



August 5, 2015

Mr. David McNair
Operations Manager
Scotts Valley Water District
2 Civic Center Drive
Scotts Valley, CA 95066

Dear Mr. McNair,

M.E. Simpson Co., Inc. is a technical service company providing Leak Survey Programs, Large Meter Testing and Repair Programs, Valve Assessment, and Fire Hydrant Assessment Programs. These **“Technical Services”** offered by M.E. Simpson Co., Inc. are designed to aid a utility in reducing non-revenue water and improving operational condition and information of water distribution system assets.

M.E. Simpson Co., Inc. is pleased to submit this report of our leak detection survey for the Scotts Valley Water District. This survey addressed the Scotts Valley water distribution system, consisting of approximately 63.5 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 335,280 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 / TriCorr Touch or Vivax Metrotech HL6000 leak correlator**. The **FCS S-30 or LMIC** is a tool used as an electronically enhanced listening device. 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 3 leaks were located. These leaks have been grouped as follows: Main Line Leak - 1, Service Line Leak - 0, Fire Service Leak -0, Valve Leak - 1, Hydrant Leak - 1, 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	1000 Bethany Drive see enclosed diagram	1,440 GPD
Valve	Glenwood Drive & Deerfield Drive see enclosed diagram **Fixed**	4,320 GPD
Hydrant	712 Cadillac Drive see enclosed diagram	2,880 GPD
3 Leaks Located	ESTIMATED LEAKAGE TOTAL	8,640 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 an average sale price of \$7.72 per thousand gallons is used, these leaks were costing your utility in excess of \$66.70 per day or \$24,345.79 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 Scotts Valley Water District'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 3 leaks, the cost of this 2015 leak survey will pay for itself within 12 months. It only takes a recovery of about 8,640 gallons per day on an annual basis (8,640 per day is only 6 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,



Michael D. Simpson
CEO
MDS/jph

M.E. SIMPSON COMPANY, INC.

LEAK LOCATION REPORT

Client: Scotts Valley, California

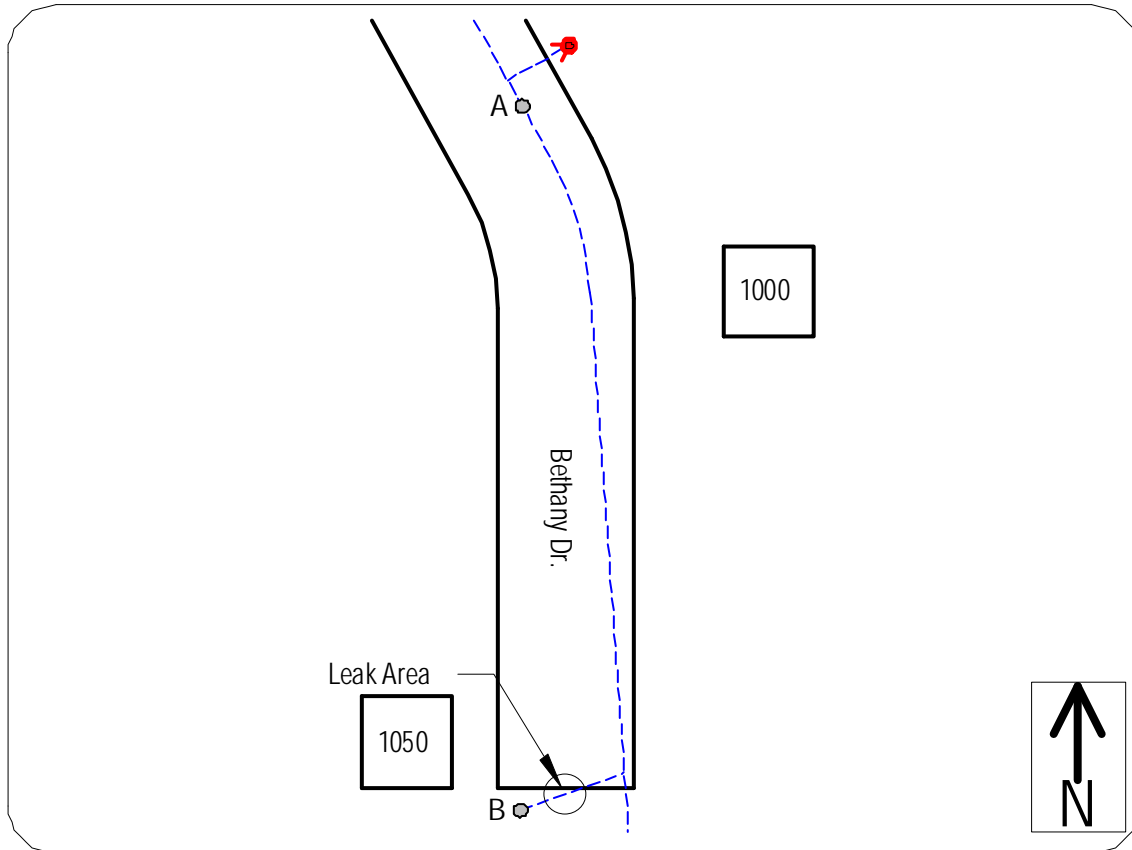
Time: 8:45:00 AM **Leak#** 02

Date: Wednesday, July 15, 2015

Tech: Rick A. & Vincent A.

Address: 1000 Bethany Drive

Below is a diagram of the area surveyed for a suspect leak.



Distance: 169' from A to B

Connection point: A= Main Line Valve

Connection point: B= Blow-Off Valve

Connection point:

Connection point:

Leak Location: 8' from B

Comments: We used a ground microphone to survey the area and the loudest noise is at a stub tee. We suggest digging at this point.

We thank you for the opportunity to work for your Utility and look forward to serving you again. If you have any questions please don't hesitate to call.

M.E. SIMPSON COMPANY, INC.

LEAK LOCATION REPORT

Client: Scotts Valley, California

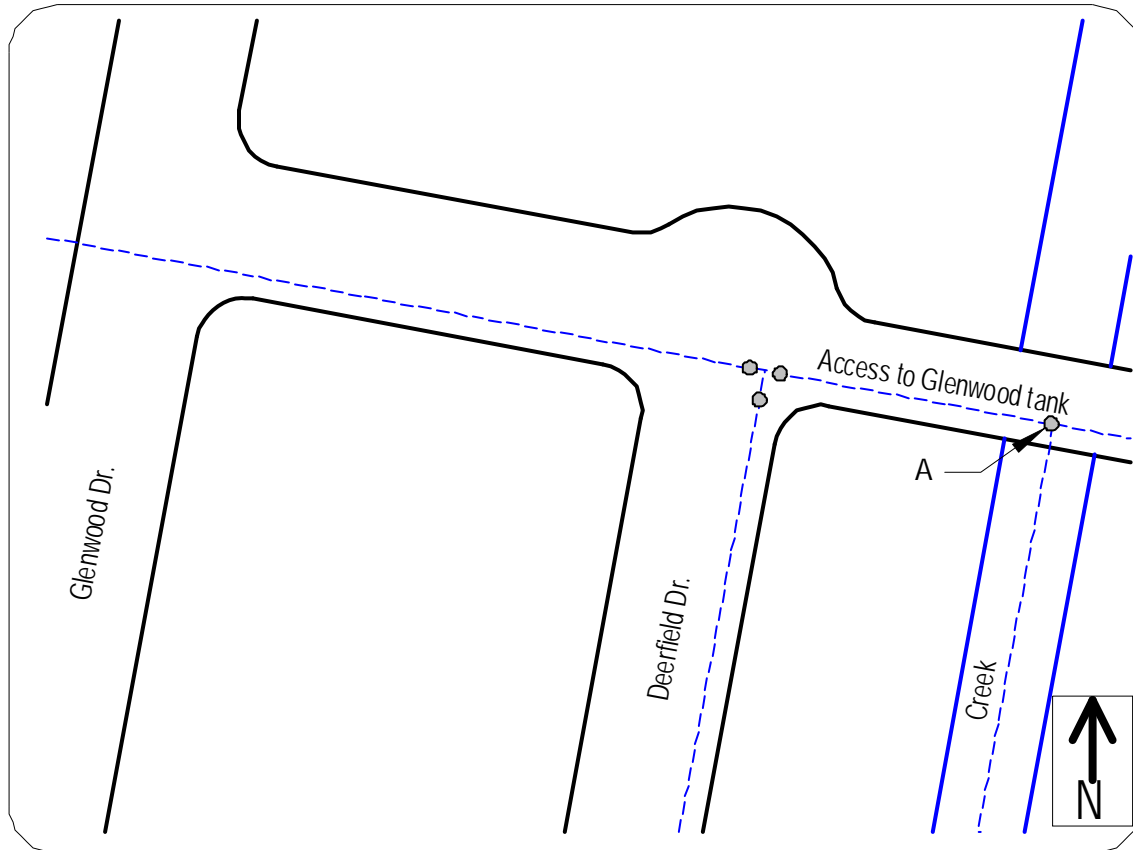
Time: 9:27:00 AM **Leak#** 01

Date: Wednesday, July 08, 2015

Tech: Rick A. & Vincent A.

Address: Glenwood Drive & Deerfield Drive

Below is a diagram of the area surveyed for a suspect leak.



Distance: 0' from A

Connection point: A= Main Line Stub Valve

Connection point:

Connection point:

Connection point:

Leak Location: 0' from A

Comments: This was a leak on a main line stub valve. The valve was screaming and we could hear it when we walked up to the valve box. We could visibly see water coming out of the stub valve. Dan from the water department came out and closed the valve and the leak noise quit and the water stopped. This leak is fixed.

We thank you for the opportunity to work for your Utility and look forward to serving you again. If you have any questions please don't hesitate to call.

M.E. SIMPSON COMPANY, INC.

LEAK LOCATION REPORT

Client: Scotts Valley, California

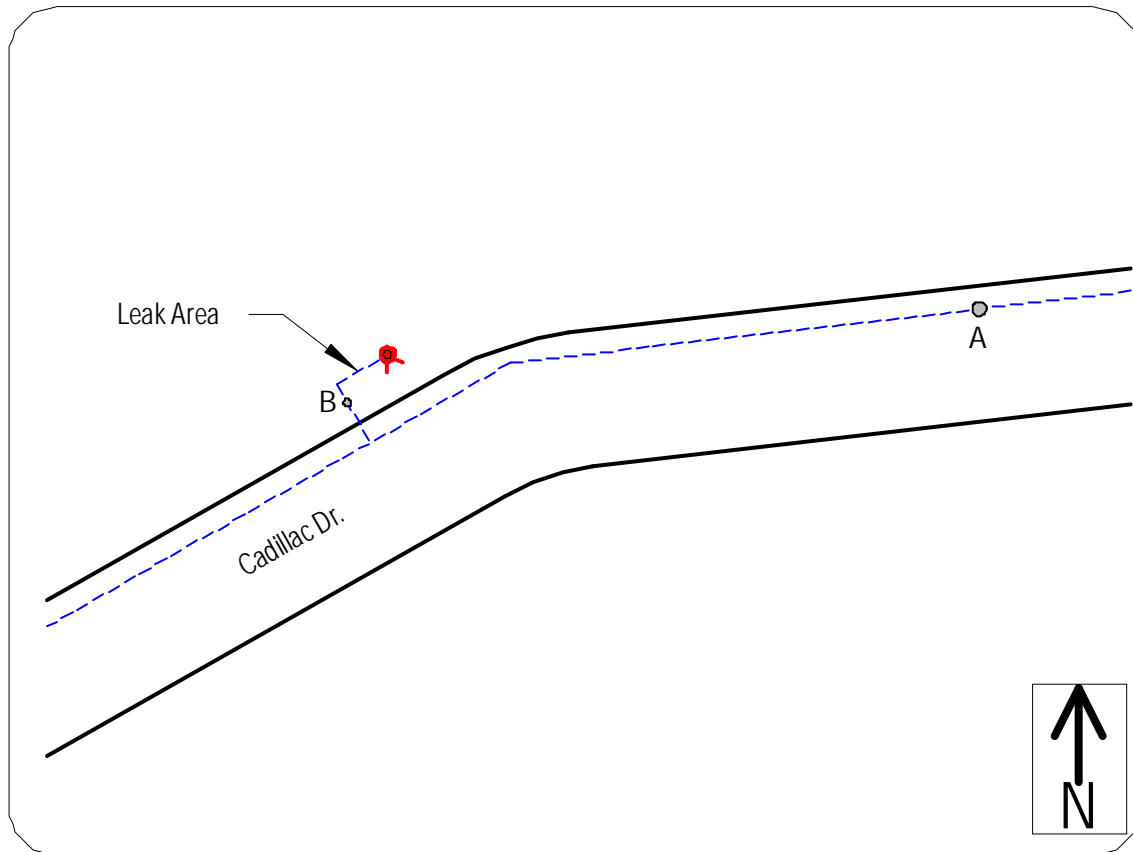
Time: 2:00:00 PM **Leak#** 03

Date: Wednesday, July 15, 2015

Tech: Rick A. & Vincent A.

Address: 712 Cadillac Drive

Below is a diagram of the area surveyed for a suspect leak.



Distance: 146' from A to B / 10' from B to C

Connection point: A= Main Line Valve

Connection point: B= Hydrant Auxiliary Valve

Connection point: C= Hydrant

Connection point:

Leak Location: 5' from B

Comments: We correlated from "A" to "B" and it comes up 0' from "B". We correlated from "B" to "C" and it comes up 5' from "B". We suggest digging up at the 90 degree angle on the hydrant leg.

We thank you for the opportunity to work for your Utility and look forward to serving you again. If you have any questions please don't hesitate to call.

