

Review of CVRWQCB Staff Draft 2007 Monitoring Review

TO: Roberta Firoved/California Rice Commission

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Overview

The CVRWQCB staff prepared a draft report for review by members of the ILP and other interested stakeholders. The report, entitled *Draft 2007 Review of Monitoring Data*, provides a review of a portion of the data collected by Coalitions approved under the Irrigated Lands Conditional Waiver. Also included are "supplemental data" which appear to include March and September 2003 UC Davis Phase I data, CVRWQCB July 2004 through March 2006 data, and some amount of CVRWQCB Surface Water Ambient Monitoring Program (SWAMP) data.

Data are grouped into four Zones, each representing large watershed areas. The report does not contain an assessment of compliance with the terms and conditions of the Conditional Waiver, rather it is used to identify spatial and temporal data gaps, and the frequency with which adopted water quality objectives and/or "trigger values" were exceeded.

The draft report was provided to Conditional Waiver Technical Issues Committee (TIC) Members, Irrigated Lands Program (ILP) Stakeholders and Interested Parties by CVRWQCB staff via email dated June 13, 2007. The finalized report will be made available via the CVRWQCB's website and will be the topic of a CVRWQCB workshop.

Purpose of Comments

The CRC requested that CH2M HILL review the data report in the context of rice water quality control. The following questions were considered during our review:

- Does the Executive Summary provide sufficient detail for executive and layman readership?
- Are conclusions adequately supported by data?
- Could the reader be left with the impression that CRC monitoring and reporting was not consistent with the requirements of the Conditional Waiver or the CRC's approved Monitoring and Reporting Program (MRP) Plan?
- Do maps include sufficient summary information so that if used in the newspaper they will include enough information to tell the whole story?
- Are Basin Plan requirements described correctly?

- Does summary information include sufficient detail to provide basis for recommending future MRP revisions?

Comments

Characterization Conditional Prohibition of Discharge (Rice Pesticides Program)

The CVRWQCB Basin Plan includes a conditional prohibition of discharge for five historically used rice pesticides. The Basin Plan prohibits the discharge of those pesticides *unless the discharger implements approved management practices*. Where approved management practices are utilized, the Basin Plan establishes Performance Goals for water quality monitoring sites located in drains. The logic behind these Performance Goals was that attainment of these numeric water quality concentrations would result in attainment of taste thresholds at the municipal drinking water intakes.

Through various text and tables and Attachment A, it appears as though CVRWQCB staff is interpreting the Basin plan language as an *absolute* prohibition. Through this interpretation, staff is counting any *detections* of molinate and thiobencarb (rice-specific pesticides, i.e. only registered for use on rice) at drain sites as exceedances of water quality trigger values. This misinterpretation has the effect of leading the layman to believe that the conditional prohibition is being violated, which is not the case based on the CRVWQCB's regular review and approval of the Rice Pesticides Program and grower implementation of approved management practices.

It is suggested that all narrative discussion of molinate and thiobencarb detections be re-evaluated in the context of the conditional nature of the prohibition of discharge. For drain sites, the monitoring results should be compared to the Basin Plan performance goals. Without such revisions, the report will be inconsistent with the Basin Plan.

Additionally, if any monitoring sites for rice pesticides were within closed systems, those results should not be included as either drain or river sites.

Maps

The maps represent a critical portion of the report, as they are the most readily absorbed by the general public and media. The maps provide a useful summary of the reviewed data; however, additional summary information would provide a more thorough summary of the data and help to prevent misinterpretation by the layman. The following are specific comments on Zone 1 maps; it is assumed that similar comments would apply to other zones as well:

- **Figure Z1-1:** The title of this figure is "Supplemental Monitoring Sites". In the text, the term "supplemental" should be clarified/defined.
- **Figures Z1-4, Z1-5, Z1-5, Z1-6, Z1-7, Toxicity Results:** The maps present the number of times that statistically significant toxicity was detected. Although the maps do present the *sites* for which there was no detected, the *number* of samples for which toxicity was not detected should also be presented (e.g., n=# on the detection graphs). Additionally, graphs showing the temporal distribution of the toxicity results would be useful, as they may help to identify seasonal toxicity trends that may, in turn, be traced back to use patterns for specific pesticides or ambient seasonal conditions.

In addition, the report should clearly and plainly explain the purpose and nature of toxicity tests for readers unfamiliar with these tests. For example, it would be useful to explain that relatively sensitive organisms are intentionally employed, so that the tests do not necessarily indicate toxicity to all other organisms, but rather serve as a warning that the most sensitive organisms could be at risk at the time of sampling. Also, the cause of the toxicity is not necessarily determined by the test; rather, this requires additional and quite detailed analysis that the coalitions are also undertaking where toxicity is detected. Finally, a detection of toxicity does not prove that farming or irrigation in any way caused the toxicity; rather, this must be investigated by more detailed sampling and analysis. In Zone 1, there are many potential non-agricultural causes of toxicity.

- **Figure Z1-9, Monitoring Results for Escherichia coli:** The map presents the number of times that e. coli triggers are exceeded. It is suggested that the numeric trigger be noted on the map. Additionally, the number of sample events should also be included so that the reader could determine the % of the time that triggers are exceeded. Additionally, graphs showing the temporal distribution of the e.coli measurements would be useful, as they may help to identify seasonal toxicity trends that may, in turn, be traced back to use patterns for specific pesticides or ambient seasonal conditions.

Executive Summary

Suggest adding a summary that includes the specific data reviewed, including the number of sites, time period, parameters, and entities that collected the data that is assessed.

Could, either in the ES or Conclusions, state that the amount of data available for review is significantly more data than was available in 2003.

It also provides insight into the types of water quality ~~impacts~~ concerns that appear to be more pervasive in agricultural drainages within the Central Valley. In addition, source water quality, urban influences, legacy pollutants, and ambient conditions (air temperature, maintained nature of channels, hydraulic structures, low-flow conditions) contribute to water quality concerns

Suggest revising paragraph as indicated above in strikeout/underline.

Use of the word impacts overstates the appropriate application of the limited data analysis.

Are “agricultural drainages” streams/rivers that receive ag drainage, constructed ag drains, or ag-dominated waterbodies?

Overview of Water Quality Concerns

3. Toxicity to *Selenastrum capricornutum* (algal species) is widespread in the Central Valley. Toxicity to algae is generally associated with herbicides and metals, such as copper, though to-date the results of the analysis (including those undertaken by Coalitions and the UC Davis Phase 1 monitoring) have not conclusively identified specific causative agents. The California Rice Commission is undertaking special studies to help determine the causes of algal toxicity in Zone 1.

Request the above text be revised as suggest as indicated with underlined text. Information regarding the seasonality of such detections would be beneficial to the reader.

5. Predominant pesticides detected in water throughout the Central Valley monitoring sites include chlorpyrifos, diazinon, simazine, diuron, and DDT/breakdown products.

Information regarding the seasonality of such detections would be beneficial to the reader.

6. The toxic effects of organophosphate pesticides, such as diazinon and chlorpyrifos, are common in all Zones. This information is based upon results of toxicity tests, toxicity identification evaluations, and well as discrete pesticide analyses.

Please confirm that either specific TIEs or the detection of these pesticides at levels that exceed known toxicity thresholds for test species is the basis of this conclusion.

7. Salinity, as measured by electrical conductivity, is a concern in all Zones of the Central Valley although most notably in Zones 2, 3, and the northwest portions of Zone 4. Information that would clarify how much of this salinity is the result of background, or uncontrollable factors, and how much is contributed by irrigated agriculture is not available, and will require additional study. At this time, there is a concerted effort by many State and local agencies to address issues of salinity in the Central Valley.

What is the basis for the “concern”? Salinity in the Delta has been a known issue of concern for a very long time and the SWRCB is engaged in establishing and enforcing salinity requirements in the Delta (primarily associated with Delta pumping). In addition, TMDL efforts for Salinity are underway in the San Joaquin. Some historic perspective on this matter would provide the layman with background understanding regarding the Board’s ongoing efforts to address salinity in the Central Valley.

Data Gaps

2. Status vs. Trend. It should be emphasized that the information in this 2007 Review is not sufficient to assess changes in water quality resulting from any management practices that may be implemented. The data submitted by Coalition Groups and summaries that are provided herein suffice, at the most, to give a baseline for the water bodies that have been monitored. In some cases, and there water quality concerns exist, source identification coupled with management practice implementation will need to take place. Subsequent monitoring and reporting to include details on management practice implementation will provide data that could indicate improvements.

Through use of the phrases “not sufficient” the reader might interpret this to mean that the intent of the data collected thus far was to assess changes in water quality. However, at the outset of the program it was recognized that new monitoring parameters, sites, and increased frequencies (relative to historic trend monitoring) would provide an initial dataset. Alternatively, use of a phrase such as “information is sufficient to provide baseline

data but use of data to assess changes in water quality would be limited due to short time frame of dataset” would not provide the reader the opportunity to misinterpret the purpose of the collected data. Further, it should be noted that when the Conditional Waiver was adopted, it was recognized that the initial few years would provide no more than baseline data upon which to prioritize water quality concerns and identify management actions.

3. Standards Applied to Detected Results. Because the Irrigated Lands Conditional Waiver is a general waiver, it does not set forth the designated beneficial uses in each water body, nor the water quality criteria and objectives (i.e., water quality standards that apply to each water body). The applicable water quality standards can vary from water body to water body, and there is a need to determine if measurements are exceeding criteria. The Central Valley Water Board has tentatively identified a process by which it could set forth the beneficial uses by water body according to existing Basin Plan requirements, and thereby identify the limits to be used in implementing the water quality standards. When this process is completed, the true effects of irrigated agriculture on waters of the State will be more clearly defined.

The statement “*Because the Irrigated Lands Conditional Waiver is a general waiver, it does not set forth the designated beneficial uses in each water body, nor the water quality criteria and objectives.*” is problematic. The issue at hand is that it may be inappropriate to apply drinking water standards to waterbodies that are agriculturally dominated and/or constructed ag drains. This has nothing to do with the waiver, rather, it is a matter of Basin Planning process. It would be better stated that where water quality standards/objectives are adopted for specific waterbodies, monitoring results have been compared to those standards/objectives. Where monitoring sites are located on waterbodies that do not have adopted standards/objectives, a public process is being developed to compare results to threshold values. This comparison will allow for the prioritization of concerns.

4. Pesticides Applied vs. Pesticides Analyzed. The MRP requires that coalition monitoring include tests for the specific list of standard-use pesticides for which analytical methods have been established. Regional Board staff have determined that the list of pesticides for which there are established analytical methods~~It is clear that this list of pesticides~~ is not comprehensive for all the pesticides that are in use in all areas of the Central Valley. A comparison of pesticides used in Zone 4 (Table Z4-1) and the baseline ILP MRP monitoring requirements shows that not all currently pesticides are currently included in baseline monitoring. This is evidenced in Table Z4-1, Pesticide Use in Zone 4, which identifies the list of pesticides used for each crop type in Zone 4, many of which are not part of the baseline ILP MRP monitoring requirements. It is also true that approved environmental analytical procedures at environmentally sensitive levels do not exist for all of the pesticides that are registered for use in the State of California. An effective approach to monitor precisely for the pesticides that are being used has not been developed and will need to be in order to address this data gap.

Suggest revising paragraph as indicated above in strikeout/underline.

The statements “*The MRP requires that coalition monitoring include tests for the specific list of standard-use pesticides for which analytical methods have been established*” and “*This is evidenced in Table Z4-1, Pesticide Use in Zone 4, which identifies the list of pesticides used for each crop type in Zone 4, many of which are not part of the baseline ILP MRP monitoring requirements*” are problematic. The first statement generalizes the requirements of the MRP and needs to be reworded to accurately reflect the requirements of the waiver with respect to pesticide monitoring. Specifically, the MRP requires that monitoring and reporting be conducted in accordance with approved MRP Plans developed in accordance with the CVRWQCB’s Monitoring and Reporting Program Order R5-2005-0833 (MRP Order). The MRP Order specifies that Phase 1 monitoring was to include a Pesticide Use Evaluation. Phase 2 was to include chemical pesticide analyses based on the Pesticide Use Evaluation. Further, the MRP Order listed the minimum monitoring requirements for pesticide.

The second statement could be interpreted to mean that the MRP plans did not include required analyses. The MRP requires that monitoring and reporting be conducted in accordance with an approved Coalition-specific MRP Plans. The statement as written implies that Coalitions are not compliant with the MRP requirements. If the analysis of pesticides applied versus pesticides analyzed has determined that additional pesticides should be monitoring by Coalitions, then it is a matter of revising MRPs.

5. Acute Effects vs. Long-Term Effects. The ILP MRP requires monitoring for the acute effects for aquatic toxicity species, which are primarily mortality and fertilization. Long-term effects, or sub-lethal effects, can be equally as detrimental to species survival, and include factors such as growth and reproduction. Testing for chronic effects is beyond the scope of existing approved Conditional Waiver monitoring program requirements ~~program monitoring~~.

Suggest revising paragraph as indicated above in ~~strikeout~~/underline.

6. Missing Seasonal Data. The ILP MRP requires monitoring of two storm events during the winter season, and monthly during irrigation season. The intent of more frequent irrigation season monitoring was to capture the impact of drainage from irrigated lands when water is being applied to the fields and when the application of pesticides takes place. However, data that is not captured includes occasions when drainage occurs from water that is applied for other purposes, such as pre-planting application, post-harvest application, and application of water for frost protection. Additionally, subwatershed areas in Zone 4 have incorrectly interpreted the irrigation season to include only when water is being supplied to the grower by the local irrigation water purveyor, which is an abbreviated period of time, as little as two months. This interpretation excludes monitoring for the remainder of the year, in areas that are quite arid and in which water is often being applied to fields year round.

Again, this tone and wording makes it sound as though all the Coalitions are doing something that is not compliant with the requirements of the Conditional Waiver. Each approved MRP specifies the number of events and the timing of events. Suggest calling this section “Seasonal Data Gaps”. If revisions to the Conditional Waiver program are thought necessary to improve the ability of the program to characterize agricultural discharges, then that should be stated.

Some Coalitions, specifically rice, have developed crop-specific calendars and monitoring schedules to capture key run-off events.

The Zone 4 issue should be grouped into the summary with the other zones.

7. Missing Spatial Data. There are some areas of the Central Valley for which there is partial or no monitoring data available, or for which representative sites have not been designated. These areas have been identified within each of the Zone report sections. The areas with the largest geographical areas for which monitoring sites have not been identified include Zones 1 and 4.

Again, makes it sound like Coalitions are doing something wrong. Suggest calling this section "Spatial Data Gaps". If revisions to the Conditional Waiver program are thought necessary to improve the ability of the program to characterize agricultural discharges, then that should be stated.

Introduction Comments

Page 5

Are the data described in bullet items 1,2 and 6 termed "supplemental" data on Figure Z1-2 and within Tables Z1-3, Z1-4, and Z1-5?

Zone 1 Comments

Page Z1-2

The narrative for the Solano/Yolo Subwatershed describes management practices being implemented in the subwatershed. It is noted that rice growers implement a range of management practices in all rice growing regions.

Table Z1-1

Although the table is a report of the 303(d) list, it would be beneficial note that certain rice pesticides for which the Colusa Basin Drain are listed are no longer registered or used. Same comment applies to the narrative section on Colusa Basin Drain.

Table Z1-2

Site No. 8 is listed as Sacramento Slough near Karnak (SS1). It is noted that in 2005 the CRC moved its Sacramento Slough sampling site to a site now designated Sacramento Slough Bridge (SSB). The sampling was moved to provide for field technician safety. If results for SS1 and SSB are combined in this table, is suggested that the newer site name be utilized and that the site be footnoted to provide clarity for future readers.

Site No. 33 is just listed as Sacramento Slough. Please provide additional site identification information for this site to reduce confusion.

The "subtotals" row on page Z1-7 appears to present the subtotal for Coalition monitoring sites? Please clarify the data that are being subtotaled.

Page Z1-10

"In some cases, the same stressor will affect two species, but ~~it will require those effects will be observed at different concentrations levels for each.~~"

Suggest revising paragraph as indicated above in strikeout/underline.

Figure Z1-3

The figure includes samples with “significant toxicity”. This should be clarified as “statistically significant toxicity” and this change should be reflected throughout the narrative.

Seasonality of toxic events would be beneficial to the reader.

Are TIE results included in the summary? It should be noted whether TIEs were successful at determining the causative toxic agents. Alternatively, if the evaluation of TIE results is not included this report, it should be noted so that a diligent reader would understand that TIEs were undertaken in conjunction with the sampling and in response to results triggering that analysis.

Page Z1-12

Overall, 1.6% percent of the total fathead minnow tests (501 total) ~~resulted~~ showed in statistically significant toxicity.

Suggest revising paragraph as indicated above in strikeout/underline.

Water flea toxicity is generally associated with insecticide toxicity. ~~7~~ and Out of the 96 monitoring locations, 21% had a test result with toxicity to water flea at least one time, although monitoring frequency at each site varied.”

Suggest revising paragraph as indicated above in strikeout/underline.

Page Z1-14

The table below indicates that 94 sample tests resulted in significant toxicity to ~~selenastrum water flea~~, approximately 24.1% of the 390 *selenastrum* tests.

Suggest revising paragraph as indicated above in strikeout/underline.

Page Z1-16

Please clarify the definition of “water quality trigger”. Under the Conditional Waiver program, a “trigger” has generally indicated a result which requires some type of follow up action (for instance, observed statistically significant above a toxicity threshold triggers follow-up sampling and analysis). In this case, water quality trigger seems to mean some level that selected studies have shown to be of water quality concern due to toxic effects observed at that level. Please clarify.

Additionally, Table Z1-8 goes on to use the terminology “**Number Tests Outside of the Limits**”. Please use consistent language within the report and define terms appropriately to provide the reader proper context within the confines of the Basin Plan and generally accepted aquatic toxicology literature.

Page Z1-21

Regarding sediment toxicity, seasonality would be useful information. Future review of seasonality of toxicity combined with a review of pesticide use records and/or ambient drain/stream conditions could provide insight into potential causative agents.

Summary

The report summarizes a substantial amount of information at a programmatic level that is useful in identifying potential water quality concerns and data gaps. The maps prove very useful in demonstrating the spatial distribution of water quality concerns. This information can form a useful basis for revisions to MRP Plans and the development of long-term monitoring strategies designed to measure baseline conditions as well as develop programs to measure the long-term influence of implemented management practices and ambient conditions.

A primary concern for the CRC is the misinterpretation of the conditional prohibition of discharge. Revisions to the narrative and exceedance tables should be sought to ensure that the write-up is consistent with the Basin Plan's Rice Pesticides Program and that the layman is not left with the incorrect impression that rice growers are not in compliance with the terms and conditions of the CVRWQCB's program for control of rice water quality.

Additionally, the seasonality of toxicity events and bacteria exceedances would be useful information, as it would allow for analysis of pesticide use in comparison to observed toxicity.