

January 18, 2019



Memorandum

DATE: 1/18/2019

TO: Ukiah Valley Basin Groundwater
Sustainability Agency Technical
Advisory Committee

COPY TO: Ms. Sarah Dukett

SUBJECT: **Review of Phase 1 Reports by the Technical
Advisory Committee**

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This memorandum has been prepared to summarize the input received from the members of the Ukiah Valley Basin Groundwater Sustainability Agency (UVBGSA) Technical Advisory Committee (TAC) for the review of completed reports for Phase 1 of the UVB Groundwater Sustainability Plan (GSP) Development. The Larry Walker Associates (LWA) Team, per its scope of work for Phase 2, discussed the Phase 1 reports at a TAC meeting on 8 November 2018. The purpose of the discussion and the review in general was to assess the extent that the LWA Team can and should rely on the information presented in reports produced during Phase 1 of the project. This memorandum summarizes the review process and the comments that were received from TAC members. It also defines the next steps the LWA Team will take in utilizing the Phase 1 reports. It is anticipated that following the TAC review and this memorandum, the UVBGSA Board will take action to either accept or accept with qualification the Phase I reports based on the comments and suggestions provided by the TAC. The Phase 1 reports which were subject to the TAC review included the following (also shown in **Table 1**):

- Ukiah Valley Groundwater Basin Draft Groundwater Monitoring Protocol Manual
- Data Gap Analysis
- Initial Groundwater Sustainability Plan Hydrogeologic Conceptual Model (IHCM)
- Initial Groundwater Sustainability Plan Preliminary Water Budget Study

- Preliminary Water Demand Review
- Preliminary Sustainable Management Criteria

Review of Phase I Documents

The LWA Team reviewed the Phase 1 reports and highlighted the sections believed to be of primary importance. The results of the LWA Team review were captured in **Table 1** and distributed to TAC members ahead of the November 8 meeting. The LWA review was focused on those areas of available information that will be used as the foundation of work during Phase 2 of the project. As the goal of the Phase 1 reports was to produce specific sections of an initial groundwater sustainability plan, it is important to note that some sections are more beneficial to Phase 2 of the project, such as those describing detailed and specific data and information, summarizing a thorough literature review, or elaborating on a qualitative subject. For example, a significant effort in preparing a hydrogeologic conceptual model (HCM) is to review the literature and process the available information and data. Similarly, evaluation of data gaps includes processing the historical and available data and identifying gaps that may affect the preparation of the GSP. As such, these reports are entirely applicable and useful to Phase 2 of the project and will help, if deemed adequate, in avoiding unnecessary, repeated efforts. On the other hand, subjects such as defining management actions, sustainable management criteria, and estimating the water budget are entirely dependent on additional work that will be performed during Phase 2 and the Phase 1 reports will be most beneficial in providing background information.

To assist the TAC in its review of the Phase 1 documents, the LWA Team developed a number of key questions to be addressed by the TAC upon their review of these reports. These key questions were intended to provide suggested structure for the TAC review:

- What is the overall evaluation of the findings and conclusions in the reports? Are there any specific findings or conclusions that TAC members strongly agree or disagree with?
- Are there specific assumptions made in the reports that do not seem reasonable and/or need to be adjusted?
- Are there missing sources of data and information that need to be added? Or, are there sources of data and information used that are not truly representative and need to be corrected?
- Can the TAC come to a final recommendation to the UVBGSA board regarding approval of the documents?
- Are there any other comments and observations not covered by the above questions?

In addition to the questions above, specific questions for some reports were included in **Table 1** and shared with the TAC to help the LWA Team in its future work in using information contained in the Phase 1 reports. These questions and reports were discussed during the TAC meeting on 8 November 2018 and TAC members were given additional time to provide supplemental comments after the meeting.

In addition to the comments received during the meeting, the LWA Team received comments from the Sonoma County Water Agency¹ and Mr. Zac Robinson, the agricultural representative on the

¹ Memorandum from Mr. Don Seymour and Mr. Marcus Trotta to Dr. Laura Foglia dated 14 December 2018 and titled: Comments Regarding Phase I Ukiah Valley Basin Reports. This memorandum is made available as an attachment.

GSA, through an email to Dr. Foglia on 13 December 2018. A summary of these comments is provided in the next Section.

Table 1. LWA's suggested review process for the Phase 1 reports.

| Document Title | Date Produced | Goal of the Document | Pages/Section to Review | Important Sections | Specific/Detailed Questions |
|---|-------------------|---------------------------------|---|------------------------------------|---|
| Ukiah Valley Groundwater Basin Draft Groundwater Monitoring Protocol Manual | October, 2016 | Define Monitoring Objectives | Section 1.2, and Section 2-6 (9 pages) | Sections 2-6 | |
| Data Gap Analysis | December, 2016 | Data Management System/Data Gap | Sections 1-6 along with related figures in App A (10 pages) | Sections 2, 3, 6; probably 4 and 5 | |
| Initial Groundwater Sustainability Plan Hydrogeologic Conceptual Model (IHCM) | December 28, 2017 | HCM | Sections 1-8 along with respective figures (20 pages) | Sections 2 through 8 | <ul style="list-style-type: none"> ➤ Are surface water bodies and surface water/groundwater interactions accurately presented in the report? ➤ Is there a need to include imported water in this report? ➤ How complete does the TAC find the WCR database? ➤ What is the overall perception of the TAC with regards to the Transmissivity, Specific Capacity, and other hydrogeological properties estimated? Are the values of these parameters in agreement with the general knowledge of the basin that the TAC has? ➤ Can LWA rely on the estimated bottom of the basin provided or there is a need for further studying? |
| Initial Groundwater Sustainability Plan Preliminary Water Budget Study | December 29, 2017 | Water Budget/Modeling | Sections 1-6 with respective figures (18 pages) | Sections 1.2, and 6. | <ul style="list-style-type: none"> ➤ What is the TAC's evaluation of the adequacy of the model based? ➤ Following the above question and considering the limitations outlined in Section 6, to what extent or in what specific categories of input data should the LWA rely on the developed model? ➤ Since the produced results of the water budget differs from the 2017 study, how accurate the overall trend of flow rates and groundwater budget looks to TAC members based on the local knowledge of the basin? |
| Preliminary Water Demand Review | December 29, 2017 | Future Water Budget | Just the memorandum without the appendix (4 pages) | Section 4 | This memorandum relies heavily on the "Water Supply Assessment for the Ukiah Valley Area Plan" report prepared by the Mendocino County Water Agency in October 2010. Are there any concerns among the TAC members regarding the 2010 report that LWA needs to be aware of or address? |
| Preliminary Sustainable Management Criteria | January 2, 2018 | Sustainable Management Criteria | Sections 2 and 3 (5 pages) | Sections 2.7 and 3.1.6 | <ul style="list-style-type: none"> ➤ How does the TAC find the Sustainability indicators outlined in Table 2, overall? ➤ How does the TAC find the Tier framework proposed on page 9 of the report? |

Summary of Comments

One key point made during the discussion with the TAC members on November 8 was on filling data gaps: a better concept of “data needs” (rather than a focus on spatial or temporal coverage) is to identify the most important/impactful information using either statistical or modelling tools and analysis. In other words, there is no need to try to cover all possible data gaps but prioritizing what seems to be important in understanding the basin and responding to potential undesirable results. This was discussed due to the relatively large data gaps pointed out in the Phase 1 reports and the expensive nature of adding monitoring wells and streamflow gauges to address all of those gaps.

In addition, TAC members discussed the issue of “underflow” wells and the inefficiency in which they were addressed in the Phase 1 reports. The need to have a separate discussion about underflow wells and the way to address them was highlighted.

Also, TAC members were not content with how the seasonal nature of tributaries and their contribution to aquifer recharge and the Russian River were considered in the Water Budget Study. A better explanation and consideration of tributary reaches in the modeling and the water budget is necessary.

Moreover, many TAC members registered concerns about potential future changes in the operation of the Potter Valley Project and how such changes may affect the water balance in the watershed. This was not specifically addressed in the Phase 1 Reports since they did not consider future scenarios and management actions. However, it was agreed this should be a specific focus of the GSP when we reach the scenario development and evaluation element of the planning effort. Written comments were received from the Sonoma County Water Agency (Sonoma Water) and Mr. Zac Robinson after the TAC meeting.

In its comments, Sonoma Water comprehensively addresses the shortcomings of the HCM report in its point of view (made available as an attachment to this memo). Sonoma Water offers comments with regards to lumping the Terrace Deposits and Quaternary Alluvium geological units, which affect a majority of the HCM report and lead to changes in the defined principal aquifers, and subsequently, changes to the groundwater model layering and water budget. The LWA Team will discuss this comment further with Sonoma Water and others at the next TAC meeting to decide on how to best respond. In addition, comments are made with respect to the geological cross sections that the LWA Team will need to address in the final HCM Chapter of the GSP. Sonoma Water also made comments with regards to specific sections of the report that LWA will need to consider in producing the final HCM Chapter.

With respect to the Water Budget Report, as the report itself points out and Sonoma Water mentions in its memo, the proposed water budget does not meet all the requirements of SGMA. However, the report provides a valuable starting point for the groundwater model to be developed by the LWA Team. As Sonoma Water points out, the temporal discretization and the hydrological baseline of the model is insufficient in addressing the GSP requirements. In his comments, Mr. Robinson also presents doubts on defining no-flow boundaries for the majority of the basin perimeter. In addition, he emphasizes a need for a better representation of the tributaries in the model as they play an important role in the groundwater/ surface water interaction that the GSP will be needed to address.

The Data Gap report will be addressed and explained to the County and the TAC in a separate memorandum. The Data Gap report has been used extensively by the LWA Team in the data

gathering process and has been discussed in-depth with the TAC during the meeting on 8 November 2018.

The remaining three reports as discussed by the LWA Team in the last meeting and stated by Sonoma Water, will be used as informative reports since they are incomplete in addressing their subject matter due to the nature of the Phase 1 study and do not completely follow the Best Management Practices published by the DWR. In Phase 2, the LWA Team will work comprehensively on the subjects of Water Budget, Sustainable Management Criteria, and developing representative monitoring protocols and will prepare complete reports addressing those subjects consistent with the requirements of the GSP.

Fulfillment of Phase 2 Scope Requirements

The work described in this memorandum is intended to fulfill the requirements of Tasks 7,8, and 9 with respect to reviewing the Phase 1 reports and including comments made by the TAC, as described in the Phase 2 scope of services.

January 18, 2019

**Attachment A: Sonoma Water Memorandum titled:
“Comments Regarding Phase I Ukiah Valley Basin
Reports”**



Sonoma Water

ENGINEERING AND RESOURCE PLANNING

MEMORANDUM

FILE:

DATE: 12/14/2018

TO: Laura Foglia

FROM: Don Seymour/Marcus Trotta

SUBJECT: Comments Regarding Phase I Ukiah Valley Basin Reports

Introduction

The Sonoma County Water Agency (Sonoma Water) has completed its review of six documents relating to the Ukiah Valley Groundwater Sustainability Plan (GSP). The six reviewed documents include:

- Initial groundwater sustainability plan; hydrogeologic conceptual model; Ukiah Valley Groundwater Basin, Mendocino County, California (LACO Associates, 2017a)
- Initial groundwater sustainability plan; preliminary water budget study; Ukiah Valley groundwater basin, Mendocino County, California (LACO, 2017b)
- Technical memorandum; Preliminary water demand review; Ukiah Valley groundwater basin, Mendocino County, California (LACO, 2017c)
- Preliminary sustainable management criteria report; Ukiah Valley groundwater basin initial groundwater sustainability plan (LACO, 2018)
- Ukiah Valley Groundwater Basin Draft Groundwater Monitoring Protocol Manual (LACO, 2016)

- Memorandum to Ms. Sarah Dukett Re: Technical review of phase 1 reports (Grovehoug et al., 2018)

In general, we found the first five reports to exhibit various levels of completeness and are generally insufficient as SGMA GSP chapters, but do contain some useful data and information that can be a starting point for the GSP. Additionally, there are some instances where the reports contain misleading and erroneous information. We have tried to include comments that will help guide the process of developing these reports into GSP chapters.

The *Technical Review of Phase 1 Reports* was the last document we reviewed. This document had specific questions regarding the other four reports. We have provided answers to almost all of the specific questions based on our report reviews. To avoid the need to rewrite our reviews, detailed below, we have simply highlighted in red the sections that specifically answer questions on Table 1 of the *Technical Review of Phase 1 Reports*. The only question we did not specifically answer was the last question regarding the preliminary water budget study. This question requests an assessment of, "...how accurate the overall trend of flow rates and groundwater budgets looks based on the current knowledge of the Basin." We did not take the time to compare this water budget to other water budgets.

Hydrogeologic Conceptual Model Report Review

This report has two stated purposes:

- To characterize the extent and geometry of the water bearing subsurface geologic formations, and estimate the hydrogeologic properties;
- Provide a foundation for a MODFLOW-2005 model that supplements the draft water budget study prepared by LACO in December, 2017.

Overall, this is a competent if not extensive conceptual model. It provides a start for the Hydrogeologic Conceptual Model chapter of the GSP. The text correctly points out that future work is needed to fully address the SGMA regulations. In addition to the future work detailed in the report, we would suggest including:

- A discussion of soils in the Basin;
- A map and discussion of gaining and losing stream reaches;
- A discussion of data gaps;
- A contour map showing the base of the Basin. **Note that refining the base of the Basin will have little to no impact on groundwater sustainability. Sustainability relies on achieving minimum thresholds that avoid undesirable results: which largely translates into maintaining**

certain agreed-upon groundwater elevations. The total depth of the Basin will have little influence on the GSA's ability to meet minimum thresholds.; and

- A differentiation between geologic cross sections and the extent of aquifers. (Further discussed below).

Significant concerns that should be addressed before using this report as the Hydrogeologic Conceptual Model chapter in the GSP include the following:

- The cross-sections are generally confusing, in part because legends for the cross-sections are not included in the report. Although the report includes a brief description of geologic units, the cross-sections do not clearly display the geologic units. Neither do the cross-sections attempt to show the continuity of sands or clay beds. Rather than display geologic contacts or continuity of clay and sand zones, the cross-sections divide the geology into Qal, Low K Qtub, High K Qtub, and Qtub. Interpreting from the text in section 6.4.2, we assume that these correspond to Quaternary alluvium, continental deposits with high hydraulic conductivity, with low hydraulic conductivity, and continental deposits with undetermined hydraulic conductivity. This type of interpretation about hydrogeologic properties is more appropriate in the Principal Aquifer and Aquitards section. The geologic cross-sections should retain geologic information. The WCR database should be further evaluated to determine if sufficient information is available to infer and display the distribution of clay and sand zones in the Basin;
- The report lumps Terrace Deposits and Quaternary Alluvium together in both the geologic cross sections and the discussion of principal aquifers. This causes significant confusion and misrepresents groundwater conditions. Significant problems include:
- The geologic map on Figure 2 shows that most of cross-section A-A' is covered by Terrace Deposits - now known as Quaternary Alluvium. However, the cross-sections show continental deposits at the surface. This results in a disconnect between the geologic map and the cross-sections;
- The discussion of the Aquifer-I physical properties confuses the area mapped as Qal and the combined Qal and Terrace Deposits. For example, the text indicates that the lateral extent of Aquifer-I is consistent with the mapped geologic extent of the Quaternary Alluvium. The text goes on, however, to discuss the older alluvium and Terrace Deposits on the upper elevations of the margins of the Valley; not part of the mapped geologic extents of the Quaternary Alluvium;
- Table 4: Aquifer-1 Hydrogeologic Properties clearly demonstrates the problem of lumping the Quaternary alluvium with the Terrace deposits into a single aquifer. While the text states that the Quaternary alluvium has high hydraulic conductivities, Table 4 demonstrates that the hydraulic conductivities range from 0.1 to 153 feet per day. This range of hydraulic conductivities is not representative of the alluvium that borders the Russian River and its

tributaries. This will be important when discussing the influence of pumping on surface water depletions;

The Quaternary Alluvium and Terrace Deposits should be separated in both the geologic cross sections and the principal aquifer discussion;

- The surface water data collection programs section is as much a discussion of the Russian River and its tributaries as it is a discussion of data collection programs. Further explanation about the interaction between the surface water system and the groundwater system is required. The discussion of the surface water system is too perfunctory and is inadequate for this report. We would suggest reviewing chapter 3 of Sonoma Water's Fish Habitat Flows & Water Rights Project Draft Impact Report, which provides a detailed description of the Russian River System;
- Figures 6, 7, 8, and 9 are included at the end of the report, but are never discussed nor called out in the text. This is an inadequate response to § 354.14. Text must be included that describes the types of soils in the Basin, the surface water system and how it is significant to the management of the Basin, how recharge areas that substantially contribute to the replenishment of the Basin are designated, the source and point of delivery of imported water supplies; and
- There is no discussion, nor any map showing discharge areas including significant active springs, seeps and wetlands within or adjacent to the Basin (§ 354.14 (d) (6)).

Other observations on how to improve the Hydrogeologic Conceptual Model include the following:

- Information on existing monitoring networks should be addressed in the Plan Area section of the GSP rather than the Hydrogeologic Conceptual Model. The discussion of surface water data collection would be greatly improved with a map showing the locations of the 10 streamflow gages in the Ukiah Valley Groundwater Basin. This would allow readers to visually assess the relationship between the gages, and will become important when discussing the locations of gaining and losing streams;
- In addition to average flow rates for the Russian River, the report should identify the maximum and minimum flow rates. Some type of statistical assessment, such as a flow rate exceedances graph, would be helpful to demonstrate whether the average flow rate represents the flow rate at average times, or if it is highly influenced by rare flood flows. From a sustainability standpoint, streamflow depletions during low flows are the most significant, and the average flow rate tells us little about this;
- Because groundwater quality is one aspect of SGMA, the report should identify the USGS' GAMA monitoring as an ongoing monitoring program;

- Figure 2 does not appear to include 479 wells as stated in Section 3.0, however this may be a function of many wells being located very near each other. Additional explanation would be helpful;
- Although not specifically stated in the SGMA regulations, one geologic cross-section that runs the length of Ukiah Valley would be helpful. This would show how the geology changes from north to south in the Valley;
- Groundwater elevation data should be included on the cross-sections if known;
- The database of georeferenced wells identified in Section 4 heavily favors domestic wells. Domestic wells are commonly shallower than irrigation or municipal wells. Using predominantly domestic wells may therefore result in data that is focused on shallow groundwater data. This may not be a problem, but should be acknowledged;
- The Franciscan formation is not part of the Basin. It should be identified as a geologic formation outside of the Basin, and not as a part of the Basin's geology;
- The legend in Figure 2 does not list the geologic formations in temporal order. It would be clearer to list the geologic formations with youngest at the top of the legend and oldest at the bottom;
- The discussion of the Maacama fault should include a discussion on its impact or influence on groundwater flow, if known;
- There is no need to include a discussion of the Franciscan Formation in the Primary Aquifers section: as noted earlier in the report, it is not a significant aquifer;
- The values of specific capacity and transmissivity are possibly reasonable. However, they may not make a large difference in how we sustainability is reached. The most significant problem is that by lumping the Quaternary Alluvium with the Terrace Deposits, this report does not differentiate between important zones of significantly different transmissivity; and
- The specific yield number of 8% is likely low. This is a common problem with the USGS approach to estimating specific yield. The report proposes estimating specific yield through aquifer tests. While this would be a preferred approach, aquifer tests must often be conducted for weeks or months to establish a true specific yield. It may be more practical to establish a specific yield based on analyzing a number of core samples.

Preliminary Water Budget Review

This report presents a water budget from a numerical groundwater model. The model used for the water budget covers only three years. Therefore, the expected range of climatic variation, and

subsequent range of water budget terms, is not reflected in this report. The report specifically states that the water budget derived from the model does not meet all of the water budget requirements proposed by SGMA. Because the report does not meet the water budget requirements proposed by SGMA, this report is not adequate for the GSP water budget chapter.

The model is very cursory. While it represents a good effort at an initial model, it will need to be expanded and improved in order to be useful for the GSP. In particular, historical water budgets in GSPs must cover a period of at least 10 years. It is wise to choose a time period that is representative of average conditions. Future water budgets must be based on 50 years of historical hydrology. It is our understanding that the GSA intends to develop a GSFLOW model of the Ukiah Valley in coordination with the USGS' efforts to develop a GSFLOW model of the Russian River Watershed.

Because the model developed for the water budget analysis is only an initial effort, and the resulting water budget is too limited to be used in a GSP, we spent limited time on the review of the water budget analysis. Specific improvements to the report that we noted include the following;

- This report continues the problem of combining Terrace Deposits and Quaternary Alluvium into a single unit. These two units have different hydrogeologic characteristics. To accurately estimate surface water depletions, Quaternary Alluvium should be separated from Terrace Deposits;
- The water budget results are lumped into categories that are overly broad. The more refined the water budget, the more useful it will be for groundwater management because it will allow individual components to be targeted for management. For example, pumping should be divided into municipal, agricultural, and domestic pumping; and
- It will be informative to plot net surface water/groundwater interaction as a percentage of river flow leaving the Basin. We suspect in winter months the surface water/groundwater interaction is a small percentage of the total flow leaving the Basin. However, in summer and fall months the surface water/groundwater interaction may be a more significant portion of the flow leaving the Basin. This will demonstrate the impact of surface water depletions on surface water flows during critical months.

An accurate model will be necessary to assess the anticipated impacts and likely success of any project or management action that may be needed in the future. In particular, a reliable groundwater model is necessary to assess groundwater/surface water interactions. SGMA regulations §354.28 (c) (6) (B) specifically requires, "A description of the groundwater and surface water model used to quantify surface water depletion." While this regulation goes on to state that a numerical model is not specifically necessary, the importance of surface water depletion in this Basin supports the need for a reliable numerical model. Simulating surface water depletions should be a primary focus of the updated groundwater model.

Preliminary Water Demand Review

There is no specific requirement in SGMA to develop a water demand. We assume that the water demands in this report will be incorporated into the ultimate groundwater model and water budget.

This report is relatively confusing. The main confusion seems to stem from this report citing various background reports that lump demands into different sets; and the report's failure to adequately differentiate between groundwater production and surface water supplies. This report would benefit significantly from a simple table that shows the various estimates of average annual and recent:

- Groundwater pumped for agricultural purposes
- Groundwater pumped for municipal purposes
- Groundwater pumped for domestic purposes
- Groundwater pumped for industrial purposes (if known)
- Surface water delivered for agricultural purposes
- Surface water delivered for municipal purposes
- Surface water delivered for domestic purposes
- Surface water delivered for industrial purposes (if known)

This table would demonstrate the range of estimates and uncertainty in these estimates. Understanding this uncertainty is vital because groundwater pumping is one of the primary components of the Basin's groundwater budget.

Because the estimates of groundwater pumping for agriculture are apparently rough, it would be beneficial to refine these estimates using data available from DWR. Detailed crop data are available from the DWR Land Use Viewer site for 2014; and 2016 data are expected to be available soon. (<https://gis.water.ca.gov/app/CADWRLandUseViewer/>). A relatively accurate estimate of water use could be developed by applying crop duties and irrigation efficiencies to the data from the site. Unfortunately, this approach will not differentiate between the amount of groundwater and the amount of surface water used for irrigation.

Estimating future water use may require a hybrid of the methodologies presented in section 3 of this report. The methodologies are clearly not applicable to all water use sectors. For example, the population-based methodology arrives at the extraordinarily high estimate of 234 gallons per capita per day (gpcd). This is approximately twice the statewide average, and is likely due to the fact that this estimate includes all agricultural use. Estimates of gpcd water use are customarily only applied to municipal and domestic water uses. This approach should only be applied to the domestic portion of water use when estimating future water demands.

Similarly, the connection-based methodology only addresses water delivered by municipal or mutual water systems. Agricultural water demands should be addressed using the land used based methodology.

Preliminary Sustainable Management Criteria Report Review

The purpose of this report is to assist with developing the sustainable management criteria (SMC) for the Ukiah Valley Groundwater Basin. This report was produced in January, 2018. DWR's Best Management Practice (BMP) document for SMC's was released in November, 2017. It is unclear whether the author had time to review the BMP for SMC's prior to writing this report.

It is clear that this report could be improved through a more rigorous reading of the SMC BMP. This report is inadequate as a basis for establishing Sustainable Management Criteria. There are a number of fundamental errors in this report that could lead to an unacceptable GSP. Examples of these fundamental errors include the following:

- This report presents undesirable results as narratives. DWR has stated that undesirable results are **quantitative combinations** of minimum thresholds. The GSP should not adopt the definition of undesirable results included in this report. Section 2 of this report is titled undesirable results; however, it actually addresses significant and unreasonable effects as well as existing conditions. Undesirable results will likely only be estimated after minimum thresholds have been established.
- Section 3 of the report incorrectly states that minimum threshold definitions and values are not required because there are no undesirable results in the Basin. This is a misrepresentation of both the definition of undesirable results and the requirement for minimum thresholds. Minimum thresholds will be required at every representative monitoring point for each sustainability indicator, regardless of existing conditions.
- The report misrepresents the undesirable effect from surface water depletions. Citing a study by Marquez et al. (2017), the report states that the total average net gain of the Russian River over a year is approximately 18,560 acre feet. The report goes on to say that surface water depletion does not have an undesirable result in the Basin. This analysis fails to meet the SGMA requirements of assessing the adverse effect on **all beneficial users** of surface water. This analysis appears to only address the effects of surface water depletions on groundwater storage in the Basin. A far more complete analysis of the beneficial uses of surface water is necessary for the GSP. This analysis should additionally include a temporal aspect to beneficial uses, and not lump the surface water/groundwater interaction into a single annual number.
- The minimum thresholds for surface water depletion presented in this report are not SGMA compliant. Minimum thresholds must be quantitative, not the qualitative tiered approach as presented in this report. Quantitative values of surface water depletion must be developed for both a Minimum Threshold and Measurable Objective.
- The report only provides a generalized discussion of what measurable objectives are. Additional effort will be needed to set measurable objectives at each representative monitoring site in the Basin for each of the six sustainability indicators.

Other, less significant comments about this report include the following:

- The report states that groundwater extraction from deeper wells is likely to have less impact on surface water flows when clay layers are present. This is true for short periods of time. However, extended periods of groundwater extraction may impact surface water flows years or decades in the future. This must be acknowledged, and can be addressed with an accurate and well-calibrated model;
- The report provides a good start at a sustainability goal. The sustainability goal in the GSP must be a three-part goal including a sustainability statement, a discussion of undesirable results, and a path for avoiding undesirable results. The sustainability goal cannot be developed until the minimum thresholds and undesirable results are quantified;
- The recommended projects presented in this report focus on filling data gaps. This will be an important activity after the GSP is developed. However, the GSP will also need a list of projects that could be implemented should undesirable results be observed in the Basin. This will include actions that can be taken should surface water depletions impact beneficial users of the Russian River and its tributaries; and
- Table 2 correctly identifies the relevant sustainability indicators and the correct variables that must be measured for each sustainability indicator. Unfortunately, the remainder of the report does not tie each sustainability indicator to specific quantitative measurements as required by SGMA.

Overall, significant work will be needed on the sustainable management criteria and projects before these chapters are SGMA compliant.

Preliminary Sustainable Management Criteria Report Review

The purpose of this report is to describe monitoring objectives, data and reporting standards and monitoring protocols for the Ukiah Valley Groundwater Basin. This report should reference DWR's Best Management Practice (BMP) document for Monitoring Protocols.

- Section 1.3 should be removed from this document, as it is duplicative with information that will be included in the Hydrogeologic Conceptual Model chapter of the Basin Setting.
- Section 2 of the document should also be removed and replaced with objectives that are developed following the development of Sustainable Management Criteria.
- The recommended monitoring frequency of twice per year will not be sufficient for monitoring surface water-groundwater interaction.

- Section 6 is titled Surface Water-Groundwater Interaction Data Reporting, but does not appear to address reporting. The approach for using the elevation of the top of the well casing for correlating surface water and groundwater interactions is flawed, as this interaction is driven by water-level elevation not the elevation of the wellhead.

Conclusions

The reviewed documents have variable levels of completeness and utility. The Hydrogeologic Conceptual Model document comes the closest to providing a reasonable start for a chapter of the GSP. However, as stated in the document itself, additional work is still required before a complete Hydrogeologic Conceptual Model can be developed.

The Sustainable Management Criteria document is likely the farthest from providing a reasonable start for a chapter of the GSP. This document includes significant errors and misunderstandings of the SGMA regulations.

January 18, 2019

Attachment B: Comments made by the Agricultural Representative, Mr. Zachary Robinson, through email communication

From: Zac Robinson [<mailto:zac@huschvineyards.com>]
Sent: Thursday, December 13, 2018 10:38 AM
To: Laura Foglia <lauraf@lwa.com>
Subject: RE: stakeholders interviews

Laura,

Sorry for the delayed response. It seems to be a busy year end for my winery.

From memory, I would point out the following items:

- The question of boundaries in the LACO model requires some additional thought. I suspect their choice of a no flow boundary led to some odd results which show in their variance report. In my mind leakage from Lake Mendocino is a similar issue (since the Lake is a boundary).
- The LACO data gap analysis was based on the concept of “data point deserts”. Implicit in this thinking is that monitoring stations need to be uniformly distributed across the basin. I am hoping you can be more sophisticated and ask about the **value of information** at a given location.
- The LACO handling of flow in the tribs was too simplistic to address our interest in surface/groundwater interaction. By the way, I still intend to share that creek monitoring data with you, but I have a few permissions I still need to acquire.

I understand your scope of work may influence your ability to explore some topics. Nonetheless I hope we can learn more about:

- How Coyote Dam releases affect groundwater head and the transfer of river/groundwater interaction.
- How channel excision is affecting our groundwater heads and storage.
- Seasonal shifts with the surface/groundwater interaction.
- A good understanding on how the regions creeks supply the groundwater.
- How the basin responds to drought.
- Can we buy “insurance” with ideas like recharge basins

Thanks.

-zac