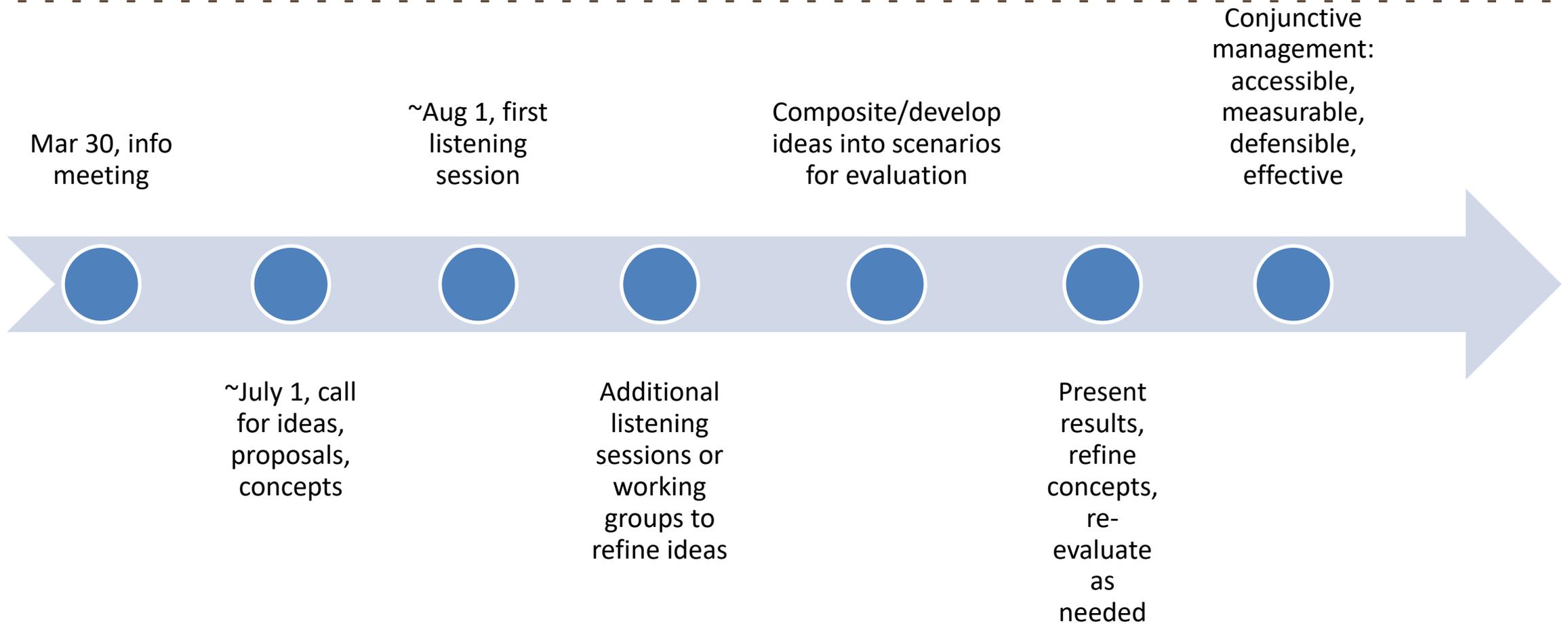


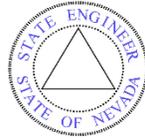
Agenda for NDWR stakeholder workshops on Conjunctive Management concepts and ideas for the Humboldt River Region

August 1, 2023

Presenter/ Comment by	Type	Title	Approximate time
NDWR Welcome			1:00 PM - 1:10 PM
Allander, Kip	Presentation	NDWR - Establishment of Capture Management Zone and Humboldt River Conservancy District	1:10 PM - 1:35 PM
Eason, James	Presentation	GBWC - Conjunctive use management strategies related to municipal water providers	1:35 PM - 2:00 PM
Hooper, Scott	Comment	Curtail by priority	2:00 PM - 2:10 PM
Wolf, Lili	Comment	Conjunctively manage water resources by priority	2:10 PM - 2:20 PM
Garret, Jennifer	Comment	Regulate all water use by priority	2:20 PM - 2:30 PM
Break			2:30 PM - 2:45 PM
Busselman, Doug	Presentation	NFB - Conjunctive management should be based on impact and implemented by basin	2:45 PM - 3:10 PM
Ure Stix, Therese	Presentation	SLO - Use of critical groundwater management areas as a tool in conjunctive management, an Oregon example	3:10 PM - 3:35 PM
Skulan, Caitlin	Presentation	SLO - Use of groundwater management areas and mitigation measures for conjunctive management, an Idaho example	3:35 PM - 4:00 PM
General Comment and Discussion session			4:00 PM - 4:25 PM

TIMELINE/PROCESS





NEVADA DIVISION OF
WATER RESOURCES



Nevada Department of
**CONSERVATION &
NATURAL RESOURCES**

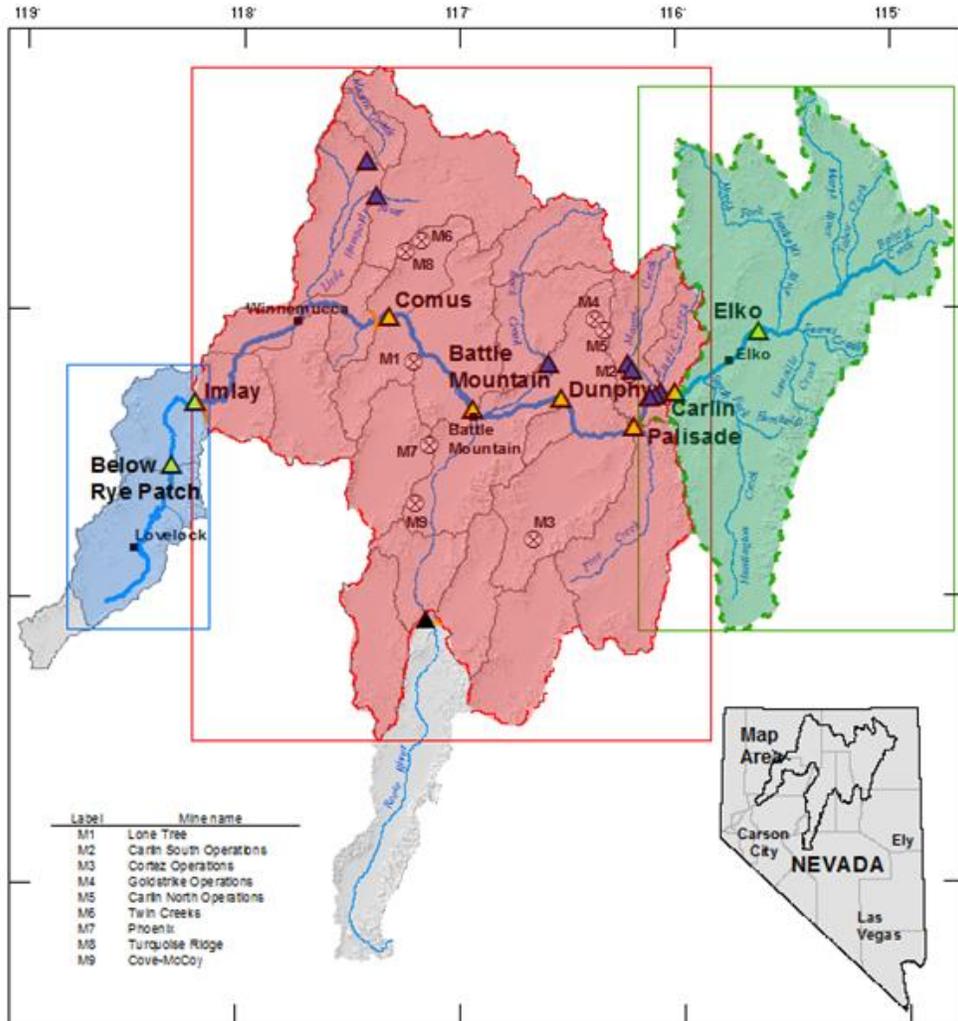
Establishing Capture Management Zone and Humboldt River Conservancy District for the Humboldt River Region

NDWR

Carson City, Nevada and Virtual
August 1, 2023

Presented By:

Kip Allander, *Hydrogeologist*



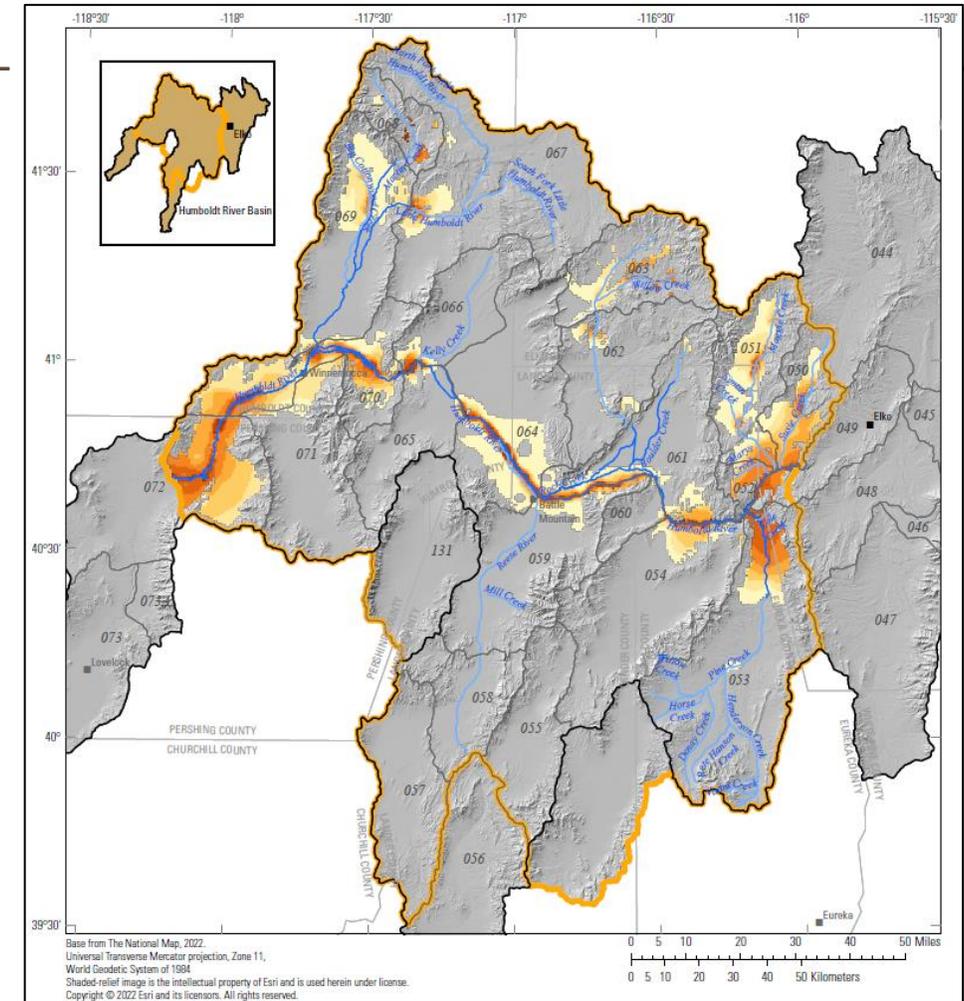
OVERVIEW OF NDWR APPROACH FOR CONJUNCTIVE MANAGEMENT

- The core tenets of NDWR's approach to developing conjunctive management strategy for the Humboldt River Region are:
 - Continue to maximize beneficial use of water resources, both underground and surface water.
 - Adhere to the Prior Appropriation Doctrine.
 - Prevent increase in conflict from underground water rights moving into the future.
 - Reduce existing conflict from UG water rights.
 - While minimizing harm to the regional economy.
 - Through engagement with stakeholders.
- Conjunctive management must work within the confines of NV water law and the Humboldt Decree.
- The ideas and concepts being presented here are not final and far from complete and largely based on concepts that have been presented in the past.

ESTABLISHING A CAPTURE MANAGEMENT ZONE (CMZ)

- Define area of capture impact as **x%** of capture after **y** years of pumping.
 - For example: 10% capture after 100 years or 1% capture after 50 years.
 - Based on capture maps derived from models.
- Establish this area as CMZ.
- Areas within CMZ subject to capture management.
 - Areas outside exempt.
- Establish two subzones within CMZ
 - Curtailment zone
 - Assessment zone

Example capture map for Middle Humboldt River Basin:
10% capture after 50 years of pumping



Extracted from:

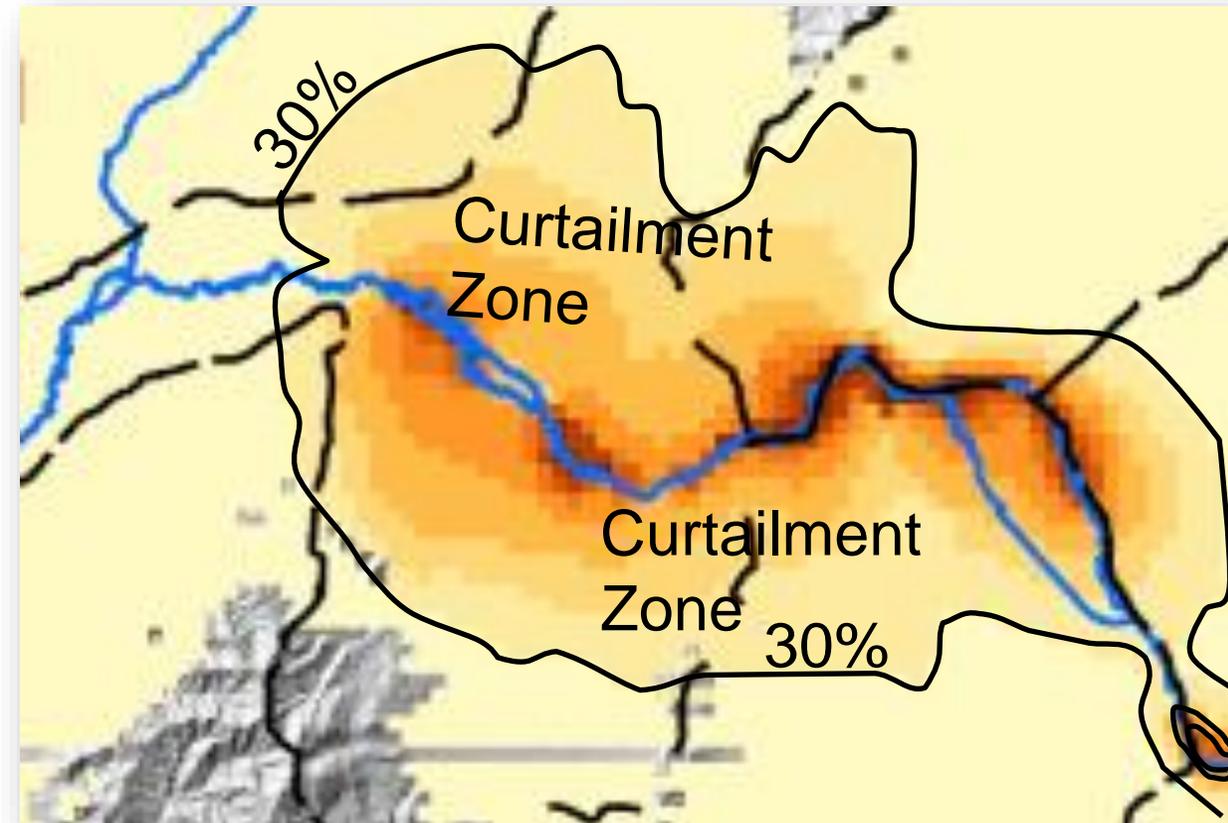
<http://www.water.nv.gov/documents/Humboldt%20Modeling%20Annual%20Update%20Mar%202022.pdf>

CURTAILMENT ZONE

- Define Curtailment Zone for areas with substantial conflict
 - For example: 30% or 50% of pumping sourcing from stream capture.
- All non-exempted pumping curtailed unless capture is offset.
- Offsets can be from Decree rights, artificial storage credits, water trading, and ???.
- Offsets must be of sufficient quantity and reliability (wetness) to offset capture.

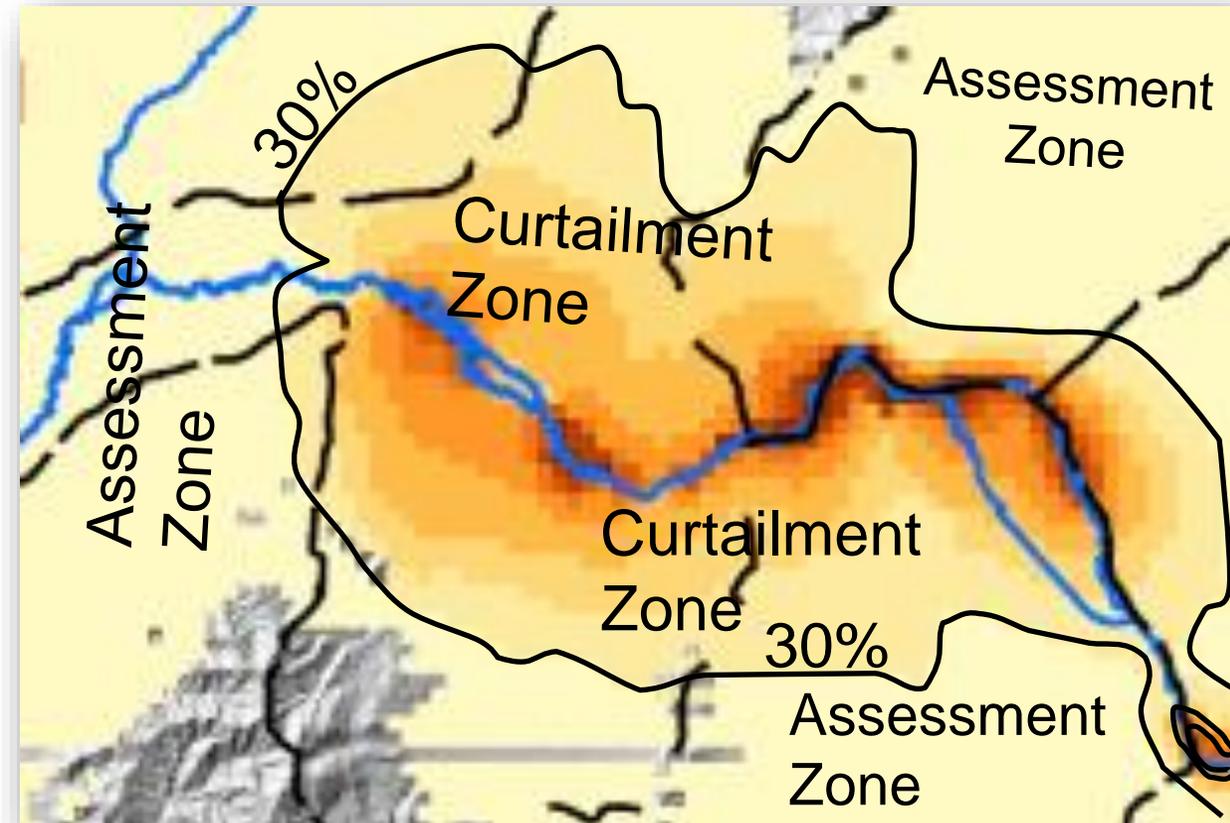
Hypothetical example for a 30% capture curtailment zone modified from:

http://www.water.nv.gov/HumboldtRiver/2023_HumboldtOutreach.pdf



ASSESSMENT* ZONE

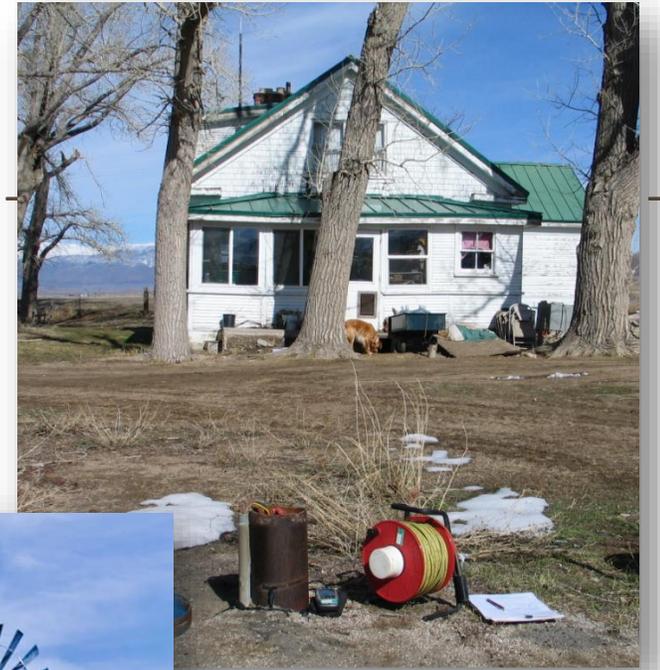
- Area outside of Curtailment zone within CMZ.
- Assessments based on value of 'surface' irrigation water conflicted.
- Assessments prorated by time in conflict.
- UG water rights only in priority when Decree and Storage rights are fully served (or will be).



* - Not groundwater assessments by NDWR.

EXEMPTIONS

- GW pumping resulting in <5 AFY of capture after y years.
 - <0.01 cfs of streamflow depletion
 - All Domestic wells
 - Many Stock water rights



CONSIDERATIONS FOR IMPLEMENTATION

- Based on capture timing and magnitude from models.
 - Current capture rate or starting from some effective date?
 - Or some mix of the two.
- Gradual implementation could be more manageable and have less immediate impact but could take longer to see conflicts reduced.

WATER RIGHTS WITHIN THE CMZ

- Would remain valid.
 - Maintain priority and value.
- Can be sold, transferred, or offset as needed to find relief.
- Can be moved to areas of CMZ with lower capture liability.
- In basins with unappropriated water, Order may be issued closing all new appropriations until 'Curtailed' rights have been dealt with.

HUMBOLDT RIVER CONSERVANCY DISTRICT ([NRS 541](#))

Establishment of the District

- Establish a local District
- Governed by locally elected board members.
- Boundaries defined by CMZ.
- Levy base assessments on GW and SW users within CMZ.
 - Funds staff and facilities.
- Levy capture assessments for UG rights within assessment zone.
- Would require petition from counties, court action, or legislative action to stand up a Conservancy District.

HUMBOLDT RIVER CONSERVANCY DISTRICT

Mission/Activities of the District

- Manage the CMZ.
- Apply for/manage grants and other funding sources.
- Use capture assessments and other funds to purchase, retire, and/or resell water rights:
 - To reduce conflict from capture impacts.
 - To make Decree offset available for UG rights.
- Undertake river restoration or enhancement projects.
- Manage/Maintain water markets and water trading to offset impacts or incentivize conservation.

Questions?



Comments

Levi Kryder, Hydrology Unit Chief
Division of Water Resources
Email: lkryder@water.nv.gov



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NDWR Abstract Presentation

Presented by James Eason, Michael
Hardy and Chris Facque



NDWR ABSTRACT PRESENTATION



Table of Contents

- 1. Introduction and Overview
Spring Creek System by James Eason**
- 2. Existing Regulations and
Hydrogeology by Mike Hardy**
- 3. Proposed Concept,
Implementation and Timing by
Chris Facque**
- 4. Questions**

3 Takeaways

1. **Concept, an “Exemption” to NSE Order 1329 or Amend the Order 1329 for “Regulated Utilities”.**
2. **Qualifications to be subject to Exemption or Amended Order may include:**
 - When the utility can demonstrate they are outside of direct contact with the Humbolt River.
 - When the utility manages an integrated water system with multiple intertied pressure zones, variable flow drives or timed well operation, and support return flow systems into the basin.
3. **Removes requirement for initial conflicts analysis to the “Back-End” of permitting.**

Introduction and Overview

1. Concept Introduction:

- Alternative permitting approach to managing the conflicts analysis under order 1329 for regulated utilities

2. Water system overview:

- Pressure zones, well location, tract areas, effluent and treatments systems

3. Test case/example scenario:

- Well 8 drilling, development, and permitting (no new volume in this instance)

4. Costs, timing, other state regulators (NDEP, BSDW):

- Requirements for water system resiliency, dedication rates, fire flow demands, etc.
- No opportunity to show capture does not exist, once capture or impacts are modelled water resources must be replaced



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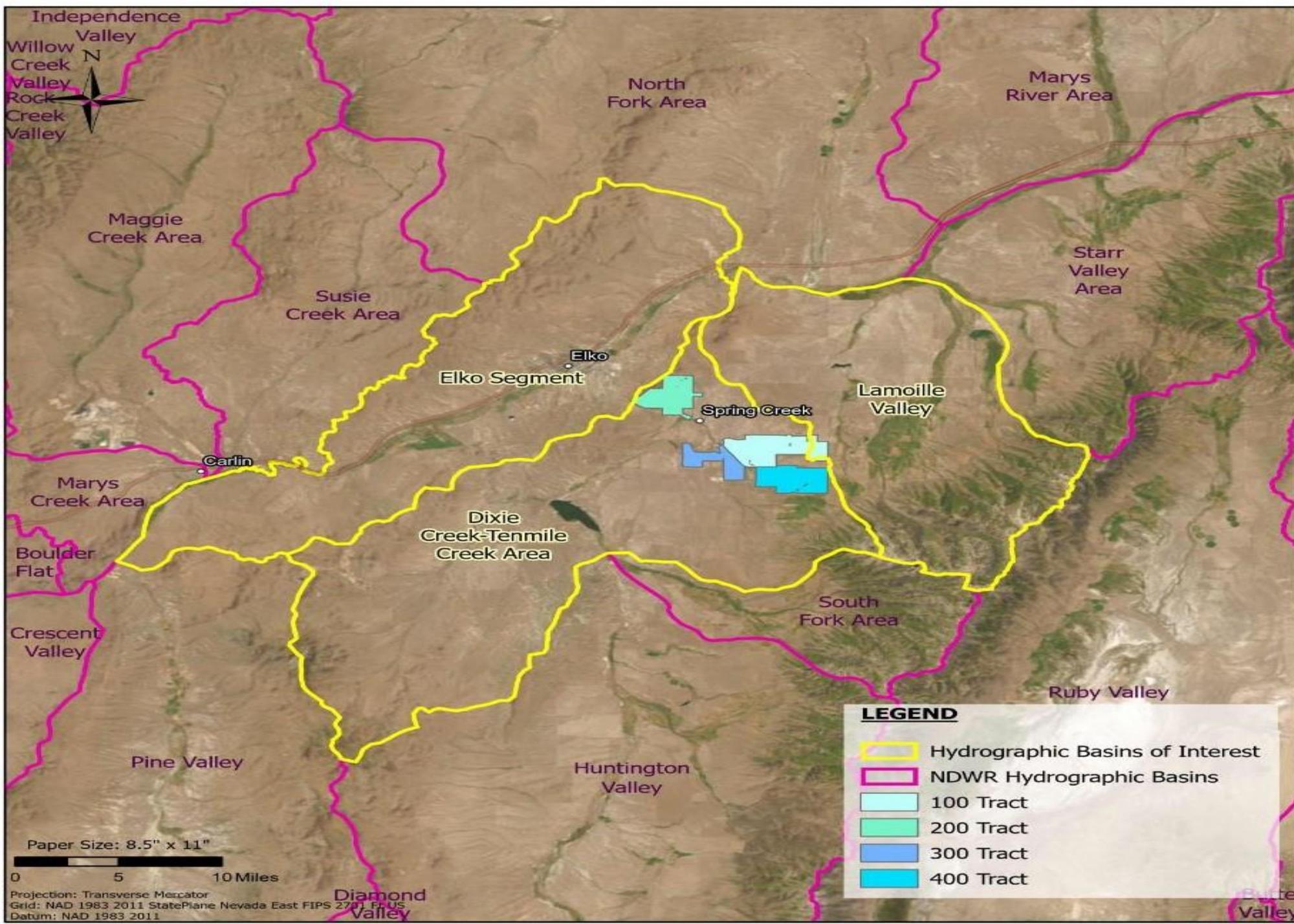
Hydrographic Basins:

- Dixie Creek-Tenmile Creek
- Lamoille Valley
- Elko Segment

GBWC Spring Creek System's relationship to the Humboldt River

Exemption 1:

Utilities are exempt from Order 1329 when they are outside of direct contact with the Humboldt River.



LEGEND

- Hydrographic Basins of Interest
- NDWR Hydrographic Basins
- 100 Tract
- 200 Tract
- 300 Tract
- 400 Tract

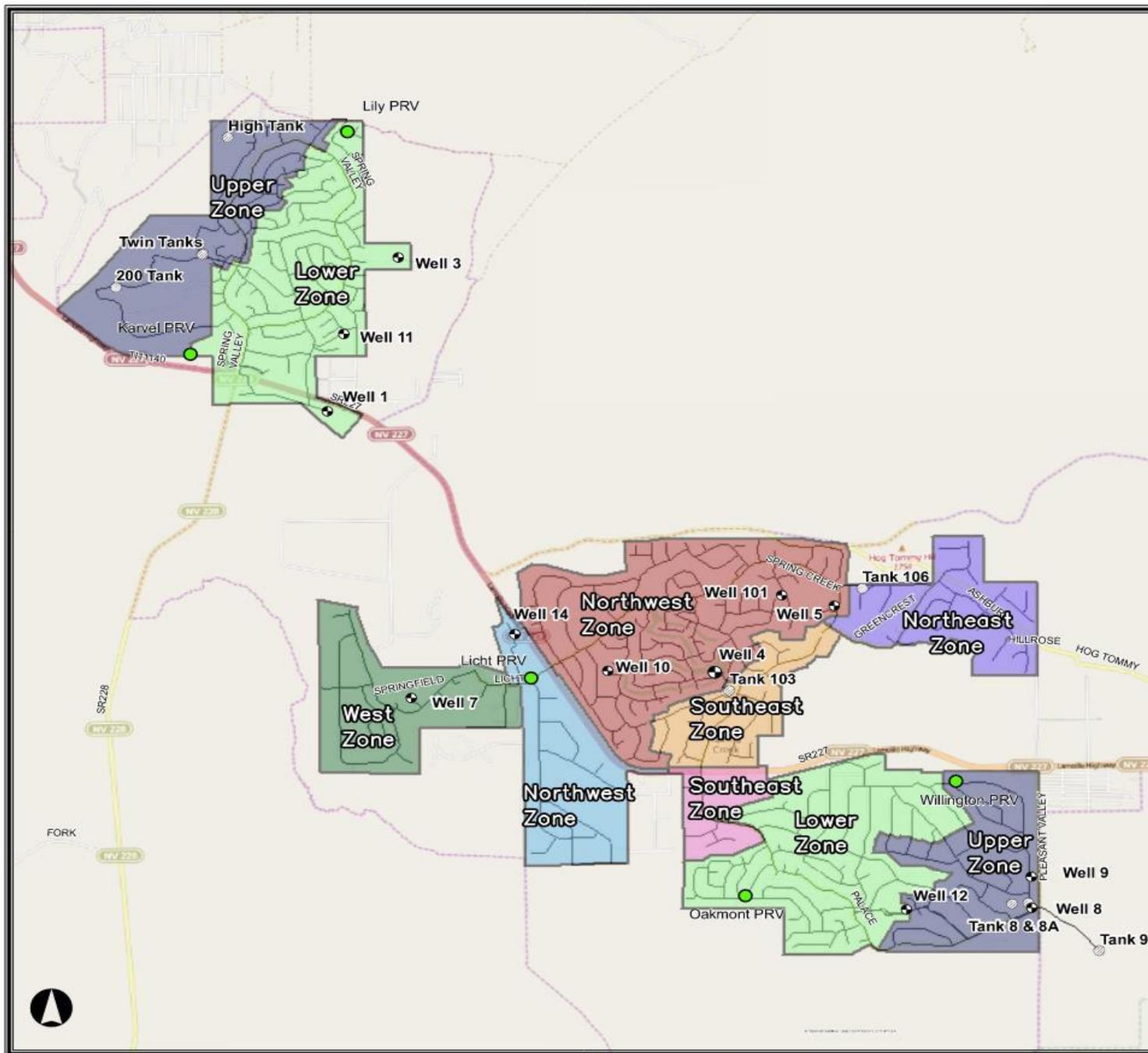


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Spring Creek Service Area

The upper area is the 200 Tract. Broken into two pressure zones and served by three wells.

The lower area is the 100/300 and 400 Tract. Broken into eight pressure zones, served by nine wells and interconnected.



Map Symbols

- PRV
- ⊕ Well
- Tank
- Pipe
- Existing Pressure Zones

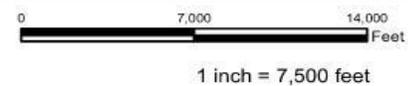


Figure 1-1
Overview of
Existing System



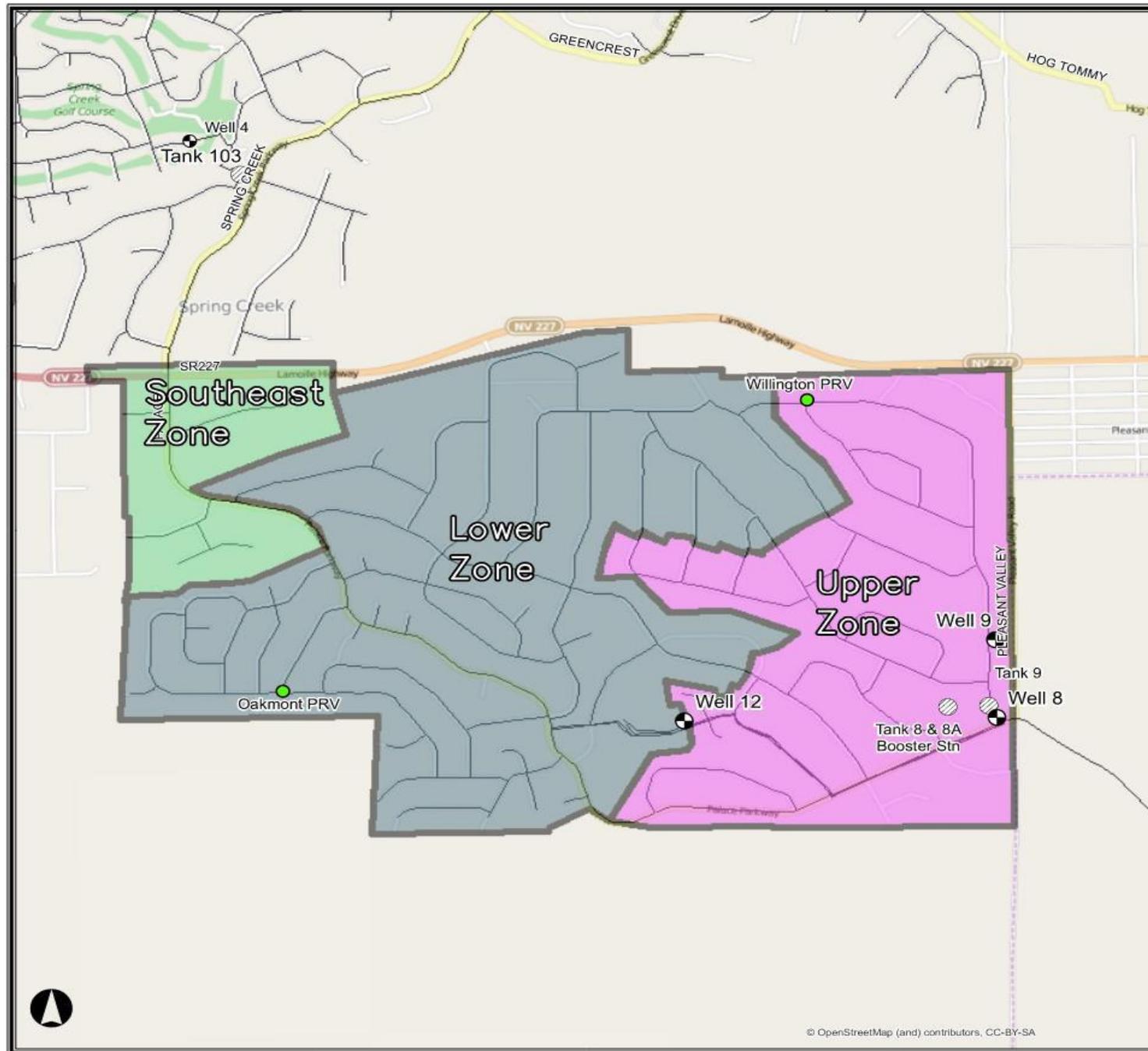
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400 Tract New Well location

Exemption 2:

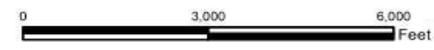
When a Utility can
demonstrate an
integrated system

The 400 Tract has
three separate
pressure zones, three
wells located in the
area and is connected
to the 100 and 300
tracts through
interties located in the
Southeast Zone and
Lower Zone.



Map Symbols

- PRV
- ⊕ Well
- Tank
- Pipe
- Lower Zone
- Upper Zone
- Southeast Zone



1 inch = 3,000 feet



Figure 2-4
400 Tract
Existing System



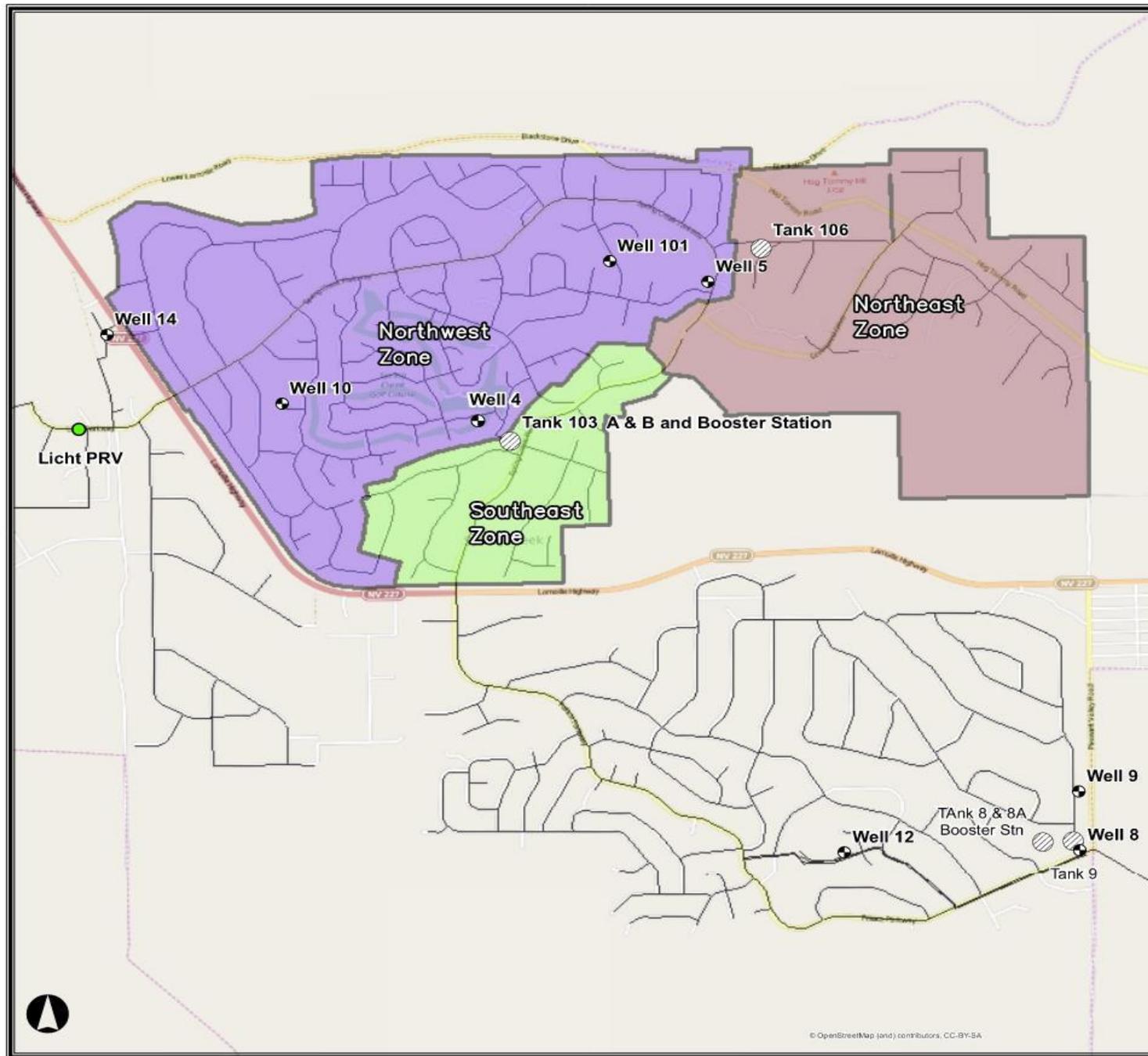
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100 Tract Water and Wastewater Area

Integrated System Example:

The 100 Tract
Southeast Zone
interconnects with the 400
Tract. The line in
highlighted in yellow.

Water from the 100
Tract is pushed into
the 100 and 400 Tracts
to supplement wells 7,
8, 9, 12 and 14.



Map Symbols

- PRV
- Well
- Tank
- Pipe
- North East Zone
- Northwest Zone
- Southeastt Zone



1 inch = 4,000 feet



Figure 2-2
100 Tract
Existing System



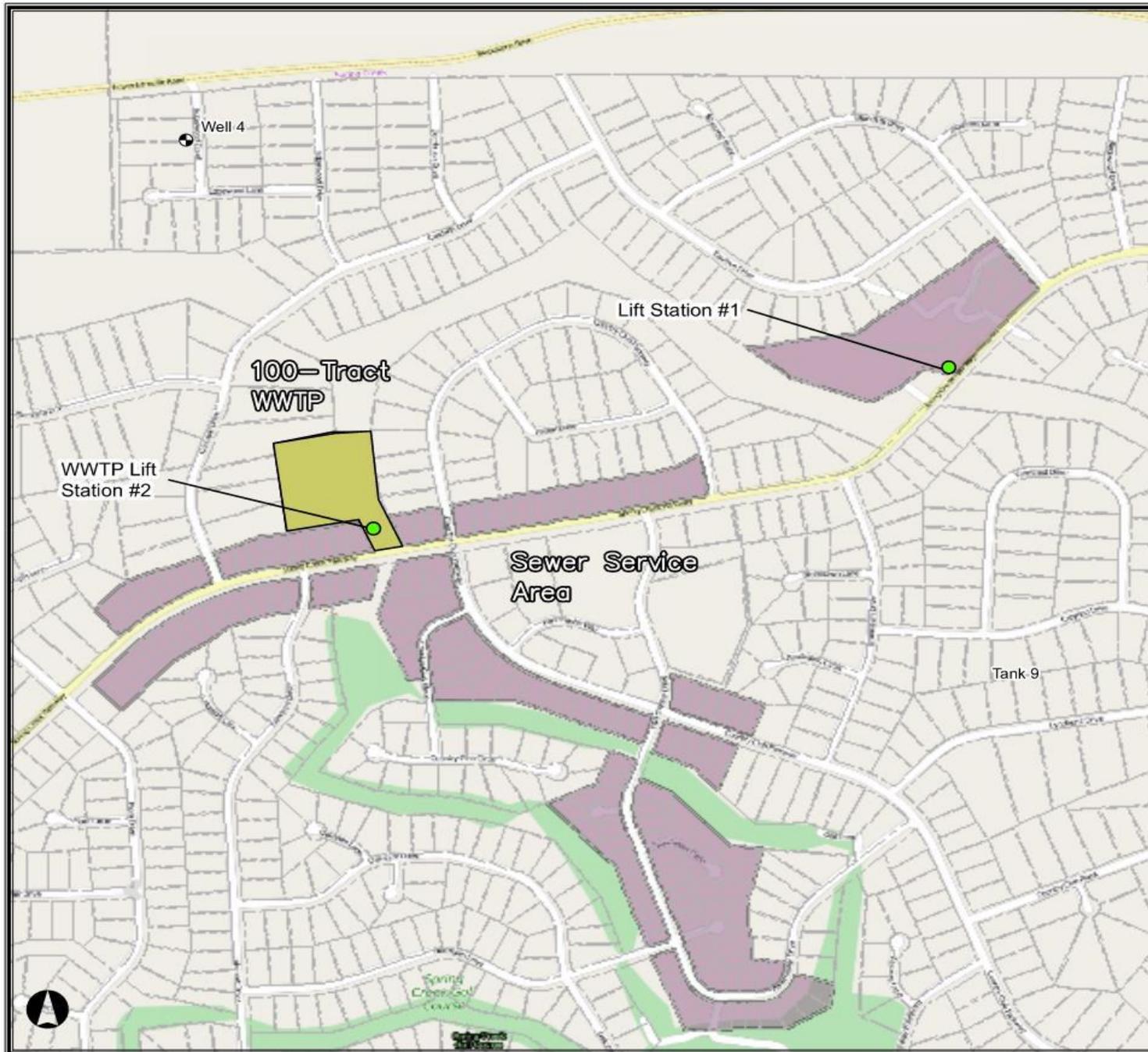
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100 Tract Wastewater service area

Integrated System and Return Flow Credit Example:

Permitted 50,000 Gallon a Day Wastewater Treatment Plant.

The treated effluent to returned to the basin through permitted RIBS.



Map Symbols

-  Sewer Treatment
-  Elko Parcel
-  Sewer Service Area
-  golf course



1 inch = 1,000 feet



Figure 2-5
100 Tract
Sewer Service Area

Existing Regulations and Hydrogeology

1. Existing NAC 445A Regulations for Municipal Wells.
2. Glover Analysis/Modflow Numerical Modeling: When they're applicable and when they're not.
3. When GW Modeling is necessary, applying real data from a pump test analysis, and a Hydrologic Report to remove unknown or unrealistic assumptions



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New Municipal Water Well Hydrologic Report NAC 445A.6688

Existing Municipal Water Well Regulation:

NAC 445A.6688 Water wells: Determination and reporting of yield characteristics of well. (NRS 445A.800) After the construction of a water well and before the attachment of a permanent pump to the well, the supplier of water shall:

- 1. Cause a step drawdown test and a constant discharge aquifer test, or another engineering investigation or analysis suitable for determining the characteristics of the well for the production of water, to be performed on the well and submit the results of the tests, investigation or analysis to the Division or the appropriate district board of health. The supplier of water shall coordinate its activities with the Bureau of Water Pollution Control of the Division to ensure that any discharge of water resulting from the tests, investigation or analysis will not violate any standards for water quality.
2. Determine the well yield for the well and submit that information to the Division or the appropriate district board of health.

Great Basin Water Company Spring Creek Division Test Well Project Report June 2021



Prepared for:



Prepared by:

Lumos & Associates, Inc. 9222 Prototype Drive Reno, Nevada 89521-8987 775-827-6111



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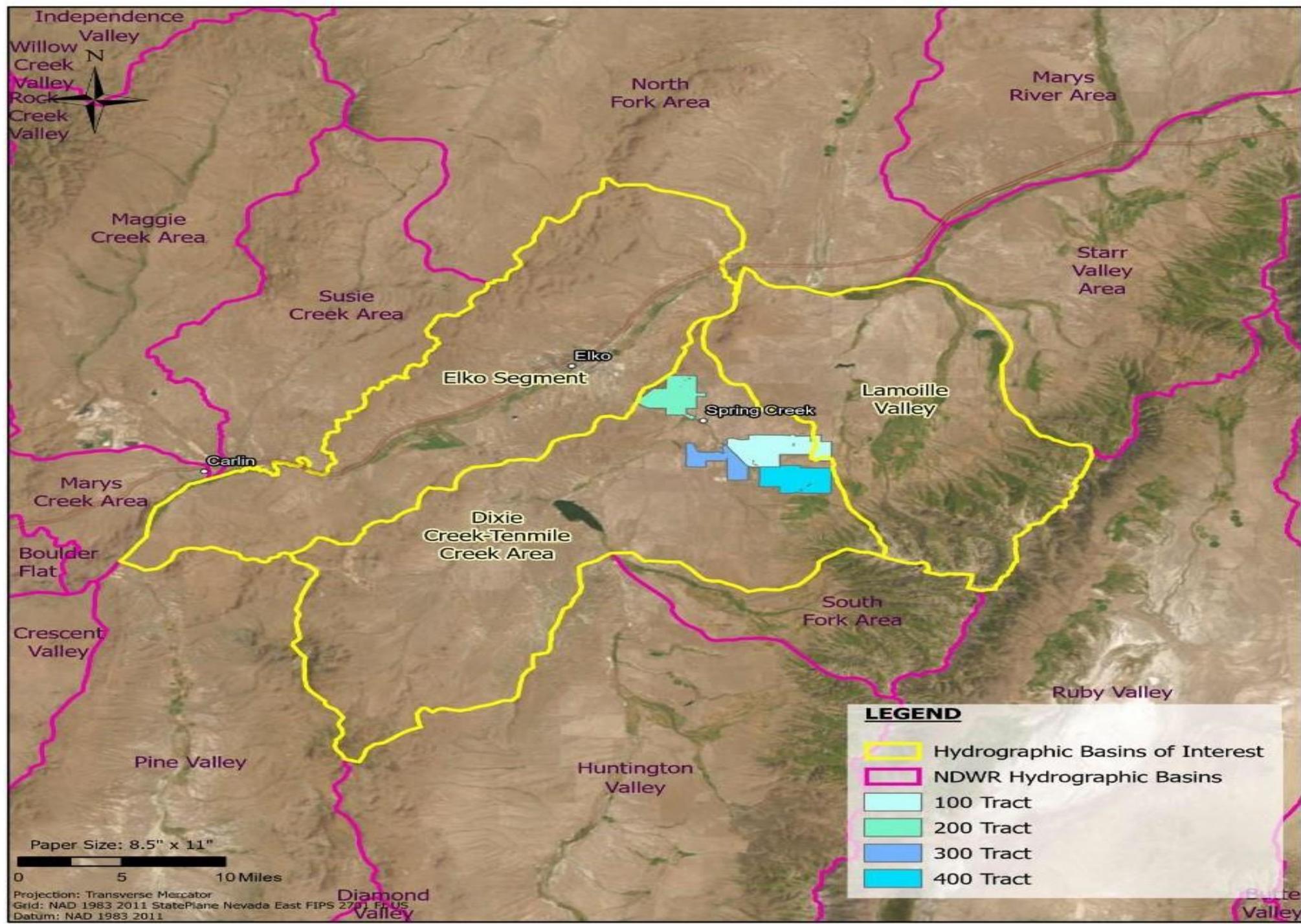


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Glover Analysis/ Modflow Numerical Model

Glover Analysis:

- Designed for Water Table (Unconfined) Aquifer Systems adjacent to large river systems to determine the volume of water being extracted from the river.
- Humboldt River





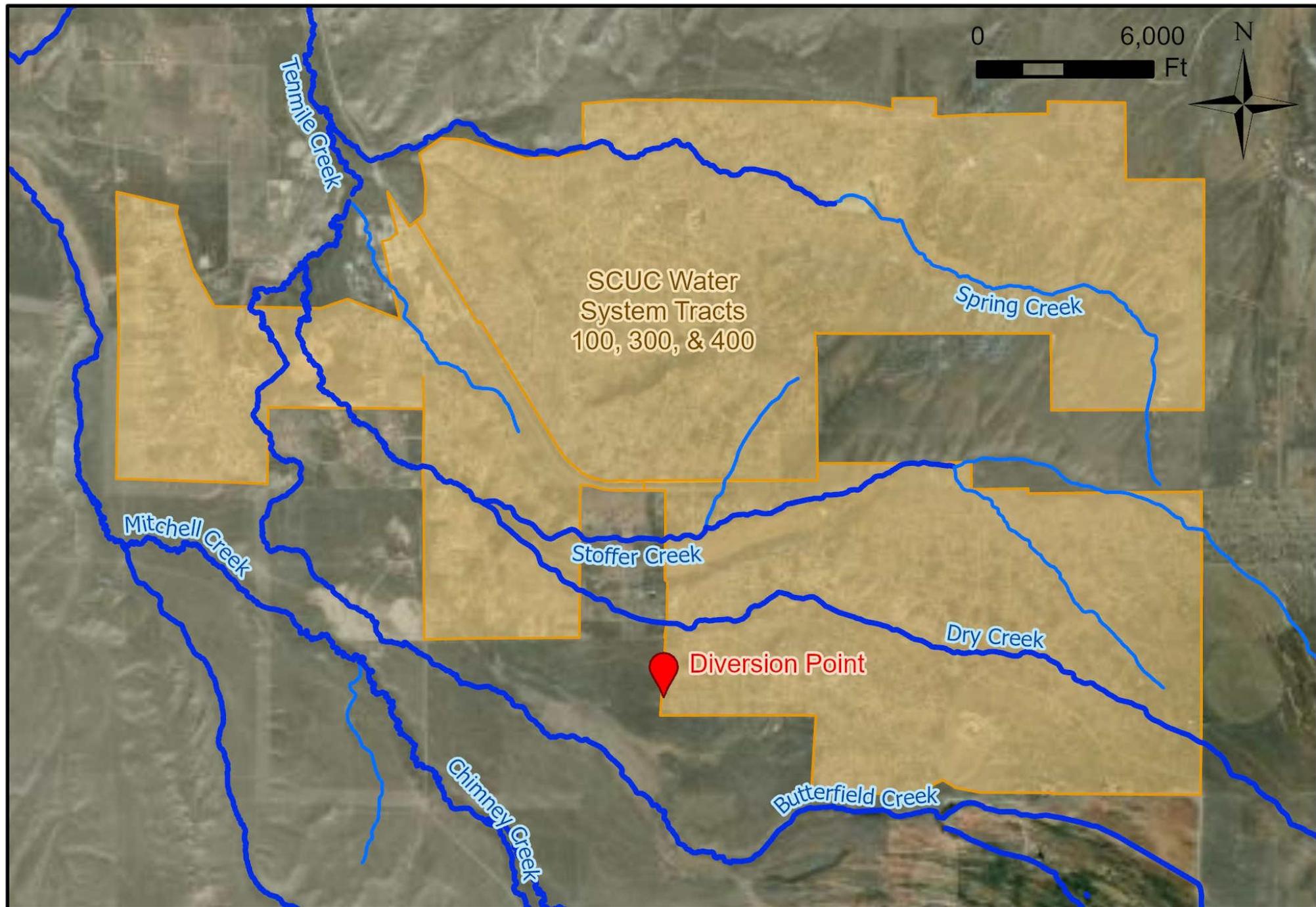
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**Glover Analysis/
Modflow Numerical
Model**

(Continued)

**Ephemeral Stream
Definition:**

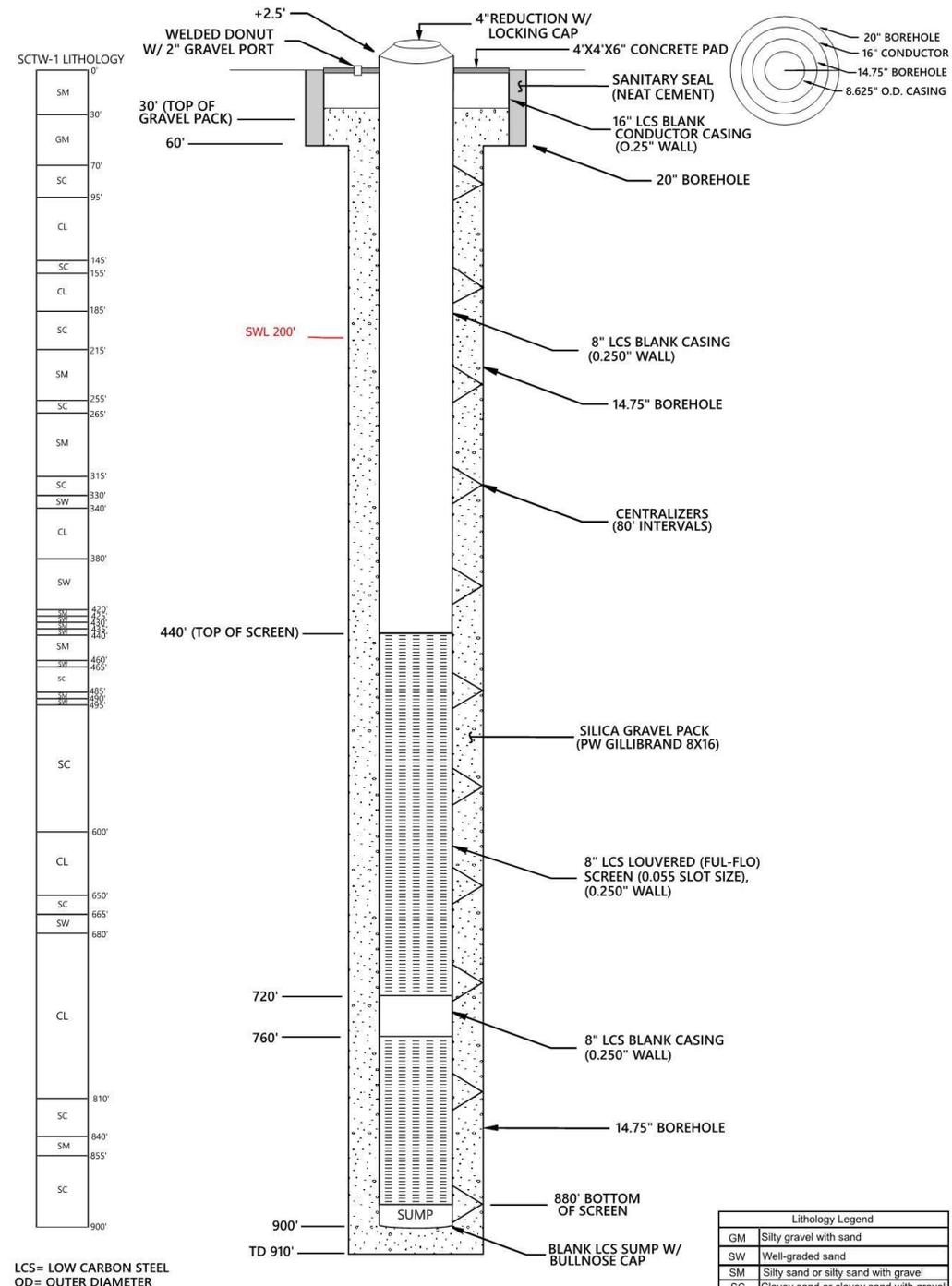
An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream.





Real Geologic and
Hydrologic Data

- Lithologic Log
- Unified Soil Classification System.
- Well Design





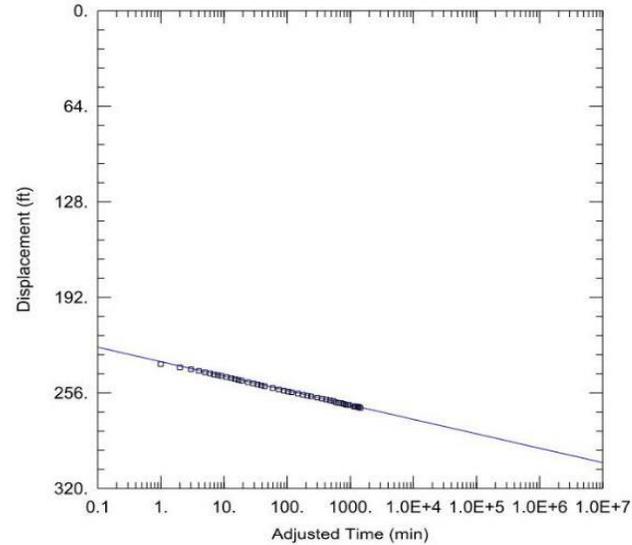
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Real Geologic and
Hydrologic Data
(Continue)

Pumping Test Data
and Analysis
(AQTESOLV Software)

Great Basin Water Co. – Spring Creek Division
Spring Creek Test Well Project

June 23, 2021
PN: 8595.004

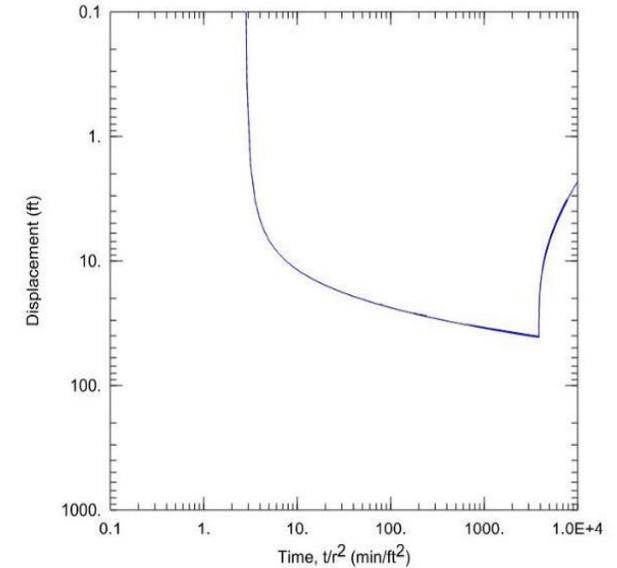


WELL TEST ANALYSIS					
Data Set: L:\...\GBWC-SCTW (constant rate) PWL.aqt					
Date: 05/27/21			Time: 10:38:45		
PROJECT INFORMATION					
Company: Lumos					
Client: Great Basin Water Co.					
Project: 8595.004					
Location: Spring Creek, NV					
Test Well: GBWC-SCD Test Well					
Test Date: 4/26/2021					
AQUIFER DATA					
Saturated Thickness: 400. ft			Anisotropy Ratio (Kz/Kr): 1.		
WELL DATA					
Pumping Wells			Observation Wells		
Well Name	X (ft)	Y (ft)	Well Name	X (ft)	Y (ft)
Test Well	0	0	Test Well	0	0
SOLUTION					
Aquifer Model: Confined			Solution Method: Cooper-Jacob		
T = 1459.7 ft ² /day			S =		

Figure 13: Cooper and Jacob (1946) Solution

Great Basin Water Co. – Spring Creek Division
Spring Creek Test Well Project

June 23, 2021
PN: 8595.004



RECOVERY TEST					
Data Set: L:\...\GBWC-SCTW (recovery test) PWL.aqt					
Date: 05/27/21			Time: 10:51:44		
PROJECT INFORMATION					
Company: Lumos					
Client: Great Basin Water Co.					
Project: 8595.004					
Location: Spring Creek, NV					
Test Well: GBWC-SCD Test Well					
Test Date: 4/26/2021					
WELL DATA					
Pumping Wells			Observation Wells		
Well Name	X (ft)	Y (ft)	Well Name	X (ft)	Y (ft)
Test Well (Recovery)	0	0	Test Well (Recovery)	0	0
SOLUTION					
Aquifer Model: Confined			Solution Method: Theis		
T = 1300.1 ft ² /day			S =		
Kz/Kr = 0.7			b = 400. ft		

Figure 14: Residual Drawdown Analysis

Proposed Concept, Implementation & Timing

1. Concept application or engagement for regulated utilities. Described as an “Exemption” NSE to Order 1329, but could be a separate Order, provides a road-map for utilities to permit and develop new production wells.
2. Utilizes existing application filing and permitting processes.
3. Utilizes existing permit term structures for monitoring and/or mitigation plans, and flexibility to utilize water resources within a large place of use or service area (mining and milling).
4. Removes requirement for initial conflicts analysis to the “Back-End” of permitting
 - Allows utilities to maintain regulatory compliance and develop new and backup well sources
 - Management plans include description of effluent sources, well operation
 - Data sources include well drilling data, pump tests, etc.



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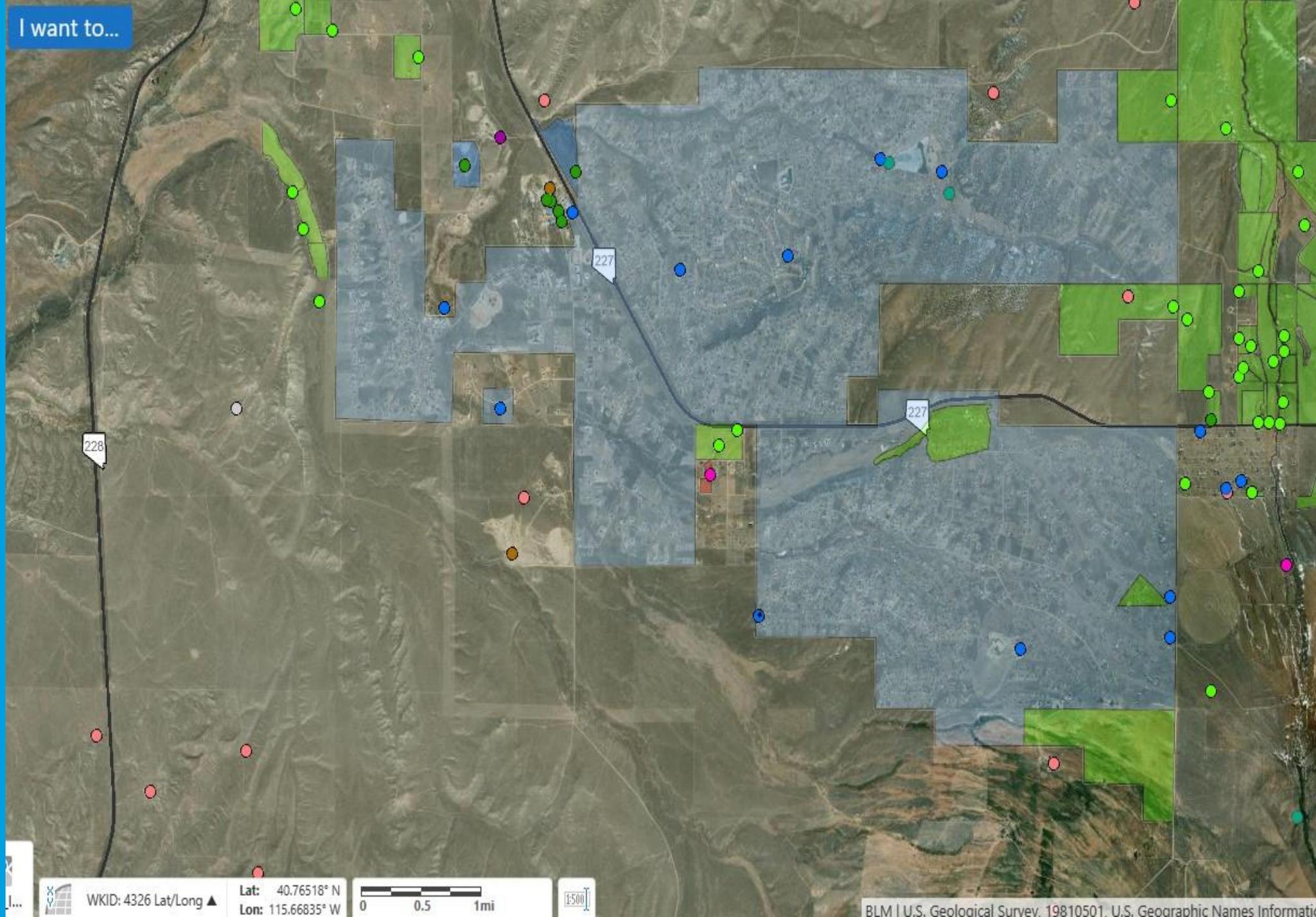


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100, 300 and 400
Tract System

GBWC's Infrastructure
and Basin Boundary

17



3 Takeaways

1. **Concept, an “Exemption” to NSE Order 1329 or Amend the Order 1329 for “Regulated Utilities”.**
2. **Qualifications to be subject to Exemption or Amended Order may include:**
 - When the utility can demonstrate they are outside of direct contact with the Humbolt River.
 - When the utility manages an integrated water system with multiple intertied pressure zones, variable flow drives or timed well operation, and support return flow systems into the basin.
3. **Removes requirement for initial conflicts analysis to the “Back-End” of permitting.**

Questions

July 13, 2023

Levi Kryder
Chief, Hydrology Section
Department of Conservation and Natural Resources
Nevada Division of Water Resources
901 S. Stewart St., Suite 2002
Carson City, NV 89701
lkryder@water.nv.gov

Dear Mr. Kryder,

I am submitting this letter not as a request to make a presentation at the August 1st meeting but rather as a simple public comment.

I have been following the water adjudication discussion. I understand the desire of the Nevada Division of Water Resources to find a solution that makes all present irrigation water users whole. However, as outlined below, I do not believe this is possible. I also believe that this attempt has resulted in the conversation often becoming lost “in the weeds”. To my mind, the history of the present problem and governing law allow only one course of action. To wit:

- 1) The event that triggered this difficulty is that the Lovelock irrigation users are not receiving the water to which they are legally entitled.
- 2) Prior to the last decade, the Lovelock irrigation users had, on average, been receiving the water to which they are legally entitled.
- 3) Point 2 indicates that, until recently, the adjudication system set up by the Edwards and Bartlett decrees had been in balance and was sustainable.
- 4) The present inability to deliver the Lovelock users the water to which they are entitled temporally corresponds to a great increase in irrigation by persons pumping Humboldt River water.
- 5) The Edwards and Bartlett decrees have governed Humboldt River water use for almost 100 years and are based on Nevada statute. As such, they are the established law governing use of Humboldt River water for irrigation purposes.
- 6) The fundamental criterion in Nevada law and the Edwards and Bartlett decrees by which water is delivered to irrigation users is date of first beneficial use.
- 7) I do not believe that the Nevada Division of Water Resources has the authority to unilaterally overturn established law. My understanding is that the Nevada Division of Water Resources has only authority to administer established law, not to make new law.
- 8) The Nevada Division of Water Resources has, unfortunately, by allowing increased use of Humboldt River water by pumped irrigation, over-adjudicated the water available from the Humboldt River.
- 9) In my opinion, the only recourse open to the Nevada Division of Water Resources is to follow the law and reduce the amount of water being used for irrigation upstream from Lovelock on the basis of date of first use.
- 10) Given the facts presented above, the practical result is that, since pumped irrigation has a later date of first beneficial use, pumped irrigation use be reduced until Humboldt River irrigation water use is again in balance and sustainable.

I understand that this course of action is not the win-win situation the Nevada Division of Water Resources was hoping for. However, water cannot be created from thin air. There is no administrative action that can bring Humboldt River water use back into balance except to reduce its use and governing law requires that this reduction be based on date of first beneficial use.

It is also important to stress that Nevada agricultural land value is primarily determined by the water rights associated with the land. Any reduction of irrigation water use would greatly decrease the value of the affected land. Surface irrigation users were the original users of the water they use. Furthermore, they have not changed their usage patterns and are thus not the cause of the present imbalance of Humboldt River water use. Destroying the value of the surface users' lands by decreasing their ability to irrigate would thus be inequitable, punishing people who have done nothing wrong and are not the cause of the problem.

I understand the Nevada Division of Water Resources is in a "damned if you do, damned if you don't" situation, and I sympathize with the Department personnel who have to respond to the present difficulty. However, I believe that both by established law and equity the Department has no choice but to allocate irrigation water according to the established law and principles in Nevada statute and the Edwards and Bartlett decrees, that is, by date of first beneficial use. Any other course of action will destroy hundreds of millions of value of agricultural land in Elko County. This would undoubtedly result in a lawsuit by the affected landowners against the Department. Given the black letter law governing the present situation, I think the Department would likely lose this suit. It seems to me that it is therefore in the Department's best interests to follow present law in resolving this situation. Given that the ultimate result will almost certainly be a court upholding established law, for the Department not to follow the present law only needlessly prolongs everyone's uncertainty.

Sincerely,

Scott L. Hooper (by email)

June 20, 2023

Nevada Department Water Resources

To Whom It May Concern,

I attended the Water Management Strategies meeting that was held on March 28, 2023. Thank you for having this meeting and working to include all parties involved.

The Humboldt River Adjudication(1923-1938) is a well thought out adjudicated system. For years, people submitted data that proved their beneficial use of the surface water and these water rights have been used and valued ever since. But now, due to over adjudication, well water pumping and Mother Nature, we don't always have the water that is needed. I appreciate that the Department of Water Resources is trying to alleviate some of the issues and make it have the least impact on everyone involved.

The following are some of my thoughts on this issue.

Surface water users are under the Humboldt River Adjudication as well as some permits that were granted after the adjudication. These Surface users, have priority over Well water right users, yet the Well water users are not held to the same rules as the Surface users. Here are a couple of examples. The Well water users are able to pump all year long and Surface users are only able to irrigate from 4/15-8/15, (depending on what district you are in). The Surface users are not able to irrigate when there is not sufficient water. Well water users are able to keep irrigating as long as their well will produce. Surface users along with Well water users are allotted so many acre feet/acre, but it is known that the Surface users don't use their full duty because the allotted water isn't there for the entire season, but with a well, the full duty allotted is used, which impacts the Surface users rights over time.

Water rights is a heated topic and I understand that people will be impacted by the following changes I think need to be implemented, but the Surface users have already been impacted by what the Department of Water Resources has allowed and therefore, I feel the following changes need to be made. If an existing well or a new well is determined to be within the Humboldt River groundwater model and producing conflict, then the following rules should apply to that irrigation well.

1. The Well water users' irrigation date of use has to be the same as the Decreed use, ie 4/15-8/15.
2. If the water commissioner determines the Surface user is unable to irrigate due to lack of water, then the Well water user is unable to irrigate.
3. Surface users have priority dates that determine when water can be turned on. Priority dates need to be implemented and regulated on the Well water users.
4. Currently, subject to regulation, surface users are able to sell or move their water rights. Water well users should be able to purchase surface users rights to gain senior priority if both parties are interested.

Thank you again for including all that are impacted by this tough, but necessary situation.


Lili A. Wolf - Surface user

6/20/23

Nevada Division of Water Rights

Water Rights Meeting Comments

I am commenting on the Water Rights Meeting held on 3/28/23.

I really enjoyed the meeting information and want to thank you for putting it on and for asking for comments on solutions to the Nevada Water Rights issues that the Division of Water Rights is grappling with.

The Humboldt River Adjudication has a very comprehensive and functional water rights system that was completed after years of research and demonstrations of people proving their water rights that were accepted and put into law with the Bartlett and Edwards decrees. These water rights have been established and delivered accordingly for many years and property values are determined according to these same water rights. These rights cannot now be dismantled and changed because mistakes, e.g., over adjudicating, have been made recently.

It has always been said, "first in time, first in right" and I think that should continue to hold today. Surface irrigation was the first way Nevada was irrigated and the areas most efficient to irrigate have the earliest water rights. Pivots that were developed later allow irrigation of land that is less efficient to irrigate.

Therefore, I feel the following options are worth considering;

1. The duration of well water usage should be tied to the availability of surface water availability and usage. For example, if it is a drought year and no surface water is flowing for surface irrigation, then the wells in that area should not be able to pump any ground water for irrigation. That straw in the ground is depleting water for the surface user as well as the well user for the next year. The underground water should not be depleted further if there is not enough water for surface irrigation.

2. The well water irrigation season should be the same as the surface water irrigation season in the area (for Elko County, April 15th to August 15th). Currently the well water users can pump all year long as long as they have not used their allotted duty. Surface right holders often do not get their allotted duty because the water runs out. Once again, keeping a straw in the underground pool all year doesn't allow rejuvenation for the next year. Also, the growing season has already been established depending on the area and it should also hold true for the well water users.

In summary, Nevada has a very functional system of water rights based on date of first beneficial use that works very well and should be continued. Well water users should have to follow the same rules set up in the Bartlett and Edwards decree as the surface water users are bound by.

Once again, thank you for the informative meeting and for the opportunity to comment.

Sincerely,



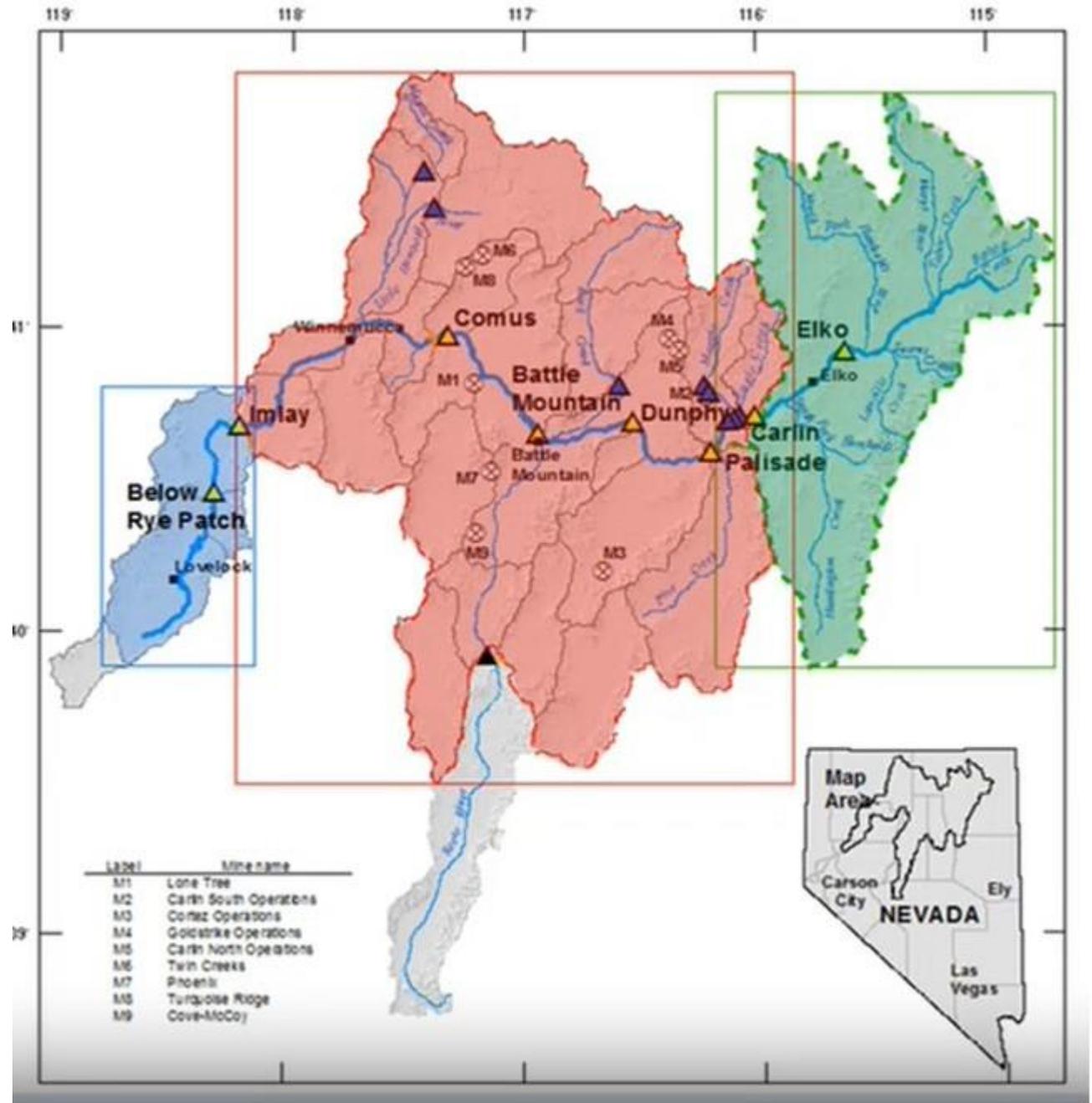
Jennifer Garrett

Rancher

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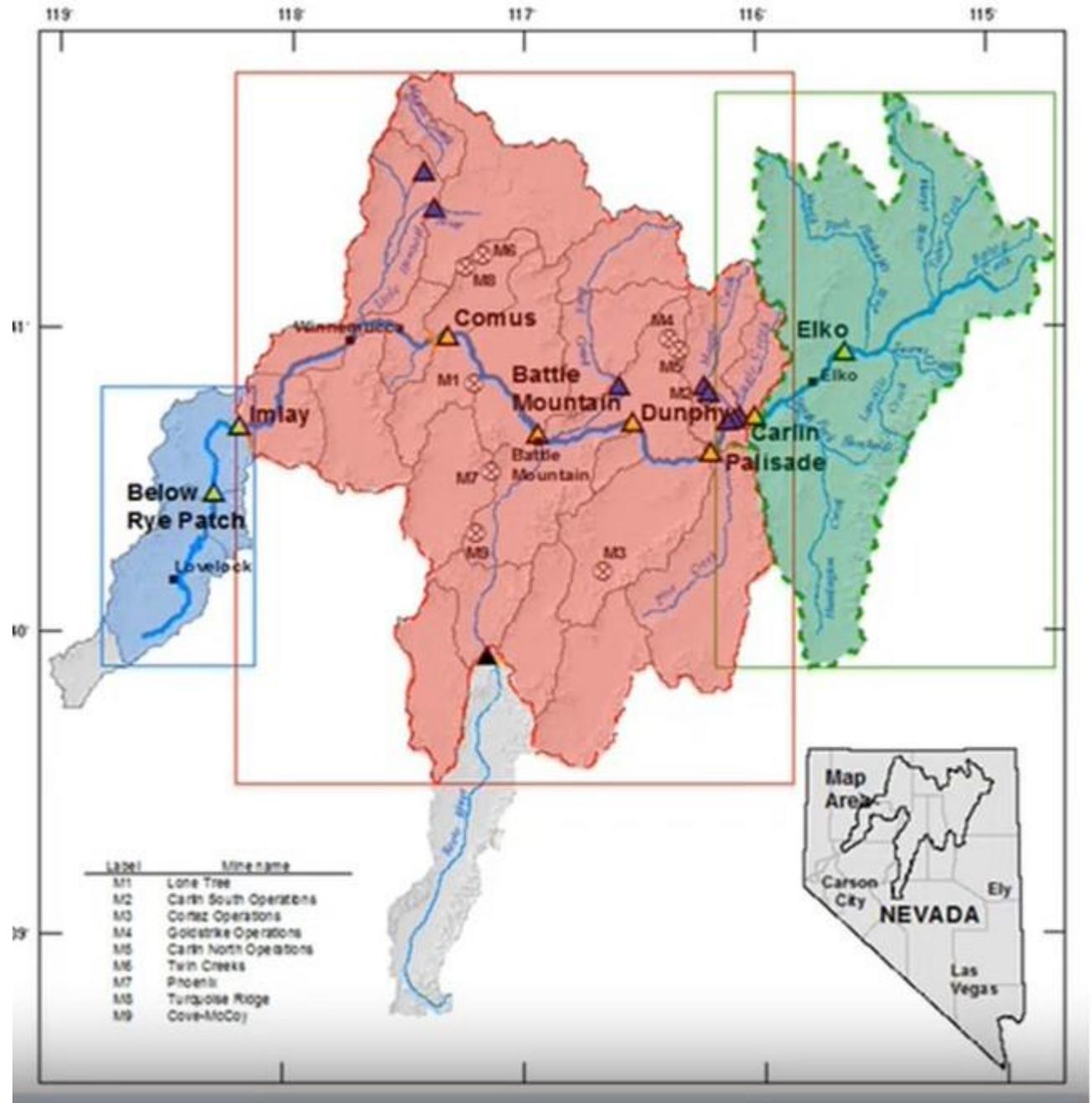
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MARCH 2011

Nevada Farm Bureau Proposed Plan For Humboldt River System Conjunctive Management



Nevada Farm Bureau's Proposed Desired Outcome...

*Providing sufficient amounts
of surface water in the
Humboldt River System to
meet the senior surface water
right needs in non-drought
conditions and mitigate
groundwater pumping to not
be the drought in other
years...*



Local Groundwater Basin Meetings With Water Right Owners

- Provide specific basin circumstances for water right owners to understand
- Clarify the details of the basin - as covered by the capture models - and highlight the degree of impact of groundwater pumping in that basin on Humboldt River surface water
- Provide context of where their specific basin fits in overall
- Encourage water right owners to meet and discuss possible alternative ideas to resolve the conflict
- Provide them with a deadline for responding back to the Division of Water Resources, offering their proposals
- Make it clear that conflict situations will be dealt with through curtailment of those wells that do conflict with surface waters

Following Local Groundwater Basin Meetings

- Review and analyze proposed actions from local basin groups
- Using capture models determine effects of proposed actions in addressing the reduction of impacts on Humboldt River surface water
- Provide feedback to the local basin groups with the result of the analysis of their proposals that have been carried out using the capture model
- Clarify where their proposal(s) will accomplish necessary objectives to make a difference in contributing to maintaining a sufficient amount of water to meet the water right needs of senior surface water rights
- Continue to stay in touch with the water right owners in each groundwater basin to keep them apprised of the developing process

Farm Bureau's Overall Process Proposal

- On a well-specific-basis we believe that where the capture models demonstrate conflict and reduction of surface water amounts, curtailment should be an initial option to resolve the conflict
- We support mitigation options, which need to be analyzed by the capture models to determine whether they accomplish meaningful results
- We propose that reductions in pumping should be considered as replacement water
 - The amounts related to reductions need to be verified through well metering
 - Capture model analysis of the replacement water need to document the degree of accomplishment achieved

More On Conservation/Reduction Of Pumping

- Water right owners proposing a mitigation plan for consideration, using conservation measures or a reduction in pumping as replacement water, should submit a formal proposal to be considered and evaluated, using the capture model for their well(s)
 - These proposals might be an annual conservation/reduction plan
 - Could take the form of totally not using the well(s) for multiple years – building credits of replaced water
- Consistent and on-going well monitoring will be used to verify compliance with the mitigation plan

Steps & Timeline

1. Prepare for basin-by-basin informational meetings
(Prepared for January 2024 Launch)
2. Hold groundwater basin meetings
(Starting January 2024 ending March 2024)
3. Analyze recommendations from groundwater basin and report back results to local groundwater groups
(On-going from January to May 2024)
4. Finalize the necessary Order to curtail groundwater pumping curtailment, based on capture model demonstrations of conflicts with senior surface water rights
(Completed in March of 2024)

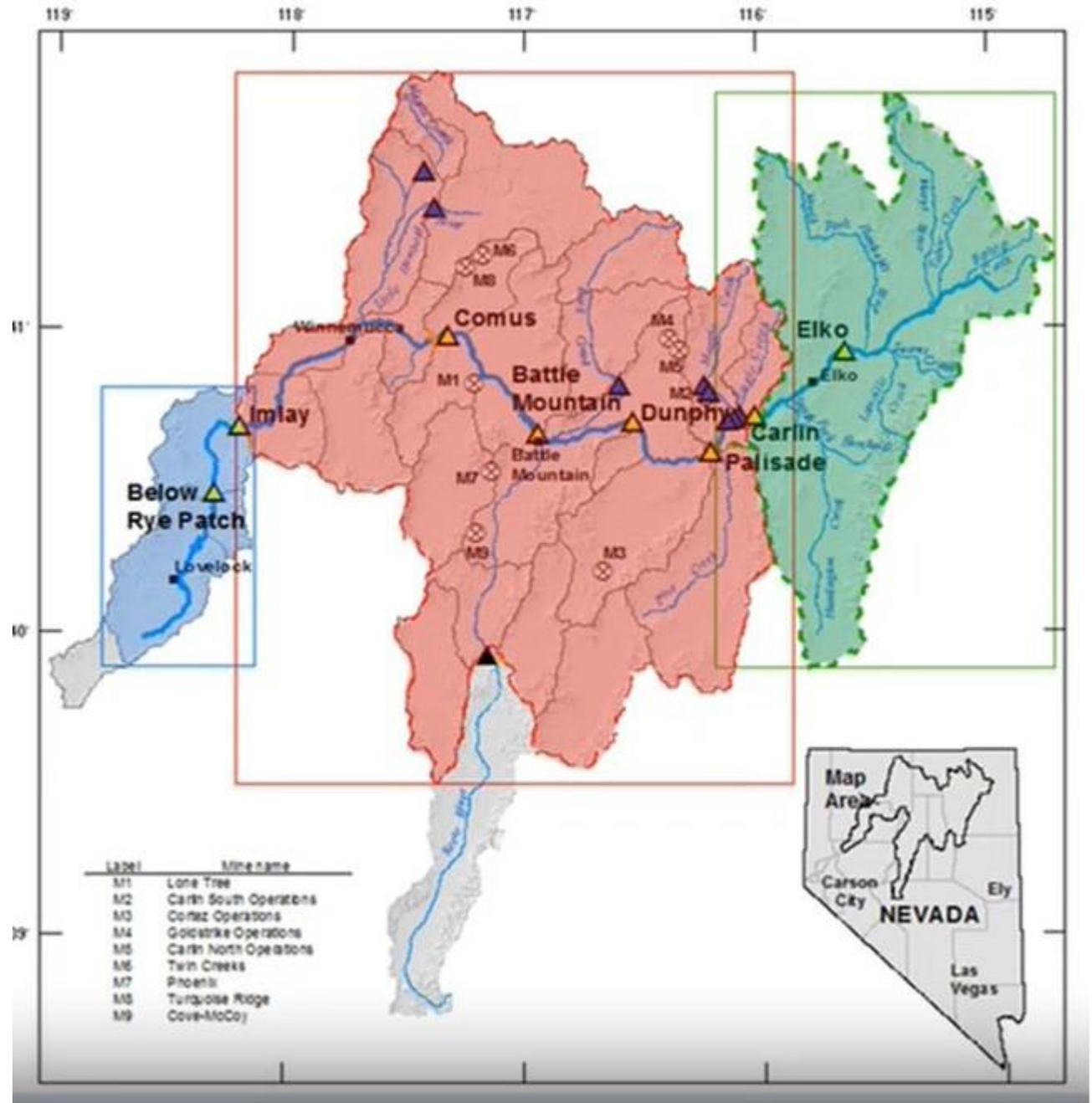
Steps & Timeline (continued)

5. Accept petitions of proposed conservation replacement mitigation and perform the analysis necessary to determine the effect of the proposed reduced pumping. If the mitigation plans are acceptable and found to be effective in meeting the necessary offset of the conflict...sign the agreement and move forward with implementation
(Start in February 2024 and continue on an on-going basis)
6. Monitor to ensure plans are in compliance
(Starting April 2024)
7. Prepare annual report and present results at follow-up groundwater basin meetings
(Schedule each year from January to March)

Thank you!



Nevada Farm Bureau





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Use of Critical Groundwater Management Areas as a Tool in Conjunctive Management, an Oregon Example

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Overview

- Oregon CGWA Background & Concept
- Oregon Law
- Practical Administration
- Possible Application to Nevada
- Funds and Sources
- Steps and Timeline to Implement
- Expected Outcomes



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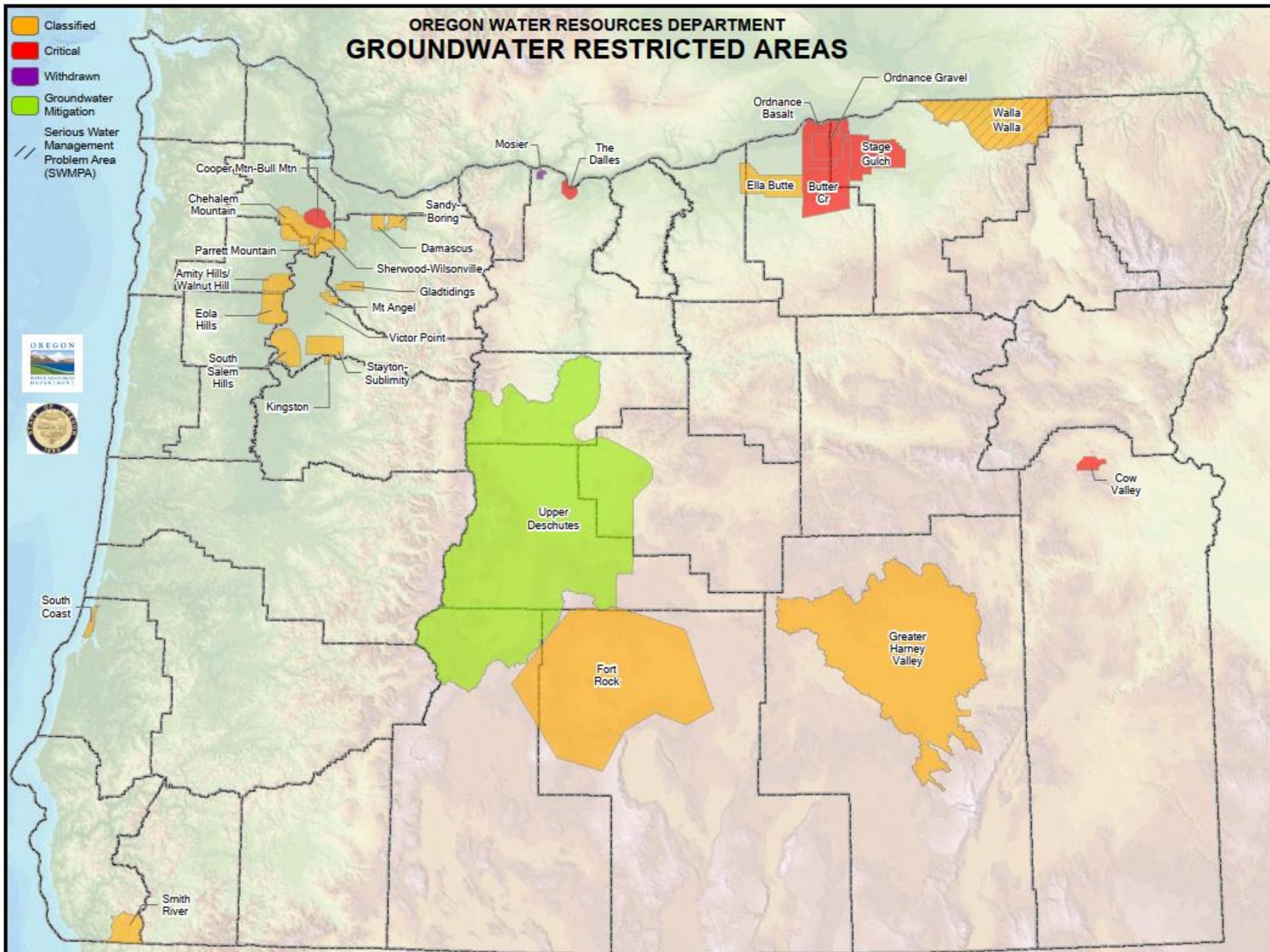
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Map prepared by OWRD GIS (rh), 2/23/2018 (G:\dev\arcmap\projects\state\state_2016_GWRAs_letter.mxd)



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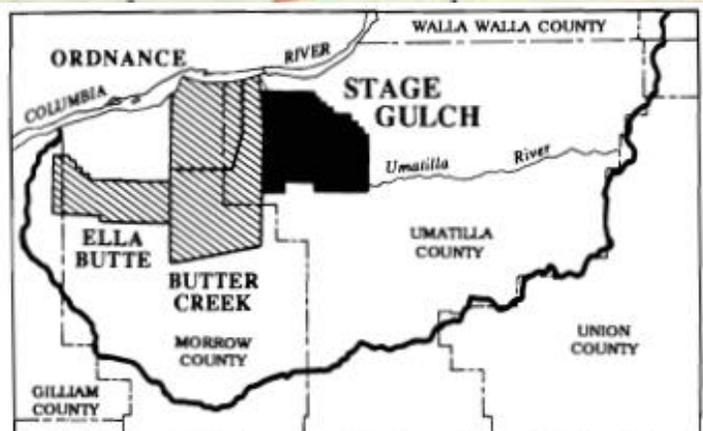
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Intersection: Columbia River, Umatilla River, Butter Creek





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Groundwater Use Development

- GW for irrigation almost nonexistent in 1950's
- Prior development – shallow alluvial wells
- Area overlays a basalt layer/aquifer (basalt wells: 200-400 feet deep)
- GW development boomed in 1970's
- 1985 Proclamation halted processing of applications:
 - Water levels declining
 - GW supply overdrawn
 - Substantial inference occurring



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- 22 designated basins – varying levels
 - Withdrawal of Unappropriated Waters
 - Prevent new allocations
 - Classification of Water
 - Prevent new allocations
 - Serious Water Management Problem Areas
 - Allows implementation of measurement and reporting
 - **Critical Groundwater Area Designation (“CGWA”)**
 - **Only tool to address over-appropriation by curtailing authorized use**
 - Groundwater Mitigation Area (Deschutes)
- 7 areas are CGWA



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Oregon Law – *experts in materials*

- ORS 537
- OAR Chapter 690
 - Division 1 – Rulemaking
 - Adopts process under Oregon APA for OWRD rulemaking process
 - Oregon APA: ORS 183
 - Division 8 – Statutory Ground Water Terms
 - GW terms include relationship to surface water
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 - Nexus to Surface Water: OAR 690-009-0050(2)(b):
 - **The Department shall control the use of wells greater than one mile from a surface water source only through a critical ground water area determination in accordance with ORS 537.730 through 537.740.**
 - Division 507 – Umatilla Basin Program
 - 690-507-0750 ~ 690-507-0840 = Stage Gulch CGWA



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Critical Groundwater Area Designation Rulemaking Process



In order to declare a Critical Groundwater Area (CGWA) under **ORS 537.730(1)(a-g)**, **one** of the following seven conditions must be met:

The groundwater supply is nearly overdrawn

Pattern of substantial interference
on senior water rights holders

Groundwater is declining excessively

Patterns of interference on
regulated geothermal resources

Pattern of substantial interference
between wells

Groundwater temperature is, or has been,
extensively altered

Groundwater pollution
is impacting public health





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If conditions are met for CGWA Declaration under **ORS 537.730(1)(a-g)**,
OWRD may initiate the following rulemaking process

(A) CRITICAL GROUNDWATER AREA DESIGNATION

(B) RULE DRAFTING BEGINS

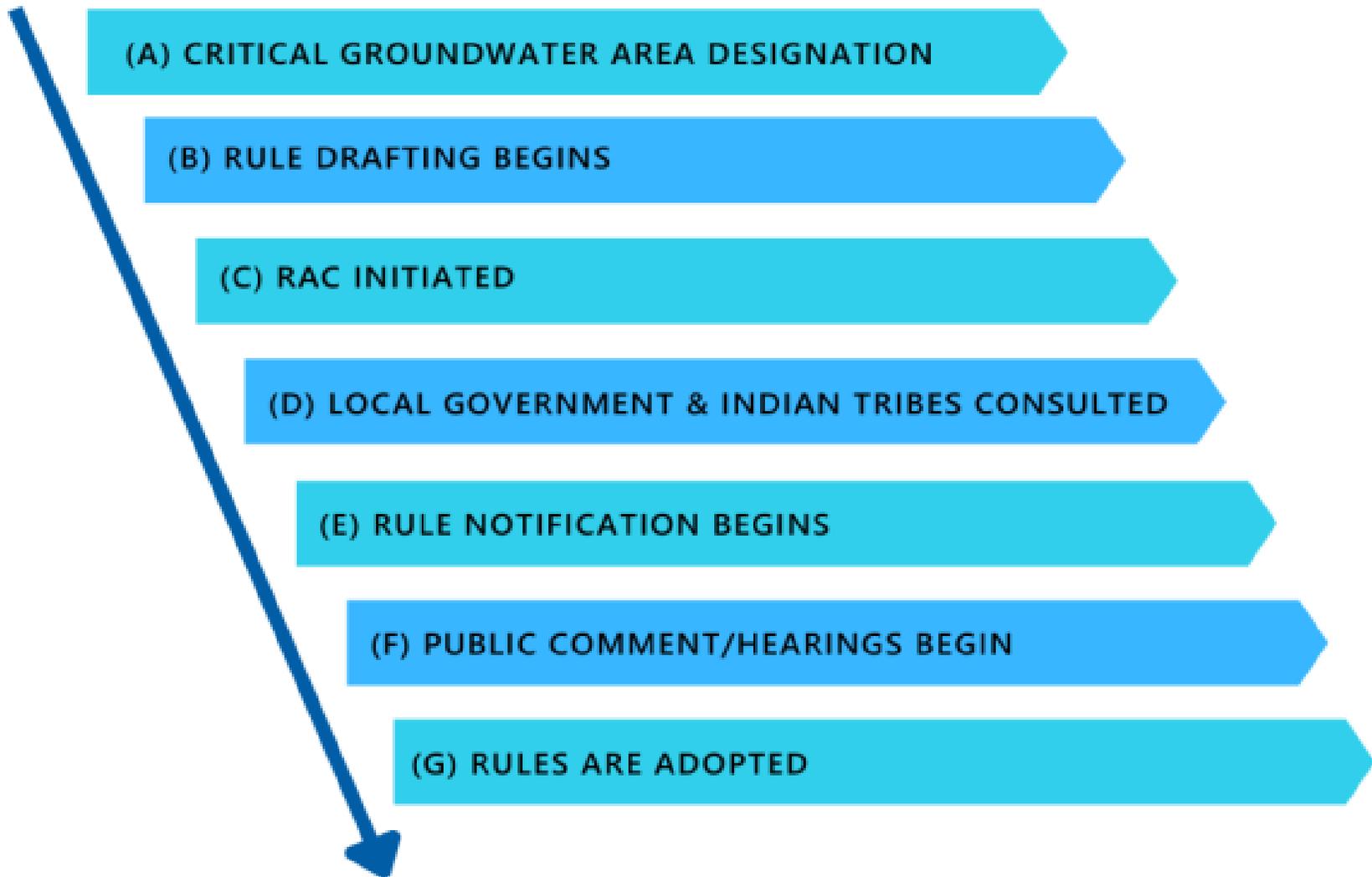
(C) RAC INITIATED

(D) LOCAL GOVERNMENT & INDIAN TRIBES CONSULTED

(E) RULE NOTIFICATION BEGINS

(F) PUBLIC COMMENT/HEARINGS BEGIN

(G) RULES ARE ADOPTED





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Practical Administration

- Oregon - hydrogeologist assigned to each CGWA
- Monitor –
 - Field investigation to check well depth (~February)
 - GW level trends
- Water User Reporting requirements
 - Flow meter & power meter – 1/week when in use
 - Measurement records to OWRD by 12/1
- OWRD determines Sustainable Annual Yield (can change)
- Water User requests water by July 1 for following year
- OWRD provides notice by August 1 as to allocation
- Reduction to SAY in 4 years (75%, 50%, 25%, 0)



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CGWA to Surface Water Nexus

- OAR 690-009-0010 et seq.
- Rules govern the use of GW, per [ORS] 537.730 and 537.775, where the GW is hydraulically connected to, and the use interferes with, surface waters (“SW”).
- “Hydraulic Connection” means that water can move between a SW source and an adjacent aquifer.
- Rules - criteria to determine “whether wells have the potential to cause substantial interference with SW supplies”
- OWRD makes determination based on “best available information” or Water Well Report



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- All wells within less than 1/4 mile from SW source = assumed connected ... unless applicant provides contrary information
- All wells from an aquifer that is connected to a SW source shall be assumed to have potential to cause substantial interference if:
 - POD is less than ¼ mile from SW; or
 - Rate is greater than 5 cfs if POD is less than 1 mile from SW; or
 - Rate is greater than 1% of minimum stream flow; or other
- Any wells that produce water from a connected aquifer, must consider, injury, % of capture, cumulative impacts



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Controls 690-009-0050

- OWRD reviews case-by-case basis
- Controls – similar or compatible with SW, in “accordance to relative dates of priorities of GW and SW appropriations”
- Controls – OWRD shall control use of wells greater than 1 mile from a SW source only through a CGWA determination under ORS 537.730 through 537.740.



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Possible Application to Nevada



- Laws on connection to create “stream corridor” with rebuttable presumption of connection
- Critical designation to reach all wells in Humboldt River groundwater basins
- Use of “best available information” includes science and the model
- Case-by-Case basis is used to address connection and interference
- Increase tools to manage connectivity



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Funds and Sources

- *Schroeder Law Office will defer discussion of funding and sources of funding to later presentation specifically addressing this topic.*



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Steps & Timeline to Implement

- Science is in place
- Statutes – provide stronger & directed authority to regulate GW-SW water connection issues
 - (2 years)
- Determine which GW basins should be “critical” or otherwise create a nexus of GW-SW interference other than “critical” to reach outside 1 mile zone
 - NDWR can internally work on this process now
- Rulemaking to establish “critical” areas
 - (1-2 years)
- Four years to reach PY (or SAY like Oregon) once CGWA established
 - (4 years)



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Expected Outcomes

- **Stronger administration of connected water**
- **Honor prior appropriation of all sources while moving towards sustainable use of water supplies**
- **Support environment and ecosystem (public interest) by maintaining surface water sources**



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Resources

- <https://www.oregon.gov/owrd/programs/GWWL/GW/Pages/AdminAreasAndCriticalGWAreas.aspx>
 - 2021 CGWA Staff Report to Water Resources Commission
- [https://www.oregon.gov/owrd/wrdreports/gw_report_3_5_stage_gulch_area_umatilla_county_oregon\(1\).pdf](https://www.oregon.gov/owrd/wrdreports/gw_report_3_5_stage_gulch_area_umatilla_county_oregon(1).pdf)
 - 1990 Report related to Stage Gulch
- <https://www.oregon.gov/owrd/programs/GWWL/GW/Documents/GWAdminAreasTable.pdf>
 - Table of OWRD Groundwater Administrative Areas (all 22)
- https://www.oregon.gov/owrd/programs/GWWL/GW/Documents/AnnualReport_StageGulch_2023.pdf
 - 2023 OWRD Report re Stage Gulch CGWA



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*Groundwater Management Areas & Mitigation Measures
An Idaho Example*

Caitlin Skulan
August 1, 2023



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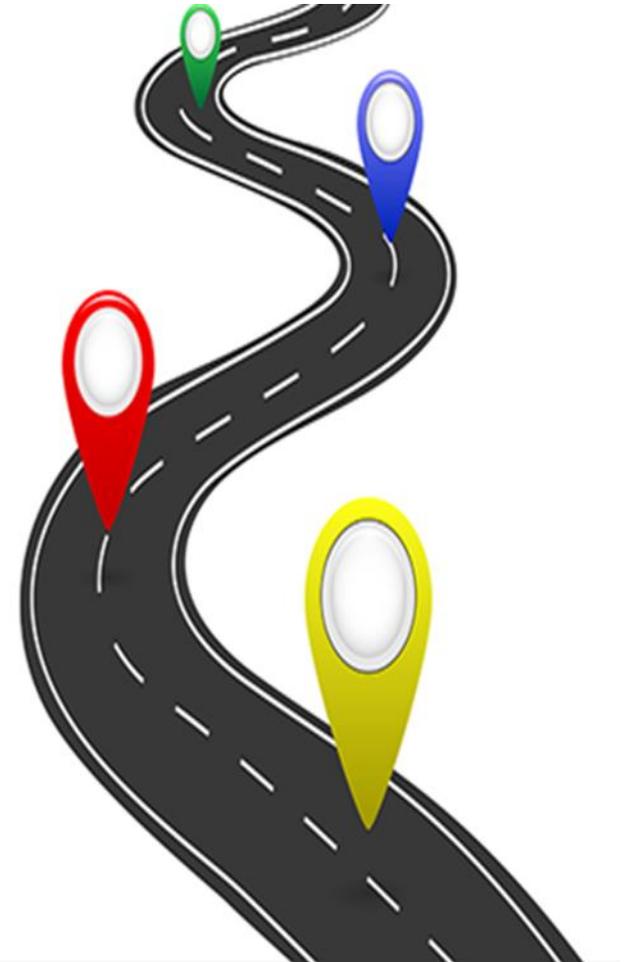
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Presentation Roadmap

- Groundwater Management Areas
 - CGWA v. GWMA
 - Eastern Snake River Plain Aquifer
 - ESRPA Mitigation Measures
 - Other GWMA Management Plans
- Nevada Implementation
 - Authority & Funding
- Desired Outcomes
- Questions?





Groundwater Management Areas

An Idaho Example

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CGWA v. GWMA

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Critical Groundwater Area

- Idaho Code 42-233a
 - Basin Without Sufficient Water to Provide Safe Supply at Current Rate of Withdrawal
 - Designation Followed By Public Hearing
 - Tools:
 - Area-wide Groundwater Management Plan
 - Use Reporting
 - Priority-based Reduction or Shut-off

Groundwater Management Area

- Idaho Code 42-233b
 - Basin that May Be Approaching Condition of CGWA
 - Designation Followed by Newspaper Notice
 - Tools:
 - Area-wide Groundwater Management Plan
 - Use Reporting
 - Priority-based Reduction or Shut-off



ESRPA Mitigation Measures

- Mitigation Plans
 - Administered by Groundwater Districts
 - Submitted & Approved Annually
 - Reduce Net Withdrawal by 240,000 AFA
 - Reduction, Conservation, Recharge

- Priority-Based Reduction

- If Not Participating in Mitigation Plan
- 2023 Water Rights Subject to Reduction: 1953 & Later



- IDWR Recharge Rights – 200,000 AFA

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Other Management Plans

- **Big Wood River GWMA – *Complex***
 - Moving Average Streamflow Target (32 CFS) to Support Senior Surface Rights
 - Fallowed Acres
 - Irrigation Season Reduced
 - Conservation Infrastructure & Efficiency Fund
 - Storage Water Delivery
 - Cloud Seeding
- **Bear River GWMA – *Simple***
 - New GW Rights Must Mitigate Impacts to Bear River
 - Provide Mitigation Water to River/Tributaries
 - Sources: Stored Water or Bear River Surface Water





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Implementing GWMA's in Nevada

- Statutory Authority Needed
 - Expansion/Addition to NRS 534.110
- Funding Requirements
 - Staffing
 - Monitoring/Enforcement





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Desired Outcomes

- Provide Adaptive Tools for Groundwater Basin Management
- Manage Effects to All Hydraulically Connected Sources
- “Bring Everyone to the Table”
- Development of Basin-Specific Mitigation & Management Plans





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Questions?

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Use of Critical Groundwater Management Areas as a
Tool in Conjunctive Management, an Oregon Example

Therese A. Stix

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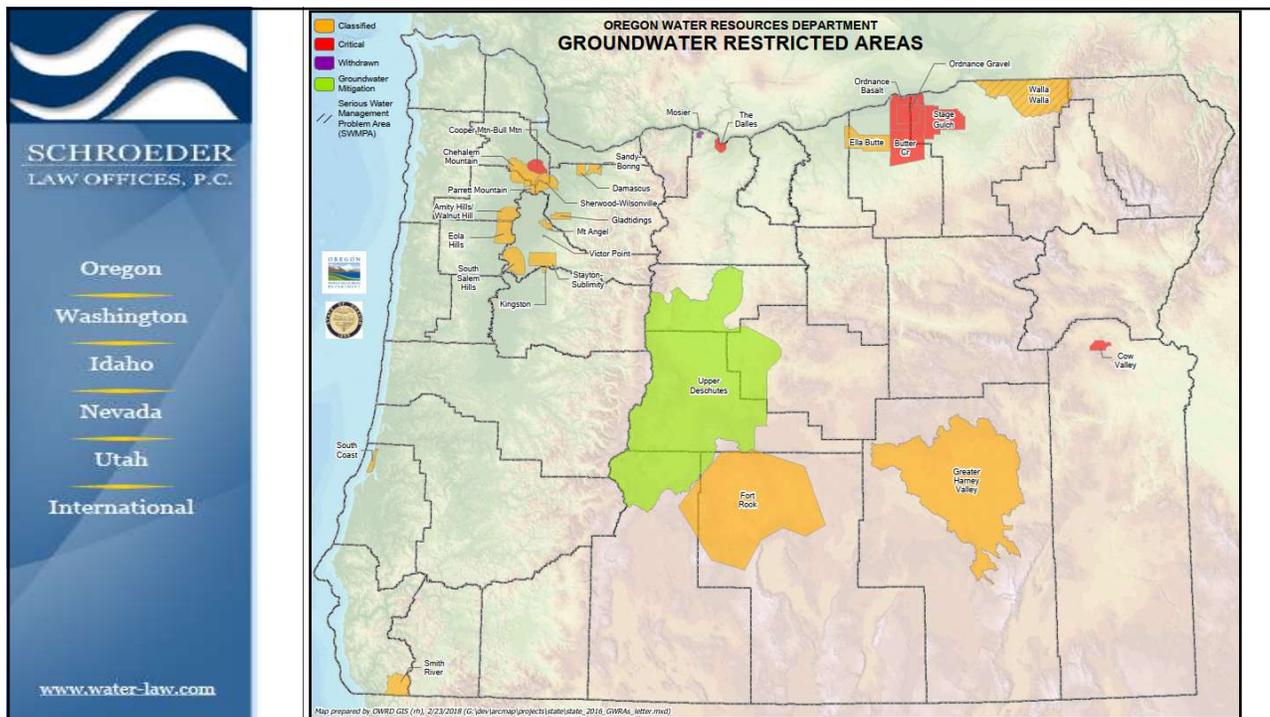
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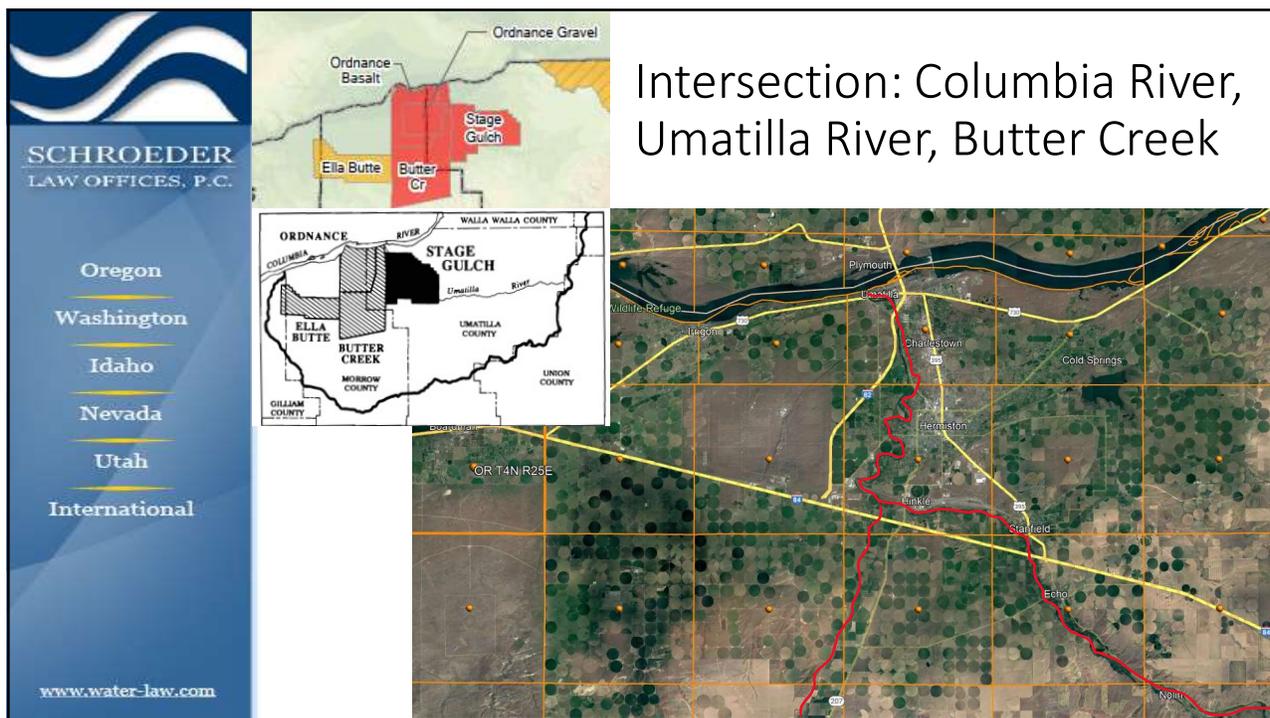
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Oregon Law – *experts in materials*

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Critical Groundwater Area Designation Rulemaking Process

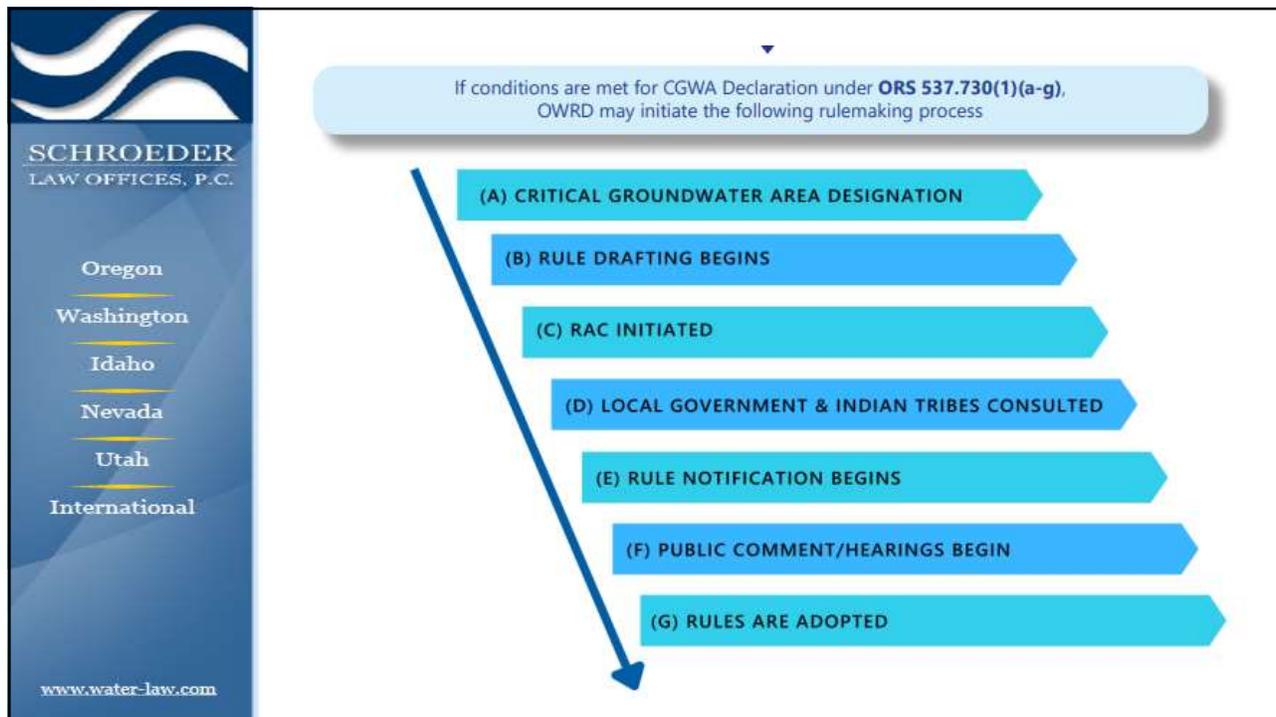


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Nexus, conti...

Controls 690-009-0050

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Funds and Sources

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 - (4 years)

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Expected Outcomes

- Stronger administration of connected water
- Honor prior appropriation of all sources while moving towards sustainable use of water supplies
- Support environment and ecosystem (public interest) by maintaining surface water sources

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Resources

- <https://www.oregon.gov/owrd/programs/GWWL/GW/Pages/AdminAreasAndCriticalGWAreas.aspx>
 - 2021 CGWA Staff Report to Water Resources Commission
- [https://www.oregon.gov/owrd/wrdreports/gw_report_3_5_stage_gulch_area_umatilla_county_oregon\(1\).pdf](https://www.oregon.gov/owrd/wrdreports/gw_report_3_5_stage_gulch_area_umatilla_county_oregon(1).pdf)
 - 1990 Report related to Stage Gulch
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 - 2023 OWRD Report re Stage Gulch CGWA

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Oregon Revised Statutes (“ORS”)

537.730 Designation of critical ground water area; rules; notice. (1) The Water Resources Commission by rule may designate an area of the state a critical ground water area if:

- (a) Ground water levels in the area in question are declining or have declined excessively;
- (b) The Water Resources Department finds a pattern of substantial interference between wells within the area in question;
- (c) The department finds a pattern of interference or potential interference between wells of ground water claimants or appropriators within the area in question with the production of geothermal resources from an area regulated under ORS chapter 522;
- (d) The department finds a pattern of substantial interference between wells within the area in question and:
 - (A) An appropriator of surface water whose water right has an earlier priority date; or
 - (B) A restriction imposed on surface water appropriation or a minimum perennial streamflow that has an effective date earlier than the priority date of the ground water appropriation;
- (e) The available ground water supply in the area in question is being or is about to be overdrawn;
- (f) The purity of the ground water in the area in question has been or reasonably may be expected to become polluted to an extent contrary to the public welfare, health and safety; or
- (g) Ground water temperatures in the area in question are expected to be, are being or have been substantially altered except as specified in ORS 537.796.

(2) The proceeding to designate a critical ground water area shall be conducted according to the provisions under ORS chapter 183 applicable to the adoption of rules by an agency, except that a hearing on a critical ground water declaration shall occur at least 60 days after notice has been given.

(3) In addition to the notice requirements under ORS 183.335, the department shall give notice by regular mail to:

- (a) The owners of record of all ground water registrations, permits and certificates for water use within the affected area; and
- (b) Each water well constructor licensed under ORS 537.747.

(4) If the department satisfies the notice requirements under ORS 183.335 and subsection (3) of this section, a person shall not contest a critical ground water area designation on grounds of failure to receive notice by regular mail. [1955 c.708 §26; 1957 c.341 §8; 1981 c.589 §5; 1985 c.673 §62; 1987 c.442 §1; 1989 c.201 §4; 1991 c.400 §4]

537.735 Rules designating critical ground water area. (1) A rule adopted by the Water Resources Commission under ORS 537.730 shall:

- (a) Define the boundaries of the critical ground water area and shall indicate which of the ground water reservoirs located either in whole or in part within the area in question are included within the critical ground water area. Any number of ground water reservoirs which either wholly or partially overlie one another may be included within the same critical ground water area.
- (b) Contain a provision requiring a periodic review of conditions in the critical ground water area. The review shall be in sufficient detail to evaluate the continuing need for the critical ground water area designation and shall occur no less frequently than once every 10 years.

(2) In adopting the rule, the commission shall consider any orders or permits applicable to the reservoir issued by the governing board or State Geologist of the State Department of Geology and Mineral Industries under ORS chapter 522.

(3) A rule by the commission under subsection (1) of this section may include any one or more of the following corrective control provisions:

(a) A provision closing the critical ground water area to any further appropriation of ground water, in which event the commission shall thereafter refuse to accept any application for a permit to appropriate ground water located within such critical area.

(b) A provision determining the permissible total withdrawal of ground water in the critical area each day, month or year.

(c) The disposition of any application for a water right permit for the use of water in the area that is pending at the time the commission initiates the rulemaking process or that is received during the rulemaking process.

(d) Any one or more provisions making such additional requirements as are necessary to protect the public welfare, health and safety in accordance with the intent, purposes and requirements of ORS 537.505 to 537.795 and 537.992.

(e) A provision closing all or part of the critical ground water area to further appropriation of ground water for its thermal characteristics.

(f) A provision determining the permissible change in thermal characteristics of ground water in all or part of the critical ground water area each day, month or year. Insofar as may be reasonably done, the Water Resources Director shall apportion the permissible total temperature impact among those appropriators whose exercise of valid rights in the critical area affect the thermal characteristics of the ground water, in accordance with the relative dates of priority of such rights. [1955 c.708 §27; 1981 c.589 §6; 1981 c.919 §1; 1985 c.673 §63; 1989 c.201 §5; 1991 c.400 §5]

537.740 Filing rules designating critical ground water area. In addition to any applicable requirements under ORS chapter 183, the Water Resources Commission shall file a copy of any rules designating a critical ground water area under ORS 537.730 to 537.740 with the county clerk of each county within which any part of the critical ground water area lies, and the county clerk shall record the designation in the deed records of the county. [1955 c.708 §28; 1985 c.673 §64; 1991 c.400 §6]

537.742 Contested case proceeding to limit use of ground water in critical ground water area. (1) Any time after the Water Resources Commission adopts a rule under ORS 537.730 designating a critical ground water area, the commission may initiate a contested case proceeding to limit the use of ground water in the area if the commission has reason to believe that any of the qualifying criteria of ORS 537.730 (1) exists.

(2) Upon the conclusion of a contested case proceeding initiated under subsection (1) of this section and upon finding that the problems that resulted in the designation of a critical ground water area under ORS 537.730 can be resolved by implementing one or more of the corrective control provisions of this section, the commission shall issue a final order establishing any one or more of the following corrective control provisions:

(a) A provision apportioning the permissible total withdrawal as established by rule under ORS 537.730, among the appropriators holding valid rights to ground water in the critical area in accordance with the relative dates of priority of such rights.

(b) A provision according preference, without reference to relative priorities, to withdrawals of ground water in the critical area for residential and livestock watering purposes first. Thereafter, the commission may authorize withdrawals of ground water in the critical area for other beneficial purposes, including agricultural, industrial, municipal other than residential, and recreational purposes, in such order as the commission considers advisable under the circumstances, so long as such withdrawal will not materially affect a properly designed and operating well with prior rights that penetrates the aquifer.

(c) A provision reducing the permissible withdrawal of ground water by any one or more appropriators or wells in the critical area.

(d) Where two or more wells in the critical area are used by the same appropriator, a provision adjusting the total permissible withdrawal of ground water by such appropriator, or a provision forbidding the use of one or more of such wells completely.

(e) A provision requiring the abatement, in whole or part, or the sealing of any well in the critical area responsible for the admission of polluting materials into the ground water supply or responsible for the progressive impairment of the quality of the ground water supply by dispersing polluting materials that have entered the ground water supply previously.

(f) A provision requiring and specifying a system of rotation of use of ground water in the critical area.

(3) The commission shall conduct the proceeding under this section according to the provisions of ORS chapter 183 applicable to contested case proceedings. [1991 c.400 §2]

Oregon Administrative Rules (“OAR”)

Chapter 690, Division 8

STATUTORY GROUND WATER TERMS

690-008-0001 Definition and Policy Statements

(2) “Critical Ground Water Area Boundary” means a line established in a critical ground water area order on a map that surrounds an area in which one or more of the statutory criteria for critical area declaration are met and which is located either:

- (a) Physically by coincidence with natural features such as ground water reservoir boundaries, hydrologic barriers, or recharge or discharge boundaries; or
- (b) Administratively by surrounding an affected area when that area does not coincide with an area bounded by natural features.

(4) “Declined Excessively” means any cumulative lowering of the water levels in a ground water reservoir or a part thereof which:

- (a) Precludes, or could preclude, the perpetual use of the reservoir; or
- (b) Exceeds the economic pumping level; or
- (c) Constitutes a decline determined to be interfering with:
 - (A) A surface water diversion having a priority date senior to the priority dates of the causative ground water appropriations; or
 - (B) A surface water body that has been administratively withdrawn with an effective date senior to the priority dates of the causative ground water appropriations unless the causative ground water appropriations are for uses that are exceptions to the withdrawals; or
 - (C) An adopted minimum stream flow or instream water right, or closure having an effective date senior to the priority dates of the causative ground water appropriations; or
 - (D) A surface water body which has a classification that is senior to the priority date of the causative ground water appropriation(s) and the use or uses to which the ground water is being put are not included in the classification.
- (d) Constitutes a lowering of the annual high water level within a ground water reservoir, or part thereof, greater than 50 feet below the highest known water level; or
- (e) Results in ground water pollution; or
- (f) Constitutes a lowering of the annual high water level greater than 15% of the greatest known saturated thickness of the ground water reservoir. the saturated thickness shall be calculated

using pre-development water levels and the bottom of the ground water reservoir, or the economic pumping level, whichever is shallower.

(6) “Excessively Declining Water Levels” (Note: “Excessively” as used in ORS 537.730(1)(a) is taken to modify both “are declining” and “have declined”) means any ongoing lowering of the water level in a ground water reservoir or part thereof which:

- (a) Precludes, or could preclude, the perpetual use of the reservoir; or
- (b) Represents an average downward trend of three or more feet per year for at least 10 years; or
- (c) Represents, over a five year period, an average annual lowering of the water level by 1% or more of the initial saturated thickness as determined by observation or investigation in the affected area; or
- (d) Results in water quality deterioration.

(7) “Overdraw” means to artificially produce water, in any one-year period, from a ground water reservoir, or part thereof, at an annual rate that:

- (a) Exceeds the average annual recharge to that ground water supply over the period of record; or,
- (b) Reduces surface water availability resulting in:
 - (A) One or more senior appropriators being unable to use either their permitted or customary quantity of surface water, whichever is less; or
 - (B) Failure to satisfy an adopted minimum streamflow or instream water right with an effective date senior to the causative ground water appropriation(s).
- (c) Reduces the availability of surface waters that have been:
 - (A) Withdrawn with an effective date senior to the priority dates of the causative ground water appropriations; or
 - (B) Restrictively classified with an effective date senior to the priority date(s) of the causative ground water appropriations.

(8) “Substantial or Undue Interference” means the spreading of the cone of depression of a well to intersect a surface water body or another well, or the reduction of the ground water gradient and flow as a result of pumping, which contributes to:

- (a) A reduction in surface water availability to an extent that:
 - (A) One or more senior surface water appropriators are unable to use either their permitted or customary quantity of water, whichever is less; or

(B) An adopted minimum streamflow or instream water right with an effective date senior to the causative ground water appropriation(s) cannot be satisfied.

(b) The ground water level being drawn down to the economic level of the senior appropriator(s);
or

(c) One or more of the senior ground water appropriators being unable to obtain either the permitted or the customary quantity of ground water, whichever is less, from a reasonably efficient well that fully penetrates the aquifer where the aquifer is relatively uniformly permeable. However, in aquifers where flow is predominantly through fractures, full penetration may not be required as a condition of substantial or undue interference.

OAR Chapter 690, Division 9

GROUND WATER INTERFERENCE WITH SURFACE WATER

690-009-0010 Basis for Regulatory Authority and Purpose

The right to reasonable control of the ground waters of the State of Oregon has been declared to belong to the public. Through the provisions of the Ground Water Act of 1955, ORS 537.505 to 537.795, the Water Resources Commission has been charged with administration of the rights of appropriation and use of the ground water resources of the state. These rules govern the use of ground waters, pursuant to 537.730 and 537.775, where the ground water is hydraulically connected to, and the use interferes with, surface waters.

690-009-0020 Definitions

- (1) “Confined Aquifer” means an aquifer in which ground water is under sufficient hydrostatic head to rise above the bottom of the overlying confining bed, whether or not the water rises above land surface.
- (2) “Commission” means the Water Resources Commission.
- (3) “Confining Bed”: means a layer of low permeability material immediately overlying a confined aquifer.
- (4) “Department” means the Water Resources Department, and consists of the Director of the Department and all personnel employed in the Department including but not limited to all watermasters appointed under ORS 540.020 (536.039).
- (5) “Director” means the Water Resources Director.
- (6) “Hydraulic Connection” means that water can move between a surface water source and an adjacent aquifer.
- (7) “Unconfined Aquifer” means an aquifer in which the hydrostatic head at the upper surface of the ground water is atmospheric.

690-009-0030 General Policy

The following rules establish criteria to guide the Department in making determinations whether wells have the potential to cause substantial interference with surface water supplies and in controlling such interference. The rules apply to all wells, as defined in ORS 537.515 (7), and to all existing and proposed appropriations of ground water except the exempt uses under 537.545. The authority under these rules may be locally superseded where more specific direction is provided by the Commission after the effective date of adoption of these rules.

690-009-0040 Determination of Hydraulic Connection and Potential for Substantial Interference

For the purposes of permitting and distributing ground water, the potential for substantial interference with surface water supplies shall be determined by the Department.

(1) The Department shall determine whether wells produce water from an unconfined or confined aquifer. Except for wells that satisfy the conditions in section (2) of this rule the Department shall further determine whether the aquifer is hydraulically connected to the surface water source. The basis of the determination shall be information provided on the Water Well Report for any well in question. If there is no Water Well Report available or if the information provided is inadequate, the Department shall make the determination on the basis of the best available information. Such information may include other Water Well Reports, topographic maps, hydrogeologic maps or reports, water level and other pertinent data collected during a field inspection, or any other available data or information that is appropriate, including any that is provided by potentially affected parties.

(2) All wells located a horizontal distance less than one-fourth mile from a surface water source that produce water from an unconfined aquifer shall be assumed to be hydraulically connected to the surface water source, unless the applicant or appropriator provides satisfactory information or demonstration to the contrary. Department staff may provide reasonable assistance to the applicant or appropriator in acquiring the satisfactory information.

(3) The Department shall determine the horizontal distance between any well in question and the nearest surface water source on the basis of the edge of the surface water source as also determined by the Department.

(4) All wells that produce water from an aquifer that is determined to be hydraulically connected to a surface water source shall be assumed to have the potential to cause substantial interference with the surface water source if the existing or proposed ground water appropriation is within one of the following categories:

(a) The point of appropriation is a horizontal distance less than one-fourth mile from the surface water source; or

(b) The rate of appropriation is greater than five cubic feet per second, if the point of appropriation is a horizontal distance less than one mile from the surface water source; or

(c) The rate of appropriation is greater than one percent of the pertinent adopted minimum perennial streamflow or instream water right with a senior priority date, if one is applicable, or of the discharge that is equaled or exceeded 80 percent of time, as determined or estimated by the Department, and if the point of appropriation is a horizontal distance less than one mile from the surface water source; or

(d) The ground water appropriation, if continued for a period of 30 days, would result in stream depletion greater than 25 percent of the rate of appropriation, if the point of appropriation is a horizontal distance less than one mile from the surface water source. Using the best available information, stream depletion shall be determined or estimated by the Department, employing at least one of the following methods:

(A) Suitable equations and graphical techniques that are described in pertinent publications (such as “Computation of Rate and Volume of Stream Depletion by Wells,” by C.T. Jenkins, in Techniques of Water-Resources Investigations of the United States Geological Survey: Book 4, Chapter D1);

(B) A computer program or ground water model that is based on such or similar equations or techniques.

(5) Any wells, other than those covered in section (4) of this rule, that produce water from an aquifer that is determined to be hydraulically connected to the surface water source may be determined by the Department to have the potential to cause substantial interference with the surface water source. In making this determination, the Department shall consider at least the following factors:

(a) The potential for a reduction in streamflow or surface water supply; or

(b) The potential to impair or detrimentally affect the public interest as expressed by an applicable closure on surface water appropriation, minimum perennial streamflow, or instream water right with a senior priority date; or

(c) The percentage of the ground water appropriation that was, or would have become, surface water; or

(d) Whether the potential interference would be immediate or delayed; or

(e) The potential for a cumulative adverse impact on streamflow or surface water supply.

(6) All wells that produce water from an aquifer that is not hydraulically connected to a surface water source shall be assumed not to interfere with the surface water source.

690-009-0050 Ground Water Controls

(1) The Department shall review existing ground water appropriations to determine the potential to cause substantial interference with a surface water source on a case-by-case basis, in accordance with OAR 690-009-0040, whenever substantial interference with a surface water source is suspected to exist by the Department.

(2) Whenever the Department determines that substantial interference with a surface water supply exists, the Department shall control those groundwater appropriations that have been determined under section (1) of this rule to have the potential to cause substantial interference. The controls shall be similar to or compatible with, but not more restrictive than controls on the affected surface water source, in accordance with the relative dates of priorities of the ground water and surface water appropriations:

(a) Prior to controlling the use of any well greater than 500 feet from a surface water source, the Department shall determine whether any control would provide relief to the surface water supply in an effective and timely manner. The Department shall make the determination on the basis of the best available information, employing at least one of the methods set forth in OAR 690-009-0040(4)(d);

(b) The Department shall control the use of wells greater than one mile from a surface water source only through a critical ground water area determination in accordance with ORS 537.730 through 537.740.

OAR Division 690 Chapter 507

Stage Gulch Critical Groundwater Area

690-507-0750 Stage Gulch Critical Groundwater Area (CGWA): Purpose

(1) The Director issued an order on May 15, 1991, declaring the Stage Gulch Critical Groundwater Area. The order described the exterior boundaries and divided the area with eight subareas for the purposes of managing the groundwater resource. The response of ground-water levels to pumpage in each subarea is largely independent of pumpage within other subareas.

(2) To promote optimum use of the limited groundwater supply in the Stage Gulch Critical Groundwater Area, the Commission encourages development of water management plans to maintain a high standard of water use efficiency.

(3) The purpose of these rules is to stabilize water levels in the basalt groundwater reservoir in the Stage Gulch Critical Groundwater area of Umatilla County. These rules carry out the authority granted to the Commission in ORS 536.900 to 536.935 and 537.505 to 537.745.

690-507-0760 Stage Gulch CGWA: Definitions

The following definitions apply to OAR 690, division 507:

(1) “Commission” means the Water Resources Commission.

(2) “Department” means the Water Resources Department.

(3) “Director” means the Director of the Water Resources Department.

(4) “Physically Capable” means that the well, pump installed, and distribution system are able to produce and distribute the quantity of water requested.

(5) “Reasonably Stable Water Level” means an annual static water level decline of less than one foot over the entire subarea as determined by averaging the annual water level change of the representative wells in the subarea, and the water level change for the subarea averaged over five consecutive years displays no decline.

(6) “Sustainable Annual Yield” means the volume of water that can be pumped on an annual basis while maintaining reasonably stable water levels. This is a measurement of the capacity of the available source.

(7) “Water User” means a person who pumps water from the basalt groundwater reservoir.

690-507-0770 Stage Gulch CGWA: General Requirements

(1) The use of water from the basalt groundwater reservoir within the Stage Gulch Critical Groundwater Area shall be limited to the sustainable annual yield.

(2) The Commission delegates to the Director the authority to implement these rules.

(3) Water from the basalt groundwater reservoir in the Stage Gulch Critical Groundwater Area shall be used for irrigation only during the irrigation season. The irrigation season shall begin on the 1st of March and end on the 30th of November. Water for all other authorized uses may be used at any time:

(a) A water user who wishes to use water for irrigation at any time other than the irrigation season designated in this section shall make a written request to the Department in Salem;

(b) If the request is authorized, the Department may require the water user to submit to the Department in Salem a static water level measurement for each well authorized to be pumped. Water level measurements shall be made by a Certified Water Rights Examiner, Licensed Water Well Driller, Registered Geologist, Licensed Land Surveyor, Registered Professional Engineer, pump installer, or the water user.

(4) The Department shall not accept any new applications for appropriation of water from the basalt groundwater reservoir within the Stage Gulch Critical Groundwater Area.

690-507-0775 Stage Gulch CGWA: Water Users Exempt from Division Requirements

(1) Any school located in the Stage Gulch Critical Groundwater Area using water from the basalt reservoir for watering lawns, grounds and fields not exceeding ten (10) acres in area shall meet the requirements of OAR 690-507-0780(2) to (5) and 690-507-0785. Except as provided in section (2) of this rule, water users with wells located in Subarea E of the Stage Gulch Critical Groundwater Area and all other water users exempt under the provisions of ORS 537.545(a), (b), (d), (e), and (f) are not subject to the provisions of OAR 690, division 507.

(2) Permitted wells located in Subarea E of the Stage Gulch Critical Groundwater Area shall not be deepened to a point where the well would penetrate the deep basalt reservoir underlying said subarea.

690-507-0780 Stage Gulch CGWA: Duties of Water Users

(1) Appropriation of groundwater from the Stage Gulch Critical Groundwater Area is prohibited unless the water user meets the requirements of sections (2) to (5) of this rule.

(2) A water user authorized by OAR 690-507-0810 to pump water from the basalt groundwater reservoir shall satisfy the following conditions:

(a) Wells shall have an access port with a minimum diameter of 3/4 inch. The access shall be adequate to determine the water level at any time;

(b) A water user may install a functioning airline with a pressure gage in addition to the access port. The airline shall be calibrated and yield accurate data. The airline shall not enter the well through the access port. The airline shall be adequate to determine the water level at any time;

(c) A water user shall install and maintain a totalizing flow meter on each well authorized by OAR 690-507-0810 except wells authorized for irrigation of 10 acres or less. The meter shall meet the requirements of OAR 690-507-0785.

(3) If a flow meter is required, a water user shall record flow meter and power meter readings on a weekly basis at times when water is being used. The water user shall use forms provided by the Department and shall mail the readings to the Department in Salem by December 1st of the same year. The Department may accept other power-use information from a water user in lieu of weekly power meter readings. Acceptable power-use information may include, but is not limited to, copies of monthly statements provided by the water user or directly by the utility.

(4) A water user shall report broken flow meters to the watermaster in Pendleton within 48 hours after determining that the flow meter is broken. A water user shall not appropriate for more than 60 days without an operating flow meter. While the flow meter is broken, the water user shall record daily the hours the pump operates, the power meter reading and the time the power meter was read. The water user shall mail the data to the Department in Salem within one week of the installation of the repaired or replacement flow meter. The data shall include a statement of the initial reading on the newly installed flow meter and the current power meter reading. The water user shall notify the watermaster within 48 hours of installing the repaired or replacement flow meter.

(5) A water user shall notify the Department in Salem or the watermaster in Pendleton prior to commencing any repair or modification work on a pump or well. If emergency repairs are required at times that preclude prior Department notification, a water user shall notify the Department by 5 p.m. on the first business day following commencement of the repair work. A water user shall mail a description of the repair or modification work to the Department within 10 days of the completion of the repair or modification.

690-507-0785 Stage Gulch CGWA: Flow Meter Specifications and Installation Guidelines

(1) A flow meter shall meet the following specifications:

(a) A flow meter shall be of the velocity-propeller type or shunt line venturi type with enclosed propeller made of non-corrosive materials. Other types of flow meters may be used with the written approval of the Water Resources Director;

(b) A flow meter shall have a rated accuracy of plus or minus two percent of actual flow for all rates of flow within the range of flow for which the meter is designed. The flow meter shall register the full range of discharge from the source of water for which it is to be used;

(c) The register head of the flow meter shall have a visual, recording, mechanical, digital totalizer located on or adjacent to the flow meter and shall be equipped with a test sweep hand so that flow rate can be quickly determined. The register face shall be protected by a suitable plate or cover;

(d) Units of water measurement shall be in acre-feet, cubic feet, or gallons. The totalizer shall read directly in the above-described units. Flow meters recording in acre-feet shall read to the nearest 1/10th acre-foot, and the decimal multiplier shall be clearly indicated on the face of the register head;

(e) The totalizing part of the flow meter shall have a sufficient capacity to record the quantity of water authorized to be pumped over a period of two (2) years;

(f) Both the register and the flow meter unit shall be provided with a method of sealing with a wire or lead seal to prevent unauthorized tampering with the placement or position of the flow meter.

(2) The flow meter installation shall be as follows:

(a) The flow meter shall be installed in accordance with manufacturer's specifications and in such a manner that there shall be a full pipe of water at all times during which water is being pumped;

(b) There shall be no turnouts or diversions between the source of water and the flow meter installation;

(c) The flow meter shall be placed in the pipe not less than five pipe diameters downstream from any valve, elbow, or other obstruction which might create turbulent flow, or install straightening vanes as recommended by the flow meter manufacturer. There shall also be at least one pipe diameter of unobstructed flow on the downstream side of the flow meter;

(d) All in-line saddle flow meters equipped with U-bolt fasteners shall be provided with a sealing wire and lead seal near the terminal ends of the U-bolt following the complete installation of the flow meter;

(e) Except for wells authorized for municipal use, the flow meter and register shall not be locked in a building which would prevent access to the register. The register or flow meter shelter may

be equipped with a lock to prevent tampering or breakage, provided that a lock is used and for which that watermaster has a key;

(f) The flow meter installation is subject to inspection and approval by the Director;

(g) In the case of artesian wells which flow at various times, the flow meter shall be installed in a manner which will measure both pumped and flowing discharges.

(3) Flow meters shall be kept clear of debris or other foreign or vegetative growth which could impede their operation. All flow meters shall be lubricated as specified by the manufacturer.

690-507-0790 Stage Gulch CGWA: Sustainable Annual Yield

(1) Each of the subareas in the Stage Gulch Critical Ground-water Area shall be managed according to the sustainable annual yield within that subarea. The Department shall refine the sustainable annual yield over time through the use of pumpage data and the response of ground-water levels.

(2) The initial sustainable annual yield for each of the seven managed subareas in the Stage Gulch Critical Groundwater Area was determined using data from the 1980 through the 1989 irrigation season and is listed below:

SUBAREA — SUSTAINABLE ANNUAL YIELD

A — 11,450 Acre Feet

B — 200 Acre Feet

C — 400 Acre Feet

D — 3,250 Acre Feet

F — 200 Acre Feet

G — 2,750 Acre Feet

H — 8,850 Acre Feet

690-507-0800 Stage Gulch CGWA: Method for Determining the Sustainable Annual Yield

(1) The Department shall determine the sustainable annual yield for each subarea by comparing the volume of groundwater pumped annually from each subarea for a given year to the average of the annual changes in groundwater levels for the area for the same year:

(a) The Department shall calculate pumpage from each well based on data collected by the Department and as submitted under OAR 690-507-0780. The pumpage for each subarea shall be calculated by totaling the pumpage from each well in the subarea required to have a flow meter;

(b) The Department shall calculate annual change in groundwater levels for a subarea by subtracting the current year's February or March water level from the previous year's February or March water level. The average shall be calculated by adding the change at each well in the

subarea and dividing by the number of wells with available water level data. Data from all permitted or certificated wells in each subarea that are measurable shall be used to calculate the average annual change. If water level data cannot be collected at a particular well, data from a nearby well may be substituted.

(2) The total volume of groundwater pumped from each subarea for a given year shall be plotted against the average change in groundwater levels from that subarea for that year.

(3) A line of regression is drawn through the data using the least squares fit method and extended through the zero decline axis.

(4) The initial determination of sustainable annual yield for subareas B, C, and F of the Stage Gulch Critical Groundwater Area shall be based on the average annual pumpage in each subarea during the period 1985 through 1989, rounded upward to the nearest 50 acre-feet.

690-507-0810 Stage Gulch CGWA: Distribution of Sustainable Annual Yield

(1) The method for distributing the sustainable annual yield from the basalt groundwater reservoir within each managed subarea in the Stage Gulch Critical Groundwater Area is as follows:

(a) Except as provided in section (5) of this rule, a water user who intends to pump water for any authorized use except municipal use during any year shall make a request to the Department in Salem by July 1st of the preceding year on forms provided by the Department;

(b) The Department shall assume that municipal water users intend to pump a quantity of water equivalent to the average pumped for the previous three (3) years, unless the municipal water user informs the Department otherwise by July 1st;

(c) Except as provided in section (5) of this rule, the distribution of groundwater for any authorized use except municipal use shall be based on the priority dates of the water rights within the individual subarea;

(d) In determining the amount of groundwater each water user is allocated to pump during the next calendar year or irrigation season, the Department may consider:

(A) Requests for allocations received;

(B) The sustainable annual yield;

(C) The limits of the groundwater rights;

(D) The relative dates of priority, with preference given without regard to priority date for municipal use;

(E) Historical usage;

(F) Whether or not a water user is physically capable of pumping and putting to a beneficial use the quantity requested; and

(G) Any other factors deemed appropriate by the Department.

(e) The Department shall notify by certified mail with return receipt requested, each water user by August 1st of the amount of groundwater allocated under these rules to each water user for the next calendar year or irrigation season;

(f) Persons who wish to challenge the allocation determined under this rule shall request a hearing before the Department pursuant to ORS 183.415 to 183.470.

(2) If pumpage for a particular year exceeds the sustainable annual yield for a subarea, the total subarea allocation for the second year after that occurrence shall be reduced by that volume.

(3) If any water user requests more water than has been historically used, the Department may allocate less water than requested if, upon investigation, it appears unlikely the user will pump the volume requested.

(4) If any water user requests less water than has been historically used, the Department may allocate more water than requested if, upon investigation, it appears likely that the user will pump more than the volume requested.

(5) The method of requesting and distributing water in section (1) of this rule may not apply if a voluntary agreement among groundwater users in any subarea is reached. The Director may approve the agreement if it is consistent with ORS 537.730 to 537.740 and the requirements of these rules (division 507). The Department shall be a party to any agreement reached.

(6) Any agreement approved by the Director may be terminated by the lapse of time as provided in the agreement, by consent to the parties to the agreement or by the Director if the Director finds, after investigation and a public hearing upon adequate notice, that:

(a) The agreement is not being substantially complied with by the parties thereto;

(b) Changed conditions have made the continuance of the agreement a detriment to the public welfare, safety and health or contrary in any particular to the intent, purposes and requirements of ORS 537.505 to 537.795 or OAR division 690, chapter 507; or

(c) That the agreement is ineffective in achieving reasonably stable water levels.

(7) A gradual reduction of pumpage in excess of the sustainable annual yield shall be implemented beginning in 1992:

(a) Those users who would not be allocated any water in 1992 shall be allowed to pump seventy-five percent of their average pumpage for the period 1986 to 1990;

(b) Those users who would not be allocated any water in 1993 shall be allowed to pump fifty percent of their average pumpage for the period 1986 to 1990;

(c) Those users who would not be allocated any water in 1994 shall be allowed to pump twenty-five percent of their average pumpage for the period 1986 to 1990.

(8) Those users who would be allocated only a portion of their request because it exceeds the sustainable annual yield shall be allowed to pump that volume of water requested that is within the sustainable annual yield. The volume of water allocated under the sustainable annual yield shall be subtracted from the user's average pumpage for the period 1986 to 1990. A percentage of the difference shall be allocated as described in section (7) of this rule in addition to the volume allocated below the sustainable annual yield.

690-507-0820 Stage Gulch CGWA: Process of Periodic Review of Sustainable Annual Yield

(1) The Department shall determine whether a reasonably stable water level was achieved in the basalt groundwater reservoir in each subarea in 1995 and every five years thereafter.

(2) For any subarea in which a reasonably stable water level was achieved, the Department may increase the sustainable annual yield if the evaluation under section (1) of this rule indicates that more water is available than the existing sustainable annual yield.

(3) For any subarea in which a reasonably stable water level was not achieved, the Department may decrease the sustainable annual yield or modify subarea boundaries, or both, if the evaluation under section (1) of this rule indicates that less water is available than the existing sustainable annual yield.

(4) For any subarea in which a reasonably stable water level was achieved but for which individual wells, in the Director's judgment, show significant water level declines, the Department may propose modification of subarea boundaries.

(5) If the Department proposes to modify sustainable annual yields or subarea boundaries, it shall conduct a rulemaking hearing as part of the basin program.

(6) The Department may propose modification of subarea boundaries or sustainable annual yields at times other than the five year review required in section (1) of this rule.

(7) Individuals with a groundwater right in the Stage Gulch Critical Groundwater Area may petition the Department to modify subarea boundaries or sustainable annual yields under the following conditions:

(a) The petition shall be in writing;

(b) The petition shall contain evidence in support of the proposed modification; and

(c) The petition shall specify the proposed location of the boundary or sustainable annual yield.

690-507-0830 Stage Gulch CGWA: Annual Reporting

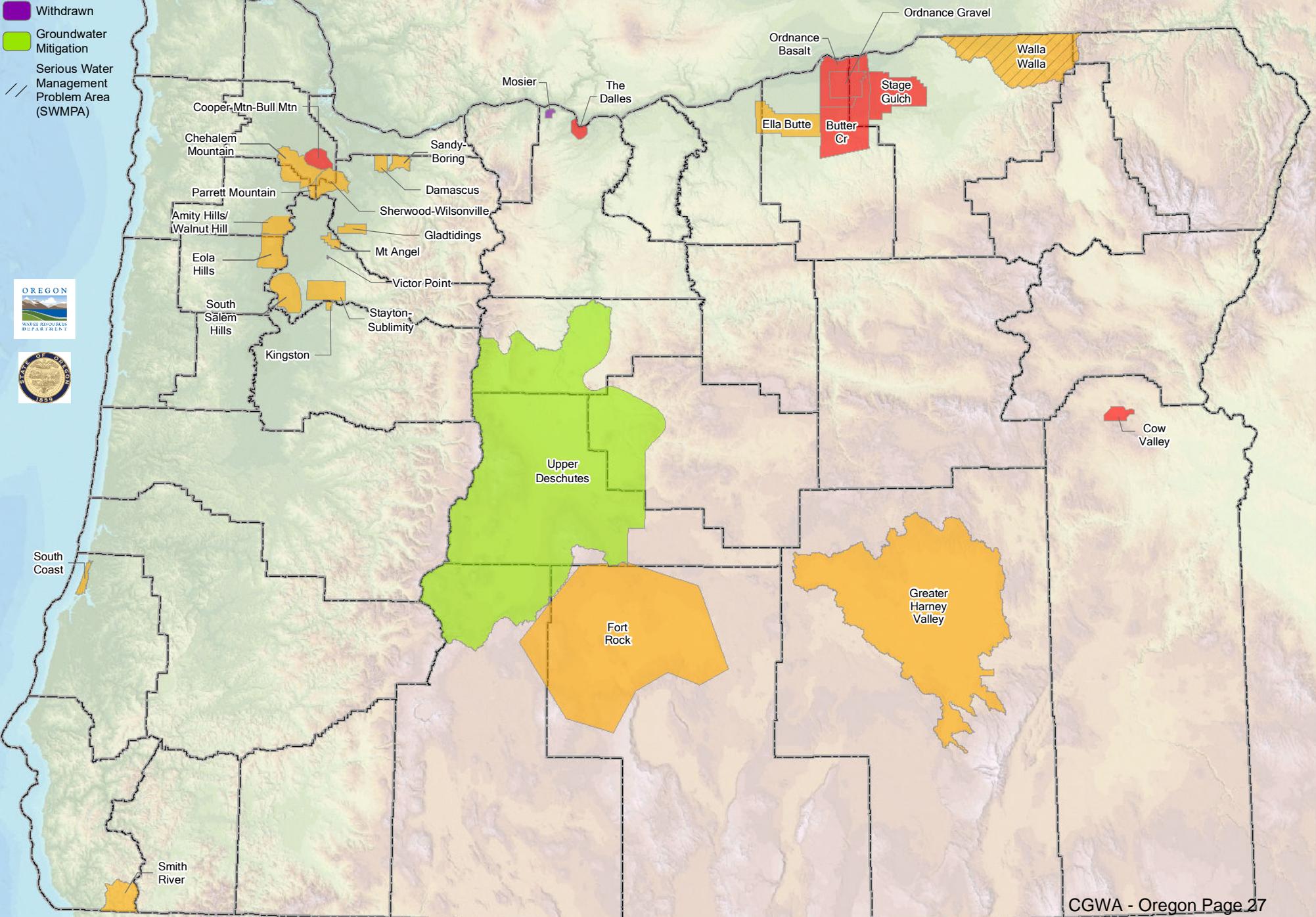
The Department shall publish a report for the Stage Gulch Critical Groundwater Area by May 31 of each year. The report shall include the water user's name, well locations, permit numbers, priority dates, authorized diversions, actual diversion, and water levels.

690-507-0840 Stage Gulch CGWA: Violation Policy

Whenever the Department has reason to believe a violation of a rule in OAR 690, division 507 has occurred, it shall investigate. If a violation has occurred, the Director may take enforcement action.

OREGON WATER RESOURCES DEPARTMENT GROUNDWATER RESTRICTED AREAS

- Classified
- Critical
- Withdrawn
- Groundwater Mitigation
- Serious Water Management Problem Area (SWMPA)



Map prepared by OWRD GIS (rh), 2/23/2018 (G:\dev\arcmap\projects\state\state_2016_GWRAs_letter.mxd)

Critical Groundwater Area Designation Rulemaking Process



In order to declare a Critical Groundwater Area (CGWA) under **ORS 537.730(1)(a-g)**, **one** of the following seven conditions must be met:

The groundwater supply is nearly overdrawn

Pattern of substantial interference on senior water rights holders

Groundwater is declining excessively

Patterns of interference on regulated geothermal resources

Pattern of substantial interference between wells

Groundwater temperature is, or has been, extensively altered

Groundwater pollution is impacting public health



If conditions are met for CGWA Declaration under **ORS 537.730(1)(a-g)**, OWRD may initiate the following rulemaking process

(A) CRITICAL GROUNDWATER AREA DESIGNATION

(B) RULE DRAFTING BEGINS

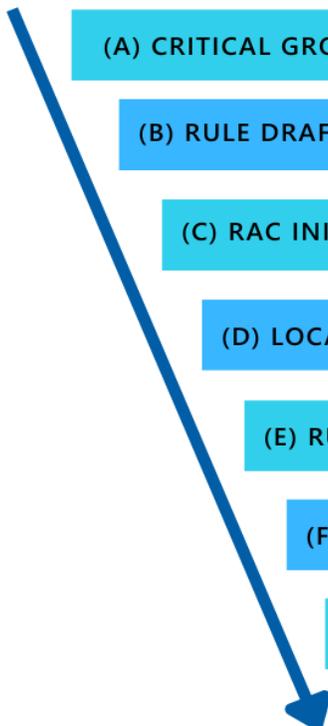
(C) RAC INITIATED

(D) LOCAL GOVERNMENT & INDIAN TRIBES CONSULTED

(E) RULE NOTIFICATION BEGINS

(F) PUBLIC COMMENT/HEARINGS BEGIN

(G) RULES ARE ADOPTED



Critical Groundwater Area Designation Rulemaking Details

(A) Critical Groundwater Designation

Relevant Statute(s) and Rule(s): **ORS 537.730(1)(a)-(g)**

In order for a Critical Groundwater Area (CGWA) declaration; one of the conditions under statute ORS 537.730(1)(a)-(g) need to met. These conditions are:

- Groundwater levels in the area in question are declining or have declined excessively;
- The Oregon Water Resources Department (OWRD) finds a pattern of substantial interference between wells within the area in question;
- OWRD finds a pattern of interference or potential interference between wells of groundwater claimants or appropriators within the area in question with the production of geothermal resources from an area regulated under ORS chapter 522;
- OWRD finds a pattern of substantial interference between wells within the area in question and:
 - An appropriator of surface water whose water right has an earlier priority date; or
 - A restriction imposed on surface water appropriation or a minimum perennial streamflow that has an effective date earlier than the priority date of the groundwater appropriation;
- The available groundwater supply in the area in question is being or is about to be overdrawn;
- The purity of the groundwater in the area in question has been or reasonably may be expected to become polluted to an extent contrary to the public welfare, health and safety; or
- Groundwater temperatures in the area in question are expected to be, are being or have been substantially altered except as specified in ORS 537.796.

(B) Rule Drafting Begins

The Critical Groundwater Area Rules (CGWA) must contain the following information.

Defined Boundaries of a CGWA

Relevant Statute(s) and Rule(s): **ORS 537.735(1)(a-b) and OAR 690-010-0130(2)(a)**

The rules must define the boundaries of the critical groundwater area (CGWA) including in groundwater reservoirs located either in whole or in part of (CGWA). Any number of groundwater reservoirs which either wholly or partially overlies one another may be included within the CGWA.

Provisions for periodic review of conditions every 10 years

Relevant Statute(s) and Rule(s): **ORS 537.735(1)(b), OAR 690-010-0130(2)(b), OAR 690-010-0150(4)**

The rules must have a provision for OWRD to conduct a periodic review of the conditions within the critical groundwater area are no less than once every 10 years to evaluate the continuing need for the CGWA.

Corrective Actions (if needed)

Relevant Statute(s) and Rule(s): **ORS 537.735 (3)(a)-(f)/OAR 690-010-0150(2)(a)-(f)**

The rules may include any one or more of the corrective control provisions under **ORS 537.735(3)(a)-(f)**.

Provisions to review the rules every 3 years

Relevant Statute(s) and Rule(s): **ORS 690-010-0150(4), ORS 537.780(3)**

The Rules must contain a provision of a review of the rules if the rule adopted by the commission restricts groundwater every three years.

Assurance of substantial evidence in the rules

Relevant Statute(s) and Rule(s): **ORS 537.730(a-g), OAR 690-010-0130(2)(b)**

The rules must contain the substantial evidence relied upon for the CGWA declaration that meet ORS 537.730(1)(a)-(g)

(C) RAC Initiated

Relevant Statute(s) and Rule(s): **ORS 183.407**

OWRD selects Rules Advisory Committee (RAC) members from among those who are likely to be affected by the proposed new rule or rule change. We gain valuable feedback on the draft rules and any fiscal impacts from the RAC members. Meetings are generally 2-3 hours but may last longer.

(D) Local Government & Indian Tribes Consulted

Relevant Statute(s) and Rule(s): **ORS Chapter 197, OAR Chapter 660 Division 30, OAR Chapter 690 Division 005, OAR 690-010-0140.**

OWRD needs to consult with the affected local government to determine whether it's proposed CGWA rules are compatible with the county's acknowledged comprehensive use plan. OWRD will also consult with any federally recognized tribes with in the proposed Critical Groundwater Area. OWRD must provide the following information to the affected local government:

- Boundaries of the proposed critical groundwater area;
- List of any groundwater reservoirs located either in whole or in part within the proposed critical groundwater area;
- Copies of any evidence relied upon for the designation;
- List of any proposed corrective control provisions to be included in the proposed critical groundwater area rule under ORS 537.735
- A of copy of the proposed rules.

(E) Rule Notification Begins

Relevant Statute(s) and Rule(s): **ORS 183.335, ORS 537.730(3)(a), ORS 537.730(3)(b), OAR 690-010-0130(5)-(6)**

In addition to the requirements under ORS 183.335, OWRD must notify the owner of record of all groundwater registrations, permits and certificates for water user with CGWA by regular mail. Additionally, any water well constructor licensed under ORS 537.747 by regular mail.

(F) Public Comment/ Public Hearing Begin

Relevant Statute(s) and Rule(s): **ORS Chapter 183.335(b), ORS 537.730(2), OAR 690-010-0130(5)**

OWRD must hold a hearing within the basin 60 days after initial notification.

(G) Rules Are Adopted

Groundwater Administrative Controls and Criteria Allowing Implementation

Control	Criteria
Withdrawal of Unappropriated Waters ORS 536.410 OAR 690, Div 80	ORS 536.410: Withdraw from any and all uses if necessary: <ol style="list-style-type: none"> 1. To insure compliance with state water resources policy OR 2. To act in the public interest to conserve water for the maximum beneficial use
Classification of Water ORS 536.340 OAR 690, Div 500-520	ORS 536.340: Classify to highest and best types or quantities of use for the future
Serious Water Management Problem Areas ORS 540.435 OAR 690, Div 85	ORS 540.435: The Commission can require installation of a measuring device if it finds water use information is necessary because of serious water management problems caused by: <ol style="list-style-type: none"> 1. Groundwater level decline OR 2. Unresolved user disputes OR 3. Frequent water shortages
Critical Groundwater Area Designation ORS 537.730 to 537.742 OAR 690, Div 10	ORS 537.730: The Commission may by rule designate an area a CGWA if: <ol style="list-style-type: none"> 1. Groundwater levels are declining or have declined excessively OR 2. The Department finds a pattern of well to well interference OR 3. The Department finds a pattern of substantial interference between wells and senior surface water rights OR 4. The groundwater is being or about to be overdrawn OR 5. The groundwater has been or is expected to become contaminated to an extent contrary to public welfare, health and safety OR 6. Groundwater temperatures are expected to be, are being or have been substantially altered except as specified in ORS 537.796
Groundwater Mitigation Area	Deschutes Mitigation Program in OAR Chapter 690, Divisions 505, 521, and 522

Withdrawal and Classification prevent new allocation within the designated area. Serious Water Management Problem Area designation allows the Department to require water use measurement and reporting. Critical Groundwater Area Designation is the only tool that can address over-appropriation by curtailing authorized use. Many of the terms found in control criteria are defined in rule (OAR 690, Divisions 8 and 400) and statute.



MEMORANDUM

TO: Water Resources Commission

FROM: Justin Iverson, Groundwater Section Manager

SUBJECT: Agenda Item D, August 25, 2021
Water Resources Commission Meeting

Critical Groundwater Area Three Year Review

I. Introduction

This is an informational overview of conditions in critical groundwater areas for Commission discussion as required in statute and rule.

II. Background

A critical groundwater area (CGWA) may be designated to address groundwater supply, quality, or thermal issues. A designation under ORS 537.730-742 allows the Commission to take corrective actions necessary to address groundwater issues, which may include reducing groundwater pumping under existing permitted or certificated rights. Oregon currently has seven existing critical groundwater areas (see Attachment 1) which were designated because of water supply issues. Table 1 on the next page summarizes Oregon's seven critical groundwater areas.

All seven critical groundwater areas in Oregon were designated by order of the State Engineer or Water Resources Director pursuant to the 1955 statute. Current statutes, codified in 1991, allow critical groundwater areas to be established by rule. The rules associated with several of these areas require periodic review of conditions to evaluate the effectiveness of the designation in achieving reasonably stable groundwater levels. ORS 537.780(3) also requires the periodic review of rules that result in restriction of existing groundwater rights.

Future potential groundwater uses in an area may also be managed by withdrawal (ORS 536.410) or classification (ORS 536.340). Groundwater areas designated under these administrative controls (see Attachment 1) are not addressed in this report.

Recommended Action 1.A. of the 2017 Integrated Water Resources Strategy (IWRS), calls for conducting additional groundwater investigations, including "evaluating groundwater administrative areas." The IWRS notes that evaluations could include a review of water-level trends, boundary accuracy, and whether designated areas are meeting the goals of groundwater stabilization, groundwater recovery, and protection of existing water users. This report focuses on water-level trends within critical groundwater areas.

Table 1: Summary of Critical Groundwater Areas in Oregon

Restricted Area & Effective Date	Affected Aquifer or Formation	Allowable Uses	Other Limitations	Affected Area	Affected County	Source
Cow Valley Nov. 12, 1959	Alluvial Aquifer and Underlying Volcanic Rocks and Sediments	Exempt Uses Only		33 sq. mi. (map)	Malheur	Special Order Vol.10 Pg 216
The Dalles Dec. 11, 1959	Columbia River Basalt	Exempt Uses Only		21 sq. mi. (map)	Wasco	Special Order Vol.10 Pg 247
Cooper - Bull Mtn. May 17, 1974	Columbia River Basalt	Exempt Uses Only	Domestic exemption on parcels larger than 10 acres	41 sq. mi. (map)	Washington	Special Order Vol.24 Pg 370
Ordinance Basalt April 2, 1976	Columbia River Basalt	Exempt Uses Only		175 sq. mi. (map)	Morrow Umatilla	Special Order Vol.27 Pg 40
Ordinance Gravel April 2, 1976	Alluvial Aquifer	Exempt Uses Only		82 sq. mi. (map)	Morrow Umatilla	Special Order Vol.27 Pg 40
Butter Creek Jan. 27, 1986	Columbia River Basalt	Exempt Uses Only	Annual Allocation to “Sustainable Annual Yield”	274 sq. mi. (map)	Morrow Umatilla	Special Order Vol.40 Pg 1
Stage Gulch May 15, 1991	Columbia River Basalt	Exempt Uses Only	Annual Allocation to “Sustainable Annual Yield”	183 sq. mi. (map)	Umatilla	Special Order Vol.45 Pg 278

III. Discussion

Water Rights Largely Remain Valid

In all seven critical groundwater areas (CGWAs), while pumping has generally declined since designation, the number of valid groundwater rights remains near the same level that resulted in the original supply concerns and have the potential to be exercised directly or by transfer in the future should the critical area status be altered. Many of these rights are not fully exercised for voluntary reasons, which may include changes in land use, implementation of conservation measures, or development of new supplies. Many junior rights in the Butter Creek and Stage Gulch CGWAs do not receive an annual allocations of limited supplies under the current critical area rules, and the duty of some municipal rights in the Cooper-Bull Mountain area were curtailed by the special order designating that critical area.

Water Level Responses Vary After CGWA Designation

The Cow Valley CGWA (see Attachment 1) in the Malheur Basin was the first CGWA designated in the state. Groundwater levels in this CGWA recovered between the 1980s and early 1990s but have declined since that time in response to a dryer climate cycle and increased use under existing rights.

Groundwater levels in two of the oldest CGWAs, The Dalles (see Attachment 1) and Cooper-Bull Mountain (see Attachment 1), have recovered in response to reduced pumping and the development of alternate surface water supplies. In Cooper-Bull Mountain, aquifer storage and recovery (ASR) projects have also supported water level recovery. Similarly, groundwater levels in the Ordnance Gravel CGWA (see Attachment 1) have stabilized with the implementation of the County Line aquifer recharge (AR) project.

Groundwater level declines have generally continued, albeit generally at a slower rate, in the three Columbia River Basalt CGWA's in the Umatilla Basin; Ordnance Basalt, (see Attachment 1); Butter Creek (see Attachment 1); and Stage Gulch (see Attachment 1). Allowed annual groundwater pumping is a fraction of that permitted under the existing water rights for these areas, controlled by an annual allocation process defined in the Umatilla Basin Rules ([OAR 690-507](#)). Considerable staff effort is expended each year on the groundwater monitoring and allocation process for the Butter Creek and Stage Gulch critical areas. Two irrigators have developed agricultural ASR projects in the Butter Creek CGWA to support operation of their farms, while others have investigated the potential for an ASR project and found it to be infeasible.

IV. Summary

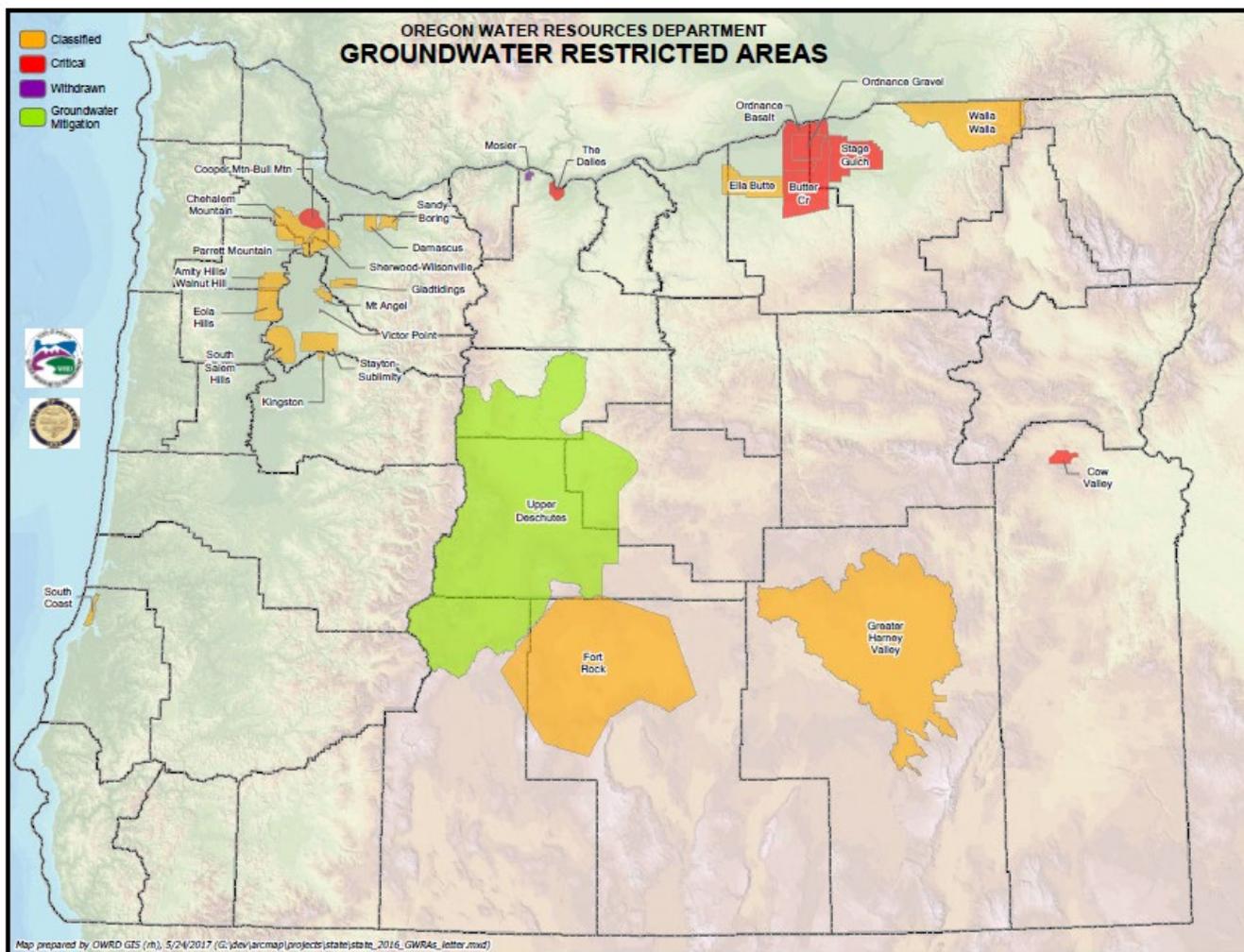
Critical groundwater area provisions for maintaining or achieving reasonably stable groundwater levels have been more effective in some areas than others. In some areas, reductions in groundwater use coupled with a transition to alternate surface water supplies and in some cases artificial groundwater recharge have led to water level recovery or stabilization. In other areas, declines continue in spite of pumping curtailments. Given this, existing CGWA controls should be maintained, and controls in areas where groundwater levels continue to decline should be re-evaluated as resources allow.

Attachment 1:

- Map of Groundwater Restricted Areas in Oregon
- Cow Valley Critical Groundwater Area Summary, Map, and Hydrograph
- The Dalles Critical Groundwater Area Summary, Map, and Hydrograph
- Cooper-Bull Mtn. Critical Groundwater Area Summary, Map, and Hydrograph
- Ordnance Basalt Critical Groundwater Area Summary, Map, and Hydrograph
- Ordnance Gravel Critical Groundwater Area Summary, Map, and Hydrographs
- Butter Creek Critical Groundwater Area Summary, Map, and Hydrographs
- Stage Gulch Critical Groundwater Area Summary, Map, and Hydrographs

Justin Iverson, Groundwater Section Manager
(503) 986-0933

Map of Groundwater Restricted Areas in Oregon (CGWAs Indicated in Red)



Cow Valley Critical Groundwater Area, Malheur County

Control Instrument: Order of the State Engineer, November 12, 1959 (Vol. 10, pg. 216)

Reasons for Critical Groundwater Area Declaration: Groundwater level declines in the alluvial aquifer; overdrawn groundwater supply; need to protect existing groundwater rights

Area: ~50 sq. miles

Controlled Aquifer: The Cow Valley Ground Water Reservoir, including all water bearing zones in the alluvial deposits and the underlying volcanic rocks and sediments

Summary of Original Critical Area Control by Order of the State Engineer:

- Closed to further appropriation of groundwater
- Permit applications will not be accepted
- Pending permit applications were rejected
- Watermaster regulates use to those allowed by permit or certificate
- Unlawful diversions ceased
- Totalizing meters and record of withdrawal required for each non-exempt well
- State engineer makes an annual evaluation of the groundwater supply

Current Administration of Area:

- No new permits are issued
- Water levels and water use (through power meter readings) are tracked

Description:

Cow Valley is a small, east-west trending upland valley at the southern end of the Blue Mountain exposure in the Willow Creek arm of the Malheur River basin. The structural basement of the valley was formed by normal block faulting that controls many of the drainages in the area. The basement of Cow Valley is largely composed of metamorphosed sedimentary and igneous rocks, which are uncomfortably overlain by younger lava flows and pyroclastic deposits of Miocene age. The bulk of the valley fill near the surface is composed of coalescing alluvial fan, fluvial, and epiclastic deposits that either interfinger with volcanic units or are possibly juxtaposed by normal faulting beneath Cow Valley. Cow Valley is drained by Cow Creek, which seldom flows through the entire valley (Hartford, 1988). When flowing, Cow Creek exits Cow Valley at an elevation of about 3845' AMSL through an earthen dam structure (Pence Dam) in the northeast corner of the valley. This feature may reduce the rate of storage loss as groundwater elevations decline and the hydraulic gradient toward Pence Dam is flattened.

Prior to 1950, the valley floor was used mainly for grazing, with the first irrigation well drilled in 1949. Based on the success of this well, several additional wells were soon drilled, and 14 irrigation wells were in use by the 1958 irrigation season. In 1954, the groundwater branch of the U.S. Geological Survey worked in cooperation with the Oregon State Engineer's office to investigate groundwater level declines in Cow Valley. This investigation produced the report "The Ground Water Resources of Cow Valley near Ironside, Malheur County, Oregon" by S.G. Brown and R.C. Newcomb in 1956. Cow Valley was designated as a Critical Groundwater Area in 1959, the first in the state, only 10 years after development had begun.

Currently, there are 758 acres permitted for primary groundwater irrigation in Cow Valley with a maximum duty of 5274 acre feet per year.

MALH 74 (State Observation Well 561) is routinely measured three times per year by the local watermaster and comprises the only continuous long-term record of groundwater elevation in Cow Valley (Figure 1). The current historic low groundwater elevations may be due, in part, to increased use observed since about 2010 (Figure 2). However, recent declines are likely exacerbated by an ongoing drought following a wet climate cycle in the mid-1980s that resulted in a corresponding groundwater elevation rise.

Evidence for a single aquifer system is observed when comparing water level elevations in three Cow Valley wells (MALH 74, MALH 64, and MALH 72) that penetrate only alluvium, both alluvium and volcanic rock, and a combination of alluvium, volcanic rock, and older Mesozoic metasedimentary rocks, respectively (Figure 3). The close correspondence of water level elevations between wells and elevation changes over time illustrates that despite lithology encountered, there appears to be a single aquifer system underlying Cow Valley. Other nearby wells have been dropped from the observation net over the years, as their trends were substantially similar to MALH 74, which is now cited as representative of the single Cow Valley aquifer. In November of 2015, a water level recorder was installed in MALH 74 to better evaluate the timing and magnitude of groundwater elevation changes in the aquifer (Figure 4).

In 2015, the Department received a complaint from two exempt groundwater users in Cow Valley, citing groundwater declines forcing them to lower pumps in some wells. Their claim is that groundwater appropriation from permitted wells within the valley has increased significantly, particularly from wells producing from the shallow alluvial aquifer, resulting in undue interference with their exempt livestock wells. Exempt use wells within Cow Valley are junior to all permitted uses (Table 1), in addition to being comparatively shallow (Table 2). Given these facts, exempt users will likely need to deepen wells that do not fully penetrate the single Cow Valley aquifer system.

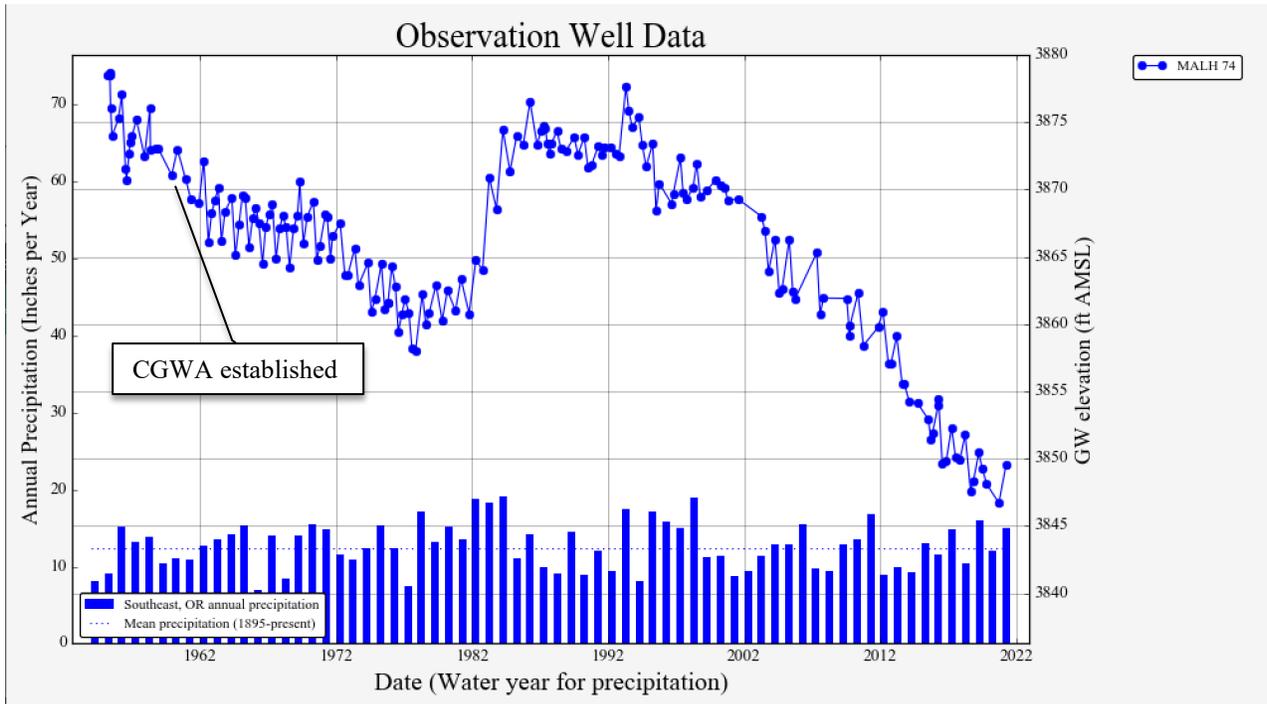


Figure 1. Representative hydrograph for Cow Valley CGWA

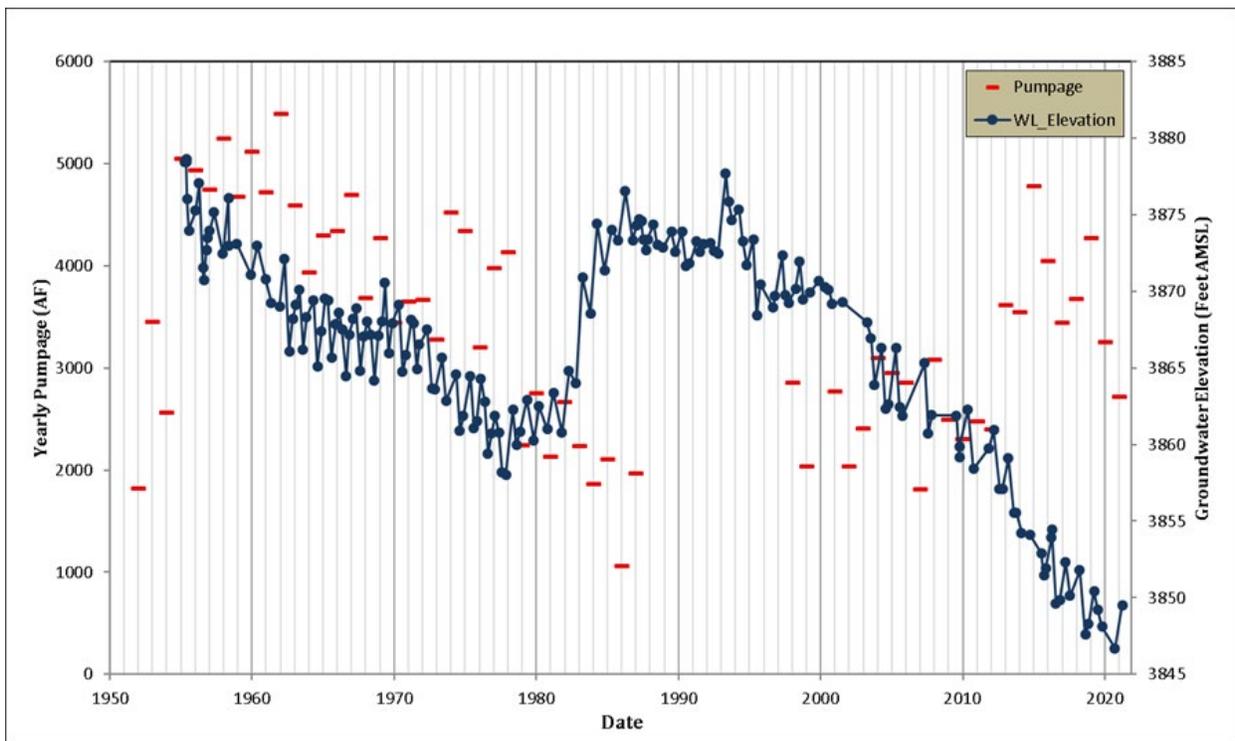


Figure 2. Total water use data from permitted wells in Cow Valley CGWA show an inverse relationship to groundwater elevations at MALH 74

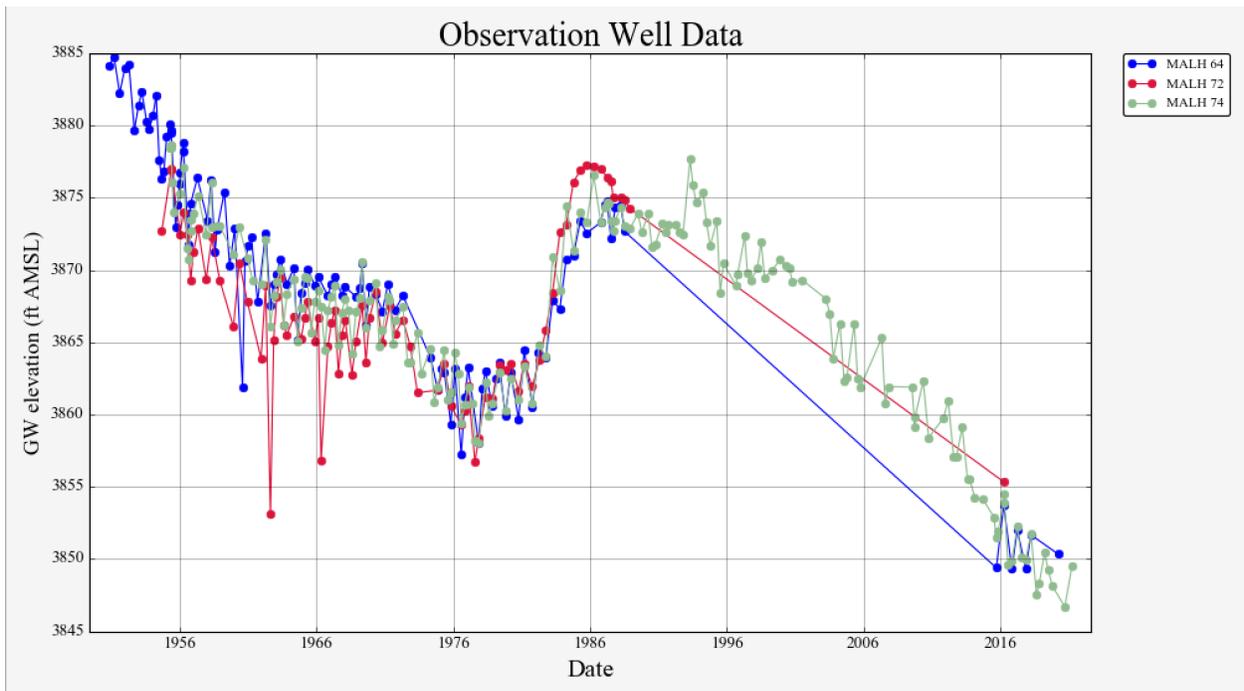


Figure 3. MALH 74 (green) is considered to be representative of groundwater elevations throughout Cow Valley

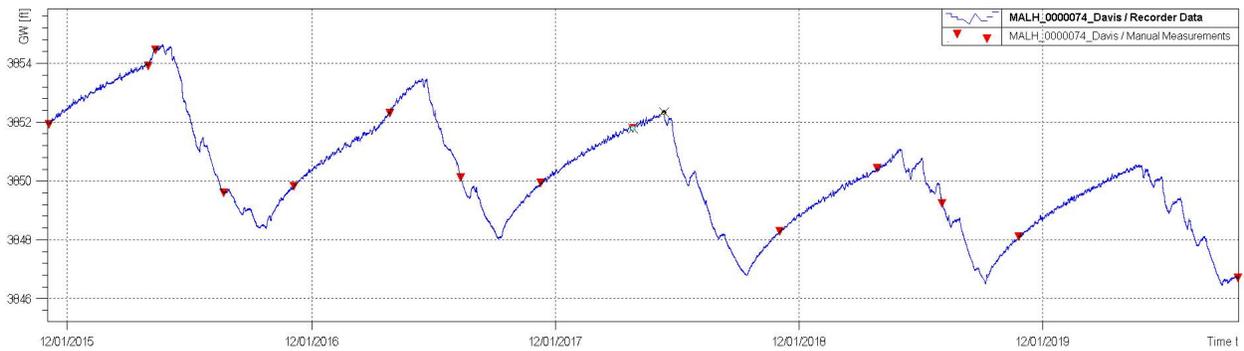


Figure 4. Water level plot of continuous recorder data (blue) and manual measurements (red)

Exempt Use Wells		Certificated Water Rights	
Log ID	Completion Date	Certificate	Priority Date
MALH 74	09/30/1954	81208	02/14/1950
MALH 93	11/05/1954	81209	09/18/1950
MALH 75	11/06/1954	81210	05/10/1951
MALH 77	04/18/1955	81211	02/05/1951
MALH 76	04/29/1955	81212	02/02/1953
MALH 65	05/18/1955	81213	09/18/1950
MALH 88	05/18/1955	89176	09/18/1950
MALH 69	05/18/1955	89177	05/10/1951
MALH 96	01/13/1956	89178	02/05/1951
MALH 86	12/16/1957	89179	02/02/1953
MALH 92	12/04/1975	89180	02/14/1950
		89181	09/18/1950
		89182	09/20/1950
		89183	05/10/1951
		89184	08/21/1951
		89198	03/30/1954
		89199	11/05/1951
		89526	03/30/1954
		89527	11/05/1951

Table 1. Priority dates for certificates are all senior to those of exempt use wells within Cow Valley CGWA.

Certificated Points of Appropriation		Exempt Use Wells	
Log ID	Depth (feet)	Log ID	Depth (feet)
MALH 62	330	MALH 65	176
MALH 66	535	MALH 74	280
MALH 64	421	MALH 75	100
MALH 68	362	MALH 77	156
MALH 71	255	MALH 76	300
MALH 72	1000	MALH 93	Unknown
MALH 73	200	MALH 92	66
MALH 79	248	MALH 86	48
MALH 67	310	MALH 88	128
MALH 90	338	MALH 96	194
MALH 87	360		
MALH 78	285		

Table 2. Well Depths in Cow Valley are variable, but exempt use wells are typically shallower than certified Points of Appropriation (POAs).

The Dalles Critical Groundwater Areas, Wasco County

Control Instrument: Order of the State Engineer, December 11, 1959 (Vol. 10, pg. 247)

Reasons for Critical Groundwater Area Declaration: Groundwater level declines in basalt aquifers

Area: 21 sq. miles for The Dalles Groundwater Reservoir and 7 sq. miles for the smaller overlying Threemile Groundwater Reservoir

Controlled Aquifer: Two Columbia River Basalt Group aquifers

Summary of Original Critical Area Control by Order of the State Engineer:

- Basalt aquifers are closed to further appropriation
- Pending permit applications were approved with conditions
- Threemile Ground Water Reservoir is restricted to those having a priority of 1932 or earlier
- Wells constructed to underlying aquifers must be continuously cased and sealed 50 feet into the underlying basalt aquifer
- Totalizing meters and record of withdrawal from each non-exempt use well are required
- Well owners annually provide a record of monthly withdrawal from each well
- State engineer makes an annual evaluation of the groundwater supply

Current Administration of Area:

- No new permits are issued
- Pumpage is recorded monthly
- Water levels are measured monthly at larger wells in The Dalles Groundwater Reservoir

Description:

The Dalles Critical Groundwater Area (CGWA) is located near the axis of the Dalles synclinal fold and adjacent to the Columbia River in north Central Oregon, with the City of The Dalles occupying the northern third of the administrative area. Two distinct aquifers within the Columbia River Basalt Group (CRBG) are included in the CGWA. The Dalles Ground Water Reservoir occurs within the interbed zones of the upper flows of the Frenchman Springs Basalt and the Threemile Ground Water Reservoir occurs within the “upper 100 feet of basalt” in the Threemile Creek drainage and is likely within the Rosalia lava flow of the Priest Rapids Basalt. The Threemile Ground Water Reservoir directly overlies The Dalles Ground Water Reservoir in the Threemile Creek area. Groundwater development began in the CRBG aquifers in the late 1920s and continued through the 1950s. Water level declines in the Threemile Ground Water Reservoir were originally reported in a USGS study of the area published in 1932. The Critical Groundwater Order went into effect on December 11, 1959. The Circuit Court of Wasco County ordered a stay of enforcement of the State Engineer’s Order on April 25, 1960. The stay was lifted in 1966, after completion of The Dalles Irrigation Project. Groundwater levels in the Threemile Groundwater Reservoir recovered significantly after surface water became available in 1966 (Figure 5).

There has also been significant water level recovery in The Dalles Groundwater Reservoir observation wells since the early 2000s. Water rights are essentially the same as in 1959 but the use has dropped due to land use changes from irrigation to residential and reductions in industrial diversions with the closure of the Martin-Marietta Aluminum plant. Figure 6 shows the groundwater level trend that occurred between 1958 and present in The Dalles Groundwater Reservoir.

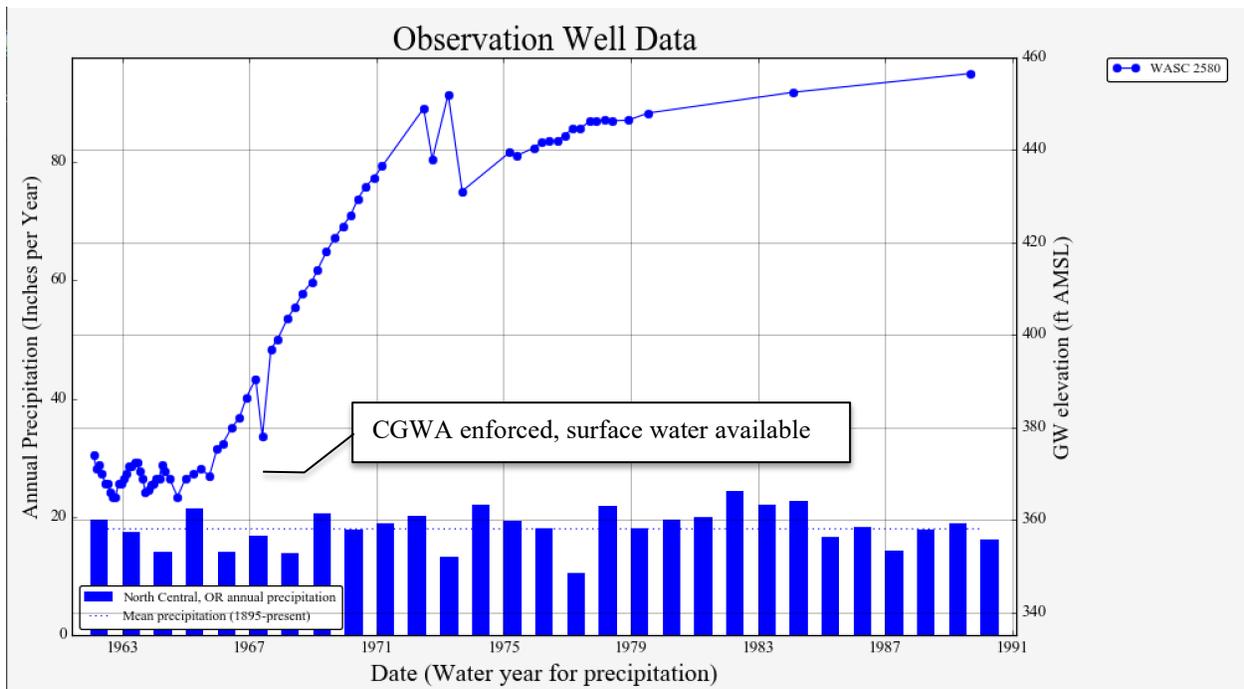


Figure 5. Representative hydrograph for Threemile Groundwater Reservoir

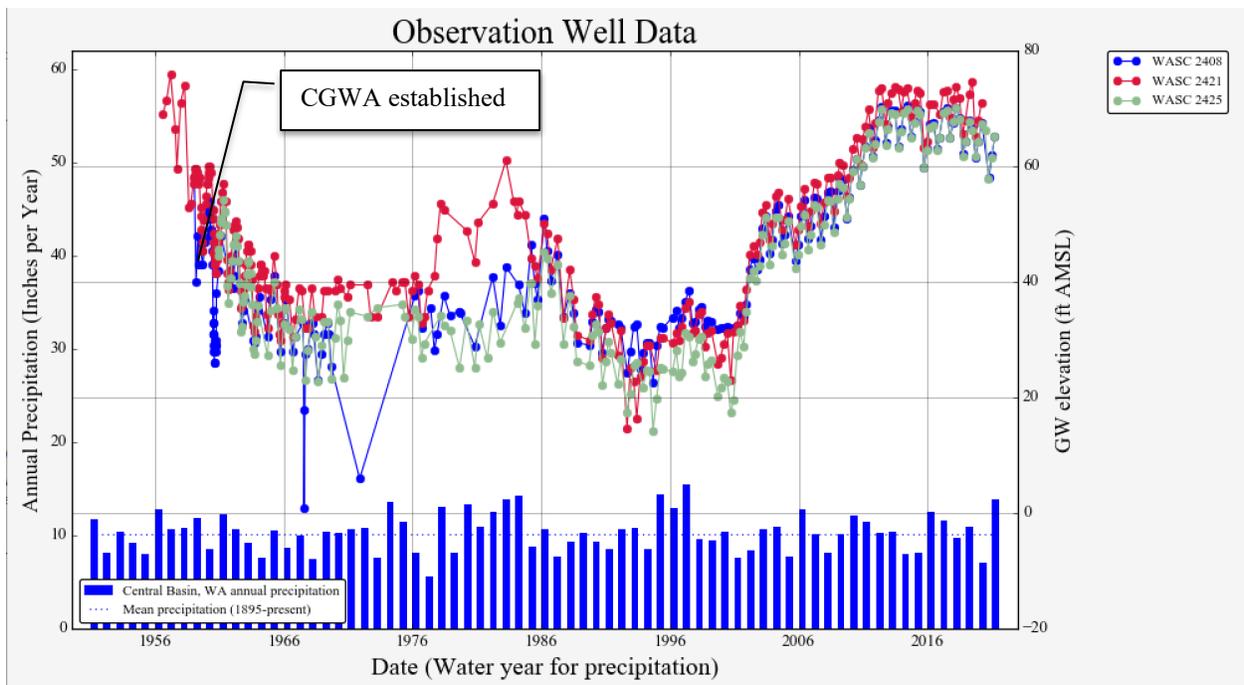


Figure 6. Representative hydrograph for The Dalles Groundwater Reservoir

Cooper Mountain – Bull Mtn Critical Groundwater Area, Washington County

Control Instrument: Order of the State Engineer dated May 17, 1974 (Vol 24, pg. 370)

Reasons for Critical Groundwater Area Declaration: Groundwater level declines in basalt aquifers

Area: ~41 sq. miles

Controlled Aquifer: Columbia River Basalt Group (CRBG) aquifers and the overlying alluvium/sedimentary aquifer

Summary of Original Critical Area Control by Order of the State Engineer:

- Basalt aquifers are closed to further appropriation of groundwater from new filings
- Sedimentary aquifers are open to further appropriation of groundwater from new filings
- Exempt uses from the basalt aquifers are limited to existing wells
- Annual appropriation (use) from the basalt aquifers is limited to 2900 acre-feet based on priority and utilizes a notification system
- Additional exempt use is restricted to single family domestic and stockwatering on tracts not less than 10 acres in area
- Watermaster regulates use to those allowed by permit or certificate
- Unlawful diversions cease
- Totalizing meters and record of withdrawal from each non-exempt use well are required
- Well owners annually provide a record of monthly withdrawal from each well
- Annual pumpage restrictions are placed on certain public supply wells
- State engineer makes an annual evaluation of the groundwater supply

Current Administration of Area:

- No new permits are issued
- Watermaster allocates use based on requests, priorities, and the 2900 acre-foot limit
- Watermaster staff reads totalizing meters annually and measures water levels in wells

Description:

The Cooper Mountain – Bull Mountain CGWA is roughly centered on a Columbia River Basalt Group (CRBG) syncline that forms the highlands of its namesake mountains. This area was a favorable target for municipal groundwater development because high capacity production wells could be drilled directly into basalt without the expense of drilling through 500 to 1000 feet of valley fill sediments (as is necessary in the surrounding lowland valley) and groundwater could be pumped to storage tanks on the flanks of the mountains and then gravity fed to water users on the valley floor.

Groundwater development from the CRBG aquifers by municipal water providers supported suburban development in the surrounding Tualatin Basin in the 1950s and 1960s. Other agricultural, industrial, and domestic users utilized the aquifer during this time as well. Figure 7 shows the groundwater level decline that occurred between 1957 and 1974 due to unsustainable groundwater extraction from the aquifer. The CGWA order capped the annual volume of water that could be extracted from the aquifer at 2900 acre feet, which was significantly less than the total water right holdings of the municipal providers (approximately 6700 acre feet) and other users. Due to this restriction, the municipal providers developed pipelines to import treated surface water from the Bull Run and Hagg Lake systems to meet the majority of municipal demand, greatly reducing the volume of water pumped from the aquifer. Under the restrictions imposed by the CGWA, groundwater levels have recovered to near historic levels in the intervening years.

Currently, the aquifer is closed to further permitted groundwater appropriation, and new exempt uses on properties less than 10 acres in size must offset their water use by abandoning an existing exempt well in the CGWA. All permitted water users report their annual use to the watermaster, which has been significantly less than the annual cap volume since at least 2003. In the past decade, the aquifer has been utilized by the surrounding municipal water providers for Aquifer Storage and Recovery (ASR) projects. ASR has resulted in increased seasonal groundwater level fluctuations and additional groundwater level recovery in the aquifer system (see Figure 8).

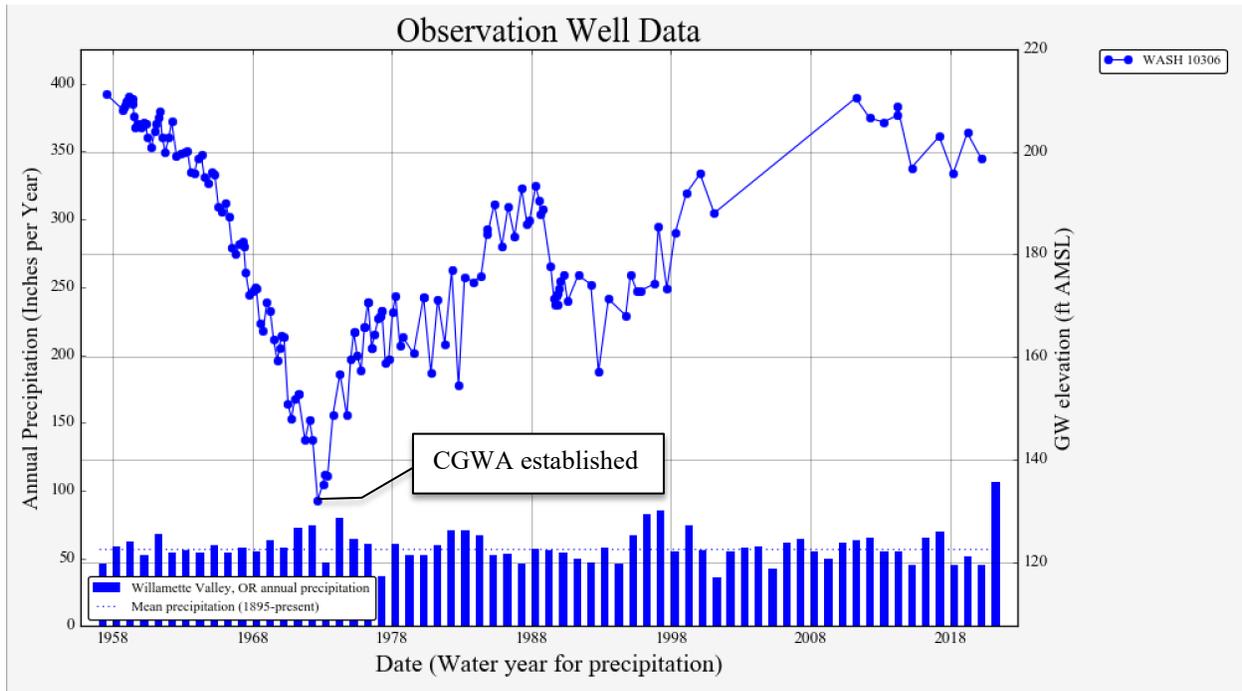


Figure 7. Representative hydrograph for Cooper-Bull Mountain CGWA

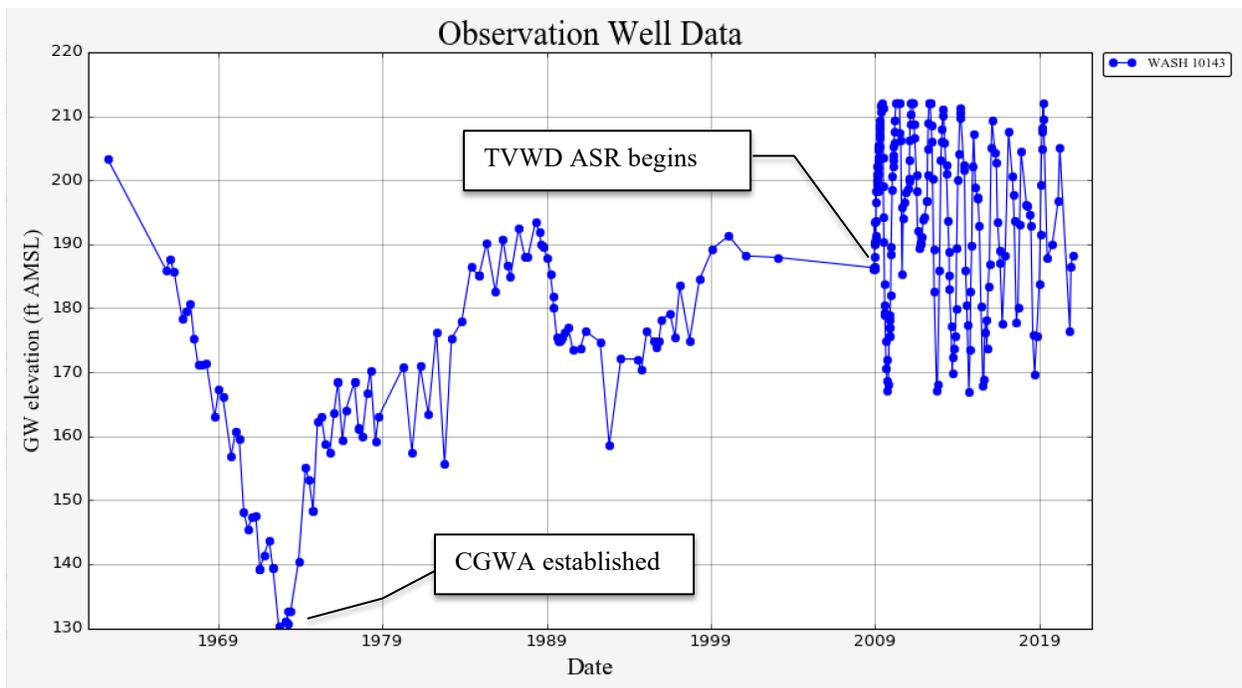


Figure 8. Hydrograph showing Cooper-Bull Mountain CGWA well response to ASR

Ordinance Basalt Critical Groundwater Area, Morrow and Umatilla Counties

Control Instrument: Order of the Director dated April 2, 1976 (Vol. 27, pg. 40)

Reasons for Critical Groundwater Area Declaration: Groundwater level declines in Columbia River Basalt Group aquifers

Area: 175 sq. miles

Controlled Aquifer: Columbia River Basalt Group (CRBG) Aquifers

Summary of Original Critical Area Control by Order of the Director:

- Basalt (shallow and deep) aquifers are closed to further appropriation
- Irrigation season is defined
- Totalizing meters and record of withdrawal from each non-exempt well is required
- State engineer makes an annual evaluation of water levels and use to determine the effectiveness of the control provisions to maintain reasonably stable groundwater levels

Current Administration of Area:

- No new permits are issued
- Department staff monitor groundwater levels and use annually

Description:

The Ordinance Basalt Critical Groundwater Area is roughly centered on the former Umatilla Ordnance Depot, located west of the Umatilla River near Hermiston and south of the Columbia River. The Columbia River Basalt Group (CRBG) is a series of lava flows with a composite thickness greater than 10,000 feet in the Columbia Plateau. Each flow is characterized by a series of internal features, which generally include a thin rubble zone at the contact between flows and a thick, dense, low porosity and low permeability interior zone. In some cases, sedimentary layers were deposited during the time between basalt flow emplacements. A flow top, sedimentary interbed (if present) and flow bottom are collectively referred to as an “interflow zone.” Most water occurs in interflow zones under confining conditions at the contacts between lava flows. CRBG flow features result in a series of stacked, thin aquifers that are confined by dense flow interiors. The low permeability of the basalt flow interiors usually results in little connection between the stacked, tabular aquifers. Each aquifer within the basalts has a unique water level head. Two aquifers within the CRBG were identified in the Critical Area order, a “shallow” zone located less than 400 feet below the surface and a “deep” zone located between 400 and 900 feet below land surface.

Basalt groundwater development began in the 1940s and increased into the 1970s. Groundwater levels declined at a rate of 3 to 4 feet per year during this period. Deep basalt groundwater levels are currently declining at a lesser rate (Figure 9). This is likely due to usage reductions over time and leakage from the upper aquifers through improperly constructed wells. Total decline in the deep basalt aquifer exceeds 150 feet. Wells completed only into the shallow basalt show relatively stable long-term water levels (Figure 10), with a total decline of less than 20 feet.

The basalt aquifers in this CGWA are closed to further permitted appropriation. OWRD staff measure groundwater levels and annual use each February, when irrigation pumps are idle. Water levels in the shallow basalt aquifer are reasonably stable, although they have not recovered to historic levels. Water levels in the deep basalt aquifer continue to decline approximately two feet per year. Commingling wells, which are open to both the shallow and the deep basalt aquifers, continue to make accurate groundwater level data collection difficult. Commingling wells should be repaired or replaced with wells that meet current well construction standards.

In recent years, many of the wells in the critical area have converted use from irrigation to confined animal feeding operations, transitioning from seasonal to year-round use. Although this does not represent an increase in annual volumetric use, it does mean that many of the wells are pumping during February data collection efforts. This complicates assessment of year-to-year water level changes at many of the CGWA observation wells. Dedicated water level monitoring wells are needed in both the shallow and the deep basalt aquifers to assess the stability of the resource into the future.

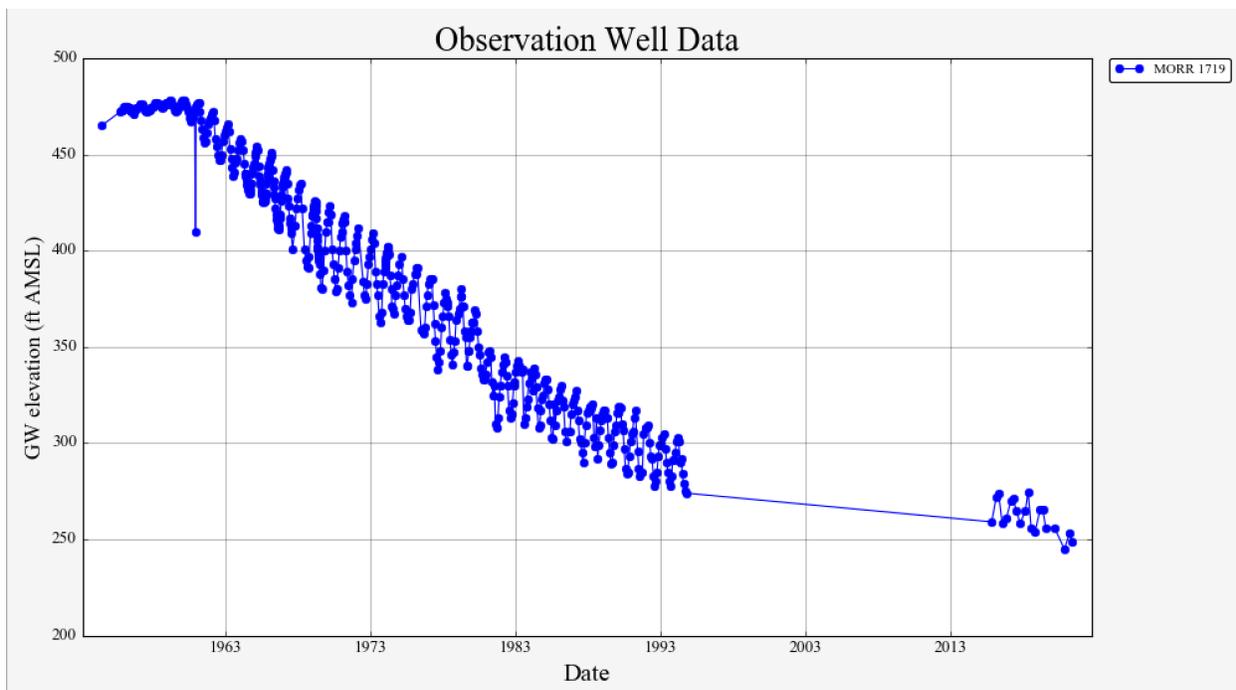


Figure 9. Representative long-term hydrograph for Ordnance Deep Basalt aquifer

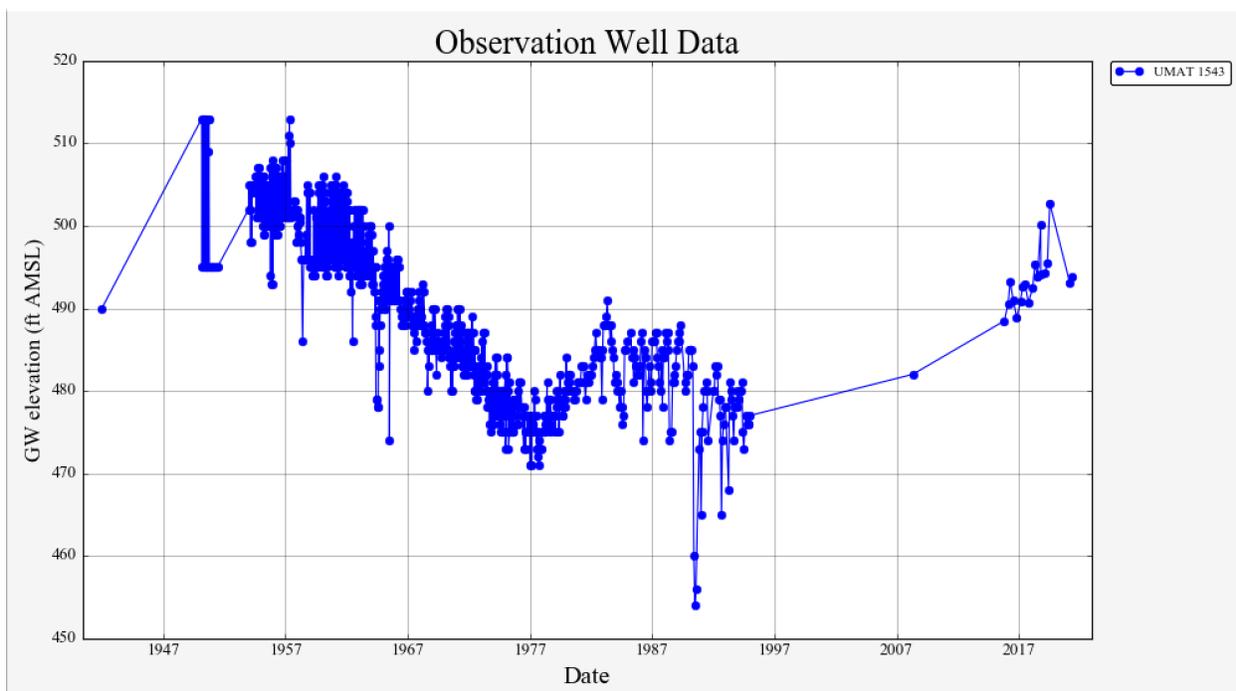


Figure 10. Representative long-term hydrograph for Ordnance Shallow Basalt Aquifer

Ordnance Gravel Critical Groundwater Area, Morrow and Umatilla Counties

Control Instrument: Order of the Director dated April 2, 1976 (Vol. 27, pg. 40)

Reasons for Critical Groundwater Area Declaration: Groundwater level declines in sedimentary aquifer

Area: 82 sq. miles

Controlled Aquifer: Shallow sand and gravel aquifer

Summary of Original Critical Area Control by Order of the Director:

- Gravel aquifer is closed to further appropriation
- Annual appropriation (use) within the Lost Lake-Depot subarea is limited to 9,000 acre-feet
- Totalizing meters and record of withdrawal from each non-exempt well is required
- State engineer makes an annual evaluation of groundwater levels and use to determine the effectiveness of control provisions to maintain reasonably stable groundwater levels

Current Administration of Area:

- No new permits are issued
- Department staff monitor groundwater levels and use annually
- Department staff track 9,000 acre-foot limit and artificial groundwater recharge and recovery in the Lost Lake-Depot subarea.

Description:

The Ordnance Gravel Critical Groundwater Area is located west of the Umatilla River near Hermiston. The broad plain of the CGWA is characterized by sediments ranging up to approximately 200 feet thick that overly the Columbia River Basalt Group. The erosional topography of the underlying basalt controls the geometry of the bottom of the sedimentary aquifer. The thickest accumulation of saturated coarse sands and gravels lies in an east-west oriented trough near the center of the CGWA. The sediments thin and become finer-grained toward the margins of the CGWA.

Significant groundwater development of the Ordnance Gravel aquifer began in the 1950s and increased through 1970. Groundwater levels declined during this period (Figure 11). There are two areas of intense groundwater development: the Lost Lake-Depot subarea and the Westland Road subarea. The Order curtailed use under groundwater rights in the Lost Lake-Depot subarea to a total of 9,000 acre-feet per year and prevented new permitted allocation in the remainder of the CGWA. Coincident with the Critical Groundwater Area Order being issued, an artificial groundwater recharge project was implemented. This project continues through the present, diverting winter water from the Umatilla River and allowing it to recharge the aquifer through leaky canals. Artificial groundwater recharge causes an increase in seasonal water levels in nearby wells (Figure 12). Lost Lake-Depot subarea groundwater right holders use this artificially stored water to make up for curtailment implemented by the CGWA order.

OWRD staff measure groundwater levels and annual use each February, when irrigation pumps are idle. In recent years, several dedicated observation wells have been drilled in the gravel aquifer, which has greatly improved OWRD's ability to assess the condition of the resource and the feasibility of new artificial groundwater recharge proposals. Under the current artificial recharge and groundwater pumping regime, water levels in the Ordnance Gravel aquifer are relatively stable.

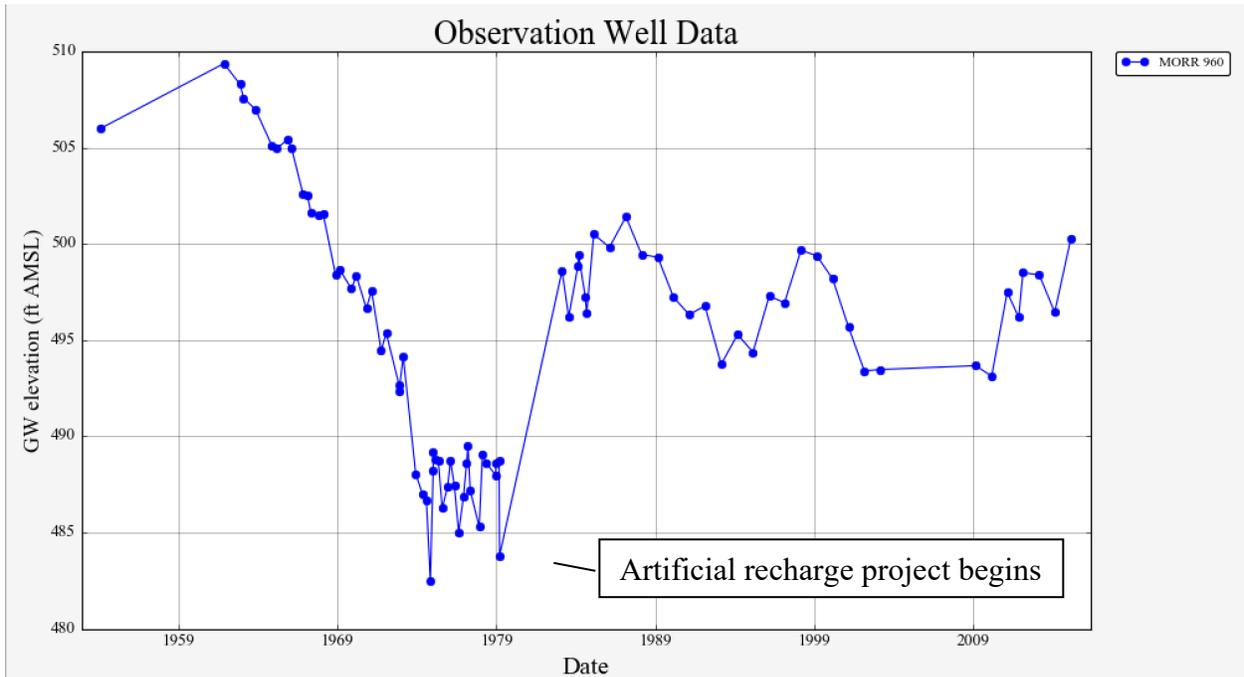


Figure 11. Representative long-term hydrograph for Ordnance Gravel CGWA

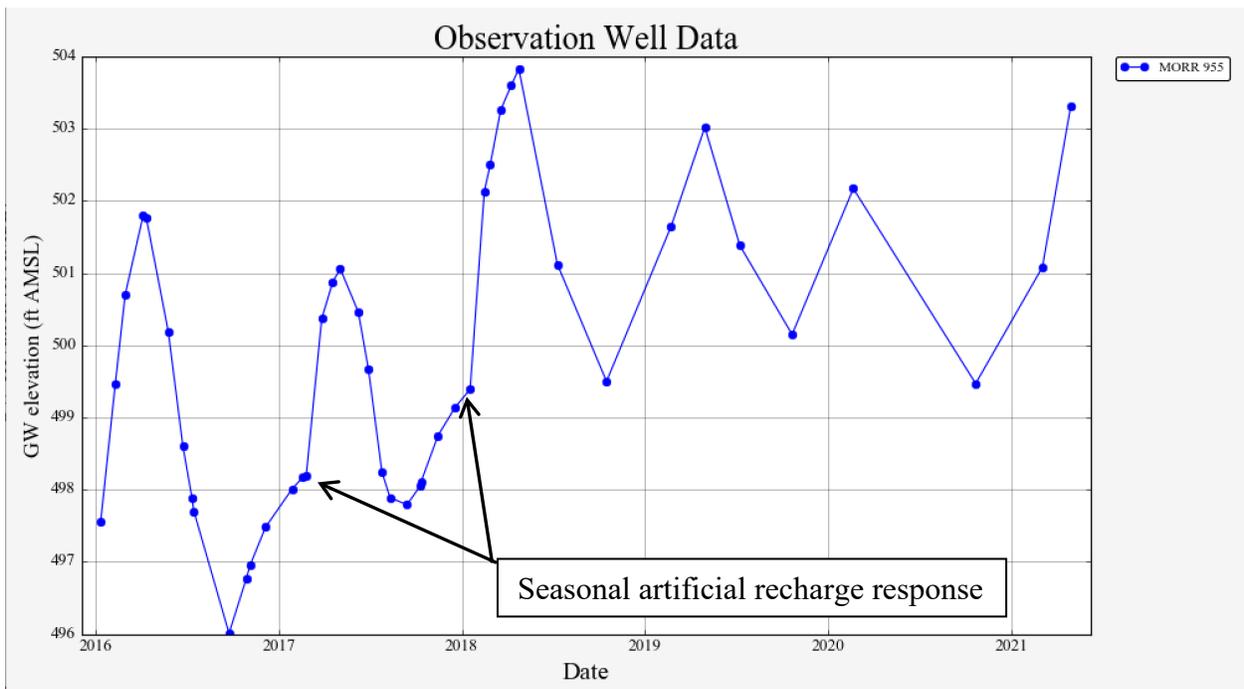


Figure 12. Artificial Groundwater Recharge effects are evident in seasonal groundwater trends

Butter Creek Critical Groundwater Area, Morrow and Umatilla Counties

Control Instrument: Order of the Director dated January 27, 1986 (Vol. 24, pg. 1) (for declaration of the critical groundwater area); OAR 690-507-0610 to -0700 (in 1990, 1992, and 1999 for designating subareas and determination and distribution of sustainable annual yield)

Reasons for Critical Groundwater Area Declaration: Groundwater level declines in basalt aquifers

Area: ~274 sq. miles

Controlled Aquifer: CRB aquifers

Summary of Original Critical Area Control by Order of the Director:

By Order:

- Appropriation limited to exempt uses and existing authorizations
- Pending applications were rejected
- Creates six subareas for management purposes
- Establishes total annual withdrawal for four subareas
- Except for exempt uses, provides for use on the basis of relative priority
- Establishes a system to request and be authorized to pump an annual volume
- Requires totalizing meters for all non-exempt use withdrawals

By Rule:

- Establishes an irrigation season from March 15th to November 1st
- Requires functioning access ports on wells
- Requires a totalizing flowmeter on authorized wells
- Requires water user to keep a monthly water use record and report readings by December 1st each year
- Causes water users to perform certain actions when flowmeters break
- Causes water users to notify OWRD of well or pump work
- Sets an initial sustainable annual yield (SAY) for each subarea and creates a method to revise those values
- Creates a method to distribute the SAY amongst users
- Defines reasonably stable water level
- Allows changes in SAY in order to achieve reasonably stable water levels
- Notes a rulemaking process to change subarea boundaries

Current Administration of Area:

- OWRD tracks pumpage and water levels in Critical Area wells
- OWRD receives, compiles, and analyzes annual allocation requests from water users
- Based on SAYs, requests, and other factors, OWRD determines annual allocations for each water right in the Critical Area.

Description:

The Butter Creek CGWA is located within the Umatilla Basin in north-central Oregon. The area is bordered on the west by the Ordinance Basalt Critical Groundwater Area and the Ella Butte Groundwater Limited Area and on the east by the Stage Gulch Critical Groundwater Area. Portions of the cities of Hermiston and Umatilla are included within the boundaries. The area is entirely underlain by a thick sequence of numerous basalt lava flows of the Columbia River Basalt group, which is also the most important groundwater reservoir in the area.

Irrigation from groundwater sources in the Umatilla Basin, primarily the basalt groundwater reservoir, increased rapidly in the late 1960s through the late 1970s. Several factors combined to encourage the rapid development of the basalt groundwater reservoir. These included more efficient hard-rock drilling methods, the large production of water available from typical deep basalt wells, new irrigation techniques, favorable crop prices, and the availability of relatively inexpensive electrical power. In the Butter Creek area, the peak in the development occurred in the middle to late 1960s. Regional investigations indicated that for the period from 1965 to 1980 water levels declined 100 feet or more in much of the Butter Creek area.

Water levels continued to decline during the period 1980 to 1990, despite reduced pumpage documented in the area during that same period. Figure 13 shows the groundwater level decline that occurred between 1972 and 1986 due to unsustainable groundwater extraction from the aquifer, and the reduction in decline rate after implementation of the CGWA. Although the rates of decline in the deep basalt groundwater reservoir have slowed in some areas, total declines are at historically low levels in all subareas, and several areas continue to experience declines at rates similar to the pre-1986 rates (Figure 14).

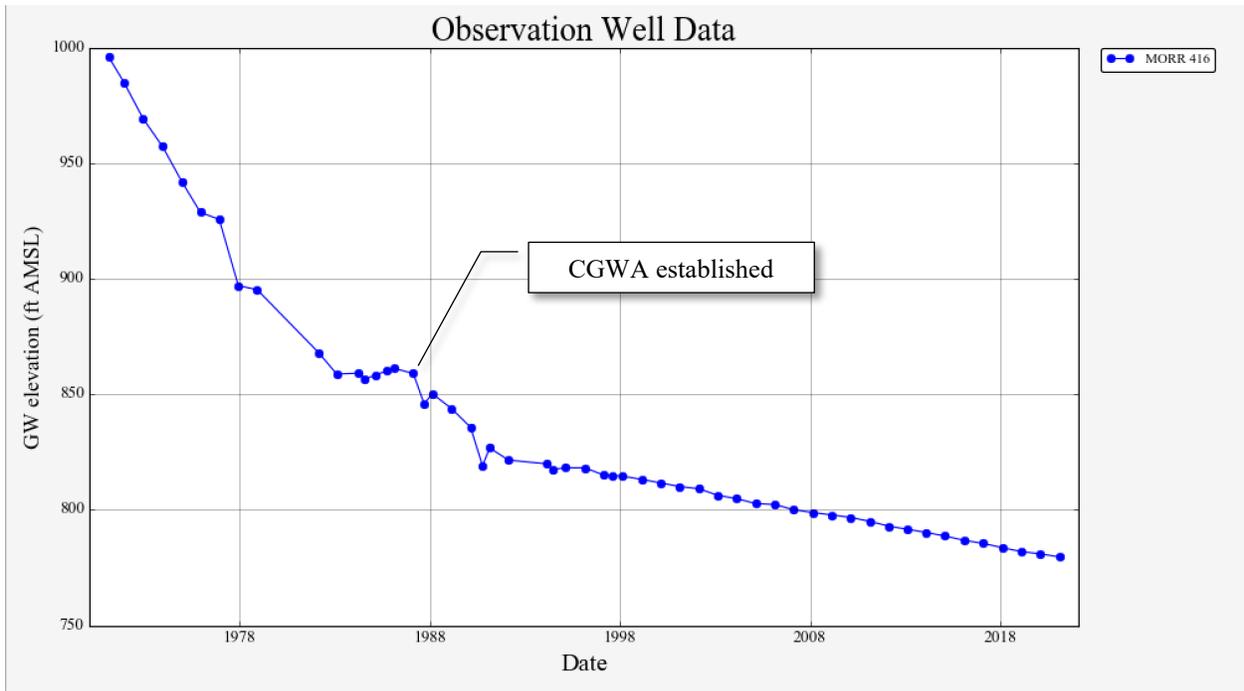


Figure 13. Representative hydrograph for Butter Creek CGWA Pine City Subarea

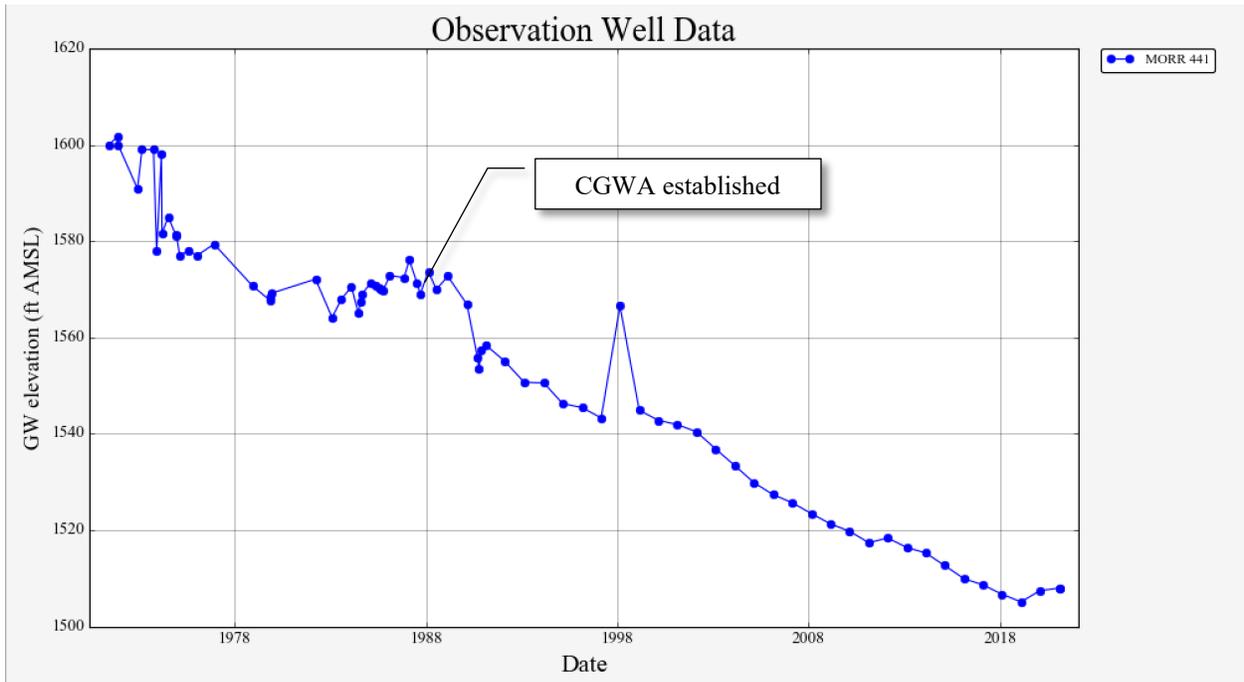


Figure 14. Representative hydrograph for Butter Creek CGWA South Subarea

Stage Gulch Critical Groundwater Area, Umatilla County

Control Instrument: Order of the Director dated 5/15/1991, (for declaration of the critical groundwater area); OAR 690-507-0750 to -0840 (in 1991 for designating subareas and determination/distribution of sustainable annual yield)

Reasons for Critical Area Declaration: Excessively declining water levels in basalt aquifers indicating an overdrawn groundwater supply

Area: 183 sq. miles

Controlled Aquifer: Upper and deep basalt groundwater reservoirs

Summary of Original Critical Area Control by Order of the Director:

- Creates the critical groundwater area for the upper and deep basalt groundwater reservoirs that underlie the area
- Limits the appropriation (use) to exempt uses and existing authorizations
- Indicates that no new permits will be issued
- Indicates that pending application is rejected
- Creates eight subareas for management purposes
- Limits the extent of deepening of certain wells
- Establishes an irrigation season from March 1st to November 30th but includes an exception method for a longer season
- Requires functioning access ports on wells
- Requires a totalizing flowmeter on authorized wells
- Requires water users to keep a weekly use record and report readings by December 1st each year
- Causes water users to perform certain actions when flowmeters break
- Requires water users to notify WRD of well or pump work
- Sets an initial Sustainable Annual Yield (SAY) for seven of the eight subareas and establishes a method to revise those values
- Limits water use to the SAY and establishes a method to distribute the SAY amongst users
- Defines reasonably stable water level

Current Administration of Area:

- OWRD tracks pumpage and water levels in the area
- OWRD receives, compiles, and analyzes requests annually from users for an allocation
- Based on the SAY, requests, and other factors, OWRD determines annual allocations for each water right in the area

Process of Periodic Review:

- OAR 690-507-0820 requires the department to determine whether a reasonably stable water level was achieved in each subarea in 1995 and every five years thereafter
- Allows for changes in SAY to achieve reasonably stable water levels
- Allows for modifications of subarea boundaries
- Allows for review of SAY and subarea boundaries at times other than the five year required review
- Requires a rulemaking hearing for changes to SAY or subarea boundaries
- Allows individual water users within the CGWA to petition the Department to modify SAY or subarea boundaries

Description:

The Stage Gulch CGWA is located within the Umatilla Basin in north-central Oregon. The area abuts the eastern boundary of the Butter Creek Critical Groundwater Area. The cities of Echo, Stanfield, and most of Hermiston are included within the boundaries. The area is entirely underlain by a thick sequence of numerous basalt lava flows of the Columbia River Basalt group, which is also the most important groundwater reservoir in the area.

Irrigation from groundwater sources in the Umatilla Basin, primarily from the basalt groundwater reservoir, increased rapidly in the late 1960s through the late 1970s. Several factors combined to encourage the rapid development of the basalt groundwater reservoir. These included more efficient hard-rock drilling methods, the large production of water available from typical deep basalt wells, new irrigation techniques, favorable crop prices, and the availability of relatively inexpensive electrical power. In the Stage Gulch area, the peak in the development occurred in the middle to late 1970s. Regional investigations indicated that for the period 1965 to 1980 water levels declined 50 feet or more in much of the Stage Gulch area.

Water levels continued to decline during the period 1980 to 1990, despite reduced pumpage documented in the area during that same period. Figure 15 shows the groundwater level decline that occurred between 1974 and 1991 due to unsustainable groundwater extraction from the aquifer, and the reduction in decline rate after implementation of the CGWA. Although the rates of decline in the deep basalt groundwater reservoir have slowed in some areas, total declines are at historically low levels in all subareas, and several areas continue to experience declines at rates similar to the pre-1991 rates (Figure 16).

Oregon Administrative Rule 690-507-0780 outlines the duties of the water users in the Stage Gulch Critical Groundwater Area. The rules require that each authorized well have an access port with a minimum diameter of $\frac{3}{4}$ inch (690-507-0780(2)(a)), which allows the determination of the water level at any time. The rules also allow for installation of an airline in addition to the access port (690-507-0780 2b). As of 2016, the majority of authorized wells in the Critical Area do not have the required access port, however many do have airlines that allow determination of water levels. At least one quarter of the authorized wells in the Critical Area have no means of determining water level at any time.

The rules also require a totalizing flowmeter be installed and maintained on each well authorized for 10 or more acres. The specifications for required flowmeters are outlined in 690-507-0785. The majority of the authorized wells do have flowmeters installed; however, many of these do not meet the required specifications. Specifically, it is common for flowmeters to roll over during the course of an irrigation season (690-507-0785(1)(e)), which causes difficulty in accurately assessing the total amount of water pumped during the year from each well.

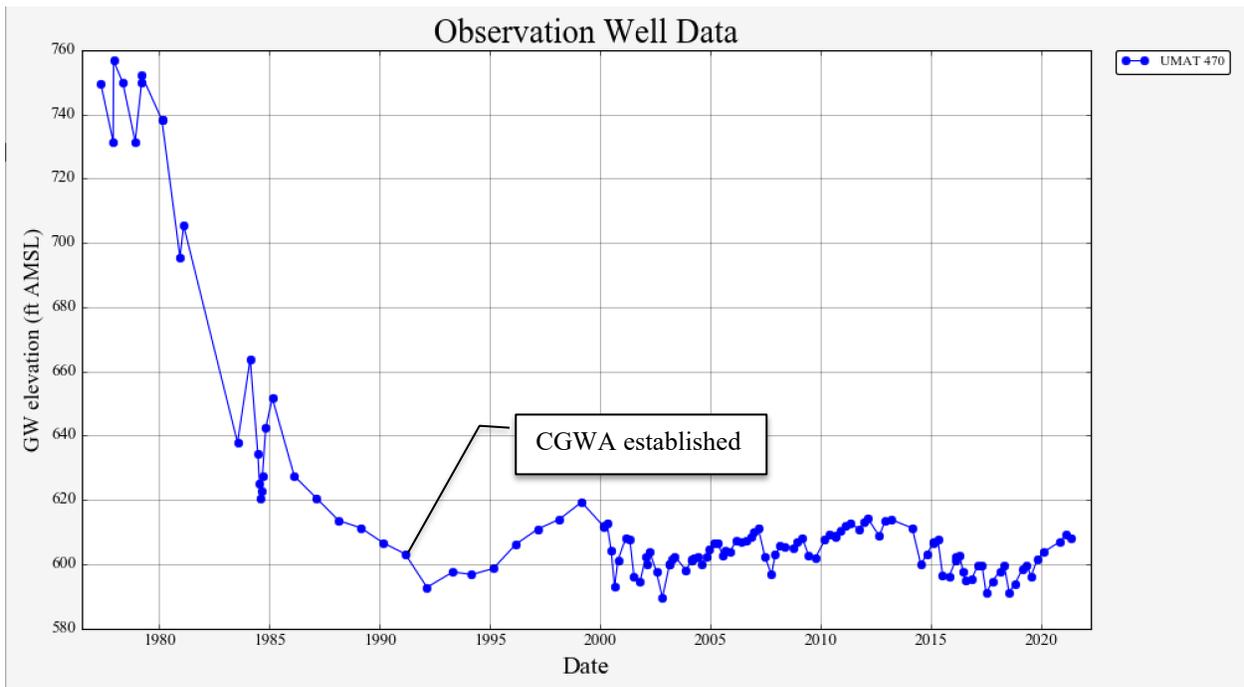


Figure 15. Representative hydrograph for Stage Gulch CGWA Subarea G

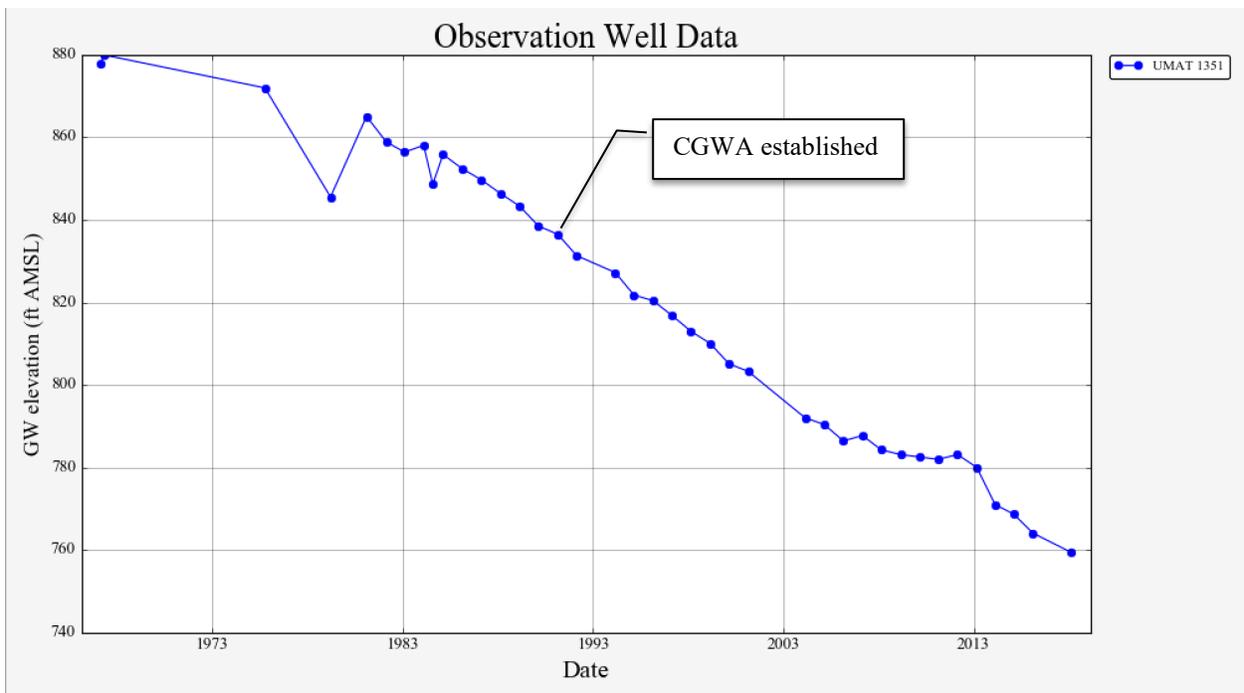


Figure 16. Representative hydrograph for Stage Gulch CGWA Subarea H

Stage Gulch Critical Groundwater Area, Subarea A
Proposed Allocations by Well and Water Right for 2023
Sustainable Annual Yield: 11450.00 acre-feet
Total Allocation: 11450.00 acre-feet

Owner Name	Water Right	Priority Date	Logid	Water Use (af) 2019	Water Use (af) 2020	Water Use (af) 2021	Requested Allocation (af)	Proposed Allocation (af)
			UMAT 5970	128.36	161.48	172.27	0.00	154.03
CITY OF ECHO	Cert:92295 CF *	08/24/1945		Water Right Total:			0.00	154.03
			UMAT 2049	0.00	0.00	0.00	0.00	0.00
			UMAT 5450	227.80	287.28	332.39	0.00	140.00
CITY OF HERMISTON	Cert:87263 CF *	09/28/1945		Water Right Total:			0.00	140.00
			UMAT 5735	435.26	308.78	278.14	0.00	340.72
CITY OF HERMISTON	Cert:19619 OR *	06/03/1949		Water Right Total:			0.00	340.72
			UMAT 2585	0.00	0.00	0.00	30.00	30.00
			UMAT 2586	32.96	7.21	16.72	6.00	6.00
UNION PACIFIC ENVIRONMENTAL CENTRAL FUNCTIONS	Cert:54117 CF *	02/03/1950		Water Right Total:			36.00	36.00
			UMAT 1315	0.00	0.00	0.00	0.00	0.00
			UMAT 5970	128.36	161.48	172.27	0.00	154.04
CITY OF ECHO	Inchoate: T 7044 CF (REG) *	09/24/1953		Water Right Total:			0.00	154.04
			UMAT 2075	0.00	0.00	0.00	0.00	0.00
			UMAT 5450	227.80	287.28	332.39	0.00	95.00
CITY OF HERMISTON	Cert:87264 CF *	02/05/1958		Water Right Total:			0.00	95.00
			UMAT 2974	0.15	0.00	2.08	0.00	1.00
			UMAT 57155	640.91	832.29	593.83	0.00	350.00
CITY OF STANFIELD	Cert:95563 CF *	03/06/1959		Water Right Total:			0.00	351.00
			UMAT 50789	90.44	80.89	58.06	58.06	58.06
HERMISTON SCHOOL DISTRICT	Cert:33377 OR *	11/07/1962		Water Right Total:			58.06	58.06
			UMAT 2937	176.03	134.63	252.70	475.00	300.00
LOYALTA INC	Cert:76119 CF CR *	11/07/1962		Water Right Total:			475.00	300.00
			UMAT 2974	0.15	0.00	2.08	0.00	0.50
CITY OF STANFIELD	Cert:33489 OR *	07/29/1963		Water Right Total:			0.00	0.50
			UMAT 2067	5.00	5.00	5.00	0.00	0.00
DESERAL INDUSTRIES INC	Cert:38849 OR *	08/30/1965		Water Right Total:			0.00	0.00
			UMAT 2061	293.85	372.07	439.40	0.00	625.00
CITY OF HERMISTON	Cert:38852 OR *	05/11/1967		Water Right Total:			0.00	625.00
			UMAT 2500	114.20	282.85	264.41	121.20	121.20
HERMISTON 353	Cert:74445 (T 7531 RR) *	03/14/1968		Water Right Total:			121.20	121.20
			UMAT 51260	114.79	96.56	96.56	0.00	40.00
JB LAND	Cert:80923 (RR) *	03/14/1968		Water Right Total:			0.00	40.00
			UMAT 51260	114.79	96.56	96.56	0.00	40.00
JB LAND	Cert:88346 CF *	03/14/1968		Water Right Total:			0.00	40.00
			UMAT 2872	0.00	0.00	0.00	0.00	0.00

Stage Gulch Critical Groundwater Area, Subarea A
Proposed Allocations by Well and Water Right for 2023
Sustainable Annual Yield: 11450.00 acre-feet
Total Allocation: 11450.00 acre-feet

Owner Name	Water Right	Priority Date	Logid	Water Use (af) 2019	Water Use (af) 2020	Water Use (af) 2021	Requested Allocation (af)	Proposed Allocation (af)
STANFIELD HUTTERIAN BRETHERN	Cert:94233 CF *	12/28/1970		Water Right Total:			0.00	0.00
			UMAT 2799	4.00		4.00	4.00	4.00
SCOTT & SHARON TULLIS	Cert:42977 OR *	08/20/1971		Water Right Total:			4.00	4.00
			UMAT 1224	571.23	415.98	510.47	0.00	600.00
J R SIMPLOT CO	Cert:76263 (T 7197 RR) *	06/12/1972		Water Right Total:			0.00	600.00
			UMAT 1224	571.23	415.98	510.47	362.40	362.40
			UMAT 2561	0.00	0.00	0.00	362.40	0.00
			UMAT 2562	90.41	0.00	0.00	45.00	45.00
J R SIMPLOT CO	Cert:79993 CF *	06/12/1972		Water Right Total:			769.80	407.40
			UMAT 1303	0.00	0.00	0.00	0.00	0.00
			UMAT 54154	577.18	512.93	348.76	0.00	22.98
FRED WIDMAN	Cert:95964 CF *	02/16/1973		Water Right Total:			0.00	22.98
			UMAT 1232	563.82	312.64	329.35	18.00	18.00
			UMAT 1233	449.09	151.20	413.40	125.00	18.00
Chester Prior	Cert:95542 CF *	03/26/1974		Water Right Total:			143.00	36.00
			UMAT 1232	563.82	312.64	329.35	282.00	150.00
			UMAT 1233	449.09	151.20	413.40	125.00	125.00
EAGLE RANCH	Cert:80652 (T 9591 RR) *	03/26/1974		Water Right Total:			407.00	275.00
			UMAT 2816	91.51	210.44	282.03	300.00	260.00
H T BURNS INC	Cert:64103 (T 6305 RR) *	06/18/1974		Water Right Total:			300.00	260.00
			UMAT 2816	91.51	210.44	282.03	0.00	24.00
H T BURNS INC	Cert:75149 CF *	06/18/1974		Water Right Total:			0.00	24.00
			UMAT 2937	176.03	134.63	252.70	952.50	400.00
LOYALTA INC	Cert:76120 CF *	09/11/1974		Water Right Total:			952.50	400.00
			UMAT 1335	93.36	99.17	207.27	884.40	200.00
AMSTAD FARMS	Cert:75128 CF *	09/26/1974		Water Right Total:			884.40	200.00
			UMAT 1306	7.39	2.92	6.53	89.70	89.70
DESERT SPRINGS BOTTLED WATER CO	Cert:93648 CF *	12/02/1974		Water Right Total:			89.70	89.70
			UMAT 2103	65.24	111.37	85.07	0.00	100.00
WILLIAM & YVONNE ELFERING	Cert:84626 (RR) *	12/02/1974		Water Right Total:			0.00	100.00
			UMAT 2167	23.65	56.99	60.55	60.00	60.00
HERMISTON CEMETERY DISTRICT	Cert:46626 OR *	04/29/1975		Water Right Total:			60.00	60.00
			UMAT 2881	514.00	369.78	637.96	0.00	0.00
			UMAT 2935	65.16	130.05	287.92	250.00	250.00
			UMAT 2937	176.03	134.63	252.70	250.00	250.00

Stage Gulch Critical Groundwater Area, Subarea A
Proposed Allocations by Well and Water Right for 2023
Sustainable Annual Yield: 11450.00 acre-feet
Total Allocation: 11450.00 acre-feet

Owner Name	Water Right	Priority Date	Logid	Water	Water	Water	Requested Allocation (af)	Proposed Allocation (af)
				Use (af) 2019	Use (af) 2020	Use (af) 2021		
			UMAT 54342	3.80	0.00	0.00	250.00	5.00
WINDY RIVER LLC	Inchoate: T 10879 CF (REG) *	08/22/1975		Water Right Total:			750.00	505.00
			UMAT 1318	300.42	265.38	469.95	0.00	450.00
			UMAT 1321	349.97	97.99	305.41	0.00	350.00
			UMAT 1334	19.75	11.49	44.58	0.00	50.00
			UMAT 1335	93.36	99.17	207.27	0.00	180.00
AMSTAD FARMS	Cert:61534 OR *	03/30/1976		Water Right Total:			550.00	1,580.00
			UMAT 1232	563.82	312.64	329.35	300.00	300.00
			UMAT 1233	449.09	151.20	413.40	250.00	250.00
EAGLE RANCH	Cert:61534 OR *	03/30/1976		Water Right Total:			550.00	1,580.00
			UMAT 1216	354.97	0.00	414.52	300.00	300.00
WINDY RIVER LLC	Cert:75124 CF *	07/19/1976		Water Right Total:			300.00	300.00
			UMAT 1215	364.30	417.32	196.12	122.50	122.50
WINDY RIVER LLC	Cert:75554 (T 6970 RR) *	07/19/1976		Water Right Total:			122.50	122.50
			UMAT 1215	364.30	417.32	196.12	122.50	122.50
WINDY RIVER LLC	Cert:79990 CF *	07/19/1976		Water Right Total:			122.50	122.50
			UMAT 1176	21.11	9.44	53.81	0.00	55.00
JOHN & DEBBIE MCBEE	Cert:51696 OR *	08/25/1976		Water Right Total:			0.00	55.00
			UMAT 1214	395.52	620.30	657.53	175.00	175.00
WINDY RIVER LLC	Cert:75555 (T 6970 RR) *	12/02/1976		Water Right Total:			175.00	175.00
			UMAT 1214	395.52	620.30	657.53	175.00	175.00
WINDY RIVER LLC	Cert:79991 CF *	12/02/1976		Water Right Total:			175.00	175.00
			UMAT 54154	577.18	512.93	348.76	713.40	525.00
FARMLAND RESERVE INC	Cert:94107 CF *	02/25/1977		Water Right Total:			713.40	525.00
			UMAT 56771	14.49	59.90	43.49	18.50	18.29
HERMISTON PARTNERS	Cert:89052 CF *	02/25/1977		Water Right Total:			18.50	18.29
			UMAT 2783	10.00		10.00	0.00	10.00
MITCHELL S & CINDY L WILSON	Cert:49823 OR *	02/25/1977		Water Right Total:			0.00	10.00
			UMAT 56771	14.49	59.90	43.49	0.00	21.00
PIONEER HI-BRED INTERNATIONAL INC	Cert:89233 CF *	02/25/1977		Water Right Total:			0.00	21.00
			UMAT 2507	225.61	875.04	265.48	94.20	63.00
PORT OF UMATILLA	Cert:87374 (RR) *	02/25/1977		Water Right Total:			94.20	63.00
			UMAT 2507	225.61	875.04	265.48	41.00	41.00
			UMAT 55585	211.73	193.18	223.00	41.00	41.00
STANFIELD HUTTERIAN BRETHERN	Inchoate: T 11254 CF (REG) *	02/25/1977		Water Right Total:			82.00	82.00
			UMAT 2507	225.61	875.04	265.48	25.90	25.90

Stage Gulch Critical Groundwater Area, Subarea A
Proposed Allocations by Well and Water Right for 2023
Sustainable Annual Yield: 11450.00 acre-feet
Total Allocation: 11450.00 acre-feet

Owner Name	Water Right	Priority Date	Logid	Water Use (af) 2019	Water Use (af) 2020	Water Use (af) 2021	Requested Allocation (af)	Proposed Allocation (af)
STANFIELD HUTTERIAN BRETHERN	Cert:87368 (RR) *	02/25/1977	UMAT 55585	211.73	193.18	223.00	380.70	200.00
			Water Right Total:			406.60	225.90	
VERDON LLC	Cert:87373 (RR) *	02/25/1977	UMAT 2515	0.00		0.00	88.50	45.00
			Water Right Total:			88.50	45.00	
WINDY RIVER LLC	Cert:52574 (T 5501 RR) *	02/25/1977	UMAT 2881	514.00	369.78	637.96	0.00	0.00
			Water Right Total:			0.00	0.00	
WINDY RIVER LLC	Inchoate: T 10879 CF (REG) *	02/25/1977	UMAT 2881	514.00	369.78	637.96	668.00	508.56
			UMAT 2935	65.16	130.05	287.92	0.00	0.00
			UMAT 2937	176.03	134.63	252.70	0.00	0.00
			UMAT 54342	3.80	0.00	0.00	0.00	0.00
			Water Right Total:			668.00	508.56	
AMSTAD FARMS	Cert:75122 CF *	03/14/1977	UMAT 1334	19.75	11.49	44.58	388.20	130.00
			Water Right Total:			388.20	130.00	
OSU Exp Station HAREC	Cert:55012 OR *	05/09/1977	UMAT 2510	4.27	33.30	60.19	95.00	60.00
			Water Right Total:			95.00	60.00	
HERMISTON 353	Cert:48688 OR *	06/16/1977	UMAT 2500	114.20	282.85	264.41	105.00	105.00
			Water Right Total:			105.00	105.00	
DOUBLE M RANCH	Cert:79538 (T 8865 RR) *	06/24/1977	UMAT 2634	60.65	62.82	72.70	1.45	1.45
			Water Right Total:			1.45	1.45	
DOUBLE M RANCH	Cert:79537 (T 8865 RR) *	06/24/1977	UMAT 2634	60.65	62.82	72.70	32.72	32.72
			Water Right Total:			32.72	32.72	
DOUBLE M RANCH	Cert:81756 CF *	06/24/1977	UMAT 2634	60.65	62.82	72.70	18.90	18.90
			Water Right Total:			18.90	18.90	
DOUBLE M RANCH	Cert:81755 CF *	06/24/1977	UMAT 2634	60.65	62.82	72.70	19.63	19.63
			Water Right Total:			19.63	19.63	
CITY OF STANFIELD	Permit: G 17091 *	09/22/1977	UMAT 2962	0.40	6.58	6.58	0.00	0.00
			UMAT 50189	0.00	12.28	9.00	0.00	0.00
			UMAT 57155	640.91	832.29	593.83	0.00	350.00
			Water Right Total:			0.00	350.00	
J R SIMPLOT CO	Inchoate: T 6783 CF (REG) *	03/22/1978	UMAT 2562	90.41	0.00	0.00	0.00	0.00
			Water Right Total:			0.00	0.00	
J R SIMPLOT CO	Cert:85549 (T 6783 RR) *	03/22/1978	UMAT 2562	90.41	0.00	0.00	0.00	0.00
			Water Right Total:			0.00	0.00	
WINDY RIVER LLC	Cert:76128 CF CR *	04/27/1978	UMAT 1279	64.08	11.67	14.28	461.40	65.00
			Water Right Total:			461.40	65.00	

**Stage Gulch Critical Groundwater Area, Subarea A
Proposed Allocations by Well and Water Right for 2023
Sustainable Annual Yield: 11450.00 acre-feet
Total Allocation: 11450.00 acre-feet**

Owner Name	Water Right	Priority Date	Logid	Water	Water	Water	Requested Allocation (af)	Proposed Allocation (af)
				Use (af) 2019	Use (af) 2020	Use (af) 2021		
			UMAT 1311	80.58	79.01	71.57	0.00	77.05
CITY OF ECHO	Permit: G 18545 *	06/21/1978		Water Right Total:			0.00	77.05
			UMAT 2508	0.00		0.00	10.00	8.35
MIKAMI BROTHERS	Cert:53186 OR *	01/25/1979		Water Right Total:			10.00	8.35
			UMAT 1214	395.52	620.30	657.53	350.00	350.00
			UMAT 1215	364.30	417.32	196.12	245.00	245.00
			UMAT 1216	354.97	0.00	414.52	300.00	300.00
L and L Farms	Cert:95493 CF (T 9845, T 10251 RR) *	04/19/1979		Water Right Total:			895.00	895.00
			UMAT 2878	0.00		0.00	0.00	0.00
LOYALTA INC	Cert:53394 OR *	09/19/1979		Water Right Total:			0.00	0.00
			UMAT 2561	0.00	0.00	0.00	0.00	0.00
J R SIMPLOT CO	Inchoate: T 6783 CF (REG) *	04/23/1980		Water Right Total:			0.00	0.00
			UMAT 2561	0.00	0.00	0.00	0.00	0.00
J R SIMPLOT CO	Cert:86130 (RR) CR *	04/23/1980		Water Right Total:			0.00	0.00
			UMAT 2050	3.56		3.52	3.52	3.52
HERMISTON SCHOOL DISTRICT	Cert:54088 OR *	01/12/1981		Water Right Total:			3.52	3.52
			UMAT 2816	91.51	210.44	282.03	0.00	0.00
H T BURNS INC	Cert:75134 CF *	01/29/1981		Water Right Total:			0.00	0.00
			UMAT 51260	114.79	96.56	96.56	0.00	20.00
JB LAND	Cert:88907 CR *	06/26/1981		Water Right Total:			0.00	20.00
			UMAT 2862	0.34	0.00	0.00	325.00	50.00
WALCHLI FARMS	Cert:76116 CF *	10/09/1981		Water Right Total:			325.00	50.00
			UMAT 2771	0.00		0.00	0.00	0.00
Troy Murray	Cert:76114 CF *	05/31/1983		Water Right Total:			0.00	0.00
			UMAT 2944	0.00	0.00	0.00	0.00	0.00
STEVE KOESTER FARMS	Cert:60744 OR *	07/14/1983		Water Right Total:			0.00	0.00
			UMAT 2881	514.00	369.78	637.96	50.00	50.00
			UMAT 2935	65.16	130.05	287.92	0.00	0.00
			UMAT 2937	176.03	134.63	252.70	0.00	0.00
			UMAT 54342	3.80	0.00	0.00	0.00	0.00
WINDY RIVER LLC	Inchoate: T 10879 CF (REG) *	07/12/1984		Water Right Total:			50.00	50.00
			UMAT 5450	227.80	287.28	332.39	0.00	95.00
CITY OF HERMISTON	Cert:87262 CF *	08/15/1984		Water Right Total:			0.00	95.00
Subarea A Total:				7,861.33	6,481.11	8,626.48	10,972.68	11,450.00

Stage Gulch Critical Groundwater Area, Subarea B
Proposed Allocations by Well and Water Right for 2023
Sustainable Annual Yield: 200.00 acre-feet
Total Allocation: 200.00 acre-feet

Owner Name	Water Right	Priority Date	Logid	Water	Water	Water	Requested Allocation (af)	Proposed Allocation (af)
				Use (af) 2019	Use (af) 2020	Use (af) 2021		
			UMAT 2907	1.26	30.50	2.48	1,050.00	190.00
GOLDEN VALLEY FARMS	Cert:76117 CF *	04/08/1965		Water Right Total:			1,050.00	190.00
			UMAT 2909	0.00	0.00	0.00	1,388.55	5.00
			UMAT 2910	0.00	0.00	0.00	1,388.55	5.00
GOLDEN VALLEY FARMS	Cert:87321 (RR) *	02/27/1978		Water Right Total:			2,777.10	10.00
			UMAT 2907	1.26	30.50	2.48	0.00	0.00
			UMAT 2909	0.00	0.00	0.00	143.70	0.00
			UMAT 2910	0.00	0.00	0.00	91.60	0.00
GOLDEN VALLEY FARMS	Cert:87322 (RR) *	06/13/1983		Water Right Total:			235.30	0.00
Subarea B Total:				1.26	30.50	2.48	4,062.40	200.00

Stage Gulch Critical Groundwater Area, Subarea C
Proposed Allocations by Well and Water Right for 2023
Sustainable Annual Yield: 400.00 acre-feet
Total Allocation: 400.00 acre-feet

Owner Name	Water Right	Priority Date	Logid	Water Use (af) 2019	Water Use (af) 2020	Water Use (af) 2021	Requested Allocation (af)	Proposed Allocation (af)
			UMAT 2928	11.66	0.00	0.00	0.00	10.00
MILLS MINT FARM	Cert:53479 OR *	08/13/1973		Water Right Total:			0.00	10.00
			UMAT 2918	0.00		0.00	0.00	0.00
MILLS MINT FARM	Cert:53482 OR *	01/10/1977		Water Right Total:			0.00	0.00
			UMAT 2912	0.00		0.00	15.00	10.00
GOLDEN VALLEY FARMS	Cert:76131 CF *	04/10/1978		Water Right Total:			15.00	10.00
			UMAT 2903	118.04	237.90	159.32	2,777.10	380.00
GOLDEN VALLEY FARMS	Cert:87320 (RR) *	12/26/1978		Water Right Total:			2,777.10	380.00
			UMAT 2903	118.04	237.90	159.32	0.00	0.00
GOLDEN VALLEY FARMS	Cert:87322 (RR) *	06/13/1983		Water Right Total:			0.00	0.00
Subarea C Total:				129.69	237.90	159.32	2,792.10	400.00

Stage Gulch Critical Groundwater Area, Subarea D
Proposed Allocations by Well and Water Right for 2023
Sustainable Annual Yield: 3250.00 acre-feet
Total Allocation: 3250.00 acre-feet

Owner Name	Water Right	Priority Date	Logid	Water	Water	Water	Requested Allocation (af)	Proposed Allocation (af)
				Use (af) 2019	Use (af) 2020	Use (af) 2021		
			UMAT 1238	332.56	429.49	448.53	40.00	40.00
			UMAT 1286	0.00	0.00	0.00	40.00	40.00
			UMAT 1294	315.36	490.11	357.39	40.00	40.00
			UMAT 1341	635.50	585.28	504.57	40.00	40.00
			UMAT 1347	0.00	0.00	0.00	0.00	40.00
FARMLAND RESERVE INC	Cert:74762 CF *	03/25/1955		Water Right Total:			160.00	200.00
			UMAT 1282	470.07	61.85	557.04	80.00	80.00
FARMLAND RESERVE INC	Cert:91070 CF *	04/08/1963		Water Right Total:			80.00	80.00
			UMAT 1238	332.56	429.49	448.53	80.00	80.00
			UMAT 1286	0.00	0.00	0.00	0.00	64.00
			UMAT 1294	315.36	490.11	357.39	80.00	80.00
			UMAT 1341	635.50	585.28	504.57	80.00	80.00
			UMAT 1347	0.00	0.00	0.00	0.00	0.00
FARMLAND RESERVE INC	Cert:92001 CF (T 6787 RR) *	04/08/1963		Water Right Total:			240.00	304.00
			UMAT 1238	332.56	429.49	448.53	125.00	166.00
			UMAT 1286	0.00	0.00	0.00	125.00	0.00
			UMAT 1294	315.36	490.11	357.39	125.00	167.00
			UMAT 1341	635.50	585.28	504.57	125.00	167.00
			UMAT 1347	0.00	0.00	0.00	0.00	0.00
FARMLAND RESERVE INC	Cert:85124 (T 6775 RR) CR *	06/08/1971		Water Right Total:			500.00	500.00
			UMAT 1282	470.07	61.85	557.04	440.00	440.00
FARMLAND RESERVE INC	Cert:91071 CF *	06/08/1971		Water Right Total:			440.00	440.00
			UMAT 1282	470.07	61.85	557.04	650.00	626.00
FARMLAND RESERVE INC	Cert:80850 (T 6775, T 11086 RR) *	02/16/1973		Water Right Total:			650.00	626.00
			UMAT 1238	332.56	429.49	448.53	275.00	366.00
			UMAT 1286	0.00	0.00	0.00	275.00	0.00
			UMAT 1294	315.36	490.11	357.39	275.00	367.00
			UMAT 1341	635.50	585.28	504.57	275.00	367.00
			UMAT 1347	0.00	0.00	0.00	0.00	0.00
FARMLAND RESERVE INC	Cert:87042 CF *	02/16/1973		Water Right Total:			1,100.00	1,100.00
			UMAT 2992	0.00		0.00	0.00	0.00
GOLDEN VALLEY FARMS	Cert:87321 (RR) *	02/27/1978		Water Right Total:			0.00	0.00
			UMAT 2992	0.00		0.00	0.00	0.00
GOLDEN VALLEY FARMS	Cert:87322 (RR) *	06/13/1983		Water Right Total:			0.00	0.00
Subarea D Total:				1,753.49	1,566.73	1,867.53	3,170.00	3,250.00

Stage Gulch Critical Groundwater Area, Subarea F
Proposed Allocations by Well and Water Right for 2023
Sustainable Annual Yield: 200.00 acre-feet
Total Allocation: 115.16 acre-feet

Owner Name	Water Right	Priority Date	Logid	Water	Water	Water	Requested Allocation (af)	Proposed Allocation (af)
				Use (af) 2019	Use (af) 2020	Use (af) 2021		
BRIAN MONTECUCCO	Inchoate: T 6442 CF 04/27/1978 (REG) *		UMAT 1278	236.04	292.13	284.84	13.20	7.60
			Water Right Total:					
BRIAN MONTECUCCO	Cert:76307 (T 6442 04/27/1978 RR) *		UMAT 1278	236.04	292.13	284.84	186.80	107.56
			Water Right Total:					
Subarea F Total:				236.04	292.13	284.84	200.00	115.16

Stage Gulch Critical Groundwater Area, Subarea G
Proposed Allocations by Well and Water Right for 2023
Sustainable Annual Yield: 2750.00 acre-feet
Total Allocation: 2750.00 acre-feet

Owner Name	Water Right	Priority Date	Logid	Water Use (af) 2019	Water Use (af) 2020	Water Use (af) 2021	Requested Allocation (af)	Proposed Allocation (af)
			UMAT 1226	424.39	173.20	435.64	0.00	0.00
			UMAT 1235	328.63	259.20	350.43	0.00	0.00
Chester Prior	Cert:95542 CF *	03/26/1974		Water Right Total:			0.00	0.00
			UMAT 1226	424.39	173.20	435.64	450.00	450.00
			UMAT 1235	328.63	259.20	350.43	225.00	225.00
EAGLE RANCH	Cert:80652 (T 9591 RR) *	03/26/1974		Water Right Total:			675.00	675.00
			UMAT 469	245.08	64.52	267.03	218.00	218.00
			UMAT 470	0.00	0.00	0.00	0.00	0.00
			UMAT 1285	367.42	107.53	368.59	120.00	120.00
EAGLE RANCH	Cert:75127 CF *	09/05/1974		Water Right Total:			338.00	338.00
			UMAT 469	245.08	64.52	267.03	0.00	0.00
			UMAT 476	0.00		0.00	0.00	0.00
			UMAT 1285	367.42	107.53	368.59	0.00	0.00
EAGLE RANCH	Cert:79672 CF *	10/15/1975		Water Right Total:			0.00	0.00
			UMAT 469	245.08	64.52	267.03	682.00	682.00
			UMAT 470	0.00	0.00	0.00	0.00	0.00
			UMAT 1226	424.39	173.20	435.64	450.00	450.00
			UMAT 1235	328.63	259.20	350.43	225.00	225.00
			UMAT 1285	367.42	107.53	368.59	380.00	380.00
EAGLE RANCH	Cert:61534 OR *	03/30/1976		Water Right Total:			1,737.00	1,737.00
			UMAT 469	245.08	64.52	267.03	0.00	0.00
			UMAT 476	0.00		0.00	0.00	0.00
			UMAT 1285	367.42	107.53	368.59	0.00	0.00
EAGLE RANCH	Cert:79673 CF *	10/15/1976		Water Right Total:			0.00	0.00
Subarea G Total:				1,365.52	604.45	1,421.69	2,750.00	2,750.00

Stage Gulch Critical Groundwater Area, Subarea H
Proposed Allocations by Well and Water Right for 2023
Sustainable Annual Yield: 8850.00 acre-feet
Total Allocation: 8850.00 acre-feet

Owner Name	Water Right	Priority Date	Logid	Water	Water	Water	Requested Allocation (af)	Proposed Allocation (af)
				Use (af) 2019	Use (af) 2020	Use (af) 2021		
			UMAT 58365				70.80	70.80
Morrison Ranch LLC	Inchoate: T 13113 CF (REG) *	01/28/1953		Water Right Total:			70.80	70.80
			UMAT 3010	70.00	70.00	685.71	0.00	0.00
Todd Longgood	Inchoate: T 13113 CF (REG) *	01/28/1953		Water Right Total:			70.80	70.80
			UMAT 1351	133.79	373.00	378.16	61.65	61.65
FARMLAND RESERVE INC	Inchoate: T 11473 CF (REG) *	09/16/1954		Water Right Total:			61.65	61.65
			UMAT 1356	102.07	149.40	109.52	0.00	120.33
GLENN ROHDE	Cert:55612 CF *	10/04/1966		Water Right Total:			0.00	120.33
			UMAT 1295	839.19	898.76	538.19	1,032.20	600.00
FARMLAND RESERVE INC	Cert:85124 (T 6775 RR) CR *	06/08/1971		Water Right Total:			1,032.20	600.00
			UMAT 1364	69.77	153.06	241.64	300.00	221.12
REESE FARM	Cert:55613 CF *	02/02/1972		Water Right Total:			300.00	221.12
			UMAT 1300	40.77	93.20	139.26	1,246.00	260.00
FARMLAND RESERVE INC	Cert:80850 (T 6775, T 11086 RR) *	02/16/1973		Water Right Total:			1,246.00	260.00
			UMAT 1351	133.79	373.00	378.16	212.40	212.40
FARMLAND RESERVE INC	Inchoate: T 11473 CF (REG) *	11/30/1973		Water Right Total:			212.40	212.40
			UMAT 1382	0.00	0.00	0.00	195.60	180.00
EMA TRUST, ERIC ANDERSON, TRUSTEE	Cert:86211 (RR) *	07/19/1974		Water Right Total:			195.60	180.00
			UMAT 1295	839.19	898.76	538.19	187.50	180.00
			UMAT 1300	40.77	93.20	139.26	187.50	40.00
			UMAT 1326	139.80	239.09	216.25	187.50	120.00
			UMAT 54853	1,047.98	495.84	1,097.64	187.50	187.50
FARMLAND RESERVE INC	Cert:87666 CF *	07/19/1974		Water Right Total:			750.00	527.50
			UMAT 1359	0.00	0.00	0.00	0.00	0.00
RICHARD & ASHLEY SNOW	Cert:47008 OR *	07/19/1974		Water Right Total:			0.00	0.00
			UMAT 1382	0.00	0.00	0.00	16.20	16.20
EMA TRUST, ERIC ANDERSON, TRUSTEE	Cert:86213 (RR) *	10/21/1974		Water Right Total:			16.20	16.20
			UMAT 1295	839.19	898.76	538.19	90.35	90.00
			UMAT 1300	40.77	93.20	139.26	90.35	40.00
			UMAT 1326	139.80	239.09	216.25	90.35	90.00
			UMAT 54853	1,047.98	495.84	1,097.64	90.35	90.35
FARMLAND RESERVE INC	Cert:87667 CF *	10/21/1974		Water Right Total:			361.40	310.35
			UMAT 1361	862.27	1,140.27	1,004.93	600.00	600.00
			UMAT 1369	357.93	327.35	319.16	600.00	400.00

Stage Gulch Critical Groundwater Area, Subarea H
Proposed Allocations by Well and Water Right for 2023
Sustainable Annual Yield: 8850.00 acre-feet
Total Allocation: 8850.00 acre-feet

Owner Name	Water Right	Priority Date	Logid	Water Use (af) 2019	Water Use (af) 2020	Water Use (af) 2021	Requested Allocation (af)	Proposed Allocation (af)
GOLDEN VALLEY FARMS	Inchoate: T 10517	11/12/1975		Water Right Total:			1,200.00	1,000.00
	CF (REG) *							
			UMAT 1329	0.00	0.00	0.00	1,071.00	0.00
			UMAT 54853	1,047.98	495.84	1,097.64	1,071.00	850.00
FARMLAND RESERVE INC	Cert:80849 CF *	12/29/1975		Water Right Total:			2,142.00	850.00
			UMAT 1362	909.19	924.46	840.23	1,027.50	500.00
Branstetter Ranch	Cert:85256 (RR) *	07/16/1976		Water Right Total:			1,027.50	500.00
			UMAT 1362	909.19	924.46	840.23	328.20	400.00
Branstetter Ranch	Cert:89677 CF *	07/16/1976		Water Right Total:			328.20	400.00
			UMAT 1367	104.53	130.44	153.97	495.00	129.65
REW RANCHES INC	Cert:86212 (RR) *	09/09/1976		Water Right Total:			495.00	129.65
			UMAT 1300	40.77	93.20	139.26	75.36	75.36
			UMAT 1326	139.80	239.09	216.25	75.36	75.36
			UMAT 1361	862.27	1,140.27	1,004.93	75.36	75.36
			UMAT 1369	357.93	327.35	319.16	75.36	75.36
			UMAT 54853	1,047.98	495.84	1,097.64	75.36	75.36
FARMLAND RESERVE INC	Cert:87713 CF *	12/15/1976		Water Right Total:			376.80	376.80
			UMAT 2998	704.91	640.26	356.69	1,147.50	700.00
JML	Cert:67300 CF *	05/23/1977		Water Right Total:			1,147.50	700.00
			UMAT 1356	102.07	149.40	109.52	0.00	50.00
GLENN ROHDE	Cert:55015 OR *	12/06/1977		Water Right Total:			0.00	50.00
			UMAT 2999	396.17	509.96	0.00	1,980.00	400.00
			UMAT 3000	1,607.69	1,762.89	399.75	3,168.00	1,600.00
			UMAT 3004	525.55	868.79	261.89	150.00	150.00
			UMAT 3007	0.02	16.71	39.40	1,484.25	40.00
ST HILAIRE	Cert:80295 (T 8688	02/15/1978		Water Right Total:			6,782.25	2,190.00
	RR) *							
			UMAT 2999	396.17	509.96	0.00	20.00	16.00
			UMAT 3000	1,607.69	1,762.89	399.75	32.00	28.00
			UMAT 3004	525.55	868.79	261.89	18.20	14.20
			UMAT 3007	0.02	16.71	39.40	15.75	15.00
ST HILAIRE	Cert:88817 CF *	02/15/1978		Water Right Total:			85.95	73.20
			UMAT 1361	862.27	1,140.27	1,004.93	185.40	0.00
			UMAT 1369	357.93	327.35	319.16	185.40	0.00
GOLDEN VALLEY FARMS	Inchoate: T 10517	02/21/1978		Water Right Total:			370.80	0.00
	CF (REG) *							
			UMAT 1361	862.27	1,140.27	1,004.93	534.60	0.00
			UMAT 1369	357.93	327.35	319.16	534.60	0.00
GOLDEN VALLEY FARMS	Inchoate: T 10517	08/02/1978		Water Right Total:			1,069.20	0.00
	CF (REG) *							
			UMAT 1361	862.27	1,140.27	1,004.93	539.10	0.00

Stage Gulch Critical Groundwater Area, Subarea H
Proposed Allocations by Well and Water Right for 2023
Sustainable Annual Yield: 8850.00 acre-feet
Total Allocation: 8850.00 acre-feet

Owner Name	Water Right	Priority Date	Logid	Water Use (af) 2019	Water Use (af) 2020	Water Use (af) 2021	Requested Allocation (af)	Proposed Allocation (af)
GOLDEN VALLEY FARMS	Cert:84095 (T RR) *	10517 08/02/1978		Water Right Total:			539.10	0.00
			UMAT 1351	133.79	373.00	378.16	108.90	0.00
FARMLAND RESERVE INC	Inchoate: T CF (REG) *	11473 05/10/1979		Water Right Total:			108.90	0.00
			UMAT 1364	69.77	153.06	241.64	0.00	0.00
REESE FARM	Cert:56073 OR *	05/10/1979		Water Right Total:			0.00	0.00
			UMAT 1383	0.00		0.00	0.00	0.00
HARRIET ISOM	Cert:55842 OR *	03/17/1980		Water Right Total:			0.00	0.00
			UMAT 1362	909.19	924.46	840.23	230.18	0.00
Branstetter Ranch	Cert:85257 (RR) *	03/12/1981		Water Right Total:			230.18	0.00
			UMAT 1362	909.19	924.46	840.23	281.33	0.00
Branstetter Ranch	Cert:89678 CF *	03/12/1981		Water Right Total:			281.33	0.00
			UMAT 3010	70.00	70.00	685.71	692.40	0.00
LORENZEN RANCHES, INC	Cert:94466 (T RR) *	13113 03/28/1983		Water Right Total:			692.40	0.00
			UMAT 58365				25.50	0.00
Morrison Ranch LLC	Inchoate: T CF (REG) *	13113 03/28/1983		Water Right Total:			51.00	0.00
			UMAT 3010	70.00	70.00	685.71	25.50	0.00
Todd Longgood	Inchoate: T CF (REG) *	13113 03/28/1983		Water Right Total:			51.00	0.00
Subarea H Total:				7,911.62	7,583.20	6,782.39	21,174.36	8,850.00

NDWR Abstract

Establishment of Capture Management Zone and Humboldt River Conservancy District

This abstract summarizes some of the current thoughts and ideas of the NDWR on how to approach Conjunctive Management within the Humboldt River Basin. The ideas and concepts expressed in this abstract are not final or complete. The objective of this Conjunctive Management concept is to prevent additional conflict from developing from new applications for underground water rights and to reduce conflict from existing underground rights that are in conflict over a period of time.

The fundamental concept being presented here is the creation of a Capture Management Zone (CMZ) based on current and future impacts of groundwater pumping on stream capture. The Capture Management would largely be managed by a Conservancy District that would encompass the same area and boundaries as the CMZ.

Capture Management Zone

The CMZ would be established based on estimated impacts of pumping on stream capture of x% after y years [between 1% and 10% capture in 50 or 100 years]. For underground water rights within the CMZ, capture would be managed using conjunctive management principles as well as traditional hydrographic basin management using perennial yield. Areas outside the CMZ would still be managed traditionally by hydrographic basins and perennial yield and would be exempt from CMZ management.

The CMZ would consist of two subzones. A curtailment zone where pumping impacts on stream capture are severe [25% or 50% of pumped water in conflict]. And an assessment zone which lies between the curtailment zone and outer edge of the CMZ. Within the curtailment zone, all non-exempted pumping would be curtailed unless it has been offset with dedicated decree rights of sufficient quantity and reliability (wetness) to offset the impact. Within the assessment zone, assessments will be levied based on [mean annual] pumping rate multiplied by capture rate with assessment rates being based on water value [economic value of water used for irrigation in the Humboldt River]. Assessments would be prorated in a given year based on time that groundwater pumping is out of priority. GW is only in priority when all senior surface water decree and storage rights are met or will be met.

Although the CMZ would be established based on full estimated impact after y years [50 or 100 years], implementation of conjunctive management would be gradual through time based on impacts of pumping starting from some effective future date [say 1/1/2025]. However, in recognition of need to get relief to impacted senior surface water rights, time of pumping would proceed at a rate of 2 years of pumping per year up until the total actual number of years of pumping is met. Total years of actual pumping would be defined as evaluation date minus proof of completion date (or permit date in absence of POC date).

All existing water rights within the CMZ would remain valid and maintain priority and value even if curtailed. All water rights can be sold, transferred, or offset with decree as needed to find relief from curtailment or assessments. An Order would be issued closing off all new appropriations within hydrographic basins with curtailments until all curtailed water rights are dealt with. New change applications within the curtailment zone would require decree water of sufficient 'wetness' to offset capture impacts. Minor groundwater uses with less than 5 AFY of capture impact after y years would be exempted from CMZ management which would exempt all domestic wells and many stock wells.

Humboldt River Conservancy District

The Humboldt River Conservancy District (HRCD) would be established to manage the CMZ and levy and use capture assessments as well as a base assessment to all GW and SW water right holders within the CMZ. The staff and operations of the HRCD would be funded through the base assessments. The HRCD would use the capture assessments to purchase and retire or resell SW and GW water rights that are in greatest conflict to avoid or reduce capture impacts. For example, purchase of groundwater rights within the CMZ and resale of rights to outside of the CMZ, or to a location of lesser impact within the assessment zone, or retirement if hydrographic basin is over appropriated. Or purchase of Humboldt decree rights for resale to offset impact from GW water rights within the CMZ (curtailment or assessment zones). Additionally, the HRCD may use capture assessments to undertake river restoration or enhancement projects that result in more efficient flow of the Humboldt River or Tributaries such that more water is available for existing users.

The HRCD may also manage and maintain a water market and water trading that could be used to offset impacts or encourage conservation efforts. The HRCD would be overseen by a board of elected officials from local jurisdictions and be representative of the various water user groups.



By: James Eason, Director of State Operations, GBWC
To: Levi Kryder, Chief, Hydrology Section
Date: July 14, 2023
Subject: Conjunctive Use Management Strategies for the Upper Humboldt River Region – Abstract Submittal

Introduction

NDWR requires water purveyors and utilities to address conjunctive use issues while maintaining compliance with either/or responsibilities and requirements of the Public Utilities Commission of Nevada, Nevada Department of Environmental Protection, or a public board or similar body. Some of these requirements include and are not limited to dedication rates with safety factors, backup production well sources, and fire flow demands. Rate payers bear the brunt of new permitting requirements.

Concept

New appropriations or change applications filed for a publicly regulated water system and that are within an existing utility service area shall be exempted from the replacement water scenario as described under the State Engineer's Order 1329. Publicly regulated water systems shall be exempt, when the utility can demonstrate they are outside of direct contact with the Humboldt River or when they manage an integrated water system with multiple intertied pressure zones, variable flow drives or timed well operation, and support return flow systems into the basin. Post application approval, the utility will use metered water usage and system data paired with stream flow measurements to identify if conjunctive use impacts from operating the water system have occurred. Groundwater modelling, well and pump test results, or similar data will be used to determine potential conjunctive use impacts.

Implementation

Implementation of this scenario maintains existing application processes (publication/protest, RFA Committee review, NSE Signature) and provides exemption from the conflicts analysis in lieu of permit term requirements. Permit terms may be included with requirements for detailed reporting for metered use, well capacities, stream water flow monitoring, or stream diversions in proximity to production wells. If impacts to stream flows are identified, timed well operation and effluent water streams could be used to offset conjunctive use impacts. This approach uses existing statutory constructs and, potentially, preferred use provisions within designated groundwater basins, and monitoring plan components already included in many water right permits. Analysis of potential conjunctive use impacts remains variable to accommodate different areas and conditions.

Similar Concept Implementation

Additional time is needed to evaluate examples of this concept in other neighboring States; however, the Chino Basin Conjunctive Use Environmental Water Storage/Exchange Program (CBEWP) appears to partially implement this scenario.

Challenges

- Groundwater modelling data and related tools are still under development.
- Utility and NDWR staffing needs to manage monitoring and management plans.

Nevada Farm Bureau Abstract
For Conjunctive Management Humboldt River Basin
(Contact: Doug Busselman, 775-870-3349 – email doug@nvfb.org)

Description of the concept/method and how it would work: Nevada Farm Bureau believes that conjunctive management needs to be based on site specific circumstances. Not all areas have the same connection and interaction throughout a system. We also believe that regulatory activity to operate conjunctive management needs to be based on established scientific documentation that the specific groundwater and surface water are connected.

Nevada Farm Bureau supports the option which covers *“curtailments based on wells which have the greatest impact on stream flows.”* This needs to provide scientific documentation that the specific groundwater and surface water are connected and that the evidence is based on site specific circumstances. We also support the combined options of *“replacement water”* and *“conservation systems which reduce levels of pumping.”*

How To Implement This Concept -- Use of the Capture Models – Replacement Water – Reductions Of Pumping:

We have been able to confirm that the models will be capable of determining the capture impact of individual wells and their impact on stream flows. The wells also have requirements for metering to monitor the amount of water pumped.

Using actual annual water pumping results of the meters on the well, the model should be used to recognize and record reductions in pumping over the course of an annual water season. From this information the model would be used to calculate capture impacts for a well for whatever conservation measures might yield or whether it was not used in one year or another.

Both reductions in annual pumping or non-pumping of a well should provide for the model to reflect conservation taking place which would be translated into the same type of consequences as “replacement water.” Less water pumped is less water being captured.

For those specific wells, which have been demonstrated by the scientific findings as having the greatest impact on surface flows, either curtailment or reductions in pumping should be covered in a management plan which addresses senior surface water right owners not receiving sufficient water to meet their rights.

Local Basin Meetings:

Considering possible Humboldt River conjunctive management activities, there needs to be full public discussion of what conjunctive management of water resources will mean in practice. Farm Bureau’s proposal includes local/basin level meetings which provides water right owners in each basin with basin-level details and analysis for what the circumstances of water resources are for their specific basin. This is especially critical for groundwater basins which are over-appropriated and those which are over-pumped. The local basin situation should also identify what the impact of local wells are having for river flows, based on the capture models of wells within the basin.

Participants in the basin-level process should be asked to offer their input on ideas which they believe will provide resolution for workable solutions. These basin-level recommendations should be submitted to the Division of Water Resources and the comprehensive report should receive an analysis assessment of whether the proposals submitted will accomplish resolution of conflicts which impact senior water rights.

Examples of successful implementation: It is our assertion that conducting the operations that we’ve presented fits within the application of Nevada State Law. It also follows somewhat the operating procedures of the Snake River in Idaho (as we understand their process). When senior water right owners are negatively impacted in obtaining their water, groundwater pumping is reduced or curtailed.

Pitfalls or issues as well as the role of the public and the State Engineer’s office: From our perspective the State Engineer’s role is to enforce Nevada state law and provide protection for senior water rights. Additionally, the State Engineer’s office is responsible for engagement with the public. The State Engineer’s office is also responsible for monitoring wells that have been identified as having an impact on river flows, and managing the use of the models in calculating whether water conservation is sufficiently meeting the requirements to provide for senior water rights.

ABSTRACT SUBMISSION

August 1, 2023 Humboldt Conjunctive Management Stakeholder Meeting

Use of Critical Groundwater Management Areas as a Tool in Conjunctive Management, an Oregon Example

Schroeder Law Offices, P.C.

Therese A. Ure Stix

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While conjunctive management focuses on the interaction between groundwater and surface water, helping all water systems come into equilibrium will only assist in overtaxing the resources, regardless of the source. Thus, bringing the groundwater basins into a sustainable annual (or perennial) yield, should be a concept that NDWR is pursuing, regardless of whether or not the basin is part of the Humboldt River System.

Like the Critical Management Areas in Nevada (NRS 534.110(7)), Oregon has a system in place to determine Critical Groundwater Areas (CGWA). OAR 690-010-0050¹. Oregon uses CGWA designations as a tool to assist in managing substantial interference issues between wells and senior surface water rights.² However, unlike Nevada, Oregon implements a stricter regime of curtailment in CGWA without the option of allowing the basin water users to attempt to agree on a basin wide management plan. The CGWA boundaries are set by rule. Subareas within a CGWA are sometimes determined as well.

Under the Oregon structure, an annual sustainable yield is determined by the Oregon Water Resources Department (OWRD) each year. Water right holders within the boundaries of the CGWA request an allocation of up to their full duty of their water right located within the CGWA. OWRD then allocates the ASY to all the water right holders in than CGWA by priority and any administrative rule. Water users within a CGWA can and do exchange allocations and can do so without a transfer for money or other consideration. This system can be implemented much faster than the management areas in Nevada and thereby more robust in protecting the resources and senior water users.

A presentation related to this abstract will address the CGWA concept in Oregon, how it comports with prior appropriation doctrine, how it is implemented and used each year, how it relates to conjunctive management issues along the Umatilla River by using the Stage Gulch and/or Butter Creek CGWAs as an example.

¹ <https://www.oregon.gov/owrd/programs/GWWL/GW/Pages/AdminAreasAndCriticalGWAreas.aspx>

² https://www.oregon.gov/owrd/programs/GWWL/GW/Documents/Summary_of_Groundwater_Controls.pdf

ABSTRACT SUBMISSION

August 1, 2023 Humboldt Conjunctive Management Stakeholder Meeting

**Use of Groundwater Management Areas and Mitigation Measures for
Conjunctive Management, an Idaho Example**

Schroeder Law Offices, P.C.

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On November 2, 2016, Idaho Department of Water Resources, Director Gary Spackman created the largest groundwater management area (“GWMA”) in Idaho, encompassing the Eastern Snake River Plain Aquifer (“ESPA”). The ESPA region extends from the upper eastern corner of the state, near Saint Antony Idaho to Thousand Springs, near Hagerman, Idaho, where the ESPA discharges into the Snake River. Spackman signed the order creating the GWMA in hopes of halting the drop of the aquifer level, which had experienced an annual rate of decline estimated at 200,000 acre-feet.

In Idaho, a GWMA is a separate designation from a critical groundwater area (“CGWA”). A GWMA is all or part of a groundwater basin that may be approaching the conditions of a CGWA. Applications for water appropriation in a GWMA may be approved only after it is determined that sufficient supply is available and other prior water rights will not be injured. The IDWR Director may also require reporting of water use by water users in a GWMA.

In creating the ESPA GWMA, the intent was to bring all of the region’s water users into the fold in an effort to restore the water supply. Although this was partially accomplished in 2015 through a settlement agreement between groundwater and surface water groups within the conjunctively managed ESPA region, not all members of the groundwater district participated in the agreement. The GWMA was implemented as a tool to allow all water users in the region to participate in the development of a management plan.

A presentation related to this abstract will further address the GWMA concept in Idaho, how it comports with the prior appropriation doctrine and existing Nevada statutory law. The presentation will further address the management concepts contemplated and/or implemented in the ESPA GWMA currently and historically including mitigation tools utilized to assist in the conjunctive management of groundwater and surface water in the GWMA.

Conjunctive Management Stakeholder Workshop
Sign-in Sheet

Name: Organization: Phone Number: Email:

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1. Summary

Meeting title:

Announcing August 1, 2023 Humboldt Conjunctive Management Stakeholder Meeting and Call for Abstracts

Attended	91
Start time	8/1/23, 12:22:51 PM
End time	8/1/23, 5:10:10 PM
Meeting duration	4h 47m 18s
Average attendance time	2h 2m 30s

2. Participants

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Austin NDWR

Sean P. Ashcraft

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