

Water system losses report - January 23, 2012

- The unaccounted for water losses unfortunately continue after very positive initial water loss results during October (13.9%) and November (5%). It turned out that November was actually 20.8% due to the transposition of numbers.
- M.E. Simpson completed the system-wide leakage study in December and found relatively few leaks. I have attached a copy of their report. They found 18 leaks, 12 of which have already been repaired. Two leak locations are being stubborn; even after four or five repair attempts we still can't find them. Several fire hydrants are waiting on parts. Several water service repairs are scheduled for repair on private services.
- We will begin district metering this spring. We will start by separately metering the Village's three large pressure zones by classifying each billing account by zone and using zonal water meters that were recently calibrated. If we find that one zone appears to be particularly bad we will narrow the focus by creating sub zones.
- We expect to replace several large commercial meters this winter or spring. We will start with several turbo style meters that are more prone to inaccuracy at low flows.
- The water audit and historical billing information has been reviewed by Short Elliot Henderson. Their report is in draft form and will be available next month. They have not identified a cause of the leakage and are recommending that we begin district metering and continue all of our current activities.

<u>Water Service and Water Valve Exercising data</u>	<u>Current period</u>	<u>To date</u>
Curb boxes located	0	5,524
Curb boxes adjustment (completed/needed)	0	1,347/1,389
Curb boxes GPS located	0	5,051
Curb boxes leak tested	0	5,051
Curb Box Leaks found and repaired (Village/Private)	4/0	25/7
Valve/Watermain Leaks found and repaired	1/0	
Valve Exercising (operate 50% of 1,535 per year)	0	885

<u>Water meter data</u>	<u>Current period</u>	<u>To date</u>
Residential Meters changed/tested	0	176
Commercial Meters tested	0	10

6 month average unsold water rate trend

2010	<u>Jan</u>	<u>Feb</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>Aug</u>	<u>Sept</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
						21%	20%	22%	21%	22%	20%	23%
2011	<u>Jan</u>	<u>Feb</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>Aug</u>	<u>Sept</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
	23%	23%	23%	24%	25%	25%	24%	25%	25%	24%	23%	25%

<u>Year</u>	<u>Pumped</u>	<u>Sold</u>	<u>% Sold/Unsold</u>	<u>Not Sold (NS)</u>	<u>NS Acct*</u>	<u>NSUnacct**</u>	<u>% Unaccounted</u>	<u>Cost of daily unsold water @ \$4.16 thousand</u>
2000	598,898	414,683	69%/31%	184,215	95,500	88,715	18%	\$2,099
2001	640,188	492,275	77%/23%	147,913	101,000	46,913	7%	\$1,685
2002	631,980	474,974	75%/25%	157,006	112,000	45,006	7%	\$1,789
2003	662,678	599,115	90%/10%	63,563	30,500	33,063	5%	\$747
2004	701,227	616,448	88%/12%	84,779	28,000	56,779	8%	\$966
2005	766,323	628,311	82%/18%	138,012	29,800	108,212	14%	\$1,572
2006	732,793	692,154	94%/6%	40,639	23,300	17,339	2%	\$463
2007	731,696	725,217@#799%/1%		6,479	5,700	779	0%	\$74
2008	623,490	557,077	89%/11%	66,413	7,050	59,363	10%	\$760
2009	643,244^	513,143	80%/20%	130,101	7,080	123,021	19%	\$1,482
2010	616,348	490,936	80%/20%	125,412	18,050	107,362	17%	\$1,429

CBCWA water supply began in Sept 2007

@ Monthly billing implemented in Jan 2007 and skewed sales

^ Bold data in 2009 corrected to actual pumpage. 2010 estimated data.

* 2010 - 0.05 M treatment process, 2 M Tank Overflows, 10 M system filling/flushing, 6 M fire fighting & training, 0 M meter errors, 5M detected watermain and service leakage.

** 2010 - 107,362 M unreported/undetected watermain and service leakage, vandalism & theft.

Automatic meter reading was implemented between Jan 2004 and June 2006

January 16, 2012

Mr. Geoff Farr, P.E.
Executive Director of Engineering Services
Village of Howard
1336 Cornell Road
Green Bay, Wisconsin 54313

Dear Mr. Farr,

M.E. Simpson Co., Inc. is a technical service company providing Leak Survey Programs, Large Meter Testing and Repair Programs, Water Main Location, Valve Assessment, and Computer Mapping Programs. These "Technical Services" offered by M.E. Simpson Co., Inc. are designed to aid a utility in reducing unaccounted for water and lost revenue.

M.E. Simpson Co., Inc. is pleased to submit this report of our leak detection survey for the Village of Howard, Wisconsin. This survey addressed the Howard water distribution system, consisting of approximately 94.5 miles of water main. The report contains the results of our investigation including the following:

1. A DESCRIPTION OF THE AREA SURVEYED.
2. METHODOLOGY OF THE SURVEY
3. A LIST OF LEAKS AND TYPE OF LEAKS LOCATED
4. GENERAL RECOMMENDATIONS BASED ON OUR INVESTIGATION

DESCRIPTION OF THE AREA SURVEYED

Approximately 498,960 lineal feet were surveyed as part of the system investigation. This included all fire hydrants, accessible mainline valves and selected services.

METHODOLOGY

Your survey was conducted using the latest state of the art leak computers, the **FLUID CONSERVATION SYSTEMS' FCS Accu-Corr / Digi-Corr or Vivax Metrotech HL6000 leak correlator**. The FCS S-30 is a tool used as an electronically enhanced listening device. All of these correlators are manufactured by Fluid Conservation Systems of Milford, Ohio. These electronic instruments are microprocessor units that measure the time it takes the sound of the leak to travel from the leak to the point where the leak Correlator is connected to the water line. By connecting the leak correlator to the water line at two locations, it will compute the distance from the leak to each connection point thus enabling us to determine the exact leak location. Our experienced technicians used these devices, along with the S30 electronically enhanced listening device or the L-Mic electronic listening device, as listening equipment to survey your pipeline network. Each hydrant and accessible valve was used as listening points to identify leaks. Selected services, b-boxes, were used on an as needed basis to keep the listening distances under five hundred feet (500'). "Pinpointing" of the leak, as well as locating leaks that other methods fail to reveal was also done with this equipment.

LEAKAGE LOCATED

All water mains within the Project area were surveyed and 18 leaks were located. These leaks have been grouped as follows: Main Line Leak - 1, Service Line Leak - 3, Fire Service Leak -0, Valve Leak - 2, Hydrant Leak - 12, Other Type Leak - 0. All of these leaks have been verbally reported to your office with these locations, so many have probably been repaired already. Following are the leak locations with an estimated GPD (Gallons Per Day) leakage potential.

Type	Location	SIZE
Main Line	2930 Holland Road see enclosed diagram	36,000 GPD
Service Line	2546 Telluride Trail see enclosed diagram	11,520 GPD
Service Line	2796 Breckenbridge Court see enclosed diagram	11,520 GPD
Service Line	736 Meadowbrooke Court see enclosed diagram	11,520 GPD
Valve	Rogues Way & Holland Road see enclosed diagram	14,400 GPD
Valve	David Lane & Woodale Avenue see enclosed diagram	7,200 GPD
Hydrant	1059 Rogues Way see enclosed diagram	1,440 GPD
Hydrant	1673 Velp Frontage Road (S) see enclosed diagram **Fixed**	1,440 GPD
Hydrant	1694 Jackson Hole Court see enclosed diagram	1,440 GPD
Hydrant	1822 Island Court see enclosed diagram **Fixed**	1,440 GPD
Hydrant	2510 Lance Street see enclosed diagram **Fixed**	1,440 GPD
Hydrant	3535 Shawano Avenue (Across from) see enclosed diagram	1,440 GPD
Hydrant	3708 Shawano Avenue see enclosed diagram **Fixed**	1,440 GPD
Hydrant	921 Hardwood Avenue (Across from) see enclosed diagram **Fixed**	1,440 GPD
Hydrant	Cardinal Lane & Lance Street see enclosed diagram **Fixed**	1,440 GPD
Hydrant	Hillcrest Drive & Apollo Avenue see enclosed diagram **Fixed**	1,440 GPD
Hydrant	Island Court & Velp Avenue see enclosed diagram **Fixed**	1,440 GPD
Hydrant	Military Avenue & Lenwood Avenue see enclosed diagram **Fixed**	1,440 GPD
18 Leaks Located	ESTIMATED LEAKAGE TOTAL	109,440 GPD

LEAK QUANTITIES

Quantifying leaks is difficult because there is not any accurate means of doing so. Pipe material, size of the leak, system pressure, soil material and water table will affect the noise that a leak makes. Small leaks under high system pressure will make more noise than a large leak under low system pressure. However, the above leaks are of sufficient noise levels that the above estimates should be very conservative. If a production price of \$4.16 per thousand gallons is used, these leaks were costing your utility in excess of \$455.27 per day or \$166,173.70 annually. It's obvious this Leak Survey Program has proven to be cost effective. Naturally the main line leaks have the greatest potential for loss followed by service line, valves, and finally hydrants. Once leaks have been repaired, we would recommend that the Utility compare pumping rates before and after. This information will be more meaningful and accurate.

RECOMMENDATIONS

This survey confirms the Village of Howard's water distribution system will benefit from this project by a reduction in underground leakage. There is always a concern over the cost effectiveness of leak detection because of the uncertainty of the number of leaks located. However, with your present cost of water and the discovery of these 18 leaks, the cost of this 2011 leak survey will pay for itself within 2 months. It only takes a recovery of about 109,440 gallons per day on an annual basis (109,440 per day is only 76 gallons per minute throughout your entire water distribution system) to recover your investment. We would recommend that you conduct a Leak Survey Program every year. This recommendation becomes more critical as your cost of water increases.

We appreciate your cooperation and that of the Utility staff we were available to answer our questions during this project. If you have any questions with the information in this report, please do not hesitate to contact us.

Sincerely Yours,



Todd W. Schaefer
Regional Manager – Waukegan
TWS/jph