

## TECHNICAL MEMORANDUM

<b>Date:</b>	May 19, 2021
<b>To:</b>	Cameron Tana, Montgomery & Associates
<b>From:</b>	Greg Kamman, cbec eco engineering
<b>Project:</b>	20-1044
<b>Subject:</b>	Response to NMFS comments on cbec’s PV ISW TM, dated Jan. 8, 2021 Basin Management Plan: Groundwater Sustainability Update 2022 (GSU22)

The following are responses to NOAA’s National Marine Fisheries Service’s comments our January 8, 2021 Technical Memorandum entitled Pajaro Valley Interconnected Surface Water (ISW TM).

1. Introductory text: The third paragraph on page one states, *“Surface water and groundwater appear to be hydraulically linked in the basin, and this linkage is critically important in creating seasonal habitat for S-CCC steelhead. Where the groundwater aquifer supplements streamflow, the influx of cold, clean water is critically important for maintaining temperature and flow volume.”* These statements are inconsistent with the findings presented in the ISW TM for the following reasons.
  - a. Apart from two short reaches on the Pajaro River (lower river adjacent to PV6 and upper reach adjacent to PV14), available data suggest there is no hydraulic connection between groundwater and surface water in the Basin. At these two locations, ISW conditions only occur during the winter in response to river recharge associated with high and likely prolonged flow events.
  - b. There were no historic or current data indicating hydraulic connection between groundwater and surface water during the summer and fall low flow periods.
  - c. The ISW study did not observe gaining river conditions (i.e., no instances of groundwater supplementing stream flow), which would enhance fishery habitat. The best available data suggest that streams are losing rivers when hydraulic connection is established.
  - d. The findings of the ISW study do not support the statement that surface water and groundwater appear hydraulically linked in the basin. If NMFS has information that documents a hydraulic connection, we would appreciate obtaining it.
  
2. The “General Comment” of the NMFS review letter contends that the ISW study only focuses on the Aromas Red Sands aquifer and not the intervening upper alluvial aquifer. This is simply not the case. The hydraulic connectivity was evaluated through analysis of monitoring data from wells screened in both the Aromas and alluvial aquifers. The ISW TM acknowledges the

possible indirect connection of the Aromas to surface waters via the intervening alluvium and recommends additional and enhanced monitoring at RMPs to better assess this potential avenue for connection. In fact, the ISW areas identified in the report and addressed with SMC are based on water levels observed solely in the alluvium (PV14 upstream of Murphy Crossing) or both the Aromas and alluvium.

3. Specific Comment, page 2: The depth to water figure referenced in this comment did not weigh significantly in the analysis. It was intended to provide a basin-scale image of the proximity of underlying Aromas groundwater levels to surface topography and gross understanding of where ISW is most likely to occur. We agree that 2015 represents a dry year condition and understand that it's use may underrepresent the distribution of shallow groundwater levels. Based on available historic monitoring data (1990-2020), the final ISW study will replace this figure with one generated using a wet year, similar to the depth to groundwater maps used in the identification of GDEs. However, this will not change any findings of the study.
4. Specific Comment, page 4: The ISW study is based on the best available data. Based on the findings and recommendations of the ISW study, as well as development of ISW SMC, the GSA will be recommending additional long-term monitoring focused on collecting continuous groundwater levels in both the Aromas and alluvial aquifers with a focus on better characterizing ISW conditions where present or where reasonably achievable under the Basin Management Plan.
5. Specific Comment, page 6: The ISW study used the best available data. Streambed conductivities provided in Hanson et al. (2014) were evaluated, but these only provide a qualitative sense on hyporheic zone thickness. Therefore, as part of ISW SMC development and monitoring, reaches where historic/current water levels were/are within 10-feet of the stream bed thalweg elevation are considered as areas where reestablishing or enhance ISW conditions is reasonably achievable.
6. Specific Comment, page 7: Page 7 of the ISW TM discussed streamflow losses between the Chittenden and Murphy Crossing gauges. This analysis is limited to water year 2020 as that was the only stream flow data available for the Murphy Crossing gauge. Page 7 of the TM does not state there are no ISW conditions, it states there are typically no ISW conditions. Page 6 of the ISW TM acknowledges and documents the ISW conditions and limited durations in this reach.
7. Specific Comment, page 13: See responses above.