

*Video courtesy of JT Humphrey
February 2017*



STORMWATER, INFRASTRUCTURE, AND CRITICAL LAND WORKSHOP

Board of County
Commissioners
September 2025



AGENDA

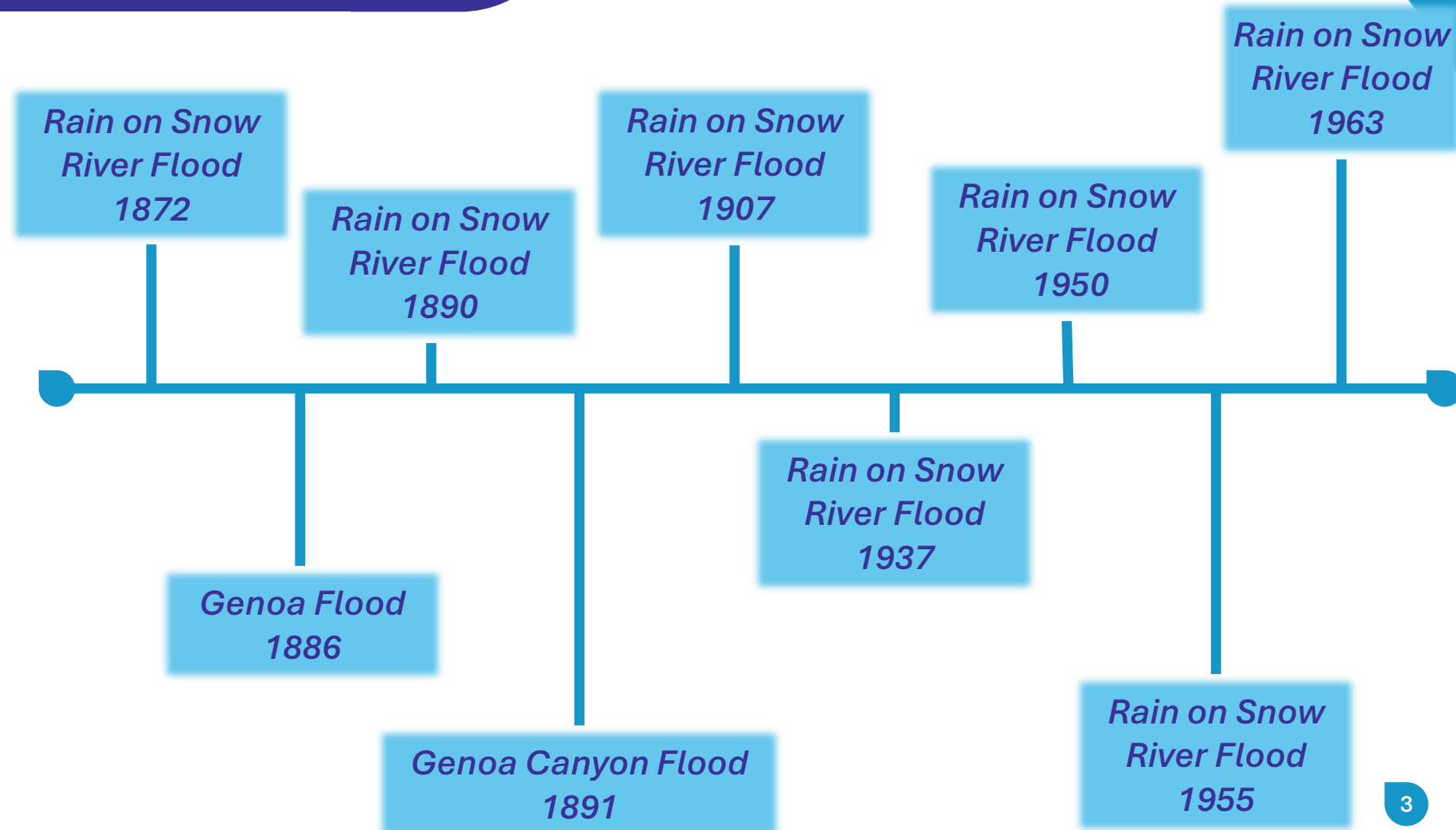
- Timeline of Stormwater Events
- Zoom In- Overview of the Carson Valley
- Critical Land Management
- Program and Maintenance Accomplishments
- Funding Gap and Solutions



August 2022

Historical *STORMWATER EVENTS*

Until the 1980s, residents of Douglas County primarily noted riverine flooding. This is largely due to the limited amount and location of development in the area.

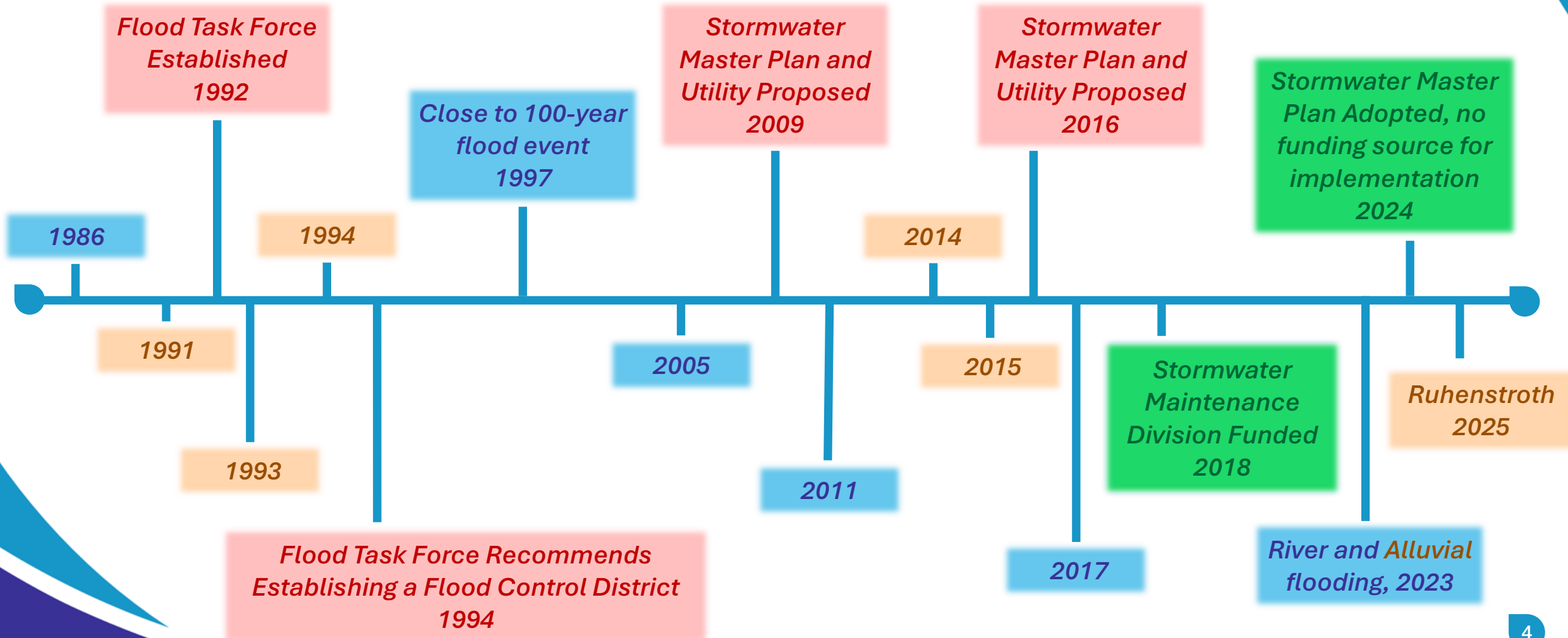


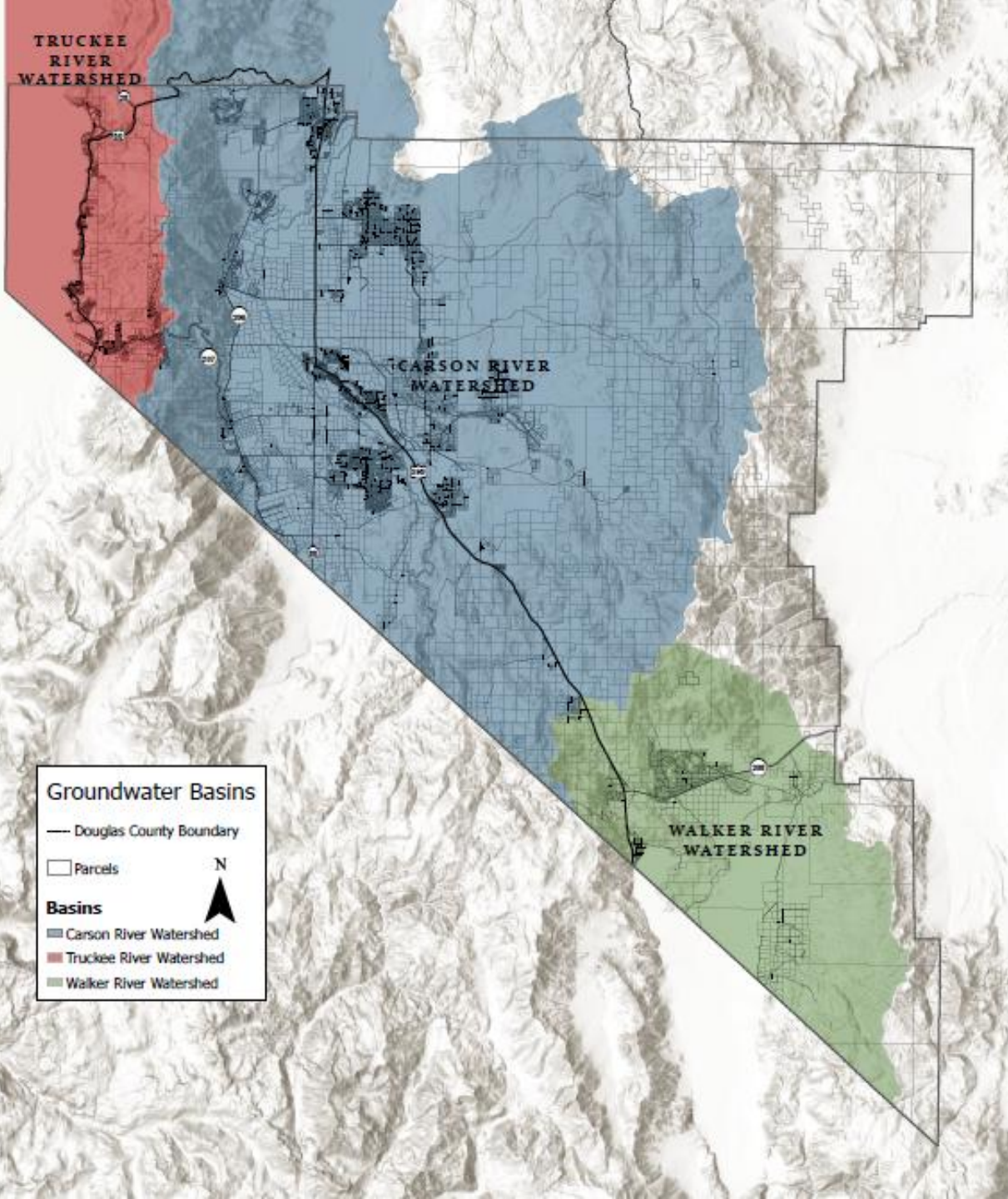
RAIN ON SNOW/ RIVER FLOODING

PROPOSED ACTIONS

ALLUVIAL FLASH FLOODING

SUCCESSFUL ACTIONS





DOUGLAS COUNTY WATERSHEDS

1

Carson

2

Tahoe

3

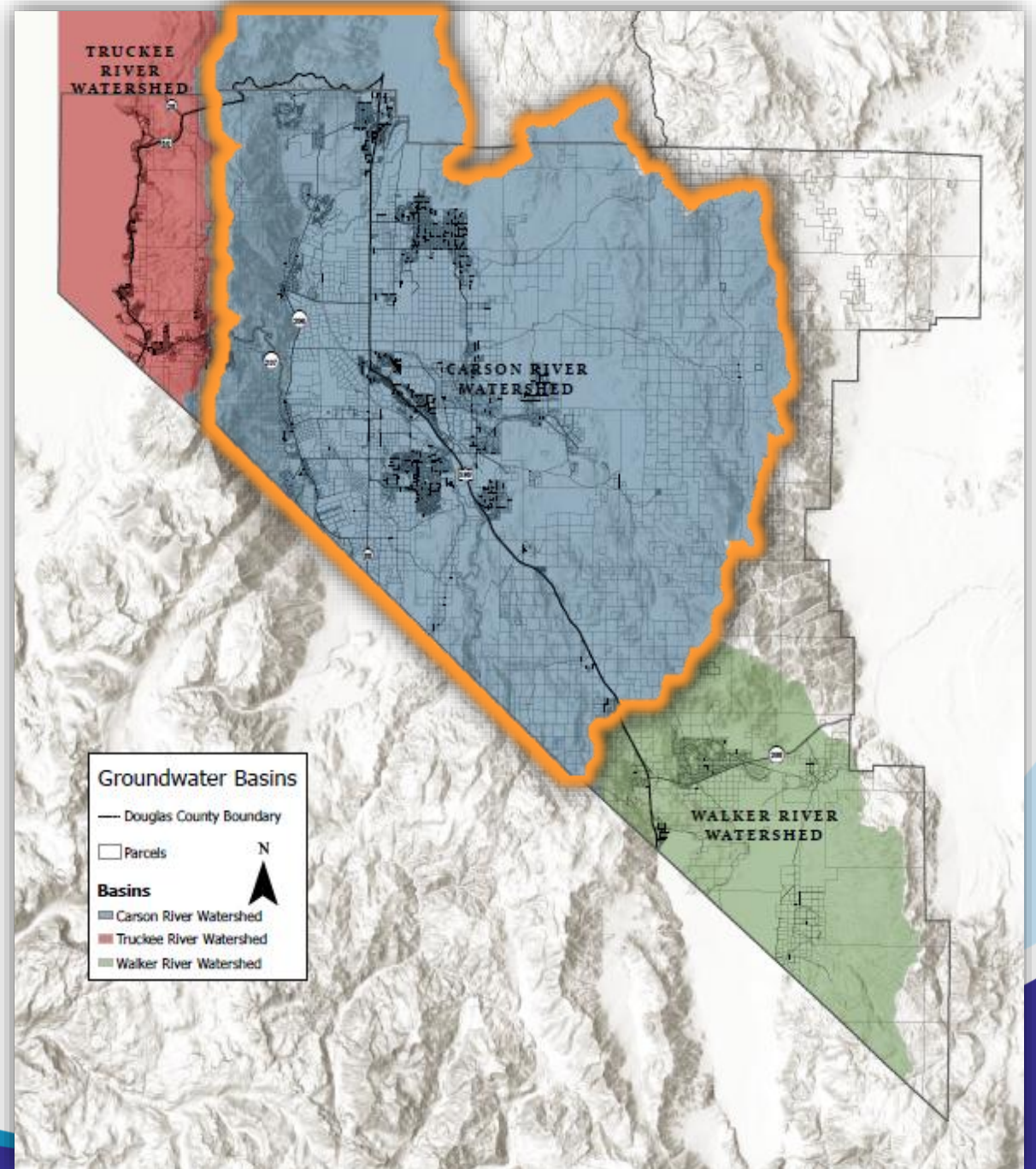
Walker

Areas of Focus In Douglas County:

1

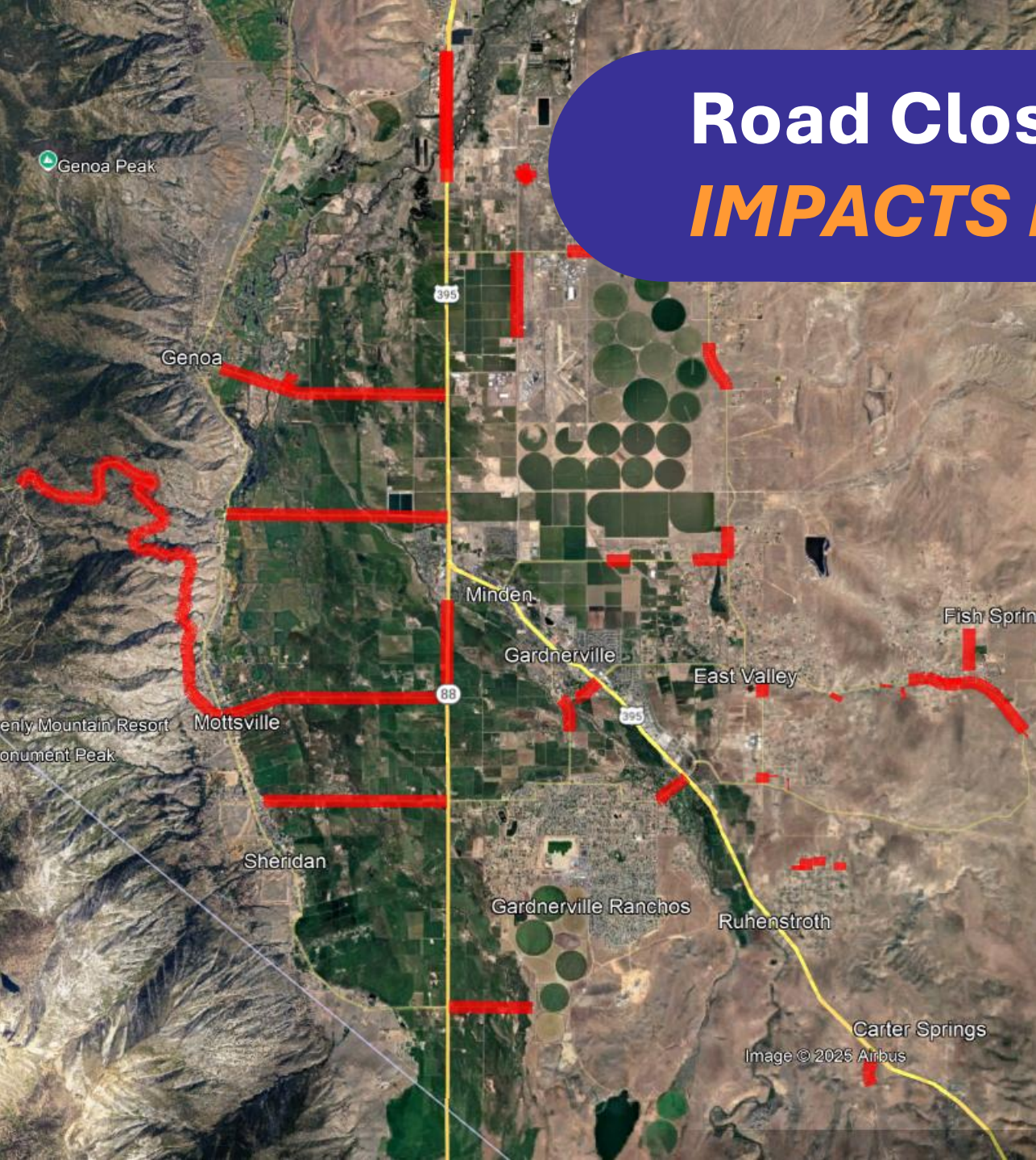
NORTH COUNTY/ TOWNS

CARSON RIVER WATERSHED



Road Closure & Emergency Response

IMPACTS FROM FLOODING





RUHENSTROTH COMMUNITY *flood depth animation*

SMELTER CREEK IN RUHENSTROTH
September 25, 2025



Video courtesy of Chris Garrison



SMELTER CREEK IN RUHENSTROTH
September 25, 2025



Photos courtesy of Teri Wass

 PINENUT CREEK IN FISH SPRINGS
July 2014



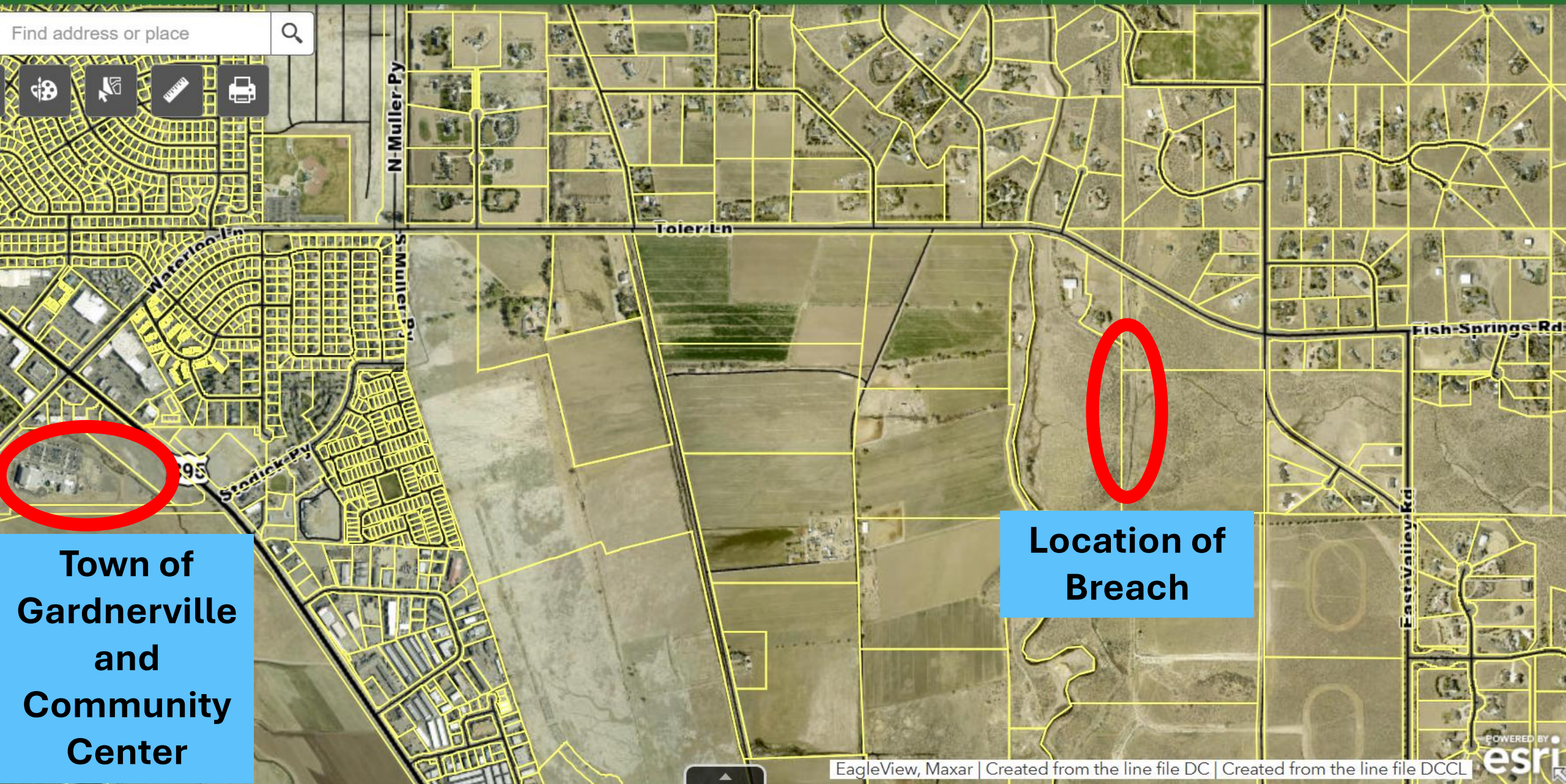
Videos courtesy of JT Humphrey



 **PINENUT CREEK IN FISH SPRINGS**
March 2023

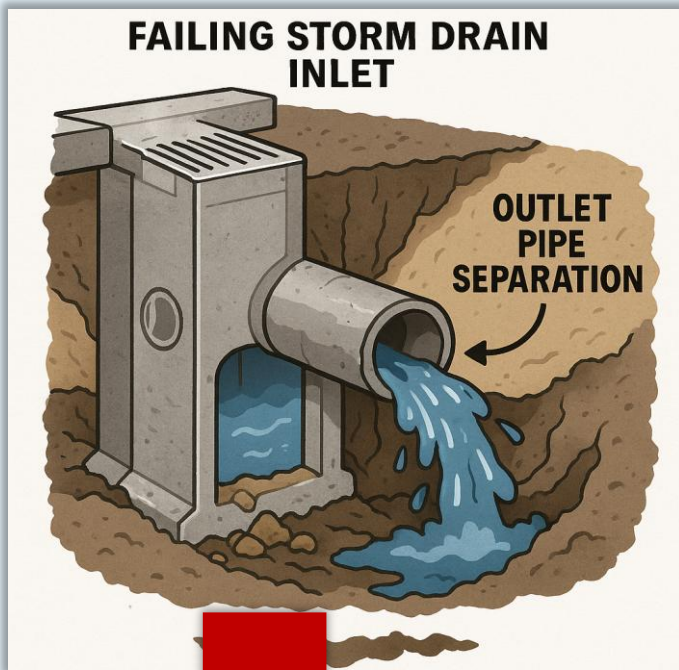


Find address or place



**Town of
Gardnerville
and
Community
Center**

**Location of
Breach**



Aging Storm Drainage Infrastructure

POTENTIAL FUTURE FAILURES

MAINTAINED BY DOUGLAS COUNTY

- Vista Grande Boulevard
- Topsy (West)
- Jacks Valley @ 395
- Mica Drive
- Saratoga Springs
- Wildhorse
- Meadow Grass
- Carson Valley Business Park
- P-51 Court
- Meridian Business Park
- N. Muller Parkway
- Toler Lane
- **Waterloo Lane**
- Pinenut Road @ Muller
- Grant Avenue
- Riverview Drive
- Upper and Lower Lake Parkway
- Hidden Woods Drive
- Lyons Avenue

MAINTAINED BY OTHER ENTITIES

- Town of Genoa
- Town of Minden
- Town of Gardnerville
- Sunridge Heights
- Sunridge
- Westwood
- Winhaven
- Lucerne Street area
- Ironwood Drive area
- Chichester
- Stodick Estates
- Arbor Gardens
- Industrial Way
- Service Drive



FAILING STORM DRAINAGE INFRASTRUCTURE WATERLOO LANE







Find address or place



**Town of
Minden**



**Location of
Dangberg
Reservoir Dam**



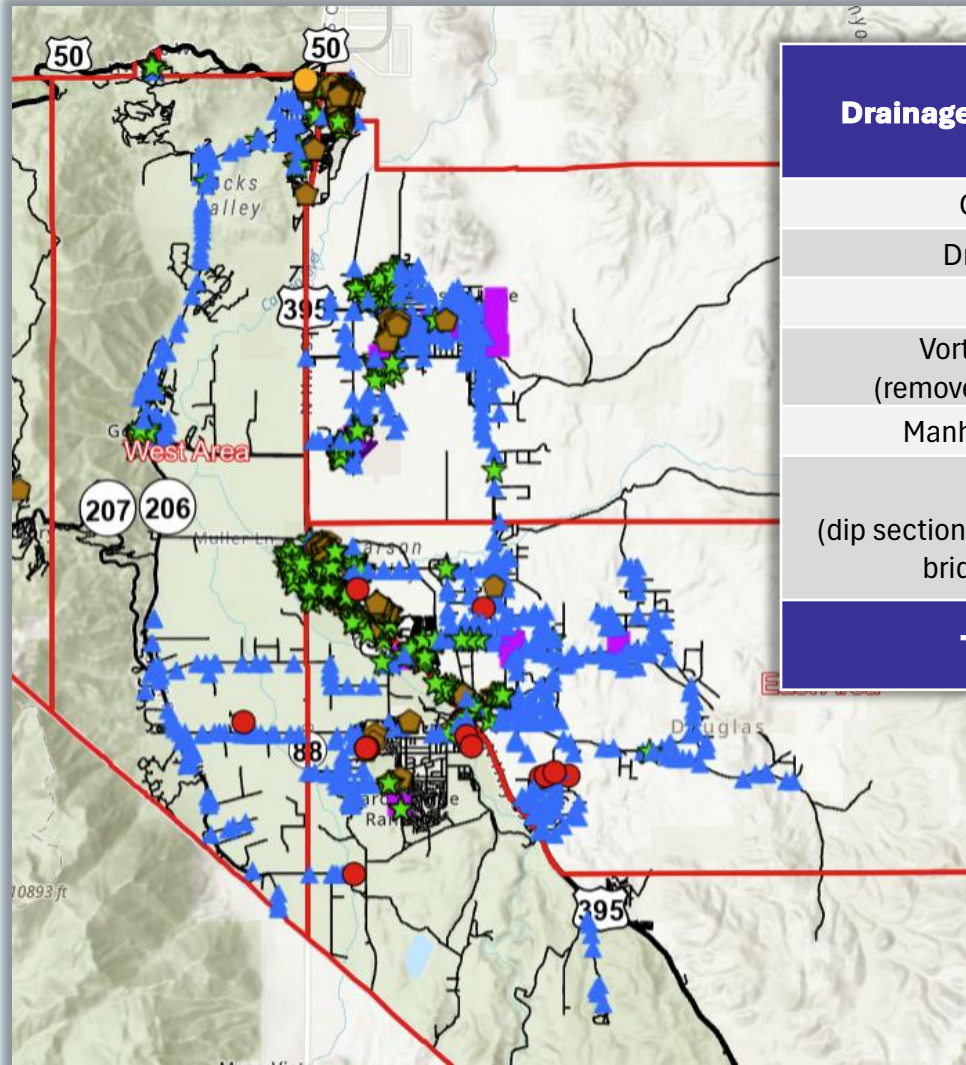
BUCKEYE CREEK BREAK OUT OVER BUCKEYE ROAD
March 2023



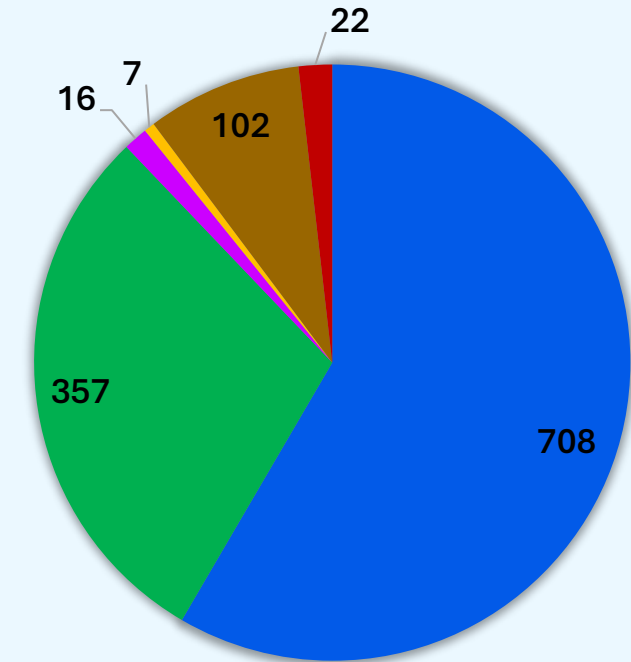


BUCKEYE CREEK FLOOD *affected area*

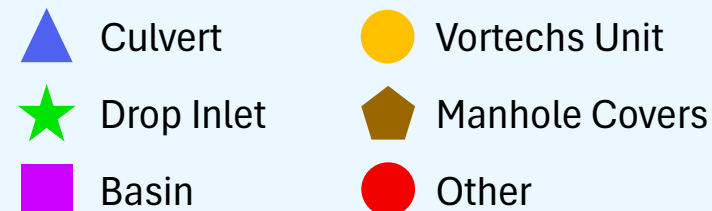
VALLEY DRAINAGE INFRASTRUCTURE



Drainage Feature Type	Total Count Valley	Count Maintained by Douglas County Valley
Culvert	735	708
Drop Inlet	539	357
Basin	17	16
Vortechs Unit (removes pollutants)	7	7
Manhole Covers	140	102
Other (dip sections, sediment traps, bridges, etc.)	25	22
Totals	1463	1212

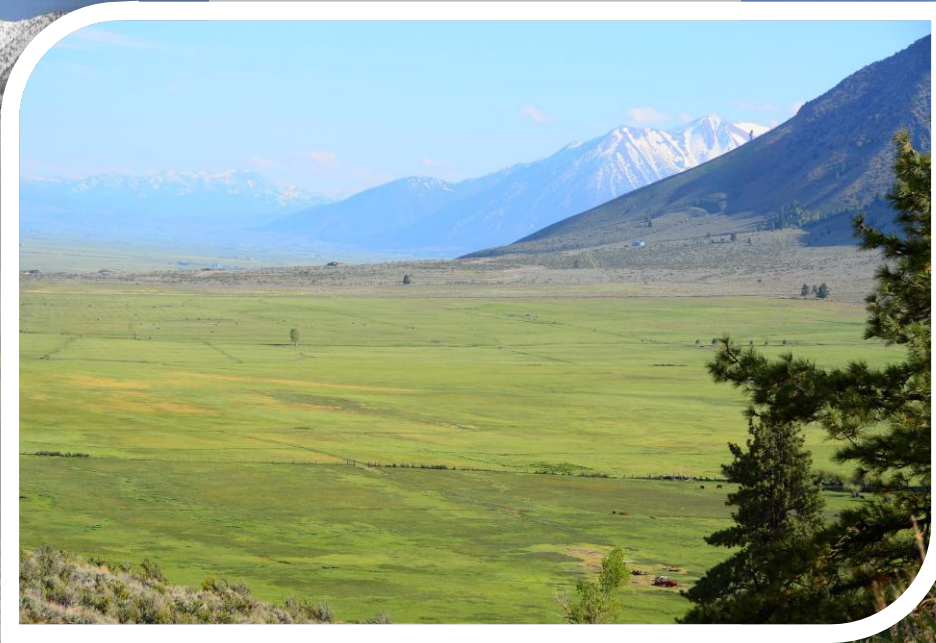


Total counts as of September 9, 2025



CONSERVATION OF CRITICAL LANDS

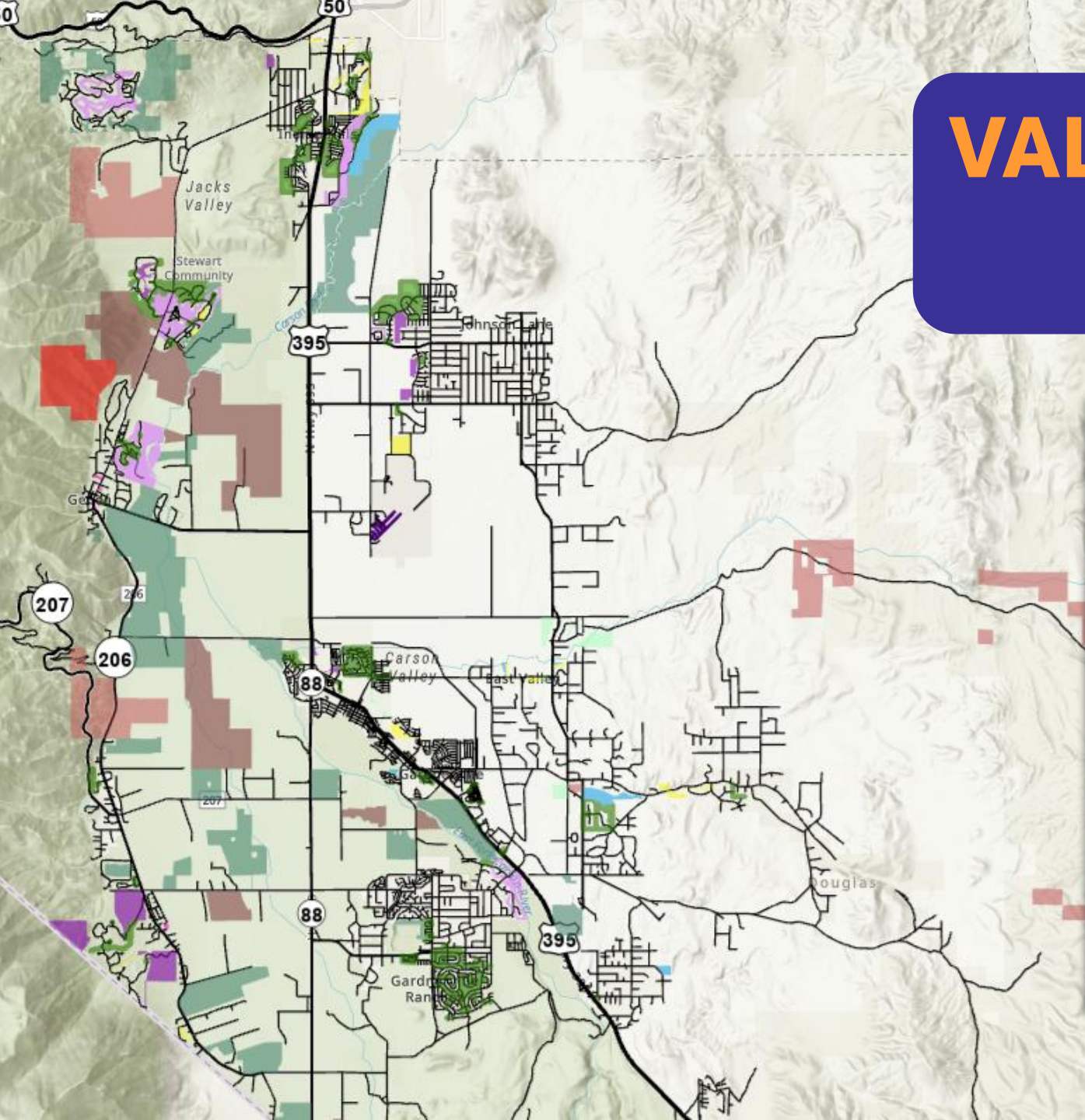
many benefits



- Reduces flooding in developed areas
- Improves water and air quality
- Protects viewshed and increases property values

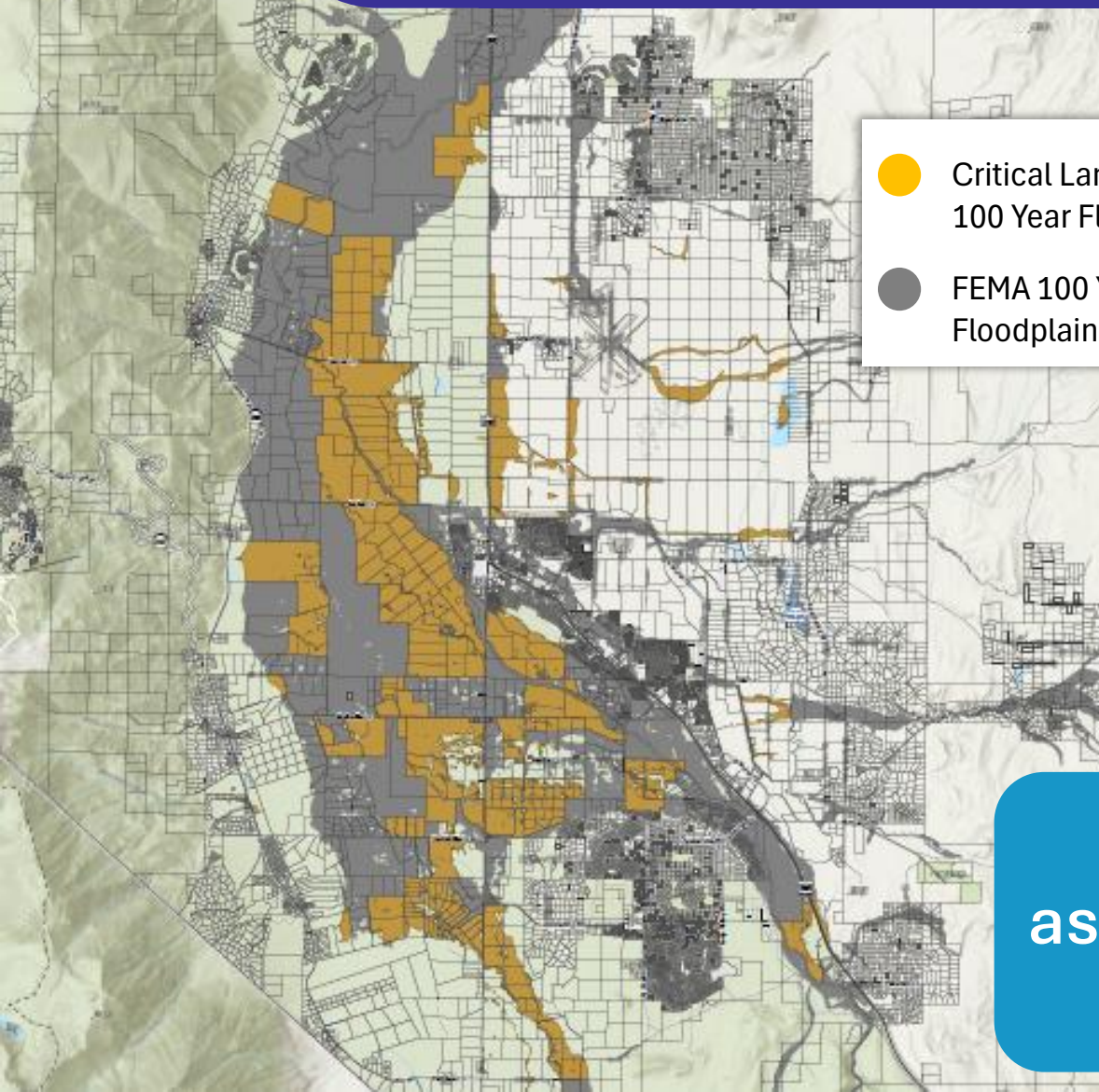
Photos courtesy of Jacques Etchegoyhen

VALLEY CRITICAL LAND INVENTORY



Open Space Type	Total Open Space Acres	Critical Land Acres in Floodplain
Agricultural Conservation Easement	6,442.87	4,148.92
Drainage Conservation Easement	195.14	64.54
Floodplain Conservation Easement	308.95	252.1
Private Conservation Easement	5,016.11	420.91
Transfer Development Rights Conservation Easement	3,859.45	2,130.63
Dedicated Open Space	633.64	37.56
Common Area	819.75	49.38
Golf Course Open Space	929.12	302.7
SNPLMA	726.13	0
Totals	18,931.16	7,406.74

FUTURE CRITICAL LAND INVENTORY

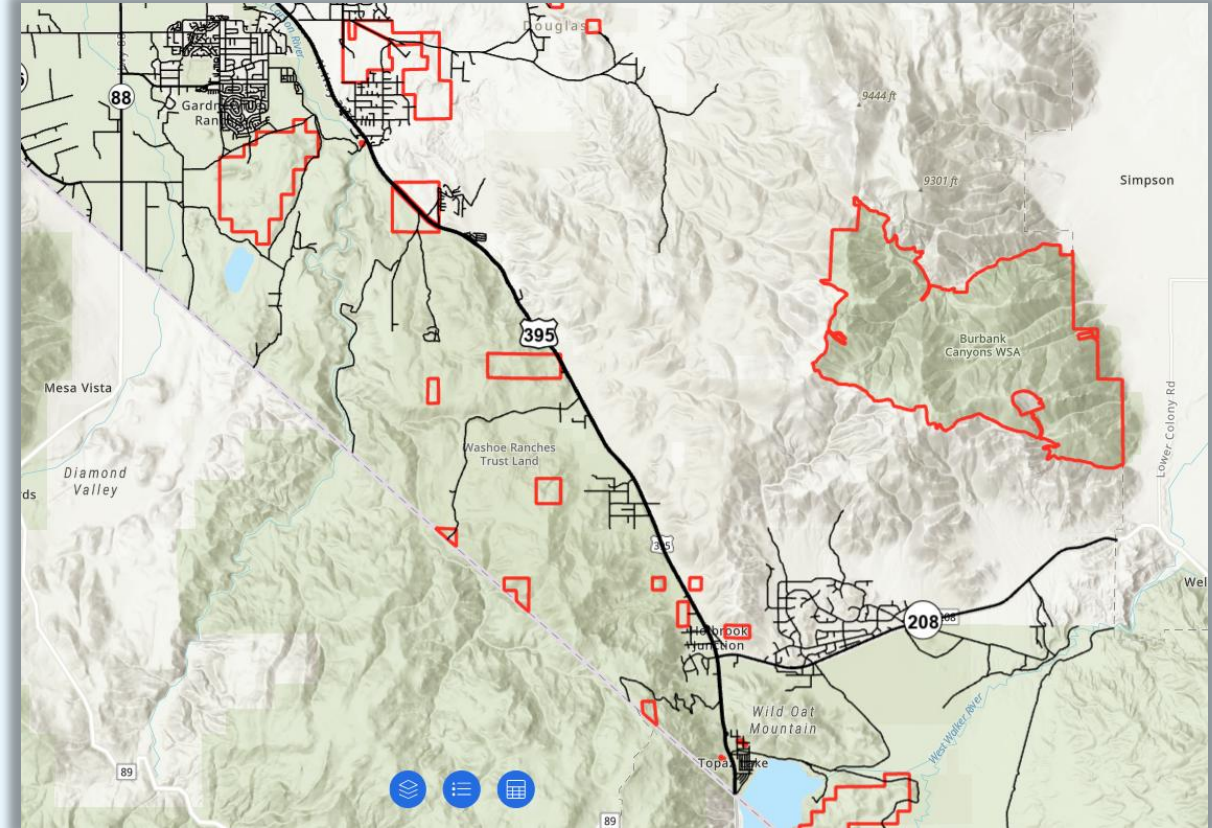
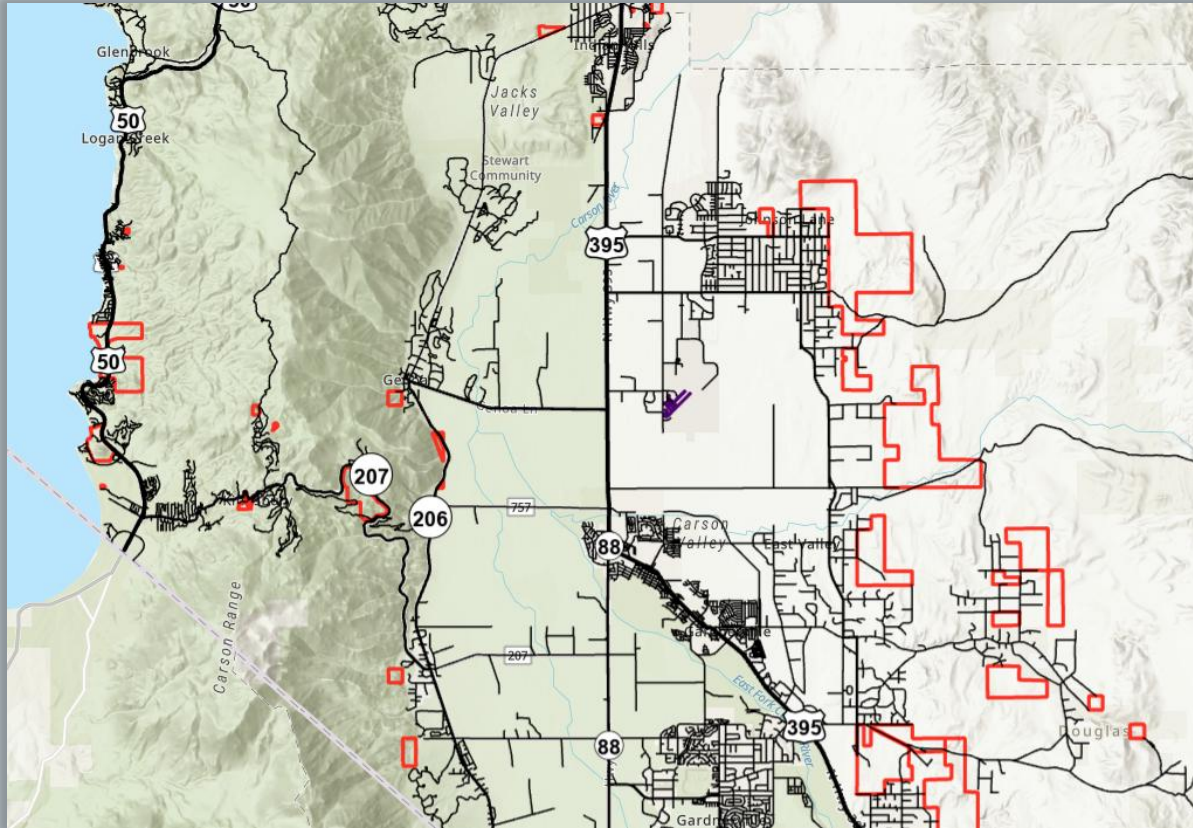


- Critical Land in the 100 Year Floodplain
- FEMA 100 Year Floodplain



Locations of future critical land assets – highest priorities are located in the primary floodplain

FUTURE CRITICAL LAND INVENTORY

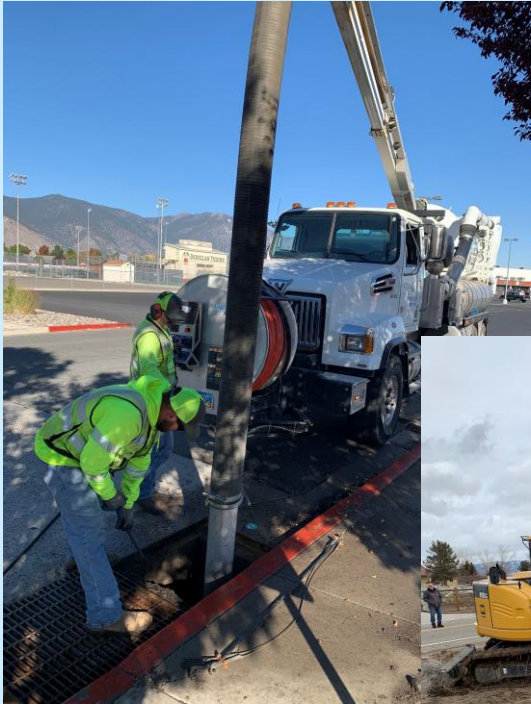


Proposed Lands Bill parcels

PROGRAM ACCOMPLISHMENTS

2018

Douglas County Stormwater Department funded



2018 - Present

Area Drainage Master Planning in
Areas of Focus

2019 - 2023

Equipment Purchases for
Maintenance work: Vactor Truck,
Excavator, Dump Trucks

2023

Johnson Lane: Pinenut North
Basins Constructed

2024-2025

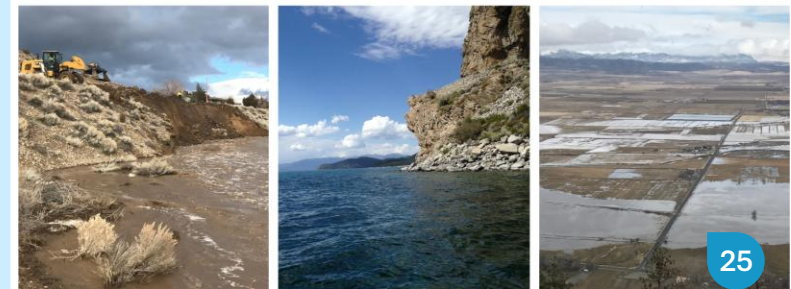
Acquired Fish Springs Redhawk
19-acres and DenMar 40-acres
for flood control/open space

2025

Johnson Lane Pamela Flood
Control Grant was awarded

2024

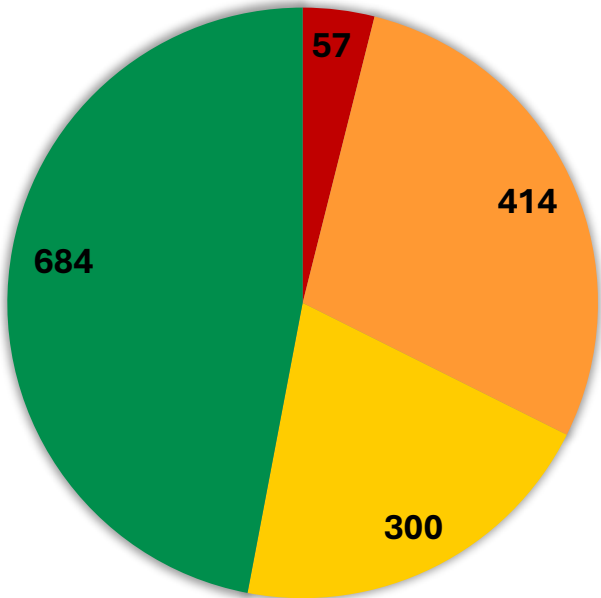
Adopted Stormwater Master Plan



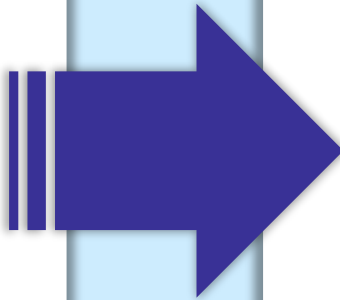
MAINTENANCE ACCOMPLISHMENTS

infrastructure improvement

**Asset Maintenance Score
at Identification**

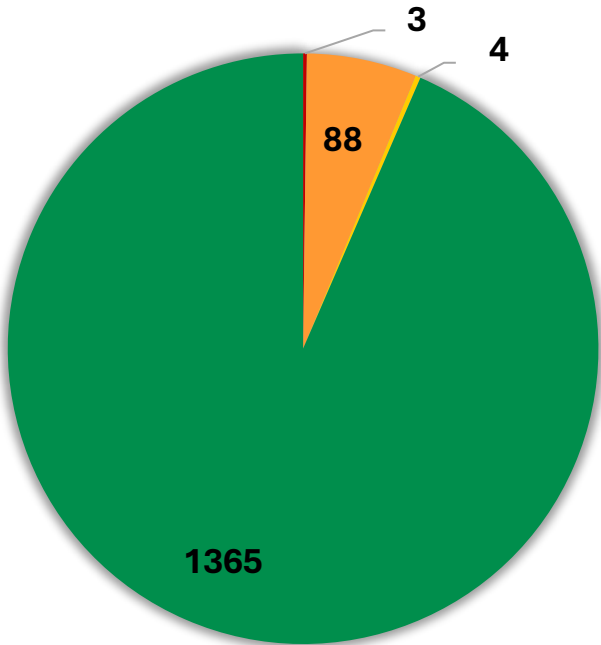


■ Serious ■ Fair
■ Satisfactory ■ Good



Current Asset Maintenance Score

September 8, 2025



■ Serious ■ Fair
■ Satisfactory ■ Good

MAINTENANCE ACCOMPLISHMENTS

by the numbers

SINCE STORMWATER PROGRAM FORMATION IN 2018:

- 5,352 inspections and maintenance of culverts, basins, and storm drains logged
- 34,140 CY of material removed from culverts, basins, and channels **≈ 3,414 truck loads ≈ 81,921,220 pounds**
- 1,384 tons of rock placed **≈ 1160 CY ≈ 116 truck loads ≈ 2,768,000 pounds**

The amount of sediment removed by the Stormwater Maintenance crew could fill the Douglas County Community Center approximately **2/3 full**, and the amount of rock placed by the crew is enough to cover **3 football fields**.

**Totals as of September 8, 2025*

SEDIMENT REMOVED



ROCK PLACED



CAPITAL IMPROVEMENT PROJECT LIST

● CRITICAL LAND/ GROUNDWATER RECHARGE

● PUBLIC SAFETY/ KEEPS ROADS OPEN

Completed

- Johnson Lane – Pinenut North (court ordered through Johnson Lane Flood Litigation Settlement)

In Progress

- Marla Bay/Zephyr Heights Water Quality Project (funded by NDOT, maintained by Douglas County)
- Johnson Lane Pamela Place Detention Basin (funded 75% through FEMA and 25% General Fund)

Future

- Fish Springs Mel/Myers Basins
- Buckeye Road box culvert @ Upper Allerman
- Waterloo box culvert @ Cottonwood Slough
- Fish Springs Pinenut Creek Dam
- Fish Springs Redhawk Basin
- East Valley Dip Section at Pinenut Road Wash
- Buckeye Detention Basin DCSID Site
- Hot Springs Buckbrush Flood Control System
- Fish Springs DenMar Basin
- Smelter Creek Sediment Basin
- Fish Springs Bently Basins
- Topaz Lake Drainage Improvements
- Fish Springs Janelle Basin
- Smelter Creek Phase 1-8 Channel Work
- Smelter Creek Tributary Alternative 2
- Johnson Lane Wash Dam
- Buckeye Road Culvert Crossing @ Martin Slough

THE FUNDING GAP

Identify sustainable funding for:

**Future
critical land
acquisition**

**Increasing
regulatory
inspections/
monitoring/
maintenance**

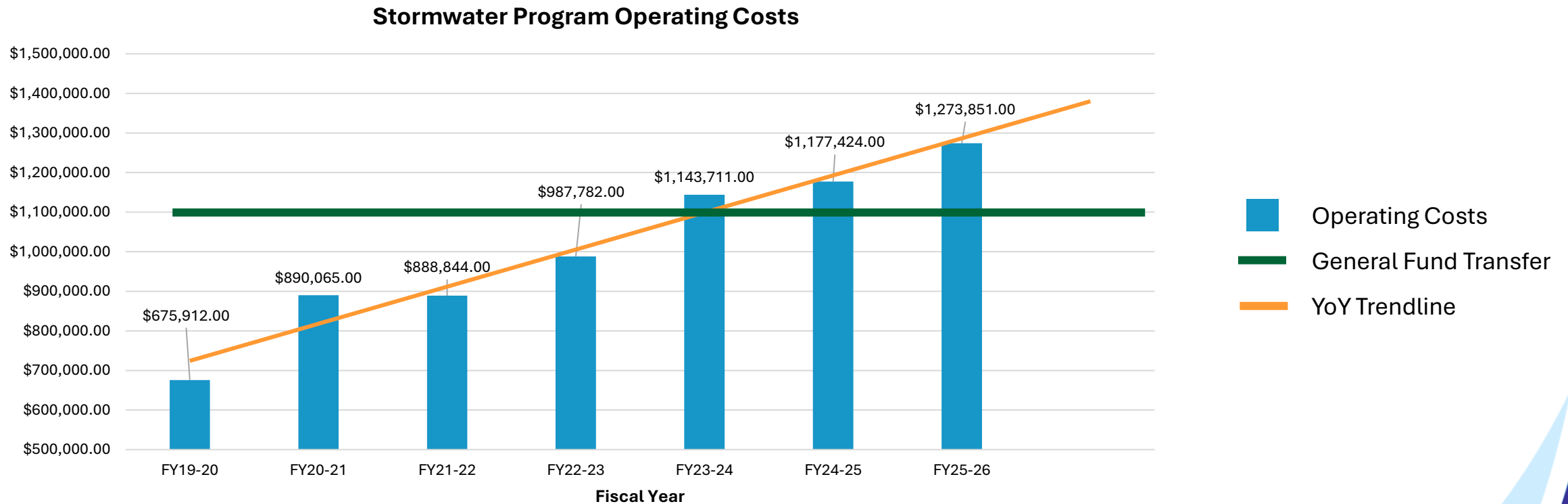
**Construction
of capital
projects**

**Day to day
program
operations**

**Keeping up
with
inflation**

STATUS QUO (GENERAL FUND)

Costs are Going Up, Revenue is Static

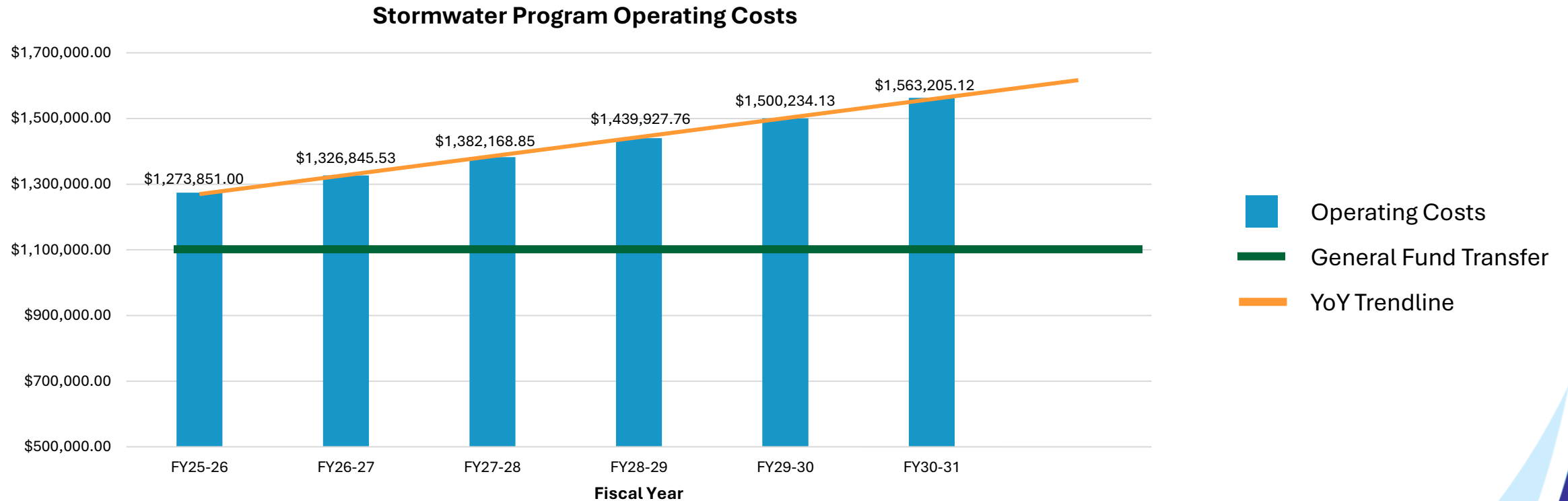


Will stormwater maintenance cease to exist in the future?

The current Stormwater Division operations are *NOT* sustainable. The funding being allocated currently will *NOT* be sufficient without identifying a dedicated funding source.

STORMWATER PROGRAM OPERATING COSTS

5 Year Projection



Will stormwater maintenance cease to exist in the future?

The current Stormwater Division operations are **NOT** sustainable. The funding being allocated currently will **NOT** be sufficient without identifying a dedicated funding source.

STORMWATER PROGRAM BUDGET

5 Year Projection

Stormwater Program Operating & Capital Costs, Total Budget Estimate



	FY25-26	FY26-27	FY27-28	FY28-29	FY29-30	FY30-31
Total	\$4,399,851.00	\$4,462,445.53	\$4,527,656.85	\$4,595,600.40	\$4,666,396.95	\$4,740,172.83
Operating Budget	\$1,273,851.00	\$1,326,845.53	\$1,382,168.85	\$1,439,927.76	\$1,500,234.13	\$1,563,205.12
Machinery & Equipment	\$70,000.00	\$72,100.00	\$74,263.00	\$76,490.89	\$78,785.62	\$81,149.19
Major Repair and Replacement	\$250,000.00	\$257,500.00	\$265,225.00	\$273,181.75	\$281,377.20	\$289,818.52
Debt Service (\$14M, 10-yr Term CIP)	\$1,806,000.00	\$1,806,000.00	\$1,806,000.00	\$1,806,000.00	\$1,806,000.00	\$1,806,000.00
Critical Land Management	\$1,000,000.00	\$1,000,000.00	\$1,000,000.00	\$1,000,000.00	\$1,000,000.00	\$1,000,000.00

FUNDING STRATEGIES

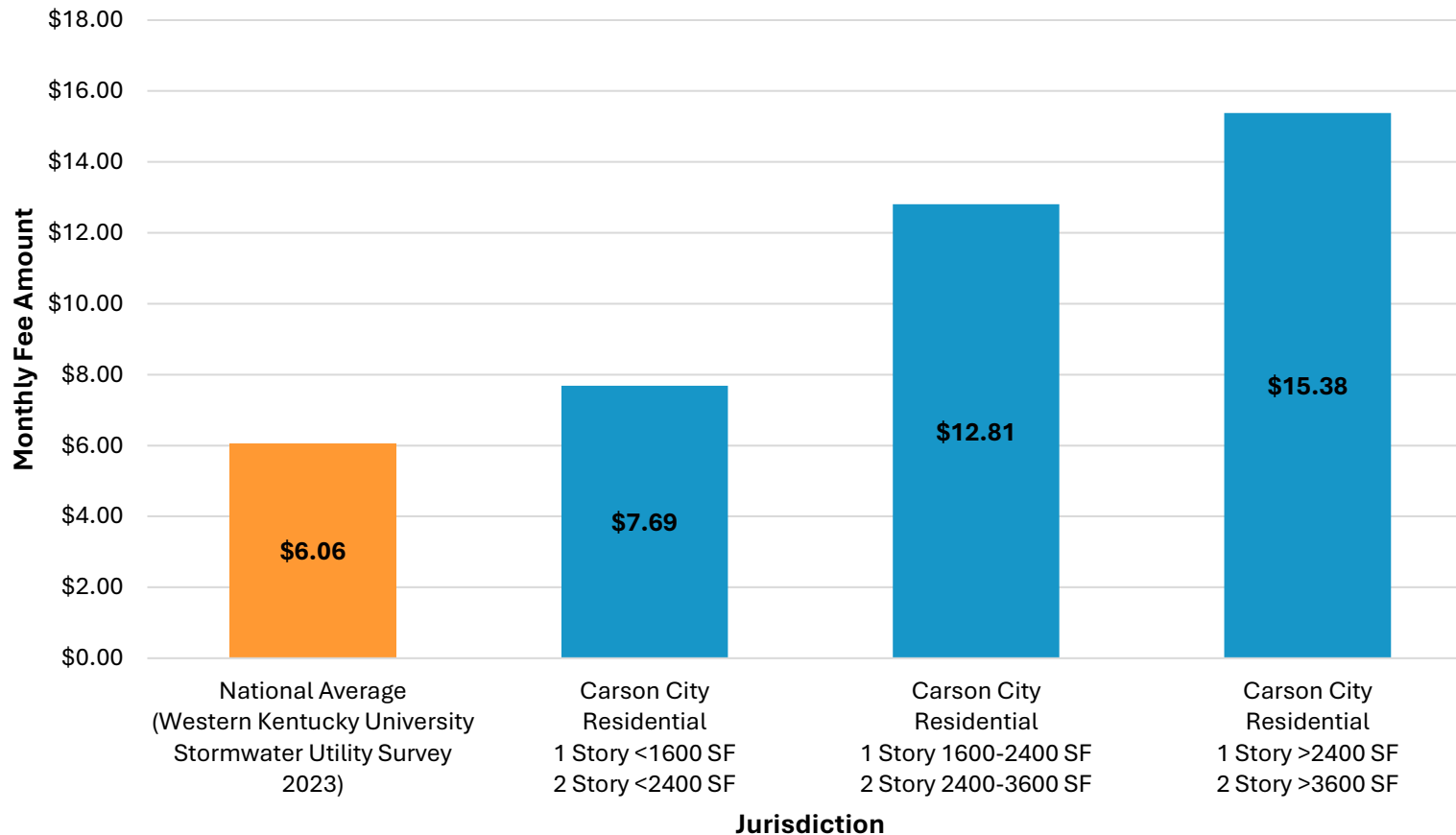
to supplement grants

- 1 Stormwater, Infrastructure, and Critical Land Utility Fee
- 2 1/4 Cent Sales Tax Increase for Stormwater Infrastructure
- 3 Special Assessment Districts
- 4 Status Quo (General Fund)

STORMWATER UTILITY FEE

Local Example: Carson City

Residential Stormwater Utility Monthly Fee Comparison



- Carson City charges Single Family Residential Stormwater Utility rates based on *home square footage* at three tiers.
- Commercial and Multi-Family rates are based on *impervious area square footage* at four tiers.

STORMWATER UTILITY FEE

What could Douglas County generate?

- It is estimated that there are approximately **56,917** ERUs in Douglas County based on a 2017 study and the number of building permits that have been finaled since that study date through June 30, 2025.
- With an estimated 56,917 ERUs, **\$4,139,004.24** could be generated annually at the national average monthly fee of \$6.06.
- A new study would be required to determine an accurate count of current **Equivalent Residential Units (ERUs)**, fee structure, and administration of utility.

Area	SFR ERUs	MFR and Commercial ERUs	Total ERUs
Valley/ Topaz	17,288	31,207*	48,495
Lake Tahoe	2,976	5,446	8,422
Total Douglas County	20,264	36,653	56,917**

*The Minden-Tahoe Airport accounts for 8,347 ERUs of this total

**Estimate only, new study would be required to determine current number of ERUs

Total Estimated ERUs in Douglas County	Example Monthly Fee Per ERU	Potential Monthly Revenue Generated	Potential Annual Revenue Generated
56,917	\$6.06*	\$344,917.02	\$4,139,004.24
56,917	\$5.00	\$284,585.00	\$3,415,020.00
56,917	\$4.00	\$227,668.00	\$2,732,016.00
56,917	\$3.00	\$170,751.00	\$2,049,012.00

*National average as determined by Western Kentucky University Stormwater Utility Survey 2023

1/4 CENT SALES TAX INCREASE

Nevada Revised Statutes Options

NRS 377B – Tax for Infrastructure (0.25% increase)

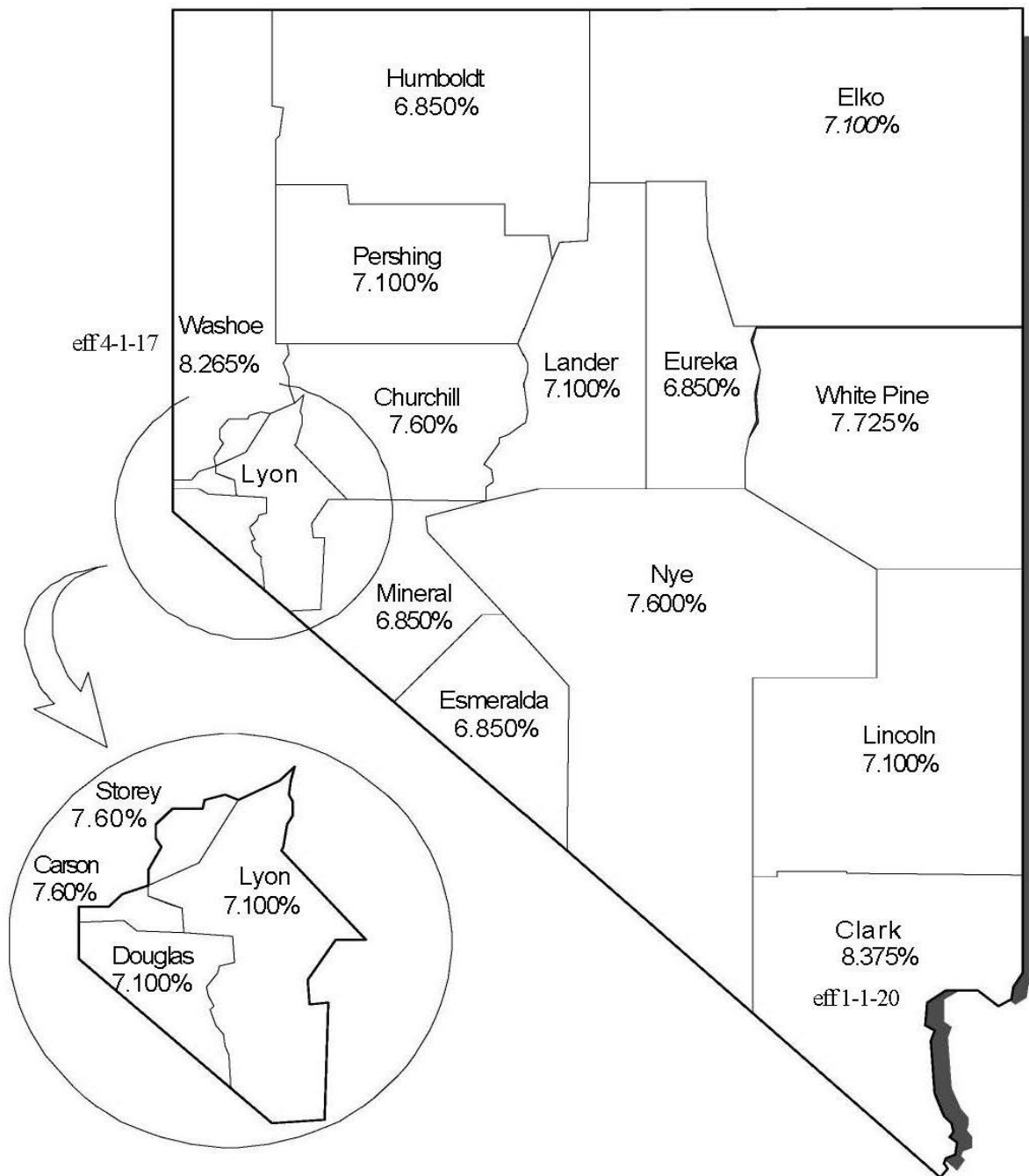
The BOCC could adopt an ordinance if approved by a two-thirds majority (4 out of 5). There have been many counties in Nevada that have used this. Not all counties have used it for flood control, but various types of infrastructure – Carson, Churchill, Clark, Elko, Lander, Lincoln, Lyon, Pershing, Storey, Washoe, and White Pine.

NRS 376A – Taxes for Development of Open Space Land

This option must go to a vote of the people, and it sunsets on September 30, 2029. The Legislature may extend this if Douglas County were to implement it prior to the sunset date.

Note: A Carson Valley Visitor's Authority FY24 estimate from a sample size of 20,189 credit/debit card transactions showed 21% of sales tax collected in the Carson Valley contributed by visitors and the Lake Tahoe Visitor's Authority estimates visitor spend at the Lake to be 29%.

Averaging these two figures results in 25% of sales tax paid by visitors in Douglas County, and a 75% resident share.



All rates effective 01/01/20

SALES TAX

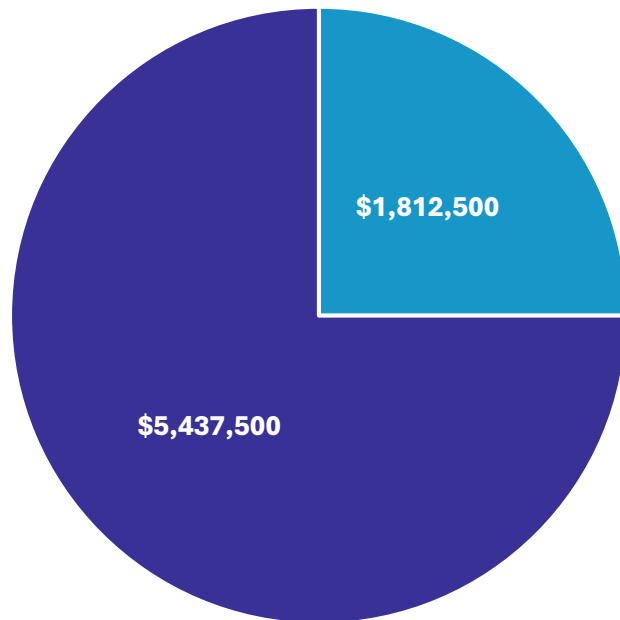
by county

A look at neighboring jurisdictions

1/4 CENT SALES TAX INCREASE

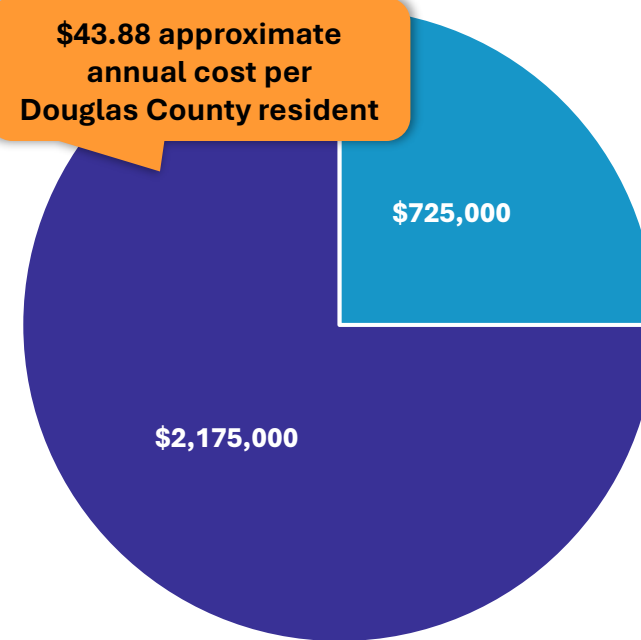
Local Example & Estimated Revenue

Washoe/ TRFMA Sales Tax (1/8 Cent)
Average Annual Revenue



- Annual 25% share paid by visitors
- Annual 75% share paid by residents

Douglas County Sales Tax (1/4 Cent)
Estimated Annual Revenue



- Annual 25% share paid by visitors
- Annual 75% share paid by residents

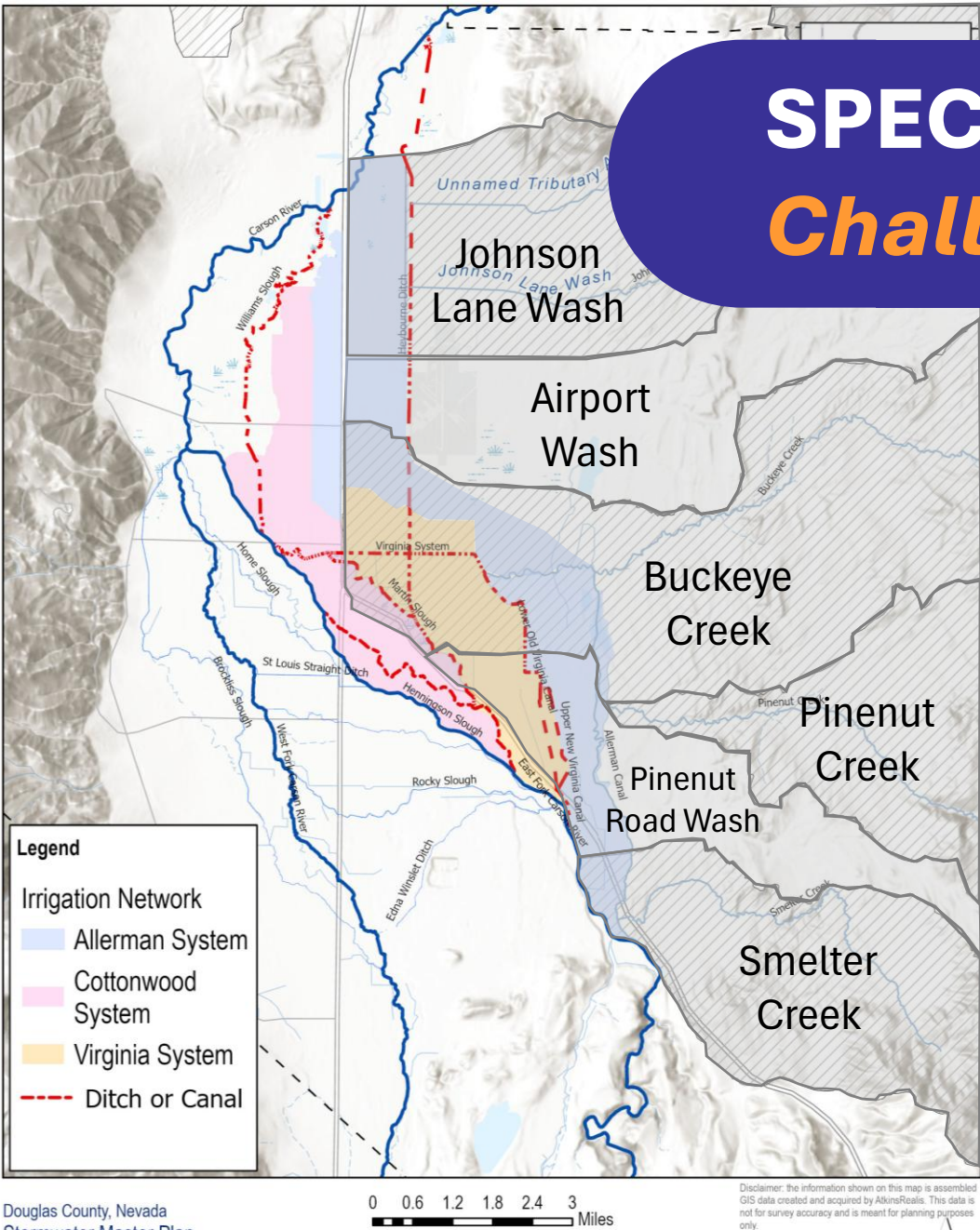
Metric	Washoe/ TRFMA (1/8 cent)	Douglas County (1/4 cent)
Average/ estimated annual revenue	\$7,250,000	\$2,900,000
Annual 25% share paid by visitors *	\$1,812,500	\$725,000
Annual 75% share paid by residents *	\$5,437,500	\$2,175,000
County population (2024)	507,280	49,564
Annual cost per resident at estimated 75% share	\$10.72	\$43.88

*Source: Carson Valley Visitor's Authority FY24 estimate from a sample size of 20,189 credit/debit card transactions showing 21% of sales tax collected in the Carson Valley contributed by visitors and estimates by Lake Tahoe Visitor's Authority of visitor spend at the Lake to be 29%. **Averaging these two figures results in 25% of sales tax paid by visitors in Douglas County, and a 75% resident share.**

SPECIAL ASSESSMENT DISTRICTS

Challenges in Douglas County

Douglas County contains complex watersheds. Drainages are all interconnected, often through the irrigation network. Water flow is rarely contained to a specific area, making it difficult to create districts that accurately represent costs and benefits within a watershed.



Douglas County, Nevada
Stormwater Master Plan

FIGURE 28 DRAINAGE AREAS & IMPACTED IRRIGATION NETWORKS

utility fee

- Residents estimated to pay annually (\$72.72 based on national average)
- The rate can be adjusted as necessary (potential increases based on CPI, expense estimation, etc.)
- There are many ways to structure a Utility Fee. There are considerations in fee design and approach. Those should be discussed and evaluated at the time the fee is established. (Similar to fee design for water and sewer utilities).

sales tax

- .25% sales tax increase would generate approximately \$2.9 million annually.
- Visitors also pay sales tax, amount generated is not solely paid by residents
- Revenue is directly based on the economy, and the County will not be able to depend on consistent annual collection
- \$2.9 million annually is not sufficient to cover ongoing operating costs and capital improvement projects identified in the Stormwater Master Plan. **If it's not sufficient, likely we would need to supplement the program with general fund dollars.**

FUNDING STRATEGIES *key points*

County declares flood emer

by Kurt Hildebrand
khildebrand@recordcourier.com

Emergency managers didn't wait for the weather to arrive to close county offices and schools on Tuesday.

By issuing notices before 5 p.m. Monday, Douglas residents got a heads up that any business they had with the county would have to go virtual. It also meant the Douglas County School District was able to alert parents early. The Douglas County School

MORE ONLINE

Visit www.douglascounty.gov and click the red bar across the top of the site

to alert parents early. The Douglas County School

2023



Clouds herald the next storm over the Carson Range over a field scoured by days of flooding

Full Dangberg pond pro

by Kurt Hildebrand
khildebrand@recordcourier.com

Buckeye Road was open on Monday morning after being

cautioned residents living below the southernmost Dangberg pond along East Valley Road that it could overflow.

Backed up by a high hazard dam, the pond is about a half mile long

infrastructure officials said or "To reduce the county is mitigation efforts or prevent That's a th

Walker said.

Visit gofundme.com and search for Ruhenstroth to donate.

Callers inundated 911 with what East Fork Fire Protection District described as "multiple simultaneous calls for service, including reports of residents unable to leave their homes, animals in distress, and a vehicle with occupants trapped in rising floodwaters."

One of the reports

IF YOU GO

County Manager Jennifer Davidson is scheduled to conduct a presentation on stormwater management to the Minden Town Board at their meeting 5:30 p.m. today in the CVIC Hall.

Johnson, who famously tipped over a Cadillac in the drainage to bring awareness to the flooding experienced in the community, said this was the worst he's seen since the aftermath of the Year's Flood of 1997. "It was definitely an impactful flood," Stormwater Manager Courtney

The Record-Courier

\$1 | Volume 145, Issue No. 79

Douglas County's Hometown Newspaper since 1880

Wednesday, October 1, 2023

Account set up in Ruhenstroth flash flooding

by Kurt Hildebrand
khildebrand@recordcourier.com

Former Douglas County commissioner Doug Johnson set up a gofundme.com account for Ruhenstroth neighbors affected by the Sept. 25 flooding.

Johnson, who famously tipped over a Cadillac in the drainage to bring awareness to the flooding experienced in the community, said this was the worst he's seen since the aftermath of the Year's Flood of 1997. "It was definitely an impactful flood," Stormwater Manager Courtney

2025



A screen shot of floodwaters from Smelter Creek as they roll through Ruhenstroth on Thursday.

FLOODING

From page A1

supplies and gave to mouth to save said. "They to the Vet Hos-Walmart." 95 was closed 30 p.m. after water and debris crossed the road. "There was lots of water and mud, for sure," Coverley said.

A unified command was established with the Douglas County Sheriff's Office with the first goal to rescue two people trapped in a vehicle by the floodwaters.

"Both the occupants and the vehicle were safely removed from the floodwaters by East Fork personnel," district officials said about the pickup. "Following the vehicle rescue, East Fork Fire and Douglas County Sheriff's Office personnel addressed numerous additional emergencies. Residents in low-lying areas were advised to shelter in place until waters receded, and crews assisted in

locating and rescuing animals that had been trapped or displaced by the flood." Most concerning was the near failure of the Allerman Canal's wall where it crosses the Corley Ranch.

East Fork Fire District Chief Alan Ernst said the watermaster shifted the flow back into the East Fork of the Carson River reducing the danger that the levee might burst onto the ranch.

The district thanked partner agencies and first responders from Tahoe Douglas Fire Protection District, Carson City Fire Department, and Truckee Meadows Fire Protection District who supported the response, ensuring continued coverage of additional calls for service during the flood event.

The county conducted a stormwater management program just eight days before the flash flooding. County Manager Jennifer Davidson is scheduled to present to the Minden Town Board at their meeting 5:30 p.m. today in the CVIC Hall.

rough Johnson Lane meet the roads.

"We have serious problems where natural drainages encounter roadways," McMacken said. "The flood problem occurs once the wash intersects Johnson Lane where an artificial channel leads to a roadside ditch with less than half the volume. It loads up with sediment."

2017

2018 | 3

Alan

WATER

down more than a foot week. temperature hit 66 esday, according to es Conservation emetry.

's big brother Wednesday at at Fork's flood rs Carson Val- rding to the ey. It crested 8. pped 17

ey / Special to The R-C

inches at Ebbetts Pass, at the of the East Fork. But with 9 inches still to go, there's plenty of water still to melt off.

High temperatures in Carson Valley are expected to drop in the mid-70s for a few days after hitting 89 degrees on Tuesday. Today's forecast calls for a high of 74 degrees in Minden.

On the other side of the front the high is expected to climb back into the upper 80s over Memorial Day weekend.

Frederick, was missing of Gardnerville, was missing a front end loader he was operating went into the raging Carson River at the Riverview Trailer Park.

"He and his equipment ended up into the river as they were attempting to put a diversion at the Riverview Trailer Park and the See Flood on page 4

QUESTIONS, DISCUSSION, & POSSIBLE DIRECTION