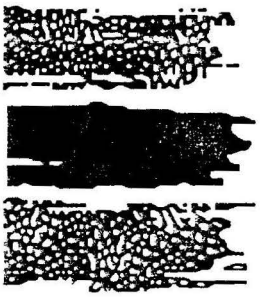


EDWARDS UNDERGROUND
WATER DISTRICT

Report 92-04

LEAK DETECTION SURVEY REPORT
FOR
THE CITY OF LYTLE

EDWARDS UNDERGROUND
WATER DISTRICT

5.4-5

June 12, 1992

Mayor John E. McGinnis
City of Lytle
P. O. Box 743
Lytle, Texas 78052

Dear Mayor McGinnis:

We are pleased to submit this final report of the leak detection survey performed on the City of Lytle water system. A summary of findings is reported in separate categories for your convenience.

The Edwards Underground Water District (District) appreciates the cooperation and assistance you have provided during the leak detection survey. Special thanks to Alfredo Aguinaga and Skip Traeger for their attention and patience during the survey. The District hopes that the information provided herein will be beneficial to the City in identifying and targeting areas of water loss and potential loss.

The District would appreciate the opportunity to recheck the remaining 5 leak sites after repairs are completed.

This survey has demonstrated the water saving potential of the Leak Detection Program. Maintaining the best possible program is vital in order to continue the successes that have been realized. For this reason, the District is soliciting your comments, both positive and negative, and any suggestions you may have on how to improve our program.

Please respond to this request candidly, as the District cannot improve on deficiencies or support positive measures without the knowledge of such conditions.

Enclosed is a water audit form. The District requests that this form be completed and returned to the District sixty (60) days after all detected leaks have been repaired. This information will assist the District in our continued assessment of the Leak Detection Program.

1615 N. ST. MARYS - P.O. BOX 15830
SAN ANTONIO TEXAS 78212-9030
512-222-2204 / 1-800-292-1047
FAX 222-0869

Should you require additional information regarding this report or have any water related questions, please do not hesitate to call.

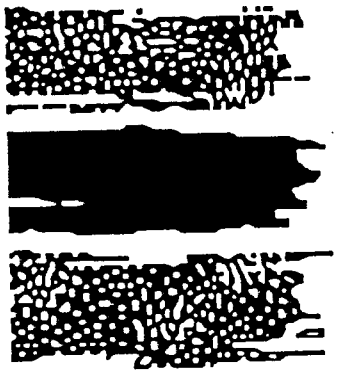
Sincerely,

Charles E. Ahrens
Water Resources Planner III

James R. Shipley
Leak Detection Technician II

CEA:JRS/bmc
Enclosures
cc: Alfredo Aguinaga, Director of Public Works

025jrs



EDWARDS UNDERGROUND
WATER DISTRICT

LEAK DETECTION SURVEY REPORT
FOR
THE CITY OF LYTLE

PREPARED BY

THE EDWARDS UNDERGROUND WATER DISTRICT

DIVISION OF PLANNING & ENVIRONMENTAL MANAGEMENT

LEAK DETECTION PROGRAM

MAY, 1992

TABLE OF CONTENTS

SUMMARY

On September 5, 1991, the City of Lytle submitted a request for the Edwards Underground Water District (EUWD) to perform a leak detection/location survey on its water distribution system. On November 25, 1991, a presurvey conference was held at the Lytle City Hall to discuss the work to be performed. It was agreed that EUWD would perform sonic leak detection on all available access points, computerized leak location as needed, record all system deficiencies found, and submit to the City an updated master water plat with the final report.

The survey began December 2, 1991, and was concluded on January 31, 1992. Over the course of the survey, EUWD surveyed a total of 1,274 access points, including 973 customer service connections, 94 fire hydrants, 197 main valves, and 10 blow-off valves covering 29.40 miles of distribution main.

EUWD detected a total of 31 leaks. This total included 1 valve leak, 2 meter box leaks, 5 fire hydrant leaks, 6 service line leaks, 1 main line leak, and 16 customer side leaks. EUWD estimates 9,128 gallons per day has been saved by the repair of 10 detected leaks as of January 31, 1992. The leaks repaired to date range from 7,200 gallons per day to 3 gallons per day.

As part of the survey, EUWD located 144 buried main line valves with a ferromagnetic detector. EUWD noted 56 water meters that were not registering accurately and an additional 58 meter boxes that need cleaning.

DISCUSSION

A. Total Access Points Surveyed - 1,274

1. Customer Service Connections - 973
2. Main Line Valves - 197
3. Fire Hydrants - 94
4. Blow Off Valves - 10

B. Total Miles of Distribution Main Surveyed - 29.40

C. Total Leaks Detected - 31

Total estimated water saved by repair of detected leaks in gallons per day as of March 10, 1992 - 9,128 G.P.D.

Main line, service line, fire hydrant, and valve leaks were detected by ground microphone correlation of leak sounds or by visual inspection. Meter box leaks and customer side leaks were found through house to house surveying.

Leakage estimates for main line, service line, fire hydrant, valve, and meter box leaks are based on hole size and system pressure in P.S.I., this information was furnished by City of Lytle personnel when EUWD was not on site at the time of repair. Leakage estimates are only recorded for leaks repaired as of March 10, 1992.

EUWD would appreciate a list of leakage estimates for all detected leaks repaired after March 10, 1992 for our records. A leakage estimating chart is enclosed for your convenience.

1. Service Line Leaks - 6
   Leakage estimates in gallons per day - 775 G.P.D.
   Leaks to be repaired - 1

   A list of these leaks is included in Appendix A.

2. Fire Hydrant Leaks - 5
   Leakage estimates in gallons per day - 1,140 G.P.D.
   Leaks to be repaired - 3

   Some fire hydrants may be reseated by flushings, others will need repair or replacement. A list of these hydrants is included in Appendix B.

3. Main Line Leaks - 1
   Leakage estimate in gallons per day - 7,200 G.P.D.

   A. Benton City Rd. - Repaired 1/4/92

4. Meter Box Leaks - 2
   Leakage estimate in gallons per day - 13 G.P.D.

   A. 19404 Somerset Rd. - Repaired 2/8/92
   B. 15368 Cottage Street - Repaired 3/10/92

5. Blow Off Valve Leaks - 1
   Leakage estimate in gallons per day - 0
   15368 Dawson @ Houston St.

6. Customer Side Leaks - 16
   Customer side leaks were generally small. EUWD was unable to estimate this water loss. Customers were notified in person when possible or by letter from the City of Lytle.

D. Main Line Valves Located by EUWD - 144
Suspected locations were surveyed by EUWD with a ferromagnetic detector to locate buried main line valves. As of March 10, 1992 128 of 144 valves had been excavated. All valve stacks will need to be raised to final grade. It is conceivable that additional valves remain unlocated within the system. Please see recommendations number I and II. A list of these valves is included in Appendix D.

E. General Maintenance Needed

1. Meter Boxes Needing Cleaning - 58
   The condition of these boxes is such that meter reading is difficult and the curb stops are inaccessible. A list of these boxes is included in Appendix F.

2. Meter Boxes Needing Repair or Replacement - 2
   A. 14651 U.S. Hwy 132 South
   B. 14627 Railroad St.

3. Valve Stacks Needing Cleaning or Repair - 3
   A. 19680 Benton City Road
   B. 15011 Adams St.
   C. Adams St. @ Pecan St.

   The condition of these valve stacks make them unusable at this time.

F. Slow Water Meters - 56

During house to house surveying, water use was detected on these services. Meters were not registering this flow or was observed sticking and/or jumping.

G. Water System Distribution Plats Submitted to the City of Lytle.

1. All plats were hand drawn by EUWD, using the City of Lytle street layout maps as a guide. The water distribution system was divided into ten (10) separate plats. A map key is

provided for your convenience. (As built plans were used where available). Long distance distribution and transmission mains were field measured from access point to access point. Main line size and type of material was furnished by City of Lytle personnel. Main line valve, customer service connections, fire hydrants with and without lead valves, and blow off valves were hand drawn on the master water system distribution plats included with this report. Fire hydrants labeled on the plat as fire hydrants without lead valves are hydrants where the lead valve could not be located or does not exist. All items hand drawn on the plats, are for access point accounting. The location and placement of these items is intended to indicate what was actually found in the field survey. Placement of hand drawn main line valves on the plat is the technician's best guess of what they control. Every effort was made to ensure the accuracy of these plats, but EUWD does not guaranty the accuracy. Please see recommendation number 1.

2. Codes for Master Water Plats

A. Yellow color indicates mains and services surveyed from access points.

*B. Blue color indicates surveyed with a ground microphone due to lack of access points.

*All mains were surveyed from all available access points. The spacing between access points on these sections is too great to survey properly.

All valves located were surveyed. When direct contact could not be made on a valve, a probe rod was used.

RECOMMENDATIONS

I. Develop master water distribution plats from "As Built" plans, EUWD plat, and utilizing the knowledge and expertise of long term field employees. Master plats should show locations of all main valves, fire hydrants, blow offs, drain or flush valves, air relief valves, and pressure regulating valves. Revised plats should be made available to field maintenance supervisors for use in the operation and maintenance of the water distribution system.

II. Utilizing the revised master distribution plats, all distribution system main line valves should be located, marked, cleaned, tested, and repaired or replaced as needed. The use of valve marker posts are recommended on main line valves subject to being lost or buried. Time spent searching for lost or buried main valves and flushing fire hydrants to reduce pressure and volume for leak repair is a major source of water loss.

III. Implement an in-house main line valve preventive maintenance program for inspection and operation of all valves on a routine basis. Please see enclosed valve maintenance packet.

IV. Implement a fire hydrant preventive maintenance program in-house or in conjunction with the local fire department. All hydrants should be inspected, flushed, lubricated, and painted on a routine basis. Please see enclosed fire hydrant maintenance packet.

V. Install lead valves as part of the installation on all new or replacement fire hydrants.

VI. All water mains listed as abandoned, should be checked to ensure that the main has been physically separated from the active water system instead of just being valved off. These locations are a potential sources of water loss if valve leakage occurs.

VII. During the course of the survey, EUWD technicians noted numerous meters in need of replacement. We recommend the initiation of a systemwide customer meter maintenance program. System meters should be upgraded through an ongoing meter change out program. This program would involve replacing a specified number of meters each month with new or rebuilt meters, until all system meters have been replaced.

All meter installations should be reviewed to determine whether the meter is properly sized and the correct type for the current use and flow-demand.

Water meters are designed to deliver a maximum flow for short periods and a lower flow for long periods without sustaining damage or above normal wear. If a meter is operating outside its intended range, it cannot register all flow, even though it may be calibrated. We recommend that all well meters and a

percentage of large commercial meters be tested in place yearly for accuracy. Please see enclosed meter information sheets.

VIII. Consider ductile iron pipe for the primary main line material used for new installations and main replacement instead of P.V.C.. Ductile iron pipe has proven to have a long service life and its sound carrying characteristics for leak detection are far superior to P.V.C. pipe.

IX. EUWD recommendations for distribution system improvements requested by the Public Works Department of the City of Lytle.

A. Loop existing dead end mains to improve system flow characteristics, reduce surging and decease the need for dead end flushing.

1. Frio City Road existing main to existing main on Wisdom Road at Ball Road.
2. Mason St. existing main to existing main on Wisdom Road.
3. Pecan St. existing main to existing main on Benton St.
4. Oak St. existing main to existing main on South Bank St.
5. US 132 existing mains between Lytle St. and FM 2790.
6. Live Oak existing main to existing main on North Benton.
7. Cottage St. existing main to existing main on N. Somerset.
8. Houston St. existing main to existing main on Somerset.
9. Houston St. existing main to existing main from Adams St. west of Dawson St.
10. Lake St. existing main between Wisdom Rd. and Benton St.
11. South Somerset existing mains at US 132 to existing main at Somerset at Railroad St.

B. Replacement of undersized small diameter old galvanized mains.

1. Along N. Prairie St. between Laredo and Adams.
2. Along Adams St. between Benton and D'Hanis.
3. Along Houston St. between D'Hanis and FM 2790.
4. Along Oak St. between S. Bank to S. Prairie St.
5. Along Florence St. between Mesquite St. and Magnolia.
6. Along Railroad St. between S. Davis and Gray St.
7. Along Martin St. between Oak St. and US 132.
8. Along US 132 between Lytle St. to FM 2790.

COMMENTS

I greatly appreciate the assistance and cooperation I received from the management and staff of the City of Lytle. I applaud your interest in water conservation and the District's Leak Detection Program and are grateful for the opportunity to survey your water system.

The active participation of Alfredo Aguinaga and Skip Traeger in this survey is greatly appreciated. Their knowledge, experience, enthusiasm, and professional work habits contributed to its success.

Your efforts and the timely repair of the leaks recorded in this report will save a significant amount of precious water. My thanks to all the staff for your efforts in helping to conserve the Edwards Aquifer.

Mark L. McGinnis
Leak Detection Technician I

MML/bmc

APPENDIX A

Service Line Leaks (6)
City of Lytle

Line	Location	Estimated Water Loss G.P.D.	Date Repaired
1	13945 Rippling Brook	720 G.P.D.	12/13/91
2	14915 Highway 81	10 G.P.D.	1/16/91
3	18628 N. Benton St.	20 G.P.D.	2/26/92
4	19275 Road 200	10 G.P.D.	1/31/92
5	15730 Road 200	15 G.P.D.	1/15/92
6	18620 Live Oak		Pending

APPENDIX B

Fire Hydrant Leaks (5)
City of Lytle

Line	Location	Estimated Water Loss G.P.D.	Date Repaired
1	Diamond B.		Pending
2	N. Somerset @ Adams		Pending
3	15011 Adams	720 G.P.D.	Unknown
4	Live Oak @ Norvell		Pending
5	Blume Dr.	420 G.P.D.	1/31/92

APPENDIX C

Customer Side Leaks (16)
City of Lytle

Line	Location
1	19529 Somerset Rd.
2	Benton City Rd.
3	15213 Adams
4	14838 Adams
5	14827 Adams
6	18995 Live Oak
7	19005 Live Oak
8	18626 Wisdom Rd.
9	15385 Laredo St.
10	15421 Lake St.
11	18827 Prairie St.
12	15606 Road 200
13	19480 FH 2790
14	15005 Fri City Road
15	19524 S. Benton St.
16	19243 D'Hanis

APPENDIX D

Main Line Valve Stacks To Be Raised To Grade (144)
City of Lytle

Line	Location	Number of Valve's	
1	Benton City Road	1	Located
2	20202 Benton City Road	3	"
3	IH 35 access road	1	"
4	FM 2790	1	"
5	13375 FM 2790	1	"
6	FM 2790 before creek crossing	1	"
7	Lytle-Somerset Rd.	1	"
8	Lytle-Somerset Rd. near fire hydrant	1	"
9	Lytle-Somerset Rd. @ Lazy J.	1	"
10	Lytle-Somerset Rd. @ Harris Trailer Park	1	"
11	Lazy J. @ Star Cross	1	"
12	19610 Benton City Road	2	"
13	Magnolia @ Benton City Road	1	"
14	Mesquite St. @ Benton City Road	3	"
15	US 81 @ Lytle St.	2	"
16	FM 2790 Next to Office	1	"
17	FM 2790 @ US 132	1	"
18	Railroad St. @ Davis	1	"
19	Railroad St. @ coin dispenser	1	"
20	Railroad St. @ Prairie St.	2	"
21	Railroad St. @ Lytle St.	1	"
22	US 132	1	"
23	14633 US 132	1	"

APPENDIX D (Cont.)

Main Line Valve Stacks To Be Raised To Grade (144)
City of Lytle

Line	Location	Number of Valve's	
24	Rolling Meadows @ Heather Glen	1	"
25	Rolling Meadows @ Willow Ln.	1	"
26	Rolling Meadows @ Rippling Brook	1	"
27	IH 35 @ Rolling Meadows	1	"
28	Adams St. @ Pine St.	1	"
29	Pine St. @ tee	2	"
30	N. Pecan @ Adams St.	1	"
31	Adams St. @ park entrance	2	"
32	Adams St. @ Lytle St.	2	"
33	Adams St. next to tee ball field	4	"
34	Somerset Rd. @ Adams St.	3	"
35	D'Hanis St. @ Adams St.	4	"
36	Somerset Rd. @ Live Oak St.	2	"
37	Mason St. @ Live Oak St.	3	"
38	Norvell St. @ Live Oak St.	3	"
39	Wisdom Rd. at Lake St.	2	"
40	Newton Dr. @ Wisdom Rd.	3	"
41	Norvell St. @ Wisdom Rd.	3	"
42	N. Somerset @ Laredo St.	5	"
43	Prairie St. @ Laredo St.	1	"
44	Laredo St. @ Elias St.	2	Located
45	Easy St. @ Cottage St.		

APPENDIX D (Cont.)

Main Line Valve Stacks To Be Raised To Grade (144)
City of Lytle

Line	Location	Number of Valve's	
46	D'Hanis @ Cottage St.	1	"
47	Cottage St. @ Prairie St.	1	"
48	D'Hanis @ Houston St.	1	"
49	Prairie St. @ Lake St.	5	"
50	Frio City Road @ FM 2790	1	"
51	FM 2790 @ the power plant	1	"
52	FM 2790 @ FM 463	1	"
53	Atascosa Creek Trailer Park	2	"
54	Road 200 @ Atascosa Creek	2	"
55	Railroad tracks @ FM 2790	4	"
56	US 132 @ FM 2790 North	3	"
57	US 132 @ Gray St.	2	"
58	US 132 @ Cortez	4	"
59	US 132 @ line to Coal Mine	1	"
60	San Jose @ Diaz	1	Pending
61	San Jose @ Juarez	2	"
62	San Jose @ Hidalgo	3	"
63	Hidalgo St. @ Coal Mine	1	"
64	San Juan @ Diaz St.	3	"
65	San Juan @ Juarez	2	"
66	San Juan @ Hidalgo	2	"
67	Hidalgo @ Hernandez St.	1	Located
68	Martin @ Oak St.	3	"

APPENDIX D (Cont.)

Main Line Valve Stacks To Be Raised To Grade (144)
City of Lytle

Line	Location	Number of Valve's	
69	Martin @ Hester St.	2	"
70	S. Prairie @ Oak St.	2	"
71	Prairie @ Mesquite St.	3	"
72	Florence St. @ S. Pecan	1	"
73	Mesquite @ Benton	1	"
74	S. Benton @ Magnolia St.	1	"
75	Railroad St. @ Somerset St.	3	"
76	Somerset @ Hester	1	"
77	US 132 @ Post Office	1	Pending
78	Prairie @ Adams	1	"
79	N. Benton @ Adams	1	"

APPENDIX E

Slow Water Meters (56)
City of Lytle

Line	Location	Date Changed
1	15158 Hester St.	1/27/92
2	15362 Cottage St.	1/27/92
3	14945 Main St.	1/16/92
4	14915-2 Main St.	1/16/92
5	14016 Heather Glen	1/17/92
6	18360 FM 2790	1/14/92
7	19529 Somerset Rd.	2/21/92
8	15144 Norvell	1/27/92
9	#20318031 Main St.	2/17/92
10	19625 Main St.	2/21/92
11	Pecan Grove Apt. #1	2/21/92
12	18350 Wisdom Rd.	2/21/92
13	19615 Martin St.	2/21/92
14	15415 Oak St.	2/26/92
15	Pecan Grove Apt. #4	2/21/92
16	19559 Somerset Rd.	2/5/92
17	15480 Hester St.	2/21/92
18	15368 Cottage St.	2/5/92
19	15397 Adams St.	3/4/92
20	15387 Adams St.	3/4/92
21	15327 Adams St.	3/4/92
22	15321 Adams St.	3/4/92

APPENDIX E (Cont.)

Slow Water Meters (56)
City of Lytle

Line	Location	Date Changed
23	15245 Adams St.	3/4/92
24	15235 Adams St.	3/4/92
25	15229 Adams St.	3/4/92
26	15217 Adams St.	3/4/92
27	15213 Adams St.	3/4/92
28	14805 Adams St.	3/4/92
29	14813 Adams St.	3/4/92
30	14913 Adams St.	3/4/92
31	14923 Adams St.	3/4/92
32	14935-1 Adams St.	3/4/92
33	18823 Pine St.	3/6/92
34	14813 Adams St.	3/6/92
35	14815 Adams St.	3/6/92
36	14827 Adams St.	3/6/92
37	14833 Adams St.	3/6/92
38	14849 Adams St.	3/6/92
39	14903 Adams St.	3/6/92
40	15011 Adams St.	3/6/92
41	15015 Adams St.	3/6/92
42	15133 Adams St.	Pending
43	15249 Adams St.	
44	15235 Adams St.	Pending
45	15109 Main St.	

APPENDIX E (Cont.)

Slow Water Meters (56)
City of Lytle

Line	Location	Date Changed
46	15133 Main St.	Pending
47	15137 Main St.	Pending
48	15055 Main St.	Pending
49	15321 Main St.	Pending
50	18510 Live Oak St.	Pending
51	18062 Wisdom Rd.	Pending
52	18103 Wisdom Rd.	Pending
53	18715 N. Benton St.	Pending
54	18428 FM 2790 N.	Pending
55	18714 Prairie St.	Pending
56	Diaz @ San Jose St. #38271780	

APPENDIX F

Meter Boxes Needing Cleaning (58)
City of Lytle

Line	Location
1	19750 IH 35
2	19710 IH 35
3	19690 IH 35
4	19358 FM 1518
5	19239 FM 1518
6	19260 FM 1518
7	19232 FM 1518
8	19545 S. Somerset St.
9	18795 Willow Ln.
10	18655 Rolling Meadows
11	19680 Benton City Rd.
12	19545 S. Somerset Rd.
13	195412 S. Somerset Rd.
14	15048 Mesquite
15	15032 Mesquite
16	15020 Mesquite
17	15169 Mesquite
18	15156 Oak St.
19	19329 S. Somerset
20	18185 IH 35 South
21	14633 US 81 South
22	FM 2790 Willis Vogel
23	13375 FM 2790

APPENDIX F (Cont.)

Meter Boxes Needing Cleaning (58)
City of Lytle

Line	Location
24	13355 FM 2790
25	12925 FM 2790
26	19608 Benton City Road
27	19231 FM 2790
28	14727 Railroad St.
29	19323 Prairie St.
30	15063 Main St.
31	15103 Main St.
32	15121 Main St.
33	15127 Main St.
34	15141 Main St.
35	14815 Adams St.
36	15227 Houston St.
37	19095 Somerset Rd.
38	18823 Live Oak St.
39	18108 Wisdom Rd.
40	18504 Wisdom Rd.
41	18525 Wisdom Rd.
42	18619 Wisdom Rd.
43	18709 Wisdom Rd.
44	18725 Wisdom Rd.
45	18801 Wisdom Rd.
46	18805 Wisdom Rd.

APPENDIX F (Cont.)

Meter Boxes Needing Cleaning (58)
City of Lytle

Line	Location
47	18720 North Benton St.
48	18619 North Benton St.
49	18602 Prairie St.
50	18802 Prairie St.
51	18730 FM 2790 North
52	18906 Prairie
53	15362 Cottage St.
54	19215 D'Hanis
55	Oak St. Cleaners
56	Cortez Road Victor Perez
57	18900 Prairie
58	18807 Wisdom Road

APPENDIX G

Missing Lids (2)
City of Lytle

Location	Type
15419 Fri City Road	Meter Box Lid
19556 FM 2790	Meter Box Lid