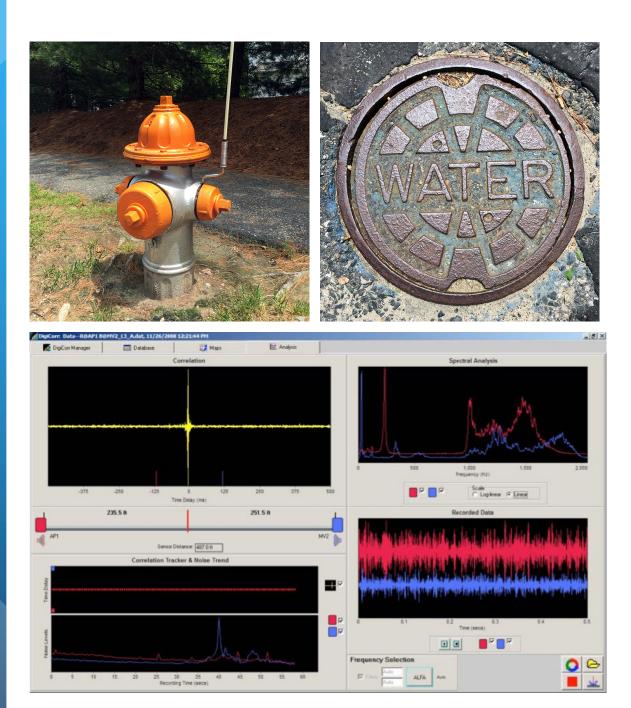


Vital Services 365 Boston Post Rd, #145 Sudbury, MA 01776

Tel: +1 (978) 793-2104 email:info@vitalleakdetection.com Website: www.vitalleakdetection.com

# LEAK DETECTION SURVEY REPORT



OUR GOALS ARE TO CONSERVE RESOURCES AND SAVE YOU MONEY

## Leak Detection Survey Report

#### The Survey Company

Vital Leak Detection provides state-of-theart leak detection services to public and private water system customers. The surveyor, Allan Williams has specialized exclusively in digital leak detection for over twenty-five years. He can be contacted at:

(978) 793-2104, and at allan@vitalleakdetection.com

#### **Equipment and Methods Used**

Vital Leak Detection utilizes the following modern, high-resolution equipment:

- Digital contact microphones;
- Digital ground microphones;
- Digital leak correlators and software;
- Digital correlating loggers and software;
- · Various ancillary equipment

All surveys are performed following Industry best practices.

#### The Survey Area

#### The

water distribution system has approximately miles of distribution main piping, together with associated fire hydrants, valves, services and ancillary fittings.

#### Infrastructure & Survey Conditions

The infrastructure is old and the town has a worsening problem of leakage. A pipe replacement program is underway. The ground on which the town sits is composed predominantly of gravel bed and sand; drainage is excellent and leaks rarely surface. Due to the harsh winters that the area can undergo, the distribution mains are generally buried deeply, further hampering attempts at leak detection using ground microphony. Inhouse leak detection efforts have some success but are necessarily limited by the difficulties mentioned and the equipment available.

Five leaks were identified and pinpointed during the survey. Estimated combined loss rate for all leakage is 145 gals/min. The estimated annual saving following repair of this leakage is approximately \$67,000 in variable operating costs only. A list of all leaks is given below and includes volume of leakage by source and estimated annualized losses.

The cost estimates were calculated using the EPA, AWWA and IWA average costs figures published in 2011 of \$0.98 per Kgal (Variable Operating Costs) and \$3.67 per Kgal Total Real Costs). Costs do vary by water system. A detailed report for each leak can be found on the pages following the leak list.

Until completion of the pipe replacement program, new leakage is likely to continue to be high. In order to minimize losses and to avoid unnecessary catastrophic pipe failures and consequential damage in the town, it is recommended that in-house leak detection efforts be supplemented by a comprehensive, pro-active, digital leak survey of the type just completed, at least every 24 months.

Leak #	Address	Source	Loss (gpm)	Pipe Material	Cover	Map#
	71 Pump House Rd	Main		Cast Iron	Soil	5
2	23 South St	Main		Cast Iron	Asphalt	5
3	220 Airport Dr (High School)	Service/Riser	30	Cast Iron	Asphalt	4
4	9 Church St	Service Corp'	15	Cast Iron	Asphalt	5
5	West Pleasant & Taylor	Main Valve	10	Cast Iron	Asphalt	3
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<b>Total Losses</b>			145			

Volume of Leakage Attributed to Sources				
Source	Number	Est. Leakage	% of Number of Leaks	% Leakage
Main	2	90.0	40%	62%
Corporation	1	15.0	20%	10%
Service	1	30.0	20%	21%
Hydrant	0	0.0	0%	0%
Valve	1	10.0	20%	6.90%
Curb Stop	0	0.0	0%	0%
(Total)	5	145	100%	100%

Annualized Losses					
Source	Est. Leakage (gals/min)	gals/day	Kgals/Year	Var Prod Cost	Total Cost
Main	90.0	129,600	47,304	46,357.92	\$173,606
Service	30.0	43,200	15,768	15,452.64	\$57,869
Hydrant	0.0	-	-	-	\$0
Valve	10.0	14,400	5,256	5,150.88	\$19,290
Curb Stop	0.0	-	-	-	\$0
	I			-	
Total	130.0	187,200	68,328	66,961	\$250,764



Survey Area	Town of Bristol Water Distribution System	Survey Date	Apr 9th - Apr 12th 2023	Leak # 1
Leak Address	71 Pump House Rd			
GPS	44.1307375460849, -73.07842792525031	Ref. Point	Road Has Been Marked	<b>Map #</b> 5
Leak Category	Hydrant Lateral	Pipe Material	Cast Iron	Diameter 6"
Cover	Soil	Loss Rate	> 50 gpm	Status Active

### **Remarks** Correlates to a point beside the hydrant lateral Corporation. Best ground sound near corporation. However could be at hydrant base.





Client Name	Town of Bristol, VT	<b>Client Address</b>	1 South Street, Bristol, VT 05443	
Survey Area	Town of Bristol Water Distribution System	Survey Date	Apr 9th - Apr 12th 2023	eak # 2
Leak Address	23 South St			
GPS	44.13149617320177, -73.08116712352769	Ref. Point	Road Has been Marked Ma	ap# 5
Leak Category	Distribution Main	Pipe Material	Cast Iron Diameter	6"
Cover	Asphalt	Loss Rate	≤ 40 gpm Status	Active

#### Remarks

Leak confirmed at, or adjacent to, main valve.







Client Name	Town of Bristol, VT	<b>Client Address</b>	1 South Street, Bristol, VT 05443
Survey Area	Town of Bristol Water Distribution System	Survey Date	Apr 9th - Apr 12th 2023
Leak Address	220 Airport Drive (High School)		
GPS	44.13595026130112, -73.09364230737954	Ref. Point	Riser in Pump House Map # 4
Leak Category	Service Line	Pipe Material	Cast Iron Diameter 4"
Cover	Asphalt	Loss Rate	≤ 40 gpm Status Active

Remarks

Correlates to the point at which the service line enters the building. Leak is probably at the vertical bend, at the base of the riser pipe.







Client Name	Town of Bristol, VT	<b>Client Address</b>	1 South Street, Bristol, VT 05443
Survey Area	Town of Bristol Water Distribution System	Survey Date	Apr 9th - Apr 12th 2023 Leak # 4
Leak Address	9 Church Street		
GPS	44.13529340148779, -73.0798349784418	Ref. Point	Road has been marked Map # 5
Leak Category	Corporation	Pipe Material	Cast Iron Diameter 6"
Cover	Asphalt	Loss Rate	≤ 15 gpm Status Active

**Remarks** Confirmed at or adjacent to corporation of service line for #9 Church St.





Client Name	Town of Bristol, VT	<b>Client Address</b>	1 South Street, Bristol, VT 05443
Survey Area	Town of Bristol Water Distribution System	Survey Date	Apr 9th - Apr 12th 2023 Leak # 5
Leak Address	West Pleasant & Taylor		
GPS	44.136219123087, -73.08195255374861	Ref. Point	Road has been marked. Map # 3
Leak Category	Valve	Pipe Material	Cast Iron Diameter 8"
Cover	Asphalt	Loss Rate	≤ 10 gpm Status Active
Remarks	Leak is at, or adjacent to, main valve.		



