TELEPHONE (661) 410-7500 FAX (661) 410-7506

VALLEY WATER MANAGEMENT COMPANY
7500 MEANY AVE.
BAKERSFIELD, CALIFORNIA 93308

February 13, 2018

Ms. Pamela Creedon, Executive Officer - Pamela.Creedon@waterboards.ca.gov
Mr. Clay Rodgers, Assistant Executive Officer – Clay.Rodgers@waterboards.ca.gov
Central Valley Regional Water Quality Control Board
1685 E Street
Fresno, CA 93706

Dear Ms. Creedon and Mr. Rodgers,

Valley Water Management Company (Valley Water) has received and reviewed the proposed Monitoring and Reporting Program (MRP), Staff Report, and draft Resolution No. R5-2017-0031. We believe the timing of adoption of this proposed MRP and Resolution is premature, particularly in light of the work we are currently undertaking with your staff. Continued collaboration with your staff on the final key issues over the next few months is required for effective decision-making in this matter. Additional information currently being compiled will make consideration of the appropriate MRP and Resolution far more fact-based and would not place groundwater quality at further risk. In order to discuss this issue further, we would like to meet with you and your staff prior to February 26th to continue discussion and resolution of the key issues in a timely manner.

Based on the outcome of our last productive meeting with you and your staff in January, we are very surprised by what we consider premature regulatory actions that cannot be fully informed until we have resolution of certain key issues that we discussed. We agreed at that meeting that there would be continued review and dialogue on three items, including:

1. Discussions with CVRWQCB staff member Doug Wachtell to iron out any differences in stratigraphic interpretation,
2. Review of the geochemistry from wells at the Clean Harbors site to firm up an interpretation of any potential impact, and
3. Discussion of what parameters might need to be better defined in our Cymric flow model.

In the short time since our January 10, 2018 meeting, Valley obtained geological and stratigraphic data from your staff, reviewed that information, and worked with Doug Wachtell to come to an agreement on the stratigraphic relationships between Valley Water Cymric shallow stratigraphy and Clean Harbors Cymric shallow stratigraphy. The outcome of that agreement is attached to this letter and represents what can happen when there is positive collaboration between Valley and the RWQCB staff: the facts are in both hands, which allows for mutual review, dialogue, and agreement.

We believe the same productive and efficient process will lead to resolution of the geochemical data. We have reviewed more recent geochemical data collected at Clean Harbors and still conclude that there is no produced water influence on the perched groundwater zones in the upper and intermediate zones and no indication of any influence in the lower Tulare zone. This subject was discussed extensively in our semiannual report submitted in October 2017. We

would like to determine the basis for your staff concluding otherwise, and discuss this key issue with an eye towards coming to agreement as we did with the stratigraphic question.

The results of Valley Water's reporting in 2017 bears repeating. Since that report was written, additional data has been reviewed. Nothing in the new data changes our interpretation of the results from 2017.

- The radial extent of the produced water mound flowing northeast from the Cymric Facility is approximately one mile long within the Upper Tulare Sand and extends just past Valley Water wells CYM-17K1, CYM-17M1, and CYM-17Q1. Groundwater in Clean Harbors (CH) Upper Perched Zone wells MW-130U and MW-143U, located in the northwest corner of the CH facility only, is not affected by the produced water plume. A different source of perched water, most likely related to the adjacent irrigated agricultural fields just to the north, appears to be affecting these wells and the CH Intermediate Perched Zone well MW-148I. Higher nitrate concentrations found in MW-148I are typically indicative of agricultural runoff and infiltration. This is a key component of our interpretation of the geochemical data.

- CH wells MW-130U and MW-143U contained perched groundwater continuously from 2005 to 2015, and from 2005 to 2017, respectively. Valley Water wells CYM-17K1, CYM-17M1, and CYM-17Q1 did not contain groundwater from 2006 to 2014, indicating a totally different source of perched groundwater. Groundwater levels declined 12 to 15 feet in CH Upper Perched Zone wells MW-130U and MW-143U between 2005 and 2017 with well MW-130U now dry and well MW-143U containing only two feet of water in 2017. In contrast, water levels in Valley Water Upper Tulare Sand wells have remained constant during this time providing further evidence of a different source of perched water.

- The groundwater level in CH Intermediate Zone wells MW-148I and 149RI have decreased 7 to 17 feet from 2005 to 2017. This decreasing trend is consistent with the decreasing trend in the Upper Perched Zone, indicating a similar source of perched water.

- The groundwater level in Valley Water's Lower Tulare Sand well CYM-21D1 has increased significantly, roughly five feet, since the June 2013 sampling event. The groundwater level in CH Lower Water Table wells MW-102RL and MW-170L has declined five to six feet during this time. This indicates a lack of connection between these wells.

- Groundwater velocities were calculated using hydraulic conductivity and effective porosity values derived from field and laboratory testing completed by Geomega in 2004 and hydraulic gradient values calculated from recent sampling/monitoring events. Groundwater velocities ranged from 0.21 to 1.4 ft/day near the ponds in the Upper Tulare Sand unit. Therefore, approximately 41 years would be required for groundwater to flow from Valley Water well CYM-17K1 to CH well MW-143U.

- Groundwater velocity in the Lower Tulare Sand/Lower Water Table Zone was calculated to be 0.01 ft/day. Therefore, 600 years would be required for groundwater to flow from Valley Water well CYM-21D1 to CH well MW-102RL.

- At the present time, CYM-17K1 and CYM-17N1 appear to be monitoring an historical slug of more saline, more fractionated water migrating through the groundwater system. It is estimated that this water was disposed in the ponds well over 25 years ago. An explanation for the more saline/fractionated slug present today is that Valley Water was accepting more Diatomite Formation produced water than Tulare Formation water during the 1980s and 1990s.

- The presence of groundwater in formerly dry (prior to May 2014) sentinel wells CYM-17K1, CYM-17M1, and CYM-17Q1 with water chemistries similar to those found in the ponds and CYM-17N1 indicates the continued migration of pond water to the northeast and east of the Cymric produced water ponds and likely represents historic pond water disposed of approximately 40 years ago.

- Chloride and Total Dissolved Solids (TDS) concentrations have been increasing in CH Upper Perched Zone wells MW-130U and MW-143U beginning in 2012 and 2013, prior to groundwater being encountered in Valley Water sentinel wells CYM-17K1, CYM-17M1, and CYM-17Q1. This timing along with the decreasing water levels in MW-130U and MW-143U indicates a completely different source of perched water. Additionally, boron concentrations in wells MW-130U and MW-143U range from 4.7 to 12 mg/L and have not increased along with the chloride and TDS values reinforcing a different source of perched water. Finally, the pH value in MW-143 U was 7.5, which is significantly different from the 6.6 to 6.8 range found in the Valley Water Upper Tulare Sand wells.

- Chloride and subsequent TDS concentrations have been increasing in CH Intermediate Perched Zone well MW-148I beginning in 2017, however boron concentrations have not increased. This indicates vertical migration from the overlying Upper Perched Zone and not from produced water. Additionally, nitrate concentrations in MW-148I were 58 mg/L in 2017 versus 13 to 15 mg/L in Valley Water Upper Tulare Sand wells. In addition, pH values were 8.1, which is substantially higher than the 6.6 to 6.8 found in Valley Water's wells.

- The overall trend of increasing concentrations of chloride, magnesium, sodium, and boron at Valley Water Lower Tulare Sand well CYM-21D1 continued with the June 2017 sampling event with concentrations of chloride of 2,400 mg/L and TDS of 8,500 mg/L. The boron concentration in June 2017 was 22 mg/L. These concentrations may indicate some influence from produced water mixing with the lower Tulare groundwater.

- All monitoring wells at the site have been sampled and analyzed for the presence of organic petroleum derivatives. No petroleum hydrocarbon components have been detected above laboratory method detection limits for groundwater samples collected and analyzed at the Cymric site through June 2017. In January 2018, monitoring well CYM-17K1 detected GRO at a concentration of 77 µg/L, just above the detection limit of 50 µg/L in January 2018. No BTEX or GRO concentrations were detected in any of the other monitoring wells and BTEX was not detected in CYM-17K1 in January 2018.

- TDS concentrations in CH Lower Water Table Zone well MW-102RL were stable between 2005 and 2014 and ranged between 3,100 and 3,400 mg/L, slightly increased to 3,700 mg/L in 2015, and have remained stable through 2017. TDS concentrations in downgradient well MW-170L slightly increased to 3,400 mg/L in 2007 and have been

generally decreasing to a concentration of 2,600 mg/L in 2017. Boron concentrations in CH Lower Water Table Zone wells MW-102RL and MW-170L ranged from 8.4 to 11 mg/L between 2005 and 2017 with no trends. Additionally, the pH value in CH Lower Water Table Zone well MW-102RL was 8.27 versus 7.4 in Valley Water well CYM-21D1. This indicates no influence on CH wells from groundwater in well CYM-21D1.

- On the bilinear diagram of O/H stable isotopes, wells CYM-17K1, CYM-17M1, CYM-17N1, CYM-17Q1, and CYM-19H1 plot near the pond water and far to the right of the groundwater found in CH wells MW-148I, MW-149RI, MW-102RL and MW-170L. Well CYM-21D1 plots between well CYM-19H1 and the CH wells. This indicates a mixture of Upper Tulare groundwater and produced water was encountered at the Valley Water Upper Tulare Sand wells CYM-17K1, CYM-17M1, CYM-17N1, CYM-17Q1 and CYM-19H1 locations with a smaller element of produced water in the Valley Water Lower Tulare Sand well CYM-21D1. This also indicates that CH Intermediate Perched and Lower Water Table Zone wells have a different source than Valley Water Upper and Lower Tulare Sand wells.

- The results of our evaluation indicate that CH Upper Perched, Intermediate Perched, and Lower Water Table Zone wells are not affected by migrating produced water.

Resolution of both the key stratigraphic and the geochemical issues will inform any required modification to the Valley flow model boundary and initial conditions. We also look forward to further discussion with the Board about other model questions, so that we can resolve them and do final model runs that reflect consensus between Valley Water and the Regional Board.

Because we are working cooperatively at the moment to address these technical issues, we believe the currently scheduled hearing on the draft MRP and Resolution is premature and should be removed from the April Board meeting and deferred to a later date. Valley Water has done considerable work on the issues outlined above, many of which are the same types of issues being discussed in the context of CV-SALTS. Valley Water firmly believes that continued collaboration and dialogue with your staff is appropriate over the next few months and will not lead to any detrimental impact to the beneficial uses of ground waters in the Cymric area.

As stated above, we would also like to meet with you and your staff prior to the current end of the public comment period on the propose MRP and Resolution. Please send us available meeting dates and times prior to February 26, 2018.

Thank you for your consideration of this request.

Sincerely,

Russell Emerson

Russell Emerson
Valley Water Manager

Attachment

cc: Melissa Thorme, Downey Brand LLP
Jim Waldron