

Pesticide Monitoring Proposal

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KINGS RIVER
WATER QUALITY COALITION

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A. KRWQC Pesticide Evaluation Spreadsheet

1. Introduction

As part of the surface water monitoring requirements under General Order R5-2013-0120, The California Regional Water Quality Control Board developed a Pesticide Evaluation Protocol to be used by Coalitions to develop the Pesticide Monitoring Proposal for the subsequent monitoring period. The Kings River Water Quality Coalition (KRWQC) has prepared this Pesticide Monitoring Report for the 2019 surface water monitoring period that details which pesticides will be monitored within the KRWQC surface waters. The pesticides identified in this report were evaluated per the methodology describe in this report.

2. Methodology

In accordance with the steps and instructions described in the ILRP Pesticide Evaluation Protocol the KRWQC enacted the following methodology culminating in the formation of a monitoring schedule for pesticides within the KRWQC boundary;

2.1 Data Collection, Compilation, and Processing:

- a. The most recent three years of pesticide data (2014-2016) for Tulare, Kings, and Fresno County was downloaded from the California Department of Pesticide Regulation, California Pesticide Information Portal (CALPIP).
- b. Pesticide Use Report (PUR) data was then Imported into SQL Server where the following filters were prescribed to screen out erroneous or unneeded data;
 - i. Spatial - PUR data was filtered by township, range and section for data within the KRWQC Boundary.
 - ii. Executive Office (EO) List Pesticides – PUR data was filtered for pesticides on the EO list of pesticides, Attachment A of the ILRP Pesticide Evaluation Protocol.
 - iii. Degradates Pesticides - PUR data was filtered for pesticides on the EO list of degradates, Attachment A1 of the ILRP Pesticide Evaluation Protocol.
- c. Grouping Pesticides - After the filters were applied to screen out unnecessary data, the remaining pesticides were grouped by those with the same toxicant in water. This was done according to the grouping list provided in Attachment B of the ILRP Pesticide Evaluation Protocol.
- d. Sum/Quantity Calculations – At this step, the Grouped Pesticide list was exported from SQL Server and imported into Excel. Cumulative Use for each year and Annual Use averaged by month was calculated for each pesticide. Cumulative Use for each month was determined by the sum of the amount of pesticide applied per month divided by three (for each year of PUR data included). Annual Use Average by month was determined by the sum of total amount applied over the three most recent years of a pesticide divided by thirty-six (for each month of PUR data included).

2.2 Preliminary Ranking

- a. Based on the calculations performed in step 2.1-d, two tabs were created in excel. The first tab includes all pesticide quantities applied calculated by the Cumulative Use for each month (Aquatic Life Tab), The second tab includes all

pesticide quantities applied calculated by the Annual Use averaged by month (Human Health Tab).

- b. On the Aquatic Life Tab, the ratio of the quantity of chemical applied based on the cumulative monthly average over the aquatic life reference value was calculated and titled Relative Risk, then sorted based on those ratios.
- c. On the Human Health Tab, the ratio of the quantity of chemical applied based on the Annual Use Average over the human health reference value was calculated and titled Relative Risk, then sorted based on those ratios.

2.3 Evaluation of Monitoring Data

- a. Available monitoring data over the most recent three years for the KRWQC was downloaded from the California Environmental Data Exchange Network (CEDEN), California Department of Pesticide Regulation (DPR), and United States Geological Survey (USGS) and imported into SQL Server.
- b. Monitoring Data was screened in SQL under the same filters described in Step 2.1-b.
- c. Monitoring Data was imported into the excel worksheet under the CEDEN Tab.
- d. Once the monitoring data was imported and compiled, the following considerations were applied in the Aquatic Life Tab for pesticides used in the KRWQC;
 - i. Are their sufficient quality data to characterize the potential impact of the pesticide in the watershed at vulnerable application and runoff time periods?
 - ii. Did sampling occur within the last 5 years?
 - iii. Are all measure values less than 10% of the reference value?
 - iv. If a Pesticide had “yes” responses to all three of these variables it was excluded from the monitoring proposal.

2.4 Evaluation of Environmental Fate

- a. To determine the environmental fate of each pesticide in the KRWQC the following criteria was established;
 - i. Pesticides which are likely to partition into sediments (unless toxic at very low concentrations) were excluded. Pesticides with a soil absorption coefficient (Koc) greater than 100,00 and provide aquatic reference value above 50 ug/L were removed per the direction of the Water Board.
 - ii. Pesticides which are not persistent in an aqueous environment by eliminating those chemicals with a hydrolysis half-life of less than one day were excluded.
 - iii. Pesticides with both a vapor pressure greater than 1×10^{-4} mPa and a Henry's law Constant greater than 100 Pa m³/mol were excluded.
- b. Pesticides included in Attachment C Environmental Fate Data were excluded from the monitoring proposal.

2.5 Chemical Analysis Availability

- a. Any pesticides that were found to have no commercially available analytical method were excluded from the monitoring proposal.

2.6 Monitoring Plan Proposal

- a. The final pesticide monitoring proposal was evaluated using the following criteria.
 - i. Highest Ranked Pesticides
 - ii. Pesticides with ratios similar to or greater than the ratios for pesticides that have been previously associated with identified water quality problems in the watershed.
 - iii. Pesticides with detection ratios greater than 10%, unless sampling frequency during vulnerable time periods has been sufficient to capture peak concentrations or there is evidence to demonstrate that values above 10% are an error.
 - iv. Pesticides without monitoring data in the entire watershed, particularly pesticides conditionally registered with the DPR due to the potential for surface water pollution.
 - v. Pesticides on the preliminary ranked list for human Health that have an adopted numeric water quality objective (MCL, CTR) were considered for further monitoring.
- b. Once monitoring decisions were decided for pesticides within the Kings and Tulare Lake Subbasin, a pivot table was created for pesticides to be monitored and which months monitoring will be conducted. **See Table 1 Monitoring Proposal.**

Chemical Name	January	February	March	April	May	June	July	August	September	October	November	December
2,4-D acids & salts	X	X										
ACETAMIPRID							X	X				
ATRAZINE					X	X						
AZOXYSTROBIN			X	X								
BIFENTHRIN						X	X	X				
CARBARYL			X	X	X	X						
CHLOROPICRIN	X	X									X	X
CHLOROTHALONIL			X			X	X	X	X			
CHLORPYRIFOS							X	X	X			
CLOTHIANIDIN				X	X	X	X	X		X		
COPPER	X		X	X							X	
CYFLUTHRIN				X	X	X	X					
CYPERMETHRIN					X	X	X					
CYPRODINIL		X			X	X	X					
DELTAMETHRIN					X							
DIAZINON	X				X							
DICHLORVOS (DDVP)					X			X				
DIMETHOATE					X	X	X	X				
DIURON	X	X										X
ESFENVALERATE	X											

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ETHALFLURALIN				X								
FENPROPATHRIN				X	X	X		X	X			
FLUMIOXAZIN	X	X									X	X
GLYPHOSATE		X		X	X	X	X					
HEXAZINONE												X
IMIDACLOPRID				X	X	X	X					
ISOXABEN	X	X	X									X
LAMBDA-CYHALOTHRIN			X	X	X	X	X					
LINURON					X				X	X		
MALATHION						X	X	X	X			
MANCOZEB			X	X	X							
METHIDATHION						X	X					
METHOMYL		X	X			X	X					
NORFLURAZON		X										
ORYZALIN	X	X	X									X
OXAMYL							X	X				
OXYFLUORFEN	X	X									X	X
PARAQUAT DICHLORIDE		X	X							X		
PENDIMETHALIN	X	X	X									X
PERMETHRIN				X	X	X	X		X			
PHORATE			X	X								
PROMETRYN				X			X					X
PROPICONAZOLE		X	X									
PYRACLOSTROBIN			X	X	X	X	X					
PYRETHRINS				X	X							
PYRIDABEN			X	X		X	X					
RIMSULFURON	X	X										
SIMAZINE		X	X									
TEBUCONAZOLE			X	X	X	X						
THIAMETHOXAM							X					
TRIFLUMIZOLE				X	X							
TRIFLURALIN		X	X	X	X							

3. Site Specific or Regulatory Exclusions

Once the initial pesticides and monitoring schedule were determined, each pesticide was reviewed prior to its inclusion in the final monitoring proposal. During this step, Iprodione was excluded from the monitoring list.

Iprodione is a foliar-applied fungicide used for disease control on non-residential turf including golf courses, sod farms, and institutional areas. Currently, there are only two sod farms enrolled in the KRWQC. One of the farms has ceased operations and converted that land into an orchard. The other is landlocked, and therefore not a threat to surface water. Given the specific nature of the material and application proximity to waterways on irrigated agricultural parcels, this pesticide was removed from the proposal.

4. Pesticide Monitoring and Implementation

Over the course of monitoring, as exceedances occur at a sampling stations identified in **Attachment A Surface Water Monitoring Locations** more than one time over a three year period, the KRWQC will prepare a Management Plan per General Order requirements. The Management Plan contains goals and actions designed to address the source of the exceedance specific to the site Management practices, outreach, and implementation are important components to the success of the plan. Based on the plan, management practices are recommended to growers within the area of the exceedance. If the management practices are applicable to a large area, the management practices identified during the Management Plan implementation and outreach will be recommended to growers of the KRWQC during annual outreach meetings. The KRWQC will attempt to document the management practices of growers and identify which practices are more effective for the protection of surface water than others. New management practices are consistently being updated by growers within the KRWQC for more farm efficiency and to optimize yields. As the KRWQC continues the implementation of the General Order, the management practices of the growers will be better documented through the Farm Evaluation Plan, the Management Practice Evaluation Plan, and the Sediment and Erosion Assessment Report. Outreach under these separate programs will also help identify those practices protective of surface waters of the State.

5. Conclusion

Monitoring of the pesticides identified in **Table 1 Monitoring Proposal** will be conducted in accordance with sites and schedules identified in the Waiver Program until such point the KRWQC Surface Water Monitoring Plan submitted to the Regional Board on May 19th, 2014 is approved.