WaterWatch of Oregon
Protecting Natural Flows In Oregon Rivers

January 9, 2024

Laura Hartt
Groundwater Allocation Rules Coordinator
OWRD
By email to: Laura.A.HARTT@water.oregon.gov

RE: Comments Post-Groundwater Allocation RAC Meeting #7

Dear Ms. Hart:

Thank you for the opportunity to submit further comments regarding the effort to amend Oregon's rules for groundwater allocation to align with statute and ensure groundwater is sustainably and equitably managed. WaterWatch continues to be supportive of the department's proposed rule amendments, but is very concerned with the recent delay in the process and the recent proposed change removing the rule language requiring minimum standards for basin rules that would enact the statute.

We understand that the draft rules would be an adjustment for entities who have grown accustomed to a 'come one come all' system of over-issuing groundwater permits, but that simply does not justify delaying compliance with the statute nor any further unsustainable groundwater permitting. This process has been thorough, lengthy, broadly inclusive, and exhaustive, starting with Commission and OWRD discussion in Winter 2021-2022; proceeding to five hybrid outreach meetings in September-October 2022; and a rules advisory committee (RAC) process that has been running for 10 months as we approach RAC meeting number eight. We urge the department to proceed expeditiously with the process required to promulgate the amended rules.

Comments

1. The draft rules are squarely within the authority of Oregon's 1955 Groundwater Act; existing rules are unlawful for failing to implement the standards in the Act.

On this issue, please see the attached November 16, 2023, WaterWatch letter to the Oregon Water Resources Commission that discusses this issue. (Attachment 1, pp. 1-2). It is OWRD's existing rules, which have, for example, led directly to groundwater levels plummeting by as much as 100 feet in the Harney Basin (which by no definition is "reasonably stable") as well as injury to surface water rights (including instream water rights) across the state, that do not align with statute.

2. Using basin program rulemaking to define reasonably stable to implement the 1955 Groundwater Act would be inefficient and, at a minimum, would need to proceed with well-defined sideboards and clear requirements.

WaterWatch strongly opposes the removal of the minimum standards for basin rules that could define reasonably stable that was indicated by OWRD staff prior to the last RAC, as shown on a presentation slide, apparently at the request of agricultural and/or municipal interests but with no input from the RAC as a whole. The minimum standards for reasonably stable should be replaced *and* made stronger and more clear.

The OWRD cannot adopt rules (including basin plans) in violation of the 1955 Groundwater Act; it is best to be clear about this up front in the rules and spell out the standards that would ensure basin plans will meet statutory directives.

While any approach of defining reasonably stable basin by basin raises serious questions regarding efficiency and use of agency and stakeholder time, even if such an approach were contemplated, OWRD must first amend the current, unlawful, statewide groundwater allocation rules to bring the rules into compliance with statute. In *no* scenario should the critical task of aligning statewide rules with statute and ensuring sustainable groundwater allocation be further delayed in favor of pursuing basin specific rules in processes that would stretch for many, many years—indeed probably decades—and put the existing system in legal jeopardy.

3. Claims that the Draft Groundwater Allocation Rules could conflict with Governor Kotek's effort to establish additional housing are unsupported by available data.

Claims that the science-based, sustainable groundwater permitting approach developed by the department would conflict with developing additional housing are not supported by data. We have heard concerns about the draft rules from the central Oregon cities, RAC meetings and before the Commission and legislature. WaterWatch has looked carefully at the City of Redmond Water Management and Conservation Plan which shows that outdoor water use by single-family homes is driving water demand, recognizes that peak season use for single-family residential connections is 3.5 times higher than non-peak use, and reports "that conservation efforts focused on reducing outdoor use by single-family homes and certain commercial customers with large landscape water use, may help to address peak-season demand." (Page 2-11).

The issue with groundwater demand in central Oregon cities appears to really one of better managing existing supply; the state should *not* be issuing more groundwater permits to enable continuation and growth of non-climate appropriate, excessive lawn and outdoor watering in central Oregon. That is not a sustainable, reasonable nor equitable use of Oregon's groundwater. We have attached a letter that we sent to the Oregon Water Resources Commission that looks that this issue further. (Attachment 1, pp. 2-4).

4. WaterWatch supports the suggestion at RAC meeting #7 that OWRD should exercise its authority to require measurement and reporting of groundwater use, including by establishing Serious Water Management Problem Areas.

Comments have been made by agricultural interests at a recent Commission meeting and at RAC meeting #7 that OWRD should do more to require measurement and reporting of groundwater use. WaterWatch has long advocated for measurement and reporting of all water use, including groundwater. However, the need for additional groundwater use data should in no way slow down amending Oregon's groundwater allocation rules to finally align with statute. That said, if OWRD thinks it may be productive, WaterWatch would support exploring at RAC meeting #8 including in the rules an aspirational schedule for requiring comprehensive measurement and reporting of groundwater use, through establishment of Serious Water Management Problem Areas or otherwise, across the state perhaps by basin. If not in the rules, perhaps this could be developed and shared in an outward facing way as a roadmap to ensuring this data is collected and reported.

Thank you for your consideration of these comments.

Sincerely,

/S/Lisa A. Brown

Lisa A. Brown
Staff Attorney
lisa@waterwatch.org

Attachment: (1) WaterWatch Letter to Oregon Water Resources Commission Re: November 17th, 2023, Agenda Item I - Groundwater Allocation Rulemaking Update (11-16-2023).

WaterWatch of Oregon
Protecting Natural Flows In Oregon Rivers

Oregon Water Resources Commission
725 Summer St. NE, STE A
Salem, OR 97301
Sent via email to: Mindy Lane, Mindy.J.LANE@water.oregon.gov

November 16, 2023

RE: November 17th, 2023, Agenda Item I - Groundwater Allocation Rulemaking Update

Dear Chair Quaempts and members of the Commission:

Thank you for your continued interest and oversight regarding the critical work being done by the agency to develop science-based Groundwater Allocation rules that implement Oregon's 1955 Groundwater Act.

WaterWatch is a member of the Groundwater Allocation RAC, submitted a letter on this topic to the Commission as a member of the Oregon Water Partnership, and testified at the September, 2023 Commission meeting. We are very supportive of the draft rules and appreciative of the OWRD's thoughtful, in-depth work and robust public engagement that has gone into the rule development. This letter will not reiterate information we previously provided, which we incorporate by reference, but is being provided only to address two issues that have been raised by water users.

1. The Draft Groundwater Allocation rules align with statute and the claim by certain water user groups that ORS 537.525(2) says otherwise misreads the statute.

Various water user groups are asserting that the Draft Groundwater Rules exceed the scope of Oregon's 1955 Groundwater Act. This assertion is incorrect. The draft rules would implement and align with statute. The existing rules, in contrast, do not align with statute as demonstrated, for example, by the plummeting groundwater levels in places like the Harney Basin caused by over-issuance of groundwater permits, and the fact that the existing groundwater permitting process fails to protect senior water rights from injury caused by pumping.

Those user groups have expressed concerns that "OWRD has exceeded the intent and scope of its enabling legislation…", claiming incorrectly that the rules conflict with ORS 537.525(2). (July 7, 2023 letter from Oregon Association of Nurseries, Oregon Cattlemen's Association, Oregon Farm Bureau Federation, Oregon Water Resources Congress, and Oregon Dairy Farmers Association to the RAC coordinator).

The groups have misread the statute. ORS 537.525(2) states "Rights to appropriate ground water and priority thereof be acknowledged and protected, except when, under certain conditions, the public welfare, safety and health require otherwise." The provision pertains to existing "rights" that have "priority" dates; these terms make the provision inapplicable to rules regarding *future* allocation of groundwater, because future allocations are not "rights" with "priority" dates.

ORS 537.525(2) further signals that, while *existing* groundwater rights will be protected, "under certain conditions, the public welfare, safety and health" may "require otherwise." This foreshadows the Act's provisions for designation of Critical Groundwater Areas, which can include as "corrective control provisions," "[a]ny 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 (Short title) to 537.795 (ORS 537.505 to 537.795 supplementary) and 537.992 (Civil penalties)." (ORS 537.735(3) and (3)(d)).

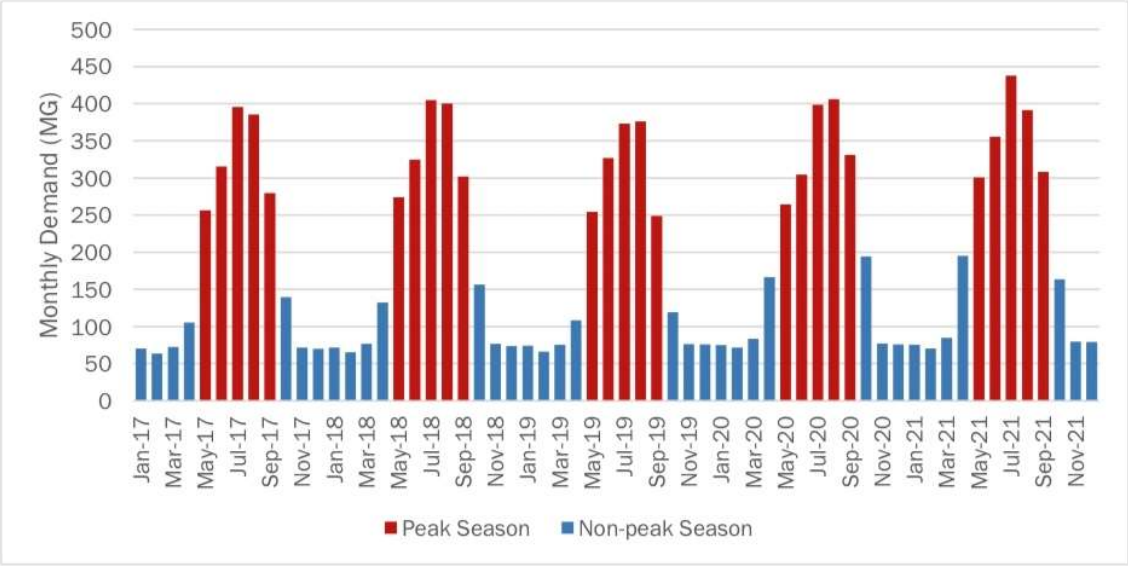
In sum, the claim by various water user groups that the Draft Groundwater Allocation rules exceed Oregon's Groundwater Act is incorrect and is based on a misreading of the statute. What the draft rules do is finally align agency rule with statute, something that is long overdue.

2. Claims that the Draft Groundwater Allocation Rules could conflict with Governor Kotek's effort to establish additional housing are unsupported by available data; cities should be asked for detailed description of their concerns to enable objective evaluation using available water use data.

Claims that the science-based, sustainable groundwater permitting approach developed by the department would conflict with developing additional housing are not supported by data. Because this claim has been voiced largely by cities in central Oregon, we looked at the City of Redmond's Water Management Conservation Plan (WMCP) that was approved by the department. Due to time constraints, we have not yet evaluated the City of Sisters and City of Bend WMCPs in light of this issue. However, a basic review of the City of Redmond WMCP shows why the concern is unfounded.

Exhibit 2-6 shows total monthly demand, with the peak season of May through September in red and the non-peak season in blue. The average monthly demand was 337 MG during the peak season and 95 MG during the non-peak season. The MMD averaged 404 MG and these peaks occurred in July (2017, 2018, and 2021) and August (2019 and 2020).

Exhibit 2-6. Monthly and Seasonal Demand, 2017 through 2021



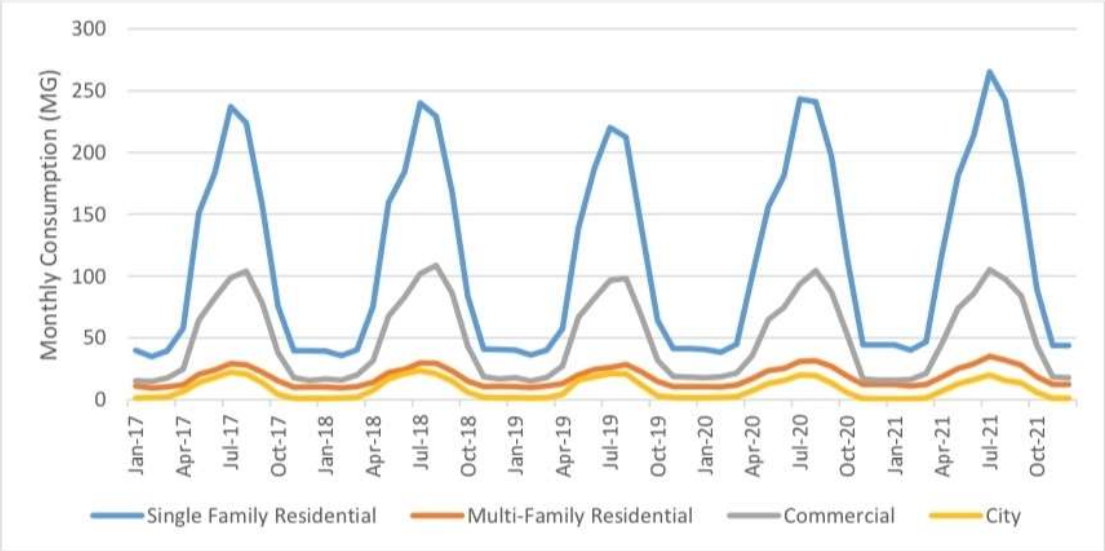
Source: City of Redmond WMCP, Prepared by GSI Water Solutions, Inc., September, 2022 (p. 2-9).

On Figure 2-6, the red bars show the dramatic increase in water use due to outdoor summer water use (e.g. lawn watering and landscape watering). The graph shows that it is *not* household use driving water demand – it is strictly peak summer use driven by outdoor watering. The current water use could support water for far more households by addressing the high peak summer use, for example though better conservation practices including but not limited to landscaping that is more adapted for the amount of water naturally available during the summer months.

It is important to note that currently, the city's average daily demand is only about 25% of its already permitted water rights, and by 2043 the city projects that average daily demand will still be well under 50% of its permitted water rights. (City of Redmond WMCP, p. 5-5). Further, by 2043, the city projects that the maximum day demand will also be approximately 5 cfs less than its permitted water rights. (*Id.*).

To examine this further, Exhibit 2-11 (also from the City of Redmond WMCP), shows how water use for multi-family residential use (shown in orange) is much more flat year round and does not contain the large outdoor water use peak currently associated with single family homes (shown in blue). There appears ample room for conservation practices to free up water needed for additional multi-family housing, or any housing not entailing extensive outdoor watering.

Exhibit 2-11. Monthly Consumption by Customer Category, 2017 through 2021



Source: City of Redmond Water Management and Conservation Plan, Prepared by GSI Water Solutions, Inc., September, 2022 (p. 2-12).

The City of Redmond WMCP also provided this analysis:

> "Average monthly peak season water use in 2021 was 3.5 times higher than non-peak season water use for single-family residential connections (due to outdoor landscape watering associated primarily with large residential lots), down from 4.1 times higher in

> 2017. In addition to the City's water conservation outreach activities, this reduction is likely attributable to a reduction in average lot sizes for single family homes driven by changes in zoning and real estate market dynamics. Average monthly peak season water use for multi-family water service connections is consistently 2.2 times higher than nonpeak season water use. The 2021 multipliers for commercial and City water use were 3.5 and 6.3, respectively.
>
> These ratios suggest that conservation efforts focused on reducing outdoor use by single-family homes and certain commercial customers with large landscape water use, may help to address peak-season demand (see Exhibit 2-10)."

(P. 2-11). This analysis highlights opportunities to provide additional water that could be directed to additional housing through bringing down "outdoor landscape watering associated primarily with large residential lots."

The City of Redmond WMCP also provides other data that highlight water saving opportunities, including a "Maximum Operational Demand," which adds a significant peak to the maximum day demand caused by people turning on their outdoor watering during the same hours each day. (P. 5-3 to 5-5). Addressing that peak, for example with scheduling or reducing outdoor use, or in-city water tanks, could instead provide water for housing.

Finally, the population of City of Redmond was 37,342 in 2022, which the city projects will increase to 56,810 by 2043. (City of Redmond WMCP, p. 5-1). The Mayor of Redmond recently stated: "We have enough water rights that we acquired over the last 20 years to meet a population of 75,000 people." (Redmond Spokesman, *State signals it's likely to deny Redmond's application for future groundwater*, October 16, 2023.) This means City of Redmond is many decades away from needing additional water, if ever, providing ample time to apply modern techniques, programs and transactions, such as implementing lawn watering schedules or restrictions and prioritizing xeriscaping – in order to sustainably meet the city's needs without causing added groundwater declines.

In sum, any statements that central Oregon cities, or any city, must be allowed to acquire additional new groundwater permits need to be objectively evaluated with available data, including data provided in the cities' WMCPs. Reviewing City of Redmond's WMCP shows that there is ample opportunity to provide water for a great deal of additional housing, including by addressing the pattern of water use; that it is not household use driving peak water demand; and that the city's existing water rights provide for a long horizon to develop sustainable strategies.

Thank you for the opportunity to comment and for your continued work on this critically important issue. We look forward to fully examining remaining concerns in the added RAC meetings and to adoption of sustainable groundwater allocation rules following those meetings.

Sincerely,

/S/Lisa A. Brown

Lisa A. Brown
Staff Attorney
lisa@waterwatch.org

The Nature Conservancy
Protecting nature. Preserving life.™

The Nature Conservancy in Oregon
821 SE 14th Avenue
Portland, OR 97214-2537

tel 503 802-8100
fax 503 802-8199
nature.org/oregon

January 12, 2024

Laura Hartt – Water Policy Analyst and Rules Coordinator

Submitted by: Zach Freed, Sustainable Water Program Director

Laura,

Thank you for the opportunity to comment on proposed rule changes to Division 8. I appreciate the time and effort that you and your colleagues have put into this rulemaking process, including the well correlation analysis. At a high level, The Nature Conservancy continues to support the proposed rules and believes the update will be an improvement over existing rules. However, recent changes to the proposed rules in Division 8 have weakened them and stray from the objective to "...be more sustainable and protective of existing water right holders." We have three suggestions to ensure that the Department can meet this objective.

First, the technical well analysis provides good support for the proposed Division 8 rules as they existed in November—that is, restricting 'reasonably stable' to 0.5 feet per year (690-008-001(9)(a)(A)) and 25 feet total decline (690-008-0001(9)(a)(B). The data suggest that these thresholds are robust against "precipitation-correlated wells," because even among those wells a 0.5 ft/yr decline threshold would only affect approximately 15% of potential well clusters and a 25 foot total decline would only affect <10% of potential well clusters. These values are therefore robust against nearly all climate-sensitive wells. The Nature Conservancy proposes keeping these values or making them more protective of the resource.

Second, the technical well analysis states "The observed attributes vary between wells but do not show obvious dependence on location." The rule-writing framework, as described by OWRD in the first meeting presentation, is to ensure that the rules are based in science. If OWRD's technical analysis does not suggest location-dependence, then the groundwater allocation rules should not be able to be weakened by basin program rulemaking in 690-008-0001(9)(d). At the very least, the prior iteration of proposed rules had a minimum threshold—preventing basin program rulemaking from defining "reasonably stable groundwater levels" as a value that is also "excessively declining water levels" (690-008-0001(7)). Based on the rule-writing framework with rules "based in science," The Nature Conservancy strongly recommends that the rules should omit the ability of basin program rules to redefine "reasonably stable groundwater levels", or at least revert to the November version of the proposed rules which retain the minimum thresholds. Otherwise, these rules would fail to achieve the goal of being "more sustainable and protective of existing water right holders" if basin program rules can simply redefine "reasonably stable groundwater" to a less protective, less sustainable rate and magnitude.

Finally, the new “pre-development water level” term introduced to 690-008-0001(9)(a)(B) is problematic. Pre-development water levels will not always be available, and the Department should use the best available data. The Nature Conservancy recommends that the rule should revert to the prior term, “highest known static water level.” This is also more consistent with both the proposed rule test and with the well trend correlation analysis.

Thank you again for the opportunity to comment.

HARTT Laura A * WRD

From: Jaeger, William K <wjaeger@oregonstate.edu>
Sent: Friday, January 5, 2024 3:38 AM
To: HARTT Laura A * WRD
Subject: Follow up comments on December 14th Groundwater RAC meeting

To: Groundwater Allocation Rules Advisory Committee members and OWRD staff

Thank you all for the information and presentations at our December 14 meeting, and for the excellent discussions during the meeting. I have a few comments on the RAC Meeting #7 materials. I will have additional comments after the follow-up session with Ben Scandella next week.

Upon reflection following our December 14, 2023 meeting, I have reservations about the way the "Goals for Reasonably Stable" are being characterized and pursued. I understand that the bullet points on ppt slide 22 are just general ideas, but I think they carry over into concerns I have about the empirical methods proposed that are related to analysis in Ben's Dec 11 memo.

Given the rulemaking objectives stated at the outset last spring to "update groundwater allocation rules to be more sustainable and protective of existing water right holders, both instream and out of stream" it seems that the third bullet point, "Sensitive to decline" has to be the most important. This implies using all information available, or potentially available, to detect a decline as soon as possible so that the decline can be halted, or possibly restored.

The first bullet, "Consistent with hydrogeologic interpretation" I take to mean that one wants to isolate or distinguish evidence of declines due to human activity (including impacts of climate change) from other declines related to 'normal' variations in precipitation and other hydrogeologic processes.

The problem I see is that the other three bullet points are in conflict with the most important "sensitive to decline" goal. For example, if one is thinking in terms of establishing a "confidence interval" (the range of water levels illustrated on page 24) for high water levels that fall within the range of natural (precipitation related) variation, the greater is that range considered to be dynamically stable (i.e., to include 95% of all detrended rates of decline as evaluated in the 12/11 memo), the less sensitive the method is to detecting declines that are <u>not</u> due to natural variation.

Relatively small or early declines due to substantial interference can go unnoticed if they stay within this "range of water levels," or if the observations occur following years when precipitation is high so that these declines are offset by natural phenomena, or also if there are lags in the emergence of evidence of the decline (for example, among wells overlying a groundwater system that is complex, so that declines may take years before the evidence is sufficiently strong, and possibly manifesting itself in nearby but not identical locations – this is something that I don't believe we have addressed in the RAC meetings) that would provide sufficient evidence to trigger the determination of substantial interference.

My understanding (somewhat tentative) is that the proposed method and analysis emphasizes choosing a high threshold for the declines found in the data (e.g., including variations for 90% or more from the detrended data among the wells analyzed) so that "water levels remain stable over 97-99% of time," and finds also that the proposed rate test "remains stable more than a standard test." The emphasis in the analysis seems to be aimed at avoiding a Type I error (claiming that there is evidence of interference when in fact there is none), rather than a method that is emphasizing avoidance of a Type II error (failing to detect a human-caused decline when one has in fact occurred).

A narrow confidence interval is necessary to avoid Type II errors, but a narrower confidence interval will also be in conflict with the stated goal of "Consistent (limited switching between stable and not) within the dynamically stable

range." This particular goal is essentially wanting to avoid Type I errors. You can't have it both ways; you can't place more weight on both. It's zero sum for a given method and data.

What one can do, however, is to use all available data and rigorous statistical methods, to do the utmost possible to minimize both Type 1 and Type 2 errors. But that approach is in conflict with the last two bullet points: "Limit (and define) the burden of collecting water levels" (data), and "Transparent and easy to implement."

"Transparent and easy to implement" is often at odds with rigorous analysis and robust results. I believe that is the case here. On the data issue, I don't recall hearing an explanation for the goal of "limiting the burden of collecting water levels." But it is at odds also with rigorous analysis and robust results. I understand that reporting requirements and the costs of data collection are big issues, but poor and incomplete data hinder the ability of the WRD to do its job, to make water use "more sustainable and protective of existing water right holders, both instream and out of stream." Apparently the state finds itself in a position of having to make decisions about whether new groundwater pumping rights can be permitted in perpetuity, and whether existing water rights can be protected in perpetuity, but be unable or unwilling to insist that comprehensive data on well levels be provided so that the best possible decisions can be made.

I'm looking forward to our next meeting.

Sincerely,

Bill

William K Jaeger
Professor
Department of Applied Economics
213 Ballard Extension Hall
Oregon State University
Corvallis, Oregon 97331
541.737.1419 (phone)
wjaeger@oregonstate.edu

1/12/2024

From: Bill Jaeger
To: Groundwater RAC members and OWRD staff
Subject: a few additional thoughts related to the proposed tests for groundwater stability or decline

I have a few additional thoughts and comments to share following the technical information sessions with Ben Scandella. The session was very useful and helped me to better understand what these methods are trying to accomplish, and what they are not intended to accomplish. I appreciated Ben's explanation of how these current tests are related to a type-I error (a "false negative", or rejecting stability when in fact a well or aquifer is stable), and that they are not intended to evaluate type-II errors ("a false positive," or affirming stability when in fact the aquifer is declining).

I look forward to the proposed approaches to identifying type-II errors. There is an asymmetry in how we might judge the importance of avoiding each type, and what the tradeoffs are. If a false positive leads to approval of an additional permit, this is essentially a pumping right in perpetuity, and so it is an irreversible action and can have very long-term costs. In the case of a type-I error, a false negative, a permit might be denied, but that in no way precludes future applications at a later date if future data once again show 'reasonable stability.'

In thinking about how one might test for the type-II error, I found myself wondering about the "population" and the "sample" involved in coming up with a good test, and how one might evaluate it (test the test). For the analysis we have done so far, the population of interest would seem to be all of the stable wells, or potential stable wells. A sample was drawn from that population (including de-trending to ensure that stability idea). And then the tests give a sense of the variability of stable groundwater levels, say, 90% of the time.

What is the population of groundwater levels that are not stable, but rather are declining? Actually I'm not sure characterizing the population of declining groundwater levels by themselves is very useful. Aren't we interested in being able to identify, as quickly as possible, the transition from reasonable stable to declining? When does that transition begin? When do we see evidence of that transition happening? And what kind of metric or test can do the best job to making that call as early as possible when the transition happens? The "population" of groundwater levels that could potentially go from stable to declining includes, I suppose, all aquifers, but the sample we need is a sample of groundwater levels that actually were previously stable and then became declining. Identifying a good sample of groundwater levels with data where that transition occurred, and then a good test that would quickly recognize the transition as soon as it happens, seems like a big challenge. Isn't it true in some cases that there can be lags between the time when interference (over appropriation) starts and when the water levels begin to show decline (e.g., in complex aquifers)?

I'm writing these notes in the hope that it may be useful for RAC members and OWRD staff, and contribute to our future conversations. One element I want to return to on the empirical methods part has to do with using precipitation data and whether it would make a difference (for the

current tests being discussed) if rather than using average precipitation over the past 2 years, or 6 years, etc., to get the best R-squared, if you instead included these lagged precipitation variables individually. So the estimation would be for groundwater level, W_t in year *t*, as a function of precipitation, *P*, in past years (t-1, t-2, t-3, t-4, etc.). The model could look like this for an estimation with four lagged precipitation variables:

$$W_t = a + b_1 P_{t-1} + b_2 P_{t-2} + b_3 P_{t-3} + b_4 P_{t-4} + \varepsilon$$

While it is true that a groundwater aquifer's geology doesn't change year to year (and so one might think that an average of P_{-1} to P_{-4} would be as good as the equation above, that would not be true if the contribution to groundwater levels is different for precipitation one year ago, versus two years ago, versus three years ago, etc. The estimates of b_1, b_2, b_3 and b_4, can differ. And I imagine that for many aquifers the estimated coefficient b_1 should be larger than b_2 and b_3, as the influence of past years' precipitation diminishes with time. If that is true, then you'll get a better fit and higher R-squared with this kind of "distributed lag" model. I'm going into some technical detail here because my intuition tells me that in the case where we are wanting to discern, as early as possible, evidence of the transition from stable to declining, this could be important.

One last item; one I think is quite important. The analysis of correlations with precipitation can be seen as a way to separate a source of "noise" from a "signal." The precipitation effects are the "noise" and if we can understand how much variation in water levels are due to that "noise" then we are better able to see the "signal" – which may be zero if the water level is stable. I think that especially in the case of wanting to identify the type-II errors, we can do a lot more if we switch this around and use a regression model to estimate or predict how water level changes are affected by last years precipitation, and the year before, and the year before that, etc. When I say "predict" I do not mean predict the future, but rather predict, for example, what the water level in well X would be (based on our estimated relationship) in year 2020 due to precipitation for each of the previous 6 years, for example. If the actual water level is lower than this predicted level, that may be evidence of a decline, or just other kinds of "noise" not due to precipitation. But with this kind of approach, estimating a regression model, applying it to past data, my sense is that the divergence between the predicted water level and the actual water level, year over year, could be a very good predictor of the transition from stable to declining water levels. This kind of approach is used in many applications in economics and other fields.

One positive side-effect of having aquifers where water levels have in fact declined in the past, is that if there are good samples of data for wells where in the past a transition was made from stable to declining, one can use that data to evaluate alternative methods, and see which ones worked best to identify the transition the soonest.

Sorry for the lengthy and detailed discussion. I hope others find it useful, or at least thought provoking.

Oregon Ground Water Association
P.O. Box 21285 Keizer, OR 97307-1285
(503) 390-7080 Fax (503) 390-7088
www.ogwa.org

January 5, 2024

Ms. Laura Hartt
Water Policy Analyst/Rules Coordinator, Policy Section
Oregon Water Resources Department
725 Summer St. N.E. Ste. A
Salem, Oregon 97301

RE: Comments on Proposed Groundwater Allocation Rules

Dear Ms. Hartt:

On behalf of the Oregon Ground Water Association, I am providing the following comments in response to the proposed draft rules as presented and discussed in the seventh RAC meeting on December 14, 2023.

The population of the planet continues to grow, especially in underdeveloped countries. We will continue to have the need to produce more food to feed the world, so it would seem foolish to intentionally forgo opportunities to finish developing the limited amount of prime farmland that is not covered with water rights. But that is exactly what the proposed groundwater allocation rules will do in their current form.

The current proposed rules rely on three basic tests to allow issuance of a new groundwater right permit. These three tests are: 1. Reasonably stable water levels, 2. No potential for substantial interference with surface water, and 3. Groundwater is available within the capacity of the resource. As I have said in previous comments in RAC meetings and in testimony before the Commission, these three tests form the legs of a three-legged stool. If any one of these tests (i.e., legs of the stool) fails, the stool will collapse and a permit cannot be issued. The third test, or leg of the stool, which is whether groundwater is available within the capacity of the resource, is pretty straightforward, since it only requires that the requested rate of pumping does not exceed what could be expected from a similarly constructed well in the area. This standard should not be too much of a challenge for an applicant to meet or for the Department to verify. Which really leaves us with two main challenging issues to address with these rules: reasonably stable water levels; and the potential for substantial interference with surface water.

REASONABLY STABLE WATER LEVELS

Throughout the rulemaking process, there has been a strong emphasis on developing rules that were firmly based in sound science. The Department has recently put a great deal of effort into developing a system for determining if water levels are reasonably stable. While there may still be some work to do, the whole approach for determining if groundwater levels are reasonably stable that was recently

presented to the RAC appears to live up to the objective of developing rules well founded in science, and I applaud the Department's efforts on this issue.

POTENTIAL FOR SUBSTANTIAL INTERFERENCE

I believe there still remains much work to be done to develop a solid, science-based foundation for determining if there is substantial interference with surface water. First, there must be a determination if there is a hydraulic connection between the proposed well(s) and nearby, effected surface waters. If there is a hydraulic connection, and the impacted stream is shown to be over-appropriated according to the WARS database, there will be a finding of the Potential for Substantial Interference (PSI). A finding of PSI will toll the death knell for that application. Inherent in making the PSI determination is the assumption that *any* degree of hydraulic connection with a stream that is already over-appropriated (according to WARS) will result in "substantial interference" with that stream. This assumption seems to be based largely on the principals discussed in the US Geological Survey report by Barlow and Leake (USGS, 2012). Barlow and Leake describe how, under very specific hydrogeologic conditions, a pumping well will eventually cause depletion of a nearby stream in an amount equal to the full pumping rate from the well (USGS, 2012). To model these impacts, the Department may use certain simple analytical models for estimating streamflow depletion, such as Jenkins (1968, 1970) and Hunt (1999, 2003). The way these simple models operate, it is impossible to get a result of zero stream depletion, especially if the models are run "...over the full term of the proposed or authorized groundwater use..." (proposed OAR 690-009-0040(4)), that is, in perpetuity. Concerns about these various factors are discussed in further detail, below.

Hydraulic Connection

We have been told that the Department will not change how they determine hydraulic connection for these new rules. Consider, however, that the distance limits imposed by the existing rules (i.e., ¼ mile and 1 mile) will no longer be in effect. This means the Department can look for hydraulic connection with streams at any distance from the proposed wells. There needs to be practical limits on how far to look for hydraulic connection. For example, does is make sense to go beyond the boundaries of the water availability basin in which the proposed well is located? Also, when in the Willamette Valley, does it make sense to even consider hydraulic connection with nearby, shallow streams when there are several tens of feet of Willamette Silt overlying the shallowest productive water bearing zone?

As stated in Justin Iverson's Master of Science Thesis (Iverson, 2002), "...the low hydraulic conductivity of the [Willamette Silt] provides a hydraulic buffer to depletion of streams bottoming in the WS [Willamette Silt] under pumping stress generated in the underlying WA [Willamette Aquifer]. Volumetric balance analysis shows that less than 1% of the water removed from the aquifer at a pumping well near the river was recharged to the Willamette Silt from the Pudding River." These results were from an analysis of a pumping well located only about 100 feet from the Pudding River and screened in the Willamette Aquifer only a few feet below the bottom of the Willamette Silt. Limitations under the existing rules constrain locating new wells to distances more than ¼ mile (1,320 feet) from any nearby stream. Furthermore, many irrigation wells are completed at greater depths to develop more productive water bearing zones which are further separated from the overlying Willamette Silt by intervening semi-confining layers of silt and clay. Therefore, the findings in Iverson's thesis likely represent a worst-case scenario. This suggests that making an assumption of hydraulic connection based on the theoretical possibility that it may occur at some infinitesimal level is not a method based on sound science.

Barlow and Leake Report

The Department seems to be relying completely on the theories presented in Barlow and Leake (USGS, 2012) to assume that pumping a well will result in stream depletion equal to the full pumping rate for any nearby, hydraulically connected stream within some reasonable timeframe. These theories are only strictly applicable to a system where a single, unconfined aquifer is discharging to a single stream. Barlow and Leake (USGS, 2012) states:

> *In many areas of the United States, groundwater systems are composed of a vertical sequence of aquifers in which an upper, unconfined aquifer is underlain by a series of one or more confining beds and confined aquifers, such as is illustrated in figure 1 [below]. In many other areas, however, the ground-water system consists of a single, often unconfined, aquifer underlain by geologic formations, such as crystalline rock, whose permeabilities are so low that the formation can be assumed to be impermeable to groundwater flow. Aquifers of this type are used throughout the report to illustrate many of the factors that affect streamflow depletion by wells.*

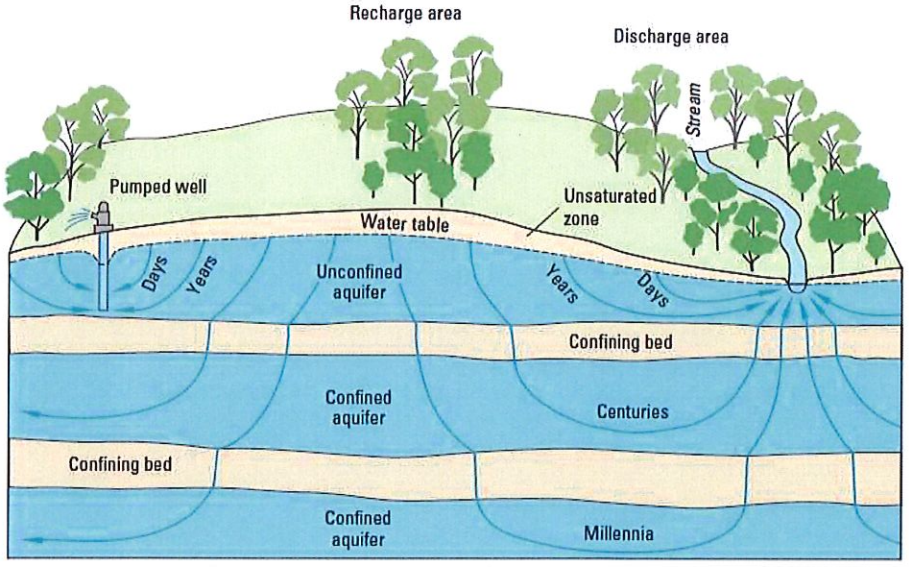


Figure 1. Groundwater flow paths in a multi-aquifer groundwater system. Groundwater flows from recharge areas at the water table to discharge locations at the stream and well. The residence time of groundwater can range from days to millennia (modified from Winter and others, 1998).

If it is not clear from the above quote, the principles discussed in the Barlow and Leake report are directly applicable only to systems consisting of a single, unconfined, aquifer underlain by effectively impermeable geologic formations. Throughout Oregon, most aquifer systems which are hydraulically connected to surface water do *not* fit that description, but are instead more likely to be characterized by a groundwater system similar to what is shown in Figure 1, above, which is to say, a much more complex system consisting of multiple layers of confining or semi-confining beds and confined or semi-confined aquifers. In the Willamette Valley, the groundwater system is similar to what is shown in Figure 1, but with a thick layer of Willamette Silt over the top of everything. In most places, the Willamette Silt is so thick that the nearby streams are not even close to incising all the way through it. Consider, therefore, the common situation where you have an irrigation well constructed to develop water from a deeper water-bearing zone, illustrated by the deepest confined aquifer shown in Figure 1, above. Even *without* the presence of the Willamette Silt, the time for a pumping impact to reach the nearby stream from this deep well could be on the order of millennia. If you factor in the presence of several 10s of feet of Willamette Silt separating the bottom of the stream channel from the uppermost water-bearing zone, the possible pumping impacts from a deep well will be considerably reduced even

further. Furthermore, none of the assumptions used in Barlow and Leake (USGS, 2012), or in the Jenkins (1968, 1970) and Hunt (1999, 2003) models, account for the upward flow of groundwater through an underlying aquitard that is induced from pumping in a shallower aquifer, as described by Butler, et al. (2007). According to Butler, et al. (2007), upward flow (leakage) through an underlying aquitard becomes an increasingly important component of the recharge to pumping wells with increasing distance from the stream.

It should be clear from these discussions that there are far too many complexities in these groundwater systems to be able to reliably predict the impact on individual streams following the assumptions and using the simple models typically employed by the OWRD. Thus, the broad application of these theories and models to the very complex aquifer systems found throughout most of the state is just not consistent with the objective of developing sound science-based rules.

The time frame for estimating potential pumping impacts on streams must also be considered. The currently proposed rules allow for estimating pumping impacts for the expected life of the water right. For a permanent water right, that means into infinity. As discussed above, under many circumstances, the theoretical pumping impacts to streams may not be realized for thousands of years. It is reasonable to expect that the way we cultivate and irrigate crops will continue to evolve, and in just 50 to 100 years we will likely be farming much more efficiently and using much less water than today. So, does it make sense to run the analytical stream depletion models (such as the Jenkins or Hunt models) out more than several decades? To do so with the assumption that the use will remain the same in perpetuity is not in keeping with the intent to write rules based in sound science.

Water Availability Reporting System (WARS) Database

One primary area of concern is the reliance on the current WARS database to determine that a nearby stream is over-allocated, which will trigger a finding of PSI. This use of the WARS database relies on two assumptions: 1. that the WARS database is an accurate measure of the water available in the stream; and 2. that surface water availability is a relevant factor in determining if groundwater is available for additional development. Each of these assumptions is discussed further below.

Accuracy of WARS Database. The WARS database was developed in the early 1990s using streamflow data from 1958 through 1987, and estimates of irrigation consumptive use based on the crop water requirements of the types and acreages of crops grown in Oregon in 1990 (OWRD, 2002).

Probably the main uncertainty with reliability of the WARS database lies with the estimates of irrigation consumptive use. It is probably fair to assume that these estimates were reasonably accurate at the time they were made. However, in the 34 years since these estimates were made, economic and market factors have forced many farmers to adopt more efficient methods of irrigation. Also, since that time, few additional acres of irrigation from surface water sources have been approved. Therefore, it is possible, even likely, that the consumptive uses in 1990 were significantly greater than they are today. This would result in the WARS database over-estimating consumptive use and thereby underestimating actual water availability. In any event, the WARS database is outdated and may not be a reliable measure of surface water availability.

Another concern about the WARS database is how instream water rights are incorporated into the surface water availability calculations. The WARS database provides surface water availability at two exceedance levels, 50% and 80%. This means that at 50% exceedance levels, the amount of available water shown in the database is expected to be met or exceeded 50% of the time. Similarly, at 80% exceedance, the amount of available water shown in the database is expected to be met or exceeded 80% of the time. So, a 50% exceedance level is a lower bar than an 80% exceedance level. Instream

water rights are established based on how much water is available at 50% exceedance (the lower bar). However, the instream water rights established at 50% exceedance are subtracted from the 80% exceedance flows (the higher bar) to derive water availability at 80% exceedance. This process is completely illogical and unscientific, and only results in further diminishing the 80% exceedance flows, which are the flows applied when evaluating a new groundwater permit.

Relevance of Surface Water Availability. If groundwater levels are determined to be reasonably stable, then the aquifer fits the definition of a sustainable groundwater source in accordance with Gleeson et al. (2020). This would suggest that groundwater is available for further development. However, if a new well is proposed to develop water from that stable aquifer, and that well is determined to be hydraulically connected to a stream that is over-appropriated according to the WARS database, then the proposed new use will be summarily denied. This seems to conflate surface water availability with groundwater availability, and raises a number of questions. First, we need to understand how the surface water sources came to be over-appropriated. Did the OWRD simply approve too many surface water rights before they had a better idea of how much water was available? Has the State issued too many instream water rights which in many cases has resulted in over-allocation of streams? Do we even need to consider the WARS data when groundwater levels are determined to be stable?

Fundamentally, if groundwater levels are stable, the aquifers will continue to discharge water to the streams as they always have. Therefore, when groundwater levels are stable, it seems that surface water availability is completely a function of the out of stream consumptive uses and instream demands. In other words, when the groundwater system is stable, surface water over-allocation must be the result of other factors that are separate and independent of the groundwater system. This suggests that the primary determining factor for allowing a new groundwater use *should be reasonably stable groundwater levels*.

RECOMMENDATIONS FOR CONSIDERATION

I have discussed a number of concerns related to making a determination of PSI in the proposed new rules. They include:

- Broadly theoretical assumptions of hydraulic connection;
- Too much reliance on broadly applied hydrogeologic theory from Barlow and Leake (USGS, 2012);
- An outdated WARS database; and
- Irrelevance of surface water over-allocation when groundwater levels are stable.

All of the above issues illustrate that the methodology in the proposed rules for determining PSI do not meet the same scientific standard that is currently being applied to the rules for determining if groundwater levels are reasonably stable. The proposed rules for determining PSI are really just a rubber-stamp process for denial of new applications. This would be fine if the Department was only concerned with protecting fish. However, the Department is obligated by law to balance allocation of the state's water resources for all uses.

If the Department is truly committed to developing *all* of the groundwater allocation rules to the same science-based standard, then more time needs to be dedicated to developing the rules for determining PSI. At a minimum, the determination of reasonably stable water levels should become the primary, real-data, science-based factor for determining groundwater availability. A finding that groundwater levels are reasonably stable should be sufficient to determine that groundwater is available for further

development, unless there is clear evidence that hydraulically connected surface water sources are experiencing historically declining flows. This evidence could be from the record of surface water regulation or historical streamflow measurements.

I don't claim to have all of the answers. There may be other factors that could be considered. It might require formation of a blue-ribbon work group of hydrologists, hydrogeologists, and water rights experts to come up with a comprehensive set of recommendations. If so, it would necessarily mean a pause in finalizing the rules, but the delay would not need to be unduly long. There is a lot at stake and so it is important that we get these rules right while we still have the chance.

Respectfully,

Gregory E. Kupillas, R.G., C.W.R.E.
Pacific Hydro-Geology Inc.
Chair, Government Affairs Committee
Oregon Ground Water Association

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January 5, 2024

Ground Water RAC 7 Comments

To: Oregon Water Resources Department

From: The League of Oregon Cities and Special Districts Association of Oregon

We are writing on behalf of the League of Oregon Cities (LOC) and Special Districts Association of Oregon (SDAO) to express our support for the proposed changes in the Oregon Water Resources Department's most recent DRAFT Division 8 rules dated 12/14/2023.

Specifically, we are supportive of the decision to eliminate language that would have restricted the Commission from adopting a basin program rule that supersedes elements of the statewide definition of "reasonably stable groundwater levels" concerning the rate and magnitude of decline (DRAFT OAR 690-008-0001(9)(d)). We believe removing such constraints is a positive step forward.

We agree that it is unnecessary for the proposed rules to impose limitations on future Commissions when considering the adoption of *basin-specific rules*. Additionally, recognizing the diverse local conditions, we support the notion that alternative approaches may be more appropriate than a one-size-fits-all strategy outlined in statewide rules.

LOC and SDAO believe it is sensible to provide flexibility for local stakeholders, contingent upon the Commission's approval through a basin program rulemaking process.

Thank you for your attention to this matter, and we trust that these changes will contribute to a more effective and adaptable regulatory framework.

Thank you,

Michael Martin, League of Oregon Cities

Mark Landauer, Special Districts Association of Oregon

CENTRAL OREGON CITIES ORGANIZATION

Bend, Culver, La Pine, Madras, Maupin
Metolius, Prineville, Redmond, Sisters

1/4/2024

Central Oregon Cities Organization (COCO) is providing these comments as follow-up to the RAC meeting held on December 14, 2023.

1) **OWRD Draft Memo: "Analysis of Oregon wells correlated with precipitation"**

On December 11, three days prior to the most recent Groundwater Allocation Rules Advisory Committee (RAC) meeting, OWRD issued a draft memo, "Analysis of Oregon wells correlated with precipitation" (Memo). Due to the complexity of the analysis described in the Memo, and limited opportunity to review its methods and how they relate to OWRD's policy recommendations with respect to the Groundwater Allocation draft rules, COCO is only able to submit limited comments at this time. We appreciate that OWRD is setting up additional technical discussions to discuss the Memo. COCO will provide additional input following the technical sessions.

COCO questions basing state policy on this work because it may mischaracterize the primary influences on groundwater- level change in wells used for the analysis, and the hydrologic uncertainty of 'similar' wells in the clustering exercise. An example for the former: the Deschutes well example (DESC 3016) demonstrates a general lack of understanding of the complex interactions within a flow system that manifests itself as groundwater-level change over time. Instead of accepting the R squared value of .2 for the correlation with precipitation, the analyst should have examined why groundwater levels went up during times when precipitation rates were generally constant. The answer is that changes in surface water (canal losses and streamflow losses) account for changes in the hydrograph for the Deschutes example - only indirectly related to changes in precipitation.

Moreover, COCO is concerned that arbitrary constraints applied in defining precipitation-correlated wells precludes consideration of important information about the duration and magnitude of water level cycles and rates of decline in *actual* precipitation-correlated wells. To identify precipitation-correlated wells, the memo states that "the set of wells analyzed was restricted to those where declines are limited to less than 0.5 feet per year over the period of record." OWRD did not provide a justification for this choice.

Additionally, wells were "required to be correlated with precipitation" based on a "backward-looking moving average window with durations of 2 through 10 years reflecting the range of typical recharge times in Oregon." But this time frame is not typical in the Deschutes Basin. Research by OWRD and USGS in the Deschutes Basin found that water levels in wells far from the Cascade crest in the Upper Deschutes Basin are influenced overwhelmingly by precipitation

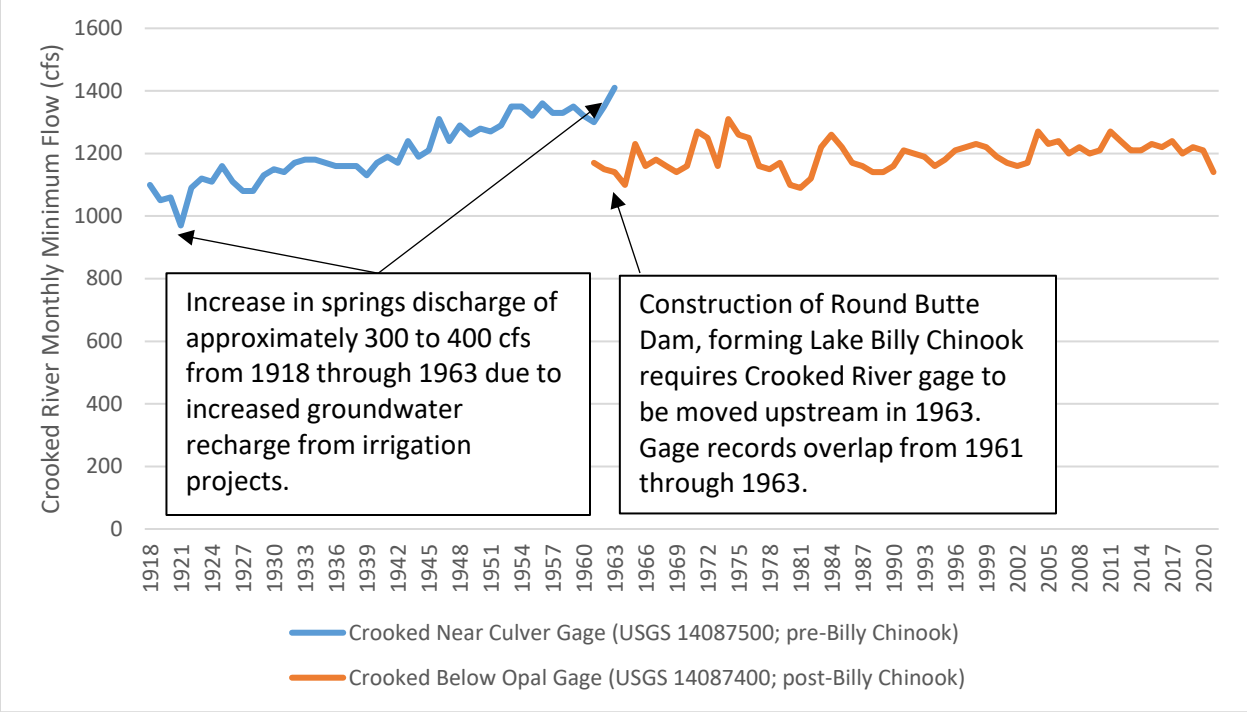
and would, even in the absence of canal piping and groundwater pumping influences, have declined at rates of more than 0.5 feet per year for durations of greater than 11 years (Gannett and Lite 2013). The artificial constraints OWRD imposed upon its sample result in an underestimate of the timescale and magnitude of the dynamically stable range for groundwater sustainability, particularly as applied to the Upper Deschutes Basin. Groundwater response times (GRTs) in excess of 50 years are consistent with OWRD's selected guidance on the topic (Cuthbert et al. 2023; Gleeson et al. 2020), as is the concept that GRT can vary spatially even within the same aquifer. So, there's no support in the literature for OWRD to artificially restrict its evaluation to such a limited sample of wells or such a short GRT.

2) **Update to definition of "Reasonably Stable" – Defining Pre-Development Water Levels**

OWRD's latest DRAFT Division 8 rules (12/14/2023) propose to change the benchmark against which current water levels are compared from the "highest known" static water level to "pre-development" static water levels. (DRAFT OAR 690-008-001(9)(a)(B)). OWRD did not provide additional information as to how "pre-development static water levels" would be defined.

COCO supports the inclusion of a framework within the draft rules for comparing current water levels to a pre-development water level that considers the history of land use and influence of human activities on water levels from the 19th century through the present. This type of approach is especially important to maximize the benefits of the significant federal and state funding being deployed to increase the efficiency of agricultural irrigation. The piping of irrigation canals provides myriad benefits but may result in groundwater level declines as artificial recharge of aquifers from canal leakage is reduced. COCO members actively support large-scale investments in agricultural efficiency, but under previous versions of OWRD's proposed rules, COCO members would be penalized, as "highest-known water levels" reflect water levels under conditions of significantly greater artificial recharge than is possible under current conditions.

Due to the influence of groundwater discharge on surface water flows in the Upper Deschutes basin, OWRD is fortunate to have a robust dataset documenting the relationship between development of surface water irrigation and groundwater levels. The chart below shows the minimum monthly flow of the Crooked River below Opal Springs from 1918 through the present. At this location, under low flow conditions, the flow of the Crooked River is nearly entirely supported by discharge from springs within an area extending from Osborne Canyon to below Opal Springs. The increase in spring discharge from 1918 through 1963 and beyond illustrates the influence of canal leakage and on-farm losses on the highly porous groundwater flow system in the Upper Deschutes Basin. **The increased discharge from Opal Springs during this time period indicates that groundwater levels in the central part of the Upper Deschutes basin were significantly lower in 1918 than they are today.** Given the robust availability of irrigation diversion data in the Upper Deschutes basin, an estimate of pre-development groundwater levels could be simulated with relative ease using the USGS groundwater flow model of the Deschutes basin (see, e.g., Gannett et al, 2017). Given the ramifications of this statewide rulemaking, COCO requests that OWRD conduct such an analysis to guide the outcome of this effort. COCO applauds the Department for taking this basic step to recognize and pre-empt unforeseen impacts of the agency's own award of grant funding to irrigation efficiency projects on Upper Deschutes Basin groundwater users.



3) **Update to definition of "Reasonably Stable" – Opportunity for Basin Program Rule to Supersede**

OWRD's most recent DRAFT Division 8 rules (12/14/2023) propose to remove language that would have prevented the Commission from adopting a basin program rule superseding elements of the statewide definition of "reasonably stable groundwater levels" with respect to the rate and magnitude of decline. (DRAFT OAR 690-008-001(9)(d)). COCO supports this change. As outlined above, it would be inappropriate for the proposed rules to put sidebars on the opportunity for future Commissions to adopt place-based, basin-specific rules, particularly in the Upper Deschutes Basin where the timescale and magnitude of the dynamically stable range for groundwater sustainability and the human influence on water level changes are well understood. Furthermore, local conditions may support alternative approaches to the one-size-fits-all approach outlined in the statewide rules. In basins such as the Upper Deschutes with the capacity to engage in collaborative rulemaking, it makes sense to provide flexibility for local stakeholders, subject to the Commission's approval through a basin program rulemaking.

4) **Basin-scale rulemaking is a long-term investment. A bridge is needed.**

For the reasons outlined above, the Upper Deschutes basin does not fit neatly into the regulatory framework the Department is pursuing. New groundwater permits in the Upper Deschutes Basin already require that applicants offset their impacts to surface water flows. And groundwater declines are overwhelmingly driven by fluctuations in precipitation, albeit over longer time periods than in basins where water levels are so strongly correlated with Pacific Decadal Oscillation. Likewise, the basin's water users and environmental community enjoy a long history of collaboration. That is why it's important that the Department retains the mechanism under the proposed rules for basins with unique hydrogeologic conditions and collaborative capacity to create their own benchmarks for successful groundwater management.

The basin-scale rulemaking required to recognize the unique context of the Upper Deschutes Basin will be a big lift, both for stakeholders and for the Department. It will likely be years before rules appropriate to the Upper Deschutes basin are adopted. In the interim, the Upper Deschutes Basin is likely to continue to be the fastest growing region in the state. Policymakers have made expanding housing supply the top priority in the years to come. It is vital that the Department provide a temporary bridge that ensures water suppliers access to new water rights sufficient to meet their projected 20-year demands.

COCO's members have made significant investments in water conservation and are confident that those investments will reduce per capita water demands in the coming years. But even as per capita water demands have sharply declined in recent years, water suppliers projected future maximum demands have increased. This is due to two major factors:

1) Actual population growth has exceeded projections.
2) Although per capita demands have declined, especially during the summer months, water demands have become increasingly concentrated during the overnight and early morning hours. This partly reflects adoption of local ordinances disallowing the use of water for landscape irrigation during the day.

To allow increased operational flexibility to meet water demands, while requiring accountability for implementation of conservation efforts, COCO proposes that OWRD modify its proposed rules to allow issuance of new permits authorizing a higher *rate* of use, while limiting the total *volume* of water use to an amount already authorized. COCO proposes including the following language under the definition of "Water is Available."

> *Water is available for a proposed groundwater use in the Deschutes Basin Groundwater Study Area if the application proposes to limit the total volume of the proposed water use to an amount already authorized under an existing permit or permits identified in the application, provided that the identified permit or permits:*
>
> *a) are held by the applicant;*
> *b) are for the same character of use;*
> *c) require mitigation consistent with the Deschutes Basin Groundwater Mitigation Rules; and*
> *d) are in good standing.*

Sincerely,

Mike Buettner

Michael Buettner, Co-Chair Central Oregon Cities Organization Water Subcommittee

Cc: COCO Members

To: Laura Hartt, Justin Iverson, Annette Liebe and Ben Scandella, Oregon Water Resources Department

From: Tamara Wood, PhD, for Oregon Lakes Association

Date: January 11, 2024

Subject: Comments Following December 14 Meeting of RAC and Technical Information Session on January 8

Hello Laura, Justin, Annette and Ben,

The December 14th meeting was lively with good discussion. The follow-up technical session with Ben was very informative. OLA once again appreciates the work that the Department puts into preparing for these sessions, and the opportunity to participate in these important discussions.

OLA's big-picture position on the proposed updates to the rules is that we find these rule changes to be, while not perfect, a big improvement over the current rules. They rely on the science-based principles of hydraulic connection and streamflow capture to establish PSI rather than encoding arbitrary time, distance and pumping thresholds as in the current version of 690-009-0040(4)(a)-(d). The establishment of defensible thresholds for groundwater level variability based on a rigorous definition of reasonably stable groundwater levels also is a big improvement. The four comments that follow pertain to the methodology for determining reasonably stable groundwater levels and the policy decisions that will be made regarding thresholds in 690-008-0001(9)(a), with reference to Ben Scandella's memo dated December 11.

1. Type II errors are as important as Type I errors.

As I said in the technical session, I think the test results shown in figs. 14, 16-18 can be framed as a test of the null hypothesis that levels are reasonably stable. The Department has, for understandable reasons, placed a high priority on not making Type I errors (falsely identifying a stable well as not stable). However, the original objective given for the rulemaking exercise was that the rules be more sustainable and protective of existing users. This objective is directly affected by Type II errors (falsely identifying an unstable well as stable). When determining the thresholds for reasonably stable levels that ultimately end up in the rules, it would be appropriate to accept a higher incidence of Type I errors as a tradeoff for a lower incidence of Type II errors. In fig. 14, for example, requiring 90% of clusters to pass the test implies a threshold of about 23 ft for the dynamically stable range, whereas requiring only 75% or 80% of wells to pass would imply a threshold between 15 and 17 ft.

Nothing in the analysis presented has shown how the proposed tests perform in terms of Type II errors. A subset of obviously unstable wells could be tested as an end point, but this doesn't demonstrate how the tests would perform with wells that are not so easily categorized. One way to approach this would be to randomly sample the database (after removing the dynamically stable wells already used in the analysis) for a comparably sized subset (~200) of wells and run them through the tests. The fraction of wells in the randomly sampled subset passing the tests

should be meaningfully smaller if Type II errors are limited. This could be done multiple times by randomly sampling new subsets with no replacement.

2. The largest multi-year decline is sensitive to the choice of minimum initial span for the rate test.

The sensitivity analyses show little sensitivity of the method to the parameters chosen, except for the minimum initial span for the rate test. Figure 13 shows that the percentiles in the maximum 5–20-year rate of decline don't start to level off until about 15 years, indicating that a minimum initial span of 15 years would be more appropriate than 10 years.

3. Pre-development water level is not necessarily the appropriate reference for measuring water level decline.

The threshold that will ultimately be substituted for "XX" in the proposed 690-008-0001(9)(a)(B) will be derived by compiling the largest declines between annual high water level maxima and subsequent minima in a set of stable groundwater hydrographs, as outlined in the memo. Based on the examples provided, these declines generally occur over a few to 10 years. The use of "pre-development static water level" implies a long-term trend over many decades and leads to a concern that the rule can be interpreted to mean that the decline in water level should always be considered relative to the earliest measurements, regardless of where in climate-driven cycles those measurements began, and whether a shallower annual high level has occurred more recently. The rules test should be applied in the same way the threshold is derived—relative to a preceding maximum, regardless of whether that maximum unequivocally represents "pre-development" conditions.

4. The presentation of the material could be made more understandable by using more precise and consistent language.

This doesn't directly affect the language in the rules, but it would help people understand the process used to inform the thresholds that ultimately end up in the rules. Here are the terms I had the most trouble with, with suggestions for a better substitute:

> **total decline/maximum decline/total maximum decline:** This sounds like the long-term multi-decadal trend over an entire record, but in the memo, it refers to a 2-10 year decline in annual high water levels. Sometimes **characteristic decline** is used to mean the same thing, but that implies some type of average, whereas this value is a maximum over the record. The graph titles use **largest decline**; a more accurate variation would be **largest multi-year decline** or **largest recoverable decline**. **Dynamically stable range** is a good choice, unless you want to make the distinction that the largest multi-year decline is just an estimate of the more theoretical dynamically stable range.
>
> **maximum rate of decline/decline rate/fastest rate:** This is confusing because when you look at any of the well level time series, as shown in figs. 1-6 for example, it's clear that there are many year-to-year declines that are far bigger than the number arrived at with the analysis. As I understand it, you first take the *minimum* rate of decline over a 5-20 yr-window ending at a given year (the minimum of 16 values paired with each year, if

there's no missing data), and then take the *maximum* of those values among the years in the record. I admit to some confusion as to why the minimum slope is chosen to be paired with each year rather than the median slope, but the effect is probably to give more weight to the longer end of the analysis window, which I think is appropriate. I would suggest using the term **maximum 5–20-year rate of decline,** even though it's a bit unwieldy, because it is more accurate.

averaging period: The 5–20-year window preceding each year over which slopes are calculated is referred to as the averaging period, but if I understand the method correctly, there's no averaging being done. Rather, the minimum slope is selected to be paired with the end year. The term "**5–20-year analysis window**" is more accurate.

HARTT Laura A * WRD

From: Siler, Nicholas <nick.siler@oregonstate.edu>
Sent: Wednesday, December 13, 2023 2:43 PM
To: HARTT Laura A * WRD
Subject: Re: 7th Groundwater Allocation RAC Meeting (via Zoom/Salem), Thurs. 12/14/23 (8:30 am - noon)
Attachments: OWRD_drought_summary_Dec_2023.pdf

Hi Laura,

In case you haven't seen this, I wanted to pass on the nontechnical summary of the report on historical and future drought in Oregon that our group at OSU put together this summer. The section on future projections may be of particular interest to your team.

See you tomorrow,

-Nick

From: HARTT Laura A * WRD <Laura.A.HARTT@water.oregon.gov>
Date: Wednesday, December 13, 2023 at 2:27 PM
To:
Subject: FW: 7th Groundwater Allocation RAC Meeting (via Zoom/Salem), Thurs. 12/14/23 (8:30 am - noon)

[This email originated from outside of OSU. Use caution with links and attachments.]

Good afternoon,

We have updated the presentation slightly, so I've attached the revision and reattached the other meeting documents. You should also have an updated Outlook calendar appointment, for those who use Outlook.

See you all tomorrow! Laura

Laura Hartt (she/her/hers)
Water Policy Analyst I Tribal Liaison
725 Summer St NE Suite A l Salem OR 97301 l Phone 971-720-0963 l Laura.A.Hartt@water.oregon.gov

OREGON WATER RESOURCES DEPARTMENT

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HARTT Laura A * WRD

From: SCANDELLA Benjamin P * WRD
Sent: Tuesday, January 9, 2024 3:56 PM
To: Karyn Hanson; ORLOWSKI Dennis R * WRD
Cc: HARTT Laura A * WRD
Subject: RE: Comment on Groundwater RAC discussion

Thanks Karyn!

FYI Laura, in case public comments go into the record at this point.

Cheers,
Ben

From: Karyn Hanson <kghkeatingeng@gmail.com>
Sent: Tuesday, January 9, 2024 11:20 AM
To: SCANDELLA Benjamin P * WRD <Benjamin.P.Scandella@oregon.gov>; ORLOWSKI Dennis R * WRD <Dennis.R.ORLOWSKI@water.oregon.gov>
Subject: Comment on Groundwater RAC discussion

Hello Ben,

I hope you are well! I am SUPER impressed with the way the staff in the groundwater section are handling the RAC discussions. I have been in those places and wish I had the kind of communication skills that both encouraged engagement and kept the technical issues grounded and understandable. I did most of the compliance statistics for our combined sewer overflow program at the City of Portland under the supervision of an engineer who I think understood the statistics as well as you do and had to represent the City to the EPA under our stipulated order. So my praise is well informed. Thank you to all of you who are doing a really great job!

I was thinking through yesterday's presentation and realized that my approach here on Chehalem Mountain has some value when folks are talking about regional considerations. I know you are trying to balance having a simple, objective approach that reduces subjectivity on the hydrogeologists' part in groundwater analysis and avoids overburdening permit holders with data collection.

I do think that evaluating the run off and scaling the use is valuable. This has been how I have looked at our concerns here. I don't have the resources yet to actually do the analysis but we are making progress on that. "We" includes the soil and water conservation districts in each county.

I think considering the runoff could help improve your regression correlation factor relative to precipitation and that could help characterize regional differences. I understand the challenge of the fact that our statistics look backward in order to describe and that predictions are difficult as quickly as rainfall intensities are changing. I do think we need to get our heads around it anyway. In some jurisdictions I have seen use of the 500 year storm under some design circumstances. I think this is an attempt to deal with the unknown future but I am not sure it is very practical. I remember in the early 2000's requiring developers to build storm water detention "swimming pools" all over the place to ensure capture of the 25 year storm. Hydrology evolved after that to catching and slowing the smaller, more frequent storms. So we can adjust.

Scaling the use would address the piece of the puzzle that seems a little under addressed by the statistical work. It may not be predictive but it does describe what is actually at stake if declines become significant. I hoped to simply do a summation of all approved water rights and perhaps a stab at domestic wells. The water balance is a challenge but still offers a helpful picture.

This may sound like too much but perhaps it could be done in specific areas where there are higher tensions. We worked under a stipulated order to reduce sewer overflows in the City of Portland. I think we spent about 5 years modeling 40 basins in the City. Those models became invaluable for capital budget planning and for design. They were the basis of our entire Asset Management program.

Thanks again for your good work Ben!

Karyn Hanson

Karyn G. Hanson, PE
KGH Engineering - Water Resources
17000 NE Slope Lane
Newberg, OR 97132

971-385-9345

PNWS-AWWA

January 8, 2024

Ground Water RAC 7 Comments

To: Oregon Water Resources Department

From: The Oregon Water Utility Council

I am writing on behalf of the Oregon Water Utility Council (OWUC) that is a member organization of the Pacific Northwest Section of the American Waterworks Association representing Oregon Water Utilities. We are writing to express our support for the proposed changes in the Oregon Water Resources Department's most recent DRAFT Division 8 rules dated 12/14/2023.

Specifically, we are supportive of the decision to eliminate language that would have restricted the Commission from adopting a basin program rule that supersedes elements of the statewide definition of "reasonably stable groundwater levels" concerning the rate and magnitude of decline (DRAFT OAR 690-008-0001(9)(d)). We believe removing such constraints is a positive step forward.

We agree that it is unnecessary for the proposed rules to impose limitations on future Commissions when considering the adoption of *basin-specific rules*. Additionally, recognizing the diverse local conditions, we support the notion that alternative approaches may be more appropriate than a one-size-fits-all strategy outlined in statewide rules.

OWUC believes it is sensible to provide flexibility for local stakeholders, contingent upon the Commission's approval through a basin program rulemaking process.

Thank you for your attention to this matter, and we trust that these changes will contribute to a more effective and adaptable regulatory framework.

Thank you,

Kari Duncan, Chair Oregon Water Utility Council

WaterClimate.org
info@waterclimate.org, 415.617.9784
P.O. Box 460, Fort Klamath, OR 97626

January 5, 2024

Oregon Water Resources Department
725 Summer St NE, Suite A
Salem, OR 97301
Sent via email to: Laura.A.Hartt@water.oregon.gov

RE: Division 8 of Oregon's groundwater rules

To Members of the Rules Advisory Committee:

Water Climate Trust and our fellow members of the Oregon Water Justice Alliance are pleased to see progress on rulemaking to implement Oregon's groundwater laws. In response to your request at the December 14, 2023, Rules Advisory Committee meeting, we are submitting the following recommendations to improve Division 8 draft rules. These recommendations reflect the urgent need to protect: (1) the human right to water for essential domestic needs, and (2) instream beneficial uses and users of water including river-dependent Native American Tribes.

Water Climate Trust is a non-profit organization working in Oregon, and throughout the U.S. West, to restore freshwater ecosystems with Indigenous communities and other stakeholders who depend on them for food, jobs, health, recreation, and cultural survival. To this end, we work to improve water and climate policy and investments through grassroots organizing, advocacy, research, communications, and enforcement.

The Oregon Water Justice Alliance is a new collaborative working to protect instream uses of water for diverse stakeholders including Native American Tribes, the commercial and sport fishing communities, and the outdoor recreation industry. The Alliance was co-founded in 2023 by the non-profit groups Maqlaqs Geetni, Maqlaqs Paddle, Ríos to Rivers, Water League of Oregon, and Water Climate Trust.

"Annual High Water Level" should be defined, but not misused as a baseline
The definition of "Annual High Water Level" is useful, but it should not be inserted into other definitions when the effect is to: (1) reduce baseline groundwater levels, or (2) create ambiguity about baseline groundwater levels. The definition currently reads "the highest elevation (shallowest depth) static groundwater level that exists in a year."

Amend Definition of "Customary Quantity"
Please amend the definition of "Customary Quantity" to include the bold text below. This will address the fact that terms of appropriative water rights often do not prohibit or prevent wasteful water use.

"Customary Quantity" means the rate or annual amount of appropriation or diversion of water ordinarily used by an appropriator within the terms of that appropriator's water right ***and without waste as defined in Oregon statute****."*

Reject Suggested Change to "Declined Excessively"

Please reject the proposal to add "Annual High Water Levels" to the definition of "Declined Excessively." Specifically, we ask that you restore the original version which reads "cumulative lowering of the water levels," and reject "cumulative lowering of the Annual High Water Levels."

Many groundwater reservoirs have been depleted from years of groundwater pumping and inadequate recharge. Our recommendation above will ensure that such depleted reservoirs are included under the definition of "Declined Excessively."

"Declined Excessively" Section (c) - Protecting Instream Flows

In the draft rules, "Declined Excessively" includes lowering of groundwater levels in a manner that "Constitutes a decline determined to substantially interfere with a surface water source as defined in OAR 690-008-0001(8)."

According to OAR 690-008-0001(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 groundwater gradient and flow as a result of pumping, which contributes to" a "reduction in surface water availability to an extent that" an "adopted minimum streamflow or instream water right with an effective date senior to the causative ground water appropriation(s) cannot be satisfied."

To protect instream beneficial uses and users of water, please amend the definition of "declined excessively" to include instream flows harmed by long-term declines in groundwater levels, not just "spreading of the cone of depression." Please also include language that protects instream uses and users where an "adopted minimum streamflow" does not yet exist.

"Declined Excessively" Section (d)

In this section, the definition of "Declined Excessively" includes "lowering the Annual High Water Level within a groundwater reservoir, or part thereof, greater than 50 feet below the highest known static water level."

As written, this section could create ever decreasing groundwater levels by setting a new baseline every year. To remedy this, please replace "Annual High Water Level" with a baseline that: (1) cannot be reduced annually, and (2) reflects historic, or "pre-development" groundwater levels.

Moreover, please revisit "greater than 50 feet below the highest known static water level." This number is arbitrary and could have wildly different impacts in different locations. This number should be replaced with the desired outcome such as protecting beneficial uses of interconnected surface water and protecting small domestic wells.

“Declined Excessively” Section (f)

In this section, the definition of “Declined Excessively” includes “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 eEconomic pPumping lLevel, whichever is shallower.”

Again, please replace “Annual High Water Level” with a baseline that: (1) cannot be reduced annually, and (2) reflects historic, or “pre-development” groundwater levels.

It is unclear how “15% of the greatest known saturated thickness . . ” correlates to the metrics used in other definitions. Most other metrics are simpler, referring to a reduction in groundwater levels. Please revise this metric so it is consistent with metrics used in the other definitions.

Economic Pumping Level

In the draft rules, “Economic Pumping Level” is based on the per-acre cost of pumping water and the per-acre value drive from pumping. In Oregon, the cost of pumping groundwater is often obscured by taxpayer subsidies for electricity and equipment.

Please add the following language to the end of this definition in order to: (1) provide a level playing among groundwater users, and (2) to ensure that pumping subsidies do not harm small domestic water users and instream beneficial uses of water.

“When determining the cost of groundwater pumping, the impact of subsidies shall be excluded.”

Excessively Declining

Please clarify that “ongoing lowering of the Annual High Water Level” does not permit an ever decreasing baseline. Moreover, please expand this definition to include groundwater levels that “harm beneficial uses of interconnected surface water.”

Substantial or Undue Interference

To protect instream beneficial uses and users of water, please amend the definition of “interference” to include instream flows harmed by long-term declines in groundwater levels, not just “spreading of the cone of depression.” Please also include language that protects instream uses and users where an “adopted minimum streamflow” does not yet exist.

Overdrawn

Please reject the attempt to eliminate language that protects instream flows. Specifically, please restore the following language: “Failure to satisfy an adopted minimum streamflow or instream water right with an effective date senior to the causative ground water appropriation(s).” Please also include language that protects instream uses and users where an “adopted minimum streamflow” does not yet exist.

Reasonably Stable

Please restore the numeric requirements (aka “sideboards”) in the definition of “reasonably stable.” Staff said publicly that these requirements were eliminated in response to public comments. With respect, these comments came from water users to the detriment of stakeholders who rely on small domestic wells and beneficial uses of instream flows.

Oregon needs numeric statewide standards that define “reasonably stable.” Leaving this up to local groundwater managers will uphold historic inequities that harm river-dependent communities and low-income communities that depend on small domestic wells.

Wasteful Use of Groundwater

Water rights and permits often do not define “waste” in a manner consistent with Oregon statutes. To remedy this, please add the bold text below to the definition of wasteful.

“Wasteful Use (of ground water)” means any artificial discharge or withdrawn of groundwater from an aquifer that is not put to a beneficial use described in a permit or water right **and Oregon statute**, including leakage from one aquifer to another aquifer within a well bore.”

Conclusion

Oregon’s groundwater rulemaking process is a once in a lifetime opportunity to remedy the harm that excessive groundwater pumping is causing to our increasingly climate-stressed freshwater ecosystems. In general, we are encouraged by OWRD’s new movement on this process. However, we are also very worried by how easily even a few seemingly innocuous word change recommendations can be slipped into its governing documents with great potential for harm. We look forward to engaging in the rulemaking process with you in 2024. Please do not hesitate to contact us if you have any questions or updates to share about this critical work.

Sincerely,

Konrad Fisher, Director
Water Climate Trust

JACKSON COUNTY
Oregon

Board of Commissioners

Rick Dyer (541) 774-6118
Dave Dotterrer (541) 774-6119
Colleen Roberts (541) 774-6117
Fax: (541) 774-6705

10 South Oakdale, Room 214
Medford, Oregon 97501

January 18, 2024

Ms. Laura Hartt
Water Policy Analyst/Rules Coordinator, Policy Section
Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem OR 97301
Laura.A.Hartt@water.oregon.gov

RE: Comments Regarding Proposed Groundwater Allocation Rulemaking

Dear Ms. Hartt and the Rules Advisory Committee:

We, the Jackson County Board of Commissioners, would like to provide comments to the Oregon Water Resources Department (OWRD) and its Rules Advisory Committee (RAC) in response to the ongoing process to develop proposed rules on groundwater allocation. Because groundwater is a vital resource in Jackson County, the proposed rules have the potential to impact the use of groundwater for the existing development and citizens in our County, as well as our future development and growth. Thus, we have a vested interest in these proposed rules and the process being used to develop the rules.

We believe that the groundwater allocation rules should be based on the best available science. In that light, we believe that the OWRD should first focus on groundwater studies conducted across the State, before restructuring the groundwater allocation system. A one-size-fits-all rule does not consider the significant difference between the various basins within the State. Additionally, the proposed rules will likely result in a de facto moratorium on new groundwater use in areas where there is not a strain on groundwater.

Our concerns include those sections of the rules that are aimed at determining when a new proposed groundwater use will "substantially interfere" with surface water sources. The proposed rules for determining "substantial interference" will likely result in the denial of a large majority of new permit applications, even when groundwater may actually be available for development. Potential denial of new applications, when groundwater is actually available, substantially impacts the citizens of our County.

We believe the rulemaking process needs to be placed on hold to allow the OWRD to put together a workgroup of experts to work on certain aspects of the rules. Water is a huge issue for all Oregonians and rushing, without considering all concerns, does a disservice to all citizens of this great State.

We, the Jackson County Board of Commissioners, support delaying the proposed rulemaking process to gather the needed information to get these rules right at this juncture in the process.
Thank you for your consideration.

Sincerely,

JACKSON COUNTY BOARD OF COMMISSIONERS

Rick Dyer, Chair

Dave Dotterrer, Commissioner

Colleen Roberts, Commissioner

:jb/kk
By: Email Only

HARTT Laura A * WRD

From: IVERSON Justin T * WRD
Sent: Thursday, January 18, 2024 9:52 PM
To: Robyn Cook
Cc: HARTT Laura A * WRD
Subject: RE: Feedback on RAC 7

Hi Robyn,
While it's clunky, I think the route for permitting a bank-filtration system as source water for an AR or ASR program would be to apply for a water surface water right when water is available, then apply for a SW to GW transfer to show that the GW pumping would impact the SW "similarly" as per the rule def in Div 380 (I think 50% capture after 10 days of pumping if memory serves).
As far as the Div 9 "may" language, that's there to acknowledge that if we find PSI we'll look to the features of the hydraulically connected surface water body, as noted in the Div 8 def of Substantial Interference, to determine if water is available.
Hope that helps,
Justin

PS, thanks also for your comments on the precip correlated wells memo. Hope you find the 1/16/24 version addresses at least some of your comments and questions.

Justin Iverson, RG
GROUNDWATER SECTION MANAGER
Oregon Water Resources Department
Cell: 503-302-9728
Justin.T.Iverson@water.oregon.gov
Pronouns: He/Him

We're hiring! See the full list of OWRD recruitments here. Search for "owrd".

From: Robyn Cook <rcook@gsiws.com>
Sent: Thursday, January 4, 2024 10:57 AM
To: IVERSON Justin T * WRD <Justin.T.IVERSON@water.oregon.gov>
Subject: Feedback on RAC 7

Hi Justin,
I hope you had a good holiday break! There are a couple of spots in the proposed rules that I'm concerned may impact future AR/ASR projects. I'm thinking about a possible scenario where a riverbank filtration system is installed (would this be a groundwater application? Or since it's intentionally pulling surface water, would that be a surface water right with a POD as a well?). If it's the former, then the wordings under these paragraphs would appear to block a new application for off-season appropriation.

- 690-008-001 (10)(a)(D and E)

It looks like there might be a window for ASR under 690-009-0040(5): "For the purposes of issuing a permit for a proposed groundwater use, a finding of potential for substantial interference with a surface water source **MAY** mean that water is not available for the proposed groundwater use if the use will substantially interfere with a surface water source as per the definitions in OAR 690-008-0001 and OAR 690-300-0010." Does the "may" mean that there is wiggle room?

Thanks!
Robyn

Robyn Cook, RG, PG, CWRE
Supervising Hydrogeologist
direct: 971.200.8505 | mobile: 503.930.3382
650 NE Holladay Street, Suite 900, Portland, OR 97232
GSI Water Solutions, Inc. | www.gsiws.com
pronouns: she, her

Please note: I work a hybrid schedule. I can be reached best through email or mobile phone.