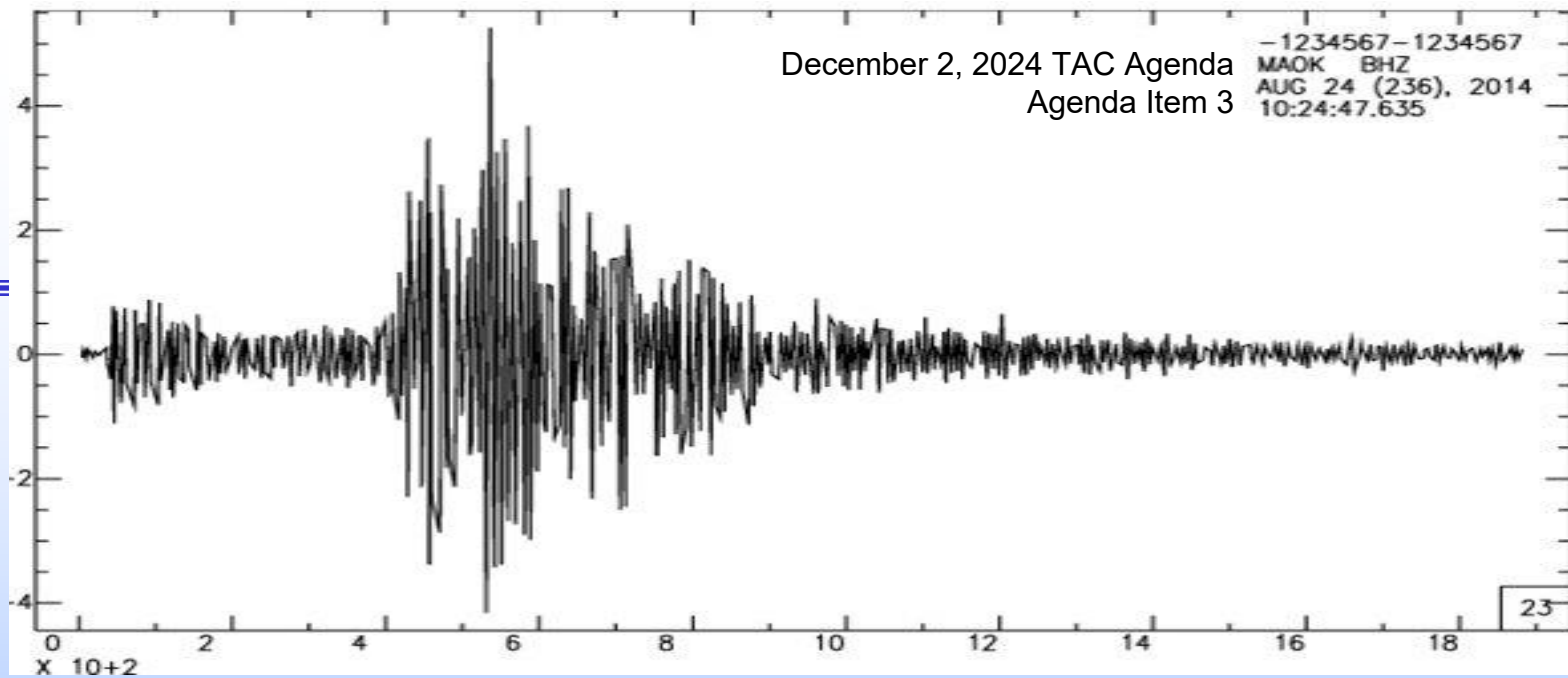




December 2, 2024 TAC Agenda  
Agenda Item 3

-1234567-1234567  
MAOK BHZ  
AUG 24 (236), 2014  
10:24:47.635



## 2014 South Napa Earthquake

### City of Napa Water System

120 leaks in 5 days ... and more

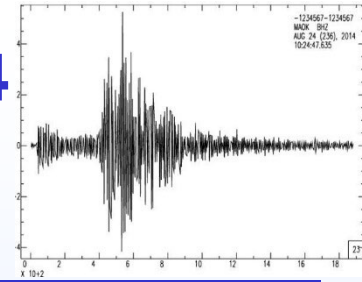




# South Napa Earthquake Aug 24, 2014

City of Napa Water System

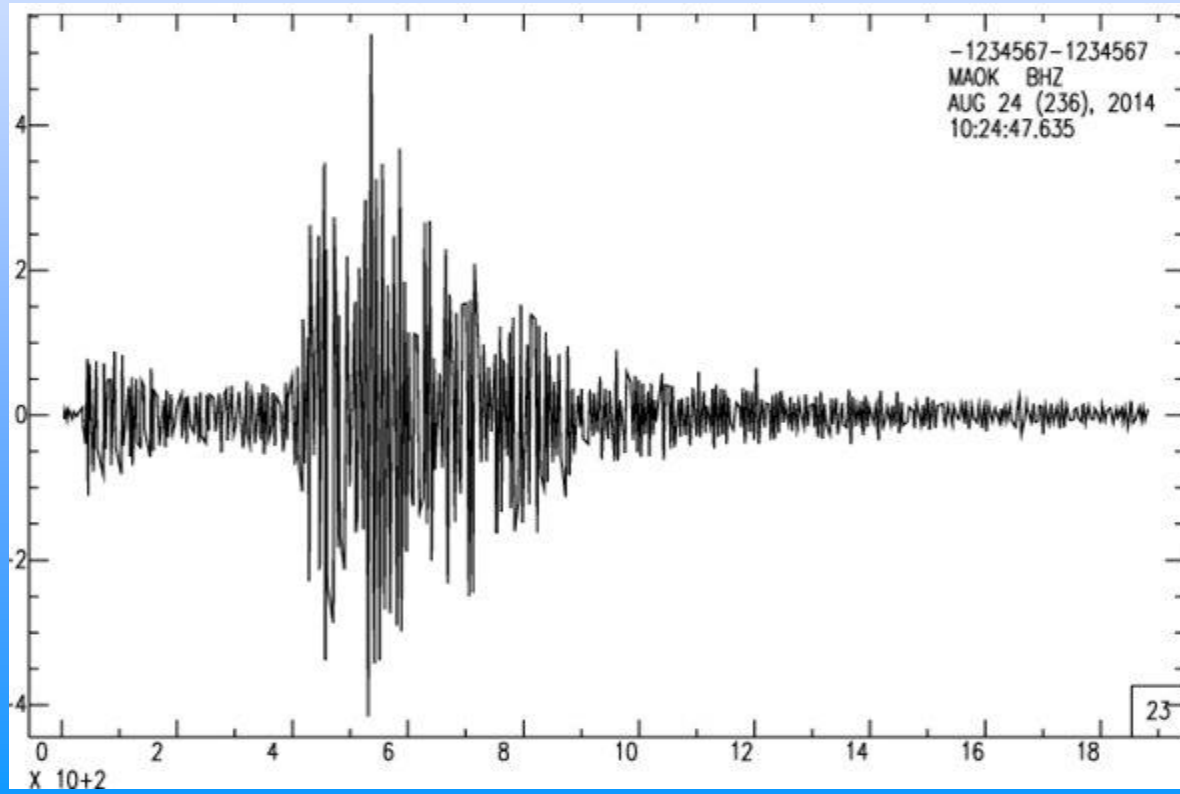
December 02, 2024



**Sunday, August 24, 2014**

**3:20 AM**

**Magnitude 6.0 Earthquake hit the South Napa Fault**



ST. HELENA

HENNESSEY TREATMENT PLANT  
WATER SOURCE  
LAKE HENNESSEY

Lake Hennessey / Conn Dam  
70% full 22,000 A-Ft

YOUNTVILLE

Milliken Reservoir/Dam  
35% full 450 A-Ft

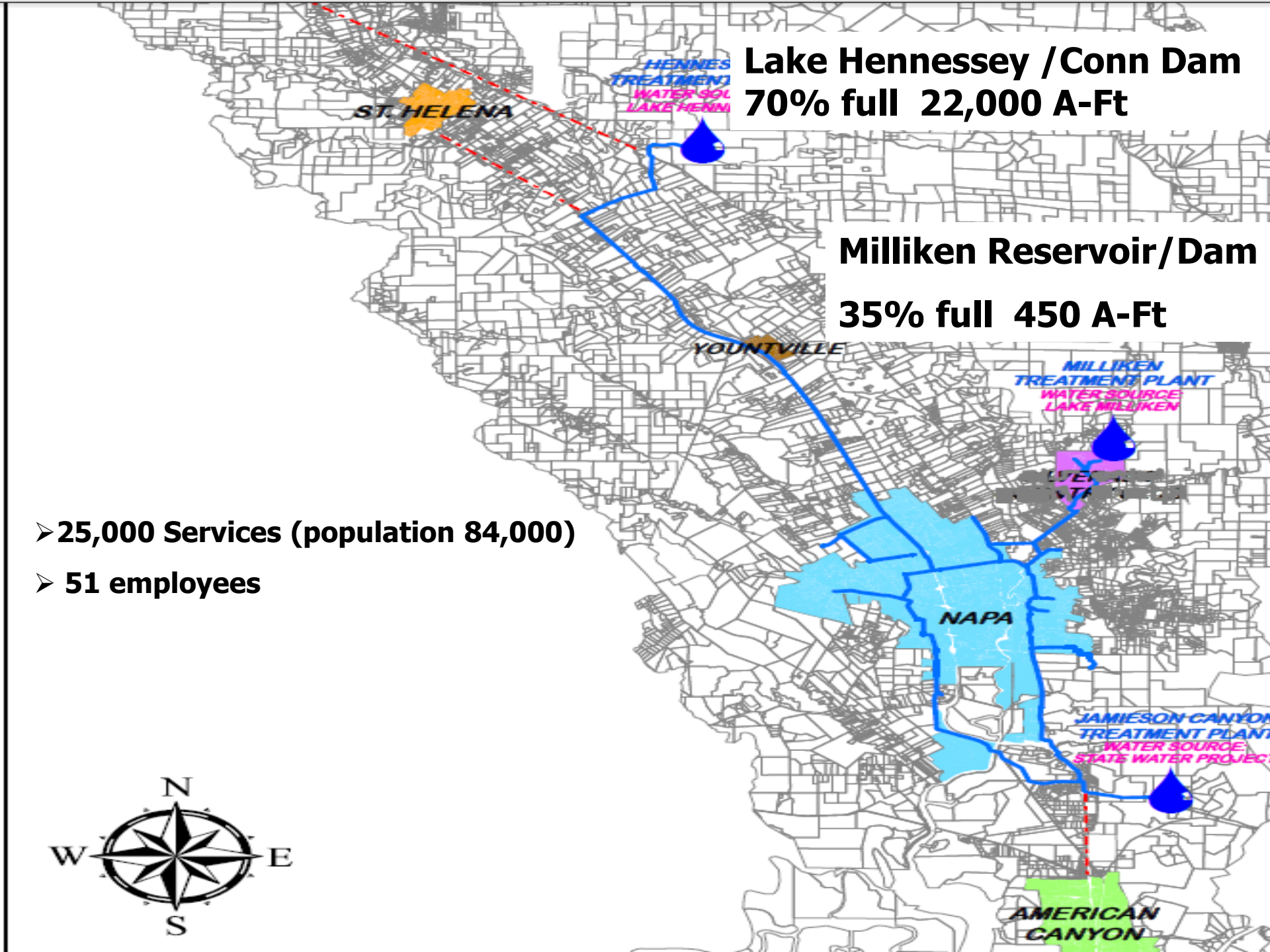
MILLIKEN TREATMENT PLANT  
WATER SOURCE  
LAKE MILLIKEN

NAPA

JAMIESON CANYON TREATMENT PLANT  
WATER SOURCE  
STATE WATER PROJECT

AMERICAN CANYON

- 25,000 Services (population 84,000)
- 51 employees

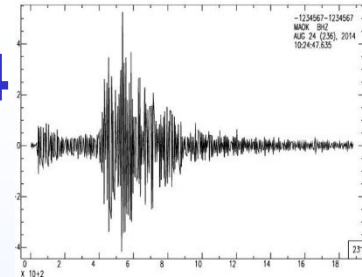




# South Napa Earthquake Aug 24, 2014

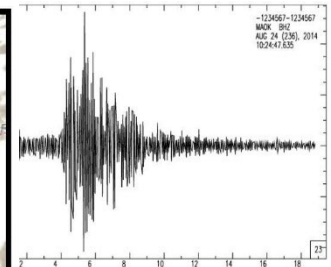
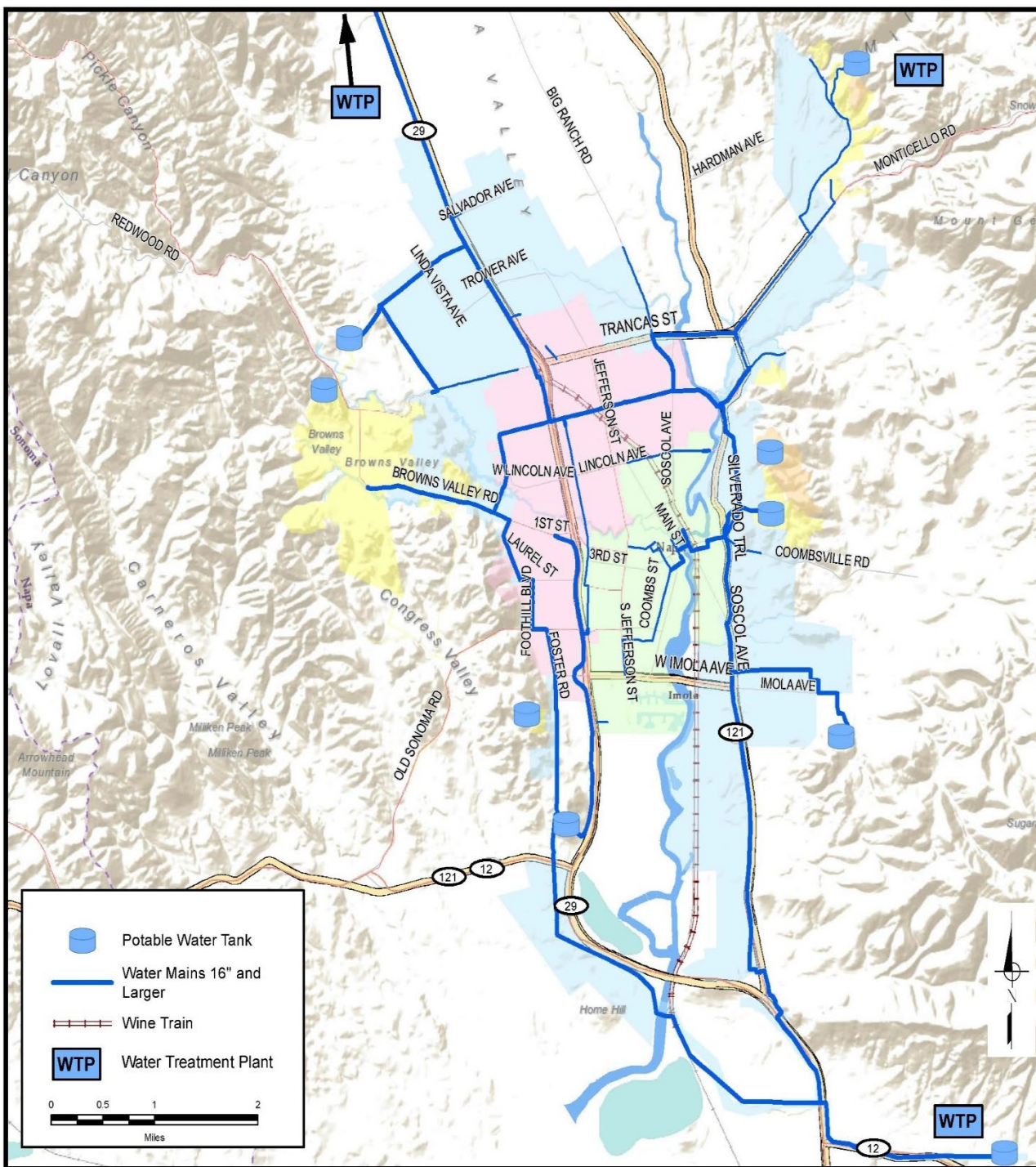
City of Napa Water System

December 02, 2024

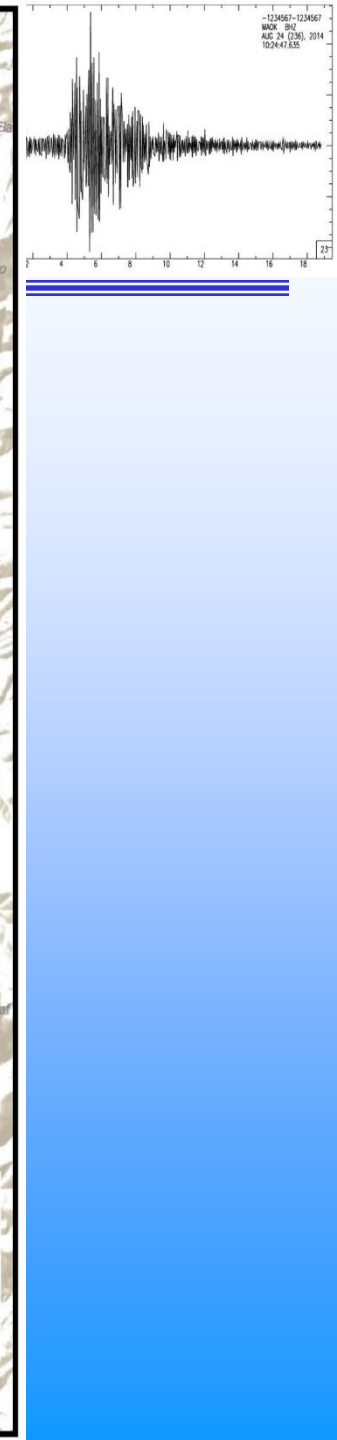
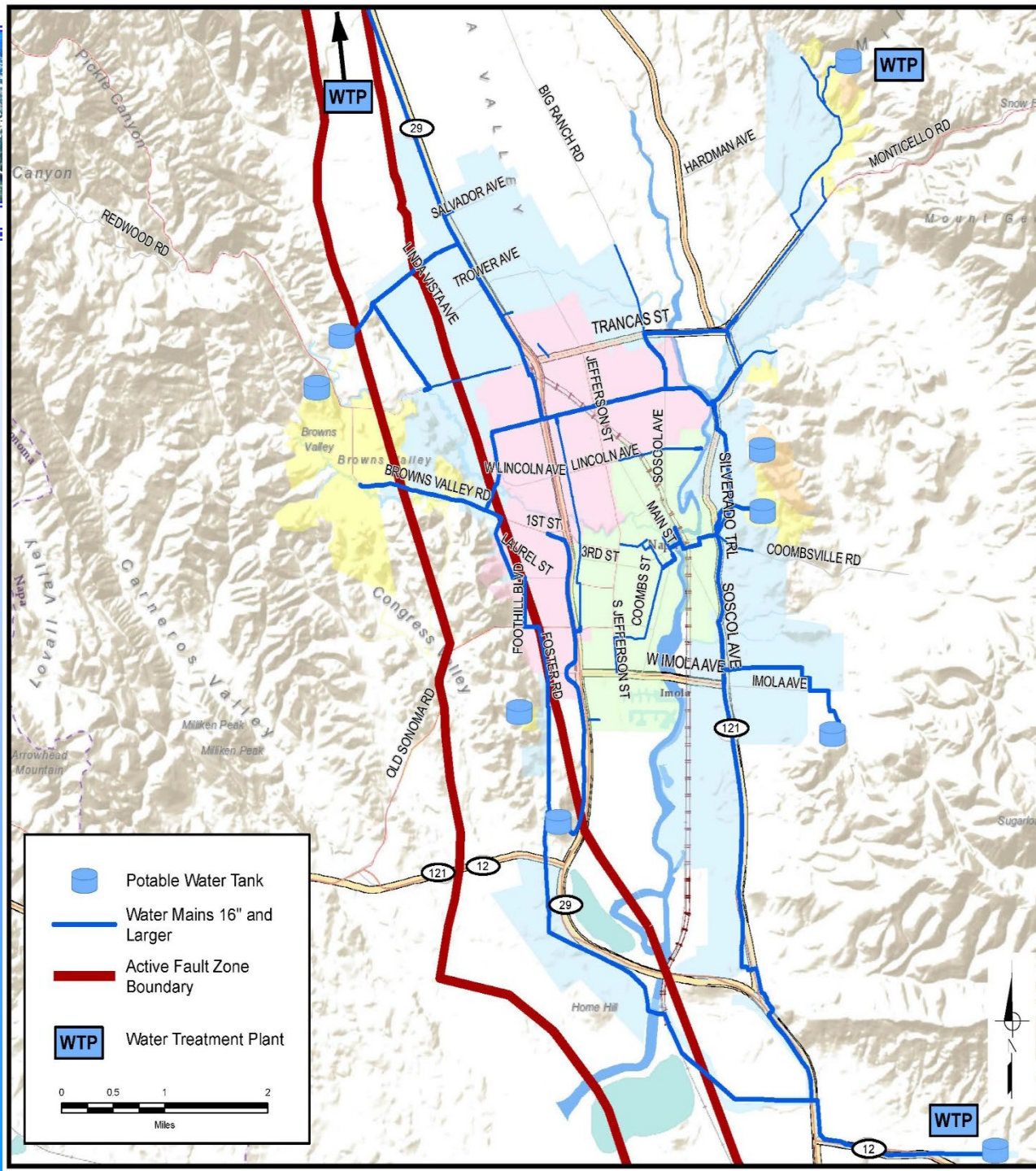


## Transmission and Distribution System

- **12 Storage Tanks – 30MG**
- **380 Miles of Pipeline – 42-inch to service laterals**
- **9 Pump Stations serve 10% of population**
- **5 Pressure Zones**
- **14 Pressure Regulating Stations**



-123651-123651  
WACK\_012  
AUG 24 12:30, 2014  
10:24:47.632

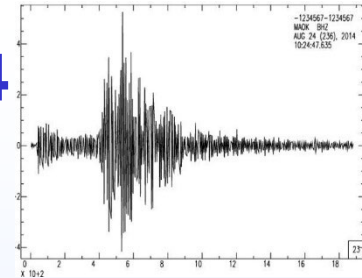


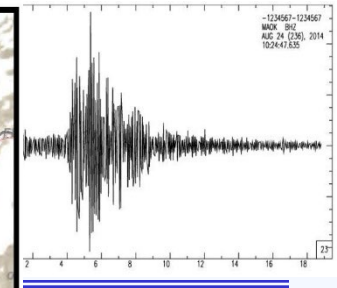
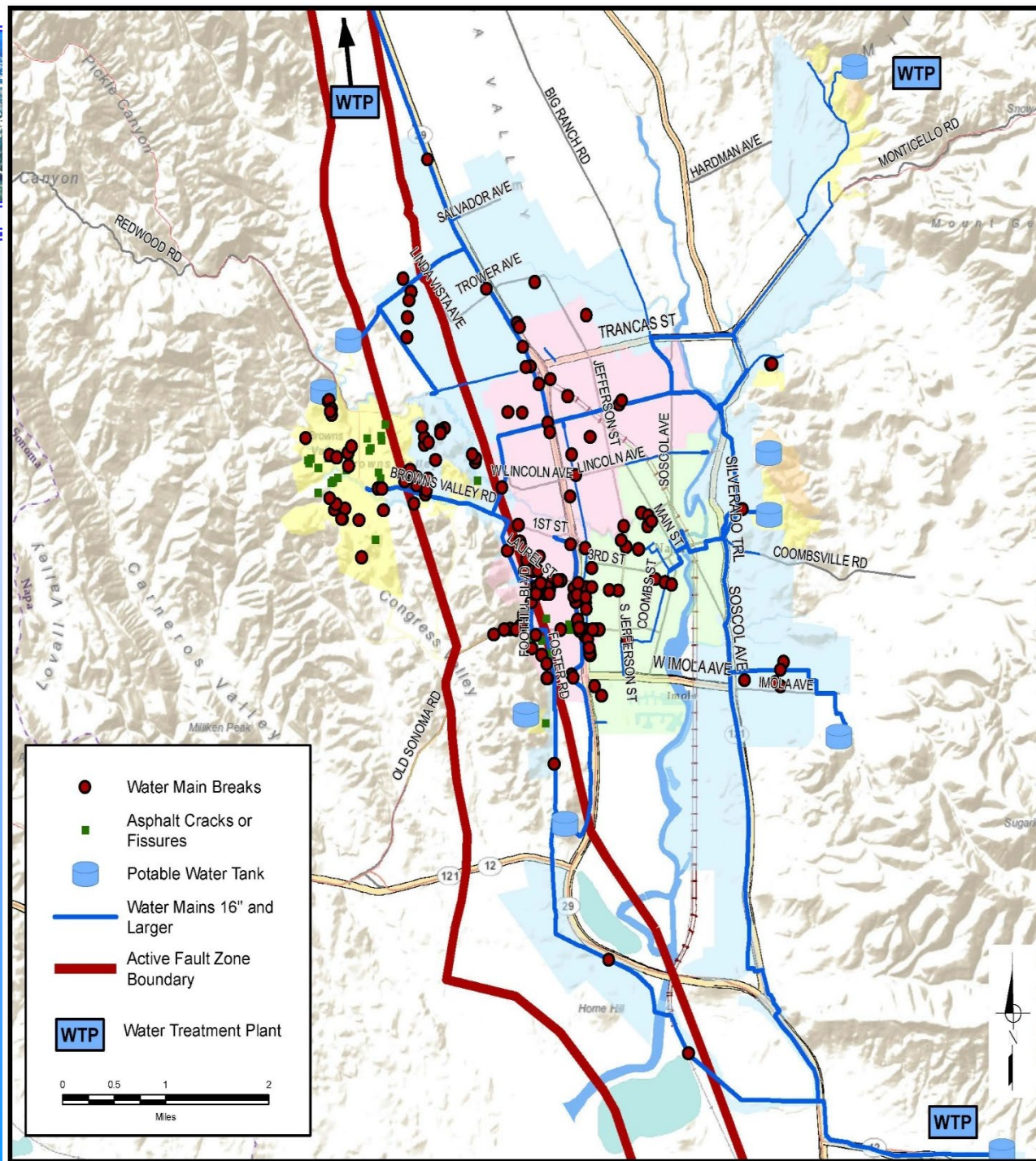


# South Napa Earthquake Aug 24, 2014

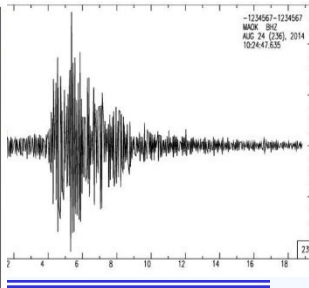
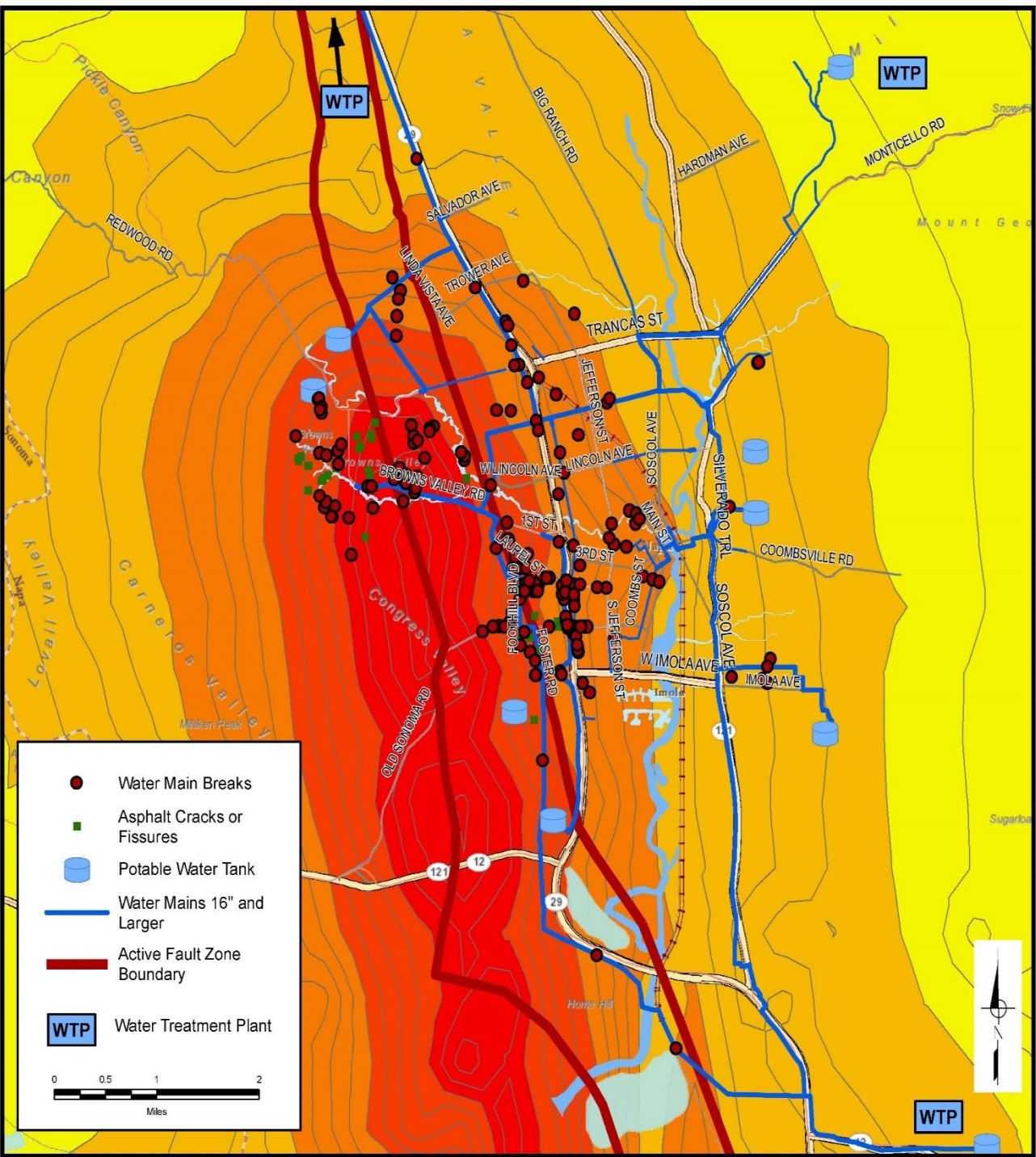
City of Napa Water System

December 02, 2024
















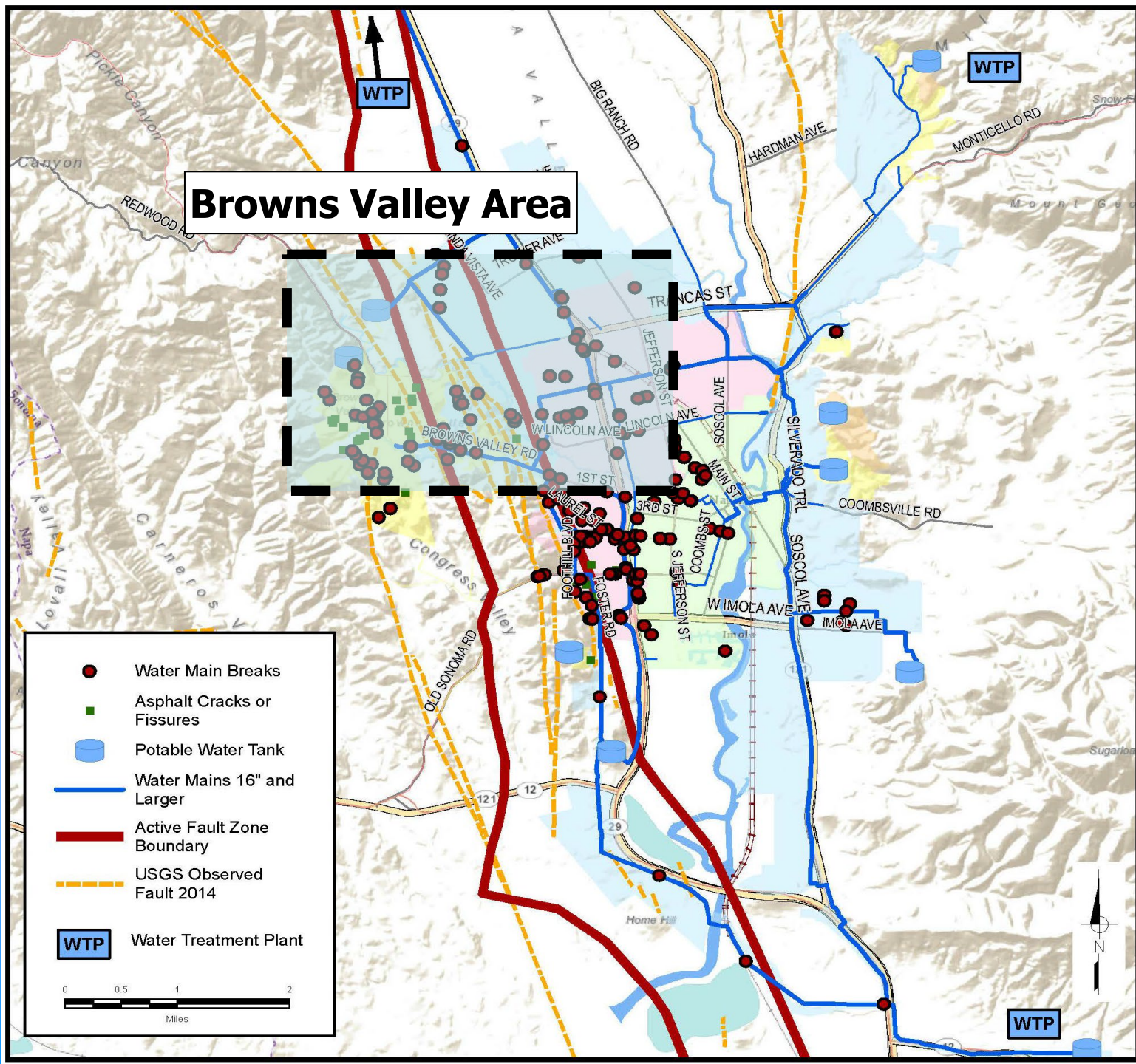
-123651-123657  
WACK\_812  
AUG. 24 (7:30), 2014  
10:24:47:632

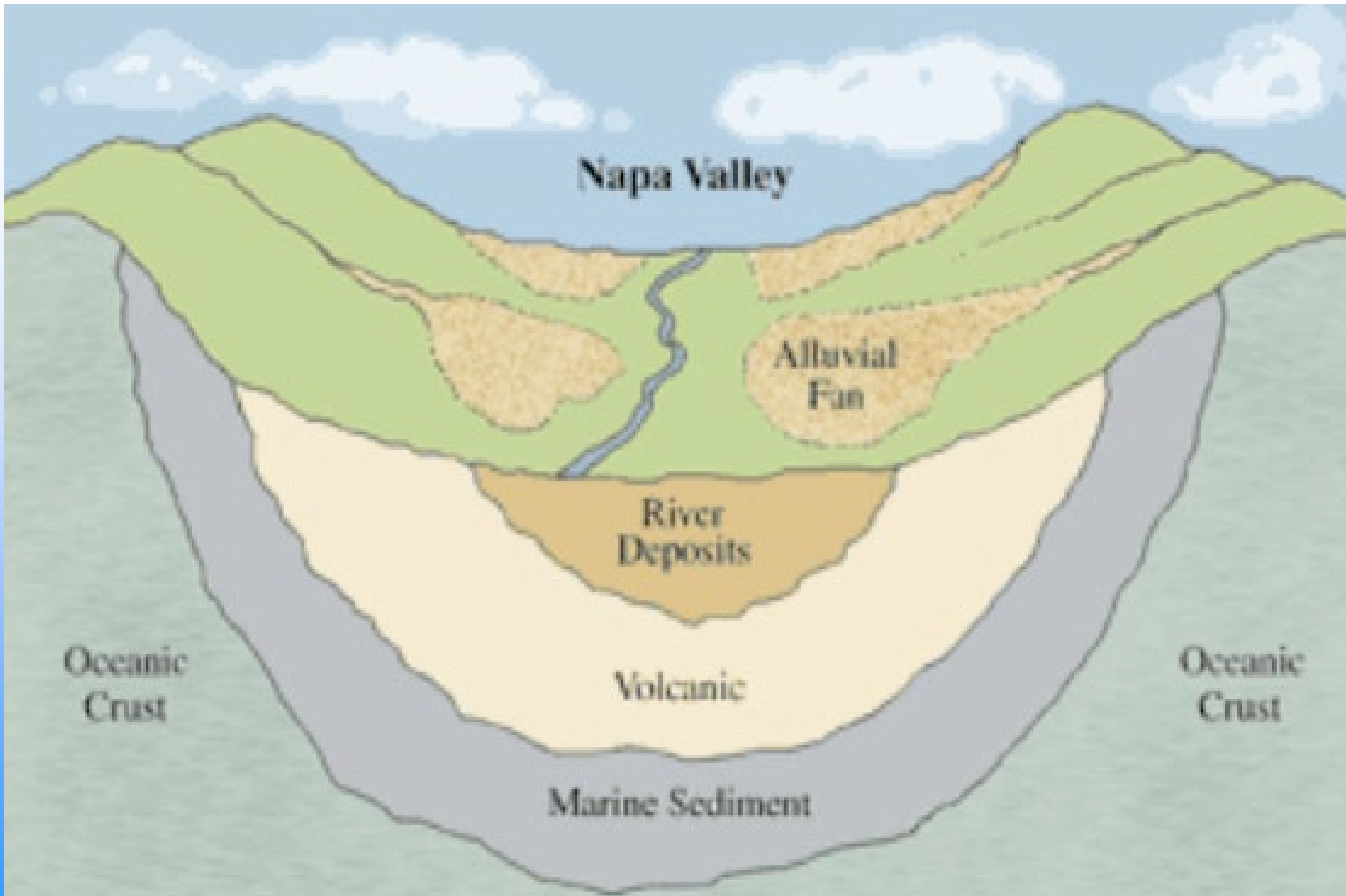


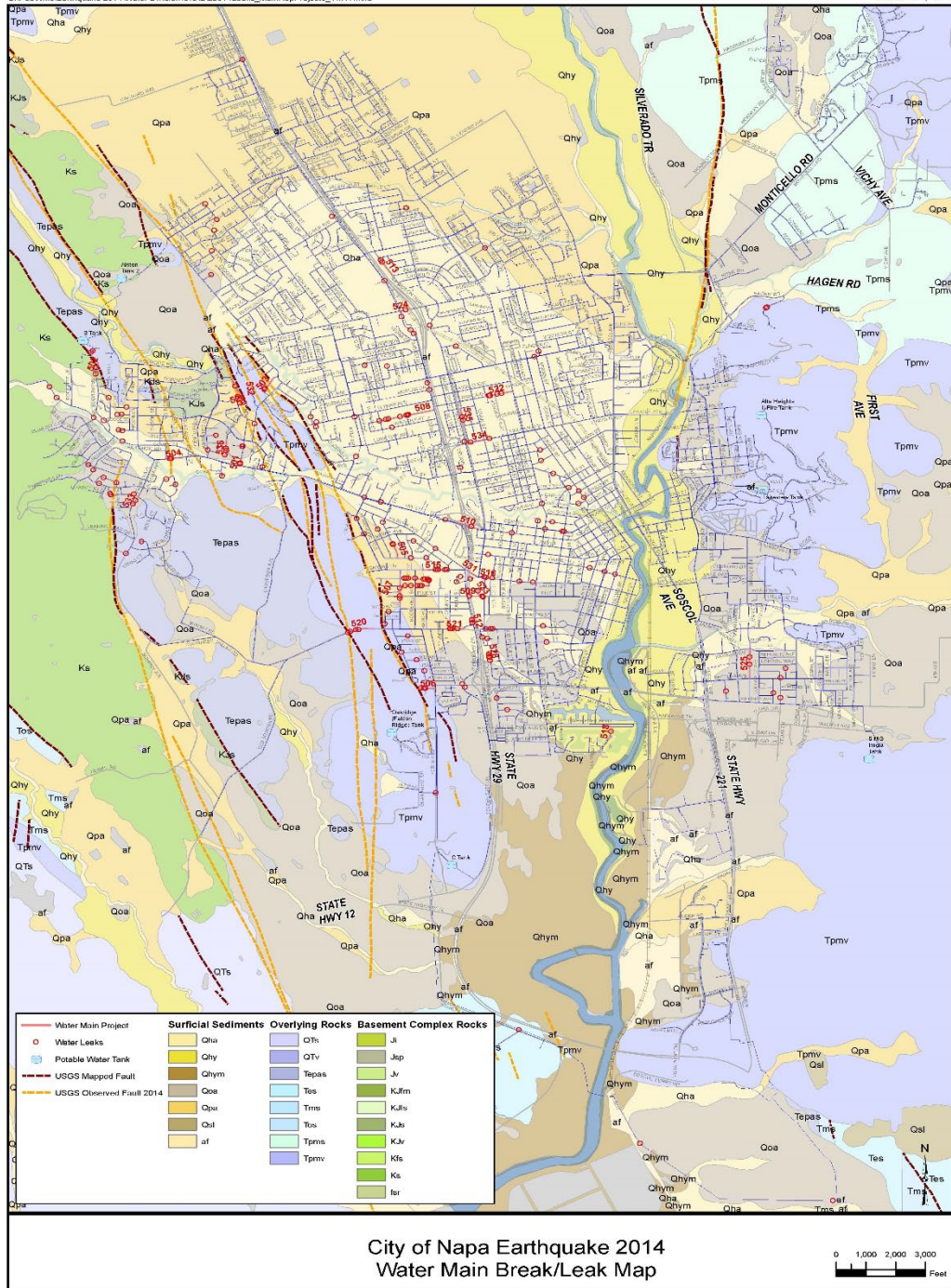
# Browns Valley Area

-  Water Main Breaks
-  Asphalt Cracks or Fissures
-  Potable Water Tank
-  Water Mains 16" and Larger
-  Active Fault Zone Boundary
-  USGS Observed Fault 2014
-  WTP Water Treatment Plant

0 0.5 1 2  
Miles







City of Napa Earthquake 2014  
Water Main Break/Leak Map

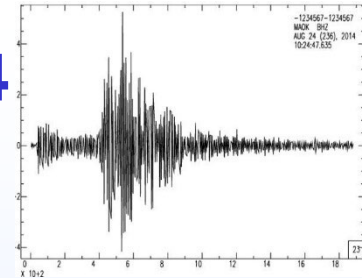




# South Napa Earthquake Aug 24, 2014

City of Napa Water System

December 02, 2024



## Water System

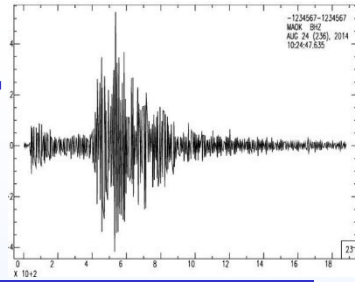


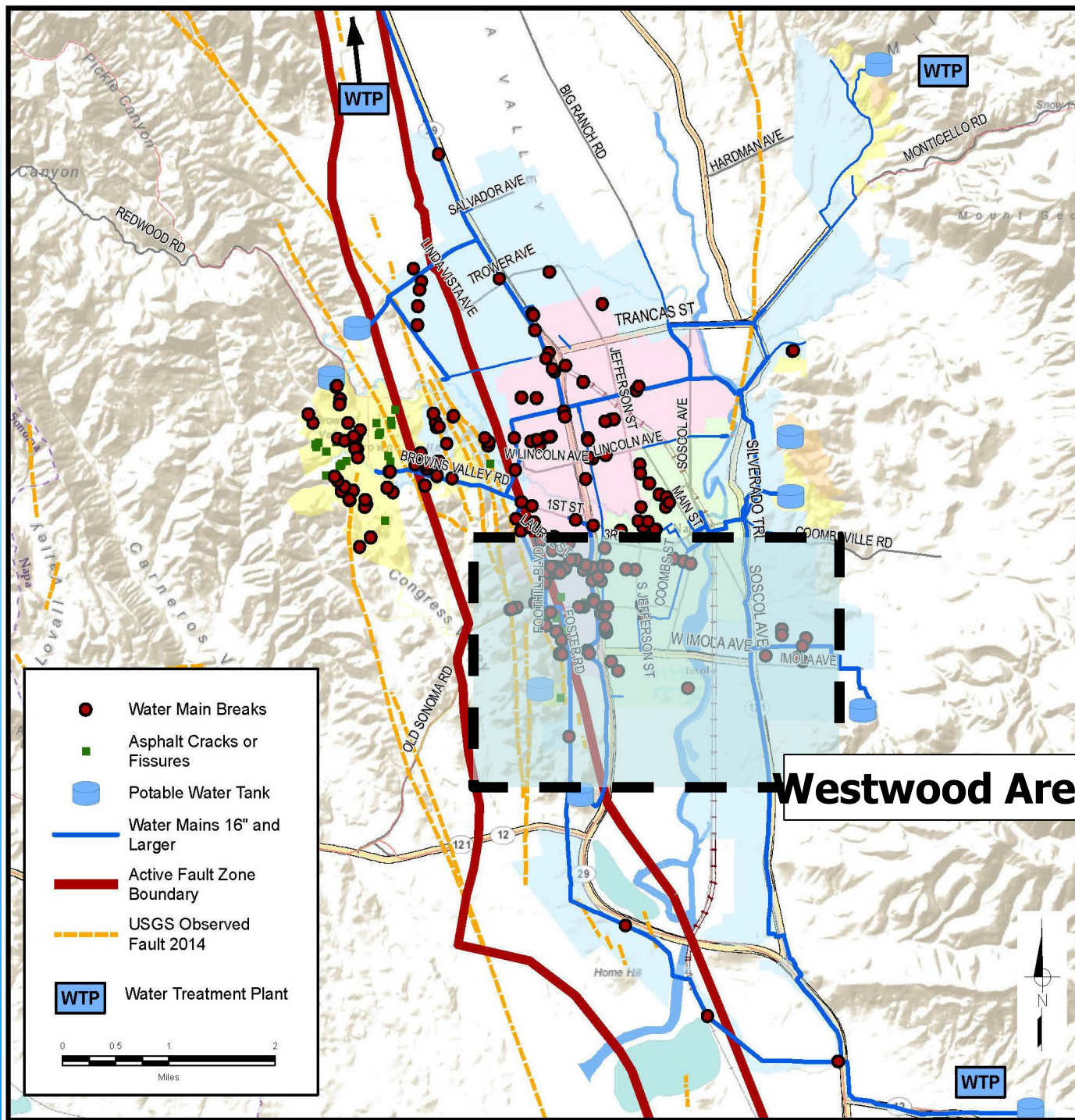


**South**

# Water System

**14**





# Westwood Area

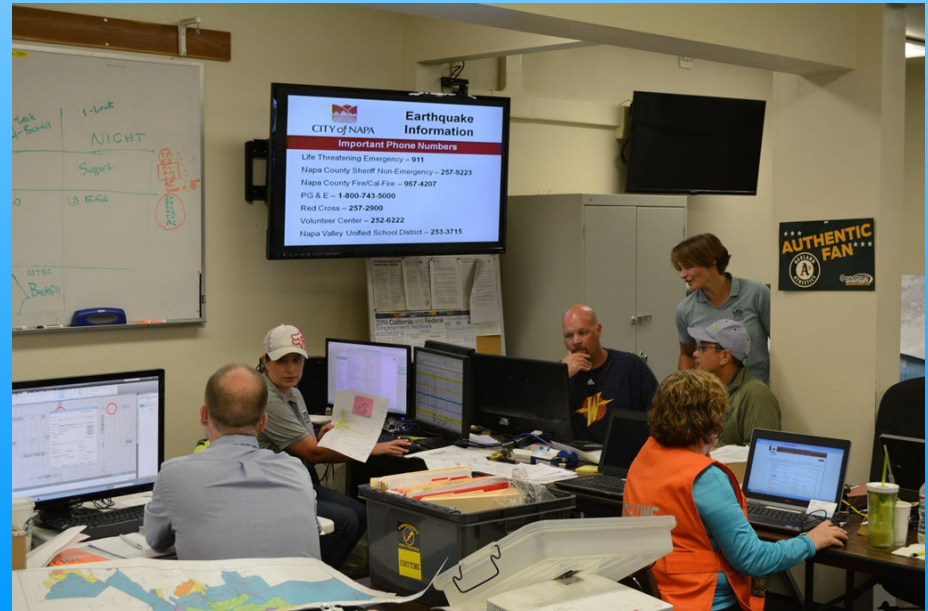
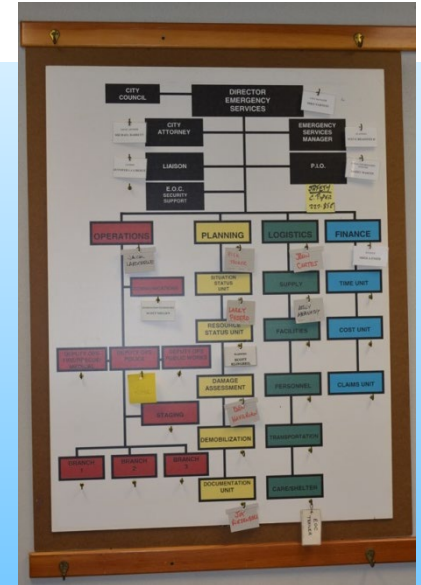


# NAPA ROCKS but ... the WATER is ON



## Day 1 - Sunday

- EOC Opens**
- DOC Established at Corp Yard**
- Employees Report to Work**



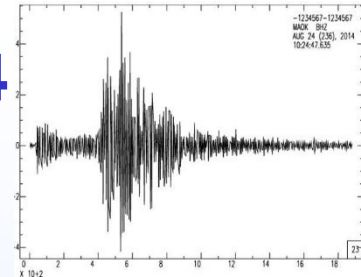




# South Napa Earthquake Aug 24, 2014

City of Napa Water System

December 02, 2024



## Day 1 - Sunday (Damage Assessment)

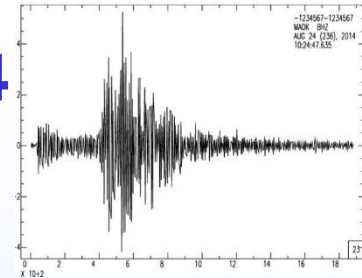
- Major Facilities - Confirm dams and treatment plants are ok**
- Tanks losing storage**
- Pump Stations, generator needs**
- 60 distribution leaks by early AM**
- Spreadsheet to track leaks**



# South Napa Earthquake Aug 24, 2014

City of Napa Water System

December 02, 2024



## Day 1 - Sunday (cont'd)

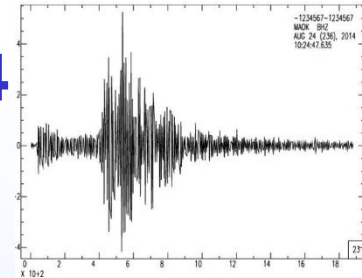
- Ramp up treatment plants - FEED the leaks to maintain positive system pressure**
- Switch to 12- and 14-hour shifts**
- CalWARN offered resources within 1-hour**
- Call in 4 contractors (on-call emergency contracts)**
- Stockpile backfill materials**



# South Napa Earthquake Aug 24, 2014

City of Napa Water System

December 02, 2024



## Day 1 - Sunday (cont'd)

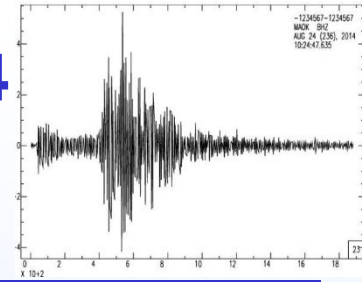
- Set up potable water stations**
- Issue precautionary boil water notice**
- Set up Bacti data spreadsheet**
- Prepare leak packets - maps, USA tags**
- Coordinate logistics hotels, food, car for teams scheduled to arrive at 11AM Monday**



# South Napa Earthquake Aug 24, 2014

## City of Napa Water System

December 02, 2024





**NAPA ROCKS but ... the WATER is ON**



## **Day 1 - Sunday (Boil Water Advisory Notice)**

If you lost water service completely for any period of time after today's earthquake, the City of Napa advises you to use one of these three options:

- use bottled water for drinking and cooking
- boil tap water for one full minute before use for drinking or cooking
- use water for drinking and cooking from one of the water stations set up by the City, on Pearl Street one block west of Main, or at the Las Flores Center on Linda Vista Avenue

All tap water remains safe for bathing and other household uses. If your water appears cloudy but you did not lose service, let the tap run until the sediment clears.

**Once all the broken water lines are repaired and City water has been restored and tested, the City will rescind this advisory notice.**

Call 707-257-9544 with questions. The Water Division is staffing phones 24 hours a day while repairs are made.

This notice is provided to you by the City of Napa (System No. 2810003) in collaboration with the State Water Resources Control Board, Division of Drinking Water.



# NAPA ROCKS but ... the WATER is ON



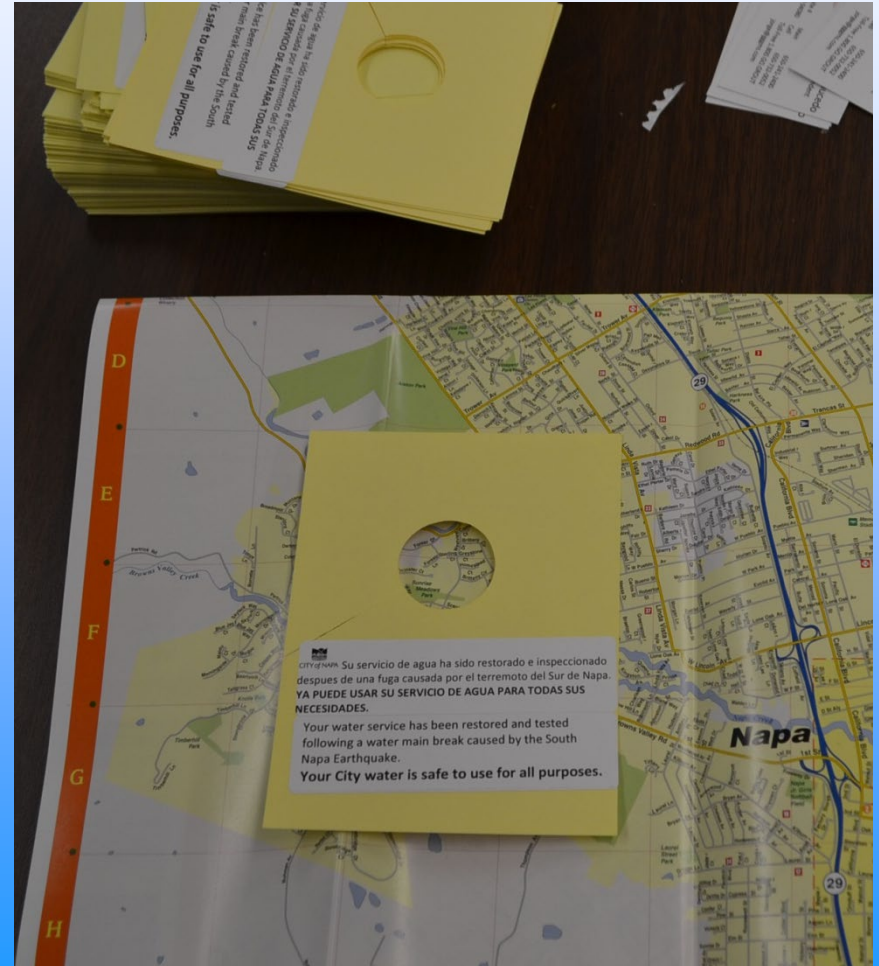
## Day 1 - Sunday (Water is Safe Notice)

Your water service has been restored and tested following a water main break caused by the South Napa Earthquake.

**Your City water is safe to use for all purposes.**

Su servicio de agua ha sido restorado e inspeccionado despues de una fuga causada por el terremoto del Sur de Napa.

**YA PUEDE USAR SU SERVICIO DE AGUA PARA TODAS SUS NECESIDADES.**





**NAPA ROCKS** but ... the **WATER** is **ON**



## **Day 2 - Monday (Highlights)**

- 90 leaks confirmed**
- Ordered repair materials**
- USA Locate Issues - contact PG&E liaison**
- 7 CalWARN Crews Arrive**
- 3 bacti samples + blank per location**
- Lab Incubator can handle 80-90 samples**
- Need cost estimate for damages**

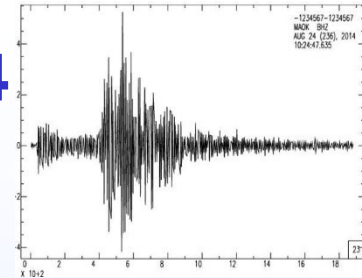




# South Napa Earthquake Aug 24, 2014

City of Napa Water System

December 02, 2024



## Water Treatment Production

### **FEED the LEAKS!**

➤ **August Average 18 MGD**

➤ **Peak Day 23 MGD**

➤ **Day 1 Sunday, August 24<sup>th</sup> 32 MGD 60 leaks**

➤ **Day 2 Monday 28 MGD 90 leaks**

➤ **Day 3 Tuesday 24 MGD 100 leaks**

➤ **Day 4 Wednesday 22 MGD 105 leaks**

➤ **Day 5 Thursday 20 MGD 110 leaks**

➤ **Day 6 Friday 19 MGD 120 leaks**

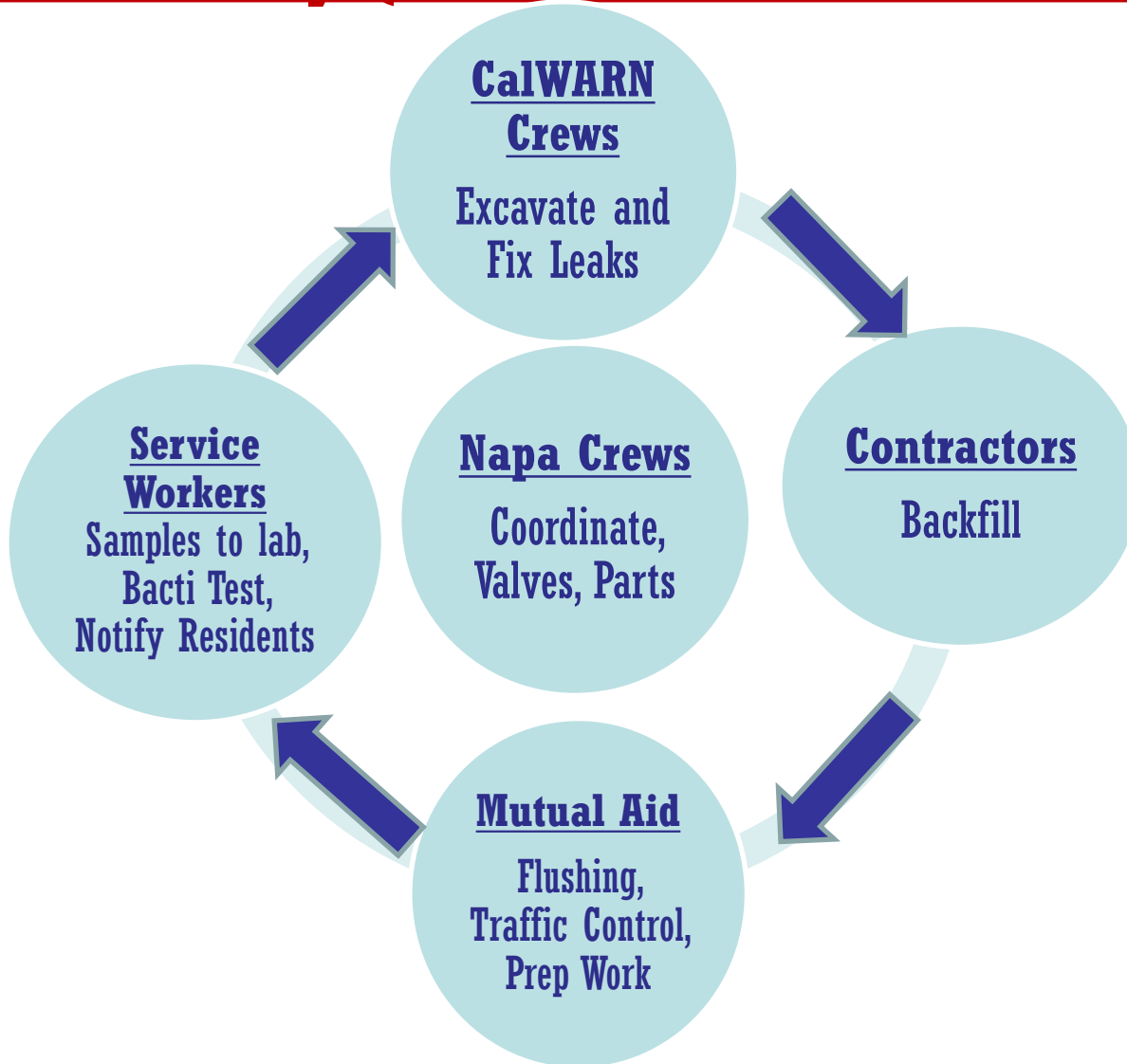




# NAPA ROCKS but ... the WATER is ON



## Day 2 - Monday (Established the "Dance")





**NAPA ROCKS but ... the WATER is ON**



## **Day 3 - Tuesday (Highlights)**

- 100+ leaks confirmed**
- Ordered 2 more crews**
- Laboratory is handling/reading samples**
- Day 2 Bactis clear, notifications out**
- Direct contact with Schools**
- Established goal to complete priority work by Friday for Labor Day Holiday**



## **Lessons Learned**

- Join CalWARN Now**
- Need to confirm customer call-ins**
- Assign water “inspectors” to geographic areas to provide accurate info on leaks**
- Develop a tracking and recording system for leaks now**
- Control Information - internal vs. public**
- Communicate clearly and often with Division of Drinking Water**
- Pre-build potable water stations**



**NAPA ROCKS but ... the WATER is ON**

12/26/07 12:26:07  
WAC 012

## **Lessons Learned**

- Organization of lab data, notifications**
- Need more administrative support for record keeping, check in/out, and cost estimating**
- The Admin/Engineering/Lab team worked too long of shifts - 16-18 hours**
- Crews need to document each leak with photo, parts, labor, time**
- Customers were understanding**
- \*\*\*FEMA Category B\*\*\* 1<sup>st</sup> 90 days!**

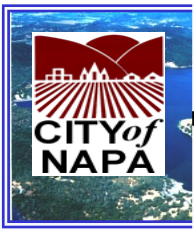


# NAPA ROCKS Keeping the WATER ON



**“All weather  
in 100 days  
in 100 days”**





**NAPA ROCKS but ... the WATER is ON**

136637-1234567  
20. 012  
1. 24 (12.30). 2014  
2447.002

## **Recovery (FEMA/OES shows up)**

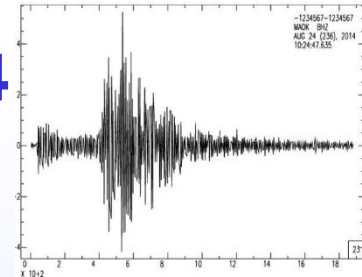
- DOCUMENTATION**
- Significant staff time required**
- Establish clear lines of communication between your team and FEMA/OES**
- Talk through process and strategy**
- Have a clear idea of what you need to fix and how you want to approach projects**
- Be organized**
- DOCUMENTATION**



# South Napa Earthquake Aug 24, 2014

City of Napa Water System

December 02, 2024



## Water System Leaks

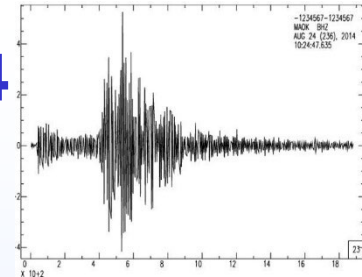
- **Day 6 Friday, August 29th 120 leaks**
- **Day 20 Friday, September 12<sup>th</sup> 167 leaks**
- **Day 37 Wednesday, October 1<sup>st</sup> 179 leaks**
- **Day 68 Saturday, November 1<sup>st</sup> 193 leaks**
- **Day 99 Monday, December 2<sup>nd</sup> 220 leaks**
- **Day 153 Monday, January 26<sup>th</sup> 241 leaks**



# South Napa Earthquake Aug 24, 2014

City of Napa Water System

December 02, 2024



## Water System Leaks

- ❑ **380 miles of pipeline**
  - ✓ **Historical Avg - 80-100 breaks per year**
  - ✓ **Aug 24 - 29<sup>th</sup> : 120 leaks repaired**
  - ✓ **Aug 30- Dec 1: 101 leaks repaired**
  - ✓ **6 Month Total: 241 leak sites**
  
- ❑ **AC Transmission Main**
  - ✓ **Historical Avg - 2 breaks every 5 years**
  - ✓ **Since Aug 24<sup>th</sup> - 3 breaks**

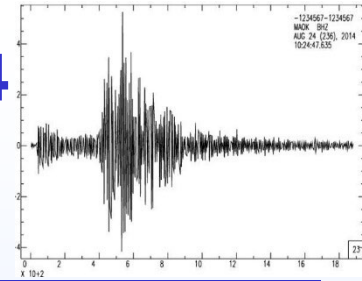




# South Napa Earthquake Aug 24, 2014

## City of Napa Water System

December 02, 2024



## Water Pipe Break History

<b>Browns Valley Area</b>						
	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Pre-earthquake</b>						<b>10</b>
<b>EQ Week 1</b>						<b>51</b>
<b>EQ Aug 31 - March 1</b>						<b>51</b>
<b>Annual Total</b>	<b>16</b>	<b>17</b>	<b>13</b>	<b>10</b>	<b>8</b>	<b>112</b>

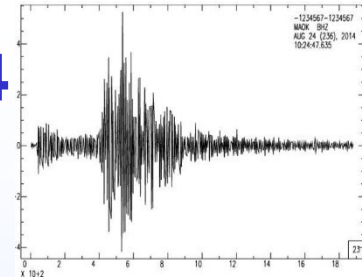
<b>Westwood Area</b>						
	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Pre-earthquake</b>						<b>5</b>
<b>EQ Week 1</b>						<b>68</b>
<b>EQ Aug 31 - March 1</b>						<b>38</b>
<b>Annual Total</b>	<b>19</b>	<b>20</b>	<b>19</b>	<b>8</b>	<b>10</b>	<b>111</b>



# South Napa Earthquake Aug 24, 2014

City of Napa Water System

December 02, 2024



## The Good News

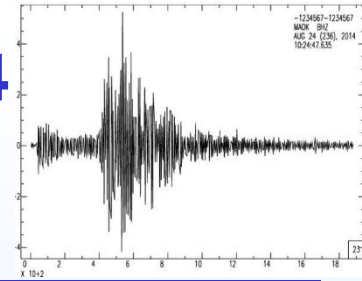
- **Fixed 120 leaks in 5 days**
- **5% of our customers were out of water for rolling periods**
- **Fixed additional 121 leaks in 6 months**



# South Napa Earthquake Aug 24, 2014

City of Napa Water System

December 02, 2024



## The Bright Side

\*\*\* **Help from our Friends** \*\*\*

➤ **Milliken Dam Concrete Radial Arch near Green Valley Fault**

**CALWARN!**

➤ **Conn Dam/ Lake Hennessey**

➤ **Barwick Jamieson *Sign up now* TP upgrades - completed 2011**

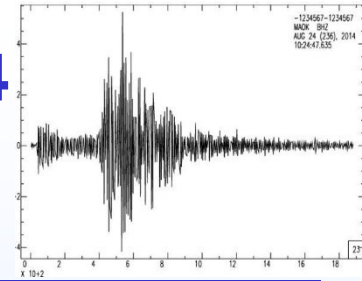
➤ **36-inch AC Transmission Mains**



# South Napa Earthquake Aug 24, 2014

City of Napa Water System

December 02, 2024

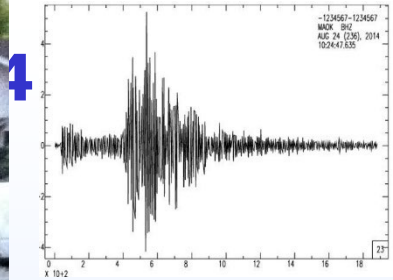


**Questions??**



So

# Twin Oaks Ct





# NAPA ROCKS but ... the WATER is ON



## Earthquake Distribution Samples.

08 27 14

~~Montana - 4 Bactis @ 8:00am~~

~~Eva St - 4 Bactis @ 8:00am~~

~~Chelsea - 4 Bactis @ 8:00am~~

~~Indiana - 4 Bactis @ 8:00am~~

~~California - 3 Bactis @ 8:00am~~

~~Idaho - 4 Bactis @ 8:00am~~

~~Oran Ct. - 3 Bactis @ 8:00am~~

~~Marlboro/Village - 4 Bactis read time @ 7:45~~

~~Pine St / Galak - 4 Bactis read time @ 7:45am~~

~~Esquire Ct. - 4 Bactis read time @ 7:45am~~

~~Clay St - 4 Bactis read time @ 7:45am~~

~~Funman Ave / Crestview Way - 2 Bactis read time @ 12:15pm~~

~~510 Roosevelt - 4 Bactis read time @ 12:15pm~~

~~116 Mayfield Ct - 4 Bactis read time @ 12:00pm~~

~~3521 Twin Oaks Ct - 4 Bactis read time @ 12:00pm~~

~~2143 Mayfair - 4 Bactis read time @ 12:55pm~~

~~2390 Pine - 4 Bactis read time @ 3:15pm~~

~~2143 Mayfair / Shelter - 4 Bactis read time @ 3:15pm~~

08 28 14

~~110 Lillienthal~~

~~1316 Malaga - 3~~

Indiana - 8 Ba

Idaho - 4 Bact

Idaho - 4 Bact

Clay - 4 Bactis

Solano - 5 Bact

Chelsea - 4 Bact

Freeway Dr. - 4

Kellebrew Ct. - 4

2748 Clifford - 4 B

1850 Laurel St - 3

2949 Backwood - 4

2880 Hilltop Dr - 4

2962 Sunrise - 4 B

3307 Kensington -

Sonoma St - 4 B

*Special to  
to Area Colored*

*Please take Picture  
OF the Board before  
you erase any  
Information!!!!*