CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2015-XXXX
MONITORING AND REPORTING PROGRAM

APPENDIX MRP-1

MANAGEMENT PLAN REQUIREMENTS FOR GROUNDWATER

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May 2015

MRP - 1: Management Plan Requirements for Groundwater

I. Management Plan Development and Required Components

This appendix describes requirements for the development of water quality management plans under Waste Discharge Requirements General Order for Growers in the Grassland Drainage Area, Order R5-2015-XXXX (hereafter "Order"). When a management plan has been triggered, the third-party shall ascertain whether or not irrigated agriculture is known to cause or contribute to the "water quality problem" (as defined in Attachment E). If the potential source(s) of the water quality exceedance(s) is unknown, the third-party may propose studies to be conducted to determine the cause, or to eliminate irrigated agriculture as a potential source (see Source Identification Study Requirements in section I.G. below).

When a Groundwater Quality Management Plan (GQMP) has been triggered, the management plan shall contain the required elements presented and discussed in the following sections. The Grassland Basin Drainage Steering Committee (Steering Committee) may develop one GQMP to cover all areas where plans have been triggered rather than developing separate management plans for each management area where plans have been triggered. The Steering Committee would maintain the overarching plan as new information is collected, potentially triggering additional management plans and completion of other management plans.

If multiple constituents of concern (COCs) are to be included in a single management plan, a discussion of the prioritization process and proposed schedule shall be included in the plan. Prioritization schedules must be consistent with requirements described in section XII of the Order, Time Schedule for Compliance.

If a number of management plans are triggered, the Steering Committee shall submit a GQMP prioritization list to the Central Valley Water Board Executive Officer. This list may prioritize the order of GQMP development based on, for example, 1) the potential to harm public health; 2) the beneficial use affected; and/or 3) the likelihood of meeting water quality objectives by implementing management practices. Prioritization schedules shall be consistent with requirements described in section XII of this Order, Time Schedule for Compliance. The Executive Officer may approve or require changes be made to the GQMP priority list. The Steering Committee shall implement the prioritization schedule approved by the Executive Officer.

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A. Introduction and Background Section

The introduction portion of the management plan shall include a discussion of the COCs that are the subject of the plan and the water quality objective(s) or trigger(s) requiring preparation of the management plan. The introduction shall also include an identification (both narrative and in map form) of the boundaries (geographic and groundwater basin[s] or portion of a basin) to be covered by the management plan including how the boundaries were delineated.

For groundwater, previous work conducted to identify the occurrence of the COCs (e.g., studies, monitoring conducted) should be summarized for the GQMP area.

B. Physical Setting and General Information

1. General Requirements

The management plan needs to provide a discussion of the physical conditions that affect groundwater (for a GQMP) in the management plan area and the associated existing data. At a minimum, the discussion needs to include the following:

a. Land use maps which identify the crops being grown in the GQMP area. These maps may already be presented in the Groundwater Quality Assessment Report (GAR) and may be referenced and/or updated as appropriate. Map(s) must be in electronic format using standard geographic information system software (ArcGIS shapefiles).

b. 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 study may be designed and implemented to determine the source(s) or to eliminate irrigated lands as a potential source. Requirements for source identification studies are given in section I.G below. In the alternative, instead of conducting a source identification study, the Steering Committee may develop a management plan for the COC(s) that meets the management plan requirements as specified in this appendix.

c. A list of the designated beneficial uses as identified in the applicable Basin Plan.

d. A baseline inventory of identified existing management practices in use within the management plan area that could be affecting the concentrations of the COCs in groundwater (as applicable) and locations of the various practices.

e. A summary, discussion, and compilation of available groundwater quality data (as applicable) for the parameters addressed by the management plan. Available data from existing water quality programs may be used, including but not limited to: California State Water Resources Control Board (State Water Board) Groundwater Ambient Monitoring Assessment (GAMA) Program, United States Geological Survey (USGS), California Department of Public Health (DPH), California Department of Pesticide Regulation (DPR), California Department of Water Resources (DWR), and local groundwater management programs. The GAR developed for the Grassland Drainage Area, and groundwater quality data compiled in that document, may serve as a reference for these data.

2. Groundwater – Geology, Soils and hydrogeology

The GQMP shall include:

a. Soil types and other relevant soils data as described by the appropriate Natural Resources Conservation Service (NRCS) soil survey or other applicable studies. The soil unit descriptions and a map of their areal extent within the study area must be included. The GAR developed for the Grassland Drainage Area and the soils mapping contained in that document, may satisfy this requirement.
b. A description of the geology and hydrogeology for the area covered by the GQMP. The description shall include:
   i. Regional and area specific geology, including stratigraphy and existing published geologic cross-sections.
   ii. 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 electrical conductivity [conductivity at 25°C, EC], concentrations of major anions and cations, nutrients, total dissolved solids [TDS], pH, dissolved oxygen

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and hardness). The discussion should reference and provide figures of existing Piper (tri-linear) diagrams, Stiff diagrams and/or Durov Diagrams for the GQMP area (see definitions in Attachment E of the Order).

iii. 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).

iv. iv. Identification of which water-bearing zones within the GQMP area are being utilized for domestic, irrigation, and municipal water production.

v. Aquifer characteristics such as depth to groundwater, groundwater flow direction, hydraulic gradient, and hydraulic conductivity, as known or estimated based on existing information (see definitions in Attachment E of the Order).

c. 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 anions and cations, nutrients, TDS, pH, dissolved oxygen and hardness).

C. Management Plan Strategy

This section provides a discussion of the strategy to be used in the implementation of the management plan and should at a minimum, include the following elements:

1. 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 addressed simultaneously [area-wide]). Any prioritization included in the management plan must be consistent with the requirements in section XII of the Order, Time Schedule for Compliance.
2. Actions to meet the following goals and objectives:
   a. Compliance with the Order's receiving water limitations (section III of the Order).
   b. 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.
   c. Identify, validate, and implement management practices to reduce loading of COC's groundwater, thereby improving water quality.
3. A description of duties and responsibilities of the individuals or groups implementing the management plan. This section should include:
   a. 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).
   b. Discussion of each individual's responsibilities.
   c. An organizational chart with identified lines of authority.
4. Strategies to implement the management plan tasks. This element must:
   a. Identify the entities or agencies that will be contacted to obtain data and assistance.
   b. Identify 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 section III of the 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 provided that the requirement(s) are sufficient to meet water quality objectives.
   c. Identify 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

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evaluated. The Steering Committee 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.

d. Include a specific schedule and milestones for the implementation of management practices and tasks outlined in the management plan. The schedule must include the following items: 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) and 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). The overall time schedule for compliance must be consistent with the requirements in section XII of the Order, Time Schedule for Compliance.

e. 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.

D. Monitoring Design

1. General Requirements

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 Order.

Management practice-specific or commodity-specific field studies may be used to approximate the contribution of irrigated lands operations. Where the Steering Committee determines that field studies are appropriate or the Executive Officer requires a technical report under CWC 13267 for a field study, the Steering Committee must identify a reasonable number and variety of field study sites that are representative of the particular management practice being evaluated.

2. Evaluation and Assessment

The Steering Committee'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.

E. Data Evaluation

Methods to be used to evaluate the data generated by GQMP monitoring and to evaluate the effectiveness of the implemented management practices must be described. The discussion should include at a minimum, the following:

1. Methods to present data and perform data analysis (graphical, statistics, modeling, index computation, or some combination thereof).
2. Information necessary to assess 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

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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.

F. Records and Reporting

With each annual monitoring report, the Steering Committee must prepare a Management Plan Status Report that summarizes the status in implementing management plans. The Management Plan Status Report must summarize the progress for the reporting period. The Management Plan Status Report shall include the following components:

(1) Title page
(2) Table of contents
(3) Executive Summary
(4) Location map(s) and a brief summary of management plans covered by the report
(5) Updated table that tallies all exceedances for the management plans
(6) A list of new management plans triggered since the previous report
(7) Status update on preparation of new management plans
(8) A summary and assessment of management plan monitoring data collected during the reporting period
(9) A summary of management plan grower outreach conducted
(10) A summary of the degree of implementation of management practices
(11) Results from evaluation of management practice effectiveness
(12) An evaluation of progress in meeting performance goals and schedules
(13) Any recommendations for changes to the management plan

G. Source Identification Study Requirements

Should the Steering Committee conduct a Source Identification Study to comply with this Order, the Steering Committee must first receive approval from the Executive Officer. Once approved, the Steering Committee may proceed with its study.

The minimum components for a source identification study are:
(1) An evaluation of the types of practices, commodities, and locations that may be a source.
(2) Continued monitoring at the management plan site/area and increased monitoring if appropriate.
(3) An assessment of the potential pathways through which waste discharges can occur.
(4) A schedule for conducting the study.

Commodity specific and/or management practice specific field studies may be required to approximate the contribution of irrigated agriculture. At a minimum, the Steering Committee must evaluate the feasibility of field studies as part of its source identification study proposal. Where field studies are deemed appropriate, the Steering Committee should identify a reasonable number and variety of field study sites that are representative of the particular commodity or management practice being evaluated. If field studies are not proposed, the Steering Committee must demonstrate how the alternative source identification method will produce data or information that will enable the determination of contributions from irrigated agricultural operations to the water quality problem.

If an approved study shows that irrigated lands are not a cause or a contributing source, then the Steering Committee can request the Executive Officer to approve completion of the associated management plan. Where irrigated lands are identified as a source, a full GQMP shall be prepared and implemented.

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II. Approval and Review of the Management Plan

The following discussion describes the review and approval process for draft management plans submitted to the Executive Officer for approval. In approving the Management Plan, the Executive Officer is concurring that the proper implementation of the identified practices (or equivalently effective practices) should result in addressing the water quality problem that triggered the preparation of the Management Plan. The Executive Officer is also concurring that any proposed schedules or interim milestones are consistent with the requirements in section XII of the Order, Time Schedule for compliance. Any proposed changes to the management plan must be approved by the Executive Officer prior to implementation.

a. Water quality management plan approval – Prior to Executive Officer approval of any management plan, the Central Valley Water Board will post the draft management plan on its website for a review and comment period. Central Valley Water Board staff will consider stakeholder comments. Based on information provided by the Steering Committee and after consideration of comments provided by other interested stakeholders, the Central Valley Water Board's Executive Officer will either: (1) approve the management plan; (2) conditionally approve the management plan or (3) disapprove the management plan. Review of the management plan and the associated action by the Executive Officer will be based on findings as to whether the plan meets program requirements and goals and contains all of the information required for a management plan.

b. Periodic review of water quality management plans – At least once every five years, the Central Valley Water Board intends to review available data to determine whether the approved management plan is resulting in water quality improvements. Central Valley Water Board staff will meet with the Steering Committee and other interested parties to evaluate the adequacy of management plans. Based on input from all parties, the Executive Officer will determine whether and how the management plan should be updated based on new information and progress in achieving compliance with the Order's surface or groundwater receiving water limitations, as applicable (see section III of the Order). The Executive Officer also may require revision of the management plan based on available information indicating that irrigated agriculture waste discharges are not in compliance with surface or groundwater receiving water limitations (as applicable) of the Order. The Executive Officer may also require revision to the management plan if available information indicates that degradation of groundwater calls for the inclusion of additional areas, constituents of concern(s), or improved management practices in the management plan. During this review, the Executive Officer will make one of the findings described below:

    1. Adequate progress – The Executive Officer will make a determination of adequate progress in implementing the plan if water quality improvement milestones and compliance time schedules have been met or the surface/groundwater receiving water limitations of the Order are met.
    2. Inadequate progress – The Executive Officer will make a determination of inadequate progress in implementing the plan if the Order's groundwater receiving water limitations are not being met, and water quality improvement milestones and compliance time schedules in the approved management plan have not been met.

    The actions taken by the Executive Officer upon a determination of inadequate progress include, but are not limited to one or more of the following for the area in which inadequate progress has been made:

    - Management practice field monitoring studies – The Steering Committee may be required to develop and implement a field monitoring study plan to characterize the commodity-specific discharge of the constituent of concern and evaluate the pollutant reduction efficacy of specific management practices. Based on the study and evaluation, the Executive Officer may require the

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GQMP to be revised to include additional practices to achieve compliance with the Order's surface and groundwater receiving water limitations.

- Independent, on-site verification of implementation of management practices and evaluation of their adequacy.

- Individual WDRs or waiver of WDRs – The board may revoke the Steering Committee coverage for individual irrigated agricultural operations and require submittal of a report of waste discharge.

III. Management Plan Completion

Management Plans can be completed in one of two ways. The first way a Management Plan can be completed is if an approved source study shows that irrigated agriculture is not causing or contributing to the water quality problem. The second way a Management Plan can be completed is if the improved management practices have resolved the water quality problem.

The goal of all management plans is to identify the source(s) of COCs, track the implementation of effective management practices, and ultimately ensure that irrigated agriculture waste discharges are meeting the groundwater receiving water limitations of the Order. If an approved source study shows that irrigated agriculture is not a source, then the Steering Committee can request the Executive Officer to approve completion of the associated management plan.

A request for approval of completion of a management plan due to improved management practices will require credible evidence that the water quality problem has been resolved. The Executive Officer will evaluate each request on a case-by-case basis. The following key components must be addressed in the request:

a) Demonstration through evaluation of monitoring data that the water quality problem is no longer occurring or demonstrated compliance with the Order's groundwater receiving water limitations.
b) Documentation of Steering Committee education and outreach to applicable Members in the watershed where water quality impairment occurred.
c) Documentation of Member implementation of management practices that address the water quality exceedances.
d) Demonstration that the management practices implemented by Members are effective in addressing the water quality problem.

Management plans may be completed for all or some of the constituents that prompted preparation of the management plan. When Executive Officer approval is given for completion of a management plan for one or more constituents, each constituent shall revert to regular, ongoing monitoring requirements (as described in the MRP). The Steering Committee must also continue tracking on-going implementation of appropriate management practices by growers, which may be done through the Farm Evaluation process.

Requests for management plan completion must summarize and discuss all information and data being used to justify completion. The Steering Committee shall not discontinue any of the associated management plan requirements prior to Executive Officer approval of its completion request.

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