



Board of Commissioners Monthly Meeting  
Monday, October 24, 2022, 4:30 PM  
17661 Pilkington Road, Lake Oswego OR

AGENDA ITEMS

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- |       |  |         |
|-------|--|---------|
| I.    | Call to Order                              | 4:30 PM |
| II.   | Public Comment (2 Minute Limit)            | 4:31 PM |
| III.  | Review and Approval of Minutes             | 4:35 PM |
|       | • September 27, 2022 Regular Board Meeting |         |
| IV.   | General Manager's Report                   | 4:40 PM |
| V.    | Unfinished Business                        | 4:50 PM |
|       | • Board Relations                          |         |
| VI.   | New Business                               | 4:55 PM |
|       | • Leak Detection Report                    |         |
| VII.  | Chair Report                               | 5:10 PM |
| VIII. | Adjournment                                | 5:15 PM |

**Upcoming Meeting**

**Regular Board Meeting: Monday, November 28, 2022 at 4:30 P.M.**

The public is welcome to attend the meeting in person or by calling in at 971-517-3083.

**Rivergrove Water District  
Board of Commissioners Regular Meeting Minutes  
Monday, September 27, 2022**

A regular meeting of the Board of Commissioners was held this day at 17661 Pilkington Road, Lake Oswego. Chair Roth presided over the meeting and other attendees included: Commissioners Johnson, Magura, and Patterson as well as the General Manager. Commissioner Howell attended the meeting via remote telephone conferencing.

1. **Call to Order:** The meeting was called to order at 4:34 p.m.
2. **Public Comment:** Public attendees included: Mr. Allen Patterson, Ms. Bonnie Robb, Ms. Malia Gibbons, Mr. Edwin Thompson, Ms. Lisa Volpel, Mr. Patrick Thompson, and Mr. Jim Strovink. Public comments were received from all attendees. Mr. Patterson also submitted a written statement.
3. **Review and Approval of Minutes:** The August 29, 2022 regular Board meeting minutes were approved by a motion from *Commissioner Johnson, seconded by Commissioner Magura, and passed by a 4-1 vote. Ayes: Commissioners Roth, Johnson, Magura, and Patterson. Nays: Commissioner Howell.*
4. **Monthly District Report:** See attached.
5. **Unfinished Business:** A tentative meeting date to discuss Board relations was tabled and will be discussed at the next regular Board meeting held in October.
6. **New Business:** None
7. **Chair Report:** None
8. **Adjournment:** The meeting was adjourned at 5:31 p.m. The next regular meeting will be held on Monday, November 28, at 4:30 p.m.

\_\_\_\_\_  
James W. Johnson, Secretary

\_\_\_\_\_  
Date

\_\_\_\_\_  
Christine K. Roth, Chair

\_\_\_\_\_  
Date



## MONTHLY BOARD REPORT October 2022

### Water Operations

#### - Capital Improvement Projects

- Deemar Way/Tamara Ave (Construction of AC waterline replacement)
  - Notice to Proceed: 9/28/22
  - Project Completion Date: 11/28/22
- Well 1 Standby Generator
  - Purchase order completed for generator unit on 6/24/2022; Project ECD: 8/2023
  - Recruiting contractor for concrete pad installation at Old Gate; ECD: 10/2022
- 2022 Water Main Replacement Project
  - Grant submitted 9/14/2022 to Business Oregon; awaiting response ECD: 12/2022

#### - Backflow Testing Program

- An extension was given to customers not in compliance with the annual inspections
  - New due date to submit passing reports to the District is **10/31/2022**
- District statistics are as follows:
  - Total Backflow Connections: 554
  - Total Connections Passed: 529
  - Total Connections Failed: 2
  - Total Remaining to Test: 25
  - Current Compliance Percentage: 95%

#### - Premise Isolation Program Abandonment Backflow Removal

- In August 2020, the Board voted to abandon the Premise Isolation Program
  - Customers were notified by letter in 10/2020 of the program's end with the new requirement of assuming responsibility for their own backflow testing
  - Backflow removal started in 06/2021 with an estimated completion date of 6/2023
- District statistics are as follows:
  - Total Backflows Installed: **680**
  - Total Backflows Removed: 406
  - Total Backflows Remaining: 274
  - Project Completion Percentage: 59%

#### - Water Meter Box Maintenance

- New annual initiative "Meter Box Monday" started which is designed to clean out and perform routine maintenance of all District meter boxes
  - Specific goals of the initiative are as follows:
    - Keep the meter unobstructed and accessible to operators and contractor personnel for easy start/final reads and bi-monthly billing
    - Ensure lids fit properly to avoid uncleanness and safety mishaps
    - Provide quick access in case of an emergency
- District statistics are as follows:
  - Total Meter Boxes: 1,383
  - Total Meter Boxes Maintenance Performed: 204
  - Total Meter Boxes Requiring Maintenance: 1,179
  - Project Completion Percentage: 14%

- **Production versus Consumption Report**

PRODUCTION versus CONSUMPTION						
Month	Production (HCF)	Consumption (HCF)	Unaccounted (HCF)	Unaccounted %	Service Connection Loss %	# of Services
<b>Oct 22</b>	<b>50,909</b>	<b>46,872</b>	<b>3,354</b>	<b>6.6%</b>	<b>2.43%</b>	<b>1,383</b>
Aug 22	36,694	34,379	2,257	6.2%	1.63%	1,382
Jun 22	20,408	14,755	5,348	26%	3.87%	1,381
Apr 22	16,054	13,521	2,275	14%	1.65%	1,380
Feb 22	18,112	15,632	2,422	13%	1.76%	1,380
Dec 21	20,737	17,828	2,851	13%	2.04%	1,380
Oct 21	46,226	42,686	3,494	7.5%	2.53%	1,380
Aug 21	59,978	52,094	7,884	13%	5.64%	1,379
Jun 21	39,255	31,149	8,106	21%	5.87%	1,378
Apr 21	22,064	17,841	4,223	19%	3.06%	1,378
Feb 21	21,323	15,224	6,099	29%	4.42%	1,378

*Anomalies: Chlorine Analyzers 58 HCF, District Leaks 625 HCF (Donlee Way 40 HCF, Red Wing Way 230 HCF, Perch Ct 150 HCF, Sycamore Ave 205 HCF)*

- **Customer Assistance Requests & On Call Duty**

- o Site visit requests: 82
- o Emergency callouts: 3
  - Sycamore Ave – main leak
  - Terry Ct – service line leak (*irrigation*)
  - Benfield Ave - meter box leak (*missing gaskets from contractor*)

**Finance/Administrative/HR**

- **October Billing**

- o Revenue charges: \$236,668

- **Employee Training Completed**

- o Oregon Flagger Certification (GM)
- o Common Workplace Injuries & Avoiding Struck-by Incidents (All employees)

- **Water Leak Detection Project**

- o See official report attached
- o A comprehensive comparison breakdown is provided as follows:

## Monthly Reconciliation Summary September 2022

**Reviewed & Approved by Commissioners  
Board Meeting: October 25, 2022**

Bank Account Name	QB's Account Number	Bank Statement Date	Beginning QuickBooks Balance	Statement Ending Balance	QuickBooks Ending Balance	Uncleared Balance
Banner Bank (Checking Act)	1015	9/30/2022	\$266,781.37	\$319,372.69	\$317,863.25	\$1,509.44
Banner Bank (Deposit Act)	1085	9/30/2022	\$52,722.42	\$52,734.97	\$52,734.97	\$0.00
LGIP (SDC)	1106	9/30/2022	\$419,552.73	\$420,186.25	\$420,186.25	\$0.00
LGIP (Capital Improvement)	1107	9/30/2022	\$967,960.67	\$969,428.55	\$969,428.55	\$0.00
LGIP ( Unemployment)	1108	9/30/2022	\$31,810.83	\$31,858.86	\$31,858.86	\$0.00
LGIP (Truck)	1109	9/30/2022	\$25,952.36	\$25,991.55	\$25,991.55	\$0.00
LGIP (Non-Restricted)	1110	9/30/2022	\$245,829.79	\$246,200.99	\$246,200.99	\$0.00

Checks issued this period 9673 - 9694 from Banner Bank Act 1015

Checks voided this period: None

RIVERGROVE WATER DISTRICT  
**Balance Sheet**  
As of September 30, 2022

	Sep 30, 22
<b>ASSETS</b>	
Current Assets	
Checking/Savings	
1015 · Checking - Banner Bank	317,439.69
1085 · Water Deposit-Banner Bank	52,734.97
1100 · LGIP	
1101 · Restricted	
1106 · System Development Account	420,186.25
1107 · Capital Improvement Account	969,428.55
1108 · Unemployment Account	31,858.86
1109 · Truck & Equipment Account	25,991.55
Total 1101 · Restricted	1,447,465.21
1110 · Non-Restricted	246,200.99
Total 1100 · LGIP	1,693,666.20
Total Checking/Savings	2,063,840.86
Total Current Assets	2,063,840.86
<b>TOTAL ASSETS</b>	<b>2,063,840.86</b>
<b>LIABILITIES &amp; EQUITY</b>	
Equity	
32000 · All Fund Balances	1,918,744.03
Net Income	145,096.83
Total Equity	2,063,840.86
<b>TOTAL LIABILITIES &amp; EQUITY</b>	<b>2,063,840.86</b>

**Accounts Receivable Summary**

From 10/10/2022 Through 10/20/2022

<b>OPEN BALANCE</b>									<u>Balance</u>
		2,919.61							2,919.61
<b>BI-MONTHLY-Adjustment</b>	<b>Amount</b>		<b>Usage</b>	<b>Count</b>					
WATER-RESIDENTIAL	-193.81			3					
<b>Totals</b>	-193.81		0.00	3					2,725.80
WAT. Penalty-RESIDENTIAL	-30.00			2					
<b>Totals</b>	-30.00		0.00	2					2,695.80
***Total Adjustment	-223.81		0.00	5					
<b>BI-MONTHLY-Charge</b>	<b>Minimum</b>	<b>Overage</b>	<b>Usage</b>	<b>Count</b>	<b>Total</b>				
WATER-RESIDENTIAL	69,570.89	159,269.24	44,876.00	1,369	228,840.13				
WATER-COMMERCIAL	183.20	511.20	144.00	3	694.40				
WATER-PUBLIC AUTHORITY	965.62	3,028.15	853.00	5	3,993.77				
WATER-HOA IRRIGATION	592.98	2,269.92	640.00	9	2,862.90				
WATER-ADULT CARE FACILITIES	139.09	209.45	59.00	2	348.54				
WATER-CHURCH	94.98	21.30	6.00	1	116.28				
<b>Totals</b>	71,546.76	165,309.26	46,578.00	1,389	236,856.02				239,551.82
***Total Charge	71,546.76	165,309.26	46,578.00	1,389	236,856.02				
<b>BI-MONTHLY-Payment</b>	<b>Amount</b>			<b>Count</b>					
WATER-RESIDENTIAL	-32,245.25			276					
WATER-HOA IRRIGATION	-1,149.33			1					
<b>Totals</b>	-33,394.58			277					206,157.24
WAT. Penalty-RESIDENTIAL	-255.00								
<b>Totals</b>	-255.00								205,902.24
***Total Payments	-33,649.58			277					
<b>BI-MONTHLY-Deposit Applied</b>	<b>Amount</b>			<b>Count</b>					
WATER-RESIDENTIAL	-85.00			2					

<b>Totals</b>	<u>-85.00</u>	<u>2</u>	<u>205,817.24</u>
WAT.Penalty-RESIDENTIAL	-15.00		
<b>Totals</b>	<u>-15.00</u>		<u>205,802.24</u>
***Total Deposit Applied	<u>-100.00</u>	<u>2</u>	
		<b>Closing Balance</b>	<b>205,802.24</b>



RIVERGROVE WATER DISTRICT  
 Checking Account Register

5:06 PM  
 10/20/22  
 Accrual Bas

Type	Date	Num	Name	Memo	Amount	Balance
Deposit	09/01/2022		Deposit		115.11	236,494.68
Check	09/01/2022	ACH	AFLAC	Monthly Health Premium August 2022 Invoice 459473	-310.99	236,298.80
Deposit	09/01/2022		Deposit		510.54	236,809.34
Check	09/02/2022	ACH	VANCO Payment Solutions	Monthly Service Fee August 2022 Invoice 00012815782	-77.00	236,732.34
Deposit	09/02/2022		Deposit		162.77	236,895.11
Deposit	09/02/2022		Deposit		1,144.02	238,039.13
Deposit	09/04/2022		Deposit		352.12	238,391.25
Deposit	09/05/2022		Deposit		122.21	238,513.46
Deposit	09/06/2022		Deposit		3,816.70	242,330.16
Deposit	09/06/2022		Deposit		387.93	242,718.09
Deposit	09/06/2022		Deposit		932.29	243,650.38
Check	09/07/2022	ACH	PGE	Monthly Electric Fees 8/21/22-8/31/22 Invoice: Multiple	-4,243.91	239,406.47
Deposit	09/07/2022		Deposit		629.00	240,035.47
General Journal	09/07/2022	PR 9/3/22	Payroll 8/21/22-9/3/22	Deferred Comp Payroll - 8/21/22-9/3/22	-1,456.93	238,578.54
General Journal	09/07/2022	PR 9/3/22	Payroll 8/21/22-9/3/22	Deferred Comp Payroll - Employer - 8/21/22-9/3/22	-264.20	238,314.34
Check	09/07/2022	ACH	PAYCHEX	Payroll 8/21/22-9/3/22 Invoice 2022090601	-63.31	238,251.03
General Journal	09/07/2022	PR 9/3/22	Payroll 8/21/22-9/3/22	Payroll 8/21/22-9/3/22	-5,841.33	232,409.70
General Journal	09/07/2022	PR 9/3/22	Payroll 8/21/22-9/3/22	Payroll 8/21/22-9/3/22	-2,799.12	229,610.58
Deposit	09/07/2022		Deposit		4,008.74	233,619.32
Deposit	09/07/2022		Deposit		2,101.13	235,720.45
General Journal	09/08/2022	jc	Customer Refund	Customer Refund	50.00	235,770.45
Deposit	09/08/2022		Deposit		229.51	235,999.96
Deposit	09/08/2022		Deposit		2,163.98	238,163.94
General Journal	09/09/2022	jc	Customer Refund	Customer Refund	30.00	238,193.94
Deposit	09/09/2022		Deposit		6,559.07	244,753.01
General Journal	09/09/2022	jc	Customer Refund	Customer Refund	50.00	244,803.01
Deposit	09/12/2022		Deposit		258.62	245,061.63
Deposit	09/12/2022		Deposit		74,533.22	319,594.85
Deposit	09/12/2022		Deposit		4,261.64	323,856.49
Deposit	09/12/2022		Deposit		386.72	324,243.21
Deposit	09/12/2022		Deposit		19,057.29	343,300.50
Deposit	09/12/2022		Deposit		284.40	343,584.90

**RIVERGROVE WATER DISTRICT**  
**Checking Account Register**

5:06 PM  
 10/20/22  
 Accrual Basis

**September 1-30, 2022**

Date	Description	Debit	Credit	Balance
09/12/2022	Deposit			343,683.06
09/13/2022	Deposit			850.33
09/13/2022	Deposit			166.22
09/14/2022	ACH PACIFIC OFFICE AUTOMATION INC Invoice 5021489229			-426.97
09/14/2022	Customer Refund			50.00
09/14/2022	Deposit			343.82
09/15/2022	Deposit			-50.00
09/15/2022	Deposit			-50.00
09/15/2022	Deposit			1,662.37
09/15/2022	Deposit			590.74
09/15/2022	Deposit			233.43
09/15/2022	Customer Refund			50.00
09/15/2022	Service Charge			-165.13
09/16/2022	Deposit			701.63
09/19/2022	Deposit			14.88
09/19/2022	Deposit			126.56
09/19/2022	Deposit			50.00
09/19/2022	Deposit			347,880.94
09/19/2022	Act 0127 13 Jacob Bernard Initial Water Deposit			50.00
09/20/2022	ACH WATER ENVIRONMENT SERVICES 18810 Hill Top Rd Surface Water 8/1/22-9/1/22 Act 10-12691-01			-14.85
09/20/2022	ACH U.S. BANK EQUIPMENT FINANCE Monthly Copier/Server Fee 8/26/22-9/26/22 Invoice 481483717			-688.05
09/20/2022	ACH KAISER FOUNDATION HEALTH PLAN Monthly Health Premium 10/1/22-10/31/22 Invoice 0015984956			-1,123.08
09/20/2022	ACH COMCAST CABLE Monthly Service 9/22/22-10/21/22 Act 8778-10-899-0001186			-585.31
09/20/2022	Deposit			545.73
09/20/2022	Deposit			-50.00
09/20/2022	ACH Banner Bank (MASTERCARD) Act 6660 Casey - Monthly Charges 8/7/22-9/2/22			-991.12
09/20/2022	PR 9/17/22 Payroll 9/4/22-9/17/22			-1,415.39
09/20/2022	PR 9/17/22 Payroll 9/4/22-9/17/22			-273.60
09/20/2022	Deposit			69.54
09/20/2022	Deposit			2,936.67
09/20/2022	PR 9/17/22 Payroll 9/4/22-9/17/22			-5,325.64
09/20/2022	PR 9/17/22 Payroll 9/4/22-9/17/22			-2,737.77
09/21/2022	OAWU Distribution Basics Class Invoice 33573			-175.00
09/21/2022	Core & Main Curb Stop Replacement Parts Invoice R525639 & R545238			-744.10
09/21/2022	9675 Pamplin Media Group Special Board Meeting Public Notice Invoice: 255437			-22.70

# RIVERGROVE WATER DISTRICT

## Checking Account Register

5:06 PM  
10/20/22  
Accrual Basis

		<b>September 1-30, 2022</b>		
Check	09/21/2022	9676	SAIF CORPORATION	Workman's Comp Annual Premium 7/1/22-7/1/23
Check	09/21/2022	9677	OAWU	Membership Renewal 2022-2023
Check	09/21/2022	9678	SOUND TELECOM	Answering Service Monthly Fee 9/1/22-9/30/22
Check	09/21/2022	9679	PRIVATE UTILITY LOCATING, LLC	Locates Invoice Multiple
Check	09/21/2022	9680	Jarrad, Seibert, Pollard & Co. LLC	Audit FY 2021/2022 Invoice 44754
Check	09/21/2022	9681	OAWU	Operator of Record (DRC) Sep 22 Contract Fee Invoice 33561
Check	09/21/2022	9682	UTILITY SERVICES ASSOCIATES, LLC	Leak Detection/Water Line Survey Invoice 126522
Check	09/21/2022	9683	Customer Refund	Customer Refund
Check	09/21/2022	9684	CONTINENTAL UTILITY SOLUTIONS	ACH Activation Fee Invoice R11793
Check	09/21/2022	9685	SECRETARY OF STATE	2021-2022 Audit Filing Fee Muni #591
Check	09/21/2022	9686	AGB	Annual Insp/Testing of Seismic Controller Invoice R22-2231
Check	09/21/2022	9687	THOMAS GREGOIRE	Rent & Utilities October 2022
Check	09/21/2022	ACH	PAYCHEX	Payroll 9/4/22-9/17/22 Invoice 2022092001
Deposit	09/21/2022		Deposit	
Deposit	09/21/2022		Deposit	
Check	09/21/2022	9688	Control Systems NW, LLC	SCADA Program Invoice 844
Check	09/21/2022	9689	RH2 Engineering, Inc.	Engineering Services August 22 Invoice 87597
Check	09/21/2022	9690	RH2 Engineering, Inc.	CIP Deemar Way & Tamara Ave Invoice 87598
Check	09/21/2022	9691	RH2 Engineering, Inc.	Project - Well 1 Generator August 22 Invoice 87599
Check	09/21/2022	9692	RH2 Engineering, Inc.	Grant & Loan Application Assistance Invoice 87600
Check	09/21/2022	9693	WATER METRICS WEST	Meter Purchase
Check	09/21/2022	9694	RH2 Engineering, Inc.	Project - Well 1 Generator July 22 Invoice 87283
Deposit	09/21/2022		Deposit	
Deposit	09/21/2022		Deposit	
Check	09/21/2022	ACH	CHEVRON & TEXACO CARD SERVICES	Monthly Fuel Charges 8/24/22-9/23/22 Invoice 83771000
Deposit	09/21/2022		Deposit	
Deposit	09/22/2022		Deposit	
Check	09/23/2022	ACH	VERIZON WIRELESS	Monthly Service 8/2/21-9/1/22 Invoice 9914708459
Deposit	09/26/2022		Deposit	
Deposit	09/26/2022		Deposit	
Deposit	09/27/2022		Deposit	
General Journal	09/27/2022	mlm	Deposit	
General Journal	09/30/2022	jc	Customer Refund	
Deposit	09/30/2022		Deposit	

-1,693.18	335,593.09
-677.50	334,915.59
-191.00	334,724.59
-225.00	334,499.59
-810.00	333,689.59
-950.00	332,739.59
-7,771.00	324,968.59
-36.67	324,931.92
-3.00	324,928.92
-250.00	324,678.92
-1,970.00	322,708.92
-1,445.63	321,263.29
-63.31	321,199.98
1,029.94	322,229.92
240.00	322,469.92
-528.13	321,941.79
-6,383.50	315,558.29
-71.00	315,487.29
-442.00	315,045.29
-6,006.00	309,039.29
-1,645.00	307,394.29
-647.25	306,747.04
179.59	306,926.63
202.28	307,128.91
-281.96	306,846.95
8,450.00	315,296.95
939.61	316,236.56
-382.43	315,854.13
241.18	316,095.31
73.00	316,168.31
116.21	316,284.52
-50.00	316,234.52
50.00	316,284.52
392.46	316,676.98

# RIVERGROVE WATER DISTRICT

## Checking Account Register

Accrual Basis

General Journal	09/30/2022	jc	Customer Refund	September 1-30, 2022	50.00	316,726.98
Deposit	09/30/2022		Deposit	Customer Refund	712.71	317,439.69
					80,945.01	317,439.69
					<u>80,945.01</u>	<u>317,439.69</u>

## RIVERGROVE WATER DISTRICT

### Revenue & Expense Budget vs. Actual

July 2022 through June 2023

	Jul '22 - Jun 23	Budget	\$ Over Budget	% of Budget
<b>Ordinary Income/Expense</b>				
<b>Income</b>				
4000 · Income				
4005 · Water Sales & Charges	326,286.83	1,007,500.00	-681,213.17	32.39%
4010 · Water Deposit Fee	1,800.00	6,800.00	-5,000.00	26.47%
4015 · New Service Fee	150.00	200.00	-50.00	75.0%
4020 · Installation Fee	550.00	2,000.00	-1,450.00	27.5%
4024 · Pre-Application Meeting Fee	0.00	1,000.00	-1,000.00	0.0%
4026 · Development Security Deposit	4,100.00	10,000.00	-5,900.00	41.0%
4030 · Delinquent & Restoration Fee	6,270.25	10,000.00	-3,729.75	62.7%
4035 · SDC Chgs-SDC Restricted CI Fund	7,660.00	51,000.00	-43,340.00	15.02%
4056 · Bank Interest/LGIP Interest				
4058 · Banner - Water Dep Interest Ear	228.06	300.00	-71.94	76.02%
4059 · LGIP - Non Restrict Int Earn	979.03	1,200.00	-220.97	81.59%
4064 · SDC Interest-LGIP CI Fund	1,646.97	1,800.00	-153.03	91.5%
4065 · CI Interest -LGIP CI Fund	3,760.75	3,600.00	160.75	104.47%
4066 · LGIP-Int Earn Unemployment Fund	122.30	150.00	-27.70	81.53%
4067 · LGIP-Int Earn Truck&Equip Fund	99.79	100.00	-0.21	99.79%
Total 4056 · Bank Interest/LGIP Interest	6,836.90	7,150.00	-313.10	95.62%
4090 · Miscellaneous Income	2,687.59	5,000.00	-2,312.41	53.75%
Total 4000 · Income	356,341.57	1,100,650.00	-744,308.43	32.38%
Total Income	356,341.57	1,100,650.00	-744,308.43	32.38%
Gross Income	356,341.57	1,100,650.00	-744,308.43	32.38%
<b>Expense</b>				
5000 · Personnel Services				
5001 · Compensation				
5020 · Administrative Wages	35,429.66	145,000.00	-109,570.34	24.43%
5040 · Operator Wages	30,842.66	130,000.00	-99,157.34	23.73%
5090 · Deferred Compensation	5,530.66	30,000.00	-24,469.34	18.44%
Total 5001 · Compensation	71,802.98	305,000.00	-233,197.02	23.54%
5100 · Payroll Tax Expense	10,260.27	35,000.00	-24,739.73	29.32%
5200 · Payroll Benefits				
5210 · Workers' Compensation	2,028.55	3,000.00	-971.45	67.62%
5220 · Health Benefits	10,078.78	60,000.00	-49,921.22	16.8%
5240 · Wellness Benefit	0.00	600.00	-600.00	0.0%
Total 5200 · Payroll Benefits	12,107.33	63,600.00	-51,492.67	19.04%
Total 5000 · Personnel Services	94,170.58	403,600.00	-309,429.42	23.33%
6000 · Material Services				
6001 · Administration/Billing/Overhead				
6005 · Property/Liability Insurance	0.00	28,000.00	-28,000.00	0.0%
6006 · Furn & Office Equipment - Admin	0.00	2,000.00	-2,000.00	0.0%
6007 · Bank Service Charges				
6008 · Banner - Check Bank Charges	547.31	1,999.00	-1,451.69	27.38%
6010 · Vanco Service Charges	269.00	1,000.00	-731.00	26.9%

## RIVERGROVE WATER DISTRICT

### Revenue & Expense Budget vs. Actual

July 2022 through June 2023

	Jul '22 - Jun 23	Budget	\$ Over Budget	% of Budget
6012 · LGIP-SDC Ser Charges-CI Fund	0.00	1.00	-1.00	0.0%
6013 · LGIP-CI Ser Chg-CI Fund	0.05	1.00	-0.95	5.0%
<b>Total 6007 · Bank Service Charges</b>	<b>816.36</b>	<b>3,001.00</b>	<b>-2,184.64</b>	<b>27.2%</b>
6018 · Meeting/Food Expense	0.00	1,000.00	-1,000.00	0.0%
6019 · Office Supplies, Equip, Repair	638.99	2,500.00	-1,861.01	25.56%
6020 · Postage & Shipping	6.75	2,000.00	-1,993.25	0.34%
6025 · Printing & Duplicating	165.42	1,500.00	-1,334.58	11.03%
6030 · Publications & Elections	472.70	2,000.00	-1,527.30	23.64%
6035 · Rent	5,444.00	18,000.00	-12,556.00	30.24%
6040 · Janitorial	0.00	2,000.00	-2,000.00	0.0%
6045 · Telephone - Admin	3,719.11	13,000.00	-9,280.89	28.61%
6050 · Mileage Expenses	0.00	500.00	-500.00	0.0%
6060 · Continued Education	815.00	5,300.00	-4,485.00	15.38%
6065 · Dues & Subscriptions	2,379.89	7,000.00	-4,620.11	34.0%
6070 · Fees, License, & Permits	727.90	5,000.00	-4,272.10	14.56%
6075 · Water Deposit Refunds	1,683.07	7,000.00	-5,316.93	24.04%
6076 · Unclaimed Property	0.00	200.00	-200.00	0.0%
6080 · Water Sales Overpay	236.11	2,000.00	-1,763.89	11.81%
6090 · Meter Reading	1,905.78	6,000.00	-4,094.22	31.76%
6095 · Utilities/Office	582.06	2,500.00	-1,917.94	23.28%
6096 · Development Review Deposit Ref	0.00	10,000.00	-10,000.00	0.0%
6099 · Contracted Services - Admin				
6099-0 · Billing	2,406.17	7,000.00	-4,593.83	34.37%
6099-1 · Copier IT	4,460.08	15,000.00	-10,539.92	29.73%
6099-2 · Personnel	0.00	5,000.00	-5,000.00	0.0%
6099-3 · Website	400.00	1,500.00	-1,100.00	26.67%
<b>Total 6099 · Contracted Services - Admin</b>	<b>7,266.25</b>	<b>28,500.00</b>	<b>-21,233.75</b>	<b>25.5%</b>
<b>Total 6001 · Administration/Billing/Overhead</b>	<b>26,859.39</b>	<b>149,001.00</b>	<b>-122,141.61</b>	<b>18.03%</b>
<b>6101 · Operation &amp; Maintenance</b>				
6100 · General Repair & Maintenance	6,747.05	40,000.00	-33,252.95	16.87%
6105 · Utilities	15,632.68	38,000.00	-22,367.32	41.14%
6110 · Small Tools & Equipment	302.90	2,500.00	-2,197.10	12.12%
6120 · Water Testing	0.00	4,000.00	-4,000.00	0.0%
6125 · Truck Maintenance	270.75	3,000.00	-2,729.25	9.03%
6130 · Gas & Oil	889.67	3,500.00	-2,610.33	25.42%
6135 · Telemetry/Scada	6,450.60	10,000.00	-3,549.40	64.51%
6155 · Chemicals	239.00	5,000.00	-4,761.00	4.78%
6160 · Contracted Services-Operations	14,758.96	22,000.00	-7,241.04	67.09%
6165 · PPE/Safety Equipment	722.56	2,000.00	-1,277.44	36.13%
6170 · Mobile Radio Phone/Pager Operat	1,530.08	5,500.00	-3,969.92	27.82%
6185 · Operations -Computer/Equipment	0.00	1,000.00	-1,000.00	0.0%
6190 · Cross Connect Program Supplies	1,005.79	15,000.00	-13,994.21	6.71%
6195 · Meters	2,286.00	4,000.00	-1,714.00	57.15%
<b>Total 6101 · Operation &amp; Maintenance</b>	<b>50,836.04</b>	<b>155,500.00</b>	<b>-104,663.96</b>	<b>32.69%</b>

## RIVERGROVE WATER DISTRICT

### Revenue & Expense Budget vs. Actual

July 2022 through June 2023

	Jul '22 - Jun 23	Budget	\$ Over Budget	% of Budget
6202 · Professional Services				
6208 · Auditor	6,310.00	10,000.00	-3,690.00	63.1%
6209 · Consultants	720.00	4,000.00	-3,280.00	18.0%
6210 · Engineering (Non-Reimbursable)	31,337.25	185,000.00	-153,662.75	16.94%
6215 · Legal Fees (Non-Reimbursable)	0.00	5,000.00	-5,000.00	0.0%
<b>Total 6202 · Professional Services</b>	<b>38,367.25</b>	<b>204,000.00</b>	<b>-165,632.75</b>	<b>18.81%</b>
<b>Total 6000 · Material Services</b>	<b>116,062.68</b>	<b>508,501.00</b>	<b>-392,438.32</b>	<b>22.82%</b>
7000 · Operating Capital Outlay				
7010 · Tool/Equipmt/Vehicles/Safety-CO	0.00	5,000.00	-5,000.00	0.0%
7040 · Fire Protection & Fire Flows-CO	8,521.14	35,000.00	-26,478.86	24.35%
7060 · AMR Meter Program CO	0.00	15,000.00	-15,000.00	0.0%
<b>Total 7000 · Operating Capital Outlay</b>	<b>8,521.14</b>	<b>55,000.00</b>	<b>-46,478.86</b>	<b>15.49%</b>
8000 · Debt Recov./Capital Improvement				
8451 · CI-Standby Power CI Fund	0.00	30,000.00	-30,000.00	0.0%
8454 · SDWL#1 Install Pmt CI-CI Fund	0.00	13,352.00	-13,352.00	0.0%
8455 · SDWL #2 Install Pmt CI-CI Fund	0.00	14,500.00	-14,500.00	0.0%
8457 · CI Dist.Main Projects	0.00	200,000.00	-200,000.00	0.0%
8461 · SDC -Standby Power-CI Fund	0.00	4,000.00	-4,000.00	0.0%
8464 · SDWL#1 Install Pmt SDC-CIF	0.00	40,062.00	-40,062.00	0.0%
8465 · SDWL #2 Install Pmt SDC-CIF	0.00	118,520.00	-118,520.00	0.0%
8467 · Water Main Replacement Projects	0.00	283,200.00	-283,200.00	0.0%
<b>Total 8000 · Debt Recov./Capital Improvement</b>	<b>0.00</b>	<b>703,634.00</b>	<b>-703,634.00</b>	<b>0.0%</b>
<b>Total Expense</b>	<b>218,754.40</b>	<b>1,670,735.00</b>	<b>-1,451,980.60</b>	<b>13.09%</b>
<b>Net Ordinary Income</b>	<b>137,587.17</b>	<b>-570,085.00</b>	<b>707,672.17</b>	<b>-24.14%</b>
<b>Other Income/Expense</b>				
<b>Other Income</b>				
9100 · Other Income				
9115 · Transfer In - Capital Improve	0.00	200,000.00	-200,000.00	0.0%
9120 · Transfer In - Unemployment	0.00	3,000.00	-3,000.00	0.0%
9125 · Transfer In - Truck & Equipment	0.00	5,000.00	-5,000.00	0.0%
<b>Total 9100 · Other Income</b>	<b>0.00</b>	<b>208,000.00</b>	<b>-208,000.00</b>	<b>0.0%</b>
<b>Total Other Income</b>	<b>0.00</b>	<b>208,000.00</b>	<b>-208,000.00</b>	<b>0.0%</b>
<b>Net Other Income</b>	<b>0.00</b>	<b>208,000.00</b>	<b>-208,000.00</b>	<b>0.0%</b>
<b>Net Income</b>	<b>137,587.17</b>	<b>-362,085.00</b>	<b>499,672.17</b>	<b>-38.0%</b>

## LEAK DETECTION EXECUTIVE SUMMARY

	<b>2012</b>	<b>2022</b>
Project Dates	8/6/12 – 8/9/12 & 9/7/12	9/1/22 – 9/8/22
Time Spent on Project	38 Hours	40 Hours
Total Areas Surveyed	14 Miles / 73,920 Feet	17.74 Miles / 93,690 Feet
Access Points Contacted	488	441
Leak Type Noises Detected	13	12
Leaks Pinpointed	7	3
Unidentified Water Loss	1	2
Total Water Loss Identified	6,964,200 Gallons Per Year	3,153,600 Gallons Per Year





**FINAL REPORT**

**WATER LEAK DETECTION PROJECT**

**Project Dates:**

**09/01/2022 – 09/08/2022**



**Project Location:**

Rivergrove Water District  
Lake Oswego, OR



**Prepared by:**

Utility Services Associates, LLC  
916 W. Center St.  
Kalispell, MT 59901

# **TABLE OF CONTENTS**

**COVER LETTER**

**EXECUTIVE SUMMARY**

**PROJECT OBSERVATIONS**

**SURVEY PHASE REVIEW**

**PINPOINTING PHASE REVIEW**

**LEAK REPORTS**

**CONCLUSION**

**COVER LETTER**



September 29, 2022

Rivergrove Water District  
Attn: Janine Casey  
17661 Pilkington Rd.  
Lake Oswego, OR 97035

Re: **September 2022 Water Leak Detection Survey and Pinpointing Project**

Dear Ms. Casey:

Utility Services Associates, LLC, (USA) is pleased to submit the enclosed Final Report on leak detection services recently completed.

The information contained in this Final Report details the procedures and results specific to this project. When applicable, recommendations have been made concerning the best approach for the repair of leaks detected and preparation for future leak detection projects.

As you review this Final Report, please pay close attention to the Leak Consultant's remarks and field observations in the Project Observation section of this report. These may assist you in determining the best course of action regarding specific leaks.

At times specific individual Leak Reports may differ in the Final Report from those provided during the course of the project. These changes, usually insignificant, generally pertain to the manner in which we report leaks and do not alter the methods used or results of pinpointing.

We strongly suggest you contact us prior to excavating any leak that we have labeled with "CAUTION" for further explanation.

This leak detection project is productive since we pinpointed leakage that, when repaired, can reduce your water loss, saving Rivergrove Water District dollars now and in the future. We appreciate your confidence in USA. If you have any questions, call us at (877) 585-5325.

Sincerely,

Cory Simonson  
President



# **EXECUTIVE SUMMARY**

## LEAK DETECTION EXECUTIVE SUMMARY

From September 1, 2022 through September 8, 2022, USA performed a leak survey for **Rivergrove Water District in Lake Oswego, OR**. Our Water Loss Consultant, Bryan Hernandez, used and appreciated the information provided to expedite and provide an accurate survey. The tables below detail the information gathered.

Time Spent on Project	
Surveying:	36 Hr
Pinpointing:	1.75 Hr
Other Time:	2.25 Hr
<b>Total Time:</b>	<b>40 Hr</b>

Total Areas Surveyed	
Total Distance in Miles	17.7443
Total Distance in feet	93,690

The mileage was estimated by the Water Loss Consultant and may not match maps.

Access Points Contacted	
Hydrants	112
Valves	217
Services	102
Other	10
<b>Total</b>	<b>441</b>

Leak Type Noises Detected	
Hydrants	0
Valves	3
Services	9
Other	0
<b>Total</b>	<b>12</b>

Leaks Pinpointed	
Main	0
Valve	1
Hydrant	0
Service Line	1
Service Connection	0
Curbstop	1
Meter	0
<b>Total</b>	<b>3</b>

Total Water Loss Identified	
Gallons Per Minute (GPM):	6
Gallons Per Day:	8,640
Gallons Per Month:	262,800
Gallons Per Year:	3,153,600

Unidentified Water Loss	
Faulty Meters	0
Unidentified Leaks	0
Possible Consumer Side Leaks	2

This project was divided into two phases; the survey phase and the pinpointing phase. The following pages outline exactly how those two phases progressed and the results of each. Any leaks pinpointed will be detailed in the attached Leak Reports.

# **PROJECT OBSERVATIONS**

**Project Observations**  
**Rivergrove Water District, OR**  
**Technician: Bryan Hernandez**

**GENERAL**

Utility Services Associates (USA) Water Loss Consultant Bryan Hernandez recently completed a five (5) day water leak detection project for the Rivergrove Water District, OR (Utility). The fieldwork portion of the project began on September 1<sup>st</sup>, 2022, and was completed on September 8<sup>th</sup>, 2022.

The information listed below is based on field data generated by Bryan during the fieldwork.

**PROJECT BACKGROUND**

USA was hired to conduct a water leak survey of as much of the City's distribution system as possible over the five (5) day period. Based on system variables, both standard and point-to-point survey techniques were employed.

**SPECIFICS**

The project was broken down into two different phases:

1. **Survey Phase** – sounding of appurtenances and recording all leak anomalies detected for further investigation. Appurtenances were selected based on system variables, location, and accessibility.
2. **Pinpointing Phase** – pinpointing all anomalies that were detected during the survey phase.

**SURVEY PHASE NOTES**

There are several variables that impact how well a leak sound will carry. The variables include but are not limited to the following:

- Pipe Type: Sound carries best in metallic-based pipe material and worst in plastic-based pipe material
- Pipe Size: Velocity or sound carry decreases as pipe size increases
- Pressure: Sound carries better as system pressure increases
- Installation: The soil condition impacts how well leak sound carries. Factors to consider are soil type and moisture content.
- Leak Type: The leak type and size will impact how well a leak sound will carry.



Sound carried well throughout the system allowing for a complete and thorough survey to be conducted. During the project, we were able to survey approximately eighteen (17.74) miles of the system.

The standard survey technique used on non-plastic-based pipe included the sounding of system appurtenances (hydrants, valves, and service shut-offs) at intervals of approximately 350' in most cases. Where PVC system was surveyed, a point to point technique was used. This technique included the sounding of all available appurtenances. This is necessary as plastic-based water lines have significantly slower velocity and muffling characteristics that prevent leak sound from carrying well.

As the survey progressed, Bryan documented twelve (12) potential leak anomalies for further inspection and pinpointing during the pinpointing phase. This multi-phased technique has proven to be the most efficient way to reduce the time spent pinpointing sounds that result from service draw or other ambient interference.

### **SYSTEM OBSERVATIONS FIELD NOTES**

- **19250 SW Indian Creek Ave** – This may be a possible faulty meter.
- **Old Gate Rd from Bryant Rd to end of the street** – Well house causing leak type noise down this street. Once the Utility crew shut this house down, leak noise ceased.
- **SW Marlin Ct** – Multiple sprinklers were being used at the time of the survey, causing usage noise down the street.
- **SW River Bend Ln (end of the street)** – Unable to locate blow off at this location.
- **SW Tree St (east end of the line)** – Valve buried under the sidewalk.
- **5670 Kenny St** – Meter buried under the fence.

### **PINPOINTING PHASE NOTES**

Upon secondary verification of the documented leak anomalies, we were able to pinpoint three (3) water system leaks and two (2) consumer-side issues. For details and a diagram for each leak, please see the Leak Report section of this report.

**Leak #3 5071 Tualata Ln** – One correlation setup with an excellent result placing leak noise approximately 17' from the "Red" on the service line. This leak was previously pinpointed by USA in 2012 with similar results. We recommend replacing the entire service line and re-sounding this area.

## POSSIBLE CONSUMER SIDE LEAKS

- 6227 Wayzata Ct
- 17825 SW Tualata Ave

## TECHNICIAN RECOMMENDATIONS

We recommend a continued focus on water loss and real loss reduction. Once repairs are made, note any observed differences in our loss estimates versus visual confirmation estimates. It is possible that leak estimates are off dramatically, so the impact on your water loss tracking efforts will be impacted.

## CONCLUSION

We would like to thank Janine Casey for her field assistance. Her hard work and system knowledge proved invaluable. We look forward to working with the Rivergrove Water District on their future non-revenue water loss reduction projects.

Bryan Hernandez  
Water Loss Consultant

# **SURVEY PHASE REVIEW**

## **SURVEY PHASE REVIEW (Water Distribution Lines)**

The first step in our survey was to review the distribution maps of the system for familiarization of the pipe network and available appurtenances to be used for contact points.

As the leak survey progressed, we determined the distances that even quiet leak type sounds traveled in various pipe materials, pipe sizes and pressure zones in each area of the system. This might have been done by slightly turning on fire hydrants, hose bibs, etc., creating a simulated, quiet leak sound. Appurtenances in that area were then checked with a sound amplification instrument to see how far the simulated leak sounds traveled, thus determining how often we would make contact with appurtenances in a given section of the water distribution system. In most areas, contact was made with pipe appurtenances at intervals no greater than 300 feet where contact points were available and accessible at pre-determined distances as noted in Paragraph B (whichever distance is necessary to obtain complete coverage). This allowed for even more quiet leaks to be located. Whenever we surveyed PVC lines, all available appurtenances were contacted.

We then conducted a comprehensive survey by making physical contact with all available main line appurtenances (valves, hydrants, etc.) and necessary customer services. USA used a sonic leak detection amplification instrument designed for this purpose.

**Appurtenances Surveyed**

<b>Hydrant</b>	11
<b>Valves</b>	217
<b>Services</b>	102
<b>Other</b>	10
<b>Total</b>	<b>441</b>

When normal contact points were not available or could not be created within a reasonable distance, we made an attempt to use a sonic ground listening instrument to make physical ground contact at intervals no greater than 6 feet directly over the pipe. If conditions did not allow this procedure our Leak Consultant advised you at time of project and notes of such are included in the Project Observations. Ground listening devices are employed when ground cover is pavement, cement or similar hard surface.

When ground cover was not a hard surface and normal contact points were not available, we made an attempt to use probe rods or a specially designed sounding plate at 6-foot intervals. A sound amplification instrument with 3VG or greater transducer was employed in conjunction with this equipment, directly over the pipe. If conditions did not allow this procedure our Leak Consultant advised you at time of project and was detailed in the Project Observations section of this Final Report. Direct contact to the main line at intervals outlined in Preparation for Service resulted in the most thorough survey.

### Areas Surveyed

Street	From	To	Distance
West Rd	End of line	Canal Rd	2,000
Canal Rd	West Rd	Childs Rd	1,050
Childs Rd	Sycamore Ave	End of line	4,700
Sycamore Ave	West Rd	Childs Rd	880
Indian Springs Rd	Childs Rd	Thru Loop	2,430
Red Wing Ct	Indian Creek Ave	End of line	1,450
Dawn St	Red Wing Ct	Old Gate Rd	1,500
Old Gate Rd	Bryant Rd	End	610
Chad Dr	Bryant Rd	End	850
Bryant Rd	Bass Ln	Chad Dr	1,240
Bass Ln	River Run	Olsen Ave	860
River Run	Childs Rd	End	1,050
Coho Ln	River Run	End	220
Trout Way	River Run	Edens Edge Dr	540
Perch Ct	Trout Way	End	300
River Bend Ln	Childs Rd	End of line	610
35th Ct	South end of line	North end of line	2,100
Megan Pl	Childs Rd	End	540
Olsen Ave	Rivers Edge	Olson Ct	1,800
Olson Ct	Bryant Rd	Childs Rd	2,900
Edens Edge Dr	Bass Ln	Olsen Ave	2,100
Kokanee Ct	Rivers Edge	End	310
Childs Rd	Sycamore Ave	65th Ave	4,900
Maree Ct	Childs Rd	End	380
Woodcrest Ln	Childs Rd	End	1,580
Riverwood Ln	Childs Rd	Patterson Ln	950
Patterson Ln	Childs Rd	End of line	900
Lorna Ln	Childs Rd	End	410
Dogwood Ct	Childs Rd	Dogwood Dr	900
Dogwood Dr	Dogwood Ct	West end of line	1,120
Marlin Ave	Childs Rd	Dogwood Dr	710
Marlin Ct	Childs Rd	End	340
Tualamere Ave	Childs Rd	Dogwood Dr	620
Childs Ct	Childs Rd	End	200
Benfield Ave	Childs Rd	End	670
Colby Ct	Benfield Ave	End	250
Benfield Ct	Benfield Ave	End	250
Dawn St	Red Wing Way	Pilkington Rd	3,250
Indian Creek Ave	Childs Rd	Red Wing Way	1,200
Indian Creek Ct	Indian Creek Ave	End	200
Arrowood Ave	Centerwood St	Dawn St	830
Centerwood St	Arrowood Ave	Tualata Ave	580
Red Leaf St	Tualata Ave	Pilkington Rd	700
McEwan Rd	65th Ave	Pilkington Rd	2,700
Reao Ct	McEwan Rd	End	210
Terry Ave	McEwan Rd	Childs Rd	1,330
Kristi Way	Terry Ave	McEwan Rd	820
Longfellow Ave	Childs Rd	McEwan Rd	1,450

Street	From	To	Distance
Nokomis Ct	East end of line	West end of line	500
Minnehaha Ct	Longfellow Ave	End	150
Wayzata Ct	Longfellow Ave	End	400
Dawn St	Longfellow Ave	65th Ave	900
McDuff Ct	65th Ave	End	220
Mission Ct	65th Ave	End	250
Edgewood St	65th Ave	Longfellow Ave	860
65th Ave	Edgewood St	Childs Rd	1,460
Pilkington Ave	Childs Rd	Jean Rd	3,970
Fernbrook Way	Tualata Ave	Benfield Ave	1,850
Kenny St	Lakeview Blvd	Tualata Ave	2,480
Benfield Ave	Kenny St	McEwan Rd	1,660
Kristi Way	McEwan Rd	Benfield Ave	890
Terry Ave	Kenny St	End	700
Longfellow Ave	Edgewood St	End	640
Terry Ct	Terry Ave	End	130
Fernbrook St	Longfellow Ave	Terry Ave	370
Don Lee Way	Edgewood St	Lakeview Blvd	950
Edgewood Ct	Edgewood St	End	200
Lakeview Blvd	Don Lee Way	Jean Rd	2,400
Kennycroft Way	Lakeview Blvd	Belmore Ave	740
Belmore Ave	Kenny St	Lakeview Blvd	1,130
Belmore Ct	Belmore Ave	End	100
Royal Ct	Belmore Ave	End	100
Tualata Ave	Red Leaf St	Jean Rd	3,000
Tree St	Central Ave	Pilkington Ave	1,320
Tualata Ln	Tualata Ave	End	690
Bickel Ct	Tualata Ln	End	130
Timbergrove St	Timbergrove Ct	Tualata Ave	470
Timbergrove Ct	Timbergrove Ln	End	580
Tualata Ct	Tualata Ave	End	380
Charleton Ct	Tualata Ave	End	180
Chinook Ct	Tualata Ave	End	300
Siletz Ct	End	Pilkington Ave	180
Dunmire Dr	End	Pilkington Ave	480
Jean Rd	Lakeview Blvd	Central Ave	1,670
Rachel Ln	End	Pilkington Ave	300
Koderra Ave	End	Pilkington Ave	240
Jenifers Way	Koderra Ave	Rachel Ln	250
Fernbrook Ct	Fernbrook St	End	200
Tamara Ct	Jean Rd	End	360
Mardee Ave	Jean Rd	End	640
Deemar Way	Mardee Ave	Jean Rd	780
Oswego Bay	Jean Rd	End	1,000
<b>Total Area Surveyed in Feet</b>			<b>93,690</b>
<b>Total Area Surveyed in Miles</b>			<b>17.7443</b>

A detailed report of decibel levels at suspected leak sound locations and observations were compiled during the survey for reinvestigation and possible pinpointing at a later time. This reinvestigation increased the speed of the survey and eliminated correlating on most false leak sounds.

**Leak Type Noises Detected**

<b>Contact Points</b>	<b>Noises Detected</b>
Hydrant	0
Valves	3
Services	9
Other	0
<b>Total</b>	<b>12</b>

All indications of leaks found during the survey were verified a second time, after which, the leaks were pinpointed with a computer-based sound correlator when possible. Pinpointing information can be found in the Pinpointing and Leak Reports Sections.

End of Section

# **PINPOINTING PHASE REVIEW**



## PINPOINTING PHASE REVIEW (Water Distribution Lines)

All indications of leaks found during the survey were verified a second time, after which, the leaks were pinpointed with a computer-based sound correlator when possible. Pinpointing leak locations through interpretation of sound intensity, either by ear, decibel metering or other like methods was not used when contact points were available for use with the correlator. However, ground listening devices were used as a quick double check on pinpointed leaks.

The equipment used did not normally require valves to be operated during surveying and pinpointing. However, on occasion, services or valves were operated to eliminate service draw noises or to change velocity noise.

The correlator equipment used had the capability to prompt the operator to input the variables when different pipe sizes and/or pipe material were encountered in the same span to be investigated. This is necessary to ensure accuracy of results based on the automatic computation of the correct leak sound velocity in leak pinpointing operations. Our correlators have the capability of correlating up to seven various pipe sizes and types at one time in a given space. To ensure effective performance in all field environments encountered in the distribution system (i.e. traffic noise, draw, pump operation, industrial noise, etc.), the correlator equipment provides 16 auto filter options and/or infinite manual filter options.

We provided a copy of leak reports, when pinpointed, which included leak locations and estimated GPM loss.

**Leaks Pinpointed**

Number	Leak Type	Location	GPM
1	Curb Stop	18922 S.W. Red Wing Way	3.00
2	Valve	S.W. Longfellow Ave. & S.W. Fernbrook St.	2.00
3	Service Line	5071 Tualata Ln.	1.00
<b>Total</b>			<b>6.00</b>

These leak reports also included a leak repair priority classification. These classifications are as follows:

Class I Any leak which is hazardous in terms of potential undermining, possibly resulting in surface collapse, encroachment and/or damage to nearby utilities, commercial or private properties or leaks severe enough to warrant immediate repair.

Class II All leaks that display water losses significant enough to be monitored on a regular repair schedule.

Class III Relatively small leaks that should be repaired as workload permits.

**Repair Priority**

Number	Leak Type	Location	GPM
1	Curb Stop	18922 S.W. Red Wing Way	3.00
<b>Total Class I</b>			<b>3.00</b>

Number	Leak Type	Location	GPM
2	Valve	S.W. Longfellow Ave. & S.W. Fernbrook St.	2.00
<b>Total Class II</b>			<b>2.00</b>

Number	Leak Type	Location	GPM
3	Service Line	5071 Tualata Ln.	1.00
<b>Total Class III</b>			<b>1.00</b>

Whenever any of the leaks detected by USA were repaired prior to completion of the field work, we gave Rivergrove Water District the option to have that section of the system re-surveyed to be sure no very quiet leaks were missed due to an overpowering noisy leak sound.

Please note that leakage that was detected and pinpointed may be larger or smaller than estimated. Estimates are based on several variables including type and size of pipe, pressure, and interpretation of correlation filter results.

In addition, we identified three possible consumer side leaks. Although pinpointing consumer side leaks was not part of the scope of this project, we have listed it below as a courtesy.

#### Possible Consumer Side Leaks

Leak Location	Notes
6227 S.W. Wayzata Ct.	Possible consumer side leak.
17825 S.W. Tualata Ave.	Possible consumer side leak.

End of Section

# LEAK REPORTS



# LEAK REPORT

Leak #:	1
Date:	September 6, 2022
Map #:	N/A
Coordinates	

Leak Type	<b>CURB STOP</b>
Leak Address	<b>18922 SW RED WING WAY</b>

Client: Rivergrove Water District

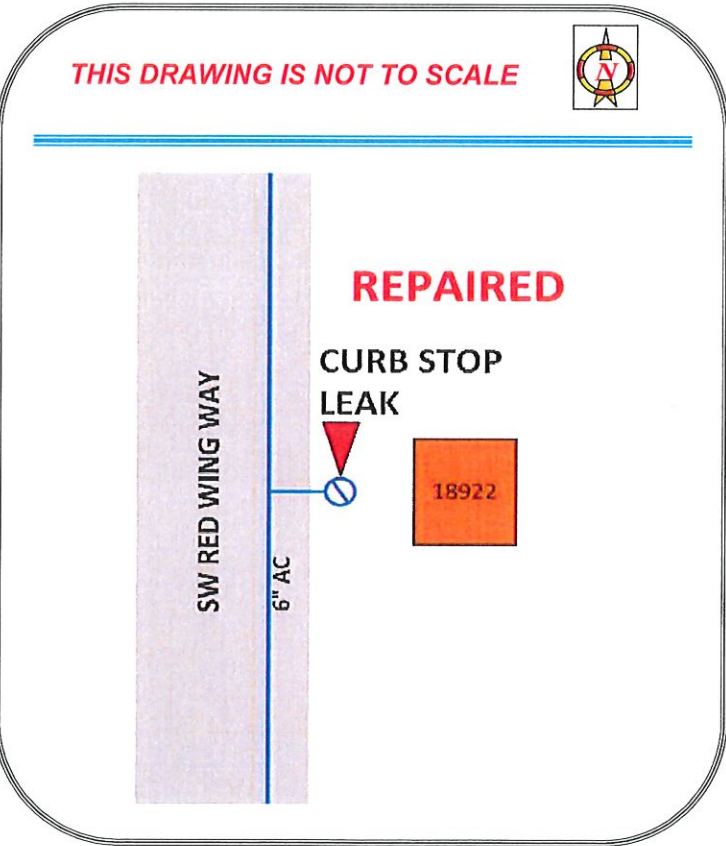
Agreement: 22055

**REMARKS**

**LEAK AT OR NEAR CURB STOP INSIDE METER BOX. VISIBLE ONCE CLEARED OF MUD SURROUNDING CURB STOP. REPAIRED. ALL NOISE IN AREA HAS CEASED.**

Action(s) Taken: LEAK REPAIRED

Recommendation(s): \_\_\_\_\_



EQUIPMENT USED	
	S-30
	VISIBLE

LEAK INFORMATION	
Leak Consultant:	BH
Leak Class:	I
Leak Rate (GPM):	3.00
Cover Type:	ASPHALT
Site Marked:	YES
Mins. Pinpointing:	15



Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"

Water Loss (gallons)	
Daily:	4,320
Weekly:	30,240
Monthly:	131,400
Annual:	1,576,800



# LEAK REPORT

Leak #:	<b>2</b>
Date:	<b>September 6, 2022</b>
Map #:	<b>N/A</b>
Coordinates	

Leak Type	<b>HYDRANT VALVE</b>
Leak Address	<b>SW LONGFELLOW AVE &amp; SW FERNBROOK ST</b>

Client: **Rivergrove Water District**

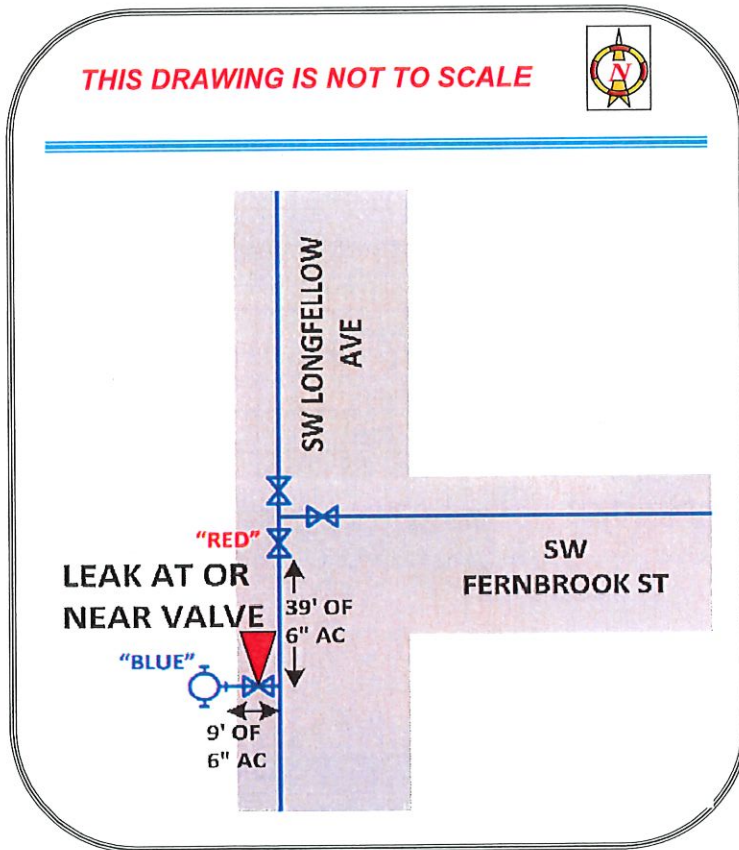
Agreement: **22055**

**REMARKS**

**TWO EXCELLENT CORRELATIONS POINTED LEAK NOISE AT OR NEAR HYDRANT AUXILIARY VALVE. CONFIRMED WITH GROUND MIC.**

Action(s) Taken: **VERIFIED WITH MULTIPLE SETUPS**

Recommendation(s): **EXCAVATE & REPAIR**



EQUIPMENT USED	
	<b>S-30</b>
	<b>LD-12</b>
	<b>LC-2500</b>

LEAK INFORMATION	
Leak Consultant:	<b>BH</b>
Leak Class:	<b>II</b>
Leak Rate (GPM):	<b>2.00</b>
Cover Type:	<b>ASPHALT</b>
Site Marked:	<b>YES</b>
Mins. Pinpointing:	<b>60</b>



Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"
<b>300</b>	<b>A</b>	<b>0 FT</b>	<b>9</b>
<b>300</b>	<b>A</b>	<b>36</b>	<b>9</b>

Water Loss (gallons)	
Daily:	<b>2,880</b>
Weekly:	<b>20,160</b>
Monthly:	<b>87,600</b>
Annual:	<b>1,051,200</b>



# LEAK REPORT

Leak #:	3
Date:	September 6, 2022
Map #:	N/A
Coordinates	

Leak Type	SERVICE LINE
Leak Address	5071 TUALATA LN

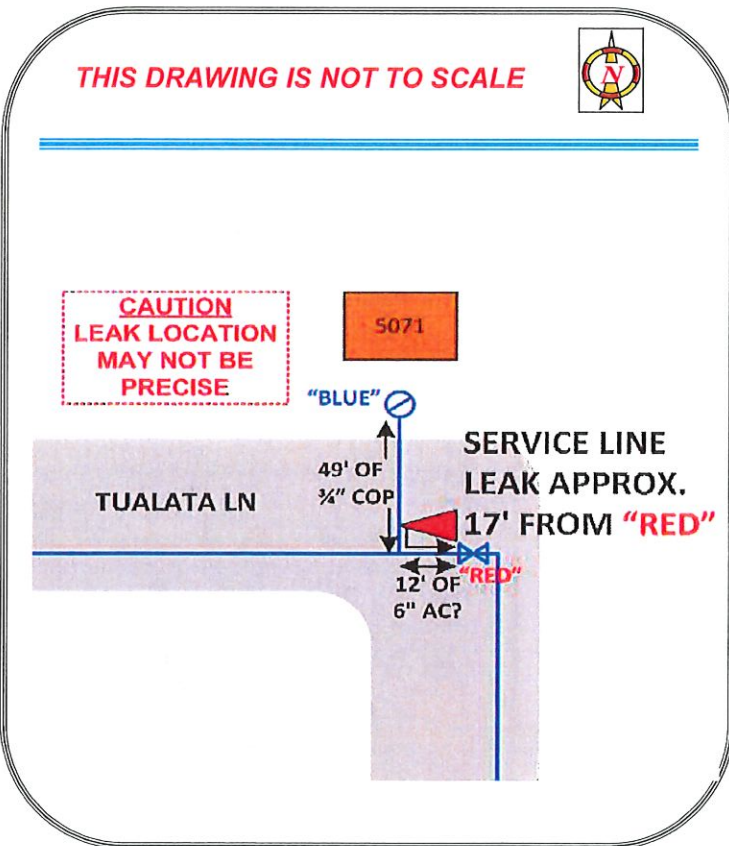
Client: Rivergrove Water District

Agreement: 22055

**REMARKS**  
 CORRELATOR PINPOINTED LEAK APPROXIMATELY 17' FROM "RED" HOWEVER THIS LEAK HAS BEEN PREVIOUSLY PINPOINTED IN THIS SAME AREA AND A CURSORY EXAMINATION OF THE SEWAGE MANHOLE COVER NEAR THE SITE MARKED REVEALED NO WATER FLOW. RECOMMEND REPLACING THIS SERVICE AND RE-SOUNDING THE CURB STOP TO SEE IF THIS FIXES THE ISSUE. PROCEED WITH CAUTION LEAK LOCATION MAY NOT BE PRECISE.

Action(s) Taken: VERIFIED WITH MULTIPLE SETUPS  
 Recommendation(s): REPAIR / REPLACE

RESURVEY FOLLOWING REPAIRS



EQUIPMENT USED	
	S-30
	LD-12
	LC-2500

LEAK INFORMATION	
Leak Consultant:	BH
Leak Class:	III
Leak Rate (GPM):	1.00
Cover Type:	ASPHALT
Site Marked:	YES
Mins. Pinpointing:	20



Computer Correlation Results			
Scan Time	Grade	Dist. "Red"	Dist. "Blue"
300	A	17	44

Water Loss (gallons)	
Daily:	1,440
Weekly:	10,080
Monthly:	43,800
Annual:	525,600

# CONCLUSION

## LEAK SURVEY CONCLUSION

Our thanks to Janine Casey and all persons involved with this project for their assistance in gathering all the necessary paperwork and personnel to create, with USA, a mutually beneficial leak detection project.

With this survey, you have demonstrated concern for prudent water utilization and conservation.

Capitalizing on the most advanced leak detection technology available today, USA has successfully completed this Leak Detection Survey. The contents of this Final Report provide Rivergrove Water District with a permanent record of the activities performed to complete a Leak Survey along with the results achieved.

An important characteristic of this Leak Report is that the facts contained herein can be used in formulating a database for decision making regarding: the need for possible future meter programs, rehabilitation and pipeline replacement and/or the investigation of new water sources, etc. These types of decisions, regarding your utilization of water, now can be predicated more on facts rather than supposition or conjecture.

Prompt repair of any leaks reported provide an immediate benefit to Rivergrove Water District, which includes recovery of most water revenue and water conservation, etc.

Having achieved these results, we recommend that you continue to set up the infrastructure necessary to continue investigating leakage in the water distribution system. Implementation of any on-going leak survey program will ensure that leak losses are kept to a minimum, and the added enhancement of saving costs due to emergency call outs.

Utility Services Associates, LLC, is proud to have served Rivergrove Water District in this way and we wish to thank you for your substantial assistance and cooperation in this project.

If you or your staff has any questions regarding this Final Report, please feel free to call us at (877) 585-5325.

Best Regards,



Cory Simonson  
President

