Meeting Summary December 16, 2024 - 8:30am - 2pm

Meeting Recording:
https://us02web.zoom.us/rec/share/KhPbpmmL-dVokG8XwNSHsccC33ztmreKCa1C55Yenyb7jUkRKOPeA37r4b7QIMEA.EjT9kY1nHjXvCAs1

Passcode to Access Recording: 8a.@Zw=?

Attendees

Ben Scandella (OWRD), Breanna O'Connor (NRCS/SWCD), Brenda Smith (High Desert Partnership), Chad Karges (High Desert Partnership), Christopher Hall (Water League), Curt Blackburn (Real Estate Broker), Debbie Gouveia (Farmer), Harmony Burright (High Desert Partnership), Holly Mondo (Karen Moon (Harney County Watershed Council), Kelly Meinz (OWRD), Ken Bierly (Consultant), Kristen Shelman (Harney County Court), Lorissa Singhose (Farmer), Mark Owens (Farmer/Legislator), Roger Sheley, Travis Singhose (Farmer), Trevor Hildebrand (Oregon Consensus), Zach Freed (The Nature Conservancy)

Meeting Notes

The discussion group discussed the results of the model scenarios by subarea (see results here) as well as the variables that affect model scenario development and optimization.

Key Considerations

- Include subarea specific considerations in future optimized scenarios.
- Consider subarea specific definition or metrics of success, including the desired groundwater management outcomes, timeline for achieving reductions and the timeline for achieving the groundwater management outcomes or goals, and the reductions needed.
- Consider more significant and immediate action in the Weaver Springs area due to the significant declines and the fact that the cone of depression contributes to declining groundwater levels in surrounding areas as well as diminished discharge in "downstream" springs.
- Further discuss and consider ways to balance social, economic, and environmental impacts in different parts of the basin and in the basin as a whole.
- There is an interest in understanding the proposed management approaches for each subarea. Where is regulation most likely to occur and when? Where are voluntary approaches feasible and where will they be encouraged? How does this affect the timing of implementation?
- There have been mixed messages about the stability of the Lower Blitzen-Voltage area between being stable or being an area of concern. This could use more clarity.

Requests for Information/Further Discussion

- Greater understanding of the extent to which the cone of depression in Weaver Springs impacts other areas over space and time (how long would it take to "fill in" and what would the resulting effects on groundwater levels in other areas be as water flows towards the cone of depression?)
- Total number of domestic wells per subarea.

- Total number, distribution, and size (discharge) of springs in each subarea.
- Greater understanding of irreversible effects on the economy and the environment and how those could be considered in management decisions and avoided.
- Greater understanding of the effects of subarea boundaries and how the decisions and actions in one subarea affect other subareas (with a particular interest in Dog Mountain).
- Greater understanding of how variability in recharge (e.g., wet or dry cycles) could affect groundwater level management.
- Additional "optimized" scenarios for consideration and discussion.

Exploring Model Results of Each Scenario by Subarea

The group discussed the model results for each of the scenarios previously identified in rulemaking advisory committee (RAC) meetings by the 6 subareas previously discussed by the discussion group and RAC.

Silver Creek Subarea

- Why is natural discharge more impacted in Scenario B compared to Scenario A even though Scenario B has reductions in Silver Creek and Scenario A doesn't?
    - The Weaver Springs cone of depression has a large impact on Silver Creek and surrounding areas. Scenario A included more significant pumping reductions implemented immediately in Weaver Springs and Dog Mountain, but in Scenario B these reductions are less and were phased in over 30 years. Phasing in reductions (along with smaller reductions) in Weaver Springs results in greater reductions needed in the surrounding areas, including Silver Creek and results in deeper/lower final groundwater levels and impacts to the natural discharge of downstream springs.
- Some of the groundwater level decline in the Silver Creek subarea can be attributed to the Weaver Springs cone of depression, which is drawing water towards it from other areas in the basin.
- Recovering groundwater levels in Weaver Springs would benefit Silver Creek and other areas.
- The results for the different scenarios in Silver Creek show the following impacts:
    - Limited/no impacts to domestic wells under all scenarios (wells that lose access to water).
    - There are varying impacts to natural discharge under Scenarios A-D (reduced flows to springs and surface water) and recovery under Scenario E.
    - Additional groundwater level declines under Scenarios A-D (ranging from -3 to -11 feet depending on the success metric used) and recovery under Scenario E.
- The Silver Creek area has the greatest diversity and abundance of groundwater dependent ecosystems in the basin. Springs in the Southwest portion of the Silver Creek subarea are affected by groundwater use and the cone of depression in Weaver Springs as well as groundwater use in nearby subareas.
- A previous map provided by the Department with the results of Scenario A showed that Silver Creek achieved "near stability" in a relatively short timeframe and yet the table states that "stable" is not reached. This was explained as follows:
    - The map shown at the October RAC meeting included time to achieve "near stability" which was defined as -0.1 ft/yr of decline versus the table shown at the December 16 discussion group which used a metric of "durably stable," meaning that it is 0 ft/yr of

decline and wells that stabilize or recover do not start declining again at some point in the future. Maps extrapolate data across a large space, so it can be difficult to see cells that may not achieve the result. The table includes a statistic that may be difficult to view in a map.
    - This reveals the importance/impact of the metric of success chosen and how it can affect management decisions.
    - Is the Department defining "reasonably stable" as 0 ft/yr of decline? Some participants raised equity considerations (is the rest of the state held to this standard), process considerations (the Department originally indicated that "stable" was an aspirational goal, but now has embraced it as the goal), and implementation considerations (is this standard realistic or achievable and can it be accurately measured).
- Even a relatively minor amount of decline in the Silver Creek area can represent a significant amount of water.
- The 50th and 80th percentile metric of success appear to be similar for this area (don't seem to produce different results).

Weaver Springs-Dog Mountain

- There is a big difference between the full pumpage scenario and the other scenarios that propose reductions for Weaver Springs. Full pumpage would result in significant additional declines in this area.
- Groundwater levels stabilize and begin to recover relatively quickly when reductions are implemented. The table shows that for most of the scenarios (with the exception of Scenario B) groundwater levels actually recover from +2 to +15 feet relatively quickly.
- This table shows that there are no modeled springs or streamflows in the subarea, but the declines in this area have an impact in springs and streamflows in adjacent subareas, namely Silver Creek and Lower Donner Und Blitzen-Voltage.
- Groundwater level declines contribute to impacts in other subareas. The results for the different scenarios show the following impacts within the Weaver Springs-Dog Mountain subarea:
    - Under most scenarios (except full pumpage and Scenario B) water is restored to some domestic wells. Additional domestic wells lose access to water under Scenario B.
    - Weaver Springs and Dog Mountain do not have resident springs but declines in this area impact other areas and downstream natural discharge.
    - Under most scenarios (except full pumpage and Scenario B) groundwater levels recover from 2018 and 2030 levels. Additional declines occur under Scenario B (primarily due to phasing in reductions).
- There is continued interest in understanding the benefits and drawbacks of lumping or splitting Weaver Springs and Dog Mountain, with a preference expressed for splitting them.
- Phased implementation of reductions in Weaver Springs will delay stabilization or recovery and prolong impacts to other subareas.
- Development in Weaver Springs has changed the hydrology of the basin and the groundwater declines in Weaver Springs are deeper and steeper than anywhere else in the basin.
- Weaver Springs will continue to draw water from the rest of the basin. Water will flow towards the cone of depression even if irrigation doesn't occur, meaning that groundwater levels could

continue to decline even without irrigation. Is there a way to project the impacts of Weaver Springs over time?

- What is a fair distribution of pumping reductions? Timing and amount of pumping reductions in Weaver Springs is an important consideration for the rest of the basin.

Silvies Subarea

- The Silvies subarea represents a significant recharge area. Participants noted that they have seen groundwater levels come up in recent years and believe this area is already stable due in part to the significant recharge from the Silvies River. They attributed fluctuations in groundwater to fluctuations in precipitation patterns. The model uses an average recharge rate from 1982-2018. There was a question about how wet and dry cycles would affect groundwater level trends in this area.
- Cones of depression in other subareas (e.g., Weaver Springs) are drawing groundwater from this area.
- Under Scenarios A-E there is a positive change in natural discharge to springs and streams and impacts to domestic wells seems small.
- If there is only -1 to -2 feet of decline in this area over 68 years that is less than -0.1 ft/yr on average.
- There are small rates of decline across this area with some wells doing better and some wells doing worse, but limited concerning data according to a few participants (either because the data is limited or because the data that is available does not elicit much concern).
- Some participants mentioned that a goal of 0 ft/yr of decline for this area seemed unnecessarily rigid and not achievable.

Northeast/Crane Subarea

- The results show that generally in this area Scenarios B-E achieve stability and recovery over different timeframes with further declines from 2030-2098 in the overall groundwater levels in Scenarios B-D until stability is reached ranging from -10 to +2 (in 50% of wells). One participant noted that they were encouraged by these results since it was good to see that this part of the basin can be stabilized, that stabilization is achievable, that the additional declines seem modest, and that allowing for phased implementation appeared to be feasible.
- A participant noted the big difference between 2018-2030 in the magnitude of change in groundwater levels and inquired. This represents the current rate of decline without implementation of reductions. One participant noted that they would prefer the model results be future focused rather than start from 2018 results. Another participant noted that it was helpful to see the change over time.
- The results for the different scenarios show the following impacts within the Northeast/Crane subarea:
    - Under scenarios A and B there are additional impacts to domestic wells. There are minimal impacts to domestic wells under C and D, and water is restored to some wells in E.
    - Natural discharge to springs and streamflow appears to increase in Scenarios B-E.
    - Under scenarios A and B groundwater levels would decline further (-10 to -11 feet) once reductions begin. Under Scenarios C and D groundwater levels would increase by about +2 feet.

- The 50th and 80th percentile results differ for this subarea representing greater spatial variability in groundwater levels.

Lower Blitzen-Voltage Subarea

- The results for this subarea were surprising for several participants and showed declines much larger than expected. This was a surprise because the water balance provided by the Department was not concerning and there was limited concerning data.
- The declines in this area may largely be a result of groundwater declines in Weaver Springs and in the Northeast/Crane area.
- The results for the different scenarios show the following impacts within the Donner Und Blitzen subarea:
    - Under most scenarios there are minor impacts to domestic wells.
    - Impacts to natural discharge are significant under Scenarios A and B, in part because no reductions are proposed in this subarea and Scenario B allowed for a phased approach to reductions in Weaver Springs. There are smaller impacts to natural discharge under Scenarios C and D and discharge improves under E.
    - Groundwater levels only stabilize after 40 years under Scenario C. Groundwater levels continue to decline under all scenarios from 2030-2098 from -4 to -10 feet.
- There are concerns about active management decisions in this area, including:
    - Allowing transfers into this subarea from other areas in the basin.
    - Apparently the Department stopped requesting groundwater level measurements for some wells in this area because they indicated that groundwater levels were stable.
    - This subarea was not a focus of the groundwater study and has limited data, primarily because it was not seen as an issue.
    - There have been mixed messages about what is happening in this area.
- The model optimization resulted in much larger reductions than was expected. Participants still do not understand what is occurring in this subarea and would like more information to support deliberations.
- There was no representation from this subarea in the Dec 16 Discussion Group meeting.

Upper Blitzen Subarea

- The results seem to show that this area is stable.
- There is an interest in better understanding the benefits and drawbacks of lumping and splitting the Upper and Lower Blitzen subareas. One participant mentioned that there does not seem to be a clear reason or need to separate them.
- There was no representation from this subarea in the Dec 16 Discussion Group meeting.

Understanding and Adjusting the "Dials" for Optimization

The group discussed the relative importance or "sensitivity" of each variable or dial that can be adjusted in the model as well as considerations for that dial. See Figure 1 below for the variables or dials that can be adjusted for model scenario development or optimization. It can be difficult to isolate and discern the specific effect of each variable since the variables are interrelated.

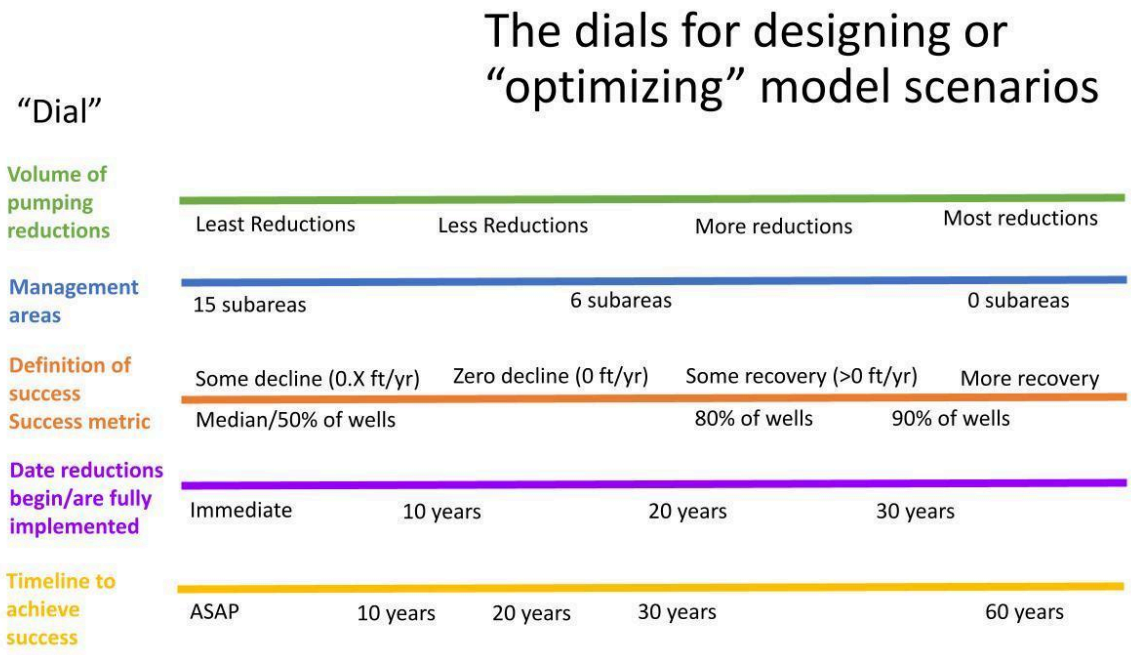

Figure 1. Variables to consider in model scenario development and optimization.

Volume of Pumping Reductions

Volume of pumping reductions vary based on how you adjust the other dials. The model is used to understand the relative impacts and outcomes of different volumes of pumping reductions at different spatial (geography based) and temporal (time-based) scales. Pumping reductions could be held constant in some areas to understand other variables or other variables could be set to optimize for pumping reductions.

- Impacts of pumping reductions:
    - Pumping reductions have an impact on groundwater levels and groundwater use, which subsequently impact the economy, groundwater dependent ecosystems, and exempt water users (e.g., domestic and stockwater).
- Discussion about pumping reductions:
    - What is a "fair" or "equitable" distribution of pumping reductions?
    - Recommend varying pumping reductions by subarea depending on amount of recharge, groundwater use, and concerning groundwater level data and trends.
    - What is the "margin of error" in the model that should be considered along with any pumping reductions determined by the model?

Management Areas (Subareas)

Management areas (subareas) set the boundaries to adjust the different levels of reductions in different parts of the basin.

- Impact of management areas:
    - Model results show that one management area results in larger overall reductions to achieve the same outcome.

    - More management areas lessen the amount of overall reductions, depending on the success metric used.
    - The difference between six subareas and fifteen subareas is minimal if the median (50^{th} percentile) of wells is used as the success metric, but the difference between these grows if the 80^{th} percentile of wells is used as the success metric.
- Discussion about management areas:
    - There remains a diversity of opinions on the management area boundaries and participants are hesitant to voice their preferences. Preferences may be influenced by impacts to participants.
    - While the six management areas were helpful for model scenarios, there continues to be a desire to explore different variations for management.
    - There is a desire to better understand the benefits and drawbacks of splitting or lumping Weaver Springs and Dog Mountain as well as Upper and Lower Donner Und Blitzen.
    - There is a desire to discuss management considerations (e.g., voluntary and regulatory approaches) for the different subarea options.
    - One subarea may make it more difficult to achieve the desired outcome. Some subareas allow for more targeted reductions. If you do not have the ability to target reductions then reductions are more spread out and more reductions need to occur to achieve the same outcome.
    - There are many different tradeoffs to consider and no ideal scenario.
    - In some parts of the basin there are lots of little cones of depression that are difficult to group together and doing so may single out senior users. More and smaller subareas may pose a potential conflict with prior appropriation.
    - Larger subareas may provide greater flexibility.
    - There is a need to ensure that any boundaries used are hydrologically robust.
    - Even though all of the groundwater is hydraulically connected, there are different groundwater reservoirs in the basin where groundwater behaves differently. How are groundwater reservoirs defined?
    - Desire to understand saturated thickness for each subarea (see approaches in Texas and Kansas for reference).
    - Subarea boundaries should also take into account implementation considerations, including their effect on voluntary agreements, a regulatory approach, and future transfers.

Definition of Success

Definition of success (desired groundwater level(s)) describes the desired "end state" for groundwater levels/groundwater level trends that will be ultimately achieved through management actions.

- Impacts of definition of success:
    - Desired outcomes is an important input for the model and is a significant determinant of the pumping reductions.
    - Generally speaking a more aspirational goal like recovery will require greater pumping reductions.
- Discussion about definition of success:

- Some expressed that the desired outcomes should account for differences/variability across the basin while others expressed that the desired outcome should be the same for every part of the basin.
- The Department has indicated that the desired outcome is that groundwater levels stabilize (0 ft/yr decline) at some point in the future.
- There was a desire to consider a less strict standard than 0 ft/yr of decline for some parts of the basin or a range (e.g., the Department previously discussed a standard of -0.1 ft/yr of decline and provided maps showing that this was achieved for parts of the basin under the original proposal). There is concern that 0 ft/yr of decline doesn't account for non-pumping related factors (e.g. climate effects).
- Questions: What other basins in the state are held to this standard? Is this an achievable standard? At what cost? Will this be the new statewide standard? Why are parts of the Harney basin held to a different standard than the rest of the state? If Weaver Springs wasn't an issue in the basin, would the Department be pursuing regulatory reductions?
- There should be a concerted effort to understand and address the interest of future generations in present decision-making.

Success Metric

Metric of success is the statistic that will be used to determine when the desired outcome has been achieved.

- Impacts of metric of success:
  - The metric of success will be used by the model to determine how many wells need to achieve the desired outcome to consider it a "success."
  - Achieving the desired outcome using a median statistic (meaning that 50% of the wells in a set area achieve the desired outcome and 50% do not - also called the 50^{th} percentile) lowers the volume of pumping reductions but also results in deeper/lower final groundwater levels, with impacts to natural discharge and domestic wells.
  - Achieving the desired outcome using a higher statistic (80^{th} or 90^{th} percentile – meaning that 80% or 90% of wells achieve the desired outcome and 20% or 10% do not) increases the volume of pumping reductions and results in higher final groundwater levels.
- Discussion about metrics of success:
  - There was minimal discussion about the metrics of success, but an overall acknowledgement of the importance and impact of deciding on a metric.

Time to Begin and Fully Implement Reductions

Time to begin and fully implement reductions describes when reductions will begin and when they will be fully implemented. Reductions can begin immediately via voluntary approaches. Reductions via regulation can occur after a contested case process. The timeframe to fully implement reductions can be short or long if a phased approach is used.

- Impacts of time to begin and fully implement reductions:
  - Waiting to implement reductions or phasing in reductions over time would increase the amount of reductions needed in certain areas and would result in deeper/lower final groundwater levels. A longer timeframe to fully implement reductions provides greater opportunities for adaptive management (the ability to adjust actions along the way).

- Beginning and fully implementing reductions quickly would reduce the amount of reductions needed and would result in higher final groundwater levels. Quicker implementation may limit opportunities for adaptive management.

- Discussion about the time to begin and fully implement reductions:
  - Consider subarea specific timelines for implementation taking into account voluntary and regulatory approaches that are likely be used.
  - There is a desire to act with urgency in areas with more concerning groundwater level trends, while allowing for a longer timeframe for implementation in areas with less concerning groundwater level trends (prioritization commensurate with impact).
  - Consider more and immediate reductions in the Weaver Springs area due to the significant declines and the fact that the cone of depression contributes to declining groundwater levels in surrounding areas as well as diminished discharge in "downstream" springs.
  - Don't reduce too much water use unnecessarily since it is difficult to turn people "back on." Reductions, once made, may have permanent effects. Be thoughtful prior to implementing reductions. Don't go "too far too fast" – learn as we go.
  - Voluntary agreements and approaches may allow for faster implementation.

Time to Achieve Success

Time to achieve success describes the desired timeframe for achieving the definition and metric of success defined above (groundwater level/groundwater level trend). Success is oftentimes achieved at some point after the reductions are fully implemented.

- Impacts of time to achieve success:
  - A longer timeline to achieve success would increase the amount of reductions needed in certain areas and would result in deeper/lower final groundwater levels. A longer timeline would provide greater opportunities for adaptive management (the ability to adjust actions along the way).
  - A quicker timeline to achieve success reduces the overall amount of reductions needed and would result in a shallower/higher groundwater level. A quicker timeline may limit opportunities for adaptive management.
- Discussion about the time to achieve success:
  - Consider subarea specific timelines for achieving success taking into account voluntary and regulatory approaches that are likely be used.
  - There is a desire to act with urgency in areas with more concerning groundwater level trends, while allowing for a longer timeframe to achieve success in areas with less concerning groundwater level trends (prioritization of resources commensurate with impact).
  - Consider more and immediate reductions in the Weaver Springs area due to the significant declines and the fact that the cone of depression contributes to declining groundwater levels in surrounding areas as well as diminished discharge in "downstream" springs.
  - Participants noted that it took 30 years to get into this situation and there should be a similar amount of time to address the situation (a suggestion of 30 years to phase in reductions and 40+ years to achieve stable [Weaver Springs being an exception]).