

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION**

ORDER R5-2012-XXXX
**ATTACHMENT B TO ORDER R5-2012-XXXX
MONITORING AND REPORTING PROGRAM**

WASTE DISCHARGE REQUIREMENTS GENERAL ORDER
FOR
GROWERS WITHIN THE EASTERN SAN JOAQUIN RIVER WATERSHED
THAT ARE MEMBERS OF THE THIRD-PARTY GROUP

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April 2012

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I. Introduction

This Monitoring and Reporting Program (MRP) is issued pursuant to California Water Code (Water Code) section 13267 which authorizes the California Regional Water Quality Control Board, Central Valley Region (hereafter Central Valley Water Board), to require preparation and submittal of technical and monitoring reports. This MRP includes requirements for a third-party representative entity assisting individual irrigated lands operators that are members of the third-party (Members), as well as requirements for individual Members subject to and enrolled under Waste Discharge Requirements General Order for Growers within the Eastern San Joaquin River Watershed that are Members of the Third-Party Group, Order R5-2012-XXXX (hereafter referred to as the "Order"). The requirements of this MRP are necessary to monitor Member compliance with the conditions of the Order and determine whether state waters accepting discharges from Members are meeting water quality objectives. Additional discussion and rationale for this MRP's requirements are provided in Attachment A of the Order.

This MRP establishes specific surface and ground water monitoring, reporting, and electronic data deliverable requirements for the third-party. Due to the nature of irrigated agricultural operations, monitoring requirements for surface waters and groundwater will be periodically reassessed to determine if changes should be made to better represent irrigated agriculture discharges to state waters. The monitoring schedule will also be reassessed so that constituents are monitored during application and/or release timeframes when constituents of concern are most likely to affect water quality. The third-party shall not implement any changes to this MRP unless the Central Valley Water Board or the Executive Officer issues a revised MRP.

II. General Provisions

This Monitoring and Reporting Program (MRP) conforms to the goals of the Non-point Source (NPS) Program as outlined in *The Plan for California's Nonpoint Source Pollution (NSP) Program* by:

- tracking, monitoring, assessing and reporting program activities,
- ensuring consistent and accurate reporting of monitoring activities,
- targeting NPS Program activities at the watershed level,
- coordinating with public and private partners, and
- tracking implementation of management practices to improve water quality and protect existing beneficial uses.

Monitoring data collected to meet the requirements of the Order must be collected and analyzed in a manner that assures the quality of the data. The third-party must follow sampling and analytical procedures as specified in the attached Quality Assurance Project Plan (QAPP) Requirements (Appendix MRP-1).

To the extent feasible, all technical reports required by this MRP must be submitted electronically in a format specified by the Central Valley Water Board that is reasonably available to the third-party.

This MRP Order becomes effective on **DATE**. The Central Valley Water Board Executive Officer may revise this MRP as necessary. Upon the effective date of this MRP, the third-

party, on behalf of the individual Members, shall implement the following monitoring and reporting.

III. Surface Water Quality Monitoring Requirements

A. Surface Water Monitoring Strategy

The third-party will utilize three different types of monitoring sites, including: 1) fixed, long-term trend sites (Core sites); 2) Rotating sites; and 3) Special Project sites. Types of monitoring shall include Assessment monitoring and Special Project monitoring.

For monitoring purposes, the East San Joaquin Water Quality Coalition (the Coalition) designated six zones within its area based on hydrology, crop types, land use, soil types, and rainfall. Within each zone, the Coalition selected core and Rotating sites to represent a diversity of water body sizes and flows and different cropping patterns. The Coalition's 25 August 2008 Monitoring and Reporting Program Plan provides additional description of this strategy.

1. Core Sites

The Core sites that are designated within each zone shall be monitored as fixed, long-term trend monitoring sites (sites are described in Table 1). For long-term trend monitoring at Core sites, the third-party shall identify a scientifically and technically justifiable monitoring design (including monitoring periods and frequency) that allows for the evaluation of water quality over time (Core Site Monitoring Strategy). The Core Site Monitoring Strategy and any third-party proposed updates to the strategy shall be submitted to the Central Valley Water Board Executive Officer for review as a part of the Annual Monitoring Report process. The third-party shall continue monitoring as described in the Coalition's 25 August 2008 Monitoring and Reporting Program Plan (2008 MRPP) until the Executive Officer has approved the Core Site Monitoring Strategy. Subsequent updates shall be implemented once approved by the Executive Officer. At a minimum, surface water monitoring (as described in section III.C.1) shall be conducted at Core sites for two consecutive years, followed by two years of no monitoring. Monitoring at Core sites may be staggered so that while some Core sites are subject to monitoring, others will not be subject to monitoring for that two-year period.

2. Rotating Sites

In the 2008 MRPP, the Coalition identified anywhere from 3 to 11 rotating monitoring sites within each of its six geographic zones, depending on the number deemed necessary to adequately characterize surface water quality within the Coalition's region. In each zone, Rotating sites will be monitored, with the constituents and frequencies described in section III.C, for two consecutive years followed by four years of no monitoring. This strategy will allow for the characterization of a large number of water bodies throughout the region over time. Rotation will be continuous so that any given water body within a zone will be reassessed on a regular basis. Any watershed drainage area that does not contain a Core site or Rotating site must have a designated representative monitoring site unless the Executive Officer has approved an exemption. Any SQMP actions required by the representative site must take place in the represented drainage.

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Two years following monitoring at Rotating sites (i.e., midway through the four year break), the third-party shall conduct an evaluation of cropping patterns and pesticide use records. This evaluation shall be submitted to the Central Valley Water Board with the Annual Monitoring Report. If significant changes in either cropping patterns or pesticide use occur in Rotating site areas, the Executive Officer may request that revised monitoring begin during the next scheduled monitoring event.

3. Special Project Sites

In addition to Core and Rotating sites, the third-party may designate Special Project sites as needed in a surface water quality management plan (SQMP) to evaluate commodity or management practice-specific effects on identified water quality problems,¹ or to evaluate sources of identified water quality problems.

In accordance with Water Code section 13267, the Executive Officer may require the third-party to conduct local or site-specific monitoring, in addition to the Core and Rotating monitoring, where monitoring identifies a localized water quality problem. Core sites and Rotating sites located in areas where management plans are required will also be considered Special Project sites.

4. Representative Monitoring

The third-party's monitoring strategy may rely on representative monitoring to characterize surface water quality conditions in its region. A technically sound justification for using representative monitoring must be provided. The representative monitoring plan must specify which watershed areas are represented by the representative monitoring sites. Third-party members within watershed areas that are represented by monitoring in another watershed must apply all SQMP requirements, if any, associated with the representative monitoring site.

B. Monitoring Locations

The surface water monitoring sites required by this MRP are currently monitored by the Coalition to monitor compliance with previous Order R5-2006-0053 (Coalition Group Conditional Waiver). The description of the surface water monitoring sites and rationale for selection of the monitoring sites is described in the 2008 MRPP (see Monitoring Strategy, pages 35-40), as amended by the Coalition and approved by the Executive Officer. A description of each monitoring site subwatershed is provided on pages 41-51 of the 2008 MRPP. A map of each site subwatershed is provided in Attachment II of the 2008 MRPP. The sites are identified in Table 1, as attached below. The third-party may submit written requests (including technical justification) for removal/addition of monitoring sites for approval by the Executive Officer.

Table 1. Third-party Core and Rotating Sites

ID	Zone	Site Type	Site Name	Station Code	Latitude	Longitude
1	6	Rotating	Ash Slough @ Ave 21	545XASAAT	37.05450	-120.41580
2	4	Rotating	Bear Creek @ Kibby Rd	535XBCAKR	37.31280	-120.41380

¹ "Water quality problem" is defined in Attachment E.

Table 1. Third-party Core and Rotating Sites

ID	Zone	Site Type	Site Name	Station Code	Latitude	Longitude
3	6	Rotating	Berenda Slough along Ave 18 1/2	545XBSAAE	37.01820	-120.32650
4	4	Rotating	Black Rascal Creek @ Yosemite Rd	535BRCAYR	37.33210	-120.39470
5	1	Rotating	Burnett Lateral @ 28 Mile Rd	535BLATMR	37.80343	-120.83992
6	4	Rotating	Canal Creek @ West Bellevue Rd	535CCAWBR	37.36075	-120.54941
A	6	Core	Cottonwood Creek @ Rd 20	545XCCART	36.8686	-120.1818
7	5	Rotating	Deadman Creek @ Gurr Rd	535XDCAGR	37.19360	-120.56120
8	5	Rotating	Deadman Creek @ Hwy 59	535DMCAHF	37.19810	-120.48690
9	6	Rotating	Dry Creek @ Rd 18	545XDCARE	36.98180	-120.21950
B	1	Core	Dry Creek @ Wellsford Rd	535XDCAWR	37.6602	-120.8743
C	5	Core	Duck Slough @ Gurr Rd	535XDSAGR	37.2142	-120.5596
11	2	Rotating	Hatch Drain @ Tuolumne Rd	535XHDATA	37.51490	-121.01220
D	3	Core	Highline Canal @ Hwy 99	535XHCHNN	37.4153	-120.7557
12	3	Rotating	Highline Canal @ Lombardy Ave	535XHCHNN	37.45560	-120.72070
13	2	Rotating	Hilmar Drain @ Central Ave	535XHDACA	37.39060	-120.95820
14	4	Rotating	Howard Lateral @ Hwy 140	535XHLAHO	37.30790	-120.78200
15	2	Rotating	Lateral 2 1/2 near Keyes Rd	535LTHNKR	37.54780	-121.09274
16	2	Rotating	Lateral 5 1/2 @ South Blaker Rd	535LFHASB	37.45823	-120.96726
17	2	Rotating	Lateral 6 and 7 @ Central Ave	535LSSACA	37.39779	-120.95971
18	2	Rotating	Levee Drain @ Carpenter Rd	535XLDACR	37.47903	-121.03012
19	4	Rotating	Livingston Drain @ Robin Ave	535XLDARA	37.31690	-120.74230
20	2	Rotating	Lower Stevinson @ Faith Home Rd	535LSAFHR	37.37238	-120.92318
21	4	Rotating	McCoy Lateral @ Hwy 140	535XMLAHO	37.30945	-120.78759
E	4	Core	Merced River @ Santa Fe	535XMRSFD	37.4271	-120.6721
22	5	Rotating	Miles Creek @ Reilly Rd	535XMCARR	37.25820	-120.47550
35	1	Rotating	Mootz Drain Downstream of Langworth Pond	535XMDDL	37.70551	-120.89438
24	3	Rotating	Mustang Creek @ East Ave	535XMCAEA	37.49180	-120.68390
25	3	Rotating	Peaslee Creek @ Lake Rd	535XPCALR	37.61769	-120.50733
F	2	Core	Prairie Flower Drain @ Crows Landing Rd	535XPFDC	37.4422	-121.0024
26	1	Rotating	Rodden Creek @ Rodden Rd	535XRCARD	37.79042	-120.80790
27	4	Rotating	Silva Drain @ Meadow Dr	535XSDAMD	37.42910	-120.62610
29	4	Rotating	Unnamed Drain @ Cemetary Rd	535XUDACR	37.32835	-120.92290
30	2	Rotating	Unnamed Drain @ Hogin Rd	535XUDAHR	37.43129	-120.99380
31	4	Rotating	Unnamed Drain @ Hwy 140	535XUDAHO	37.31370	-120.89110
32	4	Rotating	Unnamed Drain near Bear Ck @ West Bose Rd	535UNDAWB	37.29159	-120.81410
33	2	Rotating	Westport Drain @ Vivian Rd	535XWDAVR	37.53680	-121.04860

C. Monitoring Requirements and Schedule

1. Surface Water Monitoring

Surface water monitoring must provide sufficient data to describe irrigated agriculture's impacts on surface water quality and to determine whether existing or newly implemented management practices comply with the surface water limitations of the Order. Surface water monitoring shall include a comprehensive suite of constituents (also referred to as "parameters") monitored periodically in a manner that allows for an evaluation of the condition of a water body and determination of whether irrigated agriculture operations in the Eastern San Joaquin Watershed are causing or contributing to any surface water quality problems.

Surface water monitoring shall be conducted at accessible sites and shall consist of the general water quality parameters, nutrients, pathogen indicators, water column and sediment toxicity, pesticides, and metals identified in section III.C.3. As described in section III.C.3, the third-party shall identify a specific set of monitoring parameters (Monitoring Parameter Report) for each site that is scheduled to be monitored by 1 August of the calendar year in which monitoring begins (see additional discussion below under section III.C.3). A monitoring year is defined according to water year, which is 1 October through 30 September.

Follow-up sampling: The Central Valley Water Board Executive Officer may request that a parameter(s) of concern continue to be monitored at a specific Core or Rotating site during non-scheduled years. Parameters of concern may include, but are not limited to, parameters that exceed an adopted water quality objective or water quality trigger (see section VII).

Sampling events shall be scheduled to attempt to capture at least two storm runoff events per year, except where a different frequency has been required or approved by the Executive Officer.

2. Monitoring Schedule and Frequency

The third-party shall identify the appropriate monitoring periods (e.g., months, seasons) for all parameters that require testing (Table 2), including a discussion of the rationale to support the proposed schedule.

For metals, pesticides, and aquatic toxicity, the monitoring periods shall be determined utilizing previous monitoring results, knowledge of agricultural use patterns (if applicable), pesticide use trends, chemical characteristics, and other applicable criteria. All other required parameters shall be monitored according to an approved schedule and frequency during the years in which monitoring is conducted at the Core and Rotating sites.

Monitoring must be conducted when the pollutant is most likely to be present. If there is a temporal or seasonal component to the beneficial use, monitoring must also be conducted when beneficial use impacts could occur. The frequency of data collection must be sufficient to allow determination of compliance with the relevant numeric water quality objective(s) or water quality triggers. The third-party may submit written requests for the removal or addition of monitoring sites or parameters, or to modify the monitoring schedule and frequency, for approval by the Executive Officer.

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3. Monitoring Parameters

Water quality and flow monitoring shall be used to assess the wastes in discharges from irrigated lands to surface waters and to evaluate the effectiveness of management practice implementation. Water quality is evaluated with both field-measured parameters and laboratory analytical data as listed on Table 2 of this MRP. The pesticides and metals identified as “to be determined” (TBD) on Table 2 shall be identified according to the criteria discussed further below.

Parameters that are part of an adopted TMDL that is in effect and for which irrigated agriculture within the Eastern San Joaquin River Watershed shall be monitored in accordance with the adopted Basin Plan provisions or as directed by the Executive Officer. The third-party shall identify the registered pesticides and metals to be monitored for each site subwatershed prior to the beginning of each monitoring period for the Core or Rotating sites in question. The specific pesticides to be monitored at sites within each zone shall be determined, in part, using three consecutive years (most recent available) of pesticide use information and the third-party’s previous monitoring results. Based on this information, the third-party shall identify all pesticides applied or detected during the three-year PUR evaluation period. The third-party will not be required to monitor during the subsequent period of monitoring any pesticides (currently registered for use) that have not been applied within a site subwatershed area for three consecutive years and have not been detected during third-party monitoring.

The third party shall monitor pesticides (currently registered for use) that have been applied and/or detected in a site subwatershed area during all or part of three consecutive years of PUR data, unless the third-party demonstrates that an exemption is warranted. Factors that the third party may consider in requesting an exemption include: the proportion of acres treated out of total irrigated acres; total pounds or pounds per acre of pesticide applied; application rates; LC50 or EC50 toxicity thresholds; prior monitoring results; availability of reliable analytical methods; and chemical characteristics of the parameter, such as mobility or half-life. The third-party may also consider pesticide-use trends. Documentation of the evaluations must be provided to the Central Valley Water Board, including a table or chart that summarizes the three previous years of pesticide use data used in the analysis.

The metals to be monitored at sites within each site subwatershed shall be determined through an evaluation of several factors. The evaluation will provide the basis for including or excluding each metal. Evaluation factors shall include, but not be limited to: documented use of the metal applied to lands for irrigated agricultural purposes in the last three years; prior monitoring results; geological or hydrological conditions; natural or background levels of a metal; and mobilization or concentration by irrigated agricultural operations. The third-party may also consider other factors such as acute and chronic toxicity thresholds and chemical characteristics of the metals. The third-party shall evaluate the metals parameters listed in Table 2 to determine which metals warrant monitoring for each subwatershed. Documentation of the evaluations must be provided to the Central Valley Water Board.

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The third-party shall identify in a Monitoring Parameter Report all parameters to be monitored and the proposed monitoring frequency at selected sites (Core, Rotating) by 1 August of the year in which a two (2) year monitoring period begins. The Monitoring Parameter Report must also include third-party proposed “trigger limits” for any parameter that does not have an adopted numeric water quality objective identified in the Basin Plan (see section VII below for trigger limit requirements). The Monitoring Parameter Report shall be submitted to the Central Valley Water Board, by 1 August, for review and approval prior to the initiation of monitoring activities.

Table 2: Monitoring Parameters

	Measured Parameter	Matrix	Required
Field Measurements	Estimated Flow (cfs)	Water	x
	Photo Documentation	Site	x
	Conductivity (at 25 °C) (µs/cm)	Water	x
	Temperature (°C)	Water	x
	pH	Water	x
	Dissolved Oxygen (mg/L)	Water	x
Drinking Water	E. Coli	Water	x
	Total Organic Carbon (TOC)	Water	x
Gen Phys	Hardness (as CaCO ₃)	Water	TBD
	Total Suspended Solids (TSS)	Water	x
	Turbidity	Water	x
Metals	Arsenic (total)	Water	TBD
	Boron (total)	Water	TBD
	Cadmium (total and dissolved)**	Water	TBD
	Copper (total and dissolved)**	Water	TBD
	Lead (total and dissolved)**	Water	TBD
	Molybdenum (total)	Water	TBD
	Nickel (total and dissolved)**	Water	TBD
	Selenium (total)	Water	TBD
	Zinc (total and dissolved)**	Water	TBD
Nutrients	Total Ammonia (as N)	Water	x
	Unionized Ammonia (calc value)	Water	x
	Nitrogen, Nitrate+Nitrite	Water	x
	Soluble Orthophosphate	Water	x

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Table 2: Monitoring Parameters

	Measured Parameter	Matrix	Required
Pesticides	Registered pesticides determined according to the criteria in section III.C.3.	Water	TBD
303(d)	TMDL constituents required by the Basin Plan 303(d) listed constituents to be monitored if irrigated agriculture is identified as a contributing source within the Eastern San Joaquin River Watershed and requested by the Executive Officer.	Water or Sediment	TBD
Toxicity	Ceriodaphnia dubia Pimephales promelas Selenastrum capricornutum Toxicity Identification Evaluation	Water Water Water Water	x x x see section III.C.4
Toxicity	Hyalella azteca	Sediment	x
Pesticides & Sediment Parameters	Bifenthrin Cyfluthrin Cypermethrin Deltamethrin Esfenvalerate/Fenvalerate Fenpropathrin Lambda cyhalothrin Permethrin Piperonyl butoxide (PBO) Chlorpyrifos Total Organic Carbon Grain Size	Sediment Sediment Sediment Sediment Sediment Sediment Sediment Sediment Sediment Sediment Sediment Sediment	As needed* As needed* As needed* As needed* As needed* As needed* As needed* As needed* As needed* As needed* x x

* For sediment samples measuring significant toxicity and <80% survival compared to the control, the sediment pesticide analysis will be performed. Sediment pesticide analyses may be identified according to an evaluation of PUR data (see sediment toxicity testing requirements in section III.C.4 below).

** Hardness samples shall be collected when sampling for these metals.

4. Toxicity Testing

Discharge from irrigated agricultural operations to receiving waters and sediment must be evaluated using aquatic toxicity testing. The purpose of toxicity testing is to: 1) evaluate compliance with the Basin Plan narrative toxicity water quality objective; 2) identify the causes of toxicity when and where it is observed (e.g. metals, pesticides, ammonia, etc.);

and 3) evaluate any additive toxicity or synergistic effects due to the presence of multiple constituents.

a. Aquatic Toxicity

Aquatic toxicity testing shall include *Ceriodaphnia dubia*, *Pimephales promelas*, and *Selenastrum capricornutum* in the water column and shall follow the USEPA chronic testing methods² (short-term estimation methods). Toxicity test endpoints are survival and reproduction for *C. dubia*, survival and growth for *P. promelas*, and growth for *S. capricornutum*.

Water column toxicity analyses shall be conducted on 100% (undiluted) sample for the initial screening. A sufficient sample volume shall be collected in order to allow the laboratory to conduct a Phase I Toxicity Identification Evaluation (TIE) on the same sample, should acute or chronic toxicity be detected, in an effort to identify the cause of the toxicity.

If a 50% or greater difference in *Ceriodaphnia dubia* or *Pimphales promelas* mortality in an ambient sample, as compared to the laboratory control, is detected at any time in an acceptable test, a TIE shall be initiated within 48 hours of such detection. If a 50% or greater reduction in *Selenastrum capricornutum*, *Ceriodaphnia dubia*, or *Pimephales promelas* growth or reproduction in an ambient sample, as compared to the laboratory control, is detected at the end of an acceptable test, a TIE shall be initiated within 48 hours of such detection.

At a minimum, Phase I TIE^{3,4} manipulations shall be conducted to determine the general class(es) (e.g., metals, non-polar organics, and polar organics) of the chemical(s) causing acute or chronic toxicity. The laboratory report of TIE results submitted to the Central Valley Water Board must include a detailed description of the specific TIE manipulations that were utilized (Appendix MRP-1G).

If within the first 96 hours of the initial toxicity screening, the mortality reaches 100%, a multiple dilution test shall be initiated. The dilution series must be initiated within 24 hours of the sample reaching 100% mortality, and must include a minimum of five (5) sample dilutions in order to quantify the magnitude of the toxic response. For the fathead minnow test, the laboratory must take the steps to procure test species within one working day, and the multiple dilution tests must be initiated the day fish are available.

Ceriodaphnia dubia and *Pimephales promelas* Media Renewal

Daily sample water renewals shall occur during all acute and chronic toxicity tests to minimize the effects of rapid pesticide losses from test waters. A feeding regime of 2 hours prior to test initiation and 2 hours prior to test renewal shall be applied. Test

² USEPA. 2002. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition. Office of Water, Washington, D.C. USEPA-821-R-02-013.

³ USEPA. 1991. Methods for Aquatic Toxicity Identification Evaluations. Phase I Toxicity Characterization Procedures. Office of Research and Development, Washington DC. 20460. EPA-600-6-91-003.

⁴ USEPA. 1992. Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I. Environmental Research Laboratory, Duluth, MN. 55804. EPA-600-6-91-005F.

solution renewal must be 100% renewal for *Ceriodaphnia dubia* by transferring organisms by pipet into fresh solutions, as defined in the chronic freshwater manual.

Selanastrum Capricornutum Pre-Test Treatment

Algae toxicity testing shall not be preceded with treatment of the chelating agent EDTA. The purpose of omitting this agent is to ensure that metals used to control algae in the field are not removed from sample aliquots prior to analysis or during the initial screening.

b. Sediment Toxicity

Sediment toxicity analyses shall be conducted according to EPA Method 600/R-99/064. Sampling and analysis for sediment toxicity testing utilizing *Hyaella azteca* shall be conducted at each monitoring location established by the third-party for water quality monitoring, if appropriate sediment (i.e. silt, clay) is present at the site. If appropriate sediment is not present at the designated water quality monitoring site, an alternative site with appropriate sediment shall be designated for all sediment collection and toxicity testing events. Sediment samples shall be collected and analyzed for toxicity twice per year, with one sample collected between 15 August and 15 October, and one sample collected between 1 March and 30 April, during each year of monitoring. The *H. azteca* sediment toxicity test endpoint is survival. The Executive Officer may request different sediment sample collection timing and frequency under a SQMP.

All sediment samples must be analyzed for total organic carbon (TOC) and grain size (Appendix MRP-1E). Analysis for TOC is necessary to evaluate the expected magnitude of toxicity to the test species. Note that sediment collected for grain size analysis shall not be frozen. If the sample is not toxic to the test species, the additional sample volume can be discarded.

Sediment samples that show significant toxicity to *Hyaella azteca* at the end of an acceptable test and that exhibit $\geq 20\%$ reduction in organism survival compared to the control will require pesticide analysis of the same sample in an effort to determine the potential cause of toxicity. The third-party may use the previous three years of available PUR data to determine which of the parameters listed in Table 2 require testing in the sediment sample. Analysis at practical reporting limits of 1 ng/g on a dry weight basis for each pesticide is required to allow comparison to established lethal concentrations of these chemicals to the test species. This follow-up analysis must begin within five business days of when the toxicity criterion described above is exceeded. The third-party may also follow up with a sediment TIE when there is $\geq 50\%$ reduction in test organism survival as compared to the laboratory control. Sediment TIEs are an optional tool.

5. Special Project Monitoring

The Central Valley Water Board or Executive Officer, in accordance with Water Code section 13267, may require the third-party to conduct local or site-specific monitoring where monitoring identifies a water quality problem. The Central Valley Water Board may require the third-party to conduct site-specific studies (Special Project Monitoring). The studies shall be representative of the effects of changes in management practices for the parameters of concern. Once Special Project Monitoring is required, the third-party must

submit a Special Project Monitoring proposal. The proposal must provide the justification for the proposed study design, specifically identifying how the study design will quantify irrigated agriculture's contribution to the water quality problem, identify sources, and evaluate management practice effectiveness. When such a study is required, the proposed study must include an evaluation of the feasibility of conducting commodity and management practice specific field studies for those commodities and irrigated agricultural practices that could be associated with the pollutants of concern.

D. Surface Water Data Management Requirements

All surface water field and laboratory data must be uploaded into the Central Valley Regional Data Center (CV RDC) database and will be exported to the California Environmental Data Exchange Network (CEDEN) once data have been approved as CEDEN comparable. The third-party will input its data into a replica of the CV RDC database following CV RDC and CEDEN business and formatting rules.

The third-party shall utilize the most current version of the database and update associated lookup lists on a routine basis. The third-party shall ensure that the data loaded meets the formatting and business rules as detailed in the most current version of the document "Format and Business Rules for the CV RDC CEDEN Comparable Database."

The Central Valley Water Board has developed several tools to assist the third-party with processing and loading of its data. These tools, whether required or optional, will help the third-party to efficiently conduct data processing and loading and meet data management requirements.

CEDEN Comparable Field Sheets (Required)

The third party shall use CEDEN comparable field sheets when entering data. An example CEDEN comparable field sheet can be found on the CV RDC webpage. This field sheet was designed to match the entry user interface within the CEDEN comparable database to allow for easier data entry of all sample collection information. Modified versions of the field sheet may be submitted to the Central Valley Water Board Executive Officer for approval.

Format Quick Guide (Optional Tool)

The Format Quick Guide is a guidance document for the formatting of data tailored specifically for the third-party. It contains a column by column guide for filling out the CV RDC data templates with the applicable required codes. The Central Valley Water Board CV RDC will provide this document, and updates to it, upon request based on an approved monitoring plan and associated QAPP.

EDD Checklist (Optional Tool)

The electronic data deliverable (EDD) checklist provides for a structured method for reviewing data deliverables from data entry staff or laboratories prior to loading. An updated checklist will be made available on the CV RDC website.

Online Data Checker (Optional Tool)

An online data checker was developed to automate the checking of the datasets against the current format requirements and business rules associated with CEDEN comparable

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data. The data checker can be accessed on the CV RDC webpage. Please note that data submission will not be accepted through this tool; however, the checker can still be used to check data for errors.

Electronic Quality Assurance Program Plan (eQAPP) (Required)

The third-party shall use eQAPP when collecting monitoring data. The eQAPP is a spreadsheet document containing the quality control requirements for each analyte and method as detailed in the most current version of the third-party's approved QAPP. Each analyte, method, extraction, units, recovery limits, QA sample requirement, etc. is included in this document using the appropriate codes required for the CEDEN comparable database. The third party shall use the document to format the reported data and conduct a quality control review prior to loading. Data that does not meet the project quality assurance acceptance requirements must be flagged accordingly and must include brief notes detailing the problem within the provided comments field. Included in this file is also the most recent CEDEN comparable station name and code list as well as the applicable project CEDEN codes for retrieving data from the CEDEN website once it arrives there.

IV. Groundwater Quality Monitoring Requirements

The groundwater quality monitoring requirements in this MRP have been developed in consideration of the critical questions developed by the Groundwater Monitoring Advisory Workgroup (questions are presented in the Information Sheet, Attachment A). The third-party must collect sufficient data to describe irrigated agricultural impacts on groundwater quality and to determine whether existing or newly implemented management practices comply with the groundwater limitations of the Order.

A. Groundwater Vulnerability Designations

The third-party and staff of the Central Valley Water Board will evaluate available information pertaining to discharges of waste from irrigated lands to groundwater pursuant to the procedures set forth in section IV.B below. The third-party will use this information to refine and prioritize high vulnerability designations specific to groundwater within the Eastern San Joaquin River Watershed. The third-party may also propose low vulnerability areas where reduced program requirements would apply. Vulnerability determinations may be based on factors including, but not limited to, the physical conditions of the area (soil type, depth to groundwater, beneficial uses, etc.) and the practices used for irrigated agricultural fields and operations (pesticide permit and use conditions, label requirements, application method, etc.).

High vulnerability designations for groundwater are required by this MRP as part of the Groundwater Assessment Report identified in section IV.B below. Vulnerability designations may be refined/ updated periodically during the Annual Monitoring Report process. The Executive Officer will make the final determination regarding vulnerability designations.

Low vulnerability areas do not have exceedances of water quality objectives for which irrigated agriculture waste discharges are the cause or a contributing source and are not

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deemed vulnerable by the Department of Pesticide Regulation/State Water Board.⁵

High vulnerability areas have exceedances of water quality objectives for which irrigated agriculture waste discharges are the cause, or a contributing source, or are deemed vulnerable by the Department of Pesticide Regulation/State Water Board.

B. Groundwater Assessment Report

The purpose of the Groundwater Assessment Report (GAR) is to provide the technical basis informing the scope and level of effort for implementation of the Groundwater Monitoring Strategy described in section IV.C. below. The three main objectives of the GAR are to:

- Identify where known groundwater quality impacts exist for which irrigated agricultural operations are a potential contributor or where conditions make groundwater more vulnerable to impacts from irrigated agricultural activities (high vulnerability areas),
- Produce a prioritization of high vulnerability areas, and
- Evaluate the merit and feasibility of incorporating existing groundwater data collection efforts and their corresponding monitoring well systems to achieve the objectives of this Order and support its groundwater monitoring requirements.

The GAR information will provide the basis for the development of the Trend and Representative Groundwater Monitoring programs to be implemented under the Groundwater Monitoring Strategy. Three (3) months after receiving an NOA from the Central Valley Water Board, the third-party will provide a proposed outline of the GAR to the Executive Officer that describes data sources and references that will be considered in developing the GAR. The GAR is due one (1) year after third-party receipt of an NOA from the board.

The GAR shall include, at a minimum, the following data components:

- Detailed land use information with emphasis on land uses associated with irrigated agricultural operations. The information shall identify the largest acreage commodity types in the third-party area, including the most prevalent commodities comprising up to at least 80% of the irrigated agricultural acreage in the third-party area.
- Information regarding depth to groundwater, provided as a contour map(s).
- Groundwater recharge information, including identification of areas contributing recharge to urban and rural communities where groundwater serves as a significant source of supply
- Soil survey information, including significant areas of high salinity, alkalinity and acidity
- Shallow groundwater constituent concentrations (potential constituents of concern include any material applied as part of the agricultural operation, including constituents in irrigation supply water [e.g., pesticides, fertilizers, soil amendments, etc.] that could impact beneficial uses or cause degradation of high quality waters).

⁵ Areas deemed to be high vulnerability for groundwater include areas identified by the State Water Board as high vulnerability areas, or identified by the Department of Pesticide Registration as Groundwater Protection Areas (leaching and runoff).

- Information on existing groundwater data collection and analysis efforts relevant to this Order (e.g., Department of Pesticide Regulation [DPR] United States Geological Survey [USGS] State Water Board Groundwater Ambient Monitoring and Assessment [GAMA], California Department of Public Health, local groundwater management plans, etc.). This data compilation and review shall include information on existing monitoring well networks, individual well details, and monitored parameters. For existing monitoring networks (or portions thereof) and/or relevant data sets, the third-party should assess the possibility of data sharing between the data-collecting entity, the third-party, and the Central Valley Water Board.

To develop the above data components, the GAR shall review existing federal, state, county, and local databases and documents, as appropriate.

The GAR shall discuss pertinent geologic and hydrogeologic information for the third-party area(s) and utilize GIS mapping applications, graphics, and tables, as appropriate, in order to clearly convey pertinent data, support data analysis, and show results.

The GAR shall evaluate the above data components to:

- Determine where known groundwater quality impacts exist for which irrigated agricultural operations are a potential contributor or where conditions make groundwater more vulnerable to impacts from irrigated agricultural activities (high vulnerability areas). It shall also provide the rationale for proposed vulnerability determinations.
- Determine the merit and feasibility of incorporating existing groundwater data collection efforts, and their corresponding monitoring well systems for obtaining appropriate groundwater quality information to achieve the objectives of and support groundwater monitoring activities under this Order. This shall include specific findings and conclusions and provide the rationale for conclusions.
- Prepare a ranking of high vulnerability areas for staged implementation of the Groundwater Monitoring Strategy described below.

Additional information such as models, studies, and information collected as part of this Order may also be considered in designating and prioritizing vulnerability areas for groundwater. The Executive Officer will review and may approve or require changes to any third-party proposed vulnerability areas and the proposed priority ranking. The vulnerability areas, or any changes thereto, shall not be effective until third-party receipt of written approval by the Executive Officer.

C. Groundwater Monitoring Strategy

The strategy for groundwater monitoring consists of two parallel tracks; 1) a Trend Monitoring Program and 2) a Representative Monitoring Program. Each of these two groundwater monitoring programs has its own specific objectives, and the design of the associated monitoring networks will differ in accordance with the specific objectives to be reached. While it is anticipated that these two groundwater monitoring programs will provide sufficient groundwater data to evaluate whether management practices of irrigated

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agriculture are protective of groundwater quality, the Executive Officer may also, pursuant to Water Code section 13267, order Members to perform groundwater monitoring. Such an order may occur, for instance, if violations of the Order are documented or the irrigated agricultural operation is found to be a significant threat to groundwater quality.

1. Trend Groundwater Monitoring Program

- a. Objectives - The objectives of the Trend Groundwater Monitoring Program are (1) to determine baseline quality of groundwater relevant to irrigated agriculture, and (2) to develop long-term groundwater quality information that can be used to evaluate the regional effects (i.e., not site-specific effects) of irrigated agriculture and its practices.
- b. Implementation - To reach the stated objectives for the Trend Groundwater Monitoring Program, the third party shall develop a groundwater monitoring network that will (1) be implemented over both high and low vulnerability areas in the third-party area; and will (2) employ shallow wells, but not necessarily wells completed in the uppermost zone of first encountered groundwater. The use of existing wells is less costly than installing wells specifically designed for groundwater monitoring, while still yielding data which can be compared with historical and future data to evaluate long-term groundwater trends. The third party may also consider using existing monitoring networks such as those used by AB 3030 and SB 1938 plans.

The third-party shall submit a proposed Trend monitoring network workplan described in section IV.D.1 below to the Central Valley Water Board. The proposed network shall consist of a sufficient number of wells to provide aerial coverage in the third-party geographic area so that baseline conditions and composite regional effects of irrigated agriculture can be assessed according to the Trend monitoring objectives. The rationale for the distribution of Trend monitoring wells shall be included in the workplan. A required workplan for conducting trend monitoring within the third-party's boundaries is detailed in section IV.D.1 below.

- c. Annual Reporting - The results of the trend monitoring are to be included in the third-party's Annual Monitoring Report (AMR) and shall include a map of the sampled wells, tabulation of the analytical data, and time concentration charts. Groundwater monitoring data are to be submitted electronically to the State Board's Geotracker Database and to the Central Valley Water Board.

Following collection of sufficient data (sufficiency to be determined by the method of analysis proposed by the third-party) from each well, the third-party is to evaluate the data for trends. The methods to be used to evaluate trends shall be proposed by the third-party in the Trend Groundwater Monitoring Workplan described in section IV.D.1 below.

2. Representative Groundwater Monitoring Program

A Representative Groundwater Monitoring Program (RGMP) is required where known groundwater quality impacts exist for which irrigated agricultural operations are a potential contributor or where conditions make groundwater more vulnerable to impacts from

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irrigated agricultural activities (high vulnerability areas). The objective of the RGMP is to identify whether existing site-specific and/or commodity-specific management practices are protective of groundwater quality in the high vulnerability areas. A second objective of the RGMP is to assess whether, and to what extent, any newly implemented management practices are improving groundwater quality. Given the wide range of management practices/commodities that are used within the third-party's boundaries, it is anticipated that the third-party will rank or prioritize its high vulnerability areas and commodities, and present a phased approach to implement the RGMP.

- a. Implementation - The RGMP requires monitoring of wells completed into first encountered groundwater. Monitoring of first encountered groundwater is important because it is more representative of the groundwater that is affected by recent activities than deeper groundwater. Representative monitoring may be conducted by watershed or commodity groups within an area with known groundwater impacts or vulnerability, or by watershed or commodity groups that wish to determine the effects of regional or commodity driven management practices. As such, representative monitoring may transcend watershed or third-party boundaries, involving participants in other areas or third-party groups, provided the monitoring is conducted in a manner representative of areas to which it will be applied. A master schedule describing the rank or priority for the investigation(s) of the high vulnerability areas (or commodities within these areas) to be examined under the RGMP shall be prepared and submitted to the Executive Officer as detailed in the Representative Groundwater Monitoring Workplan section IV.D below.
- b. Annual Report - Annual reports of the RGMP may be submitted to the Executive Officer as part of the third-party's AMR or in a separate report due on the same date as the AMR. The report shall include all data (including analytical reports) collected by each phase of the RGMP during the previous calendar year. The report shall also contain a tabulated summary of data collected to date by the Representative Groundwater Monitoring Program. The report shall summarize the monitoring activities conducted under the RGMP, and identify the number and location of installed monitoring wells and other types of monitoring devices. Within each annual report, the third-party shall evaluate the groundwater monitoring data and make a determination whether groundwater is being impacted by activities at farms being monitored by the RGMP. If the management practices being implemented at a monitored farm are found not to be protective of groundwater quality, the Executive Officer may issue an order to the owner/operator of the monitored farm to identify and implement management practices that are protective of groundwater quality prior to submittal of the Summary Representative Monitoring Report (SRMR) described in below.

Each annual report shall also include an evaluation of whether the specific phase(s) of the Representative Groundwater Monitoring Program is/are on schedule to provide the data needed to complete the SRMR (detailed below) by the required deadline. If the evaluation concludes that information needed to complete the SRMR may not be available by the required deadline, the report shall include measures that will be taken to bring the program back on schedule.

- c. Summary Representative Monitoring Report - No later than six (6) years after implementation of each phase of the RGMP, the third-party shall submit a Summary Representative Monitoring Report (SRMR) identifying management practices that are protective of groundwater quality for the range of conditions found at farms covered by that phase of the study. The identification of management practices for the range of conditions must be of sufficient specificity to allow Members and staff of the Central Valley Water Board to identify which practices at monitored farms are appropriate for farms with the same or similar range of site conditions, and generally where such farms may be located within the third-party area (e.g., the summary report may need to include maps of the third-party that identify the types of management practices that should be implemented in certain areas based on specified site conditions). The summary report must include an adequate technical justification for the conclusions that incorporates available data and reasonable interpretations of geologic and engineering principles to identify management practices protective of groundwater quality.

The report shall include an assessment of whether monitored farms are implementing management practices that are protective of groundwater quality. If monitoring concludes that management practices currently in use are not protective of groundwater quality based upon information contained in the SRMR, and therefore are not confirmed to be sufficient to ensure compliance with the groundwater limitations of the Order, the third-party in conjunction with commodity groups and/or other experts (e.g., University of California Cooperative Extension, Natural Resources Conservation Service) shall propose and implement new/alternative management practices to be subsequently evaluated at monitored farms. Where applicable, existing GQMPs shall be updated by the third-party group to be consistent with completed SRMRs.

D. Groundwater Monitoring Workplans

The third-party shall develop and submit workplans for conducting Trend and Representative Groundwater Monitoring to the Executive Officer for approval. These workplans shall be submitted within one (1) year of third-party receipt of a NOA from the board. Required workplan elements are presented in the sections below.

1. Trend Monitoring Workplan

The third-party shall develop a workplan for conducting trend monitoring within its boundaries that meets the objectives and minimum requirements described in section IV.C.1. The Trend Monitoring Workplan shall also provide information/details regarding the following topics:

- a. A discussion of the rationale for the number of proposed wells to be monitored and their locations. The rationale needs to consider: 1) the variety of agricultural commodities produced within the third-party's boundaries (particularly those commodities comprising the most irrigated agricultural acreage), 2) the conditions discussed/identified in the GAR related to the vulnerability prioritization within the third-party area, and 3) the areas identified in the GAR as contributing significant recharge to urban and rural communities where groundwater serves as a significant source of supply.
- b. Well details for wells proposed for trend monitoring

- i. GPS coordinates
 - ii. Physical address of the property on which the well is situated (if available)
 - iii. California State well number (if known)
 - iv. Well depth
 - v. Top and bottom perforation depths
 - vi. A copy of the water well drillers log, if available
 - vii. Depth of standing water (static water level), if available (this may be obtained after implementing the program)
 - viii. Well seal information (type of material, length of seal)
- c. Proposed sampling schedule: Trend monitoring wells will be sampled annually at the same time of the year for the indicator parameters identified in Table 3 below.
- d. Proposed method(s) to be used to evaluate trends in the groundwater monitoring data over time.

Table 3: Trend Monitoring Constituents

Annual Monitoring
Conductivity (at 25 °C)
pH
Dissolved oxygen (DO)
Temperature
Alkalinity
Nitrate + Nitrite as Nitrogen
Total Kjeldahl Nitrogen
Trend monitoring wells will also be sampled initially and once every five years for the indicator parameters and the following larger list of COCs:
Total dissolved solids (TDS)
General minerals: Anions (carbonate, bicarbonate, chloride, sulfate, and nitrate)
Cations (arsenic, copper, iron, manganese, zinc, boron, calcium, sodium, and potassium)

2. Representative Groundwater Monitoring Workplan

The third-party either solely or in conjunction with a Representative Monitoring Group⁶ (watershed or commodity based) shall prepare either a Representative Groundwater Monitoring Workplan(s) that proposes a reasonable number of monitoring locations situated throughout the high vulnerability area(s), and encompassing the range of management practices used, the major agricultural commodities, and site conditions under which these commodities are grown, or a scientifically sound alternative to groundwater monitoring that will provide equivalent information. Any alternative to groundwater monitoring, such as modeling or vadose zone sampling, must be proposed by the third-party and approved by the Executive Officer in order to be included within the Representative Groundwater Monitoring Workplan. Any proposed alternative must ensure that the objectives of the Representative Groundwater Monitoring program are accomplished and sufficient

⁶ A Representative Monitoring Group refers to an entity that may be formed or collaborated with to develop and carry out representative groundwater monitoring (e.g., commodity groups).

groundwater monitoring is collected or available to confirm or validate the effectiveness of the alternative method(s).

The workplan shall be designed to meet the objectives and minimum requirements described in section IV.C.2. If the third-party chooses to rank or prioritize its high vulnerability areas in its GAR, a single Representative Groundwater Monitoring Workplan may be prepared which includes a timeline describing the priority and schedule for each of the areas/commodities to be investigated and the submittal dates for addendums proposing the details of each area's investigation.

The proposed Representative Groundwater Monitoring Workplan must identify the constituents to be monitored and the frequency of monitoring for each constituent. The proposed constituents shall be selected based upon the information collected from the GAR and must be sufficient to identify if the management practices being monitored are protective of groundwater quality. At a minimum the baseline constituents to be monitored under Representative Groundwater Monitoring must include those parameters required under Trend Monitoring.

The proposed Representative Groundwater Monitoring Workplan shall contain sufficient information/justification for the Executive Officer to evaluate the ability of the monitoring program to identify whether existing management practices in combination with site conditions, are protective of groundwater quality. The workplan must explain how data collected at monitored farms will be used to assess impacts to groundwater at represented farms that are not part of the Representative Groundwater Monitoring Program's network of monitoring wells. This information is needed to demonstrate whether data collected from the network of monitoring wells will allow identification of management practices that are protective of water quality at Member farms represented by the third-party, including represented farms from which on-site data are not collected.

Upon approval of the Representative Groundwater Monitoring Workplan, the third-party shall prepare and submit a Representative Groundwater Monitoring Workplan Monitoring Well Installation and Sampling Plan (MWISP). A description of the MWISP and its required elements/submittals are presented as Appendix MRP-3. The MWISP must be approved by the Executive Officer prior to the installation of the MWISP's associated monitoring wells.

V. Third-Party Reporting Requirements

Reports and notices shall be submitted in accordance with section IX of the Order, Reporting Provisions.

A. Quarterly Submittals of Monitoring Results

Each quarter, the third-party shall submit the previous quarter's monitoring results in an electronic format. The deadlines for these submittals are listed in Table 4 below.

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Table 4. Quarterly Monitoring Data Reporting Schedule

Due Date	Type	Reporting Period
1 March	Quarterly Monitoring Data Report	1 July through 30 September of previous calendar year
1 June	Quarterly Monitoring Data Report	1 October through 31 December of previous calendar year
1 September	Quarterly Monitoring Data Report	1 January through 31 March of same calendar year
1 December	Quarterly Monitoring Data Report	1 April through 30 June of same calendar year

Exceptions to due dates for submittal of electronic data may be granted by the Executive Officer if good cause is shown. The Quarterly Monitoring Data Report shall include the following for the required reporting period:

1. An Excel workbook containing an export of all data records uploaded and/or entered into the CEDEN comparable database (surface water data) and Geotracker database (groundwater data). The workbook shall contain, at a minimum, those items detailed in Appendix MRP-1.
2. The most current version of the third-party's eQAPP.
3. Electronic copies of all field sheets.
4. Electronic copies of photos obtained from all surface water monitoring sites, clearly labeled with the CEDEN comparable station code and date.
5. Electronic copies of all applicable laboratory analytical reports on a CD.
6. For toxicity reports, all laboratory raw data must be included in the analytical report (including data for failed tests), as well as copies of all original bench sheets showing the results of individual replicates, such that all calculations and statistics can be reconstructed. The toxicity analyses data submittals must include individual sample results, negative control summary results, and replicate results. The minimum in-test water quality measurements reported must include the minimum and maximum measured values for specific conductivity, pH, ammonia, temperature, and dissolved oxygen.
7. For chemistry data, analytical reports must include, at a minimum, the following:
 - a. A lab narrative describing QC failures,
 - b. Analytical problems and anomalous occurrences,
 - c. Chain of custody (COCs) and sample receipt documentation,
 - d. All sample results for contract and subcontract laboratories with units, RLs and MDLs,
 - e. Sample preparation, extraction and analysis dates, and
 - f. Results for all QC samples including all field and laboratory blanks, lab control spikes, matrix spikes, field and laboratory duplicates, and surrogate recoveries.

Laboratory raw data such as chromatograms, spectra, summaries of initial and continuing calibrations, sample injection or sequence logs, prep sheets, etc., are not required for submittal, but must be retained by the laboratory in accordance with the requirements of section X of the Order, Record-keeping Requirements.

If any data are missing from the quarterly report, the submittal must include a description of what data are missing and when they will be submitted to the Central Valley Water Board. If data are not loaded into the CEDEN comparable database (surface water) or Geotracker database (groundwater), this shall also be noted with the submittal.

B. Annual Monitoring Report

The Annual Monitoring Report shall be submitted by 1 May, covering the monitoring periods from the previous hydrologic water year. The report will encompass the following periods: 1 October through 31 December two years prior to the Annual Report year, and 1 January through 30 September of the year prior to the Annual Report year. Each report shall include the following components:

1. Signed transmittal letter;
2. Title page;
3. Table of contents;
4. Executive summary;
5. Description of the third-party geographical area;
6. Monitoring objectives and design;
7. Sampling site/monitoring well descriptions and rainfall records for the time period covered under the AMR;
8. Location map(s) of sampling sites/monitoring wells, crops and land uses;
9. Tabulated results of all analyses arranged in tabular form so that the required information is readily discernible;
10. Discussion of data relative to water quality objectives, and water quality management plan milestones, where applicable;
11. Sampling and analytical methods used;
12. Summary of Quality Assurance Evaluation results (as identified in Appendix MRP-1 for Precision, Accuracy and Completeness);
13. Specification of the method(s) used to obtain estimated flow at each surface water monitoring site during each monitoring event;
14. Summary of exceedances of water quality objectives occurring during the reporting period and for surface water related pesticide use information;
15. Actions taken to address water quality exceedances that have occurred, including but not limited to, revised or additional management practices implemented;
16. Evaluation of monitoring data to identify spatial trends and patterns;
17. Summary of Annual Nitrogen Budgets submitted to the third-party, including confirmation of budget development for those Members that are subject to such requirements;
18. Summary of management practice information collected as part of Farm Evaluations;
19. Summary of mitigation monitoring;
20. Summary of education and outreach activities;
21. Conclusions and recommendations.

Additional requirements and clarifications necessary for the above annual report components are described below:

Report Component (1) —Signed Transmittal Letter

A transmittal letter shall accompany each report. The transmittal letter shall be submitted and signed in accordance with the requirements of section IX of the Order, Reporting Provisions.

Report Component (8) — Location Maps

Location map(s) showing the sampling sites/monitoring wells, crops, and land uses within the third party's geographic area must be updated once per year (based on available sources of information) and included in the Annual Monitoring Report. An accompanying GIS shapefile or geodatabase of monitoring site and monitoring well information must include the CEDEN comparable site code and name (surface water only) and Global Positioning System (GPS) coordinates (surface water sites and wells used for monitoring). The map(s) must contain a level of detail that ensures they are informative and useful. GPS coordinates must be provided as latitude and longitude in the decimal degree coordinate system (at a minimum of five decimal places). The datum must be either WGS 1984 or NAD83, and clearly identified on the map. The source and date of all data layers must be identified on the map(s). All data layers/shapefiles/geodatabases included in the map shall be submitted with the AMR.

Report Component (9) – Tabulated Results

In reporting monitoring data, the third-party shall arrange the data in tabular form so that the required information is readily discernible. The data shall be summarized in such a manner to clearly illustrate compliance with the data collection requirements of the MRP.

Report Component (10) — Data Discussion to Illustrate Compliance

The annual report shall include a discussion of the third-party's compliance with the data collection requirements of the MRP. If a required component was not met, an explanation for the missing data must be included. Results must also be compared to water quality objectives and trigger limits.

Report Component (12) — Quality Assurance Evaluation (Precision, Accuracy and Completeness)

A summary of precision and accuracy results (both laboratory and field) is required in the AMR. The required data quality objectives are identified in Appendix MRP-1; acceptance criteria for all measurements of precision and accuracy must be identified. The third-party must review all QA/QC results to verify that protocols were followed and identify any results that did not meet acceptance criteria. A summary table or narrative description of all QA/QC results that did not meet objectives must be included. Additionally, the report must include a discussion of how the failed QA/QC results affect the validity of the reported data. The corrective actions to be implemented are described in Appendix MRP-1.

In addition to precision and accuracy, the third-party must also calculate and report completeness. Completeness includes the percentage of all quality control results that meet acceptance criteria, as well as a determination of project completeness. For further explanation of this requirement, refer to Appendix MRP-1. The third-party may ask the laboratory to provide assistance with evaluation of their QA/QC data, provided that the third-party prepares the summary table or narrative description of the results for the AMR.

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Report Component (14) — Summary of Exceedances

A summary of the exceedances of water quality objectives that have occurred during the monitoring period is required in the Annual Monitoring Report. In the event of exceedances for pesticides or toxicity in surface water, pesticide use data must be included in the AMR. Pesticide use information may be acquired from the agricultural commissioner. This requirement is described further in the following section on Exceedance Reports.

Report Component (16) — Evaluation of Monitoring Data

The third-party must evaluate its monitoring data in the Annual Monitoring Report in order to identify potential trends and patterns in surface and groundwater quality that may be associated with waste discharge from irrigated lands. As part of this evaluation, the third-party must analyze all readily available monitoring data that meet program quality assurance requirements to determine deficiencies in monitoring for discharges from irrigated agricultural lands and whether additional sampling locations are needed. If deficiencies are identified, the third-party must propose a schedule for additional monitoring or source studies. Upon notification from the Executive Officer, the third-party must monitor any parameter in a watershed that lacks sufficient monitoring data (i.e., a data gap should be filled to assess irrigated agriculture's effects on water quality).

The third-party should incorporate pesticide use information, as needed, to assist in its data evaluation. Wherever possible, the third-party should utilize tables or graphs that illustrate and summarize the data evaluation.

Report Component (17) – Summary of Annual Nitrogen Budgets

Once the Annual Nitrogen Budget Worksheet template has been developed by the third-party and approved by the Executive Officer, the third-party will aggregate information from Members' Final Annual Nitrogen Budget Worksheets to characterize the input, uptake, and loss of nitrogen fertilizer applications by specific crops in the Eastern San Joaquin River Watershed. This information will include a summary of nitrogen consumption ratios by crop or other equivalent reporting units. The third-party will also provide the data used to develop this summary in an electronic format, compatible with ArcGIS, identified to at least the square-mile section (TRS) level. The ratio is an estimate of anticipated crop consumption in comparison to total applied nitrogen through sources including fertilizers, manures, composts, nitrates in irrigation supply water and other sources.

Report Component (18) – Summary of Management Practice Information

Once the Farm Evaluation template has been developed by the third-party and approved by the Executive Officer, the third-party will aggregate and summarize information collected from Farm Evaluations. The third party will provide the data used to develop this summary in an electronic format, compatible with ArcGIS, identified to at least the square-mile section (TRS) level.

Report Component (19) – Mitigation Monitoring

As part of the AMR, the third-party shall report on the CEQA mitigation measures reported by Members to meet the provisions of the Order and any mitigation measures the third-party has implemented on behalf of Members. The third-party is not responsible for submitting information that Dischargers do not send them directly by the 28 February deadline (see section VII.E of the Order for individual Discharger mitigation monitoring

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requirements). The Mitigation Monitoring Report shall include information on the implementation of CEQA mitigation measures (mitigation measures are described in Attachment C of the Order), including the measure implemented, identified potential impact the measure addressed, location of the mitigation measure (township, range, section), and any steps taken to monitor the ongoing success of the measure.

C. Surface Water Exceedance Reports

The third-party shall provide exceedance reports if monitoring results show exceedances of adopted numeric water quality objectives or trigger limits, which are based on interpretations of narrative water quality objectives. For each surface water quality objective exceeded at a monitoring location, the third-party shall submit an Exceedance Report to the Central Valley Water Board. The estimated flow at the monitoring location and photographs of the site must be submitted in addition to the exceedance report but do not need to be submitted more than once. The third-party shall evaluate all of its monitoring data and determine exceedances no later than five (5) business days after receiving the laboratory analytical reports for an event. Upon determining an exceedance, the third-party shall send the Exceedance Report by email to the third-party's designated Central Valley Water Board staff contact by the next business day. The Exceedance Report shall describe the exceedance, the follow-up monitoring, and analysis or other actions the third-party may take to address the exceedance. For exceedances related to pesticides, the third-party shall also notify the agricultural commissioner of the county in which the exceedance occurred and the director of the Department of Pesticide Regulation.

Surface water exceedances of pesticides or toxicity: When any pesticide or toxicity exceedance is identified at a location that is not under an approved management plan for toxicity or pesticides, follow-up actions must include an investigation of pesticide use within the location's watershed area. For toxicity exceedances, the investigation must include all pesticides applied within the area that drains to the monitoring site during the four weeks immediately prior to the exceedance date. The pesticide use information may be acquired from the agricultural commissioner, or from information received from Members within the same drainage area. Results of the pesticide use investigation must be summarized and discussed in the Annual Monitoring Report.

D. Groundwater Exceedance Reports

The third-party shall identify groundwater exceedances of adopted numeric water quality objectives or trigger limits (which are based on interpretations of narrative water quality objectives) in the Annual Monitoring Report.

VI. Plans and Reports

A. Third-Party - Farm Evaluation Template

The third-party will develop a template or web-based information system to gather Farm Evaluation information from Members. At a minimum, the template must be designed to collect the following information:

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- Identification of on-farm management practices implemented to protect surface and groundwater quality. Specifically track which management practices recommended in management plans have been implemented at the farm.
- Description of a self-inspection plan (including description of timing and frequency of inspections) to confirm practices are working as expected (i.e., visual checking of berms, levees, etc.)
- Location of the farm
- Identification of areas of the farm that have movement of soil during storm events and/or during irrigation drainage events (sediment and erosion risk areas)
- Identification of points on the farm where water leaves the property and is conveyed downstream.

Once approved by the Executive Officer, the Farm Evaluation Template shall be distributed or made available to Members.

B. Third-Party - Sediment and Erosion Control Plan Template

The third-party will create a template to assist Members that must prepare a Sediment and Erosion Control Plan. At a minimum, the template must be designed to facilitate Member consideration of the following:

- Identification of locations subject to erosion or locations subject to frequent water flow events that may mobilize sediment (sediment and erosion risk areas). Locations to be evaluated include the fields, roads or stream crossings within the enrolled parcel, and discharge points from the field.
- Identification of practices implemented at sediment and erosion risk areas to prevent or reduce sediment discharge and erosion.

C. Third-Party – Annual Nitrogen Budget Worksheet Template

An Annual Nitrogen Budget Worksheet template will be developed by the third-party in consultation with the Central Valley Water Board, the California Department of Food and Agriculture (CDFA), and the University of California Extension and Natural Resource Conservation Services (NRCS). The template should incorporate, to the extent appropriate, the major criteria established in Code 590 of the NRCS Nutrient Management document, including soil and plant tissue testing, nitrogen application rates, nitrogen application timing, consideration of organic nitrogen fertilizer, consideration of irrigation water nitrogen levels to minimize surface and groundwater pollution and meet crop nitrogen requirements and crop yield potential.

VII. Water Quality Triggers for Development of Management Plans

This Order requires that Members comply with all adopted water quality objectives and established federal water quality criteria applicable to their discharges.

The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* (Basin Plan) contains numeric and narrative water quality objectives applicable to surface water and groundwater within the Order's watershed area. USEPA's 1993 National Toxics Rule (NTR) and 2000 California Toxics Rule (CTR) contain water quality criteria which,

when combined with Basin Plan beneficial use designations constitute numeric water quality standards. Table 5 of this MRP lists Basin Plan numeric water quality objectives and NTR/CTR criteria for constituents of concern that may be discharged by Members.

Table 5 does not include water quality criteria that may be used to interpret narrative water quality objectives, which shall be considered trigger limits. Trigger limits will be proposed by the third-party through the Monitoring Parameter Report process described in section III.C.3 of this MRP. As part of the Monitoring Parameter Report, trigger limits shall be proposed by the third-party for all parameters that are scheduled for monitoring that do not have a Basin Plan numeric water quality objective or where interpretation of narrative Basin Plan objectives is necessary to ensure the protection of applicable beneficial uses. The third-party shall provide technical justification for any new proposed trigger limits for Executive Officer review. The trigger limits shall be designed to implement narrative Basin Plan objectives and to protect applicable beneficial uses. If the Executive Officer determines that the proposed trigger limits do not provide an appropriate interpretation of the narrative water quality objective or do not protect applicable beneficial uses, the Executive Officer will make a final determination as to the appropriate trigger limits. Any trigger limits proposed by the third-party or determination of appropriate trigger limits by the Executive Officer must be consistent with applicable Basin Plan policies governing the interpretation of narrative water quality objectives.

VIII. Quality Assurance Project Plan (QAPP)

The third-party must develop and/or maintain a QAPP that includes watershed and site-specific information, project organization and responsibilities, and the quality assurance components in Appendix MRP-1 of this MRP. Chemical, bacteriological, and bioassay analyses shall be conducted at a laboratory certified for such analyses by the California Department of Public Health (DPH), except where the DPH has not developed a certification program for the material to be analyzed.

The East San Joaquin Water Quality Coalition's existing QAPP was approved by the Executive Officer on 25 November 2008. The existing QAPP is acceptable for use by the third-party provided that the third-party provides additional modifications for toxicity monitoring as described in Appendix MRP-1 within six (6) months of the effective date of this MRP. Any necessary modifications to the QAPP for groundwater monitoring shall be submitted with the groundwater trend and representative monitoring workplans. Any proposed modifications to the approved QAPP must receive Executive Officer approval prior to implementation.

The Central Valley Water Board may conduct an audit of the third-party's contracted laboratories at any time in order to evaluate compliance with the QAPP. Quality control requirements are applicable to all of the constituents listed in Appendix MRP-1, as well as any additional constituents that are analyzed or measured, as described in the appropriate method. Acceptable methods for laboratory and field procedures as well as quantification limits are described in Appendix MRP-1.

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Table 5. Basin Plan Numeric Water Quality Objectives for the Eastern San Joaquin River Watershed. * Where more than one objective is applicable, the most stringent shall be applied.

Constituent / Parameter (Synonym)	Basin Plan Water Quality Objective	Source of Numeric Threshold (footnotes in parentheses are at bottom of table)	Numeric Threshold (a)	Units	G= Groundwater IS= Inland Surface Water	Numeric Threshold Protects Designated Beneficial Use(s) in the Water Body:							
						Groundwater			Inland Surface Waters				CAS Number
						MUN- MCL	MUN- Toxicity	AGR	MUN- MCL	MUN- Toxicity	Aquatic Life & Consump	AGR	
Boron, total	Chemical Constituents	Basin Plan. SJR, mouth of Merced R to Vernalis (15 Mar – 15 Sep)	2,000	ug/L	IS							X	7440-42-8
		Basin Plan. SJR, mouth of Merced R to Vernalis (15 Mar – 15 Sep)	800 (b)	ug/L	IS							X	
		Basin Plan. SJR, mouth of Merced R to Vernalis (16 Sep – 14 Mar)	2,600	ug/L	IS							X	
		Basin Plan. SJR, mouth of Merced R to Vernalis (16 Sep – 14 Mar)	1,000 (b)	ug/L	IS							X	
		Basin Plan. SJR, mouth of Merced R to Vernalis (critical year) (c)	1,300 (b)	ug/L	IS							X	
		Basin Plan. SJR from Sack Dam to mouth of Merced River	5,800	ug/L	IS							X	
		Basin Plan. SJR from Sack Dam to mouth of Merced River	2,000 (b)	ug/L	IS							X	
Chlorpyrifos	Pesticides	Basin Plan. SJR from Mendota Dam to Vernalis; 1-hour average	0.025	ug/L	IS						X		2921-88-2
		Basin Plan. SJR from Mendota Dam to Vernalis; 4-day average	0.015	ug/L	IS						X		
Coliform, fecal	Bacteria	Basin Plan (d) (e)	200/100	MPN/mL	IS				X				--
		Basin Plan (d) (f)	400/100	MPN/mL	IS				X				
Coliform, total	Bacteria	Basin Plan	2.2/100	MPN/mL	G	X							--
Conductivity at 25 C (Electrical conductivity)	Salinity	Basin Plan. SJR, Friant Dam to Mendota Pool	150	umhos/cm	IS								--
		California Secondary MCL	900-1600	umhos/cm	G & IS	X	X		X	X			
Copper	Chemical Constituents	California Secondary MCL (total copper)	1,000	ug/L	G & IS	X			X	X			7440-50-8
	Toxicity	California Toxics Rule (USEPA), (g) (dissolved copper)	variable	ug/L	IS						X		
Diazinon	Pesticides	Basin Plan. SJR from Mendota Dam to Vernalis; 1-hour average	0.16	ug/L	IS						X		50-29-3
		Basin Plan. SJR from Mendota Dam to Vernalis; 4-day average	0.10	ug/L	IS						X		
Dissolved Oxygen, minimum	Dissolved Oxygen	Basin Plan. Merced R from Cressy to New Exchequer Dam, all year	8.0	mg/L	IS						X		7782-44-7
		Basin Plan. Tuolumne R, Waterford to La Grange, 15 Oct – 15 Jun	8.0	mg/L	IS						X		
		Basin Plan. Waters designated WARM	5.0	mg/L	IS						X		
		Basin Plan. Waters designated COLD and/or SPWN	7.0	mg/L	IS						X		
Lead	Chemical Constituents	California Primary MCL (total lead)	15	ug/L	G & IS	X			X				7439-92-1
	Toxicity	California Toxics Rule (USEPA) (g) (dissolved lead)	variable	ug/L	IS						X		

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Constituent / Parameter (Synonym)	Basin Plan Water Quality Objective	Source of Numeric Threshold (footnotes in parentheses are at bottom of table)	Numeric Threshold (a)	Units	G= Groundwater IS= Inland Surface Water	Numeric Threshold Protects Designated Beneficial Use(s) in the Water Body:							
						Groundwater			Inland Surface Waters				CAS Number
						MUN- MCL	MUN- Toxicity	AGR	MUN- MCL	MUN- Toxicity	Aquatic Life & Consump	AGR	
Molybdenum, total	Chemical Constituents	Basin Plan. SJR, mouth of Merced R to Vernalis	15	ug/L	IS							X	7439-98-7
		Basin Plan. SJR, mouth of Merced R to Vernalis (monthly mean)	10	ug/L	IS							X	
		Basin Plan. SJR, Sack Dam to mouth of Merced R	50	ug/L	IS							X	
		Basin Plan. SJR, Sack Dam to mouth of Merced R (monthly mean)	19	ug/L	IS							X	
Nitrate (as nitrogen)	Chemical Constituents	California Primary MCL	10	mg/L	G & IS	X	X		X	X			14797-55-8
Nitrite (as nitrogen)	Chemical Constituents	California Primary MCL	1	mg/L	G & IS	X	X		X	X			14797-65-0
Nitrate+Nitrite (as nitrogen)	Chemical Constituents	California Primary MCL	10	mg/L	G & IS	X	X		X	X			--
pH – minimum	pH	Basin Plan	6.5	units	G & IS	X	X		X	X			--
pH – maximum			8.5	units	G & IS	X	X		X	X			
Selenium, total	Chemical Constituents	Basin Plan. SJR, mouth of Merced R to Vernalis	12	ug/L									7782-49-2
		Basin Plan. SJR, mouth of Merced R to Vernalis (4-day mean)	5	ug/L									
		Basin Plan. SJR, Sack Dam to mouth of Merced R	20	ug/L									
		Basin Plan. SJR, Sack Dam to mouth of Merced R (4-day mean)	5	ug/L									
		California Primary MCL	50	ug/L	G & IS	X			X				
	Toxicity	National Toxics Rule (USEPA), 4-day mean	5	ug/L	IS						X		
Simazine	Chemical Constituents	California Primary MCL	4	ug/L	G & IS	X	X		X	X			122-34-9
Temperature	Temperature	Basin Plan (h)	variable		IS								
Total Dissolved Solids (TDS)	Chemical Constituents	California Secondary MCL, recommended level	500 – 1,000	mg/L	G & IS	X	X		X	X			--
Turbidity	Turbidity	Basin Plan. Where natural turbidity is <1 NTU	2	NTU	IS								
		Where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU.	variable; 2-6	NTU	IS								
		Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20%.	variable; 6 - 70	NTU	IS								
		Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.	variable; 60-110	NTU	IS								
		Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10%.	variable	NTU	IS								
Zinc	Chemical Constituents	California Secondary MCL (total zinc)	5,000	ug/L	G & IS	X			X				7440-66-6

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Constituent / Parameter (Synonym)	Basin Plan Water Quality Objective	Source of Numeric Threshold (footnotes in parentheses are at bottom of table)	Numeric Threshold (a)	Units	G= Groundwater IS= Inland Surface Water	Numeric Threshold Protects Designated Beneficial Use(s) in the Water Body:							
						Groundwater			Inland Surface Waters				CAS Number
						MUN- MCL	MUN- Toxicity	AGR	MUN- MCL	MUN- Toxicity	Aquatic Life & Consump	AGR	
Zinc	Toxicity	California Toxics Rule (USEPA) (g) (dissolved zinc)	variable	ug/L	IS						X		

Footnotes to Table 8:

a	Numeric thresholds are maximum levels unless noted otherwise.
b	Monthly mean.
c	See Basin Plan for definition of Critical Year.
d	Applies in waters designated for contact recreation (REC-1).
e	Geometric mean of the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed this number.
f	No more than ten percent of the total number of samples taken during any 30-day period shall exceed this number.
g	These numeric thresholds are hardness dependent. As hardness increases, water quality objectives generally increase.
h	The natural receiving water temperature shall not be altered unless it can be demonstrated to the satisfaction of the Water Board that such alteration does not adversely affect beneficial uses. However, at no time shall the temperature of WARM and COLD waters be increased more than 5 degrees F above natural receiving water temperature.

Abbreviations:

CAS	Chemical Abstracts Service Registry Number
fw	freshwater
MCL	maximum contaminant limit
MUN	municipal and domestic supply

Beneficial Uses:

- AGR – Agricultural water uses, including irrigation supply and stock watering
- Aquatic Life & Consump – Aquatic life and consumption of aquatic resources
- MUN-MCL – Municipal or domestic supply with default selection of drinking water MCL when available
- MUN-Toxicity – Municipal or domestic supply with consideration of human toxicity thresholds that are more stringent than drinking water MCLs

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