



September 5, 2012

Colorado Water Conservation Board  
Attn: Ben Wade  
Water Conservation Coordinator  
1313 Sherman St. Room 721  
Denver, CO 80203

**Re: Water Efficiency Grant to Implement 3 Conservation Measures  
PO# OE PDA 11000000105  
75% Progress Report**

Dear Mr. Wade,

The Left Hand Water District has continued work with the three conservation measures identified in the Water Efficiency Implementation Grant. Although there are three different measures being implemented, progress reporting will take place in this single report. The purpose of this report is to summarize the activities that have taken place since the submittal of the 50% Report and activities that remain to be completed.

### ***Residential Indoor Water Audit Program***

At the time that the 50% Report was submitted, the District had completed Subtasks 1.1 – 1.3 and was in the process of contacting homeowners in order to create a list of participants for the Residential Indoor Audit Program. The first effort of reaching out to a targeted audience of 550 homes located in older subdivisions was disappointing in that we did not receive a single request from that group of homeowners. In order to reach the desired 100 participants, District Water Program Specialist Betsy Wheeler prepared a second mailing (See Appendix A January, 2012 letter) which was sent to an additional 500 homes selected by Betsy throughout the District. Additionally, we provided 140 copies of the original flyer (Appendix A) to a representative of the Countryside Condominium Association for distribution to each one of their units. The same flyer was mailed to the 150 homes within the Elms at Meadowvale Subdivision this spring when the subdivision was transferred from a Master Meter Community to direct service from the District.

In addition to the direct mailings, the District included information regarding the availability of the Residential Indoor Audits in our January, 2012 Newsletter *Tap Water Tribune* and updated the District's website to include a section devoted to Water Conservation with a link to CRC for information on both the indoor and outdoor audits so that interested customers could sign up. <http://lefthandwater.org/water-conservation/water-conservation-page/>

With the difficulty in reaching the number of customers that we were hoping for, there was a substantial delay in the start of the Indoor Audits completed by Center for Resource Conservation. Ultimately we mailed out 1200 direct mailings, and hand delivered an additional 140. Following that effort as well as the updated website and annual newsletter, CRC signed up and completed only 35 Residential Indoor Audits. The response rate was far below what we had anticipated and what has been experienced by CRC in other cities. With 35 audits out of 1,340 mailings our response rate was under 3%.

The District held a progress meeting with CRC at the District office on August 8, 2012 to go over the results of the audits and to discuss what to do regarding the disappointing number of participants. Options included reaching out with additional mailings; or to bring the audit portion of the program to a close. In order to bring certainty to the program and so that the final reporting can remain on schedule, the District has determined that concluding the audit portion of the program at this time and beginning the process of water use data tracking and analysis is the best solution.

The final indoor audit was completed on April 16, 2012 so the 12 months reporting period will end April, 2013. Although this will put the Residential Indoor Audit Program final reporting period past the 2/12/2013 date by approximately 2 months, this still falls within the Final Report date for the approved grant (PO# OE PDA 11000000105). The Final Report to be submitted by 8/22/2013 will include all of the findings from the Residential Indoor Audits as well as an estimated water savings and cost/gallons saved.

### ***Improved Leak Detection and Repair Program***

As reported in the 50% Report, American Leak Detection (ALD) had just about completed all of the field work by the end of July, 2011. The remainder of the electronic leak detection was completed in August, 2011. The District provided 2 distribution technicians to work with American Leak Detection Services so that production was much better than anticipated in the grant application. In addition to the ten (10) subdivisions that were included in the scope of the 10 days of electronic leak detection, the District was able to survey an additional nine (9)

subdivisions as well as an additional 3.5 miles of 18 inch transmission line and 1.5 miles of 4 inch main.

In general, ALD found the system to be *“well maintained in all areas...the operating personnel assigned exhibited a high level of system knowledge which permitted a faster than estimated completion in the areas tested”*. Including the findings that were previously reported in the 50% Report the Improved Leak Detection resulted in the discovery of:

- 16 service connections at River Valley Village Mobile Home Community ~ 35.2 gpm total
- 2 F.H.'s with leakage ~ 0.60 gpm total
- 10 service line leaks ~ 17.7 gpm total

Although this was considered by ALD to be very good results for a system survey this size (with the exception of RVV Mobile Home Community), the amount of continuous unaccounted for water resulted in an annual loss of 86 A.F. This exceeded our estimate in the grant application of 81 AF and is clearly the most successful of the three programs and the most efficient.

In the Grant application, repairs to the leaks found through this program were to be done as budget allowed. We received confirmation from River Valley Village that they had completed all of the repairs that were found on their side of the master meter by email on August 17, 2011 and the District's in-house crew made repairs to all other leaks identified by the end of August, 2011. Based on the estimates provided by ALD, the District has already seen a savings of 86 AF in the past year at a cost of \$10K in ALD services and an additional \$35,000 in-kind repair work done in-house. This results in a cost/benefit of \$523 per acre foot or \$1.61 per 1,000 gallons. The budget as approved in the Grant proposal will be unchanged for this program.

Based on the results of the 2011 Enhanced Leak Detection program the District has already adopted this program to be continued at our own cost. We are currently putting together a request for proposal from ALD for a similar sized program to be completed in the fall of 2012 with a goal of completing the entire District on a continuous 5-year survey cycle.

### ***Commercial Water Audit Program***

Since providing information regarding Great Western Institutes' progress in the 50% Report, Terry Bouvette has completed the field work related to providing Commercial Water Audits and Fixture Replacements. GWI has provided a summary of the work completed, work remaining, and success towards meeting goals and objectives (See Appendix C).

Following an 8 month reporting period, the District provided GWI with all of the post audit water usage data for the business that took part in the audits/retrofits. GWI has provided the District with a draft copy of the individualized reports that will be sent to each participating entity. In order to better understand the usage trend following the audits, GWI and District will prepare a questionnaire to be delivered to each participant to assist in measuring the success of the program. Results of these questionnaires will be provided in the Final Report.

Similarly to the Residential Indoor Audits performed by CRC, it appears as though it is unlikely that the District will achieve the water savings estimated in the grant application. This is as a result of the number of facilities willing to participate in the audits, or from those contacted who would not have benefited from retrofits due to already having replaced fixtures on their own. The overall budget for this program will realize savings due to the reduced number of audits and retrofits, and this will be taken into consideration when determining the cost/benefit for this activity in the Final Report.

Appendix C of this Report contains the full 75% Progress Report from GWI.

### ***Summary***

We feel that our community is already benefitting from the implementation of these new water conservation programs and look forward to completing the remaining tasks over the next several months. Based on the implementation schedule submitted with the approved grant application we have had mixed results in maintaining the proposed schedule for individual programs. However, the overall grant timeline including the Final Report date of 8/22/2013 will be unchanged:

***Residential Indoor Audits:*** Due to a lower response rate and increased direct mailing distribution, the District has not yet obtained the CRC Report summarizing the results of the 35 indoor audits. We have distributed a questionnaire to the participants, a copy of which is included in Appendix A. With the lower number of audits completed, the budget for performing audits will be reduced, however since the fixtures were pre-purchased in bulk for both the commercial and residential indoor audits the District will continue to distribute these to interested homeowners through our water conservation public outreach programs such as the water wise garden classes, appliance rebate programs, and website/newsletter outreach.

***Improved Leak Detection and Repair Program:*** This program has been by far the most successful and easiest to administer for the District. The savings to the District are impressive at approximately 86 acre feet of annual water savings (28 million gallons). The survey and

pipeline repairs were all completed within the timeline proposed in the grant application. More information on the repairs made, the savings obtained, and the future success of this program will be included in the Final Report.

As noted above, this program has been accepted as part of our ongoing water conservation program. American Leak Detection services will cost the District approximately \$5,000 per year for a week long survey. Information from the surveys will be used to make immediate repairs, long range planning decisions for total line replacements, and future materials purchasing decisions based on trends we see with different manufacturers and materials and how they have performed. The public relations aspect of providing the survey for River Valley Village as well as being able to be pro-active regarding the distribution system repair and replacement program, though difficult to measure in monetary terms, is also considered to be a benefit to the District.

**Commercial Water Audit Program:** As was the case with the Residential Indoor Audits, this program suffered from lower than anticipated participation. Part of this appears to be simply the characteristics of the District's commercial customer base. Many of our commercial accounts are office buildings with low water use, other than outdoor irrigation use which is eligible for irrigation audits provided at no-cost through our existing conservation program. The restaurants tend to be smaller in size, or in the case of the Hwy 119 / I25 interchange, fast-food chain restaurants where fixtures and water use is somewhat dictated by corporate headquarters. The 5 hotels within the District service area, all within the Hwy 119 / I25 interchange are also mostly national chains which resulted in only 3 of the 5 hotels agreeing to participate.

The budget for this program will come in slightly lower than anticipated per GWI's 75% Progress Report (Appendix C). The reporting timeline for this program is not affected.

Please feel free to contact me with any questions or if you need any additional information included with the reporting.

Sincerely,

A handwritten signature in blue ink, appearing to read 'CS' followed by a stylized name.

Left Hand Water District

Christopher Smith, P.E.

General Manager

## APPENDIX A

### RESIDENTIAL INDOOR WATER AUDIT PROGRAM



# (FREE) Indoor Water Audit

## Why should I participate?

- Professional service provided at no charge to you
- Receive **FREE** installations of low-flow shower heads as well as faucet aerators
- Substantial benefits to your home
- Find out where you use the most water indoors
- Leak tests on fixtures to find where water is being wasted
- Learn practical, easy ways to make your home more water efficient
- Receive a personalized cost benefit analysis on switching to lower water use appliances
- Do your part to conserve Colorado's water!

## How much does the inspection cost?

Nothing. Left Hand Water District has partnered with the CRC to make this program **FREE**.

**Sign Up Today at**

**[www.ConservationCenter.org](http://www.ConservationCenter.org)**

**or call 303-999-3820 ext. 217**



**SLOW the FLOW**  
**INDOORS**



CENTER FOR  
**ReSource**  
CONSERVATION





January, 2012

Dear Left Hand Water District Customer,

The Left Hand Water District would like to help you conserve water and save money in 2012! We would like to provide you with a free, whole-house water efficiency check-up. Our audit will help you locate water leaks, pinpoint high water usage areas in your home and give you the means necessary to maximize the water efficiency potential of your home. A more water-efficient home saves you money and conserves water resources.

A trained Water Conservation Field Specialist will provide the following services:

- Provide, at no cost, water saving devices such as efficient faucet aerators and low flow showerheads
- Check water flow rates and water usage for showerheads, washing machines, toilets, faucets, and dishwashers
- Discuss existing problems and possible solutions with you
- Provide assistance through instructional and informational materials
- Review your residential water usage
- Review outdoor watering practices to help you identify potential system weaknesses that could be costing you a considerable amount of money

The check-up should take approximately one hour to complete. You or your representative must be present during the survey. Please contact the Center for ReSource Conservation, a non-profit partner of the Left Hand Water District at 303-999-3820 ext. 217 for an appointment, or email us at [water@conservationcenter.org](mailto:water@conservationcenter.org)

Thank you for taking the time to let the Left Hand Water District help you conserve water. We look forward to hearing from you.

Sincerely,

Kate Gardner,  
Water Programs Manager  
Center for ReSource Conservation  
*A non-profit partner of Left Hand Water District*

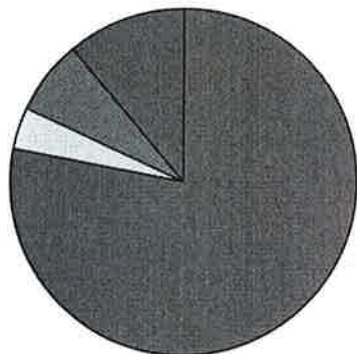




# Left Hand Water District *Tap Water Tribune*

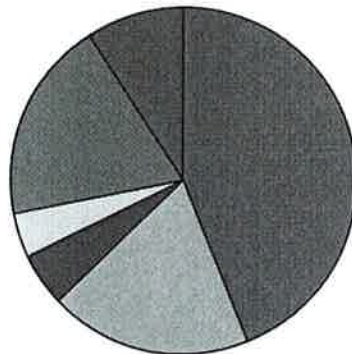
## 2012 Budget Highlights

Although the costs of water treatment and delivery continue to rise, we work hard to keep operating expenditures contained. There will be no increase in minimum monthly fees or water volume rates for 2012. Construction projects in 2012 are planned to replace aging infrastructure, with a continued emphasis on source water protection and system water quality throughout the District.



### REVENUES RECEIPTS & RESERVES

Operating Revenue	\$ 7,419,850
Non-Operating Revenue	\$ 351,798
Tap Fees	\$ 643,950
Replacement Reserves	\$ 1,000,803
<b>Total</b>	<b>\$ 9,416,401</b>



### EXPENDITURES

Operating Expenses	\$ 4,162,423
Non-Operating Exp	\$ 1,771,129
Capital & Equipment	\$ 430,195
Water & Easement Rights	\$ 409,250
Construction: Replacement	\$ 1,788,000
Construction: New/Unscheduled	\$ 855,404
<b>Total Expenditures</b>	<b>\$ 9,416,401</b>

## Water Conservation

### Indoor Water Audits

With help from a grant from the Colorado Water Conservation Board, the District would like to help you conserve water and save money in 2012. Working with the Center for ReSource Conservation, we can provide you with a free, whole-house indoor water efficiency check-up. A trained Water Conservation Field Specialist will help you locate water leaks, pinpoint high water usage areas in your home and provide, at no cost, water saving devices such as efficient faucet aerators and low-flow shower heads. Let us give you the means necessary to maximize the water efficiency potential of your home.

The check-up should take approximately one hour to complete.

We also will continue to offer outdoor irrigation audits through the Slow the Flow program of CRC.

Contact The Center for ReSource Conservation, a non-profit partner of the Left Hand Water District at 303-999-3820 ext .217 for an appointment or online request at [www.conservationscenter.org](http://www.conservationscenter.org).



## Board of Directors

**John Brunner** – At Large

**Ned Swaebly, Secretary** – District 1

**Bob Juhl, President** – District 2

**S. Alice Ochs, Treasurer** – District 3

**Corey Heil, Vice President** – District 4

**Bo Shaffer** – District 5

**Paul Schlager** – District 6

District Board meetings are held at 9:00 a.m. on the Thursday following the second Tuesday of each month at the District offices, 6800 Nimbus Road in Boulder County. Meetings are open to the public, and we welcome your input. Records of the meetings, as well as copies of the Budget and Audit are available by calling or writing to us.

## Operating Staff

**Kathy Peterson**

General Manager  
[kpeterson@lefthandwater.org](mailto:kpeterson@lefthandwater.org)

**Kim Lane**

Assistant Secretary  
[lane@lefthandwater.org](mailto:lane@lefthandwater.org)

**Vicki Santos**

Accounting Manager  
[vsantos@lefthandwater.org](mailto:vsantos@lefthandwater.org)

**Hank Schmidt**

Treatment Manager  
[hank@lefthandwater.org](mailto:hank@lefthandwater.org)

**Todd Petry**

Distribution Manager  
[tapetry@lefthandwater.org](mailto:tapetry@lefthandwater.org)

**Chris Smith, P.E.**

Engineering Manager  
[chrissmith@lefthandwater.org](mailto:chrissmith@lefthandwater.org)

## Left Hand Water District

6800 NIMBUS RD.  
P.O. BOX 210  
NIWOT, CO 80544-0210  
M-F 8:30 a.m. – 4:30 p.m.  
PHONE 303.530.4200  
FAX 303.530.5252  
[www.lefthandwater.org](http://www.lefthandwater.org)

January 2012

## LEFT HAND WATER DISTRICT

Customer Number	Parcel ID	Name	Service Address	Indoor/Audit	Customer Type
3849.01	33 CB B01 L16	HUSTON, RAY	7936 CENTREBRIDGE DR	01/13/2012	Residential
2907.01	80 RE L05	BEISNER, WILLIAM	2870 175TH AVE	01/17/2012	Residential
1516.01	35 CSC T09	COUNTRYSIDE CONDOMINIUMS	6866 COUNTRYSIDE LN #24	01/30/2012	Multiple Housing
650.01	15 AP B01 L04	MOLLER, KYLE & DIANNE	7183 ALPENGLOW CT	01/31/2012	Residential
147.02	01 JS L05	STOFFER, DONALD & SOPHIE	5591 PIONEER RD	01/31/2012	Residential
641.02	15 BH L15	BATES, MARY ELLEN	8494 BOULDER HILLS DR	02/03/2012	Residential
988.01	23 SCA L10	MORRIS, DOLORES	7647 N 32ND ST	02/06/2012	Residential
1416.01	35 HHL L07B	SESNIC, TOM	8083 MEADOWLAKE RD	02/07/2012	Residential
722.01	15 BH L29	LARSON, ANNE	8498 STIRRUP LN	02/07/2012	Residential
4607.01	04 WG L16 & L17	OSGOOD, ARLENE	7984 SAGEBRUSH CT	02/10/2012	Residential
4540.02	04 PL B05 L01	BEAM, PALMER	2050 PARK LAKE DR	02/13/2012	Residential
188.01	01 VH B02 L05	MARS, BRENNAN & JOHN	5327 ODIN AVE	02/13/2012	Residential
460.01	10 CA B04 L02	BOSTICK, LACEY & LESLIE	6236 CORINTH RD	02/17/2012	Residential
544.01	10 CA B04 L01	KING, ROBERT	10394 MACEDONIA ST	02/17/2012	Residential
535.02	10 CA B02 L03	GROUT, WILLIAM & BARBARA	10226 MACEDONIA ST	02/17/2012	Residential
2625.02	75 HH B01 L09	UKRAINCHUK, LESYA	7364 NEBRASKA WY	02/21/2012	Residential
141.06	01 JS L17	DAWSON, PATRICIA	5624 PIONEER RD	02/21/2012	Residential
59.01	01 VH B05 L10	FULLER, JOYE	4990 VALKYRIE DR	02/27/2012	Residential
3322.02	70 GR B01 L16	BARRETT, MICHAEL & LUCIA	9428 GUNBARREL RIDGE RD	02/28/2012	Residential
47.01	01 PR L05	BERLIN, ELISE	4027 PLEASANT RIDGE RD	02/28/2012	Residential
715.02	15 BH L27	GREENE, SONDRAL JO & ANDREW	8520 STIRRUP LN	03/01/2012	Residential
591.01	15 BH L25	BROPHY, CHERYL	8571 BRIDLE CT	03/02/2012	Residential
5202.02	60 WFP L20	GRANAT, ELIZABETH	8847 SPRING CREEK TR	03/05/2012	Residential
6073.01	01 083 12	TOBIAS, BETTY	4731 JAY RD	03/06/2012	Residential
7421.01	91 EL2 B14 L01	TRUONG, TY	11708 MONTGOMERY CR	03/12/2012	Dual System
4130.02	01 VH B07 L04S	PRENGER, F COYNE & SUSAN	5275 N 51ST ST	03/12/2012	Residential
448.01	10 CA B08 L06	HOWARD, KENNETH & MAXINE	10403 N 65TH ST	03/16/2012	Residential
245.01	05 SH B03 L02	MCCROSSON, PAUL	2064 STONEHENGE CR	03/16/2012	Residential
2128.01	60 OB2 L47	EASTMAN TRUST, RUTH ANN	7158 OVERBROOK DR	03/19/2012	Residential
5334.01	01 WS L08	MCCREREY, CYNTHIA	5288 WATERSTONE DR	03/20/2012	Residential
7376.01	91 EL2 B06 L02	HARTON, PATRICK	2080 PEARL HOWLETT RD	03/23/2012	Dual System
3912.01	60 OB2 L03	PELTON, TERRANCE & JANICE	7244 GOLD NUGGET DR	03/27/2012	Residential
4723.02	71 CV L08	RAY, WILLIAM & SANDRA	11716 CRYSTAL VIEW LN	04/03/2012	Residential
327.01	05 SH B05 L04	RAY, ROBERT & DIANNE	1750 STONEHENGE DR	04/06/2012	Residential
3901.01	60 OB2 L33	FAYEULLE, SERGE	7173 GOLD NUGGET DR	04/09/2012	Residential
4924.03	01 WS L27	CACCIA, ROBERTO	5445 WESTRIDGE DR	04/16/2012	Residential

Grand Totals:

36



COPY

Left Hand Water District

Please take a moment to fill out this questionnaire and mail it back to us in the envelope provided.

**Let us know how they did?**

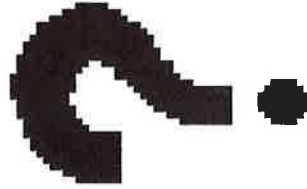
By providing us with feedback it can help us provide you with the best service possible.

**SLOWFLOW**  
the  
COLORADO

Left Hand Water District

6800 Nimbus Rd  
Longmont, CO 80503

Phone: 303-530-4200  
Fax: 303-530-5252



Left Hand Water District

- Please rate the quality of the service you received when scheduling your Indoor Water Audit.

1	2	3	4	5
Disappointing			Exceptional	

- Do you feel your auditor seemed knowledgeable?

1	2	3	4	5
Not Really		Yes, Very		

- Would you recommend this free service to a neighbor?

1	2	3	4	5
Unlikely		Likely		

- Do you think the audit will save you water and money?

1	2	3	4	5
Unlikely		Likely		

- Please rate your overall experience.

1	2	3	4	5
Disappointing			Exceptional	

- How did you schedule your appointment?  
Online      By Phone

Additional Comments:

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Thank You for your Time!!



## APPENDIX B

### IMPROVED LEAK DETECTION AND REPAIR PROGRAM

LEFT HAND WATER DISTRICT  
ENHANCED LEAK DETECTION PROGRAM - 2011

### SUBDIVISIONS SELECTED FOR LEAK DETECTION 2011

[illegible]







July 22 2011  
Left Hand Water  
Chris Smith  
PO Box 210  
Niwot CO 80544

On this date American Leak Detection completed a two day electronic leak survey per AWWA M36, Leak Detection and Water Audits at the River Valley Village Mobile Home Community in Longmont, Colorado.

The leak survey was performed by testing all accessible points on the system (lot valves, hydrants, main valves) with a broad band accelerometer to detect the vibrations indicative of pressurized leakage. Location of the leakage was confirmed by isolation of the leakage area. Approximately 10 percent of lots were not available for testing due to no access (located in areas under mobile homes not reachable due to blocked entry).

Leakage rates are estimated and provided for comparison sake in setting repair priority.

Below are noted the leakage locations identified:

1. Lot # 208, riser leak below ground, 2 gpm.
2. Lot # 207, riser leak below ground, 3 gpm.
3. Lot # 201, riser leak below ground, 5 gpm.
4. Lot # 196, possible riser leak below ground (isolation valve was not accessible and mobile home was not occupied), 1/2 gpm. Retest after excavating riser valve and access to home is available.
5. Lot # 173, riser leak below ground, 1 gpm.
6. Lot # 170, riser leak below ground, 5 gpm.
7. Lot # 169, riser leak below ground, 1 gpm.
8. Lot # 166, riser leak below ground, 1 gpm.
9. Lot # 165, possible riser leak below ground (isolation valve was not accessible and mobile home was not occupied), 1 gpm. Retest after excavating riser valve and access to home is available.
10. Lot # 156, riser leak below ground, 5 gpm.
11. Lot # 85, visible riser leak, 1/4 gpm.
12. Lot # 70, riser leak below ground, 5 gpm.



13. Lot # 67, visible riser leak, 1/4 gpm. Note: Possible below ground leak also. Retest after repair.
14. Lot # 42, visible meter valve leak, 1/10 gpm.
15. Lot # 21, riser leak above ground within casing, 1/10 gpm.
16. Lot # 1, riser leak within pit, 5 gpm.

Total estimated leakage is 35.2 gpm. Additional items of interest- parts of the community irrigation is fed by unmetered domestic water. Recommend installation of meters on irrigation and office building to determine actual imbalance.

Please call if we may provide clarification or additional information.

Warmest regards, 

Mike Parish, Area Engineer  
American Leak Detection

xc: Mark Fulkerson, River Valley MHC



1 service  
0.5 gpm



July 27 2011  
Left Hand Water  
Chris Smith  
PO Box 210  
Niwot CO 80544

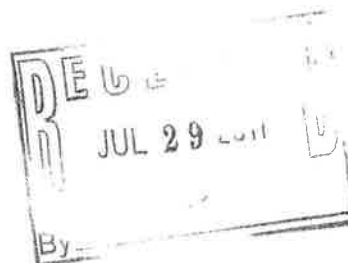
On this date American Leak Detection completed an electronic leak survey, in accordance with AWWA M-36, Leak Detection and Water Audits, in the following areas of Left Hand Water System. The areas include the Gunbarrel Estates, Overbrook, Brownsville, Cottonwood Park West, and Gaynor Lake.

The survey was performed by testing valves, hydrants and meter assemblies for vibration indicative of pressurized leakage. Location of the point of leakage, when needed, is by use of a rarefaction wave correlator, ground geophone, or broadband frequency accelerometer.

One piping leak was located at 10662 Spinnaker Way, in Gaynor Lake. The leakage is approximately 1/2 gpm, and is indicated on the copper service line between the meter pit and PVC water main. The intensity suggests the leak may be on the upstream meter pigtail.

No hydrant leakage was indicated, despite testing approximately 44 hydrants, a strong measure of proactive system maintenance.

It should be noted that the testing identified a large majority of meters not recording low flows, in the range of a fraction of a gallon per minute. It seemed a rarity to find a meter not exhibiting constant unmeasured flow, probably due to the effect of high pressure on the homes irrigation valves and toilets. The testing identified the vibration of flow through the meter and pressure regulating valve and ceased with the closing of the meter valve. None of the meters indicated any movement during the low flow, and often would spin shortly after reopening the meter valve, allowing the line and home to pressurize. This failure of measurement of low flows is common in the industry with meters in service for many years or in hard water areas. Many water systems recycle domestic service meters on a ten year cycle to limit such inaccuracy. Gaynor Lakes area appeared to be the worst in this regard with almost a hundred percent incidence of meter bleed by.



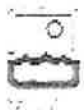
The system was well maintained in all areas and no meter leaks were present. The operating personal assigned exhibited a high level of system knowledge, which permitted a faster than estimated completion in the areas tested.

Please call if we can provide additional information or clarification.

Warm regards,



Mike Parish, Area Engineer  
American Leak Detection



1 service line 0.5 gpm  
1 hydrant 0.10 gpm  
0.2 gpm



August 3 2011  
Left Hand Water  
Chris Smith  
PO Box 210  
Niwot CO 80544

On this date American Leak Detection completed an electronic leak survey, in accordance with AWWA M-36, Leak Detection and Water Audits, in the following areas of Left Hand Water System. The areas include Morton Heights, Parkland Estates, and Springhill area.

The survey was performed by testing valves, hydrants and meter assemblies for vibration indicative of pressurized leakage. Location of the point of leakage, when needed, is by use of a rarefaction wave correlator, ground geophone, or broadband frequency accelerometer.

One piping leak was located at 1758 Rue de Trust, in Parkland Estates. The leakage is approximately 1/2 gpm, and is indicated on the copper service line between the meter pit and PVC water main. The intensity suggests the leak may be on the upstream meter pigtail.

Hydrant leakage was indicated at Della Court in Parkland Estates on a newly installed hydrant. The hydrant was tightened by Left Hand personnel and the leakage ceased. Estimated leakage rate was 1/10 gpm before sealing.

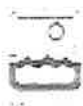
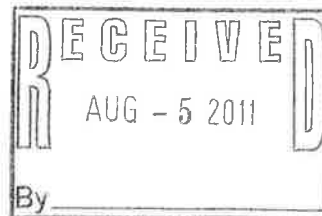
Unmetered flow was also experienced in the three areas noted above as in the previous system areas. Estimated unmeasured flow rates were in the range of less than 1/10 gpm. Extent of meter bleed by was more than fifty percent. Irrigation zone valves failing to hold are the prime suspect of the low unmetered flows.

The system was well maintained in all areas and no meter leaks were present.

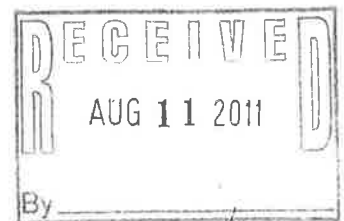
Please call if we can provide additional information or clarification.

Warm regards,

Mike Parish, Area Engineer  
American Leak Detection







7 service line  
@ 16.2 gpm

August 12 2011  
Left Hand Water  
Chris Smith  
PO Box 210  
Niwot CO 80544

On this date American Leak Detection completed an electronic leak survey, in accordance with AWWA M-36, Leak Detection and Water Audits, in the following areas of Left Hand Water System. The areas include Brigadoon, Oriole, and Rangeview.

The survey was performed by testing valves, hydrants and meter assemblies for vibration indicative of pressurized leakage. Location of the point of leakage, when needed, is by use of a rarefaction wave correlator, ground geophone, or broadband frequency accelerometer.

Seven leakage areas were identified and are noted below:

1. 6048 Dhu Court, leakage on regulator in pit, 1/10 gpm. Repaired by WD personal on site.
2. 6049 Niwot Road, service line leak upstream of meter, two gpm.
3. 6349 Waxwing Court, service line leak upstream of meter, two gpm.
4. 6279 Brigadoon Court, service line leak upstream of meter, five gpm.
5. 7354 Cardinal Lane, leakage on regulator in pit, two gpm. Repaired by WD personnel on site.
6. 6437 Redwing Place, meter leak at connection, 1/10 gpm. Repaired by WD personnel on site.
7. 7179 Cardinal Lane, service line leak upstream of meter, five gpm.

Please call if we can provide additional information or clarification.

Warm regards, 

Mike Parish, Area Engineer  
American Leak Detection

7 service line leaks  
16.2 gpm





1 FH. 0.5 gpm  
1 PRV 0.5 gpm

August 25 2011  
Left Hand Water  
Chris Smith  
PO Box 210  
Niwot CO 80544

On this date American Leak Detection completed an electronic leak survey, in accordance with AWWA M-36, Leak Detection and Water Audits, in the following areas of Left Hand Water System. The areas include Chance Acres, Boulder Hills, 18 inch steel line on Oxford Road, 4 inch AC line on Oxford Road, Valhalla, Camacar, Scott Acres, Carl Heights, Leisure Living, Nebraska and Rodeo, Chicken City.

Leakage areas located:

1. Hydrant at east end of Johnson Lane, estimated 1/2 gpm.
2. 7318 Nebraska Way, leakage in pit on PRV, estimated 1/2 gpm.

Most meters in the above areas exhibited unmeasured flow, presumably from running toilets, swamp coolers and irrigation zone valve leakage.

The survey was performed by testing valves, hydrants and meter assemblies for vibration indicative of pressurized leakage. Location of the point of leakage, when needed, is by use of a rarefaction wave correlator, ground geophone, or broadband frequency accelerometer.

The system survey is now complete. Overall results suggest a tight system with a high level of maintenance. Recommend periodic retesting of Brigadoon area due to high level of leakage found.

Please call if we can provide additional information or clarification.

Warm regards, *mp*

Mike Parish, Area Engineer  
American Leak Detection



## Christopher Smith

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**From:** River Valley Village [rivervalleyv@qwestoffice.net]  
**Sent:** Wednesday, August 17, 2011 8:41 AM  
**To:** Christopher Smith  
**Subject:** Thank you

We would like to take a minute to thank you for all the work you did to get us the grant and for the set up. We are busy repairing the leaks as we speak, that is why this is going out a little late. We had 16 leaks and the repairs should be completed by Friday August 19, 2011. Again Ascentia, Mark and myself want to thank you so much for your efforts and look forward to working with you in the future.

Mark Fulkerson  
Denise Carlson  
River Valley Village







## APPENDIX C

### COMMERCIAL WATER AUDIT PROGRAM



## GREAT WESTERN INSTITUTE

*Changing Water Conservation in the West*

315 Vassar Ave.  
Swarthmore, Pennsylvania 19081  
720-641-6136

August 30, 2012

Mr. Christopher Smith, P.E.  
District Engineer, Left Hand Water District  
6800 Nimbus Road  
Longmont, CO 80503

Re: Transmittal of 75% Progress Report Related to the Commercial Audit Portion of the  
CWCB Water Efficiency Grant

Dear Mr. Smith:

Please find herein, Great Western Institute's (GWI) 75% progress report related to Left Hand Water District's (LHWD) Water Efficiency Grant (P.O. # OE PDA 11000000105) which was received from the Colorado Water Conservation Board (CWCB) in 2011. This progress report was developed with the understanding that the LHWD would combine it with the progress reports from the other two tasks funded by the Water Efficiency Grant prior to submittal to the CWCB in accordance with the grant requirements.

We have prepared this progress report in a format consistent with the CWCB's requirements for progress reporting.

### **Work Completed**

Since the 50% Progress Report was submitted in August 2011, the following tasks have been completed as part of the commercial audit program, as defined in the scope of work contained in the approved grant:

- Completed final motel audit at the First Interstate Inn, including the installation of high-efficiency showerheads and faucet aerators;
- Obtained water use data for the 8-month period following the audits (i.e., October 2011 through June 2012) for all facilities that were audited and received retrofits; and
- Initiated an assessment of the efficacy of the retrofits and audit on the water use efficiency of each facility (which included 3 motels; one state park and 4 restaurants<sup>1</sup>)

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<sup>1</sup> Note that the original scope included auditing 5 motels and 11 restaurants, including installing high-efficiency showerheads and faucet aerators, as appropriate, at each. Due to the lack of participation of some targeted facilities and/or the lack of opportunities to improve onsite water use efficiencies; audits with retrofits were conducted at only a subset of the targeted facilities.



Ongoing work activities includes the development of a Final Project Report, which will include a summary of the work performed and the findings relevant to observed changes in water use and costs of water use efficiencies for each facility that was audited and received retrofits. For each of these facilities that received retrofits, a short facility specific report will also be prepared suitable for sharing with the audited customer.

In total, the following number of fixtures were installed in the audited facilities<sup>2</sup>:

- 192 - 0.5 gallon per minute (gpm) faucet aerators; and
- 147 - 1.5 gpm showerheads.

### **Success of Meeting Goals and Objectives**

The goals and objectives of this portion of LHWD's water efficiency grant were partial meet. Various obstacles and conditions found during execution of the field activities impacted the overall success of the project as planned. Corrective actions were implemented to reduce the impact of non-participating water customers; however, the overall water demand reductions per unit cost were higher than anticipated.

### **Obstacles Encountered**

There were a number of obstacles related to successful implementation of the commercial audit program. To begin with, LHWD does not service many large commercial water customers that would benefit from fixture retrofits. Therefore, only a dozen or so customers were targeted as potential beneficiaries of the commercial audit program. In addition, many of LHWD's restaurants and motels are new construction housing franchises for large commercial organizations (e.g., McDonalds, Taco Bell, Super 8 Motels, etc.). These organizations have specific plumbing fixture requirements dictated to them by corporate offices. Therefore, local facility managers and owners do not have any flexibility in conducting and implementing water audits that are not corporate sponsored.

Given the number of organizations that were targeted for audits, but declined to participate; the overall success of the commercial audit program was stunted. Although the commercial audit program cost less to implement than was budgeted, smaller water use demand reductions were realized than predicted, making the average price per acre-foot of demand reduction higher than anticipated. Although the overall project costs will not require the expenditure of all of the grant monies award to LHWD by the

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<sup>2</sup> GWI installed 167 faucet aerators and 81 showerheads, and the facilities were provided with the balance to install in occupied rooms, in showers that required additional plumbing changes, and for replacement parts.

CWCB; the overall effectiveness of the program in this setting was smaller and less cost-effective than initially anticipated.

### **Preliminary Findings**

Preliminary analyses indicate that the majority of the facilities that received audits with retrofit fixtures realized water use reductions (identified by comparing wintertime use before and after the retrofits). Some facilities experienced increased water use, which appears to be the result of increased facility use, unknown increases in water use, or a combination thereof. Therefore, the water audits and related retrofits were found to decrease customer water use at the majority of facilities receiving these services.

Water use at facilities that were audited but not retrofitted were not evaluated, since, in general, management was not engaged in the audit process and therefore there was no expectation for water use reductions via behavioral or structural changes at these locations.

The cost of conducting the audits and the retrofits for those facilities that actively participated was approximately \$9,500 (which is about 75% of the amount of the project budget spent to date (\$12,985)). Preliminary estimates of water savings at these facilities are about 1 acre-foot (or about 328,000 gallons) per year.

Note that the estimate of water savings expected as a result of conducting the audits and installing the retrofit fixtures as referenced in the grant application was approximately 1.7 million gallons per year<sup>3</sup>. The reasons for the observed reduction in water savings are numerous. To begin with, as previously noted, the number of audit and retrofit program participants was less than expected. In addition, some of the facilities had fewer fixtures than estimated during preparation of the grant application. Finally, it appears that the per fixture water use which was estimated for the grant was higher than actually observed.

### **Potential Need for Revisions**

Both the schedule and the budget for the project will need revision. To begin with, the site follow-up effort was scheduled for February 2012; however it was determined that this effort would be better served if the post-audit water use information could be collected and assessed. Therefore, the audit follow-up effort, which will consist of transmitting a report and a questionnaire to each participating customer, has been postponed until next month or two (September or October).

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<sup>3</sup> Estimates were made based on findings of previous water audits and retrofits conducted in Brighton and Pagosa Springs, Colorado.

In addition, the water use data, which was scheduled to be collected over 12 months following the audits, has been shortened to 8 months, since outdoor and seasonal water use at each facility will obscure the indoor savings that are expected in response to the newly installed fixtures. Therefore, the individual facility reports will be developed in the short term, such that the questionnaires can be circulated and collected prior to developing the Final Report in the 4<sup>th</sup> quarter of this year.

The budget for the project is expected to be less than anticipated due to the reduced number of audits performed, and the fewer number of facility assessments to develop. As indicated previously, 11 restaurant and 5 motel audits had been identified in the grant application for completion; however, not all of the facilities targeted for audits were accessible or amenable to the site visit and related retrofits. In the end, only 3 motels and 4 restaurants received audits and retrofits; although a total of 6 additional restaurants were visited<sup>4</sup>. In addition, the Boulder Reservoir Park was audited and retrofitted with faucet aerators<sup>5</sup>. For this reason, the following budget reductions (shown in parentheses) totaling \$3,870.15 were realized:

- Task 1.5 – Conduct Facility Audits (\$1,135.90)
- Task 1.6 – Replace Fixtures Labor and Expenses (\$2,734.25<sup>6</sup>)

Other reductions may occur during completion of other scheduled project tasks; however, quantification of those savings will not be identified until the tasks are completed.

Please review this progress report. If you require any revisions or clarification, please do not hesitate to contact me at your earliest convenience.

Respectfully submitted,

Tracy Bouvette

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<sup>4</sup> The six restaurants that were visited but not formally audited and/or did not receive retrofits included two McDonalds, a Taco Bell, Subway, Arby's, and Pepper Jacks.

<sup>5</sup> Numerous other large water use facilities (e.g., Dawson School, Rocky Mountain Christian Church, Del Camino Truck Wash, Foothills Business Park) were contacted by the audit team; however none of these customers chose to participate in the audits and retrofits.

<sup>6</sup> Includes \$1,300.00 in labor savings and \$1,434.25 in expenses related to purchasing fewer showerheads.