

Sonoma Valley Groundwater Sustainability Agency

Community Meeting – October 12, 2021

Questions and Answers

1. Please talk about the deep aquifer (fossil water) versus the shallow replenishable 200' aquifer.

Trotta – We have defined two principal aquifer systems in the basin, we have defined those primarily based on depth.

2. Define shallow versus deep aquifer – well depth in feet.

Trotta – Shallow is between 0 and 200 feet. Deeper aquifer is more than 200 feet. In many areas, the aquifers are separated by relatively thick clays. Deep aquifer is generally under pressure, and it responds a little differently than the shallow aquifer system and can be slower to directly recharge. Some water in the deep aquifer is dated to be 1000s of years old.

3. What percentage of current groundwater used comes from the shallow aquifer and what percentage from the deep?

Trotta – I don't have the information here, but I believe it is something we can get from the model. There will be a fair amount of uncertainty associated with that. I think it is safe to say that majority of the total groundwater pumped from the basin is pumped from the deep aquifer. It is difficult to determine exact percentages for each.

4. What are the theories on how the deep aquifer is recharged?

Trotta (chat) – The deep aquifer is likely primarily recharged through inflows from the basin boundaries, including upland area, and leakage from the shallow aquifer system.

5. Expand on your response to how the deep aquifer is recharged – appears there is little data to explain where/how the water is recharged.

Trotta – The mechanisms and rates of groundwater recharge are something that are challenging to quantify and accurately characterize in any groundwater basin and particularly one that has the complex different geologic units and faults that we have here. The geology makes it hard to quantify and give a simple explanation. It is going to be variable throughout the basin to some degree.

Based on the data that we do have and the modeling we've done, a large portion of the water recharges comes from what's known as mountain front recharge, which is water that's recharged up in the hills in the basin and percolates into those volcanic rocks and then moves laterally into the basin. Another mechanism is leakage from the shallow aquifer system. There are a lot of clays between the shallow and deep aquifer systems, but in some areas, those clays are thinner. One such area where we think there's more connection between the shallow and deep aquifer system is on the east side of the basin and along the Carriger creek area. As we get better information on the geology of the basin, we'll get a better handle on where the deep aquifer system is recharged.

6. Is SDC development and/or conservation factored into growth models?

Trotta – We didn't explicitly model the SDC development because there is so much uncertainty right now. We will track it in future as part of our Implementation Plan.

7. What are the depths of the Sonoma City wells and how many wells to they have? How many gallons/day are pumped and how many days/month?

Trotta – There are three or four active wells, about 400-500 feet deep. They pump on average 100-200 acre-feet per year. Majority of water the City provides is imported from the Russian River.

8. Do I understand correctly that the climate change estimate being used for the next 20 years is for wetter conditions?

Jasperse (chat) – We don't use the sequence pattern of precipitation – all forecast scenarios will not accurately predict that. What is important is the interannual variability. We use the forecast scenario to test the variability of precipitation - the model we used had the highest GHG emission rate and most severe drought to stress test groundwater conditions.

9. Are you using the model predicting the next 20 years will be wetter than normal? The “most severe drought” in the current model is from 50-70 years out. Using wetter than normal leads to all conclusions for the next 20 years being better than if you had used the first 20 years being a drought.

Jasperse – I answered a couple of very similar questions in the chat. Essentially, we look at the time domain of the modeling and we look at the severity. We look at the variability and we look at the severity of dry years and severity being the magnitude of dry years and how many consecutive years. The model we chose after much discussion through advisory committees, climate experts and modeling is the more conservative one over the 50 years. We don't care as much about sequence because the sequence is wrong, all of them are wrong. We took the more severe and pessimistic model of the RCP 8.5 relative to the RCP 4.5. Nobody knows if it will be closer to the 4.5 or 8.5 but the 4.5 assumes that there's going to be some mitigation and reduction in greenhouse gases. Every five years, at least, is we're going to update the model and we're going to use the best data again. We'll be doing this incrementally as we go along. We are not going to just hitch our wagon to this one model for the next 50 years; it's going to be adaptive. We will update the Plan every five years. Outside of the groundwater realm, Sonoma Water uses many models; we can't do that with groundwater.

10. What happens if the actual weather is way off from your model of wetter in the next 20 years? What if we have a third year of drought, and a fourth year? Have you modeled the reverse pattern dryer for the next 20 years?

Trotta – We will be looking at conditions on the ground and tracking weather patterns. For the purposes of our projections, we aren't using the sequence of dry versus the wet years or year-to-year simulation of climate; we are using it as a stress test.

Jasperse – We looked at 20 climate scenarios available by the state. We did a technical analysis and eventually selected a more conservative model. It is the variability in the model not the year-to-year simulation, and how well they down scale to our area, that is of interest to us.

11. If none of the modeling is going to be right, what is the error bound on the forecast? I am confused how the current estimate of minus 900 acre-feet per year loss and groundwater storage assumed to be going down to only net 300. If it is the years that they're looking at, are

we expecting to expand experienced negative growth in agricultural use or some other variable driving this surprisingly rosy projection of our future groundwater budget?

Trotta – The estimate of future groundwater demands incorporates growth in ag and rural residential. It incorporates assumptions on increases in pumping from municipal groundwater users. The current estimate of 900 acre-feet loss per year storage loss is from 2012-2018 and includes much drier conditions than the long-term historical period, which is the main reason why that storage change loss for that period is so high. Looking at the 300 acre-feet for years for that entire 50-year period, if you break that down into drier periods and wetter periods you'd have a much larger decline and storage showing up at the end of that 50 year period, and so those metrics in terms of that modeled storage loss is not something that we are directly using to judge sustainability by -- it's the metrics that we've set for things like groundwater levels that will be monitored in the future that determine whether or not we're achieving and maintaining sustainability.

12. The projection is reliant on an assumption that the future will be wetter (albeit, as Jay Jasperse indicated, more variable) than the past. What is the quantitative range of error on this – 3000 are-feet/year 50-year estimate (or is this not yet quantified in the report)?

Jasperse (chat) – I want to emphasize that the model scenario we are using (RCP 8.5) which assumes higher GHG emissions shows more severe drier conditions over the time domain we are evaluating compared to the RCP 4.5 (lower GHG emissions). It's just that the RCP 4.5 sequence shows drier conditions overall for the first 15-20 years and then gets rosier. The variability and severity of dry conditions (magnitude and number of continuous years of dry conditions) are what matters not the sequence of years since we know the sequence is impossible to get correct.

Your question about quantifying the error is a good one but one that cannot be answered because we can only make 50-year forecasts based on best available information and reasoned assumptions with land use and climate being the largest variables. That is why our approach is to update at least every 5 years as we move forward. We believe that the climate models will continue to improve. Forecasts of land use, of course, mainly follow policy decisions.

13. This is helpful. So, I understand you to be saying that the (more likely) RCP 4.5 scenario produced an even more optimistic net groundwater storage loss estimate than -300AF/yr. Hence the "wetter early on" RCP 8.5 scenario is truly the more conservative estimate to use. Is this accurate?

Jasperse (chat) – Yes, over the period that we need to evaluate. One minor point regarding your comment that RCP 4.5 is more likely – I hope that you're right, but time will tell on how well globally we'll work together to reduce greenhouse gases. The model we used was more pessimistic and assumed the future would be "business as usual". The decision on RCP 4.5 vs 8.5 was made by the Advisory Committees and ultimately the Boards. In all basins, the decision was to go for 8.5.

14. Is Sonoma Valley Groundwater working with the County to limit the drilling of new wells?

Trotta – We recommend that within the first year of implementing the Plan that the GSA study different policy options and prioritize those policy options that will include looking at things like well permitting when potential future mandatory demand management measures may be needed, as well as whether metering should be considered for certain water users, that Tim Parker described earlier.

15. Will someone be addressing the efforts to recharge the shallow aquifer? Especially encouraging beaver habitation?

Jasperse (chat) – The plan will look for opportunities to recharge shallow aquifer, primarily to help with baseflows in the tributaries to help improve conditions for groundwater-dependent ecosystems. As Marcus Trotta mentioned, we have a lack of data regarding surface water - groundwater interactions - as essentially every other groundwater basin in the state also has. We have had conversations with farmers about using on-farm recharge to help with shallow aquifer recharge in certain areas that might help "move the needle" for base flows. I'm not sure about beaver habitat, but I believe the Sonoma Ecology Center has been involved in at least one beaver pond on Fryer Creek.

16. What should individual well owners expect in terms of monitoring and reporting requirements?

Jasperse (chat) – For almost all residential wells where water use is less than 1785 gallons/day, the GSA cannot require metering and reporting of pumping data. It is possible, if the GSA Board determines the need to comply with SGMA, commercial and agricultural wells could be metered. Public water supply wells are already required to monitor and report. Of course, the GSA is always interested in volunteer water level monitoring. We have been monitoring groundwater levels from about 150 wells in Sonoma Valley for the past several years. This monitoring program has really enhanced our understanding of groundwater conditions.

17. You will talk about monitoring well pumping, and depth of wells?

Jasperse (chat) – Consideration of metering of agricultural/commercial groundwater users will be considered as part of the policy options management action described in Section 6.

18. What is the groundwater decline? If you look at 2012 -2021 (i.e., including last two years for drought? Seems like it would be much greater than -900 acre-feet/year.

Trotta – We haven't explicitly simulated that because of time constraints. We don't have a simulation that goes to 2021. As Jay Jasperse mentioned earlier, we continue to track groundwater levels and that is something where you can see the impacts of the drought, actual impacts that are measured and many wells, are five to 10 feet below their previous lows and slightly below the lows that they experienced during the 2012-2014 drought.

19. You mentioned agricultural growth – did you look at cannabis cultivation growth?

Trotta (chat) – We did work with Permit Sonoma to assess existing permitted cannabis cultivation and currently it is such a small amount in comparison with the overall water budget for the Subbasin. For this reason and because of significant uncertainty in locations and amounts of future growth, we did not include in this 2022 GSP. However, the GSP will be tracking how this changes each year and would consider projecting cannabis cultivation during the next 5-year update as more information is available.

20. Is County's projected permitting of cannabis farms part of the future sustainability and use models?

Trotta – We did work with Permit Sonoma. They provided us the information they had on the kind of permitted cannabis projects and ones that were in the permitting pipeline. I guess that at the time we were developing our growth estimates and the total amount of water use was quite low in comparison with the overall basin and water budget. And because there is so much uncertainty with respect to that crop in particular projecting it out into the future, at the time

we did our agricultural growth projections, we did not include future expansion of cannabis cultivation within our initial 50-year projection, but we have committed to tracking those actual permits as those projects are permitted by the county and including them in our annual evaluation and reports.

21. Can you summarize the findings for the Santa Rosa Plain's Basin draft plan? Will it also be anticipating relying on winter stream flows on the Russian River to be used for recharge?

Jasperse (chat) – Although the groundwater declines in the SRP basin are not a significant as in Sonoma Valley, the draft plan does specify that groundwater banking will be needed as a project and management action. Based on a study that we conducted in 2013 and recently updated, every year that we have data available (since 1908), shows there is additional "surplus" natural flows available for recharge – it's just a matter of how much. Ideally, you recharge during average and wet years and make sure your groundwater basins are in good shape and ready for the next drought.

22. Given that local food security may be significant issue over the 50-year planning horizon, does the Plan make any attempt to segment agricultural use by food versus non-food crops, or should we assume that virtually all agricultural usage in the valley falls into the latter non-essential category?

Trotta – We did look at it by crops, we had a work group that was made up of different agricultural producers in all three basins representing vineyards, the ag commissioner's office, and smaller producers. The Sonoma and Gold Ridge Resource Conservation Districts representatives participated as well, and so we looked at different crops that are mapped within the basin, broken out by vineyards, truck crops, pastures, etc. There's an appendix in Section three that documents the projections that were made for both agricultural, as well as for residential and in municipal growth and in our projection.

23. When you considered the Sonoma County General Plan, did you look at all permits granted after the GSP was completed? I believe wine grapes for example, are much more expensive than was studied by the GSP?

Trotta – In terms of the acreage of planted grapes, we relied on land-use mapping to identify historical pattern and crops included in our projections. A pattern and amount of acreage for all the crops that are included in our projection and then we use a combination of the trends, based on land use mapping, so the trend in increases in certain crops like vineyards or decreases in other crops like pasture lands is one parameter that we use to estimate future changes in agricultural land use. We also sent out a survey forms to growers throughout all three basins to get their opinion based on market conditions, what crops are likely to expand, and which ones are likely to contract and use a combination of those different parameters to project out the land use changes for agricultural for the 50-year projection.

24. Are there any plans to enforce fees for planned communities who are pumping from private wells for their landscaping needs?????

Jasperse (chat) – There are no plans described in the Plan. The GSA will be commencing a fee study in the next couple of months that will explore a variety of funding options for the GSA Board to consider. Funding decisions will be a policy decision by the Board that will be informed by the fee study.

25. How can we get a video recording of the meeting?

The video will not be available, but the PowerPoint presentation and notes will be posted.

26. What is it called when you pump out of streams? Will you please address it?

Not addressed.

27. How much water is the golf course using?

Not addressed.

Comments / Links

28. I strongly support "Demand Management." Reduce demand: conservation, best practices in agriculture. It's most cost effective.

29. We must turn off access to the deep, fossil water aquifer, and focus all efforts to increase the shallow aquifer.

30. Land use projections can be found here: https://sonomavalleygroundwater.org/wp-content/uploads/3-F-SVGSP_Future-gw-demands_land-use-changes_Appendix_3-F_08202021_ada2.pdf

31. Climate change model analysis can be found here: https://sonomavalleygroundwater.org/wp-content/uploads/3-G-SV_Climate-Scenario-Evaluation_ada.pdf