APPENDIX C2
RESPONSE TO COMMENTS ON EARLY DRAFT TECHNICAL MEMORANDA - SUBSIDENCE

The following technical memorandum on subsidence was released as preliminary drafts in February 2021 to provide an opportunity for stakeholder input early in the GSP preparation process:

- *Fillmore and Piru Basins **Land Subsidence Evaluation** Technical Memorandum, DBS&A, February 4, 2021. (Link to February 4, 2021 Draft Subsidence Tech Memo)*

RESPONSE TO COMMENTS ON FEBRUARY 2021 DRAFT LAND SUBSIDENCE EVALUATION

Comment Letter 7. County of Ventura Public Works, March 5, 2021

Comment 7-1:

Background

- *The memo states subsidence related to oil and gas withdrawal in the subbasins has not been historically observed or determined. How are conclusions drawn regarding hydrocarbon extraction without quantifiable or known hydrocarbon extraction data? It appears that there are plugged oil and gas wells within both subbasins which could have historically had an impact on subsidence.*
- *There is no discussion regarding hydrogeological continuity with the Santa Clara River Valley East Subbasin, groundwater extraction from this subbasin and the effect of recharge on the Piru/Fillmore subbasins, and surficial deposition and sedimentation from tributaries and the upper reaches of the Santa Clara River.*

Response to Comment 7-1:

The quantity of hydrocarbons removed from the subsurface in the Fillmore and Piru basins cannot definitively determined due to lack of adequate reporting of historical operations. For the purposes of SGMA, the quantity of the hydrocarbons is of secondary importance to the physical manifestations of land subsidence. While hydrocarbon extraction is a documentable causative factor in some oil fields, there is no readily identifiable evidence of land subsidence associated with historical hydrocarbon extraction operations. Very few currently active hydrocarbon extraction wells are found in or near these basins and likewise, no subsidence has been documented with their operations. The 2020 Ventura County General Plan does not refer to land subsidence associated with hydrocarbon extraction as a current hazard.

Groundwater extraction from the Santa Clara River Valley East Subbasin does not have a direct effect on the water levels in the Piru basin. A significant proportion of the surface water flow from the Santa Clara River East Subbasin is effluent from the waste water treatment plants in that Subbasin. The water levels near the Ventura / Los Angeles County Line are generally very stable (Appendix K) as a result of that effluent and there is little groundwater extraction occurring in that area. More detailed discussions of the relationship between the waste water treatment plant effluent and water levels in the Piru basin are contained in the GSP (for example Section 2 and Appendix K) with supplemental data contained in the online database (www. https://fillmore-piru.gladata.com/).

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Surficial deposition/sedimentation is not a sustainability indicator defined in SGMA. Any potential compaction of the sediments due to self-weight loading is beyond the scope of this Plan. SGMA is focused on subsidence due to groundwater extractions.

Comment 7-2:

Geodetic Surveys

- *Overall, the historical survey data is not very representative of groundwater extraction-related subsidence. It shows a good case for a need for more survey locations overlying the subbasins. It currently does not provide enough data to support any trends.*

Response to Comment 7-2:

We agree that the geodetic data from the existing CGPS is not necessarily representative of the potential land movements of the parts of the basin underlain by alluvium and where groundwater extractions are most extensive. The FPBGSA Board of Directors will consider the need for additional CGPS monitoring locations as more InSAR data becomes available (see Section 4 of GSPs). The long-term trends were supplied by UNAVCO.

Comment 7-3:

lnSAR Data

- *The memo states that general land surface movement trends can be seen in the lnSAR data. Agreed, the data and data collection locations are representative of minor subsidence occurring in the Fillmore Subbasin and indicative of potential elastic rebound via groundwater replenishment in the central Piru Subbasin.*

Response to Comment 7-3:

It is important to recognize that the InSAR data shows, in almost all locations, that the land surface movements derived from the satellite-generated data, are less than the instrumental resolution of the technology. While it is tempting to draw inferences from the data values less than the technologies resolution, it is generally not considered a sound scientific conclusion.

Comment 7-4:

Future Potential Subsidence

- *There is no discussion of the potential for future planned development to impede surface water infiltration and percolation (elastic subsidence) or the effect of increased pumping due to development.*

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Response to Comment 7-4:

The future planned development in these basins is negligible based on information supplied by the City of Fillmore and Ventura County. These basins are not likely to experience large urbanization programs that would materially change of the amount of impervious cover and alter infiltration of runoff.

The effects of increased future groundwater extractions were considered in Section 6 of this technical memorandum. The groundwater flow model for these basins was used to simulate what water levels are expected to be in the future using the 2070 Climate Change Factors proposed by CA DWR. The future scenarios included climate change, increases in groundwater extraction (as defined by Fillmore Basin Pumpers Association, Piru Basins Pumpers Association, City of Fillmore, and Waring Water), changes in waste water treatment plant effluents for City of Fillmore and County of Ventura, and potential changes in waste water effluent from the treatment plants in Santa Clarita (see GSP section 2, Appendices E, F, H, I, J, and K). Figure 8 in the Subsidence Technical Memorandum illustrates how future groundwater levels are not likely to fall below the estimated historical low water levels.

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