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## Central Valley Regional Water Quality Control Board

15 September 2017

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### REVIEW OF THE BUENA VISTA COALITION'S INDIVIDUAL GROUNDWATER QUALITY MANAGEMENT PLAN – SHALLOW HIGH VULNERABILITY AREA

Thank you for your 20 September 2016 submittal of the Buena Vista Coalition's (Coalition) Individual Groundwater Quality Management Plan – Shallow High Vulnerability Area (GQMP). The GQMP was submitted in response to Waste Discharge Requirements General Order for Growers in the Tulare Lake Basin that are Members of a Third Party Group, Order No. R5-2013-0120 (General Order). Central Valley Water Board staff has reviewed the GQMP and has noted areas within the plan that must be addressed to comply with the General Order.

The enclosed staff review memorandum contains GQMP elements in need of revision. Key elements that need to be addressed are the immediate need for growers to implement specific management practices (wellhead protection, proper destruction of abandoned wells, and accounting for nitrate in irrigation water) as a first step to protect groundwater quality, prior to availability of results from the Southern San Joaquin Valley Management Practices Evaluation Program (SSJV MPEP) report, and the identification of specific actions to be taken for growers identified as extreme outliers through the nitrogen management plan summary reports.

Please revise the GQMP in accordance with the staff review memorandum and resubmit an updated GQMP by **31 October 2017**. If you have any questions regarding this letter, please contact David Sholes at (559) 445-6279 or by email at [david.sholes@waterboards.ca.gov](mailto:david.sholes@waterboards.ca.gov).

Sincerely,



*for* Pamela C. Creedon  
Executive Officer

Enclosure: Central Valley Water Board Staff Review Memo of the Coalition's GQMP

cc: Sue McConnell, Central Valley Water Board, Rancho Cordova



EDMUND G. BROWN JR.  
GOVERNOR



MATTHEW RODRIGUEZ  
SECRETARY FOR  
ENVIRONMENTAL PROTECTION

**Central Valley Regional Water Quality Control Board**

**TO:** David Sholes, PG 4321 *DS*  
Senior Engineering Geologist  
Irrigated Lands Regulatory Program

**FROM:** Ryan K. West *Ryan K. West*  
Engineering Geologist  
Irrigated Lands Regulatory Program

**DATE:** 15 September 2017

**SUBJECT:** REVIEW OF THE BUENA VISTA COALITION INDIVIDUAL GROUNDWATER  
QUALITY MANAGEMENT PLAN – SHALLOW HIGH VULNERABILITY AREA

On 20 September 2016, the Buena Vista Coalition (Coalition) submitted an Individual Groundwater Quality Management Plan (GQMP) as required by section VIII.I. of Waste Discharge Requirements General Order R5-2013-0120 (General Order). Groundwater Quality Management Plans are a key mechanism under the General Order to help ensure that waste discharges from irrigated lands do not cause or contribute to an exceedance of applicable water quality objectives in the underlying groundwater, unreasonably affect applicable beneficial uses, or cause or contribute to a condition of pollution or nuisance.

Table 1 (see page 8 of this memorandum) lists the General Order’s requirements for the GQMP and identifies where in the document they have been addressed. A summary of the Coalition’s GQMP approach, public comments, and staff recommendations are discussed below.

**Summary of the Coalition’s GQMP Approach**

This individual GQMP covers one specific groundwater quality management plan area with shallow groundwater (10 to 18 feet below ground surface) in the northern portion of the Coalition’s area. The entire groundwater management plan area will be addressed simultaneously as management practices in the area are fairly uniform. The Coalition’s GQMP approach will focus on grower implementation of appropriate agricultural management practices to reduce nitrate concentrations in groundwater. Through outreach and education, the Coalition will provide grower training on recommended nitrogen and irrigation management practices specific to the crop types in the groundwater quality management plan area. Management practices implemented by growers will be identified and tracked through grower surveys and farm evaluation surveys. Groundwater monitoring will be conducted to detect trends in nitrate concentrations in order to determine the effectiveness of management practices implemented under the GQMP. If nitrate concentrations in groundwater are not responding to ongoing

management practice changes, consideration will be given to development of a pilot program of more intensive management practices in order to meet water quality objectives.

The actions that will be taken to meet the objectives of the GQMP include:

- Education of members;
- Implementation of management practices;
- Identification and tracking of management practices; and
- Groundwater Monitoring

Education of members – The Coalition’s outreach and education program will emphasize: (1) grower awareness of the purpose of the GQMP, the exceedances that triggered the plan, the schedule for plan implementation, and the expected outcomes of extended operation under the plan; (2) background information on nutrient and irrigation management practices that have been used in the past and those currently used; and (3) providing grower training on recommended nitrogen and irrigation management practices specific to the crop types in the groundwater quality management plan area. The Coalition’s small size enables Coalition staff to work closely with grower members and to become acquainted with the farming operations of each of the growers. Coalition staff meets with at least half of the Coalition’s growers annually one on one to discuss the irrigated lands regulatory program (ILRP) and how it affects their farming operations. Additionally, the Buena Vista Water District has created a newsletter with a portion devoted to the Coalition and the ILRP in order to inform and educate growers.

Implementation of management practices – Recommended nutrient and irrigation management practices will be identified from sources such as *Technical Report No. 3: Nitrate Source Reduction to Protect Groundwater Quality* (Center for Watershed Sciences, UC Davis, 2012). Grower members identified by Nutrient Management Plans (Coalition requirement), Grower Survey Forms, and Farm Evaluations as not having already implemented sound management practices will be encouraged to adopt suitable recommended practices. Recommended practices will likely fall into the following four categories: (1) design and operation of irrigation and drainage systems to reduce deep percolation; (2) management of crop plants to capture more N and decrease deep percolation; (3) management of N fertilizer and manure to increase crop N use efficiency; and (4) improvement of the storage and handling of fertilizers and manure to decrease off-target discharge.

Identification and tracking of management practices – Implementation of recommended management practices will be identified and tracked through grower submissions of Nutrient Management Plans, Grower Survey Forms, and Farm Evaluations. A baseline of protective practices currently implemented by growers in groundwater management plan areas will be defined with the first submission of these forms. Future submittals will enable the Coalition to track trends and progress in implementation of protective practices (relative to the baseline) over time throughout the groundwater management plan area.

Groundwater Monitoring - The Coalition will implement a GQMP groundwater quality monitoring program to determine the effectiveness of management practices implemented under the plan. Groundwater samples will be collected from a network of six piezometers and analyzed for nitrate as nitrogen, total dissolved solids (TDS), electrical conductivity (EC), pH, and cations and anions. Groundwater samples will be collected on a semi-annual basis to provide both a better characterization of nitrate concentrations under existing conditions and to detect trends in concentrations as management practices are implemented.

### **Summary of Public Comments**

The Buena Vista Coalition's draft GQMP was released for a 30-day public comment period. One joint comment letter was received from Leadership Counsel for Justice and Accountability, Community Water Center, and Clean Water Action (Commenters). The Commenters noted several items that the GQMP should address, summarized as follows:

- 1) Appendix C of the GQMP is not a sufficient substitute for a baseline inventory of existing management practices;
- 2) It is unclear if the Coalition has pulled the well logs for domestic wells located within their jurisdiction;
- 3) The Coalition plans to develop a pilot project in the case where current practices prove to be ineffective at reducing contamination and meeting water quality objectives, but it is not clear what the pilot project would entail. A discussion as to what a pilot project is expected to entail should be provided in the GQMP;
- 4) In regards to crop changes as a means of reducing nitrate loading to groundwater, further research should be conducted to determine what are the best crops to swap out in order to reduce nitrate leaching to groundwater;
- 5) The GQMP states that the Coalition will work with growers to control management practices in order to meet water quality objectives. While many best management practices currently do not completely eliminate nitrate leaching to groundwater, there are many practices that are not being widely implemented which reduce loading.

### **Summary of Staff Recommendations**

Central Valley Water Board staff have reviewed the GQMP to determine compliance with the General Order. Based on staff review, and considering the public comments received, additional information is needed. Some of the issues contained in the public comment letter are addressed by staff recommendations and the Coalition's Farm Evaluation Summary Report. Other issues will be addressed as the SSJV MPEP is implemented. Staff find seven areas that require additions/revisions.

- Management Practices  
Section C.4.b. of Appendix MRP-1 of the Monitoring and Reporting Program requires that information be provided regarding the identification of management practices that will be used to control sources of constituents of concern (COCs) from irrigated lands that are: technically feasible; economically feasible; proven to be effective at protecting groundwater quality; and will comply with sections III.A., and B., of the General Order.

*Staff Recommendation: As a first step to protect groundwater quality, growers must implement the following specific management practices that are known to be protective of water quality: (1) wellhead protection and proper maintenance of un-used wells; (2) proper destruction of abandoned wells; and (3) accounting for the amount of nitrate in irrigation supply water in order to reduce the amount of excess nitrogen applied. These three management practices should be included as targeted practices for growers to implement within the proposed two-year schedule.*

- Outreach Strategy

Section C.4.c. of Appendix MRP-1 of the Monitoring and Reporting Program requires the GQMP to identify the strategy for informing growers of the water quality problems that need to be addressed, method for disseminating information on relative management practices to be implemented, and a description of how the effectiveness of the outreach efforts will be evaluated.

*Staff Recommendation: The Coalition's outreach program should include a focus on growers identified as outliers through the nitrogen management plan summary reports. The GQMP should identify early targeted outreach to extreme outliers (e.g., growers with "exceptionally high" A/Y or A/R nitrogen ratios for their crop across the HVA, after considerations that would explain such a high ratio are taken into account). The GQMP must identify the method(s) of outreach to outliers and describe how the outreach will be performed. The GQMP must include specific actions and a timeline for outreach.*

- Monitoring System

The Coalition proposes to monitor shallow groundwater in six piezometers (BV8A, BV24, BV21, BV22, BV8C, and BV5A) with the objective of determining the effectiveness of management practices implemented under the GQMP.

*Staff Recommendation: Based on the piezometer map provided in the GQMP, the sampling locations appear to be grouped in two clusters; each cluster consisting of three piezometers. One cluster (piezometers BV-5A, BV-8A, and BV-8C) is located in the northern portion of the groundwater management plan area to the east of Interstate 5. The other cluster (piezometers BV-21, BV-22, and BV-24) is located in the southern portion of the groundwater management plan area immediately north of Lerdo Highway. There is an approximate 4-mile gap between the two clusters. The Coalition should consider adding additional piezometers to the proposed monitoring system that fall within the 4-mile gap. There are three piezometers (BV-10, BV-10D, and BV-14A) on the map to choose from that are centrally located at the mid-point of the 4-mile gap. Well construction details for piezometers that are part of the GQMP monitoring system should be provided in the GQMP.*

- Time Schedule for Compliance

Section XII. of the General Order requires that the time schedule for compliance with Groundwater Limitation III.B must be as short as practicable, but may not exceed 10 years from the date the GQMP is submitted for approval by the Executive Officer.

*Staff Recommendation: The GQMP must indicate that the proposed time schedule for compliance is the shortest possible and include discussion of the following items to support the time schedule: (1) The immediate and short-term or near-term management practices that will be implemented; (2) The implementation schedule for additional management practices that are dependent upon SSJV MPEP results will closely follow the SSJV MPEP schedule and efforts will be made to minimize, to the maximum extent possible, the lag time between when a practice is proven to be protective of groundwater in the SSJV MPEP, and when that practice is rolled out to appropriate coalition members for implementation within the GQMP areas; and (3) For management practices requiring substantial monetary investment prior to implementation, the GQMP should justify the proposed implementation schedule by indicating that the schedule will be based on a reasonable timeframe to budget for the required funding necessary to implement the practice, but under no circumstances will the schedule exceed 10 years.*

- Organizational Chart

Section C.3.c. of Appendix MRP-1 of the Monitoring and Reporting Program requires that an organizational chart be provided that identifies lines of authority.

*Staff Recommendation: Growers should be included as a responsible party in the organization chart since they are responsible for implementation of practices.*

- Compliance with Sections 6735(a) and 7835 of the California Business and Professions Code

Section 7835 of the California Business and Professions Code states that “All geologic plans, specifications, reports, or documents shall be prepared by a professional geologist or registered certified specialty geologist, or by a subordinate employee under his or her direction. In addition, they shall be signed by the professional geologist or registered certified specialty geologist or stamped with his or her seal, either of which shall indicate his or her responsibility for them.”

Section 6735(a) of the California Business and Professions Code states that “All civil (including structural and geotechnical) engineering plans, calculations, specifications, and reports (hereinafter referred to as “documents”) shall be prepared by, or under the responsible charge of, a licensed civil engineer and shall include his or her name and license number. Interim documents shall include a notation as to the intended purpose of the document, such as “preliminary,” “not for construction,” “for plan check only,” “for review only.” All civil engineering plans and specifications that are permitted or that are to be released for construction shall bear the signature and seal or stamp of the licensee and the date of signing and sealing or stamping. All final civil engineering calculations and reports shall bear the signature and seal or stamp of the licensee and the date of signing and sealing or stamping. If civil engineering plans are required to be signed and sealed or stamped and have multiple sheets, the signature, seal or stamp, and date of signing and sealing or stamping shall appear on each sheet of the plans. If civil engineering specifications, calculations, and reports are required to be signed and

*sealed or stamped and have multiple pages, the signature, seal or stamp, and date of signing and sealing or stamping shall appear at a minimum on the title sheet, cover sheet, or signature sheet.”*

*Staff Recommendation: The GQMP contains information that is consistent with the requirement of the aforementioned sections of the California Business and Professions Code, and, therefore, the appropriate signature or stamp needs to be included. However, the GQMP was not signed or stamped by a licensed engineer or professional geologist. A signature and license number and/or stamp of a licensed engineer or professional geologist should be included in the GQMP.*

- Certification Statement

*Reporting provisions of the General Order require the following certification statement for each person signing a report:*

*“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel or represented Members properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information, including the possibility of fine and imprisonment for violations.”*

*Staff Recommendation: The above certification statement should be included either in the GQMP or the submittal letter accompanying the GQMP.*

**Table 1. Components of the Groundwater Quality Management Plan**

Item No.	Required Component	Location in GQMP
<b>Introduction and Background</b>		
1	Provide a discussion of the constituents of concern (COCs) that are the subject of the GQMP.	Page 2
2	Provide a discussion of the water quality objective(s) or trigger(s) requiring preparation of the management plan.	Page 2
3	Identification (both narrative and in a map form) of the boundaries (geographic and groundwater basin[s] or portion of a basin) to be covered by the GQMP including how the boundaries were delineated.	Page 2 Figure B-2
4	Provide a summary of previous work conducted to identify the occurrence of the COCs (e.g., studies, monitoring conducted) for the GQMP area.	Page 3
<b>Physical Setting and Information</b>		
5	Provide land use maps which identify the crops being grown in the GQMP area (these maps may already be presented in the GAR). Map(s) must also be provided in electronic format as ArcGIS shapefiles.	Page 3 Appendix C
6	Provide soil types and other relevant soils data as described by the NRCS soil survey or other applicable studies. The soil unit descriptions and a map of their aerial extent within the study area must be included.	Page 3 Appendix D
7	Identification of the potential irrigated agricultural sources of the COC(s) for which the management plan is being developed. If the potential sources are not known, a source identification study may be designed and implemented.	Page 4
8	Provide a list of the designated beneficial uses as identified in the <i>Water Quality Control Plan for the Tulare Lake Basin</i> , Second Edition, revised January 2004 (Basin Plan).	Page 5
9	Provide a baseline inventory of identified existing management practices in use within the management plan area that could be affecting the concentrations of COCs in groundwater and locations of the various practices.	Page 5 & 6 Appendix C
10	Provide a summary, discussion, and compilation of available groundwater quality data for the parameters addressed by the management plan. The GAR developed for the Coalition's area, and groundwater quality data compiled in that document, may serve as a reference for these data.	Page 6 Appendix A
<b>Geology and Hydrogeology</b>		
11	Provide regional and area specific geology, including stratigraphy and existing published geologic cross-sections.	Pages 7 & 8 Appendix E
12	Provide information on groundwater basin(s) and sub-basins contained within the GQMP area, including a discussion of their general water chemistry as known from existing publications, including the GAR (range of EC, concentrations of major cations and anions, nutrients, TDS, pH, dissolved oxygen, and hardness). The discussion should reference and provide figures of existing Piper Diagrams, Stiff Diagrams and/or Durov Diagrams for the GQMP area.	Pages 8 & 9

13	Provide information regarding known water bearing zones, areas of shallow and/or perched groundwater, as well as areas of discharge and recharge to the basin/sub-basin in the GQMP area (rivers, unlined canals, lakes, and recharge or percolation basins).	Page 10
14	Identification of which water bearing zones within the GQMP area are being utilized for domestic, irrigation, and municipal water production.	Pages 10 & 11
15	Aquifer characteristics such as depth to groundwater, groundwater flow direction, hydraulic gradient, and hydraulic conductivity, as known or estimated based on existing information.	Page 11 Appendix B Figure B-4
16	Identification, where possible, of irrigation water sources (surface water origin and/or groundwater) and their available general water chemistry (range of EC, concentrations of major cations and anions, nutrients, TDS, pH, dissolved oxygen, and hardness).	Pages 11 & 12
<b>Management Plan Strategy</b>		
17	Provide a description of the approach to be utilized by the management plan (e.g., multiple COC's addressed in a scheduled priority fashion, multiple areas covered by the plan with a single area chosen for initial study, or all areas simultaneously [area wide]). Any prioritization included in the management plan must be consistent with the requirements in section XII of the General Order, Time Schedule for Compliance.	Page 13
18	Provide a description of actions to be taken in order to achieve compliance with the receiving water limitations of the General Order (section III).	Page 13 (incomplete)
19	Provide a description of how the Coalition plans to educate Members about the sources of the water quality exceedances in order to promote prevention, protection, and remediation efforts that can maintain and improve water quality.	Pages 13 & 14
20	Provide a description of how the Coalition will identify, validate, and implement management practices to reduce loading of COCs to surface water or groundwater, as applicable, thereby improving water quality.	Pages 14 & 15
21	Identification of key individuals involved in major aspects of the project (e.g., project lead, data manager, sample collection lead, lead for stakeholder involvement, quality assurance manager).	Page 15
22	Provide a discussion of each individual's responsibilities.	Pages 15 & 16
23	Provide an organizational chart with identified lines of authority.	Page 16 (incomplete)
24	Identification of the entities or agencies that will be contacted to obtain data and assistance.	Page 16
25	Identification of management practices used to control sources of COCs from irrigated lands that are 1) technically feasible; 2) economically feasible; 3) proven to be effective at protecting water quality, and 4) will comply with sections III.A and B of the General Order. Practices that growers will implement must be discussed, along with an estimate of their effectiveness or any known limitations on the effectiveness of the chosen practice(s). Practices identified may include those that are required by local, state, or federal law. Where an identified constituent of concern is a pesticide that is subject to DPR's Groundwater Protection Program, the GQMP may refer to DPR's regulatory program for that pesticide and any requirements associated with the use of that pesticide	Pages 16 & 17 (incomplete)

	provided that the requirement(s) are sufficient to meet water quality objectives.	
26	Identification of outreach that will be used to disseminate information to participating growers. This discussion shall include: the strategy for informing growers of the water quality problems that need to be addressed, method for disseminating information on relevant management practices to be implemented, and a description of how the effectiveness of the outreach efforts will be evaluated. The third-party may conduct outreach efforts or work with the assistance of the County Agricultural Commissioners, U.C. Cooperative Extension, Natural Resources Conservation Service, Resource Conservation District, California Department of Food and Agriculture, or other appropriate groups or agencies.	Pages 18, 19 & 20 (incomplete)
27	Provide a specific schedule and milestones for the implementation of management practices and tasks outlined in the management plan. Items to be included in the schedule include: time estimated to identify new management practices as necessary to meet the Order's surface and groundwater receiving water limitations (section III of the Order); a timetable for implementation of identified management practices (e.g., at least 25% of growers identified must implement management practices by year 1; at least 50% by year 2).	Page 20
28	Establish measureable performance goals that are aligned with the elements of the management plan strategy. Performance goals include specific targets that identify the expected progress towards meeting a desired outcome.	Pages 20 & 21
<b>Monitoring Methods</b>		
29	The monitoring system must be designed to measure effectiveness at achieving the goals and objectives of the GQMP and capable of determining whether management practice changes made in response to the management plan are effective and can comply with the terms of the General Order.	Page 23 (incomplete)
30	The third-party's Management Practice Evaluation Program and Groundwater Quality Trend Monitoring shall be evaluated to determine whether additional monitoring is needed in conjunction with the proposed management strategy(ies) to evaluate the effectiveness of the strategy(ies). This may include commodity-based representative monitoring that is conducted to determine the effectiveness of management practices implemented under the GQMP. Refer to section IV of the MRP for groundwater monitoring requirements.	Page 23
<b>Data Evaluation</b>		
31	Methods to be utilized to perform data analysis (graphical, statistics, modeling, index computation, or some combination thereof).	Page 23

32	Identify the information necessary to quantify program effectiveness going forward, including the tracking of management practice implementation. The approach for determining the effectiveness of the management practices implemented must be described. Acceptable approaches include field studies of management practices at representative sites and modeling or assessment to associate the degree of management practice implementation to changes in water quality. The process for tracking implementation of management practices must also be described. The process must include a description of how the information will be collected from growers, the type of information being collected, how the information will be verified, and how the information will be reported.	Pages 24 & 25
<b>Reporting Requirements</b>		
33	Section 6735(a) of the California Business and Professions Code requires that all final civil engineering calculations and reports shall bear the signature and seal or stamp of the licensee and the date of signing and sealing or stamping.	Not Provided
34	Reporting provisions of the General Order require a certification statement for each person signing a report.	Not Provided