Las Posas Valley Groundwater Basin
Technical Advisory Committee Regular Meeting

Tuesday June 2, 2026, 2:00 PM

Via Zoom:
https://us02web.zoom.us/j/84168071218?pwd=Kv42H0XegH4TthbvJUgzTrzACgXM8b.1
Webinar ID: 841 6807 1218
Passcode: 150451

NOTICE OF MEETING

NOTICE IS HEREBY GIVEN that the Las Posas Basin Technical Advisory Committee (TAC) will hold a regular meeting via Zoom at **2:00 PM on Tuesday June 2, 2026**.

AGENDA

A. Call to Order

B. Roll Call

C. Agenda Review

D. Public Comments

E. TAC Member Comments

F. Regular Agenda

1. Approve Minutes from Previous Meeting

The TAC will review and consider adoption of minutes from the previous meeting held on May 19, 2026; draft minutes for which are attached beginning on agenda page 3.

2. Review of Draft Recommendation Report for East Las Posas Management Area Groundwater Model Update

The has discussed and received a presentation regarding documentation of updates and refinements to the numerical groundwater model for the East Las Posas Management Area (ELPMA) of the Las Posas Valley Basin. The TAC was asked to specifically consider the applicability of the refined and updated ELPMA model as a tool for:

1. Assessing ASR operations and use as the preferred modeling tool for development of the Calleguas ASR Project Operations Plan.
2. General basin wide use for the ELPMA replacing the existing model.

The TAC will consider and provide feedback to the Administrator on the draft Recommendation Report presenting comments and recommendations from the TAC review of the ELPMA update documentation report. The draft Recommendation Report is attached on agenda page 10.

3. Update on Upcoming Committee Consultation Review Requests

The TAC will receive an update on the schedule for upcoming committee consultations from the Watermaster representative. Known current and upcoming consultation are summarized in the table below:

Consultation Description	Expected Request Date	Expected Review Due Date
ELPMA Groundwater Model Update	3/25/2026	6/5/2026
Monitoring Network Review and Evaluation	TBD	TBD
Calleguas ASR Project Operations Plan	TBD	TBD

4. Schedule for Completing Current Committee Consultations and Recommendation Reports

The TAC will discuss the schedule for completing current consultation requests from the Watermaster.

G. Items for Future Agenda

Potential items for future agenda will be considered by the TAC

H. Adjourn

Attachment 1

Minutes of May 19, 2026 TAC Regular Meeting

Las Posas Valley Groundwater Basin
Technical Advisory Committee Regular Meeting

Meeting Minutes
for
May 19, 2026

A. Call to Order

Chair Taylor called the regular meeting of the Las Posas Valley Technical Advisory Committee (TAC) to order and welcomed all attendees at 2:01 pm.

B. Roll Call

All TAC members were present (via Zoom):

- Dr. Bob Abrams – Present
- Vice Chair Tony Morgan - Present
- Chair Chad Taylor - Present

All non-voting TAC members were present (via Zoom):

- Bryan Bondy – Present
- Kimball Loeb – Present

Chair Taylor reported a quorum with all three voting members of the Las Posas Valley Technical Advisory Committee (TAC) present.

C. Agenda Review

Mr. Taylor indicated the agenda for the regular meeting was published and notified by the Watermaster. He asked for comments on the agenda from TAC members or the public. No comments were presented.

D. Public Comments

Chair Taylor offered an opportunity for members of the public to raise items not on the agenda; no comments were made.

E. TAC Member Comments

Mr. Taylor asked if TAC members had comments on items not on the agenda; none were raised.

F. Regular Agenda

1. Approve Minutes from Previous Meeting

Chair Taylor asked the TAC to discuss the draft minutes from the April 21, 2026 regular TAC meeting, which were included in the agenda packet.

Mr. Bondy identified edits and clarifications to improve the technical accuracy of the minutes. The changes Mr. Bondy identified were made by Mr. Taylor during the discussion and the TAC was open to accepting the minutes as edited.

No additional TAC or public comments were received regarding the minutes.

MOTION: Dr. Abrams moved to accept the revised minutes of the April 21, 2026 meeting
SECOND: Mr. Morgan seconded the motion
VOTE: Unanimously approved

2. Discussion of East Las Posas Management Area Groundwater Model Update

The TAC resumed discussion of the updated East Las Posas Management Area (ELPMA) groundwater model update following the presentation by Intera in the previous meeting. Chair Taylor confirmed that Dr. Abrams had reviewed the recorded presentation and supporting materials from the previous meeting. Mr. Loeb indicated that he had also reviewed the recording and supporting material as he was also absent.

Dr. Abrams asked why the MODFLOW MNW package was not utilized given that some wells are screened across multiple aquifers and pumping was distributed by transmissivity.

Mr. Bondy explained that this question had also been raised during previous reviews of the ELPMA model during preparation of the Groundwater Sustainability Plan (GSP) for the basin. He stated that during that review the advisory group found that use of the MNW package was unnecessary because:

- Most pumping occurs within the Fox Canyon Aquifer
- Areas where multiple aquifers are present are relatively limited, and in most of the affected locations and wells the second aquifer is the low-permeability Upper San Pedro Formation
- The standard well package was considered sufficient for basin-scale analysis
- Previous model revisions already introduced increased computational complexity and convergence challenges when convertible layers were implemented
- Use of the MNW package would have added further computational burden without sufficient supporting data to justify its use.

Dr. Trevor Jones (Intera, groundwater consultant to Calleguas Municipal Water District, CMWD) added that implementation of MNW would require additional parameters governing wellbore flow and aquifer-head relationships, introducing additional complexity that was not supported by available data.

Dr. Abrams stated that he was satisfied with the explanation and agreed that wellbore flow effects did not appear significant enough to warrant use of the MNW package.

Mr. Morgan stated that the updated model appeared appropriate for basin-scale evaluations but may be less suitable for highly localized or well-specific analyses. He recommended that the final documentation include additional discussion regarding the assumptions, strengths and limitations, intended applications, and appropriate use cases of the model for basin management decisions.

Mr. Morgan noted that the model would likely be used beyond ASR evaluations and suggested clearer documentation of its limitations for future groundwater management applications.

Chair Taylor agreed that additional documentation regarding model limitations and utility would be beneficial, particularly because the TAC had been asked by the Watermaster to assess the model's suitability for broader basin-wide management purposes.

Dr. Abrams commented that the revised and updated model appears to adequately simulate hydrologic responses associated with ASR operations. He also stated that the updated model is the most current and appropriate tool available for evaluating ASR operations and represents an improvement over the previous version due to improved calibration and conceptual representation. Dr. Abrams supported replacing the prior model version with the updated model.

Chair Taylor similarly stated that the revised model appears better calibrated and more consistent with the conceptual hydrogeologic understanding of the basin.

Mr. Loeb asked follow-up questions regarding the revised specified-flux boundary condition used after removal of the Happy Camp Canyon area from the model domain. Specifically, he asked whether the Underflow from Grimes Canyon Aquifer shown in Table A5 of Attachment A represented the revised boundary flux.

Dr. Jones responded that he believed this was correct but stated he would verify the information following the meeting and provide clarification to the TAC via email. Chair Taylor requested that the clarification be distributed to all TAC members. Dr. Jones emailed confirming that the boundary flow from the Happy Camp Canyon area was represented as Underflow from the Grimes Canyon Aquifer in Table A5 of Attachment A. The email from Dr. Jones is attached to these minutes.

Chair Taylor stated that the TAC is expected to provide a recommendation report to the Watermaster regarding the updated groundwater model by June 5. TAC members discussed preparation of the report and agreed to provide comments and recommendations to Chair Taylor for compilation into a draft recommendation report prior to the next TAC meeting scheduled for June 2.

No public comments were received.

3. Update on Upcoming Committee Consultation Review Requests

Chair Taylor reviewed the TAC consultation tracking schedule and noted that the TAC Recommendation report regarding the consultation request for the ELPMA model update remains scheduled for submittal by June 5. He went on to ask Mr. Loeb for an update on the monitoring network review and evaluation consultation request previously identified and/or any other upcoming consultation requests the Watermaster expected to be forthcoming.

Mr. Loeb confirmed that the monitoring network review request was still anticipated and likely to be submitted within the month. He also noted that Watermaster staff were not currently aware of any additional consultation requests expected within the next several months.

Chair Taylor offered an opportunity for the TAC and public attendees to provide comments on upcoming committee consultation review requests. No items were raised.

4. Schedule for Completing Current Committee Consultations and Recommendation Reports

Chair Taylor confirmed the Recommendation Report for the revised ELPMA model is the only active TAC consultation and that report is due on the Watermaster June 5, 2026.

Mr. Taylor asked for comments or questions from TAC members or the public; no comments were provided.

G. Items for Future Agenda

Chair Taylor offered an opportunity for TAC members and public attendees to bring up items to for future TAC meeting agendas; none were raised.

H. Adjourn

Chair Taylor noted that the TAC appreciated the attention of all those in attendance and motioned to adjourn the meeting.

MOTION: Chair Taylor moved to adjourn the meeting at 2:30 pm
SECOND: Dr. Abrams seconded the motion
VOTE: Unanimously approve

Attachment 1

Intera Response to ELPMA Model Water Budget Question from LPV TAC

From: Trevor A. Jones
To: Chad Taylor
Cc: Tyler Hatch
Subject: Las Posas Valley TAC Follow Up Response - East Las Posas Water Budget Term
Date: Wednesday, May 20, 2026 9:11:47 AM
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png
image006.png

Hi Chad,

Tyler and I have had a chance to follow up on Kim's question that he raised during yesterday's LPV TAC meeting.

The water budget term in Table A-5 titled "Underflow from Grimes Canyon Aquifer" represents subsurface inflows from the Happy Camp Canyon area. As discussed in the model report, this is the part of the model that was converted from active to inactive and replaced with a set of specified flux boundary conditions in the Grimes Canyon aquifer.

Hope that is helpful.

Thank you,
Trevor

Trevor Jones
Senior Water Resources Engineer
INTERA Incorporated
949-637-0447 www.INTERA.com

Attachment 2

Draft Recommendation Report – Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model

LAS POSAS VALLEY
TECHNICAL ADVISORY COMMITTEE

May 28, 2026

RECOMMENDATION REPORT

To: Las Posas Valley Watermaster

From: Las Posas Valley Watermaster Technical Advisory Committee, prepared by Chad Taylor, Administrator and Chair

Re: Recommendation Report – Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model

The Las Posas Valley Watermaster Technical Advisory Committee (TAC) provides this Recommendation Report regarding the Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model technical memorandum (ELPMA Model Extension TM) in response to a Las Posas Valley Basin Watermaster (Watermaster) committee consultation request dated March 25, 2026.

Calleguas Municipal Water District (CMWD), with the support of its consultant Intera, maintains the numerical flow model to support groundwater management of the ELPMA of the Las Posas Basin. The model was updated, extended, and refined to better represent groundwater conditions in the ELPMA and provide a better tool for assessing management, including CMWD aquifer storage and recovery (ASR) operations.

The Santa Barbara Superior Court judgment in Las Posas Valley Water Rights Coalition, et al., v. Fox Canyon Groundwater Management Agency (Judgment) requires the formation of a focused ASR Study Group to develop and recommend the Calleguas ASR Project Operations Plan (POP). The Judgment requires the ASR Study Group consult with the Watermaster and TAC during development of the POP prior to Court adoption and integration into the Physical Solution.

The Watermaster requested TAC consultation on the ELPMA groundwater Model Extension with specific consideration of the use of the revised model as a tool for use in evaluating:

1. Aquifer Storage and Recovery operations and its use as the preferred modeling tool for development of the Calleguas ASR Project Operations Plan.
2. General basin wide use for the ELPMA replacing the existing model in use.

The TAC discussed the ELPMA Model Extension TM in regular TAC meetings on April 7, April 21, and May 19, 2026, including a presentation by Intera. TAC comments on the ELPMA Model Extension TM were provided to the TAC Administrator by each TAC member in

tabular formats and are attached to this Recommendation Report. These specific comments have been incorporated into the recommendations presented below and will be provided to the Watermaster in the original Microsoft Excel format to aid in tracking comment and recommendation responses.

Overall, the TAC found that the updated, extended, and refined model of the ELPMA is an improvement from the previous version of the model. The ELMPA Model Extension TM demonstrates that the refined model is better calibrated to historical conditions and better simulates historical ASR operations. While the TAC has recommendations, which are presented below, the refined model does appear to be suitable for use as a tool for evaluating CMWD ASR operations and ELPMA groundwater management.

The TAC will review this Recommendation Report and discuss and consider voting to approve it in a regular meeting on June 2, 2026.

TAC RECOMMENDATIONS

1. RECOMMENDATION 1: CONSIDER PRESENTING THE

The ELPMA model was updated and extended in two successive phases of work. The first updates are described in the undated document *Attachment A, Interim Updates to the East Las Posas Management Area (ELPMA) Groundwater Model*. The second phase of work is described in the February 12, 2026, technical memorandum (TM) and appendices *Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model*.

Because these updates are described in two sets of documents and the second phase of updates revised some of the updates in the first phase and because many of the figures from the first phase were not revised and included in the second phase, the reviewer must refer to both and mentally synthesize the two when evaluating the model. Further complicating this is that the nomenclature used for the two phases of model updates is inconsistent in the February 12, 2026, TM. One set of complete documentation for the current updated model would be very helpful.

1.1 Recommendations:

Consider combining the information in Appendix A with the information in the February 12, 2026 TM to have one consistent and comprehensive model documentation report.

1.2 Technical Rationale for and Summary of Facts in Support of Recommendation:

The two sets of documents identified above present similar information and data and the more recent TM relies on some but not all of the information in the appendix. Additionally, there are some internally inconsistencies between the two documents. A single model documentation report could reduce potential confusion and eliminate any real or perceived inconsistencies.

2. RECOMMENDATION 2: ADD TO THE DISCUSSION OF MODEL UNCERTAINTY AND LIMIATIONS

Future use of the ELPMA model for evaluation of CMWD ASR operations and sustainable groundwater management would benefit from additional presentation of sensitivity analyses and quantification of model uncertainty. This should focus on identifying areas of uncertainty within the model domain and either presenting or thoroughly discussing the results of the predictive uncertainty qualitative analysis completed as part of the PESTPP-IES calibration process. For future use of the model as tool for evaluating broader management activities, the presentation should also describe limitations associated with use of the model as a predictive tool.

2.1 Recommendations:

- Add discussion of uncertainty and limitations of the model for use as a predictive tool.
- Include descriptions of specific locations within the model, such as the area around CMWD's new MW-3 clustered monitoring wells, that should be considered more uncertain and quantify that uncertainty in terms of local residual error or other relevant metrics.
- Describe the potential effects of uncertainty on model simulation results for the assessment of ASR operations and local sustainable groundwater management, including:
    - Effects of transmissivity-weighted distribution of pumping to model layers on simulation of historical and potential future ASR operations.
    - Consideration of simulating conditions relevant to local sustainable management criteria in the ELPMA.
- Describe any potential effects the use of variable stress periods for ASR datasets may have on predictive simulation of ASR operations.

2.2 Technical Rationale for Recommendation:

The model is the best available tool for simulation of future conditions and evaluation of groundwater management activities and projects within the ELPMA. However, all models have uncertainty which should be considered when evaluating any use of the model as a predictive tool. Thorough discussion and quantification of the uncertainty of a model within the model documentation is essential for appropriate subsequent use of the model.

2.3 Summary of Facts in Support of Recommendation:

The extended ELPMA model is a better representation of the groundwater system and has been calibrated to more accurately simulate groundwater elevations and flow. However, no model is perfect, and all models have error. Thorough documentation of the uncertainty and limitations of a model as a tool for predicting future and/or changed conditions provides an important guide for model users as they plan for and execute predictive simulations.

3. RECOMMENDATION 3: PROVIDE ADDITIONAL DISCUSSION OF THE RATIONALE FOR THE REPRESENTATION OF WATER BUDGET MODEL INPUTS

Multiple water budget components are described as having been held constant for portions of the model period or estimated from short periods of record. The reasoning for holding these model inputs constant or basing them on short periods of record should be better explained in the text. This includes but is not limited to the following:

- The extent of the irrigated area, which is indicated to have been simulated at a constant acreage from January 2016 through March 2023.
- Evapotranspiration (ET) along the Arroyo Simi/Las Posas corridor in the extended model period was simulated as constant monthly values equal to those used for the 2012 to 2015 period.
- Septic system return flows in the extended model period were based on calculated average values for 2012 through 2015.
- Subsurface flow from the Happy Camp Canyon area into the model domain was held constant and equal to the 2012 to 2015 monthly averages.

3.1 Recommendations:

- Provide more detailed explanations regarding the reasoning for the use of constant values and/or information from a short period of time to represent water budget inputs to the model when first discussing the inputs.
- Include quantification of the potential uncertainty included in the model as a result of the use of these assumptions and extrapolations in addition to the qualitative descriptions in Section 6.2.

3.2 Technical Rationale for Recommendation:

While it is not uncommon for water budget inputs to groundwater models to be held constant and/or be based on extrapolation from short periods of record, the rationale for such assumptions should be described when documenting the model. The descriptions of model inputs that were held constant and/or based on short periods of record do not present such rationale.

3.3 Summary of Facts in Support of Recommendation:

Several important water budget inputs to the extended model were based on an assumption that conditions remained constant during portions of the model period and the rationale for those assumptions is not well documented

4. RECOMMENDATION 4: CONSIDER RESPONDING TO SPECIFIC TAC QUESTIONS REGARDING ALTERNATIVE MODELING APPROACHES

TAC members had questions regarding some modeling approaches. These are described in the attached comment matrix in Comment IDs BA-6, BA-9 and TM-9.

4.1 Recommendations:

Consider responding to or addressing the proposed alternative approaches in the model documentation report/TM.

4.2 Technical Rationale for and Summary of Facts in Support of Recommendation:

The technical rationale and summary of facts for each specific suggestion are included in the related comment.

5. RECOMMENDATION 5: ADD DETAIL REGARDING CALIBRATION PARAMETERS AND RESULTS

The TAC review identified specific model calibration details that could be added to the text, tables, and figures to better illustrate calibration outcome and results. The specific additions are identified in the attached comment matrix in Comment IDs BA-13 and TM-13 through TM-15.

5.1 Recommendations:

Add model parameter information from calibration and quantification of calibration results to select text, tables, and figures as identified in the comments referenced above.

5.2 Technical Rationale for and Summary of Facts in Support of Recommendation:

The technical rationale and summary of facts for each specific suggestion are included in the related comment.

6. RECOMMENDATION 6: REVIEW EDITORIAL COMMENTS PROVIDED BY TAC IN TABULATED COMMENT MATRIX

The TAC members each prepared detailed tabulated comments numbered by commentor with references to specific section and page numbers and quoted text. Many of these comments are editorial in nature and identify apparent errors in the ELPMA Model Extension TM, including typographic errors and unclear text.

6.1 Recommendations:

Consider revising the text to address the comments identified as editorial and clarification in the attached tabular comment matrix and email transmittal.

6.2 Technical Rationale for Recommendation:

See individual editorial comments for rationale.

6.3 Summary of Facts in Support of Recommendation:

A summary of facts for this recommendation is not applicable.

7. TALLY OF COMMITTEE MEMBER VOTES

[this section will be modified as necessary following discussion and voting by the TAC]

TAC Member	Vote			
	Yes	No	Abstain	Absent
Chad Taylor, Chair				
Tony Morgan, East LPV Representative				
Bob Abrams, West LPV Representative				

REPORT OF BASES FOR MAJORITY AND MINORITY COMMITTEE MEMBER POSITIONS

The TAC vote to present the recommendations above to the Watermaster was unanimous, as indicated above. The bases for the unanimous positions are described for each recommendation above. [this will be modified as necessary following discussion and voting by the TAC]

Attachment 1

Specific Comments from the Las Posas Valley Basin Technical Advisory Committee, Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model

Specific Comments from the Las Posas Valley Basin Technical Advisory Committee
Documentation for the Extension and Updates to the ELPMA Updated Groundwater Model

Comment ID	Commentor	Technical or Editorial Comment	Topic	Page Number	Section ID	Quoted Text	Comment
TM-5	TMorgan	Technical	Streamflow reconstruction	p. 7	Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model, Section 3.4.1.1 Surface Water Flows Measured at Gage 803	*At the time of this model update, VCWPD's public hydrology server reported that data for water years 2021 and 2022 were missing or unavailable.*	The analog-year reconstruction for missing 2021 and 2022 streamflow data introduces uncertainty during the same period used to validate ASR response. The report would benefit from including sensitivity or uncertainty bounds for reconstructed Arroyo Simi/Las Posas inflows.
TM-6	TMorgan	Technical	Surface-water inflow trends	p. 8	Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model, Section 3.4.1.3 Total Inflows to Arroyo Simi/Las Posas	*These data show that flows entering the ELPMA have declined by approximately 22% over the past 10 years, with an average annual inflow of approximately 19,100 AFY from water year 1971 through 2015 and 14,800 AFY from water year 2016 through 2022.*	The 22 percent decline in modeled Arroyo inflow is important to background water-balance trends and could affect attribution of drawdown between ASR pumping and basin hydrologic conditions. Management use of the model would benefit from a focused discussion of this uncertainty.
TM-8	TMorgan	Technical	Hydrostratigraphic conceptual model	p. 11	Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model, Section 4.1 Review of Geophysical and Lithological Data	*The contours and interpolation parameters were iteratively adjusted to 1) honor the geophysical and well log data; 2) create surfaces that matched the interpreted hydrostratigraphy; and 3) smoothly transition the revised surface elevation to match the existing hydrostratigraphic model outside of the areas shown in Figure 4.6.*	The local hydrostratigraphic updates are a major improvement, but the smooth transition back to the prior model outside the revision area leaves basin-scale geometry and structural continuity partly inherited and should probably be identified as a remaining conceptual-model uncertainty.
TM-11	TMorgan	Technical	Upper-system calibration	p. 13	Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model, Section 5.1.1 Approach	*Other parts of the model – such as the Upper San Pedro Formation, Epworth Gravels aquifer, Shallow Alluvial aquifer, and Arroyo Simi/Las Posas – were not modified during calibration.*	The decision not to recalibrate the upper system is efficient for an FCA/GCA ASR update, but does it leaves uncertainty in recharge (see previous comments re: irrigated land quantities and septic system returns), stream-aquifer interaction, and vertical leakage that should be addressed before relying on the model for broader basin-management questions.
TM-12	TMorgan	Technical	High-dimensional calibration	p. 14	Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model, Section 5.1.2.3 Initial Parameter Distributions	*PESTPP-IES was used to estimate approximately 19,500 parameters that constrain the aquifer properties and fault conductance in the FCA, GCA, and clay marker beds that overlie and separate these aquifers.*	The calibration is sophisticated, but with about 19,500 adjustable parameters and about 16,800 head observations, individual parameter fields are unlikely to be uniquely identifiable. Management conclusions should be based on predictive ensembles, not a single calibrated realization.
TM-18	TMorgan	Technical	Local residuals	Appendix D, Table D-1	Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model, Appendix D Table D-1 Model Calibration Statistics Summarized by Well	*02N20W11B01S FCA -51.2 51.2 51.2 2.4; 02N20W11B03S USP -47.0 47.0 47.0 1.3; 02N20W17J01S FCA 18.4 31.2 37.7 10.3*	Appendix D shows several local residuals that are much larger than basinwide statistics imply. Suggest these wells be mapped and discussed for management relevance so decision-makers understand where the model is strong and where local predictions are weaker.
TM-22	TMorgan	Technical	Predictive uncertainty	p. 13; p. 21	Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model, Sections 5.1.1 Approach and 5.4.1 Calibration Statistics	*PESTPP-IES not only identifies parameter sets that satisfactorily reproduce the observed data, but also explicitly quantifies parameter and predictive uncertainty.*	Because PESTPP-IES can quantify predictive uncertainty, the model update should present uncertainty bounds for management predictions such as drawdown at sentinel wells, cross-fault leakage, storage recovery, and ASR operational scenarios.
TM-23	TMorgan	Technical	Model suitability conclusions	p. 24	Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model, Section 6.1 Summary	*These improvements to an already well-calibrated model demonstrate the model is a robust analysis tool to support ASR operations planning in the ELPMA.*	The model is suitable for basin-scale ASR planning and comparative scenario analysis. Suggest softening the conclusion to state that it should not be the sole basis for local well-specific SGMA compliance determinations or without predictive uncertainty analysis.
BA-14	Bob Abrams	Technical	Model Limitations	25	6.2 Additional Considerations and Opportunities for Future Model Improvements	*Hydrogeologic Conceptual Model (last bullet point)*	As noted on p. 22, the model in its current form cannot simulate the vertical gradients at MW-3, and the overall calibration is poor at MW-3. This last bullet should discuss the implications of this area of poor calibration relative to the Watermaster request: *2. General basin wide use for the ELPMA replacing the existing model in use* . The new updated version of the model may be better for this purpose than older versions, but the implications should be discussed, nevertheless. It should also be noted as an "Opportunity for Future Model Improvements."
TM-16	TMorgan	Technical	MW-3 vertical gradients	p. 22	Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model, Section 5.4.2 Model Performance Evaluation at Select Hydrographs	*The updated model does not capture these vertical gradients or differences in regional pumping responses.*	The failure to reproduce the 40 to 50 ft upward gradient at MW-3 is the clearest remaining conceptual-model weakness and should be resolved or bounded before using the model for local decisions south of the Moorpark anticline.
TM-17	TMorgan	Technical	South Las Posas structural uncertainty	p. 22	Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model, Section 5.4.2 Model Performance Evaluation at Select Hydrographs	*It is noted that this well is on the south side of the Moorpark Anticline; therefore, groundwater levels in this monitoring well cluster may be impacted by localized folding and faulting.*	The report correctly identifies localized folding and faulting as a likely cause of MW-3 misfit, but should targeted alternative structural simulations or a local refinement/nested model be used to test whether the current HFB and layer geometry are adequate?
TM-1	TMorgan	Technical	Temporal discretization	p. 4	Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model, Section 3.1 Simulation Time Period and Temporal Discretization (DIS)	*For the January 2022 through March 2023 period, when the model utilizes a daily stress period, boundary conditions continue to be applied as monthly average rates, except for injection and extraction at CMWD's ASR wells, which are defined at a daily resolution.*	The update is described as using daily stress periods for the ASR validation period, but most non-ASR stresses remain monthly-average inputs. Model documentation should more clearly discuss how this limits interpretation of daily to submonthly ASR drawdown and recovery responses.
TM-10	TMorgan	Technical	Pumping layer assignment	p. 12	Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model, Section 4.4 Impacts to Model Pumping	*In cases where well construction information was not available, wells were assigned using the model layering and transmissivity weighting scheme described in INTERA (2018).*	Where construction data are missing, transmissivity-weighted pumping assignments may mask vertical gradients and bias simulated aquifer response. The report should identify which high-capacity wells rely on this assumption and whether they affect ASR response areas. Do these wells show acceptable calibration metrics?
TM-19	TMorgan	Technical	ASR drawdown error distribution	p. 22-p. 23	Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model, Section 5.4.3 Evaluation of Simulated ASR Responses	*Across the 9 wells with measured ASR responses, the average model error is 1.8 feet. At all wells except 03N19W31B01S, 03N19W31D07S, and 03N19W31H01S, this difference is within the model uncertainty (Appendix D).*	The average ASR drawdown error is encouraging, but the exceptions should be emphasized because they represent the wells where model uncertainty or ASR-response estimation uncertainty may matter most for SGMA compliance evaluations. Is the drawdown error sufficient to cause wells to exceed their MTs?
BA-8	Bob Abrams	Technical	Pumping	A-12 to A-13	A.8 UPDATES TO MODEL PUMPING	*"Pumping for years prior to 1985 was not changed because reliable FCGMA pumping records were not available."*	Disagree with this approach. Wells operating pre-1985 have estimated pumping. Pumping should be scaled using the same approach as wells with data.
TM-2	TMorgan	Technical	Agricultural return flow	p. 5	Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model, Section 3.2.2 Agricultural Return Flows	*The extent of the irrigated area for the January 2016 through March 2023 period is assumed to remain constant and equal to the 2015 irrigable acreage.*	Holding the irrigated acreage constant at 2015 conditions is a material recharge assumption for the extension period. Is there stakeholder consensus that irrigated agriculture will remain constant in the future? It would be useful for the model documentation to evaluate the sensitivity of ASR and basin-storage results to changes in irrigated footprint and cropping intensity after 2015.
TM-3	TMorgan	Technical	Septic return flow	p. 6	Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model, Section 3.2.5 Septic System Return Flows	*Monthly averages calculated for the 2012 to 2015 time period were used to represent septic system return flows for the extension period.*	Using 2012 to 2015 monthly averages for septic return flow is reasonable as a simplifying assumption, but the report should identify whether population, land-use, or sewer-connection changes after 2015 could materially affect recharge in shallow-system areas.
TM-4	TMorgan	Technical	Evapotranspiration assumptions	p. 6; p. 25	Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model, Sections 3.3 Evapotranspiration (EVT) and 6.2 Additional Considerations and Opportunities for Future Model Improvements	*For the extension period, monthly EVT parameters were held constant and equal to the monthly values used for 2012 to 2015.*	The EVT treatment should be reconciled with the later statement that simulated EVT uses the same monthly pattern for 2000 through 2023 and should include a sensitivity check if phreatophyte extent or riparian ET conditions changed during the extension period.
TM-7	TMorgan	Technical	Happy Camp underflow boundary	p. 10	Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model, Section 3.5.2 Subsurface Underflows from the Happy Camp Canyon Area	*For the extension period, recharge through these boundary cells was held constant and equal to the 2012 to 2015 monthly averages.*	Holding Happy Camp underflow constant through the extension period may be acceptable for ASR-focused analysis, but the assumption should be tested or bounded for basinwide management scenarios because this boundary was previously a key conceptual revision.
TM-9	TMorgan	Technical	FCA layer split interpolation	p. 12	Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model, Section 4.3 Splitting the Fox Canyon Aquifer into Two Model Layers	*Interpolation was performed using Inverse Distance Weighting, and the results were converted back to an elevation using the layer top elevation and the layer thickness at each grid cell.*	The IDW interpolation method is computationally practical, but it can smooth abrupt fault-related offsets and compartmentalization. The report would benefit from a discussion whether alternate structural interpretations were tested near the Fairview Fault and Moorpark anticline.
BA-6	Bob Abrams	Technical	Areal Recharge	A-9	A.5.3.5 Total Recharge	*"Thus, the Epworth Gravels Aquifer, natural recharge needed to be scaled up (by a factor of 2.8) to calibrate to observed water levels to account for a) additional recharge from northern parts of the Epworth Gravels Aquifer inactivated in the model and b) higher local recharge rates due to the higher permeability and local drainage characteristics of the Epworth Gravels Aquifer."*	Probably not the best way to handle the upland unsaturated areas, especially with MODFLOW-NWT, which can allow flow through unsaturated cells. Unclear how much of an effect this cluge has on overall model performance and the model's ability to be used for multiple different modeling objectives. How much computational effort is really being saved by making the upland area unactive?
BA-9	Bob Abrams	Technical	Initial Head	A-13 to A-14	A.9 UPDATES TO INITIAL HEADS	*N/A*	These estimated initial heads could have been smoothed and possibly improved by iterating on the initial heads using the calculated head distribution from the first stress period to update the estimate, until changes from initial heads to stress period 1 heads were minimal or non-existent.
BA-13	Bob Abrams	Editorial	Calibration	20 (Table 6)	5.4 Calibration Results	*N/A*	Please add the scaled MAE and RMSE values to Table 6.
TM-13	TMorgan	Technical	Parameter documentation	p. 15	Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model, Table 4 ELPMA Model Calibration Parameterization Scheme	*Table 4 summarizes the parameterization, including the number of parameters, by type and layer, the initial parameter bounds, and the prior uncertainty assigned to each parameter.*	Table 4 is difficult to interpret for the two FCA sublayers. The premise to subdivide the FCA was to better predict water levels, however, Table 4 shows model layers 5 and 6 with identical model parameters with no hydrostratigraphic unit separating the upper and lower FCA. What changed in this update to the model?
TM-14	TMorgan	Technical	Calibrated property transparency	p. 21	Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model, Section 5.4.1 Calibration Statistics	*The final distributions of aquifer properties and HFB conductance values are shown in Appendix C and individual well calibration statistics, with estimates of model uncertainty, are included in Appendix D.*	Showing final calibrated aquifer properties and HFB conductance values only as figures limits independent review. Suggest that model documentation should provide machine-readable grids or tabulated calibrated property summaries by layer and structural feature.
TM-15	TMorgan	Technical	Signed residuals and bias	p. 21	Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model, Section 5.4.1 Calibration Statistics	*Figures 5.7 through 5.10 show the distribution of model errors, represented as the root mean square error by well. Collectively, these figures demonstrate that the updated model shows limited bias, both in the spatial and vertical distributions of model error.*	RMSE-by-well maps do not show the sign of residuals, so they are not sufficient by themselves to demonstrate limited spatial or vertical bias. Suggest including signed residual maps by aquifer.

TM-20	TMorgan	Technical	Potential false-positive ASR response	p. 23	Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model, Table 7 Summary of Measured and Simulated Drawdowns	*03N19W31H01S FCA Not Detected 21.4*	The simulated 21.4 ft drawdown at 03N19W31H01S where measured drawdown was not detected should be specifically explained, because this type of discrepancy may affect interpretation of the spatial extent of ASR impacts.
TM-21	TMorgan	Technical	Observation filtering	p. 17	Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model, Section 5.2.3.1 Additional Observation Filtering	*To account for this, a 15-day moving average was applied to reduce measurement noise, while preserving long-term trends related to regional pumping and CWMD's ASR operations.*	The 15-day moving average is a reasonable treatment for pumping-affected transducer records, but the documentation should clarify how smoothing affects the ability to evaluate short-term ASR interference, peak drawdown, and recovery timing.
BA-1	Bob Abrams	Editorial	Areal Recharge	A-5	A.5.1 Areal Recharge	*"Thus, in these areas, the recharge was kept constant at the long-term average BCM-derived value."*	Somewhere in this very long paragraph it would help the reader to be reminded how areal recharge was handled in the original model, or simply provide an explanation of how the new treatment differs from the old treatment.
BA-2	Bob Abrams	Editorial	Areal Recharge	A-5	A.5.1 Areal Recharge	*"Runoff from the "Happy Camp" GCA outcrop area also **contribute** to…"*	Highlighted word should be "contribute**s**"
BA-3	Bob Abrams	Editorial	Areal Recharge	A-5	A.5.1 Areal Recharge	*"This underflow value needed to be further adjusted during the calibration phase to **avoided** …"*	Highlighted word should be "avoid"
BA-4	Bob Abrams	Editorial	Areal Recharge	A-7	A.5.3.1 Recharge from Septic System Return Flows	*"the septic return flows were assumed to be equal the 1985 return flow…"*	Should be, "the septic return flows were assumed to be equal **to** the 1985 return flow…"
BA-5	Bob Abrams	Editorial	Areal Recharge	A-8	A.5.3.3 Recharge from Water Distribution System Leakage Return Flows	*"water volumes for the return flows from leakage of municipal water distribution systems **was** based on"*	Should be, "water volumes for the return flows from leakage of municipal water distribution systems **were** based on"
BA-7	Bob Abrams	Editorial	Evapotranspiration	A-10	A.7 EVAPOTRANSPIRATION FROM PHREATOPHYTES	*"To simulate this variation, average ET scaling factors were calculated by taking the **ration** of…"*	Should be, "To simulate this variation, average ET scaling factors were calculated by taking the ratio~~n~~ of..."
BA-10	Bob Abrams	Editorial	Hydraulic Properties	A-15	A.10 REVISED MODEL HYDRAULIC PROPERTIES	*"However, certain wells in the FCA and GCA outcrop were not…"*	Should this be, "However, certain wells in the FCA and GCA outcrop **area** were not…" ?? Also see the same omissions later in same paragraph.
BA-11	Bob Abrams	Editorial	Water Levels	A-18	A.11.2 Water Levels and Water Budget	*"The areas to the east"*	This last sentence in the first paragraph appears to truncated and missing some words.
BA-12	Bob Abrams	Editorial	Return Flows	5	M&I Return Flows and System Losses	*"Of this, 65% was assumed to be used outdoor irrigation…"*	Should this be, "Of this, 65% was assumed to be used **for** outdoor irrigation…" ??

From:	Kimball Loeb
To:	Chad Taylor
Cc:	Kaseke, Farai; Hampson, Robert; Jill Weinberger
Subject:	Comments on the Updated ELPMA Model
Date:	Friday, May 22, 2026 1:12:00 PM
Attachments:	image001.png image002.png image003.png image004.png

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Hi Chad,

I've reviewed the documentation provided to the TAC prepared by Intera on the extension and updates to the East Las Posas Management Area (ELPMA) groundwater model. The Watermaster requested consultation with the TAC in a March 25, 2026, memorandum:

Watermaster requests that the TAC review the updated ELPMA groundwater model and provide a recommendation regarding its suitability for use in evaluating:

1. Aquifer Storage and Recovery operations and its use as the preferred modeling tool for development of the Calleguas ASR Project Operations Plan.

2. General basin wide use for the ELPMA replacing the existing model in use.

My conclusions are that the updated ELPMA model is improved from the original 2018 version, represents the best available science, and is the best available tool for simulating and evaluating ASR operations and for ongoing basin-management purposes for the ELPMA. The updated model should be provided to FCGMA to replace the 2018 version for its use as both the SGMA basin manager and Watermaster.

Following are some specific comments for the FCGMA/Watermaster and others to consider when conducting and evaluating simulations with the updated model.

- The 2018 model was updated and extended by Intera for Calleguas Municipal Water District under two successive phases of work. The first updates are described in the undated document "Attachment A, Interim Updates to the East Las Posas Management Area (ELPMA) Groundwater Model." The second phase of work is described in the February 12, 2026, technical memorandum and appendices "Documentation for the Extension and Updates to the East Las Posas Management Area (ELPMA) Groundwater Model."

- Because these updates are described in two sets of documents and the second phase of updates revised some of the updates in the first phase and because many of the figures from the first phase were not revised and included in the second phase, the reviewer must refer to both and mentally synthesize the two when evaluating the model. Further complicating this is that the nomenclature used for the two phases of model updates is inconsistent in the February 12, 2026, tech memo. One set of complete documentation for the current updated model would be very helpful.

- All models have uncertainty which should be considered when evaluating any modeling

results. Although the model is well calibrated, the accuracy of groundwater elevations simulated by the model varies across the model domain and the model layers representing the aquifers and other hydrostratigraphic units. Tech memo figures 5.7 through 5.10 show the residuals (difference between measured and simulated) at locations across the Epworth Gravels Aquifer, Shallow Alluvial Aquifer, Upper San Pedro Formation, Fox Canyon Aquifer, and Grimes Canyon Aquifer. For example, residuals in the in the Fox Canyon Aquifer range from less than 1 foot to between 50 and 101 feet in a couple of locations. The tech memo concludes that the ability of the model to represent groundwater elevations at CMWD's new clustered monitoring well MW-3 (02N20W11B01S, B02S, B03S) is due to uncertainty in the hydrogeologic conceptual model south of the Moorpark anticline.

- Additionally, the hydrographs of measured versus simulated groundwater elevations at multiple well locations included in tech memo Appendix E should be reviewed when evaluating simulations of future groundwater elevations at specific locations in the ELPMA.
- Evaluation of tech memo figures 5.11 through 5.14 show comparisons of measured groundwater elevations and simulated groundwater elevations during CMWD's 2022 emergency imported water recovery event. These hydrographs show good correlation between measured and simulated groundwater elevations with reasonable residuals at the majority of the wells measured. However, there is a large residual of 51 feet at well 02N20W11B01S screened in the lower Fox Canyon Aquifer. However, the updated model underestimates the groundwater elevation at this location making the modeled simulation more conservative when evaluating potential impacts at this location. Additional information is in Table 7. The ASR Study Group should keep the table and hydrographs in mind when reviewing simulations of future ASR operations.
- Section 6.2 "Additional Considerations and Opportunities for Future Model Improvements" at the end of the tech memo includes important considerations for users of the model and reviewers of model simulations to keep in mind.

Please let me know if you have any questions about my comments.

Best regards,
Kim

Kimball Loeb, PG, CEG, CHG
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