

## **SUMMARY**

### **UWCD Groundwater Flow Model Technical Workshop At FCGMA Special Meeting, March 24, 2017**

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Kim Loeb of the Fox Canyon Groundwater Management Agency (FCGMA) called the meeting to order at 9:00 AM and asked if there were any public comments. No members of the public had comments at this time. Mr. Loeb then moved onto Item C of the FCGMA's agenda for this special Technical Advisory Group (TAG) meeting, and introduced Tony Morgan, United Water Conservation District (United or UWCD), to begin the model presentation.

Following is a brief summary of each section of the modeling workshop, in the order presented, and main points of discussion.

#### **Introduction/Background**

- Mr. Morgan presented United's goals of the modeling effort and outline of the topics to be discussed at the workshop.
- John Lindquist/United presented a brief history of numerical modeling for the groundwater basins of the Oxnard coastal plain (study area)

#### **Hydrostratigraphic Conceptual Model**

- Dan Detmer/United presented the methods and results of construction of the updated hydrostratigraphic model for the study area.
- Multiple questions were asked and clarifications made during and after Mr. Detmer's presentation. Key discussion topics included:
  - Bryan Bondy/TAG asked whether aquitards were assumed to continue into areas of merge of aquifers.
  - Mr. Bondy suggested further evaluation of the apparent increasing depth of the upper aquifer system (UAS) aquifers from west-to-east between the Oxnard Plain (OP) and Pleasant Valley (PV) basins. Mr. Bondy said he felt it was unlikely that the UAS aquifers were connected across the OP/PV boundary in the manner shown on a cross-section displayed by Mr. Detmer.
  - Dr. Steven Bachman/TAG stated that stratigraphy in the northern PV basin is complex. Mr. Bondy then suggested holding a separate "PV Workshop" as a follow-up to today's meeting, to review data and refine the hydrostratigraphic model for this area.
  - Terry Foreman/TAG suggested making some of the model grid cells representing lower aquifer system (LAS) aquifers in the narrow area between the Bailey Fault and the volcanic rocks of the Santa Monica Mountains inactive. United staff stated that some cells in the area were inactive, but not all cells.

#### **Numerical Model Construction**

- Dr. Jason Sun/United presented a summary of the software, major input parameters, and boundary conditions applied to United's current groundwater model.

- Multiple questions were asked and clarifications made during and after Dr. Sun’s presentation. Key discussion topics included:
  - Mr. Bondy asked if underflow from the volcanic rocks in the Santa Monica Mountains to the alluvial aquifers underlying the coastal plain was explicitly modeled. He pointed out that although this volume can be assumed to be small, its effect on simulated heads could potentially be notable in the immediate vicinity of this boundary.
  - Mr. Bondy asked about the modeled conductance value for the general-head boundary representing inflow from the Santa Paula basin, and pointed out that simulated heads in the northern Forebay could be influenced by proximity to a model boundary. Dr. Sun said those values would be provided in the model documentation.
  - Mr. Foreman asked whether the J-Street drain in Oxnard was explicitly modeled. He felt that there could be some discharge of groundwater in the semi-perched aquifer to this drain.
  - Mr. Bondy suggested that the dip angle of the Springville Fault should be reviewed, to determine whether significant offset might occur in deeper model layers.
  - There was discussion regarding the quantity of baseflow, storm flow, and underflow in and below Arroyo Las Posas at the northern boundary of the PV basin, and whether differing definitions were leading to some confusion regarding the water budget components. Further review of this topic was suggested for the proposed PV Workshop.

**Calibration Efforts/Results to Date**

- Dr. Sun presented a detailed description of the model calibration process and results. Mr. Lindquist compared the calibration results from the United model to those from the USGS two-layer model released in 2003.
- Key discussion topics included:
  - Mr. Foreman stated that he felt the simulated urban recharge rates in the model might be too low.
  - Mr. Bondy observed that although the overall model calibration looked reasonable, the simulated groundwater-elevation recovery at a number of calibration wells in the OP basin during the late 1990s appeared to be slower and smaller than measured recoveries. He felt further calibration efforts could improve simulation of recovery rates at these wells.
  - Lucia McGovern/Camarillo offered to share dry-weather streamflow data for the Calleguas watershed that might be useful for model calibration.
  - Dr. Bachman provided United with groundwater elevation data he thought might be supplemental to United’s database.
- At the conclusion of this discussion, Dr. Bachman indicated that the new United model was definitely preferable to the two-layer USGS model. No “fatal flaws” were noted by the TAG in the United model. TAG members concurred that the calibration of the United model generally was a significant improvement compared to the USGS model, and that including 13 model layers in the United model should prove valuable for simulating potential future water-supply projects.

### **Path Forward/Meeting Wrap-up**

- Mr. Lindquist summarized potential action items resulting from the workshop, developed from questions and comments by TAG members during the meeting that could not be answered immediately and were potentially worth further discussion. TAG members suggested a few additional action items. Following is a comprehensive list of action items resulting from this discussion:
  - United to provide the status (inactive or active) of model grid cells east of the Bailey Fault.
  - United to provide the conductivity values for aquitard layers in the Forebay area.
  - United and the TAG should plan a “PV Workshop” to clarify and potentially refine the following aspects of United’s conceptual model:
    - Hydrostratigraphy of the northern PV basin
    - Groundwater flow across the PV/East Las Posas basin boundary
    - Hydrostratigraphy of the UAS across the OP/PV boundary
    - Vertical flow from the UAS to the LAS via well bores
    - Potential use of water quality to confirm recharge rates for infiltrated surface-water in the northern PV basin (all parties to bring their water quality data to proposed workshop, to see if a mass-balance approach might help to confirm recharge amounts in this area)
    - Water budget in the PV and OP basins.
  - United to review the potential effect of explicitly including the Industrial/J-Street drain (in Oxnard) on groundwater levels and flow in the semi-perched aquifer.
  - United to review the dip angle of the Springville Fault and consider whether to revise its implementation in the model.
  - United to provide the recharge flow budget for precipitation and agricultural return water so that TAG may compare with the Daniel B. Stephens & Associates, Inc. recharge modeling, especially urban recharge.
  - Lucia McGovern to provide United with dry-weather streamflow data for the Calleguas watershed.
  - United to provide Mr. Foreman with water-budget, time-series graphs.

Mr. Loeb/FCGMA adjourned the meeting at approximately 3:15 PM.