

MEETING NOTES

Basin Monitoring Program Task Force Technical Consultant Workshop

February 9, 2021

CONSULTANTS PRESENT:

Geoscience Support Services, Johnson Yeh*
Geoscience Support Services, David Barnes*
Geoscience Support Services, Lauren Wicks*
Geoscience Support Services, Tim Chen*

West Yost, Samantha Adams*
West Yost, Veva Weamer*
WSC, Michael Cruikshank*
LeClaire & Associates, Joseph LeClaire*

OTHERS PRESENT:

City of Corona, Jennifer McMullin*
Eastern Municipal Water District, Al Javier*
Elsinore Valley Municipal WD, Jesus Gastelum*
Elsinore Valley Municipal WD, Lenai Hunter*
Elsinore Valley Municipal WD, Sudhir Mohleji*
Inland Empire Utilities Agency, Eddie Lin*
Inland Empire Utilities Agency, Joshua Aguilar*
Kahn Soares & Conway, LLP, Theresa (Tess) Dunham*
Orange County Water District, Greg Woodside*

Orange County Water District, Kevin O'Toole*
San Bernardino Valley Municipal Water District, Matt Howard*
Santa Ana Watershed Project Authority, Mark Norton*
Santa Ana Watershed Project Authority, Haley Mulla*
Santa Ana Regional Water Quality Control Board, Cindy Li*
Santa Ana Regional Water Quality Control Board, Eric Lindberg*
State of California Water Board, Rebecca Greenwood*
Santa Ana Regional Water Quality Control Board, Eric Lindberg*

*Participated via conference call

Opening Remarks and Introduction Basin Monitoring Program Task Force Scoping Committee Participants

The Basin Monitoring Program Task Force (Task Force) Technical Consultant Workshop commenced at 1:01 p.m. in a virtual Zoom Meeting, in response to, and in compliance with, COVID-19 regulations. Brief introductions and background on the Task Force were made.

Consultant Team Introductions

Tess Dunham, of Kahn, Soares and Conway, LLP, gave a quick overview of how the workshop would run. Tess would facilitate the order in which the consultant groups would answer, varying it by question. Each consultant group provided introductions for their team and their various experiences. The following three teams introduced themselves:

- Water Systems Consulting, Inc. (WSC)
 - Michael Cruikshank, of WSC has personally been involved with four out of the eight Ambient Water Quality updates conducted by the Task Force, starting with the objective period 1987 – 2006 recomputation.
 - Joseph LeClaire, of LeClaire & Associates has worked on projects for TIN/TDS Task Force Phase 2A work, completed Nitrogen losses analyses for City of Redlands and the RIX Facility. He has been part of the Task Force and its work for some time.
- West Yost & Associates (formerly WEI, now West Yost through acquisition)
 - Samantha Adams is a principal scientist and business sector leader for the groundwater unit. For the past 15 years of her career, she has worked on Salt Nutrient Management Projects (SNMPs), computing Ambient Water Quality to develop SNMPs/Max Benefits throughout the groundwater management zones within the watershed; and has worked within the San Diego Regional Board and Colorado River Regional Board.
 - Veva Weamer has been with the firm (formerly WEI) for 13 years, with contributions in data management and analysis for all projects listed above.

- Geoscience Support Services, Inc.
 - Johnson Yeh is a principal Geohydrologist and has been working at Geoscience for 31 years. He's worked on various projects throughout the watershed including modeling imported water recharge, the most recent Santa Ana River Waste Load Allocation Model update, and the integrated model in the Upper Santa Ana River Watershed.
 - David Barnes is a senior modeler at Geoscience with 11 years of professional experience in water resources. He helped develop the Upper Santa Ana River integrated water model for Upper SAR Watershed. He has a Bachelors in Hydrology and Water Resources from University of Arizona and a Masters in Civil/Environmental Engineering from MIT.
 - Lauren Wicks has been with Geoscience for 9 years. Her experience includes modeling in San Bernardino basin area and was one of many team members of WLAM update and the integrated SAR model.
 - Tim Chen is a project modeler and project engineer with 8 years of experience in modeling. His experience within the SAR Watershed includes groundwater flow modeling for SBBA, modeling in the Rialto/Colton basin, groundwater flow and particle tracking flow for the Yucaipa basin.

Responses to Questions Regarding Groundwater Monitoring Program Update

Tess Dunham, of Kahn, Soares and Conway, LLP, facilitated the reading and selection of order for the following set of questions.

Question 1: *The Recycled Water Policy requires a basin- or subbasin-wide monitoring plan that includes an appropriate network of monitoring locations to provide a reasonable and cost-effective means of determining whether the concentrations of salts, nutrient and other constituents of concern are consistent with applicable water quality objectives (§6.2.4.1). Are there more cost-effective approaches than the one currently used by the BMPTF for making this determination? In particular, are there existing areas/tasks where the required level of effort incurs costs that are highly disproportionate to the benefits associated with the final product (i.e., the results provide little or no apparent value to subsequent decision making)?*

Responses:

- WSC
 - a. As part of each previously conducted recomputation, a well attrition analysis is completed to assist in maintaining monitoring points over time. Efforts for the water quality data collection do not need to be extraneous; the monitoring that is already being conducted for day-to-day business should suffice. Data is collected from various sources/databases, so there may be ways to streamline the monitoring portion if agencies are duplicating efforts for this.
 - b. Temporal clustering/declustering and spatial-averaging data manipulation is straight forward and beneficial.
 - c. The statistics are very cumbersome and repeated each time; there may be room for improvement in this area since it is repeated each and every cycle.
- West Yost
 - a. One recommendation would be to create a standardized, uniform monitoring plan with listed wells that need to be monitored; not just accepting the data that is out there already. This will aid in uniform data that can be compared over time.
 - b. Ensure the compliance of two key components of Recycled Water Policy when creating the monitoring plan:
 - 1. Address its requirements: sampling in areas around water supply wells, areas proximate to large recycled water projects (particularly groundwater recharge projects), areas around other potential sources to

salts/nutrients, and groundwater/surface water where there is connectivity between the two.

2. Support assessment of water quality every five years, under six specified categories: demonstrate the current conditions are reflected in SNMP.
 - c. Another would be to create a prioritization scheme that would allow for focus on the areas that would benefit from further analysis and effort, while maintaining lower involvement in areas of static trends.
- Geoscience
 - a. Extending the frequency of updating the AWQ study to be a longer length of time than the three years between cycles. Doing statistics for a trailing average would not suffer from being updated on a longer cyclical basis than every three years.
 - b. The standard error statistic contains an additional component that makes using the AWQ final results/data difficult for use in groundwater modeling. If the standard error component of the statistic is re-evaluated, and complexity is eliminated, then the final results from AWQ study can be used later in the groundwater model. This would eliminate an additional component of standard error from those measurements.

Tess reminded the group that this is a time to be innovative and creative to give the Task Force options in moving forward with the various tasks it completes. The Basin Plan can be amended in the future to include these new ideas, procedures, or plans and that the current Basin Plan should not stifle the ideas brought forth today.

Question 2: *Both the 2009 and current Recycled Water Policies include specific direction for determining assimilative capacity and conducting antidegradation analysis for groundwater recharge projects. In the 2009 Recycled Water Policy, assimilative capacity is to be calculated by comparing the mineral water quality objective with the "average concentration" of the basin/subbasin (§9-c-1). In the current Recycled Water Policy, this language was revised to state that assimilative capacity shall be calculated by comparing the mineral water quality objective with the "representative concentration" of the basin or subbasin (§8.2.4.1). Although these provisions apply specifically to recharge projects, should the BMPTF consider an alternative approach (as supported in the Recycled Water Policy) for characterizing the "representative concentrations" of salt and/or nitrogen in a given groundwater basin rather than the long-term, volume-weighted average that the Santa Ana Water Board presently relies on to make that determination? Should the BMPTF and the Santa Ana Water Board revisit the prior decision to use a 20-year temporal average, to apply a statistical confidence interval to the well data, and to characterize current ambient quality as a spatially-averaged single value? Is there a better approach that offers greater utility in the context of common water resource management practices in the region?*

Responses:

- Geoscience
 - a. The 20-year rolling statistic is a stable metric and could be something to re-consider. Change in the frequency of 20-year trailing statistic may be beneficial given that the 20-year average can tend to bias the data towards past water quality as opposed to looking at where the water quality is going. It is worth noting that the time it takes to complete the other 17 years of re-analysis of the same data each time would be less.
- West Yost
 - a. Per the Regional Board, consultants/agencies are not able to use the AWQ as starting position for modeling because it is not representative of the most current groundwater condition. If the statistics and calculations are re-evaluated, they would be usable in many areas, outside of the AWQ study.
 - b. AWQ was originally formulated to work with the data they had available. That is different now, we have much more data available to us. Changing the procedure for how

the AWQ is calculated would make more sense since it is not operating on the same limited data as it was previously.

- c. Current condition of the groundwater quality is variable based on the groundwater basin. Some basins are small and shallow while other basins are very large and not as influenced by the environment. Trends do need to be studied in order to create specific management plans to influence management decisions more accurately.
- WSC
 - a. Sometimes the changes are due to having additional wells that come into the networks of being sampled. It allows us to get a more reliable, and accurate, picture of the actual water quality in that area.
 - b. Supplementing with newer knowledge of the hydrogeology and implementing those updates to the basins into the AWQ would help. Since 1998, the newer modeling and reports of the hydrogeology in the watershed could contribute to the confidence of the study. If there were more accurate volumes and characteristics of the basins, the numbers would have greater confidence in the analysis and interpretive tools.

Question 3: *The Recycled Water Policy requires that the associated monitoring plans be designed to effectively evaluate water quality in the basin, with a focus on water supply wells. (§6.2.4.1.1.) The Recycled Water Policy also states that monitoring plans may include data from existing wells where such wells are located and screened appropriately to determine water quality in the most critical areas of the basin. (§6.2.4.1.2.) What approach(es) would you recommend for identifying the "most critical areas?" Or, is it better to continue collecting and analyzing all available well data for all groundwater management zones in the watershed, as the Task Force currently does, rather than trying to make this determination?*

Responses:

- West Yost
 - a. Mapping salt and nutrient loading sources and all information for each management zone; and then make sure that this will trigger the response of appropriate levels of monitoring and regulation of the data.
- Geoscience
 - a. Mapping forward particle tracking, conducting analyses and viewing trends of the water quality, especially where changes in water quality are anticipated as a result.
 - b. Forward particle tracking is a modeling study; completed and run on top of existing groundwater flow models and releases particles and tracks them along ambient water flow paths. This would be assisting the mapping loading sources and follow the particles in the flow of the basin and seeing where these effects the recycled water.
- WSC
 - a. Conducting particle tracking is captured in the Recycled Water Policy already; all of this information is currently in the AWQ recomputation.
 - b. Expand that to all areas; to include the sources of particle loading and areas that need to be focused on based on the issues (heat maps) and using that information to make regulatory/management decisions on finding/monitoring the sources of those particles.

Question 4: *The Recycled Water Policy (§6.1.3 & §6.2.4.3) includes a number factors to be considered as groundwater basins are being evaluated and salt and nitrogen management plans (SNMPs) are developed; these include, in part, the following:*

- (a) salt and nutrient source identification and loading estimates*
- (b) fate and transport of salts and nutrients*
- (c) contribution of imported water & recycled water to basin water supply*
- (d) reliance on groundwater to supply [users] in a basin or subbasin*
- (e) number and density of on-site wastewater treatment (septic) systems*
- (f) population*

What are the advantages and disadvantages of attempting to integrate these factors into the BMPTF's existing monitoring and reporting program? Are their options for meeting these new obligations more efficiently and cost-effectively?

Responses:

- Geoscience
 - a. Trying to make a more comprehensive report or modeling tool that captures satisfying all of the Recycled Water Policy objectives instead of it focusing on answering only one question.
 - i. The advantages would be:
 - 1. One model/report that contains a comprehensive look at the watershed.
 - 2. Having the capability of tracking fate and transport of the nutrients, for all projects or using it for individual areas.
 - 3. Possible to identify critical zones easier.
 - ii. Disadvantages would be a high level of collaborative effort and teamwork between agencies in any given area.
- WSC
 - a. Time and effort can have significant costs especially when breaking out the individual groundwater basins/management zones.
 - b. Prioritization would need to be completed in order to see who could/should collaborate together to get the more efficient effort and cost effective work/modeling
- West Yost
 - a. Prioritization is key here. To maintain a cost-effective effort, prioritization allows for those who can, to work together to accomplish the goal they are striving for.
 - b. Some questions to think about as a Task Force:
 - i. What is the umbrella role that the Task Force can provide to all agencies without being too specific and getting bogged down with each different groundwater management zone and the intricacies and specificity needed for each area?
 - ii. Task Force can assist with the prioritization and can serve as a peer review body and comprehensive collaboration that allows for time an effort to be productive and efficient.
 - c. Important: Monitoring/data management/modeling will cost far less than the costs for trying to convince the Regional Board that the SNMP is beneficial for that groundwater management zone. WSC also commented that it is much cheaper than having to replace and upgrade expensive wastewater treatment plant equipment.

Question 5: *The Recycled Water Policy (§6.2.1.1) requires the Santa Ana Water Board to identify basins that are a threat to water quality and thus need an SNMP (§6.1.3). What objective scientific metrics are recommended for making this determination or for otherwise prioritizing groundwater basins for the purpose of developing such plans?*

Responses:

- WSC
 - a. Areas that are needing the SNMP, are already completing them. They need to do it and are working on them.
 - b. It would be very beneficial to use the heat maps and view the AWQ and how the trends look over time.
 - c. Actual groundwater basin water quality will need to be evaluated.
 - d. Developing the large groundwater, surface water integrated water model would be beneficial to see exactly how the water flows, especially between basins.
- Geosciences
 - a. Evaluate all factors: population growth, water quality, pumping well flow, water demand, and various metrics.
 - i. Determined Assimilative capacity and declining rate of assimilated capacity were important in prioritizing the basins.
- West Yost
 - a. Evaluating current state and knowing the existing mitigating activities would help with assisting prioritization in areas that do not need that added effort.

Question 6: *Historically, the BMPTF has focused exclusively on TDS and Nitrate. The Recycled Water Policy allows SNMPs to "address other constituents that may adversely affect groundwater quality" (§6.2.1.1). What, if any, such constituents should the BMPTF consider adding to its existing Monitoring and Reporting Program and what would be the rationale/justification for doing so? In particular, are there recommendations you would make with respect to evaluating individual salt ions (chloride, sodium, sulfate, etc.) in the context of SNMP development?*

Responses:

- West Yost
 - a. No recommendations for tracking an objective standpoint beyond TDS and salt management. There are some additional nutrients that are evaluated for source water characterization.
- WSC
 - a. No recommendations for other nutrients to monitor. Secondary ions are usually treated and addressed as TDS and nitrate.
- Geoscience
 - a. No recommendation/response.

Question 7: *The Recycled Water Policy (§6.2.6) appears to anticipate the use of computer models to simulate groundwater quality. Although the BMPTF stated a preference for more frequent and intensive water quality monitoring in lieu of developing a sophisticated groundwater model, the Imported Water Recharge Workgroup (now a subcommittee of the BMPTF) has been relying on such simulation models for many years now. Should the BMPTF revisit the prior recommendation and reconsider the value and utility of such models? What would be the advantages and disadvantages of realigning the BMPTF's commitment to monitoring vs. modeling?*

Responses:

- WSC
 - a. Monitoring data is helpful in continuing to attempt toward an integrated model and updating the efforts and management throughout the watershed.
- Geoscience
 - a. Modeling does not supplant monitoring. It helps establish baselines and historical data. It can simulate and assist in making decisions through simulating the trends and where the basin quality is going.
 - b. A model can also help avoid having to implement or experiment with real world projects by simulating management efforts to change where the quality is going.
- West Yost
 - a. The question is more modeling versus compliance actions. Lack of knowledge about geology/hydrogeology is a major downfall in trying to collaborate and attempting to collaborate on large regional, integrated models. Simulating the whole watershed/system is very complex and would not be easily done for a whole regional area.
 - b. Management and technology are another place for prioritizing the investment in focusing development in modeling tools for areas that are really needing it.
 - c. Task force could perhaps act as a middleman and not take the whole effort for the whole region/watershed.

Summary by Tess Dunham: There seems to be a theme of the role of Task force in assisting in evaluating the current condition and facilitating collaboration, but not taking on the whole region/watershed. The Task Force continues with monitoring and evaluating in areas that the agencies have access to and continues to contribute to furthering efforts and requirements together. It also supports the Regional board and assisting a streamlined and singular set of results for the various areas of the watershed.

Question 8: *The Imported Water Recharge Workgroup subdivided the watershed into five sub-regions and conducted its water quality evaluations on a staggered basis that rotated from top to bottom every five years. Given the complexity of tasks that must be completed to comply with the Recycled Water Policy, should the BMPTF consider adopting a similar approach? What would be the advantages and disadvantages for doing so? Can you recommend a more cost-effective implementation strategy?*

- West Yost
 - a. The biggest disadvantage to a cascading approach is that the Regional Board does not have all of the information at once.
 - b. An advantage is that cascading is elegant and can provide a solution that makes it easier to digest the watershed for modeling.
 - c. Monitoring addresses the past and modeling helps with the future, and then every 5 years looking at how the decisions that were made impacted the current status of the basins. This can be done by comparing current values and the expected modeling results with the data provided and was expected.
 - d. Note about comprehensive modeling would be to realize that certain areas that have more detailed surface water and groundwater modeling could cause complications in those areas.

- Geoscience
 - a. From efficiency perspective, a cascading report can be duplicative. But if the duplicative overlapping portions are minimized then you could see some cost savings.
 - b. Rotating scheme would not be recommended going forward.
 - c. Looking at the biggest portion of the watershed as possible, when possible, would be more beneficial than that. A less frequent, more comprehensive report would be getting a fuller picture. Moving away from the integrated, whole region approach, would mean that sub-basin by sub-basin may still cut off parts of the picture that would be helpful in making decisions.
 - d. More comprehensive reporting would save effort (in time, effort and data information).
- WSC
 - a. There is economy in scale and benefits to the AWQ update process. Data collection, analysis, mapping and creating the interpretive tools is more cost effective and efficient for the entire region.

Question 9: *The Recycled Water Policy requires the groundwater evaluations to be updated every five years (§6.2.6.). The Basin Plan currently requires such re-evaluations to be completed every three years. Focusing exclusively on the scientific and technical issues that are being addressed during these evaluations, what would be the advantages and disadvantages of revising the Santa Ana watershed's update schedule to extend it from 3 years to 5 years? Should the BMPTF consider a hybrid approach where high priority basins continue to be reassessed every 3 years and low priority basins would only be evaluated every 5 years? If so, what procedure would you recommend for establishing each basin's relative priority?*

- Geoscience
 - a. Changes within the prioritization and how the timing of basin updates occur can complicate the monitoring and response for the basins. If a basin starts to trend downwards, there should be a plan to get the basin back on a three-year time frame, if the five-year time frame is not often enough.
 - b. The Task Force would need to decide how the time frame will be for the averaging cycles. The 20-year cycles can cause a gradual downturn to be missed if it stays the same.
- WSC
 - a. The most cost-effective change would be to move the cycles to five-year cycles from the three-year cycles.
 - b. Interpretive tools can be created to help address some of the Recycled Water Policy requirements.
 - c. At a five-year cycle, the trends would still be captured and would be enough to catch any changes that would need to be addressed in between. Any longer (10 years) would miss critical trends but five years should be appropriate.
- West Yost
 - a. Every five years would be more cost effective, especially since groundwater concentrations change very, very slowly. There would be increased capability to combine efforts better with everything on five-year cycles (AWQ and recycled water policies).
 - b. They would not recommend dividing areas into different schedules. It would cause too much need to manage on different timelines and adds unneeded complexity.
 - c. What is the value of completing three-year cycle versus utilizes the time/money/effort that can be put into the future; rebalance the money being spent and doing things that provide decision grade information and put it towards things that will need to be done anyway.

Questions from Scoping Committee Members:

Al Javier, EMWD: Question: Referring to Sam's reference of Perris South and the mitigating efforts that are already in place: Why are we repeating this AWQ? What is the appropriate solution/response to continue to update the Basin Plan to make it not a requirement?

West Yost's conceptual response – What is the objective? What is current ambient water quality? What's the trend? What are the loading sources and management activities? Prioritize the analysis that needs to be completed every five years. If water quality is staying relatively the same, then computing AWQ here is not adding any value in the system. If trends change drastically or something else becomes an issue, then it will need to be addressed and re-evaluated. Changing the Basin Plan amendment would need to happen anyway, so it would need to be change of AWQ three-year to five-year cycle.

Responses to Questions Regarding Surface Water Monitoring Program Update

Tess Dunham, of Kahn, Soares and Conway, LLP, gave an oral report on a handout.

Question 1: *In the current Annual Report of Santa Ana River Water Quality, data for multiple parameters is compiled and included beyond data for TDS and nitrogen. Should the BMPTF continue to compile data for the additional parameters or focus only on TDS, nitrogen and related parameters?*

- West Yost
 - a. Limit scope of report to questions that need to be answered in terms of Basin Plan and requirements.
 - b. Monitoring answers those questions directly. Data reporting and collection as a whole with the Task Force all together may be beneficial.
- WSC
 - a. No recommendation/response.
- Geosciences
 - a. No recommendation/response.

Question 2: *The Recycled Water Policy focuses mostly on salt and nutrient impacts to groundwater basins and sub-basins. Are there any provisions in the Recycled Water Policy that the BMPTF should consider in updating the Surface Water Monitoring program?*

- Geoscience
 - a. Recommend increasing data collection for monitoring along the stream for improving the Waste Load Allocation Model.
- West Yost
 - a. 100% agree with Geoscience. Increased monitoring data and it will also serve understanding the groundwater basins.
- WSC
 - a. No recommendation/response.

Question 3: *Are there new tools or approaches that the BMPTF should consider developing or utilizing to evaluate compliance with TDS and nitrogen objectives for Reaches 2, 3, 4 and 5 of the Santa Ana River?*

- WSC
 - a. No other recommendations.
- Geoscience
 - a. Integrated water model may definitely help here. Surface water and groundwater component will only be benefitted and will be better simulated in the groundwater. One area that will really benefit is Prado Dam, spatially and temporally, for the source of the rising groundwater.
 - b. Monitoring with deeper wells and vertically giving breadth, done in conjunction to improve modeling and updating with monitoring over time.
 - c. Local current monitoring places to keep them from being washed away or adding to the areas around the river.
 - d. Field studies can also look at seepage pan measurements to assist in monitoring/data collection, single moments in time.
 - e. Still Water sciences is working for SBVMWD right now and can provide comprehensive monitoring program feedback.
- West Yost
 - a. Surface water monitoring would be more accurate with more monitoring at Prado Dam and could help understand what is happening.
 - b. Chino Basin has four wells in proximity to the Santa Ana River still today.

Question 4: *What implications, if any, does the State Water Board's on-going effort to develop Numeric Nutrient Endpoints have for the BMPTF? Should the BMPTF consider modifications to its surface water quality monitoring program in anticipation of probable changes in statewide nutrients policy?*

- Geoscience
 - a. No recommendation/response.
- WSC
 - a. No recommendation/response.
- West Yost
 - a. Point of consideration: For any potential regulation, “monitoring is double-edged sword; what we don’t know, won’t hurt you but when you need it, you won’t be prepared for it.”
 - b. Design a monitoring program to see what would work or how that would look. Cost-benefit analysis of monitoring vs regulatory action to be avoided.

Cindy Li, RWQCB: Would like to stay away from biology. We always focused on salt and nitrate management as a Task Force and it gets very complicated when addressing biological issues. It’s recommended to not start addressing these biological parameters under this effort.

Question 5: *In late 2016, State Water Board staff initially recommended that Reach 3 of the Santa Ana River be added to the 303(d) list due to impaired macroinvertebrate communities attributed, in part, to exceedances of water quality objectives for TDS and various individual salt ions (chloride, sodium, and sulfate). This assessment was based on data from benthic surveys that was evaluated using the California Stream Condition Index (CSCI). Although the recommendation was later withdrawn in 2017, it may be resurrected in the next 303(d) review cycle (currently scheduled for 2022-2024). What, if any, modifications to the surface water monitoring program should the BMPTF consider addressing this concern?*

- West Yost
 - a. No recommendation/response.
- Geoscience
 - a. No recommendation/response.
- WSC
 - a. No recommendation/response.

Question 6: *The BMPTF has identified as a priority the need to conduct a study to identify and quantify the cause(s) of TDS exceedances during baseflow conditions at below Prado Dam. This would be a follow-on study to the ones performed by WEI in early 2015, which showed that the exceedances were not due to POTW discharges and were more likely the result of poor-quality rising groundwater in the Prado Basin Management Zone (PBMZ). Do you have suggested approaches or considerations that the BMPTF should take into account for this study?*

- Geoscience
 - a. Mixing model approach with detailed chemical analysis to characterize each source component, map the flows of the river in that area and leading up to it, and see what is contributing to the water quality at Prado Dam. Start with analysis upstream of Prado Dam to see where the water quality begins to really change. Model would be run to see what various factors/variables are contributing and seeing what that rising component is.
 - b. During an internal conversation, our firm stumbled upon a high-resolution surface water sampling approach, manned aerial drone/vehicles that can complete the sampling every 100 ft. For example, USDA is now using drones for sampling within the river.
 - c.
- WSC
 - a. Possible stable isotopes of nitrogen and oxygen to use Nitrate as a surrogate to see how rising groundwater is contributing to the levels of TDS concentration.
- West Yost
 - a. Monitoring and analytical components are needed. There needs to be much more monitoring data available to start to understand the issues in the area. It could be valuable to conduct a data collection effort to see what is available.
 - b. Consider evaluating other things in the river (riparian, environment) to address all possible causes of the high TDS concentrations, if it is not just rising groundwater.
 - c. West Yost has been part of a monitoring program of the riparian. Veva Weamer is leading this program and is providing a talk on it at the upcoming GRA conference. There is data that is available and can be used; reports available on Chino Basin Watermaster's Reports Page on their website. This specific monitoring program is in its 5th year.

Questions from Scoping Committee Members:

Greg Woodside, OCWD: Do you find that surface water monitoring is addressed by a subset of consultants, and how can we find them?

Tess suggested Wood Environmental which addresses nitrogen with the LE/CL TMDL Task Force. Mark Norton suggested Richard Meyerhoff (GEI Consultants), Wood Environmental, CDM Smith as groups that assist the MSAR TMDL Task Force, as well.

- Geoscience
 - i. When it came to numeric nutrient endpoints and the stream index, these were more specific metrics than what they really focus on.
 - ii. City of Los Angeles did similar work in preparation for their stormwater facility plan (Especially for Volume 4) and LA River Studies in Volume 5. Tim Chen of Geoscience was part of the technical group and is happy to facilitate any introductions if requested.
- WSC –
 - i. Some of the groups that conduct habitat studies/fish studies are more geared toward surface water issues and sampling. Stillwater and stormwater focused groups may also be more apt to work with these areas.
 - ii. Potential helpful contacts were listed as Wendy Katagi of Stillwater Sciences, Richard Meyerhoff of GEI Consultants, and Steve Wolosoff of CDM Smith.
- West Yost
 - i. Mark Wildermuth is a hydrologist, especially in the Chino Basin. He's a great resource and expert of that area.

Mark Norton, SAWPA: How are other regions throughout the state conducting their SNMPs and how do they compare to our procedures?

- West Yost
 - a. The Regional Boards in other regions are being very particular and are needing more comprehensive work, based on experiences in the San Diego Region and Colorado River Region, particularly about how their SNMPs are being developed. Costs are far more significant than what the Task Force is doing.

Tess Dunham, Kahn, Soares, and Conway, LLP discussed an upcoming piece of legislation, AB377, that may have some impact on any dischargers to ground and surface waters throughout the state.

Rebecca Greenwood, State Water Board, gave a suggestion of remembering the data flow and management. It's a requirement of the Recycled Water Policy that data is electronically submitted, remembering the data sets will be taken from GAMA, changed and then could be resubmitted as duplicative data.

Closing Comments/Remarks

Mark Norton, of SAWPA, and Tess Dunham, Kahn, Soares and Conway, LLP, thanked the participants of the workshop for their contributions to the workshop.