

# **SAMPLING FOR PESTICIDE RESIDUES IN CALIFORNIA WELL WATER**

**2011 Update**

Twenty-sixth Annual Report

Pursuant to the  
Pesticide Contamination Prevention Act



California Environmental Protection Agency  
DEPARTMENT OF PESTICIDE REGULATION

**February 2012**

# **SAMPLING FOR PESTICIDE RESIDUES IN CALIFORNIA WELL WATER**

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Pesticide Contamination Prevention Act

California Environmental Protection Agency  
California Department of Pesticide Regulation  
Environmental Monitoring Branch  
Ground Water Protection Program  
1001 I Street, Sacramento, California 95814

## EXECUTIVE SUMMARY

This report summarizes well sampling results collected by the Department of Pesticide Regulation (DPR) and California Department of Public Health (CDPH) in 2010, and provides an analysis of those results to determine the probable sources of the detected pesticides. This report also summarizes the actions taken in 2010 by DPR and the State Water Resources Control Board (SWRCB) to prevent migration of pesticides to ground water from nonpoint agricultural sources and point sources, respectively.

Beginning with this 2011 Update, DPR will report wells sampled and actions taken to protect ground water during the prior calendar year, rather than the prior fiscal year period used in previous reports. If an agency submits a large data set at the conclusion of a multi-year well sampling study, DPR will report these data in the calendar year in which they were received regardless of when the samples were collected. Since the 2010 Update included DPR's activities through June 2010, this year's transitional report only includes information on DPR's activities from July through December 2010.

This 26th annual report satisfies the requirements of Food and Agricultural Code (FAC) section 13152(e).

## BACKGROUND

DPR began addressing pesticide contamination of ground water in the early 1980s after the discovery of contamination from the legal application of the fumigant 1,2-dibromo-3-chloropropane (DBCP). Reports of additional pesticides in ground water resulted in the passage of the Pesticide Contamination Prevention Act (PCPA) of 1985, which added sections [13141-13152](#) to the FAC. The purpose of the PCPA is to prevent further pesticide pollution<sup>1</sup> of ground water aquifers which may be used for drinking water supplies in California. Among other provisions, this law requires DPR to:

- Obtain environmental fate data from pesticide registrants to support the registration of agricultural use pesticides.<sup>2</sup>
- Use those data to identify pesticides with the potential to pollute ground water.
- Conduct well sampling to determine if potential leachers have moved to ground water.
- Determine whether a pesticide detected in ground water was due to legal<sup>3</sup> agricultural use.
- Conduct a formal hearing to determine whether continued use of a pesticide found in ground water due to legal agricultural use should be allowed.
- If continued use is allowed, adopt mitigation measures in regulation to prevent pollution of ground water.

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<sup>1</sup> FAC section 13142 defines "pollution" as "the introduction into the groundwaters of the state of an active ingredient, other specified product, or degradation product of an active ingredient of a pesticide above a level, with an adequate margin of safety that does not cause adverse health effects."

<sup>2</sup> California's definition of "agricultural use" is broad, and includes not only pesticides used in production agriculture, but also on turf (e.g., golf courses, cemeteries) and along rights-of-way.

<sup>3</sup> Pesticide applications made in accordance with the registered label.

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- Establish a database of well sampling results that must be reported to DPR by all local, county, and State agencies monitoring for pesticides in ground water.
- Prepare an annual report that summarizes the reported monitoring results, analyzes those results to determine the probable source of the residues, and specifies the actions taken by DPR for nonpoint agricultural sources and by the SWRCB for point sources to prevent further contamination of ground water.

## RESULTS OF WELL SAMPLING FOR PESTICIDES AND SOURCES OF DETECTED RESIDUES

From January through December 2010, the CDPH and from July through December 2010, DPR sampled 3,071 wells for 136 pesticides and degradates. One or more of 21 pesticides and degradates were detected in 286 wells located in 18 counties out of 51 counties sampled (Table i). The 17 pesticides detected were 1,2,4-trichlorobenzene, 1,2-dichloropropane (1,2-D), unspecified 1,2-D + 1,3-D + C-3 pesticides, atrazine, bentazon, bromacil, DBCP, diquat dibromide, diuron, ethylene dibromide (EDB), methyl bromide, naphthalene, norflurazon, ortho-dichlorobenzene, oxamyl, simazine, and xylene. The four degradates detected were azoxystrobin acid, deethyl-simazine or deisopropyl-atrazine (ACET), desmethylnorflurazon (DSMN), and diamino-chlorotriazine (DACT).

**Table i. Summary of well sampling data collected in 2010.**

<i>Category</i>	<i>Reporting Period and Agency</i>			
	<i>2010</i>			<i>1985-2010</i>
	<i>Total</i>	<i>CDPH</i>	<i>CDPR</i>	<i>All Reporting Agencies<sup>4</sup></i>
<b>Counties Sampled</b>	51	51	12	58
<b>Counties with Detections</b>	18	16	7	50
<b>Wells Sampled<sup>5</sup></b>	3,071	2,934	137	23,127
<b>Wells with Detections</b>	286	254	32	5,194
<b>Pesticides and Degradates Sampled<sup>6</sup></b>	136	118	23	338
<b>Pesticides and Degradates Detected</b>	21	13	8	108

Eight of the 13 pesticides detected by CDPH are no longer registered for use in California. These are 1,2,4-trichlorobenzene, 1,2-D, unspecified 1,2-D + 1,3-D + C-3 pesticides, DBCP, EDB, naphthalene, ortho-dichlorobenzene, and xylene. Although xylene has not been used as a pesticide

<sup>4</sup> See Appendix A for a list of the local, state, and federal agencies that have contributed well monitoring data to DPR since the early 1980s.

<sup>5</sup> “Wells Sampled” and “Wells with Detections”: the total number of individual wells sampled or found to contain pesticides regardless of the number of sampling events or detections that occurred during the reporting period.

<sup>6</sup> “Pesticides Sampled” and “Pesticides Detected”: the total number of individual pesticides or pesticide degradation products sampled or found in ground water regardless of the number of sampling events or detections that occurred during the reporting period.

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or included in pesticide formulations for many years, it has many other industrial uses which may account for its continued detection in ground water.

The following summarizes the registered pesticides detected by CDPH and actions taken or planned by DPR in response:

- CDPH detected atrazine, a registered herbicide, in one public water supply well in Kern County at a concentration that did not exceed the Maximum Contaminant Level (MCL) established by CDPH (Table ii and [Appendix E](#)). Atrazine is regulated by DPR as a ground water contaminant in certain areas of the state known as ground water protections areas (GWPAAs). From 1990 through 2010, less than 200 pounds of atrazine were applied in Kern County and there was no reported use within 6 miles of this well during that 20 year period. DPR is investigating this detection to determine if follow-up monitoring is needed.
- CDPH detected bentazon<sup>7</sup>, a registered herbicide, in one public water supply well in Riverside County ([Appendix E](#)). The water system owner retested this well twice within four months and did not detect bentazon in the follow-up samples. This well also had been sampled for bentazon twice in 2007 but no residues were detected in those samples. From 1990 through 2010 pesticide handlers reported using 67 pounds of bentazon in Riverside County. DPR will not initiate monitoring unless there are two or more consecutive detections of bentazon in this well.
- CDPH detected diquat dibromide, a registered herbicide, in one public water supply well in Mendocino County ([Appendix E](#)). This is the first detection of diquat dibromide in this well. From 1990 through 2010, almost 900 pounds of diquat dibromide was applied in Mendocino County but there was no reported use within one mile of this well. DPR does not consider diquat dibromide to be a likely threat to ground water because it binds strongly to soil and will defer follow-up monitoring until a second consecutive detection is reported in this well.
- CDPH detected methyl bromide, a registered fumigant, in one public water supply well in Los Angeles County ([Appendix E](#)). The water system owner retested this well ten times and did not detect methyl bromide residues in the follow-up samples. There is no reported use of this pesticide within one mile of the well. Historically, methyl bromide has never been detected in follow-up sampling conducted by water system owners in response to detections of this pesticide. DPR does not consider methyl bromide to be a likely threat to ground water based on its high volatility and will defer follow-up monitoring until a second consecutive detection is reported in this well.
- CDPH detected oxamyl, a registered insecticide and nematicide, in one public water supply well in Kern County ([Appendix E](#)). CDPH tests approximately 600 wells per year for oxamyl, but this is the first reported detection of oxamyl in California. From 1990 through 2010 pesticide handlers reported using 1,372 pounds of oxamyl in the 36 square mile

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<sup>7</sup> Bentazon is a registered agricultural herbicide that DPR has detected previously in ground water in rice production areas. Current regulations prohibit bentazon use in the production of rice.

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township where the well is located. DPR is investigating this report to determine if follow-up monitoring is needed.

The following summarizes the registered pesticides and/or degradates detected by DPR and the actions taken or planned in response:

- DPR sampled 124 wells for azoxystrobin, an agricultural fungicide, and two degradates. Although azoxystrobin was not detected, the acid degradate of azoxystrobin was detected in three wells in Glenn County ([Appendix E](#)). DPR determined that the degradate is not likely to pose a threat to public health at the concentrations detected. No further monitoring has been planned.
- DPR detected four registered agricultural herbicides – bromacil, diuron, norflurazon, and simazine – and three degradates – ACET, DACT, and DSMN – in ground water. Of the pesticides and degradates detected, only simazine and bromacil have established drinking water quality levels and the detections of these pesticides did not exceed their respective Lifetime Health Advisory Limit (HAL) established by the U.S. Environmental Protection Agency (EPA), Public Health Goal (PHG) established by Office of Environmental Health Hazard Assessment (OEHHA) or MCL (Table ii). DPR is investigating these detections to determine if further regulatory action is needed.

**Table ii. Registered pesticides and degradates detected by CDPH or DPR that are currently regulated to protect ground water.**

<i>Pesticide Detected</i>	<i>Wells with Detections</i>	<i>Amount Detected (ppb)</i>	<i>Drinking Water Quality Levels</i>
<b>Deethyl-simazine or deisopropyl atrazine (ACET) (degradate of atrazine or simazine)</b>	17	0.054 – 0.514	None established (NE)
<b>Atrazine</b>	1	0.31	CDPH MCL: 1 ppb OEHHA PHG: 0.15
<b>Bromacil</b>	3	0.051 – 0.29	EPA HAL: 70 ppb
<b>Diamino-chlorotriazine (DACT) (degradate of atrazine or simazine)</b>	26	0.055 – 0.854	NE
<b>Diuron</b>	5	0.05 – 0.161	NE
<b>Desmethyl-norflurazon (DSMN) (degradate of norflurazon)</b>	17	0.059 – 1.3	NE
<b>Norflurazon</b>	4	0.074 – 0.302	NE
<b>Simazine</b>	10	0.05 – 0.172	CDPH MCL: 4 ppb OEHHA PHG: 4 ppb

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# ACTIONS TAKEN TO PREVENT MIGRATION OF PESTICIDES TO GROUND WATER

## Department of Pesticide Regulation

DPR took the following actions in 2010 to prevent the migration of agricultural pesticides to ground water:

### *I. Protecting Vulnerable Areas from Pesticide Contamination*

#### Regulating the Use of Pesticides Found in Ground Water through Permitting

DPR continues to regulate seven pesticides listed in the California Code of Regulations, Title 3 [3 CCR] section 6800[a] that have been found in ground water due to agricultural use – atrazine, bentazon, bromacil, diuron, norflurazon, prometon, and simazine – by requiring permits and specified mitigation measures for use in ground water protection areas (GWPA) which are classified as leaching or runoff depending on the pathway of pesticide movement to ground water. Mitigation measures for leaching GWPA are designed to prevent over-irrigation in soils vulnerable to leaching. Mitigation measures for runoff GWPA are designed to prevent contamination of runoff water or to manage potentially contaminated runoff to prevent it from moving to other vulnerable areas.

In addition, DPR continues to enforce statewide regulations to protect ground water from the use of aldicarb and bentazon (3 CCR sections 6458 and 6457, respectively) by regulating the application period, specific crop, and crop growth stage on which they can be applied.

#### Assessing the Effectiveness of Mitigation Measures

To assess the effectiveness of the mitigation measures implemented in leaching and runoff GWPA, DPR established a well network in 1999 to monitor changes in pesticide concentrations over time. A preliminary analysis indicates a decrease in concentrations of bromacil, diuron, and simazine, which have been regulated since the early 1990s, and an increase in concentrations of norflurazon, which was not regulated until the late 1990s. This is consistent with a previous age-dating study that showed that the median time for a pesticide to move from the soil surface to well water is seven to nine years, indicating that there would be an expected lag time between adoption of regulations and changes in pesticide concentrations in ground water. A complete analysis of changes in the pesticide concentrations in these wells since 1999 is anticipated in 2012.

DPR is also evaluating other pesticide use modifications that protect ground water while also being practical and effective for growers. The most recent effort focused on the application of preemergent herbicides through a low volume micro-sprinkler irrigation system. Study results will be published in a separate report.

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### Monitoring Ground Water Vulnerability outside GWPAs

DPR is currently conducting a study to assess the vulnerability of areas outside current GWPAs by monitoring for regulated and suspected pesticide contaminants. Results from this study will be issued in a separate report.

### *II. Identifying Potential Ground Water Contaminants*

The PCPA (FAC sections 13141–13152) requires registrants who propose to register an agricultural use pesticide to submit data on that pesticide’s persistence and mobility in the environment. DPR uses these data to identify pesticides that may pose an elevated threat to ground water and prioritize them for monitoring.

### Collecting and Reporting Environmental Fate Data on Agricultural Pesticides

DPR’s Pesticide Chemistry Database includes a wide range of registrant-submitted environmental fate data on over 400 registered agricultural use pesticides. Annually, DPR compares these data to threshold values known as “Specific Numerical Values” to identify agricultural pesticides that may be persistent and mobile in the environment. This information is presented in the annual report titled “Pesticide Contamination Prevention Act Status Report,” which is available through DPR’s Ground Water Protection Program homepage <[www.cdpr.ca.gov](http://www.cdpr.ca.gov)>. The Pesticide Chemistry Database is currently undergoing an extensive quality assurance review to ensure that the data set is correct and complete. To date, about two-thirds of the studies not previously in the database have been evaluated and entered into the database. In addition, the staff are recalculating terrestrial field dissipation half-lives to ensure that the recorded data are consistent with established procedures (Bergin, 2010).

### Development of Contaminant Transport Modeling Tools

DPR uses a multi-component modeling tool to evaluate the environmental behavior of pesticides in the soil environment. This modeling tool is used to evaluate the potential impacts on ground water of new pesticides proposed for use in California. DPR also uses the modeling tool in conjunction with other use and label data to prioritize currently used pesticides for routine ground water monitoring throughout the state.

The first component of the modeling tool utilizes the LEACHM pesticide fate and transport model (Hutson and Wagenet, 1992) to predict residue movement through the root zone of a simulated crop. These estimates are passed to a second modeling component that simulates residue movement to ground water and eventually to domestic wells. The pesticide terrestrial field dissipation rate is one of the important types of inputs used in this model. However, a limitation with the current modeling scenario is the inability to assign depth-specific dissipation rates to a soil profile. The current modeling scenario assumes a constant terrestrial field dissipation rate with soil depth, but studies indicate that slower dissipation rates dominate at lower soil layers. Thus, using a constant dissipation rate would underestimate pesticide concentrations in ground water. In 2007 DPR initiated a study to provide estimates of

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depth-specific pesticide dissipation rates for two commonly used pesticides, diuron and simazine. Results from this investigation will be issued in a separate report.

### Evaluating New Pesticides for Registration and Use in California

Agricultural use pesticides proposed for registration whose physical and chemical properties exceed the SNVs undergo additional review to ensure that the pesticide does not pose an undue threat to ground water. DPR evaluates the ground water contamination potential of these pesticides by examining terrestrial field dissipation studies and using the LEACHM model described above.

Between July 1, 2010, and December 31, 2010, DPR's Ground Water Protection Program evaluated the ground water contamination potential of 2 active ingredients (A.I.s). Following the evaluations, it was concluded that products containing these active ingredients did not present a significant threat to ground water and that the environmental fate data provided by the pesticide registrants supported the registration of these A.I.s.

### Prioritizing Potential Pesticide Contaminants for Monitoring

As required by the PCPA, the Ground Water Protection List (GWPL) (3 CCR section 6800[b]) consists of agricultural pesticides that exceed Specific Numerical Values for mobility and persistence and are intended to be applied to or injected into the soil by ground-based application equipment or by chemigation, or the label of the pesticide requires or recommends that the application be followed, within 72 hours, by flood or furrow irrigation. DPR monitors ground water in California to determine if pesticides on the GWPL have migrated to ground water as a result of legal agricultural use. Prior monitoring results indicate that the risk of ground water contamination varies with the pesticides' environmental fate, use intensity, and application practices. Recently, DPR developed a method using these factors to prioritize the pesticides on this list for monitoring. Based on the intensity of pesticide use and computer modeling, 17 A.I.s were selected from the GWPL prioritization scheme for method development and monitoring. The 17 A.I.s were further categorized as having a relatively high, medium, or low potential to leach to ground water (Clayton, 2011). Proposed ground water monitoring in 2012 will be focused on three A.I.s in the high priority category – linuron, mefenoxam, and propyzamide – and one A.I. in the low priority category – methomyl. Although categorized as a lower threat to ground water, DPR selected methomyl, a carbamate insecticide, because it had never been included in a wide-area monitoring study and use overlap with propyzamide would allow for a more efficient study design.

### ***III. Monitoring for Potential Pesticide Contaminants***

#### Monitoring for Azoxystrobin, Dichloran, and Iprodione

In 2010, azoxystrobin, dichloran, and iprodione were selected for monitoring based on the GWPL prioritization scheme. From May to November 2010, DPR sampled 124 wells for azoxystrobin, dichloran, iprodione, two azoxystrobin degradates, and an iprodione degradate. Seventy-nine of these wells were also sampled for atrazine, bromacil, diuron, norflurazon,

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prometon, and simazine – pesticides regulated as ground water contaminants (3 CCR section 6800[a]); hexazinone and tebuthiuron – pesticides that DPR identified as potential ground water contaminants and subsequently detected in ground water (3 CCR section 6800 [b]); and degradates of several of these pesticides. This multi-analyte screen composed of pesticides and degradates that have been detected in ground water is collectively referred to as the “triazine screen.”

Three of the 124 wells sampled had residues of azoxystrobin acid, a degradate of azoxystrobin, at concentrations of 0.101 parts per billion (ppb), 0.268 ppb, and 0.263 ppb. Twenty-three of the 79 wells sampled for analytes on the “triazine screen” had residues of one or more of the following: bromacil, diuron, norflurazon, simazine or three of their degradates – ACET, DACT, and DSMN. Of this total, 12 wells contained residues of three or more pesticides and/or degradates and one well contained 6 pesticides and degradates. The reported concentrations of bromacil and simazine did not exceed mandatory or advisory health levels. The final report is anticipated in 2012.

### Monitoring for Oryzalin

In December 2010, DPR began monitoring for oryzalin, a soil-applied agricultural herbicide, to test the predictive capabilities of the current GWPL prioritization scheme described previously and to sample high-use areas that had not been surveyed during previous studies conducted in 1993, 1998, and 2006. DPR sampled 13 wells located in San Joaquin County for oryzalin and pesticides in the triazine screen. Oryzalin was not detected in any wells sampled. Norflurazon, DSMN (a degradate of norflurazon), ACET and DACT (degradates of atrazine and/or simazine) were detected in six of the 13 wells sampled. DPR will sample 27 additional wells in 2011 to achieve the study goal of 40 wells sampled. The final report is anticipated in 2012.

### ***IV. Pesticide Contamination Prevention Act Review Process Triggered by Detections of Hexazinone in Ground Water***

Hexazinone, a soil-applied agricultural herbicide, was registered for use in California in the late 1970s. Hexazinone residues were first reported in California ground water in 1997. Subsequent investigations (November 1997 through August 2009) resulted in 22 additional detections and a determination, in 2010, that movement of hexazinone residues from alfalfa field applications to shallow ground water was the result of legal agricultural use. In November 2010, DPR notified the registrants of pesticide products containing hexazinone that residues had been detected in California ground water as a result of legal agricultural use. This notification initiated the [Pesticide Contamination Prevention Act Review Process](#) which gave the registrants an opportunity to present information to a subcommittee of the Pesticide Registration and Evaluation Committee at a public hearing. On December 1, 2010, in response to this notification, E. I. Du Pont De Nemours and Co., Inc., the registrant of seven products containing hexazinone, requested a public hearing which DPR scheduled to occur on May 9, 2011.

For more information, please refer to DPR’s “Pesticide Contamination Prevention Act Review Process Triggered by Detection of Hexazinone in Ground Water” Web page at: <http://www.cdpr.ca.gov/docs/emon/grndwtr/hexazinone.htm>.

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### *V. Improving Access to DPR Ground Water Protection Program Information*

In 2010, DPR completed a major overhaul of the [Ground Water Protection Program](#) homepage to identify and fill content gaps such as how DPR identifies potential pesticide contaminants and formally reviews pesticides detected in ground water. Once all aspects of the program were represented, DPR focused on improving the site navigation to make it easier for users to find the information they need.

DPR also established a Ground Water Protection Program [Electronic Mailing List](#) which allows subscribers to receive e-mail updates on DPR's Ground Water Protection Program, including public meeting notices and related information.

### **State Water Resources Control Board**

Actions taken by the SWRCB (State Water Board) and the Regional Water Quality Control Boards (Regional Water Boards) to prevent pesticides from migrating to groundwater of the State are as follows:

#### **State Water Board**

State Water Board staff participated in the following activities:

- Regularly attended meetings sponsored by DPR, including the interagency Pesticide Registration and Evaluation Committee (PREC) and Pest Management Advisory Committee (PMAC).
- Participated in ongoing consultations with DPR staff, University of California (UC) scientists, and pesticide manufacturers to design monitoring studies and Best Management Practices (BMPs).
- Participated in discussions with U.S. Geological Survey (USGS) scientists on studies dealing with pesticides and water quality.
- Reviewed, on an ongoing basis, DPR Notices of "Materials Entering Evaluation" and advised DPR on potential water quality impacts of pesticide registration and use decisions.
- Reviewed and commented on DPR's proposed studies on pesticide and water quality pursuant to the Management Agency Agreement (MAA) with DPR.
- In coordination with the USGS and Lawrence Livermore National Laboratory (LLNL), the State Water Board is implementing the Groundwater Ambient Monitoring and Assessment Program (GAMA). To date, the GAMA – Priority Basins Project has sampled over 2,300, mostly public water supply wells, for various chemicals and parameters, including pesticides, herbicides and their degradates. The water quality results from 385 wells for the following study units published in 2010 are summarized in Table 12: Colorado River, South Coast Ranges Interior, Sierra Regional, Upper Santa Ana River, and South Coast Ranges-Coastal.

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### **Regional Water Quality Control Boards**

The report summarizes, by county, the monitoring, assessment, cleanup, and other actions taken by the nine RWQCBs to address point sources of contamination for pesticides.

## **PREFACE**

This report fulfills the requirements of AB 2701 (Chapter 644, Statutes of 2004), which amended the PCPA to require DPR to post specified information on sampling for pesticide residues in California ground water to its website. This law replaced the previous requirement that DPR submit the sampling information in a written report to the Legislature, SWRCB, and CDPH.

This report summarizes the locations of the sampled wells by county. DPR can provide additional location information (county, township, range, and section) upon request. If you require this information, please contact DPR's Ground Water Protection Program at 916-324-4039.

## **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 discusses the source of active ingredients, contained in registered pesticide products, which have been found in ground water. DPR provides this information to satisfy legal mandates and inform the public. Any discussion of commercially available pesticide products, or the way they are applied, does not constitute an actual or implied endorsement of these products by DPR.

## ABBREVIATIONS

1,2-D	1,2-dichloropropane (propylene dichloride)
3 CCR	Title 3 of the California Code of Regulations
ACET	deethyl-simazine or deisopropyl-atrazine
A.I.s	Active Ingredients
BMP	Best Management Practices
CAC	County Agricultural Commissioner
CDFA	California Department of Food and Agriculture
CDPH	California Department of Public Health
DACT	diaminochlorotriazine
DBCP	1,2-dibromo-3-chloropropane
DEA	deethyl-atrazine
DSMN	desmethyl norflurazon
DPR	Department of Pesticide Regulation
DWR	Department of Water Resources
EDB	ethylene dibromide
FAC	Food and Agriculture Code
GAMA	Groundwater Ambient Monitoring and Assessment
GWPA	ground water protection area
GWPL	Groundwater Protection List
LEACHM	Leaching Estimation and Chemistry Model
LLNL	Lawrence Livermore National Lab
MAA	Management Agency Agreement
MCL	Maximum Contaminant Level
OEHHA	Office of Environmental Health Hazard Assessment
PCPA	Pesticide Contamination Prevention Act
PHG	Public Health Goal
PMAC	Pest Management Advisory Committee
PMZ	Pesticide Management Zone
ppb	parts per billion
PREC	Pesticide Registration and Evaluation Committee
RWQCB	Regional Water Quality Control Board
SNV	specific numerical values
SWRCB	State Water Resources Control Board
USGS	United States Geological Survey
U.S. EPA	United States Environmental Protection Agency

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# INTRODUCTION

California has regulated pesticides for more than a century. Its citizens – through their Legislature – have established a comprehensive body of law to control pesticide sales and use, and to assure that the state’s pesticide regulators also have the tools to assess the impacts of that use. The first pesticide-related law was passed in this state in 1901, and since the 1960s, a whole body of modern, increasingly science-based pesticide law and regulation has come into being.

DPR began addressing pesticide contamination of ground water in the early 1980s after the discovery of contamination from the legal application of the fumigant DBCP. Reports of additional pesticides in ground water resulted in the passage of the PCPA in 1985, which added sections [13141-13152](#) to the FAC. DPR’s [Ground Water Protection Program](#) is based on general authority in the FAC to protect the environment from harmful pesticides, and specific authority in the PCPA that establishes a process to prevent further pesticide pollution of ground water used for drinking water supplies by agricultural pesticides. “Pollution” is defined in FAC section 13142(j) as “the introduction into the groundwaters of the state of an active ingredient, other specified product, or degradation product of an active ingredient of a pesticide above a level, with an adequate margin of safety that does not cause adverse health effects.”<sup>8</sup>

To implement the PCPA, DPR does the following:

- Obtains environmental fate data from pesticide registrants to support the registration of agricultural use pesticides.<sup>9</sup>
- Uses those data to identify agricultural use pesticides with the potential to pollute ground water.
- Conducts well sampling to determine if these pesticides have moved to ground water.
- Determines whether a pesticide detected in ground water was due to legal<sup>10</sup> agricultural use.
- Conducts a formal hearing to determine whether continued use of a pesticide found in ground water due to legal agricultural use should be allowed.
- Adopts mitigation measures in regulation to prevent pollution of ground water if continued use is allowed following a formal hearing.
- Establishes a database of well sampling results that must be reported to DPR by all local, county, and State agencies monitoring for pesticides in ground water.
- Prepares an annual report that summarizes the reported monitoring results, analyzes those results to determine the probable source of the residues, and specifies the actions taken by DPR for nonpoint agricultural sources and by the SWRCB for point sources to prevent further contamination of ground water.

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<sup>8</sup> Excerpted from “[Regulating Pesticides: The California Story, a Guide to Pesticide Regulation in California \(2001\)](#)” <<http://www.cdpr.ca.gov/dprabout.htm>>.

<sup>9</sup> California’s definition of “agricultural use” is broad, and includes not only pesticides used in production agriculture, but also on turf (e.g., golf courses, cemeteries) and along rights-of-way.

<sup>10</sup> Pesticide applications made in accordance with the registered label.

## **INTRODUCTION**

This report summarizes well sampling results collected by CDPH and DPR in 2010, and provides an analysis of those results to determine the probable sources of the detected residues. This report also summarizes the actions taken in 2010 by DPR and the SWRCB to prevent migration of pesticides to ground water from nonpoint agricultural sources point sources, respectively.

Beginning with the 2011 Update, DPR will report wells sampled and actions taken to protect ground water during the prior calendar year, rather than the prior fiscal year period used in previous reports. If an agency submits a large data set at the conclusion of a multi-year well sampling study, DPR will report these data in the calendar year in which they were received regardless of when the samples were collected. Also, since the 2010 Update included DPR's activities through June 2010, this year's transitional report only includes information on DPR's activities from July through December 2010.

This report satisfies the requirements of FAC section 13152(e) and describes, in detail, state agency ground water sampling results and the actions taken by DPR and the SWRCB to prevent pesticides from migrating to the ground waters of the state.



## COLLECTING GROUND WATER SAMPLING DATA

### PRINCIPAL SAMPLING AGENCIES

The PCPA requires all agencies that sample wells for pesticides to submit the results to DPR. Principal sampling agencies include DPR, CDPH, and SWRCB. The regulatory responsibilities unique to these agencies determine the pesticides selected for sampling; the sensitivity of the laboratory analyses used; the locations and well types sampled; and the sampling frequency of a specific well or pesticide. For example, DPR primarily samples shallow, domestic wells in areas where pesticides are used to detect potential pesticide contamination as early as possible. In contrast, public water systems monitor their wells, typically much deeper than domestic wells, for an established list of regulated and unregulated pesticides and their degradates regardless of whether these constituents were ever used near the sampled wells. While DPR's Well Inventory Database includes the results of thousands of wells sampled for hundreds of pesticides, it does not provide a comprehensive assessment of ground water quality throughout California.

#### *Department of Pesticide Regulation*

DPR protects human health and the environment by regulating pesticide sales and use and by fostering reduced-risk pest management. DPR's strict oversight begins with product evaluation and registration and continues through statewide licensing of commercial applicators, agricultural pesticide dealers and advisers, and monitoring air, water, soil, and fresh produce for pesticide residues. Before a pesticide may be used in California, the registrant must submit data on the product's toxicology and chemistry, environmental fate, effectiveness against targeted pests, hazards to nontarget organisms (fish and wildlife), and the degree of worker exposure expected under normal use conditions. DPR evaluates these data to minimize the risk of the pesticide to human health and the environment. If the data indicate potential, uncontrollable adverse environmental or human health effects, DPR's Director may deny the registration request or cancel current product registrations.

DPR uses monitoring data to better understand the behavior of pesticides in soil, air, and water and assess the impact of pesticide use on the environment. To ensure consistent and reliable sampling results, DPR funds the Department of Food and Agriculture's Center for Analytical Chemistry to develop [analytical methods](#) and conduct sample analyses. Following reports of pesticide detections from other agencies, DPR conducts additional sampling to confirm the detections, characterize the nature and extent of the potential contamination, and determine how to prevent or mitigate the off-site movement of pesticides.

DPR's [Ground Water Protection Program](#) focuses on detection of potential pesticide contaminants and on developing reduced-risk practices for pesticides that have been found in ground water due to legal agricultural use. If pesticides are ever found in ground water or soil due to nonagricultural use, such as residential uses in urban areas, and are determined to present a hazard or potential adverse effect, they will be reviewed as part of DPR's formal pesticide registration reevaluation process.

For more information about pesticide regulation in California, please visit DPR's Web site at: [www.cdpr.ca.gov](http://www.cdpr.ca.gov).

## COLLECTING GROUND WATER SAMPLING DATA

### *California Department of Public Health*

CDPH is responsible for the enforcement of the federal and California Safe Drinking Water Acts and the regulatory oversight of ~7,500 public water systems to assure the delivery of safe drinking water to all Californians. CDPH staff performs field inspections, issue operating permits, review plans and specifications for new facilities, take enforcement actions for noncompliance with laws and regulations, review water quality monitoring results, and support and promote water system security. In addition, CDPH staff are involved in funding infrastructure improvements, conducting source water assessments, evaluating projects utilizing recycled treated wastewater, and promoting and assisting public water systems in drought preparation and water conservation.

CDPH establishes health protective drinking water standards that must be met by [public water systems](#). These standards, known as [maximum contaminant levels](#) (MCL), take into account not only chemicals' health risks but also factors such as detection and treatment capabilities, as well as treatment costs. CDPH establishes a contaminant's MCL at a level as close to the [public health goal](#)<sup>11</sup> (PHG) established by the OEHHA as is technically and economically feasible, placing primary emphasis on the protection of public health (see [the MCL process](#)). Along with the MCL, a regulated chemical also has a [detection limit for purposes of reporting \(DLR\)](#), the level at which CDPH is confident about quantification being reported. Health-based advisory levels, called [notification levels](#), have been established for certain chemicals without MCLs. When chemicals are found at concentrations greater than their notification levels, certain requirements and recommendations apply. The level at which CDPH recommends removal of a drinking water source from service is called the "response level."

Under CDPH oversight, public water systems monitor drinking water for regulated contaminants. Drinking water may also be monitored for [emerging contaminants](#) and chemicals identified through the U.S. EPA's [Unregulated Contaminant Monitoring Program](#). As required by law, public water systems assure compliance with mandated drinking water standards and provide their customers with information on the quality of their drinking water through annual [Consumer Confidence Reports](#) (CCRs). Public water systems with more than 10,000 service connections that detect contaminants above their PHGs are also required to provide [PHG exceedence reports](#) every three years and to hold public hearings regarding their reports.

CDPH compiles and evaluates [drinking water quality data](#) collected by public water systems and, as required by the PCPA, submits the results for pesticide monitoring to DPR for inclusion in this report.

For more information about drinking water safety and regulation in California, go to the CDPH website at <[www.cdph.ca.gov](http://www.cdph.ca.gov)>, click on the "Programs" tab at the top of the page and follow the links to the Division of Drinking Water and Environmental Management Home Page.

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<sup>11</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.

## COLLECTING GROUND WATER SAMPLING DATA

### *State Water Resources Control Board – Groundwater Ambient Monitoring and Assessment Program (GAMA)*

The SWRCB expanded the GAMA Program following implementation of the [Groundwater Quality Monitoring Act of 2001](#) which added Part 2.76 (commencing with Section 10780) to Division 6 of the Water Code. This law resulted in a [publicly accepted plan](#) to monitor and assess basins that account for over 90% of groundwater use. The plan identified these “priority basins” based on groundwater used statewide. The main objectives of the GAMA Program are to improve statewide ambient groundwater quality monitoring and assessment and to increase the availability of information about groundwater quality to the public. The GAMA Program has four current projects:

- The [GAMA Priority Basin Project](#) monitors for dozens of chemicals at very low detection limits, including emerging contaminants. Monitoring and assessments for priority basins are to be completed every ten years, with trend monitoring every three years<sup>12</sup>. The SWRCB is collaborating with the U.S. Geological Survey (USGS) and Lawrence Livermore National Laboratory (LLNL) to implement the GAMA Priority Basin Project.
- The GAMA Program also assesses the quality of domestic well water through its [Domestic Well Project](#). The GAMA Domestic Well Project has sampled in several county-focus areas in coordination with local environmental health departments, and provides an education component to help domestic well users to better understand water quality issues.
- The [GAMA Special Studies Project](#) partners with LLNL to conduct several groundwater studies including nitrate, wastewater, and groundwater recharge. LLNL scientists use the Tritium-Helium age dating technique, isotopic composition of water and nitrate molecules to determine source(s), and presence of noble gases to determine recharge source and condition, as well as sophisticated computer modeling techniques. UC Davis has also contributed to GAMA Special Studies.
- The GAMA Program shares groundwater quality information primarily through its [GeoTracker GAMA](#) information management system accessible through the State Water Board’s Web site. GeoTracker GAMA provides access to a Google map-based database that readily provides a wealth of groundwater information including results of water quality testing, water level information, copies of environmental monitoring well logs as well as links to published reports for a specific area of interest. Millions of records of data come from the SWRCB and Regional Water Quality Control Boards (RWQCBs), CDPH, the Department of Water Resources (DWR), DPR, USGS, and LLNL. Scientists, regulators, water managers, educators and the public can use these data, and as more data are shared through GeoTracker GAMA, the groundwater quality picture for California becomes clearer.

For more information about the SWRCB’s GAMA Program, go to [www.swrcb.ca.gov](http://www.swrcb.ca.gov) and select “More” from the links at the top of the page, then follow the “Groundwater” link to the GAMA Program Home Page.

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<sup>12</sup> DPR will include GAMA Priority Basin Project data when the complete dataset becomes available.

## GROUND WATER SAMPLING RESULTS

This section describes DPR's Ground Water Protection Program and our response to detections reported by other state and local agencies. It also summarizes ground water sampling results submitted by CDPH and produced through DPR's regulatory monitoring activities.

### Ground Water Monitoring Requirements

The PCPA ([FAC sections 13141-13152](#)) requires DPR to take steps to prevent or mitigate ground water pollution from the agricultural use of pesticides. DPR must base these regulatory actions on scientifically defensible monitoring surveys and reliable analytical results.

As required by the PCPA, DPR samples for pesticides included in the Ground Water Protection List (GWPL [3 CCR section 6800[b)]), a list of pesticides that exceed mobility and persistence thresholds known as specific numerical values (SNVs) and are used in ways that increase the potential for ground water contamination. Because a pesticide's mobility, persistence and use vary widely, DPR developed a process to rank pesticides on the GWPL based on these factors and to prioritize sampling for those that pose the greatest risk to ground water. DPR targets sampling activities where the probability of detecting pesticide residues is the greatest: shallow domestic wells that are located in high use areas and/or in GWPAs.

The PCPA specifies that the sampling results must be obtained from an approved [analytical method](#) that provides unequivocal identification of a pesticide, such as mass spectroscopy, or from verification within 30 days by a second analytical method or a second analytical laboratory also approved by DPR. To ensure consistent and reliable sampling results, DPR funds the Department of Food and Agriculture's Center for Analytical Chemistry to develop [analytical methods](#) and conduct ground water sample analyses.

### Responding to Pesticide Detections

DPR uses a wide range of information, including the data reported by other public agencies, to identify and monitor areas that may be vulnerable to pesticide contamination. With few exceptions, DPR samples all wells with reported pesticide detections regardless of the analytical methods or laboratories used by the reporting agencies because the PCPA requires DPR to base its regulatory actions on sampling results obtained from DPR-approved [analytical methods](#) and laboratories.<sup>13</sup> DPR rarely limits sampling to the reported pesticide; DPR also tests wells with suspected pesticide contamination for a broad range of known and suspected pesticide contaminants using sensitive analytical methods that can detect amounts as low as 0.05 ppb.

Before sampling wells with reported detections, DPR establishes the accuracy of the reports by reviewing them with the reporting agencies, the well owners, and, occasionally, the analytical laboratories. DPR also reviews analytical laboratory procedures following reports of pesticide detections that appear unlikely due to unusual environmental fate characteristics, such as high

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<sup>13</sup> The California Department of Food and Agriculture's Center for Analytical Chemistry provides approved analytical services for DPR's environmental monitoring programs.

## GROUND WATER SAMPLING RESULTS

volatility or irreversible binding to soil particles, or a lack of documented pesticide use near the well. Evaluating the laboratory's analytical methods as well as the quality control data allows DPR to assess the reliability of the reported sample results. If DPR determines that the data were reported in error or may be invalid due to unacceptable analytical variability, DPR will not sample the well but will closely follow future sampling results for that well.

Although DPR is mandated to monitor ground water for the presence of pesticides and it is DPR's policy to sample wells with reported pesticide detections, DPR does not have the legal authority to require well owners to participate. Since participation is voluntary, DPR works cooperatively with the well owners and, in some cases, the reporting agencies to obtain samples from the wells with pesticide detections. Occasionally, DPR is unable to sample the original well because it was destroyed or the well owner declines DPR's request to sample the well. In this case, DPR attempts to sample other nearby wells especially if the pesticide was, or could have been, used in the area.

Typically, DPR will not conduct additional sampling if:

- The detection of a pesticide regulated as a ground water contaminant (3 CCR section 6800[a]) occurred in a GWPA where the use of these pesticides are regulated to protect ground water.
- The detected pesticide is no longer registered for sales and use in California.<sup>14</sup>
- The pesticide was detected at levels less than 80% of DPR's analytical reporting limit.
- The pesticide was not detected in follow-up samples taken by the reporting agency.
- DPR is unable to develop an adequate analytical method for the pesticide.

State law authorizes DPR to regulate the sales and use of legally registered pesticides that pollute or threaten to pollute ground water. If an approved laboratory confirms the presence of a pesticide in a ground water sample using an approved analytical method, DPR will determine whether the legal agricultural use of that pesticide caused the detection. Pesticides that are found in ground water or soil under specific conditions, due to legal agricultural use, are subject to a public, [formal review process](#) to determine whether they can continue to be used and, if so, under what conditions. Pesticides that have been reviewed through this process include atrazine, bentazon, bromacil, diuron, hexazinone, norflurazon, prometon, and simazine. With the exception of aldicarb and hexazinone, it was determined that the agricultural use of these pesticides could be modified so that there would be a high probability that their continued use would not pollute ground water. DPR added these pesticides to the GWPL (3 CCR section 6800[a]) and required applicators to adopt amended use practices when using these pesticides in vulnerable areas known as GWPAs as well as statewide in the case of bentazon. Statewide use restrictions were also adopted for aldicarb.

State law does not authorize DPR to regulate pesticide residues found in ground water due to manufacturing processes, accidental spills or releases, or illegal disposal or to address the detection of unregistered or banned pesticides in ground water. DPR refers these types of pesticide detections to the SWRCB, the state lead agency for water quality protection, for further investigation.

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<sup>14</sup> DPR has no regulatory authority over pesticides that are no longer allowed to be used in California.

## GROUND WATER SAMPLING RESULTS

### Sampling Results Summary

The ground water monitoring data included in this report were collected by CDPH in 2010 and by DPR from July through December 2010. No other agency reported to DPR during this time period. In total, over 3,000 wells in 51 counties were sampled for one or more of 136 pesticides or pesticide degradates. CDPH and DPR detected 21 pesticides and pesticide degradates in 286 wells (Table 1 and [Appendix B](#)).

**Table 1. Well sampling data summarized by agency.**

<i>Category</i>	<i>Reporting Period and Agency</i>			
	<i>2010</i>			<i>1985-2010</i>
	<i>Total</i>	<i>CDPH</i>	<i>CDPR</i>	<i>All Agencies<sup>15</sup></i>
<b>Counties Sampled</b>	51	51	12	58
<b>Counties with Detections</b>	18	16	7	50
<b>Wells Sampled<sup>16</sup></b>	3,071	2,934	137	23,127
<b>Wells with Detections</b>	286	254	32	5,194
<b>Pesticides and Degradates Sampled<sup>17</sup></b>	136	118	23	339
<b>Pesticides and Degradates Detected</b>	21	13	8	108

Of the 21 pesticides and degradates reported detected, 9 are currently registered for use in California, 4 are degradates of currently registered pesticides, and 8 are no longer allowed to be used in California (Table 2).

**Table 2. California registration status of pesticides and pesticide degradates detected in 2010.**

<i>Pesticide</i>	<i>Registered Pesticide</i>	<i>Pesticide Degradate</i>	<i>Canceled Pesticide</i>
<b>Atrazine</b>	<b>X</b>		
<b>Bentazon<sup>18</sup>, sodium salt</b>	<b>X</b>		
<b>Bromacil</b>	<b>X</b>		
<b>Diquat dibromide</b>	<b>X</b>		
<b>Diuron</b>	<b>X</b>		
<b>Methyl bromide (bromomethane)<sup>19</sup></b>	<b>X</b>		

<sup>15</sup> See Appendix A for a list of the local, state, and federal agencies that have contributed well monitoring data to DPR since the early 1980s.

<sup>16</sup> “Wells Sampled” and “Wells with Detections” present the total number of individual wells sampled or found to contain pesticide residues regardless of the number of sampling events or detections that occurred during the reporting period.

<sup>17</sup> “Pesticides Sampled” and “Pesticides Detected” present the total number of individual pesticides or pesticide degradation products sampled or found in ground water regardless of the number of sampling events or detections that occurred during the reporting period.

<sup>18</sup> The detection of bentazon was not confirmed in subsequent samples in 2010.

<sup>19</sup> The detection of methyl bromide was not confirmed in subsequent samples in 2010.

## GROUND WATER SAMPLING RESULTS

<i>Pesticide</i>	<i>Registered Pesticide</i>	<i>Pesticide Degradate</i>	<i>Canceled Pesticide</i>
Norflurazon	X		
Oxamyl	X		
Simazine	X		
ACET		X	
Azoxystrobin acid		X	
DACT		X	
DSMN		X	
1,2,4-Trichlorobenzene			X
1,2-D			X
1,2-D + 1,3-D + C-3 pesticides			X
DBCP			X
Ethylene dibromide			X
Naphthalene			X
Ortho-dichlorobenzene			X
Xylene			X

## California Department of Public Health Sampling Results

### *CDPH Sampling Results Summarized by Pesticide*

In 2010, CDPH reported that California's water system owners sampled for 118 pesticides and pesticide degradates in 2,934 public water supply wells (Table 1). Thirteen pesticides were detected (Table 3) in 254 wells ([Appendix B](#)). Of the pesticides detected by CDPH, five are registered in California – atrazine, bentazon, diquat bromide, methyl bromide, and oxamyl. Water system owners resampled for bentazon and methyl bromide but did not detect these pesticides in the subsequent samples. The remaining pesticides that were detected are no longer registered for use in California.

**Table 3. Pesticide detections and concentrations reported by CDPH in 2010.**

<i>Pesticide</i>	<i>Wells with Detections</i>	<i>Amount Detected (ppb)</i>	<i>Registration Status and Drinking Water Quality Levels</i>
1,2,4-Trichlorobenzene	1	0.94	Registration: Canceled CDPH MCL: 5 ppb OEHHA PHG <sup>20</sup> : 5 ppb EPA HAL: 70 ppb
1,2-D (1,2-dichloropropane)	6	0.56 - 1	Registration: Canceled CDPH MCL: 5 ppb OEHHA PHG: 0.5 ppb – Exceeded in all wells No Established HAL

<sup>20</sup> Public Health Goal (PHG) established by the OEHHA is the level of a contaminant in drinking water below which there is no known or expected risk to health.

## GROUND WATER SAMPLING RESULTS

<i>Pesticide</i>	<i>Wells with Detections</i>	<i>Amount Detected (ppb)</i>	<i>Registration Status and Drinking Water Quality Levels</i>
<b>1,2-D + 1,3-D + C-3 pesticides</b>	1	0.76	Registration: Canceled CDPH MCL: 5 ppb OEHHA PHG: 0.5 ppb – Exceeded in the 1 well No Established HAL
<b>Atrazine</b>	1	0.31	Registration: Currently registered in California CDPH MCL: 1 ppb OEHHA PHG: 0.15 ppb – Exceeded in the 1 well No Established HAL
<b>Bentazon<sup>21</sup>, sodium salt</b>	1	9.2	Registration: Currently registered in California CDPH MCL: 18 ppb OEHHA PHG: 200 ppb EPA HAL: 200 ppb
<b>DBCP</b>	241	0.01 - 1	Registration: Canceled CDPH MCL: 0.2 ppb – Exceeded in 55 wells OEHHA PHG: 0.0017 ppb – Exceeded in all wells No Established HAL
<b>Diquat dibromide</b>	1	2.1	Registration: Currently registered in California CDPH MCL: 20 ppb OEHHA PHG: 15 ppb No Established HAL
<b>Ethylene dibromide (EDB)</b>	7	0.02 - 0.36	Registration: Canceled CDPH MCL: 0.05 ppb – Exceeded in 4 wells OEHHA PHG: 0.01 ppb – Exceeded in all wells No Established HAL
<b>Methyl bromide<sup>22</sup> (bromomethane)</b>	1	0.67	Registration: Currently registered in California No Established MCL or PHG EPA HAL: 10 ppb
<b>Naphthalene</b>	1	2	Registration: Canceled No Established MCL or PHG EPA HAL: 100 ppb
<b>Ortho-dichlorobenzene</b>	1	0.72	Registration: Canceled CDPH MCL: 600 ppb OEHHA PHG: 600 ppb EPA HAL: 600 ppb
<b>Oxamyl</b>	1	9	Registration: Currently registered in California CDPH MCL: 50 ppb OEHHA PHG: 26 No Established HAL
<b>Xylene</b>	1	10	Registration: Canceled CDPH MCL: 1,750 ppb OEHHA PHG: 1,800 ppb No Established HAL

<sup>21</sup> The detection of bentazon was not confirmed in subsequent samples in 2010.

<sup>22</sup> The detection of methyl bromide was not confirmed in subsequent samples in 2010.

## GROUND WATER SAMPLING RESULTS

### Detections of Pesticides Registered for Use in California

Of the 13 pesticides detected by CDPH in 2010, 5 are registered in California – atrazine, bentazon, diquat bromide, methyl bromide, and oxamyl. Four of the 5 detected pesticides did not exceed the MCLs established by CDPH, PHGs established by OEHHA, or HALs established by the U.S. EPA (Table 3 and [Appendix C](#)). The reported concentration of atrazine did not exceed the established MCL but was more than double the established PHG.

- Atrazine, a registered herbicide, was detected in one public water supply well in Kern County at a concentration that did not exceed the MCL (Table 3 and [Appendix E](#)). Atrazine is regulated by DPR as a ground water contaminant in certain areas of the state known as ground water protection areas (GWPA). From 1990 through 2010, less than 200 pounds of atrazine were applied in Kern County and there was no reported use within six miles of this well which is located outside of GWPA. DPR is investigating this detection to determine if follow-up monitoring is needed.
- Bentazon,<sup>23</sup> a registered herbicide, was detected in one public water supply well in Riverside County ([Appendix E](#)). However, the water system owner retested this well twice within four months and did not detect bentazon in the follow-up samples. This well also had been sampled for bentazon twice in 2007 but no residues were detected in those samples. From 1990 through 2010, pesticide handlers reported using only 67 pounds of bentazon in Riverside County. DPR will not initiate monitoring unless there are two or more consecutive detections of this pesticide in this well.
- Diquat dibromide, a registered herbicide, was detected in one public water supply well in Mendocino County ([Appendix E](#)). This is the first detection of diquat dibromide in this well. From 1990 through 2010, almost 900 pounds of diquat dibromide were applied in Mendocino County but there was no reported use within one mile of this well. DPR does not consider diquat dibromide to be a likely threat to ground water because it binds strongly to soil and will defer follow-up monitoring until a second consecutive detection is reported in this well.
- Methyl bromide, a registered fumigant, was detected in one public water supply well in Los Angeles County ([Appendix E](#)). DPR has no record of this pesticide having been applied within one mile of the well. In response to this detection, the water system owner resampled this well but did not detect methyl bromide in the 10 follow-up samples taken in 2010. Historically, methyl bromide has never been detected in follow-up samples taken by water system owners in response to detections of this pesticide in their wells. DPR does not consider methyl bromide to be a likely threat to ground water based on its high volatility and will defer follow-up monitoring until a second consecutive detection is reported in this well.
- Oxamyl, a registered insecticide and nematicide, was detected in one public water supply well in Kern County ([Appendix E](#)). Although CDPH samples approximately 600 public water supply wells for oxamyl every year, this is the first reported detection of oxamyl in California. From 1990 through 2010, pesticide handlers reported using 1,372 pounds of oxamyl in the 36 square

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<sup>23</sup> Bentazon is a registered agricultural herbicide that DPR has detected previously in ground water in rice production areas. Current regulations prohibit bentazon use in the production of rice.

## GROUND WATER SAMPLING RESULTS

mile township where the well is located. DPR is investigating this report to determine if follow-up monitoring is needed.

### Detections of Canceled Pesticides

Eight of the pesticides detected – 1,2,4-trichlorobenzene, 1,2-D, unspecified 1,2-D + 1,3-D + C-3 pesticides, DBCP, EDB, naphthalene, ortho-dichlorobenzene, and xylene – are no longer registered for use in California. DPR took actions to cancel these registrations following the determination that exposure during manufacture and/or use could lead to adverse human health effects. Fifty five of the 241 wells sampled for DBCP and 3 of the 7 wells sampled for EDB exceeded their respective MCLs established by CDPH. All of the detections of 1,2-D, 1,2-D + 1,3-D + C-3 pesticides, DBCP, and EDB exceeded PHGs established by OEHHA (Table 3 and [Appendix C](#)).

Xylene is no longer used as a pesticide but is included in some products as an inert ingredient. It is also a component of gasoline and is widely used in industrial manufacturing. Nonpesticide uses are considered to be the source of these detections.

DPR does not respond to reported detections of chemicals that are no longer registered as pesticides in California.

### Detections of Registered Pesticides Reported Previously

DPR followed up on pesticide detections reported by CDPH in previous report years. DPR investigated these detections by examining pesticide use near the sampled wells and the properties of the individual pesticides. The sampled wells have no history of any pesticide contamination and these pesticides have not been detected in any other nearby wells.

- In 2009, CDPH detected atrazine in a well in Kern County<sup>24</sup>. This well had no history of atrazine detections in prior samples and atrazine was not detected in follow-up sampling in 2010. DPR will take no further action on this atrazine report.
- In 2008, CDPH detected methyl bromide in three wells in San Luis Obispo County ; thiobencarb – an agricultural herbicide used on rice – in one well in Los Angeles County; and diquat dibromide in two wells in Mendocino County and San Mateo County. The wells in San Luis Obispo County were retested in 2010 and no methyl bromide was detected. DPR is currently waiting for the water system owners to retest and provide results for the wells with reported detections of thiobencarb and diquat bromide.
- In 2007, CDPH detected methyl bromide in one well in Tehama County and diquat dibromide in one well in San Mateo County. The well was retested in 2010 and no diquat dibromide was detected. DPR is currently waiting for the water system owners to retest and provide results for the well where methyl bromide was detected.

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<sup>24</sup> The detections of atrazine reported by CDPH in 2009 and 2010 occurred in different wells.

## GROUND WATER SAMPLING RESULTS

### *CDPH Sampling Results Summarized by County*

The number of public water supply wells and pesticides sampled annually in each county is related to the number and size of the regulated water systems located within each county. For this reporting period, the median number of public supply wells sampled per county was 20 and ranged from 644 wells in Los Angeles County to one well each in Alpine, Calaveras, and Trinity counties. The median number of pesticides analyzed per county was 57 and ranged from 92 in Kern County to 3 in Calaveras County. CDPH did not report any sampling data for Del Norte, Humboldt, Imperial, Lassen, Modoc, San Francisco, and Sierra counties ([Appendix D](#)).

Of the 2,934 public water supply wells sampled by water system owners, pesticides were detected in 255 (9%) of the wells sampled (Table 4). Of this total, one pesticide was detected in 247 (97%) wells; two pesticides were detected in 6 (2%) wells and five pesticides were detected in one well. It is important to note that not every well was sampled for every pesticide and not every detection was confirmed by follow-up sampling ([Appendix E](#)).

**Table 4. Counties with pesticide detections reported by CDPH in 2010.**

COUNTY	Wells Sampled	Pesticides Detected	Wells with Detections													
			Total	1,2,4-Trichlorobenzene	1,2-Dichloropropane	1,2-D + 1,3-D + C-3 pesticides	Atrazine	Bentazon, sodium salt	DBCP	Diquat dibromide	Ethylene dibromide	Methyl bromide	Naphthalene	Ortho-dichlorobenzene	Oxamyl	Xylene
Fresno	170	6	89	1	0	1	0	0	89	0	3	0	1	1	0	0
Kern	160	5	24	0	2	0	1	0	20	0	1	0	0	0	1	0
Los Angeles	644	3	3	0	1	0	0	0	1	0	0	1	0	0	0	0
Madera	41	2	5	0	0	0	0	--	5	--	1	0	0	0	--	0
Mendocino	11	1	1	--	--	--	0	0	0	1	0	--	--	--	0	0
Merced	38	1	11	0	0	0	0	--	11	--	0	0	0	0	--	0
Riverside	129	2	9	0	0	0	0	1	8	0	0	0	0	0	0	0
Sacramento	160	1	2	0	0	0	0	0	2	0	0	0	0	0	0	0
San Bernardino	276	1	33	0	0	0	0	0	33	0	0	0	0	0	0	0
San Diego	33	2	2	0	1	0	0	0	1	0	0	0	0	0	0	0
San Joaquin	73	2	17	0	0	0	0	0	17	0	1	0	0	0	0	0
San Mateo	18	1	2	0	2	0	0	0	0	0	0	0	0	0	0	0
Sonoma	79	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0
Stanislaus	119	1	22	0	0	0	0	0	22	0	0	0	0	0	0	0
Tulare	128	1	32	0	0	0	0	0	32	0	0	0	0	0	0	0
Yuba	13	1	1	0	0	0	--	--	0	--	0	0	0	0	--	1
<b>Total Wells</b>	<b>2092</b>	<b>32</b>	<b>254</b>	<b>1</b>	<b>6</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>241</b>	<b>1</b>	<b>7</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>

-- Not Sampled

## GROUND WATER SAMPLING RESULTS

Although its use as an agricultural fumigant was banned in the early 1980s, DBCP continues to be the most frequently detected pesticide with detections in 241 of the 1,183 public water supply wells sampled for this pesticide in 36 counties ([Appendix B](#) and [Appendix E](#)). Counties with large agricultural production areas had the highest percentage of wells with detections versus the total wells sampled: Fresno (64%), San Joaquin (39%), Merced (33%), Tulare (32%), Stanislaus (28%), and Kern (22%) (Table 5 and [Appendix E](#)).

**Table 5. Counties with DBCP detections reported by CDPH in 2010.**

<i>COUNTY</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>	<i>Percent with Detections</i>
<b>Fresno</b>	138	89	<b>64</b>
<b>Kern</b>	89	20	<b>22</b>
<b>Los Angeles</b>	36	1	<b>3</b>
<b>Madera</b>	19	5	<b>26</b>
<b>Merced</b>	33	11	<b>33</b>
<b>Riverside</b>	79	8	<b>10</b>
<b>Sacramento</b>	14	2	<b>14</b>
<b>San Bernardino</b>	164	33	<b>20</b>
<b>San Diego</b>	25	1	<b>4</b>
<b>San Joaquin</b>	44	17	<b>39</b>
<b>Stanislaus</b>	80	22	<b>28</b>
<b>Tulare</b>	99	32	<b>32</b>
<b>Total Wells</b>	820	241	<b>29</b>

## Department of Pesticide Regulation Sampling Results

### *DPR Sampling Results Summarized by Pesticide*

From July to December 2010, DPR sampled 137 domestic wells in 12 counties for the following:

- Pesticides regulated as ground water contaminants (3 CCR section 680 [a]) – atrazine, bromacil, diuron, norflurazon, prometon, and simazine – and their degradates – ACET, DACT, DEA, and DSMN;
- Pesticides on the GWPL (3 CCR section 6800[b]) that have been detected in ground water by DPR – hexazinone and tebuthiuron – and four tebuthiuron degradates; and
- Pesticides on the GWPL (3CCR section 6800[b]) not yet sampled by DPR – azoxystrobin, dichloran, iprodione, and oryzalin – and their degradates – 3,5-dichloroaniline, azoxystrobin acid, and azoxystrobin Z.

Bromacil, diuron, norflurazon, and simazine and their degradates, ACET, DACT, and DSMN, were detected in 29 of the 82 wells sampled for these pesticides and degradates (Table 6 and [Appendix B](#)). Of the pesticides and degradates detected, only simazine and bromacil have established drinking water quality levels and the concentrations detected did not exceed their

## GROUND WATER SAMPLING RESULTS

respective HAL, PHG, or MCL (Table 6). DPR is investigating the nine detections that occurred outside of established GWPA's to determine if further regulatory action is needed. By policy, DPR may create new GWPA's based on detections of pesticides, or their degradates, that are regulated as ground water contaminants and listed in 3 CCR section 6800(a). The remaining detections occurred within GWPA's where the use of these pesticides has been regulated since 2004, or earlier, to prevent further pollution. DPR has observed decreases in well water concentrations for many of the regulated pesticides in contaminated wells located within GWPA's in Fresno and Tulare counties that have been sampled annually since 1999. DPR attributes this change to regulatory actions taken prior to 2004 in areas where pesticides listed in 3 CCR section 6800 (a) were detected<sup>25</sup>.

The acid degradate of azoxystrobin, a registered agricultural fungicide, was detected in 3 wells in Glenn County but did not detect the parent pesticide in any well sampled (Table 6 and [Appendix B](#)). DPR determined that the degradate is not likely to pose a threat to public health at the concentrations detected (J. Schreider, pers. comm.). No further monitoring has been planned.

**Table 6. Pesticide detections and concentrations reported by DPR from July through December 2010.**

<i>Pesticides Detected</i>	<i>Wells with Detections</i>	<i>Amount Detected (ppb)</i>	<i>Registration Status and Drinking Water Quality Levels</i>
<b>ACET</b>	17	0.054 – 0.514	Registration status: Degradate No established CDPH MCL, OEHHA PHG, or EPA HAL
<b>Azoxystrobin acid</b>	3	0.101 – 0.268	Registration status: Degradate of azoxystrobin No established CDPH MCL, OEHHA PHG, or EPA HAL
<b>Bromacil</b>	3	0.051 – 0.29	Registration status: Registered No established CDPH MCL or OEHHA PHG EPA HAL: 70 ppb
<b>DACT</b>	26	0.055 – 0.854	Registration status: Degradate No established CDPH MCL, OEHHA PHG, or EPA HAL
<b>Diuron</b>	5	0.05 – 0.161	Registration Status: Registered No established CDPH MCL, OEHHA PHG, or EPA HAL
<b>DSMN</b>	17	0.051 – 1.02	Registration status: Degradate of norflurazon No established CDPH MCL, OEHHA PHG, or EPA HAL
<b>Norflurazon</b>	4	0.074 – 0.302	Registration Status: Registered No established CDPH MCL, OEHHA PHG, or EPA HAL
<b>Simazine</b>	10	0.05 – 0.172	Registration Status: Registered CDPH MCL: 4 ppb OEHHA PHG: 4 ppb EPA HAL: none established

DPR tends to have a higher detection frequency than other reporting agencies because sampling is focused in areas with relatively high pesticide use to determine if there are ground water impacts from the legal agricultural use of these pesticides.

<sup>25</sup> For more information on DPR's regulatory program and assessment of its mitigation measures, see the section titled "Protecting Vulnerable Areas from Pesticide Contamination."

## GROUND WATER SAMPLING RESULTS

### *DPR Sampling Results Summarized by County*

Of the 138 wells sampled, pesticide residues were detected in 23% (32) of the wells sampled (Table 1). Of the wells that tested positive, 25% (8) contained one pesticide, 25% (8) contained two pesticides, 25% (8) contained three pesticides, 12.5% (4) contained four pesticides, 9.4% (3) contained five pesticides, and one well contained six pesticides.

**Table 7. Pesticide detections summarized by county and pesticide reported by DPR from July through December 2010.**

<i>COUNTY</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>								
		<i>Total</i>	<i>ACET</i>	<i>Azoxystrobin acid</i>	<i>Bromacil</i>	<i>DSMN</i>	<i>Diuron</i>	<i>DACT</i>	<i>Norflurazon</i>	<i>Simazine</i>
<b>Butte</b>	7	0	0	0	0	0	0	0	0	0
<b>Fresno</b>	17	13	11	0	1	9	3	13	2	7
<b>Glenn</b>	16	3	0	3	0	0	0	0	0	0
<b>Kern</b>	10	2	1	0	2	0	1	2	0	1
<b>Merced</b>	11	0	0	0	0	0	0	0	0	0
<b>Monterey</b>	17	1	0	0	0	0	0	0	0	1
<b>San Joaquin</b>	13	6	3	--	0	5	0	6	2	0
<b>Santa Barbara</b>	3	0	0	0	0	0	0	0	0	0
<b>Santa Cruz</b>	1	0	0	0	0	0	0	0	0	0
<b>Stanislaus</b>	11	6	1	0	0	3	1	5	0	0
<b>Tulare</b>	23	1	1	0	0	0	0	0	0	1
<b>Ventura</b>	8	0	0	0	0	0	0	0	0	0
<b>Total Wells</b>	137	32	17	3	3	17	5	26	4	10

-- Not Sampled

## ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION

### DEPARTMENT OF PESTICIDE REGULATION

As required by FAC section 13152, this section describes recent actions by DPR to prevent pesticides from migrating to California's ground water.

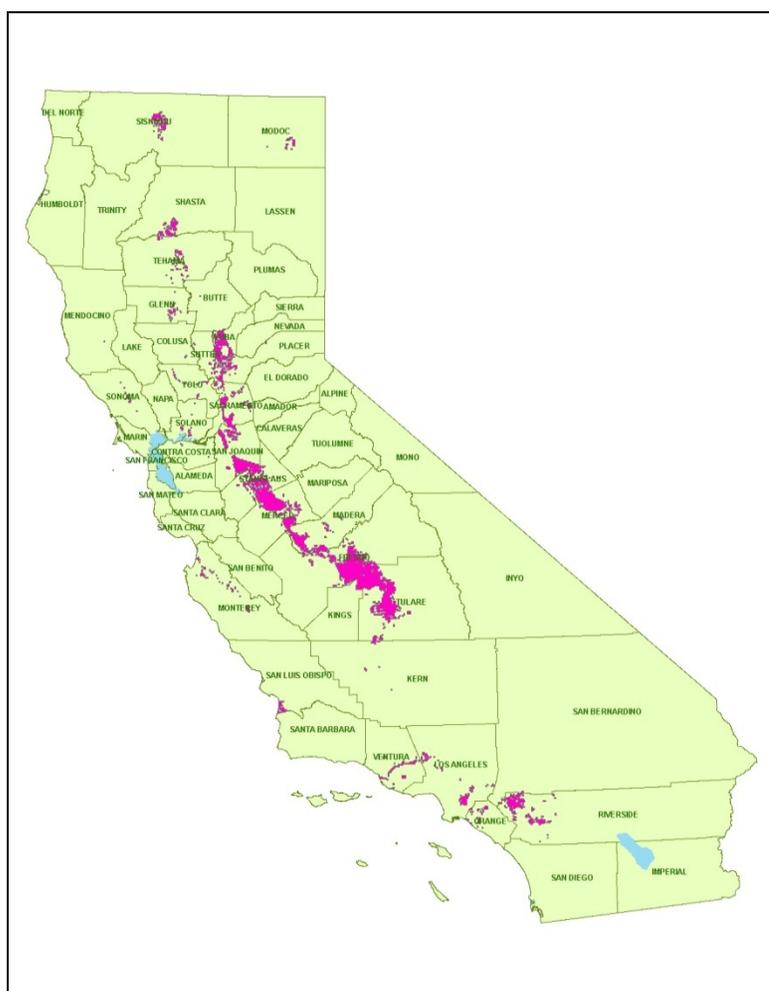
#### *Protecting Vulnerable Areas from Pesticide Contamination*

#### **Regulating the Use of Pesticides Found in Ground Water through Permitting**

Figure 2. Ground Water Protection Areas (GWPA)s).

Under the PCPA, pesticides detected in ground water at levels that pollute or threaten to pollute ground water were to be prohibited unless future contamination could be controlled. From 1989 – 1999, DPR adopted mandated statewide mitigation measures for aldicarb and bentazon, and some mandatory but mainly advisory mitigation measures for atrazine, bromacil, diuron, norflurazon, prometon, and simazine that applied only in “Pesticide Management Zones” (PMZs). PMZs - one-square mile sections of land around contaminated wells – had grown to encompass about 313,000 acres statewide by 2003.

In 2004, DPR expanded the areas where certain pesticides<sup>26</sup> are regulated to 2.4 million acres (Figure 2) and adopted mandatory mitigation measures to protect ground water.<sup>27</sup> Called “ground water protection areas” (GWPA)s, these new areas include all the former existing and draft PMZs as well as sections of land with no reported detections but with soil types and depths-to-ground water that are characteristic of contaminated areas. Based on the



<sup>26</sup> 3 CCR section 6800[a] includes atrazine, bentazon, bromacil, diuron (except for products with less than 7% diuron that are applied to foliage), norflurazon, prometon, and simazine.

<sup>27</sup> 3 CCR sections 6416, 6487.1 – 6487.5

## **ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – DPR**

pathway of pesticide movement to ground water, GWPAs are designated as either leaching or runoff. There are 1,673 sections of land (1.1 million acres) identified as leaching GWPAs, where the mitigation measures are designed to prevent over-irrigation. There are 2,015 sections of land (1.3 million acres) identified as runoff GWPAs, where the mitigation measures are designed to either prevent offsite movement of contaminated runoff or manage contaminated runoff so that it does not move to ground water. Fifty four sections of land (35,000 acres) were identified as partial leaching and partial runoff GWPAs.

For the first time, DPR had identified a basis for not only regulating pesticides to prevent pesticide contamination before it occurs but also for targeting mitigation measures to the pathway of contamination. Property operators, such as growers, must obtain a permit from the County Agriculture Commission (CAC) before they may use a regulated pesticide listed in 3 CCR section 6800(a) in a leaching or runoff GWPA. The permit specifies the pesticide use modifications, tailored to the specific vulnerability of the intended treatment site, which the permittee must follow. The permittee must notify the CAC within 24 – 48 hours before 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 appropriately. CACs also conduct application inspections to ensure compliance with permit and pesticide label requirements.

In addition, DPR continues to enforce statewide regulations to protect ground water from the use of aldicarb and bentazon (3 CCR sections 6458 and 6457, respectively) by regulating the application period, specific crop, and crop growth stage on which they can be applied.

More information on how DPR and CACs regulate the use of ground water 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).

### **Assessing the Effectiveness of Mitigation Measures**

In 1999, DPR initiated a long term monitoring study to gather baseline pesticide concentrations and eventually measure the effectiveness of the expected revision in the ground water protection regulations. The revised regulations were adopted in 2004 to protect ground water from further contamination by pesticide residues. The wells were selected on the basis of type, location, and monitoring history. DPR's well monitoring network is comprised of approximately 70 shallow, domestic wells located in runoff and leaching GWPAs in Fresno and Tulare counties. Previous sampling by DPR showed that all of the candidate wells contained residues of pesticides that in 1999 were regulated as ground water contaminants, which were primarily simazine, bromacil, and diuron. The objective of the monitoring is to determine trends in pesticide residue concentration and detection frequency in areas where the use of these pesticides is regulated.

Preliminary analysis suggests that regulatory action taken by DPR prior to 2004 resulted in measurable decreases in well water concentration for many of the regulated pesticides. Available data also indicate the need for further monitoring of this network to assess the success of the more encompassing regulations implemented following 2004. DPR will publish a separate report that includes the first in-depth statistical analysis and discussion of these data as well as

## **ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – DPR**

analysis of pesticide use patterns, agricultural practices, well construction, and other observational information that may impact the observed effects for each well.

For a summary of the results, please refer to:

Garretson, C. 2010. Study 182 / 228–Preliminary Summary of Results for Well Sampling from 1999 through 2010. Available at:

<[http://www.cdpr.ca.gov/docs/emon/pubs/ehapreps/228\\_study\\_memo\\_2010.pdf](http://www.cdpr.ca.gov/docs/emon/pubs/ehapreps/228_study_memo_2010.pdf)>.

For more information about this study, please refer to:

Garretson, C. 1999. Study 182: Protocol for Monitoring the Concentration of Detected Pesticides in Wells Located in Highly Sensitive Areas. Available at:

<<http://www.cdpr.ca.gov/docs/emon/pubs/protocol/prot182.pdf>>.

DPR is also working on the development of pesticide use modifications that protect ground water and are practical and effective. The most recent effort focused on the application of preemergent herbicides through a low volume micro-sprinkler irrigation system. Study results will be presented in a separate report. For more information on this study, please refer to:

DaSilva, A. 2007b. Study 241 - Protocol to Demonstrate the Effectiveness of Chemigation of Pre-emergence Herbicides through Low-Volume Micro-Sprinkler Irrigation Systems on a Sandy Soil. Available at: <<http://www.cdpr.ca.gov/docs/emon/pubs/protocol/241prot.pdf>>.

For more information on earlier, related studies, please refer to:

Troiano, J. 2003. Study 221 - Protocol to Demonstrate the Effectiveness of Chemigation of Pre-emergence Herbicides through Low-Volume Irrigation Systems. Available at:

<<http://www.cdpr.ca.gov/docs/emon/pubs/protocol/prot221.pdf>>.

Basinal, L., T. Jacobsen, A. Da Silva, J. Troiano, P. Reising, D. Laird, D. Stubbs, and A. Barefoot. 2007. Demonstration of Effectiveness of Chemigation of Pre-emergence Herbicides Applied through Low Volume Irrigation Systems. Final Report to DPR. Available at:

<<http://www.cdpr.ca.gov/docs/emon/pubs/ehapreps/eh0701.pdf>>.

DaSilva, A., 2007a. Study 221 - Demonstration Study on Chemigation of Simazine and Diuron on Citrus Orchard in Tulare County. Available at:

<<http://www.cdpr.ca.gov/docs/emon/surfwtr/caps/study221memo.pdf>>.

Dias, J. and A. DaSilva. 2008. Preliminary Results for Study 221: Effect of Chemigation Injection Speed on the Efficacy and Leaching of the Pre-Emergence Herbicides Simazine and Diuron. Available at: <[http://www.cdpr.ca.gov/docs/emon/surfwtr/caps/studymemo\\_221.pdf](http://www.cdpr.ca.gov/docs/emon/surfwtr/caps/studymemo_221.pdf)>.

## ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – DPR

### Monitoring Ground Water Vulnerability outside GWAs

DPR is currently conducting a study to assess the vulnerability of areas outside current GWAs by monitoring for regulated and suspected pesticide contaminants. Study results will be presented in a separate report.

For more information about this study, please refer to:

Nordmark, C, Fossen, M. and Marade, J. 2007. Study 240: Protocol for Monitoring Ground Water in Sections with Reported Detections Outside Existing GWAs. Available at: <http://www.cdpr.ca.gov/docs/emon/pubs/protocol.htm>.

### Identifying Potential Ground Water Contaminants

The purpose of the PCPA (FAC sections 13141–13152) is to prevent pesticide pollution of ground water of the state that may be used for drinking water supplies. The PCPA outlines procedures for:

- Obtaining physical and chemical data on agricultural use pesticides from manufacturers (registrants).
- Establishing specific numerical values (SNVs [threshold values]) for data that the PCPA associates with the potential of a pesticide to leach through soil to ground water.
- Identifying registered agricultural use pesticides that exceed one or more of the SNVs in both categories for persistence and mobility and posting this list to DPR's Web site annually.<sup>28</sup>
- Placing agricultural pesticides that exceed the SNVs and are applied in specified ways<sup>29</sup> on the GWPL (3 CCR section 6800[b]).
- Monitoring for pesticides identified as potential contaminants to determine if they have migrated to ground water as a result of legal agricultural use.

To facilitate the primary goal of preventing further pollution of ground water, DPR developed several key processes to evaluate an agricultural pesticide's pollution potential: the creation of a physical-chemical properties database, modeling a pesticide's fate in the environment, evaluating new pesticides for potential leaching prior to registration, and the prioritization of pesticides for monitoring.

For more information, please refer to DPR's Identifying Potential Pesticide Contaminants Web page at: [http://www.cdpr.ca.gov/docs/emon/grndwtr/gwp\\_contaminants.htm](http://www.cdpr.ca.gov/docs/emon/grndwtr/gwp_contaminants.htm).

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<sup>28</sup> The SNVs associated with mobility are water solubility (> 3 ppm) and soil adsorption coefficient (Koc) (< 1900 cm<sup>2</sup>/gm), and the SNVs associated with persistence are hydrolysis (> 14 days half-life), aerobic soil metabolism (> 610 days half-life), and anaerobic soil metabolism (> 9 days half-life) (FAC section 13144 and 3 CCR section 6804).

<sup>29</sup> The pesticide is intended to be applied to, or injected into, the soil by ground-based application equipment or by chemigation; or the label of the pesticide requires or recommends that the application be followed within 72 hours by flood or furrow irrigation (FAC section 13145 [d]).

## **ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – DPR**

### **Collecting and Reporting Environmental Fate Data on Agricultural Pesticides**

DPR maintains environmental fate data on over 400 agricultural use pesticides in the Pesticide Chemistry Database. The database contains the following physical and chemical data for those pesticides: water solubility, vapor pressure, hydrolysis half-life, aqueous photolysis half-life, Henry's Law constant ( $K_H$ ), anaerobic and aerobic soil metabolism half-lives, field dissipation half-life, soil photolysis half-life, soil adsorption coefficient ( $K_{oc}$ ), and the octanol-water partition coefficient ( $K_{ow}$ ). This information is obtained from studies submitted by pesticide registrants in compliance with the California registration process for agricultural use pesticides.

DPR prepares the "Pesticide Contamination Prevention Act Status Report" by screening the data in the Pesticide Chemistry Database against the SNVs to identify mobile and persistent pesticides that may have the potential to contaminate ground water. The SNVs are threshold values that DPR established for five pesticide properties: water solubility,  $K_{oc}$ , hydrolysis half-life, aerobic soil metabolism half-life, and anaerobic soil metabolism half-life. The status report lists agricultural use pesticides that exceed the SNVs or have ground water protection data gaps. The report also provides the sales and use data and the registration status of each pesticide that exceeds the SNVs.

The Pesticide Chemistry Database is currently undergoing an extensive quality assurance review. Although DPR has all required ground water protection data for registered agricultural use pesticides, some data were not transferred to the Pesticide Chemistry Database. Staff identified approximately 900 studies associated with 125 pesticides that were not in the database and focused their reviews on pesticides with a potential to contaminate ground water, such as those on the GWPL (3 CCR section 6800[b]). To date, about two-thirds of those studies have been evaluated and entered into the database. In tandem with the data gap review process, terrestrial field dissipation half-lives are being recalculated for consistency and clarity using an established standard operating procedure (Bergin, 2010).

To view the most recent report of agricultural pesticides that exceed mobility and persistence criteria, please refer to:

Bergin, R. 2010 Status Report Pesticide Contamination Prevention Act. Available at:  
<[http://www.cdpr.ca.gov/docs/emon/pubs/ehapreps/report\\_pcpa10.pdf](http://www.cdpr.ca.gov/docs/emon/pubs/ehapreps/report_pcpa10.pdf)>.

For more information, please refer to the Pesticide Chemistry Data page at:  
<[http://www.cdpr.ca.gov/docs/emon/grndwtr/chem\\_data.htm](http://www.cdpr.ca.gov/docs/emon/grndwtr/chem_data.htm)>.

### **Use of Contaminant Transport Computer Modeling Tools**

DPR uses a multi-component modeling tool to evaluate the environmental behavior of pesticides in the soil environment. This modeling tool is used to help evaluate the potential of pesticide products submitted for California registration to contaminate ground water. DPR also uses the modeling tool in conjunction with other elements to prioritize pesticides for routine ground water monitoring throughout the state. Pesticides with a higher simulated threat of contaminating ground water generally receive priority for ground water monitoring. The model has also been used to aid the design of DPR field studies, particularly when studying how water applications influence the movement and fate of pesticides in the soil.

## ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – DPR

The first component of the modeling tool utilizes the LEACHM pesticide fate and transport model (Hutson and Wagenet, 1992) to predict residue movement through the root zone of a simulated crop. This component simulates a typical California soil known to be vulnerable to pesticide movement and where the underlying ground water has been impacted by pesticides resulting from agricultural use (Spurlock, 2000). The model simulates climatic conditions typical of the area, natural rainfall, and irrigation applications made during the active growing season. Pesticide applications are simulated at maximum label rates with frequency and timing of applications specific to their use patterns. Various physical-chemical properties of the pesticide under evaluation are used. However, a few of these properties have a wide-ranging distribution of values and the model output happens to be particularly sensitive to these properties. To address these issues, the physical-chemical properties are randomly selected in large quantities from their respective range of distribution and substituted into successive model simulations. The result of these successive simulations is a distribution of estimated leaching residues below the crop root zone.

These estimates are passed to a second modeling component that simulates residue movement to ground water and eventually to domestic wells. With the aid of statistical methods, each estimated well water concentration can be assigned a level of probability of occurrence (Troiano and Clayton, 2009). DPR considers the predicted concentrations in well water and their associated probabilities when assessing a pesticide's potential to threaten California ground water.

A limitation of the current modeling scenario is the inability to assign depth-specific residue dissipation rates to a soil profile. Studies indicate that slower abiotic hydrolytic processes rather than biotic degradation dominate pesticide dissipation in deeper subsurface soils containing little organic matter, especially in saturated soils or in those that are frequently irrigated. In some instances this modeling limitation may result in underestimated well water concentrations. Data obtained from a field study conducted by DPR (Clayton, 2007) that investigated simazine and diuron fate at various depths in the soil is expected to identify a process or lead to further research to identify a process that estimates depth-specific residue dissipation rates. Current analysis of study data indicates that the dissipation rate of simazine and diuron, two pesticides found in California ground water, is considerably reduced at greater soil depths. However, the staff were unable to determine important hydraulic properties of the soil with a computer modeling procedure successfully used in past studies. Limitations with this modeling procedure were related to abrupt changes in soil type over the ten-foot depth of soil collected in the study. This necessitated further sampling of the soil along with various laboratory-based analyses of the samples in order to determine the required soil hydraulic properties. With this information, progress with this study will continue resulting in a study report in the near future.

For more information, please refer to:

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. Available at:

[http://www.cdpr.ca.gov/docs/emon/pubs/ehapreps/analysis\\_memos/probabilistic\\_model.pdf](http://www.cdpr.ca.gov/docs/emon/pubs/ehapreps/analysis_memos/probabilistic_model.pdf).

## **ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – DPR**

### **Evaluating New Pesticides for Registration and Use in California**

Agricultural use pesticides proposed for registration whose physical and chemical properties exceed the SNVs undergo additional review to ensure that the pesticide does not pose an undue threat to ground water. The staff review data from terrestrial field dissipation studies where pesticides are applied to bare or cropped plots and then monitored for movement and persistence in the soil. These data provide a partial assessment of the potential threat the pesticide might pose to ground water. Persistence data from these studies along with other physical-chemical data supplied by the pesticide registrants and agronomic practices are used in the LEACHM modeling scenario described earlier to estimate each pesticide's potential to contaminate ground water in leaching-vulnerable California soils.

If it appears that a new pesticide is likely to be detected in ground water following normal use practices, DPR will require the pesticide registrant to supply additional data that would extend the scope of the existing data or provide information that is more specific to California conditions. A re-evaluation of the pesticide would be conducted with the enhanced data to determine whether the contamination potential can be mitigated. If necessary, the registrant will be required to take steps, such as amending the product label or committing to a stewardship program, to mitigate the potential threat to ground water before DPR would approve the pesticide for use in California. A perceived continued threat to California ground water would most likely result in denial of California registration.

Between July 1, 2010, and December 31, 2010, DPR's Ground Water Protection Program evaluated the ground water contamination potential of 2 active ingredients proposed for California registration. Following evaluation, the staff concluded that products containing these active ingredients did not present a significant threat to ground water and determined that the data provided by the registrant supported registration.

### **Prioritizing Potential Pesticide Contaminants for Monitoring**

As required by the PCPA, DPR monitors ground water in California to determine if pesticides on the GWPL have migrated to ground water as a result of legal agricultural use. Prior monitoring results indicate that the risk of ground water contamination varies with the pesticides' environmental fate, use intensity, and typical application practices. Since the pesticides on the GWPL do not pose equal risks to ground water and the SNV process fails to assign any magnitude of their risk, DPR has developed a method to rank the pesticides on this list based on a comparison of their relative risks. This ranking enables DPR to direct limited resources to monitoring the pesticides that pose the greatest risk to ground water.

The ranking scheme relies on information that includes pesticide use and environmental fate data, label-specific information such as application site, rate, and method, and whether the pesticide is currently registered for use. DPR assigns higher priority for analytical method development and field monitoring to agricultural pesticides that:

- Have a higher likelihood of ground water contamination due to their persistence and mobility in soil based on computer simulated contaminant transport modeling. The modeling scenario is similar to that described earlier.

## ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – DPR

- Are used intensively or whose use is increasing based on data collected through DPR's [Pesticide Use Reporting Program](#).
- Are primarily applied directly to the soil or are watered in by flood or furrow irrigation soon after application.

Other qualitative factors, such as application method, use sites, and the existence of previous detections in California or nationwide are considered in the ranking process.

Based on the intensity of pesticide use and computer modeling, 17 A.I.s were selected from the GWPL prioritization scheme for future consideration for method development and monitoring. These pesticides are relatively highly ranked, currently registered for use, and have not been monitored for in the previous 15 years, if at all. After considering the qualitative factors mentioned above, the 17 A.I.s were further categorized as having a relatively high, medium, or low potential to leach to ground water. A method development and monitoring priority for the A.I.s was established as high, medium, or low, respectively. Proposed ground water monitoring in 2012 will be focused on 3 A.I.s in the high priority category – linuron, mefenoxam, and propyzamide – and 1 A.I. in the low priority category – methomyl (Clayton, 2011). Methomyl was proposed for monitoring despite its low priority because of its overlapping use pattern with propyzamide and because it has never been included in a wide-area monitoring study conducted by DPR. Efficiencies can be achieved by sampling for both pesticides concurrently.

Development work continues with the GWPL prioritization scheme. The staff have begun updating methods of quantifying use for each A.I. including statewide use, use in leaching and runoff vulnerable areas, and change in use over specific time periods. The staff are also updating the various qualitative factors of the prioritization scheme including identification of sites of use and the estimated proportion of direct soil application of each A.I. In addition, the staff are considering adopting a more sophisticated probabilistic approach for the computer modeling-component of the scheme. The overall performance of the prioritization scheme can be evaluated by its ability to predict ground water contaminants.

Currently, the scheme has established high rankings for the pesticides known to impact California ground water, with the exception of prometon because only minimal use of this pesticide has occurred since pesticide use reporting began in California. Results from future ground water monitoring studies will be compared to rankings of active ingredients on the prioritization scheme.

For more information, please refer to:

Clayton, M. 2011. Selection of Pesticide Active Ingredients for Future Analytical Method Development and Ground Water Monitoring. Available at: [http://www.cdpr.ca.gov/docs/emon/pubs/ehapreps/analysis\\_memos/ai\\_priorities\\_2011\\_2304-ross.pdf](http://www.cdpr.ca.gov/docs/emon/pubs/ehapreps/analysis_memos/ai_priorities_2011_2304-ross.pdf).

## ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – DPR

### *Monitoring for Potential Pesticide Contaminants*

#### **Monitoring for Azoxystrobin, Dichloran, and Iprodione**

Azoxystrobin, dichloran, and iprodione, all agricultural pesticides on the GWPL (3 CCR section 6800[b]), were selected for monitoring based on DPR's method for prioritizing potential pesticide contaminants (Pyatt, 2009). DPR prioritized AIs on the GWPL (3 CCR section 6800[b]) using a combined ranking scheme based on fate and transport modeling and pesticide use reporting. Of the AIs that were high priority, iprodione was selected as the primary candidate for analytical method development, with dichloran and azoxystrobin identified as lower ranked priorities (Pyatt, 2009). In 2010, DPR began sampling wells for these pesticides and their main degradates to determine if they had migrated to ground water in areas with high reported agricultural use and shallow depth-to-ground water.

A multi-analyte screen (ADI) was developed by the CDFA laboratory for following parent pesticides and degradates.

- azoxystrobin (methyl (E)-2-{2-[6-(2-cyanophenoxy) pyrimidin-4-yloxy]phenyl}-3-methoxyacrylate).
- dichloran (2,6-dichloro-4-nitroaniline).
- iprodione (3-(3,5-dichlorophenyl)-N-(1-methylethyl)2,4-dioxo-1-imidazoline-carboximide) and its stereoisomer (3-(1-methylethyl)-N-(3,5-dichlorophenyl)-2,4-dioxo-1-imidazolidine carboxamide).
- azoxystrobin degradates (methyl(Z)-2{2-[6-(2-cyanophenoxy)pyrimidin-4-yloxy]phenyl}-3-methoxyacrylate (R-230310)) and ((E)-2-[6(2-cyanophenoxy)pyrimidin-4-yloxy]phenyl)-3-methoxyacrylic acid).
- iprodione degradate (3,5-dichloroaniline).

As reported in the [2010 Update of the Well Inventory Database](#), DPR sampled 114 wells for azoxystrobin, dichloran, iprodione, two azoxystrobin degradates, and an iprodione degradate between May and August 2010. Seventy-nine of those wells were also sampled for atrazine, bromacil, diuron, norflurazon, prometon, and simazine – pesticides regulated as ground water contaminants and listed in 3 CCR section 6800[a]; hexazinone and tebuthiuron – pesticides that have been detected in ground water and are listed in 3 CCR section 6800 [b]; and degradates of several of these pesticides (collectively referred to as the “triazine screen”). In November 2010, DPR sampled an additional 10 wells in Glenn County for azoxystrobin, dichloran, iprodione, 2 azoxystrobin degradates, and an iprodione degradate.

Three of the 124 wells sampled had residues of azoxystrobin acid, a degradate of azoxystrobin, at concentrations of 0.101 ppb, 0.268 ppb, and 0.263 ppb ([Appendix C](#)). Two of these detections were located in very shallow wells near rice fields in Glenn County. DPR sampled additional wells within one mile of the detections and detected azoxystrobin acid residues in a third well in Glenn County (Table 8). DPR's Medical Toxicology Branch reviewed the detected concentrations and concluded that, based on the limited available evidence on the degradate, the detected concentrations might not be expected to pose a threat the human health (Schreider, 2011).

## ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – DPR

Twenty-three of the 79 wells sampled for analytes on the “triazine screen” had residues of one or more of the following: bromacil, diuron, norflurazon, simazine and or three of their degradates – ACET, DACT, and DSMN. (Table 8). Of this total, twelve wells contained residues of three or more pesticides and/or degradates and one well contained six pesticides and degradates. None of the detected pesticide concentrations exceeded mandatory or advisory health levels.

**Table 8. Well sampling results for Study GW10A collected in 2010.**

County	Wells Sampled for ADI*	Wells Sampled for Triazine Screen	Wells With Detections								
			Total	Azoxystrobin Acid	DACT	ACET	Simazine	Bromacil	DSMN	Norflurazon	Diuron
Butte	7	7	0	0	0	0	0	0	0	0	0
Fresno	17	17	13	0	13	11	7	1	9	2	3
Glenn	16	2	3	3	0	0	0	0	0	0	0
Kern	10	9	2	0	2	1	1	2	0	0	1
Merced	11	3	0	0	0	0	0	0	0	0	0
Monterey	17	14	1	0	0	0	1	0	0	0	0
Santa Barbara	3	3	0	0	0	0	0	0	0	0	0
Santa Cruz	1	1	0	0	0	0	0	0	0	0	0
Stanislaus	11	11	6	0	5	1	0	0	3	0	1
Tulare	23	4	1	0	0	1	1	0	0	0	0
Ventura	8	8	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>124</b>	<b>79</b>	<b>26</b>	<b>3</b>	<b>20</b>	<b>14</b>	<b>10</b>	<b>3</b>	<b>12</b>	<b>2</b>	<b>5</b>

\* ADI = azoxystrobin, dicoran, iprodione, two azoxystrobin degradates, and an iprodione degradate

Study results will be presented in a separate report.

For more information about this study, please refer to:

Dias, J., 2010. Study GW10: Protocol for Groundwater Protection List monitoring for azoxystrobin, chlorothalonil, dichloran, and iprodione. Available at: [http://www.cdpr.ca.gov/docs/emon/pubs/protocol/gw10protocol\\_final.pdf](http://www.cdpr.ca.gov/docs/emon/pubs/protocol/gw10protocol_final.pdf).

Pyatt, E. 2009. 2009 Request to develop analytical methods for azoxystrobin, chlorothalonil, dichloran, iprodione, and vinclozolin and significant degradates in well water. Available at: [http://www.cdpr.ca.gov/docs/emon/pubs/ehapreps/analysis\\_memos/iprodione\\_and\\_other\\_fungicides.pdf](http://www.cdpr.ca.gov/docs/emon/pubs/ehapreps/analysis_memos/iprodione_and_other_fungicides.pdf).

## ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – DPR

### Monitoring for Oryzalin

DPR selected oryzalin, a soil-applied agricultural herbicide, to test the predictive capabilities of the current GWPL prioritization scheme described previously and to sample high-use areas that had not been surveyed during previous studies conducted in 1993, 1998, and 2006. In December 2010, DPR sampled 13 wells located in San Joaquin County for oryzalin and pesticides and degradates included in the “triazine screen” described above. Oryzalin was not detected in any wells sampled. Norflurazon, DSMN (a degradate of norflurazon), ACET and DACT (degradates of atrazine and/or simazine) were detected in 6 of the 13 wells sampled (Table 7).

DPR will sample 27 additional wells in 2011, for a total of 40 wells. Counties where sampling may occur include Fresno, Kern, Kings, Madera, Merced, Stanislaus, and Tulare based on the high oryzalin use and/or soil vulnerability. Results from this sampling will be available in the 2012 Update of the Well Inventory Database. Study results will be presented in a separate report.

For more information about this study, please refer to:

Aguirre, K., 2010. Study GW10B: Protocol for Groundwater Protection List Monitoring for Oryzalin. Available at:

<[http://www.cdpr.ca.gov/docs/emon/pubs/protocol/gw10b\\_protocol\\_final.pdf](http://www.cdpr.ca.gov/docs/emon/pubs/protocol/gw10b_protocol_final.pdf)>.

### ***Pesticide Contamination Prevention Act Review Process Triggered by Detections of Hexazinone in Ground Water***

Hexazinone, a soil-applied agricultural herbicide, was registered for use in California in the late 1970s. Hexazinone residues were first reported in California ground water in 1997. Subsequent investigations (November 1997 through August 2009) resulted in 22 additional detections and a determination, in 2010, that movement of hexazinone residues from alfalfa field applications to shallow ground water was the result of legal agricultural use. In November 2010, DPR notified the registrants of pesticide products containing hexazinone that residues had been detected in California ground water as a result of legal agricultural use. This notification initiated the [Pesticide Contamination Prevention Act Review Process](#) which gave the registrants an opportunity to present information to a subcommittee of the Pesticide Registration and Evaluation Committee at a public hearing. On December 1, 2010, in response to this notification, E. I. Du Pont De Nemours and Co., Inc., the registrant of seven products containing hexazinone, requested a public hearing which DPR scheduled to occur on May 9, 2011.

For more information, please refer to DPR’s “Pesticide Contamination Prevention Act Review Process Triggered by Detection of Hexazinone in Ground Water” Web page at:

<<http://www.cdpr.ca.gov/docs/emon/grndwtr/hexazinone.htm>>.

## ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – DPR

### *Improving Access to DPR Ground Water Protection Program Information*

In 2010, DPR completed a major overhaul of the [Ground Water Protection Program](#) Home page. This effort allowed us to identify and fill content gaps such as how DPR identifies potential pesticide contaminants and formally reviews pesticides detected in ground water. Once all aspects of the program were represented, DPR focused on improving the site navigation to make it easier for users to find the information that they need.

DPR also established a Ground Water Protection Program [Electronic Mailing List](#) which allows subscribers to receive e-mail updates on DPR's Ground Water Protection Program, including public meeting notices and related information.

To sign up for pesticide-related updates, including ground water protection, you can either click the Ground Water Protection Program link above or go to DPR's Home page <[www.cdpr.ca.gov](http://www.cdpr.ca.gov)> and click on the "News, Op-Eds & Publications" link on the left-hand side and then click on "E-Mailing Lists". You can also navigate to the Ground Water Protection Program Home page by clicking on "Water" at the top of the main DPR Home page.

## **ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – SWRCB**

### **STATE AND REGIONAL WATER RESOURCES CONTROL BOARDS**

As required by PCPA (FAC 13152), this section, prepared by the SWRCB and the RWQCBs, describes recent actions taken to prevent pesticides from migrating to California’s ground water.

#### ***State Water Board***

Actions taken by the SWRCB (State Water Board) to prevent pesticides from migrating to groundwater of the State are as follows:

- Regularly attended meetings sponsored by the DPR, including the interagency PREC and Pest Management Advisory Committee PMAC.
- Participated in ongoing consultations with DPR staff, University of California (UC) scientists, and pesticide manufacturers to design monitoring studies and Best Management Practices (BMPs).
- Participated in discussions with U.S. Geological Survey (USGS) scientists on studies dealing with pesticides and water quality.
- Reviewed, on an ongoing basis, DPR Notices of “Materials Entering Evaluation” and advised DPR on potential water quality impacts of pesticide registration and use decisions.
- Reviewed and commented on DPR’s proposed studies on pesticide and water quality pursuant to the Management Agency Agreement (MAA) with DPR.
- In coordination with the USGS and LLNL, the State Water Board is implementing the GAMA. To date, the GAMA – Priority Basins Project has sampled over 2,300, mostly public water supply wells, for various chemicals and parameters, including pesticides, herbicides and their degradates. The water quality results from 385 wells for the following study units published in 2010 are summarized in Table 12: Colorado River, South Coast Ranges Interior, Sierra Regional, Upper Santa Ana River, and South Coast Ranges-Coastal.

## ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – SWRCB

**Table 9. Actions taken to protect ground water by the SWRCB in 2010.**

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
<b>Tulare County</b>	Domestic Wells	Pesticides, Herbicides, and Degradates	One hundred eighty two domestic wells were sampled in Tulare County. Delta Laboratory analyzed water samples for DBCP only. DBCP was found in 26 wells at maximum concentration of 1.63µg/L. Additionally, LLNL analyzed water samples from 19 wells for CDFA list of pesticides and degradates. The most frequently detected were Simazine, Diuron and Bromacil at maximum concentrations of 0.158, 0.75 and 1.021µg/L, respectively. The most frequently detected degradates were Deisopropyl Atrazine and Deethylatrazine at maximum concentrations of 0.732 and 0.05µg/L, respectively. Less frequently detected pesticides and degradates were Atrazine (0.037µg/L), Cyanazine (0.012µg/L), Norflurazon (1.39µg/L), Hexazinone (0.027µg/L), Desmethylnorflurazon (0.323 µg/L), Primodone (0.07 µg/L), Metolachlor (0.077 µg/L), and Diamino Chlorotriazine (0.099 µg/L).
<b>Upper Santa Ana Watershed</b>	Various GAMA sampled wells	Pesticides, Herbicides, and Degradates	Ninety nine wells were sampled during June-November 2006, and all samples were analyzed for pesticide. Out of 134 pesticides and degradates 13 were detected, all below any health-based threshold values. The pesticides detected in more than 10% of the wells were: Atrazine, Simazine, Deethylatrazine and Deisopropylatrazine (degradates), Bromacil, Diuron, and 3,4-Dichloro-aniline at maximum concentration of 0.78, 0.139, 0.055, 0.72, E1.99, 0.229 and E0.018µg/L, respectively.
<b>Colorado River</b>	Various GAMA sampled wells	Pesticides, Herbicides, and Degradates	Twenty eight wells were sampled during October-December, 2007, and all samples were analyzed for pesticides. Out of 62 pesticides and degradates 5 were detected, all below any health-based threshold values. Most common were: Atrazine, Simazine and Deethylatrazine (degradate) at max. concentration of E 0.007, E0.007 and E0.005 µg/L, respectively
<b>South Coast Ranges-Interior</b>	Various GAMA sampled wells	Pesticides, Herbicides, and Degradates	Fifty four wells were sampled during August-December 2008, and 69 samples were analyzed for pesticides. Out of 123 pesticides and degradates, 5 were detected, all below any health-based threshold values. Most common were: Simazine and Deethylatrazine (degradate), at maximum concentration of 0.014 and E 0.011µg/L, respectively. Also, Prometon, Tebuthiuron and Bentazon were found at concentrations of 0.021, E0.03, 0.11µg/L, respectively.

**ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – SWRCB**

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
<b>Upper Santa Ana</b>	Various GAMA sampled wells	Pesticides, Herbicides, and Degradates	Ninety nine wells were sampled during November 2006-March 2007, and all samples were analyzed for pesticides. Out of 134 pesticides and degradates, 13 were detected, in more than 75% of the wells, all below any health-based threshold values. The most common were: Atrazine, Simazine and Deethylatrazine (degradate) at maximum concentrations of 0.078, 0.139 and E0.051 µg/L respectively. Also, Bromacil, Diuron, 3,4-Dichloroaniline (degradate), Prometon and Tebuthiuron were detected at maximum concentrations of 0.13, 0.229, E0.018, 0.002 and 0.02 µg/L, respectively.
<b>South coast Ranges - Coastal</b>	Various GAMA sampled wells	Pesticides, Herbicides, and Degradates	Seventy wells were sampled during May-December 2008, and 69 samples were analyzed for pesticides. Out of 123 pesticides, polar pesticides and degradates, 11 were detected, in about 30% of the wells, all below any health-based threshold values. The most common were: Deethylatrazine (degradate), Atrazine, Simazine at maximum concentrations of 0.021, 0.011 and 0.009 µg/L, respectively. Also, Metolachlor, Bromacil and Diuron, were detected at maximum concentrations of 0.011, 0.08 and E0.02 µg/L, respectively.

## ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – RWQCBs

### *Regional Water Quality Control Boards*

The information below summarizes, by county, the monitoring, assessment, cleanup, and other actions taken by the nine RWQCBs to address point sources of contamination for pesticides.

### **Region 1 – North Coast Regional Water Quality Control Board**

**Table 10. Actions taken by the North Coast Regional Water Quality Control Board (Region 1) in 2010.**

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
<b>Humboldt</b>	Sierra Pacific, Arcata	Pentachlorophenol, Tetrachlorophenol,	Ongoing contamination cleanup.
	Carlotta Lumber Company	Pentachlorophenol, Tetrachlorophenol	Ongoing contamination cleanup.
	Sun Valley Bulb Farms	Chlorothalonil, Dithiocarbamate	Ongoing monitoring and assessment to prevent discharges to surface water and ground water under RWQCB direction.
	Pacific Lumber Co., Carlotta	Pentachlorophenol, Tetrachlorophenol	Ongoing contamination cleanup.
	Schmidbauer, Arcata	Pentachlorophenol, Tetrachlorophenol	Ongoing contamination cleanup.
	Schmidbauer, Eureka	Pentachlorophenol, Tetrachlorophenol	Ongoing contamination assessment and cleanup.
	Simpson Plywood Mill (Old), Eureka	Pentachlorophenol, Tetrachlorophenol	Ongoing contamination assessment and cleanup.
	Hi-Ridge Lumber Company	Pentachlorophenol, Tetrachlorophenol	Ongoing contamination assessment and cleanup.
	Pine Mountain Lumber Company	Pentachlorophenol, Tetrachlorophenol	Ongoing contamination assessment and cleanup.
	Morgan Door, Roseburg	Pentachlorophenol, Tetrachlorophenol	Ongoing contamination cleanup.
<b>Siskiyou</b>	J.H. Baxter	Pentachlorophenol, Tetrachlorophenol	Ongoing contamination cleanup.

**ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – RWQCBs**

**Region 2 – San Francisco Bay Regional Water Quality Control Board**

**Table 11. Actions taken by the San Francisco Bay Regional Water Quality Control Board (Region 2) in 2010.**

<b>COUNTY</b>	<b>SITE</b>	<b>PESTICIDE</b>	<b>PREVENTION ACTION</b>
	Jones-Hamilton	Pentachlorophenol (PCP), Tetrachlorophenol (TCP)	Ongoing groundwater monitoring for VOCs, PCP and TCP.
	Port of Oakland (Embarcadero Cove)	Chlordane, Pentachlorophenol, DDT, Endosulfan, 2,3,7,8-TCDD, DDD	Remedial Action Plan including continuous ground water monitoring.
	Peerless Southern Pacific Railroad	Pentachlorophenol	Additional soil and ground water investigations required.
	FMC, Newark	EDB	Ongoing groundwater monitoring for VOCs, specified time schedule for final cleanup actions. Ground water cleanup underway.
<b>Contra Costa</b>	Chevron	Endrin, Lindane, Dieldrin, DDT, Arsenic	A cut-off wall with a ground water extraction trench around the impoundment has been constructed.
	Levin Metals	Aldrin, 4,4'-DDD, 4,4'-DDE, o,p,-DDT, Dieldrin, BHC	Awaiting report of completion for remedial dredging project.
	FMC, Richmond	DDT, DDD, DDE, Dieldrin, Chlordane, Tedion, Endosulfan, Ethion, Carbophenothion, Heptachlor	Monitor to assure remaining pollutants do not migrate.
<b>Marin</b>	Former Sonoma Mosquito Abatement District, San Rafael	DDD, DDE, DDT, Dieldrin	DTSC has mailed out draft deed restriction and draft O&M Agreement for site.
<b>Solano</b>	Travis Air Force Base	Aldrin, Heptachlor, Alpha-Chlordane, Heptachlor Epoxide	Groundwater extraction, treatment and monitoring have been ongoing since 2001.

**ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – RWQCBs**

**Region 3 – Central Coast Regional Water Quality Control Board, Central Coast**

**Table 12. Actions taken by the Central Coast Regional Water Quality Control Board (Region 3) in 2010.**

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Monterey	Monterey Soil Service, King City	EDB and DBCP	Monitored natural attenuation is used at the site for low-level residual EDB and DBCP concentrations in groundwater. Groundwater monitoring activities are expected to continue into fiscal year 2011/2012.
Santa Clara	Castle-Veg-Tech, Morgan Hill	Toxaphene, Endrin, Lindane, Endosulfan	The Water Board and dischargers entered into settlement agreements to resolve outstanding violations and penalties. As a result, improvements to the groundwater monitoring network were made to better characterize aquifers beneath the site and pesticide impacts. Regular monitoring events have taken place and been reported on-time and in compliance with the settlement agreements. Responsible party has prepared a site-specific risk assessment and it is currently under review by the Water Board and OEHHA.
Santa Cruz	WFS-Greengro, Watsonville	1,2-DCP	Responsible parties prepared a site specific risk assessment which is currently under review by Santa Cruz County staff. Groundwater monitoring activities are expected to continue until the risk assessment is finalized. Water Board staff expects the responsible parties will seek case closure during 2012 because low level residual 1,2-DCP concentrations continue to attenuate in groundwater.

**ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – RWQCBs**

**Region 4 – Los Angeles Regional Water Quality Control Board**

**Table 13. Actions taken by the Los Angeles Regional Water Quality Control Board (Region 4) in 2010.**

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Ventura	HWY 101 and Pleasant Valley Road (Construction project)	4,4-DDD, 4,4-DDE 4,4-DDT, Dieldrin PCBs, Toxaphene	Mandatory Calleguas Creek Pesticide TMDL was incorporated in the general construction dewatering permit for this project. Quarterly monitoring is required
	Oxnard Wastewater Treatment Plant	Heptachlor epoxide, PCBs	Influent and effluent monitoring are required for these pesticides.
	Camrosa Water Reclamation Facility	Lindane, 4,4'-DDE, 4,4'-DDT	Ongoing monitoring and assessment to prevent discharges to surface water and ground water under LARWQCB direction. Semi-annual monitoring is required.
	Camarillo Sanitary District's Water Reclamation Plant (WRP)	Lindane, chlordane, 2,4-D, endrin, toxaphene, 4,4-DDE, 4,4-DDD, and 2,4,5-TP	Effluent limitation for lindane, chlordane, 2,4-D, endrin, toxaphene, 4,4-DDE, 4,4-DDD, and 2,4,5-TP (Silvex). Ongoing monitoring of pesticides in effluent and surface water, under NPDES permits requirements.
	City of Thousand Oaks' Hill Canyon Wastewater Treatment Plant (WWTP)	Alpha-BHC, Beta-BHC, Lindane (gamma-BHC), chlordane, 4,4-DDD, 4,4-DDE, Dieldrin, Heptachlor, Heptachlor epoxide, Toxaphene, Methoxychlor, 2,4-D, 2,4,5-TP (Silvex)	Effluent limitation for Alpha-BHC, Beta-BHC, Lindane (gamma-BHC), chlordane, 4,4-DDD, 4,4-DDE, Dieldrin, Heptachlor, Heptachlor epoxide, Toxaphene, Methoxychlor, 2,4-D, 2,4,5-TP (Silvex). Ongoing monitoring of pesticides in effluent and surface water, under NPDES permits requirements.
	Ojai Valley	Priority pollutant pesticides	Ongoing monitoring of pesticides in effluent and surface water, under NPDES permits requirements.
	Santa Clarita Valley Sanitation District's Saugus WRP	Priority pollutant pesticides	Ongoing monitoring of pesticides in effluent and surface water, under NPDES permits requirements.
	Santa Clarita Valley Sanitation District's Valencia WRP	Priority pollutant pesticides	Ongoing monitoring of pesticides in effluent and surface water, under NPDES permits requirements.
	Santa Paula Water Recycling Facility	Priority pollutant pesticides	Ongoing monitoring of pesticides in effluent and groundwater, under NPDES permits requirements.
	Simi Valley Water Quality Control Plant	Lindane, 4,4'-DDE, endrin, toxaphene	Ongoing monitoring and assessment to prevent discharges to surface water and ground water under LARWQCB direction. Monthly monitoring is required for lindane and 4,4'-DDE. Quarterly monitoring for endrin and toxaphene,

**ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – RWQCBs  
REGION 4 – LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD, CONTINUED**

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
	Ventura County Waterworks District No. 1 Moorpark WWTP	Priority pollutant pesticides	Ongoing monitoring of pesticides in effluent and surface water, under NPDES permits requirements.
Los Angeles	Avalon Wastewater Treatment Facility	Endosulfan, HCH, endrin, aldrin, chlordane, DDT, dieldrin, heptachlor, heptachlor epoxide, PCBs, toxaphene	Ongoing monitoring and assessment to prevent discharges to surface water and ground water under LARWQCB direction. Annual monitoring is required.
	Long Beach Water Reclamation Plant	4,4'-DDE	Ongoing monitoring and assessment to prevent discharges to surface water and ground water under LARWQCB direction. Monthly monitoring is required.
	Tapia Water Reclamation Facility	Aldrin, alpha-BHC, 4,4'-DDE, 4,4'-DDD, dieldrin, endrin, heptachlor.	Ongoing monitoring and assessment to prevent discharges to surface water and ground water under LARWQCB direction. Monthly monitoring is required.
	City of Burbank WRP	Lindane (gamma-BHC)	Effluent limitation for lindane and ongoing monitoring of priority pollutant pesticides in effluent and surface water, under NPDES permits requirements.
	Joint Outfall System's Pomona WRP	Priority pollutant pesticides	Ongoing monitoring of pesticides in effluent and surface water, under NPDES permits requirements.
	Newhall Ranch Sanitary District's Newhall Ranch WRP	Lindane (gamma-BHC) and 4,4-DDE	Effluent limitation for lindane and 4,4-DDE. Ongoing monitoring of pesticides in effluent and surface water, under NPDES permits requirements.
Regional	<p><b>Regional General NPDES Permits</b> -- For the most part pesticides do not show in reasonable amounts in discharges covered under the general NPDES permit. Therefore, effluent limitations are not necessary for most authorized discharges. When appropriate or where pesticide TMDL is in effect, effluent limitations for pesticides are incorporated into the general NPDES permit enrollments as a preventive measure.</p>		
	<p><b>Regional Individual NPDES Permits</b> – A reasonable potential analysis is used to evaluate all individual NPDES discharges and to determine whether a limit is required. The permits for discharges that demonstrate reasonable potential for pesticides include numeric effluent limitations. Discharges from individual NPDES permittees to receiving waters that have an effective TMDL for pesticides include effluent limits that have been developed based on the waste load allocations included in that TMDL..</p>		

**ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – RWQCBs**

**Region 5 – Central Valley Regional Water Quality Control Board – Fresno**

**Table 14. Actions taken by the Central Valley Regional Water Quality Control Board (Region 5, Fresno) in 2010.**

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Fresno	Blue Hills Disposal Site, County of Fresno	Dicamba, 2,4-D, Silvex	DTSC lead. Corrective action underway.
	Thompson Hayward Agriculture and Nutrition	Alpha-BHC, Beta-BHC, Gamma-BHC, Dieldrin, DBCP, Diphenamid, Heptachlor, Heptachlor Epoxide	DTSC lead. Site has been certified by DTSC and de-listed as a U.S. EPA NPL site. Remedial Action Plan Implemented. Implementation of Operation, Maintenance, and Monitoring Plan and Agreement. Cap completed. Deed restriction imposed.
	J.R. Simplot, Helm Facility	Dieldrin	Long-term groundwater monitoring.
	FMC Corporation, Fresno Facility	1,2,3-TCP, Aldrin, Dieldrin, DDT, DDD, DDE, Heptachlor, Lindane, Toxaphene, Ethyl Parathion, Malathion, Ethion, Endosulfan, Dimethoate, Furadan, Dinitrocresol, Dinoseb (DNBP)	DTSC lead. Discharge undergoing remediation, using SVE. 1,2,3-TCP in groundwater is remediated using SVE and pump and treat as primary plume control tool.
	Britz, Inc., Five Points	Toxaphene, DDT, DNBP	State Superfund site (DTSC lead). Natural attenuation. Operation and Maintenance Plan in place.
	Fresno County Wells	DBCP, EDB, 1,2-D	Pesticides detected in 146 wells (AB 1803 sampling).
	CPS (PureGro), Oxalis	1,2-Dichloropropane, 1,2,3-TCP, nitrate	Microcosm testing deemed in-situ chemical oxidation and enhanced bioremediation not viable. Engineering feasibility study and work plan for alternative in preparation.
	Mike Perez Property	DDT Toxaphene	Closure letter issued on 15 June 2009.
	Wingate Chemical Co. (Former)	Unknown	Workplan addendum for Soil and Groundwater assessment in preparation.
Kern	Brown & Bryant, Inc., Arvin	1,2-D, 1,3-D, DBCP, Dinoseb, EDB, carbaryl	Federal Superfund site (DTSC lead). U.S. EPA has prepared Remedial Information Feasibility Study Report.

**ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – RWQCBs  
 REGION 5 – CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD – FRESNO,  
 CONTINUED**

<b>COUNTY</b>	<b>SITE</b>	<b>PESTICIDE</b>	<b>PREVENTION ACTION</b>
	Brown and Bryant, Inc., Shafter	DDE, DDT, Dinoseb, VOCs, (DCP, ethylene dibromide)	State Superfund site (DTSC lead). A Final Remedial Action Plan (Soil Excavation and Soil Vapor Extraction) is being implemented. All the excavations are risk free except for AOC 2 (more excavation is planned) and AOC 3 (SVE system operation is planned).
	CPS Bakersfield Norris Rd	1,2,3-DCP	Quarterly monitoring on-going. Additional plume definition assessment needed
<b>Kings</b>	Lemoore N.A.S.	Unspecified	Investigation ongoing.
	Lakeland Dusters	DDT, Toxaphene	Remediation underway.
	Madera Municipal Airport	DDT, DDE, Toxaphene, Dicofol, Endrin	Long-term monitoring on going.
	Western Farm Service, Inc., Madera Facility	Dinoseb, DBCP, Dieldrin	Long-term monitoring on going.
<b>Tulare</b>	Crop Prod. Services – Cutler	Unknown	Additional site assessment workplan being prepared.
	Kaweah Crop Dusters	DDT, 2,4-D, 2,4,5-T, Methoxychlor	Cleanup ongoing.
	Tulare County Wells	1,2-D	Detected in wells through AB 1803 sampling. No assessment underway.

## Actions Taken to Prevent Ground Water Contamination – RWQCBs

### Region 5 – Central Valley Regional Water Quality Control Board – Redding

**Table 15. Actions taken by the Central Valley Regional Water Quality Control Board (Region 5, Redding) in 2010.**

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
<b>Butte</b>	L.P, Remanufacturing Facility, Chico	Pentachlorophenol Tetrachlorophenol	Land use restricted. Groundwater monitoring continues.
<b>Butte</b>	Former Butte County Mosquito and Vector Abatement District, Chico	DDT, DDE, DDD, Endrin, Endrin Ketone, Heptachlor, $\alpha$ - Chlordane, $\gamma$ - Chlordane	Pesticides detected in former septic tank and adjacent soils during excavation. Due to shallow local water table, in November 2010 Butte County Environmental Health Division referred the case to the Central Valley Water Board.
<b>Shasta</b>	Former Branstetter Mill Site, Redding	Pentachlorophenol	Pesticides associated with former dip tank. Residential development planned. Initial investigation identified potential human health concerns. In February 2008, case referred to DTSC who has entered into a voluntary cleanup agreement with RP, further assessment planned.
<b>Tehama</b>	Louisiana-Pacific, Former VG Mill and Jamb, Red Bluff	Pentachlorophenol Tetrachlorophenol Stoddard Solvent	CAO Order 98-712. On-going groundwater monitoring and assessment.

**ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – RWQCBs**

**Region 5 –Central Valley Regional Water Quality Control Board – Sacramento**

**Table 16. Actions taken by the Central Valley Regional Water Quality Control Board (Region 5, Sacramento) 2010.**

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
<b>Merced</b>	Merced Municipal Airport	Alachlor, Captan, Carbophenothion (trithion), DDT (total) Dicofol (Kethane), Dieldrin, Endosulfan I, II, Endosulfan sulfate, Endrin, Endrin aldehyde, Endrin ketone, Heptachlor epoxide, Methoxychlor, Toxaphene.	Groundwater monitoring did not detect pesticides in shallow groundwater.
	J.R. Simplot, Winton	1,2-DCP, 1,2,3-TCP	Pilot studies using HRC and groundwater extraction/treatment system using methanol is ongoing to treat VOCs.
	Western Farm Service, Merced	1,2-DCP, DBCP, 1,2,3-TCP	A feasibility study is being developed for full-scale remediation.
<b>Sacramento</b>	Western Farm Service, Walnut Grove	Aldrin, beta - BHC, gamma - BHC, DDD, DDE, dieldrin, heptachlor epoxide, endosulfan, disultoton, 1,2-DCP	Investigation continuing. Pesticides are associated with a drainage collection area.
	Occidental Chemical, Lathrop	EDB, DBCP, Sulfolane	Groundwater cleanup underway pursuant to stipulation and judgment approving settlement (1981). Two extraction wells brought on line in 2010 to enhance recovery of sulfolane. Treatment unit fully reconditioned in 2010.
<b>San Joaquin</b>	Continental Grain Company	Carbon Tetrachloride, chloroform, 1,2-DCP, 1,2-DCA, tetrachloroethane	Groundwater being extracted and re-circulated through an in-situ zero-valent iron formation. The process is reducing constituent concentrations.
	John Taylor Fertilizers, Stockton	Dinoseb, 1,2,3-TCP, 1,2-DCP, bromacil	Soil investigation did not identify on-site source areas for these groundwater contaminants. Investigation underway.

**ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – RWQCBs  
 REGION 5 – CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD –  
 SACRAMENTO, CONTINUED**

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
	Defense Depot, Tracy	Dieldrin, heptachlor, DDE, DDD, DDT, a-chlordane and g-chlordane	1) Pump and treat has been implemented for main dieldrin plume. 2) On April 14, 2010, the Central Valley Water Board, Department of Toxic Substances Control, and U.S. EPA settled a dispute regarding the cleanup of a dieldrin plume in the NW corner of the Depot that requires remedial actions. Implementation of the remedy is scheduled for June 2011. 3) In 2009, DLA discovered shallow soil near Building 237 contaminated with heptachlor, dieldrin, DDE, DDD, DDT, a-chlordane, and g-chlordane. After additional characterization and reporting has been completed, DLA has scheduled a removal action in September 2011.
	Port of Stockton, Rough and Ready Island	DDD, DDE, DDT, Heptachlor Epoxide, alachlor	Assessment ongoing. Soil removal actions have occurred and more are planned. Groundwater assessment underway.
	Crop Production Service, Stockton (former Pure Gro/Brea)	1,2-DCP, 1,2,3-TCP, Dinoseb	A pilot was conducted evaluating zero-valent iron for in-situ groundwater treatment.
	Former Oxychem/ Simplot/ PureGro, Stockton	1,2-DCP, Dinoseb, Chlorobenzene, 1,1,2-DCA, 2,4,5-TP, Atrazine, bromacil, tebuthiuron, simazine, DBCP, 1,2,3-TCP	Phytoremediation in progress to treat trace constituents in soil and remove contaminants from groundwater
	Cal Farm Supply	b-BHC	Groundwater monitoring will determine if b-BHC remains in groundwater.
	Crop Production Service, Vernalis	DBCP, EDB, diuron, 1,2-DCP	Unchanged
<b>Solano</b>	John Taylor Fertilizer, Dixon	DDT, tebuthiuron	Unchanged
	TSI, Dixon	DDT, DDE, 1,2-DCP, 1,2,3-TCP, endrin, endosulfan, methoxychlor, toxaphene, trifluralin	Soil remediation taking place in-situ, and some contaminated soil was excavated. VOCs are being removed from the soil column with soil vapor extraction.
	Chemurgic Agricultural Chemicals	BHC	Groundwater remediation by extraction and carbon filtration with monitoring ongoing.
<b>Stanislaus</b>	Geer Road Landfill	1,1-DCA, 1,1,1-TCA, TCE, Chloridazon, Freons	Unchanged
	Crop Production Service, Modesto	DBCP, EDB, 1,2-DCP, chlorpyrifos, DDT, disulfoton, 2,4,5-TP	An engineered cap has been installed over a majority of the site.
	Shell Agricultural Research Facility	Chloroform	Soil has been remediated. Chloroform remains.

**ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – RWQCBs  
 REGION 5 – CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD –  
 SACRAMENTO, CONTINUED**

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
	Bowles Flying Service	2,4-D, Thiobencarb, Diuron, Metalaxyl, Molinate, Simazine	Monitoring wells installed.
<b>Sutter</b>	PureGro, Robbins	1,2-DCA	Trees were planted on the site to phytoremediate nitrates in the groundwater.
	John Taylor Fertilizers, Yuba City	1,2,3-TCP	In-situ groundwater remediation using hydrogen-releasing compound is removing VOCs.
	Frontier Fertilizer Company, Davis	EDB, DCP, DBCP, Carbon tetrachloride	DTSC is lead agency. Thermal treatment of VOCs in vadose zone is selected remedy, with continuation of groundwater pump and treat. Heat treatment is scheduled to commence in early 2011.
<b>Yolo</b>	J.R. Simplot, Courtland (mailing address in Sacramento County; facility located in Yolo County)	1,2,3-TCP	Phytoremediation underway for soil and groundwater remediation.

## Actions Taken to Prevent Ground Water Contamination – RWQCBs

### Region 6 – Lahontan Regional Water Quality Control Board

Table 17. Actions taken by the Lahontan Regional Water Quality Control Board (Region 6) in 2010.

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Lassen	Sierra Army Base	Arsenic, Aldrin, Chlordane, Dieldrin	Sierra Army Depot completed the pesticide cleanup in 2007 (Equipment Yard, Building 209) as approved in the RoD
Placer	Resort at Squaw Creek Golf Course	Clopyralid	Key wells, up-gradient, within the course, and downgradient, are being monitored with a focus on detection of nutrients and pesticides in the shallow aquifer prior to affecting any potential municipal supplies located nearby. An updated chemical application and management plan (CHAMP) was completed and approved by the RASC Technical Review Committee October, 2010.
San Bernardino	George Air Force Base	Dieldrin	Groundwater monitoring continues to evaluate concentration trends. To date, those wells have not been found to contain dieldrin.
	China Lake Naval Weapons Center	4,4' DDD 4,4' DDE 4,4' DDT Dieldrin Chlordane	Ground water is monitored, and is not used for drinking water in the area east of China Lake Playa.

### Region 7 – Colorado River Basin Regional Water Quality Control Board

Table 18. Actions taken by the Colorado River Basin Regional Water Quality Control Board (Region 7) in 2010.

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Imperial	J.R. Simplot Company, Sandin Siding Facility	Dieldrin, 4,4'-DDT, Endrin	Site in remediation. Risk base corrective action in-progress (site closed in 2001)
Riverside	Woten Aviation Services	Disyston, DEF, Ethyl Parathion, Methyl Parathion	U.S. EPA has lead in cleanup.
	Foster Gardner, Inc., Coachella Facility	1,2-Dichloroethane, 1,2-D, Ethylene Dibromide	Cleanup on going. DTSC has lead in cleanup.

**ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – RWQCBs**

**Region 8 – Santa Ana Regional Water Quality Control Board**

**Table 19. Actions taken by the Santa Ana Regional Water Quality Control Board (Region 8) in 2010.**

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
<b>Orange</b>	Great Lakes Chemical Corporation (formerly Great Western Savings), Irvine	1,2-D, EDB, 1,2-DCE	On-site full-scale multi-phase vacuum extraction system is continuing. GLCC now discharges to County Sanitation District of Orange County under Special Purpose Discharge Permit as of 12/2001. GLCC was issued a CAO by RWQCB on 4/17/97 for off-site remediation of impacted groundwater. GLCC is operating an on-and off-site groundwater extraction and treatment system. The full treatment system has been operating continuously since December 2001. Waste Discharge Requirements (Order No. 0025) was rescinded in April 2002. Treated groundwater is discharged to sewer line.
<b>Riverside</b>	Sunnymead Mutual Water Company (North and South Well)	DBCP	Unchanged
	Arlington Basin	DBCP	Unchanged
	City of Corona (Well 8, mun.)	Simazine	Unchanged
	Home Gardens County Water District (Wells 2 and 3, mun.)	DBCP, Simazine	Unchanged
	City of Riverside, Twin Spring, mun.	DBCP	A 9,000 gpm GAC treatment system has been installed (Palmyrita Treatment Plant)
	City of Corona (Well 17, mun.)	Simazine, DBCP	Unchanged
	City of Riverside (Russell “B”, mun.)	Simazine, DBCP	Unchanged
	City of Riverside (Garner “B”, mun.)	DBCP	Unchanged
	City of Riverside (Russell “C”, mun)	DBCP	Unchanged
	City of Riverside (1st Street)	DBCP	Unchanged

**ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – RWQCBs  
REGION 8 – SANTA ANA REGIONAL WATER QUALITY CONTROL BOARD, CONTINUED**

<b>COUNTY</b>	<b>SITE</b>	<b>PESTICIDE</b>	<b>PREVENTION ACTION</b>
<b>Riverside</b>	City of Riverside (Electric Street, mun.)	DBCP	Unchanged
	City of Riverside (Palmyrita, mun.)	DBCP	Unchanged
	City of Riverside (3 wells, mun.)	DBCP	Unchanged
	City of Riverside (3 wells, emergency, Downtown Riverside)	DBCP	Unchanged
	Riverside County Hall Of Records, (pr)	DBCP	Unchanged
	Loma Linda University, Arlington, (Wells 1 and 2, mun.)	DBCP	Unchanged
	City of Riverside (Moor-Griffith, mun.)	DBCP	Unchanged
	Lake Hemet MWD (Wells A and B, mun.)	DBCP	Unchanged
<b>San Bernardino</b>	Victoria Farms MWC (Well 01 and 03, mun.)	DBCP	Unchanged
	Gage System Wells (16 wells, mun.)	DBCP	Unchanged
	Raub Wells (4 wells, mun.)		
	Bunker Hill Basin: Crafton/Redlands area (36 wells)	DBCP	Unchanged
	South San Bernardino Company Water District (4 wells, mun.)	DBCP	Unchanged
	Cucamonga VWD (15 wells, mun.)	DBCP	Unchanged
	Monte Vista CWD (3 wells, mun.)	DBCP	Unchanged
	City of Upland (13wells)	DBCP	Unchanged

**ACTIONS TAKEN TO PREVENT GROUND WATER CONTAMINATION – RWQCBs  
 REGION 8 – SANTA ANA REGIONAL WATER QUALITY CONTROL BOARD, CONTINUED**

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
	City of Loma Linda (6 wells, mun.)	DBCP	A GAC treatment system (Richardson) is being built to treat groundwater from two newly installed supply wells (Richardson #5 and Mt. View #6). Mt. View #3 and #5 will be inactive upon completion of treatment system.

## Actions Taken to Prevent Ground Water Contamination – RWQCBs

### Region 9 – San Diego Regional Water Quality Control Board

Table 20. Actions taken by the San Diego Regional Water Quality Control Board (Region 9) in 2010.

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
San Diego	City of Oceanside Water Utility District (Well No. 12-11S/ 4W-18L1 S)	1,2-DCP (1,2-Dicloropropane)	The City of Oceanside has destroyed the well.
	MCB Camp Pendleton	<b>1111-MW4=4,4'</b> -DDD at 0.02 µg/L; <b>1A1-MW-1=4,4'</b> DDD at 0.01 µg/L; <b>09S/07W-11K01=</b> dalapon=0.83 µg/L; <b>23W-07A,B,C =</b> dalapon=0.43-1.7µg/L; <b>1111MW-3= 4,4-</b> DDD=0.03 µg/L; 4,4-DDE=0.08 µg/L; 4,4-DDT=0.04µg/L; <b>06GWCW1193 = 4,4-</b> DDT=0.74 µg/L; <b>06GW09A392= 4,4-</b> DDD=0.52 µg/L	Ground water monitoring activities will be conducted to determine fluctuations of pesticide concentrations with time across the site.  Currently under investigation by DTSC and RWQCB.

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## Appendix A – Ground Water Sampling Results Summarized by Reporting Agency

The following table summarizes, by reporting agency, the number of wells sampled and the total samples analyzed through December 31, 2010.

<i>Reporting Agency</i>	<i>Total Wells Sampled</i>	<i>Total Samples Analyzed</i>
<b>American Environmental Consulting Firm</b>	1	3
<b>California Department Of Pesticide Regulation</b>	5,532	69,758
<b>California Department Of Public Health</b>	13,685	1,953,179
<b>California Department Of Water Resources</b>	333	20,861
<b>California Water Service Company</b>	7	72
<b>Ciba-Geigy</b>	27	184
<b>City Of Davis</b>	1	6
<b>City Of Oceanside</b>	1	1
<b>City Of San Francisco</b>	11	319
<b>Fresno County</b>	2,023	2,080
<b>Glenn County</b>	5	74
<b>Imperial County</b>	1	11
<b>Kern County</b>	336	3,558
<b>Lake County</b>	4	9
<b>Madera County</b>	115	151
<b>Marin County</b>	8	60
<b>Modoc County</b>	4	13
<b>Regional Water Quality Control Board, Central Coast (Region 3)</b>	27	794
<b>Regional Water Quality Control Board, Central Valley (Region 5)</b>	56	433
<b>Regional Water Quality Control Board, Lahontan (Region 6)</b>	2	10
<b>Regional Water Quality Control Board, Los Angeles (Region 4)</b>	47	865
<b>Regional Water Quality Control Board, North Coast (Region 1)</b>	75	1,934
<b>Regional Water Quality Control Board, San Diego (Region 9)</b>	2	5
<b>Regional Water Quality Control Board, San Francisco Bay (Region 2)</b>	13	724
<b>Regional Water Quality Control Board, Santa Ana (Region 8)</b>	18	18
<b>Rhone-Poulenc Ag. Co.</b>	152	1,116
<b>Riverside County</b>	5	50
<b>Sacramento County</b>	130	1,717
<b>San Diego County</b>	8	16
<b>San Luis Obispo County</b>	2	2

**APPENDIX A—GROUND WATER SAMPLING RESULTS SUMMARIZED BY REPORTING AGENCY, CONTINUED**

<i>Reporting Agency</i>	<i>Total Wells Sampled</i>	<i>Total Samples Analyzed</i>
<b>San Mateo County</b>	8	368
<b>Santa Barbara County</b>	4	244
<b>Santa Clara County</b>	718	12,019
<b>Santa Clara Valley Water District</b>	20	576
<b>Solano Irrigation District</b>	10	162
<b>State Water Resources Control Board</b>	182	570
<b>Stockton – East San Joaquin Water Conservation District</b>	49	621
<b>Sutter County</b>	1	4
<b>U. S. Bureau Of Land Management</b>	2	12
<b>U. S. Department Of Agriculture</b>	9	84
<b>U. S. Environmental Protection Agency</b>	6	623
<b>U. S. Forest Service</b>	49	298
<b>U. S. Geological Survey</b>	373	16,017
<b>Yolo County</b>	36	627
<b>Yuba County</b>	47	537

## Appendix B – Well Sampling Results Summarized by Pesticide and Reporting Agency

The following table summarizes, by pesticide, the number of counties where wells were sampled, the number of individual wells<sup>30</sup> sampled, and the number of individual wells with detections reported by CDPH (Jan-Dec 2010) and DPR (Jul-Dec 2010).

Pesticide	Status <sup>31</sup>	Summary		By Reporting Agency	
		Counties Sampled	Wells Sampled	CDPH Detections	DPR Detections
1,2,4-Trichlorobenzene		48	2360	1	NS
1,2-D (1,2-dichloropropane)		48	2361	6	NS
1,2-D + 1,3-D + C-3 pesticides	G	47	1728	1	NS
1,3-D (1,3-Dichloropropene, Telone)	A	41	1588	0	NS
2,4,5-T		23	207	0	NS
2,4,5-TP (2 (2,4,5-Trichlorophenoxy) propionic acid. Silvex)		31	456	0	NS
2,4-D (2,4-Dichlorophenoxyacetic acid)	A	31	459	0	NS
3,5-Dichloroaniline	d	11	124	NS	0
3-Hydroxycarbofuran	d	30	323	0	NS
4(2,4-DB), dimethylamine salt	A	11	58	0	NS
ACET (Deethyl-simazine or deisopropyl-atrazine)	d	12	92	NS	17
Acetochlor		8	32	0	NS
Acifluorfen, sodium salt		6	27	0	NS
Acrylonitrile		4	13	0	NS
Alachlor	A	37	804	0	NS
Aldicarb	A	30	329	0	NS
Aldicarb sulfone	d	30	329	0	NS
Aldicarb sulfoxide	d	30	329	0	NS
Aldrin		27	262	0	NS
Ametryne		3	4	0	NS
Atraton		3	13	0	NS
Atrazine	A	40	996	1	0
Azoxystrobin	A	11	124	NS	0
Azoxystrobin acid		11	124	NS	3
Azoxystrobin Z	d	11	124	NS	0
Barban	d	2	3	0	NS
Bentazon, sodium salt	A	31	458	1	NS

<sup>30</sup> Some of the wells counted in this table were sampled more than once during the reporting period. For the purposes of this table, a well is only counted once regardless of the number of samples taken.

<sup>31</sup> Status code for the pesticide: 'A' = Active/currently registered in California. 'd'=Degradate of a pesticide. 'G'=Group of pesticides/degradates reported as a single result. 'i'=Compound may be pesticide related as an impurity, solvent, inert ingredient, etc. or may be found in ground water as a result of other sources.

**APPENDIX B – WELL SAMPLING RESULTS SUMMARIZED BY PESTICIDE AND REPORTING AGENCY, CONTINUED**

<i>Pesticide</i>	<i>Status</i> <sup>31</sup>	<i>Summary</i>		<i>By Reporting Agency</i>	
		<i>Counties Sampled</i>	<i>Wells Sampled</i>	<i>CDPH Detections</i>	<i>DPR Detections</i>
<b>BHC (other than gamma isomer) (Hexachlorobenzene)</b>		10	42	0	NS
<b>Bromacil</b>	A	35	618	0	3
<b>Butachlor</b>		34	513	0	NS
<b>Butylate</b>		3	4	0	NS
<b>Captan</b>	A	3	9	0	NS
<b>Carbaryl</b>	A	30	328	0	NS
<b>Carbofuran</b>	A	31	410	0	NS
<b>Carbon disulfide</b>		24	281	0	NS
<b>Carbophenothion</b>		2	8	0	NS
<b>Chloramben</b>		1	1	0	NS
<b>Chlordane</b>		29	380	0	NS
<b>Chlorobenzilate</b>		4	12	0	NS
<b>Chloroneb</b>		6	16	0	NS
<b>Chloropicrin</b>	A	1	1	0	NS
<b>Chlorothalonil</b>	A	22	114	0	NS
<b>Chlorpropham</b>	A	8	16	0	NS
<b>Chlorpyrifos</b>	A	3	4	0	NS
<b>DCPA (Chlorthal-dimethyl, dacthal)</b>	A	4	12	0	NS
<b>Chlorthal-dimethyl acid degradates (Dacthal degradates)</b>	d	15	127	0	NS
<b>Cyanazine</b>		2	8	0	NS
<b>Cycloate</b>	A	3	4	0	NS
<b>DACT (Diaminochlorotriazine)</b>	d	12	92	NS	26
<b>Dalapon</b>		31	464	0	NS
<b>DBCP (1,2-Dibromo-3-chloropropane)</b>		36	1183	241	NS
<b>DDD (Dichlorodiphenyldichloroethane)</b>	d	9	34	0	NS
<b>DDE (Dichlorodiphenyldichloroethylene)</b>	d	11	46	0	NS
<b>DDT (Dichlorodiphenyldichloroethylene)</b>		9	34	0	NS
<b>DEA (Deethyl-atrazine)</b>	d	12	92	NS	0
<b>Desmethyl-norflurazon (DSMN)</b>		12	92	NS	17
<b>Diazinon</b>	A	31	428	0	NS
<b>Dicamba</b>	A	30	376	0	NS
<b>Dichloran</b>	A	11	124	NS	0
<b>Dichlorprop, butoxyethanol ester</b>		10	37	0	NS
<b>Dieldrin</b>		27	282	0	NS
<b>Dimethoate</b>	A	33	531	0	NS
<b>Dinoseb</b>		31	457	0	NS
<b>Diphenamid</b>		6	13	0	NS
<b>Diquat dibromide</b>	A	31	424	1	NS

APPENDIX B – WELL SAMPLING RESULTS SUMMARIZED BY PESTICIDE AND REPORTING AGENCY, CONTINUED

<i>Pesticide</i>	<i>Status</i> <sup>31</sup>	<i>Summary</i>		<i>By Reporting Agency</i>	
		<i>Counties Sampled</i>	<i>Wells Sampled</i>	<i>CDPH Detections</i>	<i>DPR Detections</i>
Disulfoton	A	3	9	0	NS
Diuron	A	18	152	0	5
Endosulfan	A	9	34	0	NS
Endosulfan sulfate	d	9	34	0	NS
Endothall		29	376	0	NS
Endrin		29	385	0	NS
Endrin aldehyde	d	9	34	0	NS
EPTC (S-Ethyl dipropylthiocarbamate)	A	8	31	0	NS
Ethion		1	1	0	NS
Ethyl Alcohol	A	1	3	0	NS
Ethylene dibromide		37	1133	7	NS
Fenuron		2	3	0	NS
Fluometuron		2	3	0	NS
Formaldehyde	A	1	1	0	NS
Glyphosate, isopropylamine salt	A	25	309	0	NS
Heptachlor		29	384	0	NS
Heptachlor epoxide		29	384	0	NS
Hexachlorobenzene		31	426	0	NS
Hexazinone	A	12	92	NS	0
Iprodione	A	11	124	NS	0
Lindane (gamma-BHC)		30	394	0	NS
Linuron		3	10	0	NS
Malathion	A	2	111	0	NS
MCPA (2-methyl-4-chlorophenoxyacetic acid), dimethylamine salt	A	2	3	0	NS
MCPP (2-(4-chloro-2-methylphenoxy)propionic acid)	A	2	3	0	NS
Methiocarb	A	22	171	0	NS
Methomyl	A	30	328	0	NS
Methoxychlor		30	398	0	NS
Methyl bromide (bromomethane)	A	47	1566	1	NS
Methyl parathion	A	2	111	0	NS
Metolachlor	A	34	528	0	NS
Metribuzin	A	34	528	0	NS
Molinate		38	780	0	NS
Monuron		2	3	0	NS
Naphthalene		41	1598	1	NS
Napropamide	A	3	4	0	NS
Neburon		2	3	0	NS
Norflurazon	A	12	92	NS	4
Ortho-dichlorobenzene		48	2360	1	NS

APPENDIX B – WELL SAMPLING RESULTS SUMMARIZED BY PESTICIDE AND REPORTING AGENCY, CONTINUED

<i>Pesticide</i>	<i>Status</i> <sup>31</sup>	<i>Summary</i>		<i>By Reporting Agency</i>	
		<i>Counties Sampled</i>	<i>Wells Sampled</i>	<i>CDPH Detections</i>	<i>DPR Detections</i>
Oryzalin	A	1	13	NS	0
Oxamyl	A	31	426	1	NS
Paraquat dichloride	A	7	50	0	NS
Parathion or ethyl parathion		2	111	0	NS
PCNB (Pentachloronitrobenzene)	A	1	1	0	NS
Permethrin	A	6	16	0	NS
Permethrin, other related compounds	A	4	12	0	NS
Picloram		31	462	0	NS
Prometon	A	17	235	0	0
Prometryn	A	23	232	0	NS
Propachlor		34	546	0	NS
Propazine		3	4	0	NS
Propham		2	3	0	NS
Propoxur	A	23	171	0	NS
Secbumeton		3	13	0	NS
Siduron	A	2	3	0	NS
Simazine	A	40	1,007	0	10
Simetryn		3	4	0	NS
Tebuthiuron	A	12	92	NS	0
Tebuthiuron degradate 104 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-N-methylurea)	d	12	92	NS	0
Tebuthiuron degradate 106 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-urea)	d	12	92	NS	0
Tebuthiuron degradate 107 (2-Dimethylethyl-5-methylamino-1,3,4-thiadiazole)	d	12	92	NS	0
Tebuthiuron degradate 108 (2-Dimethylethyl-5-amino-1,3,4-thiadiazole)	d	12	92	NS	0
Terbacil		11	43	0	NS
Terbutryn		6	17	0	NS
Thiobencarb	A	39	837	0	NS
Toxaphene		29	382	0	NS
Triadimefon	A	3	4	0	NS
Trifluralin	A	19	96	0	NS
Vernolate		3	4	0	NS
Xylene	i	49	2,349	1	NS

## Appendix C – Summary of Historical and Current Pesticide Detections and Current Water Quality Limits

The following table provides updated information, from 1984 through 2010, of all reported pesticide detections in ground water. If the pesticide or degradate was not detected during the most current reporting period, a dash is shown in the column. The “Drinking Water Quality Levels” include regulatory and advisory levels established by CDPH (ANL, DLR, MCL, and NL); OEHHA (PHG); and the U.S. EPA (MCL, MCLG, and Lifetime HAL). Standards were obtained through CDPH and the U.S. EPA. Some pesticides are chemically indistinguishable but have distinct chemical numbers in the Well Inventory Database. For the purposes of this appendix, the results for metolachlor and (S)-metolachlor have been combined into one entry as have several non-specific chlorthal-dimethyl degradates.

To satisfy state and federal drinking water standards, CDPH tests for and continues to find pesticides that were banned many years ago but still pose a hazard to the people who may drink the water. Since these pesticides are no longer registered or allowed to be used in California, DPR has no regulatory authority to investigate these detections or to to mitigate these past problems.

<i>Pesticide Detected</i>	<i># Sampled / # Detections</i>		<i>Concentration Ranges (ppb)</i>		<i>Drinking Water Quality Levels (ppb)<sup>(a)</sup></i>	<i>Pesticide Type, CA Registration Status, Comments</i>
	<i>Counties</i>	<i>Wells</i>	<i>Historical</i>	<i>Current</i>		
<b>1,2,4-Trichlorobenzene</b>	58/5	8,403/7	0.53 - 21	0.94	CDPH MCL – 5 OEHHA PHG – 5 USEPA MCL – 70 USEPA MCLG – 70 USEPA HAL – 70	Herbicide. Not registered.
<b>1,2-D + 1,3-D + C-3 pesticides</b>	57/3	7,922/3	0.67 - 1.2	0.76	See 1,2-D and 1,3-D	Fumigant. Not registered.
<b>1,2 D (1,2-dichloropropane)</b>	58/24	12,417/182	0.1 - 160	0.56 - 1	CDPH MCL – 5 OEHHA PHG – 0.5 USEPA MCL – 5 USEPA MCLG – 0	Fumigant. Not registered.
<b>1,3 D (1,3-Dichloropropene, telone)</b>	56/4	10,382/8	0.64 - 1.9	---	CDPH MCL – 0.5 OEHHA PHG – 0.2	Fumigant. Registered.

**APPENDIX C – SUMMARY OF HISTORICAL AND CURRENT PESTICIDE DETECTIONS AND CURRENT WATER QUALITY LIMITS, CONTINUED**

<i>Pesticide Detected</i>	<i># Sampled / # Detections</i>		<i>Concentration Ranges (ppb)</i>		<i>Drinking Water Quality Levels (ppb)<sup>(a)</sup></i>	<i>Pesticide Type, CA Registration Status, Comments</i>
	<i>Counties</i>	<i>Wells</i>	<i>Historical</i>	<i>Current</i>		
<b>2,4,5-T (Trichlorophenoxy-acetic acid)</b>	47/2	2,131/2	0.02 - 0.21	---	USEPA HAL – 70.0	Herbicide. Not registered.
<b>2,4,5-TP (2 (2,4,5-Trichlorophenoxy) propionic acid, Silvex)</b>	58/3	6,552/4	0.15 - 1.4	---	CDPH MCL – 50 OEHHA PHG – 25 USEPA MCL – 50 USEPA MCLG – 50 USEPA HAL – 50	Herbicide. Not registered.
<b>2,4-D (2,4-Dichlorophenoxy-acetic acid)</b>	58/12	7,237/17	0.3 - 46	---	CDPH MCL – 70 OEHHA PHG – 20 USEPA MCL – 70 USEPA MCLG – 70	Herbicide. Registered.
<b>2,4-DP, isooctyl ester (2,4-dichlorophenoxy-propionic acid)</b>	9/2	106/3	0.01 - 0.06	---	---	Herbicide. Registered.
<b>2-Hydroxycyclohexyl hexazinone</b>	8/1	69/1	0.126	---	---	Degradate of hexazinone, a registered herbicide.
<b>ACET (Deethylsimazine or deisopropyl-atrazine)</b>	37/18	1,616/427	0.023 - 6	0.054 - 0.514	---	Degradate detected in ground water due to the legal agricultural use of atrazine and/or simazine, registered herbicides. DPR regulates the use of atrazine and simazine based on detections of ACET.
<b>Alachlor</b>	55/4	8,055/4	0.1 - 9	---	CDPH MCL – 2 OEHHA PHG – 4 USEPA MCL – 2 USEPA MCLG – 0	Herbicide. Registered.
<b>Alachlor ESA</b>	10/7	167/34	0.05 - 1.38	---	---	Degradate of alachlor, a registered herbicide. Detections of this degradate are currently under investigation by DPR.

**APPENDIX C – SUMMARY OF HISTORICAL AND CURRENT PESTICIDE DETECTIONS AND CURRENT WATER QUALITY LIMITS, CONTINUED**

<i>Pesticide Detected</i>	<i># Sampled / # Detections</i>		<i>Concentration Ranges (ppb)</i>		<i>Drinking Water Quality Levels (ppb)<sup>(a)</sup></i>	<i>Pesticide Type, CA Registration Status, Comments</i>
	<i>Counties</i>	<i>Wells</i>	<i>Historical</i>	<i>Current</i>		
<b>Alachlor OXA</b>	10/2	167/2	0.05 - 0.058	---	---	Degradate of alachlor, a registered herbicide. Detections of this degradate are currently under investigation by DPR.
<b>Aldicarb</b>	55/3	5,961/5	1.1 - 87 <sup>32</sup>	---	CDPH AAL – 7 USEPA MCL – 3 USEPA MCLG – 1	Insecticide. Registered. This pesticide was detected in ground water due to legal agricultural use.
<b>Aldicarb sulfone</b>	51/6	4,781/61	0.05 - 1281 <sup>33</sup>	---	USEPA MCL – 3 USEPA MCLG – 1 USEPA HAL – 7	Degradate detected in ground water due to the legal agricultural use of aldicarb.
<b>Aldicarb sulfoxide</b>	51/5	4,788/25	0.06 - 13.2	---	USEPA MCL – 4 USEPA MCLG – 1 USEPA HAL – 7	Degradate detected in ground water due to the legal agricultural use of aldicarb.
<b>Aldicarb total (parent and breakdown products)</b>	10/2	110/33	0.13 - 49	---	See aldicarb and individual breakdown products above	Combined aldicarb parent and degradates reported by some agencies in the mid-1980s and as late as 2003 detected in ground water due to legal agricultural use. This reporting method is no longer used by agencies sampling for aldicarb and its degradates.
<b>Aldrin</b>	54/2	5,591/24	21 - 107	---	CDPH ANL – 0.002	Insecticide. Not registered.
<b>Atrazine</b>	57/25	12,810/318	0.001 - 8.5	0.31	CDPH MCL – 1 OEHHA PHG – 0.15 USEPA MCL – 3 USEPA MCLG – 3	Herbicide. Registered. DPR regulates the use of this pesticide following its detection in ground water due to legal agricultural use.
<b>Azinphos-methyl (Guthion)</b>	43/1	1,292/1	0.014	---	---	Insecticide. Registered.

<sup>32</sup> In 2009, CDPH reported detecting 87 ppb of aldicarb in a well however, this pesticide was not detected in follow-up sampling conducted three months later. The second highest detection reported statewide was 7.2 ppb.

<sup>33</sup> In 1986, Rhone-Poulenc Ag. Co. reported detecting 1281 ppb of aldicarb sulfone in Stanislaus County. Rhone-Poulenc Ag. Co. also reported detecting 768 ppb and 965 ppb of aldicarb sulfone in a nearby well in the same year.

**APPENDIX C – SUMMARY OF HISTORICAL AND CURRENT PESTICIDE DETECTIONS AND CURRENT WATER QUALITY LIMITS, CONTINUED**

<i>Pesticide Detected</i>	<i># Sampled / # Detections</i>		<i>Concentration Ranges (ppb)</i>		<i>Drinking Water Quality Levels (ppb)<sup>(a)</sup></i>	<i>Pesticide Type, CA Registration Status, Comments</i>
	<i>Counties</i>	<i>Wells</i>	<i>Historical</i>	<i>Current</i>		
<b>Azoxystrobin acid</b>	11/1	124/3	0.101 - 0.268	0.101 - 0.268	---	Degradate of azoxystrobin, a registered fungicide. Subsequent investigation by DPR could not establish legal agricultural use as the source as no detection was within a mile of a second contaminated well.
<b>Benomyl</b>	38/2	1,090/2	190 - 500 <sup>34</sup>	---	---	Fungicide. Registered.
<b>Bentazon</b>	55/18	5,831/114	0.02 - 20	9.2	CDPH MCL – 18 OEHHA PHG – 200 USEPA HAL – 200	Herbicide. Registered. DPR regulates the use of this pesticide following its detection in ground water due to legal agricultural use.
<b>BHC (other than gamma isomer) (Hexachlorobenzene)</b>	49/1	2,216/1	0.08	---	---	Fungicide. Not registered.
<b>Bromacil</b>	56/20	10,598/267	0.025 - 23	0.051 - 0.29	USEPA HAL – 70	Herbicide. Registered. DPR regulates the use of this pesticide following its detection in ground water due to legal agricultural use.
<b>Butachlor</b>	52/1	5,631/1	0.39	---	---	Herbicide. Not registered.
<b>Captan</b>	38/2	1,492/3	0.1 - 0.5	---	CDPH ANL – 15	Fungicide. Registered.
<b>Carbaryl</b>	53/4	5,946/4	2 - 55 <sup>35</sup>	---	CDPH ANL – 700	Insecticide. Registered.
<b>Carbofuran</b>	54/4	6,552/5	0.016 - 0.686	---	CDPH MCL – 18 OEHHA PHG – 1.7 USEPA MCL – 40 USEPA MCLG – 40	Insecticide. Registered.

<sup>34</sup> In 1988, CDPH reported detecting 500 ppb of benomyl in one well but did not detect this pesticide in a follow-up sample taken in 1992. In 1991, the U.S. Department of Agriculture reported detecting 190 ppb of benomyl in one well but did not detect this pesticide in follow-up samples taken in 1992.

<sup>35</sup> In 1987, CRWCCR reported detecting 2 ppb of carbaryl in one well but did not detect this pesticide in a follow-up sample taken four months later. Between 1988 and 1993, CDPH reported detecting 2, 2.3, and 55 ppb of carbaryl in three wells but did not detect this pesticide in follow-up samples taken during the same time period.

**APPENDIX C – SUMMARY OF HISTORICAL AND CURRENT PESTICIDE DETECTIONS AND CURRENT WATER QUALITY LIMITS, CONTINUED**

<i>Pesticide Detected</i>	<i># Sampled / # Detections</i>		<i>Concentration Ranges (ppb)</i>		<i>Drinking Water Quality Levels (ppb)<sup>(a)</sup></i>	<i>Pesticide Type, CA Registration Status, Comments</i>
	<i>Counties</i>	<i>Wells</i>	<i>Historical</i>	<i>Current</i>		
<b>Carbon disulfide</b>	42/6	1,147/14	0.2 - 5	---	CDPH NL – 160	Fumigant. Not registered.
<b>Chlordane</b>	56/1	6,875/1	20	---	CDPH MCL – 0.1 OEHHA PHG – 0.03 USEPA MCL – USEPA MCLG – 0	Insecticide. Not registered.
<b>Chlorothalonil</b>	51/1	4,469/1	0.8 - 1.1	---	USEPA HAL – 500	Fungicide. Registered.
<b>Chlorpyrifos</b>	38/2	1,443/3	0.02 - 0.06	---	USEPA HAL – 2	Insecticide. Registered.
<b>DCPA (Chlorthal-dimethyl, dacthal)</b>	34/4	1,541/9	0.03 - 300 <sup>36</sup>	---	USEPA HAL – 70.0	Herbicide. Registered.
<b>Chlorthal-dimethyl acid degradates (Dacthal degradates)</b>	44/14	1,983/99	0.03 - 30	---	---	Degradate of chlorthal-dimethyl, a registered herbicide. In 1991, DPR determined that reported concentrations did not pose a health risk and did not conduct further monitoring. DPR is reviewing all subsequent detections to determine if these concentrations pose a health risk.
<b>Coumaphos</b>	11/1	132/1	1	---	---	Insecticide. Registered.
<b>DACT (Diaminochlorotriazine)</b>	32/12	1,043/286	0.05 - 7.158	0.055 - 0.854	---	Degradate detected in ground water due to the legal agricultural use of atrazine and/or simazine, registered herbicides. DPR regulates the use of atrazine and simazine based on detections of DACT.
<b>Dalapon</b>	50/1	5,141/5	1 - 17	---	CDPH MCL – 200 OEHHA PHG – 790 USEPA MCL – 200 USEPA MCLG – 200 USEPA HAL – 200	Herbicide. Not registered.

<sup>36</sup> In 1988, the CVRWQCB reported detecting 300, 1.3 and 0.7 ppb of chlorthal-dimethyl in one well. In 1989, they detected this pesticide in two additional wells with concentrations ranging from 2 to 3.6 ppb. In 1989, DPR sampled in the vicinity of the wells sampled by CDPH but did not detect chlorthal-dimethyl.

**APPENDIX C – SUMMARY OF HISTORICAL AND CURRENT PESTICIDE DETECTIONS AND CURRENT WATER QUALITY LIMITS, CONTINUED**

<i>Pesticide Detected</i>	<i># Sampled / # Detections</i>		<i>Concentration Ranges (ppb)</i>		<i>Drinking Water Quality Levels (ppb)<sup>(a)</sup></i>	<i>Pesticide Type, CA Registration Status, Comments</i>
	<i>Counties</i>	<i>Wells</i>	<i>Historical</i>	<i>Current</i>		
<b>DBCP (1,2-Dibromo-3-chloropropane)</b>	56/25	12,644/3,111	0.001 - 8000	0.01 - 1	CDPH MCL – 0.2 OEHHA PHG – 0.0017 USEPA MCL – 0.2 USEPA MCLG – 0	Soil fumigant. Not registered. Source of residues considered by DPR to be from historical nonpoint source, legal agricultural use. CDPH and/or SWRCB are authorized to respond to these detections.
<b>DDD (Dichlorodiphenyl-dichloroethane)</b>	43/1	1,922/1	1.04	---	---	Degradate of DDT.
<b>DDE (Dichlorodiphenyl-dichloroethylene)</b>	45/3	3,433/6	0.01 - 0.09	---	---	Degradate of DDT.
<b>DDT (dichlorodiphenyl-trichloroethane)</b>	43/3	2,132/4	0.02 - 0.12	---	---	Insecticide. Not registered.
<b>DEA (Deethyl-atrazine)</b>	38/19	1,661/123	0.001 - 2	---	---	Degradate detected in ground water due to the legal agricultural use of atrazine, a registered herbicide. DPR regulates the use of atrazine based on detections of DEA.
<b>Demethyl-norflurazon<sup>37</sup></b>	2/2	5/5	0.24 - 0.57	---	---	Degradate detected in ground water due to the legal agricultural use of norflurazon, a registered herbicide. DPR regulates the use of norflurazon based on detections of this degradate.
<b>Demeton</b>	46/1	1,774/1	1	---	---	Insecticide. Not registered.
<b>Diazinon</b>	56/7	7,302/8	0.01 – 2.6	---	CDPH NL – 1.2 U.S. EPA HAL– 1	Insecticide. Registered.
<b>Dicamba</b>	52/5	4,938/7	0.01 - 0.5	---	U.S. EPA HAL – 4000	Herbicide. Registered.

<sup>37</sup>These detections were reported to DPR by the U.S. GS. “Demethyl-norflurazon” is assumed to be a synonym of “desmethyl-norflurazon,” the term used by DPR in its monitoring programs.

**APPENDIX C – SUMMARY OF HISTORICAL AND CURRENT PESTICIDE DETECTIONS AND CURRENT WATER QUALITY LIMITS, CONTINUED**

<i>Pesticide Detected</i>	<i># Sampled / # Detections</i>		<i>Concentration Ranges (ppb)</i>		<i>Drinking Water Quality Levels (ppb)<sup>(a)</sup></i>	<i>Pesticide Type, CA Registration Status, Comments</i>
	<i>Counties</i>	<i>Wells</i>	<i>Historical</i>	<i>Current</i>		
<b>Dichlorprop, butoxyethanol ester</b>	32/3	521/3	0.1 - 6.8	---	---	Herbicide. Not registered.
<b>Dichlorprop</b>	3/1	49/1	6.8	---	---	Herbicide. Not registered.
<b>Dieldrin</b>	56/5	5,646/6	0.05 - 7	---	CDPH AAL – 0.002	Insecticide. Not registered.
<b>Dimethoate</b>	54/3	6,769/3	0.38 - 10	---	CDPH AAL – 1	Insecticide. Registered.
<b>Dinoseb</b>	50/1	6,156/1	30	---	CDPH MCL – 7 OEHHA PHG – 14 USEPA MCL – 7 USEPA MCLG – 7	Herbicide Not registered.
<b>Diquat dibromide</b>	48/6	4,755/11	0.67 – 6.6	2.1	CDPH MCL – 20 OEHHA PHG – 15 USEPA MCL – 20 USEPA MCLG – 20	Herbicide. Registered.
<b>Diuron</b>	54/22	8,259/517	0.015 - 5.2	0.05 - 0.161	---	Herbicide. Registered. DPR regulates the use of this pesticide following its detection in ground water due to legal agricultural use.
<b>DSMN (Desmethyl-norflurazon)</b>	26/6	663/87	0.05 - 1.86	0.059 - 1.3	---	Degradate detected in ground water due to the legal agricultural use of norflurazon, a registered herbicide. DPR regulates the use of norflurazon based on detections of this degradate.
<b>Endosulfan</b>	50/4	2,884/10	0.01 - 34.7 <sup>38</sup>	---	---	Insecticide. Registered.
<b>Endosulfan sulfate</b>	49/2	2,239/3	0.15 - 0.48	---	---	Degradate of endosulfan, a registered insecticide.
<b>Endothall</b>	49/1	4,235/2	100 - 160	---	CDPH MCL – 100 OEHHA PHG – 580 USEPA MCL – 100 USEPA MCLG – 100 USEPA HAL – 50.0	Herbicide. Not registered. Early 1989 detections were not confirmed by DPR monitoring.

<sup>38</sup> In 1992, Glenn County reported detecting 34.7 ppb of endosulfan in one well but did not detect this pesticide in a follow-up sample taken one month later. The second highest detection statewide was 4.5 ppb.

**APPENDIX C – SUMMARY OF HISTORICAL AND CURRENT PESTICIDE DETECTIONS AND CURRENT WATER QUALITY LIMITS, CONTINUED**

<i>Pesticide Detected</i>	<i># Sampled / # Detections</i>		<i>Concentration Ranges (ppb)</i>		<i>Drinking Water Quality Levels (ppb)<sup>(a)</sup></i>	<i>Pesticide Type, CA Registration Status, Comments</i>
	<i>Counties</i>	<i>Wells</i>	<i>Historical</i>	<i>Current</i>		
<b>Endrin</b>	58/4	7,201/5	0.03 - 2	---	CDPH MCL – 2 OEHHA PHG – 1.8 USEPA MCL – 2 USEPA MCLG – 2 USEPA HAL – 2	Insecticide. Not registered.
<b>EPTC (S-Ethyl dipropylthio-carbamate)</b>	40/1	2,333/1	5.6 - 170 <sup>39</sup>	---	---	Herbicide. Registered.
<b>Ethylene dibromide</b>	56/20	8,653/184	0.006 - 4.7	0.02 - 0.36	CDPH MCL – 0.05 OEHHA PHG – 0.01 USEPA MCL – 0.05 USEPA MCLG – 0	Fumigant, insecticide, nematocide. Not registered. Source of residues considered by DPR to be from historical non-point source, legal agricultural use. CDPH and/or SWRCB are authorized to respond to these detections.
<b>Ethylene dichloride (1,2-dichloroethane)</b>	11/1	197/1	2.9	---	CDPH MCL – 0.5 OEHHA PHG – 0.4 USEPA MCL – 5	Fumigant. Not registered.
<b>Ethylene thiourea</b>	8/1	67/1	0.725	---	---	Fumigant. Not registered.
<b>Glyphosate, isopropylamine salt</b>	52/1	4,722/1	20	---	CDPR MCL – 700 OEHHA PHG – 900 USEPA MCL – 700 USEPA MCLG – 700	Herbicide. Registered.
<b>Heptachlor</b>	56/4	6,653/12	0.01 - 0.25	---	CDPH MCL – 0.01 OEHHA PHG – 0.008 USEPA MCL – 0.4 MCLG – 0	Insecticide. Not registered.
<b>Heptachlor epoxide</b>	56/1	6,641/1	0.01	---	CDPH MCL – 0.01 OEHHA PHG – 0.006 USEPA MCL – 0.2 USEPA MCLG – 0	Degradate of heptachlor, a canceled herbicide. Not registered.

<sup>39</sup> In 1989 DWR reported detecting 170 ppb of EPTC in a well however, this pesticide was not detected in follow-up sampling conducted in 1990. In 1991, DWR took a third sample from this well and reported detecting 5.6 ppb of EPTC.

**APPENDIX C – SUMMARY OF HISTORICAL AND CURRENT PESTICIDE DETECTIONS AND CURRENT WATER QUALITY LIMITS, CONTINUED**

<i>Pesticide Detected</i>	<i># Sampled / # Detections</i>		<i>Concentration Ranges (ppb)</i>		<i>Drinking Water Quality Levels (ppb)<sup>(a)</sup></i>	<i>Pesticide Type, CA Registration Status, Comments</i>
	<i>Counties</i>	<i>Wells</i>	<i>Historical</i>	<i>Current</i>		
<b>Hexazinone</b>	47/10	2,525/30	0.05 - 0.55	---	U.S. EPA HAL – 400	Herbicide. Registered. In 2010, DPR determined that the legal agricultural use of hexazinone caused its detection in ground water. In 2011, DPR entered this pesticide into the formal review process.
<b>Lindane</b>	58/3	7,289/6	0.05 - 180	---	CDPH MCL – 0.2 OEHHA PHG – 0.032 U.S. EPA MCL – 0.2 U.S. EPA MCLG – 0.2	Insecticide. Not Registered.
<b>Malathion</b>	37/1	1,220/1	0.32	---	CDPH AAL – 160 U.S. EPA HAL – 500	Insecticide. Registered.
<b>Merphos</b>	21/2	427/2	1 - 1.5	---	---	Defoliant. Not registered.
<b>Methomyl</b>	52/2	5,508/2	0.8 - 15	---	U.S. EPA HAL – 200	Insecticide. Registered.
<b>Methoxychlor</b>	57/2	6,819/4	0.32 - 0.55	---	CDPH MCL – 30 OEHHA PHG – 0.09 U.S. EPA HAL – 40 U.S. EPA MCL – 40 U.S. EPA MCLG – 40	Insecticide. Not registered.
<b>Methyl bromide (bromomethane)</b>	58/16	12,046/38	0.5 - 9.3	0.67 <sup>40</sup>	U.S. EPA HAL – 10	Fumigant. Registered.
<b>Methylene chloride (dichloromethane)</b>	6/2	61/6	3 - 6	---	CDPH MCL – 5 OEHHA PHG – 4 U.S. EPA MCL – 5 U.S. EPA MCLG – 0	Fumigant. Not registered.
<b>Metolachlor</b>	52/2	6,033/2	0.036 - 0.1	---	U.S. EPA HAL – 700	Herbicide. Registered. Largely replaced by the use of (S)-metolachlor, an isomer of metolachlor. Since it is difficult to distinguish between the two pesticides analytically, the sampling results have been combined for the purpose of reporting.

<sup>40</sup> Methyl bromide was not detected in follow-up sampling conducted by the water system owner during 2010.

**APPENDIX C – SUMMARY OF HISTORICAL AND CURRENT PESTICIDE DETECTIONS AND CURRENT WATER QUALITY LIMITS, CONTINUED**

<i>Pesticide Detected</i>	<i># Sampled / # Detections</i>		<i>Concentration Ranges (ppb)</i>		<i>Drinking Water Quality Levels (ppb)<sup>(a)</sup></i>	<i>Pesticide Type, CA Registration Status, Comments</i>
	<i>Counties</i>	<i>Wells</i>	<i>Historical</i>	<i>Current</i>		
<b>Metolachlor ESA</b>	9/7	166/64	0.05 - 24	---	---	Degradate of metolachlor, a registered herbicide. Detections of this degradate are currently under investigation by DPR.
<b>Metolachlor OXA</b>	9/5	166/23	0.05 - 2.65	---	---	Degradate of metolachlor, a registered herbicide. Detections of this degradate are currently under investigation by DPR.
<b>Mexacarbate</b>	23/1	427/1	22	---	---	Insecticide. Not registered.
<b>Molinate</b>	55/6	7,471/13	0.002 - 29	---	CDPH MCL – 20 OEHHA PHG – 1	Herbicide. Not registered.
<b>Molinate sulfoxide</b>	17/1	210/1	0.8	---	---	Degradate of molinate, an unregistered herbicide.
<b>Monuron</b>	25/1	507/4	0.04 - 2	---	---	Herbicide. Not registered.
<b>MTP (monomethyl tetrachloro-terephthalic acid)</b>	10/1	274/1	2.41 - 2.55	---	---	Degradate of chlorthal-dimethyl, a registered herbicide.
<b>Naled</b>	16/1	221/1	5	---	---	Insecticide. Registered.
<b>Naphthalene</b>	57/12	8,044/27	0.5 - 66	2	CDPH NL – 17 U.S. EPA HAL – 100	Fumigant. Not registered
<b>Norflurazon</b>	35/8	1,284/76	0.022 - 2.48	0.074 - 0.302	U.S. EPA HAL – 30 <sup>41</sup>	Herbicide. Registered. DPR regulates the use of this pesticide following its detection in ground water due to legal agricultural use.
<b>Ortho-dichlorobenzene (1,2-Dichlorobenzene)</b>	58/10	11,322/22	0.56 - 12	0.72	CDPH MCL – 600 OEHHA PHG – 600 U.S. EPA MCL – 600 U.S. EPA MCLG – 600 U.S. EPA HAL – 600	Herbicide and insecticide. Not registered.

<sup>41</sup> The 2011 Edition of the Drinking Water Standards and Advisories (U.S. EPA Office of Water), where most of the HALs in this appendix were obtained, did not include a HAL for norflurazon. The HAL for norflurazon was obtained from the 1996 Registration Eligibility Document Fact Sheet for norflurazon published in 1996 by the U.S. EPA Office of Pesticide Programs <<http://www.epa.gov/oppsrrd1/REDs/factsheets/0229fact.pdf>>.

**APPENDIX C – SUMMARY OF HISTORICAL AND CURRENT PESTICIDE DETECTIONS AND CURRENT WATER QUALITY LIMITS, CONTINUED**

<i>Pesticide Detected</i>	<i># Sampled / # Detections</i>		<i>Concentration Ranges (ppb)</i>		<i>Drinking Water Quality Levels (ppb)<sup>(a)</sup></i>	<i>Pesticide Type, CA Registration Status, Comments</i>
	<i>Counties</i>	<i>Wells</i>	<i>Historical</i>	<i>Current</i>		
<b>Oxamyl</b>	51/1	5,742/1	9	9	CDPH MCL – 50 OEHHA PHG – 26 U.S. EPA MCL – 200 U.S. EPA MCLG – 200	Insecticide and nematicide. Registered.
<b>Paraquat dichloride</b>	33/3	955/5	0.91 - 16	---	U.S. EPA HAL – 30	Herbicide. Registered.
<b>Picloram</b>	51/3	5,207/5	0.1 - 1.1	---	CDPH MCL – 500 OEHHA PHG – 500 U.S. EPA MCL – 500 U.S. EPA MCLG – 500	Selective herbicide. Not registered.
<b>Prometon</b>	49/13	5,491/52	0.05 - 80 <sup>42</sup>	---	U.S. EPA HAL – 400	Herbicide. Registered. DPR regulates the use of this pesticide in areas of California following its detection in ground water due to legal agricultural use.
<b>Prometryn</b>	57/3	8,393/3	0.1 - 0.5	---	---	Herbicide. Registered.
<b>Propachlor</b>	52/1	5,528/1	1.1	---	CDPH NL – 90	Herbicide. Not registered.
<b>Propazine</b>	41/1	1,063/1	0.2	---	U.S. EPA HAL – 10	Herbicide. Not registered.
<b>Propham</b>	35/1	1,066/1	6	---	U.S. EPA HAL – 100	Herbicide. Not registered.
<b>Propoxur</b>	47/2	1,713/2	4 - 5	---	U.S. EPA HAL – 3	Insecticide. Registered.
<b>Simazine</b>	57/29	13,361/849	0.002 - 49.2 <sup>43</sup>	0.05 - 0.172	CDPH MCL – 4 OEHHA PHG – 4 U.S. EPA MCL – 4 U.S. EPA MCLG – 4	Herbicide. Registered. DPR regulates the use of this pesticide following its detection in ground water due to legal agricultural use.
<b>Tebuthiuron</b>	32/6	476/12	0.005 - 22.1	---	U.S. EPA HAL – 500	Herbicide. Registered. Detections currently under investigation by DPR.

<sup>42</sup> The USGS sampled a well in Fresno County twice and reported detecting 80 ppb in one sample and no residues in the other sample. As there are no sample dates associated with these reports (a common issue for data reported to DPR in the 1980s), it is not possible to determine the order in which these samples were taken. There are no other follow-up sampling data available for this well. To provide context for this high value, the median value of all detections of prometon is 0.019 ppb.

<sup>43</sup> CDPH sampled a well in Fresno County twice, reporting detections of 10.4 ppb and 49.2 ppb. There are no other follow-up sampling data available for this well. To provide context for these apparently high values, the median value of all detections of simazine is 0.141 ppb.

**APPENDIX C – SUMMARY OF HISTORICAL AND CURRENT PESTICIDE DETECTIONS AND CURRENT WATER QUALITY LIMITS, CONTINUED**

<i>Pesticide Detected</i>	<i># Sampled / # Detections</i>		<i>Concentration Ranges (ppb)</i>		<i>Drinking Water Quality Levels (ppb)<sup>(a)</sup></i>	<i>Pesticide Type, CA Registration Status, Comments</i>
	<i>Counties</i>	<i>Wells</i>	<i>Historical</i>	<i>Current</i>		
<b>Tebuthiuron degradate 104 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-N-methylurea)</b>	24/1	236/1	0.058	---	---	Degradate of tebuthiuron, a registered herbicide.
<b>Tetrachloroethylene</b>	9/3	193/5	0.2 - 2.5	---	CDPH MCL – 5 OEHHA PHG – 0.06 U. S. EPA MCL – 5 U.S. EPA MCLG – 0 U.S. EPA HAL – 10	Insecticide. Not registered.
<b>Tetrachlorvinphos (Stirofos)</b>	23/1	189/1	1	---	---	Insecticide. Registered.
<b>Thiobencarb</b>	55/6	7,349/9	0.006 - 8.7	---	CDPH MCL – 70 OEHHA PHG – 70	Herbicide. Registered.
<b>Thiram</b>	2/1	18/4	5 - 17	---	---	Fungicide. Registered.
<b>Toxaphene</b>	58/4	7,333/6	1 - 57	---	CDPH MCL – 3 OEHHA PHG – 0.03 U.S. EPA MCL – 3 U.S. EPA MCLG – 0	Insecticide. Not registered.
<b>TPA (Tetrachloroterephthalic Acid)</b>	10/8	274/35	0.1 - 15	---	---	Degradate of chlorthal-dimethyl, a registered herbicide.
<b>Trifluralin</b>	39/2	1,388/2	0.01 - 0.9	---	U.S. EPA HAL – 10	Herbicide. Registered.
<b>Xylene</b>	58/32	11,158/116	0.25 - 1100	10	CDPH MCL – 1,750 OEHHA PHG – 1,800 U.S. EPA MCL – 10,000 U.S. MCLG – 10,000	Historical use as an insecticide and in pesticide formulations. Currently used in petroleum and chemical manufacturing. Detections are the result of the industrial use of this chemical.

(a) The following abbreviations apply to the Water Quality Limits mentioned above (All limits were converted into ppb)  
 1) CDPH Archived Advisory Levels (AAL) for Drinking Water. Source: CDPH. Last update: May 2011.  
 (<<http://www.cdph.ca.gov/certlic/drinkingwater/Pages/NotificationLevels.aspx> ).

**APPENDIX C – SUMMARY OF HISTORICAL AND CURRENT PESTICIDE DETECTIONS AND CURRENT WATER QUALITY LIMITS, CONTINUED**

- 2) CDPH Maximum Contaminant Levels (MCL). Source: CDPH. Last update: July 2011.  
(<http://www.cdph.ca.gov/certlic/drinkingwater/Pages/MCLsandPHGs.aspx>).
- 3) CDPH Notification Levels (NL). Source: CDPH. Last update: May 2011.  
(<http://www.cdph.ca.gov/certlic/drinkingwater/Pages/NotificationLevels.aspx>).
- 4) OEHHA California Public Health Goals (PHG). Source: CDPH. Last update: July 2011.  
(<http://www.cdph.ca.gov/certlic/drinkingwater/Pages/MCLsandPHGs.aspx>).
- 5) U.S. EPA Lifetime Health Advisory Limits (HAL). Source: U.S. EPA. Last update: January 2011.
- 6) (<http://water.epa.gov/action/advisories/drinking/upload/dwstandards2011.pdf>). For pesticides that are no longer registered, the Pesticide Action Network provides HALs. Source: Pesticide Action Network Pesticide Database. (<http://www.pesticideinfo.org/>).
- 7) U.S. EPA Maximum Contaminant Levels (MCL). Source: U.S. EPA. Last update: August 2011.  
(<http://www.epa.gov/safewater/contaminants/#organic>).
- 8) U.S. EPA Maximum Contaminant Level Goals (MCLG). Source: U.S. EPA. Last update: August 2011).  
(<http://www.epa.gov/safewater/contaminants/#organic>)

## Appendix D – Well Sampling Results Summarized by County and Reporting Agency

Summary, by county, of the number of pesticides and pesticide degradates analyzed and the number detected, the number of individual wells sampled and the number of individual wells<sup>44</sup> with detections, by DPR and by CDPH.

COUNTY	Summary				By Reporting Agency							
					CDPH 2010				DPR July 1 to December 31, 2010			
	Pesticides Analyzed	Pesticides Detected	Wells Sampled	Wells with Detections	Pesticides Analyzed	Pesticides Detected	Wells Sampled	Wells with Detections	Pesticides Analyzed	Pesticides Detected	Wells Sampled	Wells with Detections
Alameda	34	0	23	0	34	0	23	0	--	--	--	--
Alpine	6	0	1	0	6	0	1	0	--	--	--	--
Amador	11	0	2	0	11	0	2	0	--	--	--	--
Butte	62	0	51	0	43	0	44	0	22	0	7	0
Calaveras	3	0	1	0	3	0	1	0	--	--	--	--
Colusa	12	0	5	0	12	0	5	0	--	--	--	--
Contra Costa	66	0	11	0	66	0	11	0	--	--	--	--
Del Norte	--	--	--	--	--	--	--	--	--	--	--	--
El Dorado	8	0	13	0	8	0	13	0	--	--	--	--
Fresno	80	13	187	102	63	6	170	89	22	7	17	13
Glenn	31	1	24	3	9	0	8	0	22	1	16	3
Humboldt	--	--	--	--	--	--	--	--	--	--	--	--
Imperial	--	--	--	--	--	--	--	--	--	--	--	--
Inyo	11	0	5	0	11	0	5	0	--	--	--	--
Kern	91	10	169	26	74	5	159	24	22	5	10	2
Kings	59	0	22	0	59	0	22	0	--	--	--	--
Lake	73	0	18	0	73	0	18	0	--	--	--	--
Lassen	--	--	--	--	--	--	--	--	--	--	--	--
Los Angeles	81	3	643	3	81	3	643	3	--	--	--	--
Madera	39	2	41	5	39	2	41	5	--	--	--	--
Marin	41	0	4	0	41	0	4	0	--	--	--	--
Mariposa	25	0	17	0	25	0	17	0	--	--	--	--

<sup>44</sup> Some of the wells counted in this table were sampled more than once during the reporting period. For the purposes of this table, a well is only counted once regardless of the number of samples taken.

**APPENDIX D – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND REPORTING AGENCY, CONTINUED**

COUNTY	Summary				By Reporting Agency							
					CDPH 2010				DPR July 1 to December 31, 2010			
	Pesticides Analyzed	Pesticides Detected	Wells Sampled	Wells with Detections	Pesticides Analyzed	Pesticides Detected	Wells Sampled	Wells with Detections	Pesticides Analyzed	Pesticides Detected	Wells Sampled	Wells with Detections
Mendocino	63	1	11	1	63	1	11	1	--	--	--	--
Merced	50	1	49	11	31	1	38	11	22	0	11	0
Modoc	--	--	--	--	--	--	--	--	--	--	--	--
Mono	46	0	4	0	46	0	4	0	--	--	--	--
Monterey	76	1	104	1	57	0	87	0	22	1	17	1
Napa	67	0	9	0	67	0	9	0	--	--	--	--
Nevada	10	0	2	0	10	0	2	0	--	--	--	--
Orange	85	0	191	0	85	0	191	0	--	--	--	--
Placer	43	0	8	0	43	0	8	0	--	--	--	--
Plumas	10	0	13	0	10	0	13	0	--	--	--	--
Riverside	57	2	129	9	57	2	129	9	--	--	--	--
Sacramento	59	1	160	2	59	1	160	2	--	--	--	--
San Benito	39	0	5	0	39	0	5	0	--	--	--	--
San Bernardino	79	1	276	33	79	1	276	33	--	--	--	--
San Diego	81	2	33	2	81	2	33	2	--	--	--	--
San Francisco	--	--	--	--	--	--	--	--	--	--	--	--
San Joaquin	74	6	86	23	61	2	73	17	18	4	13	6
San Luis Obispo	17	0	64	0	17	0	64	0	--	--	--	--
San Mateo	66	1	18	2	66	1	18	2	--	--	--	--
Santa Barbara	77	0	31	0	58	0	28	0	22	0	3	0
Santa Clara	60	0	119	0	60	0	119	0	--	--	--	--
Santa Cruz	76	0	31	0	57	0	30	0	22	0	1	0
Shasta	6	0	16	0	6	0	16	0	--	--	--	--
Sierra	--	--	--	--	--	--	--	--	--	--	--	--
Siskiyou	6	0	3	0	6	0	3	0	--	--	--	--
Solano	56	0	10	0	56	0	10	0	--	--	--	--
Sonoma	88	1	79	1	88	1	79	1	--	--	--	--
Stanislaus	72	5	130	28	54	1	119	22	22	4	11	6
Sutter	5	0	2	0	5	0	2	0	--	--	--	--

**APPENDIX D – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND REPORTING AGENCY, CONTINUED**

<i>COUNTY</i>	<i>Summary</i>				<i>By Reporting Agency</i>							
					<i>CDPH 2010</i>				<i>DPR July 1 to December 31, 2010</i>			
	<i>Pesticides Analyzed</i>	<i>Pesticides Detected</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>	<i>Pesticides Analyzed</i>	<i>Pesticides Detected</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>	<i>Pesticides Analyzed</i>	<i>Pesticides Detected</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
<b>Tehama</b>	8	0	3	0	8	0	3	0	--	--	--	--
<b>Trinity</b>	6	0	1	0	6	0	1	0	--	--	--	--
<b>Tulare</b>	84	3	151	33	66	1	128	32	22	2	23	1
<b>Tuolumne</b>	23	0	20	0	23	0	20	0	--	--	--	--
<b>Ventura</b>	72	0	39	0	54	0	31	0	22	0	8	0
<b>Yolo</b>	56	0	22	0	56	0	22	0	--	--	--	--
<b>Yuba</b>	10	1	13	1	10	1	13	1	--	--	--	--

## Appendix E – Well Sampling Results Summarized by County and Pesticide

Appendix E summarizes the reported results of wells sampled for pesticides and/or pesticide degradates from January through December 2010 for each county where sampling occurred. Each county table lists the pesticides and/or pesticide degradates that were sampled, the number of individual wells sampled for each pesticide and/or pesticide degradate, and the number of wells where detections occurred.

Approximately 11% of the wells with reported residues had two to seven different pesticides and/or pesticide degradates detected during this reporting period. A well with more than one pesticide or pesticide degradate detected will appear more than once in a county table. As a result, the total number of wells with detections in a county in Appendix E *will appear to exceed* the number in each county in [Appendix D](#).

The links in the table below allow you to navigate to a specific county to view that county's data. Clicking on the county name at the top of each county table will take you back to this page.

<a href="#">Alameda</a>		<a href="#">Marin</a>		<a href="#">San Mateo</a>	<b>D</b>
<a href="#">Alpine</a>		<a href="#">Mariposa</a>		<a href="#">Santa Barbara</a>	
<a href="#">Amador</a>		<a href="#">Mendocino</a>	<b>D</b>	<a href="#">Santa Clara</a>	
<a href="#">Butte</a>		<a href="#">Merced</a>	<b>D</b>	<a href="#">Santa Cruz</a>	
<a href="#">Calaveras</a>		<a href="#">Modoc</a>	<b>NS</b>	<a href="#">Shasta</a>	
<a href="#">Colusa</a>		<a href="#">Mono</a>		<a href="#">Sierra</a>	<b>NS</b>
<a href="#">Contra Costa</a>		<a href="#">Monterey</a>	<b>D</b>	<a href="#">Siskiyou</a>	
<a href="#">Del Norte</a>	<b>NS</b>	<a href="#">Napa</a>		<a href="#">Solano</a>	
<a href="#">El Dorado</a>		<a href="#">Nevada</a>		<a href="#">Sonoma</a>	<b>D</b>
<a href="#">Fresno</a>	<b>D</b>	<a href="#">Orange</a>		<a href="#">Stanislaus</a>	<b>D</b>
<a href="#">Glenn</a>	<b>D</b>	<a href="#">Placer</a>		<a href="#">Sutter</a>	
<a href="#">Humboldt</a>	<b>NS</b>	<a href="#">Plumas</a>		<a href="#">Tehama</a>	
<a href="#">Imperial</a>	<b>NS</b>	<a href="#">Riverside</a>	<b>D</b>	<a href="#">Trinity</a>	
<a href="#">Inyo</a>		<a href="#">Sacramento</a>	<b>D</b>	<a href="#">Tulare</a>	<b>D</b>
<a href="#">Kern</a>	<b>D</b>	<a href="#">San Benito</a>		<a href="#">Tuolumne</a>	
<a href="#">Kings</a>		<a href="#">San Bernardino</a>	<b>D</b>	<a href="#">Ventura</a>	
<a href="#">Lake</a>		<a href="#">San Diego</a>	<b>D</b>	<a href="#">Yolo</a>	
<a href="#">Lassen</a>	<b>NS</b>	<a href="#">San Francisco</a>	<b>NS</b>	<a href="#">Yuba</a>	<b>D</b>
<a href="#">Los Angeles</a>	<b>D</b>	<a href="#">San Joaquin</a>	<b>D</b>		
<a href="#">Madera</a>	<b>D</b>	<a href="#">San Luis Obispo</a>			

**D** = Counties that had pesticide detections.

**NS** = Counties that were not sampled.

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u>Alameda</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	23	
	1,2-D + 1,3-D + C-3 pesticides	8	
	1,2-D (1,2-dichloropropane)	23	
	1,3-D (1,3-Dichloropropene, telone)	15	
	2,4,5-TP (silvex)	15	
	2,4-D	15	
	Alachlor	15	
	Atrazine	15	
	Bentazon, sodium salt	15	
	Carbofuran	15	
	Chlordane	15	
	Dalapon	15	
	DBCP	17	
	Dinoseb	15	
	Diquat dibromide	15	
	Endothall	15	
	Endrin	15	
	Ethylene dibromide	17	
	Glyphosate, isopropylamine salt	15	
	Heptachlor	15	
	Heptachlor epoxide	15	
	Hexachlorobenzene	15	
	Lindane (gamma-BHC)	15	
	Methoxychlor	15	
	Methyl bromide (bromomethane)	2	
	Molinate	15	
	Naphthalene	8	
	Ortho-dichlorobenzene	23	
	Oxamyl	15	
	Picloram	15	
	Simazine	15	
	Thiobencarb	15	
	Toxaphene	15	
	Xylene	23	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u><i>Alpine</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	1	
	1,2-D + 1,3-D + C-3 pesticides	1	
	1,2-D (1,2-dichloropropane)	1	
	Methyl bromide (bromomethane)	1	
	Ortho-dichlorobenzene	1	
	Xylene	1	

<u><i>Amador</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,1,2,2-Tetrachloroethane	1	
	1,2-D + 1,3-D + C-3 pesticides	1	
	1,2-D (1,2-dichloropropane)	1	
	Methyl bromide (bromomethane)	1	
	Ortho-dichlorobenzene	1	
	Xylene	1	

<u><i>Butte</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	39	
	1,2-D + 1,3-D + C-3 pesticides	39	
	1,2-D (1,2-dichloropropane)	39	
	1,3-D (1,3-Dichloropropene, telone)	7	
	2,4,5-T	2	
	2,4,5-TP (silvex)	2	
	2,4-D	2	
	3,5-Dichloroaniline	7	
	3-Hydroxycarbofuran	1	
	ACET (Deethyl-simazine or deisopropyl-atrazine)	7	
	Acetochlor	1	
	Alachlor	11	
	Aldicarb	1	
	Aldicarb sulfone	1	
	Aldicarb sulfoxide	1	
	Atrazine	18	
	Azoxystrobin	7	
	Azoxystrobin acid	7	
	Azoxystrobin Z	7	
	Bentazon, sodium salt	2	
	Bromacil	18	
	Butachlor	11	
	Carbaryl	1	
	Carbofuran	1	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u><i>Butte</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Carbon disulfide	3	
	DACT (Diaminochlorotriazine)	7	
	Dalapon	2	
	DEA (Deethyl-atrazine)	7	
	Desmethyl-norflurazon (DSMN)	7	
	Diazinon	2	
	Dicamba	2	
	Dichloran	7	
	Dimethoate	10	
	Dinoseb	2	
	Diuron	7	
	Glyphosate, isopropylamine salt	6	
	Hexachlorobenzene	1	
	Hexazinone	7	
	Iprodione	7	
	Lindane (gamma-BHC)	1	
	Methomyl	1	
	Methoxychlor	1	
	Methyl bromide (bromomethane)	9	
	Metolachlor	11	
	Metribuzin	11	
	Molinate	11	
	Naphthalene	38	
	Norflurazon	7	
	Ortho-dichlorobenzene	39	
	Oxamyl	1	
	Picloram	2	
	Prometon	7	
	Prometryn	1	
	Propachlor	11	
	Simazine	18	
	Tebuthiuron	7	
	Tebuthiuron degradate 104 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-N-methylurea)	7	
	Tebuthiuron degradate 106 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-urea)	7	
	Tebuthiuron degradate 107 (2-Dimethylethyl-5-methylamino-1,3,4-thiadiazole)	7	
	Tebuthiuron degradate 108 (2-Dimethylethyl-5-amino-1,3,4-thiadiazole)	7	
	Thiobencarb	11	
	Xylene	39	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u>Calaveras</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Atrazine	1	
	Simazine	1	
	Thiobencarb	1	

<u>Colusa</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	4	
	1,2-D + 1,3-D + C-3 pesticides	4	
	1,2-D (1,2-dichloropropane)	4	
	1,3-D (1,3-Dichloropropene, telone)	3	
	Atrazine	1	
	Methyl bromide (bromomethane)	4	
	Molinate	1	
	Naphthalene	3	
	Ortho-dichlorobenzene	4	
	Simazine	1	
	Thiobencarb	1	
	Trichlorobenzenes	4	
	Xylene	4	

<u>Contra Costa</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	10	
	1,2-D + 1,3-D + C-3 pesticides	9	
	1,2-D (1,2-dichloropropane)	10	
	1,3-D (1,3-Dichloropropene, telone)	6	
	2,4,5-T	1	
	2,4,5-TP (silvex)	6	
	2,4-D	6	
	3-Hydroxycarbofuran	4	
	Alachlor	7	
	Aldicarb	4	
	Aldicarb sulfone	4	
	Aldicarb sulfoxide	4	
	Aldrin	5	
	Atrazine	7	
	Bentazon, sodium salt	6	
	Bromacil	7	
	Butachlor	7	
	Captan	1	
	Carbaryl	4	
	Carbofuran	5	
	Carbon disulfide	7	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u><i>Contra Costa</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Carbophenothion	1	
	Chlordane	6	
	Chlorpropham	1	
	Chlorthal-dimethyl acid degradates (Dacthal degradates)	4	
	Cyanazine	1	
	Dalapon	6	
	DBCP	6	
	Diazinon	7	
	Dicamba	5	
	Dieldrin	5	
	Dimethoate	7	
	Dinoseb	6	
	Diphenamid	1	
	Diquat dibromide	5	
	Disulfoton	1	
	Diuron	4	
	Endothall	5	
	Endrin	6	
	EPTC	1	
	Ethylene dibromide	6	
	Glyphosate, isopropylamine salt	5	
	Heptachlor	6	
	Heptachlor epoxide	6	
	Hexachlorobenzene	6	
	Lindane (gamma-BHC)	6	
	Methiocarb	4	
	Methomyl	4	
	Methoxychlor	6	
	Methyl bromide (bromomethane)	9	
	Metolachlor	7	
	Metribuzin	7	
	Molinate	7	
	Naphthalene	9	
	Ortho-dichlorobenzene	10	
	Oxamyl	5	
	Picloram	6	
	Prometon	1	
	Prometryn	2	
	Propachlor	6	
	Propoxur	4	
	Simazine	7	
	Terbacil	1	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<b><u>Contra Costa</u></b>	<b><i>Pesticide</i></b>	<b><i>Wells Sampled</i></b>	<b><i>Wells with Detections</i></b>
	Thiobencarb	7	
	Toxaphene	6	
	Xylene	10	

<b><u>Del Norte</u></b>	<b><i>Pesticide</i></b>	<b><i>Wells Sampled</i></b>	<b><i>Wells with Detections</i></b>
	NOT SAMPLED IN THE CURRENT YEAR		

<b><u>El Dorado</u></b>	<b><i>Pesticide</i></b>	<b><i>Wells Sampled</i></b>	<b><i>Wells with Detections</i></b>
	1,2,4-Trichlorobenzene	13	
	1,2-D + 1,3-D + C-3 pesticides	13	
	1,2-D (1,2-dichloropropane)	13	
	1,3-D (1,3-Dichloropropene, telone)	11	
	Methyl bromide (bromomethane)	13	
	Naphthalene	12	
	Ortho-dichlorobenzene	13	
	Xylene	13	

<b><u>Fresno</u></b>	<b><i>Pesticide</i></b>	<b><i>Wells Sampled</i></b>	<b><i>Wells with Detections</i></b>
	1,2,4-Trichlorobenzene	88	1
	1,2-D + 1,3-D + C-3 pesticides	86	1
	1,2-D (1,2-dichloropropane)	88	
	1,3-D (1,3-Dichloropropene, telone)	77	
	2,4,5-T	1	
	2,4,5-TP (silvex)	1	
	2,4-D	1	
	3,5-Dichloroaniline	17	
	3-Hydroxycarbofuran	2	
	ACET (Deethyl-simazine or deisopropyl-atrazine)	17	11
	Alachlor	44	
	Aldicarb	2	
	Aldicarb sulfone	2	
	Aldicarb sulfoxide	2	
	Aldrin	2	
	Atraton	1	
	Atrazine	64	
	Azoxystrobin	17	
	Azoxystrobin acid	17	
	Azoxystrobin Z	17	
	Bentazon, sodium salt	1	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<i><u>Fresno</u></i>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	BHC (other than gamma isomer)	1	
	Bromacil	48	1
	Butachlor	30	
	Carbaryl	2	
	Carbofuran	2	
	Carbon disulfide	7	
	Chlordane	5	
	Chlorothalonil	1	
	DACT (Diaminochlorotriazine)	17	13
	Dalapon	1	
	DBCP	138	89
	DEA (Deethyl-atrazine)	17	
	Desmethyl-norflurazon (DSMN)	17	9
	Diazinon	31	
	Dicamba	1	
	Dichloran	17	
	Dieldrin	2	
	Dimethoate	31	
	Dinoseb	1	
	Diquat dibromide	1	
	Diuron	18	3
	Endothall	2	
	Endrin	5	
	EPTC	3	
	Ethylene dibromide	129	3
	Glyphosate, isopropylamine salt	1	
	Heptachlor	5	
	Heptachlor epoxide	5	
	Hexachlorobenzene	6	
	Hexazinone	17	
	Iprodione	17	
	Lindane (gamma-BHC)	6	
	Methomyl	2	
	Methoxychlor	6	
	Methyl bromide (bromomethane)	79	
	Metolachlor	31	
	Metribuzin	31	
	Molinate	31	
	Naphthalene	80	1
	Norflurazon	17	2
	Ortho-dichlorobenzene	88	1
	Oxamyl	2	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<b><u>Fresno</u></b>	<b><i>Pesticide</i></b>	<b><i>Wells Sampled</i></b>	<b><i>Wells with Detections</i></b>
	Picloram	1	
	Prometon	21	
	Prometryn	9	
	Propachlor	27	
	Secbumeton	1	
	Simazine	65	7
	Tebuthiuron	17	
	Tebuthiuron degradate 104 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-N-methylurea)	17	
	Tebuthiuron degradate 106 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-urea)	17	
	Tebuthiuron degradate 107 (2-Dimethylethyl-5-methylamino-1,3,4-thiadiazole)	17	
	Tebuthiuron degradate 108 (2-Dimethylethyl-5-amino-1,3,4-thiadiazole)	17	
	Terbacil	3	
	Terbutryn	1	
	Thiobencarb	32	
	Toxaphene	5	
	Trifluralin	1	
	Xylene	88	

<b><u>Glenn</u></b>	<b><i>Pesticide</i></b>	<b><i>Wells Sampled</i></b>	<b><i>Wells with Detections</i></b>
	1,2,4-Trichlorobenzene	8	
	1,2-D + 1,3-D + C-3 pesticides	8	
	1,2-D (1,2-dichloropropane)	8	
	1,3-D (1,3-Dichloropropene, telone)	1	
	3,5-Dichloroaniline	16	
	ACET (Deethyl-simazine or deisopropyl-atrazine)	2	
	Atrazine	2	
	Azoxystrobin	16	
	Azoxystrobin acid	16	3
	Azoxystrobin Z	16	
	Bromacil	2	
	Carbon disulfide	1	
	DACT (Diaminochlorotriazine)	2	
	DEA (Deethyl-atrazine)	2	
	Desmethyl-norflurazon (DSMN)	2	
	Dichloran	16	
	Diuron	2	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<b><u>Glenn</u></b>	<b><i>Pesticide</i></b>	<b><i>Wells Sampled</i></b>	<b><i>Wells with Detections</i></b>
	Hexazinone	2	
	Iprodione	16	
	Methyl bromide (bromomethane)	2	
	Naphthalene	7	
	Norflurazon	2	
	Ortho-dichlorobenzene	8	
	Prometon	2	
	Simazine	2	
	Tebuthiuron	2	
	Tebuthiuron degradate 104 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-N-methylurea)	2	
	Tebuthiuron degradate 106 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-urea)	2	
	Tebuthiuron degradate 107 (2-Dimethylethyl-5-methylamino-1,3,4-thiadiazole)	2	
	Tebuthiuron degradate 108 (2-Dimethylethyl-5-amino-1,3,4-thiadiazole)	2	
	Xylene	8	

<b><u>Humboldt</u></b>	<b><i>Pesticide</i></b>	<b><i>Wells Sampled</i></b>	<b><i>Wells with Detections</i></b>
	NOT SAMPLED IN THE CURRENT YEAR		

<b><u>Imperial</u></b>	<b><i>Pesticide</i></b>	<b><i>Wells Sampled</i></b>	<b><i>Wells with Detections</i></b>
	NOT SAMPLED IN THE CURRENT YEAR		

<b><u>Inyo</u></b>	<b><i>Pesticide</i></b>	<b><i>Wells Sampled</i></b>	<b><i>Wells with Detections</i></b>
	1,2,4-Trichlorobenzene	5	
	1,2-D + 1,3-D + C-3 pesticides	4	
	1,2-D (1,2-dichloropropane)	5	
	1,3-D (1,3-Dichloropropene, telone)	4	
	Carbon disulfide	1	
	DBCP	1	
	Ethylene dibromide	1	
	Methyl bromide (bromomethane)	4	
	Naphthalene	4	
	Ortho-dichlorobenzene	5	
	Xylene	5	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<i><u>Kern</u></i>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,1,2,2-Tetrachloroethane	128	
	1,2,4-Trichlorobenzene	128	
	1,2-D + 1,3-D + C-3 pesticides	118	
	1,2-D (1,2-dichloropropane)	128	2
	1,3-D (1,3-Dichloropropene, telone)	68	
	2,4,5-T	12	
	2,4,5-TP (silvex)	15	
	2,4-D	15	
	3,5-Dichloroaniline	10	
	3-Hydroxycarbofuran	14	
	4(2,4-DB), dimethylamine salt	1	
	ACET (Deethyl-simazine or deisopropyl-atrazine)	9	1
	Alachlor	25	
	Aldicarb	14	
	Aldicarb sulfone	14	
	Aldicarb sulfoxide	14	
	Aldrin	15	
	Atraton	11	
	Atrazine	35	1
	Azoxystrobin	10	
	Azoxystrobin acid	10	
	Azoxystrobin Z	10	
	Bentazon, sodium salt	15	
	BHC (other than gamma isomer)	11	
	Bromacil	32	2
	Butachlor	13	
	Carbaryl	14	
	Carbofuran	16	
	Carbon disulfide	12	
	Chlordane	13	
	Chloropicrin	1	
	DACT (Diaminochlorotriazine)	9	2
	Dalapon	16	
	DBCP	89	20
	DDD	4	
	DDE	4	
	DDT	4	
	DEA (Deethyl-atrazine)	9	
	Desmethyl-norflurazon (DSMN)	9	
	Diazinon	22	
	Dicamba	12	
	Dichloran	10	
	Dichlorprop, butoxyethanol ester	1	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<i><u>Kern</u></i>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Dieldrin	15	
	Dimethoate	23	
	Dinoseb	16	
	Diquat dibromide	2	
	Diuron	20	1
	Endosulfan	4	
	Endosulfan sulfate	4	
	Endothall	8	
	Endrin	16	
	Endrin aldehyde	4	
	Ethylene dibromide	74	1
	Formaldehyde	1	
	Glyphosate, isopropylamine salt	3	
	Heptachlor	15	
	Heptachlor epoxide	15	
	Hexachlorobenzene	22	
	Hexazinone	9	
	Iprodione	10	
	Lindane (gamma-BHC)	22	
	MCPA, dimethylamine salt	1	
	MCPP (2-(4-chloro-2-methylphenoxy)propionic acid)	1	
	Methiocarb	1	
	Methomyl	14	
	Methoxychlor	22	
	Methyl bromide (bromomethane)	73	
	Metolachlor	23	
	Metribuzin	23	
	Molinate	23	
	Naphthalene	118	
	Norflurazon	9	
	Ortho-dichlorobenzene	128	
	Oxamyl	17	1
	Paraquat dichloride	1	
	Picloram	15	
	Prometon	20	
	Prometryn	22	
	Propachlor	13	
	Propoxur	1	
	Secbumeton	11	
	Simazine	42	1
	Tebuthiuron	9	
	Tebuthiuron degradate 104 (N-(5-(1,1-	9	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<b><u>Kern</u></b>	<b><i>Pesticide</i></b>	<b><i>Wells Sampled</i></b>	<b><i>Wells with Detections</i></b>
	Dimethylethyl-1,3,4-thiadiazol-2-yl)-N-methylurea)		
	Tebuthiuron degradate 106 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-urea)	9	
	Tebuthiuron degradate 107 (2-Dimethylethyl-5-methylamino-1,3,4-thiadiazole)	9	
	Tebuthiuron degradate 108 (2-Dimethylethyl-5-amino-1,3,4-thiadiazole)	9	
	Terbutryn	11	
	Thiobencarb	30	
	Toxaphene	13	
	Xylene	129	

<b><u>Kings</u></b>	<b><i>Pesticide</i></b>	<b><i>Wells Sampled</i></b>	<b><i>Wells with Detections</i></b>
	1,2,4-Trichlorobenzene	17	
	1,2-D + 1,3-D + C-3 pesticides	17	
	1,2-D (1,2-dichloropropane)	17	
	1,3-D (1,3-Dichloropropene, telone)	17	
	2,4,5-T	5	
	2,4,5-TP (silvex)	6	
	2,4-D	6	
	3-Hydroxycarbofuran	4	
	4(2,4-DB), dimethylamine salt	2	
	Alachlor	8	
	Aldicarb	4	
	Aldicarb sulfone	4	
	Aldicarb sulfoxide	4	
	Aldrin	3	
	Atrazine	8	
	Bentazon, sodium salt	6	
	Bromacil	8	
	Butachlor	8	
	Carbaryl	4	
	Carbofuran	5	
	Chlordane	4	
	Chlorothalonil	3	
	Dalapon	6	
	DBCP	5	
	Diazinon	8	
	Dicamba	5	
	Dichlorprop, butoxyethanol ester	2	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u><i>Kings</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Dieldrin	3	
	Dimethoate	8	
	Dinoseb	6	
	Diquat dibromide	1	
	Endothall	6	
	Endrin	4	
	Ethylene dibromide	3	
	Glyphosate, isopropylamine salt	1	
	Heptachlor	4	
	Heptachlor epoxide	4	
	Hexachlorobenzene	3	
	Lindane (gamma-BHC)	4	
	MCPA, dimethylamine salt	2	
	MCPP (2-(4-chloro-2-methylphenoxy)propionic acid)	2	
	Methiocarb	1	
	Methomyl	4	
	Methoxychlor	4	
	Methyl bromide (bromomethane)	17	
	Metolachlor	8	
	Metribuzin	8	
	Molinate	8	
	Naphthalene	17	
	Ortho-dichlorobenzene	17	
	Oxamyl	5	
	Picloram	4	
	Propachlor	8	
	Propoxur	1	
	Simazine	8	
	Thiobencarb	8	
	Toxaphene	4	
	Trifluralin	4	
	Xylene	19	

<u><i>Lake</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	4	
	1,2-D + 1,3-D + C-3 pesticides	4	
	1,2-D (1,2-dichloropropane)	4	
	1,3-D (1,3-Dichloropropene, telone)	2	
	2,4,5-T	6	
	2,4,5-TP (silvex)	6	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<i><u>Lake</u></i>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	2,4-D	6	
	3-Hydroxycarbofuran	7	
	4(2,4-DB), dimethylamine salt	6	
	Acifluorfen, sodium salt	4	
	Acrylonitrile	2	
	Alachlor	8	
	Aldicarb	7	
	Aldicarb sulfone	7	
	Aldicarb sulfoxide	7	
	Aldrin	3	
	Atrazine	12	
	Bentazon, sodium salt	6	
	BHC (other than gamma isomer)	2	
	Bromacil	8	
	Butachlor	8	
	Carbaryl	7	
	Carbofuran	7	
	Carbon disulfide	2	
	Chlordane	3	
	Chlorobenzilate	2	
	Chloroneb	2	
	Chlorothalonil	2	
	Chlorthal-dimethyl (dacthal / DCPA)	2	
	Chlorthal-dimethyl acid degradates (Dacthal degradates)	4	
	Dalapon	6	
	DBCP	3	
	DDD	2	
	DDE	2	
	DDT	2	
	Diazinon	1	
	Dicamba	6	
	Dichlorprop, butoxyethanol ester	4	
	Dieldrin	3	
	Dimethoate	8	
	Dinoseb	6	
	Diquat dibromide	7	
	Endosulfan	2	
	Endosulfan sulfate	2	
	Endothall	6	
	Endrin	3	
	Endrin aldehyde	2	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u>Lake</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Ethylene dibromide	4	
	Heptachlor	3	
	Heptachlor epoxide	3	
	Hexachlorobenzene	3	
	Lindane (gamma-BHC)	3	
	Methiocarb	7	
	Methomyl	7	
	Methoxychlor	3	
	Methyl bromide (bromomethane)	4	
	Metolachlor	8	
	Metribuzin	8	
	Molinate	8	
	Naphthalene	2	
	Ortho-dichlorobenzene	4	
	Oxamyl	8	
	Permethrin	2	
	Permethrin, other related compounds	2	
	Picloram	6	
	Prometryn	8	
	Propachlor	3	
	Propoxur	7	
	Simazine	12	
	Thiobencarb	8	
	Toxaphene	3	
	Trifluralin	2	
	Xylene	4	

<u>Lassen</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	NOT SAMPLED IN THE CURRENT YEAR		

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u>Los Angeles</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	640	
	1,2-D + 1,3-D + C-3 pesticides	419	
	1,2-D (1,2-dichloropropane)	640	1
	1,3-D (1,3-Dichloropropene, telone)	534	
	2,4,5-TP (silvex)	15	
	2,4-D	15	
	3-Hydroxycarbofuran	8	
	Acetochlor	5	
	Alachlor	20	
	Aldicarb	9	
	Aldicarb sulfone	9	
	Aldicarb sulfoxide	9	
	Aldrin	5	
	Atraton	1	
	Atrazine	25	
	Bentazon, sodium salt	15	
	BHC (other than gamma isomer)	1	
	Bromacil	11	
	Butachlor	7	
	Captan	1	
	Carbaryl	9	
	Carbofuran	14	
	Carbon disulfide	115	
	Chlordane	14	
	Chlorothalonil	1	
	Chlorpropham	1	
	Chlorthal-dimethyl acid degradates (Dacthal degradates)	8	
	Dalapon	15	
	DBCP	36	1
	DDD	1	
	DDE	4	
	DDT	1	
	Diazinon	10	
	Dicamba	9	
	Dieldrin	5	
	Dimethoate	9	
	Dinoseb	15	
	Diphenamid	1	
	Diquat dibromide	14	
	Disulfoton	1	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u>Los Angeles</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Diuron	2	
	Endosulfan	1	
	Endosulfan sulfate	1	
	Endothall	14	
	Endrin	14	
	Endrin aldehyde	1	
	EPTC	4	
	Ethion	1	
	Ethylene dibromide	36	
	Glyphosate, isopropylamine salt	14	
	Heptachlor	14	
	Heptachlor epoxide	14	
	Hexachlorobenzene	15	
	Lindane (gamma-BHC)	14	
	Malathion	1	
	Methiocarb	3	
	Methomyl	8	
	Methoxychlor	14	
	Methyl bromide (bromomethane)	407	1
	Methyl parathion	1	
	Metolachlor	9	
	Metribuzin	9	
	Molinate	22	
	Naphthalene	396	
	Ortho-dichlorobenzene	640	
	Oxamyl	14	
	Paraquat dichloride	6	
	Parathion or ethyl parathion	1	
	PCNB (Pentachloronitrobenzene)	1	
	Picloram	15	
	Prometon	3	
	Prometryn	5	
	Propachlor	6	
	Propoxur	3	
	Secbumeton	1	
	Simazine	25	
	Terbacil	5	
	Terbutryn	1	
	Thiobencarb	56	
	Toxaphene	14	
	Xylene	639	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u><i>Madera</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	19	
	1,2-D + 1,3-D + C-3 pesticides	19	
	1,2-D (1,2-dichloropropane)	19	
	1,3-D (1,3-Dichloropropene, telone)	14	
	Alachlor	22	
	Aldrin	8	
	Atrazine	28	
	Bromacil	15	
	Butachlor	15	
	Carbon disulfide	6	
	Chlordane	15	
	Chlorothalonil	8	
	DBCP	19	5
	Diazinon	2	
	Dieldrin	8	
	Dimethoate	15	
	Endrin	15	
	EPTC	2	
	Ethylene dibromide	18	1
	Heptachlor	15	
	Heptachlor epoxide	15	
	Hexachlorobenzene	15	
	Lindane (gamma-BHC)	15	
	Methoxychlor	15	
	Methyl bromide (bromomethane)	19	
	Metolachlor	15	
	Metribuzin	15	
	Molinate	15	
	Naphthalene	15	
	Ortho-dichlorobenzene	19	
	Prometon	2	
	Prometryn	2	
	Propachlor	13	
	Simazine	28	
	Terbacil	2	
	Thiobencarb	15	
	Toxaphene	15	
	Trifluralin	8	
	Xylene	19	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u>Marin</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	2	
	1,2-D + 1,3-D + C-3 pesticides	2	
	1,2-D (1,2-dichloropropane)	2	
	2,4,5-T	3	
	2,4,5-TP (silvex)	3	
	2,4-D	3	
	3-Hydroxycarbofuran	2	
	4(2,4-DB), dimethylamine salt	2	
	Alachlor	2	
	Aldicarb	2	
	Aldicarb sulfone	2	
	Aldicarb sulfoxide	2	
	Atrazine	4	
	Bentazon, sodium salt	3	
	Bromacil	2	
	Butachlor	2	
	Carbaryl	2	
	Carbofuran	2	
	Dalapon	3	
	Diazinon	1	
	Dicamba	3	
	Dimethoate	2	
	Dinoseb	3	
	Diquat dibromide	2	
	Endothall	2	
	Ethylene dibromide	1	
	Methiocarb	2	
	Methomyl	2	
	Methyl bromide (bromomethane)	2	
	Metolachlor	2	
	Metribuzin	2	
	Molinate	2	
	Ortho-dichlorobenzene	2	
	Oxamyl	2	
	Picloram	3	
	Prometryn	1	
	Propachlor	2	
	Propoxur	2	
	Simazine	4	
	Thiobencarb	2	
	Xylene	2	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u>Mariposa</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	6	
	1,2-D + 1,3-D + C-3 pesticides	6	
	1,2-D (1,2-dichloropropane)	6	
	1,3-D (1,3-Dichloropropene, telone)	4	
	Acetochlor	2	
	Alachlor	13	
	Atrazine	13	
	Bromacil	7	
	Butachlor	7	
	Carbon disulfide	1	
	Chlorothalonil	2	
	Diazinon	2	
	Dimethoate	7	
	Methyl bromide (bromomethane)	6	
	Metolachlor	7	
	Metribuzin	7	
	Molinate	7	
	Naphthalene	1	
	Ortho-dichlorobenzene	6	
	Prometryn	2	
	Propachlor	5	
	Simazine	13	
	Terbacil	2	
	Thiobencarb	7	
	Xylene	6	

<u>Mendocino</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	2,4,5-T	7	
	2,4,5-TP (silvex)	7	
	2,4-D	7	
	3-Hydroxycarbofuran	7	
	4(2,4-DB), dimethylamine salt	7	
	Acifluorfen, sodium salt	7	
	Alachlor	10	
	Aldicarb	7	
	Aldicarb sulfone	7	
	Aldicarb sulfoxide	7	
	Aldrin	3	
	Atrazine	10	
	Bentazon, sodium salt	7	
	BHC (other than gamma isomer)	3	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u><i>Mendocino</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Bromacil	10	
	Butachlor	10	
	Carbaryl	7	
	Carbofuran	7	
	Chlordane	3	
	Chlorobenzilate	3	
	Chloroneb	3	
	Chlorothalonil	3	
	Chlorthal-dimethyl (dacthal / DCPA)	3	
	Chlorthal-dimethyl acid degradates (Dacthal degradates)	7	
	Dalapon	7	
	DBCP	1	
	DDD	3	
	DDE	3	
	DDT	3	
	Dicamba	7	
	Dichlorprop, butoxyethanol ester	7	
	Dieldrin	3	
	Dimethoate	10	
	Dinoseb	7	
	Diquat dibromide	7	1
	Endosulfan	3	
	Endosulfan sulfate	3	
	Endothall	7	
	Endrin	3	
	Endrin aldehyde	3	
	Ethylene dibromide	1	
	Heptachlor	3	
	Heptachlor epoxide	3	
	Hexachlorobenzene	3	
	Lindane (gamma-BHC)	3	
	Methiocarb	7	
	Methomyl	7	
	Methoxychlor	3	
	Metolachlor	10	
	Metribuzin	10	
	Molinate	10	
	Oxamyl	7	
	Permethrin	3	
	Permethrin, other related compounds	3	
	Picloram	7	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u><i>Mendocino</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Prometryn	10	
	Propachlor	3	
	Propoxur	7	
	Simazine	10	
	Thiobencarb	10	
	Toxaphene	3	
	Trifluralin	3	
	Xylene	1	

<u><i>Merced</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	16	
	1,2-D + 1,3-D + C-3 pesticides	16	
	1,2-D (1,2-dichloropropane)	16	
	1,3-D (1,3-Dichloropropene, telone)	10	
	3,5-Dichloroaniline	11	
	ACET (Deethyl-simazine or deisopropyl-atrazine)	3	
	Alachlor	21	
	Atrazine	24	
	Azoxystrobin	11	
	Azoxystrobin acid	11	
	Azoxystrobin Z	11	
	Bromacil	15	
	Butachlor	12	
	Chlordane	6	
	DACT (Diaminochlorotriazine)	3	
	DBCP	33	11
	DEA (Deethyl-atrazine)	3	
	Desmethyl-norflurazon (DSMN)	3	
	Diazinon	12	
	Dichloran	11	
	Dimethoate	12	
	Diuron	3	
	Endrin	6	
	Ethylene dibromide	29	
	Heptachlor	6	
	Heptachlor epoxide	6	
	Hexachlorobenzene	6	
	Hexazinone	3	
	Iprodione	11	
	Lindane (gamma-BHC)	6	
	Methoxychlor	6	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u>Merced</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Methyl bromide (bromomethane)	16	
	Metolachlor	12	
	Metribuzin	12	
	Molinate	12	
	Naphthalene	14	
	Norflurazon	3	
	Ortho-dichlorobenzene	16	
	Prometon	3	
	Prometryn	2	
	Propachlor	11	
	Simazine	24	
	Tebuthiuron	3	
	Tebuthiuron degradate 104 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-N-methylurea)	3	
	Tebuthiuron degradate 106 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-urea)	3	
	Tebuthiuron degradate 107 (2-Dimethylethyl-5-methylamino-1,3,4-thiadiazole)	3	
	Tebuthiuron degradate 108 (2-Dimethylethyl-5-amino-1,3,4-thiadiazole)	3	
	Thiobencarb	12	
	Toxaphene	6	
	Xylene	16	

<u>Modoc</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	NOT SAMPLED IN THE CURRENT YEAR		

<u>Mono</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	2	
	1,2-D + 1,3-D + C-3 pesticides	2	
	1,2-D (1,2-dichloropropane)	2	
	1,3-D (1,3-Dichloropropene, telone)	2	
	2,4,5-TP (silvex)	1	
	2,4-D	1	
	3-Hydroxycarbofuran	1	
	Alachlor	1	
	Aldicarb	1	
	Aldicarb sulfone	1	
	Aldicarb sulfoxide	1	
	Aldrin	1	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<b><u>Mono</u></b>	<b><i>Pesticide</i></b>	<b><i>Wells Sampled</i></b>	<b><i>Wells with Detections</i></b>
	Atrazine	1	
	Bentazon, sodium salt	1	
	Carbaryl	1	
	Carbofuran	1	
	Chlordane	1	
	Dalapon	1	
	DBCP	3	
	Dicamba	1	
	Dieldrin	1	
	Dinoseb	1	
	Diquat dibromide	1	
	Endothall	1	
	Endrin	1	
	Ethylene dibromide	3	
	Glyphosate, isopropylamine salt	1	
	Heptachlor	1	
	Heptachlor epoxide	1	
	Hexachlorobenzene	1	
	Lindane (gamma-BHC)	1	
	Methiocarb	1	
	Methomyl	1	
	Methoxychlor	1	
	Methyl bromide (bromomethane)	2	
	Molinate	1	
	Naphthalene	2	
	Ortho-dichlorobenzene	2	
	Oxamyl	1	
	Picloram	1	
	Propachlor	1	
	Propoxur	1	
	Simazine	1	
	Thiobencarb	1	
	Toxaphene	1	
	Xylene	2	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u>Monterey</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	61	
	1,2-D + 1,3-D + C-3 pesticides	40	
	1,2-D (1,2-dichloropropane)	61	
	1,3-D (1,3-Dichloropropene, telone)	26	
	2,4,5-T	45	
	2,4,5-TP (silvex)	49	
	2,4-D	52	
	3,5-Dichloroaniline	17	
	3-Hydroxycarbofuran	47	
	ACET (Deethyl-simazine or deisopropyl-atrazine)	14	
	Alachlor	51	
	Aldicarb	47	
	Aldicarb sulfone	47	
	Aldicarb sulfoxide	47	
	Aldrin	4	
	Atrazine	66	
	Azoxystrobin	17	
	Azoxystrobin acid	17	
	Azoxystrobin Z	17	
	Bentazon, sodium salt	51	
	Bromacil	61	
	Butachlor	47	
	Carbaryl	47	
	Carbofuran	50	
	Carbon disulfide	6	
	Chlordane	4	
	Chlorothalonil	1	
	Chlorthal-dimethyl acid degradates (Dacthal degradates)	3	
	DACT (Diaminochlorotriazine)	14	
	Dalapon	49	
	DBCP	7	
	DEA (Deethyl-atrazine)	14	
	Desmethyl-norflurazon (DSMN)	14	
	Diazinon	15	
	Dicamba	48	
	Dichloran	17	
	Dieldrin	4	
	Dimethoate	49	
	Dinoseb	49	
	Diquat dibromide	52	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u>Monterey</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Diuron	14	
	Endothall	4	
	Endrin	4	
	Ethylene dibromide	3	
	Glyphosate, isopropylamine salt	3	
	Heptachlor	4	
	Heptachlor epoxide	4	
	Hexachlorobenzene	4	
	Hexazinone	14	
	Iprodione	17	
	Lindane (gamma-BHC)	4	
	Methiocarb	3	
	Methomyl	47	
	Methoxychlor	4	
	Methyl bromide (bromomethane)	26	
	Metolachlor	47	
	Metribuzin	47	
	Molinate	48	
	Naphthalene	40	
	Norflurazon	14	
	Ortho-dichlorobenzene	61	
	Oxamyl	48	
	Picloram	49	
	Prometon	14	
	Propachlor	47	
	Propoxur	3	
	Simazine	66	1
	Tebuthiuron	14	
	Tebuthiuron degradate 104 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-N-methylurea)	14	
	Tebuthiuron degradate 106 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-urea)	14	
	Tebuthiuron degradate 107 (2-Dimethylethyl-5-methylamino-1,3,4-thiadiazole)	14	
	Tebuthiuron degradate 108 (2-Dimethylethyl-5-amino-1,3,4-thiadiazole)	14	
	Thiobencarb	48	
	Toxaphene	4	
	Trifluralin	1	
	Xylene	61	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u>Napa</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	3	
	1,2-D + 1,3-D + C-3 pesticides	3	
	1,2-D (1,2-dichloropropane)	3	
	2,4,5-T	4	
	2,4,5-TP (silvex)	4	
	2,4-D	4	
	3-Hydroxycarbofuran	5	
	4(2,4-DB), dimethylamine salt	3	
	Alachlor	4	
	Aldicarb	5	
	Aldicarb sulfone	5	
	Aldicarb sulfoxide	5	
	Aldrin	1	
	Atrazine	5	
	Bentazon, sodium salt	4	
	BHC (other than gamma isomer)	1	
	Bromacil	4	
	Butachlor	4	
	Carbaryl	5	
	Carbofuran	5	
	Chlordane	1	
	Chlorobenzilate	1	
	Chloroneb	1	
	Chlorothalonil	1	
	Chlorthal-dimethyl (dacthal / DCPA)	1	
	Dalapon	4	
	DBCP	3	
	DDD	1	
	DDE	1	
	DDT	1	
	Diazinon	2	
	Dicamba	4	
	Dieldrin	1	
	Dimethoate	4	
	Dinoseb	4	
	Diquat dibromide	5	
	Endosulfan	1	
	Endosulfan sulfate	1	
	Endothall	6	
	Endrin	1	
	Endrin aldehyde	1	
	Ethylene dibromide	3	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u><i>Napa</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Heptachlor	1	
	Heptachlor epoxide	1	
	Hexachlorobenzene	1	
	Lindane (gamma-BHC)	1	
	Methiocarb	3	
	Methomyl	5	
	Methoxychlor	1	
	Methyl bromide (bromomethane)	3	
	Metolachlor	4	
	Metribuzin	4	
	Molinate	4	
	Naphthalene	2	
	Ortho-dichlorobenzene	3	
	Oxamyl	6	
	Permethrin	1	
	Permethrin, other related compounds	1	
	Picloram	4	
	Prometryn	2	
	Propachlor	5	
	Propoxur	3	
	Simazine	5	
	Thiobencarb	4	
	Toxaphene	1	
	Trifluralin	1	
	Xylene	3	

<u><i>Nevada</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	2	
	1,2-D + 1,3-D + C-3 pesticides	2	
	1,2-D (1,2-dichloropropane)	2	
	1,3-D (1,3-Dichloropropene, telone)	2	
	DBCP	2	
	Ethylene dibromide	2	
	Methyl bromide (bromomethane)	2	
	Naphthalene	2	
	Ortho-dichlorobenzene	2	
	Xylene	2	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<i><u>Orange</u></i>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	189	
	1,2-D + 1,3-D + C-3 pesticides	187	
	1,2-D (1,2-dichloropropane)	189	
	1,3-D (1,3-Dichloropropene, telone)	186	
	2,4,5-TP (silvex)	8	
	2,4-D	8	
	3-Hydroxycarbofuran	9	
	Acenaphthene	7	
	Acetochlor	7	
	Alachlor	111	
	Aldicarb	9	
	Aldicarb sulfone	9	
	Aldicarb sulfoxide	9	
	Aldrin	9	
	Ametryne	1	
	Atrazine	111	
	Bentazon, sodium salt	8	
	BHC (other than gamma isomer)	9	
	Bromacil	110	
	Butachlor	112	
	Butylate	1	
	Carbaryl	9	
	Carbofuran	8	
	Chlordane	9	
	Chloroneb	1	
	Chlorothalonil	9	
	Chlorpropham	1	
	Chlorpyrifos	1	
	Chlorthal-dimethyl acid degradates (Dacthal degradates)	1	
	Cycloate	1	
	Dalapon	8	
	DBCP	184	
	DDD	9	
	DDE	9	
	DDT	9	
	Diazinon	110	
	Dicamba	9	
	Dieldrin	9	
	Dimethoate	110	
	Dinoseb	8	
	Diphenamid	1	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u>Orange</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Diquat dibromide	8	
	Diuron	7	
	Endosulfan	9	
	Endosulfan sulfate	9	
	Endothall	8	
	Endrin	9	
	Endrin aldehyde	9	
	Ethylene dibromide	184	
	Glyphosate, isopropylamine salt	8	
	Heptachlor	9	
	Heptachlor epoxide	9	
	Hexachlorobenzene	9	
	Lindane (gamma-BHC)	9	
	Linuron	7	
	Malathion	110	
	Methiocarb	7	
	Methomyl	9	
	Methoxychlor	9	
	Methyl bromide (bromomethane)	187	
	Methyl parathion	110	
	Metolachlor	112	
	Metribuzin	112	
	Molinate	111	
	Naphthalene	185	
	Napropamide	1	
	Ortho-dichlorobenzene	188	
	Oxamyl	8	
	Paraquat dichloride	7	
	Parathion or ethyl parathion	110	
	Permethrin	1	
	Picloram	8	
	Prometon	110	
	Prometryn	111	
	Propachlor	112	
	Propazine	1	
	Propoxur	7	
	Simazine	111	
	Simetryn	1	
	Terbutryn	1	
	Thiobencarb	111	
	Toxaphene	9	
	Triadimefon	1	
	Trifluralin	2	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u>Orange</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Vernolate	1	
	Xylene	189	

<u>Placer</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	7	
	1,2-D + 1,3-D + C-3 pesticides	4	
	1,2-D (1,2-dichloropropane)	7	
	1,3-D (1,3-Dichloropropene, telone)	7	
	2,4,5-TP (silvex)	3	
	2,4-D	3	
	3-Hydroxycarbofuran	3	
	Alachlor	1	
	Aldicarb	3	
	Aldicarb sulfone	3	
	Aldicarb sulfoxide	3	
	Atrazine	1	
	Bentazon, sodium salt	3	
	Bromacil	1	
	Butachlor	1	
	Carbaryl	3	
	Carbofuran	3	
	Chlorthal-dimethyl acid degradates (Dacthal degradates)	3	
	Dalapon	3	
	DBCP	4	
	Diazinon	1	
	Dicamba	3	
	Dimethoate	1	
	Dinoseb	3	
	Diquat dibromide	3	
	Endothall	3	
	Ethylene dibromide	4	
	Glyphosate, isopropylamine salt	3	
	Methomyl	3	
	Methyl bromide (bromomethane)	4	
	Metolachlor	1	
	Metribuzin	1	
	Molinate	1	
	Naphthalene	4	
	Ortho-dichlorobenzene	7	
	Oxamyl	3	
	Paraquat dichloride	3	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u><i>Placer</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Picloram	3	
	Prometryn	1	
	Propachlor	1	
	Simazine	1	
	Thiobencarb	1	
	Xylene	7	

<u><i>Plumas</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	13	
	1,2-D + 1,3-D + C-3 pesticides	13	
	1,2-D (1,2-dichloropropane)	13	
	1,3-D (1,3-Dichloropropene, telone)	11	
	DBCP	5	
	Ethylene dibromide	5	
	Methyl bromide (bromomethane)	13	
	Naphthalene	11	
	Ortho-dichlorobenzene	13	

<u><i>Riverside</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	112	
	1,2-D + 1,3-D + C-3 pesticides	84	
	1,2-D (1,2-dichloropropane)	112	
	1,3-D (1,3-Dichloropropene, telone)	84	
	2,4,5-TP (silvex)	39	
	2,4-D	39	
	3-Hydroxycarbofuran	36	
	Acetochlor	2	
	Alachlor	48	
	Aldicarb	36	
	Aldicarb sulfone	36	
	Aldicarb sulfoxide	36	
	Aldrin	40	
	Atrazine	73	
	Bentazon, sodium salt	39	1
	Bromacil	2	
	Butachlor	2	
	Carbaryl	36	
	Carbofuran	37	
	Carbon disulfide	19	
	Chlordane	39	
	Dalapon	39	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u>Riverside</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	DBCP	79	8
	DDE	2	
	Diazinon	2	
	Dicamba	38	
	Dieldrin	38	
	Dimethoate	2	
	Dinoseb	39	
	Diquat dibromide	32	
	Endothall	34	
	Endrin	39	
	EPTC	2	
	Ethylene dibromide	79	
	Glyphosate, isopropylamine salt	37	
	Heptachlor	39	
	Heptachlor epoxide	39	
	Hexachlorobenzene	52	
	Lindane (gamma-BHC)	41	
	Methiocarb	36	
	Methomyl	36	
	Methoxychlor	41	
	Methyl bromide (bromomethane)	84	
	Metolachlor	2	
	Metribuzin	2	
	Molinate	58	
	Naphthalene	85	
	Ortho-dichlorobenzene	112	
	Oxamyl	37	
	Picloram	39	
	Propachlor	40	
	Propoxur	36	
	Simazine	73	
	Terbacil	2	
	Thiobencarb	58	
	Toxaphene	39	
	Xylene	112	

<u>Sacramento</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	155	
	1,2-D + 1,3-D + C-3 pesticides	37	
	1,2-D (1,2-dichloropropane)	155	
	1,3-D (1,3-Dichloropropene, telone)	38	
	2,4,5-T	10	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u>Sacramento</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	2,4,5-TP (silvex)	41	
	2,4-D	41	
	3-Hydroxycarbofuran	10	
	4(2,4-DB), dimethylamine salt	2	
	Acifluorfen, sodium salt	2	
	Alachlor	40	
	Aldicarb	10	
	Aldicarb sulfone	10	
	Aldicarb sulfoxide	10	
	Aldrin	8	
	Atrazine	41	
	Bentazon, sodium salt	41	
	Bromacil	8	
	Butachlor	8	
	Carbaryl	10	
	Carbofuran	10	
	Chlordane	38	
	Chlorothalonil	8	
	Chlorthal-dimethyl acid degradates (Dacthal degradates)	33	
	Dalapon	41	
	DBCP	14	2
	Diazinon	8	
	Dicamba	41	
	Dichlorprop, butoxyethanol ester	2	
	Dieldrin	37	
	Dimethoate	8	
	Dinoseb	41	
	Diquat dibromide	40	
	Endothall	41	
	Endrin	40	
	Ethylene dibromide	14	
	Glyphosate, isopropylamine salt	41	
	Heptachlor	40	
	Heptachlor epoxide	40	
	Hexachlorobenzene	41	
	Lindane (gamma-BHC)	40	
	Methiocarb	2	
	Methomyl	10	
	Methoxychlor	40	
	Methyl bromide (bromomethane)	37	
	Metolachlor	8	
	Metribuzin	8	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u>Sacramento</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Molinate	41	
	Naphthalene	37	
	Ortho-dichlorobenzene	155	
	Oxamyl	10	
	Paraquat dichloride	30	
	Picloram	41	
	Propachlor	8	
	Simazine	41	
	Thiobencarb	46	
	Toxaphene	40	
	Trifluralin	8	
	Xylene	155	

<u>San Benito</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	3	
	1,2-D + 1,3-D + C-3 pesticides	3	
	1,2-D (1,2-dichloropropane)	3	
	1,3-D (1,3-Dichloropropene, Telone)	3	
	2,4,5-T	4	
	2,4,5-TP (silvex)	4	
	2,4-D	4	
	3-Hydroxycarbofuran	4	
	Aalachlor	4	
	Aldicarb	4	
	Aldicarb sulfone	4	
	Aldicarb sulfoxide	4	
	Atrazine	4	
	Bentazon, sodium salt	4	
	Bromacil	3	
	Butachlor	3	
	Carbaryl	4	
	Carbofuran	4	
	Dalapon	4	
	DBCP	1	
	Diazinon	3	
	Dicamba	4	
	Dimethoate	3	
	Dinoseb	4	
	Diquat dibromide	4	
	Ethylene dibromide	1	
	Methomyl	4	
	Methyl bromide (bromomethane)	3	
	Metolachlor	3	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u><i>San Benito</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Metribuzin	3	
	Molinate	3	
	Naphthalene	3	
	Ortho-dichlorobenzene	3	
	Oxamyl	4	
	Picloram	4	
	Propachlor	3	
	Simazine	4	
	Thiobencarb	3	
	Xylene	3	

<u><i>San Bernardino</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	207	
	1,2-D + 1,3-D + C-3 pesticides	133	
	1,2-D (1,2-dichloropropane)	207	
	1,3-D (1,3-Dichloropropene, telone)	125	
	2,4,5-T	11	
	2,4,5-TP (silvex)	56	
	2,4-D	56	
	3-Hydroxycarbofuran	26	
	4(2,4-DB), dimethylamine salt	7	
	Acetochlor	5	
	Acifluorfen, sodium salt	7	
	Alachlor	80	
	Aldicarb	30	
	Aldicarb sulfone	30	
	Aldicarb sulfoxide	30	
	Aldrin	42	
	Atrazine	95	
	Bentazon, sodium salt	56	
	BHC (other than gamma isomer)	7	
	Bromacil	14	
	Butachlor	14	
	Captan	7	
	Carbaryl	30	
	Carbofuran	56	
	Carbon disulfide	32	
	Carbophenothion	7	
	Chloramben	1	
	Chlordane	64	
	Chlorothalonil	9	
	Chlorpropham	7	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<i><u>San Bernardino</u></i>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Chlorthal-dimethyl acid degradates (Dacthal degradates)	11	
	Cyanazine	7	
	Dalapon	56	
	DBCP	164	33
	DDD	7	
	DDE	12	
	DDT	7	
	Diazinon	14	
	Dicamba	33	
	Dichlorprop, butoxyethanol ester	7	
	Dieldrin	37	
	Dimethoate	14	
	Dinoseb	56	
	Diphenamid	7	
	Diquat dibromide	54	
	Disulfoton	7	
	Endosulfan	7	
	Endosulfan sulfate	7	
	Endothall	54	
	Endrin	64	
	Endrin aldehyde	7	
	EPTC	12	
	Ethylene dibromide	149	
	Glyphosate, isopropylamine salt	57	
	Heptachlor	64	
	Heptachlor epoxide	64	
	Hexachlorobenzene	78	
	Lindane (gamma-BHC)	68	
	Methiocarb	29	
	Methomyl	30	
	Methoxychlor	68	
	Methyl bromide (bromomethane)	133	
	Metolachlor	14	
	Metribuzin	14	
	Molinate	89	
	Naphthalene	126	
	Ortho-dichlorobenzene	207	
	Oxamyl	56	
	Picloram	56	
	Prometon	7	
	Prometryn	7	
	Propachlor	36	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u><i>San Bernardino</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Propoxur	29	
	Simazine	98	
	Terbacil	12	
	Thiobencarb	89	
	Toxaphene	64	
	Trifluralin	9	
	Xylene	207	

<u><i>San Diego</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	26	
	1,2-D + 1,3-D + C-3 pesticides	18	
	1,2-D (1,2-dichloropropane)	26	1
	1,3-D (1,3-Dichloropropene, telone)	16	
	2,4,5-T	2	
	2,4,5-TP (silvex)	9	
	2,4-D	9	
	3-Hydroxycarbofuran	8	
	4(2,4-DB), dimethylamine salt	2	
	Acifluorfen, sodium salt	1	
	Alachlor	14	
	Aldicarb	8	
	Aldicarb sulfone	8	
	Aldicarb sulfoxide	8	
	Aldrin	6	
	Ametryne	1	
	Atrazine	21	
	Bentazon, sodium salt	9	
	BHC (other than gamma isomer)	1	
	Bromacil	1	
	Butachlor	1	
	Butylate	1	
	Carbaryl	8	
	Carbofuran	9	
	Carbon disulfide	13	
	Chlordane	10	
	Chloroneb	1	
	Chlorothalonil	1	
	Chlorpropham	1	
	Chlorpyrifos	1	
	Chlorthal-dimethyl acid degradates (Dacthal degradates)	6	
	Cycloate	1	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u><i>San Diego</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Dalapon	9	
	DBCP	25	1
	DDD	1	
	DDE	1	
	DDT	1	
	Dicamba	6	
	Dichlorprop, butoxyethanol ester	2	
	Dieldrin	6	
	Dinoseb	9	
	Diphenamid	1	
	Diquat dibromide	8	
	Endosulfan	1	
	Endosulfan sulfate	1	
	Endothall	8	
	Endrin	10	
	Endrin aldehyde	1	
	Ethylene dibromide	25	
	Glyphosate, isopropylamine salt	9	
	Heptachlor	10	
	Heptachlor epoxide	10	
	Hexachlorobenzene	10	
	Lindane (gamma-BHC)	10	
	Methiocarb	6	
	Methomyl	8	
	Methoxychlor	9	
	Methyl bromide (bromomethane)	18	
	Metolachlor	1	
	Metribuzin	1	
	Molinate	14	
	Naphthalene	17	
	Napropamide	1	
	Ortho-dichlorobenzene	26	
	Oxamyl	9	
	Permethrin	1	
	Picloram	9	
	Prometryn	1	
	Propachlor	2	
	Propazine	1	
	Propoxur	4	
	Simazine	21	
	Simetryn	1	
	Terbacil	1	
	Terbutryn	1	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u><i>San Diego</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Thiobencarb	14	
	Toxaphene	10	
	Triadimefon	1	
	Trifluralin	1	
	Vernolate	1	
	Xylene	26	

<u><i>San Francisco</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	NOT SAMPLED IN THE CURRENT YEAR		

<u><i>San Joaquin</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	49	
	1,2-D + 1,3-D + C-3 pesticides	39	
	1,2-D (1,2-dichloropropane)	49	
	1,3-D (1,3-Dichloropropene, telone)	31	
	2,4,5-TP (silvex)	5	
	2,4-D	5	
	3-Hydroxycarbofuran	5	
	ACET (Deethyl-simazine or deisopropyl-atrazine)	13	3
	Acrylonitrile	3	
	Alachlor	5	
	Aldicarb	5	
	Aldicarb sulfone	5	
	Aldicarb sulfoxide	5	
	Aldrin	5	
	Atrazine	18	
	Bentazon, sodium salt	5	
	Bromacil	18	
	Butachlor	5	
	Carbaryl	5	
	Carbofuran	5	
	Carbon disulfide	4	
	Chlordane	5	
	Chlorothalonil	5	
	DACT (Diaminochlorotriazine)	13	6
	Dalapon	5	
	DBCP	44	17
	DEA (Deethyl-atrazine)	13	
	Desmethyl-norflurazon (DSMN)	13	5

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<i><u>San Joaquin</u></i>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Diazinon	5	
	Dicamba	5	
	Dichlorprop, butoxyethanol ester	5	
	Dieldrin	5	
	Dimethoate	5	
	Dinoseb	5	
	Diquat dibromide	5	
	Diuron	13	
	Endothall	5	
	Endrin	5	
	EPTC	5	
	Ethyl Alcohol	3	
	Ethylene dibromide	43	1
	Heptachlor	5	
	Heptachlor epoxide	5	
	Hexachlorobenzene	5	
	Hexazinone	13	
	Lindane (gamma-BHC)	5	
	Methiocarb	5	
	Methomyl	5	
	Methoxychlor	5	
	Methyl bromide (bromomethane)	30	
	Metolachlor	5	
	Metribuzin	5	
	Molinate	5	
	Naphthalene	33	
	Norflurazon	13	2
	Ortho-dichlorobenzene	49	
	Oryzalin	13	
	Oxamyl	5	
	Picloram	5	
	Prometon	18	
	Prometryn	5	
	Propachlor	5	
	Propoxur	5	
	Simazine	18	
	Tebuthiuron	13	
	Tebuthiuron degradate 104 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-N-methylurea)	13	
	Tebuthiuron degradate 106 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-urea)	13	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<b><u>San Joaquin</u></b>	<b><i>Pesticide</i></b>	<b><i>Wells Sampled</i></b>	<b><i>Wells with Detections</i></b>
	Tebuthiuron degradate 107 (2-Dimethylethyl-5-methylamino-1,3,4-thiadiazole)	13	
	Tebuthiuron degradate 108 (2-Dimethylethyl-5-amino-1,3,4-thiadiazole)	13	
	Terbacil	5	
	Thiobencarb	8	
	Toxaphene	5	
	Trifluralin	5	
	Xylene	49	

<b><u>San Luis Obispo</u></b>	<b><i>Pesticide</i></b>	<b><i>Wells Sampled</i></b>	<b><i>Wells with Detections</i></b>
	1,2,4-Trichlorobenzene	58	
	1,2-D + 1,3-D + C-3 pesticides	27	
	1,2-D (1,2-dichloropropane)	58	
	1,3-D (1,3-Dichloropropene, telone)	26	
	Alachlor	16	
	Atrazine	22	
	Carbon disulfide	8	
	DBCP	6	
	Ethylene dibromide	8	
	Hexachlorobenzene	5	
	Methyl bromide (bromomethane)	30	
	Molinate	21	
	Naphthalene	27	
	Ortho-dichlorobenzene	58	
	Simazine	22	
	Thiobencarb	21	
	Xylene	47	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<i><u>San Mateo</u></i>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	14	
	1,2-D + 1,3-D + C-3 pesticides	8	
	1,2-D (1,2-dichloropropane)	14	2
	1,3-D (1,3-Dichloropropene, telone)	7	
	2,4,5-T	6	
	2,4,5-TP (silvex)	11	
	2,4-D	11	
	3-Hydroxycarbofuran	6	
	Acrylonitrile	1	
	Alachlor	12	
	Aldicarb	6	
	Aldicarb sulfone	6	
	Aldicarb sulfoxide	6	
	Aldrin	6	
	Atrazine	12	
	Barban	1	
	Bentazon, sodium salt	11	
	Bromacil	6	
	Butachlor	6	
	Carbaryl	6	
	Carbofuran	11	
	Carbon disulfide	2	
	Chlordane	11	
	Chlorothalonil	6	
	Chlorpropham	1	
	Dalapon	11	
	DBCP	12	
	Diazinon	7	
	Dicamba	6	
	Dieldrin	6	
	Dimethoate	6	
	Dinoseb	11	
	Diquat dibromide	11	
	Diuron	3	
	Endothall	11	
	Endrin	11	
	Ethylene dibromide	12	
	Fenuron	1	
	Fluometuron	1	
	Glyphosate, isopropylamine salt	11	
	Heptachlor	11	
	Heptachlor epoxide	11	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u><i>San Mateo</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Hexachlorobenzene	11	
	Lindane (gamma-BHC)	11	
	Linuron	1	
	Methomyl	6	
	Methoxychlor	11	
	Methyl bromide (bromomethane)	7	
	Metolachlor	6	
	Metribuzin	6	
	Molinate	12	
	Monuron	1	
	Naphthalene	8	
	Neburon	1	
	Ortho-dichlorobenzene	14	
	Oxamyl	11	
	Picloram	11	
	Propachlor	6	
	Propham	1	
	Propoxur	1	
	Siduron	1	
	Simazine	12	
	Thiobencarb	12	
	Toxaphene	11	
	Trifluralin	6	
	Xylene	13	

<u><i>Santa Barbara</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	23	
	1,2-D + 1,3-D + C-3 pesticides	14	
	1,2-D (1,2-dichloropropane)	23	
	1,3-D (1,3-Dichloropropene, telone)	13	
	2,4,5-TP (silvex)	2	
	2,4-D	2	
	3,5-Dichloroaniline	3	
	3-Hydroxycarbofuran	2	
	ACET (Deethyl-simazine or deisopropyl-atrazine)	3	
	Acetochlor	2	
	Alachlor	3	
	Aldicarb	2	
	Aldicarb sulfone	2	
	Aldicarb sulfoxide	2	
	Aldrin	2	
	Atrazine	10	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<i><u>Santa Barbara</u></i>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Azoxystrobin	3	
	Azoxystrobin acid	3	
	Azoxystrobin Z	3	
	Bentazon, sodium salt	2	
	Bromacil	5	
	Butachlor	2	
	Carbaryl	2	
	Carbofuran	2	
	Carbon disulfide	2	
	Chlordane	2	
	Chlorthal-dimethyl acid degradates (Dacthal degradates)	2	
	DACT (Diaminochlorotriazine)	3	
	Dalapon	2	
	DBCP	7	
	DDE	2	
	DEA (Deethyl-atrazine)	3	
	Desmethyl-norflurazon (DSMN)	3	
	Diazinon	2	
	Dicamba	2	
	Dichloran	3	
	Dieldrin	2	
	Dimethoate	2	
	Dinoseb	2	
	Diquat dibromide	2	
	Diuron	3	
	Endothall	2	
	Endrin	2	
	EPTC	2	
	Ethylene dibromide	7	
	Glyphosate, isopropylamine salt	2	
	Heptachlor	2	
	Heptachlor epoxide	2	
	Hexachlorobenzene	2	
	Hexazinone	3	
	Iprodione	3	
	Lindane (gamma-BHC)	2	
	Methiocarb	2	
	Methomyl	2	
	Methoxychlor	2	
	Methyl bromide (bromomethane)	14	
	Metolachlor	2	
	Metribuzin	2	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u><i>Santa Barbara</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Molinate	3	
	Naphthalene	14	
	Norflurazon	3	
	Ortho-dichlorobenzene	23	
	Oxamyl	2	
	Picloram	2	
	Prometon	3	
	Propachlor	2	
	Propoxur	2	
	Simazine	10	
	Tebuthiuron	3	
	Tebuthiuron degradate 104 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-N-methylurea)	3	
	Tebuthiuron degradate 106 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-urea)	3	
	Tebuthiuron degradate 107 (2-Dimethylethyl-5-methylamino-1,3,4-thiadiazole)	3	
	Tebuthiuron degradate 108 (2-Dimethylethyl-5-amino-1,3,4-thiadiazole)	3	
	Terbacil	2	
	Thiobencarb	3	
	Toxaphene	2	
	Xylene	22	

<u><i>Santa Clara</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	117	
	1,2-D + 1,3-D + C-3 pesticides	54	
	1,2-D (1,2-dichloropropane)	117	
	1,3-D (1,3-Dichloropropene, telone)	47	
	2,4,5-T	2	
	2,4,5-TP (silvex)	41	
	2,4-D	41	
	3-Hydroxycarbofuran	24	
	4(2,4-DB), dimethylamine salt	1	
	Alachlor	40	
	Aldicarb	24	
	Aldicarb sulfone	24	
	Aldicarb sulfoxide	24	
	Aldrin	24	
	Atrazine	40	
	Bentazon, sodium salt	41	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u><i>Santa Clara</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Bromacil	25	
	Butachlor	25	
	Carbaryl	24	
	Carbofuran	40	
	Carbon disulfide	25	
	Chlordane	40	
	Chlorothalonil	1	
	Chlorthal-dimethyl acid degradates (Dacthal degradates)	25	
	Dalapon	41	
	DBCP	41	
	Diazinon	25	
	Dicamba	26	
	Dichlorprop, butoxyethanol ester	1	
	Dieldrin	24	
	Dimethoate	32	
	Dinoseb	41	
	Diquat dibromide	40	
	Diuron	11	
	Endothall	40	
	Endrin	40	
	Ethylene dibromide	41	
	Glyphosate, isopropylamine salt	40	
	Heptachlor	40	
	Heptachlor epoxide	40	
	Hexachlorobenzene	40	
	Lindane (gamma-BHC)	40	
	Methiocarb	23	
	Methomyl	24	
	Methoxychlor	40	
	Methyl bromide (bromomethane)	45	
	Metolachlor	25	
	Metribuzin	25	
	Molinate	40	
	Naphthalene	51	
	Ortho-dichlorobenzene	117	
	Oxamyl	40	
	Picloram	41	
	Propachlor	25	
	Propoxur	23	
	Simazine	40	
	Thiobencarb	40	
	Toxaphene	40	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u><i>Santa Clara</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Trifluralin	1	
	Xylene	117	

<u><i>Santa Cruz</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,1,2,2-Tetrachloroethane	14	
	1,2,4-Trichlorobenzene	14	
	1,2-D + 1,3-D + C-3 pesticides	13	
	1,2-D (1,2-dichloropropane)	14	
	1,3-D (1,3-Dichloropropene, telone)	14	
	2,4,5-T	10	
	2,4,5-TP (silvex)	21	
	2,4-D	21	
	3,5-Dichloroaniline	1	
	3-Hydroxycarbofuran	20	
	ACET (Deethyl-simazine or deisopropyl-atrazine)	1	
	Alachlor	22	
	Aldicarb	20	
	Aldicarb sulfone	20	
	Aldicarb sulfoxide	20	
	Aldrin	17	
	Atrazine	23	
	Azoxystrobin	1	
	Azoxystrobin acid	1	
	Azoxystrobin Z	1	
	Bentazon, sodium salt	21	
	Bromacil	23	
	Butachlor	22	
	Carbaryl	20	
	Carbofuran	20	
	Carbon disulfide	5	
	Chlordane	17	
	Chlorothalonil	6	
	Chlorthal-dimethyl acid degradates (Dacthal degradates)	11	
	DACT (Diaminochlorotriazine)	1	
	Dalapon	21	
	DBCP	22	
	DEA (Deethyl-atrazine)	1	
	DSMN (Desmethyl-norflurazon)	1	
	Diazinon	22	
	Dicamba	21	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u><i>Santa Cruz</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Dichloran	1	
	Dieldrin	17	
	Dimethoate	22	
	Dinoseb	21	
	Diquat dibromide	21	
	Diuron	1	
	Endothall	17	
	Endrin	17	
	Ethylene dibromide	19	
	Glyphosate, isopropylamine salt	17	
	Heptachlor	17	
	Heptachlor epoxide	17	
	Hexachlorobenzene	17	
	Hexazinone	1	
	Iprodione	1	
	Lindane (gamma-BHC)	16	
	Methiocarb	11	
	Methomyl	20	
	Methoxychlor	17	
	Methyl bromide (bromomethane)	13	
	Metolachlor	22	
	Metribuzin	22	
	Molinate	22	
	Naphthalene	13	
	Norflurazon	1	
	Ortho-dichlorobenzene	14	
	Oxamyl	20	
	Picloram	21	
	Prometon	1	
	Propachlor	22	
	Propoxur	11	
	Simazine	23	
	Tebuthiuron	1	
	Tebuthiuron degradate 104 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-N-methylurea)	1	
	Tebuthiuron degradate 106 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-urea)	1	
	Tebuthiuron degradate 107 (2-Dimethylethyl-5-methylamino-1,3,4-thiadiazole)	1	
	Tebuthiuron degradate 108 (2-Dimethylethyl-5-amino-1,3,4-thiadiazole)	1	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u><i>Santa Cruz</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Thiobencarb	22	
	Toxaphene	17	
	Trifluralin	6	
	Xylene	14	

<u><i>Shasta</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	16	
	1,2-D + 1,3-D + C-3 pesticides	16	
	1,2-D (1,2-dichloropropane)	16	
	Methyl bromide (bromomethane)	16	
	Ortho-dichlorobenzene	16	
	Xylene	16	

<u><i>Sierra</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	NOT SAMPLED IN THE CURRENT YEAR	1	

<u><i>Siskiyou</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	3	
	1,2-D + 1,3-D + C-3 pesticides	3	
	1,2-D (1,2-dichloropropane)	3	
	Methyl bromide (bromomethane)	3	
	Ortho-dichlorobenzene	3	
	Xylene	3	

<u><i>Solano</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	8	
	1,2-D + 1,3-D + C-3 pesticides	8	
	1,2-D (1,2-dichloropropane)	9	
	1,3-D (1,3-Dichloropropene, telone)	3	
	2,4,5-T	2	
	2,4,5-TP (silvex)	3	
	2,4-D	3	
	3-Hydroxycarbofuran	1	
	Alachlor	3	
	Aldicarb	1	
	Aldicarb sulfone	1	
	Aldicarb sulfoxide	1	
	Aldrin	3	
	Atrazine	3	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u>Solano</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Bentazon, sodium salt	3	
	Bromacil	3	
	Butachlor	1	
	Carbaryl	1	
	Carbofuran	1	
	Carbon disulfide	1	
	Chlordane	3	
	Chlorthal-dimethyl acid degradates (Dacthal degradates)	1	
	Dalapon	3	
	DBCP	3	
	Diazinon	3	
	Dicamba	3	
	Dieldrin	3	
	Dimethoate	3	
	Dinoseb	3	
	Diquat dibromide	3	
	Endothall	3	
	Endrin	3	
	Ethylene dibromide	3	
	Glyphosate, isopropylamine salt	1	
	Heptachlor	3	
	Heptachlor epoxide	3	
	Hexachlorobenzene	3	
	Lindane (gamma-BHC)	3	
	Methiocarb	1	
	Methomyl	1	
	Methoxychlor	3	
	Methyl bromide (bromomethane)	4	
	Metolachlor	3	
	Metribuzin	3	
	Molinate	3	
	Naphthalene	7	
	Ortho-dichlorobenzene	9	
	Oxamyl	1	
	Picloram	3	
	Prometryn	2	
	Propachlor	1	
	Propoxur	1	
	Simazine	3	
	Thiobencarb	3	
	Toxaphene	3	
	Xylene	10	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<i><u>Sonoma</u></i>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	34	
	1,2-D + 1,3-D + C-3 pesticides	33	
	1,2-D (1,2-dichloropropane)	34	
	1,3-D (1,3-Dichloropropene, telone)	9	
	2,4,5-T	37	
	2,4,5-TP (silvex)	41	
	2,4-D	41	
	3-Hydroxycarbofuran	32	
	4(2,4-DB), dimethylamine salt	25	
	Acifluorfen, sodium salt	6	
	Acrylonitrile	7	
	Alachlor	36	
	Aldicarb	32	
	Aldicarb sulfone	32	
	Aldicarb sulfoxide	32	
	Aldrin	16	
	Ametryne	2	
	Atrazine	49	
	Bentazon, sodium salt	41	
	BHC (other than gamma isomer)	6	
	Bromacil	30	
	Butachlor	32	
	Butylate	2	
	Carbaryl	32	
	Carbofuran	33	
	Carbon disulfide	7	
	Chlordane	16	
	Chlorobenzilate	6	
	Chloroneb	8	
	Chlorothalonil	10	
	Chlorpropham	2	
	Chlorpyrifos	2	
	Chlorthal-dimethyl (dacthal / DCPA)	6	
	Chlorthal-dimethyl acid degradates (Dacthal degradates)	8	
	Cycloate	2	
	Dalapon	48	
	DBCP	12	
	DDD	6	
	DDE	6	
	DDT	6	
	Diazinon	22	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u>Sonoma</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Dicamba	39	
	Dichlorprop, butoxyethanol ester	6	
	Dieldrin	14	
	Dimethoate	30	
	Dinoseb	41	
	Diphenamid	2	
	Diquat dibromide	47	
	Diuron	6	
	Endosulfan	6	
	Endosulfan sulfate	6	
	Endothall	44	
	Endrin	16	
	Endrin aldehyde	6	
	Ethylene dibromide	18	1
	Glyphosate, isopropylamine salt	7	
	Heptachlor	16	
	Heptachlor epoxide	16	
	Hexachlorobenzene	16	
	Lindane (gamma-BHC)	16	
	Methiocarb	15	
	Methomyl	32	
	Methoxychlor	16	
	Methyl bromide (bromomethane)	33	
	Metolachlor	32	
	Metribuzin	32	
	Molinate	34	
	Naphthalene	21	
	Napropamide	2	
	Ortho-dichlorobenzene	34	
	Oxamyl	48	
	Paraquat dichloride	2	
	Permethrin	8	
	Permethrin, other related compounds	6	
	Picloram	49	
	Prometryn	20	
	Propachlor	32	
	Propazine	2	
	Propoxur	15	
	Simazine	49	
	Simetryn	2	
	Terbutryn	2	
	Thiobencarb	37	
	Toxaphene	16	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u><i>Sonoma</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Triadimefon	2	
	Trifluralin	12	
	Vernolate	2	
	Xylene	34	

<u><i>Stanislaus</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	53	
	1,2-D + 1,3-D + C-3 pesticides	53	
	1,2-D (1,2-dichloropropane)	53	
	1,3-D (1,3-Dichloropropene, telone)	43	
	2,4,5-T	3	
	2,4,5-TP (silvex)	3	
	2,4-D	3	
	3,5-Dichloroaniline	11	
	3-Hydroxycarbofuran	3	
	ACET (Deethyl-simazine or deisopropyl-atrazine)	11	1
	Alachlor	47	
	Aldicarb	3	
	Aldicarb sulfone	3	
	Aldicarb sulfoxide	3	
	Aldrin	3	
	Atrazine	58	
	Azoxystrobin	11	
	Azoxystrobin acid	11	
	Azoxystrobin Z	11	
	Bentazon, sodium salt	3	
	Bromacil	58	
	Butachlor	47	
	Carbaryl	3	
	Carbofuran	3	
	Chlordane	3	
	Chlorothalonil	3	
	DACT (Diaminochlorotriazine)	11	5
	Dalapon	3	
	DBCP	80	22
	DEA (Deethyl-atrazine)	11	
	DSMN (Desmethyl-norflurazon)	11	3
	Diazinon	47	
	Dicamba	3	
	Dichloran	11	
	Dieldrin	3	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u>Stanislaus</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Dimethoate	47	
	Dinoseb	3	
	Diquat dibromide	3	
	Diuron	14	1
	Endothall	3	
	Endrin	3	
	Ethylene dibromide	77	
	Glyphosate, isopropylamine salt	3	
	Heptachlor	3	
	Heptachlor epoxide	3	
	Hexachlorobenzene	3	
	Hexazinone	11	
	Iprodione	11	
	Lindane (gamma-BHC)	2	
	Methomyl	3	
	Methoxychlor	3	
	Methyl bromide (bromomethane)	53	1
	Metolachlor	47	
	Metribuzin	47	
	Molinate	47	
	Naphthalene	45	
	Norflurazon	11	
	Ortho-dichlorobenzene	53	
	Oxamyl	3	
	Picloram	3	
	Prometon	11	
	Propachlor	47	
	Simazine	58	1
	Tebuthiuron	11	
	Tebuthiuron degradate 104 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-N-methylurea)	11	
	Tebuthiuron degradate 106 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-urea)	11	
	Tebuthiuron degradate 107 (2-Dimethylethyl-5-methylamino-1,3,4-thiadiazole)	11	
	Tebuthiuron degradate 108 (2-Dimethylethyl-5-amino-1,3,4-thiadiazole)	11	
	Thiobencarb	49	
	Toxaphene	3	
	Trifluralin	3	
	Xylene	53	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u><i>Sutter</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	1	
	1,2-D (1,2-dichloropropane)	1	
	1,3-D (1,3-Dichloropropene, telone)	1	
	Ortho-dichlorobenzene	1	
	Xylene	2	

<u><i>Tehama</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	2	
	1,2-D + 1,3-D + C-3 pesticides	2	
	1,2-D (1,2-dichloropropane)	2	
	Diquat dibromide	1	
	Methyl bromide (bromomethane)	2	
	Ortho-dichlorobenzene	2	
	Paraquat dichloride	1	
	Xylene	2	

<u><i>Trinity</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	1	
	1,2-D + 1,3-D + C-3 pesticides	1	
	1,2-D (1,2-dichloropropane)	1	
	Methyl bromide (bromomethane)	1	
	Ortho-dichlorobenzene	1	
	Xylene	1	

<u><i>Tulare</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	86	
	1,2-D + 1,3-D + C-3 pesticides	83	
	1,2-D (1,2-dichloropropane)	86	
	1,3-D (1,3-Dichloropropene, telone)	66	
	2,4,5-T	24	
	2,4,5-TP (silvex)	29	
	2,4-D	29	
	3,5-Dichloroaniline	23	
	3-Hydroxycarbofuran	23	
	ACET (Deethyl-simazine or deisopropyl-atrazine)	4	1
	Alachlor	31	
	Aldicarb	23	
	Aldicarb sulfone	23	
	Aldicarb sulfoxide	23	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u><i>Tulare</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Aldrin	21	
	Atrazine	35	1
	Azoxystrobin	23	
	Azoxystrobin acid	23	
	Azoxystrobin Z	23	
	Barban	2	
	Bentazon, sodium salt	29	
	Bromacil	30	9
	Butachlor	26	
	Carbaryl	23	
	Carbofuran	28	
	Carbon disulfide	1	
	Chlordane	23	
	Chlorothalonil	21	
	Chlorpropham	2	
	DACT (Diaminochlorotriazine)	4	16
	Dalapon	29	
	DBCP	99	32
	DEA (Deethyl-atrazine)	4	1
	DSMN (Desmethyl-norflurazon)	4	9
	Diazinon	23	
	Dicamba	24	
	Dichloran	23	
	Dieldrin	21	
	Dimethoate	26	
	Dinoseb	29	
	Diquat dibromide	20	
	Diuron	11	8
	Endothall	24	
	Endrin	23	
	Ethylene dibromide	96	
	Fenuron	2	
	Fluometuron	2	
	Glyphosate, isopropylamine salt	21	
	Heptachlor	23	
	Heptachlor epoxide	23	
	Hexachlorobenzene	23	
	Hexazinone	4	
	Iprodione	23	
	Lindane (gamma-BHC)	20	
	Linuron	2	
	Methomyl	23	
	Methoxychlor	23	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u><i>Tulare</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Methyl bromide (bromomethane)	64	
	Metolachlor	26	
	Metribuzin	26	
	Molinate	26	
	Monuron	2	
	Naphthalene	83	
	Neburon	2	
	Norflurazon	4	6
	Ortho-dichlorobenzene	86	
	Oxamyl	28	
	Picloram	29	
	Prometon	4	
	Prometryn	2	
	Propachlor	26	
	Propham	2	
	Propoxur	2	
	Siduron	2	
	Simazine	35	1
	Tebuthiuron	4	
	Tebuthiuron degradate 104 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-N-methylurea)	4	
	Tebuthiuron degradate 106 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-urea)	4	
	Tebuthiuron degradate 107 (2-Dimethylethyl-5-methylamino-1,3,4-thiadiazole)	4	
	Tebuthiuron degradate 108 (2-Dimethylethyl-5-amino-1,3,4-thiadiazole)	4	
	Thiobencarb	26	
	Toxaphene	23	
	Trifluralin	21	
	Xylene	82	

<u><i>Tuolumne</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	20	
	1,2-D + 1,3-D + C-3 pesticides	20	
	1,2-D (1,2-dichloropropane)	20	
	1,3-D (1,3-Dichloropropene, telone)	4	
	Acetochlor	8	
	Alachlor	12	
	Atrazine	12	
	Bromacil	8	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u><i>Tuolumne</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Butachlor	8	
	Chlorothalonil	8	
	Diazinon	8	
	Dimethoate	8	
	Methyl bromide (bromomethane)	20	
	Metolachlor	8	
	Metribuzin	8	
	Molinate	8	
	Naphthalene	4	
	Ortho-dichlorobenzene	20	
	Prometryn	8	
	Simazine	12	
	Terbacil	8	
	Thiobencarb	8	
	Xylene	20	

<u><i>Ventura</i></u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	26	
	1,2-D + 1,3-D + C-3 pesticides	24	
	1,2-D (1,2-dichloropropane)	26	
	1,3-D (1,3-Dichloropropene, telone)	26	
	2,4,5-T	5	
	2,4,5-TP (silvex)	5	
	2,4-D	5	
	3,5-Dichloroaniline	8	
	3-Hydroxycarbofuran	5	
	ACET (Deethyl-simazine or deisopropyl-atrazine)	8	
	Alachlor	6	
	Aldicarb	5	
	Aldicarb sulfone	5	
	Aldicarb sulfoxide	5	
	Aldrin	5	
	Atrazine	18	
	Azoxystrobin	8	
	Azoxystrobin acid	8	
	Azoxystrobin Z	8	
	Bentazon, sodium salt	5	
	Bromacil	14	
	Butachlor	6	
	Carbaryl	5	
	Carbofuran	5	
	Carbon disulfide	1	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u>Ventura</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Chlordane	5	
	DACT (Diaminochlorotriazine)	8	
	Dalapon	5	
	DBCP	8	
	DEA (Deethyl-atrazine)	8	
	DSMN (Desmethyl-norflurazon)	8	
	Diazinon	6	
	Dicamba	5	
	Dichloran	8	
	Dieldrin	5	
	Dimethoate	6	
	Dinoseb	5	
	Diquat dibromide	5	
	Diuron	13	
	Endothall	1	
	Endrin	5	
	Ethylene dibromide	8	
	Glyphosate, isopropylamine salt	1	
	Heptachlor	5	
	Heptachlor epoxide	5	
	Hexachlorobenzene	5	
	Hexazinone	8	
	Iprodione	8	
	Lindane (gamma-BHC)	5	
	Methomyl	5	
	Methoxychlor	5	
	Methyl bromide (bromomethane)	24	
	Metolachlor	6	
	Metribuzin	6	
	Molinate	6	
	Naphthalene	24	
	Norflurazon	8	
	Ortho-dichlorobenzene	26	
	Oxamyl	6	
	Picloram	5	
	Prometon	8	
	Prometryn	6	
	Propachlor	6	
	Simazine	18	
	Tebuthiuron	8	
	Tebuthiuron degradate 104 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-N-methylurea)	8	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<u>Ventura</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	Tebuthiuron degradate 106 (N-(5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-urea)	8	
	Tebuthiuron degradate 107 (2-Dimethylethyl-5-methylamino-1,3,4-thiadiazole)	8	
	Tebuthiuron degradate 108 (2-Dimethylethyl-5-amino-1,3,4-thiadiazole)	8	
	Thiobencarb	6	
	Toxaphene	5	
	Xylene	26	1

<u>Yolo</u>	<i>Pesticide</i>	<i>Wells Sampled</i>	<i>Wells with Detections</i>
	1,2,4-Trichlorobenzene	19	
	1,2-D + 1,3-D + C-3 pesticides	18	
	1,2-D (1,2-dichloropropane)	19	
	1,3-D (1,3-Dichloropropene, telone)	19	
	2,4,5-T	5	
	2,4,5-TP (silvex)	5	
	2,4-D	5	
	3-Hydroxycarbofuran	4	
	Alachlor	9	
	Aldicarb	5	
	Aldicarb sulfone	5	
	Aldicarb sulfoxide	5	
	Aldrin	5	
	Atrazine	9	
	Bentazon, sodium salt	5	
	Bromacil	9	
	Butachlor	9	
	Carbaryl	4	
	Carbofuran	5	
	Chlordane	5	
	Chlorothalonil	5	
	Dalapon	5	
	DBCP	5	
	Diazinon	5	
	Dicamba	5	
	Dieldrin	5	
	Dimethoate	9	
	Dinoseb	5	
	Diquat dibromide	5	
	Endothall	2	
	Endrin	5	

**APPENDIX E – WELL SAMPLING RESULTS SUMMARIZED BY COUNTY AND PESTICIDE,  
CONTINUED**

<b><u>Yolo</u></b>	<b><i>Pesticide</i></b>	<b><i>Wells Sampled</i></b>	<b><i>Wells with Detections</i></b>
	Ethylene dibromide	5	
	Glyphosate, isopropylamine salt	2	
	Heptachlor	5	
	Heptachlor epoxide	5	
	Hexachlorobenzene	5	
	Lindane (gamma-BHC)	5	
	Methiocarb	2	
	Methomyl	5	
	Methoxychlor	5	
	Methyl bromide (bromomethane)	18	
	Metolachlor	9	
	Metribuzin	9	
	Molinate	9	
	Naphthalene	18	
	Ortho-dichlorobenzene	19	
	Oxamyl	4	
	Picloram	5	
	Prometryn	3	
	Propachlor	9	
	Propoxur	3	
	Simazine	9	
	Thiobencarb	10	
	Toxaphene	5	
	Trifluralin	2	
	Xylene	19	

<b><u>Yuba</u></b>	<b><i>Pesticide</i></b>	<b><i>Wells Sampled</i></b>	<b><i>Wells with Detections</i></b>
	1,2,4-Trichlorobenzene	13	
	1,2-D + 1,3-D + C-3 pesticides	13	
	1,2-D (1,2-dichloropropane)	13	
	1,3-D (1,3-Dichloropropene, telone)	6	
	DBCP	5	
	Ethylene dibromide	5	
	Methyl bromide (bromomethane)	10	
	Naphthalene	12	
	Ortho-dichlorobenzene	13	
	Xylene	13	1

## Glossary of Terms

<b>TERM</b>	<b>DEFINITION</b>
<b>AB 1803</b>	(1983) (Chapter 881, Statutes of 1983) A law that required CDPH to evaluate each public water system to determine its potential for contamination. The systems were required to conduct specified water analyses and to report those results. Monitoring required by AB 1803 was completed in June 1989.
<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 ground water to its Web site. This law replaced the previous requirement that DPR submit the sampling information in a written report to the Legislature, the SWRCB, and CDPH.
<b>Archived advisory level (AAL)</b>	In 1982 and 1983, CDPH provided advisory levels (then called “action levels” and now called “notification levels”) for a number of chemicals to the Central Valley Regional Water Quality Control Board. Many were pesticides that had not been detected in drinking water but which were nonetheless of concern because of their association with a particular site. Some of those chemicals now have enforceable drinking water standards. The remaining chemicals were archived, along with several others with advisory levels established in 1990-91, or updated more recently. If a chemical is detected above its archived advisory level, the requirements and recommendations are the same as for chemicals detected above their notification levels and response levels. More information is available at: < <a href="http://www.cdph.ca.gov/certlic/drinkingwater/Documents/Notificationlevels/archivedadvisorylevels.pdf">http://www.cdph.ca.gov/certlic/drinkingwater/Documents/Notificationlevels/archivedadvisorylevels.pdf</a> >.
<b>Active ingredient</b>	The chemical or chemicals in a pesticide formulation that are biologically active and are capable, in themselves, or 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>Adjuvant</b>	Chemicals added to a pesticide product to improve its effectiveness, including wetting agents, dispersing agents, stickers, emulsifiers, spreaders, and penetrants. In California, must be registered as pesticides.

**GLOSSARY OF TERMS, CONTINUED**

<b><i>TERM</i></b>	<b><i>DEFINITION</i></b>
<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>Aquifer</b>	A geologic formation, group of formations, or part of a formation, that is water bearing and which transmits water in sufficient quantity to supply springs and pumping wells.
<b>Cal/EPA</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>Data gap</b>	When registrants fail to submit required health or environmental studies.

**GLOSSARY OF TERMS, CONTINUED**

<b><i>TERM</i></b>	<b><i>DEFINITION</i></b>
<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 ground water 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>EPA Registration Number (EPA Reg. No)</b>	Assigned by U.S. EPA to identify each pesticide product registration. This number must appear on the product's label.
<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>Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)</b>	Governs the registration, sale, possession and use of pesticides nationally.
<b>Formulation</b>	Pesticide product as sold, usually a mixture of active and inert ingredients.
<b>Ground water</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 by either leaching or runoff.
<b>Groundwater Protection List (GWPL)</b>	A list of pesticides having the potential to pollute ground water included in 3 CCR section 6800.

**GLOSSARY OF TERMS, CONTINUED**

<b><i>TERM</i></b>	<b><i>DEFINITION</i></b>
<b>Health advisory level (HAL)</b>	An advisory number published by U.S. EPA’s Office of Drinking Water and Office of Water Regulations and Standards. Short-term (ten days or less), long-term (seven years or less), and lifetime exposure health advisories for noncarcinogens and suspected human carcinogens are included where data sufficient for derivation of the advisories exist. A HAL is a guideline, which includes a margin of safety to protect human health. For lifetime HALs, water that contains a pesticide at a concentration at or below its HAL is acceptable for drinking every day over the course of one's lifetime.
<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 ground water; the process by which residues are dissolved in soil water and follow the movement of water through the soil matrix as it recharges a ground water 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 adopted as regulations by CDPH. They 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 costs of treatment. Health and Safety Code §116365(a) requires CDPH to establish a contaminant’s MCL at a level as close to its PHG as is technically and economically feasible, placing primary emphasis on the protection of public health.
<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 ground water levels and flow conditions, (2) obtaining samples for determining ground water quality, or (3) evaluating hydraulic properties of water-bearing strata.

GLOSSARY OF TERMS, CONTINUED

<b>TERM</b>	<b>DEFINITION</b>
<b>Non-agricultural use</b>	<i>See “agricultural use.”</i>
<b>Noncrop areas</b>	These areas include rights-of-way, golf courses, cemeteries, and industrial and institutional sites. Agricultural use of pesticides in noncrop areas include weed control around buildings on a farm or on rights-of-way, irrigation canals and ditches, golf courses, parks, and cemeteries.
<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>Notification level (NL)</b>	Notification levels are health-based advisory levels established by CDPH for chemicals in drinking water that lack maximum contaminant levels (MCLs). When chemicals are found at concentrations greater than their notification levels, certain requirements and recommendations apply. The level at which CDPH recommends removal of a drinking water source from service is called the “response level”. Since the early 1980s, notification levels (known as “action levels” through 2004) for 93 contaminants have been established. Of those, 39 have gone through the <a href="#">formal regulatory process</a> and now have <a href="#">MCLs</a> . Currently there are 30 chemicals with <a href="#">notification levels</a> . In addition, another 24 chemicals have <a href="#">archived advisory levels</a> , which are also available for use.
<b>Organic matter</b>	Plant and animal debris or remains found in the soil in all stages of decay. The major elements in organic matter are oxygen, hydrogen, and carbon.
<b>Permit</b>	Time- and site-specific permits are issued by county agricultural commissioners for the use of pesticides designated as restricted materials.
<b>Permit condition</b>	CACs routinely condition permits on following use controls tailored to the local area, the pesticide, and the application method, designed to prevent harm to people or the environment.
<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.

**GLOSSARY OF TERMS, CONTINUED**

<b><i>TERM</i></b>	<b><i>DEFINITION</i></b>
<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 ground water (GWPL); (3) the director to monitor ground water for these pesticides; (4) all local, county, and state agencies to report to DPR the results of pesticides sampled in ground water; (5) the director to maintain a specified well sampling database and to post certain information annually on its website about pesticides in ground water; 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 ground water due to legal agricultural use.
<b>Pesticide Management Zone (PMZ)</b>	A geographic surveying unit of approximately one square mile, which is vulnerable to ground water contamination based on detections of pesticides or pesticide degradates in ground water due to agricultural use. PMZs were formally listed in section 3 CCR section 6802 and were pesticide specific. The use of a pesticide inside its PMZs was subject to certain ground water 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>Public health goal (PHG)</b>	PHGs are established by Cal/EPA's <a href="#">OEHHA</a> . 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 §116365(c) for contaminants with MCLs, and for those for which CDPH will be adopting 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.

**GLOSSARY OF TERMS, CONTINUED**

<b><i>TERM</i></b>	<b><i>DEFINITION</i></b>
<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>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 is 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 ground water.
<b>State Well Number</b>	A unique number assigned to a well consisting of the county number/township/range/section/tract and sequence number.
<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 is contains 36 sections</p>
<b>Triazine</b>	A pesticide derived from any of three isomeric compounds, each having three carbon and three nitrogen atoms in a six-member ring. Triazine herbicides are strong inhibitors of photosynthesis. Atrazine and simazine are examples of commonly used triazine herbicides.
<b>Well Inventory Database</b>	A statewide database, required by the PCPA and maintained by DPR, of wells sampled for pesticides and pesticide degradates.