Sierra Valley Technical Advisory Committee Meeting Summary: February 8, 2021

Project Website: www.sierravalleygmd.org/sierra-valley-groundwater-sustainability-plan
Data Portal: https://sierra-valley.gladata.com

ACTION ITEMS

ACTION ITEM: Check to see if any groundwater quality exceedances occurred in public supply wells (i.e. those that supply 25 or more people).

ACTION ITEM: Clarify the role of Sustainable Management Criteria (SMCs) and which Constituents of Concern (COCs) get selected to have SMCs established.

ACTION ITEM: Include the wells serving the Calpine area as part of the monitoring network for groundwater quality.

ACTION ITEM: Describe level of cost for proposed monitoring approach.

ACTION ITEM: Update the table of COCs and rename specific conductivity as TDS.

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Key Terms and Acronyms

Domestic wells typically provide water to an individual home.

Public water supply represents water supplied to the public. The US Geological Survey defines public water systems as those systems (either publicly or privately owned) that supply water to at least 25 people or have at least 15 connections. Municipal wells an example of a public water supply system.

Constituents of Concern (COCs) refer to those substances (either naturally occurring or man-made) that are deemed as hazardous (or potentially hazardous) by an environmental regulation.

Maximum Contaminant Level (MCL) is the maximum amount of a substance allowed in a public water supply, under the Safe Drinking Water Act.

Secondary MCLs refer to drinking water standards for substances that are not considered to pose health risks and involve considerations such as taste, color, odor.

Sustainable Management Criteria (SMCs) are set as **Minimum Threshold (MT)** levels that should not be exceeded for a certain COC or condition. In SGMA, SMCs are tied to those factors or conditions that Groundwater Sustainability Agencies (GSAs) can influence through management actions to bring measurements back into compliance. Exceeding a Minimum Threshold results in locally defined, undesirable conditions (i.e., are significant and unreasonable).

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Welcome, Introductions, Agenda Review

The fourth meeting of the Technical Advisory Committee (TAC) for the Sierra Valley (SV) Groundwater Sustainability Plan (GSP) was a hybrid meeting, due COVID-19 protocols. The meeting agenda was reviewed, followed by introductions and reminders regarding remote meeting practices. The topics for this meeting covered:

- Project updates and long-term schedule
- Proposed approach for Sustainable Management Criteria (SMCs) and Monitoring Network for Groundwater Quality in the GSP
- Initial Discussion on Groundwater Dependent Ecosystems (GDEs)

There were 25 meeting participants: 16 TAC members (12 online, 4 in-person), 2 ex-officio members (online), 1 planning committee member (in-person), 2 public (1 in-person, 1 online) and 5 technical team members (2 online, 3 in-person).

Project Updates

JANUARY TAC: Draft Meeting Summary

Judie Talbot, GSP outreach facilitator, provided a reminder that the meeting notes for the January 11, 2021 TAC session are posted online at https://www.sierravalleygmd.org/files/b19401519/1-11-21+Meeting+Summary+Draft+v.2.pdf . While no edits were suggested, meeting participants are encouraged to send in any needed revisions.

SIERRA VALLEY DATA PORTAL

Immediately prior to the TAC meeting, an orientation was provided to the Sierra Valley data portal. Gus Tolley, DBSA Hydrogeologist, highlighted features of the online database. The data portal contains SGMA-related data that has been collected for the basin, allowing the data to be accessed and reviewed without a login. Permissions are needed to enter and edit data.

The URL for the data portal is: https://sierra-valley.gladata.com. It opens to a map of wells in the Sierra Valley Basin. In the top right is a toolbar that allows the user to: measure distance, look for data within a selected area (query a region), look for data within a specified distance from a point (query a radius), return to the initial view, switch basemaps and zoom in/out. Hovering over each icon will show you its function. Note that streets and topography are options found within the basemap selections.

On the left side of the page is as icon showing a map pin:  Hovering the cursor over this image, it expands to say “Map Layers.” Clicking on the Map Layers box allows users to turn different filters on and off. The section, “Monitoring Points” currently contains data on wells only. Wells can be sorted by:

- Status (i.e., abandoned, active, destroyed, inactive, unknown),
- Type (i.e., agricultural, domestic, exploratory, monitoring, stockwater, unknown, etc.), or
- Other (i.e., analytical results / water quality, water levels, production data, etc). As a note, production data or pumping levels have not yet been entered into the database.

Continuing down the Map Layers box, users can search for wells by jurisdiction, screen depth, and explore "Additional Layers" of information – such as administrative boundaries, crop mapping, geology, groundwater dependent ecosystems, modeling components and surface water. Users are encouraged to review the data portal and experiment with turning different options on and off. Remember, no matter where you are, the arrow in the upper right  will always take you back to the original view. (Think of it as the "escape" button!)

Note: Most of the layers include an Opacity Slide. Adjusting it from one side to the other allows you to emphasize or minimize different layers of information. Fading out some pieces of information allows you to see other underlying data or features.

Since the accuracy of the database informs the accuracy of the model, the technical team is requesting TAC and community members to review the different data layers – and to submit corrections for any necessary additions, deletions or modifications. Specifically, feedback is sought on the following items:

- Land Use (i.e., vegetation type; go to the Map Layer "Additional Layers," then "Modeling", then click on "SWMB Land Use") – this refers to the "Soil Water Model Budget" that relates to lower portion of the basin, or the valley flor
- Irrigation Type (i.e., flood, center pivot, wheel line; go to "Additional Layers," "Modeling", then click on "SWMB Irrigation Type")
- Irrigation Water Source (i.e., surface water or groundwater; go to "Additional Layers," "Modeling", then "SWMB Irrigation – Groundwater" and "SWMB Irrigation – Surface Water")
- The technical team would especially appreciate knowing which wells supply groundwater irrigation to which fields (go to "Filter by Status" and click active (or all); go to "Filter by Type" and click agricultural wells, then go to "Additional Layers," "Modeling," and click on "SWMB Land Use")

Please submit your comments by **March 19, 2021** to gtolley@geo-logic.com.

Discussion from the Orientation Session

Question: Are the inputs from the watermaster maps incorporated?

Response: Not yet.

Suggestion: Send out an email to TAC members once portal has been updated, asking them for specific feedback

GSP SCHEDULE: LOOK AHEAD

Judie Talbot, GSP Outreach Facilitator, referenced the expanded "Look Ahead" schedule for developing different sections of the GSP. See https://www.sierravalleygmd.org/files/8641b6697/SV-GSP-Revised-Look-Ahead-Schedule-02021.03.01.pdf. The schedule lists the chapters and key content areas of the GSP. Separate columns indicate the proposed months for a three-phased approach to address topics:

- Introduction of topic
- First look at proposed approach for addressing the topic in the GSP
- Review the draft text for the GSP

Updates on the status of each topic area will be presented to the GSAs at monthly meetings of the SVGMD Board.

This format allows multiple points for stakeholders to discuss and provide input on specific content areas. Development of the GSP will be a highly iterative process. There are many feedback loops with chances to revisit text if new information becomes available. Also, there will be another review before the Public Review Draft of the GSP is released. Due to the timeline, reviews of draft text for the GSP will move ahead at a steady rate.

Proposed Approach for Groundwater Quality (SMCs and Monitoring)

Laura Foglia, LWA Project Manager, explained that she would be suggesting an approach for addressing groundwater quality within the GSP. The format would entail:

1. A description of Constituents of Concern (COCs)
2. Setting Sustainable Management Criteria (SMCs) for specific COCs
3. A discussion of the monitoring network to measure COCs

Agreement on an overall approach would help advance next steps, in terms of beginning to write text for the GSP.

BACKGROUND

Groundwater Quality Considerations

At the first TAC meeting, in November 2020, groundwater was described as generally good. There are a few localized areas where groundwater has exceeded regulatory thresholds (such as Maximum Contaminant Levels or Basin Plan Water Quality objectives). Two areas of concern identified by TAC members include:

- higher levels of naturally occurring arsenic in the western portion of the basin, near Calpine; and
- possible impacts from septic systems

While regulatory entities have responsibility for implementing cleanup of contaminants, the GSAs will focus on monitoring groundwater quality conditions and evaluating groundwater management and use to ensure that pumping and recharge activities do not degrade water quality or spread contaminants. This is especially important in designing future groundwater projects.

At the November meeting, TAC members were asked to consider what would constitute “significant and unreasonable” undesirable results to groundwater quality. Three items surfaced:

- Adverse groundwater quality impacts to safe drinking water
- Adverse groundwater quality impacts to irrigation water use
- Spread of degraded groundwater to other areas

Adverse water quality impacts to stream baseflows was also mentioned; however, this will be addressed in developing content regarding surface water – groundwater interactions.

Groundwater Quality Data

There are significant data gaps regarding the spatial and temporal distribution of information on groundwater quality. There are many areas of the basin without data, or wells where one constituent has been sampled once in a period of 50 years. Single points of data are not helpful in describing groundwater quality conditions or trends.

To improve data sets, the GSAs will be working with other regulatory programs to collect information on groundwater quality.

Over the past 10 years, data on groundwater quality has come from a small set of municipal or monitoring wells – which tend to be located near the basin boundary in the northern and southern portions of the basin. These wells can be incorporated into a groundwater monitoring network for the basin.

CONSTITUENTS OF CONCERN (COCS)

The content on groundwater quality will be found within chapters and 2 and 3 of the GSP

- Chapter 2 will list and describe relevant ***Constituents of Concern***: arsenic, boron, iron, manganese, nitrate as nitrogen, MTBEs, nitrate as nitrogen, and Total Dissolved Solids (TDS) (Note: COCs can evolve over the period of time covered by the GSP)
- Chapter 3 will define **Sustainable Management Criteria** (SMCs or measurable thresholds) for a subset of the COCs: Nitrate (as nitrogen) and Total Dissolved Solids (TDS). The SMCs will include ***Minimum Thresholds*** (MT, or levels beyond which "significant and unreasonable" undesired results will occur), ***Triggers*** (warning thresholds that indicate a trend that groundwater quality is degrading, and a quantitative definition for ***Undesirable Results***.
- Chapter 3 will also describe a ***monitoring network*** for monitoring the proposed COCs at prescribed intervals: expanding the network with at least five additional monitoring sites

Discussion

- There are wells, beyond those drilled by Sierra County Water District #1, that show exceedances of arsenic.
- Sierra County Water Works District #1 samples one municipal well every month for arsenic; another well is sampled every three months. This data is on the SDWIS website at: https://sdwis.waterboards.ca.gov/PDWW
- Those wells may have been screened out as being outside the basin boundary. Even so, they could still be included as part of the monitoring network.
- There is also a high manganese issue in the Calpine area, including domestic wells that have been sampled and are inside the basin boundaries.

Question: Would the use of management areas help address the fact that high manganese and arsenic are occurring in the Calpine area?
Response: Formal use of management areas would require setting management criteria for all indicators in each area. It would be better to monitor at a basin-wide scale, knowing that

management actions (such as recharge) may not be suitable or appropriate in some areas of the basin.

Question: Were there any trends or characterizing aspects of the wells with exceedances?
Response: For arsenic and boron, the exceedances seem to come from deeper wells. For some wells with exceedances, there may not be information on well construction.

Comment: Most ranchers have drilled a new well within the past 30 years. These have all been tested by the county and are not showing impaired groundwater quality.

Sustainable Management Criteria (SMC)

The proposal is that SMCs be established for those COCs:

- with existing thresholds that have been, or are likely to be, exceeded.
- with data points from multiple measurements since 1990.
- commonly addressed in GSPs.
- that local agencies have regulatory authority for.

Using this approach, it is proposed that SMCs be established for:

Nitrate as Nitrogen

- Setting the Minimum Threshold at the same value as the Title 22 drinking water standard, e.g., 10 mg/L as nitrogen
- Setting triggers at 5 mg/L or 9 mg/L
- Defining undesirable results as: Exceedance of minimum thresholds for concentration in over 10% (or 5%) of wells in the monitoring network AND/OR Increases in degradation of groundwater quality of more than 1% per year, on average over 10 years, in more than 10% (or 5%) of wells in the monitoring network

Total Dissolved Solids (TDS)

- Setting the Minimum Threshold at the same value as the secondary MCL, e.g., 500 mg/L
- Setting a trigger at 210 mg/L

Monitoring Network

It is proposed that some system of regular monitoring be established for arsenic, boron, nitrate as nitrogen, pH and TDS. Manganese and MTBE are not proposed to be part of that regular monitoring. The proposal for the monitoring network includes:

- using the existing monitoring of groundwater quality from public supply wells
- adding at least 5 more monitoring locations to provide better spatial coverage of the basin,
- careful consideration of the location and construction of additional monitoring well locations to obtain data on desired COCs
- a monitoring frequency of once per year (or once every other year) to provide better temporal coverage

PROPOSED APPROACH

1. Identify and discuss the list of COCs in Chapter 2, which will include: arsenic, boron, iron, manganese, MTBE, nitrate (as nitrogen), pH, and TDS
2. Develop SMCs for nitrate (as nitrogen) and TDS
3. Develop a monitoring network comprised of existing public supply wells and at least five (5) additional monitoring locations.

Discussion: Comments

All TAC members were asked to weigh in on the proposed approach: to offer comments on this and describe any additional information needed to provide a recommendation. The key points from each TAC member are summarized below:

a. This is a really good start for the GSP, which can always be updated in the future. All three components are reasonable starting points. Also, for the undesirable descriptor, the percentages seem appropriate. It could also be expressed as a specific number of wells. Given that water monitoring results can sometimes have errors, consider stating that results come from more than one well or more than one reading. Lastly, monitoring for these COCs will be relatively low-cost that can be done with a probe meter.

b. It should be noted that groundwater quality is generally good. Note that levels are low, but that we want to monitor to determine trends. It was noted that there is other data that supports the idea of generally good groundwater quality. For example, production practices in the basin involve low levels of pesticide use and nitrogen application. (It was noted that this type of information will be discussed in the section on Basin Setting.)

c. Agree with all the points, especially knowing that some of the data gaps will start to be addressed within the next five years.

d. Regarding the monitoring network, selection needs to consider well construction along with its location. For example, a well with a 100-foot seal (or in a different aquifer) might not pick up nitrogen from septics. A shallower well might show more of the contaminants that come from the surface. A deeper will with a good seal is less likely to show contaminants from the surface. Also: we will want to make sure that the monitoring network does not involve outlier wells.

e. The selection of the additional monitoring wells is critical to telling a more complete story of groundwater quality in the basin. It needs to be robust enough to provide clear direction for management.

f. It would be helpful to think about what changes might occur in pumping or surface activities (for example, in response to different climate conditions) – and whether that should be factored into the selection of COCs.

Discussion: Questions and Answers

Question: What kind of costs are associated with the monitoring proposal?

Response: Gus Tolley explained that the costs would not be high. For pH and nitrate, the monitoring could be done with a reusable field meter. The machine itself costs somewhere around $500, with some additional costs for calibration fluids. The samples do not need to be sent to a lab.

Question: Can the proposal for additional monitoring locations use existing wells? (Yes)

Question: Why are Sustainable Management Criteria (SMCs) not being established for all Constituents of Concern (COCs) being monitored, e.g. arsenic?

Response: Monitoring is being proposed to better describe baseline conditions for groundwater quality. If monitoring shows that a COC has some concerning levels, a SMC could be established in the future. Generally, SMCs are set for those COCs where the GSAs have management authority to help reduce the level of the constituent. Arsenic is naturally occurring. While the GSAs could design groundwater management actions, to make sure the problem doesn't get worse, they would not be able to take actions that reduce the amount of arsenic that occurs.

Next Steps

Laura Foglia explained that, over the next month or so, text for the section of the GSP addressing groundwater quality will be developed. The draft text will be presented to, and discussed with, the TAC at the April meeting.

Groundwater Dependent Ecosystems (GDEs)

Christian Braudrick, a geomorphologist with Stillwater Sciences, is managing several GDE projects which focus on the interaction between physical and biological systems.

WHAT ARE GDEs?

DWR defines GDEs as ecological communities or species that depend on groundwater for some of their water needs. Access to groundwater may occur below ground (such as roots reaching the aquifer) or at the surface (for example, at springs or marshes that are fed by groundwater sources). GDEs are one type of groundwater use in the basin. Also, they often sustain special status species of plants and animals. SGMA regulations require that GDEs be identified and considered in developing a GSP.

GDE MAPPING

Vegetation is an important factor in determining where GDEs are (or may be) located. Plant species must be identified, then considered in relation to groundwater sources (aquifers, springs, etc.) – to determine if they are dependent, potentially dependent, or not dependent on groundwater.

It is also vital to determine the relationships between surface water and groundwater. In some cases, groundwater may be feeding surface streams (said to be "gaining" streams) – this is referred to as interconnected surface water. In other cases, streams may be recharging groundwater (said to be "losing" streams).

Mapping Approach

1. Identify the plants located in the Sierra Valley basin using databases such as VEGCAMP, CalVeg, and the National Wetland Inventory.
2. Determine potential GDEs by looking at vegetation type – specifically "phreatophytes" (or plants with deep roots know to access groundwater and requiring more water than is usually provided by precipitation). DWR has a Natural Communities website showing phreatophytes, which has been uploaded to the Sierra Valley data portal.
3. Add in local vegetation data not found in larger databases.
4. Add in local data about hydrology and geology: surface water diversions, springs and groundwater levels – especially depth to groundwater.
5. Create a single map of GDEs
6. Identify GDE units based on shared hydrology (for example, areas that represent interconnected surface water, or areas without interconnected surface water).

GDE MAPPING EFFORTS IN SIERRA VALLEY BASIN

In Sierra Valley basin, source data on vegetation includes CalVeg (from 2000) and the National Wetlands Inventory (from 1984). The map indicates that potential GDE locations are on the western side of the basin. A new vegetation map is being prepared; however it won't be available until after 2022.

In the basin, Information on shallow groundwater and interconnected surface water is relatively sparse. Next steps for the GDE mapping process will focus on: assessing the likelihood of vegetation being dependent on groundwater, accounting for the depth of groundwater levels, and then defining GDE units. Some examples were shown from other basins where maps showed areas where groundwater elevation were 30' or less – since most GDE root systems don't extend down beyond 30'. In the example, three groundwater zones were identified as possible GDEs.

SENSITIVE SPECIES

Looking at sensitive species includes consideration of both plant and animal species. Animal species include invertebrates, mollusks, amphibians, birds and mammals. There is a total of 56 sensitives species found within the Sierra Valley basin. The consultant team is now working to determine how many of these species are dependent on groundwater. Sensitive species will then be assigned to GDE units, to understand relative importance of different GDE units.

TAC members are invited to add into the list of sensitive species, which was developed by using the California Freshwater Species Database and the California Natural Diversity Database. Again, this is just a list of know sensitive species – and the list has not yet been assessed for which species are groundwater-dependent.

TRACKING GDE HEALTH

A Normalized Differential Vegetation Index (NVDI) can be used to track changes in vegetation health (such as plant density and leaf area) through time. This information is obtained from satellite imagery. The trend in vegetation health can then be compared to changes in groundwater levels to look for possible correlations.

As an example, a map of the Sierra Valley basin shows areas where NVDI (vegetation health) is increasing (see blue dots) and areas where NVDI (vegetation health) is decreasing (see red dots). The next step will be to see which of those areas represent groundwater-dependent vegetation.

Discussion: Comments, Questions and Answers

Comment: Plumas Audubon Society has a lot of information about what special status birds breed or migrate through the valley. We would like to participate in this step of the process.

Response: The technical team is very interested in working with those who have local, on-the-ground knowledge to help fill data gaps.

Question: How will interconnected surface water be assessed, such as seasonal ponds and lakes? These are critical for bird breeding sites and success – perhaps more than vegetation maps might indicate. It would be helpful to get more information about groundwater and surface water in the basin.

Response: The technical team will be working to identify interconnected surface water. Some of that desired information might represent a data gap to be addressed in the future. Outside of tracking vegetation, the health of GDEs could be tracked by gauging areas of surface water flow – or by tracking discharge for trends. For a non-flowing surface water bodies, we could look at nearby measurements of groundwater to see if there are any trends associated with potentially interconnected surface water levels.

Comment: There will be additional discussion on groundwater and surface water interactions and interconnected surface water.

Question/Comment: Did you consider using CalFlora data also? Additionally, Bill Harnach published an "Annotated checklist of the FLORA OF THE SIERRA VALLEY REGION of Sierra and Plumas Counties, CA" in 2015 that might also be useful. He documents 93 families, 434 genera, 1129 recorded taxa and 127 taxa that would probably be found in the Sierra Valley region. (Of these 161 are introduced species.)

Question: How will depth to groundwater be indicated across the basin? Will it be a range? Will it be a single point in time? What depth to groundwater data will be used?

Response: It depends on what the GSA wants to do. SGMA in general would say to use 2015 as a reference year. An ecologically based approach would be to take the highest recorded groundwater over the lifetime of the vegetation. Other basins have used high groundwater levels from a relatively wet year – which is a conservative approach to eliminating potential candidate GDE locations. You don't want the potentially groundwater-dependent vegetation eliminated too easily.

Comment: From the perspective of CDFW, an initially conservative look at GDE identification is supported.

Response: Data on groundwater levels would come from well monitoring. Additional data could come from the model -which would provide some additional information tied to a specific year or time of year.

Question: Are there any plans for any field verification? Would that happen during this initial process or would that need to wait for the five-year update?

Response: Field assessments of GDEs is not part of this particular scope of work. If there are areas where stakeholders have questions about the accuracy of the data, that could be addressed during the five-year update. The hope is that there would be additional funding for the CDFW mapping effort.

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Participants

TAC MEMBERS

X = attendance

	Organization, Name		Organization, Name
	City of Loyalton Brooks Mitchell	X	Sierra County Environmental Health Elizabeth Morgan
X	Feather River Land Trust Ken Roby		Sierra County Public Works Tim Beals
X	Feather River Trout Unlimited William Copren		Sierra Valley Groundwater Mgmt. District Dave Goicoechea
X	Hinds Engineering Greg Hinds	X	Sierra Valley Resource Conservation District Rick Roberti
X	Integrated Environmental Restoration Svcs. Michael Hogan	X	Sierraville Public Utility District Tom Archer and Paul Rose (alternate)
X	Plumas Audubon Jill Slocum	X	UC Cooperative Extension Tracy Schohr
X	Plumas County Tracey Ferguson and Tim Gibson (alternate)	X	Upper Feather River IRWM Uma Hinman
X	Plumas County Environmental Health Rob Robinette	X	USFS – Plumas National Forest Joe Hoffman
X	Sierra Brooks Water System Tom Rowson	X	USFS – Plumas National Forest Rachel Hutchinson

EX-OFFICIO MEMBERS

X	CA Department of Water Resources Debbie Spangler	X	CA Department of Fish and Wildlife Bridgett Gibbons

TECHNICAL TEAM & PLANNING COMMITTEE

X Laura Foglia, LWA Project Manager

X Christian Braudrick, Geomorphologist, Stillwater Sciences

X Betsy Elzufon, LWA Asst. Project Mgr. (admin)

X Judie Talbot, Outreach Facilitator

X Gus Tolley, DBS&A Hydrogeologist

X Kristi Jamason, Planning Committee

COMMUNTY MEMBERS

X Dwight Ceresola, Plumas County Supervisor

X Dwight Smith, McGinley and Associates