
361	Mendon Road Driveway, NS	8	CI	1964	660	1.75	$ 141,900	Water Main Replacement	$ 68,470,400
362	Village Road	8	AC	1973	1080	1.75	$ 232,200	Water Main Replacement	$ 68,702,600
363	Patton Road	8	AC	1973	280	1.75	$ 60,200	Water Main Replacement	$ 68,762,800
364	Rock Ridge Drive	6	DI	1973	340	1.75	$ 73,100	Water Main Replacement	$ 68,835,900
365	Rock Ridge Drive	6	DI	1973	520	1.75	$ 111,800	Water Main Replacement	$ 68,947,700
366	Lucille Street	8	CI	1930	2080	1.63	$ 447,200	Water Main Replacement	$ 69,394,900
367	Ballou Street	8	CI	1917	1720	1.63	$ 369,800	Water Main Replacement	$ 69,764,700
368	Cady Street	8	CI	1937	720	1.63	$ 154,800	Water Main Replacement	$ 69,919,500
369	Cass Avenue	10	CI	1921	2160	1.63	$ 518,400	Water Main Replacement	$ 70,437,900
370	Elm Street	10	CI	1921	3500	1.63	$ 840,000	Water Main Replacement	$ 71,277,900
371	Carnation Street	8	CI	1922	1680	1.63	$ 361,200	Water Main Replacement	$ 71,639,100
372	Rhodes Avenue	12	CI	1929	1100	1.63	$ 165,000	Cleaning and Lining	$ 71,804,100
373	Carnation Street	10	CI	1930	480	1.63	$ 115,200	Water Main Replacement	$ 71,919,300
374	Diamond Hill Road	12	CI	1925	7450	1.63	$ 1,117,500	Cleaning and Lining	$ 73,036,800
375	Smithfield Road, NS	8	CI	1928	440	1.63	$ 94,600	Water Main Replacement	$ 73,131,400
376	Eighth Avenue	8	CI	1917	340	1.63	$ 73,100	Water Main Replacement	$ 73,204,500
377	Richelieu Street	8	CI	1917	380	1.63	$ 81,700	Water Main Replacement	$ 73,286,200
378	Robinson Street	8	CI	1917	1200	1.63	$ 258,000	Water Main Replacement	$ 73,544,200
379	Winthrop Street	8	CI	1917	1600	1.63	$ 344,000	Water Main Replacement	$ 73,888,200
380	Robinson Street	8	CI	1919	860	1.63	$ 184,900	Water Main Replacement	$ 74,073,100

Appendix K
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Pipe Rank	Street	Size (in.)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
381	Ella Avenue	8	CI	1919	400	1.63	$ 86,000	Water Main Replacement	$ 74,159,100
382	Rutland Street	8	CI	1920	400	1.63	$ 86,000	Water Main Replacement	$ 74,245,100
383	Sixth Avenue	8	CI	1920	450	1.63	$ 96,750	Water Main Replacement	$ 74,341,850
384	Cherry Hill Avenue	8	CI	1921	440	1.63	$ 94,600	Water Main Replacement	$ 74,436,450
385	Cleveland Street	8	CI	1921	400	1.63	$ 86,000	Water Main Replacement	$ 74,522,450
386	Dana Street	8	CI	1921	1360	1.63	$ 292,400	Water Main Replacement	$ 74,814,850
387	Napoleon Street	8	CI	1921	320	1.63	$ 68,800	Water Main Replacement	$ 74,883,650
388	Providence Street	8	CI	1921	1280	1.63	$ 275,200	Water Main Replacement	$ 75,158,850
389	Warwick Street	8	CI	1921	880	1.63	$ 189,200	Water Main Replacement	$ 75,348,050
390	Oxford Avenue	12	CI	1921	340	1.63	$ 51,000	Cleaning and Lining	$ 75,399,050
391	Cooper Avenue	8	CI	1922	1080	1.63	$ 232,200	Water Main Replacement	$ 75,631,250
392	Kenwood Street	8	CI	1922	740	1.63	$ 159,100	Water Main Replacement	$ 75,790,350
393	Newport Street	8	CI	1922	800	1.63	$ 172,000	Water Main Replacement	$ 75,962,350
394	Progresso Avenue	8	CI	1922	1040	1.63	$ 223,600	Water Main Replacement	$ 76,185,950
395	Yolande Place	8	CI	1922	345	1.63	$ 74,175	Water Main Replacement	$ 76,260,125
396	River Street	12	CI	1922	150	1.63	$ 22,500	Cleaning and Lining	$ 76,282,625
397	Second Avenue	12	CI	1923	720	1.63	$ 108,000	Cleaning and Lining	$ 76,390,625
398	Beech Street	8	CI	1924	380	1.63	$ 81,700	Water Main Replacement	$ 76,472,325
399	Eighth Avenue	8	CI	1924	860	1.63	$ 184,900	Water Main Replacement	$ 76,657,225
400	Elmore Street	8	CI	1924	640	1.63	$ 137,600	Water Main Replacement	$ 76,794,825
401	Fairlawn Avenue	8	CI	1924	520	1.63	$ 111,800	Water Main Replacement	$ 76,906,625
402	Hemond Avenue	8	CI	1924	1100	1.63	$ 236,500	Water Main Replacement	$ 77,143,125
403	Mailloux Street	8	CI	1924	330	1.63	$ 70,950	Water Main Replacement	$ 77,214,075
404	Minerva Street	8	CI	1924	480	1.63	$ 103,200	Water Main Replacement	$ 77,317,275
405	Mitris Boulevard	8	CI	1924	880	1.63	$ 189,200	Water Main Replacement	$ 77,506,475
406	Monroe Street	12	CI	1924	1160	1.63	$ 174,000	Cleaning and Lining	$ 77,680,475
407	Buxton Street	8	CI	1925	240	1.63	$ 51,600	Water Main Replacement	$ 77,732,075
408	East Mill Street	8	CI	1925	350	1.63	$ 75,250	Water Main Replacement	$ 77,807,325
409	Florida Street	8	CI	1925	440	1.63	$ 94,600	Water Main Replacement	$ 77,901,925
410	Loring Street	8	CI	1925	620	1.63	$ 133,300	Water Main Replacement	$ 78,035,225
411	Parker Street	8	CI	1925	580	1.63	$ 124,700	Water Main Replacement	$ 78,159,925
412	Piedmont Street	8	CI	1925	1220	1.63	$ 262,300	Water Main Replacement	$ 78,422,225
413	Salisbury Street	8	CI	1925	240	1.63	$ 51,600	Water Main Replacement	$ 78,473,825
414	Verdun Street	8	CI	1925	400	1.63	$ 86,000	Water Main Replacement	$ 78,559,825
415	Warner Street	8	CI	1925	180	1.63	$ 38,700	Water Main Replacement	$ 78,598,525

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Pipe Rank	Street	Size (in.)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
416	Woodland Road	8	CI	1925	1140	1.63	$ 245,100	Water Main Replacement	$ 78,843,625
417	Atlanta Street	8	CI	1926	700	1.63	$ 150,500	Water Main Replacement	$ 78,994,125
418	Bailey Street	8	CI	1926	900	1.63	$ 193,500	Water Main Replacement	$ 79,187,625
419	Chestnut Street	8	CI	1926	500	1.63	$ 107,500	Water Main Replacement	$ 79,295,125
420	Gaskill Street	8	CI	1926	700	1.63	$ 150,500	Water Main Replacement	$ 79,445,625
421	Mill Street, NS	8	CI	1926	280	1.63	$ 60,200	Water Main Replacement	$ 79,505,825
422	Burnside Avenue	8	CI	1927	480	1.63	$ 103,200	Water Main Replacement	$ 79,609,025
423	Kermit Street	8	CI	1927	500	1.63	$ 107,500	Water Main Replacement	$ 79,716,525
424	LeBrun Avenue	8	CI	1927	680	1.63	$ 146,200	Water Main Replacement	$ 79,862,725
425	Ormond Street	8	CI	1927	240	1.63	$ 51,600	Water Main Replacement	$ 79,914,325
426	St. Cecile Avenue	8	CI	1927	1140	1.63	$ 245,100	Water Main Replacement	$ 80,159,425
427	Trent Street	8	CI	1927	530	1.63	$ 113,950	Water Main Replacement	$ 80,273,375
428	Canal Street, NS	8	CI	1928	2180	1.63	$ 468,700	Water Main Replacement	$ 80,742,075
429	Cranston Street	8	CI	1928	960	1.63	$ 206,400	Water Main Replacement	$ 80,948,475
430	Great Road, NS	8	CI	1928	1120	1.63	$ 240,800	Water Main Replacement	$ 81,189,275
431	Lafayette Street	8	CI	1928	200	1.63	$ 43,000	Water Main Replacement	$ 81,232,275
432	Montcalm Street	8	CI	1928	200	1.63	$ 43,000	Water Main Replacement	$ 81,275,275
433	Morse Avenue, NS	8	CI	1928	480	1.63	$ 103,200	Water Main Replacement	$ 81,378,475
434	Nursery Avenue	8	CI	1928	1880	1.63	$ 404,200	Water Main Replacement	$ 81,782,675
435	Ross Street	8	CI	1928	240	1.63	$ 51,600	Water Main Replacement	$ 81,834,275
436	Smithfield Road, NS	8	CI	1928	880	1.63	$ 189,200	Water Main Replacement	$ 82,023,475
437	White Parkway, NS	8	CI	1928	1540	1.63	$ 331,100	Water Main Replacement	$ 82,354,575
438	Mendon Road	12	CI	1928	11500	1.63	$ 1,725,000	Cleaning and Lining	$ 84,079,575
439	Benelli Street	8	CI	1929	270	1.63	$ 58,050	Water Main Replacement	$ 84,137,625
440	Jackson Street	8	CI	1929	420	1.63	$ 90,300	Water Main Replacement	$ 84,227,925
441	Newbury Avenue	8	CI	1929	1380	1.63	$ 296,700	Water Main Replacement	$ 84,524,625
442	Phillips Street	8	CI	1929	1380	1.63	$ 296,700	Water Main Replacement	$ 84,821,325
443	Beausoleil Street	12	CI	1929	600	1.63	$ 90,000	Cleaning and Lining	$ 84,911,325
444	Burrington Street	8	CI	1930	1460	1.63	$ 313,900	Water Main Replacement	$ 85,225,225
445	Congress Street	8	CI	1930	800	1.63	$ 172,000	Water Main Replacement	$ 85,397,225
446	Fournier Street	8	CI	1930	800	1.63	$ 172,000	Water Main Replacement	$ 85,569,225
447	Havelock Street	8	CI	1930	80	1.63	$ 17,200	Water Main Replacement	$ 85,586,425
448	Laflamme Avenue	8	CI	1930	180	1.63	$ 38,700	Water Main Replacement	$ 85,625,125
449	Linden Avenue	8	CI	1930	1350	1.63	$ 290,250	Water Main Replacement	$ 85,915,375
450	Oakton Street	8	CI	1930	860	1.63	$ 184,900	Water Main Replacement	$ 86,100,275

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Pipe Rank	Street	Size (in.)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
451	Olive Street	8	CI	1930	780	1.63	$ 167,700	Water Main Replacement	$ 86,267,975
452	Seamans Street	8	CI	1930	580	1.63	$ 124,700	Water Main Replacement	$ 86,392,675
453	Tache Street	8	CI	1930	480	1.63	$ 103,200	Water Main Replacement	$ 86,495,875
454	Vivian Street	8	CI	1930	680	1.63	$ 146,200	Water Main Replacement	$ 86,642,075
455	Knight Street	10	CI	1930	1880	1.63	$ 451,200	Water Main Replacement	$ 87,093,275
456	Hamilton Street	12	CI	1930	960	1.63	$ 144,000	Cleaning and Lining	$ 87,237,275
457	Rodman Street	8	CI	1931	800	1.63	$ 172,000	Water Main Replacement	$ 87,409,275
458	Temple Street	8	CI	1931	300	1.63	$ 64,500	Water Main Replacement	$ 87,473,775
459	Talcott Street	12	CI	1931	1060	1.63	$ 159,000	Cleaning and Lining	$ 87,632,775
460	Hope Street	8	CI	1932	780	1.63	$ 167,700	Water Main Replacement	$ 87,800,475
461	Joffre Avenue	8	CI	1932	1320	1.63	$ 283,800	Water Main Replacement	$ 88,084,275
462	Manila Avenue	8	CI	1932	1060	1.63	$ 227,900	Water Main Replacement	$ 88,312,175
463	Olo Street	8	CI	1932	440	1.63	$ 94,600	Water Main Replacement	$ 88,406,775
464	Oregon Avenue	8	CI	1932	1200	1.63	$ 258,000	Water Main Replacement	$ 88,664,775
465	Papineau Avenue	8	CI	1932	760	1.63	$ 163,400	Water Main Replacement	$ 88,828,175
466	Pelletier Avenue	8	CI	1932	600	1.63	$ 129,000	Water Main Replacement	$ 88,957,175
467	Warren Avenue	8	CI	1932	520	1.63	$ 111,800	Water Main Replacement	$ 89,068,975
468	Greene Street	12	CI	1932	1020	1.63	$ 153,000	Cleaning and Lining	$ 89,221,975
469	Harris Avenue	12	CI	1932	1700	1.63	$ 255,000	Cleaning and Lining	$ 89,476,975
470	Beacon Avenue	8	CI	1933	1480	1.63	$ 318,200	Water Main Replacement	$ 89,795,175
471	Conrad Street	8	CI	1933	660	1.63	$ 141,900	Water Main Replacement	$ 89,937,075
472	Lilac Avenue	8	CI	1933	980	1.63	$ 210,700	Water Main Replacement	$ 90,147,775
473	Roberts Street	8	CI	1933	340	1.63	$ 73,100	Water Main Replacement	$ 90,220,875
474	Angell Street	8	CI	1934	750	1.63	$ 161,250	Water Main Replacement	$ 90,382,125
475	Glendale Avenue	8	CI	1934	1040	1.63	$ 223,600	Water Main Replacement	$ 90,605,725
476	Mowry Street	8	CI	1934	1220	1.63	$ 262,300	Water Main Replacement	$ 90,868,025
477	St. Hughes Street	8	CI	1934	950	1.63	$ 204,250	Water Main Replacement	$ 91,072,275
478	Breault Avenue	8	CI	1935	480	1.63	$ 103,200	Water Main Replacement	$ 91,175,475
479	Libbeus Street	8	CI	1935	460	1.63	$ 98,900	Water Main Replacement	$ 91,274,375
480	Poplar Street	8	CI	1935	1180	1.63	$ 253,700	Water Main Replacement	$ 91,528,075
481	Rutland Street	8	CI	1935	600	1.63	$ 129,000	Water Main Replacement	$ 91,657,075
482	Desrochers Avenue	8	CI	1936	240	1.63	$ 51,600	Water Main Replacement	$ 91,708,675
483	Denby Street	8	CI	1937	375	1.63	$ 80,625	Water Main Replacement	$ 91,789,300
484	Tenth Avenue	8	CI	1937	480	1.63	$ 103,200	Water Main Replacement	$ 91,892,500
485	Holley Lane	6	DI	1988	1880	1.50	$ 404,200	Water Main Replacement	$ 92,296,700

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486	Flora Avenue	8	CI	1956	1280	1.38	$ 275,200	Water Main Replacement	$ 92,571,900
487	Hayes Street	8	CI	1949	1060	1.38	$ 227,900	Water Main Replacement	$ 92,799,800
488	Annette Avenue	8	CI	1953	1300	1.38	$ 279,500	Water Main Replacement	$ 93,079,300
489	Elder Ballou Meetinghouse Rd	12	CI	1949	830	1.38	$ 124,500	Cleaning and Lining	$ 93,203,800
490	Elder Ballou Meetinghouse Rd	8	CI	1949	1060	1.38	$ 227,900	Water Main Replacement	$ 93,431,700
491	Morse Avenue	8	CI	1954	160	1.38	$ 34,400	Water Main Replacement	$ 93,466,100
492	Fabien Street	8	CI	1939	380	1.38	$ 81,700	Water Main Replacement	$ 93,547,800
493	Fairfield Avenue	8	CI	1939	1180	1.38	$ 253,700	Water Main Replacement	$ 93,801,500
494	Larch Street	8	CI	1939	1560	1.38	$ 335,400	Water Main Replacement	$ 94,136,900
495	Rome Avenue	8	CI	1939	80	1.38	$ 17,200	Water Main Replacement	$ 94,154,100
496	Birch Street	8	CI	1940	350	1.38	$ 75,250	Water Main Replacement	$ 94,229,350
497	Smithfield Road, NS	8	CI	1940	150	1.38	$ 32,250	Water Main Replacement	$ 94,261,600
498	Arlington Street	8	CI	1941	475	1.38	$ 102,125	Water Main Replacement	$ 94,363,725
499	Benefit Street	8	CI	1941	560	1.38	$ 120,400	Water Main Replacement	$ 94,484,125
500	Emerson Street	8	CI	1941	380	1.38	$ 81,700	Water Main Replacement	$ 94,565,825
501	Franklin Street	8	CI	1941	360	1.38	$ 77,400	Water Main Replacement	$ 94,643,225
502	Lambert Avenue	8	CI	1941	740	1.38	$ 159,100	Water Main Replacement	$ 94,802,325
503	Lexington Street	8	CI	1941	300	1.38	$ 64,500	Water Main Replacement	$ 94,866,825
504	Ward Street	8	CI	1941	680	1.38	$ 146,200	Water Main Replacement	$ 95,013,025
505	Louise Street	8	CI	1942	1060	1.38	$ 227,900	Water Main Replacement	$ 95,240,925
506	Norman Street	8	CI	1942	280	1.38	$ 60,200	Water Main Replacement	$ 95,301,125
507	Olive Street	8	CI	1942	420	1.38	$ 90,300	Water Main Replacement	$ 95,391,425
508	Cumberland Street	8	CI	1943	800	1.38	$ 172,000	Water Main Replacement	$ 95,563,425
509	Kennedy Street	8	CI	1945	800	1.38	$ 172,000	Water Main Replacement	$ 95,735,425
510	Notheast Street	8	CI	1945	170	1.38	$ 36,550	Water Main Replacement	$ 95,771,975
511	Darwin Street	8	CI	1946	420	1.38	$ 90,300	Water Main Replacement	$ 95,862,275
512	Olympia Avenue	8	CI	1946	560	1.38	$ 120,400	Water Main Replacement	$ 95,982,675
513	Virginia Avenue	8	CI	1946	1360	1.38	$ 292,400	Water Main Replacement	$ 96,275,075
514	Bartlett Street	12	CI	1947	380	1.38	$ 57,000	Cleaning and Lining	$ 96,332,075
515	Janet Avenue	8	CI	1948	340	1.38	$ 73,100	Water Main Replacement	$ 96,405,175
516	Lefrancois Boulevard	8	CI	1948	820	1.38	$ 176,300	Water Main Replacement	$ 96,581,475
517	Talcott Street	8	CI	1948	760	1.38	$ 163,400	Water Main Replacement	$ 96,744,875
518	16" TRANSMISSION	16	CI	1948	2870	1.38	$ 502,250	Cleaning and Lining	$ 97,247,125
519	Norman Street	8	CI	1949	600	1.38	$ 129,000	Water Main Replacement	$ 97,376,125
520	St. Louis Avenue	8	CI	1949	1120	1.38	$ 240,800	Water Main Replacement	$ 97,616,925

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521	Elder Ballou Meetinghouse Rd	12	CI	1949	320	1.38	$ 48,000	Cleaning and Lining	$ 97,664,925
522	Circle Street	8	CI	1950	360	1.38	$ 77,400	Water Main Replacement	$ 97,742,325
523	Craigie Avenue	8	CI	1953	550	1.38	$ 118,250	Water Main Replacement	$ 97,860,575
524	Ridge Street	8	CI	1953	940	1.38	$ 202,100	Water Main Replacement	$ 98,062,675
525	Ruskin Avenue	8	CI	1953	670	1.38	$ 144,050	Water Main Replacement	$ 98,206,725
526	Sidney Avenue	8	CI	1953	680	1.38	$ 146,200	Water Main Replacement	$ 98,352,925
527	St Agnes Avenue	8	CI	1953	1120	1.38	$ 240,800	Water Main Replacement	$ 98,593,725
528	Campeau Street	8	CI	1954	720	1.38	$ 154,800	Water Main Replacement	$ 98,748,525
529	Cliffe Avenue	8	CI	1954	560	1.38	$ 120,400	Water Main Replacement	$ 98,868,925
530	Gadoury Boulevard	8	CI	1954	720	1.38	$ 154,800	Water Main Replacement	$ 99,023,725
531	Theresa Street	8	CI	1955	1240	1.38	$ 266,600	Water Main Replacement	$ 99,290,325
532	Jillson Avenue	8	CI	1956	3620	1.38	$ 778,300	Water Main Replacement	$ 100,068,625
533	Macarthur Road	8	CI	1956	1080	1.38	$ 232,200	Water Main Replacement	$ 100,300,825
534	Marshall Road	8	CI	1956	1300	1.38	$ 279,500	Water Main Replacement	$ 100,580,325
535	Nimitz Road	8	CI	1956	1440	1.38	$ 309,600	Water Main Replacement	$ 100,889,925
536	Patton Road	8	CI	1956	1400	1.38	$ 301,000	Water Main Replacement	$ 101,190,925
537	Wanda Avenue	8	CI	1956	260	1.38	$ 55,900	Water Main Replacement	$ 101,246,825
538	Cherry Street	8	CI	1957	280	1.38	$ 60,200	Water Main Replacement	$ 101,307,025
539	Morin Street	8	CI	1957	1880	1.38	$ 404,200	Water Main Replacement	$ 101,711,225
540	Asylum Street	8	DI	2007	565	1.25	$ 121,475		$ 101,832,700
541	Access Road	8	AC	1960	2900	1.13	$ 623,500	Water Main Replacement	$ 102,456,200
542	Mendon Road	8	DI	1963	760	1.13	$ 163,400	Water Main Replacement	$ 102,619,600
543	Achille Street	8	DI	1965	650	1.13	$ 139,750	Water Main Replacement	$ 102,759,350
544	Deborah Ave, NS	8	DI	1968	540	1.13	$ 116,100	Water Main Replacement	$ 102,875,450
545	Diamond Hill Road	8	DI	1963	320	1.13	$ 68,800	Water Main Replacement	$ 102,944,250
546	Walnut Hill Road	8	DI	1967	3480	1.13	$ 748,200	Water Main Replacement	$ 103,692,450
547	Fortin Drive	12	DI	1970	570	1.13	$ 159,600	Water Main Replacement	$ 103,852,050
548	Capwell Avenue	8	DI	1973	1260	1.13	$ 270,900	Water Main Replacement	$ 104,122,950
549	Cynthia Drive, NS	8	DI	1968	1880	1.13	$ 404,200	Water Main Replacement	$ 104,527,150
550	Sharon Parkway, NS	8	DI	1971	1720	1.13	$ 369,800	Water Main Replacement	$ 104,896,950
551	Fogarty Hospital Line, NS	10	DI	1965	520	1.13	$ 124,800	Water Main Replacement	$ 105,021,750
552	Bourdon Boulevard	8	DI	1963	2120	1.13	$ 455,800	Water Main Replacement	$ 105,477,550
553	Memorial Drive	8	DI	1963	600	1.13	$ 129,000	Water Main Replacement	$ 105,606,550
554	Roscoe Street	8	CI	1958	240	1.13	$ 51,600	Water Main Replacement	$ 105,658,150
555	Avenue A	8	CI	1959	1120	1.13	$ 240,800	Water Main Replacement	$ 105,898,950

Appendix K
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Main Database Sorted by Total Rating

Pipe Rank	Street	Size (in.)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
556	Bertha Avenue	8	CI	1959	720	1.13	$ 154,800	Water Main Replacement	$ 106,053,750
557	Fall Street	8	CI	1959	240	1.13	$ 51,600	Water Main Replacement	$ 106,105,350
558	Pichette Boulevard	8	CI	1959	400	1.13	$ 86,000	Water Main Replacement	$ 106,191,350
559	Thibeault Avenue	8	CI	1959	240	1.13	$ 51,600	Water Main Replacement	$ 106,242,950
560	Wade Road	8	CI	1959	600	1.13	$ 129,000	Water Main Replacement	$ 106,371,950
561	18" HARRIS POND LINE	18	AC	1960	18000	1.13	$ 3,780,000	Cleaning and Lining	$ 110,151,950
562	Ward Street	6	DI	1972	410	1.13	$ 88,150	Water Main Replacement	$ 110,240,100
563	Dexter Street	6	DI	1973	360	1.13	$ 77,400	Water Main Replacement	$ 110,317,500
564	Richelieu Street	6	DI	1973	140	1.13	$ 30,100	Water Main Replacement	$ 110,347,600
565	Grange Avenue	8	AC	1974	160	1.13	$ 34,400	Water Main Replacement	$ 110,382,000
566	Arona Street	8	AC	1975	200	1.13	$ 43,000	Water Main Replacement	$ 110,425,000
567	St Augustin Street	8	AC	1975	180	1.13	$ 38,700	Water Main Replacement	$ 110,463,700
568	Bennett Street	8	AC	1976	190	1.13	$ 40,850	Water Main Replacement	$ 110,504,550
569	Grace Avenue	8	CI	1985	290	0.88	$ 62,350	Water Main Replacement	$ 110,566,900
570	Morin Heights Boulevard	8	DI	1982	2960	0.88	$ 636,400	Water Main Replacement	$ 111,203,300
571	Cambridge Court	8	DI	1987	260	0.88	$ 55,900	Water Main Replacement	$ 111,259,200
572	Harvard Court	8	DI	1987	260	0.88	$ 55,900	Water Main Replacement	$ 111,315,100
573	Hartford Avenue	8	DI	1990	380	0.88	$ 81,700	Water Main Replacement	$ 111,396,800
574	Hartford Avenue	10	DI	1990	250	0.88	$ 60,000	Water Main Replacement	$ 111,456,800
575	Bellevue Avenue, NS	8	DI	1988	1140	0.88	$ 245,100	Water Main Replacement	$ 111,701,900
576	Milton Avenue, NS	8	DI	1988	300	0.88	$ 64,500	Water Main Replacement	$ 111,766,400
577	Northeast Street	6	DI	1978	420	0.88	$ 90,300	Water Main Replacement	$ 111,856,700
578	Orchard Street	8	CI	1988	360	0.88	$ 77,400	Water Main Replacement	$ 111,934,100
579	Hollis Street	8	DI	1939	570	0.75	$ 122,550	Water Main Replacement	$ 112,056,650
580	St. Barnabe Street	8	DI	1949	1080	0.75	$ 232,200	Water Main Replacement	$ 112,288,850
581	Arnold Avenue, NS	8	DI	2011	300	0.63	$ 64,500		$ 112,353,350
582	Holley Lane	8	DI	1998	400	0.63	$ 86,000		$ 112,439,350
583	Oregon Avenue	8	DI	1998	540	0.63	$ 116,100		$ 112,555,450
584	Star Avenue	8	DI	1964	1220	0.50	$ 262,300	Water Main Replacement	$ 112,817,750
585	Ray Avenue	8	DI	1966	2000	0.50	$ 430,000	Water Main Replacement	$ 113,247,750
586	Surrey Lane	8	DI	1970	620	0.50	$ 133,300	Water Main Replacement	$ 113,381,050
587	Rustic Drive	8	DI	1968	860	0.50	$ 184,900	Water Main Replacement	$ 113,565,950
588	Newton Street	8	DI	1962	1040	0.50	$ 223,600	Water Main Replacement	$ 113,789,550
589	Blue Stone Drive	8	DI	1964	1020	0.50	$ 219,300	Water Main Replacement	$ 114,008,850
590	Albert Street	8	DI	1966	275	0.50	$ 59,125	Water Main Replacement	$ 114,067,975

Appendix K
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Pipe Rank	Street	Size (in.)	Type	Year	Length (feet)	Total Rating	Cost Estimate	Method of Improvement	Cumulative Cost Estimate
591	Division Street	8	DI	1975	760	0.50	$ 163,400	Water Main Replacement	$ 114,231,375
592	Morse Avenue	8	DI	1966	260	0.50	$ 55,900	Water Main Replacement	$ 114,287,275
593	Castle Heights Court	8	DI	1959	460	0.50	$ 98,900	Water Main Replacement	$ 114,386,175
594	Irene Boulevard	8	DI	1960	760	0.50	$ 163,400	Water Main Replacement	$ 114,549,575
595	Jervis Street	8	DI	1960	840	0.50	$ 180,600	Water Main Replacement	$ 114,730,175
596	Marie-Ann Court	8	DI	1961	90	0.50	$ 19,350	Water Main Replacement	$ 114,749,525
597	Wilcox Street	8	DI	1961	340	0.50	$ 73,100	Water Main Replacement	$ 114,822,625
598	Bound Road	8	DI	1962	1340	0.50	$ 288,100	Water Main Replacement	$ 115,110,725
599	Myette Street	8	DI	1962	520	0.50	$ 111,800	Water Main Replacement	$ 115,222,525
600	Rose Avenue	8	DI	1962	460	0.50	$ 98,900	Water Main Replacement	$ 115,321,425
601	Ruth Street	8	DI	1962	300	0.50	$ 64,500	Water Main Replacement	$ 115,385,925
602	Sunrise Avenue	8	DI	1962	580	0.50	$ 124,700	Water Main Replacement	$ 115,510,625
603	Victory Boulevard	8	DI	1962	500	0.50	$ 107,500	Water Main Replacement	$ 115,618,125
604	Bradley Street	8	DI	1963	540	0.50	$ 116,100	Water Main Replacement	$ 115,734,225
605	Getchell Avenue	8	DI	1963	1600	0.50	$ 344,000	Water Main Replacement	$ 116,078,225
606	Heather Drive	8	DI	1963	420	0.50	$ 90,300	Water Main Replacement	$ 116,168,525
607	Holland Avenue	8	DI	1963	440	0.50	$ 94,600	Water Main Replacement	$ 116,263,125
608	Pinecrest Drive	8	DI	1963	1000	0.50	$ 215,000	Water Main Replacement	$ 116,478,125
609	Rachel Street	8	DI	1963	540	0.50	$ 116,100	Water Main Replacement	$ 116,594,225
610	Sunset Avenue	8	DI	1963	560	0.50	$ 120,400	Water Main Replacement	$ 116,714,625
611	Hillsdale Street	8	DI	1964	300	0.50	$ 64,500	Water Main Replacement	$ 116,779,125
612	Langevin Street	8	DI	1964	910	0.50	$ 195,650	Water Main Replacement	$ 116,974,775
613	Crest Road	8	DI	1965	570	0.50	$ 122,550	Water Main Replacement	$ 117,097,325
614	Thibeault Avenue	8	DI	1965	280	0.50	$ 60,200	Water Main Replacement	$ 117,157,525
615	Fournier Street	10	DI	1965	460	0.50	$ 110,400	Water Main Replacement	$ 117,267,925
616	Bound Road	12	DI	1965	2300	0.50	$ 644,000	Water Main Replacement	$ 117,911,925
617	Diana Drive	8	DI	1967	760	0.50	$ 163,400	Water Main Replacement	$ 118,075,325
618	Brien's Court	8	DI	1968	200	0.50	$ 43,000	Water Main Replacement	$ 118,118,325
619	Founders Drive	12	DI	1968	2320	0.50	$ 649,600	Water Main Replacement	$ 118,767,925
620	St Augustin Street	12	DI	1968	660	0.50	$ 184,800	Water Main Replacement	$ 118,952,725
621	Bernon Street	8	DI	1969	540	0.50	$ 116,100	Water Main Replacement	$ 119,068,825
622	Wagon Wheel Lane	8	DI	1969	360	0.50	$ 77,400	Water Main Replacement	$ 119,146,225
623	Nancy Court	8	DI	1970	800	0.50	$ 172,000	Water Main Replacement	$ 119,318,225
624	Foster Street	8	DI	1971	380	0.50	$ 81,700	Water Main Replacement	$ 119,399,925
625	Elder Ballou Meetinghouse Rd	12	DI	1971	1440	0.50	$ 403,200	Water Main Replacement	$ 119,803,125

Appendix K
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626	Carey Court	8	DI	1973	520	0.50	$ 111,800	Water Main Replacement	$ 119,914,925
627	Oxford Avenue	8	DI	1973	180	0.50	$ 38,700	Water Main Replacement	$ 119,953,625
628	Rock Ridge Drive	8	DI	1973	1900	0.50	$ 408,500	Water Main Replacement	$ 120,362,125
629	Admiral Street	8	DI	1974	400	0.50	$ 86,000	Water Main Replacement	$ 120,448,125
630	Dike Street	8	DI	1974	240	0.50	$ 51,600	Water Main Replacement	$ 120,499,725
631	Carrington Avenue	12	DI	1974	320	0.50	$ 89,600	Water Main Replacement	$ 120,589,325
632	Welles Street	12	DI	1974	560	0.50	$ 156,800	Water Main Replacement	$ 120,746,125
633	Welles Street	12	DI	1975	420	0.50	$ 117,600	Water Main Replacement	$ 120,863,725
634	Columbus Street	8	DI	1977	180	0.50	$ 38,700	Water Main Replacement	$ 120,902,425
635	Laurier Street	8	DI	1977	240	0.50	$ 51,600	Water Main Replacement	$ 120,954,025
636	Bourassa Avenue	8	DI	1978	840	0.25	$ 180,600	Water Main Replacement	$ 121,134,625
637	Beacon Avenue	8	DI	1980	960	0.25	$ 206,400	Water Main Replacement	$ 121,341,025
638	Berkley Street	8	DI	1979	280	0.25	$ 60,200	Water Main Replacement	$ 121,401,225
639	Fulton Street	8	DI	1978	480	0.25	$ 103,200	Water Main Replacement	$ 121,504,425
640	Hillside Avenue	8	DI	1978	290	0.25	$ 62,350	Water Main Replacement	$ 121,566,775
641	Bozoian Street	8	DI	1978	280	0.25	$ 60,200	Water Main Replacement	$ 121,626,975
642	Hawthorn Circle	8	DI	1978	620	0.25	$ 133,300	Water Main Replacement	$ 121,760,275
643	Papineau Avenue	8	DI	1978	400	0.25	$ 86,000	Water Main Replacement	$ 121,846,275
644	Pine Swamp Road, Cumb	8	DI	1978	960	0.25	$ 206,400	Water Main Replacement	$ 122,052,675
645	Seventh Avenue	8	DI	1978	360	0.25	$ 77,400	Water Main Replacement	$ 122,130,075
646	Viva Way	8	DI	1978	360	0.25	$ 77,400	Water Main Replacement	$ 122,207,475
647	Alice Avenue	8	DI	1979	480	0.25	$ 103,200	Water Main Replacement	$ 122,310,675
648	Aubin Street	8	DI	1979	320	0.25	$ 68,800	Water Main Replacement	$ 122,379,475
649	Berard Avenue	8	DI	1979	460	0.25	$ 98,900	Water Main Replacement	$ 122,478,375
650	Fisher Street	8	DI	1979	260	0.25	$ 55,900	Water Main Replacement	$ 122,534,275
651	Kermit Street	8	DI	1979	240	0.25	$ 51,600	Water Main Replacement	$ 122,585,875
652	Theodore Street	8	DI	1979	400	0.25	$ 86,000	Water Main Replacement	$ 122,671,875
653	Maple Street	8	DI	1980	400	0.25	$ 86,000	Water Main Replacement	$ 122,757,875
654	Privilege Street	8	DI	1980	250	0.25	$ 53,750	Water Main Replacement	$ 122,811,625
655	Logee Street	8	DI	1981	660	0.25	$ 141,900	Water Main Replacement	$ 122,953,525
656	Ronian Street	8	DI	1981	360	0.25	$ 77,400	Water Main Replacement	$ 123,030,925
657	Sycamore Street	8	DI	1981	680	0.25	$ 146,200	Water Main Replacement	$ 123,177,125
658	Washington Street	8	DI	1981	280	0.25	$ 60,200	Water Main Replacement	$ 123,237,325
659	Maple Street	12	DI	1981	320	0.25	$ 89,600	Water Main Replacement	$ 123,326,925
660	Washington Street	12	DI	1981	340	0.25	$ 95,200	Water Main Replacement	$ 123,422,125

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661	Ricard Street	8	DI	1982	500	0.25	$ 107,500	Water Main Replacement	$ 123,529,625
662	Scotia Street	8	DI	1982	320	0.25	$ 68,800	Water Main Replacement	$ 123,598,425
663	CVS Drive	12	DI	1982	1080	0.25	$ 302,400	Water Main Replacement	$ 123,900,825
664	Park East Drive	12	DI	1982	6400	0.25	$ 1,792,000	Water Main Replacement	$ 125,692,825
665	Park East Drive	16	DI	1982	480	0.25	$ 158,400	Water Main Replacement	$ 125,851,225
666	Cranston Street	8	DI	1983	200	0.25	$ 43,000	Water Main Replacement	$ 125,894,225
667	Privilege Street	8	DI	1983	300	0.25	$ 64,500	Water Main Replacement	$ 125,958,725
668	Cherry Hill Avenue	8	DI	1985	840	0.25	$ 180,600	Water Main Replacement	$ 126,139,325
669	Rome Avenue	8	DI	1985	380	0.25	$ 81,700	Water Main Replacement	$ 126,221,025
670	Corsi Street	12	DI	1985	400	0.25	$ 112,000	Water Main Replacement	$ 126,333,025
671	Mendon Road	12	DI	1985	1060	0.25	$ 296,800	Water Main Replacement	$ 126,629,825
672	Prince Street	8	DI	1986	450	0.25	$ 96,750	Water Main Replacement	$ 126,726,575
673	St. Joseph Street	8	DI	1987	240	0.25	$ 51,600	Water Main Replacement	$ 126,778,175
674	Tara Lane	8	DI	1987	1150	0.25	$ 247,250	Water Main Replacement	$ 127,025,425
675	Brookhaven Lane	12	DI	1987	1240	0.25	$ 347,200	Water Main Replacement	$ 127,372,625
676	St. Joseph Street	12	DI	1987	100	0.25	$ 28,000	Water Main Replacement	$ 127,400,625
677	Ledgewood Lane	8	DI	1988	680	0.25	$ 146,200	Water Main Replacement	$ 127,546,825
678	Merrill Court	8	DI	1988	500	0.25	$ 107,500	Water Main Replacement	$ 127,654,325
679	New Street	8	DI	1988	660	0.25	$ 141,900	Water Main Replacement	$ 127,796,225
680	Oregon Avenue	8	DI	1988	740	0.25	$ 159,100	Water Main Replacement	$ 127,955,325
681	Springwater Drive	8	DI	1988	320	0.25	$ 68,800	Water Main Replacement	$ 128,024,125
682	Century Drive	12	DI	1988	1000	0.25	$ 280,000	Water Main Replacement	$ 128,304,125
683	Goldstein Drive	12	DI	1988	380	0.25	$ 106,400	Water Main Replacement	$ 128,410,525
684	Oregon Avenue	12	DI	1988	360	0.25	$ 100,800	Water Main Replacement	$ 128,511,325
685	Springwater Drive	12	DI	1988	1740	0.25	$ 487,200	Water Main Replacement	$ 128,998,525
686	Arland Court	8	DI	1989	525	0.25	$ 112,875	Water Main Replacement	$ 129,111,400
687	Hawthorn Circle	8	DI	1989	760	0.25	$ 163,400	Water Main Replacement	$ 129,274,800
688	Progresso Avenue	8	DI	1989	120	0.25	$ 25,800	Water Main Replacement	$ 129,300,600
689	Darwin Street	8	DI	1990	270	0.25	$ 58,050	Water Main Replacement	$ 129,358,650
690	Jacob Lane	8	DI	1990	180	0.25	$ 38,700	Water Main Replacement	$ 129,397,350
691	Minerva Street	8	DI	1990	120	0.25	$ 25,800	Water Main Replacement	$ 129,423,150
692	Congress Street	10	DI	1990	400	0.25	$ 96,000	Water Main Replacement	$ 129,519,150
693	Hartford Avenue	10	DI	1990	300	0.25	$ 72,000	Water Main Replacement	$ 129,591,150
694	Mill Street	8	DI	1991	420	0.25	$ 90,300	Water Main Replacement	$ 129,681,450
695	Seamans Street	8	DI	1993	300	0.25	$ 64,500	Water Main Replacement	$ 129,745,950

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696	Miles Avenue	8	DI	1994	260	0.25	$ 55,900	Water Main Replacement	$ 129,801,850
697	Marian Lane	8	DI	1995	400	0.25	$ 86,000	Water Main Replacement	$ 129,887,850
698	Thibeault Avenue	8	DI	1995	160	0.25	$ 34,400	Water Main Replacement	$ 129,922,250
699	Edgewood Avenue	8	DI	1996	280	0.25	$ 60,200	Water Main Replacement	$ 129,982,450
700	Baxter Street	8	DI	1997	240	0.25	$ 51,600	Water Main Replacement	$ 130,034,050
701	Blueberry Hill	8	DI	1998	270	0.00			$ 130,034,050
702	Louise Street	8	DI	2007	400	0.00	$ -		$ 130,034,050
703	Dulude Avenue	8	DI	2001	815	0.00	$ -		$ 130,034,050
704	Logee Street	8	DI	2004	320	0.00	$ -		$ 130,034,050
705	Logee Street	8	DI	2004	984	0.00	$ -		$ 130,034,050
706	Steve Lopes Way	8	DI	2004	550	0.00	$ -		$ 130,034,050
707	Greenville Road, NS	12	DI	2004	1450	0.00	$ -		$ 130,034,050
708	Logee Street	12	DI	2004	320	0.00	$ -		$ 130,034,050
709	Logee Street	12	DI	2004	340	0.00	$ -		$ 130,034,050
710	Logee Street	12	DI	2004	588	0.00	$ -		$ 130,034,050
711	Logee Street	12	DI	2004	644	0.00	$ -		$ 130,034,050
712	Bernon Street	16	DI	2004	1152	0.00	$ -		$ 130,034,050
713	Crawford Street	16	DI	2004	866	0.00	$ -		$ 130,034,050
714	Greene Street	16	DI	2004	718	0.00	$ -		$ 130,034,050
715	Logee Street	16	DI	2004	1000	0.00	$ -		$ 130,034,050
716	Park Avenue	16	DI	2004	290	0.00	$ -		$ 130,034,050
717	River Street	16	DI	2004	2994	0.00	$ -		$ 130,034,050
718	River Street	16	DI	2004	892	0.00	$ -		$ 130,034,050
719	Second Ave	16	DI	2004	420	0.00	$ -		$ 130,034,050
720	South Main Street	16	DI	2004	560	0.00	$ -		$ 130,034,050
721	Bertenshaw Road	30	DI	2004	756	0.00	$ -		$ 130,034,050
722	Cross Country	30	DI	2004	564	0.00	$ -		$ 130,034,050
723	Fairfield Avenue	30	DI	2004	738	0.00	$ -		$ 130,034,050
724	Flora Avenue	30	DI	2004	1174	0.00	$ -		$ 130,034,050
725	Lilac Avenue	30	DI	2004	920	0.00	$ -		$ 130,034,050
726	Logee Street	30	DI	2004	504	0.00	$ -		$ 130,034,050
727	Lydia Avenue	30	DI	2004	276	0.00	$ -		$ 130,034,050
728	Marian Lane	30	DI	2004	136	0.00	$ -		$ 130,034,050
729	Wanda Avenue	30	DI	2004	200	0.00	$ -		$ 130,034,050
730	Danielle Drive	8	DI	2007	475	0.00	$ -		$ 130,034,050

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731	Fieldside Drive	8	DI	2007	325	0.00	$ -		$ 130,034,050
732	Stevens Way	8	DI	2007	640	0.00	$ -		$ 130,034,050
733	Vivian Street	8	DI	2007	560	0.00	$ -		$ 130,034,050
734	Wanda Avenue	8	DI	2007	2000	0.00	$ -		$ 130,034,050
735	Manville Road	20	DI	2011	900	0.00	$ -		$ 130,034,050
736	Burnside Avenue	8	DI	2012	100	0.00	$ -		$ 130,034,050
737	Cady Street	8	DI	2012	710	0.00	$ -		$ 130,034,050
738	Havelock Street	8	DI	2012	250	0.00	$ -		$ 130,034,050
739	Miller Lane	8	DI	2012	275	0.00	$ -		$ 130,034,050
740	Morse Avenue	8	DI	2013	140	0.00	$ -		$ 130,034,050
741	Circle Street	8	DI	2014	680	0.00	$ -		$ 130,034,050
742	Danielle Drive	8	DI	2015	925	0.00	$ -		$ 130,034,050
743	Easement	8	DI	2016	800	0.00	$ -		$ 130,034,050
744	Mount Saint Charles Avenue	12	DI	2016	840	0.00	$ -		$ 130,034,050
745	Colony Avenue	8	DI	2017	365	0.00	$ -		$ 130,034,050
746	Congress Street	8	DI	2007	1700	0.00	$ -		$ 130,034,050
									$ 130,034,050

APPENDIX L

Woonsocket Water System Hydraulic Model Update

Memorandum

To: *Marc Viggiani, City of Woonsocket, Water Superintendent*

From: *Lauren Kershaw and Douglas Martin, CDM Smith*

Date: *February 26, 2018*

Subject: *Water Model Update, Calibration and ISO Fire Flow Evaluation*

In accordance with Task Order No. 2017-02, CDM Smith Inc. (CDM Smith) is pleased to submit this technical memorandum summarizing the hydraulic model update development, calibration, and hydraulic analysis.

Purpose

Most water suppliers create hydraulic computer models of their water transmission and distribution systems to prioritize capital improvements for infrastructure rehabilitation or replacement. By utilizing a hydraulic computer model, the City benefits from many modern modeling software features and capabilities for system-wide analysis, planning, design, and operations optimization.

The City's water distribution system computer model was initially developed in 2006 as a skeleton model only displaying pipes 8-inches and larger. The City now has an accurate water system GIS database which has been used as the basis for the 2017 model update. While creating the 2017 model, CDM Smith used all system finished water distribution and transmission pipes, including those 6-inches and smaller.

CDM Smith was assessed existing and future demand conditions, as well as simulating recent Insurance Services Offices (ISO) fire flow results within the City while utilizing the newly calibrated model. Following these model simulations, we evaluated the resulting data and recommended necessary improvements.

Objectives

By updating the model, the City can evaluate and maintain their water supply system while providing an acceptable and reliable level of service to its customers. Following the evaluation, the Water Division can document and propose specific improvements needed for the current and future water distribution system.

The major objectives of this evaluation are:

- Update the City's computer model to current conditions.
- Calibrate the hydraulic computer model.
- Review historical water demands and trends for last 5 years and evaluate future growth and development to the system.
- Identify and assess possible system deficiencies related to ISO fire flow during maximum day demands, low pressure areas during peak hour demand, high pressure areas during average day demands and areas with high velocity and significant head loss.

To accomplish these objectives, CDM Smith:

- Reviewed all pertinent data and information, relevant plans, and past reports regarding the water supply and distribution system as provided by the City.
- Performed a hydrant flow testing field program to evaluate the condition of the existing distribution system.
- Updated and calibrated the City's distribution system computer model to reflect existing conditions in the distribution system piping network.
- Reviewed the City's total water distribution figures for the last 5 years and evaluated for trends to project future water demands.
- Simulated average day, maximum day, and peak hour demands conditions to evaluate pressures, velocities, and head losses.
- Used InfoWater model to simulate multiple fire flow demand conditions throughout the distribution system including the most recent 2005 ISO flow test information.
- Evaluated the City's current piping network for its ability to effectively convey the necessary fire flows throughout the system.

Water System Overview

The City owns, operates, and maintains a water supply and distribution system that provides potable water and fire protection. **Figure 1** shows Woonsocket's water system and water system facilities. **Figure 2** displays the City's water system in an easy-to-read schematic.

Woonsocket's water system includes:

- One Water Treatment Plant
- Four Booster Pumping Stations;
- Nine Storage Tanks;

BLACKSTONE, MA

BELLINGHAM, MA

WRENTHAM, MA

WOONSOCKET

NORTH SMITHFIELD

CUMBERLAND

LINCOLN

Low Service Tank
- Cobble Hill

High Service Tank
- Diamond Hill

High Service Booster Pump Station
- Diamond Hill

Interconnection
- Woonsocket to Cumberland Metering Station

High Service Tank
- Highland Industrial Park

High Service Booster Pump Station
- Highland Industrial Park

High Service Tank
- Mount Saint Charles 5

High Service Booster Pump Station
- Mount Saint Charles

Interconnection
- Cumberland to Woonsocket Metering Station

Charles Hamman Water Treatment Plant

High Service Tank
- Rhodes Avenue

High Service Booster Pump Station
- Rhodes Avenue

Low Service Tank
- Mount Saint Charles 1

Low Service Tanks
- Mount Saint Charles 2
- Mount Saint Charles 3
- Mount Saint Charles 4

Interconnection
-Woonsocket to Lincoln

N W E S

Legend

Pipe
- Less than 8-inches
- 8-inches
- 10-inches
- 12-inches
- 14-inches
- Greater than 14-inches

High Service Areas
- Mount Saint Charles High Service Area
- Rhodes Avenue High Service Area
- Combined Diamond Hill & Industrial Park HSA

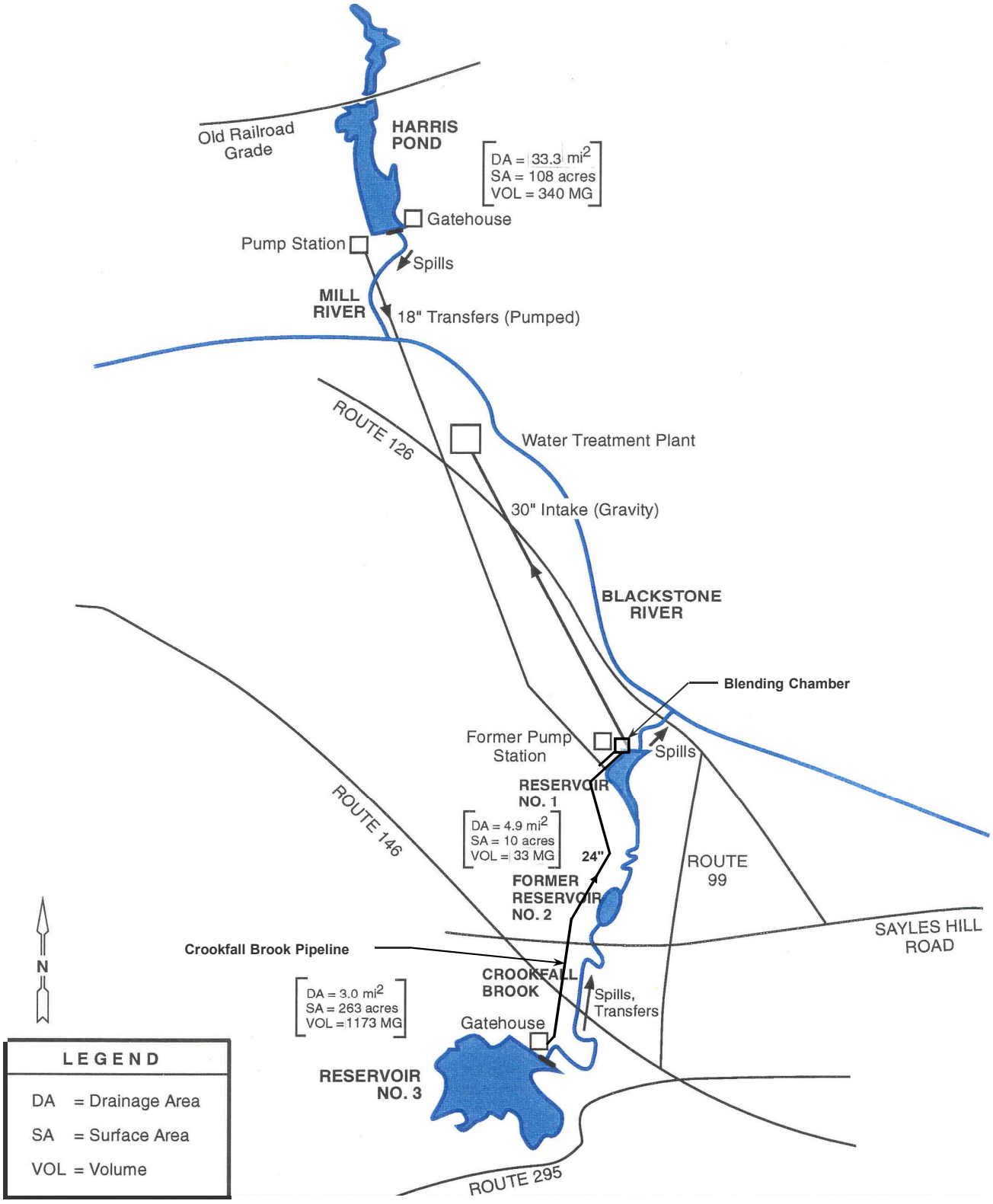
WOONSOCKET WATER DIVISION
WATER SYSTEM DISTRIBUTION MODEL UPDATE

Figure 1
Water System Overview

1 inch = 800 feet

0 800 1,600 2,400 3,200 *Feet*

CDM Smith



Not to Scale

Figure 2-2
City of Woonsocket, Rhode Island
Water Distribution System Evaluation
Water Supply Sources Schematic

- About 13 miles of transmission main (16-inch and larger) piping to supply the storage tanks and main distribution network;
- Approximately 117.6 miles of transmission and distribution mains to supply the storage tanks and main distribution network;
- About 9,444 individual distribution system service connections;
- Four distinct pressure/service zones; and
- Interconnections with three surrounding communities

Model Development

Each water distribution system is unique with varying data and information available to describe the system. The primary objective in developing a hydraulic computer model is to represent the physical water distribution system network with a high degree of accuracy, and the level of model detail should reflect the desired use and goals of the model. The development of the model is a significant data gathering effort to develop and inventory the water system.

The model represents how the actual physical elements of the distribution system are interconnected and interact. Models represent system facilities through two primary elements – nodes and pipes. Nodes represent features at specific locations and pipes define the relationships (i.e., connectivity) between nodes.

Nodes represent junctions, endpoints, critical points, water sources, supply sources, pumps, tanks, valves, and demand points. The model stores elevation information at the nodes where water supply and demand data are represented either entering and leaving the network. Model simulation reports present pressure, hydraulic grade line (HGL), and supply and demand at all node locations. In addition to elevations, node data also includes geographic coordinates that establish the physical layout and representation of the system in the model. The model stores pipe information including age, diameter, length, material, and internal pipe roughness. The model reports direction of flow, flow rate, and head (energy) loss in all pipes.

The model database also includes metadata and descriptive information to define, manage, and organize the node and pipe facility data. Every model must have at least one boundary node so that there is a reference point for the HGL of the system, and every node in the model must be connected such that it has a "path" to the boundary node(s). Boundary nodes are typically supply sources or storage tanks, providing a supply source for all model elements.

CDM Smith imported the City's updated GIS Database into a new InfoWater file. The updated GIS database contained the hydrant locations and provided the information necessary to construct the model and plan the model calibration field program.

Model Calibration

Model calibration is necessary to test and adjust the model so that it accurately replicates and predicts distribution system behavior. There are numerous uncertainties with input data and assumptions, especially pipe roughness coefficients, which dictate the need for calibration. Calibration is the process of fine tuning the model until it simulates actual field conditions within acceptable limits. Adjustments to the input data typically include demand distribution and internal pipe roughness (friction) coefficients. Calibrating a model is a trial and error process and standard calibration guidelines have not yet been adopted as each water system is unique. However, the end goal is to find the optimum adjustments within reason so that the model simulates and predicts actual real-world system behavior.

The primary data input adjusted during model calibration is pipe roughness coefficients (C-factors). These coefficients are based upon pipe age and material, but they can vary over a wide range and their correlation with age can vary from system to system. In some cases, pipe roughness coefficients can even vary from how far a pipe is from a source. As described earlier, during model development, C-factors are assigned for each pipe based on age and material. Model calibration verifies and adjusts these initial, assumed coefficients to better simulate actual system performance.

To adjust internal pipe roughness coefficients and calibrate a model, it is necessary to create stressed conditions that induce high head losses in pipes. This is typically done through fire hydrant flow tests, where flow from hydrants cause high flow rates (and velocities) with measurable system head losses. The model is then simulated to duplicate the conditions from the fire hydrant flow tests to an acceptable level of accuracy. The model predicted simulation results of the fire flow tests are compared against the actual field observations, and the model is iteratively adjusted until the model-predicted results reasonably agree with the field observations.

Calibration is also important because it provides a valuable understanding of how the system behaves and provides for troubleshooting of system problems, such as unknown closed isolation valves. The following paragraphs discuss the calibration field program that CDM Smith conducted to gather flow and pressure data through fire hydrant flow tests to calibrate the City's distribution system model.

Field Program

With the City's assistance, CDM Smith planned and conducted a field program with the goal of recalibrating the City's water distribution system model. By performing the field program, the City and CDM Smith stressed the distribution system to gather flow and pressure data through a series of fire hydrant flow tests and hydrant pressure monitoring. We used the resulting data to calibrate the computer model by matching these measured hydraulic conditions.

CDM Smith reviewed the City's water distribution system and selected representative locations for fire hydrant flow tests to determine available flow and corresponding pressure drops. We also

selected locations for hydrant pressure recorders (HPRs) throughout the distribution system to continuously monitor pressures before, during, and after the field program. **Figure 3** shows the hydrant pressure recorders and fire flow test locations. **Table 1** provides the locations of these hydrants with the corresponding field program results. For the fire flow tests, CDM Smith selected hydrants connected to smaller (12-inch and smaller) distribution mains, since smaller mains typically generate larger pressure drops.

Hydrant Pressure Recorders

Prior to conducting the field program, CDM Smith installed seven HPRs in November 2017 at select locations in the distribution system to continuously monitor system pressures. The City assisted with the installation of these recorders. The HPRs remained in place throughout and shortly after the field program. CDM Smith selected the locations for and utilized the HPRs during the fire hydrant flow testing to monitor pressures in the distribution system at key boundary nodes within the distribution system.

Fire Hydrant Flow Tests

The fire hydrant flow tests stress the water distribution system with high flow rates, thereby increasing pipeline velocities which cause increased head (pressure) losses in the piping network local to the test. As described previously, the pressure losses at each hydrant are used to adjust the pipe friction factors in the model, representative of effective internal pipe roughness. Data gathered from fire hydrant flow tests provides a means to check the model against actual system conditions and adjust model parameters as needed until the model accurately simulates measured system conditions.

During the nights of November 6th through the 8th 2017, CDM Smith and the City conducted 24 fire hydrant flow tests from about 9:00 P.M. to 5:00 A.M., when system demands are typically the lowest and to minimize disruption to the City's customers. By performing the testing during night and early morning hours when customer consumption is low, the distribution system is in near static conditions with minimal pipeline velocities thereby reducing the variability that system demands can have on calibration. Under these hydraulic conditions, the flow rates from the flowing hydrants were the governing cause for the pressure losses as measured during the field program, allowing the impact of C-factors to be fine-tuned during model calibration with the most amount of certainty.

Each fire hydrant flow test consisted of simultaneously taking flow and pressure measurements, and included two "gauge" hydrants and two "flow" hydrants. Prior to starting each test, all four hydrants were flushed to remove any debris, dirty water, rust, or sediment that may have accumulated in the hydrant laterals or barrels, to not clog measurement equipment and gauges during the test. Pitot gauges with diffusers were attached to one of the 2-1/2-inch nozzles on both "flow" hydrants and pressure gauges with special hydrant cap assemblies were attached to one of the 2-1/2-inch nozzles on both "gauge" hydrants. CDM Smith used diffusers at both "flow" hydrants to reduce flow momentum and limit potential erosion damage to immediate surroundings.

WOONSOCKET WATER DIVISION
WATER SYSTEM DISTRIBUTION MODEL UPDATE

Figure 3
Model Calibration Hydrant Locations

N
W E
S

Legend

Pipe
- Less than 8-inches
- 8-inches
- 10-inches
- 12-inches
- 14-inches
- Greater than 14-inches

Hydrant
- Hydrant

High Service Areas
- Mount Saint Charles High Service Area
- Rhodes Avenue High Service Area
- Combined Diamond Hill & Industrial Park HSA

1 inch = 800 feet

0 800 1,600 2,400 3,200 Feet

CDM Smith

TEST NUMBER	ZONE	FLOW A		FLOW	Gage A							Gage B						
		FLOW 1 (GPM)	FLOW 2 (GPM)	FLOW 2 (GPM)	STATIC FIELD PRESSURE (PSI)	RESIDUAL 1 FIELD PRESSURE (PSI)	RESIDUAL 2 FIELD PRESSURE (PSI)	PRESSURE GAUGE ID	STATIC CALIBRATED PRESSURE (PSI)	RESIDUAL 1 CALIBRATED PRESSURE (PSI)	RESIDUAL 2 CALIBRATED PRESSURE (PSI)	STATIC FIELD PRESSURE (PSI)	RESIDUAL 1 FIELD PRESSURE (PSI)	RESIDUAL 2 FIELD PRESSURE (PSI)	PRESSURE GAUGE ID	STATIC CALIBRATED PRESSURE (PSI)	RESIDUAL 1 CALIBRATED PRESSURE (PSI)	RESIDUAL 2 CALIBRATED PRESSURE (PSI)
1	LOW	1,061.22	949.18	991.67	64	58	46	34	64.00	58.00	46.00	61	55	42	35	61.00	55.00	42.00
3	HSIP	1,277.88	1,277.88	180.16	54	53	53	34	54.00	53.00	53.00	54	55	55	35	54.00	55.00	55.00
4	LOW	1,150.34	1,034.35	1,085.90	75	70	61	34	75.00	70.00	61.00	74	70	61	35	74.00	70.00	61.00
5	LOW	0.00	0.00	1,033.11	52	55		34	52.00	55.00	0.00	73	68		35	73.00	68.00	0.00
7	LOW	1,453.14	1,403.86	1,370.55	83	81	77	34	83.00	81.00	77.00	83	80	75	35	83.00	80.00	75.00
8	LOW	1,162.51	787.02	887.48	75	63	48	34	75.00	63.00	48.00	81	77	69	35	81.00	77.00	69.00
9	LOW	978.40	822.02	948.42	58	55	50	34	58.00	55.00	50.00	55	51	45	35	55.00	51.00	45.00
10	LOW	0.00	0.00	1,005.67	56	53		34	56.00	53.00	0.00	62	59		35	62.00	59.00	0.00
12	HSDH	1,433.63	1,342.35	1,349.99	90	87	79	34	90.00	87.00	79.00	96	93	82	35	96.00	93.00	82.00
13	HSDH	1,443.42	1,393.80	1,230.78	93	90	86	34	93.00	90.00	86.00	84	82	79	35	84.00	82.00	79.00
15	LOW	1,453.14	1,277.88	1,342.35	110	102	85	24	112.65	104.52	87.25	110	102	94	29	108.19	100.35	92.51
16	LOW	167.79	167.79	375.20	62	56	42	34	62.00	56.00	42.00	87	80	60	35	87.00	80.00	60.00
17	LOW	1,331.82	1,162.51	1,162.51	86	79	63	34	86.00	79.00	63.00	76	69	54	35	76.00	69.00	54.00
18	HSRA	1,255.65	1,162.51	1,299.72	69	66	58	34	69.00	66.00	58.00	86	83	73	35	86.00	83.00	73.00
19	LOW	1,074.40	750.40	855.58	79	69	60	34	79.00	69.00	60.00	99	97	95	35	99.00	97.00	95.00
21	LOW	581.25	290.63	443.94	58	40	35	34	58.00	40.00	35.00	50	47	42	35	50.00	47.00	42.00
22	LOW	1,299.72	1,209.98	1,288.85	70	67	62	34	70.00	67.00	62.00	85	83	60	35	85.00	83.00	60.00
23	HSMSC	1,403.86	1,277.88	1,363.16	95	90	80	34	95.00	90.00	80.00	80	77	68	35	80.00	77.00	68.00

TABLE 1
CITY OF WOONSOCKET, RHODE ISLAND
WATER DISTRIBUTION SYSTEM MODEL
MODEL CALIBRATION FIELD PROGRAM
FIRE HYDRANT FLOW TEST RESULTS

CDM Smith

TEST NUMBER	ZONE	FLOW A		FLOW	Gage A								Gage B						
		FLOW 1 (GPM)	FLOW 2 (GPM)	FLOW 2 (GPM)	STATIC FIELD PRESSURE (PSI)	RESIDUAL 1 FIELD PRESSURE (PSI)	RESIDUAL 2 FIELD PRESSURE (PSI)	PRESSURE GAUGE ID	STATIC CALIBRATED PRESSURE (PSI)	RESIDUAL 1 CALIBRATED PRESSURE (PSI)	RESIDUAL 2 CALIBRATED PRESSURE (PSI)	STATIC FIELD PRESSURE (PSI)	RESIDUAL 1 FIELD PRESSURE (PSI)	RESIDUAL 2 FIELD PRESSURE (PSI)	PRESSURE GAUGE ID	STATIC CALIBRATED PRESSURE (PSI)	RESIDUAL 1 CALIBRATED PRESSURE (PSI)	RESIDUAL 2 CALIBRATED PRESSURE (PSI)
26	HSMSC	1,233.03	1,061.22	887.88	87	77	60	34	87.00	77.00	60.00	82	73	54	35	82.00	73.00	54.00
27	HSMSC	978.40	604.99	581.25	117	57	33	34	117.00	57.00	33.00	95	73	62	35	95.00	73.00	62.00
28	LOW	1,472.38	1,423.78	1,363.16	100	98	92	34	100.00	98.00	92.00	87	85	81	35	87.00	85.00	81.00
29	LOW	1,266.82	0.00	0.00	78	70		34	78.00	70.00	0.00	72	67		35	72.00	67.00	0.00
30	LOW	919.04	649.86	604.99	74	56	41	34	74.00	56.00	41.00	64	46	28	35	64.00	46.00	28.00
31	LOW	581.25	335.59	290.63	67	51	46	34	67.00	51.00	46.00	73	57	49	35	73.00	57.00	49.00

TABLE 1
CITY OF WOONSOCKET, RHODE ISLAND
WATER DISTRIBUTION SYSTEM MODEL
MODEL CALIBRATION FIELD PROGRAM
FIRE HYDRANT FLOW TEST RESULTS

The "gauge" hydrants were first fully opened to pressurize their hydrant barrels and CDM Smith measured and recorded the static pressures under normal conditions. Next, the first "flow" hydrant ("Flow A") was fully opened to induce flow in the distribution system local to the test area. CDM Smith measured and recorded the stabilized pressure (velocity head) from the pitot gauges at the "Flow A" hydrant as well as the stabilized residual pressures (pressure drops) at both "gauge" hydrants. Finally, the second "flow" hydrant ("Flow B") was fully opened to induce additional system flow, further stressing the system and causing additional pressure losses. Once all the pressure gauges stabilized, CDM Smith measured and recorded the pitot pressures at both "flow" hydrants and the residual pressures (pressure drops) at both "gauge" hydrants. After each test, all four hydrants were closed to return the system to normal conditions and this process was repeated for all the fire hydrant flow tests throughout the City system during the field program.

System Operations and Boundary Conditions

On the nights of fire flow testing, CDM Smith initially requested that the City supply the system solely from the storage tanks with the WTP offline. This method of operation typically provides the easiest means to define boundary conditions during fire hydrant flow testing, since it eliminates the variability with pumping and establishes the system-wide HGL purely based off storage tank levels, which are easier to verify from operating data. However, because of concerns with low pressures at higher ground elevations at certain locations in the distribution system, the City was unable to operate with only storage tanks feeding the system. Instead, the City only ran the WTP at a low flow while monitoring the SCADA system data minute by minute data to establish system conditions while keeping all other pumping systems off.

Following the field program, CDM Smith collected operating system data (tank levels, discharge flow, and statuses from the City for all supply sources, pumps, storage tanks, and valves for the nights of field testing to establish calibration boundary conditions. This boundary condition data established the total system consumption and hydraulic grade line of all system components during each fire flow test. The boundary condition data for each fire hydrant flow test was then tabulated.

Calibration Approach

Using the data gathered during the field program, CDM Smith first adjusted all the measured gauge pressures and pitot pressures based on calibration curves for each pressure gauge used during the field program. Prior to the field program, all the pressure gauges were calibrated using a dead-weight tester to ensure accurate measurements from the fire flow tests. Next, CDM Smith calculated the hydrant discharge flow rates and corresponding pressure drops for each fire hydrant flow test using standard hydrant pitot gauge equations. The gauges consider the measured pitot pressure, diameter of the hydrant discharge port, and a hydrant discharge coefficient based on the physical transition of each flow hydrant's barrel to the discharge port. **Table 1** shows the final results of all the fire hydrant flow tests conducted during the November 2017 field program. These results, along with the boundary condition data were used during model calibration.

CDM Smith setup a unique scenario in the model to simulate each fire hydrant flow test from the model calibration field program and assigned corresponding boundary conditions and system demands to each scenario. Model scenarios are a specific set of water consumption demands, facilities, and operational parameters (e.g., pump discharge, tank levels, valve statuses, system conditions, etc.) for a model simulation. CDM Smith assigned tank levels and pump discharge flow rates and pressures to all tank and pump nodes in each calibration model scenario corresponding to the times that each fire flow test was conducted to establish the system-wide HGL. CDM Smith identified junction nodes for each fire flow test to represent the gauge, flow, and pressure recorder hydrants.

The City provided SCADA data, which documented approximate tank levels at the start of each hydrant flow test. CDM Smith estimated water system demands simultaneously during all tests using mass balance techniques. Since flow data was unavailable for two of the four Mount Saint Charles low service tanks, CDM Smith combined these four tanks into one in the model since the tank levels are similar and consistent. We then allocated or distributed these estimated system demands throughout the model for each hydrant flow tests simulation.

As described earlier, customer water consumption was low during the field program thereby resulting in minimal pipeline flow velocities and virtually static conditions. For this reason, the hydrant flow tests were the governing cause for significant hydraulic changes and impacts within the distribution system. These impacts are mainly generated by high flow velocities that cause increased head losses and pressure drops.

CDM Smith then simulated each fire hydrant flow test in the model and compared the actual field observed results to the model predicted results. First, we compared static pressures to verify that the assumed ground elevations at all model junctions were correct. If the model predicted results did not match the field results for the simulated hydrant flows, CDM Smith iteratively adjusted model parameters (typically pipe C-factors) within standard industry guidelines to fine tune and calibrate the model to match the hydraulic conditions measured during the field program. CDM Smith continued this process until all model predicted fire flow test results closely agreed with actual field data within the recommended 5-psi target range as referenced in the results below.

If adjustments to model parameters or the model predicted results did not match field observed results, CDM Smith reviewed and investigated the model setup and field data and system operations to troubleshoot any discrepancies (e.g., ground elevations, boundary conditions or system demands, or unknown closed isolation valves).

Calibration Results

Although there are no official calibration standards for water distribution system models, recommended industry guidelines suggest that pressure drops in the calibrated model be within 5 pounds per square inch (psi) of actual field measured pressure drops. This target pressure drop represents the deviation in the field pressure drop and the model predicted pressure drop. When properly calibrated, the model produces a snapshot of the distribution system's performance under

the specific set of boundary conditions for each fire flow test. CDM Smith performed the iterative trial and error calibration process to fine tune and adjust the model match the measured field conditions during the fire flow testing field program. **Table 2** presents the final results of the model calibration**.**

With most field programs, there are usually system operational issues, equipment malfunctions, and unknown system conditions that impact the calibration results. Using data produced during the November 2017 field program, CDM Smith calibrated almost of the fire flow tests within the targeted pressure drop range of 5 psi. During Test No. 5, there appears to have an equipment malfunction or system operational issues that adversely affected calibration of this test. The most realistic reason would be a clogged pitot gage, which led to the rise in pressure once flow A opened rather than the necessary drop.

Available Water Supply

The City currently owns and operates the Charles G. Hammann Memorial Water Treatment Plant (WTP). The WTP, built in 1962, is located on Manville Road and can treat a maximum flow of 13.25 million gallons per day (mgd) with a maximum finished water pumping capacity of 13.5 mgd. The plant currently (based on the 5 most recent years of records) produces an average of approximately 3.5 mgd of treated water, with a current maximum daily flow rate of 5.3 mgd in 2013.

As part of its ongoing capital improvement program and infrastructure replacement plan, the City is proactively replacing the existing WTP. The proposed treatment plant will supply demand for existing conditions as well as provide future flowrates up to 10.5 mgd.

Historical and Projected Water Demands

With information and data provided by the City, CDM Smith has presented below the Water Division historic water demands and documented our methodology for project water demands to through the 2040 planning period.

2011-2016 Water Demand Trends

CDM reviewed historical water production and consumption trends in Woonsocket for the last five years (2012 to 2016) using water production data provided by the Woonsocket Water Division. The graph below displays the average daily flow delivered by the WTP from 2012 through 2016. The values used were averages of the average daily demands for each year.

TEST NUMBER	GAUGE A									GAUGE B									COMMENTS/NOTES
	FIELD			MODEL			STATIC DIFFERENCE (PSI)	PRESSURE DROP 1 DIFFERENCE (PSI)	PRESSURE DROP 2 DIFFERENCE (PSI)	FIELD			MODEL			STATIC DIFFERENCE (PSI)	PRESSURE DROP 1 DIFFERENCE (PSI)	PRESSURE DROP 2 DIFFERENCE (PSI)	
	STATIC (PSI)	RESIDUAL 1 (PSI)	RESIDUAL 2 (PSI)	STATIC (PSI)	RESIDUAL 1 (PSI)	RESIDUAL 2 (PSI)				STATIC (PSI)	RESIDUAL 1 (PSI)	RESIDUAL 2 (PSI)	STATIC (PSI)	RESIDUAL 1 (PSI)	RESIDUAL 2 (PSI)				
1	64.00	58.00	46.00	**64.52**	**57.94**	**47.60**	0.52	-0.06	1.60	61.00	55.00	42.00	**61.52**	**54.48**	**43.11**	0.52	-0.52	1.11	
3	54.00	53.00	53.00	**54.24**	**53.19**	**53.16**	0.24	0.19	0.16	54.00	55.00	55.00	**54.55**	**52.63**	**52.55**	0.55	-2.37	-2.45	
4	75.00	70.00	61.00	**75.33**	**68.37**	**60.56**	0.33	-1.63	-0.44	74.00	70.00	61.00	**74.02**	**67.90**	**59.62**	0.02	-2.10	-1.38	
5	52.00	55.00	0.00	**52.09**	**46.61**		0.09	-8.39	0.00	73.00	68.00	0.00	**73.43**	**68.33**		0.43	0.33	0.00	Defective GA result. Gage could have been clogged for reading 1.
7	83.00	81.00	77.00	**82.46**	**80.29**	**76.32**	-0.54	-0.71	-0.68	83.00	80.00	75.00	**83.59**	**81.07**	**75.85**	0.59	1.07	0.85	
8	75.00	63.00	48.00	**75.44**	**61.87**	**52.62**	0.44	-1.13	4.62	81.00	77.00	69.00	**80.68**	**76.43**	**71.79**	-0.32	-0.57	2.79	
9	58.00	55.00	50.00	**57.99**	**55.71**	**51.86**	-0.01	0.71	1.86	55.00	51.00	45.00	**55.02**	**52.41**	**47.13**	0.02	1.41	2.13	
10	56.00	53.00	0.00	**56.53**	**50.80**		0.53	-2.20	0.00	62.00	59.00	0.00	**62.50**	**57.83**		0.50	-1.17	0.00	
12	90.00	87.00	79.00	**89.63**	**83.55**	**76.05**	-0.37	-3.45	-2.95	96.00	93.00	82.00	**96.38**	**90.02**	**80.72**	0.38	-2.98	-1.28	
13	93.00	90.00	86.00	**93.84**	**87.89**	**82.49**	0.84	-2.11	-3.51	84.00	82.00	79.00	**84.24**	**80.76**	**77.54**	0.24	-1.24	-1.46	
15	112.65	104.52	87.25	**112.52**	**103.46**	**89.20**	-0.13	-1.06	1.95	108.19	100.35	92.51	**108.37**	**102.28**	**90.71**	0.18	1.93	-1.80	
16	62.00	56.00	42.00	**62.32**	**59.64**	**43.60**	0.32	3.64	1.60	87.00	80.00	60.00	**86.16**	**83.28**	**59.83**	-0.84	3.28	-0.17	
17	86.00	79.00	63.00	**86.04**	**76.85**	**62.72**	0.04	-2.15	-0.28	76.00	69.00	54.00	**76.05**	**67.43**	**51.98**	0.05	-1.57	-2.02	
18	69.00	66.00	58.00	**69.05**	**66.12**	**59.45**	0.05	0.12	1.45	86.00	83.00	73.00	**86.03**	**82.70**	**72.87**	0.03	-0.30	-0.13	
19	79.00	69.00	60.00	**79.35**	**68.69**	**58.50**	0.35	-0.31	-1.50	99.00	97.00	95.00	**99.42**	**95.83**	**93.32**	0.42	-1.17	-1.68	
21	58.00	40.00	35.00	**57.98**	**39.05**	**37.85**	-0.02	-0.95	2.85	50.00	47.00	42.00	**50.00**	**46.40**	**42.28**	0.00	-0.60	0.28	
22	70.00	67.00	62.00	**70.11**	**66.45**	**58.59**	0.11	-0.55	-3.41	85.00	83.00	60.00	**85.14**	**78.80**	**62.90**	0.14	-4.20	2.90	
23	95.00	90.00	80.00	**95.04**	**89.08**	**79.79**	0.04	-0.92	-0.21	80.00	77.00	68.00	**79.99**	**76.85**	**69.78**	-0.01	-0.15	1.78	
26	87.00	77.00	60.00	**87.96**	**73.33**	**56.36**	0.96	-3.67	-3.64	82.00	73.00	54.00	**82.93**	**68.39**	**51.30**	0.93	-4.61	-2.70	
27	117.00	57.00	33.00	**116.73**	**55.30**	**37.56**	-0.27	-1.70	4.56	95.00	73.00	62.00	**95.14**	**74.91**	**66.73**	0.14	1.91	4.73	
28	100.00	98.00	92.00	**100.02**	**96.07**	**89.45**	0.02	-1.93	-2.55	87.00	85.00	81.00	**87.04**	**85.03**	**80.33**	0.04	0.03	-0.67	
29	78.00	70.00	0.00	**77.99**	**69.13**		-0.01	-0.87	0.00	72.00	67.00	0.00	**71.99**	**66.41**		-0.01	-0.59	0.00	
30	74.00	56.00	41.00	**74.16**	**53.72**	**40.68**	0.16	-2.28	-0.32	64.00	46.00	28.00	**64.15**	**46.10**	**31.36**	0.15	0.10	3.36	
31	67.00	51.00	46.00	**68.83**	**50.46**	**49.98**	1.83	-0.54	3.98	73.00	57.00	49.00	**74.85**	**57.90**	**53.84**	1.85	0.90	4.84	

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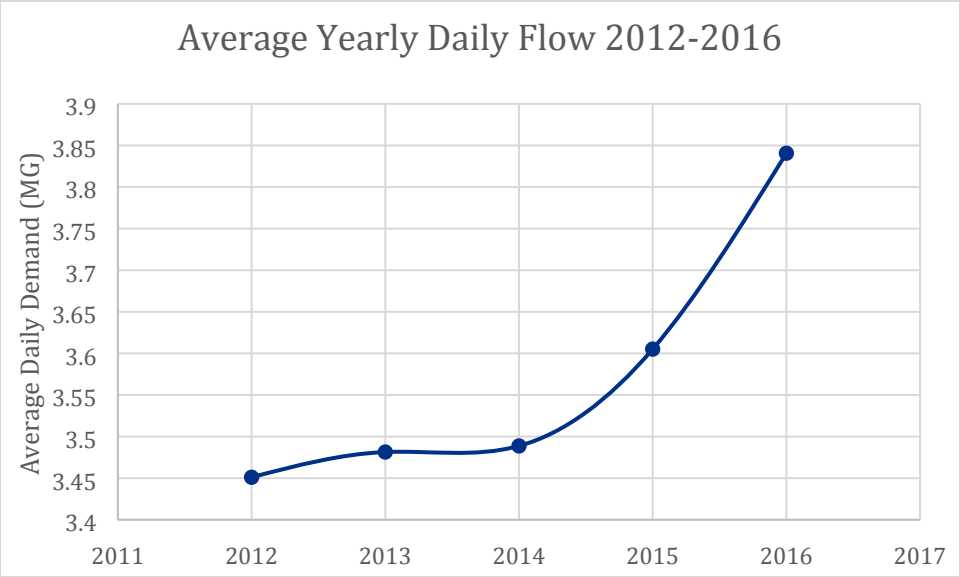
TABLE 2
CITY OF WOONSOCKET, RHODE ISLAND
MODEL CALIBRATION DATA



Over the last 5 years, the City's water demands have increased approximately 10 percent with 6.5 percent of that in 2016. Following discussions with the City, CDM Smith learned that the increase in water demands in 2015 and 2016 correlates with the startup and operation of their new Cumberland interconnection station, which provides wholesale water supply from Woonsocket to Cumberland. Due to communication issues between the new interconnection station and the existing WTP, the SCADA system did not record or document the flows to Cumberland. For billing purposes, the City read the flow totalizer quarterly when preparing bills for Cumberland.

We also learned that the increase in supply to Cumberland through the interconnection was due to water supply and operational issues at Cumberland's Sneech Pond WTP. The Town is currently constructing new wells, which will reduce their wholesale water purchases from Woonsocket once the new wells are online. This increase is not included when projecting demands in the future since this increased need is only temporary.

Future Development and Water Needs

In 2007, CDM Smith produced a water model report which provided projections to 2030. Comparing the future demands that were projected back in 2007, the 2015 projected ADD and MDD of 4.74 mgd and 7.96 mgd, respectively, were quite conservative compared to the actual ADD and MDD of 3.61 mgd and 5.16 mgd. The marginal change in water demands from 2007 through 2016 is mainly due to limited residential development and the reduction in commercial and industrial water use over this 10 years period. To calculate future water demand projects, CDM Smith maintained the same approach used in 2007 to establish future water supply needs through the 2040 planning year.

Average day demand is defined as the total average daily consumption of all water billing routes plus non-revenue water. Maximum day demand is the largest amount of water consumption within

a 24-hour period during the year. System pumping is sized for the maximum day rate, and any demands exceeding maximum day to meet peak hour typically come from storage. The peak hour demand is the largest amount of water used in any single hour, of any day, during the year. The maximum day and peak hour event normally occur in the summer months.

Utilizing data from 2012 to 2016, **Table 3** displays yearly consumption data with calculated peaking factors, or ratios between average day demands and maximum day demand. The maximum day demand/ average day demand (MDD/ADD) peaking factors ranged from 1.37 to 1.52. Maximum day to average day water consumption can be influenced by several factors, depending on the extent of nonresidential users, climate conditions, and supply capability. The peaking factor of 2.95 was used for peak hour demand per the 2007 evaluation.

Table 3 - Summary of Water Use 2012-2016

Water Use Classification	2012 Consumption	2013 Consumption	2014 Consumption	2015 Consumption	2016 Consumption	5-Year Average Consumption
Average Daily Demand (ADD)	3.45 mgd	3.48 mgd	3.49 mgd	3.61 mgd	3.84 mgd	3.57 mgd
Maximum Daily Demand (MDD)	5.25 mgd	5.30 mgd	5.24 mgd	5.16 mgd	5.27 mgd	5.24 mgd
MDD/ADD Peaking Factor	1.52	1.52	1.50	1.43	1.37	1.47
PHD Peaking Factor	2.95	2.95	2.95	2.95	2.95	2.95

Utilizing these peaking factors, CDM Smith projected the City's water demands through to 2040. The average yearly increase of total demands from 2012-2015 (not including the increase in 2016) is 0.98%. This percentage was used for the yearly projected increase through to 2040. CDM Smith used this percent increase per year using past consumption records and understanding that the City does not anticipate any significant development within the next ten to 15 years when the water supply needs will be investigated again. The average peaking factor of 1.47 was then used to project the maximum daily demands through 2040.

Table 4 – Summary of Projected Water Demands

	2020	2030	2040
Total Average Day Demand (mgd)	3.79	4.17	4.60
Maximum Day Demand (mgd)	5.56	6.13	6.76

Fire Flows

The Insurance Services Office (ISO) establishes fire flow requirements and evaluates the ability of water distribution systems to provide adequate flows for fire protection. ISO is an association that compiles data that is used to establish rates for fire protection insurance policies for both residential and commercial buildings and typically estimates fire flow requirements at several locations within a community. ISO estimates fire flow requirements only for a portion of a community and these sites are selected to provide a relative representation of a community's system-wide fire protection capabilities. The locations that ISO establishes for fire flow requirements are re-evaluated on a recurring cycle of ISO Public Protection Classification (PPC) surveys.

Fire Flow Criteria

Water distribution systems must supply both needed fire flow volume and maintain residual pressures throughout the entire distribution system while providing fire protection.

Minimum Pressure During Needed Fire Flows

Industry standards state that water distribution systems must maintain a minimum residual pressure of 20 psi at all ground elevations throughout the entire system during the maximum day demand (MDD) plus fire flow supply conditions. The minimum pressure of 20 psi will provide adequate supply of water to other customers in the system during fire flow scenarios. In addition, it will also allow for adequate supply for a fire pump truck while overcoming friction losses in hydrant lateral branches, hydrant barrels and nozzles, and through suction hoses to the pumper truck.

Needed Fire Flows

ISO defines "needed fire flows" as the discharge flow rate to control a fire at a designated location in the water distribution system and for a specified duration while maintaining a residual pressure of 20 psi throughout the entire system. Generally, the needed fire flow at each representative location selected by ISO is based on the building in the area with the largest required fire flow. ISO calculates the needed fire flows based on a formula that considers land use, building construction, occupancy characteristics, spacing between buildings, and building fire protection systems (i.e., fire pumps or sprinkler systems).

To meet ISO insurance ratings, water suppliers are generally responsible for delivering a maximum fire flow rate of 3,500 gallons per minute (gpm) while maintaining residual pressure at 20 psi at all points within the distribution system. Larger needed fire flows are frequently required at commercial, institutional and industrial premises. For needed fire flows greater than 3,500 gpm, building owners are required to supplement fire protection provided by the water system to meet ISO's total needed fire flow requirements. The supplement fire protection needs can be met by

installing dedicated fire storage tanks, pumps to supply sprinkler systems and/or fire protection connections.

The AWWA recommends fire flow durations based on the NFPA's *Fire Protection Handbook.* The maximum required fire flow for a single fire event as defined by ISO is 12,000 gpm. In accordance with these requirements, water distribution systems must maintain residual pressure of 20 psi while providing needed fire flows for the following durations:

- 2 hours for needed fire flows of 2,500 gpm or less
- 3 hours for needed fire flows between 3,000 and 3,500 gpm

ISO Fire Protection Analysis

General

CDM Smith evaluated the ability of the distribution system to provide adequate flow during fires based on fire flow requirements established for the City by the ISO.

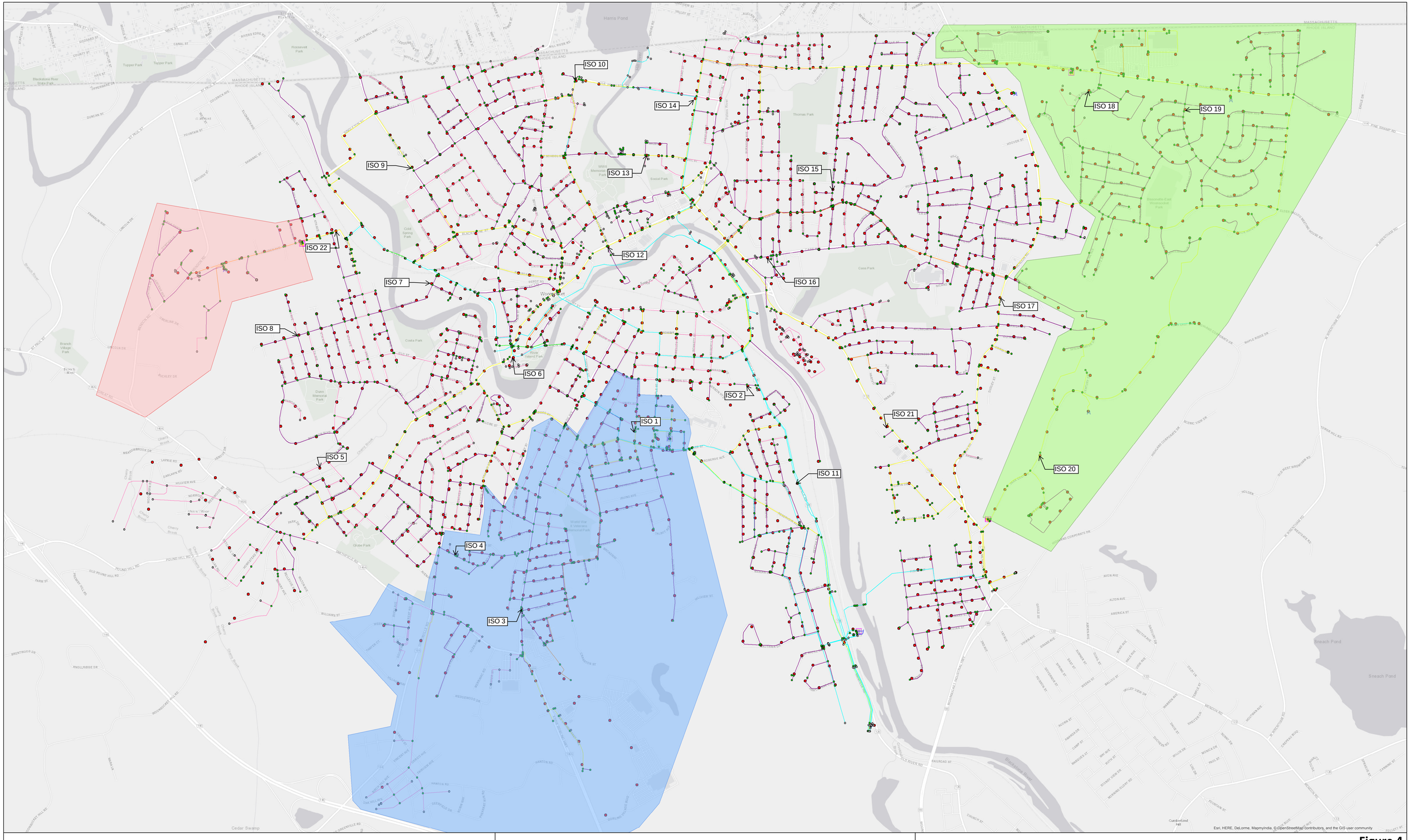
ISO last established fire flow requirements for the Woonsocket water system in November 2005 at 22 locations and the ISO documentation is presented in **Appendix A**. **Figure 4** displays these locations geographically.

System Fire Protection Analysis

To further evaluate the City's system, CDM Smith utilized the model to determine the available fire flow at each of the systems hydrants using the established MDD, typical tank level, and source operation as presented above. When simulating the needed fire flows, we used AWWA requirement of maintaining 20 psi residual pressure at the hydrant and all other locations in the system when determining available fire flow within the City's water supply system. The model results indicate that the available fire flow in the system during a MDD scenario ranges from 1000 gpm to over 5,000 gpm.

AWWA Document M31 – Distribution System Requirements for Fire Protection, indicates that 500 gpm is considered by some experts to be the minimum amount of water that can safely and effectively control any fire. During a MDD scenario, it appears the system can provide a minimum of 500 gpm at most of the model junctions however, due to older and undersized cast iron and asbestos cement pipes in combination with insufficient hydraulic looping there are several locations that do not meet the 500 gpm criteria.

CDM Smith determined that the distribution system is unable to provide the needed fire flow at a residual pressure of 20 psi for 9 of the ISO tests. Although the model simulations indicate that the system cannot provide the needed fire flows by ISO standards for Test Nos. 6, 13, 14 and 16, CDM Smith did not deem these tests to be deficient, as the system is able to provide 3,500 gpm for the 3-hour duration. This is the maximum fire flow rate that a water system is required to supply. Therefore, of the twenty-two ISO test locations, there were four locations where the available fire



N

W E

S

Legend

Pipe

- Less than 8-inches
- 8-inches
- 10-inches
- 12-inches
- 14-inches
- Greater than 14-inches

Hydrant

- Hydrant

High Service Areas

- Mount Saint Charles High Service Area
- Rhodes Avenue High Service Area
- Diamond Hill & Industrial Park Combined High Service Area

WOONSOCKET WATER DIVISION
WATER SYSTEM DISTRIBUTION MODEL UPDATE

Figure 4
ISO Test Locations

1 inch = 800 feet

0 800 1,600 2,400 3,200 *Feet*

CDM Smith

flow was less than the required fire flow, and five locations where the residual pressure was at or below 20 psi.

Table 5 presents our findings from the model fire flow simulations. The following paragraphs discuss the deficiencies found in Woonsocket's distribution system.

Mount Saint Charles Avenue

This area is primarily residential, although the Mount Saint Charles Academy is located near the end of Mount Saint Charles Avenue. ISO evaluated this area for two fire flow scenarios (ISO Test Nos. 2 and 11). During the previous 2007 water system evaluation, the water system could not provide the necessary fire flows of 4,500 gpm and 1,000 gpm for the Mount Saint Charles Avenue area. In 2017, the City designed and constructed the Mount Saint Charles Avenue water main replacement project and this improvement significantly enhanced fire protection in the Mount Saint Charles Avenue area. The water system can now provide the required fire flow volumes to this area.

Mount Saint Charles High Service Area

CDM Smith simulated fire flows in the Mount Saint Charles high service area and determined that the system does not provide acceptable fire protection on Piedmont Street at Seabury Street (ISO Test No. 4). ISO requires a fire flow capacity of 3,000 gpm and the system provides 750 gpm while maintaining a 20-psi residual pressure. The City's Mount Saint Charles high service area falls 250 gpm short of the fire flow requirement for Park Avenue (ISO Test No. 3). These fire flow limitations are caused by the lack of piping redundancy (i.e., hydraulic looping) in this high service area with only one transmission main in the Mount Saint Charles high service area. This 12-inch transmission main is located along Division and Hamilton Streets and transports water from the high service tank on Logee Street. The 12-inch main reduces to a 10-inch main at Knight Street and continues southerly along Knight Street into the service zone.

Because of the lack of hydraulic loops in the extremity of this service zone, the ISO fire flow demand of 3,000 gpm along Piedmont Street causes most of the Mount Saint Charles high service area to experience pressures below 20 psi. When performing this fire flow simulation, CDM Smith determined that many areas of this service zone have no water pressure.

To enhance fire protection in the Mount Saint Charles high service area, the City has completed the design of a significant water main improvements project in the Park Avenue area and plans to bid and construct the project in 2018. By proactively completing this project, the City will improve fire protection in this area of the system.

Singleton Street / River Street Area

As documented previously, there are fire flow limitations on Harris Avenue at Katherine Road (ISO Test No. 9). The system can supply the required residential fire flow demand, but does not meet the commercial fire flow demand of 6,000 gpm. ISO requires a commercial fire flow of 6,000 gpm while

ISO COMMERCIAL RISK SERVICES, INC. DATA [1]					HYDRAULIC MODEL SIMULATION RESULTS						
Test Number	District Type	Test Location	Zone	Needed Fire Flow at 20 psi (gpm)	Fire Flow Model Node	Fire Flow Duration (hours)	Critical Node at Needed Fire Flow	Critical Node Location	Pressure at Critical Node during Needed Fire Flow (psi)	Available Fire Flow at 20 psi [2] (gpm)	Comments
1	Commercial	Division Street at Washington	City of Woonsocket Water Division, Mount Saint Charles	4500	J5178	4	J1990	End of Bradley Street	36.05	6,936	
2	Commercial	Bernon Street w/o Manville	City of Woonsocket Water Division, Main	1000	J4764	2	J1266	Mendon Road at Wilcox Street	32.06	5,201	
3	Commercial	Park Avenue at Hemond Avenue	City of Woonsocket Water Division, Mount Saint Charles	2250	J5196	2	J4736	End of Old Louisquisset Pike	11.41	2,000	Only 1 transmission main and no hydraulic loops in the extremity of the high service area
4	Commercial	Piedmont Street at Seabury Street	City of Woonsocket Water Division, Mount Saint Charles	3000	J5204	3	J122	Smithfield Road at White Parkway, North Smithfield (NS)	0.00	750	
5	Commercial	Roberta Avenue at Andrews Street	City of Woonsocket Water Division, Main	2000	J5486	2	J632	Roberta Avenue at Andrews Street	0.00	1,250	Significant head losses along South Main Street, Smithfield Road and surrounding neighborhoods
6	Commercial	Main Street at Island Place	City of Woonsocket Water Division, Main	5000	J2476	4	J3834	End of Fairmount Street	11.46	3,650	System can provide required 3,500 gpm for 3 hours
7	Commercial	Edwards Street (assumed Water Street) & Fairmount Street	City of Woonsocket Water Division, Main	3500	J2640	3	J3834	End of Fairmount Street	19.28	3,250	Low pressures at end of Fairmount Street due to increased elevation
8	Residential	River Street (assumed Fairmount) at Eighth Street	City of Woonsocket Water Division, Main	1000	J200	2	J3834	End of Fairmount Street	3.85	650	Low pressures at end of Fairmount Street due to increased elevation
9	Commercial	Harris Avenue at Katherine Road	City of Woonsocket Water Division, Main	6000	J5414	4	J5414	Harris Avenue at Katherine Road	0.00	3,000	Significant head losses along Harris Avenue
10	Commercial	Winter Street at Privilege Street	City of Woonsocket Water Division, Main	4500	J5124	4	J3322	End of Summer Street	0.00	2,800	Low pressures along Gaskill Street
11	Residential	Manville Road & 1000' S/o Marcel	City of Woonsocket Water Division, Main	1000	J5040	2	J614	Woonsocket Hill Road at Bellevue Avenue, NS	35.90	5,708	
12	Commercial	Clinton Street at Veteran's Parkway	City of Woonsocket Water Division, Main	3000	J5488	3	J3834	End of Fairmount Street	29.38	6,477	
13	Commercial	East School Street at Hazel Street	City of Woonsocket Water Division, Main	5500	J4092	4	J4092	East School Street at Hazel Street	0.00	4,400	System can provide required 3,500 gpm for 3 hours
14	Commercial	Privilege Street at Rathburn Street	City of Woonsocket Water Division, Main	4500	J3070	4	J3070	Privilege Street at Rathburn Street	0.00	3,400	System can provide required 3,500 gpm for 3 hours (3,400 gpm available for 4 hour simulation)
15	Commercial	Winthrop Street at Yolande Place	City of Woonsocket Water Division, Main	2250	J2966	2	J3986	Maple Street north of South Joseph Street	23.54	3,907	
16	Commercial	Cass Avenue e/o Wood Avenue	City of Woonsocket Water Division, Main	5000	J4084	4	J4084	Cass Avenue east of Wood Avenue	0.00	3,900	System can provide required 3,500 gpm for 3 hours
17	Commercial	Mendon Road s/o Cass Avenue	City of Woonsocket Water Division, Main	2000	J5490	2	J3834	End of Fairmount Street	34.31	6,073	
18	Commercial	Rock Ridge Drive s/o Diamond Hill Road	City of Woonsocket Water Division, Diamond Hill	4500	J5492	4	J3834	End of Fairmount Street	34.67	8,475	
19	Residential	Walnut Hill Road at Rustic Drive	City of Woonsocket Water Division, Diamond Hill	1000	J5120	2	J3834	End of Fairmount Street	36.20	7,585	
20	Commercial	Park East Drive n/o CVS Drive	City of Woonsocket Water Division, Highland Industrial Park	2000	J5012	2	J3834	End of Fairmount Street	35.74	6,908	
21	Commercial	Columbus Street at Cumberland Hill Road	City of Woonsocket Water Division, Main	2000	J5494	2	J3834	End of Fairmount Street	34.41	4,046	
22	Residential	Rhodes Avenue at 7th Avenue	City of Woonsocket Water Division, Rhodes Avenue	1000	J5152	2	J576	Mendon Road at Rhodes Avenue	53.17	5,173	

Notes:

(1) ISO Commercial Risk Services, Inc. provided this information to the City of Woonsocket (See Appendix A for supporting document from ISO).

(2) ISO does not consider Needed Fire Flows greater than 3,500 gpm in determining the classification of the City when using the Fire Suppression Rating Schedule.

the water system provides 3,000 gpm. As indicated previously, the City must only improve fire protection to provide a flow rate of 3,500 gpm over a three-hour duration.

There are several factors limiting fire protection in this area. First, there are head losses in the existing transmission mains which supply water directly to this area. Although a significant amount of water can be supplied through the new 16-inch transmission main in River Street, the fire demand requires that the 12-inch transmission mains in Singleton Street, Harris Avenue, and Blackstone Street provide a significant flow volume. These mains are all cast-iron and were installed in the 1890s and early 1900s and are most likely unlined mains based on their age. Through the model calibration process, CDM Smith determine that the carrying capacity (C-factors) of these mains are quite low. We presume that their internal diameters have been significantly reduced due to internal corrosion and tuberculation, which reduces the flow area.

Furthermore, there are several areas in the transmission system piping which restrict flow and increase head losses to this area. Water main diameters fluctuate in Harris Avenue, Privilege Street and East School Street at several locations where the 12-inch mains reduce to 6-inch and 8-inch mains, causing restrictions and limiting flow.

Andrews Street / Roberta Avenue

Using the model, CDM Smith simulated ISO Test No. 5 and determined that the system cannot meet the needed residential fire flow of 2,000 gpm, while provide a fire flow volume of 1,200 gpm in this area. We believe that the condition of the 12-inch main in South Main Street contributes to the limited fire protection. The South Main Street water main is also the only significant water main in the area, which supplies water to this dead-end area.

Fairmount Street Area

The Fairmount Street area (ISO Test Nos. 7 and 8) have fire flow deficiencies of 250 gpm and 350 gpm. The combination of existing aging 6-inch and 8-inch mains in Fairmount Street limits the system's ability to provide flow to this area. The model indicates that these mains are not producing the proper volumes and pressures necessary to the dead-end portion of Fairmount Avenue.

Privilege Street Area

The Privilege Street Area consists of three ISO tests (10, 13 and 14). All three ISO tests in this area were unable to meet their commercial fire flow volumes of 4,500 gpm, 5,500 gpm and 4,500 gpm respectively, but could meet required residential fire flow supply to each. Test Nos. 13 and 14 were however able to meet the required 3,500 gpm for 3-hour that the City is responsible for providing to commercial buildings. The building owner is then responsible for the additional fire flow volumes as discussed earlier. Test No. 10 produces very low pressures along Gaskill Street likely due to the unlined, cast iron piping in the area, which was installed from the 1890s and the early 1900s.

Cass Avenue Area

Test Nos. 15, 16, and 17 were conducted within the Cass Avenue Area. For Test No. 16, the system cannot provide the ISO required 5,000 gpm fire flow but can meet the minimum 3,500 gpm that the City is responsible to provide. For Tests 15 and 17, the system can provide the 2,250 gpm and 2,000 gpm that ISO required for these areas.

Combined Industrial Park and Diamond Hill High Service Area

ISO conducted three fire flow tests in the Industrial Park and Diamond Hill high service area (Test No. 18, 19 and 20). The system can supply the residential fire flow of 1,000 gpm in Test No. 19, and the required 4,500 gpm and 2,000 gpm commercial fire flow (Test Nos. 18 and 20) in this area. In 2016, the City installed a 12-inch line connecting East Park Drive to Brookhaven Lane creating the Diamond Hill and Industrial Park Combined High Service Area. This connection has solved previous ISO issues in the Diamond Hill high service area, where the pump station and storage were limited and unable to provide the necessary fire flows.

Rhodes Avenue High Service Area

The Rhodes Avenue high service area primarily supplies customers in North Smithfield and only a very small area of Woonsocket. The piping configuration in this area consists of numerous dead ends and very few hydraulic loops. The field program included one hydrant flow test in this high service area (Test No. 22). We simulated the required residential fire flow of 1,000 gpm for a 2-hour duration. The model resulted with more than enough flow to meet this residential requirement.

Piping Improvements for Fire Protection

While performing this fire protection evaluation, we utilized the calibrated model, past reports and studies, and incorporated all piping upgrades to the system up to 2017. CDM Smith then assessed potential improvements to the system that would improve existing fire protection in the areas referenced above. **Figure 5** shows our recommended improvements to the water system while **Table 6** presents corresponding enhancements in available fire flow volumes resulting from these recommended improvements. We have further documented our findings and recommendations below.

Mount Saint Charles High Service Area

To create an additional hydraulic loop and redundancy in the Mount Saint Charles high service area, CDM Smith recommends replacing some of the existing 6-inch and 8-inch water mains in Knight Street, Cottage Street, Blakely Street, Park Avenue, Smithfield Road, and Providence Street with a new 12-inch water main. We also recommend installing a new 12-inch water main in sections of Blakely Street and Smithfield Road which currently do not have any water mains. **Figure 5** presents these recommended water main improvements, which enhance fire protection in the Park Avenue area of the Mount Saint Charles high service area.

BLACKSTONE, MA

BELLINGHAM, MA

WRENTHAM, MA

WOONSOCKET

CUMBERLAND

NORTH SMITHFIELD

LINCOLN

Low Service Tank
- Cobble Hill

High Service Tank
- Diamond Hill

High Service Booster Pump Station
- Diamond Hill

Interconnection
- Woonsocket to Cumberland Metering Station

High Service Tank
- Highland Industrial Park

High Service Booster Pump Station
- Highland Industrial Park

High Service Tank
- Mount Saint Charles 5

High Service Booster Pump Station
- Mount Saint Charles

Interconnection
- Cumberland to Woonsocket Metering Station

Charles Hamman Water Treatment Plant

Interconnection
-Woonsocket to Lincoln

Low Service Tank
- Mount Saint Charles 1

Low Service Tanks
- Mount Saint Charles 2
- Mount Saint Charles 3
- Mount Saint Charles 4

High Service Tank
- Rhodes Avenue

High Service Booster Pump Station
- Rhodes Avenue

SINGLETON STREET/ RIVER STREET AREA IMPROVEMENTS

FAIRMOUNT STREET AREA IMPROVEMENTS

ROCKLAND AVENUE/ ROBERTA AVENUE IMPROVEMENTS

SOUTH MAIN STREET IMPROVEMENTS

MOUNT SAINT CHARLES HIGH SERVICE AREA IMPROVEMENTS

PARK AVENUE AREA IMPROVEMENTS

Singleton Street
Gaskill Street
Winter Street
Privilege Street
East School Street
Woodland Road
River Street
Rhodes Avenue
Blackstone Street
Main Street
3rd Avenue
Fairmount Avenue
8th Avenue
2nd Avenue
Mason Street
Bourbon Blvd.
Roberta Avenue
South Main Street
Providence Street (Route 104)
Crest Road
Smithfield Road (Route 146A)
Blakeley Street
Cottage Street
Park Avenue

16" 12" 10" 8"

Legend

Pipe
- Less than 8-inches
- 8-inches
- 10-inches
- 12-inches
- 14-inches
- Greater than 14-inches

High Service Areas
- Mount Saint Charles High Service Area
- Rhodes Avenue High Service Area
- Combined Diamond Hill & Industrial Park HSA

WOONSOCKET WATER DIVISION
WATER SYSTEM DISTRIBUTION MODEL UPDATE

Figure 5
Proposed Fire Protection Piping Improvements

1 inch = 800 feet

0 800 1,600 2,400 3,200 Feet

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ISO COMMERCIAL RISK SERVICES, INC. DATA					HYDRAULIC MODEL SIMULATION RESULTS					
Test Number	District Type	Test Location	Zone	Needed Fire Flow at 20 psi (gpm)	Fire Flow Model Node	Fire Flow Duration (hours)	Critical Node at Needed Fire Flow	Critical Node Location	Pressure at Critical Node during Required Fire Flow (psi)	Available Fire Flow at 20 psi (gpm)
3	Commercial	Park Avenue and Hemond Avenue	High	2,250	J5196	2	J4736	End of Old Louisquisset Pike	48.40	3,500
4	Commercial	Piedmont Street at Seabury Street	High	3,000	J5204	3	J122	Smithfield Road at White Parkway, North Smithfield	41.26	3,750
5	Commercial	Roberta Avenue at Andrews Street	Low	2,000	J5486	2	J632	Roberta Avenue at Andrews Street	39.85	4,300
7	Commercial	Edwards Street (assumed Water Street) and Fairmount Street	Low	3,500	J2640	3	J3834	End of Fairmount Street	24.97	4,300
8	Residential	River Street (assumed Fairmount) at Eighth Street	Low	1,000	J200	2	J3834	End of Fairmount Street	29.34	1,750
9	Commercial	Harris Avenue at Katherine Road	Low	3,500	J5414	3	J5414	Harris Avenue at Katherine Road	54.44	6,700
10	Commercial	Winter Street at Privilege Street	Low	3,500	J5124	3	J3322	End of Summer Street	32.51	6,000

NOTES

1. All ISO fire flow tests simulated under 2016 maximum day demand conditions (the highest maximum day demand in the last 5 years).
2. Critical pressure was determined at end of each ISO fire flow simulation.
3. Improvements were only proposed to meet up to 3,500 gpm for 3 hours. If ISO called for more, that was not shown on this Table.

These improvements create an additional transmission path from the Mount Saint Charles high service storage tank to the extremity of this service area. This new 12-inch main, along with the existing 10-inch main from the tank to the service zone, maintain pressures in the entire service zone during the simulated fire events. As discussed previously, CDM Smith teamed with the City to design this Park Avenue Area Water Main Improvements project and we anticipate bidding the project for spring 2018 construction.

Singleton Street / River Street Area

To improve fire protection in the Singleton Street/River Street area, CDM Smith has recommended distribution system piping improvements in this area. The recommended improvements for fire protection in this area but the new water mains also reinforce the City's transmission system on the suction side of the Rhodes Avenue high service pump station.

CDM Smith recommends replacing the existing 12-inch mains in sections of Main Street, Blackstone Street, Singleton Street, and River Street. These 12-inch mains were all installed in the late 1890s and early 1900s. To provide sufficient fire protection in this area, we determined that the existing 12-inch mains should be replaced with new 16-inch pipe as shown in **Figure 5**.

We also recommend replacing existing 6-inch and 8-inch mains in Spring Street, Woodland Road, Gaskill Street, Winter Street, East School Street and Privilege Street. Our model simulations indicated that new 16-inch pipe should be installed in Spring Street, Woodland Road, and Gaskill Street and new 12-inch pipe constructed in Winter Street, East School Street and Privilege Street. The City should also consider upgrading the 8-inch and 12-inch mains in Harris Avenue due to their old age.

These improvements will hydraulically loop this area of the City's transmission system with the new 16-inch water main in River Street, which was installed in the 2004. Replacing these mains will also reduce pressure losses to this area since these water mains were originally installed in the 1890s and early 1900s.

Fairmount Street Area

During the hydraulic evaluation of the Fairmount Street area, CDM Smith determined that limited fire protection and low pressures are resulting from high elevations and not head losses through the transmission and distribution system. To satisfy pressures and fire protection needs, CDM Smith recommends replacing the existing 6-inch and 8-inch water mains in Fairmount Street with a new 8-inch water main. This improvement will provide flow volume but will not maintain the residual pressures above 20 psi at the end of Fairmount Street. To maintain pressures to the Fairmount Street area where the water customers have experienced chronic low-pressure problems., we also used the model to simulate other water main improvements that are needed to maintain acceptable pressures during fires within the Fairmount Street. These water main improvements include the replacement of old, unlined cast iron piping with new 8-inch ductile iron water mains in the following streets:

- Mason Street from South Main Street to Tenth Avenue
- Second Avenue from Mason Street to Fairmount Street
- Eighth Avenue from Mason Street to Fairmount Street

We also recommend replacing the existing 12-inch water main in a section of South Main Street with a new 16-inch water main as recommended in the 2007 Water Distribution System Evaluation. This improvement will reduce head losses and maintain pressures to the extremity of the distribution system in North Smithfield. The existing 12-inch water main in South Main Street was installed in the 1890s and is beyond its useful life.

Rockland Avenue / Roberta Avenue

By replacing the 12-inch main in South Main Street, the City will remedy the fire flow deficiency in the Rockland Avenue / Roberta Avenue area as recommended in the 2007 study. CDM Smith also recommends installing a new 8-inch water main from Roberta Avenue to Bourdon Boulevard to hydraulically loop the Fairmount Street Area with this area of the distribution system.

Other Piping Improvements

Low Pressure Areas

While performing hydraulic model simulations, CDM Smith determined that there are isolated areas of the City's distribution system which experience pressures below 35 psi under peak demand conditions. Specifically, these areas are local to the:

- Mount Saint Charles low service tanks,
- Diamond Hill Road and Mendon Road intersection near the Cobble Hill tank site,
- Fairmount Street west of Eighth Avenue,
- Beausoleil Street, and
- Great Road in North Smithfield.

The low pressures near the Mount Saint Charles tank site occur within the low service system where ground elevation near the low-service storage tanks area. However, domestic water service in this area is supplied by the Mount Saint Charles high service area where pressures are maintained above 35 psi. Since the high service area provides sufficient pressures, no improvements are necessary.

Low pressures near the Cobble Hill tank site are also a result of high ground elevations immediately adjacent to the tank. The pressures along Diamond Hill Road and Mendon Road only drop below 35 psi during peak hour demand conditions. Since this is an isolated and small area, CDM Smith would

recommend small residential booster pumps for the affected customers on Diamond Hill Road and Mendon Road to increase their domestic water supply pressures above 35 psi.

High ground elevation is the primary cause of the low pressures at the end of Fairmount Street, west of Eighth Avenue. CDM Smith has recommended that the City perform an evaluation to enhance fire protection and pressures in the Fairmount Street area as discussed above. This study will also assess improvements near Eighth Street.

The Beausoleil Street area experiences pressures below 35 psi under peak demand conditions due to high ground elevations and the lack of a hydraulic loop at the end of this street. Since this is an isolated and small area, CDM Smith would recommend small residential booster pumps for customers on Beausoleil Street to increase their domestic water supply pressures above 35 psi.

Finally, the Great Road area in North Smithfield experiences pressures below 35 psi under peak demand conditions due to high ground elevations and the condition of the existing 12-inch main in South Main Street. During the model calibration process, CDM determined that the C-factor of the existing 12-inch main is quite low, causing significant head losses at high flow rates. This 12-inch cast-iron main, installed in the 1890s, is the only major transmission main that supplies water to this area of North Smithfield.

As discussed, the low pressures affect a small number of water users and the City may choose to install individual residential booster pumps in homes that experience low water pressure to provide adequate domestic pressures. The City can investigate all low-pressure concerns on a case-by-case basis when customers call the Water Division with complaints of low water pressure. The City can also provide larger service connections to some of the customers in these areas in lieu of the standard ½-inch service connections. These larger service connections will help to reduce friction loss and maintain a slightly higher water pressure.

High Pressure Areas

There are two areas of the City's distribution system that experience high pressures that warrant further investigation. In both cases, CDM Smith recommends that the Water Division monitor pressures in these areas to confirm the high pressures predicted by the computer model.

The first location is along Holly Lane where model simulations document pressures that exceed 120 psi along the edge of the Highland Industrial Park high service area. The Water Division indicated that the condominium complex in this area installed pressure reducing valves to decrease pressures to more acceptable levels. CDM Smith recommends that the Water Division confirm that all units in this complex have pressure reducing valves.

Transit Street is the second location where pressures exceed 120 psi at the intersection with Broad Street. This small section of Transit Street is served by the Mount Saint Charles high service area. The high pressures are the result of lower ground elevations. If the Water Division determines that

pressures do exceed 120 psi at this location, CDM Smith recommends modifying the high service boundary in Transit Street to serve this area by the low service zone.

There is a 16-inch water main that crosses the Blackstone River from the treatment plant. These high pressures are a result of low elevation that in this main as it crosses under the river. Because no customers are served from this isolated section, CDM Smith does not believe the high pressures in this main are cause for major concern.

cc: Stephen D'Agostino, Director, Woonsocket Department of Public Works
Jon Pratt, P.E., City Engineer, Woonsocket Engineering Department
Chuck Adelsberger, P.E., Associate, CDM Smith

Appendix A -
2005 ISO Hydrant Flow Data Summary

INSURANCE SERVICES OFFICE, INC.

HYDRANT FLOW DATA SUMMARY

City Woonsocket
County Providence State Rhode Island Provided by: City of Woonsocket Date: 11/11/2005

TEST NO.	TYPE DIST.*	TEST LOCATION	SERVICE	FLOW - GPM				PRESSURE PSI		FLOW -AT 20 PSI		REMARKS***
				INDIVIDUAL HYDRANTS			TOTAL	STATIC	RESID.	NEEDED **	AVAIL.	
1	Comm	Division Street @ Washington	City of Woonsocket Water Division, Mt. St. Charles	1010	1010	0	2020	82	79	4500	10400	(D)-(4152 gpm)
2	Comm	Bernon Street w/o Manville	City of Woonsocket Water Division, Main	460	460	0	920	52	47	1000	2500	
3	Comm	Park Avenue @ Hemond Avenue	City of Woonsocket Water Division, Mt. St. Charles	810	0	0	810	86	78	2250	2500	
4	Comm	Piedmont Street @ Seabury Street	City of Woonsocket Water Division, Mt. St. Charles	560	0	0	560	117	83	3000	1000	
5	Comm	Roberta Avenue @ Andrews Street	City of Woonsocket Water Division, Main	580	0	0	580	75	19	2000	550	
6	Comm	Main Street @ Island Place	City of Woonsocket Water Division, Main	1300	0	0	1300	105	102	5000	7900	
7	Comm	Edwards Street & Fairmount Street	City of Woonsocket Water Division, Main	1300	0	0	1300	100	87	3500	3500	
8	Res	River Street @ Eighth Street	City of Woonsocket Water Division, Main	530	0	0	530	57	50	1000	1300	
9	Comm	Harris Avenue @ Katherine Road	City of Woonsocket Water Division, Main	820	820	0	1640	94	47	6000	2100	(A)-(2920 gpm)
10	Comm	Winter Street @ Privledge Street	City of Woonsocket Water Division, Main	1220	1220	0	2440	90	77	4500	6100	
11	Res	Manville Road & 1000' S/o Marcel	City of Woonsocket Water Division, Main	1400	0	0	1400	90	88	1000	9500	
12	Comm	Clinton Street @ Veteran's Parkway	City of Woonsocket Water Division, Main	1530	0	0	1530	102	100	3000	11400	

THE ABOVE LISTED NEEDED FIRE FLOWS ARE FOR PROPERTY INSURANCE PREMIUM CALCULATIONS ONLY AND ARE *NOT* INTENDED TO PREDICT THE MAXIMUM AMOUNT OF WATER REQUIRED FOR A LARGE SCALE FIRE CONDITION.

THE AVAILABLE FLOWS ONLY INDICATE THE CONDITIONS THAT EXISTED AT THE TIME AND AT THE LOCATION WHERE TESTS WERE WITNESSED.

***Comm = Commercial; Res = Residential.**

****Needed is the rate of flow for a specific duration for a full credit condition. Needed Fire Flows greater than 3,500 gpm are not considered in determining the classification of the city when using the Fire Suppression Rating Schedule.**

***** (A)-Limited by available hydrants to gpm shown. Available facilities limit flow to gpm shown plus consumption for the needed duration of (B)-2 hours, (C)-3 hours or (D)-4 hours.**

INSURANCE SERVICES OFFICE, INC.

HYDRANT FLOW DATA SUMMARY

City Woonsocket
County Providence State Rhode Island Provided by: City of Woonsocket Date: 11/11/2005

TEST NO.	TYPE DIST.*	TEST LOCATION	SERVICE	FLOW - GPM				PRESSURE PSI		FLOW -AT 20 PSI		REMARKS***
				INDIVIDUAL HYDRANTS			TOTAL	STATIC	RESID.	NEEDED **	AVAIL.	
13	Comm	East School Street @ Hazel Street	City of Woonsocket Water Division, Main	1480	0	0	1480	105	95	5500	4700	
14	Comm	Privelege Street @ Rathburn Street	City of Woonsocket Water Division, Main	1400	0	0	1400	93	86	4500	5000	
15	Comm	Winthrop Street @ Yolande Place	City of Woonsocket Water Division, Main	1010	0	0	1010	84	82	2250	6600	
16	Comm	Cass Avenue e/o Wood Avenue	City of Woonsocket Water Division, Main	1280	0	0	1280	88	80	5000	4100	
17	Comm	Mendon Road s/o Cass Avenue	City of Woonsocket Water Division, Main	820	0	0	820	70	67	2000	3700	
18	Comm	Rock Ridge Drive s/o Diamond Hill Road	City of Woonsocket Water Division, Diamond Hill	1400	0	0	1400	93	88	4500	6000	(D)-(3165 gpm)
19	Res	Walnut Hill Road @ Rustic Drive	City of Woonsocket Water Division, Diamond Hill	1340	0	0	1340	87	84	1000	7200	
20	Comm	Park East Drive n/o CVS Drive	City of Woonsocket Water Division, Highland	1510	0	0	1510	67	64	2000	6700	
21	Comm	Columbus Street @ Cumberland Hill Road	City of Woonsocket Water Division, Main	1140	0	0	1140	83	77	2000	4100	
22	Res	Rhodes Avenue @ 7th Avenue	City of Woonsocket Water Division, Rhodes Ave	1090	0	0	1090	82	66	1000	2300	

THE ABOVE LISTED NEEDED FIRE FLOWS ARE FOR PROPERTY INSURANCE PREMIUM CALCULATIONS ONLY AND ARE *NOT* INTENDED TO PREDICT THE MAXIMUM AMOUNT OF WATER REQUIRED FOR A LARGE SCALE FIRE CONDITION.

THE AVAILABLE FLOWS ONLY INDICATE THE CONDITIONS THAT EXISTED AT THE TIME AND AT THE LOCATION WHERE TESTS WERE WITNESSED.

***Comm = Commercial; Res = Residential.**

****Needed is the rate of flow for a specific duration for a full credit condition. Needed Fire Flows greater than 3,500 gpm are not considered in determining the classification of the city when using the Fire Suppression Rating Schedule.**

***** (A)-Limited by available hydrants to gpm shown. Available facilities limit flow to gpm shown plus consumption for the needed duration of (B)-2 hours, (C)-3 hours or (D)-4 hours.**

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EXHIBIT 1-4

PLEASE SEE EXCEL FILES.

EXHIBIT 1-5

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Minimum Service Charge		***Dec-15***	***Dec-16***	***Dec-17***	***Jun-18***
Customer Service Charge All Ratepayers					
5/8	Inch	8,379	8,422	8,480	8,501
3/4	Inch	247	247	245	243
1	Inch	384	382	384	387
1 1/2	Inch	65	62	61	61
2	Inch	122	127	130	129
3	Inch	7	6	6	6
4	Inch	9	10	9	9
6	Inch	6	6	6	6
8	Inch	5	5	5	5
10	Inch	-	-	-	-
		9,224	9,267	9,326	9,347
Additional Fire Protection Service Charge Only Ratepayers in Woonsocket					
5/8	Inch	7,795	7,838	7,892	7,915
3/4	Inch	220	220	218	216
1	Inch	360	358	360	362
1 1/2	Inch	56	54	53	53
2	Inch	114	115	118	117
3	Inch	6	5	5	5
4	Inch	8	8	7	7
6	Inch	4	4	5	5
8	Inch	-	-	-	-
10	Inch	-	-	-	-
		8,563	8,602	8,658	8,680

EXHIBIT 1-7

Quarterly Consumption
Woonsocket Water

Attachment to DIV 1-7

			CONSUMPTION cf		
			FY 2016	**FY 2017**	**FY 2018**
SEPTEMBER	Residential		28,386,820	22,868,119	23,830,082
	Commercial & Public		16,496,957	15,636,647	17,999,963
		TOTAL RETAIL	**44,883,777**	**38,504,766**	**41,830,045**
DECEMBER	Residential		19,614,037	23,155,382	19,233,131
	Commercial & Public		12,223,815	17,858,864	14,886,138
		TOTAL RETAIL	**31,837,852**	**41,014,246**	**34,119,269**
MARCH	Residential		23,970,865	19,263,264	18,911,810
	Commercial & Public		15,120,761	13,938,627	15,022,478
		TOTAL RETAIL	**39,091,626**	**33,201,891**	**33,934,288**
JUNE	Residential		18,753,311	18,549,814	18,096,886
	Commercial & Public		12,943,562	14,800,461	14,708,788
		TOTAL RETAIL	**31,696,873**	**33,350,275**	**32,805,674**
TOTAL	Residential		90,725,033	83,836,579	80,071,909
	Commercial & Public		56,785,095	62,234,599	62,617,367
		TOTAL RETAIL	**147,510,128**	**146,071,178**	**142,689,276**
SEPTEMBER	Wholesale (North Smithfield)		2,028,700	2,154,100	2,082,200
	Wholesale (Cumberland)		521,497	1,361,140	1,619,972
		TOTAL WHOLESALE	**2,550,197**	**3,515,240**	**3,702,172**
DECEMBER	Wholesale (North Smithfield)		1,544,900	1,945,100	1,812,800
	Wholesale (Cumberland)		3,203,275	2,185,121	1,210,481
		TOTAL WHOLESALE	**4,748,175**	**4,130,221**	**3,023,281**
MARCH	Wholesale (North Smithfield)		1,659,300	1,589,400	1,800,000
	Wholesale (Cumberland)		282,273	1,393,931	250,972
		TOTAL WHOLESALE	**1,941,573**	**2,983,331**	**2,050,972**
JUNE	Wholesale (North Smithfield)		1,612,700	1,673,300	1,700,000
	Wholesale (Cumberland)		370,576	960,791	165,765
		TOTAL WHOLESALE	**1,983,276**	**2,634,091**	**1,865,765**
TOTAL	Wholesale (North Smithfield)		6,845,600	7,361,900	7,395,000
	Wholesale (Cumberland)		4,377,621	5,900,983	3,247,190
		TOTAL WHOLESALE	**11,223,221**	**13,262,883**	**10,642,190**

EXHIBIT 1-8

ESTIMATED POPULATION OF WOONSOCKET'S RETAIL SERVICE TERRITORY

USING JUNE 2018 BILLING QUARTER COUNTS

	Connections outside of Woonsocket Services	Number of Units	Avg. # people per household	Total
North Smithfield	600		2.5	1,500
Lantern Estates		60	2	120
St Antoine Hospice		250	1	250
The Villa		90	1	90
Gatewood Apartments		60	2	120
Rockcliff		72	2	144
The Meadows		80	2	160
Landmark Rehabilitation		81	1	81
Cumberland	35		2.5	88
Bellingham	8		2.5	20
Blackstone	23		2.5	58

Woonsocket population obtained from http://censusviewer.com/city/RI/Woonsocket based on 2010 census counts — 41,186

TOTAL ESTIMATED POPULATION OF WOONSOCKET'S RETAIL SERVICE TERRITORY	43,816

6/27/2018

population 2018

EXHIBIT 1-15

COST TO INSTALL METERS 2018

METER SIZE	METER PRICE	ERTS PRICE	1 HOURLY RATE	2 HOURLY RATE	BENEFITS	# OF EMPLOYEES	TOTAL
5/8"	$360.05	$79.00	$17.68		$12.17	1 EMPLOYEE	$468.90
3/4"	$394.51	$79.00	$17.68		$12.17	1 EMPLOYEE	$503.36
1"	$434.74	$79.00	$17.68		$12.17	1 EMPLOYEE	$543.59
1.5"	$985.19	$79.00		$69.90	$24.34	2 EMPLOYEES	$1,158.43
2.0"	$1,291.78	$79.00		$69.90	$24.34	2 EMPLOYEES	$1,465.02

EXHIBIT 1-16

BLACKSTONE

BELLINGHAM

WRENTHAM

RIVER HAVEN CONDOMINIUMS

MENDON RD

12

DIAMOND HILL RD

PLAZA VILLAGE GROUP

WOONSOCKET NURSING CENTER

TOWN OF NORTH SMITHFIELD WHOLESALE CUSTOMER

TOWN OF NORTH SMITHFIELD INTERCONNECT

RHODES AV

WOONSOCKET

WOONSOCKET HOUSING AUTHORITY

WOONSOCKET REGIONAL WASTEWATER

16

20

18

TOWN OF CUMBERLAND INTERCONNECT

TOWN OF CUMBERLAND WHOLESALE CUSTOMER

PARK EAST DR

STERICYCLE INC.

TECHNIC

MSC #4

MSC #2 MSC #5

MSC #3

MSC #1

30

TOWN OF CUMBERLAND INTERCONNECT

CUMBERLAND

WATER TREATMENT PLANT

10

NORTH SMITHFIELD

DOWLING VILLAGE SHOPPING CENTER

RAW WATER FROM RESERVOIR #3

MANVILLE

24

Large Customers

Water Tanks

Water Transmission Lines

POTABLE

NON-POTABLE