



# Solving Mosier Aquifer Declines

Wasco County Soil and Water Conservation District

[www.wascoswcd.org](http://www.wascoswcd.org)

## Presentation for Mosier Residents & Partners

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Mosier Grange Hall

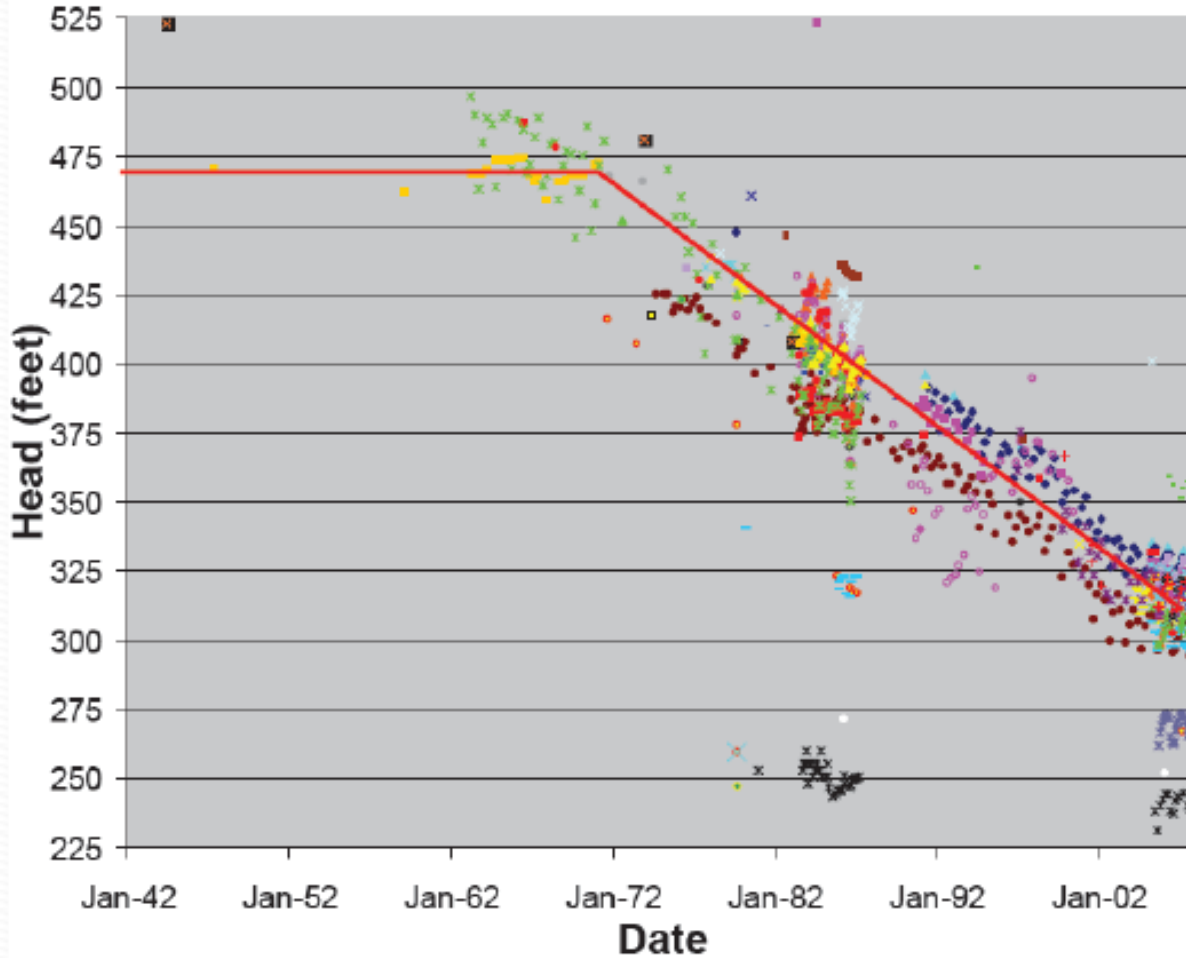
October 15, 2013



# Groundwater Aquifer Declines

Wasco County Soil and Water Conservation District

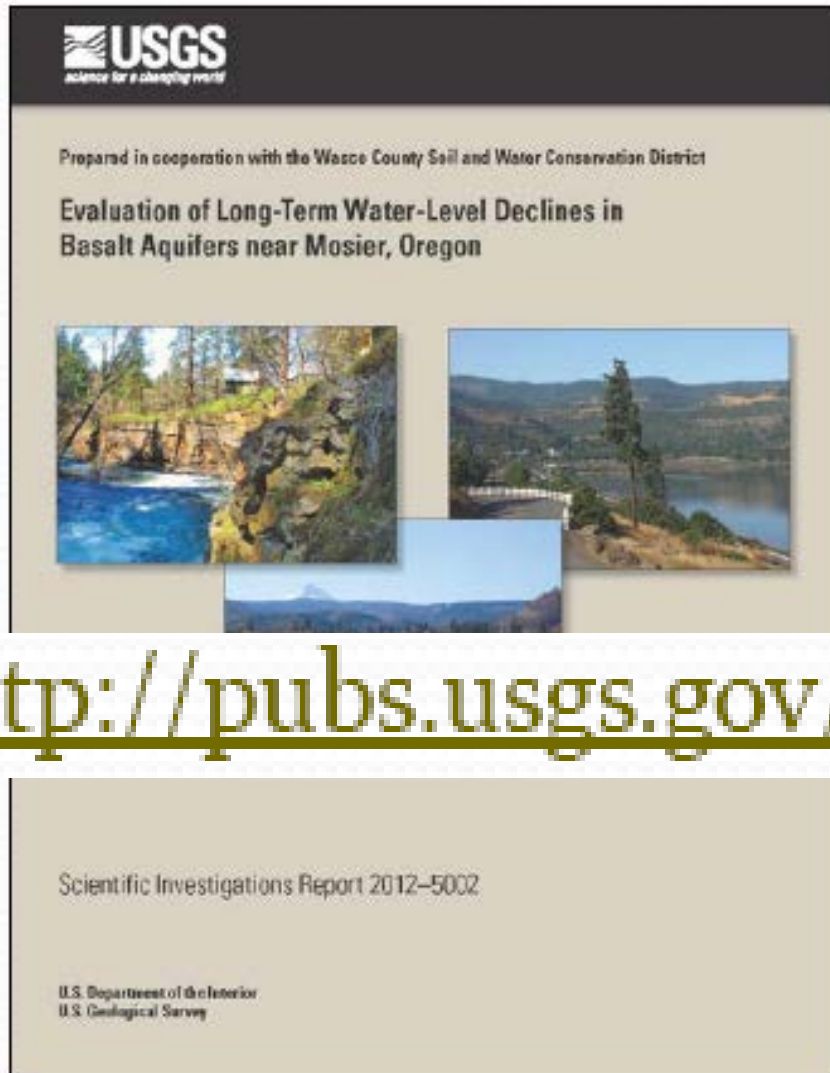
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# USGS Scientific Investigations Report 2012-5002

Wasco County Soil and Water Conservation District

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<http://pubs.usgs.gov/sir/2012/5002/>





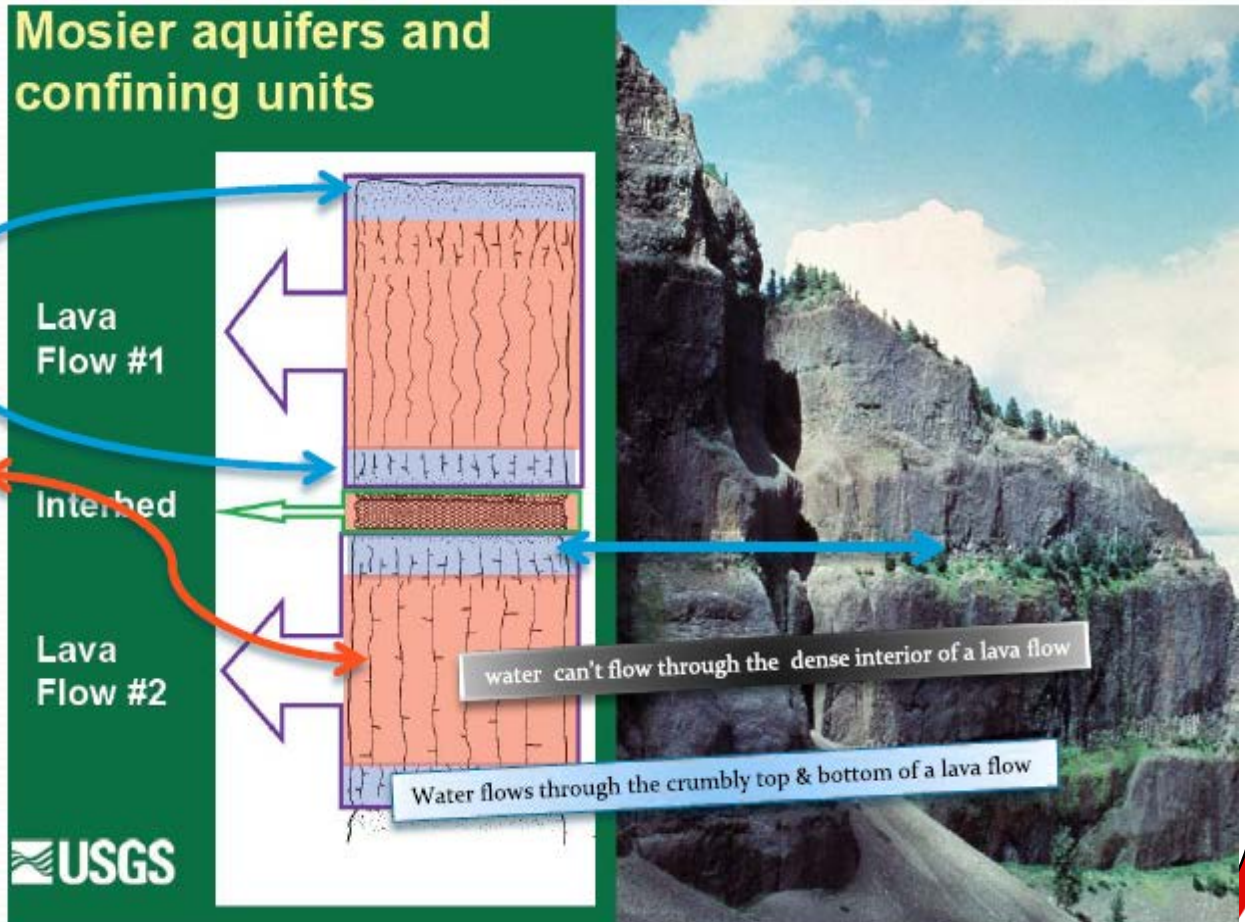
# BASALT LAYERS

Mosier's main aquifers are found in basalt = old lava flows...

## Mosier aquifers and confining units

Each lava flow is more crumbly on the top and bottom. The top and bottom of the layers contain **aquifers**.

Each lava flow is more solid in the middle. The dense interior of each layer is a **confining unit**.

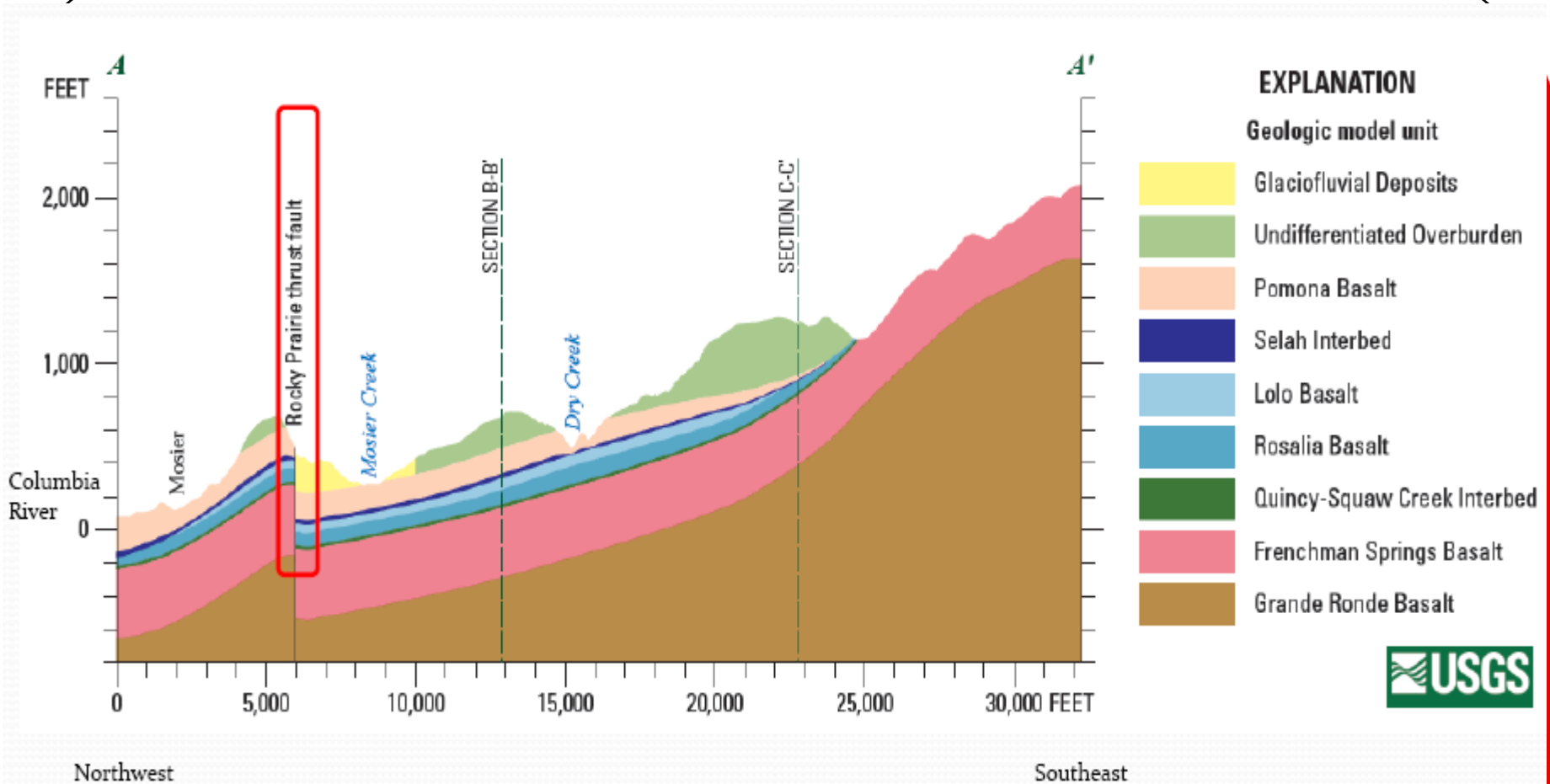




# GEOLOGICAL CROSS SECTION

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# Cause of Decline

## Why are water levels dropping in Mosier-area wells?

The USGS conducted:

- extensive data collection , and
- computer modeling of Mosier's aquifers,

And determined that:

“leakage through **commingling wells** is a significant and likely **the dominant cause of water level declines.**”

According to estimates derived from the USGS groundwater-flow simulation model:

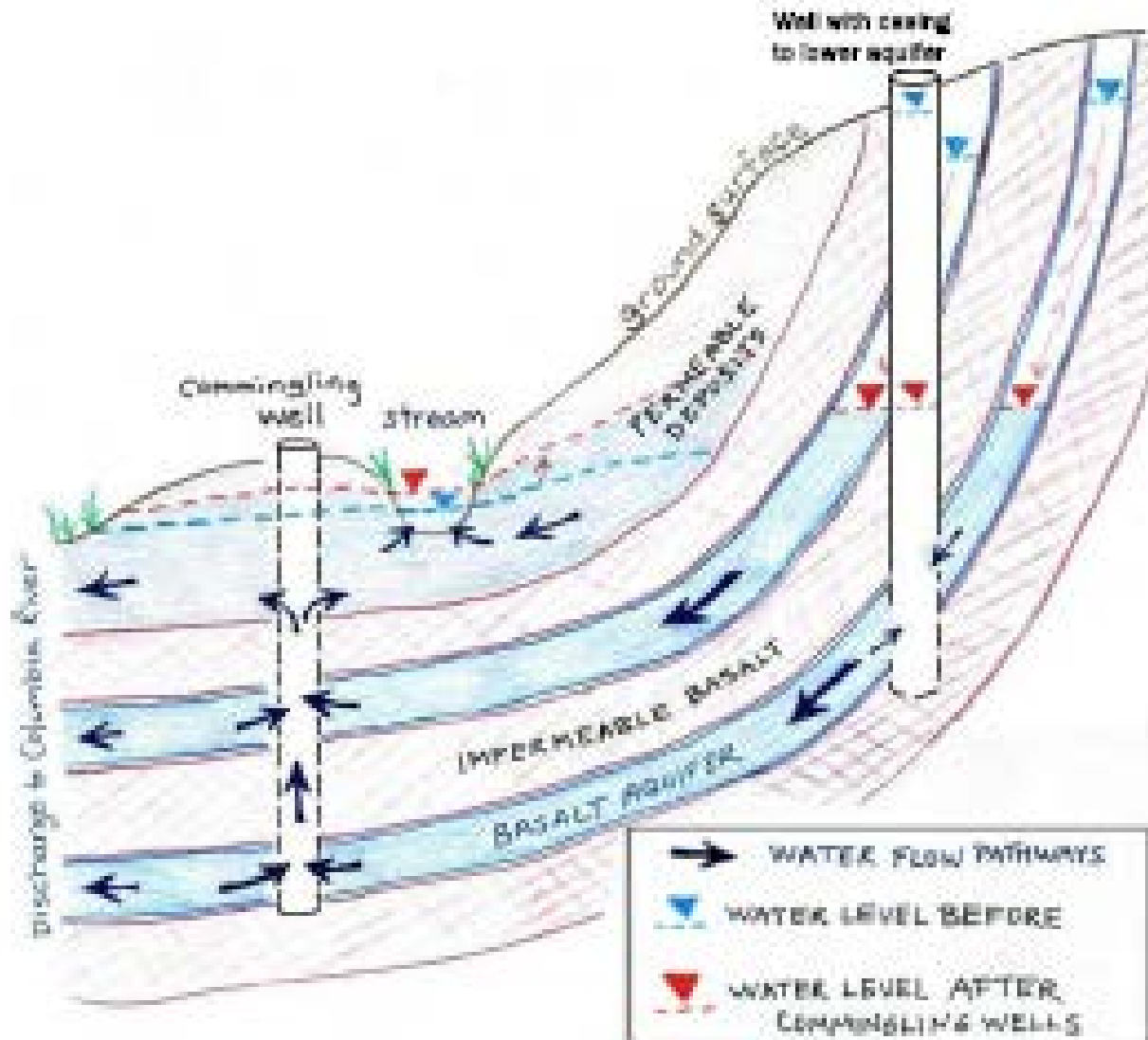
- **80 – 90% of the water level declines are due to commingling.**
- The remaining 10 – 20% of the declines can be attributed to pumping.
- Changes in precipitation have not contributed significantly to the declines.



# Commingling Wells

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# NEXT STEPS

**Use less water – high efficiency irrigation systems already in place**

**Use aquifer storage and recovery methods / artificial recharge  
Not much to gain unless commingling wells fixed**

**Systematically evaluate suspected commingling wells  
in priority zones – **Beginning November 2013****

**Begin repairing or decommissioning and replacing faulty wells**





# INITIAL PLAN

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## WASCO COUNTY SWCD LONG RANGE OUTLOOK

ACTIONS TO BE ACCOMPLISHED	2016-2025	2026-2035	2036-2045
MOSIER WELL EVALUATIONS (84 WELLS ZONES 1, 2, & 3)	[Solid blue bar spanning 2016-2025]		
MOSIER GW RESTORATION - REPAIR ZONE 1 WELLS (EST 13)	[Solid blue bar spanning 2016-2025]	[Dotted blue bar spanning 2026-2035]	
MOSIER GW RESTORATION - REPAIR ZONE 2 WELLS (EST 13)		[Solid blue bar spanning 2026-2035]	[Dotted blue bar spanning 2036-2045]
MOSIER GW RESTORATION - REPAIR ZONE 3 WELLS (EST 16)			[Solid blue bar spanning 2036-2045]

**ASSUMES**  
**NO OUTSIDE FUNDING**  
**COST SHARE WITH WELL OWNERS**

**WORK ON ZONES 1, 2, AND 3 DONE BY 2040**



# THE UPDATED PLAN

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																		DATE		
	2013				2014				2015				2016				2017			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
MOSIER WELLS ZONE 1 EVALUATIONS				—	—															
MOSIER WELLS ZONE 2 EVALUATIONS								—	—											
MOSIER WELLS ZONE 3 EVALUATIONS													—	—						
ZONE 1, 2, 3 WELL REPAIRS EST 42 TOTAL																				

**START REPAIRS**

**ASSUMES**  
**LOCAL AND SOME GRANT FUNDING**  
**ZONE 1-3 EVALUATIONS DONE BEFORE REPAIRS START**  
**REPAIRS BEGIN FALL 2016**



# UPDATED PLAN (CONT)

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																				DATE
	2016				2017				2018				2019				2020			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>ZONE 1 REPAIRS 13</b>				—	—	—	—	—	—	—	—	—	—	—	—	—				
<b>ZONE 2 REPAIRS 4</b>																	—	—	—	—
	2021				2022				2023				2024				2025			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>ZONE 2 REPAIRS 9</b>	—	—		—	—	—	—	—	—	—	—	—								
<b>ZONE 3 REPAIRS 6</b>												—	—	—	—	—	—	—	—	—
	2026				2027				2028				2029				2030			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>ZONE 3 REPAIRS 10</b>	—	—		—	—	—	—	—	—	—	—	—	—	—	—					

## Assumes

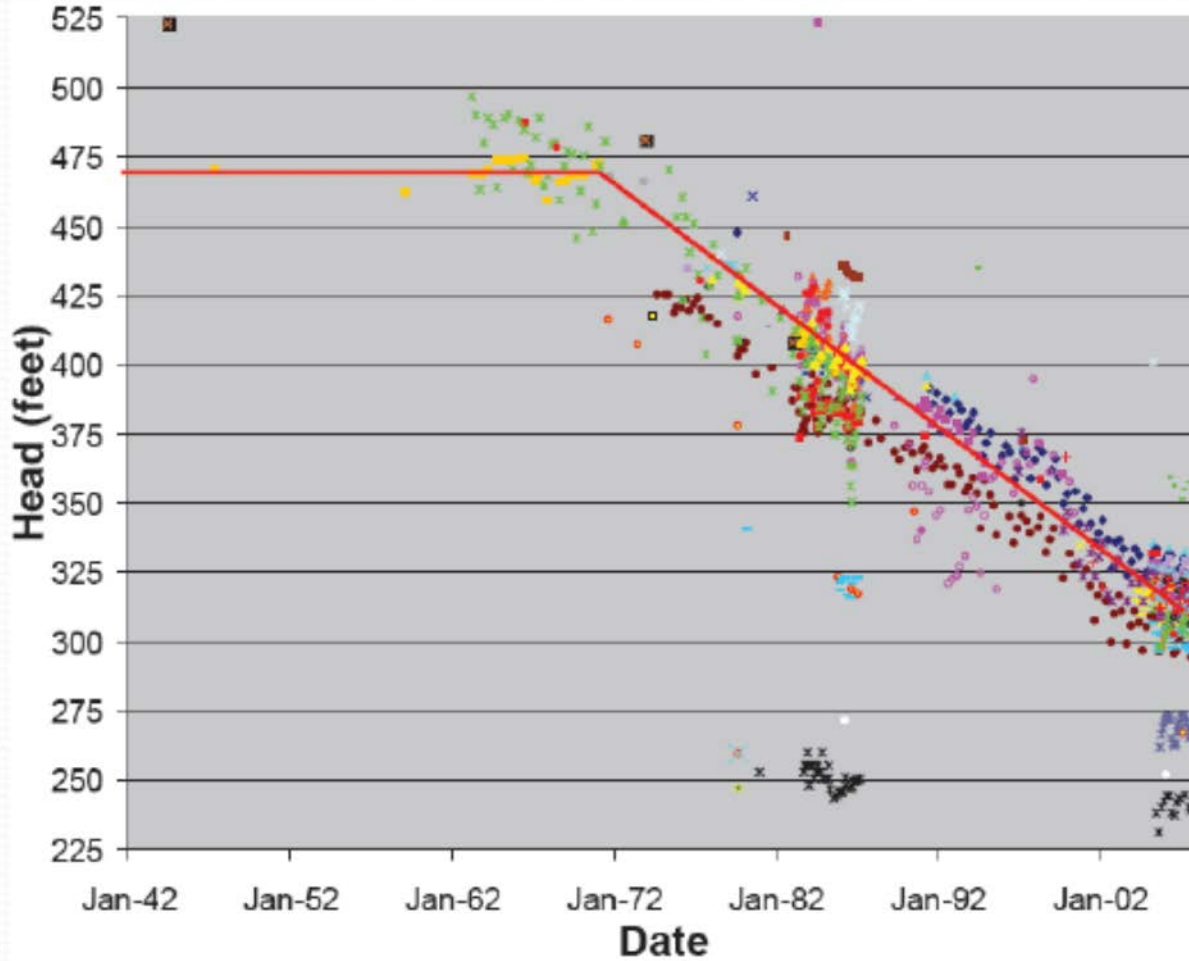
Repairs by zone: 13, 13, 16 (13 year repair effort starting 2016)  
 Repairs cost \$100k per well, landowner 50% cost share  
 and SWCD can continue to budget \$150k per year. No inflation.



# EXPECTED RESULT

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**~ 50% Recovery**

**2016**

**2029**