



# Oregon

Tina Kotek, Governor

Water Resources Department  
725 Summer St NE, Suite A  
Salem, OR 97301  
(503) 986-0900  
Fax (503) 986-0904  
[www.Oregon.gov/OWRD](http://www.Oregon.gov/OWRD)

## MEMORANDUM

**TO:** Water Resources Commission

**FROM:** Ivan Gall – Acting Deputy Director, Water Management

**SUBJECT:** Agenda Item H, November 17, 2023  
Water Resources Commission

### **Groundwater Level Declines – Impacts and Managing for Sustainability**

#### **I. Introduction**

This report and associated discussion will help frame questions that arise around managing groundwater use through voluntary or regulatory actions to halt or slow groundwater declines by reducing groundwater use. *This is an informational report.*

#### **II. Integrated Water Resources Strategy Recommended Actions**

- 1.A - Conduct Additional Groundwater Investigations
- 1.B – Improve Water Resource Data Collection and Monitoring
- 2.A – Regularly Update Long-Term Water Demand Forecasts
- 3.A – Determine Flows Needed (Quality and Quantity) to Support Instream Needs
- 3.B – Determine Needs of Groundwater-Dependent Ecosystems
- 11.E – Develop Additional Groundwater Protections
- 12.A – Ensure the Safety of Oregon’s Drinking Water

#### **III. Background**

Groundwater development and use has increased across Oregon for decades, supplying water for farms, cities, households, power, industry, and other purposes. Basins in Oregon underlain by productive regional aquifer systems have seen the most groundwater development. Basins where the underlying geology is not conducive to productive aquifer systems have seen less permitted groundwater development, relying more on surface water supplies to meet larger water demands. However, most rural households across Oregon rely upon groundwater from exempt wells for their primary domestic water supply.

Water is a finite resource, and groundwater appropriation in some basins has exceeded recharge to the aquifer system, resulting in removal of groundwater from storage in the aquifer and declining groundwater levels. Groundwater level data measured in wells over time help us understand how aquifers respond to natural and pumping stresses. Groundwater level declines

are a symptom of unsustainable withdrawals; in areas of declines, wells may go “dry,” springs may dry up, or yields may decline – impacting people, businesses, communities and ecosystems that rely on those sources of water. Groundwater is a key part of the hydrological system, so pumping wells capture groundwater, reducing the amount of groundwater available to support stream flow, spring discharge, and groundwater dependent ecosystems.

Unfortunately, many areas of Oregon are showing signs of groundwater declines. Preventing unsustainable groundwater level declines is the best management tool to protect existing users and ensure future water availability for existing users. This also prevents the need for curtailment after investments have been made. If decline rates are excessive, reductions in groundwater use may be needed, either through voluntary actions by groundwater right holders or through regulatory processes, such as establishing a critical groundwater area (CGWA). There are currently seven CGWAs in Oregon, the last of which was established in 1991.

The Commission adopted new statewide rules (Oregon Administrative Rule Chapter 690, Division 10) in September 2023 that guide the Department in the process of establishing new CGWAs. These rules also establish a contested case process in the event curtailment of existing rights is necessary to slow groundwater level declines. The Commission will likely be involved in future rulemakings that establish CGWAs and providing input on draft orders for the contested case process as decisions are made about the quantity and timing of groundwater reductions, and metrics to guide groundwater management. Reducing existing groundwater use will slow or stop groundwater declines; however, it also impacts communities, agricultural businesses, and industries that are subject to curtailment.

#### **IV. Discussion**

Groundwater level data measured in wells over time provide information on how an aquifer system responds to stresses like wet or dry cycles, pumping, recharge projects, or long-term climate trends. Groundwater levels are measured in water wells using simple and affordable equipment.

Department staff measure groundwater levels in over 1,200 wells each year. Groundwater Section staff also compile groundwater level data measured by other entities, like the U.S. Geological Survey, for 210 other wells in Oregon. The Department is currently operating 142 recorder wells, equipped with data loggers to collect continuous water level data over time. Some groundwater right permit holders are required to measure groundwater levels in their wells, and submit the data to the Department, providing data on approximately 1,300 additional wells. Based on water levels, Oregon has basins with excessive and continuing groundwater level declines, including the Malheur Lake (Harney), Klamath, and Walla Walla, and areas within the Columbia River Basalt aquifer systems.

### *Impacts of Groundwater Level Declines*

Groundwater level declines have adverse environmental, economic, and social consequences. Depending on the aquifer properties and rate of groundwater level decline, the use of groundwater from an aquifer system may not be sustainable and may require more active management of the resource. Negative consequences of declining groundwater levels include:

- Dry wells and diminished well yields.
- Less groundwater discharge to streams, springs, seeps, and groundwater dependent ecosystems (fens, wetlands).
- Less groundwater available for plants.
- Saltwater intrusion in coastal areas, leading to contamination of freshwater aquifers.
- Increased pumping costs to lift the groundwater from greater depth.
- Potential groundwater quality impacts resulting from upwelling or mixing of deep saline groundwater.
- Land subsidence, leading to infrastructure damage such as roads, canals, bridges, and building foundations.
- Legal and regulatory issues; under prior appropriation, the resource needs to be protected for senior users, resulting in the need to curtail for junior users. As water supplies diminish, conflict can increase, as can the regulatory and legal disputes.

### *Managing Aquifer Systems with Declining Groundwater Levels*

In addition to the negative impacts from declining groundwater levels noted above, the Legislative Assembly found (see Oregon Revised Statute 537.525 (7); paraphrased) that to ensure the preservation of the public welfare, safety, and health, it is necessary that reasonably stable groundwater levels be determined and maintained.

“Reasonably stable” has only been defined in the context of groundwater management in the Butter Creek and Stage Gulch CGWAs (OAR 690-507-0620(5) and 690-507-0760(5))<sup>1</sup>. Where groundwater levels have declined to the extent that a CGWA is needed, basin specific definitions of reasonably stable water levels can be established through the rulemaking process that establishes a CGWA to provide aquifer management targets.

### *Harney Critical Groundwater Area*

The Department is working to update the Division 512 rules, proposing the establishment of a new CGWA in the Harney Basin, with specific subareas, each with their own permissible total withdrawal. The permissible total withdrawal is an annual volume of groundwater that can be pumped from a subarea to meet a target groundwater level decline rate. Following the establishment of the CGWA, the Department will likely begin a contested case process to address rapidly declining groundwater levels in several subareas of the Harney Basin. Prior to the contested case process, the Commission will be asked to provide input to important aspects

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<sup>1</sup> “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.

around groundwater use curtailment, including when curtailment should begin, how much curtailment should occur, and on what implementation schedule.

In addition to the CGWA work in the Harney Basin, the Department will be working to enroll water users in the Conservation Reserve Enhancement Program to retire groundwater use and is exploring other options for voluntary groundwater use reduction.

## **V. Conclusion**

The Department has several tools to address groundwater declines to manage the groundwater resource for sustainable use and protection of existing water right holders. One tool is establishing a CGWA and subsequent curtailment. Staff will discuss options and scenarios with the Commission to familiarize them with terms and concepts around how the Department approaches curtailment, or voluntary reduction in groundwater use, to stabilize groundwater levels.

Ivan Gall  
(971) 283-6010