DWR-ERP

Emergency Response Plan

Leak Detection

California

Rural Water Association

Date

February 23rd 2021

Mark Hardison - Leak Detection Specialist lll
California Rural Water Association
Critical Zone Leak Detection

PWS System

Lake Francis Mutual Water Company
PO Box 422 Dobbins Ca 95935
Ethel S Winchell - Board Memeber
(530) 741-0820 / ethel@lakefrancisestates.org

Quality On Tap!

Our Commitment Our Profession

Leak Report

Date:	02/16/2022
System:	Lake Francis Mutual Water Company
Leak Detection members:	M. Hardison
Equipment Used:	FCS Correlator/Acoustic Ground Mic/DXmic Pro Ground Mic
Map Reference:	Diamond Maps/Google/GPS/GIS Map

Street and/or Block Numbers:

Shirley Drive/Ingersoll Drive

Leak Number	Address of Suspected Leak	Utility or Customer (U or C)	Leak Pinpointed (Y or N)	Leak to be Rechecked (Y or N)	Leak Repaired (Y or N)	Comment
1	Kenneth/Ingersoll	U	Y	N	N	Leaking Wharf Head

	Meters / Corp Stop	Hydrants	Valves	Test Rods	Other
Indicate Number of Manual Listening Points Used	13	5	0	0	N/A
Indicate Number of Leak Noise Loggers Listening Points Used	0	0	0	0	N/A

Miles of Mains Surveyed:	0.36	Survey Time: (Hours)	4.0
Number of Leaks Suspected:	1	Rechecked: (Numbers)	0
Number of Leaks Pinpointed:	1	Pinpointing Time: (Hours)	0.25

Remarks:

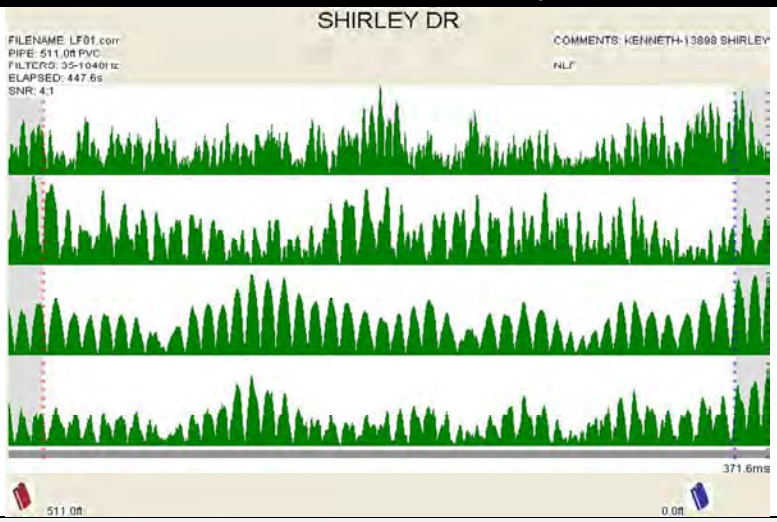
Leaking Wharf Head at Ingersoll Dr/Kenneth Ave. discovered during visual inspection on survey #4. See photo of leaking Wharf Head on page 11.

Ground Mic Log

Address	Meter/Corp	Valve	Hydrant	Wharf Head	Stand Pipe	Leak Detected	Notes
Kenneth/Shirley				✓			
13898 Shirley Dr	✓			✓			
13882 Shirley Dr	✓						
13908 Shirley Dr	✓						
Lot #3 Shirley Dr	✓			✓			
13931 Ingersoll Dr	✓						
Lot #5 Ingersoll Dr	✓						
Lot #6 Ingersoll Dr	✓						
Lot #34 Ingersoll Dr	✓						
Lot #35 Ingersoll Dr	✓						
13889 Ingersoll Dr	✓			✓			
13931 Ingersoll Dr	✓						
13886 Ingersoll Dr	✓						
Lot #11 Ingersoll Dr	✓						
Kenneth/Ingersoll				✓		✓	Leaking from Wharf Head

Leak Detection Survey Results

Survey #1



Survey Graph

The Correlator program allows for a "***Snapshot Option***". When the snapshot button is pressed during a correlation, the snapshot feature effectively enables the operator to compare noise levels at different points during the correlation process. When a leak is detected, the graph will have a peak in the same spot and will be located in the same spot on all snapshots. This will indicate the presence of a leak.

The correlation has detected a "Leak(s)".

The Correlator displays a peak in all snapshots graphs in the same spot but is not leak due too:

Water passing through a meter.	Running pumps.	Pressure Reducing Valve.
Electrical (Transformer).	Illegal service.	Underground Sewer, Power, Cable lines.
		Gas Service

The correlation has detected "No leak(s)".

✓ The Correlator program snapshots are all differ in graph peaks, this indicates flow due to pumping, pressure surges or momentary use of water through meter(s).

The correlation has detected "No leak(s)".

The Correlator program displays a "***Center Correlation***". The graph peak is in the center of the screen with equal footage on each side indicates the program sensor at a 50/50 point hears no sounds.

The correlation has detected "No leaks".

Remarks:

No leaks were found during this survey.

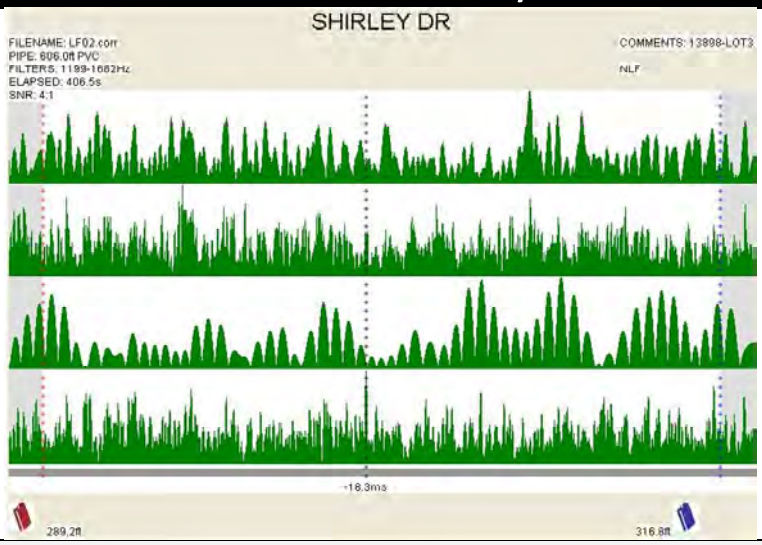
Location:

Wharf Head at Kenneth Ave/Shirley Dr. to Wharf Head at 13898 Shirley Dr.

Hydrant	2
Valve	
Corp Stop	
Diameter	4"
Material	PVC
Length	511'

Leak Detection Survey Results

Survey #2



Survey Graph

The Correlator program allows for a "***Snapshot Option***". When the snapshot button is pressed during a correlation, the snapshot feature effectively enables the operator to compare noise levels at different points during the correlation process. When a leak is detected, the graph will have a peak in the same spot and will be located in the same spot on all snapshots. This will indicate the presence of a leak.

The correlation has detected a "Leak(s)".

The Correlator displays a peak in all snapshots graphs in the same spot but is not leak due too:

Water passing through a meter.	Running pumps.	Pressure Reducing Valve.
Electrical (Transformer).	Illegal service.	Underground Sewer, Power, Cable lines.
		Gas Service

The correlation has detected "No leak(s)".

✓

The Correlator program snapshots all differ in graph peaks, this indicates flow due to pumping, pressure surges or momentary use of water through meter(s).

The correlation has detected "No leak(s)".

The Correlator program displays a "***Center Correlation***". The graph peak is in the center of the screen with equal footage on each side indicates the program sensor at a 50/50 point hears no sounds.

The correlation has detected "No leaks".

Remarks:

No leaks were found during this survey.

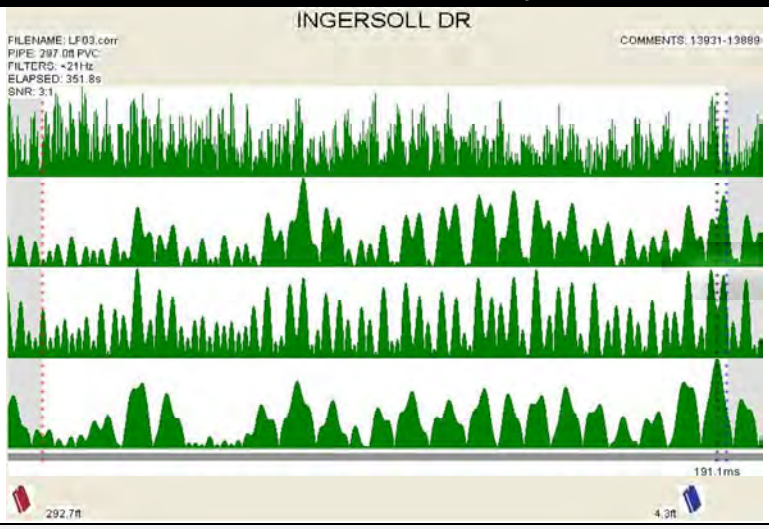
Location:

Wharf Head at 13898 Shirley Dr. to Wharf head at Lot#3 on Shirley Dr.

Hydrant	2
Valve	
Corp stop	
Diameter	4"
Material	PVC
Length	606'

Leak Detection Survey Results

Survey #3



Survey Graph

The Correlator program allows for a "***Snapshot Option***". When the snapshot button is pressed during a correlation, the snapshot feature effectively enables the operator to compare noise levels at different points during the correlation process. When a leak is detected, the graph will have a peak in the same spot and will be located in the same spot on all snapshots. This will indicate the presence of a leak.

The correlation has detected a "Leak(s)".

The Correlator displays a peak in all snapshots graphs in the same spot but is not leak due too:

Water passing through a meter.	Running pumps.	Pressure reducing Valve.
Electrical (Transformer).	Illegal service.	Underground Sewer, Power, Cable lines.
		Gas Service

The correlation has detected "No leak(s)".

✓ The Correlator program snapshots all differ in graph peaks, this indicates flow due to pumping, pressure surges or momentary use of water through meter(s).

The correlation has detected "No leak(s)".

The Correlator program displays a "***Center Correlation***". The graph peak is in the center of the screen with equal footage on each side indicates the program sensor at a 50/50 point hears no sounds.

The correlation has detected "No leaks".

Remarks:

No leaks were found during this survey.

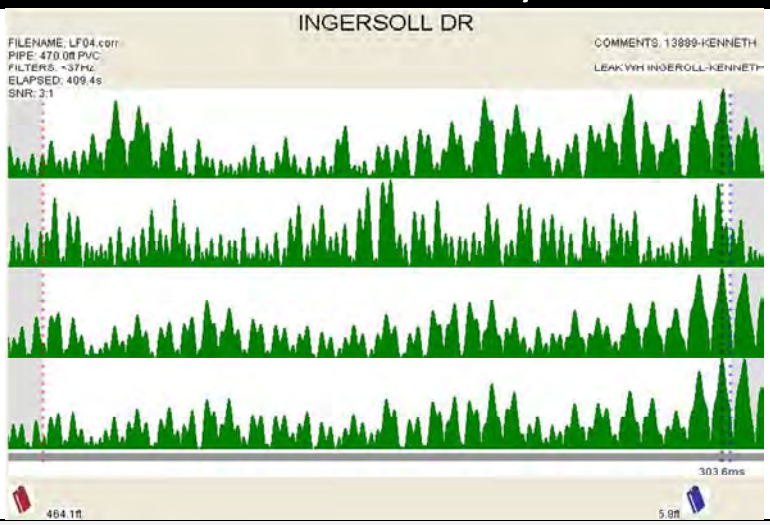
Location:

Meter at 13931 Ingersoll Dr. to Wharf head at 13889 Ingersoll Dr.

Hydrant	1
Valve	
Corp Stop	1
Diameter	4"
Material	PVC
Length	297'

Leak Detection Survey Results

Survey #4



Survey Graph

The Correlator program allows for a "***Snapshot Option***". When the snapshot button is pressed during a correlation, the snapshot feature effectively enables the operator to compare noise levels at different points during the correlation process. When a leak is detected, the graph will have a peak in the same spot and will be located in the same spot on all snapshots. This will indicate the presence of a leak.

The correlation has detected a "Leak(s)".

The Correlator displays a peak in all snapshots graphs in the same spot but is not leak due too:

Water passing through a meter.	Running pumps.	Pressure Reducing Valve.
Electrical (Transformer).	Illegal service.	Underground Sewer, Power, Cable lines.
		Gas Service

The correlation has detected "No leak(s)".

✓

The Correlator program snapshots all differ in graph peaks, this indicates flow due to pumping, pressure surges or momentary use of water through meter(s).

The correlation has detected "No leak(s)".

The Correlator program displays a "***Center Correlation***". The graph peak is in the center of the screen with equal footage on each side indicates the program sensor at a 50/50 point hears no sounds.

The correlation has detected "No leaks".

✓

Remarks:

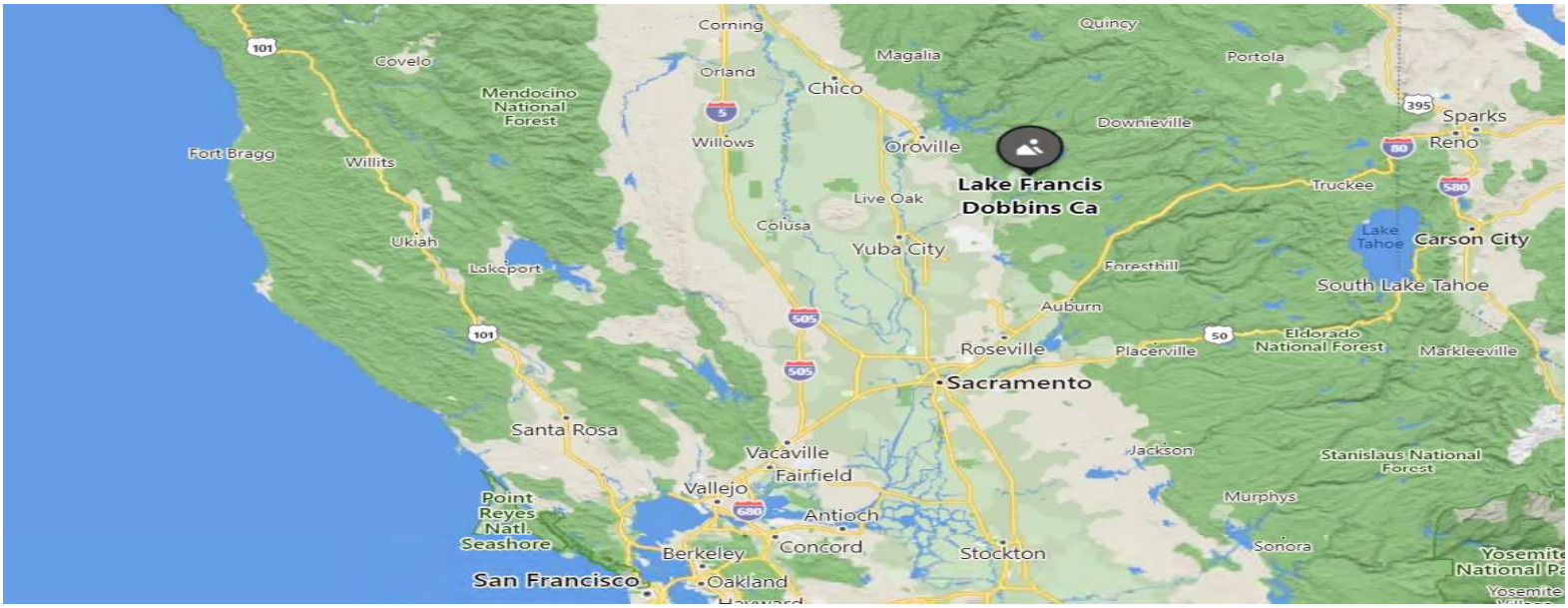
Leaking Wharf Head at Ingersoll Dr/Kenneth Ave. discovered during visual inspection on survey #4. See photo of leaking Wharf-Head on page 11. No additional leaks were found during this survey.

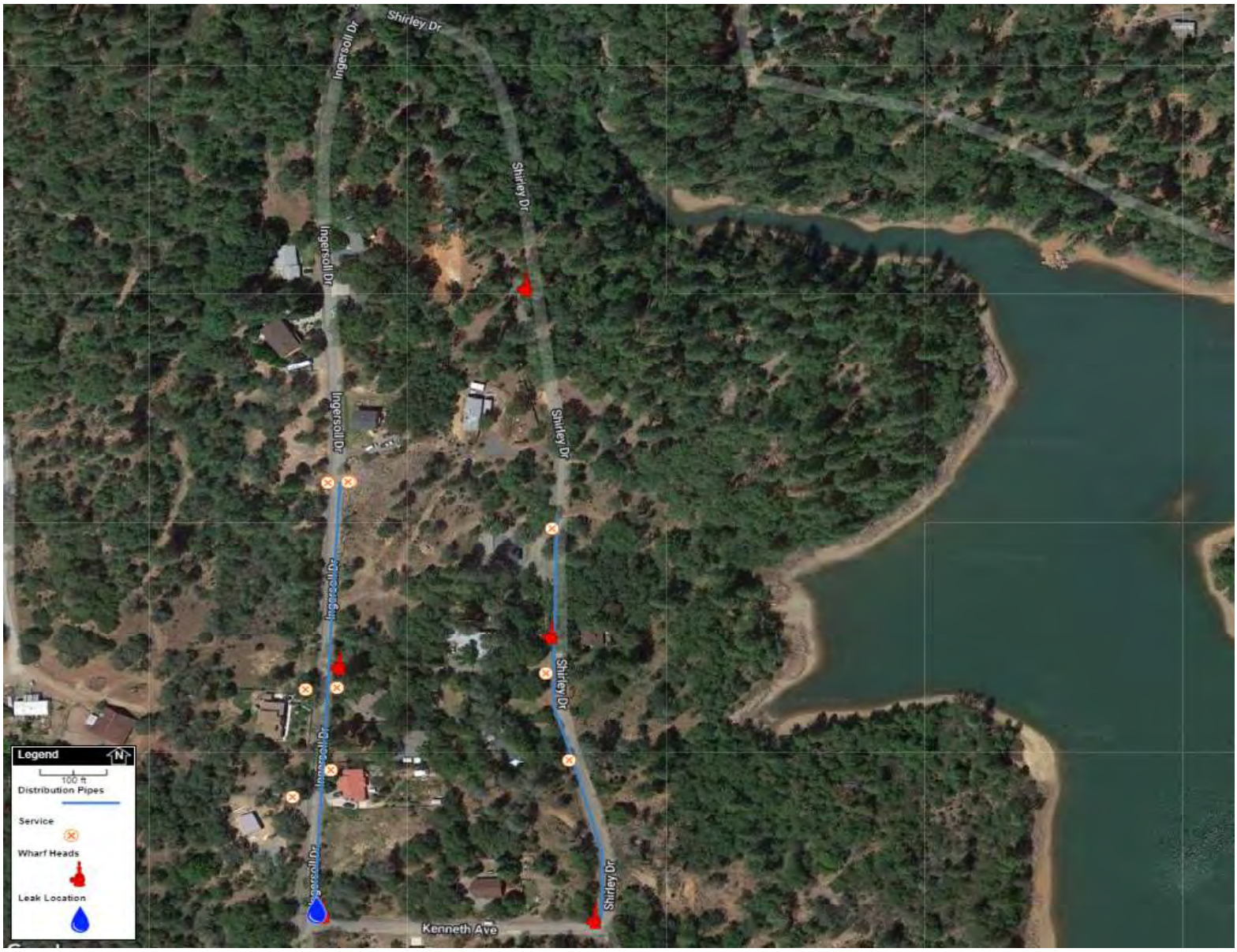
Location:

Wharf head at 13889 Ingersoll Dr. to Wharf head at Ingersoll Dr/Kenneth Ave.

Hydrant	2
Valve	
Corp Stop	
Diameter	4"
Material	PVC
Length	470'

CRWA Survey Map



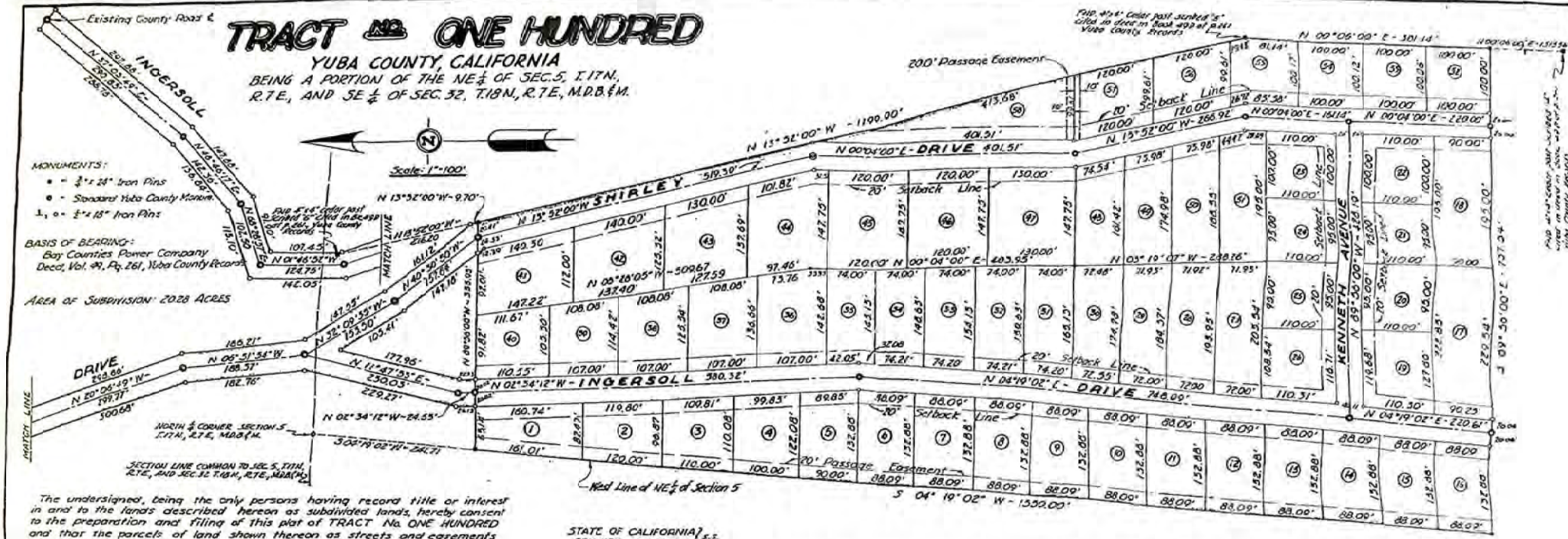


DiamondMaps.com

TRACT No. ONE HUNDRED

YUBA COUNTY, CALIFORNIA

BEING A PORTION OF THE NE¼ OF SEC. 5, T. 17N., R. 7E., AND SE ¼ OF SEC. 32, T. 18N., R. 7E., M.D.B.&M.



The undersigned, being the only persons having record title or interest in and to the lands described hereon as subdivided lands, hereby consent to the preparation and filing of this plat of TRACT No. ONE HUNDRED and that the parcels of land shown thereon as streets and easements are not dedicated for the use of the public, but are for the exclusive use of lot owners in the subdivision, their assignees, licensees, tenants and servants.

E. R. Ingersoll

G. R. Ingersoll

Emma Ingersoll

Yuba County Title Company, a corporation Trustee under Deed of Trust Recorded in Book 287 at Page 9 Official Records of Yuba County.

Ray J. Phillips, President

Donald J. Gavin, Vice President

STATE OF CALIFORNIA } s.s.
COUNTY OF YUBA }

On this 23rd day of September, 1960, before me a Notary Public in and for said County and State, residing therein duly commissioned and sworn, personally appeared E. R. Ingersoll and Emma Ingersoll known to me to be the persons whose names are subscribed to the within instrument and acknowledged to me that they executed the same.

In WITNESS WHEREOF, I have hereonto set my hand and affixed my Official Seal the day and the year in this certificate first above written.

Feb. 17, 1963
My commission expires

Notary Public in and for said County and State

STATE OF CALIFORNIA } s.s.
COUNTY OF YUBA }

On this 23rd day of September, 1960, Before me a Notary Public in and for said County and State, residing therein duly commissioned and sworn, personally appeared Ray J. Phillips and Donald J. Gavin known to me to be the President and Vice President of the corporation described in and that executed the within instrument, and also known to me to be the persons who executed the within instrument on behalf of the Corporation herein named, and they acknowledged to me that such Corporation executed the same.

In WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in this certificate first above written.

July 20, 1961
My commission expires

Notary Public in and for said County and State

I, Lawrence California hereby certify that I am a registered civil engineer of the State of California and that this map correctly represents a survey made by me or under my direction at the request of E. R. Ingersoll in July, 1960, and that the survey is true and complete as shown. All monuments shown hereon are of the character and occupy the positions indicated and are sufficient to enable the survey to be retraced.

Sept. 14, 1960
Date

Registered Civil Engineer License No 8958

I, Louis T. Mlcoch, County Surveyor of the County of Yuba, State of California, hereby certify that the within map of TRACT No. ONE HUNDRED is substantially the same as the tentative map on file and all the provisions of Division 4, Part 2, Chapter 2, Article 7, of the Business and professions Code of the State of California and any local ordinances applicable at the time of approval of the tentative map have been complied with and that I am satisfied that the within map is technically correct.

September 22, 1960
Date

County Surveyor, County of Yuba

Approved July 6, 1960
YUBA COUNTY PLANNING COMMISSION

Chairman

Secretary

STATE OF CALIFORNIA } s.s.
COUNTY OF YUBA }

I, Adrienne Conley, County Clerk of said County and State hereby certify that the Board of Supervisors of said County have [redacted] approved the within map of TRACT No. ONE HUNDRED for subdivision purposes in accordance with the conditional approval of the tentative map heretofore filed as approved, and the County of Yuba, on behalf of the public rejects any parcels of land offered for public use.

9-30-60
Date

County Clerk, County of Yuba

I, Mildred Topley, County Auditor of Yuba County, State of California, do hereby certify that there are no liens for State, County, or other taxes except 1960-1961 taxes, a lien but not yet payable, against the land designated on this map or any part thereof.

9-30-60
Date

County Auditor, County of Yuba

I, William C. Bassett, Tax Collector, in and for the County of Yuba, do hereby certify that there are no unpaid taxes against the land embraced within the boundaries of the herein embodied map or special assessments collected as taxes.

9-30-60
Date

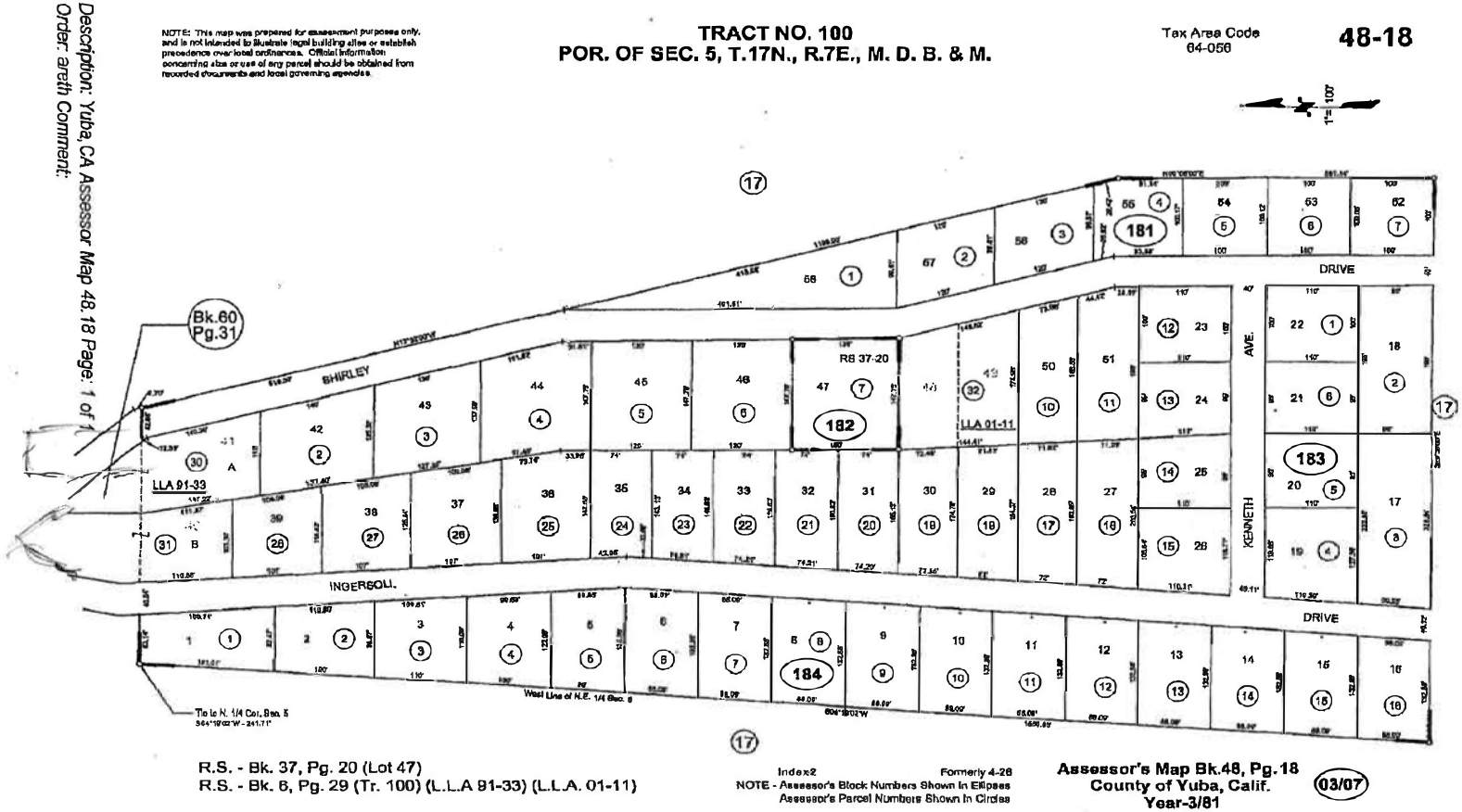
County Tax Collector, County of Yuba

Accepted for Record and filed in office of the Recorder of Yuba County, State of California at the request of Yuba County Title Insurance Co. at 9:48 o'clock A.M. On the 15th day of October, 1960, and Recorded in Book 6 of Page 29 Yuba County Records.

Fee $00

Recorder, County of Yuba

Description: Yuba, CA Assessor Map 48.18 Page: 1 of 1
Order: areth Comment:



CRWA Survey Pictures

A Sustainable Water Future For California

California has a large and growing gap between the amount of water available and the amount that people use. This gap can be illustrated by the large and ongoing shortfall in the state's two primary water sources: the Sacramento-San Joaquin River Delta and California's groundwater basins, which are collectively overtapped at the rate of about 6–7 million acre-feet per year. But California can fill this gap. Four simple solutions have the potential to generate 11–14 million acre-feet of water in new supplies and demand reductions. That's enough water to restore a thriving Delta and replenish depleted aquifers with millions of acre-feet to spare to support population and economic growth.

The following four solutions can generate 11-14 million acre-feet per year for California.

14 million acre-feet (total potential savings) =

- enough to serve 20 cities the size of Los Angeles every year
- enough to fill Shasta Lake—California's largest reservoir—three times

Agricultural Efficiency:
Agriculture, which uses about 80 percent of California's developed water supply, could reduce water use by **5.6–6.6 million acre-feet per year**, while maintaining current acreage levels and crop mix. This is a savings of about 17–22 percent of agricultural water use.

6.6 million acre-feet (potential agricultural efficiency savings) =

- enough to irrigate 2.5 million acres of fruits and nut trees
- enough to fill Lake Oroville—the state's second-largest reservoir—twice

Urban Efficiency:
Urban areas, which encompass residential and business uses and account for the remaining 20 percent of California's developed water use, could reduce water use by **2.9–5.2 million acre-feet per year,** or by about 32–57 percent.

5.2 million acre-feet (potential urban efficiency savings) =

- enough to supply 7 cities the size of Los Angeles every year
- equivalent to 100 ocean desalination plants, like the one being constructed in Carlsbad

Water Reuse:
Californians can stretch water supplies further by treating, where necessary, and reusing water for multiple purposes. The current water reuse potential, beyond what has already been achieved, is **1.2–1.8 million acre-feet per year.**

1.8 million acre-feet (potential water reuse savings) =

- enough to supply more than 2 cities the size of Los Angeles every year
- enough to irrigate 400,000 acres of vegetables

Stormwater Capture:
Capturing rainwater and storing it for later use instead of sending it to sewers and out to sea can increase water supplies and reduce pollution and treatment costs. Improving stormwater capture in just the Bay Area and urban Southern California can increase supply by **420,000–630,000 acre-feet per year.**

630,000 acre-feet (potential stormwater capture savings) =

- nearly enough water to supply Los Angeles every year
- enough water to fill about 300,000 Olympic-sized swimming pools

NRDC
The Earth's Best Defense

PACIFIC INSTITUTE

www.nrdc.org/water/ca-water-supply-solutions.asp
www.pacinst.org/publication/ca-water-supply-solutions

Save Our Water

WATER LOSS CHART

LEAK SIZE or DRIP	LEAK SIZE or DRIP	Amount Loss Per DAY *(Gallons)*	Amount Loss Per MONTH *(Gallons)*	Amount Loss Per YEAR *(Gallons)*
1 (One) Drop *per second*		4.5	139.5	1,642.5
2 (Two) Drops *per second*		9	279	3,285
3 (Three) Drops *per second*		18	558	6,570
1/16 Inch or 1.6mm		822	25,002.5	300,030
1/8 Inch or 3.2mm		2,850	86,687.5	1,040,250
1/4 Inch or 6.5 mm		11,400	346,750	4,161,000
1/2 Inch or 13mm		45,600	1,387,000	16,644,000