

**SAMPLING FOR PESTICIDE RESIDUES  
IN CALIFORNIA WELL WATER  
2019 Update**



Annual Well Sampling Report  
Pursuant to the  
Pesticide Contamination Prevention Act

California Environmental Protection Agency  
DEPARTMENT OF PESTICIDE REGULATION  
Environmental Monitoring Branch  
Groundwater Protection Program

**February 2020**

This page intentionally left blank

Cover photo—Agricultural well pumping to canal. *Photo credit: DPR*

## SUMMARY

As required under Food and Agricultural Code (FAC) section 13152(e), this report summarizes the results of groundwater sampling in California for pesticide residues from January through December 2018 by the Department of Pesticide Regulation (DPR) and the State Water Resources Control Board (SWRCB). The report also includes United States Geological Survey (USGS) data from January through December 2017. DPR delays collecting USGS data to ensure the data are complete and updated. Some USGS data included in this report are still listed as preliminary by USGS. Actions taken by DPR to prevent migration of pesticides to groundwater from nonpoint agricultural sources are identified in Table 2, and wells with detections are identified by county in Appendix D.<sup>1</sup>

A total of 4,384 wells were sampled for one or more of 310 agricultural use pesticides and pesticide degradates (Table i).<sup>2</sup> Thirty-six pesticides/degradates were detected; 11 of the detected pesticides are no longer registered for use in California (Table 2).

**Table i.** Summary of well sampling results from DPR (2018), SWRCB (2018), and USGS (2017).

DPR	DPR	SWRCB	USGS	† TOTAL	Percent Detections
‡ Pesticides/Degradates Sampled	56	95	244	310	11.6
Pesticides/Degradates Detected	15	12	23	36	
‡‡ Wells Sampled	149	4,080	165	4,384	10.4
Wells with Detections	104	314	37	454	
Counties Sampled	8	55	30	57	40.4
Counties with Detections	6	15	13	23	

† “Total” reflects *unique* values, not a summation of values. For example, of the 58 California counties, some counties are sampled by more than one agency, but some are not sampled at all. (For the 2018 data, Trinity County was not sampled.)

‡ “Pesticides Sampled” and “Pesticides Detected” represents the total number of pesticides sampled for or detected in groundwater regardless of the number of sampling events or detections that occurred during the reporting period.

‡‡ “Wells Sampled” and “Wells with Detections” represents the total number of wells sampled or found to contain pesticide residues regardless of the number of sampling events or detections that occurred during the reporting period.

<sup>1</sup> Although DPR is required to provide locations of sampled wells, information in this report is summarized by county to protect well owner privacy. DPR can provide additional location information—including township, range, and section—upon request.

<sup>2</sup> Some exceptions to the “agricultural use” status of sampled pesticides apply; some industrial use pesticides and pesticides that are no longer—or never were—registered for use in California are included due to the varying monitoring goals of reporting agencies.

### **PREFACE**

This report fulfills the requirements of the Pesticide Contamination Prevention Act of 1985 (PCPA), Assembly Bill (AB) 2701 of 2004, and Senate Bill 1117 of 2014. The PCPA originally required DPR to submit the results of groundwater sampling for pesticide residues in an annual *written* report; AB 2701 amended the PCPA to require DPR to post the information on the DPR Web site.

### **ACKNOWLEDGEMENTS**

The authors wish to thank the reviewers whose unique perspectives and experiences helped ensure the accuracy and readability of this report. We gratefully acknowledge the staff of DPR and cooperating federal, state, local, and private agencies for contributing to the database.

### **DISCLAIMER**

As required by the PCPA, this report describes active ingredients of registered pesticide products that have been detected in groundwater. DPR provides this information to satisfy legal mandates and provide information to the public. Any discussion of commercially available pesticide products does not constitute an actual or implied endorsement of the products by DPR.

## ABBREVIATIONS

CAC	County Agricultural Commissioner
CALVUL	California Vulnerability Model
3CCR	Title 3, California Code of Regulations
CDPH	California Department of Public Health
DDW	Division of Drinking Water
DPR	Department of Pesticide Regulation
FAC	Food and Agriculture Code
GAMA	Groundwater Ambient Monitoring and Assessment Program
GWPA	Ground Water Protection Area
GWPL	Groundwater Protection List
LLNL	Lawrence Livermore National Laboratory
LEACHM	Leaching Estimation and Chemistry Model
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
OEHHA	Office of Environmental Health Hazard Assessment
PCPA	Pesticide Contamination Prevention Act
PHG	Public Health Goal
PMZ	Pesticide Management Zone
ppb	Parts per billion
SNV	Specific Numerical Value
SWRCB	State Water Resources Control Board
U.S. EPA	United States Environmental Protection Agency
USGS	United States Geological Survey

## CONTENTS

<b>PREFACE .....</b>	<b>II</b>
<b>ACKNOWLEDGEMENTS.....</b>	<b>II</b>
<b>DISCLAIMER .....</b>	<b>II</b>
<b>ABBREVIATIONS .....</b>	<b>III</b>
<b>BACKGROUND .....</b>	<b>1</b>
<b>PROTECTING GROUNDWATER FROM PESTICIDE CONTAMINATION — THE PCPA .....</b>	<b>1</b>
<b>IDENTIFYING POTENTIAL GROUNDWATER CONTAMINANTS UNDER THE PCPA .....</b>	<b>3</b>
Using Environmental Fate Data to Predict Pesticide Behavior in the Environment.....	3
Using Computer Modeling Tools to Predict Pesticide Contamination Potential.....	4
<b>MONITORING FOR PESTICIDES—PRIORITIZING THE CANDIDATES .....</b>	<b>5</b>
<b>RESPONDING TO PESTICIDE DETECTIONS IN GROUNDWATER.....</b>	<b>5</b>
Areas of Non-Authorization.....	6
<b>ASSESSING THE EFFECTIVENESS OF MITIGATION MEASURES .....</b>	<b>7</b>
<b>SAMPLING RESULTS .....</b>	<b>7</b>
<b>DETECTIONS OF PESTICIDES AND RELATED DEGRADATES.....</b>	<b>7</b>
<b>DPR RESPONSES TO PESTICIDE DETECTIONS .....</b>	<b>22</b>
<b>REFERENCES.....</b>	<b>31</b>
<b>APPENDIX A .....</b>	<b>32</b>
<b>APPENDIX B .....</b>	<b>36</b>
<b>APPENDIX C .....</b>	<b>38</b>
<b>APPENDIX D .....</b>	<b>39</b>
<b>GLOSSARY OF TERMS.....</b>	<b>49</b>

## BACKGROUND

### PROTECTING GROUNDWATER FROM PESTICIDE CONTAMINATION — THE PCPA

The Department of Pesticide Regulation (DPR) began addressing pesticide contamination of groundwater in the early 1980s after the discovery of 1,2-dibromo-3-chloropropane (DBCP) in well water. Subsequent reports of pesticides in groundwater led to passage of the Pesticide Contamination Prevention Act (PCPA) of 1985,<sup>3</sup> an act designed to prevent pesticide *pollution*<sup>4</sup> of groundwater by *agricultural use*<sup>5</sup> pesticides, with emphasis on the protection of public drinking water supplies.

The PCPA of 1985 added Article 15 (sections 13141 – 13152) to the Food and Agricultural Code (FAC). FAC section 13150 allows the continued sale and use of detected pesticides that were determined to pollute or threaten to pollute groundwater provided certain conditions for use have been met. DPR authorizes use modifications of detected pesticides under the [Restricted Materials](#) permit program (Title 3, California Code of Regulations [3CCR] section 6400 et seq.), implemented by California's County Agricultural Commissioners (CACs). DPR continues to monitor for pesticides that were determined not to pollute at the levels detected.

The PCPA authorized establishment of a program that identifies pesticides that have the potential to pollute groundwater.<sup>6</sup> Under this program, DPR is required to conduct groundwater sampling, maintain a database of wells sampled for pesticides, and conduct a formal review to determine if use of detected pesticides can be modified to protect groundwater.

To implement the PCPA, DPR:

- Obtains physical/chemical/environmental fate data from pesticide registrants to support the registration of agricultural use pesticides; maintains the data in DPR's Pesticide Chemistry Database (see [Pesticide Data Index](#)).

---

<sup>3</sup> The PCPA added sections 13141-13152 to the FAC. 3CCR sections 6416-6487.5 and 6800-6804 implement these FAC sections.

<sup>4</sup> FAC section 13142 defines "*pollution*" as "the consequence of polluting," and "*pollute*" as "...to introduce a product into the groundwaters of the state resulting in an active ingredient, other specified ingredient, or a degradation product of a pesticide above a level that does not cause adverse health effects, accounting for an adequate margin of safety."

<sup>5</sup> California's definition of "agricultural use" is broad and includes not only pesticides used in production agriculture, but also those used on turf (e.g., golf courses, cemeteries) and along rights-of-way.

<sup>6</sup> See DPR's [Groundwater Protection Program](#).

- Uses data in the Pesticide Chemistry Database to establish persistence and mobility threshold values called [specific numerical values](#) (SNVs)<sup>7</sup> and evaluates the groundwater pollution potential of agricultural use pesticides based (in part) on these values. **NOTE:** Senate Bill (SB) 1117 modified the process for determining pollution potential by requiring DPR to develop a *peer reviewed method*<sup>8</sup> (in consultation with a subcommittee of the Director’s Pesticide Registration and Evaluation Committee) to determine the potential of a pesticide to pollute groundwater using SNVs. This revised procedure is currently under internal review.
- Compiles the [Groundwater Protection List](#) (GWPL)<sup>9</sup> that includes agricultural use pesticide active ingredients, other specified ingredients, and degradation products that have the potential to pollute groundwater. Also added are pesticides whose use has been modified following their detection in groundwater.<sup>10</sup>
- Utilizes contaminant transport modeling tools to:
  - Evaluate the contamination potential of pesticides prior to their California registration;
  - Prioritize pesticides for monitoring; and
  - Define [Ground Water Protection Areas](#) (GWPA)s.<sup>11</sup>
- Monitors for agricultural use pesticides on the GWPL and their degradates to determine if they have migrated to groundwater.
- Evaluates reported pesticide and degradate detections in groundwater, including those reported by other agencies.<sup>12</sup>
- Determines whether detection of a pesticide in groundwater is the result of *legal* agricultural use<sup>13</sup> and if so, conducts a [formal review process](#) to determine if the pesticide’s use can be modified to prevent pollution.

---

<sup>7</sup> SNV threshold values for all parameters are listed in 3CCR section 6804.

<sup>8</sup> Peer review is conducted using the process described in section 57004 of the Health and Safety Code.

<sup>9</sup> The Groundwater Protection List (3CCR section 6800) is divided into two parts. Section 6800(a) includes seven chemicals that have been detected in groundwater or soil and are regulated as groundwater contaminants with the potential to pollute: atrazine, bentazon, bromacil, diuron, norflurazon, prometon, and simazine. Section 6800(b) includes 98 chemicals that have the potential to become groundwater contaminants based on their mobility, persistence, and legal uses. SB 1117 requires DPR to “...include on the GWPL each active ingredient, other specified ingredient, and degradation product of a pesticide that, when applied, has the potential to pollute groundwater.”

<sup>10</sup> Previously detected pesticides on the GWPL (3CCR section 6800[a]) include: atrazine, bentazon (Basagran®), bromacil, norflurazon, prometon, simazine, and diuron (except diuron products with less than 7% diuron that are applied to foliage).

<sup>11</sup> See Appendix A for more information on GWPA)s.

<sup>12</sup> See Appendix B for a list of reporting agencies and a discussion of their role in the PCPA process.

<sup>13</sup> Legal agricultural uses include pesticide applications made in accordance with the registered pesticide label.



- Conducts ongoing groundwater monitoring of pesticides whose continued use has been modified to prevent pollution.
- Continuously reviews new science and data that could impact the validity of a finding that a pesticide has not polluted and does not threaten to pollute the groundwaters of the state.
- Resubmits a pesticide to the formal review process or mitigates the threat if new information indicates that continued use of a previously reviewed pesticide threatens to pollute the groundwaters of the state.

In addition, DPR:

- Maintains a database of pesticide detections in groundwater reported to DPR by local, county, and state agencies.<sup>14</sup>
- Prepares an annual Well Sampling Report that summarizes monitoring results and specifies actions taken by DPR in response to detections from nonpoint agricultural sources. Annual Well Sampling Reports are available at: <http://www.cdpr.ca.gov/docs/emon/grndwtr/wellinv/wirmain.htm>.

#### **IDENTIFYING POTENTIAL GROUNDWATER CONTAMINANTS UNDER THE PCPA**

DPR developed several evaluation procedures to estimate a pesticide's potential to pollute groundwater. These procedures are described below.

##### Using Environmental Fate Data to Predict Pesticide Behavior in the Environment

The PCPA required DPR to establish threshold SNVs for six physical/chemical parameters presumed to be correlated to a pesticide's potential to leach to groundwater: water solubility, soil organic carbon coefficient (Koc), hydrolysis half-life, aerobic soil metabolism half-life, anaerobic soil metabolism half-life, and field dissipation half-life. Water solubility and Koc are indicators of *mobility* within the soil, while hydrolysis half-life, aerobic and anaerobic soil metabolism, and field dissipation are indicators of *persistence* of the pesticide in soil.<sup>15</sup> A pesticide is predicted to have the potential to leach to groundwater if it is both mobile and persistent.

DPR developed threshold SNVs by evaluating nationwide groundwater studies and performing a statistical comparison of the physical/chemical attributes of pesticides detected in groundwater as a result of legal agricultural use (called *leachers*), and pesticides not detected (*nonleachers*). Analysis showed data for water solubility, hydrolysis half-life, Koc, and anaerobic soil metabolism

---

<sup>14</sup> See Appendix C for more information on the Well Inventory Database.

<sup>15</sup> Although DPR has not established an SNV for field dissipation data, these data are used in modeling procedures to assess the leaching potential of new products proposed for registration.

half-life were significantly different for leachers and nonleachers (Johnson, 1991).<sup>16</sup> However, leacher and nonleacher aerobic soil metabolism data were not significantly different.<sup>17</sup>

After establishing threshold SNVs, DPR scientists used the data to characterize a pesticide's behavior in the environment. Pesticides that exceed at least one mobility SNV, one persistence SNV, and are applied under specific conditions are placed on the GWPL and monitored to determine if they have migrated to groundwater as a result of their legal agricultural use.

SB 1117 modified the process for estimating pollution potential by requiring DPR to develop a peer reviewed SNV-based method in consultation with a subcommittee of the Director's Pesticide Registration and Evaluation Committee. This revised procedure is currently under internal review.

### Using Computer Modeling Tools to Predict Pesticide Contamination Potential

In addition to evaluating the contamination potential of agricultural use pesticides by comparing SNV values, DPR scientists use two models to predict pesticide behavior.<sup>18</sup>

- **LEACHM**, the *leaching estimation and chemistry model* (Hutson, 2003) is a pesticide fate and transport modeling tool used to evaluate the leaching potential of a pesticide. The model enables DPR scientists to predict a pesticide's movement through the root zone of a leaching-vulnerable soil (Spurlock, 2000) and predict the occurrence and magnitude of well water concentrations based upon mobility and persistence data, label information, climate data, and label-recommended irrigation practices (Troiano and Clayton, 2009). If the pesticide is determined to be a potential groundwater contaminant following the evaluation, the registrant is required to take steps (e.g., amending the product label or committing to a stewardship program) to mitigate the potential threat to groundwater before DPR will approve the pesticide for use in California. If mitigation is not possible, California registration is denied.
- **CALVUL**, the *California vulnerability model* is used to evaluate areas of California that are vulnerable to pesticide contamination based on soil type and depth-to-groundwater. If pesticide use on a given section of land is deemed likely to result in groundwater contamination, the section is designated a GWPA.<sup>19</sup> Currently, only pesticides listed under 3CCR section 6800(a) are regulated within GWPAs.

---

<sup>16</sup> An evaluation of SNVs for these properties resulted in the identification of 90 percent of the chemicals detected in groundwater due to legal agricultural use.

<sup>17</sup> Because the PCPA requires DPR to establish an SNV for each physical/chemical parameter, and because soil metabolism half-life appears to be an ineffective predictor of a pesticide's groundwater contamination potential, the SNV for aerobic soil metabolism half-life is set at a value that minimizes its importance in the discrimination procedure.

<sup>18</sup> The data used in these models are maintained in DPR's Pesticide Chemistry Database. The database includes pesticide mobility and persistence data submitted by pesticide registrants.

<sup>19</sup> To use a pesticide regulated as a groundwater contaminant in a GWPA, users must obtain a Restricted Materials permit from their County Agricultural Commissioner. These permits specify the enforceable management practices required for use in each type of GWPA. For more information on GWPAs, see Appendix A.

### **MONITORING FOR PESTICIDES — PRIORITIZING THE CANDIDATES**

Pesticides predicted to have the potential to contaminate groundwater are ranked for annual monitoring.<sup>20</sup> This ranking enables DPR to focus limited resources on pesticides that present the greatest contamination risk. DPR assigns highest priority to California registered agricultural use pesticides that are:

- On the GWPL;<sup>21</sup>
- Reported as detections in groundwater by public agencies (see Appendix B for a list of reporting agencies);
- Believed to have a higher likelihood of contaminating groundwater based on computer simulated transport modeling or based upon a review of new science and data that indicate the pesticide could potentially pollute groundwater;
- Used intensively, or whose use is increasing (coupled with other risk factors such as persistence and mobility in soil); or
- Injected into the soil by ground-based application equipment, or applied by chemigation, or followed within 72 hours by flood or furrow irrigation.

DPR also assigns a higher priority to pesticides that:

- Have been detected previously in California (or nationwide); and
- Have no monitoring history in California.

### **RESPONDING TO PESTICIDE DETECTIONS IN GROUNDWATER**

DPR conducts sampling to confirm detections of agricultural use pesticides, but does not conduct additional sampling if the detected pesticide is:

- No longer registered for use as a pesticide in California (e.g., detections from legacy pesticide use or from non-pesticidal use);
- Reported in error or is an invalid detection due to unacceptable analytical variability;
- Not detected in follow-up samples taken by the reporting agency;
- Detected at a concentration below DPR's Screening Level (less than 80 percent of DPR's analytical reporting limit; screening level of 0.04 ppb);

---

<sup>20</sup> For more information on pesticide monitoring ranking see: Clayton, M. 2011, *Selection of Pesticide Active Ingredients for Future Analytical Method Development and Ground Water Monitoring*.

<sup>21</sup> DPR samples groundwater for pesticides on the GWPL to: 1) determine if pesticides identified as potential contaminants have migrated to groundwater as a result of their legal agricultural use; 2) expand GWPAs if regulated pesticides are detected in new sections; and 3) assess the effectiveness of mitigation measures used in GWPAs.

- Regulated as a groundwater contaminant under 3CCR section 6800(a) and detected in a GWPA or region (where use of the pesticide is regulated);
- Registered for use as a pesticide but also occurs naturally (such as copper); or
- Detected in a private well that DPR does not have permission to sample.

DPR will defer sampling and place a pesticide on a “watch list” if the pesticide was detected at less than 80 percent of DPR’s analytical reporting limit, or if DPR is unable to develop an analytical method that meets the criteria necessary to validate the detection.

If groundwater detections of an active ingredient or its degradates are determined to be from a pesticide’s legal agricultural use, the findings are subject to a formal review process to determine if the pesticide’s use can continue as currently permitted, with modified use restrictions, or if all uses should be prohibited.<sup>22</sup> If it is determined that use can be modified to the extent that there is a high probability it will not pollute, DPR adds the pesticide to section 6800(a) of the GWPL and requires applicators to adopt mitigation measures when applying the pesticide in GWPAs. Detections of agricultural use pesticides (or their degradates or other specified ingredients) that do not trigger the formal review process or are determined not to pollute, are placed on a “watch list” and tracked by DPR for changes in detection concentration or frequency.

If a detected pesticide is added to the GWPL and regulated as a groundwater contaminant under 3CCR section 6800(a)—and the well is located in a GWPA—regulation of use under the Restricted Materials permit program is believed to constitute an adequate response to detections unless concentrations are high enough to indicate existing mitigation measures are not adequate to prevent pollution. If the well is not located in a GWPA, DPR may establish a GWPA that includes the well site if: 1) the well is in a section of land that is adjacent to an existing GWPA, or 2) the pesticide is detected in two or more wells within a four-section area that is not adjacent to an existing GWPA. (For more information on GWPAs, see Appendix A.)

### Areas of Non-Authorization

State law does not authorize DPR to regulate pesticide use when detections in groundwater are the result of manufacturing processes, accidental spills/releases, or illegal disposal; DPR refers these detections to the SWRCB for further investigation.

---

<sup>22</sup> Pesticides that have been subject to the formal review process include aldicarb (1988); atrazine (1986); bentazon (1989); bromacil (1986); chlorthal dimethyl (2019); diuron (1986); hexazinone (2010); metolachlor/S-metolachlor (2016); norflurazon (1998); prometon (1986); and simazine (1986). With the exception of aldicarb, chlorthal dimethyl, hexazinone, and metolachlor/S-metolachlor, it was determined that the agricultural use of these pesticides could be modified so there would be a high probability that their continued use would not pollute groundwater. In 1988, statewide use restrictions were adopted for aldicarb. Chlorthal dimethyl (2019), hexazinone (2010), and metolachlor/S-metolachlor (2016) were determined not to have polluted or threatened to pollute groundwater in the state, but continued monitoring of each was recommended.

Another pesticide recently placed in the formal review process was alachlor (2016). The formal review of alachlor was suspended due to the imminent federal cancellation of all alachlor products.

## **ASSESSING THE EFFECTIVENESS OF MITIGATION MEASURES**

In 1999, DPR established a well monitoring network to evaluate baseline pesticide concentrations in an effort to measure the effectiveness of groundwater protection regulations. Currently, DPR's well monitoring network includes 60 shallow, domestic wells located in runoff and/or leaching GWPAs in Fresno and Tulare counties. Preliminary analysis suggests that regulatory action taken by DPR has resulted in measurable decreases in both detection frequencies and well water concentrations for many regulated pesticides (Garretson, 1999 and 2012).

## **SAMPLING RESULTS**

### **DETECTIONS OF PESTICIDES AND RELATED DEGRADATES**

This annual report includes well sampling data from DPR and the SWRCB for the sampling period of January through December 2018. This report also includes previously unreported well sampling data from the USGS for the sampling period of January through December 2017. DPR delays collecting USGS data to ensure the data are complete and updated. Some USGS data included in the report are still listed as preliminary by USGS. Table 1 includes the well sampling data from all three agencies.

A total of 4,384 wells were sampled for one or more of 310 agricultural use pesticides and pesticide degradates. Of the wells sampled, 454 wells tested positive for one or more pesticides/degradates. Sampling efforts yielded detections of 36 pesticides/degradates, 11 of which are not registered for use in California.

Sampling data were collected from wells in 57 counties; Trinity County was not sampled by any agency during the period covered by the 2019 report. Twenty-three counties had wells with detections. (See Appendix D for county sampling results.)

**Table 1.** Summary of well sampling results for DPR, SWRCB (2018), and USGS (2017).

Note: Some detection values listed in this table are below the reporting limit. Each reporting agency determines the value they will report regardless of “accepted” reporting limits. For instance, the SWRCB may report *estimated values*, which can be below reporting limits. Double dashes (--) indicate no reporting limit listed or no residues were detected. “REG” indicates the pesticide/degradate is registered in California, “nr” indicates it is currently not registered.

Pesticide or Degradate	Samples Taken/ Positive	Wells Sampled/ Positive	Counties Sampled/ Positive	Reporting Limit Range (ppb)	Detected Concentration Range (ppb)	Sampling Agencies	Parent Compound Registered?
1,2,4-Triazole	15 / 0	15 / 0	5 / 0	--	--	USGS	nr
1,2-D + 1,3-D + C-3 pesticides	4019 / 0	1884 / 0	48 / 0	0.5	--	SWRCB	nr
1,2-Dicloropropane (1,2-D) (propylene dichloride)	5331 / 75	2676 / 21	54 / 9	0.26 - 0.5	0.001 - 1.4	SWRCB USGS	nr
1,3-D (telone)	3645 / 0	1780 / 0	50 / 0	0.5 - 2.4	--	SWRCB USGS	REG
1,4-Dichlorobenzene (P-DCB)	170 / 0	165 / 0	30 / 0	0 - 0.26	--	USGS	REG
1-Naphthol (degradate of Carbaryl)	74 / 0	74 / 0	20 / 0	0.05	--	USGS	REG
2-(1-Hydroxyethyl)-6-methylaniline (degradate of Alachlor or Acetachlor)	15 / 0	15 / 0	5 / 0	--	--	USGS	nr
2,4,5-T (2,4,5-trichloro phenoxy acetic acid)	204 / 0	172 / 0	20 / 0	0.9 - 2	--	SWRCB	nr
2,4,6-trichlorophenol	17 / 0	13 / 0	2 / 0	5	--	SWRCB	nr
2,4-D (2,4-dichlorophenoxy-acetic acid)	1179 / 0	887 / 0	40 / 0	0.1 - 10	--	SWRCB USGS	REG
2,4-DB (4-(2,4-dichlorophenoxy)butyrate)	180 / 0	149 / 0	14 / 0	3 - 10	--	SWRCB	REG
2,6-Diethylaniline (degradate of Alachlor)	75 / 0	75 / 0	20 / 0	0.006	--	USGS	nr
2-Aminobenzimidazole (degradate of Bentazon)	15 / 0	15 / 0	5 / 0	0 - 0.054	--	USGS	REG
2-Ethyl-6-methylaniline (degradate of Diuron or Monuron)	75 / 0	75 / 0	20 / 0	0.01	--	USGS	REG
2-Hydroxy alachlor (degradate of Alachlor)	15 / 0	15 / 0	5 / 0	0.01	--	USGS	nr
2-Isopropyl-6-methyl-4-pyrimidinol (degradate of Diazinon)	15 / 0	15 / 0	5 / 0	0.025	--	USGS	REG
3,4-Dichloroaniline (degradate of Diuron, Linuron, or Propanil)	75 / 3	75 / 3	20 / 2	0.006	0.004 - 0.006	USGS	REG
3,5-Dichloro aniline (degradate of Dichloran or Iprodione)	75 / 0	75 / 0	20 / 0	0.006	--	USGS	REG
3-Phenoxybenzoic acid (degradate of Permethrin, Cypermethrin, Lamda-cyhalothrin, or Gamma-cyhalothrin)	15 / 0	15 / 0	5 / 0	0.25	--	USGS	REG
4-Chloro-ortho-cresol (degradate of MCPPE, MCPA, or MCPB)	75 / 0	75 / 0	20 / 0	0.008	--	USGS	REG

Table 1. Continued. Pesticide or Degradate	Samples Taken/ Positive	Wells Sampled/ With Detections	Counties Sampled/ Positive	Reporting Limit Range (ppb)	Detected Concentration Range (ppb)	Sampling Agencies	Parent Compound Registered?
4-Hydroxy chlorothalonil (degradate of Chlorothalonil)	15 / 0	15 / 0	5 / 0	--	--	USGS	REG
4-Hydroxy molinate (degradate of Molinate)	15 / 0	15 / 0	5 / 0	0.01	--	USGS	nr
Acephate	15 / 0	15 / 0	5 / 0	0.025	--	USGS	REG
ACET (deethyl-simazine) (degradate of Atrazine or Simazine)	139 / 74	139 / 74	11 / 4	0.025- 0.05	0.017 - 0.802	DPR USGS	REG
Acetochlor	189 / 0	157 / 0	29 / 0	0 - 0.1	--	SWRCB USGS	nr
Acetochlor ESA (degradate of Acetachlor)	15 / 0	15 / 0	5 / 0	1	--	USGS	nr
Acetochlor OA (degradate of Acetachlor)	30 / 0	15 / 0	5 / 0	0.1 - 0.25	--	USGS	nr
Acetochlor sulfinylacetic acid (degradate of Acetochlor)	15 / 0	15 / 0	5 / 0	0.1	--	USGS	nr
Acifluorfen	99 / 0	68 / 0	5 / 0	0.5	--	SWRCB	nr
Acrylonitrile	25 / 0	20 / 0	4 / 0	--	--	USGS	nr
Alachlor	2257 / 0	1706 / 0	45 / 0	0.008 - 1	--	DPR SWRCB USGS	nr
Alachlor 2nd amide (degradate of Alachlor)	90 / 0	90 / 0	25 / 0	0 - 0.01	--	USGS	nr
Alachlor OXA (degradate of Alachlor)	30 / 0	15 / 0	5 / 0	0 - 0.2	--	USGS	nr
Alachlor sulfinylacetic acid (degradate of Alachlor)	15 / 0	15 / 0	5 / 0	--	--	USGS	nr
Aldicarb	733 / 0	616 / 0	33 / 0	0.01 - 3	--	SWRCB USGS	nr
Aldicarb sulfone (degradate of Aldicarb)	750 / 0	633 / 0	33 / 0	0 - 4	--	SWRCB USGS	nr
Aldicarb sulfoxide (degradate of Aldicarb)	750 / 0	633 / 0	33 / 0	0.003 - 3	--	SWRCB USGS	nr
Aldrin	881 / 0	610 / 0	33 / 0	0.05 - 0.075	--	SWRCB	nr
Allyl alcohol	144 / 0	144 / 0	27 / 0	--	--	USGS	nr
Alpha-terpineol	144 / 0	144 / 0	27 / 0	--	--	USGS	nr
Ametryne	15 / 0	15 / 0	5 / 0	0.01	--	USGS	nr
Anthranilic acid isopropylamide (degradate of Bentazon)	15 / 0	15 / 0	5 / 0	0.01 - 0.021	--	USGS	REG
Asulam	15 / 0	15 / 0	5 / 0	0.25	--	USGS	nr
Atraton	10 / 0	8 / 0	3 / 0	0.5	--	SWRCB	nr

Table 1. Continued. Pesticide or Degradate	Samples Taken/ Positive	Wells Sampled/ With Detections	Counties Sampled/ Positive	Reporting Limit Range (ppb)	Detected Concentration Range (ppb)	Sampling Agencies	Parent Compound Registered?
Atrazine	2644 / 14	1964 / 13	45 / 7	0.008 - 0.5	0.006 - 0.7	DPR SWRCB USGS	REG
Azinphos-methyl (guthion)	159 / 0	159 / 0	26 / 0	0.05 - 0.12	--	DPR USGS	nr
Azinphos-methyl-oa (degradate of Azinphos-methyl)	83 / 0	83 / 0	24 / 0	0.042	--	USGS	nr
Azoxystrobin	139 / 0	139 / 0	11 / 0	0 - 0.05	--	DPR USGS	REG
Benefin (benfluralin)	73 / 0	73 / 0	20 / 0	0.014	--	USGS	REG
Bensulide (bentasan)	124 / 0	124 / 0	7 / 0	0.05	--	DPR	REG
Bentazon (Basagran®)	1133 / 6	847 / 6	37 / 4	0 - 2	0.039 - 2.33	SWRCB USGS	REG
BHC (other than gamma isomer)	233 / 0	88 / 0	8 / 0	0.005 - 0.05	--	SWRCB	nr
Bifenthrin	15 / 0	15 / 0	5 / 0	0.001	--	USGS	REG
Bromacil	1232 / 73	826 / 38	37 / 2	0.01 - 10	0.05 - 5.57	DPR SWRCB USGS	REG
Bromoxynil phenol	15 / 0	15 / 0	5 / 0	0 - 0.006	--	USGS	REG
Butachlor	936 / 0	656 / 0	33 / 0	0.3 - 0.38	--	SWRCB	nr
Butralin	15 / 0	15 / 0	5 / 0	0.01	--	USGS	nr
Butylate	15 / 0	15 / 0	5 / 0	0.025	--	USGS	nr
Camphor	1 / 0	1 / 0	1 / 0	0.044	--	USGS	REG
Captan	181 / 1	110 / 1	6 / 1	0.1	0.11	SWRCB	REG
Carbaryl	950 / 0	831 / 0	39 / 0	0.05 - 5	--	DPR SWRCB USGS	REG
Carbendazim	15 / 0	15 / 0	5 / 0	0.025	--	USGS	REG
Carbofuran	1231 / 1	976 / 1	41 / 1	0 - 5	7	DPR SWRCB USGS	nr
Carbon disulfide	985 / 5	543 / 5	41 / 3	0.5 - 1	0.1 - 1.2	SWRCB USGS	nr
Carbophenothion	181 / 0	110 / 0	6 / 0	--	--	SWRCB	nr
Carboxy molinate (degradate of Molinate)	15 / 0	15 / 0	5 / 0	0 - 0.01	--	USGS	nr
Chlordane	997 / 0	711 / 0	35 / 0	0.1	--	SWRCB	nr



Table 1. Continued. Pesticide or Degradate	Samples Taken/ Positive	Wells Sampled/ With Detections	Counties Sampled/ Positive	Reporting Limit Range (ppb)	Detected Concentration Range (ppb)	Sampling Agencies	Parent Compound Registered?
Chloroneb	11 / 0	11 / 0	1 / 0	--	--	SWRCB	nr
Chloropicrin	149 / 1	144 / 1	27 / 1	0.18	0.645	USGS	REG
Chlorosulfonamide acid (degradate of Halosulfuron)	15 / 0	15 / 0	5 / 0	--	--	USGS	REG
Chlorothalonil	121 / 0	92 / 0	8 / 0	0.1 - 5	--	SWRCB	REG
Chlorpropham	181 / 0	110 / 0	6 / 0	--	--	SWRCB	REG
Chlorpyrifos	110 / 0	110 / 0	29 / 0	0 - 0.01	--	SWRCB USGS	REG
Chlorpyrifos oxon (degradate of Chlorpyrifos)	90 / 0	90 / 0	25 / 0	0 - 0.08	--	USGS	REG
Chlorsulfuron	15 / 0	15 / 0	5 / 0	--	--	USGS	REG
Chlorthal-dimethyl (dacthal/DCPA)	190 / 0	188 / 0	22 / 0	0 - 0.05	--	DPR SWRCB USGS	REG
Chorimuron ethyl	15 / 0	15 / 0	5 / 0	0.01	--	USGS	nr
Clomazone	124 / 0	124 / 0	7 / 0	0.05	--	DPR	REG
Cyanazine	271 / 0	199 / 0	27 / 0	0 - 0.022	--	SWRCB USGS	nr
Cyfluthrin	75 / 0	75 / 0	20 / 0	0.016	--	USGS	REG
Cyhalothric acid (degradate of Bifenthrin )	14 / 0	14 / 0	5 / 0	0.1	--	USGS	REG
Cypermethrin	75 / 0	75 / 0	20 / 0	0.02	--	USGS	REG
DACT (degradate of Simazine)	139 / 84	139 / 84	11 / 4	0.05	0.045 - 6.32	DPR USGS	REG
Dacthal degradates (non specific degradate of Chlorthal-dimethyl)	486 / 16	377 / 14	24 / 5	0 - 0.1	0.13 - 2.8	SWRCB	REG
Dalapon	1088 / 0	808 / 0	34 / 0	5 - 10	--	SWRCB	nr
DBCP (1,2-dibromo-3-chloropropane)	4096/1178	2166 / 283	47 / 11	0 - 5	0.01 - 1.2	SWRCB USGS	nr
DCPU (degradate of Diuron)	15 / 2	15 / 2	5 / 1	0.01 - 0.014	0.007	USGS	REG
DDD (degradate of DDT)	122 / 0	88 / 0	8 / 0	0.005 - 0.02	--	SWRCB	nr
DDE (degradate of DDT)	122 / 0	88 / 0	8 / 0	0.005 - 0.01	--	SWRCB	nr
DDT (dichloro diphenyl trichloro ethane)	122 / 0	88 / 0	8 / 0	0.005 - 0.02	--	SWRCB	nr
DDVP (dichlorvos)	90 / 0	90 / 0	25 / 0	0 - 0.04	--	USGS	REG

Table 1. Continued.							
Pesticide or Degradate	Samples Taken/ Positive	Wells Sampled/ With Detections	Counties Sampled/ Positive	Reporting Limit Range (ppb)	Detected Concentration Range (ppb)	Sampling Agencies	Parent Compound Registered?
DEA (deethyl-atrazine) (degradate of Atrazine)	210 / 16	210 / 16	28 / 6	0 - 0.05	0.005 - 0.137	DPR USGS	REG
Dechlorofipronil (degradate of Fipronil )	15 / 0	15 / 0	5 / 0	0 - 0.14	--	USGS	REG
Dechlorometolachlor (degradate of Metolachlor)	15 / 1	15 / 1	5 / 1	0.003 - 0.014	0.003	USGS	REG
DEET (diethyltoluamide)	1 / 0	1 / 0	1 / 0	0.06	--	USGS	REG
Deiodo flubendiamide (degradate of Flubendiamide)	15 / 0	15 / 0	5 / 0	0.038	--	USGS	nr
Deisopropyl prometryn (degradate of Prometryn)	15 / 0	15 / 0	5 / 0	0.01	--	USGS	REG
Demethyl fluometuron (degradate of Fluometuron)	15 / 0	15 / 0	5 / 0	--	--	USGS	nr
Desethyl hydroxy atrazine (degradate of Atrazine)	15 / 0	15 / 0	5 / 0	0.005	--	USGS	REG
Desulfinyl fipronil amide (degradate of Fipronil)	15 / 0	15 / 0	5 / 0	0.012	--	USGS	REG
Desulfinyl fipronil (degradate of Fipronil)	90 / 0	90 / 0	25 / 0	0 - 0.029	--	USGS	REG
Diazinon	1066 / 0	798 / 0	41 / 0	0.006 - 2	--	DPR SWRCB USGS	REG
Diazoxon (degradate of Diazinon)	15 / 0	15 / 0	5 / 0	0.01	--	USGS	REG
Dicamba	895 / 0	662 / 0	31 / 0	0 - 1.5	--	SWRCB USGS	REG
Dichloran	124 / 0	124 / 0	7 / 0	0.05	--	DPR	REG
Dichlorbenil (Casaron)	124 / 0	124 / 0	7 / 0	0.05	--	DPR	REG
Dichlorprop	116 / 0	85 / 0	11 / 0	0 - 5	--	SWRCB	REG
Dicrotophos	90 / 0	90 / 0	25 / 0	0 - 0.08	--	USGS	nr
Didemethyl tebuthiuron (degradate of Tebuthiuron)	15 / 0	15 / 0	5 / 0	0.01	--	USGS	REG
Dieldrin	793 / 0	619 / 0	38 / 0	0.005 - 0.02	--	SWRCB USGS	nr
Diflubenzuron	15 / 0	15 / 0	5 / 0	0.025	--	USGS	REG
Diflufenzopyr	15 / 0	15 / 0	5 / 0	--	--	USGS	nr
Dimethenamid	139 / 0	139 / 0	11 / 0	0 - 0.05	--	DPR USGS	REG
Dimethenamid ESA (degradate of Dimethenamid)	30 / 0	15 / 0	5 / 0	0 - 0.1	--	USGS	REG
Dimethenamid OA (degradate of Dimethenamid)	15 / 0	15 / 0	5 / 0	--	--	USGS	REG

Table 1. Continued.							
Pesticide or Degradate	Samples Taken/ Positive	Wells Sampled/ With Detections	Counties Sampled/ Positive	Reporting Limit Range (ppb)	Detected Concentration Range (ppb)	Sampling Agencies	Parent Compound Registered?
Dimethoate	1179 / 0	896 / 0	42 / 0	0.01 - 20	--	DPR SWRCB USGS	REG
Dinoseb	1131 / 0	834 / 0	36 / 0	2	--	SWRCB	nr
Diphenamid	181 / 0	110 / 0	6 / 0	100	--	SWRCB	nr
Diquat dibromide	1083 / 0	817 / 0	38 / 0	4	--	SWRCB	nr
Disulfoton	340 / 1	268 / 1	28 / 1	0 - 0.05	0.14	DPR SWRCB USGS	nr
Disulfoton oxon sulfone (degradate of Disulfoton)	30 / 0	15 / 0	5 / 0	0 - 4	--	USGS	REG
Disulfoton oxon sulfoxide (degradate of Disulfoton)	15 / 0	15 / 0	5 / 0	--	--	USGS	REG
Disulfoton sulfone (degradate of Disulfoton)	90 / 0	90 / 0	25 / 0	0 - 0.01	--	USGS	REG
Diuron	270 / 22	146 / 17	13 / 3	0.01 - 1	0.016 - 0.204	DPR SWRCB USGS	REG
Diuron-desdimethyl (DPCMU) (degradate of Diuron)	15 / 0	15 / 0	5 / 0	0 - 0.051	--	USGS	REG
DSMN (desmethylnorflurazon) (degradate of Norflurazon)	139 / 36	139 / 36	11 / 2	0.01 - 0.05	0.008 - 1.97	DPR USGS	REG
Endosulfan	122 / 0	88 / 0	8 / 0	0.005 - 0.01	--	SWRCB	nr
Endosulfan	122 / 0	88 / 0	8 / 0	0.005 - 0.01	--	SWRCB	nr
Endosulfan I	75 / 0	75 / 0	20 / 0	0.01	--	USGS	nr
Endosulfan sulfate (degradate of Endosulfan)	197 / 0	162 / 0	24 / 0	0.016 - 0.05	--	SWRCB USGS	nr
Endothall	1029 / 0	776 / 0	36 / 0	20 - 45	--	SWRCB	REG
Endrin	1020 / 0	718 / 0	35 / 0	0.05 - 0.1	--	SWRCB	nr
Endrin aldehyde (degradate of Endrin)	122 / 0	88 / 0	8 / 0	0.01 - 0.05	--	SWRCB	nr
EPTC (S-ethyl-dipropylthiocarbamate)	341 / 0	244 / 0	31 / 0	0 - 0.1	--	SWRCB USGS	REG
Ethion	88 / 0	88 / 0	20 / 0	0 - 0.005	--	SWRCB USGS	REG
Ethion monooxon (degradate of Ethion)	61 / 0	61 / 0	20 / 0	0.021	--	USGS	REG
Ethofumesate	124 / 0	124 / 0	7 / 0	0.05	--	DPR	REG
Ethoprop (prophos)	214 / 0	214 / 0	28 / 0	0 - 0.05	--	DPR USGS	REG

Table 1. Continued. Pesticide or Degradate	Samples Taken/ Positive	Wells Sampled/ With Detections	Counties Sampled/ Positive	Reporting Limit Range (ppb)	Detected Concentration Range (ppb)	Sampling Agencies	Parent Compound Registered?
Ethylene dibromide	3419 / 18	2009 / 5	45 / 3	0 - 0.28	0.002 - 0.13	SWRCB USGS	nr
Ethylene dichloride	169 / 2	164 / 2	30 / 2	0.8	0.02 - 0.06	USGS	nr
Ethyl-methylphenyl-aminopropanol (degradate of Metolachlor)	15 / 0	15 / 0	5 / 0	0.01	--	USGS	REG
Etoxazole	15 / 0	15 / 0	5 / 0	--	--	USGS	REG
Fenamiphos	159 / 0	159 / 0	26 / 0	0.003 - 0.05	--	DPR USGS	nr
Fenamiphos sulfone ( degradate of Fenamiphos)	90 / 0	90 / 0	25 / 0	0 - 0.054	--	USGS	nr
Fenamiphos sulfoxide (degradate of Fenamiphos)	83 / 0	83 / 0	24 / 0	0 - 0.08	--	USGS	nr
Fenbutatin-oxide (vendex)	15 / 0	15 / 0	5 / 0	--	--	USGS	REG
Fentin hydroxide	15 / 0	15 / 0	5 / 0	--	--	USGS	nr
Fipronil	90 / 0	90 / 0	25 / 0	0.018	--	USGS	REG
Fipronil desulfinyl (degradate of Fipronil)	75 / 0	75 / 0	20 / 0	--	--	USGS	REG
Fipronil sulfide (degradate of Fipronil)	90 / 0	90 / 0	25 / 0	0 - 0.016	--	USGS	nr
Fipronil sulfonate (degradate of Fipronil)	15 / 0	15 / 0	5 / 0	0.1	--	USGS	REG
Fipronil sulfone (degradate of Fipronil)	90 / 0	90 / 0	25 / 0	0.024	--	USGS	REG
Fipronil-carboxamide (degradate of Fipronil)	15 / 0	15 / 0	5 / 0	0.01	--	USGS	REG
Flubendiamide	15 / 0	15 / 0	5 / 0	--	--	USGS	nr
Fludioxonil	124 / 1	124 / 1	7 / 1	0.05	0.165	DPR	REG
Flumetsulam	15 / 0	15 / 0	5 / 0	0.05	--	USGS	nr
Fluometuron	15 / 0	15 / 0	5 / 0	0.018	--	USGS	nr
Fonofos (dyfonate)	159 / 0	159 / 0	26 / 0	0.005 - 0.05	--	DPR USGS	nr
Formaldehyde	8 / 0	4 / 0	2 / 0	--	--	SWRCB	REG
Glyphosate	961 / 0	708 / 0	36 / 0	25	--	SWRCB	REG
Halosulfuron-methyl	15 / 0	15 / 0	5 / 0	--	--	USGS	REG
Heptachlor	993 / 1	706 / 1	35 / 1	0.005 - 0.01	0.012	SWRCB	nr

Table 1. Continued.							
Pesticide or Degradate	Samples Taken/ Positive	Wells Sampled/ With Detections	Counties Sampled/ Positive	Reporting Limit Range (ppb)	Detected Concentration Range (ppb)	Sampling Agencies	Parent Compound Registered?
Heptachlor epoxide (degradate of Heptachlor)	992 / 0	706 / 0	35 / 0	0.005 - 0.01	--	SWRCB	nr
Hexachlorobenzene	1166 / 0	810 / 0	37 / 0	0.05 - 0.5	--	SWRCB	nr
Hexazinone	213 / 3	213 / 3	28 / 3	0.012 - 0.05	0.002 - 0.006	DPR USGS	REG
Hydroxy didemethyl fluometuron (degradate of Fuometuron)	15 / 0	15 / 0	5 / 0	0.25	--	USGS	nr
Hydroxy monodemethyl fluometuron (degradate of Fluometuron)	15 / 0	15 / 0	5 / 0	0.025	--	USGS	nr
Hydroxyacetochlor (degradate of Acetochlor)	15 / 0	15 / 0	5 / 0	0.025	--	USGS	nr
Hydroxycarbofuran (degradate of Carbofuran)	750 / 0	633 / 0	33 / 0	0 - 3	--	SWRCB USGS	nr
Hydroxydiazinon (degradate of Diazinon)	15 / 0	15 / 0	5 / 0	--	--	USGS	REG
Hydroxyfluometuron (degradate of Fluometuron)	15 / 0	15 / 0	5 / 0	0.01	--	USGS	nr
Hydroxymetolachlor (degradate of Metolachlor)	15 / 0	15 / 0	5 / 0	0.005	--	USGS	REG
Hydroxysimazine (degradate of Simazine)	15 / 0	15 / 0	5 / 0	0.25	--	USGS	REG
Hydroxytebuthiuron (degradate of Tebuthiuron)	15 / 0	15 / 0	5 / 0	0.025	--	USGS	REG
Imazamox	15 / 0	15 / 0	5 / 0	--	--	USGS	REG
Imazaquin	15 / 0	15 / 0	5 / 0	--	--	USGS	nr
Imazethapyr	15 / 0	15 / 0	5 / 0	--	--	USGS	REG
Imidacloprid	194 / 14	139 / 9	11 / 3	0.025 - 0.05	0.053 - 0.536	DPR USGS	nr
Imidacloprid guanidine (degradate of Imidacloprid)	55 / 0	55 / 0	5 / 0	0.05	--	DPR	REG
Imidacloprid olefin (degradate of Imidacloprid)	55 / 0	55 / 0	5 / 0	0.1	--	DPR	REG
Imidacloprid olefinic-guanidine (degradate of Imidacloprid)	55 / 0	55 / 0	5 / 0	0.05	--	DPR	REG
Imidacloprid urea (degradate of Imidacloprid)	55 / 0	55 / 0	5 / 0	0.05	--	DPR	REG
Indoxacarb	15 / 0	15 / 0	5 / 0	0.01	--	USGS	REG
Iprodione	75 / 0	75 / 0	20 / 0	0.014	--	USGS	REG
Isofenphos	75 / 0	75 / 0	20 / 0	0.014	--	USGS	nr
Isoxaflutole	15 / 0	15 / 0	5 / 0	0.025	--	USGS	nr

Table 1. Continued. Pesticide or Degradate	Samples Taken/ Positive	Wells Sampled/ With Detections	Counties Sampled/ Positive	Reporting Limit Range (ppb)	Detected Concentration Range (ppb)	Sampling Agencies	Parent Compound Registered?
Kresoxim-methyl	15 / 0	15 / 0	5 / 0	--	--	USGS	REG
Lactofen	15 / 0	15 / 0	5 / 0	--	--	USGS	nr
Lambda-cyhalothrin	75 / 0	75 / 0	20 / 0	0.014	--	USGS	REG
Lindane (gamma-BHC)	1158 / 1	789 / 1	36 / 1	0.05 - 0.2	0.011	SWRCB	nr
Linuron	139 / 0	139 / 0	11 / 0	0 - 0.05	--	DPR USGS	REG
Malaoxon (degradate of Malathion)	90 / 0	90 / 0	25 / 0	0.022	--	USGS	REG
Malathion	214 / 0	214 / 0	28 / 0	0.016 - 0.05	--	DPR USGS	REG
MCPA (2-methyl-4-chlorophenoxy) acetic acid)	5 / 0	5 / 0	5 / 0	10	--	SWRCB	REG
MCPA (2-methyl-4-chlorophenoxyacetic acid)	10 / 0	10 / 0	3 / 0	0.25	--	USGS	REG
MCPP	5 / 0	5 / 0	5 / 0	10	--	SWRCB	REG
Metalaxyl	215 / 2	215 / 2	28 / 2	0 - 0.05	0.007 - 0.147	DPR USGS	REG
Metconazole	15 / 0	15 / 0	5 / 0	--	--	USGS	REG
Methamidophos	15 / 0	15 / 0	5 / 0	0.025	--	USGS	nr
Methidathion	90 / 0	90 / 0	25 / 0	0.012	--	USGS	nr
Methiocarb	596 / 0	527 / 0	29 / 0	0.05 - 5	--	DPR SWRCB	REG
Methomyl	750 / 0	633 / 0	33 / 0	0 - 2	--	SWRCB USGS	REG
Methomyl oxime (degradate of Methomyl)	15 / 0	15 / 0	5 / 0	2	--	USGS	REG
Methoxychlor	1157 / 0	788 / 0	36 / 0	0.05 - 10	--	SWRCB	nr
Methoxyfenozide	15 / 1	15 / 1	5 / 1	--	0.047	USGS	REG
Methyl bromide	3720 / 0	1878 / 0	51 / 0	0.5 - 2	--	SWRCB USGS	nr
Methyl iodide	25 / 0	20 / 0	4 / 0	3.4	--	USGS	nr
Methyl paraoxon (degradate of Methyl parathion)	90 / 0	90 / 0	25 / 0	0 - 0.014	--	USGS	nr
Methyl parathion	144 / 0	144 / 0	22 / 0	0.008 - 0.05	--	DPR USGS	nr
Metolachlor	1184 / 0	901 / 0	42 / 0	0.012 - 20	--	DPR SWRCB USGS	REG

Table 1. Continued.							
Pesticide or Degradate	Samples Taken/ Positive	Wells Sampled/ With Detections	Counties Sampled/ Positive	Reporting Limit Range (ppb)	Detected Concentration Range (ppb)	Sampling Agencies	Parent Compound Registered?
Metolachlor ESA (degradate of Metolachlor)	15 / 0	15 / 0	5 / 0	0.1	--	USGS	REG
Metolachlor hydroxy morpholinone (degradate of Metolachlor)	15 / 0	15 / 0	5 / 0	0.025	--	USGS	REG
Metolachlor OXA (degradate of Metolachlor)	15 / 0	15 / 0	5 / 0	0.2	--	USGS	REG
Metribuzin	1183 / 0	900 / 0	42 / 0	0 - 2	--	DPR SWRCB USGS	REG
Metribuzin DA (degradate of Metribuzin)	30 / 0	15 / 0	5 / 0	0.01 - 0.4	--	USGS	REG
Metribuzin-DK (degradate of Metribuzin)	15 / 0	15 / 0	5 / 0	0.4	--	USGS	REG
Molinate	1717 / 0	1257 / 0	45 / 0	0.008 - 2	--	SWRCB USGS	nr
MTP (degradate of Chlorthal-dimethyl)	122 / 6	120 / 5	11 / 2	0 - 0.05	0.056 - 0.13	DPR USGS	REG
Myclobutanil	83 / 0	83 / 0	24 / 0	0.01	--	USGS	REG
Naled	15 / 0	15 / 0	5 / 0	4	--	USGS	REG
Napropamide	124 / 0	124 / 0	7 / 0	0.05	--	DPR	REG
Nicosulfuron	15 / 0	15 / 0	5 / 0	0.025	--	USGS	REG
Norflurazon	263 / 37	139 / 20	11 / 2	0.005 - 0.05	0.052 - 0.376	DPR USGS	REG
Novaluron	14 / 0	14 / 0	5 / 0	0.1	--	USGS	REG
OEAT (deisopropylhydroxy-atrazine) (degradate of Atrazine)	15 / 0	15 / 0	5 / 0	--	--	USGS	REG
O-Ethyl O-methyl S-propyl phosphorothioate (degradate of Ethoprop)	15 / 0	15 / 0	5 / 0	0.25	--	USGS	REG
O-Ethyl S-methyl S-propyl phosphorodithioate (degradate of Ethoprop)	15 / 0	15 / 0	5 / 0	--	--	USGS	REG
O-Ethyl S-propyl phosphorothioate (degradate of Ethoprop)	15 / 0	15 / 0	5 / 0	0.25	--	USGS	REG
OIET (hydroxy-atrazine) (degradate of Atrazine)	15 / 0	15 / 0	5 / 0	0.01	--	USGS	REG
Omethoate (degradate of Dimethoate)	15 / 0	15 / 0	5 / 0	0.005	--	USGS	REG
Ortho-dichlorobenzene	5156 / 0	2519 / 0	52 / 0	0.5	--	SWRCB	nr
Orthosulfamuron	15 / 0	15 / 0	5 / 0	0.01	--	USGS	REG
Oryzalin	139 / 0	139 / 0	11 / 0	0.05	--	DPR USGS	REG

Table 1. Continued.							
Pesticide or Degradate	Samples Taken/ Positive	Wells Sampled/ With Detections	Counties Sampled/ Positive	Reporting Limit Range (ppb)	Detected Concentration Range (ppb)	Sampling Agencies	Parent Compound Registered?
Oxamyl	1067 / 0	818 / 0	36 / 0	0 - 20	--	SWRCB USGS	REG
Oxamyl oxime (degradate of Oxamyl)	15 / 0	15 / 0	5 / 0	0.025	--	USGS	REG
Oxydisulfoton (degradate of Disulfoton)	15 / 0	15 / 0	5 / 0	--	--	USGS	nr
Oxyfluorfen	89 / 0	89 / 0	25 / 0	0.01	--	USGS	REG
Paraoxon (degradate of Parathion or ethyl parathion)	15 / 0	15 / 0	5 / 0	--	--	USGS	nr
Paraquat dichloride	6 / 0	6 / 0	3 / 0	20	--	SWRCB	REG
Parathion (ethyl parathion)	69 / 0	69 / 0	4 / 0	0.05	--	DPR	nr
PCNB (pentachloronitrobenzene)	13 / 0	13 / 0	2 / 0	0.1	--	SWRCB	REG
p-Cresol	1 / 0	1 / 0	1 / 0	9.9	--	USGS	nr
Pendimethalin	90 / 0	90 / 0	25 / 0	0.012	--	USGS	REG
Pendimethalin metabolite (degradate of Pendimethalin)	15 / 0	15 / 0	5 / 0	0.25	--	USGS	REG
Permethrin	101 / 0	101 / 0	25 / 0	0 - 0.01	--	SWRCB USGS	REG
Permethrin, other related compounds	26 / 0	26 / 0	6 / 0	0 - 0.01	--	SWRCB USGS	REG
Phorate	214 / 0	214 / 0	28 / 0	0.02 - 0.05	--	DPR USGS	REG
Phorate sulfone (degradate of Phorate)	15 / 0	15 / 0	5 / 0	0.01	--	USGS	REG
Phorate oxon sulfone degradate of Phorate)	15 / 0	15 / 0	5 / 0	0.025	--	USGS	REG
Phorate oxon sulfoxide (degradate of Phorate)	15 / 0	15 / 0	5 / 0	0.01	--	USGS	REG
Phorate sulfoxide (degradate of Phorate)	15 / 0	15 / 0	5 / 0	0.005	--	USGS	nr
Phoratoxon (degradate of Phorate)	90 / 0	90 / 0	25 / 0	0 - 0.027	--	USGS	REG
Phosmet (imidan)	75 / 0	75 / 0	20 / 0	0.14	--	USGS	REG
Phosmet-oa (degradate of Phosmet)	68 / 0	68 / 0	19 / 0	0.051	--	USGS	REG
Phostebupirim	15 / 0	15 / 0	5 / 0	--	--	USGS	nr
Picloram	1082 / 1	804 / 1	34 / 1	0.5 - 1	1.1	SWRCB	nr
Piperonyl butoxide	84 / 0	84 / 0	8 / 0	0 - 0.05	--	DPR USGS	REG



Table 1. Continued. Pesticide or Degradate	Samples Taken/ Positive	Wells Sampled/ With Detections	Counties Sampled/ Positive	Reporting Limit Range (ppb)	Detected Concentration Range (ppb)	Sampling Agencies	Parent Compound Registered?
Profenofos	15 / 0	15 / 0	5 / 0	--	--	USGS	nr
Prometon	529 / 1	331 / 1	31 / 1	0.01 - 0.5	0.073	DPR SWRCB USGS	REG
Prometryn	515 / 0	412 / 0	37 / 0	0.01 - 2	--	DPR SWRCB USGS	REG
Propachlor	885 / 0	643 / 0	32 / 0	0 - 0.5	--	SWRCB	nr
Propanil	214 / 0	214 / 0	28 / 0	0.01 - 0.05	--	DPR USGS	REG
Propargite	90 / 0	90 / 0	25 / 0	0.02	--	USGS	REG
Propazine	15 / 2	15 / 2	5 / 1	0.01	0.002 - 0.008	USGS	nr
Propiconazole	90 / 0	90 / 0	25 / 0	0 - 0.008	--	USGS	REG
Propiconazole (trans)	75 / 0	75 / 0	20 / 0	0.018	--	USGS	REG
Propionic acid	10 / 0	10 / 0	2 / 0	1380	--	USGS	nr
Propoxur	487 / 0	417 / 0	29 / 0	0 - 5	--	SWRCB USGS	REG
Propyzamide	90 / 0	90 / 0	25 / 0	0 - 0.008	--	USGS	REG
Prosulfuron	15 / 0	15 / 0	5 / 0	--	--	USGS	nr
Pyraclostrobin	15 / 0	15 / 0	5 / 0	0.003	--	USGS	REG
Pyridaben	15 / 0	15 / 0	5 / 0	--	--	USGS	REG
Pyriproxyfen	15 / 0	15 / 0	5 / 0	--	--	USGS	REG
Sebumeton	10 / 0	8 / 0	3 / 0	0.5	--	SWRCB	nr
Siduron	15 / 0	15 / 0	5 / 0	--	--	USGS	REG
Silvex	1065 / 0	802 / 0	35 / 0	0.7 - 1	--	SWRCB	nr
Simazine	2658 / 84	1981 / 55	46 / 6	0.006 - 1	0.005 - 0.1	DPR SWRCB USGS	REG
Sulfentrazone	15 / 0	15 / 0	5 / 0	0.05	--	USGS	REG
Sulfometuron methyl	15 / 0	15 / 0	5 / 0	0.01	--	USGS	REG
Sulfosulfuron	15 / 0	15 / 0	5 / 0	--	--	USGS	REG

Table 1. Continued.							
Pesticide or Degradate	Samples Taken/ Positive	Wells Sampled/ With Detections	Counties Sampled/ Positive	Reporting Limit Range (ppb)	Detected Concentration Range (ppb)	Sampling Agencies	Parent Compound Registered?
Sulfosulfuron ethyl sulfone (degradate of Sulfosulfuron)	15 / 0	15 / 0	5 / 0	--	--	USGS	REG
TCPSA (degradate of Triallate)	14 / 0	14 / 0	5 / 0	0.1	--	USGS	nr
Tebuconazole	15 / 0	15 / 0	5 / 0	0.01	--	USGS	REG
Tebufenozide	15 / 0	15 / 0	5 / 0	0.005	--	USGS	REG
Tebupirimfos oxon (degradate of Tebupirimfos)	15 / 0	15 / 0	5 / 0	0	--	USGS	nr
Tebuthiuron	221 / 0	212 / 0	28 / 0	0.028 - 0.05	--	DPR USGS	REG
Tebuthiuron TP 109 (OH) (degradate of Tebuthiuron)	15 / 0	15 / 0	5 / 0	0.05	--	USGS	REG
Tefluthrin	72 / 0	72 / 0	20 / 0	0.014	--	USGS	nr
Terbacil	348 / 0	221 / 0	24 / 0	0.025 - 0.1	--	SWRCB USGS	nr
Terbufos	90 / 0	90 / 0	25 / 0	0.018	--	USGS	nr
Terbufos oxon (degradate of Terbufos)	15 / 0	15 / 0	5 / 0	--	--	USGS	nr
Terbufos oxon sulfone (degradate of Terbufos)	105 / 0	90 / 0	25 / 0	0.025 - 0.045	--	USGS	nr
Terbufos oxon sulfoxide (degradate of Terbufos)	15 / 0	15 / 0	5 / 0	0.045	--	USGS	nr
Terbufos sulfoxide (degradate of Terbufos)	15 / 0	15 / 0	5 / 0	--	--	USGS	nr
Terbutylazine	90 / 0	90 / 0	25 / 0	0.008	--	USGS	REG
Terbutryn	10 / 0	8 / 0	3 / 0	0.5	--	SWRCB	REG
Tetrachloroethane	5156 / 0	2519 / 0	52 / 0	0.5	--	SWRCB	nr
Tetraconazole	15 / 0	15 / 0	5 / 0	--	--	USGS	REG
Thiamethoxam	124 / 0	124 / 0	7 / 0	0.05	--	DPR	REG
Thiobencarb	2172 / 1	1616 / 1	46 / 1	0.016 - 1	0.034	DPR SWRCB USGS	REG
Toxaphene	1014 / 0	721 / 0	35 / 0	1	--	SWRCB	nr
TPA (degradate of Chlorthal-dimethyl)	107 / 20	105 / 18	7 / 3	0.05	0.121 - 159	DPR	REG
Triallate	139 / 0	139 / 0	11 / 0	0 - 0.05	--	DPR USGS	REG

Table 1. Continued.							
Pesticide or Degradate	Samples Taken/ Positive	Wells Sampled/ With Detections	Counties Sampled/ Positive	Reporting Limit Range (ppb)	Detected Concentration Range (ppb)	Sampling Agencies	Parent Compound Registered?
Tribufos	90 / 0	90 / 0	25 / 0	0.018	--	USGS	REG
Triclopyr	15 / 0	15 / 0	5 / 0	0.1	--	USGS	REG
Trifloxystrobin	15 / 0	15 / 0	5 / 0	--	--	USGS	REG
Trifluralin	201 / 0	166 / 0	23 / 0	0 - 0.018	--	SWRCB USGS	REG
Uniconazole	69 / 0	69 / 0	4 / 0	0.05	--	DPR	REG
Vernolate	67 / 0	52 / 0	4 / 0	2	--	SWRCB	REG

ppb – Parts per billion

DPR – California Department of Pesticide Regulation

SWRCB – California State Water Resources Control Board, Drinking Water Program

USGS – United States Geological Survey

nr – Not registered: the parent pesticide is not currently registered for use in California

REG – Registered: the parent pesticide is currently registered for use in California

## DPR RESPONSES TO PESTICIDE DETECTIONS

As required under the PCPA (FAC section 13152[e][4]), this section of the annual report describes actions taken by DPR to mitigate the detection of agricultural use pesticides in groundwater (Table 2).

Table 2 summarizes detections of nonpoint agricultural source pesticides in groundwater by DPR and the SWRCB in 2018 and by the USGS in 2017 and DPR's responses to those detections. Of the 36 agricultural use pesticide/degradate detections reported:

- 12 are pesticides (or degradates of a parent compound) listed under 3CCR section 6800(a) and already regulated as groundwater contaminants within GWPAs. Seven of the 12 compounds were also detected outside of GWPAs.
- 6 are detections of bentazon which is listed under 3CCR section 6800(a) and already regulated as a groundwater contaminant within rice growing areas. No detections were reported outside rice areas.
- 7 are pesticides (or degradates of a parent compound) listed under 3CCR section 6800(b) as potential groundwater contaminants.
- 5 are not listed under 3CCR sections 6800(a) or (b): three are degradates of chlorthal dimethyl, two others are being investigated.
- 11 are no longer registered for use as a pesticide in California (e.g., detections from legacy pesticide use or from non-pesticidal use).

**Table 2.** Wells with pesticides and degradates reported detected in groundwater in the 2019 report year from DPR, SWRCB, and USGS. Detection concentration ranges and drinking water quality standards are reported in parts per billion (ppb). The compound's registration status and DPR's initial evaluation and response to agricultural use pesticide detections.

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	† CA MCL	† OEHA PHG	† U.S. EPA MCL	† U.S. EPA MCLG	†† Cancer Group	*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b)
									‡ DPR Response to Detections (0.04 ppb screening level)
<b>1,2-Dichloropropane (1,2-D) (propylene dichloride)</b>	21	12	0.001 - 1.4	5	0.5	5	0	B2	<b>Not registered for use in California since 1990.</b>
<b>3,4-Dichloroaniline (degradate of diuron, propanil)</b>	3	0	0.004 - 0.006	---	---	---	---	---	Parent pesticides are on the GWPL, 3CCR section 6800(a) and (b), respectively. ----- No wells had detections that exceeded the DPR screening level.

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	† CA MCL	† OEHHA PHG	† U.S. EPA MCL	† U.S. EPA MCLG	†† Cancer Group	*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b)
									‡ DPR Response to Detections (0.04 ppb screening level)
<b>ACET (deisopropyl-atrazine or deethyl-simazine)</b> <i>(degrade of atrazine, simazine)</i>	74	72	0.017 - 0.802	---	---	---	---	---	Parent pesticides are on the GWPL, 3CCR section 6800(a). ----- All seventy-two (72) wells that exceeded the DPR screening level were located in Ground Water Protection Areas (GWPA)s. Pesticide applications in GWPA)s are made under the authority of the <a href="#">Restricted Materials</a> permit program (applications are managed by County Agricultural Commissioners).
<b>Atrazine</b>	13	4	0.006 - 0.7	1	0.15	3	3	N	This pesticide is on the GWPL, 3CCR section 6800(a). ----- One (1) well with a detection over the DPR screening level is in a GWPA. Three (3) wells not in GWPA)s had detections that exceeded the DPR screening level. DPR is conducting further investigation.
<b>Bentazon (Basagran®)</b>	6	5	0.039 - 2.33	18	200	---	---	E	This pesticide is on the GWPL, 3CCR section 6800(a), and listed in 3CCR section 6457. ----- Five (5) detections were over the DPR screening level but all 6 were inside rice growing areas where bentazon is restricted. The detections are assumed to be from legacy use.

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	† CA MCL	† OEHHA PHG	† U.S. EPA MCL	† U.S. EPA MCLG	†† Cancer Group	*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b)
									‡ DPR Response to Detections (0.04 ppb screening level)
<b>Bromacil</b>	38	38	0.05 - 5.57	---	---	---	---	C	This pesticide is on the GWPL, 3CCR section 6800(a). ----- Thirty-eight (38) wells with detections over the DPR screening level are in GWPAs.
<b>Captan</b>	1	1	0.11	---	---	---	---	---	This pesticide is not on the GWPL. ----- One (1) well had a detection that exceeded the DPR screening level. DPR is currently reviewing these results and is conducting further investigation.
<b>Carbofuran</b>	1	1	7	18	0.7	40	40	N	<b>Not registered for use in California since 2000.</b> ----- No other pesticides were detected in this well.
<b>Carbon disulfide</b>	5	5	0.1 - 1.2	---	---	---	---	---	<b>Not registered for use in California since 1987.</b>
<b>Chloropicrin</b>	1	1	0.654	---	---	---	---	---	This pesticide is on the GWPL, 3CCR section 6800(b). ----- This detection is being investigated. No other pesticides were detected in this well.

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	† CA MCL	† OEHHA PHG	† U.S. EPA MCL	† U.S. EPA MCLG	†† Cancer Group	*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b)
									‡ DPR Response to Detections (0.04 ppb screening level)
<b>DACT (diaminochlorotriazine)</b> <i>(degradate of simazine)</i>	84	84	0.045 - 6.32	---	---	---	---	---	Parent pesticide is on the GWPL, 3CCR section 6800(a). ----- Eighty-two (82) wells with detections over the DPR screening level are in GWPAs. Two (2) wells had detections that exceeded the DPR screening level. DPR is currently reviewing these results and is conducting further investigation.
<b>Dacthal acid degradates</b>	14	14	0.13 - 2.8	---	---	---	---	---	This pesticide is not on the GWPL. ----- Fourteen (14) wells had detections over the DPR screening level. DPR completed the formal review process for dacthal acid degradates in 2019. These degradates were found not to pollute at the levels detected.
<b>DBCP (1,2-dibromo-3-chloropropane)</b>	283	188	0.01 - 1.2	0.2	0.0017	0.2	0	B2	<b>Not registered for use in California since 1979.</b>
<b>DCPU (degradate of Diuron)</b>	2	0	0.007	---	---	---	---	---	Parent pesticide is on the GWPL, 3CCR section 6800(a). ----- No wells exceeded the DPR screening level.
<b>DEA (deethyl-atrazine)</b> <i>(degradate of atrazine)</i>	16	4	0.005 - 0.137	---	---	---	---	---	Parent pesticide is on the GWPL, 3CCR section 6800(a). ----- Three (3) wells with detections over the DPR screening level are located in GWPAs. One (1) well not in a GWPA had a detection that exceeded the DPR screening level and is being investigated.

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	† CA MCL	† OEHHA PHG	† U.S. EPA MCL	† U.S. EPA MCLG	†† Cancer Group	*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b)
									‡ DPR Response to Detections (0.04 ppb screening level)
Dechlorometolachlor ( <i>degrade of metolachlor</i> )	1	0	0.003	---	---	---	---	---	Parent pesticide is on the GWPL, 3CCR section 6800(b). ----- No detections were over the DPR screening level.
Disulfoton	1	1	0.14	---	---	---	---	---	<b>Not registered for use in California since 1987.</b>
Diuron	17	16	0.016 - 0.204	---	---	---	---	L	This pesticide is on the GWPL, 3CCR section 6800(a). ----- All sixteen (16) wells with detections over the DPR screening level are in GWPAs.
DSMN (desmethyl norflurazon or demethylnorflurazon) ( <i>degrade of norflurazon</i> )	36	35	0.008 - 1.97	---	---	---	---	---	Parent pesticide is on the GWPL, 3CCR section 6800(a). ----- Thirty-five (35) wells with detections over the DPR screening level are in GWPAs.
Ethylene dibromide (EDB)	5	2	0.002 - 0.13	0.05	0.01	0.05	0	L	<b>Not registered for use in California since 1987.</b>
Ethylene dichloride	2	1	0.02 - 0.06	0.5	0.4	5	0	---	<b>Not registered for use in California since 1987.</b>
Fludioxonil	1	1	0.165	---	---	---	---	---	This pesticide is on the GWPL, 3CCR section 6800(b). ----- This is the second reported detection of this pesticide in this well. DPR is currently reviewing this result and is conducting additional sampling.
Heptachlor	1	0	0.012	0.01	0.008	0.4	0	B2	<b>Not registered for use in California since 1988.</b>



Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	† CA MCL	† OEHHA PHG	† U.S. EPA MCL	† U.S. EPA MCLG	†† Cancer Group	*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b)
									‡ DPR Response to Detections (0.04 ppb screening level)
Hexazinone	3	0	0.002 - 0.006	---	---	---	---	D	This pesticide is on the GWPL, 3CCR section 6800(b). ----- DPR completed the formal review process for hexazinone in 2010. These detections were found not to pollute at the levels detected.
Imidacloprid	9	9	0.053 - 0.536	---	---	---	---	---	This pesticide is on the GWPL, 3CCR section 6800(b). ----- DPR is currently reviewing these results. DPR expanded sampling for study GW17 to include additional areas with high imidacloprid use and shallow groundwater.
Lindane	1	0	0.011	---	---	---	---	---	<b>Not registered for use in California since 2000.</b>
Metalaxyl	2	1	0.007 - 0.147	---	---	---	---	---	This pesticide is on the GWPL, 3CCR section 6800(b). ----- One (1) well had a detection over the DPR screening level. Two other nearby wells did not contain residues. DPR is currently reviewing these results and is conducting further investigation.

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	† CA MCL	† OEHHA PHG	† U.S. EPA MCL	† U.S. EPA MCLG	†† Cancer Group	*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b)
									‡ DPR Response to Detections (0.04 ppb screening level)
<b>MTP (degradate of Dacthal)</b>	5	5	0.056 - 0.13	---	---	---	---	---	The parent pesticide is not listed on the GWPL, 3CCR(b). ----- Five (5) wells had detections over the DPR screening level. DPR completed the formal review process for dacthal acid degradates in 2019. These degradates were found not to pollute at the levels detected.
<b>Methoxyfenozide</b>	1	1	0.047	---	---	---	---	---	This pesticide is not on the GWPL. ----- This is the third reported detection of this pesticide in California that exceeded the DPR screening level. DPR is currently reviewing these results and is conducting further investigation.
<b>Norflurazon</b>	20	20	0.052 - 0.376	---	---	---	---	---	This pesticide is on the GWPL, 3CCR section 6800(a). ----- Twenty (20) wells with detections over the DPR screening level are in GWPAs.
<b>Picloram</b>	1	1	1.1	500	166	500	500	---	<b>Not registered for use in California since 1988.</b>
<b>Prometon</b>	1	1	0.073	---	---	---	---	N	This pesticide is on the GWPL, 3CCR section 6800(a). ----- One (1) well with a detection over the DPR screening level is in a GWPA.
<b>Propazine</b>	2	0	0.002 - 0.008	---	---	---	---	N	<b>Not registered for use in California since 1988.</b>

Pesticide or Pesticide Degradate	Wells with Detections	Wells with Detections over 0.04 ppb	Concentration Range (ppb)	† CA MCL	† OEHHA PHG	† U.S. EPA MCL	† U.S. EPA MCLG	†† Cancer Group	*Groundwater Protection List (GWPL) Status: 3CCR section 6800(a) or (b)
									‡ DPR Response to Detections (0.04 ppb screening level)
<b>Simazine</b>	55	45	0.001 - 0.1	4	4	4	4	N	This pesticide is on the GWPL, 3CCR section 6800(a). ----- Forty-four (44) wells with detections over the DPR screening level are in GWPAs. One (1) well with a detection that exceeded the DPR screening level is being investigated.
<b>Thiobencarb</b>	1	0	0.034	70	42	---	---	---	This pesticide is on the GWPL, 3CCR section 6800(b). ----- No detections were over the DPR screening level.
<b>TPA (degradates of Dacthal)</b>	18	18	0.121 - 159	---	---	---	---	---	The parent pesticide is not on the GWPL. ----- Eighteen (18) wells had detections over the DPR screening level. DPR completed the formal review process for dacthal acid degradates in 2019. These degradates were found not to pollute at the levels detected.

† Drinking water quality standards: MCL: maximum contaminant level; MCLG: maximum contaminant level goal; PHG: public health goal. Other acronyms used include: OEHHA: California (CA); Office of Environmental Health Hazard Assessment; U.S. EPA: United States Environmental Protection Agency .

- California (State Water Resources Control Board) MCL values are available at: [http://www.waterboards.ca.gov/drinking\\_water/certlic/drinkingwater/Documents/DWdocuments/MCLsEPAsDWP\\_2018\\_10\\_02.pdf](http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Documents/DWdocuments/MCLsEPAsDWP_2018_10_02.pdf).
- Office of Environmental Health Hazard Assessment public health goals available at: <https://oehha.ca.gov/water/public-health-goals-phgs>.
- U.S. EPA MCL, MCLG, and cancer risk (descriptor) designations derived from the publication *2018 Edition of the Drinking Water Standards and Health Advisories Tables* available at: <https://www.epa.gov/dwstandardsregulations/2018-drinking-water-standards-and-advisory-tables>.
- All health standards not found at sources listed above were derived from the *SWRCB water quality goal search app* available at: [https://www.waterboards.ca.gov/water\\_issues/programs/water\\_quality\\_goals/search.html](https://www.waterboards.ca.gov/water_issues/programs/water_quality_goals/search.html).

†† Cancer Group (descriptor) acronyms (U.S. EPA): (A) human carcinogen; (B1) probable human carcinogen—indicates limited human evidence; (B2) probable human carcinogen—sufficient evidence in animals and inadequate or no evidence in humans; (C) possible human carcinogen; (D) not classifiable as to human carcinogenicity; (E) evidence of noncarcinogenicity for humans; (L) likely to be carcinogenic to humans; (N) not likely to be carcinogenic in humans; (S) suggestive evidence of carcinogenic potential.

\* Pesticides on the Groundwater Protection List (GWPL) 3CCR section 6800(a) or (b) are those labeled for agricultural, outdoor institutional, or outdoor industrial use that have the potential to pollute groundwater. Section 6800(a) includes seven agricultural herbicides that are regulated as groundwater contaminants: atrazine, bentazon, bromacil, diuron, norflurazon, prometon, and simazine. Section 6800(b) includes 98 pesticides that have the potential to become groundwater contaminants based on their mobility, persistence, and legal uses. The GWPL is available at: <http://www.cdpr.ca.gov/docs/legbills/calcode/040101.htm>.

If the detected pesticide is regulated as a groundwater contaminant under 3CCR section 6800(a)—and the well is located in a GWPA where use of the pesticide is regulated—current regulation of use is believed to constitute an adequate response to new detections *unless* concentrations are high enough to indicate existing mitigation measures are not adequate to prevent *pollution*. (“Pollution” is defined in FAC section 13142 as “...the consequence of polluting,” and “pollute” means “to introduce a pesticide product into the groundwaters of the state resulting in an active ingredient, other specified ingredient, or a degradation product of a pesticide above a level that does not cause adverse health effects, accounting for an adequate margin of safety.”)

‡ DPR responds only to detections of pesticides over the 0.04 ppb screening level unless the drinking water quality standard (health advisory goal/standard) is low. DPR’s policy relative to its response to reported detections is available upon request.

‡‡ DPR does not investigate detections within GWPAs for pesticides (or their degradates) that are on the 6800(a) list of known groundwater contaminants (Schuette, 2004). Applications of these pesticides in GWPAs are managed by County Agricultural Commissioners via the **Restricted Materials** permit program. This program requires applicators to modify their pesticide use practices based on soil properties of the GWPA.

††† The Public Health Goal (PHG) for ethylene dibromide (EDB) is listed in the SWRCB (not OEHHA) data table under “More about MCLS and PHGs” at the following web address: [http://www.waterboards.ca.gov/drinking\\_water/certlic/drinkingwater/MCLsandPHGs.shtm](http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/MCLsandPHGs.shtm). This is a March 20, 2019 update document.

## REFERENCES

- Braun, A. L. and L. S. Hawkins. 1991. Presence of bromacil, diuron, and simazine in surface water runoff from agricultural fields and non-crop site in Tulare County, California.
- Clayton, M. 2011. Selection of pesticide active ingredients for future analytical method development and ground water monitoring.
- Garretson, C. 1999: Study 182: Protocol for monitoring the concentration of detected pesticides in wells located in highly sensitive areas.
- Garretson, C. 2012: Study 182/228 – Preliminary summary of results for well sampling from 1999 through 2011.
- Hutson, J.L. 2003. Leaching estimation and chemistry model LEACHM: model description and user's guide.
- Johnson, B. 1991. Setting revised specific numerical values.
- Marade, S.J. and J. Troiano. 2000. Sections of land requiring special assignment as runoff or leaching Ground Water Protection Areas.
- Schuette, J. 2004. Summary of program policies specifying when the director will not determine if a detection was the result of legal, agricultural use ("N" memorandum). California Department of Pesticide Regulation, Environmental Monitoring Branch. December 1, 2004.
- Spurlock, F. 2000. Effect of irrigation scheduling on movement of pesticides to ground water in coarse soils: Monte Carlo analysis of simulation modeling.
- Troiano, J., et al. 1993. Influence of amount and method of irrigation water application on leaching of atrazine.
- Troiano, J., et al. 1999. Empirical modeling of spatial vulnerability applied to a norflurazon retrospective well study in California. Available at: <http://eurekamag.com/research/003/124/003124777.php> (verified January 2019).
- Troiano, J., et al. 2000. Update of the California vulnerability soil analysis for movement of pesticides to ground water: October 14, 1999.
- Troiano, J. and M. Clayton. 2009. Modification of the probabilistic modeling approach to predict well water concentrations used for assessing the risk of ground water contamination by pesticides.

## APPENDIX A

### GROUND WATER PROTECTION AREAS (GWPA'S)

Ground Water Protection Areas (GWPA's) are defined as one-square-mile sections of land that have been determined by the DPR Director to be sensitive to the movement of pesticides to groundwater. These areas are identified through the detection in groundwater of pesticides (or their degradates) listed in 3CCR section 6800(a),<sup>23</sup> or through the use of the CALVUL computer model.

#### History of GWPA Development

Early research conducted by DPR scientists enabled DPR to identify two important soil conditions that contribute to groundwater contamination: 1) coarse-textured soils where *leaching* is the predominant contamination pathway (Troiano et al., 1993); and 2) hardpan soil layers where *runoff* from the application site into dry wells or areas with high infiltration rates is the predominant contamination pathway (Braun and Hawkins, 1991). Depth-to-groundwater was identified as another factor that contributes to contamination when it was discovered that pesticide detections were more frequent in areas of shallow groundwater (Troiano et al., 1999). Based on this research, the empirical model CALVUL was used to identify areas vulnerable to groundwater contamination.<sup>24</sup>

#### Criteria for GWPA Designation

GWPA's for *leaching* or *runoff* pathways were established based on the following criteria (Troiano et al., 2000; Marade and Troiano, 2000):

- If a section of land had an estimated depth-to-groundwater of 70 feet or less and the predominant soil type was characterized as coarse-textured, it was identified as a *leaching* GWPA. If the section had an estimated depth-to-groundwater of 70 feet or less and the soil contained a hardpan layer, it was identified as a *runoff* GWPA.
- If a section had both leaching and runoff characteristics (coarse-textured soil with a hardpan layer), it was identified as a leaching GWPA if the mean hardpan depth was greater than 48 inches, or as a runoff GWPA if the mean hardpan depth was less than 48 inches.
- If a section did not meet the above criteria but was previously identified as a Pesticide Management Zone (PMZ), it was classified as a leaching or runoff GWPA as follows:
  - If the predominant soil in the section was coarse-textured it was classified as a leaching GWPA; otherwise, the section was classified as a runoff GWPA.
  - If the PMZ lacked soil survey data, it was assigned a GWPA pathway based on soil condition information provided by local agencies. DPR also assessed agronomic practices in the section to determine whether leaching or runoff was the apparent pathway for recharge of water to groundwater.

<sup>23</sup> Pesticides listed in 3CCR section 6800(a): atrazine, bentazon, bromacil, norflurazon, prometon, simazine, and diuron (except for diuron products with less than 7% diuron that are applied to foliage).

<sup>24</sup> GWPA's are classified in regulation as sections of land characterized by either coarse-textured or hardpan soils with a ten-year spring-averaged annual estimated depth-to-groundwater of 70 feet or less.

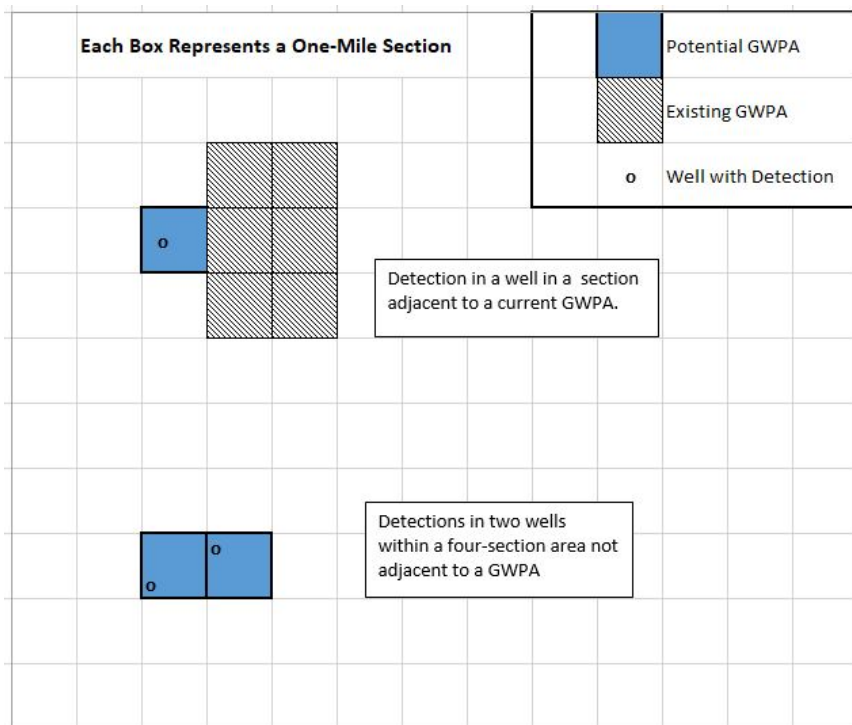
## GWPA Designation

By 2004, designation of GWPAs was based largely on modeling efforts that used soil type and depth-to-groundwater data to identify areas vulnerable to groundwater contamination, although all of the former (and draft) PMZs developed by DPR from 1989 to 1999 were also designated GWPAs.

DPR establishes new GWPAs based on the following criteria:

- CALVUL modeling identifies the area as vulnerable; or
- Active ingredients listed in 3CCR section 6800(a), or their degradation products, are detected in:
  - One well in a section that is adjacent to a GWPA; or
  - Two or more wells within a four-section area that is not adjacent to an existing GWPA.(See **Figure A-1** to see how new GWPAs are added based on detections.)

**Figure A-1.** Determination of detection-based GWPAs.



DPR's use of the CALVUL model increased the area under regulation from 313,000 acres (the acreage identified as PMZs) to about 2.4 million acres (PMZs plus GWPAs). In 2020, DPR designated 122 additional sections (approximately 78,000 acres) in 15 different counties as GWPAs based on the detections of active ingredients listed in 3CCR section 6800(a) or their degradation products. The document EH03-05 (Est. 08/03) entitled "*Ground Water Protection Areas*"—incorporated by reference in the definitions of 3CCR section 6000—was amended to include the new GWPAs and was retitled "*Ground Water Protection Areas 2018 (Rev. 10/18)*." The document identifies each GWPA as either a leaching or runoff GWPA. Currently, there are 3,840 GWPAs in California (**Figure A-2**).

**Figure A-2.** Ground Water Protection Areas.

Individuals using 3CCR section 6800(a) pesticides registered for agricultural, outdoor industrial, and outdoor institutional use in GWPA are required to modify their use practices. Users must obtain a [Restricted Materials](#) permit from their CACs. The management practices required in each type of GWPA are identified on a permit or Notice of Intent.<sup>25</sup> At least one of the following management practices (or an alternative management practice approved by the DPR Director) must be met for the following type of GWPA:

- **6487.3 Engineered Rights-of-Way** within a GWPA: 1) runoff is directed to a vegetated area or a fallow field; 2) compliance with a permit issued pursuant to the storm water provisions of the federal Clean Water Act; or 3) the property owner complies with the requirements of 6487.4 (see below).
- **6487.4 Runoff GWPA**s: 1) application timing is limited to the period April 1 – July 31; 2) the soil is disturbed prior to pesticide application; 3) the pesticide is incorporated into the soil; 4) the pesticide is applied as a band treatment; or 5) runoff is retained on- or off-site, or directed to a fallow field.
- **6487.5 Leaching GWPA**s: 1) the permittee shall not apply any irrigation water for six months following application of the pesticide; 2) the pesticide shall be applied to the planting bed or the berm above the level of irrigation water; or 3) irrigation shall be managed according to a specified formula.



<sup>25</sup> More information on how DPR and CACs regulate the use of groundwater contaminants in vulnerable areas is available at: [http://www.cdpr.ca.gov/docs/emon/grndwtr/gwp\\_id\\_gwpa.htm](http://www.cdpr.ca.gov/docs/emon/grndwtr/gwp_id_gwpa.htm).



The permittee must notify the CAC within 24 to 48 hours prior to application to give the CAC an opportunity to inspect the site. Pre-application site inspections allow CACs to determine whether the use modifications are protective and, if they are not, to revise the permit accordingly.

## APPENDIX B

### PRINCIPAL SAMPLING AGENCIES

The principal agencies contributing groundwater monitoring data for this annual Well Sampling Report are DPR, SWRCB, and USGS. Unique regulatory responsibilities define for each agency the pesticides selected for monitoring, type and sensitivity of laboratory analyses, well types sampled, sampling locations, and sampling frequency. For instance, DPR primarily samples shallow, domestic wells in areas where agricultural pesticides are used, while the SWRCB assesses the overall quality of groundwater used for consumption (regardless of the frequency or intensity of pesticide use near sampled wells).

#### DEPARTMENT OF PESTICIDE REGULATION

DPR's Groundwater Protection Program samples groundwater as a function of its responsibilities under the PCPA. (See the **Background** section of this report for a detailed description of DPR's program.)

#### STATE WATER RESOURCES CONTROL BOARD

The SWRCB is responsible for enforcement of the federal and California Safe Drinking Water Acts. To meet the goal of ensuring delivery of safe drinking water, SWRCB's Division of Drinking Water (DDW) oversees approximately 7,500 [public water systems](#) and establishes health protective drinking water standards. These standards, known as [maximum contaminant levels](#) (MCL), are developed by evaluating not only the health risks presented by a chemical, but by assessing the technical and economic factors related to its use (such as treatment efficacy and cost). SWRCB establishes a contaminant's MCL at a level as close to the [public health goal](#)<sup>26</sup> (PHG) established by the Office of Environmental Health Hazard Assessment (OEHHA) as is technically and economically feasible, placing primary emphasis on the protection of public health (see [the MCL process](#)).

- The [Division of Drinking Water](#) (DDW) regulates public water systems to ensure the delivery of safe drinking water; oversees water recycling projects; issues permits for water treatment devices; supports and promotes water system security; and performs a number of other functions. DDW consists of two field operations branches and a Program Management Branch. The Northern and Southern California field operations branches are responsible for the enforcement of the federal and California Safe Drinking Water Acts, and for regulatory oversight of public water systems. The Program Management Branch includes the Data/Toxicology Office which compiles, evaluates, and reports public water system drinking water quality data.

The DDW performs a role that was until recently performed by the California Department of Public Health (CDPH); this role includes reporting pesticide detections in drinking water wells to DPR.

The SWRCB also monitors groundwater as a function of its Groundwater Ambient Monitoring and Assessment Program (GAMA).<sup>27</sup> This program is designed to improve groundwater quality and

---

<sup>26</sup> Public Health Goals are concentrations of drinking water contaminants that pose no significant health risk if consumed for a lifetime, based on current risk assessment principles, practices, and methods.

<sup>27</sup> For more information about SWRCB's GAMA Program, go to <http://www.waterboards.ca.gov/gama/>

increase public availability of information about groundwater quality. The SWRCB expanded the GAMA Program following implementation of the [Groundwater Quality Monitoring Act of 2001](#) (Part 2.76 [commencing with section 10780], Division 6 of the Water Code). This law resulted in a [publicly accepted plan](#) to monitor and assess “priority basins” — basins that account for over 90 percent of the groundwater used in California. The GAMA Program includes four projects:

- The [GAMA Priority Basin Project](#) monitors dozens of chemicals at very low detection limits. Monitoring and assessment of priority basins is completed every ten years; trend monitoring is performed every three years. SWRCB is collaborating with the USGS and Lawrence Livermore National Laboratory (LLNL) to implement the GAMA Priority Basin Project.
- The [GAMA Domestic Well Project](#) samples multiple areas in coordination with county environmental health departments. It also provides water quality information to domestic well users.
- The [GAMA Special Studies Project](#) partners with LLNL to conduct groundwater studies that evaluate nitrate, wastewater, and groundwater recharge. LLNL scientists use tools that include Tritium-Helium age dating and computer modeling. The University of California, Davis, also contributes to the GAMA Special Studies Project.
- The [GeoTracker GAMA](#) information management system enables users (scientists, regulators, water managers, educators, and the public) to access millions of data records from the SWRCB and Regional Water Quality Control Boards, Department of Water Resources, DPR, and USGS. GeoTracker GAMA provides access to a Google map-based database that provides the results of groundwater quality testing, groundwater level evaluations, environmental monitoring well logs, and links to published reports.

#### **UNITED STATES GEOLOGICAL SURVEY**

The USGS compiles surface water, groundwater, and water quality data from local databases to develop a national information system. The USGS groundwater database contains records compiled from about 850,000 wells studied over the past 100 years. This well information is available via the Internet through NWISWeb, the National Water Information System Web Interface.

- The USGS [Office of Groundwater](#) maintains the **Groundwater Watch** program. This program compiles data from active well networks.

#### **CALIFORNIA DEPARTMENT OF PUBLIC HEALTH**

The CDPH no longer provides DPR with well sampling information for drinking water wells; this role has been assumed by the SWRCB’s DDW (see program description above).

#### **OTHER SAMPLING AGENCIES**

Other agencies that sample for pesticides in the environment and may contribute groundwater data include the U.S. Environmental Protection Agency and state agencies such as the Air Resources Board and Department of Fish and Wildlife.

## APPENDIX C

### THE WELL INVENTORY DATABASE

**Figure C-1.** Wells in the DPR Well Inventory Database.

In the early 1980s, DPR established the Well Inventory Database under the authority granted in FAC section 13152(c) and began collecting groundwater sampling data from public agencies. The database currently contains over 2.6 million records, including monitoring data from over 29,000 public and private wells sampled for over 470 different pesticides and pesticide degradates (**Figure C-1**). Although approximately 45 agencies submitted data for inclusion in the database in the past, the majority of the data now added comes from DPR, SWRCB, and USGS.

The Well Inventory Database includes the following information:

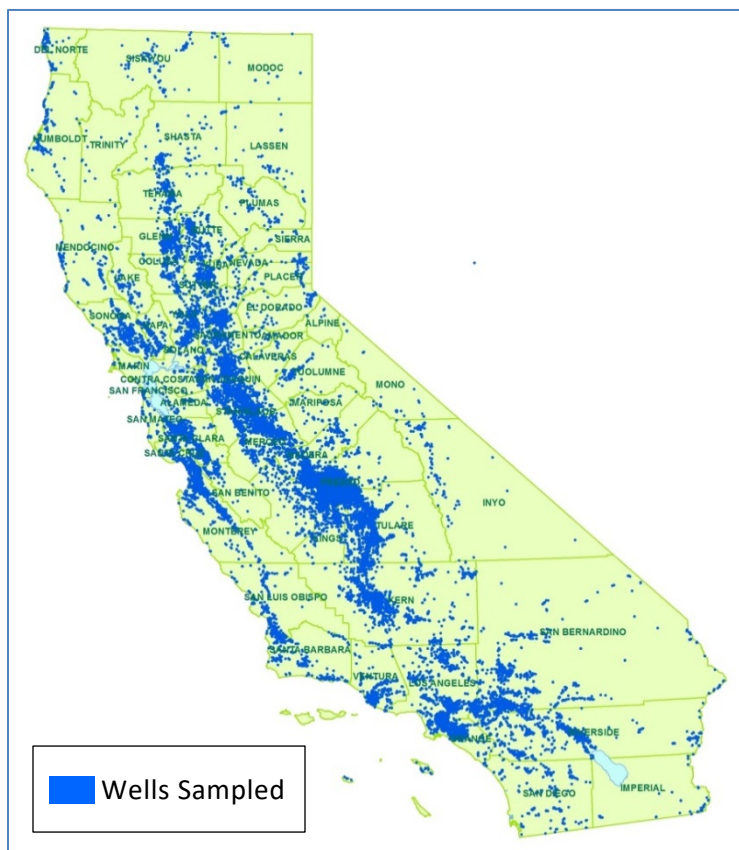
- Well location by county;
- Well type (domestic, agricultural, industrial, large water system);
- Well sampling agency and study number(s);
- Sample date, analysis date, analyzing laboratory;
- Chemical analyzed, concentration detected, method detection limit or reporting limit;
- Unusual or important notes about the detection or analytical method;
- Legal agricultural use determination/point or non-point source determination;
- Year of the well sampling report the detection was reported/published in; and
- Confidential information (available only to government agencies), including specific well location (latitude and longitude) and construction information (including well depth and perforation).

The Well Inventory Database is available for download at:

[https://www.cdpr.ca.gov/docs/emon/grndwtr/well\\_inventory\\_database/index.htm](https://www.cdpr.ca.gov/docs/emon/grndwtr/well_inventory_database/index.htm).

Due to privacy concerns, DPR does not release well owner information or the specific locations of sampled wells. See DPR's policy on the release of well sampling data at:

[http://www.cdpr.ca.gov/docs/emon/grndwtr/wellinv/data\\_policy.htm](http://www.cdpr.ca.gov/docs/emon/grndwtr/wellinv/data_policy.htm).



## APPENDIX D

### Well Sampling Results Summarized by County

Appendix D, Table 1, summarizes the numbers of wells and unique pesticides/degradates tested, the number of wells with detections, and the number of unique pesticides/degradates detected in each county for this year's report. To understand the data, note that wells tested more than once during the year were only counted as a single well. Furthermore, a well may be tested for a chemical multiple times and have multiple chemicals reported as detected, or a single chemical can be detected in multiple wells, but each of these counted only once in the appropriate column.

Appendix D, Table 2, provides details on the detections listed in Table 1. The table only shows the counties with detections and their respective pesticides/degradates detected.

- 'Wells Tested' shows the number of wells in the county tested for the detected chemical.
- 'Wells Positive' shows the number of wells that had detections.
- 'Concentration Range' is the concentration levels of the chemical reported in parts-per-billion (ppb) from the lowest to the highest detection.
- 'DPR Evaluation' lists whether the detected pesticide/degradate is currently registered for use in California, and if the detection(s) require follow-up investigation. Detections of pesticides at levels below DPR's screening level, pesticides previously determined not to pollute at the levels detected, and pesticides/degradates on the 6800(a) list detected in GWPAs will not require additional follow-up. Detections of unregistered pesticides may be from historical use (i.e., DBCP) and DPR will generally not conduct follow-up investigation unless illegal use is suspected.

A list of all pesticides/degradates monitored in each county, whether detected or not, is available upon request from [GWPP@cdpr.ca.gov](mailto:GWPP@cdpr.ca.gov).

Full Well Inventory Database downloads are available at [https://www.cdpr.ca.gov/docs/emon/grndwtr/well\\_inventory\\_database/index.htm](https://www.cdpr.ca.gov/docs/emon/grndwtr/well_inventory_database/index.htm).

Table D1: Totals of wells sampled, pesticides/degradates tested, wells with detections and the number of unique pesticides/degradates detected for each California County.

County	Wells Tested	Pesticides/ Degradates Tested	Wells With Detections	Unique Chemicals Detected
Alameda	30	118	--	--
Alpine	1	5	--	--
Amador	3	11	--	--
Butte	79	229	1	2
Calaveras	1	3	--	--
Colusa	10	221	3	3
Contra Costa	8	52	--	--
Del Norte	3	1	--	--
El Dorado	21	139	2	2
Fresno	304	252	143	15
Glenn	25	218	1	4
Humboldt	1	1	--	--
Imperial	7	95	--	--
Inyo	34	55	--	--
Kern	390	79	30	4
Kings	27	21	--	--
Lake	27	38	--	--
Lassen	8	6	--	--
Los Angeles	712	150	10	6
Madera	109	89	19	3
Marin	10	97	--	--
Mariposa	35	32	--	--
Mendocino	49	43	--	--
Merced	78	32	14	2
Modoc	3	7	--	--
Mono	4	2	--	--
Monterey	158	130	9	3
Napa	44	132	--	--
Nevada	16	127	--	--
Orange	16	52	--	--
Placer	16	123	--	--
Plumas	6	8	--	--
Riverside	194	160	15	6
Sacramento	266	237	13	13
San Benito	17	45	--	--
San Bernardino	327	148	38	7
San Diego	74	81	9	5
San Francisco	1	92	--	--
San Joaquin	173	63	37	3

County	Wells Tested	Pesticides/ Degradates Tested	Wells With Detections	Unique Chemicals Detected
San Luis Obispo	81	152	4	2
San Mateo	13	127	--	--
Santa Barbara	75	96	10	3
Santa Clara	87	124	1	1
Santa Cruz	22	50	--	--
Shasta	20	97	--	--
Sierra	4	7	--	--
Siskiyou	10	6	--	--
Solano	21	128	--	--
Sonoma	184	144	1	1
Stanislaus	123	59	22	1
Sutter	14	31	--	--
Tehama	37	97	--	--
Trinity	0	0	--	--
Tulare	252	100	68	11
Tuolumne	56	30	--	--
Ventura	49	146	3	4
Yolo	25	65	1	1
Yuba	24	16	--	--

Table D2. Pesticides and degradates reported detected in the 2019 Report by County.

County	Pesticide/Degradate Detected	Wells Tested	Wells Positive	Concentration Range (ppb)	DPR Evaluation
Butte	Bentazon	6	1	0.235	Registered pesticide. The detection is located in a rice growing area where bentazon is regulated.
Butte	Hexazinone	1	1	0.002	Registered pesticide. A 2010 review determined that these degradates did not pollute at these levels.
Colusa	Bentazon	7	3	0.922 - 2.33	Registered pesticide. The detections are located in rice growing areas where bentazon is regulated.
Colusa	Hexazinone	3	1	0.002	Registered pesticide. A 2010 review determined that these degradates did not pollute at these levels.
Colusa	Thiobencarb	5	1	0.034	Registered pesticide. Detection is below the DPR screening level.
El Dorado	1,2-dicloropropane (1,2-D)	20	1	0.002	Not registered for use in California since 1990.
El Dorado	Ethylene dibromide	17	2	0.002	Not registered for use in California since 1987.
Fresno	1,2-dicloropropane (1,2-D)	85	2	0.001 - 0.002	Not registered for use in California since 1990.
Fresno	ACET (degradate of simazine)	62	37	0.06 - 0.561	Degradate of a registered pesticide. Detections are in GWPA.
Fresno	Atrazine	143	1	0.075 - 0.091	Registered pesticide. Detection is in a single well in a GWPA.
Fresno	Bromacil	76	14	0.05 - 2.98	Degradate of a registered pesticide. Detections are in GWPA.
Fresno	DACT (degradate of simazine)	62	45	0.052 - 2.61	Degradate of a registered pesticide. Detections are in GWPA.
Fresno	DBCP	180	95	0.01 - 0.768	Not registered for use in California since 1979.
Fresno	DCPU (degradate of diuron)	3	2	0.007	Degradate of a registered pesticide. Detection is below the DPR screening level.
Fresno	DEA (degradate of atrazine)	62	3	0.012 - 0.137	Degradate of a registered pesticide. Detections are in GWPA.
Fresno	Diuron	62	10	0.049 - 0.204	Registered pesticides. Detections are in GWPA.
Fresno	DSMN (degradate of norflurazon)	62	25	0.008 - 1.97	Degradate of a registered pesticide. Detections are in GWPA.



County	Pesticide/Degradate Detected	Wells Tested	Wells Positive	Concentration Range (ppb)	DPR Evaluation
Fresno	Fludioxonil	59	1	0.165	Registered pesticide. Second detection in this well. No detections in three nearby wells. DPR is conducting a field study.
Fresno	Imidacloprid	62	6	0.053 - 0.536	Registered pesticide. DPR is conducting a study in vulnerable areas with high use.
Fresno	Norflurazon	62	12	0.054 - 0.326	Registered pesticide. Detections are in GWPAs.
Fresno	Prometon	62	1	0.073	Registered pesticide. Detection is in a GWPA.
Fresno	Simazine	143	29	0.05 - 0.1	Registered pesticide. Detections are in GWPAs.
Glenn	Bentazon	2	1	0.039	Registered pesticide. The detection is located in a rice growing area where bentazon is being regulated.
Glenn	Dechlorometolachlor (degradate of metolachlor)	1	1	0.003	Degradate of a registered pesticide. Detection is below the DPR screening level.
Glenn	Hexazinone	1	1	0.006	Registered pesticide. A 2010 review determined that these degradates did not pollute at these levels.
Glenn	Methoxyfenozide	1	1	0.047	Registered pesticide. DPR is conducting further investigation.
Kern	1,2-dicloropropane (1,2-D)	174	3	0.032 - 0.66	Not registered for use in California since 1990.
Kern	Carbon disulfide	20	3	0.1 - 0.6	Not registered for use in California since 1987.
Kern	DBCP	277	24	0.01 - 0.27	Not registered for use in California since 1979.
Kern	Ethylene dibromide	261	1	0.029 - 0.033	Not registered for use in California since 1987.
Los Angeles	1,2-dicloropropane (1,2-D)	643	1	0.5	Not registered for use in California since 1990.
Los Angeles	Carbofuran	117	1	7	Not registered for use in California since 1987.
Los Angeles	Carbon disulfide	130	1	0.57	Not registered for use in California since 1987.
Los Angeles	DBCP	147	5	0.014 - 0.11	Not registered for use in California since 1979.
Los Angeles	Heptachlor	148	1	0.012	Not registered for use in California since 1988.
Los Angeles	Lindane (gamma-BHC)	196	1	0.011	Registered pesticide. Detection is below the DPR screening level.
Madera	ACET (degradate of simazine)	3	1	0.095	Degradate of a registered pesticide. Detection is in a GWPA.

County	Pesticide/Degradate Detected	Wells Tested	Wells Positive	Concentration Range (ppb)	DPR Evaluation
Madera	DACT (degradate of simazine)	3	3	0.16 - 0.529	Degradate of a registered pesticide. Detections are in GWPA's.
Madera	DBCP	54	16	0.01 - 0.86	Not registered for use in California since 1979.
Merced	Atrazine	44	1	0.7	Registered pesticide. Detection is being evaluated.
Merced	DBCP	50	13	0.01 - 0.14	Not registered for use in California since 1979.
Monterey	Dacthal degradates (non specific)	15	4	0.23 - 0.86	Degradate of a registered pesticide. A 2019 review determined that these degradates did not pollute at these levels.
Monterey	MTP (degradate of dacthal)	13	2	0.056 - 0.13	Degradate of a registered pesticide. A 2019 review determined that these degradates did not pollute at these levels.
Monterey	TPA (degradate dacthal)	13	5	0.916 - 101	Degradate of a registered pesticide. A 2019 review determined that these degradates did not pollute at these levels.
Riverside	3,4-Dichloroaniline (degradate)	12	2	0.005 - 0.006	Degradate of a registered pesticide. Detections do not exceed the DPR screening level.
Riverside	Atrazine	96	5	0.006 - 0.04	Registered pesticide. Four of the detections do not exceed the DPR screening level. The 0.04 ppb detection is being evaluated.
Riverside	DBCP	95	10	0.012 - 0.3	Not registered for use in California since 1979.
Riverside	DEA (degradate of atrazine)	19	6	0.011 - 0.029	Degradate of a registered pesticide. Detections are below the DPR screening level.
Riverside	Ethylene dichloride	12	1	0.02	Not registered for use in California since 1987.
Riverside	Simazine	95	4	0.007 - 0.085	Registered pesticide. Detections are below DPR screening level.
Sacramento	1,2-dicloropropane (1,2-D)	192	1	0.001	Not registered for use in California since 1990.
Sacramento	ACET (degradate of simazine)	7	2	0.017 - 0.038	Degradate of a registered pesticide. Detections do not exceed the DPR screening level.

County	Pesticide/Degradate Detected	Wells Tested	Wells Positive	Concentration Range (ppb)	DPR Evaluation
Sacramento	Atrazine	167	2	0.037 - 0.041	Registered pesticide. One of the detections does not exceed the DPR screening level. The 0.041 ppb detection is being evaluated.
Sacramento	Bentazon	165	1	0.056	Registered pesticide. The detection is located in a rice growing area where bentazon is being regulated.
Sacramento	Chloropicrin	39	1	0.645	Registered pesticide. The detection is being evaluated.
Sacramento	DACT (degradate of simazine)	7	2	0.045 - 0.21	Degradate of a registered pesticide. Detections are being evaluated.
Sacramento	Dacthal degradates (non specific)	94	6	0.13 - 1.1	Degradate of a registered pesticide. A 2019 review determined that these degradates did not pollute at these levels.
Sacramento	DBCP	195	1	0.02 - 0.03	Not registered for use in California since 1979.
Sacramento	DEA (degradate of atrazine)	7	3	0.005 - 0.052	Degradate of a registered pesticide. Two detections are below the DPR screening level. One detection will be evaluated.
Sacramento	Diuron	7	1	0.016	Registered pesticide. Detection is below the DPR screening level.
Sacramento	Metalaxyl	7	1	0.007	Registered pesticide. Detection is below the DPR screening level.
Sacramento	Propazine	7	2	0.002 - 0.008	Not registered for use in California since 1988.
Sacramento	Simazine	167	2	0.008 - 0.016	Registered pesticide. Detections are below the DPR screening level.
San Bernardino	1,2-dicloropropane (1,2-D)	224	4	0.009 - 1.2	Not registered for use in California since 1990.
San Bernardino	3,4-Dichloroaniline (degradate)	12	1	0.004	Degradate of a registered pesticide. Detection does not exceed the DPR screening level.
San Bernardino	Atrazine	90	2	0.015 - 0.018	Registered pesticide. The detections do not exceed the DPR screening level.

County	Pesticide/Degradate Detected	Wells Tested	Wells Positive	Concentration Range (ppb)	DPR Evaluation
San Bernardino	Dacthal degradates (non specific)	27	2	1.7 - 2.8	Degradate of a registered pesticide. A 2019 review determined that these degradates did not pollute at these levels.
San Bernardino	DBCP	243	29	0.01 - 1.2	Not registered for use in California since 1979.
San Bernardino	DEA (degradate of atrazine)	9	2	0.009 - 0.018	Degradate of a registered pesticide. Detections are below the DPR screening level.
San Bernardino	Simazine	90	4	0.01 - 0.043	Registered pesticide. Three detections are below the DPR screening level. One detection will be evaluated.
San Diego	1,2-dicloropropane (1,2-D)	58	5	0.5 - 1.4	Not registered for use in California since 1990.
San Diego	Captan	6	1	0.11	Registered pesticide. This detection is being evaluated.
San Diego	Dacthal degradates (non specific)	17	1	0.14	Degradate of a registered pesticide. A 2019 review determined that these degradates did not pollute at these levels.
San Diego	Disulfoton	6	1	0.14	Not registered for use in California since 2006.
San Diego	Ethylene dichloride	2	1	0.06	Not registered for use in California since 1987.
San Joaquin	1,2-dicloropropane (1,2-D)	83	2	0.5 - 1.1	Not registered for use in California since 1990.
San Joaquin	DBCP	145	35	0.01 - 0.94	Not registered for use in California since 1979.
San Joaquin	Ethylene dibromide	135	2	0.031 - 0.13	Not registered for use in California since 1987.
San Luis Obispo	Carbon disulfide	3	1	1.2	Not registered for use in California since 1987.
San Luis Obispo	TPA (degradate dacthal)	7	3	0.121 - 0.383	Degradate of a registered pesticide. A 2019 review determined that these degradates did not pollute at these levels.
Santa Barbara	Imidacloprid	9	1	0.103 - 0.104	Registered pesticide. DPR is conducting a study in vulnerable areas with high use.
Santa Barbara	MTP (degradate of dacthal)	16	3	0.063 - 0.101	Degradate of a registered pesticide. A 2019 review determined that these degradates did not pollute at these levels.

County	Pesticide/Degradate Detected	Wells Tested	Wells Positive	Concentration Range (ppb)	DPR Evaluation
Santa Barbara	TPA (degradate dacthal)	16	10	0.435 - 159	Degradate of a registered pesticide. A 2019 review determined that these degradates did not pollute at these levels.
Santa Clara	Dacthal degradates (non specific)	13	1	0.13	Degradate of a registered pesticide. A 2019 review determined that these degradates did not pollute at these levels.
Sonoma	Atrazine	66	1	0.006	Registered pesticide. The detection does not exceed the DPR screening level.
Stanislaus	DBCP	89	22	0.013 - 0.31	Not registered for use in California since 1979.
Tulare	ACET (degradate of simazine)	39	34	0.092 - 0.802	Degradate of a registered pesticide. Detections are in GWPAs.
Tulare	Bromacil	87	24	0.057 - 5.57	Degradate of a registered pesticide. Detections are in GWPAs.
Tulare	DACT (degradate of simazine)	39	34	0.254 - 6.32	Degradate of a registered pesticide. Detections are in GWPAs.
Tulare	DBCP	155	33	0.01 - 0.77	Not registered for use in California since 1979.
Tulare	DEA (degradate of atrazine)	39	1	0.078	Degradate of a registered pesticide. Detection is in a GWPA.
Tulare	Diuron	39	6	0.05 - 0.072	Registered pesticide. Detections are in GWPAs.
Tulare	DSMN (degradate of norflurazon)	39	11	0.056 - 0.83	Degradate of a registered pesticide. Detections are in GWPAs.
Tulare	Imidacloprid	39	2	0.069 - 0.124	Registered pesticide. DPR is conducting a study in vulnerable areas with high use.
Tulare	Metalaxyl	39	1	0.147	Registered pesticide. Two nearby wells had no metalaxyl detections.
Tulare	Norflurazon	39	8	0.052 - 0.376	Registered pesticide. Detections are in GWPAs.
Tulare	Simazine	162	14	0.052 - 0.099	Registered pesticide. Detections are in GWPAs.
Ventura	1,2-dicloropropane (1,2-D)	38	2	0.005 - 0.007	Not registered for use in California since 1990.
Ventura	Atrazine	22	1	0.012	Registered pesticide. The detection does not exceed the DPR screening level.

County	Pesticide/Degradate Detected	Wells Tested	Wells Positive	Concentration Range (ppb)	DPR Evaluation
Ventura	DEA (degradate of atrazine)	11	1	0.015	Degradate of a registered pesticide. Detection is in a GWPA.
Ventura <sup>1</sup>	Simazine	22	2	0.005 - 0.006	Registered pesticide. Detections are in GWPAs.
Yolo	Picloram	23	1	1.1	Not registered for use in California since 1988.

## GLOSSARY OF TERMS

<b>TERM</b>	<b>DEFINITION</b>
<b>AB 2021</b>	See "Pesticide Contamination Prevention Act."
<b>AB 2701</b>	AB 2701 (Chapter 644, Statutes of 2004) amended the Pesticide Contamination Prevention Act (PCPA) to require DPR to post specified information on sampling for pesticide residues in California groundwater to its Web site. This law replaced the previous requirement that DPR submit the sampling information in a written report to the Legislature.
<b>Active ingredient</b>	The chemical or chemicals in a pesticide formulation that are biologically active and are capable, in themselves, of preventing, destroying, repelling or mitigating insects, fungi, rodents, weeds, or other pests. The remainder of the product consists of one or more <i>inert ingredients</i> (such as water, solvents, emulsifiers, surfactants, clay and propellants), which are there for reasons other than pesticidal activity.
<b>Agricultural Commissioner</b>	Local official whose duties include pesticide use enforcement in their counties.
<b>Agricultural use</b>	<p>The use of any pesticide or method or device for the control of plant or animal pests, or any other pests, or the use of any pesticide for the regulation of plant growth or defoliation of plants. Agricultural use includes but is not limited to commercial production of animals or plants (including forest), parks, golf courses, cemeteries, roadsides, rights-of-way, and nurseries. It excludes the sale or use of pesticides intended for:</p> <ul style="list-style-type: none"> <li>a) Home use</li> <li>b) Structural pest control</li> <li>c) Industrial or institutional use</li> <li>d) The control of an animal pest under the written prescription of a veterinarian</li> <li>e) Uses by certain local districts or agencies that operate under a cooperative agreement with the California Department of Public Health, such as many mosquito abatement districts.</li> </ul> <p>See also "legal agricultural use."</p>
<b>Analysis</b>	For the well inventory data, it is the act of determining whether a substance is present in a water sample using laboratory methodology.

<b>TERM</b>	<b>DEFINITION</b>
<b>CalEPA</b>	California Environmental Protection Agency. Comprised of the Department of Pesticide Regulation, the Department of Toxic Substances Control, the Water Resources Control Board, the Air Resources Control Board, and the Office of Environmental Health Hazard Assessment.
<b>California Code of Regulations (CCR)</b>	Regulations formally adopted by state agencies. Regulations about pesticides and pest control operations are mainly in Title 3, Division 6, and Title 16, Division 19.
<b>Chemigation</b>	Applying pesticide through an irrigation system or mixing with irrigation water before the water is applied to the soil or crop.
<b>Degradation</b>	<p>With respect to pesticides, degradation is the breakdown of the parent chemical by the action of microbes, water, air, sunlight, or other agents into daughter products (degradates) that may undergo further degradation by similar processes.</p> <p>With respect to groundwater quality, degradation refers to a reduction of water quality.</p>
<b>Detection</b>	A well water sample in which the presence of a pesticide is detected at or above the minimum detection limit of the analytical instruments used for analysis of the pesticide under investigation. A detection may be designated as confirmed or unconfirmed.
<b>Director</b>	In the context of this report, “director” means director of the Department of Pesticide Regulation.
<b>Environmental fate</b>	Describes the processes by which pesticides move and are transformed in the environment, including persistence in air, water, and soil; reactivity and degradation; migration in groundwater; and bioaccumulation in aquatic or terrestrial organisms.
<b>FAC</b>	Food and Agricultural Code. Division 6 of the FAC (specifically sections 11401 - 12499) pertains to the registration, sale and use of pesticides.
<b>Formulation</b>	Pesticide product as sold, usually a mixture of active and inert ingredients.
<b>Groundwater</b>	Water found below the surface of the land, usually in porous rock formations.
<b>Ground Water Protection Area (GWPA)</b>	A geographic area defined in state regulations as vulnerable to pesticide contamination through the mechanism of either leaching or runoff.



<b>TERM</b>	<b>DEFINITION</b>
<b>Groundwater Protection List (GWPL)</b>	A list of pesticides having the potential to pollute groundwater included in 3CCR section 6800(b).
<b>Inert ingredient</b>	Any substance other than an active ingredient which is intentionally included in a pesticide product. Also known as “other” ingredients, they do not attack a particular pest but may be chemically or biologically active.
<b>Leaching</b>	A pathway by which agricultural pesticides may reach groundwater; the process by which residues are dissolved in soil water and follow the movement of water through the soil matrix as it recharges a groundwater aquifer.
<b>Legal agricultural use</b>	The application of a pesticide, according to its labeled directions and in accordance with federal and state laws and regulations, for agricultural use as defined in FAC section 11408.  See also “agricultural use.”
<b>Maximum contaminant level (MCL)</b>	MCLs are health protective drinking water standards to be met by public water systems. MCLs take into account not only chemicals' health risks but also factors such as their detectability and treatability, as well as the cost of treatment.
<b>Maximum contaminant level goal (MCLG)</b>	The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are non-enforceable public health goals.
<b>Mitigation measure</b>	A use practice designed to reduce the risk of harm to people or the environment.
<b>Model</b>	Mathematical equations that represent certain processes. These equations can be implemented in a computer program to facilitate calculations and to test model predictions against measured data.
<b>Monitoring well</b>	A well used principally for any of the follow purposes: (1) observing groundwater levels and flow conditions, (2) obtaining samples for determining groundwater quality, or (3) evaluating hydraulic properties of water-bearing strata.
<b>Non-agricultural use</b>	See “agricultural use.”

<b>TERM</b>	<b>DEFINITION</b>
<b>Nonpoint source</b>	Pollution sources which are diffuse and do not have a distinct discharge point (compare with <i>point source</i> ), for example, applications of agricultural pesticide to crops.
<b>Permit</b>	Time- and site-specific permits are issued by County Agricultural Commissioners for the use of pesticides designated as restricted materials.
<b>Pest</b>	Any undesired insect, rodent, nematode, fungus, bird, vertebrate, invertebrate, weed, virus, bacteria, or other microorganism (except microorganisms on or in humans or animals) which is declared to be injurious to health or environment.
<b>Pest control</b>	The use or application of any pesticide. It also means the use of any substance, method or device to control pests; prevent, destroy, repel, mitigate or correct any pest infestation or disorder of plants; or inhibit, regulate, stimulate or otherwise alter plant growth by direct application to plants.
<b>Pesticide</b>	A substance, or mixture of substances, intended to defoliate plants, regulate plant growth, or prevent, destroy, repel, or mitigate any insects, fungi, bacteria, weeds, rodents, predatory animal, or any other form of plant or animal life declared to be a pest detrimental to vegetation, man, animal, or households, or any environment. Also, in California only, a spray adjuvant.
<b>Pesticide Contamination Prevention Act (PCPA, AB 2021)</b>	A law, effective January 1, 1986, which added agricultural use sections 13141 through 13152 to Division 7 of the FAC. The PCPA requires the following: 1) each registrant of an agricultural use pesticide to submit environmental fate data to DPR; 2) the Director to use those data to establish a list of pesticides with the potential to pollute groundwater (GWPL); 3) the Director to monitor groundwater for these pesticides; 4) all local, county, and state agencies to report to DPR the results of pesticides sampled in groundwater; 5) the Director to maintain a specified well sampling database and to post certain information annually on its website about pesticides in groundwater; and 6) a specified subcommittee and the Director to conduct a formal review to determine if continued use of a pesticide can be allowed if it is detected and verified in groundwater due to legal agricultural use.
<b>Pesticide Management Zone (PMZ)</b>	A geographic surveying unit of approximately one-square-mile, which is vulnerable to groundwater contamination based on detections of pesticides or pesticide degradates in groundwater due to agricultural use. PMZs were formally listed in 3CCR section 6802 and were pesticide specific. The use of a pesticide inside its PMZs was subject to certain groundwater protection restrictions and requirements. PMZs were renamed GWPAs in May 2004.
<b>Point source</b>	A source of contamination, such as a spill or at a waste site that is initially deposited and concentrated in a small, well-defined area.

<b>TERM</b>	<b>DEFINITION</b>
<b>Pollution</b>	Food and Agriculture Code section 13142 defines “ <i>pollution</i> ” as “the consequence of polluting,” and “ <i>pollute</i> ” as “...to introduce a product into the groundwaters of the state resulting in an active ingredient, other specified ingredient, or a degradation product of a pesticide above a level that does not cause adverse health effects, accounting for an adequate margin of safety.”
<b>Public health goal (PHG)</b>	PHGs are established by OEHHA. They are concentrations of drinking water contaminants that pose no significant health risk if consumed for a lifetime, based on current risk assessment principles, practices, and methods. OEHHA establishes PHGs pursuant to Health and Safety Code section 116365(c) for contaminants with MCLs.
<b>Range</b>	When used in the context of mapping locations, a range is a single series or row of townships, each six miles square, extending parallel to, and numbered east and west from, a survey base meridian line.  A range is a vertical column of townships.
<b>Registered pesticide</b>	A pesticide product approved by the U.S. EPA and DPR for use in California.
<b>Regulations</b>	These are adopted by state agencies to implement or clarify statutes enacted by the California Legislature. They can also be adopted in response to federal legislation, court decisions, changing technologies, and concerns for the health and well-being of the residents of California.
<b>Restricted material</b>	A pesticide that with certain exceptions may be possessed or used only by or under the supervision of licensed or certified persons, and only in accordance with a permit issued by the CAC.
<b>Senate Bill (SB) 1117</b>	SB 1117 of 2014 amended the Pesticide Contamination Prevention Act (PCPA) to require DPR to regulate each active ingredient, other specified ingredient, or degradation product of a pesticide on the GWPL that is detected as a result of lawful agricultural use. It also revises the information that DPR is required to post on its Internet Web site to include pesticide degradation products and other specified ingredients.  SB 1117 also revises the information included in the GWPL to include not only each active ingredient, but other specified ingredients or degradation product(s) of a pesticide that, when applied, have the potential to pollute groundwater. It also requires DPR’s Director—in consultation with a specified subcommittee of the Director’s Pesticide Registration and Evaluation Committee—to develop a peer reviewed method to determine pollution potential using specific numerical values.

---

<b>TERM</b>	<b>DEFINITION</b>
<b>Section</b>	Section/Township/Range: Public Land Survey System units. A section is a one-square-mile block of land containing 640 acres. A township contains 36 sections. A range is a vertical column of townships.
<b>Specific numerical values (SNV)</b>	Certain numeric threshold values that the PCPA requires to be established for the following physical and chemical properties of pesticide active ingredients: water solubility, soil adsorption coefficient, hydrolysis, aerobic, and anaerobic soil metabolism, and field dissipation (the field dissipation SNV has not been established). The PCPA associates these properties with the longevity and mobility of a pesticide in the soil and requires the establishment of SNVs in regulation as a means of predicting which pesticides are likely to pollute groundwater.
<b>Township</b>	<p>When used in the context of mapping locations, a township is a public land surveying unit that is a square parcel of land, six miles on each side. The location of a township is established as being so many six-mile units east or west of a north-south line running through an initial point (called the “principal meridian”) and so many six-mile units north or south of an east-west line running through another point (called the “baseline”).</p> <p>A township normally contains 36 sections.</p>
<b>Well Inventory Database</b>	A statewide database, required by the PCPA and maintained by DPR, of wells sampled for pesticides and pesticide degradates.

---