Appendix A

WRIGHT-PIERCE
Engineering a Better Environment™

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Central Regional Office, 627 Main Street, Worcester, MA 01608

JANE SWIFT
Governor

BOB DURAND
Secretary

LAUREN A. LISS
Commissioner

WATER WITHDRAWAL PERMIT
MGL c 21G

This permit is issued pursuant to the Massachusetts Water Management Act for the sole purpose of authorizing the withdrawal of a volume of water as stated below and subject to the following special and general conditions. This permit conveys no right in or to any property beyond the right to withdraw the volume of water for which it is issued.

PERMIT NUMBER: 9P4-2-14-002.01 **RIVER BASIN:** Concord

PERMITTEE: Acton Water Supply District
P.O. Box 953
Acton, MA 01720

EFFECTIVE DATE: April 30, 1999

AMENDED DATE: March 11, 2002

EXPIRATION DATE: August 31, 2011

NUMBER OF WITHDRAWAL POINTS: 3

Groundwater: 3
Surface Water: 0

USE: Public Water Supply

DAYS OF OPERATION: 365

LOCATIONS:

Source	Source Code	Latitude	Longitude	Location
Marshal Wellfield	09G	42-31-38	71-24-08	Off North Main St. (Route 27)
Kennedy Wells	10G – 13G	42-31-33	71-24-10	Off North Main St. (Route 27)
Conant II Wellfield	14G – 18G	42-29-21	71-25-15	Post Office Square

SPECIAL CONDITIONS

1. Maximum Authorized Annual Withdrawal Volume

This permit authorizes the withdrawal of water, on average over a calendar year, at the rate described below. The volume reflected by this rate is in addition to the 1.56 mgd previously registered to the permittee through the Water Management Act Program.

The permitted volume is expressed in millions of gallons, both as an average daily withdrawal rate per year and as a total annual withdrawal volume for each five-year period of the permit term.

Withdrawals are authorized as follows:

		Daily Average (MGD)	Total Annual (MGY)
Period One Years 2 – 5	EXPIRED 7/7/1994 – 8/31/1996	0.27	98.55
Period Two Years 6 - 10	EXPIRED 9/1/1996 – 8/31/2001	0.36	131.40
Period Three Years 11 - 15	9/1/2001 – 8/31/2006	0.37	135.05
Period Four Years 16 – 20	9/1/2006 – 8/31/2011	0.38	138.70

2. Maximum Authorized Daily Withdrawal Rate

Withdrawals from individual withdrawal points are not to exceed the approved daily volume listed below without specific advance written approval from the Department.

Source	Source Code	Daily Rate (MGD)
Marshall Wellfield	09G	0.30
Kennedy Wells	10G - 13G	0.54
Conant II Wellfield	14G – 18G	0.216

3. Wetlands Monitoring

Marshall Wellfield (09G): Since the Marshall Wellfield is not currently being used as a significant source, and has been relegated to emergency status, it is determined that further wetlands monitoring is not required.

Kennedy Wells (10G - 13G): Although vegetative comparisons from the 1990 baseline report cannot be evaluated, it appears quite clear that even during the 1999 summer drought conditions that wetland vegetation is thriving and dominates within the test plots in spite of pumping withdrawals. Therefore the Department does not see need for future wetland vegetation monitoring for the Kennedy site.

Conant II Wellfield (14G - 18G): The Acton Water District shall sustain at all times a minimum depth of four (4) to five (5) inches of water in the central area of the isolated vernal pool adjacent to Well #1 (also referred to as "Pond A") from ice out until May 15th of every year. The Water District must submit a record of daily (weekday) water levels in the pool during the specified time period by May 31st of every year. This condition will not apply if the Conant II Wellfield is not in use during the entire specified time period (i.e. ice out until May 15th).

The Acton Water District shall monitor surface and groundwater levels in the large wetland system adjacent to Wells 2, 3, 4, and 5 as required in special condition #2 of the Wetlands Order of Conditions 85-605. These levels will be measured in May and October and submitted to the Department by October 31st of each year.

Since the Conant Wellfield is a relatively new source the Department extends the monitoring requirement for the Conant Wellfield based on the schedule outlined above.

4. **Zone of Contribution (Zone II or Zone III) Delineations**

Department records show that the Marshall Wellfield (09G), the Kennedy Wells (10G - 13G) and the Conant II Wellfield (14G - 18G) have DEP approved Zone II delineations. No further Zone II work is required as a condition of this permit for these sources.

5. **Wellhead Protection**

The Wellhead Protection requirements in 310 CMR 22.21(2) have been met for Marshall, Kennedy, and Conant II. No further work relative to wellhead protection is required as a condition of this permit.

6. **Water Conservation Requirements**

The Department acknowledges the outstanding work that the Acton Water Supply District has undertaken to encourage water conservation by the District's users. The Acton Water Supply District has set high standards of water conservation and has succeeded in raising the level of public participation and awareness of water conservation.

Based on the minimum water conservation requirements and a review of your completed water conservation questionnaire, the Department is requiring the continued implementation of water conservation including the following:

Metering

- Continue to meter 100 percent of your water system with all meters of proper size and accuracy to measure water flow to within 5 percent, including public buildings and facilities.

- Continue your ongoing program to inspect individual service meters. Such program shall include sufficient funds in the annual water department budget to recalibrate, repair or replace meters as needed.

- Master meters must be calibrated annually.

Leak Detection

- The District shall conduct a full leak detection survey biennially (every two years) should unaccounted for water exceed 10%. The supplier shall have leak detection reports available for inspection by the Department.

Leak Repair

- The District must have repair reports available for inspection by the Department.

- Leaks are to be fixed as soon as possible but in no event shall any leak remain unrepaired more than seven (7) days after detection.

Pricing

- The Acton Water Supply District shall continue to ensure that water supply system operations are fully funded by water supply system revenues. The pricing system should reflect the full cost of supplying water, including but not limited to:

  - Administrative costs
  - Staff salaries, benefits, insurance and pension costs
  - Distribution system operation, maintenance and repair, including leak detection and repair costs and metering costs
  - Pumping costs and utilities
  - Treatment costs
  - Capital replacement costs, capital depreciation and debt service
  - Any costs associated with water conservation programs and public education programs
  - Watershed or wellhead purchase and/or protection costs and land acquisition
  - Emergency planning
  - Enforcement of the building code and/or local regulations.

Plumbing

- The Town of Acton is enforcing the March 1, 1989 plumbing code for new construction and building rehabilitation where installation of water saving devices and low flow toilets is required.

- The Acton Water Supply District has demonstrated to the Department's satisfaction that it has made a "Best Effort" attempt to work with the Town of Acton to retrofit all public buildings within its service area with water saving devices (faucet aerators, low flow shower heads and toilet displacement bottles/dams).

- Continued implementation of a retrofit device program (faucet aerators, low flow shower heads and toilet displacement bottles/dams) should be available to customers at cost.

Education

- The District has developed and implemented a public education program which emphasizes:

  - The costs associated with providing water,
  - Investments in efficiency and conservation provide consumers with long-term savings,
  - The environmental benefits of reducing water demand.

- Continue mailing bill stuffers with water conservation tips or water saving messages at least annually with your customer's water bills, or as a separate mailing.

Outdoor Water Use

- The Department supports the adoption by the District of an annual Mandatory Water Use Restriction Bylaw. In addition to water use restrictions, the District has coupled it with an aggressive local education program to make consumers A) aware of the water use restrictions and penalties for violation, and B) knowledgeable about the shortfall in the water supply system and the need for water conservation.

Water Main Flushing

- The need for water main flushing and the use of water in construction shall be metered or estimated as appropriate to assist in determining actual demand. Volumes flushed to waste shall be reported annually in section C.G. "Other" on your Water Supply Annual Statistical Report.

Commonwealth of Massachusetts
Executive Office of Environmental Affairs
Department of Environmental Protection

William F. Weld
Governor
Daniel S. Greenbaum
Commissioner

REGISTRATION STATEMENT FOR WATER WITHDRAWAL

Registration under MGL c. 21G for the water withdrawal identified below is accepted by the Department of Environmental Protection.

GENERAL INFORMATION

Registration Number: 2-14-002.03 River Basin: Concord

Registrant: Acton Water District
PO Box 953
Acton, MA 01720

Number of withdrawal points

Groundwater: 8

Surface water: 0

Location(s): 002-01G Whitcomb Well, 002-02G Conant Well, 002-03G Lawsbrook Well, 002-04G Christofferson Well, 002-05G & 002-06G Assabet Wells, 002-07G Clapp Well, 002-08G Scribner Well

Use: Public Water Supply

Average Volume per Day (MGD): 1.56

Days of Operation: 365

Total Annual Volume (MGY): 569.40

Registration renewed effective January 1, 1998.
Expiration date January 1, 2008.

Glenn Haas

Glenn Haas, Director
Department of Environmental Protection
Division of Watershed Management

CONDITIONS AND REQUIREMENTS

Compliance with registration conditions is required by 310 CMR 36.08. Those applicable are described below.

Metering

Install source meter(s) for all these points: N/A

Calibrate all meter(s): Annually

Records

Withdrawal records are required to be kept as follows:

Monthly: yes

Other: N/A

Other information required: N/A

Other Conditions and Requirements: N/A

REPORTING

The Registrant is required by 310 CMR 36.11 to file an annual statement of withdrawal by January 31 of each year that this registration is in force, on forms specified by the Department. The Registrant shall include withdrawal records from the previous calendar year with the annual report filing. At the request of the Department, the registrant may be required to report withdrawal volumes monthly, in accordance with 310 CMR 36.08.

REGISTRATION RENEWAL

This registration statement expires on January 1, 1998, unless a renewal registration request is filed with the Department prior to that date, in accordance with 310 CMR 36.10.

REGISTRATION TRANSFER

This statement shall be surrendered to the Department upon transfer of any withdrawal authorized by this document.

Transfer of this registration is governed by the provisions of 310 CMR 36.09.

NOTE: Regulations are subject to change. The applicant is responsible to use the most current regulations.

David Y. Terry
Director
Division of Water Supply

Date 12/11/97

emcc/verified

September 29, 2015

Matthew Mostoller, Environmental Compliance Manager
Acton Water District
693 Massachusetts Avenue
Acton, MA 01720

Subject: Final Water Needs Forecast for the Acton Water District

Dear Mr. Mostoller:

Thank you for working with staff in the Department of Conservation and Recreation's Office of Water Resources (OWR) over the past few months to finalize the water needs forecasts for your water supply system. This letter is a follow-up to our July 29, 2015, letter to you, which explained the draft water needs forecasts that OWR had developed for your water supply system. We appreciate your advising OWR staff that you had no further changes to the draft forecast. Please regard the draft projections as the final projections. The following outlines the data sources, assumptions, and forecast details for your reference.

ASSUMPTIONS AND SOURCES OF INFORMATION

Current System Metrics (2011 – 2014):

Base water use:	1.68 mgd
Base UAW:	12.6%
Base residential volume:	1.18 mgd
Base nonresidential volume:	0.28 mgd

Source: Annual Statistical Reports (ASRs) submitted to DEP, 2011 – 2014. Data from 2010 was not used, based on discussions with the Acton Water District, because of concerns about metering issues associated with a new treatment plant that was put into service in the 2009 – 2010 time period. Base water use represents finished water.

Base Employment, town-wide (2014): 9,981

Source: Massachusetts Department of Transportation (DOT) and Metropolitan Area Planning Council (MAPC) (2011). Interpolated for 2014 based on employment projections provided by DOT and MAPC.

Base service population:	21,645
Base Calculated RGPCD:	54.5

Sources: Base service population consists of year-round population and out-of-town population served in the towns of Stow and Boxborough. Year-round population served is calculated from the average town population based on Census 2010 and Census estimates for 2011 through 2014. It is assumed that the Acton Water District currently serves 95% of the total population of the town of Acton; population not served was determined based on the number of domestic wells (300) listed in DEP's SearchWell database multiplied by the average household size in Acton (2.66) plus population served by the town of Concord (370), as reported by the Concord Water Department. Out-of-town population served (11) is based on the number of connections served (4) and average household size in the towns of Stow and Boxborough.

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Executive Office of Energy & Environmental Affairs

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Department of Conservation & Recreation

PROJECTIONS

	2021	2026	2031
Service Population Projections (includes out-of-town population)	23,101	23,830	24,559
Employment Projections	10,457	10,356	10,273

Sources: Service Population Projections are interpolated from population projections in the Acton 2020 Plan (2012). It is assumed that the percent of the year-round population served by the public water supply system will increase to 98% over the planning period, based on discussions with the Acton Water District. Service population includes out-of-town population served in the towns of Stow and Boxborough. Employment projections are interpolated from employment projections developed by DOT and MAPC (2011).

Final Water Needs Forecasts:

Scenario 1: Assuming 65 RGPCD and 10% UAW:

	2021	2026	2031
Projected Water Use (mgd)	2.00	2.05	2.10
		Five Percent Buffer:	+0.11

Scenario 2: Assuming water use continues at current RGPCD (54.5) and UAW (12.6%) during the planning period:

	2021	2026	2031
Projected Water Use (mgd)	1.79	1.83	1.87
		Five Percent Buffer:	+0.09

Thank you for your cooperation with this process. If you have any questions concerning these projections, please contact Marilyn McCrory at (617) 626-1423.

Sincerely,

Anne Carroll, Director
Office of Water Resources

ecc: Christopher D. Allen, District Manager, Acton Water District
Marilyn McCrory, OWR
Kathleen Baskin, EEA
Duane LeVangie, DEP
Elizabeth McCann, DEP
Barbara Kickham, DEP
Roland Bartl, Planning Director, town of Acton
Jennifer Pederson, MWWA (per request)
Carol Harris, Woodard and Curran (per request)
Alison Field-Juma, Organization for the Assabet, Sudbury, and Concord Rivers (per request)
Julia Blatt, Massachusetts Rivers Alliance (per request)

Appendix B

WRIGHT-PIERCE
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Appendix B

Water Main Inventory (Alphabetized)

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Abel Jones Place	10	Ductile Iron	463	FALSE	1994	120	62.7	0
Acorn Park Drive	8	Ductile Iron	529	FALSE	1995	130	86.8	0
Acorn Park Drive	8	Ductile Iron	495	FALSE	1995	130	85.7	0
Acorn Park Drive	8	Ductile Iron	341	FALSE	1995	130	86.7	0
Acorn Park Drive	8	Ductile Iron	345	FALSE	1995	130	90.1	0
Acorn Park Drive	8	Ductile Iron	210	FALSE	1995	130	87.2	0
Acorn Park Drive	8	Ductile Iron	712	FALSE	1995	130	95.3	0
Acorn Park Drive	12	Ductile Iron	516	FALSE	1995	130	80.3	0
Acorn Park Drive	12	Ductile Iron	137	FALSE	1995	130	85.1	0
Acorn Park Drive	12	Ductile Iron	245	FALSE	1995	130	89.2	0
Acorn Park Drive	12	Ductile Iron	301	FALSE	1995	130	86.6	0
Acorn Park Drive	12	Ductile Iron	121	FALSE	1995	130	83.2	0
Acorn Park Drive	12	Ductile Iron	498	FALSE	1995	130	87.9	0
Acorn Park Drive	12	Ductile Iron	152	FALSE	1995	130	89.2	0
Acton Place	8	Ductile Iron	482	FALSE	1970	110	96.8	0
Adams Street	8	Ductile Iron	338	FALSE	1970	110	106.1	0
Adams Street	8	Ductile Iron	647	FALSE	1970	110	95.8	0
Adams Street	8	Ductile Iron	1,651	FALSE	1970	110	95.4	0
Adams Street Extension	6	Ductile Iron	130	FALSE	1970	110	95.4	0
Agawam Road	6	CIPP	649	FALSE	2017	130	87.8	0
Agawam Road	6	CIPP	1,389	FALSE	2017	130	82.7	0
Agawam Road	6	CIPP	1,192	FALSE	2017	130	87.8	0
Agawam Road	6	CIPP	545	FALSE	2017	130	81	0
Alcott Street	8	Asbestos Cement	889	FALSE	1958	130	106.2	3
Alcott Street	8	Asbestos Cement	1,173	FALSE	1958	130	108.5	2
Alcott Street	8	Asbestos Cement	471	FALSE	1958	130	101.4	1
Alcott Street	8	Asbestos Cement	737	FALSE	1958	130	105.8	1
Alcott Street	8	Asbestos Cement	340	FALSE	1958	130	102.3	0
Alcott Street	8	Asbestos Cement	363	FALSE	1958	130	101.6	0
Alcott Street	8	Asbestos Cement	624	FALSE	1958	130	105.8	0
Alcott Street	8	Asbestos Cement	1,603	FALSE	1958	130	104	0
Alexandra Way	8	Ductile Iron	885	FALSE	1970	110	88.6	0
Alexandra Way	8	Ductile Iron	531	FALSE	1970	110	64.6	0
Algonquin Road	6	Asbestos Cement	1,291	FALSE	1959	120	81.3	1
Anders Way	6	Ductile Iron	245	FALSE	1997	110	89.8	0
Arlington Street	6	Asbestos Cement	774	FALSE	1950	130	84.8	4

Water Main Prioritization
Acton Water District

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Arlington Street	6	Asbestos Cement	1,051	FALSE	1960	130	87.7	3
Arlington Street	6	Asbestos Cement	423	FALSE	1950	120	86.5	3
Arlington Street	6	Asbestos Cement	273	FALSE	1950	120	88.2	1
Arlington Street	6	Asbestos Cement	230	FALSE	1950	120	87.7	1
Arlington Street	6	Cast Iron	613	FALSE	1910	80	81	1
Arlington Street	6	Cast Iron	62	FALSE	1910	80	91.9	1
Arlington Street	6	Cast Iron	648	FALSE	1910	80	90.9	1
Arlington Street	8	Asbestos Cement	918	FALSE	1950	130	86.5	2
Arlington Street	6	Cast Iron	552	FALSE	1950	80	91.9	1
Arlington Street	6	Cast Iron	583	FALSE	1950	80	91.5	1
Arlington Street	6	Cast Iron	1,910	FALSE	1950	80	79.8	0
Arlington Street	8	Cast Iron	3,723	FALSE	1965	80	82.2	0
Arlington Street	6	Ductile Iron	45	FALSE	1970	110	84.8	0
Arlington Street	6	Ductile Iron	223	FALSE	1970	120	76	0
Arlington Street	8	Ductile Iron	260	FALSE	2010	130	87.8	1
Arlington Street	8	Ductile Iron	271	FALSE	2010	130	89.9	0
Arlington Street	8	Ductile Iron	197	FALSE	2010	130	82.2	0
Arlington Street	8	Ductile Iron	123	FALSE	2010	130	90.4	0
Arlington Street	8	HDPE	89	FALSE	2010	130	90.4	0
Arlington Street	8	Ductile Iron	945	FALSE	2010	130	90.4	0
Arlington Street	8	Ductile Iron	156	FALSE	2010	130	92.1	0
Arlington Street	8	Ductile Iron	250	FALSE	2010	130	92.1	0
Arlington Street	8	HDPE	78	FALSE	2010	130	92.1	0
Arlington Street	8	Ductile Iron	328	FALSE	2010	130	86.7	0
Arlington Street	8	HDPE	103	FALSE	2010	130	92.1	0
Arlington Street	8	Ductile Iron	861	FALSE	2010	130	92.1	0
Ashley Circle	6	Ductile Iron	296	FALSE	1980	110	101.4	0
Ashwood Road	6	Asbestos Cement	729	FALSE	1950	120	96.1	0
Assabet Crossing	8	Ductile Iron	485	FALSE	1990	110	95.7	0
Assabet Crossing	8	Ductile Iron	474	FALSE	1990	110	96.7	0
Audubon Drive	8	Ductile Iron	1,068	FALSE	1994	110	76.1	0
Audubon Drive	8	Ductile Iron	250	FALSE	1994	110	77.1	0
Audubon Drive	8	Ductile Iron	634	FALSE	1991	110	77.1	0
Audubon Drive	8	Ductile Iron	507	FALSE	1993	110	70.5	0
Audubon Drive	8	Ductile Iron	467	FALSE	1990	110	60.6	0
Audubon Drive Extension	8	Ductile Iron	444	FALSE	1990	110	60.6	0

Water Main Prioritization
Acton Water District

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Autumn Lane	6	Asbestos Cement	384	FALSE	1950	120	84.1	0
Avalon Drive	8	Asbestos Cement	253	FALSE	1970	130	68.1	0
Avalon Drive	6	Ductile Iron	515	FALSE	2007	130	41	0
Avalon Drive	10	Ductile Iron	169	FALSE	1970	130	69.8	0
Avalon Drive	10	Ductile Iron	1,004	FALSE	1970	130	67.3	0
Avalon Drive	8	Ductile Iron	309	FALSE	2007	130	81.3	0
Avalon Drive	8	Ductile Iron	517	FALSE	2007	130	64.6	0
Avalon Drive	8	Ductile Iron	345	FALSE	2007	130	60.5	0
Avalon Drive	8	Ductile Iron	691	FALSE	2007	130	52.8	0
Avalon Drive	8	Ductile Iron	416	FALSE	2007	130	41	0
Avalon Drive	10	Ductile Iron	190	FALSE	2007	130	68.1	0
Avalon Drive	10	Ductile Iron	176	FALSE	2007	130	52.8	0
Avalon Drive	10	Ductile Iron	180	FALSE	2007	130	47	0
Avalon Drive	10	Ductile Iron	229	FALSE	2007	130	47.5	0
Ayer Road	8	Asbestos Cement	629	FALSE	1970	130	112.6	0
Badger Circle	6	Ductile Iron	219	FALSE	1980	110	102.2	0
Balsam Drive	6	Asbestos Cement	577	FALSE	1965	120	76.6	0
Barker Road	6	Asbestos Cement	969	FALSE	1955	120	111.8	0
Baxter Road	6	Asbestos Cement	375	FALSE	1950	120	88.1	0
Bayberry Road	8	Asbestos Cement	382	FALSE	1968	130	107	0
Bayberry Road	8	Asbestos Cement	404	FALSE	1968	130	111.4	0
Bayberry Road	8	Asbestos Cement	347	FALSE	1968	130	110.5	0
Bayberry Road	8	Asbestos Cement	421	FALSE	1968	130	111.4	0
Beechnut Street	6	Ductile Iron	331	FALSE	1995	110	84.1	0
Bellantoni Drive	6	Asbestos Cement	365	FALSE	1960	120	104.5	0
Bellows Farm Road	12	Ductile Iron	368	TRUE	1997	130	77.4	0
Bellows Farm Road	12	Ductile Iron	141	TRUE	1997	130	69.7	0
Bellows Farm Road	12	Ductile Iron	226	TRUE	1997	130	67.3	0
Bellows Farm Road	12	Ductile Iron	123	TRUE	1997	130	61.1	0
Bellows Farm Road	12	Ductile Iron	215	TRUE	1997	130	58.6	0
Bellows Farm Road	12	Ductile Iron	450	TRUE	1997	130	57.7	0
Bellows Farm Road	12	Ductile Iron	97	TRUE	1997	130	57.7	0
Bellows Farm Road	12	Ductile Iron	64	TRUE	1997	130	57.7	0
Berry Lane	8	Asbestos Cement	684	FALSE	1958	130	101.6	0
Betsy Ross Circle	6	Asbestos Cement	386	FALSE	1960	120	72.6	0
Beverly Road	8	Asbestos Cement	386	FALSE	1960	130	85	0

Water Main Prioritization
Acton Water District

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Beverly Road	8	Asbestos Cement	421	FALSE	1960	130	87.6	0
Beverly Road	8	Asbestos Cement	411	FALSE	1960	130	76.4	0
Beverly Road Extension	8	Asbestos Cement	120	FALSE	1960	130	76.4	0
Billings Street	6	Asbestos Cement	1,101	TRUE	1950	120	87.1	1
Birch Ridge Road	8	Asbestos Cement	1,386	FALSE	1958	130	87.1	2
Birch Ridge Road	8	Asbestos Cement	313	FALSE	1950	130	86.7	2
Birch Ridge Road	8	Asbestos Cement	307	FALSE	1955	130	84.9	1
Bitterwsweet Lane	6	Ductile Iron	210	TRUE	1997	110	57.7	0
Black Horse Drive	6	Asbestos Cement	304	FALSE	1960	120	45.2	0
Black Horse Drive	6	Asbestos Cement	318	FALSE	1960	120	51.4	0
Black Horse Drive	6	Asbestos Cement	1,620	FALSE	1960	120	57	0
Blue Heron Way	6	Ductile Iron	437	TRUE	1997	110	79.1	0
Blueberry Path	8	Ductile Iron	707	FALSE	2006	130	87.9	0
Blueberry Path	8	Ductile Iron	1,276	FALSE	2006	130	75.9	0
Brabook Road	8	Ductile Iron	2,040	FALSE	1970	110	93.2	0
Bramble Way	6	Ductile Iron	189	TRUE	1997	110	57.7	0
Breezy Point Road	8	Ductile Iron	676	FALSE	1990	110	65.1	0
Breezy Point Road	8	Ductile Iron	464	FALSE	1990	110	66.3	0
Breezy Point Road Extension	6	Ductile Iron	871	FALSE	1990	110	66.3	0
Brewster Lane	8	Ductile Iron	536	FALSE	1991	110	70.5	0
Briar Hill Road	12	Ductile Iron	610	TRUE	1997	130	60.7	0
Briar Hill Road	12	Ductile Iron	355	TRUE	1997	130	60.7	0
Briar Hill Road	12	Ductile Iron	90	TRUE	1997	130	61.6	0
Briar Hill Road	12	Ductile Iron	165	TRUE	1997	130	61.7	0
Brimstone Lane	6	Ductile Iron	162	TRUE	1997	110	75.1	0
Broadview Road	8	Asbestos Cement	372	FALSE	1960	130	88.3	0
Broadview Road	8	Asbestos Cement	656	FALSE	1960	130	88.3	0
Broadview Road	8	Asbestos Cement	342	FALSE	1960	130	68.4	0
Bromfield Road	8	Asbestos Cement	311	FALSE	1960	130	104.1	0
Bromfield Road	8	Asbestos Cement	722	FALSE	1960	130	104.1	0
Brook Street	10	Asbestos Cement	2,244	FALSE	1960	130	109.6	0
Brookside Circle	8	Asbestos Cement	256	FALSE	1960	130	120.3	0
Brookside Circle	8	Asbestos Cement	285	FALSE	1960	130	119.2	0
Brucewood Road	8	Asbestos Cement	832	FALSE	1950	130	100	1
Brucewood Road	8	Asbestos Cement	637	FALSE	1957	130	103.7	1
Brucewood Road	8	Asbestos Cement	350	FALSE	1957	130	114	1

Water Main Prioritization
Acton Water District

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Brucewood Road	8	Asbestos Cement	319	FALSE	1950	130	96.8	1
Brucewood Road	8	Asbestos Cement	562	FALSE	1950	130	93.5	1
Brucewood Road E	8	Asbestos Cement	622	FALSE	1970	130	114.3	0
Candida Lane	8	Asbestos Cement	368	FALSE	1970	130	107.5	0
Canterbury Hill Road	8	Ductile Iron	321	FALSE	2006	130	104.4	0
Canterbury Hill Road	8	Ductile Iron	492	FALSE	2006	130	103.1	0
Canterbury Hill Road	8	Ductile Iron	276	FALSE	2006	130	83.9	0
Canterbury Hill Road	8	Ductile Iron	329	FALSE	2006	130	83.9	0
Canterbury Hill Road	8	Ductile Iron	257	FALSE	2006	130	81.5	0
Canterbury Hill Road	8	Ductile Iron	490	FALSE	2006	130	91.8	0
Canterbury Hill Road	8	Ductile Iron	375	FALSE	2006	130	77.3	0
Canterbury Hill Road	8	Ductile Iron	452	FALSE	2006	130	73.6	0
Canterbury Hill Road	8	Ductile Iron	556	FALSE	2006	130	75.9	0
Canterbury Hill Road	8	Ductile Iron	458	FALSE	2006	130	63.7	0
Canterbury Hill Road	8	Ductile Iron	1,117	FALSE	2006	130	61.9	0
Canterbury Hill Road	8	Ductile Iron	497	FALSE	2006	130	73.6	0
Canterbury Hill Road	8	Ductile Iron	218	FALSE	2006	130	72.5	0
Canterbury Hill Road	8	Ductile Iron	512	FALSE	2006	130	70.6	0
Canterbury Hill Road	8	Ductile Iron	205	FALSE	2006	130	79.7	0
Canterbury Hill Road Extension	8	Ductile Iron	249	FALSE	2006	130	81.5	0
Canterbury Hill Road Extension	8	Ductile Iron	225	FALSE	2006	130	72.5	0
Canterbury Hill Road Extension	8	Ductile Iron	461	FALSE	2006	130	70.6	0
Canterbury Hill Road Extension	8	Ductile Iron	363	FALSE	2006	130	79.7	0
Canterbury Hill Road Extension	8	Ductile Iron	247	FALSE	2006	130	77.3	0
Capt Brown's Lane	8	Asbestos Cement	692	FALSE	1960	130	76.3	0
Capt Brown's Lane	8	Asbestos Cement	1,649	FALSE	1960	130	69.2	0
Capt Forbush Lane	8	Asbestos Cement	1,403	FALSE	1960	130	62.8	0
Captain Handley Road & Sachem Way	8	Ductile Iron	1,978	FALSE	1990	110	81.1	0
Carlisle Road	8	Ductile Iron	538	FALSE	2006	130	101.8	0
Carlisle Road	8	Ductile Iron	489	FALSE	2006	130	103.9	0
Carlisle Road	8	Ductile Iron	1,137	FALSE	2006	130	104.4	0
Carlton Drive	8	Asbestos Cement	707	TRUE	1970	130	87.6	0
Carlton Drive	8	Asbestos Cement	1,033	TRUE	1970	130	87	0
Carlton Drive	8	Ductile Iron	624	FALSE	1980	110	87	0
Carriage Drive	8	Asbestos Cement	207	TRUE	1965	130	119.1	0
Carriage Drive	8	Asbestos Cement	514	TRUE	1965	130	113.8	0

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STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Carriage Drive	8	Asbestos Cement	706	TRUE	1965	130	109.5	0
Castle Drive	8	Asbestos Cement	486	FALSE	1970	130	90.4	0
Centennial Lane	6	Ductile Iron	426	FALSE	2005	110	89.9	0
Central Street	8	Asbestos Cement	394	FALSE	1950	130	92.1	1
Central Street	8	Asbestos Cement	1,292	FALSE	1950	130	91	1
Central Street	8	Asbestos Cement	386	FALSE	1950	130	82	1
Central Street	8	Asbestos Cement	1,083	FALSE	1950	130	80.8	1
Central Street	6	Asbestos Cement	432	FALSE	1950	120	86	0
Central Street	6	Asbestos Cement	1,920	FALSE	1950	120	81	0
Central Street	6	Asbestos Cement	683	FALSE	1950	120	91.7	0
Central Street	8	Asbestos Cement	557	FALSE	1950	130	76.5	1
Central Street	8	Asbestos Cement	87	FALSE	1950	130	76.5	1
Central Street	6	Cast Iron	483	FALSE	1910	80	86.4	0
Central Street	6	Asbestos Cement	667	FALSE	1970	120	82.7	0
Central Street	10	Cast Iron	489	FALSE	1910	100	87.8	0
Central Street	10	Cast Iron	937	FALSE	1910	100	88.2	0
Central Street	10	Cast Iron	740	FALSE	1910	100	86.8	0
Central Street	10	Cast Iron	737	FALSE	1910	100	90	0
Central Street	10	Cast Iron	1,007	FALSE	1950	100	92.6	0
Central Street	10	Cast Iron	3,458	FALSE	1950	100	92.6	0
Central Street	6	Ductile Iron	117	FALSE	1970	110	82.7	0
Central Street	10	Ductile Iron	58	FALSE	1970	120	88.6	0
Chadwick Street	8	Ductile Iron	544	FALSE	1970	110	110.9	0
Charter Road	6	Asbestos Cement	361	FALSE	1950	120	82.5	2
Charter Road	6	Asbestos Cement	245	FALSE	1950	120	80.5	2
Charter Road	6	Asbestos Cement	255	FALSE	1950	120	81.3	2
Charter Road	8	Ductile Iron	601	FALSE	1950	110	81.8	0
Charter Road	8	Ductile Iron	1,403	FALSE	1970	110	88.5	0
Charter Road	8	Ductile Iron	879	FALSE	1970	110	92.1	0
Charter Road	8	Ductile Iron	133	FALSE	1970	110	91.2	0
Charter Road	8	Ductile Iron	1,797	FALSE	1970	110	85.9	0
Charter Road Extension	6	Asbestos Cement	460	FALSE	1950	120	81.8	0
Charter Road Extension	6	Ductile Iron	257	FALSE	1970	110	81.3	0
Charter Road Extension	6	Ductile Iron	237	FALSE	1970	110	76.5	0
Charter Road Extension	6	Ductile Iron	153	FALSE	1970	110	76.5	0
Charter Road Extension	6	Ductile Iron	417	FALSE	1970	110	78.8	0

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Charter Road Extension	6	Ductile Iron	276	FALSE	1970	110	78.8	0
Charter Road Extension	8	Ductile Iron	1,333	FALSE	1970	110	81.3	0
Cherokee Road	6	Asbestos Cement	730	FALSE	1960	120	64.4	0
Cherokee Road	6	Asbestos Cement	764	FALSE	1960	120	69.2	0
Cherry Ridge Road	8	Asbestos Cement	1,243	FALSE	1955	130	79.8	0
Chestnut Lane	6	Ductile Iron	156	FALSE	1995	110	89.2	0
Chestnut Lane	6	Ductile Iron	284	FALSE	1995	110	84.1	0
Church Street	6	Asbestos Cement	581	FALSE	1950	120	86	0
Clover Hill Road	8	Asbestos Cement	418	TRUE	1960	130	109.5	0
Conant Street	6	Asbestos Cement	1,223	FALSE	1950	120	87.2	0
Conant Street	8	Asbestos Cement	728	FALSE	1950	130	76.8	0
Conant Street	8	Ductile Iron	1,283	FALSE	1970	110	91.6	1
Conant Street	8	Ductile Iron	991	FALSE	1970	110	91.6	1
Concetta Circle	6	Ductile Iron	385	FALSE	1987	110	95.7	0
Concord Place	6	Asbestos Cement	562	FALSE	1970	120	88.1	0
Concord Road	6	Cast Iron	615	FALSE	1940	70	88.1	0
Concord Road	6	Cast Iron	323	FALSE	1940	70	81.6	0
Concord Road	6	Cast Iron	218	FALSE	1940	70	67.4	0
Concord Road	6	Cast Iron	235	FALSE	1940	70	64.8	0
Concord Road	6	Cast Iron	457	FALSE	1940	70	64.9	0
Concord Road	6	Cast Iron	838	FALSE	1940	70	64	0
Concord Road	6	Cast Iron	306	FALSE	1950	70	98.5	0
Concord Road	10	Asbestos Cement	354	FALSE	1960	130	120.4	0
Concord Road	10	Asbestos Cement	1,387	FALSE	1960	130	116.5	0
Concord Road	10	Asbestos Cement	1,319	FALSE	1958	130	106.2	0
Coolidge Drive	8	Asbestos Cement	647	TRUE	1970	130	83.6	0
Coolidge Drive	8	Asbestos Cement	868	TRUE	1970	130	66	0
Coughlin Street	8	Ductile Iron	732	FALSE	2008	110	83.3	0
Coughlin Street	8	Ductile Iron	508	FALSE	2008	110	76.6	0
Country Club Road	6	Asbestos Cement	333	FALSE	1950	120	87.2	0
Country Club Road	6	Asbestos Cement	230	FALSE	1950	120	92.4	0
Cowdrey Lane	8	Asbestos Cement	783	FALSE	1970	130	84.3	0
Cowdrey Lane	8	Asbestos Cement	786	FALSE	1970	130	94.1	0
Craig Road	8	Asbestos Cement	525	FALSE	1950	130	116.9	0
Craig Road	8	Asbestos Cement	440	FALSE	1960	130	117.2	0
Cricket Way	8	Asbestos Cement	364	FALSE	1965	130	105.1	1

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STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Cricket Way	8	Asbestos Cement	183	FALSE	1965	130	105.2	0
Davis Road	12	Ductile Iron	1,140	TRUE	1970	140	111.7	0
Davis Road	12	Ductile Iron	510	TRUE	1970	130	110.9	0
Davis Road	12	Ductile Iron	504	TRUE	1997	130	102.1	0
Davis Road	12	Ductile Iron	318	TRUE	1997	130	100.3	0
Davis Road	12	Ductile Iron	193	TRUE	1997	130	102.8	0
Davis Road	12	Ductile Iron	243	TRUE	1997	130	105.3	0
Davis Road	12	Ductile Iron	392	TRUE	1997	130	108	0
Davis Road	12	Ductile Iron	651	TRUE	1997	130	110.3	0
Davis Road	12	Ductile Iron	79	TRUE	1997	130	92.3	0
Davis Road	12	Ductile Iron	335	TRUE	1997	130	90.4	0
Davis Road	12	Ductile Iron	226	TRUE	1997	130	85.1	0
Davis Road	12	Ductile Iron	183	TRUE	1997	130	96.7	0
Davis Road	12	Ductile Iron	254	TRUE	1997	130	83.8	0
Davis Road	12	Ductile Iron	891	TRUE	1997	130	96.7	0
Davis Road	12	Ductile Iron	93	TRUE	1997	130	75.1	0
Davis Road	12	Ductile Iron	166	TRUE	1997	130	76.3	0
Davis Road	12	Ductile Iron	226	TRUE	1997	130	79.1	0
Davis Road	12	Ductile Iron	262	TRUE	1997	130	76	0
Davis Road	12	Ductile Iron	175	TRUE	1997	130	75.4	0
Davis Road	12	Ductile Iron	53	TRUE	1997	130	76	0
Davis Road	12	Ductile Iron	312	TRUE	1997	130	75.5	0
Davis Road	12	Ductile Iron	184	TRUE	1997	130	75.4	0
Davis Road Extension	6	Ductile Iron	124	TRUE	1997	110	85.1	0
Deacon Hunt Drive	6	Asbestos Cement	1,182	FALSE	1960	120	61.4	0
Deacon Hunt Drive	8	Asbestos Cement	369	FALSE	1960	130	85.7	0
Deacon Hunt Drive	8	Asbestos Cement	212	FALSE	1960	130	76.3	0
Deer Grass Lane	6	Ductile Iron	160	TRUE	1997	110	92.3	0
Devon Drive	10	Ductile Iron	247	FALSE	2000	120	102.1	0
Devon Drive	10	Ductile Iron	181	FALSE	2000	120	102.1	0
Devon Drive Extension	10	Ductile Iron	320	FALSE	2000	120	101.9	0
Discovery Way	6	Asbestos Cement	1,139	FALSE	1950	120	108.8	0
Doris Road	8	Asbestos Cement	509	FALSE	1960	130	85	0
Driftwood Road	8	Asbestos Cement	817	FALSE	1970	130	110.7	0
Drummer ROad	8	Ductile Iron	550	FALSE	1970	110	100	0
Drummer Road	8	Ductile Iron	908	FALSE	1970	110	96.7	0

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Drummer Road	8	Ductile Iron	730	FALSE	1970	110	95.7	0
Duggan Road	8	Asbestos Cement	510	FALSE	1950	130	71.8	0
Duggan Road	8	Asbestos Cement	320	FALSE	1950	130	66.1	0
Duggan Road	8	Asbestos Cement	1,161	FALSE	1970	130	90.5	0
Duggan Road	8	Asbestos Cement	354	FALSE	1970	130	76.9	0
Duggan Road	8	Asbestos Cement	496	FALSE	1970	130	66.6	0
Durkee Road	6	Asbestos Cement	1,106	FALSE	1960	120	91.6	0
Eastern Road	8	Ductile Iron	552	FALSE	2000	110	100.1	0
Eliot Circle	8	Asbestos Cement	221	FALSE	1970	130	92.4	0
Elm Street	6	Asbestos Cement	649	FALSE	1960	120	87.8	0
Elm Street	6	Asbestos Cement	948	FALSE	1950	120	90.4	0
Elm Street	6	Asbestos Cement	340	FALSE	1950	120	87.8	0
Elm Street	6	Asbestos Cement	625	FALSE	1960	120	87.8	0
Emerson Drive	8	Asbestos Cement	338	FALSE	1958	130	107	2
Emerson Drive	8	Asbestos Cement	479	FALSE	1958	130	107	2
Ethan Allen Drive	10	Asbestos Cement	797	FALSE	1960	130	42.6	1
Ethan Allen Drive	10	Asbestos Cement	744	FALSE	1960	130	45.2	1
Ethan Allen Drive	10	Asbestos Cement	318	FALSE	1960	130	71.2	1
Ethan Allen Drive	10	Asbestos Cement	829	FALSE	1960	130	73.9	1
Ethan Allen Drive	16	Asbestos Cement	1,382	FALSE	1960	130	42.6	0
Ethan Allen Drive Extension	16	Asbestos Cement	437	FALSE	1960	130	25.7	0
Evergreen Road	8	Ductile Iron	386	FALSE	1970	110	90.6	0
Evergreen Road	8	Ductile Iron	1,482	FALSE	1970	110	71.2	0
Fairway Road	6	Asbestos Cement	427	FALSE	1950	120	92.4	0
Farley Lane	6	Asbestos Cement	296	FALSE	1970	120	83.3	0
Farmers Row	6	Ductile Iron	192	TRUE	1997	110	108	0
Farmstead Way	8	Ductile Iron	138	FALSE	1997	110	94.4	0
Farmstead Way	8	Ductile Iron	117	FALSE	1997	110	91.8	0
Farmstead Way	8	Ductile Iron	318	FALSE	1997	110	91.8	0
Farmstead Way	8	Ductile Iron	305	FALSE	1997	110	89.8	0
Faulkner Hill Road	8	Asbestos Cement	1,394	FALSE	1960	130	67.9	0
Faulkner Hill Road	8	Asbestos Cement	1,385	FALSE	1960	130	58.7	0
Faulkner Hill Road	8	Asbestos Cement	468	FALSE	1960	130	58.7	0
Fernwood Road	8	Asbestos Cement	384	FALSE	1970	130	101.1	0
Fife and Drum Road	8	Asbestos Cement	749	TRUE	1960	130	74.7	0
Fischer Path	6	Ductile Iron	258	TRUE	1997	110	61.6	0

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STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Flint Road	8	Asbestos Cement	334	FALSE	1960	130	91.8	2
Flint Road	8	Asbestos Cement	897	FALSE	1960	130	92.2	2
Flint Road	8	Asbestos Cement	336	FALSE	1960	130	92.2	2
Flint Road	8	Asbestos Cement	491	FALSE	1970	130	92	2
Flint Road	8	Asbestos Cement	379	FALSE	1970	130	92.2	2
Flintlock Drive	6	Asbestos Cement	755	FALSE	1960	120	57	0
Forest Road	8	Asbestos Cement	654	FALSE	1960	130	99.7	0
Forest Road	8	Asbestos Cement	502	FALSE	1960	130	98.9	0
Forest Road	8	Asbestos Cement	1,248	FALSE	1960	130	97.1	0
Forest Road Extension	8	Asbestos Cement	428	FALSE	1960	130	87.2	0
Forest Road Extension	10	Asbestos Cement	329	FALSE	1960	130	96.7	0
Foster Street	8	Asbestos Cement	819	FALSE	1960	130	118.4	2
Fox Hill Road	8	Asbestos Cement	209	TRUE	1965	130	87.3	0
Francine Road	8	Asbestos Cement	550	FALSE	1960	130	92.3	0
Fraser Drive	6	Asbestos Cement	155	FALSE	1950	120	88.1	0
Fraser Drive	6	Asbestos Cement	362	FALSE	1950	120	88.1	0
Freedom Farme Road	8	Asbestos Cement	1,237	FALSE	1970	130	80.8	1
Freedom Farme Road	8	Asbestos Cement	433	FALSE	1970	130	89.8	1
Gerald Circle	8	Asbestos Cement	456	FALSE	1970	130	90.9	0
Gioconda Avenue	8	Asbestos Cement	236	TRUE	1965	130	100.6	0
Gioconda Avenue	8	Asbestos Cement	497	TRUE	1965	130	100.4	0
Gioconda Avenue	8	Asbestos Cement	463	TRUE	1965	130	87.3	0
Grace Path	6	Ductile Iron	569	TRUE	1997	110	69.7	0
Grasshopper Lane	8	Asbestos Cement	601	FALSE	1965	130	105.2	0
Grasshopper Lane Extension	6	Asbestos Cement	906	FALSE	1970	120	104.6	0
Great Elm Way	6	Asbestos Cement	318	FALSE	1970	120	70.6	0
Great Elm Way	6	Asbestos Cement	1,615	FALSE	1970	120	70.6	0
Great Road	10	Asbestos Cement	582	FALSE	1960	130	122	0
Great Road	10	Asbestos Cement	766	FALSE	1960	130	122	0
Great Road	12	Ductile Iron	881	FALSE	1960	130	82.7	0
Great Road	12	Ductile Iron	250	FALSE	1960	130	83.1	0
Great Road	12	Ductile Iron	175	FALSE	1960	130	82.1	0
Great Road	10	Ductile Iron	355	FALSE	1970	130	119.8	0
Great Road	16	Ductile Iron	1,697	FALSE	1970	130	111.7	0
Great Road	16	Ductile Iron	566	FALSE	1970	130	109.2	0
Great Road	16	Ductile Iron	354	FALSE	1970	130	103.6	0

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Great Road	16	Ductile Iron	385	FALSE	1970	130	109.6	0
Great Road	16	Ductile Iron	149	FALSE	1970	130	95.4	0
Great Road	16	Ductile Iron	1,507	FALSE	1970	130	95.7	0
Great Road	16	Ductile Iron	431	FALSE	1970	130	88.8	0
Great Road	16	Ductile Iron	398	FALSE	1970	130	80.3	0
Great Road	16	Ductile Iron	515	FALSE	1970	130	81.8	0
Great Road	16	Ductile Iron	280	FALSE	1970	130	95.2	0
Great Road	16	Ductile Iron	1,265	FALSE	1970	130	95.9	0
Great Road	12	Ductile Iron	173	FALSE	1970	130	67.8	0
Great Road	12	Ductile Iron	487	FALSE	1970	130	66.3	0
Great Road	12	Ductile Iron	1,265	FALSE	1970	130	65.1	0
Great Road	16	Ductile Iron	275	FALSE	1970	130	73	0
Great Road	12	Ductile Iron	1,603	FALSE	1997	130	109.2	0
Great Road Extension	4	Ductile Iron	233	FALSE	1970	110	74.5	0
Great Road Extension	8	Ductile Iron	1,155	FALSE	1970	110	95.7	0
Great Road Extension	8	Ductile Iron	473	FALSE	1970	110	88.8	0
Great Road Extension	8	Ductile Iron	140	FALSE	2000	110	95.4	0
Green Neddle Way	6	Ductile Iron	495	TRUE	1997	110	61.1	0
Greenwood Lane	6	Asbestos Cement	305	FALSE	1960	120	86.8	0
Greenwood Lane	6	Asbestos Cement	306	FALSE	1960	120	89.8	0
Greybirch Lane	6	Ductile Iron	427	TRUE	1997	110	67.3	0
Grist Mill Road	6	Asbestos Cement	305	FALSE	1970	120	76.9	0
Grist Mill Road	6	Asbestos Cement	1,508	FALSE	1970	120	61	0
Guswood Road	8	Asbestos Cement	608	FALSE	1970	130	105.3	0
Guswood Road Extension	8	Asbestos Cement	408	FALSE	1950	130	103.6	0
Half Moon Hill	6	Asbestos Cement	153	FALSE	1970	120	91.7	0
Half Moon Hill	6	Asbestos Cement	1,429	FALSE	1970	120	89.7	0
Half Moon Hill	6	Asbestos Cement	211	FALSE	1970	120	82.9	0
Hammond Street	8	Asbestos Cement	170	FALSE	1965	130	69.9	0
Hammond Street	8	Asbestos Cement	876	FALSE	1965	130	71.2	0
Hammond Street	8	Asbestos Cement	1,092	FALSE	1965	130	75.1	0
Hammond Street	8	Asbestos Cement	253	FALSE	1965	130	71.6	0
Hammond Street	10	Ductile Iron	1,193	FALSE	1970	120	68.9	0
Harris Street	12	Ductile Iron	2,264	FALSE	1970	120	98.9	0
Harris Street	12	Ductile Iron	568	FALSE	1970	120	88.6	0
Harris Street	12	Ductile Iron	223	FALSE	1970	120	81.1	0

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Harris Street	12	Ductile Iron	247	FALSE	1970	120	76.4	0
Hartland Way	6	Ductile Iron	307	FALSE	2000	110	102.2	0
Hartland Way	6	Ductile Iron	375	FALSE	2000	110	103.7	0
Hartland Way	6	Ductile Iron	285	FALSE	2000	110	103.7	0
Hartland Way	8	Ductile Iron	237	FALSE	2000	110	100.7	0
Hartland Way	8	Ductile Iron	465	FALSE	2000	110	100.1	0
Hartland Way	8	Ductile Iron	263	FALSE	2000	110	100.8	0
Hartland Way	8	Ductile Iron	296	FALSE	2000	110	103	0
Hatch Road	8	Asbestos Cement	447	FALSE	1960	130	93.6	0
Hawthorne Street	8	Asbestos Cement	804	FALSE	1958	130	103.4	2
Hawthorne Street	8	Asbestos Cement	301	FALSE	1958	130	106.5	1
Haynes Court	6	Asbestos Cement	343	FALSE	1950	120	87.7	0
Hayward Road	8	Ductile Iron	287	TRUE	2014	130	87.9	0
Hayward Road	8	Ductile Iron	1,824	TRUE	2014	130	87.9	0
Hayward Road	8	Ductile Iron	516	FALSE	1970	130	90.1	0
Hayward Road	8	Ductile Iron	319	FALSE	2014	130	87.8	0
Hayward Road	8	Ductile Iron	520	FALSE	2014	130	88.5	0
Hayward Road	8	Ductile Iron	433	FALSE	2014	130	92.1	0
Hayward Road	8	Ductile Iron	506	FALSE	2014	130	92.1	0
Hayward Road	8	Ductile Iron	1,352	FALSE	2014	130	69.7	0
Hayward Road	8	Ductile Iron	1,188	FALSE	2014	130	69.7	0
Hayward Road Extension	6	Ductile Iron	1,519	FALSE	1970	110	87.8	0
Hazelnut Street	8	Ductile Iron	642	FALSE	1995	130	86.6	0
Hazelnut Street	8	Ductile Iron	234	FALSE	1995	130	84.9	0
Heald Road	8	Asbestos Cement	282	FALSE	1970	130	80.4	0
Heald Road	8	Asbestos Cement	493	FALSE	1970	130	87.8	0
Heather Hill Road	8	Asbestos Cement	651	FALSE	1970	130	86.3	0
Hemlock Lane	6	Asbestos Cement	1,237	FALSE	1960	120	80.8	0
Henley Road	8	Asbestos Cement	252	FALSE	1970	130	66.3	0
Hennessey Drive	8	Asbestos Cement	605	FALSE	1970	130	76.8	0
Hennessey Drive	8	Asbestos Cement	476	FALSE	1970	130	76.8	0
Heritage Road	8	Asbestos Cement	242	FALSE	1967	130	119.2	0
Heritage Road	8	Asbestos Cement	1,240	FALSE	1967	130	118	0
Heritage Road	8	Asbestos Cement	1,411	FALSE	1967	130	118	0
Heron View Road	6	Ductile Iron	341	TRUE	1970	110	96.4	0
High Road Extension	12	Cast Iron	886	FALSE	1950	120	100.4	0

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
High Street	12	Cast Iron	318	FALSE	1950	120	95.8	0
High Street	12	Cast Iron	1,659	FALSE	1950	120	79.2	0
High Street	12	Cast Iron	1,763	FALSE	1950	120	79.2	0
High Street	12	Ductile Iron	976	FALSE	2013	130	93.6	0
High Street	12	Ductile Iron	899	FALSE	2013	130	95.1	0
High Street	12	Ductile Iron	353	FALSE	2013	130	93.6	0
High Street	12	Ductile Iron	1,006	FALSE	2013	130	95.8	0
High Street	12	Ductile Iron	961	FALSE	2013	130	76.8	0
High Street	12	Ductile Iron	812	FALSE	2013	130	76.1	0
High Street Extension	8	Asbestos Cement	207	FALSE	1950	130	121.2	0
High Street Extension	8	Asbestos Cement	53	FALSE	1950	130	121.2	0
High Street Extension	8	Asbestos Cement	439	FALSE	1950	130	121.2	0
High Street Extension	8	Asbestos Cement	187	FALSE	1950	130	121.2	0
High Street Extension	12	Cast Iron	12	FALSE	1970	120	120.1	0
High Street Extension	12	Cast Iron	13	FALSE	1970	120	120.1	0
High Street Extension	8	Ductile Iron	380	FALSE	1970	110	121.2	0
High Street Extension	8	Ductile Iron	164	FALSE	1970	120	121.2	0
High Street Extension	8	Ductile Iron	120	FALSE	1970	110	121.2	0
High Street Extension	8	Ductile Iron	767	FALSE	1970	120	121.2	0
High Street Extension	99	N/A	10	FALSE	1960	130	N/A	0
High Street Extension	12	Ductile Iron	41	FALSE	1970	120	N/A	0
Highland Road	8	Asbestos Cement	224	FALSE	1970	130	40.6	0
Highland Road	8	Asbestos Cement	310	FALSE	1970	130	40.6	0
Highland Road	8	Asbestos Cement	315	FALSE	1970	130	42.2	0
Hillcrest Drive	8	Asbestos Cement	452	TRUE	1965	130	117	0
Hillcrest Drive	8	Asbestos Cement	991	TRUE	1965	130	117	0
Hillcrest Drive	8	Asbestos Cement	355	TRUE	1965	130	100.4	0
Homestead Street	6	Asbestos Cement	1,328	FALSE	1950	120	88.2	0
Horseshoe Drive	8	Asbestos Cement	1,173	FALSE	1970	130	120.4	0
Hosmer Street	8	Asbestos Cement	658	FALSE	1960	130	112	2
Hosmer Street	8	Asbestos Cement	397	FALSE	1960	130	113.9	2
Hosmer Street	8	Asbestos Cement	195	FALSE	1950	130	117	2
Hosmer Street	8	Asbestos Cement	953	FALSE	1950	130	116.2	2
Hosmer Street	8	Asbestos Cement	272	FALSE	1950	130	101.8	2
Hosmer Street	8	Asbestos Cement	1,352	FALSE	1960	130	104	2
Hosmer Street	8	Asbestos Cement	663	FALSE	1960	130	104	2

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STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Hosmer Street	8	Asbestos Cement	171	FALSE	1960	130	104	2
Hosmer Street	8	Asbestos Cement	210	FALSE	1950	130	99.4	2
Hosmer Street	8	Asbestos Cement	432	FALSE	1960	130	98	2
Hosmer Street	8	Asbestos Cement	242	FALSE	1960	130	101.9	1
Hosmer Street Extension	6	Asbestos Cement	1,329	FALSE	1960	120	108.5	0
Hosmer Street Extension	6	Asbestos Cement	458	FALSE	1960	120	108.5	0
Hosmer Street Extension	6	Asbestos Cement	623	FALSE	1960	120	99.6	0
Hosmer Street Extension	6	Asbestos Cement	1,040	FALSE	1960	120	98	0
Hosmer Street Extension	6	Asbestos Cement	1,216	FALSE	1960	120	98	0
Hosmer Street Extension	8	Asbestos Cement	1,066	FALSE	1950	130	99.4	0
Hosmer Street Extension	8	Asbestos Cement	571	FALSE	1950	130	99.6	0
Houghton Lane	6	Asbestos Cement	392	FALSE	1960	120	91.5	0
Huckleberry Lane	8	Ductile Iron	868	FALSE	1970	110	76.6	1
Huron Road	6	Asbestos Cement	342	FALSE	1959	120	65.2	2
Huron Road	6	Asbestos Cement	295	FALSE	1959	120	68.4	2
Iris Court	8	Asbestos Cement	628	FALSE	1968	130	111.4	0
Jackson Drive	8	Asbestos Cement	547	TRUE	1970	130	74.4	0
Jackson Drive	8	Asbestos Cement	306	TRUE	1970	130	74.4	0
Jackson Drive	8	Asbestos Cement	357	TRUE	1970	130	71	0
Jackson Drive	8	Asbestos Cement	1,270	TRUE	1970	130	73.2	0
Jackson Drive	8	Ductile Iron	724	TRUE	1970	130	74.9	0
Jefferson Drive	8	Asbestos Cement	1,225	TRUE	1960	130	90	0
John Swift Road	8	Asbestos Cement	1,849	TRUE	1960	130	71	0
John Swift Road	8	Asbestos Cement	514	FALSE	1970	130	74.9	0
Joseph Reed Lane	8	Asbestos Cement	168	FALSE	1960	130	64.5	0
Joseph Reed Lane	8	Asbestos Cement	353	FALSE	1960	130	61.4	0
Joseph Reed Lane	8	Asbestos Cement	1,157	FALSE	1960	130	64.5	0
Joseph Reed Lane	8	Asbestos Cement	416	FALSE	1960	130	65.3	0
Joseph Reed Lane	8	Asbestos Cement	355	FALSE	1960	130	65.3	0
Juniper Ridge Road	8	Asbestos Cement	333	FALSE	1955	130	86.7	0
Juniper Ridge Road	8	Asbestos Cement	1,185	FALSE	1955	130	79.8	0
Kate Drive	6	Ductile Iron	380	FALSE	1980	110	102.6	0
Kelley Road	8	Asbestos Cement	586	FALSE	1960	130	77.5	0
Kennedy Lane	6	Asbestos Cement	420	FALSE	1970	120	89.7	0
Kingman Road	8	Asbestos Cement	303	FALSE	1970	130	87.7	0
Kingman Road	8	Asbestos Cement	654	FALSE	1970	130	90.4	0

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Kinsley Road	6	Asbestos Cement	1,450	FALSE	1950	120	83.8	0
Kinsley Road	6	Asbestos Cement	558	FALSE	1950	120	88.1	0
Knowlton Drive	8	Asbestos Cement	1,932	FALSE	1960	130	92.4	0
Knox Trail	8	Asbestos Cement	2,188	FALSE	1950	130	125	0
Knox Trail	8	Asbestos Cement	1,127	FALSE	1950	130	110.3	0
Knox Trail	8	Ductile Iron	374	FALSE	1970	120	122.1	0
Knox Trail Extension	8	Asbestos Cement	730	FALSE	1950	130	121.2	0
Knox Trail Extension	4	Ductile Iron	164	FALSE	1970	120	122.1	0
Knox Trail Extension	8	Ductile Iron	137	FALSE	1970	120	122.1	0
Larch Road	8	Asbestos Cement	359	FALSE	1965	130	90.6	0
Larch Road	8	Asbestos Cement	756	FALSE	1965	130	76.6	0
Laurel Court	6	Asbestos Cement	450	FALSE	1950	120	93.5	0
Lawsbrook Road	6	Asbestos Cement	199	FALSE	1970	120	113.5	2
Lawsbrook Road	8	Asbestos Cement	309	FALSE	1970	130	114.8	2
Lawsbrook Road	8	Asbestos Cement	932	FALSE	1950	130	115.9	1
Lawsbrook Road	6	Asbestos Cement	455	FALSE	1960	120	101.3	0
Lawsbrook Road	6	Asbestos Cement	210	FALSE	1960	120	104.5	0
Lawsbrook Road	6	Asbestos Cement	232	FALSE	1960	120	110.7	0
Lawsbrook Road	6	Asbestos Cement	210	FALSE	1960	120	101.3	0
Lawsbrook Road	6	Asbestos Cement	80	FALSE	1960	120	98.8	0
Lawsbrook Road Extension	6	Asbestos Cement	870	FALSE	1960	120	110.7	0
Lawsbrook Road Extension	8	Asbestos Cement	730	FALSE	1950	130	98.8	0
Lawsbrook Road Extension	8	Ductile Iron	980	FALSE	1970	130	114.8	0
Ledge Rock Way	8	Ductile Iron	697	FALSE	1970	110	103.7	0
Ledge Rock Way	8	Ductile Iron	330	FALSE	1970	110	100.1	0
Ledge Rock Way	8	Ductile Iron	216	FALSE	1970	110	94.6	0
Ledge Rock Way	8	Ductile Iron	1,666	FALSE	2000	120	94.6	0
Lexington Drive	8	Ductile Iron	151	FALSE	1995	110	115.9	0
Lexington Drive	8	Ductile Iron	1,864	FALSE	1995	110	114.3	0
Lexington Drive	8	Ductile Iron	1,746	FALSE	1995	110	114.1	0
Liberty Street	6	Asbestos Cement	1,161	FALSE	1950	120	90.7	0
Liberty Street	6	Asbestos Cement	1,665	FALSE	1970	120	96.7	0
Lilac Court	6	Asbestos Cement	715	FALSE	1950	120	97	0
Lincoln Drive	8	Asbestos Cement	1,252	TRUE	1970	130	69.3	0
Lincoln Drive	8	Asbestos Cement	1,024	TRUE	1970	130	65	0
Lisa Lane	6	Asbestos Cement	362	FALSE	1970	120	113.5	0

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STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Littlefield Road	8	Ductile Iron	569	FALSE	2017	130	76.5	0
Longfellow Park	8	Asbestos Cement	305	FALSE	1960	130	104	0
Longmeadow Way	8	Ductile Iron	1,198	TRUE	1997	110	83.8	0
Loosestick Way	6	Ductile Iron	502	TRUE	1997	110	75.4	0
Lothrop Road	6	Asbestos Cement	1,252	FALSE	1950	120	91	0
Lothrop Road	6	Asbestos Cement	238	FALSE	1950	120	92.2	0
Lothrop Road	8	Asbestos Cement	341	FALSE	1970	130	84.5	0
Lothrop Road	8	Asbestos Cement	621	FALSE	1970	130	83	0
MacGregor Way	6	Ductile Iron	462	FALSE	1950	110	96.8	0
Macleod Lane	6	Ductile Iron	779	FALSE	1991	110	87.2	0
Maddy Lane	8	Ductile Iron	237	FALSE	1994	110	112.2	0
Maddy Lane	8	Ductile Iron	380	FALSE	1994	110	105.4	0
Madison Lane	8	Asbestos Cement	1,136	TRUE	1970	130	71	0
Magnolia Drive	6	Asbestos Cement	110	FALSE	1968	120	106.9	0
Magnolia Drive	8	Asbestos Cement	346	FALSE	1968	130	106.9	0
Magnolia Drive	8	Asbestos Cement	495	FALSE	1968	130	106	0
Magnolia Drive Extension	8	Asbestos Cement	363	FALSE	1968	130	111.4	0
Maillet Drive	6	Asbestos Cement	572	FALSE	1970	120	106.1	0
Main Street	12	Cast Iron	344	FALSE	1950	130	95.9	3
Main Street	12	Cast Iron	934	FALSE	1950	130	96.8	3
Main Street	10	Cast Iron	715	FALSE	1920	100	77.5	2
Main Street	6	Cast Iron	176	FALSE	1910	60	83	0
Main Street	6	Cast Iron	1,067	FALSE	1910	60	95.1	0
Main Street	6	Cast Iron	815	FALSE	1910	60	82.9	0
Main Street	10	Cast Iron	521	FALSE	1950	100	88	2
Main Street	6	Cast Iron	202	FALSE	1910	60	74.9	0
Main Street	10	Cast Iron	1,317	FALSE	1930	100	76	1
Main Street	10	Cast Iron	564	FALSE	1950	100	88	1
Main Street	10	Cast Iron	133	FALSE	1950	100	88	1
Main Street	10	Cast Iron	3,170	FALSE	1950	100	88.1	1
Main Street	6	Cast Iron	912	FALSE	1950	80	67.4	0
Main Street	12	Cast Iron	829	FALSE	1950	130	87.9	1
Main Street	10	Cast Iron	142	FALSE	1950	100	73.6	1
Main Street	10	Cast Iron	1,141	FALSE	1950	100	69	1
Main Street	10	Cast Iron	1,494	FALSE	1950	100	74.9	1
Main Street	8	Cast Iron	146	FALSE	1940	80	88	0

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STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Main Street	8	Cast Iron	168	FALSE	1940	80	88.8	0
Main Street	8	Cast Iron	51	FALSE	1940	80	88	0
Main Street	12	Cast Iron	895	FALSE	1950	120	67.4	1
Main Street	12	Cast Iron	826	FALSE	1950	130	73.2	1
Main Street	10	Cast Iron	209	FALSE	1910	100	87.1	0
Main Street	10	Cast Iron	138	FALSE	1910	100	82.5	0
Main Street	12	Cast Iron	289	FALSE	1940	120	88	0
Main Street	12	Cast Iron	90	FALSE	1910	120	88	0
Main Street	12	Cast Iron	1066	FALSE	1910	120	80	0
Main Street	12	Cast Iron	1154	FALSE	1910	120	80	0
Main Street	12	Cast Iron	239	FALSE	1910	120	77.3	0
Main Street	12	Cast Iron	322	FALSE	1950	130	117.5	0
Main Street	12	Cast Iron	868	FALSE	1950	130	101.6	0
Main Street	12	Cast Iron	669	FALSE	1950	130	110.8	0
Main Street	10	Cast Iron	189	FALSE	1950	100	69	0
Main Street	8	Ductile Iron	359	FALSE	1970	110	83.3	1
Main Street	8	Ductile Iron	2,099	FALSE	1970	110	89.9	1
Main Street	16	Ductile Iron	884	FALSE	1970	130	104.6	1
Main Street	16	Ductile Iron	1,341	FALSE	1970	130	104.6	1
Main Street	8	Ductile Iron	195	FALSE	1970	110	88	0
Main Street	16	Ductile Iron	205	FALSE	1990	130	104.4	1
Main Street	16	Ductile Iron	837	FALSE	1970	130	102.9	0
Main Street	16	Ductile Iron	494	FALSE	1970	130	104.4	0
Main Street	16	Ductile Iron	1,515	FALSE	1970	130	117.5	0
Main Street	16	Ductile Iron	368	FALSE	1970	130	103.8	0
Main Street	16	Ductile Iron	1,176	FALSE	1970	130	104.2	0
Main Street	16	Ductile Iron	59	FALSE	1970	130	103.4	0
Main Street	16	Ductile Iron	357	FALSE	1970	130	102.1	0
Main Street	16	Ductile Iron	355	FALSE	1970	130	103	0
Main Street	16	Ductile Iron	763	FALSE	1970	130	102	0
Main Street	16	Ductile Iron	235	FALSE	1970	130	100	0
Main Street	12	Ductile Iron	88	FALSE	1970	120	88	0
Main Street	16	Ductile Iron	2,015	FALSE	1970	130	98.9	0
Main Street	16	Ductile Iron	1,121	FALSE	1970	130	94.9	0
Main Street	16	Ductile Iron	616	FALSE	1970	130	99.2	0
Main Street Extension	8	Asbestos Cement	430	FALSE	1960	130	88.1	0

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Main Street Extension	16	Cast Iron	153	FALSE	1950	100	117.5	0
Main Street Extension	12	Cast Iron	1,092	FALSE	1950	120	76	0
Main Street Extension	6	Ductile Iron	309	FALSE	2005	110	87.9	0
Main Street Extension	8	Ductile Iron	64	FALSE	1970	110	N/A	0
Main Street Extension	99	N/A	62	FALSE	1950	120	N/A	0
Main Street Extension	99	N/A	10	FALSE	1970	120	N/A	0
Main Street Extension	8	Ductile Iron	211	FALSE	1990	110	N/A	0
Main Street Extension	8	Ductile Iron	554	FALSE	1990	130	N/A	0
Mallard Road	8	Asbestos Cement	1,370	FALSE	1970	130	92	1
Maple Street	6	Asbestos Cement	414	FALSE	1950	120	95.3	0
Maple Street	6	Cast Iron	1,554	FALSE	1910	60	95.3	0
Maple Street	8	Asbestos Cement	187	FALSE	1950	130	91.3	0
Marian Road	6	Asbestos Cement	300	FALSE	1960	130	88.6	1
Marian Road	6	Asbestos Cement	348	FALSE	1960	130	87.2	1
Marian Road	6	Asbestos Cement	560	FALSE	1960	130	84.9	1
Marian Road	6	Asbestos Cement	309	FALSE	1960	130	64.4	1
Marshall Path	8	Ductile Iron	764	FALSE	2006	130	87.9	0
Marshall Path	8	Ductile Iron	527	FALSE	2006	130	74.6	0
Martin Street	6	Cast Iron	784	FALSE	1910	60	88.2	0
Martin Street	6	Cast Iron	505	FALSE	1910	60	96	0
Martin Street	6	Cast Iron	611	FALSE	1910	60	98	0
Martin Street	6	Cast Iron	711	FALSE	1950	80	96.7	0
Massachusetts Avenue	8	Asbestos Cement	1,106	FALSE	1960	130	87.6	3
Massachusetts Avenue	8	Asbestos Cement	317	FALSE	1960	130	101.9	2
Massachusetts Avenue	8	Asbestos Cement	1,643	FALSE	1960	130	100.3	2
Massachusetts Avenue	8	Asbestos Cement	468	FALSE	1960	130	104.3	2
Massachusetts Avenue	6	Cast Iron	315	FALSE	1910	80	82.7	0
Massachusetts Avenue	6	Cast Iron	341	FALSE	1910	80	83.9	0
Massachusetts Avenue	6	Cast Iron	1,539	FALSE	1910	80	92.4	0
Massachusetts Avenue	6	Cast Iron	744	FALSE	1920	80	87.2	0
Massachusetts Avenue	6	Cast Iron	527	FALSE	1920	80	89.1	0
Massachusetts Avenue	6	Cast Iron	289	FALSE	1920	80	71.8	0
Massachusetts Avenue	6	Cast Iron	220	FALSE	1920	80	79.8	0
Massachusetts Avenue	6	Cast Iron	376	FALSE	1920	80	72.4	0
Massachusetts Avenue	6	Cast Iron	595	FALSE	1960	80	87.6	0
Massachusetts Avenue	6	Cast Iron	482	FALSE	1960	80	82	0

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STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Massachusetts Avenue	6	Cast Iron	611	FALSE	1960	80	84	0
Massachusetts Avenue	6	Cast Iron	747	FALSE	1960	80	92.2	0
Massachusetts Avenue	6	Cast Iron	835	FALSE	1960	80	80.5	0
Massachusetts Avenue	6	Cast Iron	206	FALSE	1960	80	80.5	0
Massachusetts Avenue	8	Ductile Iron	475	FALSE	1970	110	90.5	0
Massachusetts Avenue Extension	6	Asbestos Cement	603	FALSE	1960	120	97.4	1
Massachusetts Avenue Extension	8	Asbestos Cement	880	FALSE	1950	130	90.5	1
Massachusetts Avenue Extension	6	Asbestos Cement	140	FALSE	1960	120	97.1	0
Massachusetts Avenue Extension	8	Cast Iron	364	FALSE	1960	80	101.9	0
Massachusetts Avenue Extension	8	Cast Iron	547	FALSE	1950	80	107.6	0
Massachusetts Avenue Extension	8	Ductile Iron	580	FALSE	1970	110	90.5	0
Massachusetts Avenue Extension	8	Ductile Iron	131	FALSE	1970	110	91	0
Massachusetts Avenue Extension	99	N/A	10	FALSE	1950	120	N/A	0
Mead Terrace	6	Ductile Iron	307	FALSE	1970	110	71.8	0
Meadowbrook Road	8	Asbestos Cement	414	TRUE	1960	130	89.6	0
Meadowbrook Road	8	Asbestos Cement	567	TRUE	1960	130	92.8	0
Meetinghouse Road	8	Ductile Iron	831	FALSE	1970	110	96.7	0
Meyer Hill Drive	8	Ductile Iron	615	FALSE	1970	110	48.9	0
Meyer Hill Drive	12	Ductile Iron	467	FALSE	1970	120	94.9	0
Meyer Hill Drive	12	Ductile Iron	82	FALSE	1970	120	55.1	0
Meyer Hill Drive	12	Ductile Iron	290	FALSE	1970	120	48.9	0
Meyer Hill Drive	12	Ductile Iron	18	FALSE	1970	120	55.1	0
Meyer Hill Drive	12	Ductile Iron	72	FALSE	1970	120	55.1	0
Meyer Hill Drive	12	Ductile Iron	43	FALSE	1970	120	55.1	0
Meyer Hill Drive	12	Ductile Iron	28	FALSE	1970	120	N/A	0
Meyer Hill Drive	8	Ductile Iron	1,069	FALSE	2000	110	95.2	0
Meyer Hill Drive	8	Ductile Iron	773	FALSE	2000	110	59.2	0
Meyer Hill Drive	8	Ductile Iron	248	FALSE	2000	110	66.9	0
Meyer Hill Drive	12	Ductile Iron	30	FALSE	1990	120	N/A	0
Milbery Lane	6	Asbestos Cement	265	FALSE	1950	120	84.1	0
Milldam Road	8	Ductile Iron	146	FALSE	1970	110	102.6	0
Milldam Road	8	Ductile Iron	419	FALSE	1980	110	103.7	0
Milldam Road	8	Ductile Iron	370	FALSE	1980	110	102.2	0
Milldam Road	8	Ductile Iron	144	FALSE	1980	110	98.8	0
Milldam Road	8	Ductile Iron	690	FALSE	1980	110	98.8	0
Milldam Road Extension	6	Ductile Iron	371	FALSE	1980	110	104.3	0

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STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Minot Avenue	8	Asbestos Cement	2,033	FALSE	1960	130	98.5	0
Minot Avenue	8	Asbestos Cement	1,021	FALSE	1960	130	99.9	0
Minot Avenue	8	Asbestos Cement	404	FALSE	1960	130	99.9	0
Minuteman Road	6	Asbestos Cement	907	FALSE	1970	120	75.8	0
Minuteman Road	6	Asbestos Cement	618	FALSE	1970	120	75.8	0
Mohawk Drive	8	Ductile Iron	2,192	FALSE	1970	110	91	0
Mohawk Drive	8	Ductile Iron	356	FALSE	1970	110	81.3	0
Mohawk Drive	8	Ductile Iron	1,087	FALSE	1970	110	79.1	0
Mohegan Road	6	CIPP	553	FALSE	2017	130	80.8	0
Mohegan Road	6	CIPP	536	FALSE	2017	130	79.1	0
Mohegan Road	6	CIPP	843	FALSE	2017	130	79.1	0
Monroe Drive	8	Ductile Iron	460	TRUE	1970	130	74.9	0
Musket Drive	8	Asbestos Cement	324	TRUE	1960	130	90	0
Musket Drive	8	Asbestos Cement	302	TRUE	1960	130	83	0
Musket Drive	8	Asbestos Cement	262	TRUE	1960	130	71	0
Musket Drive	8	Asbestos Cement	321	TRUE	1960	130	74.7	0
Musket Drive	8	Asbestos Cement	550	FALSE	1970	130	91.2	0
Musket Drive	8	Ductile Iron	273	TRUE	1970	110	71	0
Mylander Way	10	Ductile Iron	277	FALSE	1994	120	82.5	0
Mylander Way	10	Ductile Iron	315	FALSE	1994	120	62.7	0
Mylander Way	10	Ductile Iron	574	FALSE	1994	120	62.7	0
Myrtle Drive	8	Asbestos Cement	588	FALSE	1968	130	110.5	0
Nadine Road	8	Asbestos Cement	797	FALSE	1960	130	99.1	0
Nagog Hill Road	6	Asbestos Cement	1,715	FALSE	1950	120	73.2	2
Nagog Hill Road	6	Asbestos Cement	293	FALSE	1950	120	74.8	2
Nagog Hill Road	6	Cast Iron	527	FALSE	1960	80	86.6	0
Nagog Hill Road	6	Cast Iron	643	FALSE	1960	80	80.8	0
Nagog Hill Road	6	Cast Iron	288	FALSE	1960	80	86.6	0
Nagog Hill Road	6	Cast Iron	295	FALSE	1960	80	86.8	0
Nagog Hill Road	16	Ductile Iron	3,124	FALSE	1960	130	73.2	0
Nagog Hill Road	16	Ductile Iron	2,334	FALSE	1970	130	71.5	0
Nagog Hill Road	16	Ductile Iron	74	FALSE	1970	130	58.1	0
Nagog Hill Road	16	Ductile Iron	280	FALSE	1970	130	20.9	0
Nagog Hill Road	16	Ductile Iron	2,035	FALSE	1970	130	55.9	0
Nagog Park	12	Asbestos Cement	257	FALSE	1960	130	83.1	1
Nagog Park	10	Asbestos Cement	908	FALSE	1960	130	80.8	0

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Nagog Park	8	Asbestos Cement	666	FALSE	1970	130	67	0
Nagog Park	8	Asbestos Cement	505	FALSE	1970	130	53.3	0
Nagog Park	10	Asbestos Cement	927	FALSE	1970	130	78.8	0
Nagog Park	10	Asbestos Cement	596	FALSE	1970	130	69.6	0
Nagog Park	10	Asbestos Cement	149	FALSE	1970	130	69.8	0
Nagog Park	10	Asbestos Cement	350	FALSE	1970	130	71.9	0
Nagog Park	10	Asbestos Cement	382	FALSE	1970	130	67.6	0
Nagog Park	8	Ductile Iron	290	FALSE	1970	110	68.9	0
Nagog Park Extension	6	Asbestos Cement	369	FALSE	1960	120	70.6	0
Nagog Park Extension	8	Asbestos Cement	329	FALSE	1960	130	80.8	0
Nagog Park Extension	8	Asbestos Cement	368	FALSE	1950	130	69.6	0
Nagog Park Extension	10	Asbestos Cement	511	FALSE	1960	130	70.6	0
Nagog Park Extension	10	Asbestos Cement	250	FALSE	1960	130	76.1	0
Nagog Park Extension	10	Asbestos Cement	510	FALSE	1970	130	76.1	0
Nagog Park Extension	8	Ductile Iron	114	FALSE	1970	110	53.3	0
Nagog Park Extension	8	Ductile Iron	499	FALSE	1970	110	52.9	0
Nagog Park Extension	8	Ductile Iron	535	FALSE	1970	110	52.9	0
Nagog Park Extension	8	Ductile Iron	303	FALSE	1970	110	68.9	0
Nagog Square	8	Asbestos Cement	500	FALSE	1960	130	80.8	0
Nash Road	6	Asbestos Cement	543	FALSE	1950	120	92.6	0
Nash Road	6	Asbestos Cement	616	FALSE	1950	120	92.5	0
Nash Road	6	Asbestos Cement	809	FALSE	1950	120	92.5	0
Nash Road	6	Asbestos Cement	200	FALSE	1950	120	92.5	0
Nashoba Road	6	Asbestos Cement	573	FALSE	1960	120	84.6	0
Nashoba Road	6	Asbestos Cement	695	FALSE	1960	120	79	0
Nashoba Road	6	Asbestos Cement	1,239	FALSE	1960	120	79	0
Nashoba Road	6	Asbestos Cement	285	FALSE	1960	120	64.4	0
Nashoba Road	6	Asbestos Cement	144	FALSE	1960	120	65.2	0
Nashoba Road	6	Asbestos Cement	193	FALSE	1960	120	63.5	0
Nashoba Road	8	Ductile Iron	404	FALSE	1960	110	82.1	0
Newtown Road	6	Asbestos Cement	704	FALSE	1960	120	77.5	1
Newtown Road	8	Asbestos Cement	1,079	FALSE	1965	130	69.3	2
Newtown Road	10	Asbestos Cement	821	FALSE	1950	130	94.6	1
Newtown Road	10	Asbestos Cement	371	FALSE	1960	130	84.9	0
Newtown Road	10	Asbestos Cement	391	FALSE	1960	130	77.5	0
Newtown Road	10	Asbestos Cement	765	FALSE	1960	130	79.1	0

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Newtown Road	10	Ductile Iron	1,103	FALSE	1970	120	74.9	0
Nonset Path	10	Asbestos Cement	269	FALSE	1970	130	77.2	1
Nonset Path	10	Asbestos Cement	2,233	FALSE	1970	130	77.2	1
Nonset Path	10	Asbestos Cement	364	FALSE	1970	130	78.6	1
Nonset Path	10	Asbestos Cement	284	FALSE	1970	130	76.3	1
Nonset Path	10	Asbestos Cement	418	FALSE	1970	130	74.2	1
Nonset Path	10	Asbestos Cement	349	FALSE	1970	130	70.6	1
Nonset Path	10	Asbestos Cement	1,043	FALSE	1970	130	70.6	1
Nonset Path Extension	6	Asbestos Cement	550	FALSE	1970	120	78.6	0
Nonset Path Extension	10	Asbestos Cement	365	FALSE	1960	130	70.6	0
North Street	8	Ductile Iron	865	FALSE	2006	130	101.8	0
Northbriar Road	12	Ductile Iron	304	FALSE	1980	120	104.4	0
Northbriar Road	12	Ductile Iron	356	FALSE	1980	120	104	0
Northbriar Road	12	Ductile Iron	603	FALSE	1980	120	98.5	0
Notre Dame Road	6	Asbestos Cement	230	FALSE	1960	130	76	0
Notre Dame Road	8	Ductile Iron	334	FALSE	1970	110	90.5	0
Notre Dame Road	8	Ductile Iron	891	FALSE	1970	110	76.1	0
Oakwood Road	8	Asbestos Cement	613	FALSE	1957	130	112.5	3
Oakwood Road	8	Asbestos Cement	319	FALSE	1950	130	101.1	3
Oakwood Road	8	Asbestos Cement	1,010	FALSE	1950	130	97.6	3
Oakwood Road	8	Asbestos Cement	334	FALSE	1950	130	96.1	3
Old Cart Path	6	Ductile Iron	256	TRUE	1997	110	82.7	0
Old Colony Lane	6	Asbestos Cement	414	FALSE	1960	120	101.3	0
Old High Street	8	Cast Iron	35	FALSE	1910	70	122	0
Old High Street	8	Cast Iron	1230	FALSE	1910	70	110	0
Old Meadow Lane	8	Asbestos Cement	659	FALSE	1960	130	120.3	0
Old Oregon Trail	6	Ductile Iron	146	TRUE	1997	110	105.3	0
Old Stone Brook	6	Asbestos Cement	446	FALSE	1970	120	70.6	0
Old Stone Brook	8	Asbestos Cement	890	FALSE	1970	130	67.5	0
Old Stone Brook	8	Asbestos Cement	293	FALSE	1970	130	70.4	0
Old Stone Brook	8	Asbestos Cement	763	FALSE	1970	130	76.3	0
Old Village Road	8	Asbestos Cement	1,444	FALSE	1965	130	105.1	1
Old Village Road	8	Asbestos Cement	223	FALSE	1965	130	97.8	1
Old Village Road	8	Asbestos Cement	434	FALSE	1965	130	90.5	1
Old Village Road	8	Asbestos Cement	1,028	FALSE	1965	130	74.8	1
Olde Barn Way	8	Asbestos Cement	276	FALSE	1970	130	89.8	0

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Olde Lantern Road	6	Asbestos Cement	1,785	FALSE	1970	130	69.9	0
Olde Surrey Drive	8	Asbestos Cement	302	TRUE	1965	130	111.1	0
Olde Surrey Drive	8	Asbestos Cement	872	TRUE	1965	130	100.6	0
Oneida Road	8	Ductile Iron	1,367	FALSE	1970	110	81.3	0
Oneida Road	8	Ductile Iron	882	FALSE	1970	110	72.8	0
Oneida Road	8	Ductile Iron	448	FALSE	1970	110	69.2	0
Orchard Drive	6	Asbestos Cement	1,184	FALSE	1950	120	82	0
Overlook Drive	8	Ductile Iron	1,068	TRUE	1994	100	89.6	0
Overlook Drive	8	Ductile Iron	394	TRUE	1994	100	85.8	0
Overlook Drive Extension	8	Ductile Iron	859	TRUE	1994	100	85.8	0
Oxbow Drive	6	Ductile Iron	453	TRUE	1997	110	100.3	0
Palmer Way	6	Ductile Iron	629	FALSE	1995	110	90.1	0
Parker Street	8	Cast Iron	836	FALSE	1910	80	120.5	2
Parker Street	8	Cast Iron	749	FALSE	1910	80	109.1	1
Parker Street	8	Cast Iron	245	FALSE	1950	80	120.5	1
Parker Street	8	Cast Iron	1,576	FALSE	1950	80	119.2	1
Parker Street	8	Cast Iron	1,136	FALSE	1950	80	112.6	1
Parker Street	8	Cast Iron	493	FALSE	1970	80	99.6	1
Parker Street	8	Cast Iron	444	FALSE	1970	80	97.1	1
Parker Street	8	Cast Iron	115	FALSE	1970	80	97.1	1
Parker Street	8	Asbestos Cement	477	FALSE	1970	130	91.3	0
Parker Street	8	Asbestos Cement	916	FALSE	1970	130	85.1	0
Parker Street	8	Asbestos Cement	431	FALSE	1970	130	79.2	0
Parker Street	12	Cast Iron	978	FALSE	1910	120	95.5	0
Parker Street	12	Cast Iron	718	FALSE	1950	120	99.6	0
Parker Street	12	Cast Iron	139	FALSE	1950	120	95.7	0
Parker Street	8	Ductile Iron	259	FALSE	1970	110	95.5	0
Parmley Drive	6	Asbestos Cement	278	FALSE	1970	120	95.8	0
Patrick Henry Circle	6	Asbestos Cement	435	FALSE	1960	120	69.6	0
Patriots Road	8	Asbestos Cement	811	TRUE	1960	130	89.6	0
Patriots Road	8	Asbestos Cement	955	TRUE	1960	130	79.1	0
Paul Revere Road	8	Asbestos Cement	335	FALSE	1960	130	71.2	1
Paul Revere Road	8	Asbestos Cement	1,693	FALSE	1960	130	69.6	1
Paul Revere Road	8	Asbestos Cement	311	FALSE	1960	130	72.6	1
Perkins Lane	6	Asbestos Cement	428	FALSE	1950	120	92.1	0
Phalen Street	8	Asbestos Cement	1,029	FALSE	1958	130	102.3	0

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STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Phlox Lane	6	Asbestos Cement	941	FALSE	1968	120	95.3	0
Pinewood Road	6	Asbestos Cement	795	FALSE	1950	120	100.7	1
Piper Road	6	Asbestos Cement	188	FALSE	1960	120	108.8	0
Piper Road	6	Asbestos Cement	466	FALSE	1950	120	108.8	0
Piper Road	6	Asbestos Cement	351	FALSE	1950	120	107.4	0
Piper Road	6	Asbestos Cement	449	FALSE	1950	120	99.8	0
Piper Road	6	Asbestos Cement	480	FALSE	1950	120	97	0
Piper Road	6	Asbestos Cement	986	FALSE	1950	120	93.5	0
Piper Road	6	Asbestos Cement	503	FALSE	1950	120	96.8	0
Piper Road	6	Asbestos Cement	344	FALSE	1950	120	97.6	0
Piper Road	6	Asbestos Cement	840	FALSE	1950	120	94.4	0
Pondview Drive	8	Asbestos Cement	699	TRUE	1965	130	113.8	0
Pondview Drive	8	Asbestos Cement	823	TRUE	1965	130	94.2	0
Pope Road	10	Ductile Iron	473	FALSE	1970	130	119.8	0
Pope Road	10	Ductile Iron	682	FALSE	1970	130	107	0
Pope Road	10	Ductile Iron	456	FALSE	1970	120	93.6	0
Pope Road	10	Ductile Iron	573	FALSE	1970	120	91.7	0
Pope Road	10	Ductile Iron	328	FALSE	1970	130	93.2	0
Pope Road	10	Ductile Iron	546	FALSE	1970	130	93.1	0
Pope Road	10	Ductile Iron	1,634	FALSE	1970	130	94.8	0
Post Office Square	10	Ductile Iron	1,223	FALSE	1970	120	95.9	1
Post Office Square Extension	10	Ductile Iron	1,381	FALSE	1970	120	N/A	0
Post Office Square Extension	99	N/A	10	FALSE	1970	120	N/A	0
Powder Horn Lane	6	Asbestos Cement	832	FALSE	1960	120	51.4	0
Powder Mill Road	8	Ductile Iron	89	FALSE	1970	120	120.5	0
Powder Mill Road	8	Ductile Iron	954	FALSE	1970	120	121.2	0
Powder Mill Road	8	Ductile Iron	91	FALSE	1970	120	121.2	0
Powder Mill Road	8	Ductile Iron	722	FALSE	1970	120	120.5	0
Powder Mill Road	8	HDPE	120	FALSE	1970	120	121.2	0
Powder Mill Road	8	Ductile Iron	454	FALSE	1970	120	119.9	0
Powder Mill Road	8	Ductile Iron	248	FALSE	1970	120	116.9	0
Prescott Road	8	Ductile Iron	755	TRUE	1990	100	91.3	0
Prescott Road	8	Ductile Iron	654	TRUE	1994	100	85.8	0
Preston Way	8	Ductile Iron	1,045	FALSE	2000	110	102.1	0
Prospect Street	6	Asbestos Cement	1,135	FALSE	1950	120	86.1	3
Prospect Street	6	Asbestos Cement	513	FALSE	1960	120	79.5	3

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Prospect Street	6	Asbestos Cement	794	FALSE	1950	120	77.3	2
Prospect Street	6	Asbestos Cement	1,039	FALSE	1950	120	77.3	2
Prospect Street	6	Asbestos Cement	409	FALSE	1950	120	76.8	2
Prospect Street	6	Asbestos Cement	1,064	FALSE	1950	120	75.3	1
Puritan Road	8	Asbestos Cement	813	FALSE	1970	130	85.1	0
Puritan Road	8	Asbestos Cement	299	FALSE	1970	130	90.9	0
Putnam Road	6	Asbestos Cement	635	TRUE	1960	120	83.1	0
Putnam Road	6	Asbestos Cement	479	TRUE	1960	120	83.1	0
Putter Drive	8	Asbestos Cement	1,123	FALSE	1970	130	87.3	0
Quaboag Road	6	CIPP	1,443	FALSE	2017	130	87.8	0
Quail Ridge Country Club	8	Ductile Iron	833	FALSE	2015	120	85.5	0
Quail Ridge Country Club	8	Ductile Iron	979	FALSE	2015	120	94.2	0
Quail Ridge Country Club	8	Ductile Iron	1363	FALSE	2015	120	94.2	0
Quail Ridge Country Club	8	Ductile Iron	206	FALSE	2015	120	81.8	0
Quail Ridge Country Club	8	Ductile Iron	746	FALSE	2015	120	81.8	0
Quail Ridge Country Club	8	Ductile Iron	189	FALSE	2015	120	80.5	0
Quail Ridge Country Club	8	Ductile Iron	1307	FALSE	2015	120	75.3	0
Quail Ridge Country Club	8	Ductile Iron	212	FALSE	2015	120	78.2	0
Quail Ridge Country Club	8	Ductile Iron	407	FALSE	2015	120	77.1	0
Quail Ridge Country Club	8	Ductile Iron	497	FALSE	2015	120	77.1	0
Quail Ridge Country Club	8	Ductile Iron	350	FALSE	2015	120	79.2	0
Quail Ridge Country Club	8	Ductile Iron	485	FALSE	2015	120	78.2	0
Quail Ridge Country Club	8	Ductile Iron	244	FALSE	2015	120	78.2	0
Quail Run	6	Ductile Iron	160	TRUE	1997	110	90.4	0
Quarry Road	8	Ductile Iron	759	FALSE	2012	130	87.2	0
Quarry Road	8	Ductile Iron	1737	FALSE	2012	130	95	0
Railroad Street	6	Asbestos Cement	513	FALSE	1970	120	87.1	0
Redwood Road	6	Asbestos Cement	582	FALSE	1950	120	100	0
Redwood Road	6	Asbestos Cement	277	FALSE	1950	120	96.1	0
Reeve Street	8	Ductile Iron	465	FALSE	1970	110	64.6	0
Revolutionary Road	8	Asbestos Cement	1,112	TRUE	1960	130	84.3	0
Revolutionary Road	8	Asbestos Cement	1,014	TRUE	1970	130	83	0
Rex Lane	8	Ductile Iron	348	FALSE	1970	110	100.1	0
River Street	8	Ductile Iron	586	FALSE	1970	120	109.1	0
River Street	8	Ductile Iron	180	FALSE	1970	120	112.9	0
River Street	8	Ductile Iron	1,534	FALSE	1970	120	119.1	0

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STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
River Street	8	Ductile Iron	269	FALSE	1970	120	113.8	0
River Street	8	Ductile Iron	2,456	FALSE	1970	120	92.6	0
Robbins Street	8	Asbestos Cement	411	TRUE	1950	120	91.3	2
Robbins Street	8	Asbestos Cement	377	TRUE	1950	120	87.1	2
Robbins Street	8	Asbestos Cement	720	FALSE	1950	130	90.7	1
Robbins Street	8	Ductile Iron	574	TRUE	1970	100	96.2	0
Robbins Street	8	Ductile Iron	177	TRUE	1970	100	96.4	0
Robbins Street	8	Ductile Iron	590	TRUE	1970	100	92.8	0
Robbins Street	8	Ductile Iron	124	TRUE	1970	110	89.9	0
Robert Road	8	Asbestos Cement	1,064	FALSE	1970	130	91.3	0
Robert Road	8	Asbestos Cement	419	FALSE	1970	130	91.3	0
Robinwood Road	8	Asbestos Cement	474	TRUE	1970	130	116.2	0
Robinwood Road	8	Asbestos Cement	603	TRUE	1970	130	114.3	0
Robinwood Road	8	Asbestos Cement	2,703	TRUE	1970	130	110.7	0
Rose Court	8	Asbestos Cement	391	FALSE	1968	130	106	0
Russell Road	8	Asbestos Cement	1,386	FALSE	1960	130	117	0
Samantha Way	6	Ductile Iron	419	FALSE	1970	110	76.4	0
Samuel Parlin Drive	8	Asbestos Cement	1,148	FALSE	1965	130	69.9	0
Samuel Parlin Drive	8	Asbestos Cement	1,121	FALSE	1965	130	55.5	0
Sandalwood Road	8	Asbestos Cement	403	FALSE	1970	130	113.7	0
Sandy Drive	8	Asbestos Cement	399	FALSE	1970	130	108.4	0
Sandy Drive	8	Asbestos Cement	569	FALSE	1970	130	112.7	0
Sandy Drive Extension	8	Asbestos Cement	584	FALSE	1970	130	112	0
Sawmill Road	8	Ductile Iron	850	FALSE	1980	110	98.5	0
Sawmill Road	8	Ductile Iron	255	FALSE	1980	110	96.2	0
School Street	8	Asbestos Cement	443	FALSE	1960	130	115.2	1
School Street	6	Asbestos Cement	1,528	FALSE	1950	120	115.2	0
School Street	8	Cast Iron	614	FALSE	1910	80	88	0
School Street	8	Cast Iron	247	FALSE	1910	80	92.6	0
School Street	8	Cast Iron	1,508	FALSE	1910	80	95.1	0
School Street	8	Cast Iron	743	FALSE	1910	80	99.8	0
School Street	8	Cast Iron	500	FALSE	1950	80	123.6	0
School Street	8	Cast Iron	76	FALSE	1950	80	119.2	0
School Street	8	Cast Iron	335	FALSE	1950	80	118.4	0
School Street	8	Cast Iron	756	FALSE	1950	80	111.9	0
School Street	8	Cast Iron	721	FALSE	1950	80	112.2	0

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
School Street	8	Cast Iron	221	FALSE	1950	80	112	0
School Street	8	Cast Iron	290	FALSE	1950	80	113.5	0
School Street	8	Cast Iron	301	FALSE	1967	80	114.6	0
School Street	8	Cast Iron	948	FALSE	1967	80	113	0
School Street	8	Cast Iron	1988	FALSE	1967	80	109	0
School Street	10	Ductile Iron	1,508	FALSE	1980	130	116.9	0
School Street Extension	6	Asbestos Cement	420	FALSE	1950	120	95.1	0
School Street Extension	8	Asbestos Cement	532	FALSE	1960	130	116.9	0
School Street Extension	8	Ductile Iron	62	FALSE	1970	110	119.7	0
School Street Extension	8	Ductile Iron	46	FALSE	1970	110	N/A	0
School Street Extension	99	Ductile Iron	10	FALSE	1970	120	N/A	0
School Street Extension	99	Ductile Iron	10	FALSE	1970	120	N/A	0
Seminole Road	6	CIPP	807	FALSE	2017	130	85.1	0
Seminole Road	6	CIPP	448	FALSE	2017	130	80.8	0
Seminole Road	6	CIPP	1,395	FALSE	2017	130	84	0
Seneca Road	8	Ductile Iron	1,009	FALSE	2005	130	81.3	0
Seneca Road	8	Ductile Iron	340	FALSE	2005	130	85.1	0
Seneca Road	8	Ductile Iron	99	FALSE	2005	130	79.1	0
Seneca Road	8	Ductile Iron	371	FALSE	2005	130	79.1	0
Shady Lane	6	Asbestos Cement	339	FALSE	1970	120	80.4	0
Silver Hill Road	8	Asbestos Cement	2,316	FALSE	1970	130	68.4	1
Simon Willard Road	8	Asbestos Cement	413	FALSE	1960	130	94.2	0
Simon Willard Road	8	Asbestos Cement	274	FALSE	1970	130	84.3	0
Simon Willard Road	8	Asbestos Cement	583	FALSE	1970	130	87.8	0
Simon Willard Road	8	Asbestos Cement	239	FALSE	1970	130	94.1	0
Simon Willard Road	8	Asbestos Cement	340	FALSE	1970	130	82	0
Simon Willard Road	8	Asbestos Cement	916	FALSE	1970	130	74.9	0
Sioux Road	6	CIPP	360	FALSE	2017	130	82.7	0
Skyline Drive	8	Ductile Iron	665	FALSE	1995	130	103.6	0
Skyline Drive	8	Ductile Iron	367	FALSE	1995	130	111.8	0
Skyline Drive	8	Ductile Iron	169	FALSE	1995	110	104.8	0
Smart Road	8	Asbestos Cement	922	FALSE	1950	130	75.6	0
Smart Road	8	Asbestos Cement	672	FALSE	1950	130	75.6	0
Spencer Road	6	Asbestos Cement	338	FALSE	1960	120	86.1	3
Spencer Road	6	Asbestos Cement	329	FALSE	1960	120	91.6	2
Spencer Road	6	Asbestos Cement	528	FALSE	1960	120	91	2

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STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Split Rock	10	Asbestos Cement	610	FALSE	1970	130	74.2	0
Spruce Street	6	Asbestos Cement	463	FALSE	1950	120	86.1	0
Spruce Street	6	Asbestos Cement	719	FALSE	1950	120	86.1	0
Spruce Street	6	Asbestos Cement	910	FALSE	1950	120	84.9	0
Squirrel Hill Road	6	Asbestos Cement	1,054	FALSE	1970	130	45.5	0
Squirrel Hill Road	6	Ductile Iron	1,306	FALSE	2000	120	46.1	0
Squirrel Hill Road Extension	8	Asbestos Cement	691	FALSE	1960	130	45.5	0
St James Circle	8	Asbestos Cement	297	FALSE	1970	130	76.8	0
Stacys Way	6	Ductile Iron	1,348	FALSE	1999	110	100.1	0
Stoneymeade Way	8	Ductile Iron	369	FALSE	1970	110	93.6	0
Stoneymeade Way	8	Ductile Iron	792	FALSE	1991	110	99.6	0
Stoneymeade Way	8	Ductile Iron	2,569	FALSE	1991	110	93.5	0
Stow Street	6	Asbestos Cement	1,300	FALSE	1950	120	96.7	4
Stow Street	6	Asbestos Cement	56	FALSE	1950	120	96.7	3
Stow Street	8	Ductile Iron	963	FALSE	2014	120	96.2	0
Stow Street	8	Ductile Iron	464	FALSE	2014	120	96.7	0
Stow Street	8	Ductile Iron	840	FALSE	2014	120	96.7	0
Stow Street	8	HDPE	239	FALSE	2014	130	96.7	0
Sudbury Road	8	Asbestos Cement	559	FALSE	1970	130	119.9	0
Sudbury Road	8	Asbestos Cement	97	FALSE	1970	130	101.2	0
Summer Street	6	Cast Iron	853	FALSE	1920	80	80	0
Summer Street	6	Cast Iron	1,597	FALSE	1920	80	80.4	0
Summer Street	6	Cast Iron	345	FALSE	1920	80	84.3	0
Summer Street	6	Cast Iron	694	FALSE	1920	80	90	0
Summer Street	6	Cast Iron	778	FALSE	1920	80	80	0
Summer Street	6	Cast Iron	601	FALSE	1920	80	84.8	0
Summer Street	6	Cast Iron	437	FALSE	1920	80	84.1	0
Summer Street	12	Cast Iron	2,812	FALSE	1920	120	80	0
Summer Street	12	Cast Iron	647	FALSE	1920	120	87.2	0
Summer Street	12	Cast Iron	474	FALSE	1920	120	86.5	0
Summer Street	12	Cast Iron	563	FALSE	1920	120	84.1	0
Sutton Place	4	Ductile Iron	707	FALSE	1970	110	58.1	0
Sutton Place	2	Ductile Iron	259	FALSE	1970	110	60.8	0
Sutton Place	6	Ductile Iron	314	FALSE	1970	110	55.9	0
Sweetbriar Way	6	Ductile Iron	209	TRUE	1997	110	75.5	0
Sylvia Street	6	Ductile Iron	704	FALSE	1970	110	83	0

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Taylor Road	6	Asbestos Cement	1,030	FALSE	1960	120	107.6	0
Taylor Road	6	Asbestos Cement	378	FALSE	1960	120	108.8	0
Taylor Road	6	Asbestos Cement	824	FALSE	1960	120	111.8	0
Taylor Road	6	Asbestos Cement	725	FALSE	1950	120	90.8	0
Taylor Road	8	Ductile Iron	1,356	FALSE	1970	110	83.3	0
Taylor Road Extension	6	Asbestos Cement	195	FALSE	1960	120	109.3	0
Taylor Road Extension	6	Asbestos Cement	265	FALSE	1960	120	109.6	0
Taylor Road Extension	10	Asbestos Cement	359	FALSE	1960	130	107.6	0
Taylor Road Extension	10	Asbestos Cement	722	FALSE	1960	130	109.3	0
Taylor Road Extension	10	Asbestos Cement	592	FALSE	1960	130	109.6	0
Tenney Circle	6	Asbestos Cement	511	FALSE	1970	120	99.1	0
Thoreau Road	8	Asbestos Cement	699	FALSE	1958	130	103.4	1
Thoreau Road	8	Asbestos Cement	329	FALSE	1958	130	101	1
Thoreau Road	8	Asbestos Cement	329	FALSE	1958	130	101	0
Thoreau Road	8	Asbestos Cement	521	FALSE	1958	130	106.5	0
Ticonderoga Road	6	Asbestos Cement	415	FALSE	1960	120	52.7	0
Ticonderoga Road	8	Asbestos Cement	306	FALSE	1960	130	46.5	0
Ticonderoga Road	8	Asbestos Cement	315	FALSE	1960	130	44.7	0
Till Drive	8	Ductile Iron	245	FALSE	1980	110	104	0
Till Drive	8	Ductile Iron	654	FALSE	1980	110	101.4	0
Tinsdale Drive	6	Ductile Iron	149	FALSE	2000	110	100.1	0
Tinsdale Drive	8	Ductile Iron	286	FALSE	2000	110	100.8	0
Torrington Lane	8	Asbestos Cement	502	FALSE	1970	130	71.2	0
Town House Lane	6	Ductile Iron	596	FALSE	1970	110	101.9	0
Townsend Road	6	Asbestos Cement	642	FALSE	1950	120	66.1	0
Trask Road	8	Asbestos Cement	616	FALSE	1970	130	94.2	0
Tupelo Way	6	Ductile Iron	772	FALSE	1998	110	75.3	0
Tuttle Drive	6	Asbestos Cement	1,187	FALSE	1950	120	79.5	0
Tuttle Drive	6	Asbestos Cement	128	FALSE	1950	120	75.5	0
Tuttle Drive	8	Asbestos Cement	180	FALSE	1970	130	84.5	0
Tuttle Drive	8	Asbestos Cement	196	FALSE	1970	130	72.8	0
Tuttle Drive	8	Asbestos Cement	826	FALSE	1970	130	71.2	0
Tuttle Drive Extension	6	Asbestos Cement	349	FALSE	1950	120	92.2	0
Valley Road	8	Asbestos Cement	688	FALSE	1960	130	93.6	0
Vanderbelt Road	8	Ductile Iron	1,021	FALSE	1970	110	112.9	0
W Road	6	Asbestos Cement	508	FALSE	1960	120	90.9	0

Water Main Prioritization
Acton Water District

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Wachusett Drive	8	Asbestos Cement	607	FALSE	1960	130	79	0
Walnut Street	6	Ductile Iron	568	FALSE	1995	110	83.2	0
Wampanoag Drive	6	Asbestos Cement	635	FALSE	1960	120	63.5	0
Wampus Avenue	6	Ductile Iron	698	FALSE	1970	110	99.2	0
Washington Drive	8	Asbestos Cement	644	TRUE	1970	130	83.6	0
Washington Drive	8	Asbestos Cement	1,238	TRUE	1970	130	73.2	0
Washington Drive	8	Asbestos Cement	343	TRUE	1970	130	62.9	0
Washington Drive	8	Asbestos Cement	1,987	TRUE	1970	130	59.4	0
Washington Drive	8	Asbestos Cement	464	FALSE	1970	130	91.2	0
Washington Drive Extension	8	Ductile Iron	1,618	TRUE	1970	130	81.5	0
Wayside Lane	8	Asbestos Cement	303	FALSE	1970	130	83	0
Westford Lane	8	Ductile Iron	1,212	FALSE	2007	130	71.9	0
Westside Drive	8	Asbestos Cement	357	FALSE	1970	130	101.2	0
Wetherbee Street	10	Ductile Iron	2,258	FALSE	1970	130	120.6	0
Wetherbee Street	10	HDPE	263	FALSE	1970	130	116.9	0
Wheeler Lane	8	Ductile Iron	705	FALSE	1980	110	102.9	0
Wheelwright	6	Ductile Iron	171	TRUE	1997	110	76.3	0
Whispering Way	6	Ductile Iron	264	TRUE	1997	110	61.7	0
Whittier Drive	8	Asbestos Cement	527	FALSE	1960	130	104.1	1
Whittier Drive	8	Asbestos Cement	659	FALSE	1960	130	94.7	1
Whittier Drive	8	Asbestos Cement	557	FALSE	1960	130	94.7	1
Willis Holden Drive	8	Asbestos Cement	135	FALSE	1965	130	59.4	0
Willis Holden Drive	8	Asbestos Cement	1,593	FALSE	1965	130	55.5	0
Willow Street	6	Asbestos Cement	214	FALSE	1960	140	86.3	0
Willow Street	6	Asbestos Cement	351	FALSE	1959	120	87.2	0
Willow Street	6	Asbestos Cement	1,247	FALSE	1950	140	92.9	0
Willow Street	6	Asbestos Cement	526	FALSE	1950	120	87.2	0
Willow Street	6	Asbestos Cement	640	FALSE	1950	120	88.4	0
Willow Street	6	Asbestos Cement	632	FALSE	1950	140	86.4	0
Willow Street	6	Asbestos Cement	501	FALSE	1950	140	88.6	0
Willow Street	6	Asbestos Cement	616	FALSE	1950	140	88.2	0
Willow Street	6	Asbestos Cement	636	FALSE	1970	140	92.9	0
Willow Street	6	Ductile Iron	50	FALSE	1970	110	87.7	0
Wilson Lane	8	Asbestos Cement	1,082	TRUE	1970	130	59.4	0
Windemere Drive	6	Asbestos Cement	314	FALSE	1970	120	61	0
Windemere Drive	6	Asbestos Cement	1,206	FALSE	1970	120	56.1	0

Water Main Prioritization
Acton Water District

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS
Windingwood Lane	6	Ductile Iron	567	TRUE	1997	110	79.1	0
Windsor Avenue	10	Cast Iron	1,114	FALSE	1910	100	92.6	0
Windsor Avenue	10	Cast Iron	1,267	FALSE	1910	100	88.5	0
Windsor Avenue	10	Cast Iron	316	FALSE	1910	100	83.9	0
Windsor Avenue Extension	10	Cast Iron	379	FALSE	1910	100	88.5	0
Wingate Lane	8	Ductile Iron	195	FALSE	1970	110	91.4	0
Wingate Lane	8	Ductile Iron	1,236	FALSE	1970	110	95.7	0
Wingate Lane	8	Ductile Iron	375	FALSE	1970	110	91.4	0
Wingate Lane Extension	8	Asbestos Cement	456	FALSE	1968	130	95.3	0
Wingate Lane Extension	8	Ductile Iron	384	FALSE	1970	110	95.7	0
Winter Street	6	Ductile Iron	824	FALSE	1970	110	84.3	0
Wood Lane	6	Asbestos Cement	1,788	FALSE	1957	120	64.8	0
Woodbury Lane	6	Asbestos Cement	1,757	TRUE	1960	120	92.8	0
Woodchester Drive	6	Asbestos Cement	468	FALSE	1970	120	56.1	0
Woodchester Drive	6	Asbestos Cement	914	FALSE	1970	120	43.3	0
Woodfield Road	8	Asbestos Cement	145	FALSE	1970	130	80.4	0
Woodfield Road	8	Asbestos Cement	744	FALSE	1970	130	80.4	0
Wright Terrace	6	Ductile Iron	404	FALSE	1970	110	72.4	0

Appendix B

Water Main Improvement Plan (Prioritized)

Water Main Prioritization
Acton Water District

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS	RANKING: PIPE DIAMETER 15%	MATERIAL 20%	DATE 20%	WATER QUALITY 15%	STATIC PRESSURE 5%	BREAK HISTORY 25%	SUM 100%
Arlington Street	6	Asbestos Cement	774	FALSE	1950	130	84.8	4	100	100	80	0	60	100	79
Stow Street	6	Asbestos Cement	1,300	FALSE	1950	120	96.7	4	100	100	80	0	60	100	79
Billings Street	6	Asbestos Cement	1,101	TRUE	1950	120	87.1	1	100	100	80	100	60	40	79
Robbins Street	8	Asbestos Cement	411	TRUE	1950	120	91.3	2	40	100	80	100	60	60	75
Robbins Street	8	Asbestos Cement	377	TRUE	1950	120	87.1	2	40	100	80	100	60	60	75
Arlington Street	6	Asbestos Cement	1,051	FALSE	1960	130	87.7	3	100	100	80	0	60	80	74
Stow Street	6	Asbestos Cement	56	FALSE	1950	120	96.7	3	100	100	80	0	60	80	74
Prospect Street	6	Asbestos Cement	1,135	FALSE	1950	120	86.1	3	100	100	80	0	60	80	74
Spencer Road	6	Asbestos Cement	338	FALSE	1960	120	86.1	3	100	100	80	0	60	80	74
Arlington Street	6	Asbestos Cement	423	FALSE	1950	120	86.5	3	100	100	80	0	60	80	74
Prospect Street	6	Asbestos Cement	513	FALSE	1960	120	79.5	3	100	100	80	0	20	80	72
Charter Road	6	Asbestos Cement	361	FALSE	1950	120	82.5	2	100	100	80	0	60	60	69
Woodbury Lane	6	Asbestos Cement	1,757	TRUE	1960	120	92.8	0	100	100	80	100	60	0	69
Putnam Road	6	Asbestos Cement	635	TRUE	1960	120	83.1	0	100	100	80	100	60	0	69
Putnam Road	6	Asbestos Cement	479	TRUE	1960	120	83.1	0	100	100	80	100	60	0	69
Charter Road	6	Asbestos Cement	245	FALSE	1950	120	80.5	2	100	100	80	0	60	60	69
Charter Road	6	Asbestos Cement	255	FALSE	1950	120	81.3	2	100	100	80	0	60	60	69
Spencer Road	6	Asbestos Cement	329	FALSE	1960	120	91.6	2	100	100	80	0	60	60	69
Spencer Road	6	Asbestos Cement	528	FALSE	1960	120	91	2	100	100	80	0	60	60	69
Huron Road	6	Asbestos Cement	342	FALSE	1959	120	65.2	2	100	100	80	0	20	60	67
Huron Road	6	Asbestos Cement	295	FALSE	1959	120	68.4	2	100	100	80	0	20	60	67
Nagog Hill Road	6	Asbestos Cement	1,715	FALSE	1950	120	73.2	2	100	100	80	0	20	60	67
Prospect Street	6	Asbestos Cement	794	FALSE	1950	120	77.3	2	100	100	80	0	20	60	67
Nagog Hill Road	6	Asbestos Cement	293	FALSE	1950	120	74.8	2	100	100	80	0	20	60	67
Prospect Street	6	Asbestos Cement	1,039	FALSE	1950	120	77.3	2	100	100	80	0	20	60	67
Prospect Street	6	Asbestos Cement	409	FALSE	1950	120	76.8	2	100	100	80	0	20	60	67
Lawsbrook Road	6	Asbestos Cement	199	FALSE	1970	120	113.5	2	100	100	60	0	80	60	66
Oakwood Road	8	Asbestos Cement	613	FALSE	1957	130	112.5	3	40	100	80	0	80	80	66
Oakwood Road	8	Asbestos Cement	319	FALSE	1950	130	101.1	3	40	100	80	0	80	80	66
Alcott Street	8	Asbestos Cement	889	FALSE	1958	130	106.2	3	40	100	80	0	80	80	66
Oakwood Road	8	Asbestos Cement	1,010	FALSE	1950	130	97.6	3	40	100	80	0	60	80	65
Pinewood Road	6	Asbestos Cement	795	FALSE	1950	120	100.7	1	100	100	80	0	80	40	65
Oakwood Road	8	Asbestos Cement	334	FALSE	1950	130	96.1	3	40	100	80	0	60	80	65
Massachusetts Avenue	8	Asbestos Cement	1,106	FALSE	1960	130	87.6	3	40	100	80	0	60	80	65
Marian Road	6	Asbestos Cement	300	FALSE	1960	130	88.6	1	100	100	80	0	60	40	64
Marian Road	6	Asbestos Cement	348	FALSE	1960	130	87.2	1	100	100	80	0	60	40	64
Marian Road	6	Asbestos Cement	560	FALSE	1960	130	84.9	1	100	100	80	0	60	40	64
Algonquin Road	6	Asbestos Cement	1,291	FALSE	1959	120	81.3	1	100	100	80	0	60	40	64
Arlington Street	6	Asbestos Cement	273	FALSE	1950	120	88.2	1	100	100	80	0	60	40	64
Arlington Street	6	Asbestos Cement	230	FALSE	1950	120	87.7	1	100	100	80	0	60	40	64
Massachusetts Avenue Extension	6	Asbestos Cement	603	FALSE	1960	120	97.4	1	100	100	80	0	60	40	64
Arlington Street	6	Cast Iron	613	FALSE	1910	80	81	1	100	70	100	0	60	40	62
Arlington Street	6	Cast Iron	62	FALSE	1910	80	91.9	1	100	70	100	0	60	40	62
Arlington Street	6	Cast Iron	648	FALSE	1910	80	90.9	1	100	70	100	0	60	40	62

Water Main Prioritization
Acton Water District

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS	RANKING: PIPE DIAMETER 15%	RANKING: MATERIAL 20%	RANKING: DATE 20%	RANKING: WATER QUALITY 15%	RANKING: STATIC PRESSURE 5%	RANKING: BREAK HISTORY 25%	RANKING: SUM 100%
Newtown Road	6	Asbestos Cement	704	FALSE	1960	120	77.5	1	100	100	80	0	20	40	62
Prospect Street	6	Asbestos Cement	1,064	FALSE	1950	120	75.3	1	100	100	80	0	20	40	62
Marian Road	6	Asbestos Cement	309	FALSE	1960	130	64.4	1	100	100	80	0	20	40	62
Carriage Drive	8	Asbestos Cement	207	TRUE	1965	130	119.1	0	40	100	80	100	80	0	61
Olde Surrey Drive	8	Asbestos Cement	302	TRUE	1965	130	111.1	0	40	100	80	100	80	0	61
Gioconda Avenue	8	Asbestos Cement	236	TRUE	1965	130	100.6	0	40	100	80	100	80	0	61
Pondview Drive	8	Asbestos Cement	699	TRUE	1965	130	113.8	0	40	100	80	100	80	0	61
Hillcrest Drive	8	Asbestos Cement	452	TRUE	1965	130	117	0	40	100	80	100	80	0	61
Olde Surrey Drive	8	Asbestos Cement	872	TRUE	1965	130	100.6	0	40	100	80	100	80	0	61
Hillcrest Drive	8	Asbestos Cement	991	TRUE	1965	130	117	0	40	100	80	100	80	0	61
Hillcrest Drive	8	Asbestos Cement	355	TRUE	1965	130	100.4	0	40	100	80	100	80	0	61
Carriage Drive	8	Asbestos Cement	514	TRUE	1965	130	113.8	0	40	100	80	100	80	0	61
Clover Hill Road	8	Asbestos Cement	418	TRUE	1960	130	109.5	0	40	100	80	100	80	0	61
Carriage Drive	8	Asbestos Cement	706	TRUE	1965	130	109.5	0	40	100	80	100	80	0	61
Hosmer Street	8	Asbestos Cement	658	FALSE	1960	130	112	2	40	100	80	0	80	60	61
Foster Street	8	Asbestos Cement	819	FALSE	1960	130	118.4	2	40	100	80	0	80	60	61
Hosmer Street	8	Asbestos Cement	397	FALSE	1960	130	113.9	2	40	100	80	0	80	60	61
Hosmer Street	8	Asbestos Cement	195	FALSE	1950	130	117	2	40	100	80	0	80	60	61
Hosmer Street	8	Asbestos Cement	953	FALSE	1950	130	116.2	2	40	100	80	0	80	60	61
Hosmer Street	8	Asbestos Cement	272	FALSE	1950	130	101.8	2	40	100	80	0	80	60	61
Massachusetts Avenue	8	Asbestos Cement	317	FALSE	1960	130	101.9	2	40	100	80	0	80	60	61
Massachusetts Avenue	8	Asbestos Cement	1,643	FALSE	1960	130	100.3	2	40	100	80	0	80	60	61
Alcott Street	8	Asbestos Cement	1,173	FALSE	1958	130	108.5	2	40	100	80	0	80	60	61
Emerson Drive	8	Asbestos Cement	338	FALSE	1958	130	107	2	40	100	80	0	80	60	61
Emerson Drive	8	Asbestos Cement	479	FALSE	1958	130	107	2	40	100	80	0	80	60	61
Hawthorne Street	8	Asbestos Cement	804	FALSE	1958	130	103.4	2	40	100	80	0	80	60	61
Gioconda Avenue	8	Asbestos Cement	497	TRUE	1965	130	100.4	0	40	100	80	100	80	0	61
Hosmer Street	8	Asbestos Cement	1,352	FALSE	1960	130	104	2	40	100	80	0	80	60	61
Massachusetts Avenue	8	Asbestos Cement	468	FALSE	1960	130	104.3	2	40	100	80	0	80	60	61
Hosmer Street	8	Asbestos Cement	663	FALSE	1960	130	104	2	40	100	80	0	80	60	61
Hosmer Street	8	Asbestos Cement	171	FALSE	1960	130	104	2	40	100	80	0	80	60	61
Arlington Street	8	Asbestos Cement	918	FALSE	1950	130	86.5	2	40	100	80	0	60	60	60
Birch Ridge Road	8	Asbestos Cement	1,386	FALSE	1958	130	87.1	2	40	100	80	0	60	60	60
Birch Ridge Road	8	Asbestos Cement	313	FALSE	1950	130	86.7	2	40	100	80	0	60	60	60
Pondview Drive	8	Asbestos Cement	823	TRUE	1965	130	94.2	0	40	100	80	100	60	0	60
Parker Street	8	Cast Iron	836	FALSE	1910	80	120.5	2	40	70	100	0	100	60	60
Hosmer Street	8	Asbestos Cement	210	FALSE	1950	130	99.4	2	40	100	80	0	60	60	60
Hosmer Street	8	Asbestos Cement	432	FALSE	1960	130	98	2	40	100	80	0	60	60	60
Jefferson Drive	8	Asbestos Cement	1,225	TRUE	1960	130	90	0	40	100	80	100	60	0	60
Musket Drive	8	Asbestos Cement	324	TRUE	1960	130	90	0	40	100	80	100	60	0	60
Musket Drive	8	Asbestos Cement	302	TRUE	1960	130	83	0	40	100	80	100	60	0	60
Revolutionary Road	8	Asbestos Cement	1,112	TRUE	1960	130	84.3	0	40	100	80	100	60	0	60
Patriots Road	8	Asbestos Cement	811	TRUE	1960	130	89.6	0	40	100	80	100	60	0	60
Meadowbrook Road	8	Asbestos Cement	414	TRUE	1960	130	89.6	0	40	100	80	100	60	0	60

Water Main Prioritization
Acton Water District

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS	RANKING						
									PIPE DIAMETER 15%	MATERIAL 20%	DATE 20%	WATER QUALITY 15%	STATIC PRESSURE 5%	BREAK HISTORY 25%	SUM 100%
Meadowbrook Road	8	Asbestos Cement	567	TRUE	1960	130	92.8	0	40	100	80	100	60	0	60
Gioconda Avenue	8	Asbestos Cement	463	TRUE	1965	130	87.3	0	40	100	80	100	60	0	60
Fox Hill Road	8	Asbestos Cement	209	TRUE	1965	130	87.3	0	40	100	80	100	60	0	60
Flint Road	8	Asbestos Cement	334	FALSE	1960	130	91.8	2	40	100	80	0	60	60	60
Flint Road	8	Asbestos Cement	897	FALSE	1960	130	92.2	2	40	100	80	0	60	60	60
Flint Road	8	Asbestos Cement	336	FALSE	1960	130	92.2	2	40	100	80	0	60	60	60
Arlington Street	6	Cast Iron	552	FALSE	1950	80	91.9	1	100	70	80	0	60	40	58
Arlington Street	6	Cast Iron	583	FALSE	1950	80	91.5	1	100	70	80	0	60	40	58
Fife and Drum Road	8	Asbestos Cement	749	TRUE	1960	130	74.7	0	40	100	80	100	20	0	58
Musket Drive	8	Asbestos Cement	262	TRUE	1960	130	71	0	40	100	80	100	20	0	58
Musket Drive	8	Asbestos Cement	321	TRUE	1960	130	74.7	0	40	100	80	100	20	0	58
John Swift Road	8	Asbestos Cement	1,849	TRUE	1960	130	71	0	40	100	80	100	20	0	58
Patriots Road	8	Asbestos Cement	955	TRUE	1960	130	79.1	0	40	100	80	100	20	0	58
Newtown Road	8	Asbestos Cement	1,079	FALSE	1965	130	69.3	2	40	100	80	0	20	60	58
Robinwood Road	8	Asbestos Cement	474	TRUE	1970	130	116.2	0	40	100	60	100	80	0	57
Robinwood Road	8	Asbestos Cement	603	TRUE	1970	130	114.3	0	40	100	60	100	80	0	57
Robinwood Road	8	Asbestos Cement	2,703	TRUE	1970	130	110.7	0	40	100	60	100	80	0	57
Lawsbrook Road	8	Asbestos Cement	309	FALSE	1970	130	114.8	2	40	100	60	0	80	60	57
Carlton Drive	8	Asbestos Cement	707	TRUE	1970	130	87.6	0	40	100	60	100	60	0	56
Carlton Drive	8	Asbestos Cement	1,033	TRUE	1970	130	87	0	40	100	60	100	60	0	56
School Street	8	Asbestos Cement	443	FALSE	1960	130	115.2	1	40	100	80	0	80	40	56
Brucewood Road	8	Asbestos Cement	832	FALSE	1950	130	100	1	40	100	80	0	80	40	56
Brucewood Road	8	Asbestos Cement	637	FALSE	1957	130	103.7	1	40	100	80	0	80	40	56
Brucewood Road	8	Asbestos Cement	350	FALSE	1957	130	114	1	40	100	80	0	80	40	56
Coolidge Drive	8	Asbestos Cement	647	TRUE	1970	130	83.6	0	40	100	60	100	60	0	56
Revolutionary Road	8	Asbestos Cement	1,014	TRUE	1970	130	83	0	40	100	60	100	60	0	56
Old Village Road	8	Asbestos Cement	1,444	FALSE	1965	130	105.1	1	40	100	80	0	80	40	56
Cricket Way	8	Asbestos Cement	364	FALSE	1965	130	105.1	1	40	100	80	0	80	40	56
Hosmer Street	8	Asbestos Cement	242	FALSE	1960	130	101.9	1	40	100	80	0	80	40	56
Alcott Street	8	Asbestos Cement	471	FALSE	1958	130	101.4	1	40	100	80	0	80	40	56
Hawthorne Street	8	Asbestos Cement	301	FALSE	1958	130	106.5	1	40	100	80	0	80	40	56
Thoreau Road	8	Asbestos Cement	699	FALSE	1958	130	103.4	1	40	100	80	0	80	40	56
Thoreau Road	8	Asbestos Cement	329	FALSE	1958	130	101	1	40	100	80	0	80	40	56
Alcott Street	8	Asbestos Cement	737	FALSE	1958	130	105.8	1	40	100	80	0	80	40	56
Lawsbrook Road	8	Asbestos Cement	932	FALSE	1950	130	115.9	1	40	100	80	0	80	40	56
Whittier Drive	8	Asbestos Cement	527	FALSE	1960	130	104.1	1	40	100	80	0	80	40	56
Flint Road	8	Asbestos Cement	491	FALSE	1970	130	92	2	40	100	60	0	60	60	56
Flint Road	8	Asbestos Cement	379	FALSE	1970	130	92.2	2	40	100	60	0	60	60	56
Washington Drive	8	Asbestos Cement	644	TRUE	1970	130	83.6	0	40	100	60	100	60	0	56
Birch Ridge Road	8	Asbestos Cement	307	FALSE	1955	130	84.9	1	40	100	80	0	60	40	55
Central Street	8	Asbestos Cement	394	FALSE	1950	130	92.1	1	40	100	80	0	60	40	55
Central Street	8	Asbestos Cement	1,292	FALSE	1950	130	91	1	40	100	80	0	60	40	55
Robbins Street	8	Asbestos Cement	720	FALSE	1950	130	90.7	1	40	100	80	0	60	40	55
Lawsbrook Road	6	Asbestos Cement	455	FALSE	1960	120	101.3	0	100	100	80	0	80	0	55

Water Main Prioritization
Acton Water District

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS	RANKING PIPE DIAMETER 15%	MATERIAL 20%	DATE 20%	WATER QUALITY 15%	STATIC PRESSURE 5%	BREAK HISTORY 25%	SUM 100%
Bellantoni Drive	6	Asbestos Cement	365	FALSE	1960	120	104.5	0	100	100	80	0	80	0	55
Lawsbrook Road	6	Asbestos Cement	210	FALSE	1960	120	104.5	0	100	100	80	0	80	0	55
Lawsbrook Road Extension	6	Asbestos Cement	870	FALSE	1960	120	110.7	0	100	100	80	0	80	0	55
Lawsbrook Road	6	Asbestos Cement	232	FALSE	1960	120	110.7	0	100	100	80	0	80	0	55
School Street	6	Asbestos Cement	1,528	FALSE	1950	120	115.2	0	100	100	80	0	80	0	55
Brucewood Road	8	Asbestos Cement	319	FALSE	1950	130	96.8	1	40	100	80	0	60	40	55
Brucewood Road	8	Asbestos Cement	562	FALSE	1950	130	93.5	1	40	100	80	0	60	40	55
Redwood Road	6	Asbestos Cement	582	FALSE	1950	120	100	0	100	100	80	0	80	0	55
Hosmer Street Extension	6	Asbestos Cement	1,329	FALSE	1960	120	108.5	0	100	100	80	0	80	0	55
Hosmer Street Extension	6	Asbestos Cement	458	FALSE	1960	120	108.5	0	100	100	80	0	80	0	55
Piper Road	6	Asbestos Cement	188	FALSE	1960	120	108.8	0	100	100	80	0	80	0	55
Old Village Road	8	Asbestos Cement	223	FALSE	1965	130	97.8	1	40	100	80	0	60	40	55
Old Village Road	8	Asbestos Cement	434	FALSE	1965	130	90.5	1	40	100	80	0	60	40	55
Whittier Drive	8	Asbestos Cement	659	FALSE	1960	130	94.7	1	40	100	80	0	60	40	55
Whittier Drive	8	Asbestos Cement	557	FALSE	1960	130	94.7	1	40	100	80	0	60	40	55
Discovery Way	6	Asbestos Cement	1,139	FALSE	1950	120	108.8	0	100	100	80	0	80	0	55
Magnolia Drive	6	Asbestos Cement	110	FALSE	1968	120	106.9	0	100	100	80	0	80	0	55
Taylor Road	6	Asbestos Cement	1,030	FALSE	1960	120	107.6	0	100	100	80	0	80	0	55
Taylor Road Extension	6	Asbestos Cement	195	FALSE	1960	120	109.3	0	100	100	80	0	80	0	55
Taylor Road Extension	6	Asbestos Cement	265	FALSE	1960	120	109.6	0	100	100	80	0	80	0	55
Old Colony Lane	6	Asbestos Cement	414	FALSE	1960	120	101.3	0	100	100	80	0	80	0	55
Lawsbrook Road	6	Asbestos Cement	210	FALSE	1960	120	101.3	0	100	100	80	0	80	0	55
Taylor Road	6	Asbestos Cement	378	FALSE	1960	120	108.8	0	100	100	80	0	80	0	55
Taylor Road	6	Asbestos Cement	824	FALSE	1960	120	111.8	0	100	100	80	0	80	0	55
Massachusetts Avenue Extension	8	Asbestos Cement	880	FALSE	1950	130	90.5	1	40	100	80	0	60	40	55
Barker Road	6	Asbestos Cement	969	FALSE	1955	120	111.8	0	100	100	80	0	80	0	55
Central Street	8	Asbestos Cement	386	FALSE	1950	130	82	1	40	100	80	0	60	40	55
Central Street	8	Asbestos Cement	1,083	FALSE	1950	130	80.8	1	40	100	80	0	60	40	55
Piper Road	6	Asbestos Cement	466	FALSE	1950	120	108.8	0	100	100	80	0	80	0	55
Piper Road	6	Asbestos Cement	351	FALSE	1950	120	107.4	0	100	100	80	0	80	0	55
Main Street	12	Cast Iron	344	FALSE	1950	130	95.9	3	10	70	80	0	60	80	54.5
Main Street	12	Cast Iron	934	FALSE	1950	130	96.8	3	10	70	80	0	60	80	54.5
Willow Street	6	Asbestos Cement	214	FALSE	1960	140	86.3	0	100	100	80	0	60	0	54
Willow Street	6	Asbestos Cement	351	FALSE	1959	120	87.2	0	100	100	80	0	60	0	54
Willow Street	6	Asbestos Cement	1,247	FALSE	1950	140	92.9	0	100	100	80	0	60	0	54
Willow Street	6	Asbestos Cement	526	FALSE	1950	120	87.2	0	100	100	80	0	60	0	54
Willow Street	6	Asbestos Cement	640	FALSE	1950	120	88.4	0	100	100	80	0	60	0	54
Homestead Street	6	Asbestos Cement	1,328	FALSE	1950	120	88.2	0	100	100	80	0	60	0	54
Church Street	6	Asbestos Cement	581	FALSE	1950	120	86	0	100	100	80	0	60	0	54
Central Street	6	Asbestos Cement	432	FALSE	1950	120	86	0	100	100	80	0	60	0	54
Spruce Street	6	Asbestos Cement	463	FALSE	1950	120	86.1	0	100	100	80	0	60	0	54
Spruce Street	6	Asbestos Cement	719	FALSE	1950	120	86.1	0	100	100	80	0	60	0	54
Spruce Street	6	Asbestos Cement	910	FALSE	1950	120	84.9	0	100	100	80	0	60	0	54
W Road	6	Asbestos Cement	508	FALSE	1960	120	90.9	0	100	100	80	0	60	0	54

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									RANKING						
STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS	PIPE DIAMETER 15%	MATERIAL 20%	DATE 20%	WATER QUALITY 15%	STATIC PRESSURE 5%	BREAK HISTORY 25%	SUM 100%
Houghton Lane	6	Asbestos Cement	392	FALSE	1960	120	91.5	0	100	100	80	0	60	0	54
Elm Street	6	Asbestos Cement	649	FALSE	1960	120	87.8	0	100	100	80	0	60	0	54
Orchard Drive	6	Asbestos Cement	1,184	FALSE	1950	120	82	0	100	100	80	0	60	0	54
Perkins Lane	6	Asbestos Cement	428	FALSE	1950	120	92.1	0	100	100	80	0	60	0	54
Kinsley Road	6	Asbestos Cement	1,450	FALSE	1950	120	83.8	0	100	100	80	0	60	0	54
Fraser Drive	6	Asbestos Cement	155	FALSE	1950	120	88.1	0	100	100	80	0	60	0	54
Baxter Road	6	Asbestos Cement	375	FALSE	1950	120	88.1	0	100	100	80	0	60	0	54
Fraser Drive	6	Asbestos Cement	362	FALSE	1950	120	88.1	0	100	100	80	0	60	0	54
Kinsley Road	6	Asbestos Cement	558	FALSE	1950	120	88.1	0	100	100	80	0	60	0	54
Nash Road	6	Asbestos Cement	543	FALSE	1950	120	92.6	0	100	100	80	0	60	0	54
Nash Road	6	Asbestos Cement	616	FALSE	1950	120	92.5	0	100	100	80	0	60	0	54
Liberty Street	6	Asbestos Cement	1,161	FALSE	1950	120	90.7	0	100	100	80	0	60	0	54
Nash Road	6	Asbestos Cement	809	FALSE	1950	120	92.5	0	100	100	80	0	60	0	54
Nash Road	6	Asbestos Cement	200	FALSE	1950	120	92.5	0	100	100	80	0	60	0	54
Country Club Road	6	Asbestos Cement	333	FALSE	1950	120	87.2	0	100	100	80	0	60	0	54
Country Club Road	6	Asbestos Cement	230	FALSE	1950	120	92.4	0	100	100	80	0	60	0	54
Fairway Road	6	Asbestos Cement	427	FALSE	1950	120	92.4	0	100	100	80	0	60	0	54
Conant Street	6	Asbestos Cement	1,223	FALSE	1950	120	87.2	0	100	100	80	0	60	0	54
Parker Street	8	Cast Iron	749	FALSE	1910	80	109.1	1	40	70	100	0	80	40	54
School Street Extension	6	Asbestos Cement	420	FALSE	1950	120	95.1	0	100	100	80	0	60	0	54
Piper Road	6	Asbestos Cement	449	FALSE	1950	120	99.8	0	100	100	80	0	60	0	54
Lilac Court	6	Asbestos Cement	715	FALSE	1950	120	97	0	100	100	80	0	60	0	54
Piper Road	6	Asbestos Cement	480	FALSE	1950	120	97	0	100	100	80	0	60	0	54
Laurel Court	6	Asbestos Cement	450	FALSE	1950	120	93.5	0	100	100	80	0	60	0	54
Piper Road	6	Asbestos Cement	986	FALSE	1950	120	93.5	0	100	100	80	0	60	0	54
Piper Road	6	Asbestos Cement	503	FALSE	1950	120	96.8	0	100	100	80	0	60	0	54
Piper Road	6	Asbestos Cement	344	FALSE	1950	120	97.6	0	100	100	80	0	60	0	54
Redwood Road	6	Asbestos Cement	277	FALSE	1950	120	96.1	0	100	100	80	0	60	0	54
Ashwood Road	6	Asbestos Cement	729	FALSE	1950	120	96.1	0	100	100	80	0	60	0	54
Hosmer Street Extension	6	Asbestos Cement	623	FALSE	1960	120	99.6	0	100	100	80	0	60	0	54
Hosmer Street Extension	6	Asbestos Cement	1,040	FALSE	1960	120	98	0	100	100	80	0	60	0	54
Lincoln Drive	8	Asbestos Cement	1,252	TRUE	1970	130	69.3	0	40	100	60	100	20	0	54
Lincoln Drive	8	Asbestos Cement	1,024	TRUE	1970	130	65	0	40	100	60	100	20	0	54
Jackson Drive	8	Asbestos Cement	547	TRUE	1970	130	74.4	0	40	100	60	100	20	0	54
Jackson Drive	8	Asbestos Cement	306	TRUE	1970	130	74.4	0	40	100	60	100	20	0	54
Madison Lane	8	Asbestos Cement	1,136	TRUE	1970	130	71	0	40	100	60	100	20	0	54
Jackson Drive	8	Asbestos Cement	357	TRUE	1970	130	71	0	40	100	60	100	20	0	54
Washington Drive	8	Asbestos Cement	1,238	TRUE	1970	130	73.2	0	40	100	60	100	20	0	54
Washington Drive	8	Asbestos Cement	343	TRUE	1970	130	62.9	0	40	100	60	100	20	0	54
Washington Drive	8	Asbestos Cement	1,987	TRUE	1970	130	59.4	0	40	100	60	100	20	0	54
Coolidge Drive	8	Asbestos Cement	868	TRUE	1970	130	66	0	40	100	60	100	20	0	54
Wilson Lane	8	Asbestos Cement	1,082	TRUE	1970	130	59.4	0	40	100	60	100	20	0	54
Charter Road Extension	6	Asbestos Cement	460	FALSE	1950	120	81.8	0	100	100	80	0	60	0	54
Massachusetts Avenue Extension	6	Asbestos Cement	140	FALSE	1960	120	97.1	0	100	100	80	0	60	0	54

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STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS	RANKING PIPE DIAMETER 15%	MATERIAL 20%	DATE 20%	WATER QUALITY 15%	STATIC PRESSURE 5%	BREAK HISTORY 25%	SUM 100%
Piper Road	6	Asbestos Cement	840	FALSE	1950	120	94.4	0	100	100	80	0	60	0	54
Hosmer Street Extension	6	Asbestos Cement	1,216	FALSE	1960	120	98	0	100	100	80	0	60	0	54
Greenwood Lane	6	Asbestos Cement	305	FALSE	1960	120	86.8	0	100	100	80	0	60	0	54
Greenwood Lane	6	Asbestos Cement	306	FALSE	1960	120	89.8	0	100	100	80	0	60	0	54
Hemlock Lane	6	Asbestos Cement	1,237	FALSE	1960	120	80.8	0	100	100	80	0	60	0	54
Phlox Lane	6	Asbestos Cement	941	FALSE	1968	120	95.3	0	100	100	80	0	60	0	54
Lawsbrook Road	6	Asbestos Cement	80	FALSE	1960	120	98.8	0	100	100	80	0	60	0	54
Maple Street	6	Asbestos Cement	414	FALSE	1950	120	95.3	0	100	100	80	0	60	0	54
Durkee Road	6	Asbestos Cement	1,106	FALSE	1960	120	91.6	0	100	100	80	0	60	0	54
Lothrop Road	6	Asbestos Cement	1,252	FALSE	1950	120	91	0	100	100	80	0	60	0	54
Lothrop Road	6	Asbestos Cement	238	FALSE	1950	120	92.2	0	100	100	80	0	60	0	54
Tuttle Drive Extension	6	Asbestos Cement	349	FALSE	1950	120	92.2	0	100	100	80	0	60	0	54
Central Street	6	Asbestos Cement	1,920	FALSE	1950	120	81	0	100	100	80	0	60	0	54
Central Street	6	Asbestos Cement	683	FALSE	1950	120	91.7	0	100	100	80	0	60	0	54
Haynes Court	6	Asbestos Cement	343	FALSE	1950	120	87.7	0	100	100	80	0	60	0	54
Jackson Drive	8	Asbestos Cement	1,270	TRUE	1970	130	73.2	0	40	100	60	100	20	0	54
Nashoba Road	6	Asbestos Cement	573	FALSE	1960	120	84.6	0	100	100	80	0	60	0	54
Taylor Road	6	Asbestos Cement	725	FALSE	1950	120	90.8	0	100	100	80	0	60	0	54
Milbery Lane	6	Asbestos Cement	265	FALSE	1950	120	84.1	0	100	100	80	0	60	0	54
Autumn Lane	6	Asbestos Cement	384	FALSE	1950	120	84.1	0	100	100	80	0	60	0	54
Elm Street	6	Asbestos Cement	948	FALSE	1950	120	90.4	0	100	100	80	0	60	0	54
Elm Street	6	Asbestos Cement	340	FALSE	1950	120	87.8	0	100	100	80	0	60	0	54
Elm Street	6	Asbestos Cement	625	FALSE	1960	120	87.8	0	100	100	80	0	60	0	54
Willow Street	6	Asbestos Cement	632	FALSE	1950	140	86.4	0	100	100	80	0	60	0	54
Willow Street	6	Asbestos Cement	501	FALSE	1950	140	88.6	0	100	100	80	0	60	0	54
Willow Street	6	Asbestos Cement	616	FALSE	1950	140	88.2	0	100	100	80	0	60	0	54
Paul Revere Road	8	Asbestos Cement	335	FALSE	1960	130	71.2	1	40	100	80	0	20	40	53
Paul Revere Road	8	Asbestos Cement	1,693	FALSE	1960	130	69.6	1	40	100	80	0	20	40	53
Paul Revere Road	8	Asbestos Cement	311	FALSE	1960	130	72.6	1	40	100	80	0	20	40	53
Central Street	8	Asbestos Cement	557	FALSE	1950	130	76.5	1	40	100	80	0	20	40	53
Main Street	10	Cast Iron	715	FALSE	1920	100	77.5	2	20	70	100	0	20	60	53
Old Village Road	8	Asbestos Cement	1,028	FALSE	1965	130	74.8	1	40	100	80	0	20	40	53
Central Street	8	Asbestos Cement	87	FALSE	1950	130	76.5	1	40	100	80	0	20	40	53
Black Horse Drive	6	Asbestos Cement	304	FALSE	1960	120	45.2	0	100	100	80	0	20	0	52
Powder Horn Lane	6	Asbestos Cement	832	FALSE	1960	120	51.4	0	100	100	80	0	20	0	52
Black Horse Drive	6	Asbestos Cement	318	FALSE	1960	120	51.4	0	100	100	80	0	20	0	52
Flintlock Drive	6	Asbestos Cement	755	FALSE	1960	120	57	0	100	100	80	0	20	0	52
Black Horse Drive	6	Asbestos Cement	1,620	FALSE	1960	120	57	0	100	100	80	0	20	0	52
Ticonderoga Road	6	Asbestos Cement	415	FALSE	1960	120	52.7	0	100	100	80	0	20	0	52
Patrick Henry Circle	6	Asbestos Cement	435	FALSE	1960	120	69.6	0	100	100	80	0	20	0	52
Betsy Ross Circle	6	Asbestos Cement	386	FALSE	1960	120	72.6	0	100	100	80	0	20	0	52
Summer Street	6	Cast Iron	853	FALSE	1920	80	80	0	100	70	100	0	60	0	52
Summer Street	6	Cast Iron	1,597	FALSE	1920	80	80.4	0	100	70	100	0	60	0	52
Summer Street	6	Cast Iron	345	FALSE	1920	80	84.3	0	100	70	100	0	60	0	52

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STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS	RANKING: PIPE DIAMETER 15%	RANKING: MATERIAL 20%	RANKING: DATE 20%	RANKING: WATER QUALITY 15%	RANKING: STATIC PRESSURE 5%	RANKING: BREAK HISTORY 25%	SUM 100%
Townsend Road	6	Asbestos Cement	642	FALSE	1950	120	66.1	0	100	100	80	0	20	0	52
Nashoba Road	6	Asbestos Cement	695	FALSE	1960	120	79	0	100	100	80	0	20	0	52
Nashoba Road	6	Asbestos Cement	1,239	FALSE	1960	120	79	0	100	100	80	0	20	0	52
Nashoba Road	6	Asbestos Cement	285	FALSE	1960	120	64.4	0	100	100	80	0	20	0	52
Nashoba Road	6	Asbestos Cement	144	FALSE	1960	120	65.2	0	100	100	80	0	20	0	52
Nashoba Road	6	Asbestos Cement	193	FALSE	1960	120	63.5	0	100	100	80	0	20	0	52
Wampanoag Drive	6	Asbestos Cement	635	FALSE	1960	120	63.5	0	100	100	80	0	20	0	52
Cherokee Road	6	Asbestos Cement	730	FALSE	1960	120	64.4	0	100	100	80	0	20	0	52
Cherokee Road	6	Asbestos Cement	764	FALSE	1960	120	69.2	0	100	100	80	0	20	0	52
Central Street	6	Cast Iron	483	FALSE	1910	80	86.4	0	100	70	100	0	60	0	52
Massachusetts Avenue	6	Cast Iron	315	FALSE	1910	80	82.7	0	100	70	100	0	60	0	52
Massachusetts Avenue	6	Cast Iron	341	FALSE	1910	80	83.9	0	100	70	100	0	60	0	52
Martin Street	6	Cast Iron	784	FALSE	1910	60	88.2	0	100	70	100	0	60	0	52
Maple Street	6	Cast Iron	1,554	FALSE	1910	60	95.3	0	100	70	100	0	60	0	52
Massachusetts Avenue	6	Cast Iron	1,539	FALSE	1910	80	92.4	0	100	70	100	0	60	0	52
Deacon Hunt Drive	6	Asbestos Cement	1,182	FALSE	1960	120	61.4	0	100	100	80	0	20	0	52
Balsam Drive	6	Asbestos Cement	577	FALSE	1965	120	76.6	0	100	100	80	0	20	0	52
Newtown Road	10	Asbestos Cement	821	FALSE	1950	130	94.6	1	20	100	80	0	60	40	52
Wood Lane	6	Asbestos Cement	1,788	FALSE	1957	120	64.8	0	100	100	80	0	20	0	52
Concord Road	6	Cast Iron	615	FALSE	1940	70	88.1	0	100	70	100	0	60	0	52
Nagog Park Extension	6	Asbestos Cement	369	FALSE	1960	120	70.6	0	100	100	80	0	20	0	52
Concord Road	6	Cast Iron	323	FALSE	1940	70	81.6	0	100	70	100	0	60	0	52
Tuttle Drive	6	Asbestos Cement	1,187	FALSE	1950	120	79.5	0	100	100	80	0	20	0	52
Tuttle Drive	6	Asbestos Cement	128	FALSE	1950	120	75.5	0	100	100	80	0	20	0	52
Massachusetts Avenue	6	Cast Iron	744	FALSE	1920	80	87.2	0	100	70	100	0	60	0	52
Summer Street	6	Cast Iron	694	FALSE	1920	80	90	0	100	70	100	0	60	0	52
Summer Street	6	Cast Iron	778	FALSE	1920	80	80	0	100	70	100	0	60	0	52
Massachusetts Avenue	6	Cast Iron	527	FALSE	1920	80	89.1	0	100	70	100	0	60	0	52
Notre Dame Road	6	Asbestos Cement	230	FALSE	1960	130	76	0	100	100	80	0	20	0	52
Main Street	6	Cast Iron	176	FALSE	1910	60	83	0	100	70	100	0	60	0	52
Summer Street	6	Cast Iron	601	FALSE	1920	80	84.8	0	100	70	100	0	60	0	52
Summer Street	6	Cast Iron	437	FALSE	1920	80	84.1	0	100	70	100	0	60	0	52
Main Street	6	Cast Iron	1,067	FALSE	1910	60	95.1	0	100	70	100	0	60	0	52
Main Street	6	Cast Iron	815	FALSE	1910	60	82.9	0	100	70	100	0	60	0	52
Martin Street	6	Cast Iron	505	FALSE	1910	60	96	0	100	70	100	0	60	0	52
Martin Street	6	Cast Iron	611	FALSE	1910	60	98	0	100	70	100	0	60	0	52
Freedom Farme Road	8	Asbestos Cement	1,237	FALSE	1970	130	80.8	1	40	100	60	0	60	40	51
Freedom Farme Road	8	Asbestos Cement	433	FALSE	1970	130	89.8	1	40	100	60	0	60	40	51
Maillet Drive	6	Asbestos Cement	572	FALSE	1970	120	106.1	0	100	100	60	0	80	0	51
Main Street	10	Cast Iron	521	FALSE	1950	100	88	2	20	70	80	0	60	60	51
Parker Street	8	Cast Iron	245	FALSE	1950	80	120.5	1	40	70	80	0	100	40	51
Lisa Lane	6	Asbestos Cement	362	FALSE	1970	120	113.5	0	100	100	60	0	80	0	51
Grasshopper Lane Extension	6	Asbestos Cement	906	FALSE	1970	120	104.6	0	100	100	60	0	80	0	51
Mallard Road	8	Asbestos Cement	1,370	FALSE	1970	130	92	1	40	100	60	0	60	40	51

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Nagog Park	12	Asbestos Cement	257	FALSE	1960	130	83.1	1	10	100	80	0	60	40	50.5
Ethan Allen Drive	10	Asbestos Cement	797	FALSE	1960	130	42.6	1	20	100	80	0	20	40	50
Ethan Allen Drive	10	Asbestos Cement	744	FALSE	1960	130	45.2	1	20	100	80	0	20	40	50
Ethan Allen Drive	10	Asbestos Cement	318	FALSE	1960	130	71.2	1	20	100	80	0	20	40	50
Ethan Allen Drive	10	Asbestos Cement	829	FALSE	1960	130	73.9	1	20	100	80	0	20	40	50
Shady Lane	6	Asbestos Cement	339	FALSE	1970	120	80.4	0	100	100	60	0	60	0	50
Willow Street	6	Asbestos Cement	636	FALSE	1970	140	92.9	0	100	100	60	0	60	0	50
Massachusetts Avenue	6	Cast Iron	289	FALSE	1920	80	71.8	0	100	70	100	0	20	0	50
Massachusetts Avenue	6	Cast Iron	220	FALSE	1920	80	79.8	0	100	70	100	0	20	0	50
Central Street	6	Asbestos Cement	667	FALSE	1970	120	82.7	0	100	100	60	0	60	0	50
Kennedy Lane	6	Asbestos Cement	420	FALSE	1970	120	89.7	0	100	100	60	0	60	0	50
Liberty Street	6	Asbestos Cement	1,665	FALSE	1970	120	96.7	0	100	100	60	0	60	0	50
Farley Lane	6	Asbestos Cement	296	FALSE	1970	120	83.3	0	100	100	60	0	60	0	50
Tenney Circle	6	Asbestos Cement	511	FALSE	1970	120	99.1	0	100	100	60	0	60	0	50
Railroad Street	6	Asbestos Cement	513	FALSE	1970	120	87.1	0	100	100	60	0	60	0	50
Parker Street	8	Cast Iron	1,576	FALSE	1950	80	119.2	1	40	70	80	0	80	40	50
Parker Street	8	Cast Iron	1,136	FALSE	1950	80	112.6	1	40	70	80	0	80	40	50
Concord Road	6	Cast Iron	218	FALSE	1940	70	67.4	0	100	70	100	0	20	0	50
Parmley Drive	6	Asbestos Cement	278	FALSE	1970	120	95.8	0	100	100	60	0	60	0	50
Concord Place	6	Asbestos Cement	562	FALSE	1970	120	88.1	0	100	100	60	0	60	0	50
Half Moon Hill	6	Asbestos Cement	153	FALSE	1970	120	91.7	0	100	100	60	0	60	0	50
Half Moon Hill	6	Asbestos Cement	1,429	FALSE	1970	120	89.7	0	100	100	60	0	60	0	50
Half Moon Hill	6	Asbestos Cement	211	FALSE	1970	120	82.9	0	100	100	60	0	60	0	50
Massachusetts Avenue	6	Cast Iron	376	FALSE	1920	80	72.4	0	100	70	100	0	20	0	50
Concord Road	6	Cast Iron	235	FALSE	1940	70	64.8	0	100	70	100	0	20	0	50
Concord Road	6	Cast Iron	457	FALSE	1940	70	64.9	0	100	70	100	0	20	0	50
Concord Road	6	Cast Iron	838	FALSE	1940	70	64	0	100	70	100	0	20	0	50
Main Street	6	Cast Iron	202	FALSE	1910	60	74.9	0	100	70	100	0	20	0	50
Silver Hill Road	8	Asbestos Cement	2,316	FALSE	1970	130	68.4	1	40	100	60	0	20	40	49
Grist Mill Road	6	Asbestos Cement	305	FALSE	1970	120	76.9	0	100	100	60	0	20	0	48
Windemere Drive	6	Asbestos Cement	314	FALSE	1970	120	61	0	100	100	60	0	20	0	48
Woodchester Drive	6	Asbestos Cement	468	FALSE	1970	120	56.1	0	100	100	60	0	20	0	48
Windemere Drive	6	Asbestos Cement	1,206	FALSE	1970	120	56.1	0	100	100	60	0	20	0	48
Woodchester Drive	6	Asbestos Cement	914	FALSE	1970	120	43.3	0	100	100	60	0	20	0	48
Grist Mill Road	6	Asbestos Cement	1,508	FALSE	1970	120	61	0	100	100	60	0	20	0	48
Olde Lantern Road	6	Asbestos Cement	1,785	FALSE	1970	130	69.9	0	100	100	60	0	20	0	48
Squirrel Hill Road	6	Asbestos Cement	1,054	FALSE	1970	130	45.5	0	100	100	60	0	20	0	48
Martin Street	6	Cast Iron	711	FALSE	1950	80	96.7	0	100	70	80	0	60	0	48
Main Street	10	Cast Iron	1,317	FALSE	1930	100	76	1	20	70	100	0	20	40	48
Massachusetts Avenue	6	Cast Iron	595	FALSE	1960	80	87.6	0	100	70	80	0	60	0	48
Massachusetts Avenue	6	Cast Iron	482	FALSE	1960	80	82	0	100	70	80	0	60	0	48
Massachusetts Avenue	6	Cast Iron	611	FALSE	1960	80	84	0	100	70	80	0	60	0	48
Massachusetts Avenue	6	Cast Iron	747	FALSE	1960	80	92.2	0	100	70	80	0	60	0	48
Minuteman Road	6	Asbestos Cement	907	FALSE	1970	120	75.8	0	100	100	60	0	20	0	48

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STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS	RANKING: PIPE DIAMETER 15%	RANKING: MATERIAL 20%	RANKING: DATE 20%	RANKING: WATER QUALITY 15%	RANKING: STATIC PRESSURE 5%	RANKING: BREAK HISTORY 25%	RANKING: SUM 100%
Minuteman Road	6	Asbestos Cement	618	FALSE	1970	120	75.8	0	100	100	60	0	20	0	48
Concord Road	6	Cast Iron	306	FALSE	1950	70	98.5	0	100	70	80	0	60	0	48
Nagog Hill Road	6	Cast Iron	527	FALSE	1960	80	86.6	0	100	70	80	0	60	0	48
Nagog Hill Road	6	Cast Iron	643	FALSE	1960	80	80.8	0	100	70	80	0	60	0	48
Nagog Hill Road	6	Cast Iron	288	FALSE	1960	80	86.6	0	100	70	80	0	60	0	48
Nagog Hill Road	6	Cast Iron	295	FALSE	1960	80	86.8	0	100	70	80	0	60	0	48
Nonset Path Extension	6	Asbestos Cement	550	FALSE	1970	120	78.6	0	100	100	60	0	20	0	48
Old Stone Brook	6	Asbestos Cement	446	FALSE	1970	120	70.6	0	100	100	60	0	20	0	48
Great Elm Way	6	Asbestos Cement	318	FALSE	1970	120	70.6	0	100	100	60	0	20	0	48
Great Elm Way	6	Asbestos Cement	1,615	FALSE	1970	120	70.6	0	100	100	60	0	20	0	48
Massachusetts Avenue	6	Cast Iron	835	FALSE	1960	80	80.5	0	100	70	80	0	60	0	48
Massachusetts Avenue	6	Cast Iron	206	FALSE	1960	80	80.5	0	100	70	80	0	60	0	48
Old Meadow Lane	8	Asbestos Cement	659	FALSE	1960	130	120.3	0	40	100	80	0	100	0	47
Brookside Circle	8	Asbestos Cement	256	FALSE	1960	130	120.3	0	40	100	80	0	100	0	47
High Street Extension	8	Asbestos Cement	207	FALSE	1950	130	121.2	0	40	100	80	0	100	0	47
High Street Extension	8	Asbestos Cement	53	FALSE	1950	130	121.2	0	40	100	80	0	100	0	47
Knox Trail	8	Asbestos Cement	2,188	FALSE	1950	130	125	0	40	100	80	0	100	0	47
High Street Extension	8	Asbestos Cement	439	FALSE	1950	130	121.2	0	40	100	80	0	100	0	47
Knox Trail Extension	8	Asbestos Cement	730	FALSE	1950	130	121.2	0	40	100	80	0	100	0	47
High Street Extension	8	Asbestos Cement	187	FALSE	1950	130	121.2	0	40	100	80	0	100	0	47
Arlington Street	6	Cast Iron	1,910	FALSE	1950	80	79.8	0	100	70	80	0	20	0	46
Heron View Road	6	Ductile Iron	341	TRUE	1970	110	96.4	0	100	5	60	100	60	0	46
Brookside Circle	8	Asbestos Cement	285	FALSE	1960	130	119.2	0	40	100	80	0	80	0	46
Heritage Road	8	Asbestos Cement	242	FALSE	1967	130	119.2	0	40	100	80	0	80	0	46
Heritage Road	8	Asbestos Cement	1,240	FALSE	1967	130	118	0	40	100	80	0	80	0	46
Heritage Road	8	Asbestos Cement	1,411	FALSE	1967	130	118	0	40	100	80	0	80	0	46
Main Street	10	Cast Iron	564	FALSE	1950	100	88	1	20	70	80	0	60	40	46
Main Street	10	Cast Iron	133	FALSE	1950	100	88	1	20	70	80	0	60	40	46
Main Street	10	Cast Iron	3,170	FALSE	1950	100	88.1	1	20	70	80	0	60	40	46
Cricket Way	8	Asbestos Cement	183	FALSE	1965	130	105.2	0	40	100	80	0	80	0	46
Grasshopper Lane	8	Asbestos Cement	601	FALSE	1965	130	105.2	0	40	100	80	0	80	0	46
Phalen Street	8	Asbestos Cement	1,029	FALSE	1958	130	102.3	0	40	100	80	0	80	0	46
Alcott Street	8	Asbestos Cement	340	FALSE	1958	130	102.3	0	40	100	80	0	80	0	46
Berry Lane	8	Asbestos Cement	684	FALSE	1958	130	101.6	0	40	100	80	0	80	0	46
Alcott Street	8	Asbestos Cement	363	FALSE	1958	130	101.6	0	40	100	80	0	80	0	46
Thoreau Road	8	Asbestos Cement	329	FALSE	1958	130	101	0	40	100	80	0	80	0	46
Thoreau Road	8	Asbestos Cement	521	FALSE	1958	130	106.5	0	40	100	80	0	80	0	46
Bromfield Road	8	Asbestos Cement	311	FALSE	1960	130	104.1	0	40	100	80	0	80	0	46
Bromfield Road	8	Asbestos Cement	722	FALSE	1960	130	104.1	0	40	100	80	0	80	0	46
Main Street	6	Cast Iron	912	FALSE	1950	80	67.4	0	100	70	80	0	20	0	46
Bayberry Road	8	Asbestos Cement	382	FALSE	1968	130	107	0	40	100	80	0	80	0	46
Myrtle Drive	8	Asbestos Cement	588	FALSE	1968	130	110.5	0	40	100	80	0	80	0	46
Magnolia Drive	8	Asbestos Cement	346	FALSE	1968	130	106.9	0	40	100	80	0	80	0	46
Rose Court	8	Asbestos Cement	391	FALSE	1968	130	106	0	40	100	80	0	80	0	46

STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS	RANKING: PIPE DIAMETER 15%	RANKING: MATERIAL 20%	RANKING: DATE 20%	RANKING: WATER QUALITY 15%	RANKING: STATIC PRESSURE 5%	RANKING: BREAK HISTORY 25%	SUM 100%
Magnolia Drive	8	Asbestos Cement	495	FALSE	1968	130	106	0	40	100	80	0	80	0	46
Bayberry Road	8	Asbestos Cement	404	FALSE	1968	130	111.4	0	40	100	80	0	80	0	46
Iris Court	8	Asbestos Cement	628	FALSE	1968	130	111.4	0	40	100	80	0	80	0	46
Bayberry Road	8	Asbestos Cement	347	FALSE	1968	130	110.5	0	40	100	80	0	80	0	46
Nonset Path	10	Asbestos Cement	269	FALSE	1970	130	77.2	1	20	100	60	0	20	40	46
Nonset Path	10	Asbestos Cement	2,233	FALSE	1970	130	77.2	1	20	100	60	0	20	40	46
Nonset Path	10	Asbestos Cement	364	FALSE	1970	130	78.6	1	20	100	60	0	20	40	46
Nonset Path	10	Asbestos Cement	284	FALSE	1970	130	76.3	1	20	100	60	0	20	40	46
Nonset Path	10	Asbestos Cement	418	FALSE	1970	130	74.2	1	20	100	60	0	20	40	46
Nonset Path	10	Asbestos Cement	349	FALSE	1970	130	70.6	1	20	100	60	0	20	40	46
Nonset Path	10	Asbestos Cement	1,043	FALSE	1970	130	70.6	1	20	100	60	0	20	40	46
Craig Road	8	Asbestos Cement	525	FALSE	1950	130	116.9	0	40	100	80	0	80	0	46
Knox Trail	8	Asbestos Cement	1,127	FALSE	1950	130	110.3	0	40	100	80	0	80	0	46
School Street Extension	8	Asbestos Cement	532	FALSE	1960	130	116.9	0	40	100	80	0	80	0	46
Guswood Road Extension	8	Asbestos Cement	408	FALSE	1950	130	103.6	0	40	100	80	0	80	0	46
Magnolia Drive Extension	8	Asbestos Cement	363	FALSE	1968	130	111.4	0	40	100	80	0	80	0	46
Bayberry Road	8	Asbestos Cement	421	FALSE	1968	130	111.4	0	40	100	80	0	80	0	46
Russell Road	8	Asbestos Cement	1,386	FALSE	1960	130	117	0	40	100	80	0	80	0	46
Craig Road	8	Asbestos Cement	440	FALSE	1960	130	117.2	0	40	100	80	0	80	0	46
Alcott Street	8	Asbestos Cement	624	FALSE	1958	130	105.8	0	40	100	80	0	80	0	46
Alcott Street	8	Asbestos Cement	1,603	FALSE	1958	130	104	0	40	100	80	0	80	0	46
Longfellow Park	8	Asbestos Cement	305	FALSE	1960	130	104	0	40	100	80	0	80	0	46
Juniper Ridge Road	8	Asbestos Cement	333	FALSE	1955	130	86.7	0	40	100	80	0	60	0	45
Hatch Road	8	Asbestos Cement	447	FALSE	1960	130	93.6	0	40	100	80	0	60	0	45
Valley Road	8	Asbestos Cement	688	FALSE	1960	130	93.6	0	40	100	80	0	60	0	45
Broadview Road	8	Asbestos Cement	372	FALSE	1960	130	88.3	0	40	100	80	0	60	0	45
Broadview Road	8	Asbestos Cement	656	FALSE	1960	130	88.3	0	40	100	80	0	60	0	45
Parker Street	8	Cast Iron	493	FALSE	1970	80	99.6	1	40	70	60	0	60	40	45
Parker Street	8	Cast Iron	444	FALSE	1970	80	97.1	1	40	70	60	0	60	40	45
Beverly Road	8	Asbestos Cement	386	FALSE	1960	130	85	0	40	100	80	0	60	0	45
Beverly Road	8	Asbestos Cement	421	FALSE	1960	130	87.6	0	40	100	80	0	60	0	45
Doris Road	8	Asbestos Cement	509	FALSE	1960	130	85	0	40	100	80	0	60	0	45
Francine Road	8	Asbestos Cement	550	FALSE	1960	130	92.3	0	40	100	80	0	60	0	45
Nadine Road	8	Asbestos Cement	797	FALSE	1960	130	99.1	0	40	100	80	0	60	0	45
Knowlton Drive	8	Asbestos Cement	1,932	FALSE	1960	130	92.4	0	40	100	80	0	60	0	45
Deacon Hunt Drive	8	Asbestos Cement	369	FALSE	1960	130	85.7	0	40	100	80	0	60	0	45
Hosmer Street Extension	8	Asbestos Cement	1,066	FALSE	1950	130	99.4	0	40	100	80	0	60	0	45
Hosmer Street Extension	8	Asbestos Cement	571	FALSE	1950	130	99.6	0	40	100	80	0	60	0	45
Forest Road Extension	8	Asbestos Cement	428	FALSE	1960	130	87.2	0	40	100	80	0	60	0	45
Forest Road	8	Asbestos Cement	654	FALSE	1960	130	99.7	0	40	100	80	0	60	0	45
Main Street Extension	8	Asbestos Cement	430	FALSE	1960	130	88.1	0	40	100	80	0	60	0	45
Simon Willard Road	8	Asbestos Cement	413	FALSE	1960	130	94.2	0	40	100	80	0	60	0	45
Larch Road	8	Asbestos Cement	359	FALSE	1965	130	90.6	0	40	100	80	0	60	0	45
Minot Avenue	8	Asbestos Cement	2,033	FALSE	1960	130	98.5	0	40	100	80	0	60	0	45

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									RANKING						
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Forest Road	8	Asbestos Cement	502	FALSE	1960	130	98.9	0	40	100	80	0	60	0	45
Forest Road	8	Asbestos Cement	1,248	FALSE	1960	130	97.1	0	40	100	80	0	60	0	45
Wingate Lane Extension	8	Asbestos Cement	456	FALSE	1968	130	95.3	0	40	100	80	0	60	0	45
Nagog Square	8	Asbestos Cement	500	FALSE	1960	130	80.8	0	40	100	80	0	60	0	45
Nagog Park Extension	8	Asbestos Cement	329	FALSE	1960	130	80.8	0	40	100	80	0	60	0	45
Minot Avenue	8	Asbestos Cement	1,021	FALSE	1960	130	99.9	0	40	100	80	0	60	0	45
Minot Avenue	8	Asbestos Cement	404	FALSE	1960	130	99.9	0	40	100	80	0	60	0	45
Parker Street	8	Cast Iron	115	FALSE	1970	80	97.1	1	40	70	60	0	60	40	45
Lawsbrook Road Extension	8	Asbestos Cement	730	FALSE	1950	130	98.8	0	40	100	80	0	60	0	45
Maple Street	8	Asbestos Cement	187	FALSE	1950	130	91.3	0	40	100	80	0	60	0	45
Old High Street	8	Cast Iron	35	FALSE	1910	70	122	0	40	70	100	0	100	0	45
Main Street	12	Cast Iron	829	FALSE	1950	130	87.9	1	10	70	80	0	60	40	44.5
Main Street	10	Cast Iron	142	FALSE	1950	100	73.6	1	20	70	80	0	20	40	44
Concord Road	10	Asbestos Cement	354	FALSE	1960	130	120.4	0	20	100	80	0	100	0	44
Main Street	10	Cast Iron	1,141	FALSE	1950	100	69	1	20	70	80	0	20	40	44
Main Street	10	Cast Iron	1,494	FALSE	1950	100	74.9	1	20	70	80	0	20	40	44
Great Road	10	Asbestos Cement	582	FALSE	1960	130	122	0	20	100	80	0	100	0	44
Great Road	10	Asbestos Cement	766	FALSE	1960	130	122	0	20	100	80	0	100	0	44
Old High Street	8	Cast Iron	1230	FALSE	1910	70	110	0	40	70	100	0	80	0	44
Squirrel Hill Road Extension	8	Asbestos Cement	691	FALSE	1960	130	45.5	0	40	100	80	0	20	0	43
Ticonderoga Road	8	Asbestos Cement	306	FALSE	1960	130	46.5	0	40	100	80	0	20	0	43
Ticonderoga Road	8	Asbestos Cement	315	FALSE	1960	130	44.7	0	40	100	80	0	20	0	43
Duggan Road	8	Asbestos Cement	510	FALSE	1950	130	71.8	0	40	100	80	0	20	0	43
Duggan Road	8	Asbestos Cement	320	FALSE	1950	130	66.1	0	40	100	80	0	20	0	43
Smart Road	8	Asbestos Cement	922	FALSE	1950	130	75.6	0	40	100	80	0	20	0	43
Smart Road	8	Asbestos Cement	672	FALSE	1950	130	75.6	0	40	100	80	0	20	0	43
Cherry Ridge Road	8	Asbestos Cement	1,243	FALSE	1955	130	79.8	0	40	100	80	0	20	0	43
Juniper Ridge Road	8	Asbestos Cement	1,185	FALSE	1955	130	79.8	0	40	100	80	0	20	0	43
Wachusett Drive	8	Asbestos Cement	607	FALSE	1960	130	79	0	40	100	80	0	20	0	43
Conant Street	8	Asbestos Cement	728	FALSE	1950	130	76.8	0	40	100	80	0	20	0	43
Kelley Road	8	Asbestos Cement	586	FALSE	1960	130	77.5	0	40	100	80	0	20	0	43
Beverly Road Extension	8	Asbestos Cement	120	FALSE	1960	130	76.4	0	40	100	80	0	20	0	43
Beverly Road	8	Asbestos Cement	411	FALSE	1960	130	76.4	0	40	100	80	0	20	0	43
Joseph Reed Lane	8	Asbestos Cement	168	FALSE	1960	130	64.5	0	40	100	80	0	20	0	43
Joseph Reed Lane	8	Asbestos Cement	353	FALSE	1960	130	61.4	0	40	100	80	0	20	0	43
Joseph Reed Lane	8	Asbestos Cement	1,157	FALSE	1960	130	64.5	0	40	100	80	0	20	0	43
Capt Brown's Lane	8	Asbestos Cement	692	FALSE	1960	130	76.3	0	40	100	80	0	20	0	43
Capt Brown's Lane	8	Asbestos Cement	1,649	FALSE	1960	130	69.2	0	40	100	80	0	20	0	43
Joseph Reed Lane	8	Asbestos Cement	416	FALSE	1960	130	65.3	0	40	100	80	0	20	0	43
Capt Forbush Lane	8	Asbestos Cement	1,403	FALSE	1960	130	62.8	0	40	100	80	0	20	0	43
Deacon Hunt Drive	8	Asbestos Cement	212	FALSE	1960	130	76.3	0	40	100	80	0	20	0	43
Joseph Reed Lane	8	Asbestos Cement	355	FALSE	1960	130	65.3	0	40	100	80	0	20	0	43
Faulkner Hill Road	8	Asbestos Cement	1,394	FALSE	1960	130	67.9	0	40	100	80	0	20	0	43
Faulkner Hill Road	8	Asbestos Cement	1,385	FALSE	1960	130	58.7	0	40	100	80	0	20	0	43

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STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS	RANKING PIPE DIAMETER 15%	MATERIAL 20%	DATE 20%	WATER QUALITY 15%	STATIC PRESSURE 5%	BREAK HISTORY 25%	SUM 100%
Faulkner Hill Road	8	Asbestos Cement	468	FALSE	1960	130	58.7	0	40	100	80	0	20	0	43
School Street	8	Cast Iron	614	FALSE	1910	80	88	0	40	70	100	0	60	0	43
School Street	8	Cast Iron	247	FALSE	1910	80	92.6	0	40	70	100	0	60	0	43
School Street	8	Cast Iron	1,508	FALSE	1910	80	95.1	0	40	70	100	0	60	0	43
School Street	8	Cast Iron	743	FALSE	1910	80	99.8	0	40	70	100	0	60	0	43
Samuel Parlin Drive	8	Asbestos Cement	1,148	FALSE	1965	130	69.9	0	40	100	80	0	20	0	43
Samuel Parlin Drive	8	Asbestos Cement	1,121	FALSE	1965	130	55.5	0	40	100	80	0	20	0	43
Willis Holden Drive	8	Asbestos Cement	135	FALSE	1965	130	59.4	0	40	100	80	0	20	0	43
Willis Holden Drive	8	Asbestos Cement	1,593	FALSE	1965	130	55.5	0	40	100	80	0	20	0	43
Hammond Street	8	Asbestos Cement	170	FALSE	1965	130	69.9	0	40	100	80	0	20	0	43
Larch Road	8	Asbestos Cement	756	FALSE	1965	130	76.6	0	40	100	80	0	20	0	43
Horseshoe Drive	8	Asbestos Cement	1,173	FALSE	1970	130	120.4	0	40	100	60	0	100	0	43
Concord Road	10	Asbestos Cement	1,387	FALSE	1960	130	116.5	0	20	100	80	0	80	0	43
Concord Road	10	Asbestos Cement	1,319	FALSE	1958	130	106.2	0	20	100	80	0	80	0	43
Hammond Street	8	Asbestos Cement	876	FALSE	1965	130	71.2	0	40	100	80	0	20	0	43
Brook Street	10	Asbestos Cement	2,244	FALSE	1960	130	109.6	0	20	100	80	0	80	0	43
Taylor Road Extension	10	Asbestos Cement	359	FALSE	1960	130	107.6	0	20	100	80	0	80	0	43
Taylor Road Extension	10	Asbestos Cement	722	FALSE	1960	130	109.3	0	20	100	80	0	80	0	43
Taylor Road Extension	10	Asbestos Cement	592	FALSE	1960	130	109.6	0	20	100	80	0	80	0	43
Nagog Park Extension	8	Asbestos Cement	368	FALSE	1950	130	69.6	0	40	100	80	0	20	0	43
Broadview Road	8	Asbestos Cement	342	FALSE	1960	130	68.4	0	40	100	80	0	20	0	43
Main Street	8	Cast Iron	146	FALSE	1940	80	88	0	40	70	100	0	60	0	43
Main Street	8	Cast Iron	168	FALSE	1940	80	88.8	0	40	70	100	0	60	0	43
Main Street	8	Cast Iron	51	FALSE	1940	80	88	0	40	70	100	0	60	0	43
Hammond Street	8	Asbestos Cement	1,092	FALSE	1965	130	75.1	0	40	100	80	0	20	0	43
Hammond Street	8	Asbestos Cement	253	FALSE	1965	130	71.6	0	40	100	80	0	20	0	43
Main Street	12	Cast Iron	895	FALSE	1950	120	67.4	1	10	70	80	0	20	40	42.5
Main Street	12	Cast Iron	826	FALSE	1950	130	73.2	1	10	70	80	0	20	40	42.5
Ayer Road	8	Asbestos Cement	629	FALSE	1970	130	112.6	0	40	100	60	0	80	0	42
Guswood Road	8	Asbestos Cement	608	FALSE	1970	130	105.3	0	40	100	60	0	80	0	42
Fernwood Road	8	Asbestos Cement	384	FALSE	1970	130	101.1	0	40	100	60	0	80	0	42
Driftwood Road	8	Asbestos Cement	817	FALSE	1970	130	110.7	0	40	100	60	0	80	0	42
Brucewood Road E	8	Asbestos Cement	622	FALSE	1970	130	114.3	0	40	100	60	0	80	0	42
Sandalwood Road	8	Asbestos Cement	403	FALSE	1970	130	113.7	0	40	100	60	0	80	0	42
Forest Road Extension	10	Asbestos Cement	329	FALSE	1960	130	96.7	0	20	100	80	0	60	0	42
Newtown Road	10	Asbestos Cement	371	FALSE	1960	130	84.9	0	20	100	80	0	60	0	42
Nagog Park	10	Asbestos Cement	908	FALSE	1960	130	80.8	0	20	100	80	0	60	0	42
Sudbury Road	8	Asbestos Cement	559	FALSE	1970	130	119.9	0	40	100	60	0	80	0	42
Sudbury Road	8	Asbestos Cement	97	FALSE	1970	130	101.2	0	40	100	60	0	80	0	42
Westside Drive	8	Asbestos Cement	357	FALSE	1970	130	101.2	0	40	100	60	0	80	0	42
Sandy Drive	8	Asbestos Cement	399	FALSE	1970	130	108.4	0	40	100	60	0	80	0	42
Sandy Drive	8	Asbestos Cement	569	FALSE	1970	130	112.7	0	40	100	60	0	80	0	42
Candida Lane	8	Asbestos Cement	368	FALSE	1970	130	107.5	0	40	100	60	0	80	0	42
Sandy Drive Extension	8	Asbestos Cement	584	FALSE	1970	130	112	0	40	100	60	0	80	0	42

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STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS	RANKING PIPE DIAMETER 15%	MATERIAL 20%	DATE 20%	WATER QUALITY 15%	STATIC PRESSURE 5%	BREAK HISTORY 25%	SUM 100%
Duggan Road	8	Asbestos Cement	1,161	FALSE	1970	130	90.5	0	40	100	60	0	60	0	41
Woodfield Road	8	Asbestos Cement	145	FALSE	1970	130	80.4	0	40	100	60	0	60	0	41
Woodfield Road	8	Asbestos Cement	744	FALSE	1970	130	80.4	0	40	100	60	0	60	0	41
Kingman Road	8	Asbestos Cement	303	FALSE	1970	130	87.7	0	40	100	60	0	60	0	41
Castle Drive	8	Asbestos Cement	486	FALSE	1970	130	90.4	0	40	100	60	0	60	0	41
Kingman Road	8	Asbestos Cement	654	FALSE	1970	130	90.4	0	40	100	60	0	60	0	41
Heather Hill Road	8	Asbestos Cement	651	FALSE	1970	130	86.3	0	40	100	60	0	60	0	41
Olde Barn Way	8	Asbestos Cement	276	FALSE	1970	130	89.8	0	40	100	60	0	60	0	41
Puritan Road	8	Asbestos Cement	813	FALSE	1970	130	85.1	0	40	100	60	0	60	0	41
Puritan Road	8	Asbestos Cement	299	FALSE	1970	130	90.9	0	40	100	60	0	60	0	41
Robert Road	8	Asbestos Cement	1,064	FALSE	1970	130	91.3	0	40	100	60	0	60	0	41
Robert Road	8	Asbestos Cement	419	FALSE	1970	130	91.3	0	40	100	60	0	60	0	41
Parker Street	8	Asbestos Cement	477	FALSE	1970	130	91.3	0	40	100	60	0	60	0	41
Putter Drive	8	Asbestos Cement	1,123	FALSE	1970	130	87.3	0	40	100	60	0	60	0	41
Parker Street	8	Asbestos Cement	916	FALSE	1970	130	85.1	0	40	100	60	0	60	0	41
School Street	8	Cast Iron	500	FALSE	1950	80	123.6	0	40	70	80	0	100	0	41
Washington Drive	8	Asbestos Cement	464	FALSE	1970	130	91.2	0	40	100	60	0	60	0	41
Musket Drive	8	Asbestos Cement	550	FALSE	1970	130	91.2	0	40	100	60	0	60	0	41
Simon Willard Road	8	Asbestos Cement	274	FALSE	1970	130	84.3	0	40	100	60	0	60	0	41
Simon Willard Road	8	Asbestos Cement	583	FALSE	1970	130	87.8	0	40	100	60	0	60	0	41
Simon Willard Road	8	Asbestos Cement	239	FALSE	1970	130	94.1	0	40	100	60	0	60	0	41
Trask Road	8	Asbestos Cement	616	FALSE	1970	130	94.2	0	40	100	60	0	60	0	41
Heald Road	8	Asbestos Cement	282	FALSE	1970	130	80.4	0	40	100	60	0	60	0	41
Cowdrey Lane	8	Asbestos Cement	783	FALSE	1970	130	84.3	0	40	100	60	0	60	0	41
Eliot Circle	8	Asbestos Cement	221	FALSE	1970	130	92.4	0	40	100	60	0	60	0	41
Cowdrey Lane	8	Asbestos Cement	786	FALSE	1970	130	94.1	0	40	100	60	0	60	0	41
Gerald Circle	8	Asbestos Cement	456	FALSE	1970	130	90.9	0	40	100	60	0	60	0	41
Tuttle Drive	8	Asbestos Cement	180	FALSE	1970	130	84.5	0	40	100	60	0	60	0	41
Lothrop Road	8	Asbestos Cement	341	FALSE	1970	130	84.5	0	40	100	60	0	60	0	41
Lothrop Road	8	Asbestos Cement	621	FALSE	1970	130	83	0	40	100	60	0	60	0	41
Wayside Lane	8	Asbestos Cement	303	FALSE	1970	130	83	0	40	100	60	0	60	0	41
Heald Road	8	Asbestos Cement	493	FALSE	1970	130	87.8	0	40	100	60	0	60	0	41
Simon Willard Road	8	Asbestos Cement	340	FALSE	1970	130	82	0	40	100	60	0	60	0	41
Central Street	10	Cast Iron	489	FALSE	1910	100	87.8	0	20	70	100	0	60	0	40
Windsor Avenue	10	Cast Iron	1,114	FALSE	1910	100	92.6	0	20	70	100	0	60	0	40
Windsor Avenue Extension	10	Cast Iron	379	FALSE	1910	100	88.5	0	20	70	100	0	60	0	40
Central Street	10	Cast Iron	937	FALSE	1910	100	88.2	0	20	70	100	0	60	0	40
Central Street	10	Cast Iron	740	FALSE	1910	100	86.8	0	20	70	100	0	60	0	40
Main Street	10	Cast Iron	209	FALSE	1910	100	87.1	0	20	70	100	0	60	0	40
Main Street	10	Cast Iron	138	FALSE	1910	100	82.5	0	20	70	100	0	60	0	40
School Street	8	Cast Iron	76	FALSE	1950	80	119.2	0	40	70	80	0	80	0	40
School Street	8	Cast Iron	335	FALSE	1950	80	118.4	0	40	70	80	0	80	0	40
School Street	8	Cast Iron	756	FALSE	1950	80	111.9	0	40	70	80	0	80	0	40
School Street	8	Cast Iron	721	FALSE	1950	80	112.2	0	40	70	80	0	80	0	40

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STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS	RANKING						
									PIPE DIAMETER 15%	MATERIAL 20%	DATE 20%	WATER QUALITY 15%	STATIC PRESSURE 5%	BREAK HISTORY 25%	SUM 100%
Massachusetts Avenue Extension	8	Cast Iron	364	FALSE	1960	80	101.9	0	40	70	80	0	80	0	40
Massachusetts Avenue Extension	8	Cast Iron	547	FALSE	1950	80	107.6	0	40	70	80	0	80	0	40
Newtown Road	10	Asbestos Cement	391	FALSE	1960	130	77.5	0	20	100	80	0	20	0	40
Newtown Road	10	Asbestos Cement	765	FALSE	1960	130	79.1	0	20	100	80	0	20	0	40
Nonset Path Extension	10	Asbestos Cement	365	FALSE	1960	130	70.6	0	20	100	80	0	20	0	40
Nagog Park Extension	10	Asbestos Cement	511	FALSE	1960	130	70.6	0	20	100	80	0	20	0	40
Nagog Park Extension	10	Asbestos Cement	250	FALSE	1960	130	76.1	0	20	100	80	0	20	0	40
School Street	8	Cast Iron	221	FALSE	1950	80	112	0	40	70	80	0	80	0	40
School Street	8	Cast Iron	290	FALSE	1950	80	113.5	0	40	70	80	0	80	0	40
School Street	8	Cast Iron	301	FALSE	1967	80	114.6	0	40	70	80	0	80	0	40
Central Street	10	Cast Iron	737	FALSE	1910	100	90	0	20	70	100	0	60	0	40
Windsor Avenue	10	Cast Iron	1,267	FALSE	1910	100	88.5	0	20	70	100	0	60	0	40
Windsor Avenue	10	Cast Iron	316	FALSE	1910	100	83.9	0	20	70	100	0	60	0	40
School Street	8	Cast Iron	948	FALSE	1967	80	113	0	40	70	80	0	80	0	40
School Street	8	Cast Iron	1988	FALSE	1967	80	109	0	40	70	80	0	80	0	40
Highland Road	8	Asbestos Cement	224	FALSE	1970	130	40.6	0	40	100	60	0	20	0	39
Highland Road	8	Asbestos Cement	310	FALSE	1970	130	40.6	0	40	100	60	0	20	0	39
Duggan Road	8	Asbestos Cement	354	FALSE	1970	130	76.9	0	40	100	60	0	20	0	39
Highland Road	8	Asbestos Cement	315	FALSE	1970	130	42.2	0	40	100	60	0	20	0	39
Duggan Road	8	Asbestos Cement	496	FALSE	1970	130	66.6	0	40	100	60	0	20	0	39
Parker Street	8	Asbestos Cement	431	FALSE	1970	130	79.2	0	40	100	60	0	20	0	39
Arlington Street	8	Cast Iron	3,723	FALSE	1965	80	82.2	0	40	70	80	0	60	0	39
John Swift Road	8	Asbestos Cement	514	FALSE	1970	130	74.9	0	40	100	60	0	20	0	39
Henley Road	8	Asbestos Cement	252	FALSE	1970	130	66.3	0	40	100	60	0	20	0	39
Old Stone Brook	8	Asbestos Cement	890	FALSE	1970	130	67.5	0	40	100	60	0	20	0	39
Old Stone Brook	8	Asbestos Cement	293	FALSE	1970	130	70.4	0	40	100	60	0	20	0	39
Old Stone Brook	8	Asbestos Cement	763	FALSE	1970	130	76.3	0	40	100	60	0	20	0	39
Hennessey Drive	8	Asbestos Cement	605	FALSE	1970	130	76.8	0	40	100	60	0	20	0	39
St James Circle	8	Asbestos Cement	297	FALSE	1970	130	76.8	0	40	100	60	0	20	0	39
Hennessey Drive	8	Asbestos Cement	476	FALSE	1970	130	76.8	0	40	100	60	0	20	0	39
Tuttle Drive	8	Asbestos Cement	196	FALSE	1970	130	72.8	0	40	100	60	0	20	0	39
Torrington Lane	8	Asbestos Cement	502	FALSE	1970	130	71.2	0	40	100	60	0	20	0	39
Tuttle Drive	8	Asbestos Cement	826	FALSE	1970	130	71.2	0	40	100	60	0	20	0	39
Simon Willard Road	8	Asbestos Cement	916	FALSE	1970	130	74.9	0	40	100	60	0	20	0	39
Oxbow Drive	6	Ductile Iron	453	TRUE	1997	110	100.3	0	100	5	20	100	80	0	39
Old Oregon Trail	6	Ductile Iron	146	TRUE	1997	110	105.3	0	100	5	20	100	80	0	39
Farmers Row	6	Ductile Iron	192	TRUE	1997	110	108	0	100	5	20	100	80	0	39
Avalon Drive	8	Asbestos Cement	253	FALSE	1970	130	68.1	0	40	100	60	0	20	0	39
Nagog Park	8	Asbestos Cement	666	FALSE	1970	130	67	0	40	100	60	0	20	0	39
Nagog Park	8	Asbestos Cement	505	FALSE	1970	130	53.3	0	40	100	60	0	20	0	39
Summer Street	12	Cast Iron	2,812	FALSE	1920	120	80	0	10	70	100	0	60	0	38.5
Main Street	12	Cast Iron	289	FALSE	1940	120	88	0	10	70	100	0	60	0	38.5
Parker Street	12	Cast Iron	978	FALSE	1910	120	95.5	0	10	70	100	0	60	0	38.5
Main Street	12	Cast Iron	90	FALSE	1910	120	88	0	10	70	100	0	60	0	38.5

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									RANKING						
STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS	PIPE DIAMETER 15%	MATERIAL 20%	DATE 20%	WATER QUALITY 15%	STATIC PRESSURE 5%	BREAK HISTORY 25%	SUM 100%
Summer Street	12	Cast Iron	647	FALSE	1920	120	87.2	0	10	70	100	0	60	0	38.5
Summer Street	12	Cast Iron	474	FALSE	1920	120	86.5	0	10	70	100	0	60	0	38.5
Summer Street	12	Cast Iron	563	FALSE	1920	120	84.1	0	10	70	100	0	60	0	38.5
Main Street	12	Cast Iron	1066	FALSE	1910	120	80	0	10	70	100	0	60	0	38.5
Main Street	12	Cast Iron	1154	FALSE	1910	120	80	0	10	70	100	0	60	0	38.5
Deer Grass Lane	6	Ductile Iron	160	TRUE	1997	110	92.3	0	100	5	20	100	60	0	38
Quail Run	6	Ductile Iron	160	TRUE	1997	110	90.4	0	100	5	20	100	60	0	38
Davis Road Extension	6	Ductile Iron	124	TRUE	1997	110	85.1	0	100	5	20	100	60	0	38
Old Cart Path	6	Ductile Iron	256	TRUE	1997	110	82.7	0	100	5	20	100	60	0	38
Ethan Allen Drive	16	Asbestos Cement	1,382	FALSE	1960	130	42.6	0	5	100	80	0	20	0	37.75
Ethan Allen Drive Extension	16	Asbestos Cement	437	FALSE	1960	130	25.7	0	5	100	80	0	20	0	37.75
Robbins Street	8	Ductile Iron	574	TRUE	1970	100	96.2	0	40	5	60	100	60	0	37
Washington Drive Extension	8	Ductile Iron	1,618	TRUE	1970	130	81.5	0	40	5	60	100	60	0	37
Robbins Street	8	Ductile Iron	177	TRUE	1970	100	96.4	0	40	5	60	100	60	0	37
Robbins Street	8	Ductile Iron	590	TRUE	1970	100	92.8	0	40	5	60	100	60	0	37
Robbins Street	8	Ductile Iron	124	TRUE	1970	110	89.9	0	40	5	60	100	60	0	37
Main Street	12	Cast Iron	239	FALSE	1910	120	77.3	0	10	70	100	0	20	0	36.5
Central Street	10	Cast Iron	1,007	FALSE	1950	100	92.6	0	20	70	80	0	60	0	36
Central Street	10	Cast Iron	3,458	FALSE	1950	100	92.6	0	20	70	80	0	60	0	36
Split Rock	10	Asbestos Cement	610	FALSE	1970	130	74.2	0	20	100	60	0	20	0	36
Nagog Park Extension	10	Asbestos Cement	510	FALSE	1970	130	76.1	0	20	100	60	0	20	0	36
Blue Heron Way	6	Ductile Iron	437	TRUE	1997	110	79.1	0	100	5	20	100	20	0	36
Windingwood Lane	6	Ductile Iron	567	TRUE	1997	110	79.1	0	100	5	20	100	20	0	36
Brimstone Lane	6	Ductile Iron	162	TRUE	1997	110	75.1	0	100	5	20	100	20	0	36
Loosestick Way	6	Ductile Iron	502	TRUE	1997	110	75.4	0	100	5	20	100	20	0	36
Sweetbriar Way	6	Ductile Iron	209	TRUE	1997	110	75.5	0	100	5	20	100	20	0	36
Wheelwright	6	Ductile Iron	171	TRUE	1997	110	76.3	0	100	5	20	100	20	0	36
Grace Path	6	Ductile Iron	569	TRUE	1997	110	69.7	0	100	5	20	100	20	0	36
Greybirch Lane	6	Ductile Iron	427	TRUE	1997	110	67.3	0	100	5	20	100	20	0	36
Green Neddle Way	6	Ductile Iron	495	TRUE	1997	110	61.1	0	100	5	20	100	20	0	36
Fischer Path	6	Ductile Iron	258	TRUE	1997	110	61.6	0	100	5	20	100	20	0	36
Whispering Way	6	Ductile Iron	264	TRUE	1997	110	61.7	0	100	5	20	100	20	0	36
Bramble Way	6	Ductile Iron	189	TRUE	1997	110	57.7	0	100	5	20	100	20	0	36
Bitterwsweet Lane	6	Ductile Iron	210	TRUE	1997	110	57.7	0	100	5	20	100	20	0	36
Nagog Park	10	Asbestos Cement	927	FALSE	1970	130	78.8	0	20	100	60	0	20	0	36
Nagog Park	10	Asbestos Cement	596	FALSE	1970	130	69.6	0	20	100	60	0	20	0	36
Nagog Park	10	Asbestos Cement	149	FALSE	1970	130	69.8	0	20	100	60	0	20	0	36
Nagog Park	10	Asbestos Cement	350	FALSE	1970	130	71.9	0	20	100	60	0	20	0	36
Nagog Park	10	Asbestos Cement	382	FALSE	1970	130	67.6	0	20	100	60	0	20	0	36
Main Street	12	Cast Iron	322	FALSE	1950	130	117.5	0	10	70	80	0	80	0	35.5
Main Street	12	Cast Iron	868	FALSE	1950	130	101.6	0	10	70	80	0	80	0	35.5
Main Street	12	Cast Iron	669	FALSE	1950	130	110.8	0	10	70	80	0	80	0	35.5
High Road Extension	12	Cast Iron	886	FALSE	1950	120	100.4	0	10	70	80	0	80	0	35.5
MacGregor Way	6	Ductile Iron	462	FALSE	1950	110	96.8	0	100	5	80	0	60	0	35

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STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS	RANKING						
									PIPE DIAMETER 15%	MATERIAL 20%	DATE 20%	WATER QUALITY 15%	STATIC PRESSURE 5%	BREAK HISTORY 25%	SUM 100%
Musket Drive	8	Ductile Iron	273	TRUE	1970	110	71	0	40	5	60	100	20	0	35
Jackson Drive	8	Ductile Iron	724	TRUE	1970	130	74.9	0	40	5	60	100	20	0	35
Monroe Drive	8	Ductile Iron	460	TRUE	1970	130	74.9	0	40	5	60	100	20	0	35
Main Street Extension	16	Cast Iron	153	FALSE	1950	100	117.5	0	5	70	80	0	80	0	34.75
Parker Street	12	Cast Iron	718	FALSE	1950	120	99.6	0	10	70	80	0	60	0	34.5
Parker Street	12	Cast Iron	139	FALSE	1950	120	95.7	0	10	70	80	0	60	0	34.5
High Street	12	Cast Iron	318	FALSE	1950	120	95.8	0	10	70	80	0	60	0	34.5
Main Street	10	Cast Iron	189	FALSE	1950	100	69	0	20	70	80	0	20	0	34
Davis Road	12	Ductile Iron	1,140	TRUE	1970	140	111.7	0	10	5	60	100	80	0	33.5
Davis Road	12	Ductile Iron	510	TRUE	1970	130	110.9	0	10	5	60	100	80	0	33.5
Knox Trail Extension	4	Ductile Iron	164	FALSE	1970	120	122.1	0	100	5	60	0	100	0	33
High Street	12	Cast Iron	1,659	FALSE	1950	120	79.2	0	10	70	80	0	20	0	32.5
High Street	12	Cast Iron	1,763	FALSE	1950	120	79.2	0	10	70	80	0	20	0	32.5
Main Street Extension	12	Cast Iron	1,092	FALSE	1950	120	76	0	10	70	80	0	20	0	32.5
High Street Extension	12	Cast Iron	12	FALSE	1970	120	120.1	0	10	70	60	0	100	0	32.5
High Street Extension	12	Cast Iron	13	FALSE	1970	120	120.1	0	10	70	60	0	100	0	32.5
Conant Street	8	Ductile Iron	1,283	FALSE	1970	110	91.6	1	40	5	60	0	60	40	32
Conant Street	8	Ductile Iron	991	FALSE	1970	110	91.6	1	40	5	60	0	60	40	32
Main Street	8	Ductile Iron	359	FALSE	1970	110	83.3	1	40	5	60	0	60	40	32
Main Street	8	Ductile Iron	2,099	FALSE	1970	110	89.9	1	40	5	60	0	60	40	32
Town House Lane	6	Ductile Iron	596	FALSE	1970	110	101.9	0	100	5	60	0	80	0	32
Winter Street	6	Ductile Iron	824	FALSE	1970	110	84.3	0	100	5	60	0	60	0	31
Willow Street	6	Ductile Iron	50	FALSE	1970	110	87.7	0	100	5	60	0	60	0	31
Central Street	6	Ductile Iron	117	FALSE	1970	110	82.7	0	100	5	60	0	60	0	31
Adams Street Extension	6	Ductile Iron	130	FALSE	1970	110	95.4	0	100	5	60	0	60	0	31
Charter Road Extension	6	Ductile Iron	257	FALSE	1970	110	81.3	0	100	5	60	0	60	0	31
Arlington Street	6	Ductile Iron	45	FALSE	1970	110	84.8	0	100	5	60	0	60	0	31
Hayward Road Extension	6	Ductile Iron	1,519	FALSE	1970	110	87.8	0	100	5	60	0	60	0	31
Wampus Avenue	6	Ductile Iron	698	FALSE	1970	110	99.2	0	100	5	60	0	60	0	31
Sylvia Street	6	Ductile Iron	704	FALSE	1970	110	83	0	100	5	60	0	60	0	31
Huckleberry Lane	8	Ductile Iron	868	FALSE	1970	110	76.6	1	40	5	60	0	20	40	30
Mead Terrace	6	Ductile Iron	307	FALSE	1970	110	71.8	0	100	5	60	0	20	0	29
Prescott Road	8	Ductile Iron	755	TRUE	1990	100	91.3	0	40	5	20	100	60	0	29
Overlook Drive	8	Ductile Iron	1,068	TRUE	1994	100	89.6	0	40	5	20	100	60	0	29
Overlook Drive	8	Ductile Iron	394	TRUE	1994	100	85.8	0	40	5	20	100	60	0	29
Prescott Road	8	Ductile Iron	654	TRUE	1994	100	85.8	0	40	5	20	100	60	0	29
Overlook Drive Extension	8	Ductile Iron	859	TRUE	1994	100	85.8	0	40	5	20	100	60	0	29
Sutton Place	4	Ductile Iron	707	FALSE	1970	110	58.1	0	100	5	60	0	20	0	29
Sutton Place	2	Ductile Iron	259	FALSE	1970	110	60.8	0	100	5	60	0	20	0	29
Sutton Place	6	Ductile Iron	314	FALSE	1970	110	55.9	0	100	5	60	0	20	0	29
Post Office Square	10	Ductile Iron	1,223	FALSE	1970	120	95.9	1	20	5	60	0	60	40	29
Great Road Extension	4	Ductile Iron	233	FALSE	1970	110	74.5	0	100	5	60	0	20	0	29
Arlington Street	6	Ductile Iron	223	FALSE	1970	120	76	0	100	5	60	0	20	0	29
Charter Road Extension	6	Ductile Iron	237	FALSE	1970	110	76.5	0	100	5	60	0	20	0	29

Water Main Prioritization
Acton Water District

									RANKING						
STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS	PIPE DIAMETER 15%	MATERIAL 20%	DATE 20%	WATER QUALITY 15%	STATIC PRESSURE 5%	BREAK HISTORY 25%	SUM 100%
Charter Road Extension	6	Ductile Iron	153	FALSE	1970	110	76.5	0	100	5	60	0	20	0	29
Charter Road Extension	6	Ductile Iron	417	FALSE	1970	110	78.8	0	100	5	60	0	20	0	29
Charter Road Extension	6	Ductile Iron	276	FALSE	1970	110	78.8	0	100	5	60	0	20	0	29
Wright Terrace	6	Ductile Iron	404	FALSE	1970	110	72.4	0	100	5	60	0	20	0	29
Longmeadow Way	8	Ductile Iron	1,198	TRUE	1997	110	83.8	0	40	5	20	100	60	0	29
Samantha Way	6	Ductile Iron	419	FALSE	1970	110	76.4	0	100	5	60	0	20	0	29
Ashley Circle	6	Ductile Iron	296	FALSE	1980	110	101.4	0	100	5	40	0	80	0	28
Badger Circle	6	Ductile Iron	219	FALSE	1980	110	102.2	0	100	5	40	0	80	0	28
Kate Drive	6	Ductile Iron	380	FALSE	1980	110	102.6	0	100	5	40	0	80	0	28
Milldam Road Extension	6	Ductile Iron	371	FALSE	1980	110	104.3	0	100	5	40	0	80	0	28
Main Street	16	Ductile Iron	884	FALSE	1970	130	104.6	1	5	5	60	0	80	40	27.75
Main Street	16	Ductile Iron	1,341	FALSE	1970	130	104.6	1	5	5	60	0	80	40	27.75
Concetta Circle	6	Ductile Iron	385	FALSE	1987	110	95.7	0	100	5	40	0	60	0	27
Hayward Road	8	Ductile Iron	287	TRUE	2014	130	87.9	0	40	5	5	100	60	0	26
Hayward Road	8	Ductile Iron	1,824	TRUE	2014	130	87.9	0	40	5	5	100	60	0	26
Nashoba Road	8	Ductile Iron	404	FALSE	1960	110	82.1	0	40	5	80	0	60	0	26
Charter Road	8	Ductile Iron	601	FALSE	1950	110	81.8	0	40	5	80	0	60	0	26
Davis Road	12	Ductile Iron	504	TRUE	1997	130	102.1	0	10	5	20	100	80	0	25.5
Davis Road	12	Ductile Iron	318	TRUE	1997	130	100.3	0	10	5	20	100	80	0	25.5
Davis Road	12	Ductile Iron	193	TRUE	1997	130	102.8	0	10	5	20	100	80	0	25.5
Davis Road	12	Ductile Iron	243	TRUE	1997	130	105.3	0	10	5	20	100	80	0	25.5
Davis Road	12	Ductile Iron	392	TRUE	1997	130	108	0	10	5	20	100	80	0	25.5
Davis Road	12	Ductile Iron	651	TRUE	1997	130	110.3	0	10	5	20	100	80	0	25.5
Davis Road	12	Ductile Iron	79	TRUE	1997	130	92.3	0	10	5	20	100	60	0	24.5
Davis Road	12	Ductile Iron	335	TRUE	1997	130	90.4	0	10	5	20	100	60	0	24.5
Davis Road	12	Ductile Iron	226	TRUE	1997	130	85.1	0	10	5	20	100	60	0	24.5
Davis Road	12	Ductile Iron	183	TRUE	1997	130	96.7	0	10	5	20	100	60	0	24.5
Davis Road	12	Ductile Iron	254	TRUE	1997	130	83.8	0	10	5	20	100	60	0	24.5
Davis Road	12	Ductile Iron	891	TRUE	1997	130	96.7	0	10	5	20	100	60	0	24.5
Powder Mill Road	8	Ductile Iron	89	FALSE	1970	120	120.5	0	40	5	60	0	100	0	24
High Street Extension	8	Ductile Iron	380	FALSE	1970	110	121.2	0	40	5	60	0	100	0	24
High Street Extension	8	Ductile Iron	164	FALSE	1970	120	121.2	0	40	5	60	0	100	0	24
High Street Extension	8	Ductile Iron	120	FALSE	1970	110	121.2	0	40	5	60	0	100	0	24
Stacys Way	6	Ductile Iron	1,348	FALSE	1999	110	100.1	0	100	5	20	0	80	0	24
High Street Extension	8	Ductile Iron	767	FALSE	1970	120	121.2	0	40	5	60	0	100	0	24
Powder Mill Road	8	Ductile Iron	954	FALSE	1970	120	121.2	0	40	5	60	0	100	0	24
Knox Trail	8	Ductile Iron	374	FALSE	1970	120	122.1	0	40	5	60	0	100	0	24
Knox Trail Extension	8	Ductile Iron	137	FALSE	1970	120	122.1	0	40	5	60	0	100	0	24
Powder Mill Road	8	Ductile Iron	91	FALSE	1970	120	121.2	0	40	5	60	0	100	0	24
Powder Mill Road	8	Ductile Iron	722	FALSE	1970	120	120.5	0	40	5	60	0	100	0	24
Powder Mill Road	8	HDPE	120	FALSE	1970	120	121.2	0	40	5	60	0	100	0	24
Macleod Lane	6	Ductile Iron	779	FALSE	1991	110	87.2	0	100	5	20	0	60	0	23
Drummer ROad	8	Ductile Iron	550	FALSE	1970	110	100	0	40	5	60	0	80	0	23
River Street	8	Ductile Iron	586	FALSE	1970	120	109.1	0	40	5	60	0	80	0	23

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STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS	RANKING						
									PIPE DIAMETER 15%	MATERIAL 20%	DATE 20%	WATER QUALITY 15%	STATIC PRESSURE 5%	BREAK HISTORY 25%	SUM 100%
Chadwick Street	8	Ductile Iron	544	FALSE	1970	110	110.9	0	40	5	60	0	80	0	23
River Street	8	Ductile Iron	180	FALSE	1970	120	112.9	0	40	5	60	0	80	0	23
Vanderbelt Road	8	Ductile Iron	1,021	FALSE	1970	110	112.9	0	40	5	60	0	80	0	23
Milldam Road	8	Ductile Iron	146	FALSE	1970	110	102.6	0	40	5	60	0	80	0	23
Walnut Street	6	Ductile Iron	568	FALSE	1995	110	83.2	0	100	5	20	0	60	0	23
Chestnut Lane	6	Ductile Iron	156	FALSE	1995	110	89.2	0	100	5	20	0	60	0	23
Chestnut Lane	6	Ductile Iron	284	FALSE	1995	110	84.1	0	100	5	20	0	60	0	23
Beechnut Street	6	Ductile Iron	331	FALSE	1995	110	84.1	0	100	5	20	0	60	0	23
Ledge Rock Way	8	Ductile Iron	697	FALSE	1970	110	103.7	0	40	5	60	0	80	0	23
Anders Way	6	Ductile Iron	245	FALSE	1997	110	89.8	0	100	5	20	0	60	0	23
Adams Street	8	Ductile Iron	338	FALSE	1970	110	106.1	0	40	5	60	0	80	0	23
School Street Extension	8	Ductile Iron	62	FALSE	1970	110	119.7	0	40	5	60	0	80	0	23
Palmer Way	6	Ductile Iron	629	FALSE	1995	110	90.1	0	100	5	20	0	60	0	23
Rex Lane	8	Ductile Iron	348	FALSE	1970	110	100.1	0	40	5	60	0	80	0	23
River Street	8	Ductile Iron	1,534	FALSE	1970	120	119.1	0	40	5	60	0	80	0	23
River Street	8	Ductile Iron	269	FALSE	1970	120	113.8	0	40	5	60	0	80	0	23
Powder Mill Road	8	Ductile Iron	454	FALSE	1970	120	119.9	0	40	5	60	0	80	0	23
Powder Mill Road	8	Ductile Iron	248	FALSE	1970	120	116.9	0	40	5	60	0	80	0	23
Ledge Rock Way	8	Ductile Iron	330	FALSE	1970	110	100.1	0	40	5	60	0	80	0	23
Lawsbrook Road Extension	8	Ductile Iron	980	FALSE	1970	130	114.8	0	40	5	60	0	80	0	23
Davis Road	12	Ductile Iron	93	TRUE	1997	130	75.1	0	10	5	20	100	20	0	22.5
Davis Road	12	Ductile Iron	166	TRUE	1997	130	76.3	0	10	5	20	100	20	0	22.5
Davis Road	12	Ductile Iron	226	TRUE	1997	130	79.1	0	10	5	20	100	20	0	22.5
Davis Road	12	Ductile Iron	262	TRUE	1997	130	76	0	10	5	20	100	20	0	22.5
Briar Hill Road	12	Ductile Iron	610	TRUE	1997	130	60.7	0	10	5	20	100	20	0	22.5
Davis Road	12	Ductile Iron	175	TRUE	1997	130	75.4	0	10	5	20	100	20	0	22.5
Davis Road	12	Ductile Iron	53	TRUE	1997	130	76	0	10	5	20	100	20	0	22.5
Bellows Farm Road	12	Ductile Iron	368	TRUE	1997	130	77.4	0	10	5	20	100	20	0	22.5
Bellows Farm Road	12	Ductile Iron	141	TRUE	1997	130	69.7	0	10	5	20	100	20	0	22.5
Bellows Farm Road	12	Ductile Iron	226	TRUE	1997	130	67.3	0	10	5	20	100	20	0	22.5
Bellows Farm Road	12	Ductile Iron	123	TRUE	1997	130	61.1	0	10	5	20	100	20	0	22.5
Bellows Farm Road	12	Ductile Iron	215	TRUE	1997	130	58.6	0	10	5	20	100	20	0	22.5
Briar Hill Road	12	Ductile Iron	355	TRUE	1997	130	60.7	0	10	5	20	100	20	0	22.5
Briar Hill Road	12	Ductile Iron	90	TRUE	1997	130	61.6	0	10	5	20	100	20	0	22.5
Briar Hill Road	12	Ductile Iron	165	TRUE	1997	130	61.7	0	10	5	20	100	20	0	22.5
Bellows Farm Road	12	Ductile Iron	450	TRUE	1997	130	57.7	0	10	5	20	100	20	0	22.5
Bellows Farm Road	12	Ductile Iron	97	TRUE	1997	130	57.7	0	10	5	20	100	20	0	22.5
Bellows Farm Road	12	Ductile Iron	64	TRUE	1997	130	57.7	0	10	5	20	100	20	0	22.5
Davis Road	12	Ductile Iron	312	TRUE	1997	130	75.5	0	10	5	20	100	20	0	22.5
Davis Road	12	Ductile Iron	184	TRUE	1997	130	75.4	0	10	5	20	100	20	0	22.5
Mohawk Drive	8	Ductile Iron	2,192	FALSE	1970	110	91	0	40	5	60	0	60	0	22
Mohawk Drive	8	Ductile Iron	356	FALSE	1970	110	81.3	0	40	5	60	0	60	0	22
Oneida Road	8	Ductile Iron	1,367	FALSE	1970	110	81.3	0	40	5	60	0	60	0	22
Adams Street	8	Ductile Iron	647	FALSE	1970	110	95.8	0	40	5	60	0	60	0	22

Water Main Prioritization
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									RANKING						
STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS	PIPE DIAMETER 15%	MATERIAL 20%	DATE 20%	WATER QUALITY 15%	STATIC PRESSURE 5%	BREAK HISTORY 25%	SUM 100%
Parker Street	8	Ductile Iron	259	FALSE	1970	110	95.5	0	40	5	60	0	60	0	22
Drummer Road	8	Ductile Iron	908	FALSE	1970	110	96.7	0	40	5	60	0	60	0	22
Meetinghouse Road	8	Ductile Iron	831	FALSE	1970	110	96.7	0	40	5	60	0	60	0	22
Drummer Road	8	Ductile Iron	730	FALSE	1970	110	95.7	0	40	5	60	0	60	0	22
Charter Road	8	Ductile Iron	1,403	FALSE	1970	110	88.5	0	40	5	60	0	60	0	22
River Street	8	Ductile Iron	2,456	FALSE	1970	120	92.6	0	40	5	60	0	60	0	22
Charter Road	8	Ductile Iron	879	FALSE	1970	110	92.1	0	40	5	60	0	60	0	22
Charter Road	8	Ductile Iron	133	FALSE	1970	110	91.2	0	40	5	60	0	60	0	22
Evergreen Road	8	Ductile Iron	386	FALSE	1970	110	90.6	0	40	5	60	0	60	0	22
Stoneymeade Way	8	Ductile Iron	369	FALSE	1970	110	93.6	0	40	5	60	0	60	0	22
Wingate Lane	8	Ductile Iron	195	FALSE	1970	110	91.4	0	40	5	60	0	60	0	22
Wingate Lane Extension	8	Ductile Iron	384	FALSE	1970	110	95.7	0	40	5	60	0	60	0	22
Wingate Lane	8	Ductile Iron	1,236	FALSE	1970	110	95.7	0	40	5	60	0	60	0	22
Wingate Lane	8	Ductile Iron	375	FALSE	1970	110	91.4	0	40	5	60	0	60	0	22
Great Road Extension	8	Ductile Iron	1,155	FALSE	1970	110	95.7	0	40	5	60	0	60	0	22
Great Road Extension	8	Ductile Iron	473	FALSE	1970	110	88.8	0	40	5	60	0	60	0	22
Charter Road	8	Ductile Iron	1,797	FALSE	1970	110	85.9	0	40	5	60	0	60	0	22
Adams Street	8	Ductile Iron	1,651	FALSE	1970	110	95.4	0	40	5	60	0	60	0	22
Main Street	8	Ductile Iron	195	FALSE	1970	110	88	0	40	5	60	0	60	0	22
Notre Dame Road	8	Ductile Iron	334	FALSE	1970	110	90.5	0	40	5	60	0	60	0	22
Brabook Road	8	Ductile Iron	2,040	FALSE	1970	110	93.2	0	40	5	60	0	60	0	22
Charter Road Extension	8	Ductile Iron	1,333	FALSE	1970	110	81.3	0	40	5	60	0	60	0	22
Acton Place	8	Ductile Iron	482	FALSE	1970	110	96.8	0	40	5	60	0	60	0	22
Hartland Way	6	Ductile Iron	307	FALSE	2000	110	102.2	0	100	5	10	0	80	0	22
Tinsdale Drive	6	Ductile Iron	149	FALSE	2000	110	100.1	0	100	5	10	0	80	0	22
Hartland Way	6	Ductile Iron	375	FALSE	2000	110	103.7	0	100	5	10	0	80	0	22
Hartland Way	6	Ductile Iron	285	FALSE	2000	110	103.7	0	100	5	10	0	80	0	22
Alexandra Way	8	Ductile Iron	885	FALSE	1970	110	88.6	0	40	5	60	0	60	0	22
Massachusetts Avenue	8	Ductile Iron	475	FALSE	1970	110	90.5	0	40	5	60	0	60	0	22
Taylor Road	8	Ductile Iron	1,356	FALSE	1970	110	83.3	0	40	5	60	0	60	0	22
Massachusetts Avenue Extension	8	Ductile Iron	580	FALSE	1970	110	90.5	0	40	5	60	0	60	0	22
Massachusetts Avenue Extension	8	Ductile Iron	131	FALSE	1970	110	91	0	40	5	60	0	60	0	22
Ledge Rock Way	8	Ductile Iron	216	FALSE	1970	110	94.6	0	40	5	60	0	60	0	22
Hayward Road	8	Ductile Iron	516	FALSE	1970	130	90.1	0	40	5	60	0	60	0	22
Great Road	12	Ductile Iron	881	FALSE	1960	130	82.7	0	10	5	80	0	60	0	21.5
Great Road	12	Ductile Iron	250	FALSE	1960	130	83.1	0	10	5	80	0	60	0	21.5
Great Road	12	Ductile Iron	175	FALSE	1960	130	82.1	0	10	5	80	0	60	0	21.5
Arlington Street	8	Ductile Iron	260	FALSE	2010	130	87.8	1	40	5	5	0	60	40	21
Tupelo Way	6	Ductile Iron	772	FALSE	1998	110	75.3	0	100	5	20	0	20	0	21
Main Street Extension	6	Ductile Iron	309	FALSE	2005	110	87.9	0	100	5	10	0	60	0	21
Breezy Point Road Extension	6	Ductile Iron	871	FALSE	1990	110	66.3	0	100	5	20	0	20	0	21
Wetherbee Street	10	Ductile Iron	2,258	FALSE	1970	130	120.6	0	20	5	60	0	100	0	21
Centennial Lane	6	Ductile Iron	426	FALSE	2005	110	89.9	0	100	5	10	0	60	0	21
Mohawk Drive	8	Ductile Iron	1,087	FALSE	1970	110	79.1	0	40	5	60	0	20	0	20

Water Main Prioritization
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STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS	RANKING PIPE DIAMETER 15%	MATERIAL 20%	DATE 20%	WATER QUALITY 15%	STATIC PRESSURE 5%	BREAK HISTORY 25%	SUM 100%
Oneida Road	8	Ductile Iron	882	FALSE	1970	110	72.8	0	40	5	60	0	20	0	20
Oneida Road	8	Ductile Iron	448	FALSE	1970	110	69.2	0	40	5	60	0	20	0	20
Evergreen Road	8	Ductile Iron	1,482	FALSE	1970	110	71.2	0	40	5	60	0	20	0	20
Pope Road	10	Ductile Iron	473	FALSE	1970	130	119.8	0	20	5	60	0	80	0	20
Main Street Extension	8	Ductile Iron	64	FALSE	1970	110	N/A	0	40	5	60	0	20	0	20
Great Road	10	Ductile Iron	355	FALSE	1970	130	119.8	0	20	5	60	0	80	0	20
School Street Extension	8	Ductile Iron	46	FALSE	1970	110	N/A	0	40	5	60	0	20	0	20
Pope Road	10	Ductile Iron	682	FALSE	1970	130	107	0	20	5	60	0	80	0	20
Meyer Hill Drive	8	Ductile Iron	615	FALSE	1970	110	48.9	0	40	5	60	0	20	0	20
Alexandra Way	8	Ductile Iron	531	FALSE	1970	110	64.6	0	40	5	60	0	20	0	20
Reeve Street	8	Ductile Iron	465	FALSE	1970	110	64.6	0	40	5	60	0	20	0	20
Wetherbee Street	10	HDPE	263	FALSE	1970	130	116.9	0	20	5	60	0	80	0	20
Notre Dame Road	8	Ductile Iron	891	FALSE	1970	110	76.1	0	40	5	60	0	20	0	20
Nagog Park Extension	8	Ductile Iron	114	FALSE	1970	110	53.3	0	40	5	60	0	20	0	20
Nagog Park Extension	8	Ductile Iron	499	FALSE	1970	110	52.9	0	40	5	60	0	20	0	20
Nagog Park Extension	8	Ductile Iron	535	FALSE	1970	110	52.9	0	40	5	60	0	20	0	20
Nagog Park Extension	8	Ductile Iron	303	FALSE	1970	110	68.9	0	40	5	60	0	20	0	20
Nagog Park	8	Ductile Iron	290	FALSE	1970	110	68.9	0	40	5	60	0	20	0	20
Main Street	16	Ductile Iron	205	FALSE	1990	130	104.4	1	5	5	20	0	80	40	19.75
Seminole Road	6	CIPP	807	FALSE	2017	130	85.1	0	100	5	0	0	60	0	19
Mohegan Road	6	CIPP	553	FALSE	2017	130	80.8	0	100	5	0	0	60	0	19
Agawam Road	6	CIPP	649	FALSE	2017	130	87.8	0	100	5	0	0	60	0	19
Sioux Road	6	CIPP	360	FALSE	2017	130	82.7	0	100	5	0	0	60	0	19
Quaboag Road	6	CIPP	1,443	FALSE	2017	130	87.8	0	100	5	0	0	60	0	19
Agawam Road	6	CIPP	1,389	FALSE	2017	130	82.7	0	100	5	0	0	60	0	19
Pope Road	10	Ductile Iron	456	FALSE	1970	120	93.6	0	20	5	60	0	60	0	19
Pope Road	10	Ductile Iron	573	FALSE	1970	120	91.7	0	20	5	60	0	60	0	19
Wheeler Lane	8	Ductile Iron	705	FALSE	1980	110	102.9	0	40	5	40	0	80	0	19
Till Drive	8	Ductile Iron	245	FALSE	1980	110	104	0	40	5	40	0	80	0	19
Till Drive	8	Ductile Iron	654	FALSE	1980	110	101.4	0	40	5	40	0	80	0	19
Milldam Road	8	Ductile Iron	419	FALSE	1980	110	103.7	0	40	5	40	0	80	0	19
Milldam Road	8	Ductile Iron	370	FALSE	1980	110	102.2	0	40	5	40	0	80	0	19
Squirrel Hill Road	6	Ductile Iron	1,306	FALSE	2000	120	46.1	0	100	5	10	0	20	0	19
Pope Road	10	Ductile Iron	328	FALSE	1970	130	93.2	0	20	5	60	0	60	0	19
Seminole Road	6	CIPP	448	FALSE	2017	130	80.8	0	100	5	0	0	60	0	19
Seminole Road	6	CIPP	1,395	FALSE	2017	130	84	0	100	5	0	0	60	0	19
Central Street	10	Ductile Iron	58	FALSE	1970	120	88.6	0	20	5	60	0	60	0	19
Agawam Road	6	CIPP	1,192	FALSE	2017	130	87.8	0	100	5	0	0	60	0	19
Agawam Road	6	CIPP	545	FALSE	2017	130	81	0	100	5	0	0	60	0	19
Avalon Drive	6	Ductile Iron	515	FALSE	2007	130	41	0	100	5	10	0	20	0	19
Pope Road	10	Ductile Iron	546	FALSE	1970	130	93.1	0	20	5	60	0	60	0	19
Pope Road	10	Ductile Iron	1,634	FALSE	1970	130	94.8	0	20	5	60	0	60	0	19
Nagog Hill Road	16	Ductile Iron	3,124	FALSE	1960	130	73.2	0	5	5	80	0	20	0	18.75
Massachusetts Avenue Extension	99	N/A	10	FALSE	1950	120	N/A	0	5	5	80	0	20	0	18.75

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STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS	RANKING: PIPE DIAMETER 15%	RANKING: MATERIAL 20%	RANKING: DATE 20%	RANKING: WATER QUALITY 15%	RANKING: STATIC PRESSURE 5%	RANKING: BREAK HISTORY 25%	SUM 100%
Main Street Extension	99	N/A	62	FALSE	1950	120	N/A	0	5	5	80	0	20	0	18.75
High Street Extension	99	N/A	10	FALSE	1960	130	N/A	0	5	5	80	0	20	0	18.75
Sawmill Road	8	Ductile Iron	850	FALSE	1980	110	98.5	0	40	5	40	0	60	0	18
Sawmill Road	8	Ductile Iron	255	FALSE	1980	110	96.2	0	40	5	40	0	60	0	18
Milldam Road	8	Ductile Iron	144	FALSE	1980	110	98.8	0	40	5	40	0	60	0	18
Milldam Road	8	Ductile Iron	690	FALSE	1980	110	98.8	0	40	5	40	0	60	0	18
Carlton Drive	8	Ductile Iron	624	FALSE	1980	110	87	0	40	5	40	0	60	0	18
Main Street	16	Ductile Iron	837	FALSE	1970	130	102.9	0	5	5	60	0	80	0	17.75
Main Street	16	Ductile Iron	494	FALSE	1970	130	104.4	0	5	5	60	0	80	0	17.75
Great Road	16	Ductile Iron	1,697	FALSE	1970	130	111.7	0	5	5	60	0	80	0	17.75
Main Street	16	Ductile Iron	1,515	FALSE	1970	130	117.5	0	5	5	60	0	80	0	17.75
Main Street	16	Ductile Iron	368	FALSE	1970	130	103.8	0	5	5	60	0	80	0	17.75
Main Street	16	Ductile Iron	1,176	FALSE	1970	130	104.2	0	5	5	60	0	80	0	17.75
Main Street	16	Ductile Iron	59	FALSE	1970	130	103.4	0	5	5	60	0	80	0	17.75
Main Street	16	Ductile Iron	357	FALSE	1970	130	102.1	0	5	5	60	0	80	0	17.75
Main Street	16	Ductile Iron	355	FALSE	1970	130	103	0	5	5	60	0	80	0	17.75
Great Road	16	Ductile Iron	566	FALSE	1970	130	109.2	0	5	5	60	0	80	0	17.75
Great Road	16	Ductile Iron	354	FALSE	1970	130	103.6	0	5	5	60	0	80	0	17.75
Great Road	16	Ductile Iron	385	FALSE	1970	130	109.6	0	5	5	60	0	80	0	17.75
Main Street	16	Ductile Iron	763	FALSE	1970	130	102	0	5	5	60	0	80	0	17.75
Main Street	16	Ductile Iron	235	FALSE	1970	130	100	0	5	5	60	0	80	0	17.75
Main Street	12	Ductile Iron	88	FALSE	1970	120	88	0	10	5	60	0	60	0	17.5
Meyer Hill Drive	12	Ductile Iron	467	FALSE	1970	120	94.9	0	10	5	60	0	60	0	17.5
Harris Street	12	Ductile Iron	2,264	FALSE	1970	120	98.9	0	10	5	60	0	60	0	17.5
Harris Street	12	Ductile Iron	568	FALSE	1970	120	88.6	0	10	5	60	0	60	0	17.5
Harris Street	12	Ductile Iron	223	FALSE	1970	120	81.1	0	10	5	60	0	60	0	17.5
Mohegan Road	6	CIPP	536	FALSE	2017	130	79.1	0	100	5	0	0	20	0	17
Mohegan Road	6	CIPP	843	FALSE	2017	130	79.1	0	100	5	0	0	20	0	17
Newtown Road	10	Ductile Iron	1,103	FALSE	1970	120	74.9	0	20	5	60	0	20	0	17
Hammond Street	10	Ductile Iron	1,193	FALSE	1970	120	68.9	0	20	5	60	0	20	0	17
Post Office Square Extension	10	Ductile Iron	1,381	FALSE	1970	120	N/A	0	20	5	60	0	20	0	17
Avalon Drive	10	Ductile Iron	169	FALSE	1970	130	69.8	0	20	5	60	0	20	0	17
Avalon Drive	10	Ductile Iron	1,004	FALSE	1970	130	67.3	0	20	5	60	0	20	0	17
Main Street	16	Ductile Iron	2,015	FALSE	1970	130	98.9	0	5	5	60	0	60	0	16.75
Great Road	16	Ductile Iron	149	FALSE	1970	130	95.4	0	5	5	60	0	60	0	16.75
Great Road	16	Ductile Iron	1,507	FALSE	1970	130	95.7	0	5	5	60	0	60	0	16.75
Great Road	16	Ductile Iron	431	FALSE	1970	130	88.8	0	5	5	60	0	60	0	16.75
Great Road	16	Ductile Iron	398	FALSE	1970	130	80.3	0	5	5	60	0	60	0	16.75
Great Road	16	Ductile Iron	515	FALSE	1970	130	81.8	0	5	5	60	0	60	0	16.75
Great Road	16	Ductile Iron	280	FALSE	1970	130	95.2	0	5	5	60	0	60	0	16.75
Main Street	16	Ductile Iron	1,121	FALSE	1970	130	94.9	0	5	5	60	0	60	0	16.75
Main Street	16	Ductile Iron	616	FALSE	1970	130	99.2	0	5	5	60	0	60	0	16.75
Great Road	16	Ductile Iron	1,265	FALSE	1970	130	95.9	0	5	5	60	0	60	0	16.75
School Street	10	Ductile Iron	1,508	FALSE	1980	130	116.9	0	20	5	40	0	80	0	16

Water Main Prioritization
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STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS	RANKING PIPE DIAMETER 15%	MATERIAL 20%	DATE 20%	WATER QUALITY 15%	STATIC PRESSURE 5%	BREAK HISTORY 25%	SUM 100%
Great Road	12	Ductile Iron	173	FALSE	1970	130	67.8	0	10	5	60	0	20	0	15.5
Great Road	12	Ductile Iron	487	FALSE	1970	130	66.3	0	10	5	60	0	20	0	15.5
Great Road	12	Ductile Iron	1,265	FALSE	1970	130	65.1	0	10	5	60	0	20	0	15.5
High Street Extension	12	Ductile Iron	41	FALSE	1970	120	N/A	0	10	5	60	0	20	0	15.5
Harris Street	12	Ductile Iron	247	FALSE	1970	120	76.4	0	10	5	60	0	20	0	15.5
Meyer Hill Drive	12	Ductile Iron	82	FALSE	1970	120	55.1	0	10	5	60	0	20	0	15.5
Meyer Hill Drive	12	Ductile Iron	290	FALSE	1970	120	48.9	0	10	5	60	0	20	0	15.5
Meyer Hill Drive	12	Ductile Iron	18	FALSE	1970	120	55.1	0	10	5	60	0	20	0	15.5
Meyer Hill Drive	12	Ductile Iron	72	FALSE	1970	120	55.1	0	10	5	60	0	20	0	15.5
Meyer Hill Drive	12	Ductile Iron	43	FALSE	1970	120	55.1	0	10	5	60	0	20	0	15.5
Meyer Hill Drive	12	Ductile Iron	28	FALSE	1970	120	N/A	0	10	5	60	0	20	0	15.5
Maddy Lane	8	Ductile Iron	237	FALSE	1994	110	112.2	0	40	5	20	0	80	0	15
Maddy Lane	8	Ductile Iron	380	FALSE	1994	110	105.4	0	40	5	20	0	80	0	15
Lexington Drive	8	Ductile Iron	151	FALSE	1995	110	115.9	0	40	5	20	0	80	0	15
Lexington Drive	8	Ductile Iron	1,864	FALSE	1995	110	114.3	0	40	5	20	0	80	0	15
Lexington Drive	8	Ductile Iron	1,746	FALSE	1995	110	114.1	0	40	5	20	0	80	0	15
Skyline Drive	8	Ductile Iron	665	FALSE	1995	130	103.6	0	40	5	20	0	80	0	15
Skyline Drive	8	Ductile Iron	367	FALSE	1995	130	111.8	0	40	5	20	0	80	0	15
Skyline Drive	8	Ductile Iron	169	FALSE	1995	110	104.8	0	40	5	20	0	80	0	15
Nagog Hill Road	16	Ductile Iron	2,334	FALSE	1970	130	71.5	0	5	5	60	0	20	0	14.75
Nagog Hill Road	16	Ductile Iron	74	FALSE	1970	130	58.1	0	5	5	60	0	20	0	14.75
Nagog Hill Road	16	Ductile Iron	280	FALSE	1970	130	20.9	0	5	5	60	0	20	0	14.75
Nagog Hill Road	16	Ductile Iron	2,035	FALSE	1970	130	55.9	0	5	5	60	0	20	0	14.75
Main Street Extension	99	N/A	10	FALSE	1970	120	N/A	0	5	5	60	0	20	0	14.75
Great Road	16	Ductile Iron	275	FALSE	1970	130	73	0	5	5	60	0	20	0	14.75
Post Office Square Extension	99	N/A	10	FALSE	1970	120	N/A	0	5	5	60	0	20	0	14.75
School Street Extension	99	Ductile Iron	10	FALSE	1970	120	N/A	0	5	5	60	0	20	0	14.75
School Street Extension	99	Ductile Iron	10	FALSE	1970	120	N/A	0	5	5	60	0	20	0	14.75
Northbriar Road	12	Ductile Iron	304	FALSE	1980	120	104.4	0	10	5	40	0	80	0	14.5
Northbriar Road	12	Ductile Iron	356	FALSE	1980	120	104	0	10	5	40	0	80	0	14.5
Assabet Crossing	8	Ductile Iron	485	FALSE	1990	110	95.7	0	40	5	20	0	60	0	14
Assabet Crossing	8	Ductile Iron	474	FALSE	1990	110	96.7	0	40	5	20	0	60	0	14
Stoneymeade Way	8	Ductile Iron	792	FALSE	1991	110	99.6	0	40	5	20	0	60	0	14
Stoneymeade Way	8	Ductile Iron	2,569	FALSE	1991	110	93.5	0	40	5	20	0	60	0	14
Captain Handley Road & Sachem Way	8	Ductile Iron	1,978	FALSE	1990	110	81.1	0	40	5	20	0	60	0	14
Farmstead Way	8	Ductile Iron	138	FALSE	1997	110	94.4	0	40	5	20	0	60	0	14
Farmstead Way	8	Ductile Iron	117	FALSE	1997	110	91.8	0	40	5	20	0	60	0	14
Farmstead Way	8	Ductile Iron	318	FALSE	1997	110	91.8	0	40	5	20	0	60	0	14
Farmstead Way	8	Ductile Iron	305	FALSE	1997	110	89.8	0	40	5	20	0	60	0	14
Hazelnut Street	8	Ductile Iron	642	FALSE	1995	130	86.6	0	40	5	20	0	60	0	14
Hazelnut Street	8	Ductile Iron	234	FALSE	1995	130	84.9	0	40	5	20	0	60	0	14
Acorn Park Drive	8	Ductile Iron	529	FALSE	1995	130	86.8	0	40	5	20	0	60	0	14
Acorn Park Drive	8	Ductile Iron	495	FALSE	1995	130	85.7	0	40	5	20	0	60	0	14
Acorn Park Drive	8	Ductile Iron	341	FALSE	1995	130	86.7	0	40	5	20	0	60	0	14

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STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS	RANKING						
									PIPE DIAMETER 15%	MATERIAL 20%	DATE 20%	WATER QUALITY 15%	STATIC PRESSURE 5%	BREAK HISTORY 25%	SUM 100%
Acorn Park Drive	8	Ductile Iron	345	FALSE	1995	130	90.1	0	40	5	20	0	60	0	14
Acorn Park Drive	8	Ductile Iron	210	FALSE	1995	130	87.2	0	40	5	20	0	60	0	14
Acorn Park Drive	8	Ductile Iron	712	FALSE	1995	130	95.3	0	40	5	20	0	60	0	14
Northbriar Road	12	Ductile Iron	603	FALSE	1980	120	98.5	0	10	5	40	0	60	0	13.5
Carlisle Road	8	Ductile Iron	538	FALSE	2006	130	101.8	0	40	5	10	0	80	0	13
North Street	8	Ductile Iron	865	FALSE	2006	130	101.8	0	40	5	10	0	80	0	13
Carlisle Road	8	Ductile Iron	489	FALSE	2006	130	103.9	0	40	5	10	0	80	0	13
Carlisle Road	8	Ductile Iron	1,137	FALSE	2006	130	104.4	0	40	5	10	0	80	0	13
Preston Way	8	Ductile Iron	1,045	FALSE	2000	110	102.1	0	40	5	10	0	80	0	13
Hartland Way	8	Ductile Iron	237	FALSE	2000	110	100.7	0	40	5	10	0	80	0	13
Hartland Way	8	Ductile Iron	465	FALSE	2000	110	100.1	0	40	5	10	0	80	0	13
Eastern Road	8	Ductile Iron	552	FALSE	2000	110	100.1	0	40	5	10	0	80	0	13
Hartland Way	8	Ductile Iron	263	FALSE	2000	110	100.8	0	40	5	10	0	80	0	13
Tinsdale Drive	8	Ductile Iron	286	FALSE	2000	110	100.8	0	40	5	10	0	80	0	13
Hartland Way	8	Ductile Iron	296	FALSE	2000	110	103	0	40	5	10	0	80	0	13
Canterbury Hill Road	8	Ductile Iron	321	FALSE	2006	130	104.4	0	40	5	10	0	80	0	13
Canterbury Hill Road	8	Ductile Iron	492	FALSE	2006	130	103.1	0	40	5	10	0	80	0	13
Seneca Road	8	Ductile Iron	1,009	FALSE	2005	130	81.3	0	40	5	10	0	60	0	12
Seneca Road	8	Ductile Iron	340	FALSE	2005	130	85.1	0	40	5	10	0	60	0	12
Audubon Drive	8	Ductile Iron	1,068	FALSE	1994	110	76.1	0	40	5	20	0	20	0	12
Audubon Drive	8	Ductile Iron	250	FALSE	1994	110	77.1	0	40	5	20	0	20	0	12
Audubon Drive	8	Ductile Iron	634	FALSE	1991	110	77.1	0	40	5	20	0	20	0	12
Brewster Lane	8	Ductile Iron	536	FALSE	1991	110	70.5	0	40	5	20	0	20	0	12
Audubon Drive	8	Ductile Iron	507	FALSE	1993	110	70.5	0	40	5	20	0	20	0	12
Audubon Drive Extension	8	Ductile Iron	444	FALSE	1990	110	60.6	0	40	5	20	0	20	0	12
Audubon Drive	8	Ductile Iron	467	FALSE	1990	110	60.6	0	40	5	20	0	20	0	12
Blueberry Path	8	Ductile Iron	707	FALSE	2006	130	87.9	0	40	5	10	0	60	0	12
Marshall Path	8	Ductile Iron	764	FALSE	2006	130	87.9	0	40	5	10	0	60	0	12
Main Street Extension	8	Ductile Iron	211	FALSE	1990	110	N/A	0	40	5	20	0	20	0	12
Main Street Extension	8	Ductile Iron	554	FALSE	1990	130	N/A	0	40	5	20	0	20	0	12
Great Road Extension	8	Ductile Iron	140	FALSE	2000	110	95.4	0	40	5	10	0	60	0	12
Canterbury Hill Road	8	Ductile Iron	276	FALSE	2006	130	83.9	0	40	5	10	0	60	0	12
Canterbury Hill Road Extension	8	Ductile Iron	249	FALSE	2006	130	81.5	0	40	5	10	0	60	0	12
Canterbury Hill Road	8	Ductile Iron	329	FALSE	2006	130	83.9	0	40	5	10	0	60	0	12
Meyer Hill Drive	8	Ductile Iron	1,069	FALSE	2000	110	95.2	0	40	5	10	0	60	0	12
Breezy Point Road	8	Ductile Iron	676	FALSE	1990	110	65.1	0	40	5	20	0	20	0	12
Breezy Point Road	8	Ductile Iron	464	FALSE	1990	110	66.3	0	40	5	20	0	20	0	12
Coughlin Street	8	Ductile Iron	732	FALSE	2008	110	83.3	0	40	5	10	0	60	0	12
Canterbury Hill Road	8	Ductile Iron	257	FALSE	2006	130	81.5	0	40	5	10	0	60	0	12
Avalon Drive	8	Ductile Iron	309	FALSE	2007	130	81.3	0	40	5	10	0	60	0	12
Canterbury Hill Road	8	Ductile Iron	490	FALSE	2006	130	91.8	0	40	5	10	0	60	0	12
Ledge Rock Way	8	Ductile Iron	1,666	FALSE	2000	120	94.6	0	40	5	10	0	60	0	12
Arlington Street	8	Ductile Iron	271	FALSE	2010	130	89.9	0	40	5	5	0	60	0	11
Stow Street	8	Ductile Iron	963	FALSE	2014	120	96.2	0	40	5	5	0	60	0	11

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STREET NAME	DIAMETER (in)	MATERIAL	LENGTH (ft)	WATER QUALITY	INSTALLATION YEAR	C-VALUE	STATIC PRESSURE (psi)	NUMBER OF BREAKS	RANKING						
									PIPE DIAMETER 15%	MATERIAL 20%	DATE 20%	WATER QUALITY 15%	STATIC PRESSURE 5%	BREAK HISTORY 25%	SUM 100%
Mylander Way	10	Ductile Iron	277	FALSE	1994	120	82.5	0	20	5	20	0	60	0	11
Hayward Road	8	Ductile Iron	319	FALSE	2014	130	87.8	0	40	5	5	0	60	0	11
Hayward Road	8	Ductile Iron	520	FALSE	2014	130	88.5	0	40	5	5	0	60	0	11
Hayward Road	8	Ductile Iron	433	FALSE	2014	130	92.1	0	40	5	5	0	60	0	11
Hayward Road	8	Ductile Iron	506	FALSE	2014	130	92.1	0	40	5	5	0	60	0	11
Arlington Street	8	Ductile Iron	197	FALSE	2010	130	82.2	0	40	5	5	0	60	0	11
Stow Street	8	Ductile Iron	464	FALSE	2014	120	96.7	0	40	5	5	0	60	0	11
Stow Street	8	Ductile Iron	840	FALSE	2014	120	96.7	0	40	5	5	0	60	0	11
Stow Street	8	HDPE	239	FALSE	2014	130	96.7	0	40	5	5	0	60	0	11
Arlington Street	8	Ductile Iron	123	FALSE	2010	130	90.4	0	40	5	5	0	60	0	11
Arlington Street	8	HDPE	89	FALSE	2010	130	90.4	0	40	5	5	0	60	0	11
Arlington Street	8	Ductile Iron	945	FALSE	2010	130	90.4	0	40	5	5	0	60	0	11
Arlington Street	8	Ductile Iron	156	FALSE	2010	130	92.1	0	40	5	5	0	60	0	11
Arlington Street	8	Ductile Iron	250	FALSE	2010	130	92.1	0	40	5	5	0	60	0	11
Arlington Street	8	HDPE	78	FALSE	2010	130	92.1	0	40	5	5	0	60	0	11
Arlington Street	8	Ductile Iron	328	FALSE	2010	130	86.7	0	40	5	5	0	60	0	11
Arlington Street	8	HDPE	103	FALSE	2010	130	92.1	0	40	5	5	0	60	0	11
Arlington Street	8	Ductile Iron	861	FALSE	2010	130	92.1	0	40	5	5	0	60	0	11
Quail Ridge Country Club	8	Ductile Iron	833	FALSE	2015	120	85.5	0	40	5	5	0	60	0	11
Quail Ridge Country Club	8	Ductile Iron	979	FALSE	2015	120	94.2	0	40	5	5	0	60	0	11
Quail Ridge Country Club	8	Ductile Iron	1363	FALSE	2015	120	94.2	0	40	5	5	0	60	0	11
Quail Ridge Country Club	8	Ductile Iron	206	FALSE	2015	120	81.8	0	40	5	5	0	60	0	11
Quail Ridge Country Club	8	Ductile Iron	746	FALSE	2015	120	81.8	0	40	5	5	0	60	0	11
Quail Ridge Country Club	8	Ductile Iron	189	FALSE	2015	120	80.5	0	40	5	5	0	60	0	11
Quarry Road	8	Ductile Iron	759	FALSE	2012	130	87.2	0	40	5	5	0	60	0	11
Quarry Road	8	Ductile Iron	1737	FALSE	2012	130	95	0	40	5	5	0	60	0	11
Great Road	12	Ductile Iron	1,603	FALSE	1997	130	109.2	0	10	5	20	0	80	0	10.5
Seneca Road	8	Ductile Iron	99	FALSE	2005	130	79.1	0	40	5	10	0	20	0	10
Marshall Path	8	Ductile Iron	527	FALSE	2006	130	74.6	0	40	5	10	0	20	0	10
Canterbury Hill Road	8	Ductile Iron	375	FALSE	2006	130	77.3	0	40	5	10	0	20	0	10
Canterbury Hill Road	8	Ductile Iron	452	FALSE	2006	130	73.6	0	40	5	10	0	20	0	10
Blueberry Path	8	Ductile Iron	1,276	FALSE	2006	130	75.9	0	40	5	10	0	20	0	10
Canterbury Hill Road	8	Ductile Iron	556	FALSE	2006	130	75.9	0	40	5	10	0	20	0	10
Canterbury Hill Road	8	Ductile Iron	458	FALSE	2006	130	63.7	0	40	5	10	0	20	0	10
Canterbury Hill Road	8	Ductile Iron	1,117	FALSE	2006	130	61.9	0	40	5	10	0	20	0	10
Canterbury Hill Road	8	Ductile Iron	497	FALSE	2006	130	73.6	0	40	5	10	0	20	0	10
Canterbury Hill Road Extension	8	Ductile Iron	225	FALSE	2006	130	72.5	0	40	5	10	0	20	0	10
Canterbury Hill Road	8	Ductile Iron	218	FALSE	2006	130	72.5	0	40	5	10	0	20	0	10
Canterbury Hill Road	8	Ductile Iron	512	FALSE	2006	130	70.6	0	40	5	10	0	20	0	10
Canterbury Hill Road Extension	8	Ductile Iron	461	FALSE	2006	130	70.6	0	40	5	10	0	20	0	10
Avalon Drive	8	Ductile Iron	517	FALSE	2007	130	64.6	0	40	5	10	0	20	0	10
Meyer Hill Drive	8	Ductile Iron	773	FALSE	2000	110	59.2	0	40	5	10	0	20	0	10
Meyer Hill Drive	8	Ductile Iron	248	FALSE	2000	110	66.9	0	40	5	10	0	20	0	10
Devon Drive	10	Ductile Iron	247	FALSE	2000	120	102.1	0	20	5	10	0	80	0	10

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									PIPE DIAMETER 15%	MATERIAL 20%	DATE 20%	WATER QUALITY 15%	STATIC PRESSURE 5%	BREAK HISTORY 25%	SUM 100%
Devon Drive	10	Ductile Iron	181	FALSE	2000	120	102.1	0	20	5	10	0	80	0	10
Devon Drive Extension	10	Ductile Iron	320	FALSE	2000	120	101.9	0	20	5	10	0	80	0	10
Seneca Road	8	Ductile Iron	371	FALSE	2005	130	79.1	0	40	5	10	0	20	0	10
Coughlin Street	8	Ductile Iron	508	FALSE	2008	110	76.6	0	40	5	10	0	20	0	10
Canterbury Hill Road	8	Ductile Iron	205	FALSE	2006	130	79.7	0	40	5	10	0	20	0	10
Canterbury Hill Road Extension	8	Ductile Iron	363	FALSE	2006	130	79.7	0	40	5	10	0	20	0	10
Canterbury Hill Road Extension	8	Ductile Iron	247	FALSE	2006	130	77.3	0	40	5	10	0	20	0	10
Westford Lane	8	Ductile Iron	1,212	FALSE	2007	130	71.9	0	40	5	10	0	20	0	10
Avalon Drive	8	Ductile Iron	345	FALSE	2007	130	60.5	0	40	5	10	0	20	0	10
Avalon Drive	8	Ductile Iron	691	FALSE	2007	130	52.8	0	40	5	10	0	20	0	10
Avalon Drive	8	Ductile Iron	416	FALSE	2007	130	41	0	40	5	10	0	20	0	10
Acorn Park Drive	12	Ductile Iron	516	FALSE	1995	130	80.3	0	10	5	20	0	60	0	9.5
Acorn Park Drive	12	Ductile Iron	137	FALSE	1995	130	85.1	0	10	5	20	0	60	0	9.5
Acorn Park Drive	12	Ductile Iron	245	FALSE	1995	130	89.2	0	10	5	20	0	60	0	9.5
Acorn Park Drive	12	Ductile Iron	301	FALSE	1995	130	86.6	0	10	5	20	0	60	0	9.5
Acorn Park Drive	12	Ductile Iron	121	FALSE	1995	130	83.2	0	10	5	20	0	60	0	9.5
Acorn Park Drive	12	Ductile Iron	498	FALSE	1995	130	87.9	0	10	5	20	0	60	0	9.5
Acorn Park Drive	12	Ductile Iron	152	FALSE	1995	130	89.2	0	10	5	20	0	60	0	9.5
Abel Jones Place	10	Ductile Iron	463	FALSE	1994	120	62.7	0	20	5	20	0	20	0	9
Mylander Way	10	Ductile Iron	315	FALSE	1994	120	62.7	0	20	5	20	0	20	0	9
Mylander Way	10	Ductile Iron	574	FALSE	1994	120	62.7	0	20	5	20	0	20	0	9
Hayward Road	8	Ductile Iron	1,352	FALSE	2014	130	69.7	0	40	5	5	0	20	0	9
Hayward Road	8	Ductile Iron	1,188	FALSE	2014	130	69.7	0	40	5	5	0	20	0	9
Quail Ridge Country Club	8	Ductile Iron	1307	FALSE	2015	120	75.3	0	40	5	5	0	20	0	9
Quail Ridge Country Club	8	Ductile Iron	212	FALSE	2015	120	78.2	0	40	5	5	0	20	0	9
Quail Ridge Country Club	8	Ductile Iron	407	FALSE	2015	120	77.1	0	40	5	5	0	20	0	9
Quail Ridge Country Club	8	Ductile Iron	497	FALSE	2015	120	77.1	0	40	5	5	0	20	0	9
Quail Ridge Country Club	8	Ductile Iron	350	FALSE	2015	120	79.2	0	40	5	5	0	20	0	9
Quail Ridge Country Club	8	Ductile Iron	485	FALSE	2015	120	78.2	0	40	5	5	0	20	0	9
Quail Ridge Country Club	8	Ductile Iron	244	FALSE	2015	120	78.2	0	40	5	5	0	20	0	9
Littlefield Road	8	Ductile Iron	569	FALSE	2017	130	76.5	0	40	5	0	0	20	0	8
Meyer Hill Drive	12	Ductile Iron	30	FALSE	1990	120	N/A	0	10	5	20	0	20	0	7.5
Avalon Drive	10	Ductile Iron	190	FALSE	2007	130	68.1	0	20	5	10	0	20	0	7
Avalon Drive	10	Ductile Iron	176	FALSE	2007	130	52.8	0	20	5	10	0	20	0	7
Avalon Drive	10	Ductile Iron	180	FALSE	2007	130	47	0	20	5	10	0	20	0	7
Avalon Drive	10	Ductile Iron	229	FALSE	2007	130	47.5	0	20	5	10	0	20	0	7
High Street	12	Ductile Iron	976	FALSE	2013	130	93.6	0	10	5	5	0	60	0	6.5
High Street	12	Ductile Iron	899	FALSE	2013	130	95.1	0	10	5	5	0	60	0	6.5
High Street	12	Ductile Iron	353	FALSE	2013	130	93.6	0	10	5	5	0	60	0	6.5
High Street	12	Ductile Iron	1,006	FALSE	2013	130	95.8	0	10	5	5	0	60	0	6.5
High Street	12	Ductile Iron	961	FALSE	2013	130	76.8	0	10	5	5	0	20	0	4.5
High Street	12	Ductile Iron	812	FALSE	2013	130	76.1	0	10	5	5	0	20	0	4.5

Appendix C

Wright-Pierce
Engineering a Better Environment™

National Primary Drinking Water Regulations

EPA

Contaminant	MCL or TT[1] (mg/L)[2]	Potential health effects from long-term[3] exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal (mg/L)[2]
Acrylamide	TT[4]	Nervous system or blood problems; increased risk of cancer	Added to water during sewage/wastewater treatment	**zero**
Alachlor	0.002	Eye, liver, kidney, or spleen problems; anemia; increased risk of cancer	Runoff from herbicide used on row crops	**zero**
Alpha/photon emitters	15 picocuries per Liter (pCi/L)	Increased risk of cancer	Erosion of natural deposits of certain minerals that are radioactive and may emit a form of radiation known as alpha radiation	**zero**
Antimony	0.006	Increase in blood cholesterol; decrease in blood sugar	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder	**0.006**
Arsenic	0.010	Skin damage or problems with circulatory systems, and may have increased risk of getting cancer	Erosion of natural deposits; runoff from orchards; runoff from glass & electronics production wastes	**0**
Asbestos (fibers >10 micrometers)	7 million fibers per Liter (MFL)	Increased risk of developing benign intestinal polyps	Decay of asbestos cement in water mains; erosion of natural deposits	**7 MFL**
Atrazine	0.003	Cardiovascular system or reproductive problems	Runoff from herbicide used on row crops	**0.003**
Barium	2	Increase in blood pressure	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits	**2**
Benzene	0.005	Anemia; decrease in blood platelets; increased risk of cancer	Discharge from factories; leaching from gas storage tanks and landfills	**zero**
Benzo(a)pyrene (PAHs)	0.0002	Reproductive difficulties; increased risk of cancer	Leaching from linings of water storage tanks and distribution lines	**zero**
Beryllium	0.004	Intestinal lesions	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries	**0.004**
Beta photon emitters	4 millirems per year	Increased risk of cancer	Decay of natural and man-made deposits of certain minerals that are radioactive and may emit forms of radiation known as photons and beta radiation	**zero**
Bromate	0.010	Increased risk of cancer	Byproduct of drinking water disinfection	**zero**
Cadmium	0.005	Kidney damage	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints	**0.005**
Carbofuran	0.04	Problems with blood, nervous system, or reproductive system	Leaching of soil fumigant used on rice and alfalfa	**0.04**

LEGEND

DISINFECTANT

DISINFECTION BYPRODUCT

INORGANIC CHEMICAL

MICROORGANISM

ORGANIC CHEMICAL

RADIONUCLIDES

Contaminant	MCL or TT[1] (mg/L)[2]	Potential health effects from long-term[3] exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal (mg/L)[2]
Carbon tetrachloride	0.005	Liver problems; increased risk of cancer	Discharge from chemical plants and other industrial activities	**zero**
Chloramines (as Cl_2)	MRDL=4.0[1]	Eye/nose irritation; stomach discomfort; anemia	Water additive used to control microbes	**MRDLG=4[1]**
Chlordane	0.002	Liver or nervous system problems; increased risk of cancer	Residue of banned termiticide	**zero**
Chlorine (as Cl_2)	MRDL=4.0[1]	Eye/nose irritation; stomach discomfort	Water additive used to control microbes	**MRDLG=4[1]**
Chlorine dioxide (as ClO_2)	MRDL=0.8[1]	Anemia; infants, young children, and fetuses of pregnant women: nervous system effects	Water additive used to control microbes	**MRDLG=0.8[1]**
Chlorite	1.0	Anemia; infants, young children, and fetuses of pregnant women: nervous system effects	Byproduct of drinking water disinfection	**0.8**
Chlorobenzene	0.1	Liver or kidney problems	Discharge from chemical and agricultural chemical factories	**0.1**
Chromium (total)	0.1	Allergic dermatitis	Discharge from steel and pulp mills; erosion of natural deposits	**0.1**
Copper	TT[5]; Action Level=1.3	Short-term exposure: Gastrointestinal distress. Long-term exposure: Liver or kidney damage. People with Wilson's Disease should consult their personal doctor if the amount of copper in their water exceeds the action level	Corrosion of household plumbing systems; erosion of natural deposits	**1.3**
Cryptosporidium	TT[7]	Short-term exposure: Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste	**zero**
Cyanide (as free cyanide)	0.2	Nerve damage or thyroid problems	Discharge from steel/metal factories; discharge from plastic and fertilizer factories	**0.2**
2,4-D	0.07	Kidney, liver, or adrenal gland problems	Runoff from herbicide used on row crops	**0.07**
Dalapon	0.2	Minor kidney changes	Runoff from herbicide used on rights of way	**0.2**
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	Reproductive difficulties; increased risk of cancer	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards	**zero**
o-Dichlorobenzene	0.6	Liver, kidney, or circulatory system problems	Discharge from industrial chemical factories	**0.6**
p-Dichlorobenzene	0.075	Anemia; liver, kidney, or spleen damage; changes in blood	Discharge from industrial chemical factories	**0.075**
1,2-Dichloroethane	0.005	Increased risk of cancer	Discharge from industrial chemical factories	**zero**

LEGEND

DISINFECTANT

DISINFECTION BYPRODUCT

INORGANIC CHEMICAL

MICROORGANISM

ORGANIC CHEMICAL

RADIONUCLIDES

Contaminant	MCL or TT[1] (mg/L)[2]	Potential health effects from long-term[3] exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal (mg/L)[2]
1,1-Dichloroethylene	0.007	Liver problems	Discharge from industrial chemical factories	**0.007**
cis-1,2-Dichloroethylene	0.07	Liver problems	Discharge from industrial chemical factories	**0.07**
trans-1,2, Dichloroethylene	0.1	Liver problems	Discharge from industrial chemical factories	**0.1**
Dichloromethane	0.005	Liver problems; increased risk of cancer	Discharge from industrial chemical factories	**zero**
1,2-Dichloropropane	0.005	Increased risk of cancer	Discharge from industrial chemical factories	**zero**
Di(2-ethylhexyl) adipate	0.4	Weight loss, liver problems, or possible reproductive difficulties	Discharge from chemical factories	**0.4**
Di(2-ethylhexyl) phthalate	0.006	Reproductive difficulties; liver problems; increased risk of cancer	Discharge from rubber and chemical factories	**zero**
Dinoseb	0.007	Reproductive difficulties	Runoff from herbicide used on soybeans and vegetables	**0.007**
Dioxin (2,3,7,8-TCDD)	0.00000003	Reproductive difficulties; increased risk of cancer	Emissions from waste incineration and other combustion; discharge from chemical factories	**zero**
Diquat	0.02	Cataracts	Runoff from herbicide use	**0.02**
Endothall	0.1	Stomach and intestinal problems	Runoff from herbicide use	**0.1**
Endrin	0.002	Liver problems	Residue of banned insecticide	**0.002**
Epichlorohydrin	TT[4]	Increased cancer risk; stomach problems	Discharge from industrial chemical factories; an impurity of some water treatment chemicals	**zero**
Ethylbenzene	0.7	Liver or kidney problems	Discharge from petroleum refineries	**0.7**
Ethylene dibromide	0.00005	Problems with liver, stomach, reproductive system, or kidneys; increased risk of cancer	Discharge from petroleum refineries	**zero**
Fecal coliform and *E. coli*	MCL[6]	Fecal coliforms and *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes may cause short term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, and people with severely compromised immune systems.	Human and animal fecal waste	**zero[6]**

LEGEND

DISINFECTANT | DISINFECTION BYPRODUCT | INORGANIC CHEMICAL | MICROORGANISM | ORGANIC CHEMICAL | RADIONUCLIDES

Contaminant	MCL or TT[1] (mg/L)[2]	Potential health effects from long-term[3] exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal (mg/L)[2]
Fluoride	4.0	Bone disease (pain and tenderness of the bones); children may get mottled teeth	Water additive which promotes strong teeth; erosion of natural deposits; discharge from fertilizer and aluminum factories	**4.0**
Giardia lamblia	TT[7]	Short-term exposure: Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste	**zero**
Glyphosate	0.7	Kidney problems; reproductive difficulties	Runoff from herbicide use	**0.7**
Haloacetic acids (HAA5)	0.060	Increased risk of cancer	Byproduct of drinking water disinfection	**n/a[9]**
Heptachlor	0.0004	Liver damage; increased risk of cancer	Residue of banned termiticide	**zero**
Heptachlor epoxide	0.0002	Liver damage; increased risk of cancer	Breakdown of heptachlor	**zero**
Heterotrophic plate count (HPC)	TT[7]	HPC has no health effects; it is an analytic method used to measure the variety of bacteria that are common in water. The lower the concentration of bacteria in drinking water, the better maintained the water system is.	HPC measures a range of bacteria that are naturally present in the environment	**n/a**
Hexachlorobenzene	0.001	Liver or kidney problems; reproductive difficulties; increased risk of cancer	Discharge from metal refineries and agricultural chemical factories	**zero**
Hexachloro-cyclopentadiene	0.05	Kidney or stomach problems	Discharge from chemical factories	**0.05**
Lead	TT[5]; Action Level=0.015	Infants and children: Delays in physical or mental development; children could show slight deficits in attention span and learning abilities; Adults: Kidney problems; high blood pressure	Corrosion of household plumbing systems; erosion of natural deposits	**zero**
Legionella	TT[7]	Legionnaire's Disease, a type of pneumonia	Found naturally in water; multiplies in heating systems	**zero**
Lindane	0.0002	Liver or kidney problems	Runoff/leaching from insecticide used on cattle, lumber, and gardens	**0.0002**
Mercury (inorganic)	0.002	Kidney damage	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and croplands	**0.002**
Methoxychlor	0.04	Reproductive difficulties	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, and livestock	**0.04**
Nitrate (measured as Nitrogen)	10	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits	**10**

LEGEND

DISINFECTANT | DISINFECTION BYPRODUCT | INORGANIC CHEMICAL | MICROORGANISM | ORGANIC CHEMICAL | RADIONUCLIDES

Contaminant	MCL or TT[1] (mg/L)[2]	Potential health effects from long-term[3] exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal (mg/L)[2]
Nitrite (measured as Nitrogen)	1	Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits	**1**
Oxamyl (Vydate)	0.2	Slight nervous system effects	Runoff/leaching from insecticide used on apples, potatoes, and tomatoes	**0.2**
Pentachlorophenol	0.001	Liver or kidney problems; increased cancer risk	Discharge from wood-preserving factories	**zero**
Picloram	0.5	Liver problems	Herbicide runoff	**0.5**
Polychlorinated biphenyls (PCBs)	0.0005	Skin changes; thymus gland problems; immune deficiencies; reproductive or nervous system difficulties; increased risk of cancer	Runoff from landfills; discharge of waste chemicals	**zero**
Radium 226 and Radium 228 (combined)	5 pCi/L	Increased risk of cancer	Erosion of natural deposits	**zero**
Selenium	0.05	Hair or fingernail loss; numbness in fingers or toes; circulatory problems	Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines	**0.05**
Simazine	0.004	Problems with blood	Herbicide runoff	**0.004**
Styrene	0.1	Liver, kidney, or circulatory system problems	Discharge from rubber and plastic factories; leaching from landfills	**0.1**
Tetrachloroethylene	0.005	Liver problems; increased risk of cancer	Discharge from factories and dry cleaners	**zero**
Thallium	0.002	Hair loss; changes in blood; kidney, intestine, or liver problems	Leaching from ore-processing sites; discharge from electronics, glass, and drug factories	**0.0005**
Toluene	1	Nervous system, kidney, or liver problems	Discharge from petroleum factories	**1**
Total Coliforms	5.0 percent[8]	Coliforms are bacteria that indicate that other, potentially harmful bacteria may be present. See fecal coliforms and *E. coli*	Naturally present in the environment	**zero**
Total Trihalomethanes (TTHMs)	0.080	Liver, kidney, or central nervous system problems; increased risk of cancer	Byproduct of drinking water disinfection	**n/a[9]**
Toxaphene	0.003	Kidney, liver, or thyroid problems; increased risk of cancer	Runoff/leaching from insecticide used on cotton and cattle	**zero**
2,4,5-TP (Silvex)	0.05	Liver problems	Residue of banned herbicide	**0.05**
1,2,4-Trichlorobenzene	0.07	Changes in adrenal glands	Discharge from textile finishing factories	**0.07**

LEGEND

DISINFECTANT | DISINFECTION BYPRODUCT | INORGANIC CHEMICAL | MICROORGANISM | ORGANIC CHEMICAL | RADIONUCLIDES

Contaminant	MCL or TT[1] (mg/L)[2]	Potential health effects from long-term[3] exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal (mg/L)[2]
1,1,1-Trichloroethane	0.2	Liver, nervous system, or circulatory problems	Discharge from metal degreasing sites and other factories	**0.2**
1,1,2-Trichloroethane	0.005	Liver, kidney, or immune system problems	Discharge from industrial chemical factories	**0.003**
Trichloroethylene	0.005	Liver problems; increased risk of cancer	Discharge from metal degreasing sites and other factories	**zero**
Turbidity	TT[7]	Turbidity is a measure of the cloudiness of water. It is used to indicate water quality and filtration effectiveness (e.g., whether disease-causing organisms are present). Higher turbidity levels are often associated with higher levels of disease-causing microorganisms such as viruses, parasites, and some bacteria. These organisms can cause short term symptoms such as nausea, cramps, diarrhea, and associated headaches.	Soil runoff	**n/a**
Uranium	30µg/L	Increased risk of cancer, kidney toxicity	Erosion of natural deposits	**zero**
Vinyl chloride	0.002	Increased risk of cancer	Leaching from PVC pipes; discharge from plastic factories	**zero**
Viruses (enteric)	TT[7]	Short-term exposure: Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste	**zero**
Xylenes (total)	10	Nervous system damage	Discharge from petroleum factories; discharge from chemical factories	**10**

LEGEND

DISINFECTANT | DISINFECTION BYPRODUCT | INORGANIC CHEMICAL | MICROORGANISM | ORGANIC CHEMICAL | RADIONUCLIDES

NOTES

1 Definitions
- **Maximum Contaminant Level Goal (MCLG):** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are non-enforceable public health goals.
- **Maximum Contaminant Level (MCL):** The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.
- **Maximum Residual Disinfectant Level Goal (MRDLG):** The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
- **Maximum Residual Disinfectant Level (MRDL):** The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
- **Treatment Technique (TT):** A required process intended to reduce the level of a contaminant in drinking water.

2 Units are in milligrams per liter (mg/L) unless otherwise noted. Milligrams per liter are equivalent to parts per million (ppm).

3 Health effects are from long-term exposure unless specified as short-term exposure.

4 Each water system must certify annually, in writing, to the state (using third-party or manufacturers certification) that when it uses acrylamide and/or epichlorohydrin to treat water, the combination (or product) of dose and monomer level does not exceed the levels specified, as follows: Acrylamide = 0.05 percent dosed at 1 mg/L (or equivalent); Epichlorohydrin = 0.01 percent dosed at 20 mg/L (or equivalent).

5 Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. If more than 10 percent of tap water samples exceed the action level, water systems must take additional steps. For copper, the action level is 1.3 mg/L, and for lead is 0.015 mg/L.

6 A routine sample that is fecal coliform-positive or E. coli-positive triggers repeat samples--if any repeat sample is total coliform-positive, the system has an acute MCL violation. A routine sample that is total coliform-positive and fecal coliform-negative or E. coli-negative triggers repeat samples--if any repeat sample is fecal coliform-positive or E. coli-positive, the system has an acute MCL violation. See also Total Coliforms.

7 EPA's surface water treatment rules require systems using surface water or ground water under the direct influence of surface water to (1) disinfect their water, and (2) filter their water or meet criteria for avoiding filtration so that the following contaminants are controlled at the following levels:
- ***Cryptosporidium*:** 99 percent removal for systems that filter. Unfiltered systems are required to include Cryptosporidium in their existing watershed control provisions.
- **Giardia lamblia:** 99.9 percent removal/inactivation
- **Viruses:** 99.9 percent removal/inactivation
- ***Legionella*:** No limit, but EPA believes that if *Giardia* and viruses are removed/inactivated, according to the treatment techniques in the surface water treatment rule, *Legionella* will also be controlled.
- **Turbidity:** For systems that use conventional or direct filtration, at no time can turbidity (cloudiness of water) go higher than 1 nephelometric turbidity unit (NTU), and samples for turbidity must be less than or equal to 0.3 NTU in at least 95 percent of the samples in any month. Systems that use filtration other than the conventional or direct filtration must follow state limits, which must include turbidity at no time exceeding 5 NTU.
- **HPC:** No more than 500 bacterial colonies per milliliter
- **Long Term 1 Enhanced Surface Water Treatment:** Surface water systems or ground water systems under the direct influence of surface water serving fewer than 10,000 people must comply with the applicable Long Term 1 Enhanced Surface Water Treatment Rule provisions (e.g. turbidity standards, individual filter monitoring, *Cryptosporidium* removal requirements, updated watershed control requirements for unfiltered systems).
- **Long Term 2 Enhanced Surface Water Treatment:** This rule applies to all surface water systems or ground water systems under the direct influence of surface water. The rule targets additional *Cryptosporidium* treatment requirements for higher risk systems and includes provisions to reduce risks from uncovered finished water storages facilities and to ensure that the systems maintain microbial protection as they take steps to reduce the formation of disinfection byproducts. (Monitoring start dates are staggered by system size. The largest systems (serving at least 100,000 people) will begin monitoring in October 2006 and the smallest systems (serving fewer than 10,000 people) will not begin monitoring until October 2008. After completing monitoring and determining their treatment bin, systems generally have three years to comply with any additional treatment requirements.)
- **Filter Backwash Recycling:** The Filter Backwash Recycling Rule requires systems that recycle to return specific recycle flows through all processes of the system's existing conventional or direct filtration system or at an alternate location approved by the state.

8 No more than 5.0 percent samples total coliform-positive in a month. (For water systems that collect fewer than 40 routine samples per month, no more than one sample can be total coliform-positive per month.) Every sample that has total coliform must be analyzed for either fecal coliforms or E. coli. If two consecutive TC-positive samples, and one is also positive for E. coli or fecal coliforms, system has an acute MCL violation.

9 Although there is no collective MCLG for this contaminant group, there are individual MCLGs for some of the individual contaminants:
- **Haloacetic acids:** dichloroacetic acid (zero); trichloroacetic acid (0.3 mg/L)
- **Trihalomethanes:** bromodichloromethane (zero); bromoform (zero); dibromochloromethane (0.06 mg/L)

Appendix D

Wright-Pierce
Engineering a Better Environment™

NATIONAL SECONDARY DRINKING WATER REGULATION

National Secondary Drinking Water Regulations are non-enforceable guidelines regarding contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. EPA recommends secondary standards to water systems but does not require systems to comply. However, some states may choose to adopt them as enforceable standards.

Contaminant	Secondary Maximum Contaminant Level
Aluminum	0.05 to 0.2 mg/L
Chloride	250 mg/L
Color	15 (color units)
Copper	1.0 mg/L
Corrosivity	Noncorrosive
Fluoride	2.0 mg/L
Foaming Agents	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Odor	3 threshold odor number
pH	6.5-8.5
Silver	0.10 mg/L
Sulfate	250 mg/L
Total Dissolved Solids	500 mg/L
Zinc	5 mg/L

FOR MORE INFORMATION ON EPA'S SAFE DRINKING WATER:

visit: **epa.gov/safewater**

call: **(800) 426-4791**

ADDITIONAL INFORMATION:

To order additional posters or other ground water and drinking water publications, please contact the National Service Center for Environmental Publications at: **(800) 490-9198**, or email: **nscep@bps-lmit.com**.

Appendix E

SPRING 2017

STANDARDS AND GUIDELINES

FOR

CONTAMINANTS IN MASSACHUSETTS DRINKING WATERS

Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
Department of Environmental Protection
Office of Research and Standards
One Winter Street
Boston, MA 02108

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

RICHARD K. SULLIVAN JR.
Secretary

KENNETH L. KIMMELL
Commissioner

TO: Interested Parties

FROM: C. Mark Smith, Director, Office of Research and Standards

DATE: ***Spring 2017***

RE: Massachusetts Drinking Water Standards and Guidelines

Attached is the latest list of the Massachusetts Drinking Water Standards and Guidelines. The last issue was sent out in May of 2016. There are no changes in this list from its last edition.

The standards and guidelines may not apply to all contaminant situations, so I urge you to continue to contact the Office of Research and Standards (ORS) with any questions regarding the application or interpretation of this information. Also, when a contaminant of interest is not on the list, please contact ORS for guidance (phone number 617-556-1158; email: diane.manganaro@state.ma.us).

The list of Massachusetts standards and guidelines is available on the MassDEP Web Page at http://www.mass.gov/eea/agencies/massdep/water/drinking/standards/standards-and-guidelines-for-drinking-water-contaminants.html with links to chemical-specific documentation. Users have the option of clicking on an individual chemical in the list to see the basis for the derivation of the drinking water criterion, along with other pertinent information. The Web Page also provides limits for some routinely used drinking water treatment chemicals. This information is presented in the Department's Office of Research and Standards (ORS) documentation for the Immediate Action Levels for Water Treatment Plant Chemicals (formerly referred to as "Memorandum on Treatment Chemicals as Do Not Drink or Use Guidance" located at: http://www.mass.gov/eea/agencies/massdep/water/regulations/immediate-action-levels-water-treatment-plant-chemicals.html.

I. Introduction

The Drinking Water List of Standards and Guidelines is a convenient compendium of guidance values available for evaluating contaminants in drinking water in Massachusetts. The list is designed to be used by individuals or groups concerned with the integrity of drinking water, for example, water suppliers, homeowners, environmental groups, government regulators, boards of health, or private consultants.

Under the Safe Drinking Water Act (SDWA), a state may be granted primacy for implementing the provisions of the SDWA. The Massachusetts Department of Environmental Protection (MassDEP) has primacy for implementation. As part of that primacy, MassDEP is responsible for ensuring the quality of Massachusetts public drinking waters.

Four primary types of guidance are available for assessing drinking water quality in the Commonwealth:

Standards:	Massachusetts Maximum Contaminant Levels (MMCLs)
Guidelines:	ORS Guidelines
	US EPA Health Advisories
	Secondary Maximum Contaminant Levels

II. Standards

The Massachusetts Maximum Contaminant Levels (MMCLs) listed in the drinking water regulations (310 CMR 22.00) consist of promulgated US EPA MCLs which have become effective, plus a few MCLs set specifically by Massachusetts. The standards are enforced by the Drinking Water Program (DWP). Massachusetts may adopt a more stringent standard than the US EPA based on an independent review of primary or secondary data. The regulations were last promulgated in March, 2016 and can be viewed at http://www.mass.gov/eea/agencies/massdep/water/regulations/310-cmr-22-00-massachusetts-drinking-water-regulations.html#1.

The MMCLs listed in 310 CMR 22.00 apply to water that is delivered to any user of a public water system as defined in 310 CMR 22.02. More specific definitions and applications are in the regulations. Private residential wells are not subject to the requirements of 310 CMR 22.00. However, these drinking water standards are recommended for the evaluation of private drinking water and are often used to evaluate private residential contamination, especially in Federal Superfund and M.G.L Chapter 21E activities.

III. Guidelines

ORS Guidelines

ORS issues guidance for chemicals other than those with Massachusetts MCLs in drinking water. These ORS guidance values are known as ORS Guidelines or ORSG and are usually developed for use by Departmental programs in the absence of any other federal standards or guidance. ORSG may be based upon US EPA Integrated Risk Information System (IRIS) toxicity values or derived based on a review and evaluation of all available data for the chemical of interest. Some ORSG may be based on US EPA Health Advisories. Standards promulgated by the US EPA but not yet effective may also be included on the list of Massachusetts Drinking Water Guidelines. ORSG are updated when IRIS toxicity values change so as to reflect the current toxicological guidance for the chemical.

ORS uses methodology similar to that used by the US EPA's Office of Groundwater and Drinking Water (OGWDW) when setting guidelines for chemicals in drinking water. Concentrations of chemicals having evidence of carcinogenicity are minimized as much as feasible; therefore, guidelines are set at a target excess lifetime cancer risk of one in one million (1×10^{-6}) or at the lowest practical quantitation limit (PQL) if the concentration at 1×10^{-6} is below the PQL. This practice applies to chemicals classified as A or B carcinogens under the old cancer classification scheme of US EPA (US EPA, 1986). Class C carcinogens are individually evaluated for a decision regarding whether to set the guidelines on cancer effects. For carcinogens classified under US EPA's Carcinogen Risk Assessment Guidelines (US EPA, 2005), MassDEP will follow US EPA OGWDW's procedures for development of guidance.

To derive guidance for potential non-carcinogenic effects for a chemical, ORS applies a percentage (usually 20%) to published or derived route-specific reference doses and then uses standard exposure assumptions to convert the dose to a drinking water concentration. This practice allows for the possibility of human exposures from sources other than drinking water.

US EPA Health Advisories

The US EPA provides drinking water guidance in the form of Health Advisories for different durations of exposure (i.e., one-day, ten-day and lifetime). These are based upon non-cancer health effects. They are used by MassDEP when evaluating the potential health risks from chemicals in drinking water when no MMCL or ORSG is available.

Secondary Maximum Contaminant Levels (SMCLs)

SMCLs are guidance values issued by the US EPA representing levels of chemicals or parameters above which the aesthetic properties of the water can be affected (e.g., taste, odor, color) or cosmetic effects may occur (e.g., skin or tooth discoloration). The SMCLs are listed in 310 CMR 22.00.

For more information

A more detailed description of the methodology used by ORS to derive water guidance can be found in Guide to the Regulation of Toxic Chemicals in Massachusetts Waters (ORS, 1990), available on MassDEP's website at: http://www.mass.gov/eea/docs/dep/water/laws/a-thru-h/dwguide.pdf.

The Department's Drinking Water Program provides a description of how ORSG and US EPA HA's are used in its regulatory oversight of water quality in public drinking water supplies in a document entitled DWP's Use of Office of Research and Standards Drinking Water

Guidelines and US EPA Health Advisory Levels (MassDEP 2009), available on MassDEP's website at: http://www.mass.gov/eea/agencies/massdep/water/drinking/standards/office-of-research-standards-drinking-water-guidelines.html

IV. Spring 2017 Drinking Water Standards and Guidelines Lists Update

No Changes from the 2016 List have been made to the 2017 List.

V. References

MassDEP. 2009. DWP's Use of Office of Research and Standards Drinking Water Guidelines and US EPA Health Advisory Levels. Massachusetts Department of Environmental Protection, Drinking Water Program. Boston, MA.

Office of Research and Standards, 1990. *Guide to the Regulation of Toxic Chemicals in Massachusetts Waters.* Massachusetts Department of Environmental Protection. Boston, MA.

US EPA (US Environmental Protection Agency). 2005. Guidelines for Carcinogen Risk Assessment. EPA/630/P-03/001F. Risk Assessment Forum. US Environmental Protection Agency. Washington, D.C.

US EPA (US Environmental Protection Agency). 1986. Guidelines for Carcinogen Risk Assessment. Risk Assessment Forum. US Environmental Protection Agency. Washington, D.C.

Please note that drinking water guidance is contained in five separate lists, in the following order:
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(3) Massachusetts Maximum Contaminant Levels – Biologicals; (4) Massachusetts Drinking Water Guidelines (ORSG);
(5) Secondary Maximum Contaminant Levels

SUBSTANCE	CASRN	MMCL (mg/L)
Acrylamide[1]	79061	Treatment Technique
Alachlor	15972608	0.002
Antimony	7440360	0.006
Arsenic	7440382	0.010
Asbestos[2]	1332214	7 million fibers/liter
Atrazine	1912249	0.003
Barium	7440393	2
Benzene	71432	0.005
Benzo(a)pyrene	50328	0.0002
Beryllium	7440417	0.004
Bromate	15541454	0.010
Cadmium	7440439	0.005
Carbofuran	1563662	0.04
Carbon tetrachloride	56235	0.005
Chloramines (as Cl_2)	N/A	4.0 (MRDL[3])
Chlordane	57749	0.002
Chlorine (as Cl_2)	7782505	4.0 (MRDL)
Chlorine dioxide (as ClO_2)	10049044	0.8 (MRDL)
Chlorite	7758192	1.0
Chlorobenzene	108907	0.1
Chromium (total)	7440473	0.1
Copper	7440508	Treatment Technique, 1.3 (Action Level)
Cyanide (as free cyanide)	57125	0.2

SUBSTANCE	CASRN	MMCL (mg/L)
2,4-D (2,4-Dichlorophenoxyacetic acid)	94757	0.07
Dalapon	75990	0.2
1,2-Dibromo-3-chloropropane (DBCP)	96128	0.0002
1,2-Dichlorobenzene (o-DCB)	95501	0.6
1,4-Dichlorobenzene (p-DCB)[4]	106467	0.005
1,2-Dichloroethane	107062	0.005
1,1-Dichloroethylene	75354	0.007
cis-1,2-Dichloroethylene	156592	0.07
trans-1,2-Dichloroethylene	156605	0.1
Dichloromethane	75092	0.005
1,2-Dichloropropane	78875	0.005
Di(2-ethylhexyl)-adipate	103231	0.4
Di(2-ethylhexyl)-phthalate	117817	0.006
Dinoseb	88857	0.007
Diquat	85007	0.02
Endothall	145733	0.1
Endrin	72208	0.002
Epichlorohydrin[5]	106898	Treatment Technique
Ethylbenzene	100414	0.7
Ethylene dibromide (EDB)[6]	106934	0.00002
Fluoride[7]	7782414	4.0
Glyphosate	1071536	0.7
Haloacetic acids (HAA5) (for chlorinated supplies only): including monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, bromoacetic acid and dibromoacetic acid	N/A	0.060

MASSACHUSETTS DRINKING WATER STANDARDS – Inorganic and Organic Chemicals

SUBSTANCE	CASRN	MMCL (mg/L)
Heptachlor	76448	0.0004
Heptachlor epoxide	1024573	0.0002
Hexachlorobenzene	118741	0.001
Hexachlorocyclopentadiene	77474	0.05
Lead	7439921	Treatment Technique, 0.015 (Action Level)
Lindane	58899	0.0002
Mercury (inorganic)	7439976	0.002
Methoxychlor	72435	0.04
Nitrate (As N)	14797558	10
Nitrate/Nitrite (total)	N/A	10
Nitrite (As N)	14797650	1
Oxamyl (Vydate)	23135220	0.2
PCBs (Polychlorinated biphenyls)[8]	1336363	0.0005
Pentachlorophenol	87865	0.001
Perchlorate[9]		0.002
Picloram	1918021	0.5
Selenium	7782492	0.05
Simazine	122349	0.004
Styrene	100425	0.1
2,3,7,8-TCDD (Dioxin)	1746016	3×10^{-8}
Tetrachloroethylene	127184	0.005
Thallium	7440280	0.002
Toluene	108883	1

SUBSTANCE	CASRN	MMCL (mg/L)
Total trihalomethanes (for chlorinated supplies only)	N/A	0.080
Including: Chloroform	67663	N/A[10]
Chlorodibromomethane	124481	N/A
Bromodichloromethane	75274	N/A
Bromoform	75252	N/A
Toxaphene	8001352	0.003
2,4,5-TP (Silvex)	93721	0.05
1,2,4-Trichlorobenzene	120821	0.07
1,1,1-Trichloroethane	71556	0.2
1,1,2-Trichloroethane	79005	0.005
Trichloroethylene	79016	0.005
Vinyl chloride	75014	0.002
Xylenes (total)	1330207	10

[1] No numerical MCL is provided for these compounds. If detected, a treatment technique is specified. Each water system must certify, in writing, to the state (using third-party or manufacturer's certification) that when acrylamide and epichlorohydrin are used in drinking water systems, the combination (or product) of dose and monomer level does not exceed the levels specified, as follows:

- Acrylamide = 0.05% dosed at 1 mg/L (or equivalent)
- Epichlorohydrin = 0.01% dosed at 20 mg/L (or equivalent)

[2] For fibers longer than 10 microns.
[3] MRDL = maximum residual disinfectant level - the highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
[4] The MMCL for this chemical is more stringent than the federal MCL.
[5] See footnote 1 above.
[6] See footnote 4 above.
[7] The U.S. Environmental Protection Agency (US EPA) completed a scientific assessment of fluoride in response to a 2006 National Academy of Sciences (NAS) report recommending that US EPA update its fluoride health and exposure assessments to take into account bone and dental effects and to consider all sources of fluoride. Based upon the NAS and US EPA information and its own independent assessment, the U.S. Health and Human Services (HHS) issued a final recommendation on April 27, 2015, lowering the non-regulatory HHS limit for fluoride in drinking water to 0.7 mg/L. US EPA is currently considering whether to lower its fluoride MCL of 4 mg/L. http://www.hhs.gov/news/press/2015pres/04/20150427a.html
[8] The MCL for PCBs applies to the decachlorobiphenyl species.
[9] The MCL is directed at the sensitive subgroups of pregnant women, infants, children up to the age of 12, and individuals with hypothyroidism. They should not consume drinking water containing concentrations of perchlorate exceeding 2 µg/L. MassDEP recommends that no one consume water containing perchlorate concentrations greater than 18 µg/L.
[10] Not applicable

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(5) Secondary Maximum Contaminant Levels

SUBSTANCE	CASRN	TYPE OF GUIDANCE	MMCL (mg/L)
Beta particle and photon radioactivity	N/A	MMCL	concentration which produces an annual dose of 4 millirem/yr
Gross alpha radiation	N/A	MMCL	15 pCi/L
Radium (226 + 228)	7440144	MMCL	5 pCi/L
Radon-222[1]	14859677	ORSG	10,000 pCi/L (ORSG)
Uranium	7440611	MMCL	0.030

[1] Exceedance of this guideline indicates that indoor air sampling for Radon-222 should be done. US EPA proposed MCLs for radon (64 FR 211; Tuesday, November 2, 1999) which have not been finalized.

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SUBSTANCE	CASRN	MMCL
Cryptosporidium	N/A	Treatment Technique
E. coli	N/A	310 CMR 22.05
Giardia lamblia	N/A	Treatment Technique
Heterotrophic plate count	N/A	Treatment Technique
Legionella	N/A	Treatment Technique
Turbidity	N/A	Treatment Technique
Viruses (enteric)	N/A	Treatment Technique
Total Coliforms	N/A	Indicator used in tiered monitoring protocol in the Total Coliform Rule[1]
Fecal Indicator (*E. coli*, enterococci, coliphage)	N/A	Indicator used in tiered monitoring protocol in the Ground Water Rule[2]

[1] For additional information on the Total Coliform Rule, go to **310 CMR 22.05** and to http://www.mass.gov/eea/agencies/massdep/water/drinking/water-systems-ops.html#39 and scroll down to the "Total Coliform Rule" subheading.

[2] For additional information on the Ground Water Rule, go to **310 CMR 22.26** and to http://www.mass.gov/eea/agencies/massdep/water/drinking/water-systems-ops.html#16 and scroll down to the "Ground Water Rule" subheading

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SUBSTANCE	CASRN	ORSG (mg/L)
Acetone	67641	6.3
Aldicarb[1]	116063	0.003
Aldicarb sulfone[2]	1646884	0.002
Aldicarb sulfoxide[3]	1646873	0.004
Bromomethane	74839	0.01
Chloroform[4]	67663	0.07
Dichlorodifluoromethane	75718	1.4
1,1-Dichloroethane	75343	0.07
1,3-Dichloropropene	542756	0.0004
1,4-Dioxane	123911	0.0003
Ethylene glycol	107211	14
Manganese[5]	7439965	general population: 0.3 (lifetime); 1.0 (limit exposure to > 1.0 mg/L to 10 days) infants < 1 yr old: 0.3 (limit exposure to > 0.3 mg/L to 10 days)
Methyl ethyl ketone	78933	4.0
Methyl isobutyl ketone	108101	0.35
Methyl *tertiary* butyl ether[6]	1634044	0.07
Metolachlor	51218452	0.1
Naphthalene	91203	0.140
Nickel[7]	7440020	0.1
n-Nitrosodimethylamine (NDMA)	62759	0.00001

SUBSTANCE	CASRN	ORSG (mg/L)
Petroleum hydrocarbons[8]	N/A	
TPH		0.2
Aliphatics		
C_5-C_8		0.3
C_9-C_{12}[9]		0.7
C_9-C_{18}[10]		0.7
C_{19}-C_{36}		14.0
Aromatics		
C_6-C_8		use guidance for individual chemicals
C_9-C_{10}		0.2
C_{11}-C_{22}		0.2
Sodium[11]	7440235	20
Tertiary-Amyl Methyl Ether (TAME)	994058	0.09
Tertiary Butyl Alcohol (TBA)	75650	0.12
Tetrahydrofuran	109999	0.6
1,1,2-Trichloro-1,2,2-trifluoroethane (FREON 113)	76131	210

All guidelines are current with the information listed in IRIS as of May 3, 2017 except where noted.

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[1] The MCLs for aldicarb, aldicarb sulfone and aldicarb sulfoxide have been stayed.
[2] See footnote 1above.
[3] See footnote 1 above.
[4] This guideline applies to non-chlorinated water supplies. For chlorinated drinking water supplies, please contact the Drinking Water Program.
[5]The ORSG for manganese is based on the US EPA manganese Health Advisory, with a modification as it pertains to infants. The lifetime Health Advisory for manganese contains a precautionary statement that "*for infants younger than 6 months, the lifetime Health Advisory of 0.3 mg/L be used even for an acute exposure of 10 days, because of the concerns for differences in manganese content in human milk and formula and the possibility of a higher absorption and lower excretion in young infants*." MassDEP is extending that age to one year out of concerns for formula use up to that age and the potential susceptibility of this early life stage to excessive manganese exposure and potential resultant toxicity. The 10-day limits are not critical bright lines, but are used to underscore the need to minimize high exposures. See also the Secondary Maximum Contaminant Level listing on p. 15 and US EPA Health Advisory reference on p. 16.
[6] The health-based guideline for MTBE was reviewed by ORS in 2000.
[7] The MCL for Nickel has been remanded and is no longer in effect, however the current US EPA IRIS chronic oral reference dose for soluble salts of nickel (https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=271) supports this value and it is also the basis for the currently listed US EPA Life-time Health Advisory value (https://www.epa.gov/sites/production/files/2015-09/documents/dwstandards2012.pdf).
[8] Monitoring for these compounds is not required but is done on a case-by-case basis. These limits may be used when evaluating health risks posed by clearly identified mixtures of petroleum hydrocarbon compounds. The analytical methods to use to generate data to compare to the Drinking Water Guidelines are the Volatile Petroleum

Hydrocarbon (VPH) and the Extractable Petroleum Hydrocarbon (EPH) methods developed by the MassDEP (MassDEP 1998).

[9] The overlap in the C_9-C_{12} range is the result of the VPH and EPH analytical methods used to quantitate these ranges of petroleum hydrocarbons in drinking water. The choice of the most appropriate range to use is based on the identity of the petroleum product of concern and is therefore determined on a case-specific basis.

[10] See footnote 9 above.

[11] All detections of sodium must be reported. Please refer to 310 CMR 22.06A for the specific requirements. The sodium guideline of 20 mg/L is based on an eight (8) ounce serving.

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(5) Secondary Maximum Contaminant Levels

Chemicals/Parameter	Status	SMCL (mg/L)
Aluminum	F[1]	0.05 to 0.2
Chloride	F	250
Color	F	15 Color Units
Copper	F	1.0
Corrosivity	F	non-corrosive
Fluoride	F	2.0
Foaming agents	F	0.5
Iron	F	0.3
Manganese[2]	F	0.05
Methyl *tertiary* butyl ether[3]	A[4]	0.020-0.040
Odor	F	3 threshold odor numbers
pH[5]	F	6.5 - 8.5
Silver	F	0.10
Sulfate	F	250[6]
Total dissolved solids (TDS)	F	500
Zinc	F	5

Secondary Standards are referenced in the Massachusetts Drinking Water Regulations (310 CMR 22.07D).

[1] Final
[2] See also ORS Guideline Level listing on p. 12 and US EPA Health Advisory reference on p. 16.
[3] The secondary MCL for MTBE is based on the Drinking Water Advisory set by US EPA and is based on taste and odor considerations.
[4] Advisory
[5] This range of values is set to avoid adverse aesthetic impacts. Alternate system-specific values for pH may be generated for other program areas (e.g., Lead and Copper Rule water quality parameters; Immediate Action Level for Water Treatment Plant Chemicals).
[6] An MCL of 500 mg/L has been proposed by US EPA (Federal Register 12/20/94).

A tabular compilation of US EPA Health Advisories and related information, including the US EPA 2016 Health Advisories for Perfluoroctanoic Acid (PFOA) and Perfluoroctane Sulfonate (PFOS), may be obtained at: https://www.epa.gov/dwstandardsregulations/drinking-water-contaminant-human-health-effects-information#dw-standards.

Appendix F

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M a s s D E P   I n f o r m a t i o n   S h e e t

Manganese Monitoring for Public Water Systems

Required Sampling and Monitoring for Manganese in Drinking Water

Public Water Systems (PWS) have a long, proven record of providing abundant, clean drinking water to their customers by using innovative and proactive approaches for risk reduction. PWS now have an additional opportunity to contribute to public health protection by determining the levels of manganese in their drinking water. The Massachusetts Department of Environmental Protection (MassDEP) is requiring all water systems to analyze their drinking water for the presence of manganese so that MassDEP can characterize the occurrence, possible sources, and possible health risks associated with manganese in those water systems.

What is manganese and where does it come from?

Manganese is a common naturally-occurring mineral found in rocks, soil, groundwater, and surface water. It is also an essential trace mineral necessary for proper metabolism, immune system function, digestion, bone strength, and as a cofactor in many enzymes.

How are people exposed to manganese?

Manganese is a natural component of most foods, including infant formula. The majority of manganese exposure in the general population comes from the diet. The overall dietary contribution from drinking water is smaller than food, but in situations where manganese levels in drinking water are elevated, the contribution can increase the overall intake of manganese. The U.S. Department of Agriculture's (USDA) recommended dietary allowance is 1.8 - 2.3 milligrams per day (mg/day) for adults. Grains and beans particularly provide manganese in our diets. For example, a cup of cooked enriched white rice contains 0.75 milligrams (mg) of manganese. In a residential setting, inhalation is an unlikely route of concern for exposure, in contrast to certain occupational settings where workers may be exposed to manganese particles in the air (*e.g.*, steel welding). Manganese is poorly absorbed through the skin, thus, skin contact with food or liquid containing manganese is an unlikely exposure route of concern.

What health effects are associated with exposure to manganese?

At higher levels of exposure, manganese can produce neurological effects. While low amounts of manganese in the diet are important for health, several recent limited studies of children exposed to elevated levels of manganese in drinking water suggest associations with behavioral and neurological effects. In addition, infants may have more difficulty processing manganese than older children and adults due to incompletely developed gastrointestinal (GI) tracts and other important metabolic organ systems. Therefore, as a precaution, it is prudent to limit exposure to high levels of manganese in water so that sensitive populations (i.e., infants/young children) are best protected.

What levels of manganese in water are health concerns?

The United States Environmental Protection Agency (USEPA) and MassDEP currently list manganese as a secondary contaminant with aesthetic concerns including unacceptable taste, staining of fixtures and dark, cloudy water at levels greater than 50 micrograms per liter (µg /L).

Drinking water may naturally have manganese and, when concentrations are greater than 50 µg/L, the water may be discolored and taste bad. Over a lifetime, the USEPA recommends that people drink water with manganese levels less than 300 µg/L and over the short term, the USEPA recommends that people limit their consumption of water with levels over 1000 µg /L, primarily due to concerns about possible neurological effects. Children up to 1 year of age should not be given water containing manganese over 300 µg /L. This includes making formula for infants with levels exceeding 300 µg /L for longer than 10 days. Formula fed infants or children could consume more manganese than the rest of the family if the manganese fortified formula is prepared with water that also contains manganese. In addition, young children appear to absorb more but excrete less manganese than older children. See EPA Drinking Water Health Advisory for Manganese at:
https://www.epa.gov/sites/production/files/2014-09/documents/support_cc1_magnese_dwreport_0.pdf

When should testing begin?
If you do not currently test for manganese, MassDEP recommends that you voluntarily collect manganese baseline samples now in order to respond to possible inquiries from the public. One sample should be taken at the entrance point to the distribution system for each of your sources. MassDEP will be adding baseline sampling for manganese to PWS sampling schedules for the 2014 – 2016 sampling period. The analytical cost of testing for manganese in drinking water is relatively low, generally between $15 and$30 per sample. If your system is currently testing or required by MassDEP to test for manganese, you must continue to sample, report, and take all other actions required by MassDEP. MassDEP continues to strongly encourage all PWSs to annually test for all secondary contaminants. Please be reminded: PWS are required to report the results of all analytical monitoring to MassDEP.

What happens when MassDEP receives the results of your manganese monitoring?
Depending on the results of your monitoring, MassDEP will provide you with a written response regarding any further actions you should take. Follow-up actions may include appropriate steps to inform and educate your customers on how they can reduce elevated manganese levels for sensitive populations, additional monitoring or other actions to assist you and your customers to reduce any elevated manganese concentrations. At a minimum you should be aware of the following:

1. Be prepared to inform your local elected and health officials and your customers of confirmed manganese levels over the USEPA and MassDEP Health Advisory of 300 µg /L so that they can take action to provide information to consumers including any sensitive individuals.
2. Be prepared to undertake any additional confirmatory sampling and monitoring that may be required:
    a. Systems with sample results that are over the Health Advisory level of 300 µg /L are required to take confirmation samples within 2 weeks, following standard inorganic monitoring contaminant confirmation procedures. You may also be required by your regional office to collect additional samples within your distribution system within the next 30 days if your system's configuration and historical information indicate that the level reaching consumers may actually be lower than at the entrance point to your system.
    b. Systems with sample results that are above the SMCL of 50 ug/L but less than the Health Advisory level of 300 ug/L are required to undertake quarterly sampling for one year in order to determine if the levels are reliably and consistently below the

Health Advisory level. After the initial year of quarterly sampling, the systems are eligible for a reduction to annual sampling, unless otherwise specified by your regional office (due to site-specific circumstances). Annual samples are scheduled during the quarter that had the highest manganese level.

   c. Systems with sample results that are below the SMCL of 50 ug/L are eligible for a reduction in sampling frequency to once every nine (9) years, unless otherwise specified by your regional office (due to site-specific circumstances). Nine (9) years is the longest waiver period under the standard monitoring framework.

3. Be prepared to provide interim and long-term corrective action plans indicating how the system plans to reduce manganese levels to below the Health Advisory level at each entry point. It is generally recommended to routinely monitor both iron and manganese at the same time and gather enough information to assess fluctuations, including pumping rates, blending patterns, periodic/seasonal use, and variations in seasonal water quality. Iron is commonly found with manganese and can interfere with manganese removal. Recording the background concentrations for both iron and manganese may be necessary to consider appropriate corrective actions for water quality management.
4. If your system has sources that are currently being treated for iron and/or manganese removal you should routinely assess treatment efficiency and changes in groundwater quality by collecting a set of raw and finished water samples. If breakthrough is indicated above the Secondary Maximum Contaminant Levels (SMCLs), review and optimize treatment as necessary to maintain levels below SMCLs.
5. If your system is currently providing treatment that is sequestering manganese, your system may have to conduct additional monitoring in the distribution system for manganese and other compounds that may be associated with the presence of manganese (e.g. iron).
6. If your system is a community public water system and detects manganese greater than the SMCL of 50 µg /L as part of required monitoring, you must report these results in your Consumer Confidence Report (CCR). For details on how to report manganese in your CCR, refer to Manganese – CCR Reporting document available at: http://www.mass.gov/eea/agencies/massdep/water/drinking/water-systems-ops.html#7
7. MassDEP is also strongly encouraging you to post your manganese results widely, as we anticipate that many of your customers will be requesting your manganese monitoring results. MassDEP has developed a fact sheet on manganese that you may find helpful when discussing manganese results with your customers and you may also want to provide the fact sheet directly to your consumers. The fact sheet is available at: http://www.mass.gov/eea/agencies/massdep/water/drinking/manganese-in-drinking-water.html

How to collect and report sampling if you are not currently sampling?

1. Sample each source at the entry point(s) to your distribution system. When sampling at a manifold entry point, ensure that samples are representative of each source under normal operating conditions and not only the source that was on-line during sample collection.
2. Use the same sampling containers to collect the samples for manganese analysis that you normally use for other inorganic (*e.g..,* metals) analyses.
3. MassDEP does not certify laboratories for the analysis of manganese in drinking water, so the analysis should be performed by a laboratory that is MassDEP-certified for the analysis of other drinking water metals using the same method it intends to use for the analysis of manganese.

4. Samples must be analyzed using one of the USEPA-recommended methods for Secondary Drinking Water Contaminants listed at https://www.epa.gov/dwanalyticalmethods. The current list includes the following methods for manganese: USEPA Methods 200.5, 200.7, and 200.8 and Standard Methods 3111B, 3113B, and 3120B.
5. Report all results on the MassDEP Secondary Contaminant Report Form (SEC) or electronically through eDEP. A copy of the form is available at http://www.mass.gov/eea/agencies/massdep/water/approvals/laboratory-analytical.html

If the results of sampling exceed 300 µg /L a minimum of one additional sample shall be collected at the same sampling point as soon as possible after the initial sample (not to exceed two weeks). PWS must follow confirmation requirements in 310 CMR 22.06 (10). On a case by case basis distribution system samples may also be necessary. For more information on manganese sample collection, analysis and reporting see http://www.mass.gov/eea/agencies/massdep/water/drinking/lead-and-other-contaminants-in-drinking-water.html#9.

Who can you contact for more information?

There are several available sources of useful information. In an effort to promote a holistic approach to public health protection, MassDEP's Drinking Water Program has provided information to various groups of environmental and medical specialists, including doctors, nurses, and local boards of health. Please contact the following MassDEP staff if you have additional questions on this information:

Region	Name	Phone	Email
WERO	Cathy Wanat	413-755-2216	Catherine.Wanat@state.ma.us
CERO	Paula Caron	508-767-2719	Paula.Caron@state.ma.us
NERO	Bill Zahoruiko	978-694-3232	William.Zahoruiko@state.ma.us
SERO	Allison Rescigno	508-946-2763	Allison.Rescigno@state.ma.us
Boston	Margaret Finn	617-292-5746	Margaret.Finn@state.ma.us

For more information on manganese in drinking water please visit our webpage at http://www.mass.gov/eea/agencies/massdep/water/drinking/manganese-in-drinking-water.html

You may also contact the MassDEP's Drinking Water Program at program.director-dwp@state.ma.us .

For questions related to manganese exposure and health you may contact the Massachusetts Department of Public Health's Bureau of Environmental Health (BEH) at 617-624-5757 or MassDEP's Office of Research and Standards (C.Mark.Smith@state.ma.us). You may also contact your Local Board of Health.

Appendix G

Wright-Pierce

Engineering a Better Environment™

W. R. Grace (Acton Plant) Site, Acton, MA

U.S. EPA | HAZARDOUS WASTE PROGRAM AT EPA NEW ENGLAND

THE SUPERFUND PROGRAM *protects human health and the environment by investigating and cleaning up often-abandoned hazardous waste sites and engaging communities throughout the process. Many of these sites are complex and need long-term cleanup actions. Those responsible for contamination are held liable for cleanup costs. EPA strives to return previously contaminated land and groundwater to productive use.*

SITE DESCRIPTION AND BACKGROUND:

The purpose of this fact sheet is to answer questions for residents about 1,4 dioxane, which is a contaminant that was found at the W.R. Grace Site. 1,4-dioxane is an industrial solvent that was first detected in groundwater at the W.R. Grace Site in 2006. Since that time, the Environmental Protection Agency (EPA) and Massachusetts Department of Environmental Protection (MassDEP) have required Grace to monitor for it. It should be noted that the 1,4-dioxane levels found do not exceed EPA's acceptable risk range. In addition, the Acton Water District (AWD) is also testing and monitoring the School Street and Assabet public water supply wells for 1,4-dioxane. The average results thus far show that the 1,4-dioxane levels do not exceed the MassDEP safe drinking water guideline of 0.3 parts per billion (ppb). This fact sheet explains this below in more detail.

The W. R. Grace (Acton Plant) Superfund Site is located in the Towns of Acton and Concord, Massachusetts and has been used for industrial purposes since the 1800's. The W. R. Grace property is composed of approximately 260 acres of land including several surface water bodies and various wetlands.

W. R. Grace acquired the property in 1954, and operations at the W. R. Grace facility included the production of materials used to make concrete and organic chemicals, container sealing compounds, latex products, and paper and plastic battery separators. Wastewater and solid industrial wastes from these operations were disposed of in several unlined lagoons and were buried in a former on-site Industrial Landfill. All manufacturing ceased at the Grace Site in 1991.

WHAT IS 1,4-DIOXANE?

1,4-dioxane is a clear liquid that easily dissolves and moves quickly in water. Once dissolved into water, it does not easily leave the water and enter into air. It is used primarily as a solvent in the manufacture of chemicals; as a laboratory reagent; and as a stabilizer and an adhesive. 1,4-dioxane may also be present in trace amounts in cosmetics, detergents, and shampoos. Government agencies believe that 1,4-dioxane is likely to be carcinogenic to humans.

WHAT DOES CANCER RISK MEAN?

Cancer risk is the "incremental" or additional proportion of the population that may be affected by a carcinogenic substance over a lifetime. In other words, an estimated cancer risk of 1 in a million (1 in 1,000,000) would mean that there is a probability of one additional cancer over background levels in a population of one million people. The term "incremental" refers to risks above the background cancer risk experienced by all individuals in the course of daily life. EPA generally takes action at a Site where the incremental cancer risk is greater than 1 in 10,000. EPA takes into account site-specific factors when determining the need for a cleanup action. For example, EPA might take into account site-specific evidence that aquatic organisms are being harmed by groundwater discharging to surface water in deciding whether cleanup action for groundwater is needed. EPA also takes into account uncertainties with the risk estimate when determining the need for a cleanup action. For example, EPA might take into account the uncertainty in estimating exposure through showering and bathing in deciding whether cleanup action is needed.

KEY CONTACTS:

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(617) 918-1111
www.epa.gov/region1/

TOLL-FREE CUSTOMER SERVICE
1-888-EPA-7341

LEARN MORE AT:
www.epa.gov/ne/superfund/sites/graceacton

United States Environmental Protection Agency

March 2012

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HAS 1,4-DIOXANE BEEN DETECTED AT THE W. R. GRACE SUPERFUND SITE? (SEE ATTACHED FIGURE)

Yes, according to the 2010 annual groundwater report, 1,4-dioxane has been detected at the W. R. Grace Superfund Site. The 1,4-dioxane concentrations detected most recently in the Northeast Area range from a low of 0.11 parts per billion (ppb) to a high of 2.1 ppb. Located on the southeast portion of the Grace property, in groundwater flowing away from the former Industrial Landfill, 1,4-dioxane concentrations have ranged historically from a low of 1.5 ppb to a high of 36 ppb. Note that 1,4-dioxane in the Northeast Area has migrated beyond the W.R Grace property line, see attached figure.

HOW FREQUENTLY IS 1,4-DIOXANE SAMPLED FOR AND ARE THE ACTON WATER DISTRICT WELLS SAMPLED FOR 1,4-DIOXANE?

W.R. Grace collects samples from numerous groundwater monitoring wells throughout the Site annually. Grace also collects water samples at the effluent discharge for the Northeast Area and the Landfill Area groundwater treatment systems on a monthly basis and analyzes them for 1,4-dioxane, volatile organic compounds (VOCs) and metals. Also, since 2007, the Acton Water District periodically samples for the presence of 1,4-dioxane in the Assabet and School Street Wellfields.

The most recent sampling of the Acton Water District wells was performed during September 2011. Untreated raw water from the School Street and Assabet wells was sampled for 1,4-dioxane using EPA drinking water method 522. After combining duplicate results by averaging, as recommended by both MassDEP and EPA, all results were below the MassDEP drinking water guideline of 0.3 ppb.

DOES THE ENVIRONMENTAL PROTECTION AGENCY (EPA) HAVE AN ENFORCEABLE DRINKING WATER STANDARD FOR 1,4- DIOXANE?

No. Currently, EPA has not set an enforceable drinking water standard for 1,4-dioxane. Enforceable Federal drinking water standards are called Maximum Contaminant Levels or MCLs. However, EPA has developed a non-site specific Federal guideline for 1,4-dioxane of 0.67 ppb, calculated using a cancer toxicity value developed by EPA in 2010. The levels found at the School Street and Assabet wells are below this non-site specific Federal guideline. Additional information on how EPA evaluates potential risk and how EPA defines "acceptable risk" is provided below.

DOES THE MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION (MASSDEP) HAVE AN ENFORCEABLE DRINKING WATER STANDARD FOR 1,4-DIOXANE?

No. Currently, MassDEP has not set an enforceable drinking water standard for 1,4- dioxane. Enforceable State drinking water standards are called Massachusetts Maximum Contaminant Levels or MMCLs. However, MassDEP has established a state drinking water guideline of 0.3 ppb, based on cancer risk and EPA's cancer toxicity value, for consumption of drinking water.

WHY DO EPA AND MASSDEP HAVE DIFFERENT GUIDELINES FOR 1,4-DIOXANE?

MassDEP and EPA guidelines for 1,4-dioxane were developed for different purposes and each agency uses different assumptions when calculating the respective guidelines. MassDEP developed their 0.3 ppb guideline to protect people who might be exposed to 1,4-dioxane from drinking contaminated water. For purposes of this guideline, MassDEP assumes a person would drink 2 liters of contaminated water per day over a 70 year lifetime.

EPA used its 1,4-dioxane guideline to determine if there is an unacceptable risk to a person who may be exposed to contamination from being on the Site. EPA assumes a person would drink contaminated water over a 30 year lifetime, including 1 liter of water per day for a young child and 2 liters of water per day for an older child or adult. Unacceptable risks may trigger EPA to require additional regulatory evaluation and/or clean up actions.

EPA evaluated the concentrations of 1,4-dioxane and compared them to the EPA guideline and determined that there are no unacceptable risks to humans from the presence of 1,4-dioxane at the Site.

WHY ARE MASSDEP'S DRINKING WATER GUIDELINES NOT ENFORCEABLE?

"Enforceable standards" are those that have been formally promulgated in regulations. EPA's Maximum Contaminant Levels (MCLs) and Massachusetts Maximum Contaminant Levels (MMCLs) are the promulgated federal and state standards, respectively.

MassDEP's drinking water guidelines are recommended levels developed by MassDEP's Office of Research and Standards (ORS) for contaminants that do not have established MCLs/MMCLs. These guidelines have not been promulgated in regulations.

HOW ARE MASSDEP DRINKING WATER GUIDELINES DEVELOPED?

The MassDEP Drinking Water Program (DWP) evaluates all drinking water sample results against enforceable Federal and State standards (MCLs and MMCLs), or against guidelines created by EPA or MassDEP Office of Research and Standards when no Federal or State MCL is available.

However, Federal or State MCLs have not been established for some contaminants that are required to be tested under the Safe Drinking Water Act (SDWA). As a result, MassDEP Office of Research and Standards has developed guidelines (or ORSGs) for these contaminants.

These guidelines, or ORSGs, are established using risk assessment methods consistent with those used by EPA's Office of Water when setting guidelines for chemicals in drinking water. ORSGs are developed using EPA's toxicity information, when available, and assume that an adult ingests 2 liters per day of contaminated water throughout a 70-year lifetime. When there is no toxicity information available, information is sought from scientific literature to support derivation of guidelines.

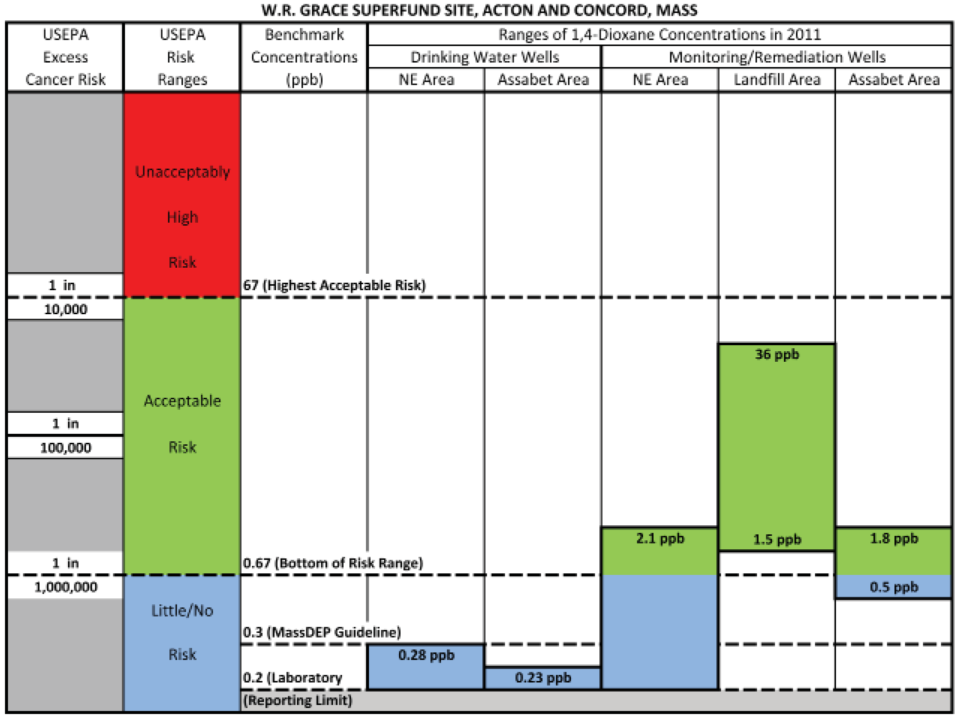
In order to limit exposure to concentrations of carcinogenic chemicals as much as possible, ORSGs for these chemicals are set at an excess lifetime cancer risk (ELCR) of one in one million (1 in 1,000,000), or at the lowest practical quantitation limit (PQL).

ORSGs are not derived for a specific site or exposure scenario but are guidelines to local water supplies and the general public. A description of the process used to derive these values can be found in the Guide to the Regulation of Toxic Chemicals in Massachusetts Waters. Questions regarding the MassDEP guideline for 1,4-dioxane should be directed to Diane Manganaro in ORS at 617-556-1158.

HOW HAS EPA CALCULATED THE POTENTIAL CANCER RISK OF 1,4-DIOXANE AT THE GRACE SITE?

EPA has conducted a site-specific assessment of the cancer risk from 1,4-dioxane at the Grace site. EPA used very conservative site-specific exposure estimates. In this instance, EPA assumed that an individual would drink contaminated water from the same source over a 30-year period including 6 years as a young child and 24 years as an older child or adult. EPA also assumed that a young child would drink 1 liter of water per day and an older child or adult would drink 2 liters of water per day. The concentration of 1,4-dioxane in residential drinking water over this 30-year period was assumed to be equal to the highest concentration found at the Site (36 ppb). It should be noted that the highest concentrations of 1,4-dioxane (36 ppb) were found on the Grace property but that concentrations beyond the Grace property are now significantly lower than that used by EPA in this site-specific risk assessment. EPA has determined that even using the maximum detected concentration of 1,4-dioxane (36 ppb), dioxane contaminated groundwater does not pose an unacceptable cancer risk to human health that would necessitate an EPA clean up action. However, due to unacceptable risks from other contaminants, groundwater at the Grace Site is actively being treated.

COMPARISON OF 1,4-DIOXANE CONCENTRATIONS IN GROUNDWATER AND DRINKING WATER TO LEVELS OF RISK
W.R. GRACE SUPERFUND SITE, ACTON AND CONCORD, MASS



WHAT IS THE POTENTIAL CANCER RISK CALCULATED BY EPA AT THE W.R. GRACE SITE?

The cancer risk estimate for the 36 ppb maximum detected 1,4-dioxane concentration is 5 in one hundred thousand (5 in 100,000). This is within EPA's acceptable risk range. It was decided to use the 36 ppb concentration because this was the highest dioxane concentration found and it represents a potential worst case scenario. It is also important to note that this risk was calculated based upon the highest concentration (36 ppb) of 1,4-dioxane on the Grace property and that because concentrations in groundwater beyond the Grace property line are significantly lower, the potential cancer risk would also be significantly lower. In addition, no one is drinking the groundwater where the highest dioxane concentrations were found on the Grace property.

HEALTH EFFECTS OTHER THAN CANCER:

The concentrations of 1,4-dioxane at the Site do not pose unacceptable non-cancer risks. At much higher concentrations (greater than 1,000 ppb), drinking water containing 1,4-dioxane may cause damage to the liver and kidneys.

For additional information about the W.R. Grace Site go to the following website: www.epa.gov/ne/superfund/sites/graceacton

ADDITIONAL CONTACTS:

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Project Manager
MA Department of Environmental Protection
(617) 654-6560
jennifer.mcweeney@state.ma.us

Matt Mostoller
Acton Water District
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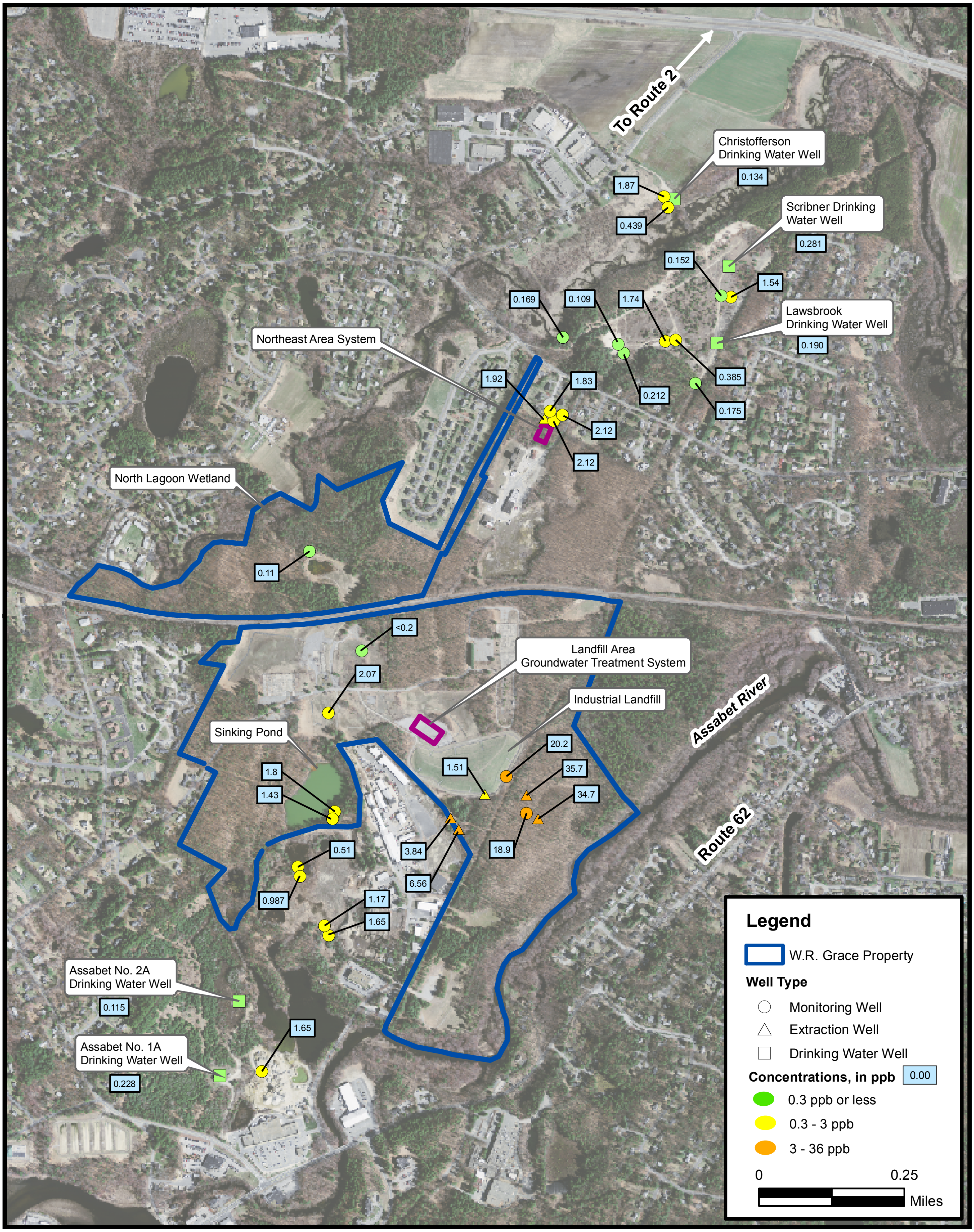
matt@actonwater.com

Questions about MassDEP's 1,4-Dioxane Guideline:
Diane Manganaro
MA Department of Environmental Protection
(617) 556-1158
Diane.Managanaro@state.ma.us



2011 W.R. Grace Superfund Site
Sampling Locations for 1,4-Dioxane

EPA

SUPERFUND

Cleaning Up New England

SITE UPDATE

W.R. Grace (Acton Plant) Superfund Site

U.S. EPA | HAZARDOUS WASTE PROGRAM AT EPA NEW ENGLAND

THE SUPERFUND PROGRAM *protects human health and the environment by investigating and cleaning up often-abandoned hazardous waste sites and engaging communities throughout the process. Many of these sites are complex and need long-term cleanup actions. Those responsible for contamination are held liable for cleanup costs. EPA strives to return previously contaminated land and groundwater to productive use.*

SITE DESCRIPTION:

The W. R. Grace (Acton Plant) Superfund site is located in the towns of Acton and Concord, Massachusetts and has been used for industrial purposes since the 1800's. The W. R. Grace property is comprised of approximately 260 acres of land in both towns and includes several surface water bodies and wetlands. Grace acquired the property in 1954 and produced materials used to make concrete additives, organic chemicals, container sealing compounds, latex products, and paper and plastic battery separators. In 1982, all production of organic chemicals ceased at the Grace (Acton Plant) facility. The site was listed on the National Priorities List (NPL) in 1983.

IS THE DRINKING WATER SAFE?

Yes. The Acton Water District (AWD) continues to closely monitor, sample and treat the town's drinking water to ensure that safe drinking water standards are maintained, and to ensure that clean drinking water continues to be provided to all residents. The AWD will continue to provide oversight at the site until safe and appropriate cleanup levels are achieved.

WHERE WE ARE NOW:

There are four main areas at which the recent cleanup activities at the Grace site were performed: the Northeast Area, the Landfill Area, Sinking Pond and the North Lagoon Wetlands. See Figure 1. Contaminated groundwater continues to be extracted and treated from both the Landfill Area and the Northeast Area of the site. Contaminated sediments from both the North Lagoon Wetland and Sinking Pond that posed unacceptable risks were excavated and properly disposed of at an approved offsite disposal facility. The below section provides a summary of the construction and cleanup activities that have recently been completed. The Environmental Protection Agency (EPA), the Massachusetts Department of Environmental Protection (MassDEP), the town of Acton, the AWD, and the Acton Citizens for Environmental Safety (ACES) will continue to provide oversight at the site.

NORTHEAST AREA:

Construction of the Northeast Area groundwater treatment system began in June 2009 and was completed in March 2010. This system consists of 1) an extraction well, from which approximately 20 gallons per minute (GPM) of contaminated groundwater are withdrawn from 211 feet below the ground surface (fbgs); a treatment system that removes Volatile Organic Compounds (VOCs) from the groundwater; and two injection wells, in which the treated groundwater is re-injected back into the aquifer at 70 fbgs. This system began operating on April 5, 2010. One objective of this treatment system is to protect the municipal water supply by reducing the mass of contamination in the most concentrated part of the plume. It was assumed that this treatment system would operate for approximately three years. At the end of this three-year period, an evaluation will be conducted to determine if pumping can be discontinued. This evaluation will include the following factors: 1) input from the AWD regarding yield and drawdown; 2.) contaminant concentrations at each of the three School Street Wells and whether they are meeting, and are expected to continue to meet, MCLs; and 3) the effectiveness of the extraction and treatment system. As of September 2012, the Northeast Area treatment system had pumped over 25.2 million gallons of contaminated groundwater and had removed approximately 13.5 pounds or 1.3 gallons of total VOCs. Figure 1 depicts the location of the Northeast Area treatment system at the site.

continued >

KEY CONTACTS:

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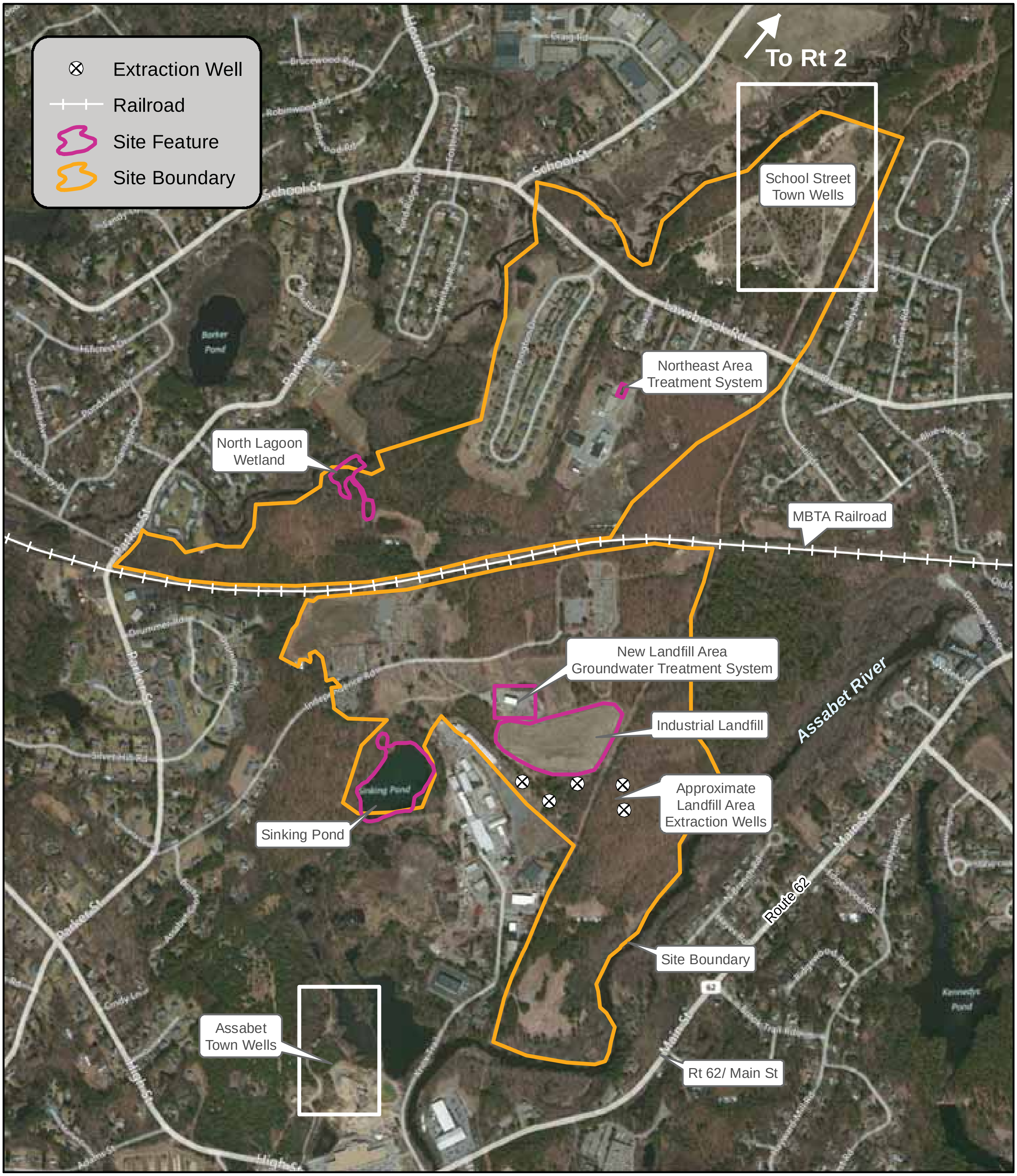
LEARN MORE AT:
www.epa.gov/region1/superfund/sites/graceacton



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0 0.25 Miles

Figure 1

W.R. Grace Superfund Site

Acton, Massachusetts

EPA

Map created by EPA Region 1 GIS
Map Tracker 7616 January 2, 2013
Data Sources: Aerial
Photo / Base Map - Bing Maps;

LANDFILL AREA:

Construction of the foundation and building for the Landfill Area groundwater treatment system began in September 2010, and the installation of the treatment system equipment was complete by April 2011. This treatment system began operation on May 2, 2011, and will continue to operate until cleanup levels are met and groundwater no longer presents an unacceptable risk. This treatment system extracts 50-55 GPM of contaminated groundwater from five extraction wells located in the vicinity of the Industrial Landfill at various depths. Contaminated groundwater is treated to remove inorganics (metals), VOCs and 1,4 Dioxane. The treated effluent is then discharged into Sinking Pond and is sampled on a periodic basis to ensure continued compliance with discharge standards. Figure 1 depicts the location of the Landfill Area treatment system at the site. As of September 2012, the former Aquifer Restoration System and the new Landfill Area treatment system had pumped over 4,866 million gallons of contaminated groundwater and removed approximately 5,961 pounds or 589 gallons of total VOCs.

Sinking Pond before remediation

Sinking Pond after Remediation

North Lagoon Wetlands before remediation

North Lagoon wetlands after remediation

PROGRESS OF GROUNDWATER TREATMENT AND SEDIMENT CLEANUP:

Figure 2 depicts the decrease of groundwater contaminated with Vinylidene Chloride (VDC) from 2007 to 2011. This figure shows that the extent of VDC contamination greater than 30 parts per billion has notably decreased since 2007.

Numerous studies and sampling determined that there were unacceptable human health and ecological risks from continued exposure to arsenic- and manganese contaminated sediment. The contaminated sediments were located within the perimeter of Sinking Pond and within the North Lagoon Wetland. The cleanup actions were implemented between June and November 2011 and included the removal and proper offsite disposal of contaminated sediment. Results from the post excavation confirmation sampling determined that the appropriate and protective cleanup levels were achieved within the remaining sediment. A total of 8,100 cubic yards of contaminated sediment was removed from Sinking Pond and properly disposed off site. A total of 2,040 cubic yards of contaminated sediment was removed from the North Lagoon Wetland and properly disposed off site . Certified clean fill was sampled and then brought in to replace the removed contaminated sediment. Various native trees, vegetation and grasses were planted in wetland and upland locations in order to restore these areas to their natural condition over time. Spring and fall inspections of these replanted areas began in 2012 and will continue until 2017. This will ensure that the replanted trees, vegetation and grasses will survive and become established. See above photographs that show these areas before and after the cleanup activities.

NEXT STEPS:

Although construction of the final clean up actions has been completed, EPA & MassDEP will continue to oversee the following site activities:

- Continued operation and proper maintenance of both the Landfill and Northeast Area treatment systems,
- Continued oversight of the annual ground water monitoring and sampling programs,
- Bi-annual inspection of the restored wetlands and uplands,
- A thorough review of clean up actions every five years to ensure that the clean up actions remain protective of both human health and the environment, and
- Continued operation and proper maintenance of the capped Industrial Landfill.

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Figure 2

Decrease of VDC Concentrations from 2007 to 2011
W.R. Grace Superfund Site

Acton, Massachusetts

Map created by EPA Region 1 GIS
Map Tracker 8938 December 5, 2012
Data Sources: Aerial Photo / Base Map - (c) 2010 Microsoft Corporation and its data suppliers; Groundwater Data - TetraTech;

Exterior photo of Landfill Area treatment system

Interior Photo of Landfill Area treatment system

Exterior photo of Northeast Area treatment system

Interior photo of Northeast Area treatment system

W.R. GRACE (ACTON PLANT) SITE HISTORY

1945-1954: Dewey & Almy Chemical Company manufactures various products at the Acton site at various times including latex, resins, plasticizers, and paper battery separators

1954-1991: W. R. Grace acquires Dewey & Almy and continues various chemical manufacturing processes at the Acton site

1978: Organic contaminants (vinylidene chloride, vinyl chloride, ethylbenzene, and benzene) detected in municipal wells (Assabet #1 and #2)

1980: W. R. Grace and EPA enter into a Consent Decree to cleanup waste disposal areas and restore groundwater to a fully useable condition

1983: Site added to the Superfund National Priorities List (NPL)

1984: As part of an agreement between the AWD and W.R. Grace, a treatment system to remove VOC's was added to the public water supply system.

1985: As required by the Consent Decree, an Aquifer Restoration System (ARS) is constructed and begins cleaning up contaminated groundwater

1989: EPA signs first Record of Decision for the site; this Record of Decision included a frame work to address all areas of the s site by dividing the site into three Operable Units: Operable Unit 1 soil contamination; Operable Unit 2 residual soil contamination; and Operable Unit 3 groundwater contamination focusing on an evaluation of the existing ARS; this first Record of Decision also included a cleanup plan to address soil and residual soil contamination at the site (Operable Units 1 and 2)

1994: Soil cleanup begins

1997: Soil cleanup completed

1998: Remedial Investigation/Feasibility study (RI/FS), ecological and human health risk assessments initiated for Operable Unit 3

1999: EPA prepares first 5-year clean up review; finds past clean up is protective

2004: EPA prepares second 5-year clean up review; finds past clean up is protective

2005: RI/FS and human health and ecological risk assessment reports released, EPA issues a Record of Decision and proposes the cleanup plans for Operable Unit 3

2005-2010: Numerous studies and engineering designs were conducted under the review and oversight of the Environmental Protection Agency, the Massachusetts Department of Environmental Protection (MassDEP), the Town of Acton, the Acton Water District, the Acton Citizens for Environmental Safety and AECOM.

2011-2012: Construction and operation of the Northeast and Landfill Area treatment systems and the removal and offsite disposal of sediment from Sinking Pond and the North Lagoon Wetland.

2012-present: Continued groundwater pumping and treatment

SUPERFUND

SITE UPDATE

Nuclear Metals, Inc. Site

Concord and Acton, MA

U.S. EPA | HAZARDOUS WASTE PROGRAM AT EPA NEW ENGLAND

THE SUPERFUND PROGRAM *protects human health and the environment by investigating and cleaning up often-abandoned hazardous waste sites and engaging communities throughout the process. Many of these sites are complex and need long-term cleanup actions. Those responsible for contamination are held liable for cleanup costs. EPA strives to return previously contaminated land and groundwater to productive use.*

INTRODUCTION:

A multi-phase cleanup is underway at the 46-acre Nuclear Metals, Inc. (NMI) Site, located at 2229 Main Street in Concord, MA. Under EPA and Massachusetts Department of Environmental Protection (MassDEP) oversight, an action to empty, demolish site buildings and remove all materials for off-site disposal was completed in September 2016. A second action to control migration of Volatile Organic Compounds (VOCs) and 1,4-dioxane contaminated groundwater started in July 2016. These actions are being performed by the Respondents (two companies that owned the site prior to September 1972), with significant financial support from settling federal agencies (that contracted with NMI).

BACKGROUND:

From 1957 to October 1972, NMI was owned and operated by a succession of companies that engaged in specialty research. In September 1972, NMI employees purchased the operation and shifted focus to large-scale production of depleted uranium (DU) armor penetrators, other DU products, and beryllium alloy parts. NMI was renamed as "Starmet Corporation" in 1997. Manufacturing operations resulted in significant contamination of equipment and to the interior of the buildings, as well as to soil, sediment, and groundwater at the 46-acre property. The Site was placed on the National Priorities List in June 2001, triggering further investigation and interim or "removal" actions by EPA and MassDEP. To date, removal actions placed interim covers on the "Holding Basin" and "Old Landfill" areas (2001), installed perimeter fencing (2002), removed DU drums and other materials from the buildings for off-site disposal (2005-2007), removed hazardous and flammable materials from the buildings for off-site disposal (2008), and removed all remaining contents from the buildings prior to demolishing them, with off-site disposal of all materials (2011-2016).

PUBLIC INFORMATIONAL MEETING

Nuclear Metals, Inc. Superfund site
Thursday, May 25, 2017 - 6:30 pm

Acton Town Hall, 472 Main Street
Room 204, Acton, MA

The meeting space if fully accessible,
if you have any questions or special needs,
please call Sarah White, EPA Community
Involvement Coordinator at 617-918-1026.
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EPA United States Environmental Protection Agency

May 2017

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A comprehensive investigation of the extent of contamination (the "Remedial Investigation" or "RI") and evaluation of remedial alternatives (the "Feasibility Study" or "FS") began in 2004 and was completed in 2015. In September 2015, EPA issued a "Record of Decision" (ROD) selecting a $125 million remedy for the site. The ROD generally includes the following components:

- Excavation and off-site disposal of approximately 82,500 cubic yards of contaminated concrete, asphalt, soil and sediment.
- In-situ stabilization of DU contaminated soils in the Holding Basin using apatite injection.
- Extraction and ex-situ treatment of groundwater for volatile organic compounds (VOCs) and 1,4-dioxane.
- In-situ treatment of DU in overburden groundwater and natural uranium in bedrock groundwater (these plumes are within the 2229 Main Street property).
- Long-term monitoring to monitor the effectiveness of in- and ex-situ treatment.
- Institutional Controls to prevent disturbance of the Holding Basin area, prevent the use of Site groundwater, and address potential vapor intrusion risks.

The ROD also addressed acceleration of the remedy component addressing extraction and treatment of groundwater impacted by VOCs and 1,4-dioxane, as those contaminants pose a threat to municipal water supply wells. This accelerated process is termed the Groundwater Non-Time-Critical Removal Action or "Groundwater NTCRA."

BUILDING NON-TIME-CRITICAL REMOVAL ACTION (NTCRA):

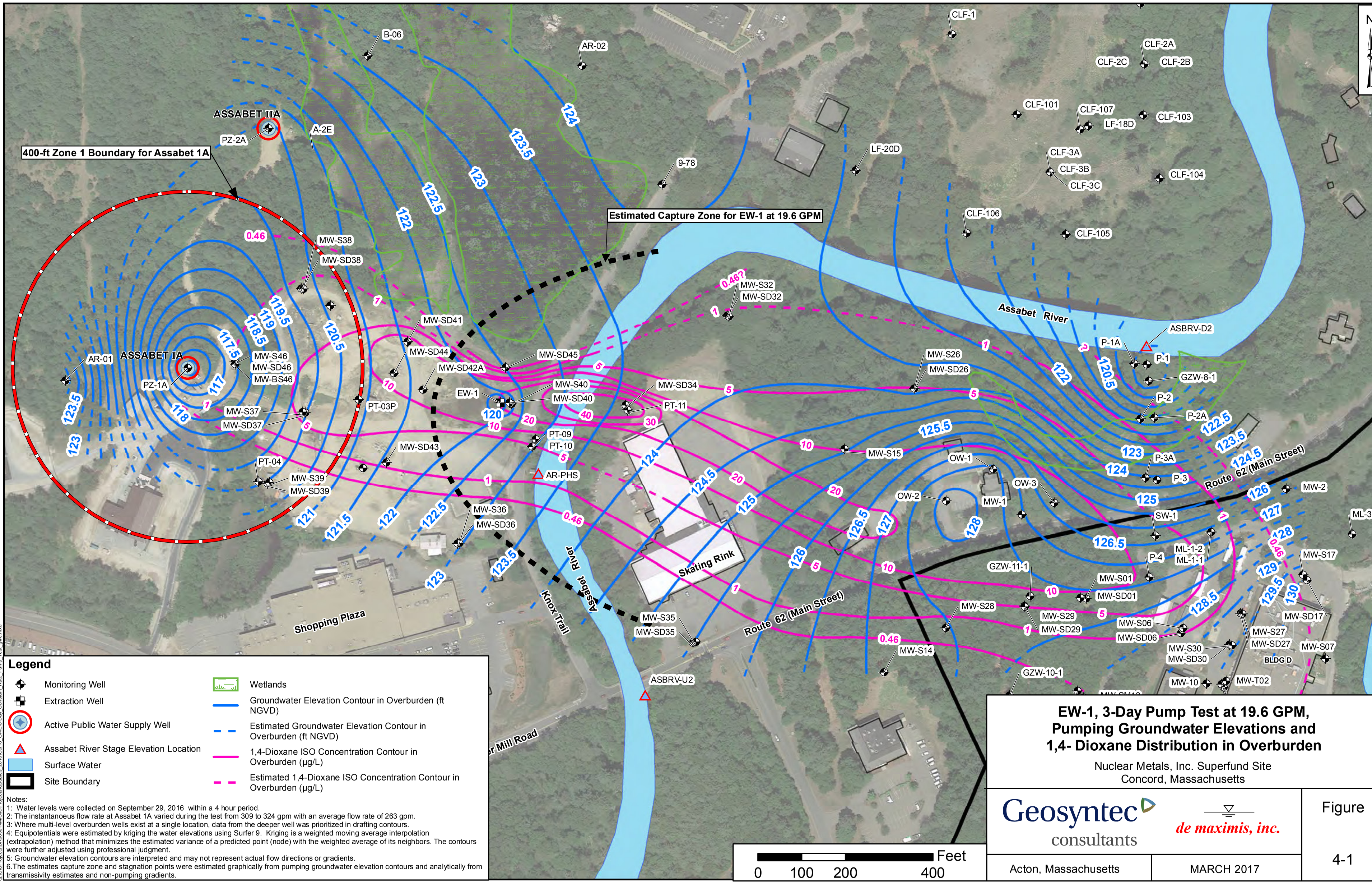
During the RI/FS, EPA determined that the site buildings presented an unacceptable risk, which resulted in an August 2011 Administrative Order with the Respondents and Settling Federal Agencies that funded a $70 million project to empty and demolish the site buildings, and transport all those materials for off-site disposal. That project started in November 2011, when the Starmet entities vacated the facility. Building contents and non-load bearing walls were removed, interior surfaces cleaned, and rooftop equipment removed prior to starting building demolition. The building's slab foundations were covered by a temporary liner which will remain in place until excavation begins during the Remedial Action (RA). This work was completed $15 million under budget, due to the project team's efforts to manage the various waste streams and competitively procure transportation and disposal, and resulted in significant savings on those costs, which was the single largest line item in the NTCRA budget.

GROUNDWATER NTCRA:

Work to better understand the extent of the VOC and 1,4-dioxane contamination in groundwater started before the ROD was issued. The risk-based acceptable concentration levels and laboratory detection limits for 1,4-dioxane decreased several times during the RI/FS process, each time expanding the area of study. The project team recognized that the final FS sampling program was inadequate to bound the extent of 1,4-dioxane to the ROD cleanup level of 0.46 ug/L (parts per billion). A work plan to determine the extent of the problem was submitted to EPA in August 2015, and led to the installation and sampling of 29 new groundwater monitoring wells and sampling of 16 existing wells between September 2015 and January 2016. All analysis for 1,4-dioxane was performed to an analytical detection limit of 0.15 ug/L. Coordination with Acton Water District allowed the NMI team to perform water elevation monitoring during a planned March 2016 "shut down" of two Acton municipal water supply wells (Assabet 1A and 2A). These data helped the team to better understand how pumping from these wells affects the flow of groundwater. This understanding was incorporated into the July 2016 Extraction Well Installation and Pump Test Work Plan. On July 7, 2016, EPA issued an Administrative Settlement Agreement and Order on Consent with the Respondents and Settling Federal Agencies for the payment and performance of the Groundwater NTCRA. The agreement specifies the actions required to install a groundwater pumping and treatment system to cut off the 1,4-dioxane and VOC contamination before it gets to the Assabet 1A Municipal Supply Well.

EW-1, 3-Day Pump Test at 19.6 GPM, Pumping Groundwater Elevations and 1,4- Dioxane Distribution in Overburden

Nuclear Metals, Inc. Superfund Site
Concord, Massachusetts



Legend

- Monitoring Well
- Extraction Well
- Active Public Water Supply Well
- Assabet River Stage Elevation Location
- Surface Water
- Site Boundary
- Wetlands
- Groundwater Elevation Contour in Overburden (ft NGVD)
- Estimated Groundwater Elevation Contour in Overburden (ft NGVD)
- 1,4-Dioxane ISO Concentration Contour in Overburden (µg/L)
- Estimated 1,4-Dioxane ISO Concentration Contour in Overburden (µg/L)

Notes:
1: Water levels were collected on September 29, 2016 within a 4 hour period.
2: The instantaneous flow rate at Assabet 1A varied during the test from 309 to 324 gpm with an average flow rate of 263 gpm.
3: Where multi-level overburden wells exist at a single location, data from the deeper well was prioritized in drafting contours.
4: Equipotentials were estimated by kriging the water elevations using Surfer 9. Kriging is a weighted moving average interpolation (extrapolation) method that minimizes the estimated variance of a predicted point (node) with the weighted average of its neighbors. The contours were further adjusted using professional judgment.
5: Groundwater elevation contours are interpreted and may not represent actual flow directions or gradients.
6. The estimates capture zone and stagnation points were estimated graphically from pumping groundwater elevation contours and analytically from transmissivity estimates and non-pumping gradients.

Geosyntec consultants | de maximis, inc.

Acton, Massachusetts | MARCH 2017

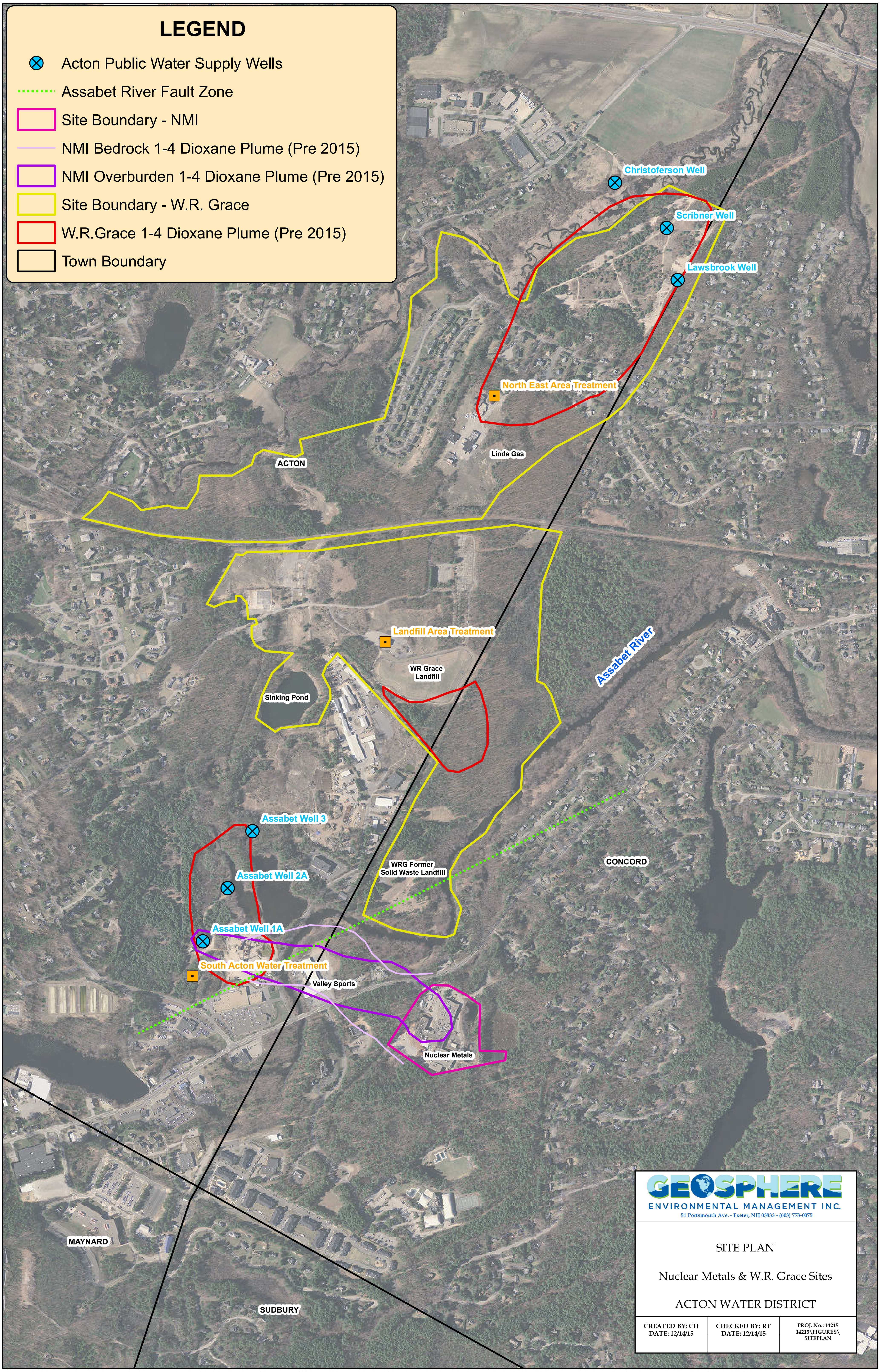
Figure 4-1

In August and September 2016, an extraction well was installed on Acton Water District property (the former gravel plant at 16 Knox Trail), along with additional monitoring wells. Following installation of the extraction well, various tests were performed to determine the capacity and flow rate from the well necessary to capture the NMI-related VOC and 1,4-dioxane contamination (See Figure above). Following these tests, the project team proceeded to install a temporary treatment system (that was previously constructed for the now complete Building NTCRA) to cut off the migration of contamination to the Assabet 1A supply well while the design and installation of the final treatment system is completed. The temporary system, installed in April 2017, will capture the contaminated groundwater, remove the VOCs, and discharge the treated water to the Assabet River. In parallel with the design and installation of the Temporary System, a Treatability Study Work Plan has been developed. The intent of this Treatability Study is to evaluate various technologies and select the best available technology for the treatment of 1-4-dioxane in the final treatment system. Selection of the final technology is scheduled to be made during the summer of 2017, and will be followed by final design and installation of a final Groundwater Treatment System. The available treatment options for 1,4-dioxane are complex systems, which will take several months to design and construct once selected. A new building will also need to be constructed to house the final system. Construction of the final Groundwater Treatment System is expected to extend into the winter of 2017/2018.

EPA sent notice letters to the Respondents and Settling Federal Agencies in September 2016 initiating negotiations for performance of the remaining components of the remedy established in the ROD, and these negotiations are currently on-going.

building demolition

Nuclear Metals building cap completion


LEGEND
Acton Public Water Supply Wells
Assabet River Fault Zone
Site Boundary - NMI
NMI Bedrock 1-4 Dioxane Plume (Pre 2015)
NMI Overburden 1-4 Dioxane Plume (Pre 2015)
Site Boundary - W.R. Grace
W.R.Grace 1-4 Dioxane Plume (Pre 2015)
Town Boundary
Christoferson Well
Scribner Well
Lawsbrook Well
North East Area Treatment
Linde Gas
ACTON
Landfill Area Treatment
WR Grace Landfill
Sinking Pond
Assabet River
Assabet Well 3
Assabet Well 2A
Assabet Well 1A
South Acton Water Treatment
Valley Sports
WRG Former Solid Waste Landfill
CONCORD
Nuclear Metals
MAYNARD
SUDBURY
GEOSPHERE
ENVIRONMENTAL MANAGEMENT INC.
51 Portsmouth Ave. - Exeter, NH 03833 - (603) 773-0075
SITE PLAN
Nuclear Metals & W.R. Grace Sites
ACTON WATER DISTRICT
CREATED BY: CH
DATE: 12/14/15
CHECKED BY: RT
DATE: 12/14/15
PROJ. No.: 14215
14215\FIGURES\SITEPLAN

Appendix H

WRIGHT-PIERCE™
Engineering a Better Environment

United States Environmental Protection Agency

Technical Fact Sheet – 1,4-Dioxane

November 2017

At a Glance

- ❖ Flammable liquid and a fire hazard. Potentially explosive if exposed to light or air.
- ❖ Found at many federal facilities because of its widespread use as a stabilizer in certain chlorinated solvents, paint strippers, greases and waxes.
- ❖ Short-lived in the atmosphere, may leach readily from soil to groundwater, migrates rapidly in groundwater and is relatively resistant to biodegradation in the subsurface.
- ❖ Classified by EPA as "likely to be carcinogenic to humans" by all routes of exposure.
- ❖ Short-term exposure may cause eye, nose and throat irritation; long-term exposure may cause kidney and liver damage.
- ❖ Federal screening levels, state health-based drinking water guidance values and federal occupational exposure limits have been established.
- ❖ Modifications to existing sample preparation procedures may be required to achieve the increased sensitivity needed for detection of 1,4-dioxane.
- ❖ Common treatment technologies include advanced oxidation processes and bioremediation.
- ❖ No federal maximum contaminant level (MCL) has been established for 1,4-dioxane in drinking water.

Introduction

This fact sheet, developed by the U.S. Environmental Protection Agency (EPA) Federal Facilities Restoration and Reuse Office (FFRRO), provides a summary of the emerging contaminant 1,4-dioxane, including physical and chemical properties; environmental and health impacts; existing federal and state guidelines; detection and treatment methods; and additional sources of information. This fact sheet is intended for use by site managers who may address 1,4-dioxane at cleanup sites or in drinking water supplies and for those in a position to consider whether 1,4-dioxane should be added to the analytical suite for site investigations.

1,4-Dioxane is a likely human carcinogen and has been found in groundwater at sites throughout the United States. The physical and chemical properties and behavior of 1,4-dioxane create challenges for its characterization and treatment. It is highly mobile and does not readily biodegrade in the environment.

What is 1,4-dioxane?

- ❖ 1,4-Dioxane is a synthetic industrial chemical that is completely miscible in water (EPA 2006; ATSDR 2012).
- ❖ Synonyms include dioxane, dioxan, p-dioxane, diethylene dioxide, diethylene oxide, diethylene ether and glycol ethylene ether (EPA 2006; ATSDR 2012; Mohr 2001).
- ❖ 1,4-Dioxane is unstable at elevated temperatures and pressures and may form explosive mixtures with prolonged exposure to light or air (EPA 2006; HSDB 2011).
- ❖ 1,4-Dioxane is a likely contaminant at many sites contaminated with certain chlorinated solvents (particularly 1,1,1-trichloroethane [TCA]) because of its widespread use as a stabilizer for chlorinated solvents (EPA 2013a; Mohr 2001). Historically, the main use (90 percent) of 1,4-dioxane was as a stabilizer of chlorinated solvents such as TCA (ATSDR 2012). Use of TCA was phased out under the 1995 Montreal Protocol and the use of 1,4-dioxane as a solvent stabilizer was terminated (ECJRC 2002; NTP 2016). Lack of recent reports for other previously reported uses suggest that many other industrial, commercial and consumer uses were also stopped.

- It is a by-product present in many goods, including paint strippers, dyes, greases, antifreeze and aircraft deicing fluids, and in some consumer products (deodorants, shampoos and cosmetics) (ATSDR 2012; Mohr 2001).
- 1,4-Dioxane is used as a purifying agent in the manufacture of pharmaceuticals and is a by-product in the manufacture of polyethylene terephthalate (PET) plastic (Mohr 2001).
- Traces of 1,4-dioxane may be present in some food supplements, food containing residues from packaging adhesives or on food crops treated with pesticides that contain 1,4-dioxane (ATSDR 2012; DHHS 2011).

Exhibit 1: Physical and Chemical Properties of 1,4-Dioxane (ATSDR 2012)

Property	1,4-Dioxane
Chemical Abstracts Service (CAS) number	123-91-1
Physical description (physical state at room temperature)	Clear, flammable liquid with a faint, pleasant odor
Molecular weight (g/mol)	88.11
Water solubility	Miscible
Melting point (^{o}C)	11.8
Boiling point (^{o}C) at 760 mm Hg	101.1
Vapor pressure at 25^{o}C (mm Hg)	38.1
Specific gravity	1.033
Octanol-water partition coefficient (log K_{ow})	-0.27
Organic carbon partition coefficient (log K_{oc})	1.23
Henry's law constant at 25 ^{o}C (atm-m^3/mol)	4.80 X 10^{-6}

Abbreviations: g/mol – grams per mole; ^{o}C – degrees Celsius; mm Hg – millimeters of mercury; atm-m^3/mol – atmosphere-cubic meters per mole

Existence of 1,4-dioxane in the environment

- 1,4-Dioxane is typically found at some solvent release sites and PET manufacturing facilities (ATSDR 2012; Mohr 2001).
- It is short-lived in the atmosphere, with an estimated 1- to 3-day half-life due to photooxidation (ATSDR 2012; DHHS 2011).
- Migration to groundwater is weakly retarded by sorption of 1,4-dioxane to soil particles; it is expected to move rapidly from soil to groundwater (EPA 2006; ATSDR 2012).
- It is relatively resistant to biodegradation in water and soil, although recent studies have identified degrading bacteria (Inoue 2016; Pugazhendi 2015; Sales 2013).
- It does not bioaccumulate, biomagnify, or bioconcentrate in the food chain (ATSDR 2012; Mohr 2001).
- 1,4-Dioxane is frequently present at sites with TCA contamination (Mohr 2001; Adamson 2014).
- It may migrate rapidly in groundwater, ahead of other contaminants (DHHS 2011; EPA 2006).
- Where delineated, 1,4-dioxane is frequently found within previously delineated chlorinated solvent plumes and existing monitoring networks (Adamson 2014).
- As of 2016, 1,4-dioxane had been identified at more than 34 sites on the EPA National Priorities List (NPL); it may be present (but samples were not analyzed for it) at many other sites (EPA 2016b).

What are the routes of exposure and the potential health effects of 1,4-dioxane?

- Exposure may occur through ingestion of contaminated food and water, or dermal contact. Worker exposures may include inhalation of vapors (ATSDR 2012; DHHS 2011; EU 2002).
- Potential exposure could occur during production and use of 1,4-dioxane as a stabilizer or solvent (DHHS 2011; EU 2002).
- Short-term exposure to high levels of 1,4-dioxane may result in nausea, drowsiness, headache, and irritation of the eyes, nose and throat (ATSDR 2012; EPA 2013b; NIOSH 2010; EU 2002). 1,4-Dioxane is readily absorbed through the lungs and gastrointestinal tract. Some 1,4-dioxane may also pass through the skin, but studies indicate that much of it will evaporate before it is absorbed. Distribution is rapid and uniform in the lung, liver, kidney, spleen, colon and skeletal muscle tissue (ATSDR 2012).
- 1,4-Dioxane is weakly genotoxic and reproductive effects in humans are unknown; however, a developmental study on rats indicated that 1,4-dioxane may be slightly toxic to the developing fetus (ATSDR 2012; Giavini and others 1985).
- Animal studies showed increased incidences of nasal cavity, liver and gall bladder tumors after exposure to 1,4-dioxane (ATSDR 2012; DHHS 2011; EPA IRIS 2013).
- EPA has classified 1,4-dioxane as "likely to be carcinogenic to humans" by all routes of exposure (EPA IRIS 2013).
- The U.S. Department of Health and Human Services states that "1,4-dioxane is reasonably anticipated to be a human carcinogen based on sufficient evidence of carcinogenicity from studies in experimental animals" (DHHS 2011).
- The National Institute for Occupational Safety and Health (NIOSH) considers 1,4-dioxane a potential occupational carcinogen (NIOSH 2010).
- The European Union has classified 1,4-dioxane as having limited evidence of carcinogenic effect (EU 2002).

Are there any federal and state guidelines and health standards for 1,4-dioxane?

- EPA's Integrated Risk Information System (IRIS) database includes a chronic oral reference dose (RfD) of 0.03 milligrams per kilogram per day (mg/kg/day) based on liver and kidney toxicity in animals and a chronic inhalation reference concentration (RfC) of 0.03 milligrams per cubic meter (mg/m^3) based on atrophy and respiratory metaplasia inside the nasal cavity of animals (EPA IRIS 2013).
- The cancer risk assessment for 1,4-dioxane is based on an oral slope factor of 0.1 mg/kg/day and the drinking water unit risk is 2.9×10^{-6} micrograms per liter (µg/L) (EPA IRIS 2013).
- EPA risk assessments indicate that the drinking water concentration representing a 1×10^{-6} cancer risk level for 1,4-dioxane is 0.35 µg/L (EPA IRIS 2013).
- No federal maximum contaminant level (MCL) for drinking water has been established (EPA 2012).
- 1,4-Dioxane is included on the fourth drinking water contaminant candidate list and is included in the Third Unregulated Contaminant Monitoring Rule (EPA 2009; EPA 2016a).
- EPA's drinking water equivalent level is 1 mg/L (EPA 2012). EPA has calculated a screening level of 0.46 µg/L for tap water, based on a 1 in 10^{-6} lifetime excess cancer risk (EPA 2017b).
- EPA established a 1-day health advisory of 4.0 milligrams per liter (mg/L) and a 10-day health advisory of 0.4 mg/L in drinking water for a 10-kilogram child and a lifetime health advisory of 0.2 mg/L in drinking water (EPA 2012).
- EPA has calculated a residential soil screening level (SSL) of 5.3 milligrams per kilogram (mg/kg) and an industrial SSL of 24 mg/kg. The soil-to-groundwater risk-based SSL is 9.4×10^{-5} mg/kg (EPA 2017b).
- EPA has calculated a residential air screening level of 0.56 micrograms per cubic meter ($\mu g/m^3$) and an industrial air screening level of 2.5 $\mu g/m^3$ (EPA 2017b).
- A reportable quantity of 100 pounds has been established under the Comprehensive Environmental Response, Compensation, and Liability Act (EPA 2011).
- The Occupational Safety and Health Administration (OSHA) established a permissible

exposure limit (PEL) for 1,4-dioxane of 100 parts per million (ppm) or 360 mg/m^3 as an 8-hour time weighted average (TWA). While OSHA has established a PEL for 1,4-dioxane, OSHA has recognized that many of its PELs are outdated and inadequate for ensuring the protection of worker health. OSHA recommends that employers follow the California OSHA limit of 0.28 ppm, the NIOSH recommended exposure limit of 1 ppm as a 30-minute ceiling, or the American Conference of Governmental Industrial Hygienists threshold limit value of 20 ppm (OSHA 2017).

- Various states have established drinking water and groundwater guidelines, including the following:

State	Guideline (µg/L)	Source
Alaska	77	AL DEC 2016
California	1.0	Cal/EPA 2011
Colorado	0.35	CDPHE 2017
Connecticut	3.0	CTDPH 2013
Delaware	6.0	DE DNR 1999
Florida	3.2	FDEP 2005
Indiana	7.8	IDEM 2015
Maine	4.0	MEDEP 2016
Massachusetts	0.3	MADEP 2004
Mississippi	6.09	MS DEQ 2002
New Hampshire	0.25	NH DES 2011
New Jersey	0.4	NJDEP 2015
North Carolina	3.0	NCDENR 2015
Pennsylvania	6.4	PADEP 2011
Texas	9.1	TCEQ 2016
Vermont	3.0	VTDEP 2016
Washington	0.438	WA ECY 2015
West Virginia	6.1	WV DEP 2009

What detection and site characterization methods are available for 1,4-dioxane?

- As a result of the limitations in the analytical methods to detect 1,4-dioxane, it has been difficult to identify its occurrence in the environment. The miscibility of 1,4-dioxane in water causes poor purging efficiency and results in high detection limits (ATSDR 2012; EPA 2006; Mohr 2001).
- The Contract Laboratory Program SOW SOM02.3 includes a CRQL of 2.0 µg/L in water, 67 µg/kg in low soil and 2,000 µg/kg in medium soil (EPA 2013c).
- Conventional analytical methods can detect 1,4-dioxane only at concentrations 100 times greater than the concentrations of volatile organic compounds. Modifications of existing analytical methods and their sample preparation procedures may be needed to achieve lower detection limits for 1,4-dioxane (EPA 2006; Mohr 2001).
- High-temperature sample preparation techniques improve the recovery of 1,4-dioxane. These techniques include purging at elevated temperature (EPA SW-846 Method 5030); equilibrium headspace analysis (EPA SW-846 Method 5021); vacuum distillation (EPA SW-846 Method 8261); and azeotropic distillation (EPA SW-846 Method 5031) (EPA 2006).
- NIOSH Method 1602 uses gas chromatography – flame ionization detection (GC-FID) to determine the concentration of 1,4-dioxane in air (ATSDR 2012; NIOSH 2010).
- EPA SW-846 Method 8015D uses gas chromatography (GC) to determine the concentration of 1,4-dioxane in environmental samples. Samples may be introduced into the GC column by a variety of techniques including the injection of the concentrate from azeotropic distillation (EPA SW-846 Method 5031). The lower quantitation limits for 1,4-dioxane in aqueous matrices by azeotropic microdistillation are 12 µg/L (reagent water), 15 µg/L (groundwater) and 16 µg/L (leachate) (EPA 2003).
- EPA SW-846 Method 8260B detects 1,4-dioxane in a variety of solid waste matrices using GC and mass spectrometry (MS). The detection limit

depends on the instrument and choice of sample preparation method (ATSDR 2012).

- A laboratory study is underway to develop a passive flux meter (PFM) approach to enhance the capture of 1,4-dioxane in the PFM sorbent to improve accuracy. Results to date show that the PFM is capable of quantifying low absorbing compounds such as 1,4-dioxane (DoD SERDP 2013b).
- EPA Method 1624 uses isotopic dilution gas chromatography – mass spectrometry (GC-MS) to detect 1,4-dioxane in water, soil and municipal discharges. The detection limit for this method is 10 µg/L (ATSDR 2012; EPA 2001b).
- EPA SW-846 Method 8270 uses liquid-liquid extraction and isotope dilution by capillary column GC-MS. This method is often modified for the detection of low levels of 1,4-dioxane in water (EPA 2007).
- EPA Method 522 uses solid phase extraction and GC-MS with selected ion monitoring for the detection of 1,4-dioxane in drinking water with detection limits as low as 0.02 µg/L (EPA 2008).
- GC-MS detection methods using solid phase extraction followed by desorption with an organic solvent have been developed to remove 1,4-dioxane from the aqueous phase. Detection limits as low as 0.03 µg/L have been achieved by passing the aqueous sample through an activated carbon column, following by elution with acetone-dichloromethane (ATSDR 2012; Kadokami and others 1990).
- Lab studies indicate effective methods for monitoring growth of dioxane-degrading bacteria in culture (Gedalanga 2014).
- Studies are underway to develop and assess methods for performing compound-specific isotope analysis (CSIA) on low levels of 1,4-dioxane in groundwater (DoD SERDP 2016).

What technologies are being used to treat 1,4-dioxane?

- Pump-and-treat remediation can treat dissolved 1,4-dioxane in groundwater and control groundwater plume migration, but requires ex-situ treatment tailored for the unique properties of 1,4-dioxane (e.g., its low octanol-water partition coefficient makes 1,4-dioxane hydrophilic) (EPA 2006; Kiker and others 2010).
- Commercially available advanced oxidation processes using hydrogen peroxide with ultraviolet light or ozone can be used to treat 1,4-dioxane in wastewater (Asano and others 2012; EPA 2006).
- Peroxone and iron activated persulfate oxidation of 1,4-dioxane might aid in the cleanup of VOC-contaminated sites (Eberle 2015; Zhong 2015; Li 2016; SERDP 2013d).
- In-situ chemical oxidation can be successfully combined with bioaugmentation for managing dioxane contamination (DoD SERDP 2013d; Adamson 2015).
- Ex-situ bioremediation using a fixed-film, moving-bed biological treatment system is also used to treat 1,4-dioxane in groundwater (EPA 2006).
- Electrical resistance heating may be an effective treatment method (Oberle 2015).
- Phytoremediation is being explored as a means to remove the compound from shallow groundwater. Pilot-scale studies have demonstrated the ability of hybrid poplars to take up and effectively degrade or deactivate 1,4-dioxane (EPA 2001a, 2013a; Ferro and others 2013).
- Microbial degradation in engineered bioreactors has been documented under enhanced conditions or where selected strains of bacteria capable of degrading 1,4-dioxane are cultured, but the impact of the presence of chlorinated solvent co-contaminants on biodegradation of 1,4-dioxane needs to be further investigated (EPA 2006, 2013a; Mahendra and others 2013).
- Results from a 2012 laboratory study found 1,4-dioxane-transforming activity to be relatively common among monooxygenase-expressing bacteria; however, both TCA and 1,1-dichloroethene inhibited 1,4-dioxane degradation by bacterial isolates (DoD SERDP 2012).
- Isobutane-metabolizing bacteria can consistently degrade low (<100 ppb) concentrations of 1,4-dioxane, often to concentrations <1 ppb. These organisms also can degrade many chlorinated co-contaminants such as TCA and 1,1-dichoroethene (1,1-DCE) (DoD SERDP 2013c).
- Ethane effectively serves as a cometabolite for facilitating the biodegradation of 1,4-dioxane at relevant field concentrations (DoD SERDP 2013f).
- Biodegradation rates are subject to interactions among transition metals and natural organic ligands in the environment. (Pornwongthong 2014; DoD SERDP 2013e).

- Photocatalysis has been shown to remove 1,4-dioxane in aqueous solutions. Laboratory studies documented that the surface plasmon resonance of gold nanoparticles on titanium dioxide (Au – TiO2) promotes the photocatalytic degradation of 1,4-dioxane (Min and others 2009; Vescovi and others 2010).
- Other in-well combined treatment technologies being assessed include air sparging; soil vapor extraction (SVE); enhanced bioremediation-oxidation; and dynamic subsurface groundwater circulation (Odah and others 2005).
- 1,4-Dioxane was reduced by greater than 90 percent in the treatment zone with no apparent downward migration of 1,4-dioxane using enhanced or extreme SVE, which uses a combination of increased air flow, sweeping with drier air, increased temperature, decreased infiltration and more focused vapor extraction to enhance 1,4-dioxane remediation in soils (DoD SERDP 2013a).

Where can I find more information about 1,4-dioxane?

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- Inoue, D., Tsunoda, T., Sawada, K., Yamamoto, N., Saito, Y., Sei, K., and M. Ike. 2016. “1,4-Dioxane degradation potential of members of the genera *Pseudonocardia* and *Rhodococcus*.” Biodegradation. Volume 27. Pages 277 to 286.

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Contact Information

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Appendix I

Wright-Pierce
Engineering a Better Environment™

Water Supply District of Acton
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Rules, Regulations and Rates

The following Rules, Regulations and Rates, in addition to the applicable provisions of Massachusetts law, shall be considered a part of the Contract with every person using or seeking to use the water and binding on all water takers.

INTRODUCTION

All requests for water services may be made by application (see last page for application) of the property owner or designee to the Water Supply District of Acton (hereinafter referred to as the "District").

No person will connect, or cause to be connected, any service pipe with the main or any distributing pipes or appurtenances, except by order of the Water Commissioners made on such application for new or temporary service or alteration to an existing service. Wherever practicable, water mains will be installed on the public way.

Demand Charges, Mitigation Fees, Costs and Service fees for new installation are shown in Appendix A1 and are subject to change by vote of the Water Commissioners.

Article I

The Commissioners will regulate the use of water in such manner as they deem to be in the best interest of the District, fix and collect prices and rates for the use thereof, and prescribe the time and manner of the payment of such prices and rates. The Commissioners will have exclusive charge and control of the District water system, subject to all by-laws, and subject to such instructions as the District may from time to time impose by its vote, and by the requirements set by the state and federal government

Except for an emergency supply of water to interconnected municipal water systems, notwithstanding any existing or future water service connection, no water service shall be provided for the use of any city, town or municipality, except for the Town of Acton, without a vote of the Commissioners and after a finding that such provision of water is beneficial to the District and in the best interest of the District and the Town of Acton.

Installation

New Service

Demand Charges are payable at the time of application. District approval is required for all service installations and alterations. No work associated with the water system will be allowed unless a completed application has been submitted and all conditions of approval have been satisfied. Pipe size, materials and type of any installation will be determined by the District.

Costs of installation service and meter based on time and materials will be charged to the applicant separate of the Demand Charge. All fees and costs for new service installations must be paid for by the applicant, and as-built record drawings annotating exact location of installed infrastructure will be submitted before water will be turned on to any development, dwelling or commercial/industrial building as applicable.

The District will have an inspector on sites where new water main and necessary fittings are installed in new developments, private roads, business and commercial sites. The Water District may charge $50/hour, or any amount deemed appropriate by the Water Commissioners to be paid to the Water District by the owner, contractor or developer. All materials used will meet the specifications of the District.

Any new water service or fire line from the water main to a dwelling, building or structure will be in a separate, underground trench. No other utility will be in the same trench unless the District determines that the conditions prevent a separate trench. In such cases, a suitable plan prepared by a registered Professional Engineer will be submitted to the District and Dig Safe for approval to insure safety and accessibility for repair, replacement or inspection of the lines located in the same trench. The District reserves the right to deny an application if the placement of water utility components do not meet these conditions. Any replacement of a water service to an existing structure will require existing service to be turned off and disconnected at the water main, and new water service to be up to current specification.

All new service connections to the District must meet minimum water efficiency requirements. This applies to new construction, change in use, or previously constructed buildings wishing to connect to the District. The minimum efficiency requirements shall be reviewed with the Environmental Manager at the time of application or for larger development projects during the project review period. Current requirements are included as Appendix A-3.

Any project that requires an extension of or addition to the water piping system will be required to meet minimum water efficiency requirements, and if greater than one single-family dwelling, provide to the District a *Water Impact Report* acceptable to the District. This report will contain the following: 1) estimated impact of the project on the District's average, daily and annual water demand; 2) impact of the project on the District's existing supply system including the effect on water flow speed and direction through the water mains proximate to the new service line and on maintenance of adequate fire flow; 3) impact of the project on the District's compliance with the state Water Management Act withdrawal permit compliance; and 4) conditions and water conservation measures that will mitigate the effect of the project's demand impact (applicants should request from the District a list of possible mitigation measures).

A mitigation fee, as referenced in Appendix A-1, will be charged for any project that has a proposed increase in water use from its current use in excess of 200 gallons per day, for projects connecting to the District that were previously connected to another Public Water System, or projects that extend the existing distribution system. Mitigation fees may be waived after review of the Water Impact Report.

The report will be reviewed and approved by the Water Commissioners or their designee. Costs associated with generating the report will be the responsibility of the applicant. The District may submit a copy of this report to the Planning Department and Building Inspector.

As a baseline, guidelines for the Water Impact Report are included in Appendix (A-2). However, the District reserves the right to require more comprehensive information on the impact of any connection.

Cross-Connections

Any water supply attached to the District system may be required to install, at the service entrance and immediately downstream of the meter, a Reduced Pressure (RP) Back Flow Device. A survey of the property will determine the need for said device and the District Manager will make the determination of the needs for the device. The device must be approved by the District, and all costs will be paid by the owner/s, and or the person/s to which the bills are so assigned. All cross-connections must be made pursuant to the District's cross-connection control program.

Permanent Outside Irrigation Systems

Upon application to the District, permanent outside irrigation systems may be installed only in conformance with following regulations:

1. All such irrigation systems, connected to the public water supply, must be equipped with a timing device that can be set to make the system conform to the District's odd/even outdoor watering and other use restrictions.

2. All such irrigation systems must be equipped with some type of moisture sensing device that will prevent the system from starting automatically when not needed.

3. All irrigation systems must be installed with an approved backflow prevention device and must be inspected initially by the plumbing inspector and may be inspected periodically after that by District.

4. Installed systems must be designed and maintained to prevent water waste. Any system found to be creating runoff from landscaped areas, over spraying onto buildings or non-landscape areas, pooling or puddling must be adjusted to efficiently irrigate the planted areas.

5. Any person who now has, or who intends to install, an automatic lawn watering system must notify the District office of the existence of said system or of their intention to install a new system prior to the actual installation. All systems, those currently in existence, as well as any installed in the future, must comply with all the Rules and Regulations.

6. The District may order any system not in conformance with the above criteria to be disconnected from the public water supply system.

Article II

Operations

Periodic inspection of service pipes to the meter may be made by the District personnel. When equipment is found defective, all payment for the necessary repairs between the curb-stop and the meter will be assessed to the property owner; this includes service leaks and line freeze-ups. Any leaks on private ways are entirely the responsibility of the homeowner or homeowners' association, as applicable. In the case of meter pits, any repairs on private property from the meter pit or property line to the residence or building served are the responsibility of the owner.

Persons allowing their meter to be damaged by frost or otherwise will be held responsible for replacement costs.

The District will keep meters periodically upgraded.

All apparatus and all places supplied with water must be accessible at all reasonable times for inspection by the District.

Any alteration made to any service within the District or any change in meter location may only be made by the District or under its direction.

Any change in meter location will be made under the direction of the District.

The fire department will have control of the hydrants in case of fires and for necessary practice. In no other case will any persons be allowed to handle hydrants or other waste apparatus without express permission of the District.

No water taker will be allowed to supply water to others, except by special permit from the Board of Water Commissioners, and anyone found doing so without a permit will be subject to shut off.

Article III

Conditions of Use of Service and Provision of Water

All water flowing through and recorded by the water meter is billable.

The District will not in any way, nor under any circumstances, be held liable or responsible to any person or persons for any loss or damage from any excess or deficiency in the pressure, volume or supply of water, due to any cause whatsoever. The District will undertake to use all reasonable care and diligence to avoid interruptions and fluctuations in the service, but cannot and does not guarantee that such will not occur.

The District will not be responsible for damages caused by discolored water resulting from natural causes or caused by the opening or closing of any gates, making repairs, the use of hydrants, or the breaking of any supply lines or any other reasons.

The District will endeavor to give due notice to as many of the consumers affected as time and character, of the work permit whenever it may be necessary to shut off the supply from any section of the District to make repairs or changes or because of broken main, and will as far as practicable, use every effort to prevent damage or inconvenience; but failure to give such notice will not involve the District in any responsibility or liability for damage arising from the shutting off of any supply or any subsequent conditions arising therefrom.

The District reserves the right at any time without notice to shut off the water supply for purpose of making repairs, extensions, or other reasons, and all consumers having boilers or other appliances on their premises are hereby warned against danger of collapse from these sources and are urged to provide safety devices for their own protection. In any event the District expressly stipulates that there shall be no liability for damages resulting therefrom.

The District will not assume any liability for conditions in the consumer's plumbing or appliances which may be the cause of trouble, coincident with, or following repairs made to any part for the supply system by the District or natural wear and tear as result of use of the water.

Article IV

Termination of Water Service

Property owners should notify the District to shut off water if their building (or buildings) become(s) vacant. Water will be turned on again when the owner notifies the District, and upon the payment of twenty-five dollars for turn-on per building.

The District reserves the right to shut off water for the purpose of making alterations or repairs.

A water service may be shut off from any customer for non-compliance with the Rules and Regulations, for non-payment of the water rates and for any violation of Massachusetts General Laws relating to water supply. When water has been shut off because of disregard of rules or non-payment of rates it will be turned on again when the District is satisfied that there will be no further cause of complaint and on the payment of twenty-five dollars.

With the approval of the Department of Environmental Protection or pursuant to its directive G.L. c. 40, sec. 41A, the District reserves the right to restrict the use of water in case of emergency in any manner deemed appropriate.

Article V

Administration of Fees and Fines

All District charges on accounts must be paid in full within 30 days of the billing date. The water may be turned off with proper notice when bills for water remain unpaid for 15 days after they become due, 30 days from the date of issue. Interest will accrue at a rate and in the manner allowed by law.

Owners of the real property supplied with water will be held responsible for the water bills of their tenants. Unpaid water bills are a lien on real estate, and collections may be made on the sale of the property. G.L.c.40, sec. 42A.

Any person violating any order restricting water use imposed by the District or by mandate of any state or federal regulatory authority will be fined not more than $200.00 for each offense, which will inure to the District for such uses as the commissioners may direct. Fines will be recovered by the indictment or on a complaint before the District Court, or by non-criminal disposition in accordance with G.L. c. 20, sec. 21D. Every day that such violation continues constitutes a separate offense.

If a meter is out of order and fails to register, the consumer will be charged at the average daily consumption as shown by the meter when in order. An average will be taken of the last three (3) corresponding readings.

Any and all penalties for violations of these regulations or arrearages for non-payment of water rates or charges may be collected as authorized by law in a civil action.

Insufficient fund checks will be charged as provided by G.L. c.44, sec. 69, and these Rules and Regulations.

As an equitable share to each water taker, a Bond Debt Fee comprised of the total long-term debt (in excess of 10 years) divided by the total number of units shall be assessed to each account. This will be billed as a separate charge on the water bill.

Mitigation fees shall be kept in a separate account to be used for compliance with the Water Management Act permit requirements, new source development costs, water conservation and efficiency programs, and other projects that are associated with managing water use.

Article VI

Prohibited Uses

Any person who shall remove, change, alter or willfully damage or injure any water meter, accessory or any water apparatus will be liable for all repair costs and other damages as determined by the District.

No person will turn on or tamper with a water main or hydrant or other device used for water supply. Any person violating said section will be fined not more than $1,000.00 for each offense, which will inure to the District or recovered by indictment or on complaint before the District Court or by non-criminal disposition in accordance with Section 21D of Chapter 40 of the Massachusetts General Laws, every day that such violation continues will constitute a separate offense. This section will not curtail the fire department or District in the normal course of providing fire protection or water supply.

Article VII

Protection of the Public Water Supply

Service pipes or fixtures of any description that are connected to the District's water mains will not under any circumstances be connected with any other sources of water supply.

No person may connect to the District's water system between the curb-stop and the water meter except by order and direction of the District.

<u>Acton Water District Regulations for Volatile Organic Chemicals (VOCs)</u>

In order to ensure that the District provides the highest quality drinking water possible, the Acton Water District has enacted stringent regulations to limit the amount of Volatile Organic Chemicals (VOCs) in water delivered from all our wells. Although the Safe Drinking Water Act and 310 CMR 22.00 (Massachusetts Drinking Water Regulations) have established maximum contaminant levels (MCLs) for these chemicals, we feel confident that we can consistently provide water that is virtually free of VOCs.

This regulation has two parts, adoption of Action Levels (ALs), and adoption of a timeline and set of procedure that we will follow should any VOC exceed an AL for a specified period of time; both parts of this regulation would be substantially more protective of public health than those required by either the State or EPA.

Acton Water District VOC Action Levels

For all regulated VOCs (the 22 types that have MCLs specified by Massachusetts DEP or EPA) the District has set an Action Level of one part per billion (ppb) and a total of five parts per billion for a total of all VOCs. These 22 VOCs currently have MCLs that range from 2 ppb to 10,000 ppb, depending upon their health effects. The methodology for VOC analysis requires detection levels of 0.5 ppb or less, so any certified laboratory could accurately report a level of 1 ppb.

If at any time the DEP or EPA sets a new MCL for any VOC, that VOC would automatically fall under these regulations. If at any time the DEP or EPA sets an MCL for a VOC that is lower than 1 ppb, the more stringent standard will prevail and become a revised standard for the Acton Water District.

The detection of any VOC at or above state or federal MCLs would require the Acton Water District to follow, in addition to these regulations, all applicable requirements of 310 CMR 22.00.

Action Level Detection: Follow Up Procedures

If at any time *one* of the attached VOCs is detected at or above 1 ppb or above 5 ppb for a total of *all* VOCs, the District will conduct follow-up testing within 10 days of receipt of original results to confirm the test results. If the follow-up testing results are confirmed to be greater than 1 ppb, the data will be presented at the next Water Commissioner's meeting. Unless the Commissioners decide that immediate action is warranted, the District will continue to monitor the well for three additional quarters. If the testing result at the end of the three quarters period is greater than the Action Level, the District shall develop a Plan of Action.

Action Level Exceedance: Follow-Up Procedures

Development of Draft Plan of Action

Within 30 days of discovering an Action Level exceedance, the Water District will develop a draft plan of action that includes:

1. Detailed list of all detections of VOCs for the source(s) in question

2. Anticipated and possible health effects

3. Plans to investigate source of VOCs

4. If multiple VOCs present, anticipated interactive effects

5. Source of VOCs, if known

6. Remediation options with estimated costs/timeframes of each option

7. Recommended option/timeframes, with rationale for recommendation

Development of Final Plan of Action

The draft plan will be presented at a special (publicized) Water Commissioner's Meeting where input from registered town voters will be solicited. A copy will be sent to the Board of Health. The plan will then be finalized within 30 days of receipt of comments, and described in the District's next *Water Words,* in a *Beacon* article, and posted on the District's web site.

Article VIII

RATE STRUCTURE

The District will confer with the owner to establish the number of residential units, measured by a given meter, to which the following rate structure will apply. The break points of the inclining block rate structure will then be multiplied by the number of units to determine the appropriate charges.

An interim meter read for the use of property transfers will be subject to a $50.00 fee.

Water rates, demand charges, rental fees, hydrants and sprinklers and other charges imposed by the District will be determined by vote of the Commissioners at a regular or special meeting of the Commissioners.

WATER RATES AND DEMAND CHARGES

The following inclining block rate structure was adopted effective July 2015. Meters will be read in March, June, September and December and water bills will be mailed as soon as reading is complete. A quarterly service charge of $15.00 per unit and a Bond Debt Fee of $46.00 per unit will be applied to all accounts.

	Current Rates Per Unit	
	Summer	**Winter**
Service Charge	$15.00	$15.00
Bond Debt Fee	$46.00	$46.00
Between 0 and 300 cubic feet (cf)	0.000	0.000
If Greater than 300:		
All Usage up to 2000 cf	0.042	0.034
Between 2001cf and 4000 cf	0.053	0.045
Between 4001cf and 6000cf	0.064	0.056
Greater than 6000 cf	0.075	0.067
Municipal	0.042	0.042

Demand charge schedule is set forth as follows:

PIPE SIZE	DEMAND CHARGE ($)
1 inch	7,400.00
1 1/2 inch	22,975.00
2 inch	45,934.00
3 inch	125,950.00
4 inch	281,535.00
6 inch	837,200.00
Multi-dwelling (per apt. or each living unit)	3,550.00

	SPRINKLER DEMAND CHARGES ($)
Buildings up to 20,000 square feet	1,000.00
Buildings between 20,000 and 40,000 square feet	2,000.00
Buildings between 40,000 and 60,000 square feet	3,000.00
Buildings between 60,000 and 80,000 square feet	4,000.00
Buildings over 80,000 square feet	5,000.00

Mitigation Fee is $5 per gallon of projected use.

Miscellaneous Charges

Labor @ $45.00 Per Hour
Labor @ $70.00 Per Hour Nights & Weekends
Compressor @ $50.00 Per Hour
Backhoe @ $125.00 Per Hour
Backhoe @ $150.00 Per Hour Nights & Weekends
Inspector @ $50.00 Per Hour

Appendix (A-2) Water Impact Report Guidance

Per Acton Water District *Rules and Regulations*, any person applying for water use requiring an extension of or addition to the water piping system or service for more than one single-family dwelling must provide a Water Impact Report to the Acton Water District, for approval by the Board of Water Commissioners.

This report must include the following:

- Project name, applicant, and contact information
- Number of dwelling units (i.e. two single family homes, 12 rental apartments, 2 duplexes, etc.)
- Estimated project start/end dates including dates for any project phases, if applicable
- Estimated average day water demand and maximum day demand, description of method used to develop demand projections
- Expected impact of the project of the District's existing supply system, including effect on water flow speed and direction through water mains proximate to the new service or services, maintenance of adequate fire flows and impact of the project on the District's Water Management Act Withdrawal Permit compliance.
- Conditions and water conservation measures that will mitigate the effect of the project's impact (see menu below for suggestions.)

Possible water conservation techniques for new developments/upgraded services that fall under Water Impact Report regulation.

Outdoor Conservation Action	**Est. water savings/yr for avg. 4 person household**
Natural Lawn and landscape (no supplemental irrigation)	81,600 gallons*
Utilize captured rainwater for irrigation needs	Depends
Drip irrigation only	Depends
Maximum total turf area of 4,000 sq. ft. (approx. 1/10 acre)	48,960 gallons*
Minimum 6 inches 10% organic soil added to landscaped/turf areas	Depends
Fix all outdoor leaks (does not apply to new developments)	Depends
Use pool cover	400 gallons
Devices to increase efficiency of irrigation system	Depends
Indoor Conservation Action	
Replace all old toilets with ultra-low flow toilets (1.6 gpf) (does not apply to new developments)	Depends
Horizontal axis washing machines	7,300 gallons
Use EPA Water Sense Labeled Fixtures (new development)	Depends
Use high efficiency spray nozzles and dishwashers	Depends
Low flow aerators (1.2 gpm) on all faucets (does not apply to new developments)	5,200
All showerheads flow-restricted (2.5 gpm) (does not apply to new developments)	4,000 gallons
Fix all leaks (does not apply to new developments)	Depends

***** Assumed baseline: ¼ acre irrigated 1 inch per week for 3 months

Appendix (A-3) Minimum W a t e r Efficiency Requirements

Category	Requirement	Alternative
Flushometer	1.28 gallon per flush	Dual Flush
Toilet	1.28 gallon per flush	Dual Flush
Urinal	0.5 gallon per flush	Waterless
Showerhead	2.0 gallon per flush	
Lavatory Faucet	1.5 gallon per minute	
Kitchen Faucet	2.2 gallon per minute	
Pre-Rinse Spray Nozzle	1.28 gallon per minute	
Clothes Washer	US EPA Energy Star Rated	
Dishwasher	US EPA Energy Star Rated	
Irrigation System	WaterSense Rated	Alternate Supply, Deed Restriction
Landscaping Plan	Native and Drought Tolerant Plantings, 6 inches of high organic content topsoil	Limited site disturbance and tree clearing, <25% lawn areas
Ice Machines	Air Cooled	
Cooling Towers	>5 Cycles of Concentration	Alternate make up water source

Water Supply District of Acton

693 MASSACHUSETTS AVENUE
P.O. BOX 953
ACTON, MASSACHUSETTS 01720

Date: ___________________________________

Account#: ________________________________

I would like to apply for water service at the following address: ____

For the following purpose only: ________________________ Will this service be 200 feet from the main? ________

I agree to pay the following amount in accordance with the "Rules, Regulations and Rates" set forth by the Water Supply District of Acton, or that may hereafter be made.

Pipe Size	**Demand Charge**		**Fire Sprinkler Demand Charges**		
1 inch	**$7,400.00**	_____	Buildings up to 20,000 square feet	$1,000.00	______
1 ½ inch	**$22,975.00**	_____	Buildings between 20,001 & 40,000 sq ft	$2,000.00	______
2 inch	**$45,934.00**	_____	Buildings between 40,001 & 60,000 sq ft	$3,000.00	______
3 inch	**$125,950.00**	_____	Buildings between 60,001 & 80,000 sq ft	$4,000.00	______
4 inch	**$281,535.00**	_____	Buildings over 80,001 sq ft:		
6 inch	**$837,200.00**	_____	1000 per each 20,000 sq ft	$5,000.00	______

Multi dwelling - # of Units________ x $3,550.00 per unit = $_______________

Hydrant Flow Test - $700.00 (two checks for $350.00 each is required). The results of the flow test should be forwarded to our office within 90 days, $350.000 will be returned at that time.

Location of Flow Test: ____

Please fill in information below for new service or for flow test:

Owner or Contractor: ____

Address: ____

Contact Person: ____________________________________ Telephone #: ______________________

Billing Address: ____

Has road opening permit been obtained? __________ Plans submitted with house number? ___________________

Fire protection sprinkler required? _______________ Will this property have an irrigation system? _____________

Signature of applicant: ____

Please note: A final water reading must be done prior to closing on this property.
****All inspections require 24 hours notice****
APPLICATION IS VOID IF METER IS NOT INSTALLED WITHIN 18 MONTHS OF APPLICATION DATE

List of Acronyms & Abbreviations

1. AWD- Acton Water District ("the District")
2. cf- cubic feet
3. CMR- Code of Massachusetts Regulations
4. DEP- Department of Environmental Protection
5. EPA- Environmental Protection Agency
6. G.L.- General Law
7. gpf- gallons per flush
8. gpm- gallons per minute
9. MA DEP- Massachusetts Department of Environmental Protection
10. MCL- maximum contaminant level
11. MGL- Massachusetts General Law
12. ppb- parts per billion
13. ppm- parts per million
14. sq ft- square feet
15. VOC- Volatile Organic Compound