SAMPLING FOR PESTICIDE RESIDUES IN CALIFORNIA WELL WATER

2001 Update of the Well Inventory Database

For Sampling Results Reported From July 1, 2000, through June 30, 2001

Sixteenth Annual Report to
the Legislature,
Department of Health Services,
the Office of Environmental Health Hazard Assessment,
and State Water Resources Control Board

Pursuant to the
Pesticide Contamination Prevention Act

California Environmental Protection Agency
DEPARTMENT OF PESTICIDE REGULATION

December 2001

EH01-03

Department of Pesticide Regulation

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by
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EH01-03

EXECUTIVE SUMMARY

The Pesticide Contamination Prevention Act

The Pesticide Contamination Prevention Act (PCPA) was enacted in 1985 to prevent further pesticide pollution of the state's ground water. The PCPA requires:

- The Department of Pesticide Regulation (DPR) to maintain a statewide database of wells sampled for active ingredients of pesticide products.
- Agencies to report to DPR the results of any well sampling for the active ingredients of pesticides.
- DPR to review findings of pesticide contamination and undertake necessary mitigation.
- DPR, in consultation with the California Department of Health Services (CDHS) and the State Water Resources Control Board (SWRCB), to annually make this report to the Legislature, CDHS, the Office of Environmental Health Hazard Assessment (OEHHA), and SWRCB.

The Well Inventory Database

The well inventory database was developed by DPR (then a division of the California Department of Food and Agriculture) in 1983 before the passage of PCPA.

The purposes of the database were to centralize information on the occurrence of nonpoint-source contamination of ground water by the agricultural use of pesticides and to facilitate graphical, numerical, and spatial analyses of the data.

To meet the requirements of the PCPA, sampling results from both point-source and nonpoint-source contamination are included in the database.

What Happens When Detections are Reported to DPR

When a pesticide is found in ground water, a well-defined process established by the PCPA is triggered. This process allows for comprehensive review of the detection.

DPR refers detections to SWRCB if the pesticide is not currently registered for use; registered for other than agricultural, outdoor industrial, or outdoor institutional uses; or found in ground water and determined not to be due to legal agricultural use. (See Appendix D for definitions of terms used in this report.)

DPR attempts to verify the detection of pesticides that are currently registered for agricultural use by conducting a well sampling study. Detections may not be verified for one of several reasons, including:

- Follow-up sampling has not yet been completed by DPR.
- Sampling was not conducted by DPR.
- The detection may have been referred to SWRCB.
- There may be no wells available for sampling.
- Permission to sample could not be obtained from the well owner.
- DPR conducted sampling in response to the positive detection and found no detections for the compound under investigation.

If a detection is verified, DPR determines whether the contamination occurred because of legal agricultural use of the chemical.

General Information about Sampling Results in the Well Inventory Database

A summary of the data in the database by report year is given in Table 1. The data can be used to:

- Display the geographic distribution of well sampling.
- Display the geographic distribution of pesticide residues in sampled wells.
- Identify areas potentially sensitive to contamination by the legal agricultural use of pesticides.

The data do not represent a complete survey of ground water quality throughout the State, nor do they represent sampling for all pesticides. The data indicate pesticides that are present in well water among those pesticides for which analyses were performed.

Sampling by agencies other than DPR is not necessarily related to suspected agricultural sources of contamination.

The Data in this Report

This is the sixteenth annual report.

- Data were submitted to DPR from July 1, 2000, to June 30, 2001.
- Data are the results of four investigations conducted by two agencies.
- Data are from studies that were conducted from January through December of 2000.

Table 1. Summary of well sampling results included in DPR's well inventory database, by report year.

CATEGORY	Total 1984-1995	1996	1997	1998	1999	2000	2001	TOTAL[d] 1984-2001
Total **wells** sampled	19,570	3,564	2,508	1,898	2,389	3,165	3,027	21,187
no detections	15,547	3,128	2,071	1,668	2,093	2,841	2,757	16,641
detections [(a)]	4,142	436	437	230	296	324	270	4,546
verified detections [(b)]	789	6	96	3	39	84	16	921
Total **counties** sampled	58	48	48	41	49	50	49	58
no detections	14	20	24	21	29	26	23	8
detections [(a)]	44	28	24	20	20	24	26	50
verified detections [(b)]	31	5	7	3	10	5	5	33
Total **pesticides** and related compounds	293	121	165	83	111	105	110	308
no detections	202	99	143	67	94	85	95	211
detections [(a)]	89	22	22	16	17	20	15	97
verified detections [(b)]	22	3	11	5	8	9	6	24
Pesticides and related compounds detected in ground water as the result of legal, agricultural use [(c)]	15	8	9	9	9	12	9[(e)]	16[(f)]

(a) Includes both verified and unverified detections.
(b) Detections are designated as verified if residues are detected in one sample as a result of an analytical method approved by DPR and verified, within 30 days in a second discrete sample taken from the well, by a second analytical method or laboratory approved by DPR; or if an unequivocal detection is made.
(c) Legal agricultural use is the application of a pesticide, according to its labeled directions and in accordance with all laws and regulations (see *appendix D: legal agricultural use).*
(d) The total includes data since the inception of the database in 1984, and is not additive. A single well that had sampling data reported in more than one year is counted one time only.
(e) The nine compounds are 1,2-D; ACET; atrazine; DBCP; deethyl-atrazine (DEA); diaminochlorotriazine (DACT); diuron; ethylene dibromide (EDB); and simazine.
(f) The 16 compounds are ACET; DACT; aldicarb sulfone; aldicarb sulfoxide; atrazine; bentazon; bromacil; 1,2-D; DBCP; deethyl-atrazine; diuron; EDB; norflurazon; prometon; simazine; and 2,3,5,6-trachloroterephthalic acid. Aldicarb (based on sulfone and sulfoxide detections), atrazine, bentazon, bromacil, diuron, norflurazon, prometon, and simazine have been reviewed through the pesticide detection response process. The uses of 1,2-D, DBCP, and EDB were canceled before the passage of the PCPA; therefore, DPR did not review these chemicals but considers them to have reached ground water as a result of legal agricultural use.

Summary of Data in This Report

- 99,449 records (chemical analyses) were added to the database for this report.
- 3,027 wells were sampled in 49 counties.
- 110 pesticide active ingredients and breakdown products were analyzed.
- 15 compounds were reported with detections.

Of the 3,027 wells sampled, 2,901 (96 percent) were public drinking water wells, 79 (3 percent) were private drinking water wells, 14 were nondrinking water wells, and 33 (1 percent) wells were either unused or the use was unknown.

Detections Referred to SWRCB

Detections of nine chemicals, including three chemicals where historical agricultural applications are considered by DPR to be the source of residues in ground water, were reported to SWRCB. The three chemicals and the number of wells with detections are:

- 1,2-dibromo-3-chloropropane (DBCP): 221 wells
- 1,2-dichloropropane (1,2-D): 8 wells.
- ethylene dibromide (EDB): 12 wells

Chemical names

Deethyl-atrazine (2-amino-4-chloro-6-isopropylamino-s-triazine, DEA) is a degradate of atrazine. 2-amino-4-chloro-6-ethylamino-s-triazine (ACET), and 2,4-diamino-6-chloro-s-triazine (DACT) are breakdown products of either atrazine or simazine.

Summary of Verified Detections

DPR verified detections of six compounds: diuron, simazine, atrazine and its breakdown product DEA, and the breakdown products ACET and DACT, which are common to both atrazine and simazine. Verified detections were made in 16 wells in five counties (Table 2). Among the wells with verified detections, 15 were private drinking water wells and one was an irrigation well. The concentrations of all verified detections of diuron, simazine, and atrazine were below their health advisory (HA) and/or maximum contamination levels (MCL). There are no established HAs or MCL for the detected breakdown products.

Table 2. Summary of wells with verified detections of pesticide residues, by county and chemical. Results are for data reported from July 1, 2000, through June 30, 2001.

County	atrazine	diuron	simazine	ACET	DACT	DEA	**Total Wells With Detections**
Contra Costa		1(a)					1
Kern	1	3		1		1	3
Merced	2		1	4	7	2	7
Shasta				1	1(a)		1
Solano	4		1(a)	2	1(a)	3	4
Total Detections	7	4	2	8	9	6	16

(a) First time verified detection of this chemical in this county.

Legal Agricultural Use Determinations and Recommendations for Pesticide Management Zones

After well sampling and land use surveys are completed, a determination is made as to whether the detection of the pesticide residues in ground water could have been due to legal agricultural use. Specific criteria must be met for making this determination.

A pesticide management zone (PMZ) is a land area where a pesticide has been detected in ground water and where it has been determined that the contamination was due to legal agricultural use. PMZs are established by regulation to prevent further contamination of ground water. Currently, the use of the chemicals atrazine, bromacil, diuron, prometon, norflurazon, and simazine are prohibited or restricted in PMZs.

Legal agricultural use was determined to be the source of residues of atrazine, diuron, simazine, ACET, DACT, and DEA in wells in Contra Costa, Kern, Merced, and Solano counties. DPR recommended 15 sections in four counties as new PMZs (Section II, Table II-1).

New Regulations on Norflurazon Use

A subcommittee of the Pesticide Registration and Evaluation Committee has made findings and recommendations to the DPR Director on continued use of norflurazon. The Director concurred with the subcommittee that the use of norflurazon can be modified so that levels of norflurazon residues will not be further elevated beyond present levels in contaminated ground waters. DPR has adopted regulations effective March 23, 2001, to add norflurazon to the list of pesticides

found in ground water due to legal agricultural use (section 6800(a) of Title 3 of the California Code of Regulations), established norflurazon PMZs, and established norflurazon use requirements.

Bentazon Monitoring

Well monitoring for bentazon was conducted annually from 1993 to 1996. During those surveys, between 7 and 12 wells were sampled each year because of the small quantities of bentazon applied in any one county or area within a county. In all, 21 different wells were sampled during the four surveys but no bentazon residues were detected. As a result of the low number of wells available for sampling in treated areas, bentazon monitoring was changed from an annual survey to a biennial survey as of September 1996. The next survey was conducted in August 1998 and no bentazon or other herbicide residues were detected in eight wells sampled in three counties.

The most recent survey conducted in November 2000 resulted in no bentazon detections in sixteen wells sampled in seven counties. One well in Kern County contained residues of atrazine, DEA, ACET, and diuron, and one well in Shasta County contained residues of ACET and DACT.

Changes in the Ground Water Program

DPR is changing the ground water protection program to make the program more preventive. Based on information collected since the early 1980s, DPR is expanding the number of sensitive areas and the number of pesticides regulated to protect ground water. Mitigation measures tailored to fit the mechanism of movement to ground water will become mandatory.

Well Monitoring Network

In order to measure the success of these regulatory changes, a network of monitoring wells has been identified for both leaching and runoff soil conditions. The data reflect only the condition of ground water in the Fresno and Tulare counties area. Pesticides are detected in other areas of California but resources do not support a comprehensive monitoring system.

Under a recent proposal, the area represented by the well network will receive increased regulatory attention. Thus, monitoring the changes in residue concentrations over time will be an important indicator of the success of pollution prevention efforts.

Activities of the State and Regional Water Boards

SWRCB and its nine regional water quality control boards are responsible for protecting the beneficial uses of water in California and for controlling all discharges of waste into waters of the state. Actions taken by SWRCB to prevent pesticides from migrating to ground water are summarized in Section III of this report.

PREFACE

This report fulfills the requirements contained in section 13152, subdivision (e) of the Food and Agricultural Code, directing DPR to report specified information on sampling for pesticide residues in California ground water to the Legislature, CDHS, OEHHA, and SWRCB annually by December 1.

This report presents data reported to DPR from July 1, 2000, through June 30, 2001. This is the sixteenth annual report.

The PCPA requires that the annual report give the location of wells for which sampling results were reported. Although well locations are specified by township, range, and section in the database, listing results in this manner in the report is not practical due to the large number of wells sampled. Instead, sampling locations are summarized by county.

The information in this report is presented in four parts. Sections I, II, and III were written by DPR staff. Section IV was written by SWRCB staff.

ACKNOWLEDGMENTS

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

The mention of commercial products, their source, or their use in this report is not to be construed as either an actual or implied endorsement of such products.

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Section I:

ACRONYMS AND ABBREVIATIONS

AB 1803	Assembly Bill No. 1803 (Connelly, 1983), Health and Safety Code, sections 4026.2 and 4026.3
AB 2021	Assembly Bill No. 2021 (Connelly, 1985), Food and Agricultural Code, sections 13141 through 13152. Also known as the Pesticide Contamination Prevention Act.
ACET	2-amino-4-chloro-6-ethylamino-s-triazine
Cal/EPA	California Environmental Protection Agency
3CCR	Title 3, California Code of Regulations
CDHS	California Department of Health Services
1,2-D	1,2-dichloropropane; propylene dichloride
2,4-D	2,4-dichlorophenoxyacetic acid
DACT	2,4-diamino-6-chloro-s-triazine
DEA	deethyl-atrazine
DBCP	1,2-dibromo-3-chloropropane
DPR	Department of Pesticide Regulation
DWR	California Department of Water Resources
EDB	ethylene dibromide
EHAP	Environmental Hazards Assessment Program (part of DPR)
EM	Environmental Monitoring (part of DPR)
FAC	Food and Agricultural Code
GWPL	Groundwater Protection List
HAL	health advisory level
MCL	maximum contaminant level
MDL	minimum detection limit
PCA	pest control adviser
PCPA	Pesticide Contamination Prevention Act of 1985 (AB 2021)
PDRP	pesticide detection response process
PMZ	pesticide management zone
ppb	parts per billion
PREC	Pesticide Registration and Evaluation Committee
RWQCB	Regional Water Quality Control Board
SB 950	Senate Bill 950: The Birth Defect Prevention Act
SWRCB	State Water Resources Control Board
U.S. EPA	U. S. Environmental Protection Agency

I. WELL INVENTORY DATABASE

INTRODUCTION

The Pesticide Contamination Prevention Act (PCPA) requires the Department of Pesticide Regulation (DPR) to maintain a statewide database of wells sampled for active ingredients of pesticide products. The database, referred to as Well Inventory Database, centralizes information on the occurrence of nonpoint source contamination of ground water by agricultural use of pesticides collected by various State and local agencies, and is updated annually. The PCPA further mandates DPR to review findings of pesticide contamination and undertake necessary mitigation measures, and report annually to the Legislature, California Department of Health Services (CDHS), the Office of Environmental Health Hazard Assessment (OEHHA), and the State Water Resources Control Board (SWRCB). This report summarizes sampling results from July 1, 2000 to June 30, 2001. It details actions taken by DPR and SWRCB and its nine regional boards to prevent pesticides from polluting ground water. It also summarizes factors contributing to the movement of pesticides to ground water resulting from legal agricultural use.

BACKGROUND

In 1979, the soil fumigant, 1,2-dibromo-3-chloropropane (DBCP), was detected in ground water wells in Lathrop, California. These detections prompted widespread subsequent testing, and many areas of DBCP contamination were found. Since then studies have been conducted throughout California to determine whether other pesticides have migrated to ground water.

On January 1, 1986, the PCPA added sections 13141 through 13152 to Division 7 of the Food and Agricultural Code (FAC). The PCPA requires DPR to maintain a statewide database of wells sampled for pesticide active ingredients, and to submit an annual report to the Legislature, the SWRCB, CDHS, and Cal/EPA's OEHHA. The report contains specific information from the database, as well as actions taken by the Director of DPR and the SWRCB to prevent pesticides from migrating to California's ground water.

In 1983, the Environmental Hazards Assessment Program (EHAP) of DPR developed the well inventory database to archive information on the occurrence of wells containing pesticide residues due to the agricultural use of pesticides. The well inventory is a unique archive of ground water sampling data for a single state. Although databases have been compiled in other states, only California centralizes monitoring results from various agencies.

The 1992 cumulative report (Maes, *et al.*, 1992) was the first to discuss the number of wells with detections resulting from the legal agricultural use of pesticides. Before 1992, well inventory reports emphasized the number of wells with confirmed, positive samples. In 1989, criteria were established for verifying detections of pesticide residues in ground water (Biermann, 1989). Reports after 1992 emphasize verified detections.

This is the sixteenth annual report. Section I summarizes the database by total wells sampled, verified detections, unverified detections, and the status of pesticides with verified detections. Section II describes the actions taken by DPR to prevent pesticides from entering ground water. Section IV summarizes the actions taken by the SWRCB and its regional boards to prevent pesticides from migrating to ground water. A summary of data added to the database, by report year, is given in Table I-1. Also included are a summary of the number of wells sampled by county and chemical (Appendix A), a summary of studies (Appendix B), the methods of data collection and format of records (Appendix C), and a glossary (Appendix D).

CRITERIA FOR CLASSIFYING RECORDS ADDED TO THE WELL INVENTORY

Each record in the well inventory database represents a well water sample analyzed for a pesticide residue and was classified as follows:

(1) Well water samples were designated as ***negative*** if pesticide residues were not detected at or above the minimum detection limit (MDL) of the method used for analysis.

(2) If pesticide residues were detected at or above the MDL, samples were classified into one of three categories:

   (a) ***unconfirmed***: Pesticide residues were detected in only one sample during a single monitoring survey. Confirmation of the initial detection by a second positive sample was not possible because either only a single sample was taken from the well or analyses of all other samples taken from the well during the survey were negative.

   (b) **confirmed, unverified:** Pesticide residues were detected in two discrete samples taken from a well during a monitoring survey. A confirmed detection is unverified unless it meets the criteria of a verified detection.

(c) **verified:** Confirmed detections are verified if they meet the criteria specified in FAC section 13149(d) of the PCPA. Section 13149(d) requires that the detection of a pesticide in ground water results either from an analytical method approved by the department that provides unequivocal identification of a chemical, or from verification within 30 days by a second analytical method or a second analytical laboratory approved by DPR. DPR has set criteria to determine whether the detection of a pesticide or its breakdown product(s) in ground water meets the standards of section 13149(d) (Biermann, 1989, 1996).

Table I-1. Summary of well sampling results included in DPR's well inventory database by report year.

CATEGORY	Total 1984-1995	1996	1997	1998	1999	2000	2001	TOTAL[d] 1984-2001
Total **wells** sampled	19,570	3,564	2,508	1,898	2,389	3,165	3,027	21,187
no detections	15,547	3,128	2,071	1,668	2,093	2,841	2,757	16,641
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Total **pesticides** and related compounds	293	121	165	83	111	105	110	308
no detections	202	99	143	67	94	85	95	211
detections [(a)]	89	22	22	16	17	20	15	97
verified detections [(b)]	22	3	11	5	8	9	6	24
Pesticides and related compounds detected in ground water as the result of legal, agricultural use [(c)]	15	8	9	9	9	12	9[(e)]	16[(f)]

(a) Includes both verified and unverified detections.
(b) Detections are designated as verified if residues are detected in one sample as a result of an analytical method approved by DPR and verified, within 30 days in a second discrete sample taken from the well, by a second analytical method or laboratory approved by DPR; or if an unequivocal detection is made.
(c) Legal agricultural use is the application of a pesticide, according to its labeled directions and in accordance with all laws and regulations. (*see Appendix D: legal agriculture use)*
(d) The total includes data since the inception of the database in 1984, and is not additive. A single well that had sampling data reported in more than one year is counted one time only.
(e) The 9 compounds are 1,2-D, ACET, atrazine, DBCP, deethyl-atrazine (DEA), diaminochlorotriazine (DACT) diuron, ethylene dibromide (EDB), simazine.
(f) The 16 compounds are ACET, DACT, aldicarb sulfone, aldicarb sulfoxide, atrazine,bentazon, bromacil, 1,2-D, DBCP, deethyl-atrazine, diuron, EDB, norflurazon, prometon, simazine, and 2,3,5,6-trachloroterephthalic acid. Aldicarb (based on sulfone and sulfoxide detections), atrazine, bentazon, bromacil, diuron, norflurazon, prometon, and simazine have been reviewed through the Pesticide Detection Response Process. The uses of 1,2-D, DBCP, and EDB were canceled prior to the passage of the PCPA; therefore, DPR did not review these chemicals but considers them to have reached ground water as a result of legal, agricultural use.

INTERPRETING THE DATA

This report discusses data submitted to DPR from July 1, 2000 to June 30, 2001. The data are the results of four investigations designed and conducted by two agencies for varying purposes.

The information contained in the well inventory database can be used to:

- Design studies for future sampling.
- Display the geographic distribution of well sampling.
- Display the geographic distribution of pesticide residues in sampled wells.
- Identify areas potentially sensitive to contamination by the legal, agricultural use of pesticides.

Interpretation of sampling results in the well inventory database is subject to the following limitations:

The data indicate which pesticides are present in well water among those pesticides for which analyses were performed. They do not represent a complete survey of ground water quality throughout the State, nor do they represent sampling for all pesticides used.

Sampling by agencies other than DPR is not necessarily related to the suspected presence of residues in ground water due to the agricultural use of pesticides. It should not be assumed that results submitted by those agencies are an indication of which pesticides are more or less likely to reach ground water as a result of agricultural use.

SUMMARY OF DATA

RESULTS BY REPORTING AGENCY

The results of four well sampling surveys were added to the well inventory database from July 1, 2000 to June 30, 2001. The surveys were conducted from January to December of 2000. The data represent 3,027 wells in 49 counties that were sampled for 110 pesticide active ingredients and breakdown products. Table I-2 summarizes the data added to the database by sampling agency. Appendix B details each of the four studies.

Of the 3,027 wells sampled, 2,901 (96%) were public drinking water wells, 79 (3%) were private drinking water wells, 14 were non-drinking water wells, and 33 (1%) wells were either unused or the use was unknown.

Table I-2. Summary of records added to DPR's well inventory database, by agency, for the reporting period July 1, 2000 through June 30, 2001.

Sampling Agency	Wells	Counties	Chemicals Analyzed	Samples with Detections	Wells with Detections	Records Added to Database
CDHS	2,938	49	105	1,320	254	98,250
DPR	90	12	14	37	16	1,199

RESULTS BY PESTICIDE AND COUNTY

Sampling Distribution

Sampling results for 110 pesticide active ingredients and breakdown products were reported. Among the 49 counties sampled, the frequency of sampling for each chemical varied widely. Table I-3 shows the chemicals sampled, number of counties and wells sampled, and number of wells with unverified and verified detections. Counties with and without detections of pesticides during the period from July 1, 2000 to June 30, 2001 are listed in Table I-4.

Table I-5 summarizes by county the pesticides analyzed, number of wells sampled, and number of wells with unverified, verified, and negative detections. The number of pesticides analyzed in individual counties ranged from 1 (Kings) to 72 (Los Angeles and Yuba). The number of wells sampled in individual counties ranged from 1 (Glenn, Siskiyou, Trinity and Tuolomne) to 684 (Los Angeles). Appendix A details the number of chemicals sampled and the number of positive wells by chemical in each of the 26 counties with detections.

Table I-3. Pesticide active ingredients and breakdown products added to the well inventory database for the 2001 report year, by total number of counties and wells sampled and number of wells with verified and unverified detections. Most wells were sampled for more than one compound. Results are for data reported from July 1, 2000 through June 30, 2001.

Chemical	Number of Counties Sampled	Number of Wells Sampled	Wells with Unverified Detections	Wells with Verified Detections
1,3-Dichloropropene (1,3-D Telone)	3	196		
1,1,2,2-Tetrachloroethane	48	2,371		
1,2,4-Trichlorobenzene	48	2,361		
1,2-D + 1,3-D + C-3 Compounds	48	2,355		
1,2-Dichloropropane (Propylene Dichloride,1,	48	2,371	8	
2,3,7,8-Tcdd (Dioxin)	16	261		
2,4,5-T	11	133		
2,4,5-Tp (Silvex)	31	606		
2,4,6-Trichlorophenol	2	11		
2,4-D	31	608	1	
2,4-Dinitrophenol	1	2		
3-Hydroxycarbofuran	30	508		
4(2,4-Db), Dimethylamine Salt	1	2		
Acenapthene	7	52		
ACET (Deethyl-Simazine Or Deisopropyl-	12	90		8
Alachlor	34	806		
Aldicarb	30	509		
Aldicarb Sulfone	30	509		
Aldicarb Sulfoxide	30	509	1	
Aldrin	34	602		
Atrazine	40	1,012		7
Barban	2	8		
Benefin (Benfluralin)	1	1		
Bentazon, Sodium Salt	33	621		
Benzene (Benzol)	49	2,378	7	
Bhc (Other Than Gamma Isomer)	2	27		
Bromacil	39	855		
Butachlor	36	751		
Carbaryl	30	516		
Carbofuran	31	540		
Chlordane	34	634		
Chlorobenzilate	1	6		
Chloromethane (Methyl Chloride)	48	2,369	4	
Chloroneb	1	6		
Chlorothalonil	30	554		
Chlorpropham	2	8		
Chlorpyrifos	1	6		
Cyanazine	12	95		
Dalapon	30	605		
Dbcp	34	1,383	221	
DDD	5	38		

Chemical	Number of Counties Sampled	Number of Wells Sampled	Wells with Unverified Detections	Wells with Verified Detections
DDE	5	38		
DDT	6	43		
DDVP (Dichlorvos)	1	6		
Deethyl-Atrazine	12	90		6
Demeton	1	1		
Diaminochlorotriazine (Dact)	12	90		9
Diazinon	34	753		
Dicamba	31	599		
Dieldrin	34	604		
Dimethoate	36	743		
Dinoseb	31	606		
Diquat Dibromide	29	502		
Disulfoton	1	1		
Diuron	32	536		4
Endosulfan	3	31		
Endosulfan Sulfate	3	31		
Endothall	27	393		
Endrin	34	644		
Endrin Aldehyde	4	34		
Eptc	1	6		
Ethylene Dibromide	35	1,341	12	
Fenuron	2	8		
Fenuron Trichloroacetate (Tca)	2	8		
Fluchloralin	1	1		
Fluometuron	1	7		
Glyphosate, Isopropylamine Salt	26	485		
Heptachlor	34	639	4	
Heptachlor Epoxide	34	642		
Hexachlorobenzene	34	648		
Hexazinone	12	90		
Lindane (Gamma-Bhc)	34	642		
Linuron	2	8		
Malathion	2	27		
Methiocarb	6	34		
Methomyl	30	509		
Methoxychlor	34	651		
Methyl Bromide (Bromomethane)	48	2,367		
Methyl Parathion	1	21		
Metolachlor	35	747		
Metribuzin	38	832		
Mexacarbate	2	7		
Mirex	1	1		
Molinate	34	772		
Monuron	2	8		
Monuron-Tca	2	8		
Naphthalene	44	2,169		
Napropamide	1	1		

Chemical	Number of Counties Sampled	Number of Wells Sampled	Wells with Unverified Detections	Wells with Verified Detections
Neburon	1	7		
Norflurazon	12	90		
Ortho-Dichlorobenzene	48	2,373		
Oxamyl	31	553		
Paraquat Dichloride	5	35		
Parathion Or Ethyl Parathion	2	27		
Pendimethalin	1	1		
Pentachloronitrobenzene (Pcnb)	1	1		
Picloram	31	610		
Prometon	13	110		
Prometryn	38	840		
Propachlor	34	705		
Propazine	2	16		
Propham	2	7		
Propoxur	6	33		
Siduron	2	8		
Simazine	40	1,019	1	2
Thiobencarb	34	982		
Toxaphene	34	632		
Trichlorobenzenes	48	2,354		
Trifluralin	3	26		
Xylene	48	2,292	8	
Total	49	2,389	267	36

Table I-4. Counties with and without detections of pesticides or related compounds for data reported during the period July 1, 2000 through June 30, 2001.

Counties without detections	**Counties with detections**	**Counties not sampled**
Alameda	Butte	Alpine
Amador	Contra Costa*	Calaveras
Colusa	El Dorado	Humboldt
Del Norte	Fresno	Imperial
Glenn	Kern*	Inyo
Lake	Kings	Modoc
Lassen	Los Angeles	Mono
Marin	Madera	San Francisco
Mariposa	Mendocino	Tehama
Monterey	Merced*	
Nevada	Napa	
Orange	Riverside	
Placer	Sacramento	
Plumas	San Bernardin	
San Benito	San Diego	
San Luis Obispo	San Joaquin	
Santa Barbara	San Mateo	
Santa Cruz	Santa Clara	
Sierra	Shasta*	
Siskiyou	Solano*	
Trinity	Sonoma	
Tuolumne	Stanislaus	
Yolo	Sutter	
	Tulare	
	Ventura	
	Yuba	

* Counties with verified detections

Table I-5. Summary, by county, of total number of pesticides and wells sampled, wells with unverified, verified, and wells with no detections. Wells may have both unverified and verified detections. Results are for data reported from July 1, 2000 through June 30, 2001.

County	Number of Pesticides Sampled	Number of Wells Sampled	Wells with Unverified Detections	Wells with Verified Detections	Wells with No Detections
Alameda	64	26			26
Amador	28	3			3
Butte	14	57	2		57
Colusa	11	6			6
Contra Costa	57	18	1	1	18
Del Norte	11	7			7
El Dorado	56	26	1		26
Fresno	59	193	80		193
Glenn	11	1			1
Kern	65	162	16	3	162
Kings	1	2	2		
Lake	55	19			19
Lassen	11	8			8
Los Angeles	72	684	12		684
Madera	37	16	2		16
Marin	32	2			2
Mariposa	18	8			8
Mendocino	53	18	1		18
Merced	57	46	4	7	46
Monterey	67	64			64
Napa	53	4	1		4
Nevada	57	3			3
Orange	71	194			194
Placer	56	10			10
Plumas	11	6			6
Riverside	57	196	12		195
Sacramento	72	159	1		159
San Benito	53	7			7
San Bernardino	57	400	55		398
San Diego	58	48	2		48
San Joaquin	37	80	22		78
San Luis Obispo	54	41			41
San Mateo	60	19	1		19
Santa Barbara	57	45			45
Santa Clara	63	87	5		87
Santa Cruz	58	16			16
Shasta	21	5		1	5
Sierra	11	4			4
Siskiyou	10	1			1
Solano	57	26	1	4	26
Sonoma	69	70	2		70
Stanislaus	36	104	16		104
Sutter	13	5	1		5
Trinity	10	1			1
Tulare	46	52	12		52

County	Number of Pesticides Sampled	Number of Wells Sampled	Wells with Unverified Detections	Wells with Verified Detections	Wells with No Detections
Tuolumne	21	1			1
Ventura	58	35	1		35
Yolo	46	16			16
Yuba	72	26	1		25

WELLS AND COUNTIES WITH VERIFIED DETECTIONS

Verified detections were made in 16 wells in five counties. Table I-6 summarizes the number of wells with verified detections, by county and pesticide, and notes the counties with a first-time verified detection of a pesticide. Most verified detections (greater than 98%) were in private drinking water wells. Only one well was an irrigation well.

Table I-6. Summary of verified detections of pesticide residues, by county and chemical. Results are for data reported from July 1, 2000 through June 30, 2001.

County	atrazine	diuron	simazine	ACET	DACT	DEA	**Total Wells with Detections**
Contra Costa		1(a)					1
Kern	1	3		1		1	3
Merced	2		1	4	7	2	7
Shasta				1	1(a)		1
Solano	4		1(a)	2	1(a)	3	4
Total Detections	7	4	2	8	9	6	16

(a) First time verified detection of this chemical in this county.

STATUS OF PESTICIDES WITH VERIFIED DETECTIONS

Atrazine

Atrazine, a selective herbicide, was reviewed through the Pesticide Detection Response Process (PDRP) in late 1986 through December 1989, including review by a subcommittee of the Pesticide Registration and Evaluation Committee (PREC), pursuant to FAC sections 13149 through 13151. DPR adopted regulations in January 1989 that prohibit the use of pesticides containing atrazine within an atrazine pesticide management zone (PMZ). A PMZ is a geographic surveying unit of approximately one square mile (a section) designated in regulation as sensitive to ground water pollution. Atrazine was also made a restricted material. Allowed uses of atrazine outside atrazine PMZs can only be applied by or under the supervision of a certified applicator.

The following sites represent the major uses of atrazine reported in 2000 (DPR, 2000).

SITE	POUNDS APPLIED
FOREST TREES, FOREST LANDS (ALL OR UNSPEC)	19,466
CORN (FORAGE - FODDER)	12,847
BERMUDAGRASS (FORAGE - FODDER)	8,014
CORN, HUMAN CONSUMPTION	7,362
SUDANGRASS (FORAGE - FODDER) (SORGHUM SUDANESE)	5,800
ALL OTHER	1,795
TOTAL	**55,284**

Detections of atrazine were verified in seven wells in three counties out of 1,012 wells sampled in 40 counties. The range of concentrations of verified detections was 0.052 to 0.374 ppb. The CDHS and U.S. EPA maximum contaminant level (MCL, see glossary) for atrazine is 3 ppb.

Diuron

Diuron, a selective herbicide, was reviewed through the PDRP in 1989, including review by a subcommittee of the PREC. DPR adopted regulations that prohibit the agricultural, outdoor institutional, or outdoor industrial uses of diuron in non-crop areas and on rights-of-way within diuron PMZs. Diuron was also made a restricted material for which a permit is required for crop uses in diuron PMZs. The permit can only be issued if growers submit a ground water protection advisory written by a licensed PCA who has completed an approved ground water protection course within the previous two years. Allowed uses of diuron can only be applied by or under the supervision of a certified applicator.

The following sites represent the major uses of diuron reported in 2000 (DPR, 2000).

SITE	POUNDS APPLIED
RIGHTS OF WAY	654,640
ALFALFA (FORAGE - FODDER) (ALFALFA	237,573
ORANGE (ALL OR UNSPEC)	199,621
LANDSCAPE MAINTENANCE	40,548
GRAPES	31,757
WALNUT (ENGLISH WALNUT, PERSIAN WA	28,976
ASPARAGUS (SPEARS, FERNS, ETC.)	25,507
GRAPES, WINE	22,843
LEMON	21,767
OLIVE (ALL OR UNSPEC)	20,872
COTTON, GENERAL	17,077
GRAPEFRUIT	6,639
ALL OTHER	36,792
TOTAL	**1,344,611**

Diuron residues were verified in four wells in two counties out of the 536 wells sampled in 32 counties. The range of concentrations of verified detections was 0.06 to 2.243 ppb. No MCL has been established for diuron. The U.S. EPA health advisory is 10 ppb.

Simazine

Simazine, a selective herbicide, was reviewed through the PDRP in 1989, including review by a subcommittee of the PREC. DPR adopted regulations that prohibit the agricultural, outdoor industrial, or outdoor institutional use of pesticides containing simazine in non-crop areas or on rights-of-way within simazine PMZs. Simazine was also made a restricted material for which a permit is required for crop uses in simazine PMZs. The permit can only be issued if growers submit a ground water protection advisory written by a licensed pest control adviser (PCA) who has completed an approved ground water protection course within the previous two years. Allowed uses of simazine can only be applied by or under the supervision of a certified applicator.

The following sites represent the major uses of simazine reported in 2000 (DPR, 2000).

SITE	POUNDS APPLIED
ORANGE (ALL OR UNSPEC)	204,313
GRAPES	157,768
GRAPES, WINE	139,685
ALMOND	62,335
WALNUT (ENGLISH WALNUT, PERSIAN WA	39,280
LEMON	27,254
OLIVE (ALL OR UNSPEC)	25,545
AVOCADO (ALL OR UNSPEC)	14,907
PEACH	11,136
NECTARINE	8,816
RIGHTS OF WAY	6,732
GRAPEFRUIT	6,054
PEAR	5,669
APPLE	5,188
LANDSCAPE MAINTENANCE	4,311
ALL OTHER	5,198
TOTAL	**724,191**

Simazine residues were verified in two wells in two counties out of the 1,019 wells sampled in 40 counties. Concentrations of verified detections ranged from 0.193 to 0.252 ppb. Both the CDHS and U. S. EPA MCL for simazine are 4 ppb.

Triazine breakdown products: ACET, DACT, and DEA.

Deethyl-atrazine (2-amino-4-chloro-6-isopropylamino-s-triazine, DEA) is a degradate of atrazine. Ninety wells in 12 counties were sampled for DEA. Verified detections were made in six wells in three counties. Concentration of verified detections range from 0.05 to 0.118 ppb.

Both 2-amino-4-chloro-6-ethylamino-s-triazine (ACET) and 2,4-diamino-6-chloro-s-triazine (DACT) are breakdown products of either atrazine or simazine. Ninety wells in 12 counties were sampled for these two breakdown products. Verified detections for ACET were made in eight wells in four counties. Concentrations ranged from 0.052 to 0.424 ppb. Verified detections for DACT were made in nine wells in three counties. Concentrations ranged from 0.058 to 0.289 ppb. There are no drinking water quality criteria for ACET, DACT, or DEA.

SUMMARY OF UNVERIFIED DETECTIONS

Samples with unverified detections are addressed in one of two ways. (1) Detections of the following are referred to SWRCB: pesticides that are not currently registered for use; pesticides registered for other than agricultural, outdoor industrial, or outdoor institutional uses; and pesticides that are found in ground water, but are determined not to be the result of legal agricultural use. SWRCB and its nine regional boards are responsible for protecting the beneficial uses of water in California and for controlling all discharges of waste into waters of the State. (2) Detections of compounds registered for agricultural, outdoor industrial, or outdoor institutional uses in California are investigated by DPR. Negative follow-up samples may result from delays (sometimes years) in reporting the initial detection to DPR.

The status of all positive samples (verified and unverified) added to the database for this report year is summarized in Table I-7. Of the 99,449 records added to the well inventory database, there were 1,320 (1.3%) unverified detections from 267 wells in 25 counties for a total of 10 pesticide active ingredients or breakdown products.

Of the 1,320 unverified samples, 1,317 (99.8%) were for seven chemicals currently not registered or not registered for agricultural use. The chemicals were benzene, heptachlor, DBCP, ethylene dibromide, propylene dichloride, methyl chloride and xylene. These detections have been reported to SWRCB.

CDHS reported detections of simazine, 2,4-D, and aldicarb sulfoxide. Simazine, 2,4-D and aldicarb sulfoxide's parent compound, aldicarb, are currently registered in California for agricultural use. DPR is investigating these detections.

Table I-7. Status, as of June 30, 2001 of all reported detections of pesticide active ingredients and breakdown products in ground water that were added to DPR's well inventory database from July 1, 2000 through June 30, 2001

Compound Detected	Number of Counties and Wells Sampled	Counties and Number of Wells with Detections	Range of Concentrations Detected (ppb)	Water Quality Criteria [(a)]	Registration Status Type of Compound Comments
1,2-dichloropropane (1,2-D; propylene dichloride)	48 counties 2,371 wells	Fresno, 1 Los Angeles, 4 San Diego, 2 San Mateo, 1	0.5 - 2.6	CDHS & USEPA MCL 5	Fumigant. NR. Source of residues was determined by DPR to be due to historical nonpoint source, legal agricultural use (LAU). Regulations were adopted in 1985 that prohibit the use or sale of pesticides in California in which 1,2-D exceeds 0.5% of the total formulation. Referred to SWRCB.
2, 4-D	31 counties 608 wells	Santa Clara, 1	0.68	CDHS & US EPA MCL 70	Herbicide. Active Registration (AR). Detection is currently under investigation by DPR.
ACET (2-amino-4-chloro-6-ethylamino-s-triazine)	12 counties 90 wells	Kern, 1 Merced, 4 Shasta, 1 Solano, 2	0.052 – 0.424		Breakdown product of atrazine or simazine. Detections in Kern and Shasta counties are currently under investigation by DPR. Detections in Merced and Solano were determined to be due to LAU
Aldicarb Sulfoxide	30 counties 509 wells	Sacramento, 1	5.5	CDHS & US EPA MCL 7	Breakdown product of aldicarb , a ground applied insecticide. Aldicarb is actively registered in California. This detection is currently under investigation by DPR.
Atrazine	40 counties 1,012 wells	Kern, 1 Merced, 2 Solano, 4	0.052 - 0.374	CDHS & USEPA MCL 3	Herbicide. AR. The detection in Kern county is under investigation by DPR. All other detections were determined to be due to LAU.
benzene	49 counties 2,378 wells	Kern, 2 Kings, 2 Napa, 1 Solano, 1 Yuba, 1	0.35 – 25.3	CDHS MCL 1 USEPA MCL 5	Benzene was an ingredient in some early grain fumigants. NR for agricultural use. Non-agricultural uses of industrial chemicals may contribute to these findings. Referred to SWRCB.

Table I-7 continued

Compound Detected	Number of Counties and Wells Sampled	Counties and Number of Wells with Detections	Range of Concentrations Detected (ppb)	Water Quality Criteria [(a)]	Registration Status Type of Compound Comments
chloromethane	48 counties 2,369lls	El Dorado, 1 Fresno, 1 Los Angeles, 1 Mendocino, 1	0.5 – 1.2	USEPA SNARLs 3	Fumigant. NR. Non-agricultural uses of industrial chemicals may contribute to these findings. Referred to SWRCB.
DBCP (1,2-dibromo-3-chloropropane)	36 counties 1,256 wells	Contra Costa, 1 Fresno, 79 Kern, 11 Los Angeles, 6 Madera, 2 Merced, 4 Riverside, 11 San Bernardino, 55 San Joaquin, 22 Stanislaus, 16 Sutter, 1 Tulare, 12 Ventura, 1	0.01 - 2.82	CDHS & USEPA MCL 0.2	Soil fumigant. NR. Use suspended in 1979. Source of residues considered by DPR to be from historical nonpoint source, legal agricultural use. Referred to SWRCB.
deethyl-atrazine	12 counties 90 wells	Kern, 1 Merced, 2 Solano, 3	0.05 - 0.118		Breakdown product of atrazine. Kern county detection is being investigated by DPR. All other detections were determined to be due to LAU.
diaminochlorotriazine (DACT)	12 counties 90 wells	Merced, 7 Shasta, 1 Solano, 1	0.058 – 0.289		Breakdown product of atrazine or simazine. Detection in Shasta county is under investigation (CUI) by DPR. All other detections were determined to be due to LAU.
diuron	32 counties 536 wells	Contra Costa, 1 Kern, 3	0.06 – 2.243	USEPA IRIS RfD 14	Herbicide. AR. Detection in 1 well in Kern County is CUI. All other detections were determined to be due to LAU.
ethylene dibromide (EDB)	35 counties 1,341 wells	Fresno, 7 Kern, 3 Madera, 1 Riverside, 1	0.02 - 1	CDHS & USEPA MCL 0.05	Fumigant, insecticide, nematicide. NR since 1/87. Source of residues considered by DPR to be from historical nonpoint source, legal agricultural use. Referred to SWRCB.

Table I-7 continued

Compound Detected	Number of Counties and Wells Sampled	Counties and Number of Wells with Detections	Range of Concentrations Detected (ppb)	Water Quality Criteria [(a)]	Registration Status Type of Compound Comments
heptachlor	34 counties 639 wells	Santa Clara, 4	0.01-0.02	CDHS MCL 0.01 USEPA MCL 0.4	Insecticide. NR in California. Referred to SWRCB.
simazine	40 counties 1,019 wells	Merced, 1 Solano, 1 Sonoma, 1	0.193 – 0.28	USEPA MCL 4.0	Herbicide. AR. Detection in Sonoma County is CUI. All other detections were determined to be due to LAU.
xylene	48 counties 2,292 wells	Butte, 2 Los Angeles, 4 Napa, 1 Sonoma, 1	0.8 - 79	CDHS MCL 1750 USEPA MCL 10000	Solvent. NR. There are no products currently registered for agricultural use in California that contain xylene as an active ingredient. Non-agricultural uses of industrial chemicals may contribute to these findings. Referred to SWRCB.

(a) Marshack, J.B. 2000. A Compilation of Water Quality Goals. Definitions of the various Water Quality Criteria are given below.

CDHS MCL: Maximum Contaminant Level (MCL) adopted by CDHS under the Safe Drinking Water Act. MCLs are formally established in regulation and are enforceable by CDHS on water suppliers. Values are expressed in ppb.

USEPA MCL: MCL adopted by the U.S. Environmental Protection Agency (USEPA) under the Safe Drinking Water Act. MCLs are enforceable by the California Department of Health Services (CDHS) on water suppliers. Values are expressed in ppb.

USEPA IRIS RfD: USEPA Integrated Risk Information System (IRIS) Reference Dose (RfD): published by USEPA's Office of Water. See glossary for complete description. Values are expressed in mg/kg/day.

USEPA SNARLs: USEPA Drinking water health advisories or suggested no-adverse-response levels (SNARLs) for toxicity other than cancer risk.

NR: Not registered

AR: Actively registered in California

LAU: Legal agricultural use

SECTION I SUMMARY

From July 1, 2000 through June 30, 2001, results were reported for 3,027 wells, located in 49 counties that were sampled for a total of 110 pesticide active ingredients or breakdown products. The data represent four ground water sampling studies conducted by two agencies from July 1, 2000 to June 30, 2001.

Of the 110 compounds, 15 pesticide active ingredients or breakdown products were detected in 270 wells in 26 counties. Verified detections were made of six compounds in 16 wells in five counties.

Detections of the following chemicals were verified for the first time in the following counties: diuron in Contra Costa County, DACT in Shasta County, and simazine and DACT in Solano County.

II. PROCESSES CONTRIBUTING TO THE PREVENTION OF PESTICIDE MOVEMENT TO GROUND WATER AS A RESULT OF AGRICULTURAL USE

The PCPA requires DPR to include in the annual report an analysis of the factors that contribute to the movement of pesticides to ground water. Factors that determine the probability of an agricultural use pesticide reaching ground water include the chemical's physiochemical properties, pesticide formulation, site of application, soil type, climate, and irrigation practices. Many of these factors have been investigated by DPR.

Pesticides may reach ground water by leaching or by movement of runoff water. Leaching is the process by which pesticide residues are dissolved or suspended in water and are carried through the soil matrix as it recharges a ground water aquifer. Pesticide residues in runoff water move from sites of application to natural or man made conduits. A natural conduit includes structures such as sinkholes, macropores, insect and animal burrows, root channels, and deep cracks in clay soils. Man made conduits include poorly constructed or damaged well seals or casings, agricultural drainage wells (dry wells), and improperly abandoned water, oil, cathodic, or natural gas wells.

Ground water contamination may arise from point or nonpoint sources. Point source contamination occurs when the pesticide comes from a defined area such as from spills (improper handling, storage, and disposal), or direct injection into the ground water during mixing or chemigation. Nonpoint source contamination occurs when pesticides reach ground water from a large area, typically because of movement of pesticides after an agricultural application.

SPECIAL STUDIES

Update on Proposed Regulation Changes

The Department plans to revise the ground water protection regulations to make them more preventive. The revised regulations would require adoption of new management practices both in areas where pesticides have been found in ground water and in areas that have a high potential for pesticide movement to ground water. Currently, pesticides that are found in ground water as a result of legal agricultural use are regulated in vulnerable areas called pesticide management zones (PMZs). PMZs are identified based on detections of one or more pesticides in ground water. DPR is planning to change the criteria for identifying vulnerable areas and designate those areas as ground water protection areas (GWPAs). GWPAs will include all current and draft PMZs as well as additional areas that have soil and depth-to-ground water that are

characteristic of PMZs. These new criteria have been developed from a statistical analysis of over 15 years of well sampling data compiled by DPR. Geological characteristics of vulnerable areas were first identified through a statistical clustering analysis. The second step was to develop a classification method so that sections that did not contain well sampling data but that had similar geologic characteristics to vulnerable areas could be grouped into vulnerable clusters. This determination was based on a combination of soil data obtained from the U.S. Natural Resource Conservation Service (formerly the Soil Conservation Service) and data generated for estimated depth-to-ground water. The current method used to group and profile sections of land based on soil data is explained in Environmental Monitoring Branch report EH 00-05 and the method to determine depth-to-ground water estimates for sections of land in Environmental Monitoring Branch report EH 00-02. The statistical methodology that was developed and the testing of the clustering analysis is referenced in the following Environmental Monitoring Branch Reports and refereed scientific journal articles available at DPR's website at http://www.cdpr.ca.gov/docs/empm/ehap.htm :

Branch Reports:

- EH 92-09 Troiano, J., B. Johnson, S. Powell, And S. Schoenig. 1992. Profiling Areas Vulnerable to Ground Water Contamination by Pesticides in California. (PDF, 1.8 Mb)
- EH 00-02 Spurlock, F. 2000. Procedures for Developing a Depth-To-Ground Water Database. (PDF 1.4 Mb)
- EH 00-05 Troiano, J., F. Spurlock, And J. Marade. 1999. Update of the California Vulnerability Soil Analysis for Movement of Pesticides to Ground Water: October 14, 1999. (PDF 1.8 Mb)
- EH 00-08 Marade, J. 2000. Draft List Of ground water protection areas. Identified by the CALVUL Model. (PDF, 61 Kb)
- EH 00-07 Marade, S.J. and J. Troiano. 2000. Sections of Land Requiring Special Assignment as Runoff or Leaching ground water protection areas. (PDF, 1.1 Mb)

Refereed Journal Articles:

- 1994 Troiano, J., B.R. Johnson, and S. Powell. 1994. Use of Cluster and Principal Component Analyses to Profile Areas in California Where Ground Water Has Been Contaminated by Pesticides. Environ. Monitor. Assess. 32: 269-288.
- 1997 Troiano, J., C. Nordmark, T. Barry, and B. Johnson. 1997. Profiling Areas of Ground Water Contamination by Pesticides in California: Phase II- Evaluation and Modification of a Statistical Model. Environ. Monitor. Assess. 45:301-318.

- 1998 Troiano, J., C. Nordmark, T. Barry, B. Johnson, and F. Spurlock. 1998. Pesticide Movement to Groundwater: Application of Arial Vulnerability Assessments and Well Monitoring to Mitigation Measures. p.239-251. In Ballatine et al. (ed.) Triazine Herbicides Risk Assessment. ACS Symposium Series 683.
- 1999 Troiano, J., J. Marade, and F. Spurlock. 1999. Empirical Modeling of Spatial Vulnerabilitiy Applied to a Norflurazon Retrospective Well Study in California. J. Environ. Qual. 28:397-403. (PDF, 135 kb). Reprinted with the permission of the American Agronomy Society.

Monitoring Temporal Changes in Concentrations of Detected Herbicides and Their Degradates in Ground Water-Well Monitoring Network

The Department has established a well monitoring network consisting of approximately 70 rural, domestic wells located in Fresno and Tulare counties. The wells will be used to measure the temporal changes in concentrations of pesticides present in those wells. This network will be used to monitor the effectiveness of the regulations the Department is planning to adopt to prevent movement of pesticides to ground water. The wells are sampled twice a year, once in the spring and once in the fall, to monitor the concentration of pesticide residues. These wells were identified because they had been previously sampled and determined to contain residues of the pesticides that will be monitored, and because they are located in one of the two soil conditions identified in vulnerable areas, either coarse textured, sandy soil or hardpan. Water samples drawn from the wells are subject to a chemical analytical screen for seven parent active ingredients -- atrazine, simazine, bromacil, diuron, prometon, hexazinone, and norflurazon -- and 3 triazine breakdown products-DEA, ACET, and DACT.

Well sampling was initiated in the fall of 1999, so data are available for the fall of 1999, spring and fall of 2000, and spring of 2001. A summary of the data will be included in the 2002 Update to the Well Inventory Database report. Since the new regulations have not yet been adopted, these data provide background concentrations for the well network. The active ingredients consistently detected are simazine and diuron in wells located in vulnerable areas with coarse-textured soils and simazine, diuron, and bromacil in vulnerable areas with soils that contain a hardpan. Simazine and diuron are used on grapes and deciduous and citrus trees, while bromacil is used only on citrus. This pattern reflects use conditions because grapes and deciduous tree crops predominate the coarse-textured soil condition whereas citrus is the predominate crop on the hardpan soil condition.

The patterns of detection have been similar for all pesticides sampled in the network. Data for simazine and its breakdown products are presented in Figure 1 because simazine has been the most consistently detected residue for which there is a maximum contaminant level (MCL). MCLs are used by the California Department of Health Services (CDHS) to regulate public drinking water, including municipal wells. Domestic well owners, who are not subject to the same level of CDHS regulatory activity, can use MCLs to decide whether they wish to filter water or seek other sources of drinking water. The current California and national drinking water MCL for simazine has been set at four micrograms per liter, or four parts per billion. MCLs for simazine's breakdown products have not been established. Figure 1 shows that simazine's breakdown products, ACET and DACT, are usually detected at higher concentrations than the parent simazine and when you add the concentrations of the breakdown products and the parent together the total concentration can exceed the MCL for the parent. This issue will be considered in our current assessment of simazine. The important features from Figure 1 are:

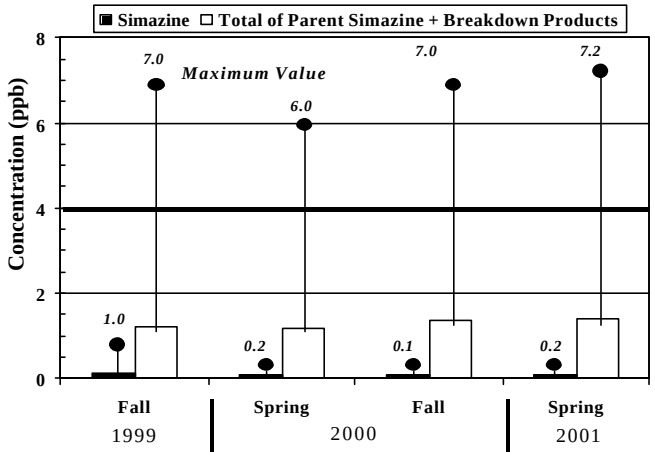
(1) The average concentration and highest values measured for simazine (solid black bar) and total triazine residues (simazine+breakdown products) (hatched bar) are consistent across the four sampling periods.

(2) The mean value and the highest value for the parent simazine are below the MCL of 4ppb.

(3) The mean values for the total triazine residues measured in a well sample are nearly ½ the MCL value.

(4) The highest values for the total triazine residues in 10% of the wells (7 of 70 wells) exceed the simazine MCL.

Figure 1. Average (Bars) and Maximum (Points) Concentrations of Simazine and Total Residues of Triazines Detected in Selected Rural, Domestic Drinking Water Wells Sampled in Fresno and Tulare Counties



OTHER ACTIVITIES

EHAP is sponsoring an effort to train County Agricultural Commissioner staff and enforcement personnel to recognize 'pesticide label' required chemigation safety devices that help to prevent ground water contamination. DPR staff is working closely with the Center for Irrigation Technology, Fresno in developing a chemigation training manual and a mobile trailer unit that will house a complete chemigation system. Training will be held in five regions of the State and is scheduled to begin mid-October 2001.

III. ACTIONS TAKEN BY THE DEPARTMENT OF PESTICIDE REGULATION TO PREVENT PESTICIDES FROM ENTERING GROUND WATER AS A RESULT OF AGRICULTURAL USE

ENVIRONMENTAL HAZARDS ASSESSMENT PROGRAM

The Environmental Monitoring Branch's Environmental Hazards Assessment Program (EHAP) performs the lead role for implementing DPR's environmental protection programs. EHAP personnel design and conduct field studies of air, soil, and surface and ground water to determine the environmental fate of pesticides, and conduct monitoring surveys to determine the presence of pesticide residues in ground water. All sampling results reported to DPR with positive pesticide detections are reviewed and either investigated by DPR or referred to SWRCB. DPR uses results of these investigations to take action to prevent pesticide contamination of ground water.

GROUND WATER PROTECTION TRAINING

Ground water protection training is part of a comprehensive program designed to protect the ground water from contamination due to legal agricultural uses of pesticides. DPR has conducted ground water protection training annually since 1989. Four training sessions were offered this year in February 2001. The training is required for licensed pest control advisers (PCAs) who write ground water protection advisories for growers. Growers must submit these advisories to the county agricultural commissioner (CAC) before the CAC can issue permits that are required for crop uses of simazine, bromacil, diuron, and all allowed uses of norflurazon, in their respective pesticide management zones (PMZs). A PMZ is an approximate one-square-mile area that has been determined to be sensitive to ground water pollution by pesticides. To be authorized to write a ground water protection advisory, a licensed PCA must have attended DPR-approved ground water protection training within the previous two years and submitted written proof of the training to the CAC. The ground water protection advisory contains specific information for applying a regulated pesticide in a PMZ to reduce the potential for movement of the chemical into ground water.

DPR speakers review the extent of pesticide residues in ground water, potential sources of pesticide residues, contamination pathways, factors that influence pesticide movement to the ground water, and management practices that limit such movement. Recommended management practices begin before the pesticide is applied with proper storage, mixing, loading, rinsing and disposal procedures, and wellhead protection. During and after application, management practices depend on the mechanism of pesticide movement to the ground water. These

mechanisms are often soil related. DPR scientists have classified California vulnerable areas into two categories, leaching areas and runoff areas, based on the dominant mechanisms that pesticides move offsite. In leaching areas (coarse soils), the training focuses on proper irrigation management practices that keep excess irrigation water from leaching pesticides down to the ground water through the soil. In runoff areas (fine-textured and hardpan soils), the training recommends incorporation of soil-applied pesticides, which helps shield residues from surface water runoff that can subsequently carry residues to ground water through drainage (dry) wells or improperly sealed wells or via movement to coarse soil areas. The training also reviews changes in ground water laws, regulations, and programs.

PESTICIDE DETECTION RESPONSE PROCESS (conducted pursuant to sections 13149 through 13151 [FAC] of the PCPA)

Under the provisions of the Pesticide Detection Response Process (PDRP, see glossary), EHAP investigates all reports of detections of pesticides in ground water from its own sampling program and from sampling conducted by other public agencies or private entities.

A pesticide is considered "found" in ground water if it is detected using an unequivocal detection method, or if the original detection is subsequently verified. DPR has established specific criteria for analytical methods that provide for an unequivocal detection and for determining if a detection is verified (Biermann 1989, 1996).

EHAP determines if the detected pesticide could have resulted from the use of a currently registered pesticide and if the pesticide's presence in ground water is due to legal agricultural use. Legal agricultural use means the pesticide was properly applied according to the label directions of a pesticide registered for agricultural use and in accordance with federal and State laws and regulations.

In the past, unless the pesticide was detected in or immediately adjacent to its PMZ, DPR routinely conducted a "four-section survey" to help determine whether the detection was due to agricultural use. Sampling was conducted in the section of land of the original detection and in three adjacent sections of land. These studies often were located in areas that have been thoroughly investigated and would provide little additional useful information. In an effort to use resources in an effective and efficient manner, DPR reviewed and modified its protocols for determining when field sampling is required (DPR, January 1996).

EHAP conducts a four-section survey under the following conditions.

1. For reported detections of new active ingredients, that is, pesticide active ingredients for which a Director's finding has not been made pursuant to FAC section 13150.
2. For pesticide active ingredients for which a Director's finding has been made pursuant to FAC section 13150 [6800(a) list chemicals] and:
    a. There has not been a previous detection of a pesticide in ground water in the section due to agricultural use, and,
    b. The sections included in the four-section survey area do not include a section which is an adopted or recommended PMZ, and,
    c. The detection is not in an area identified by modeling as an area sensitive to ground water pollution, or,
    d. Conducting a well survey will provide new information that may be useful for vulnerability assessment.

In addition, DPR uses land use maps, pesticide use information, and surveys of potential "point" sources of pesticide residues to help make the agricultural use determination. Verified detections are determined to be due to legal agricultural use if all the following criteria are met (DPR, March 1996):

1. The residue detected (active ingredient, breakdown product, or any other specified ingredient) is from a pesticide that is registered for agricultural use in California.
2. The application of a pesticide in the vicinity of the detection was reasonably likely.
3. A point source was not a likely cause.
4. A non-agricultural use of the pesticide was not a likely source.
5. A non-pesticide source was not a likely cause.
6. The pesticide should be present in a well in another adjacent section or verified within a second site within a half-mile radius of the original determination.

Verified detections of pesticide residues that are determined to be due to agricultural use and that have been previously formally reviewed by the Director are subject to the current applicable ground water regulations. Verified detections of pesticide residues that are determined to be due to agricultural use and that have not been previously formally reviewed by the Director are subject to special review specified in FAC section 13150. The purpose of the review is to determine whether continued registration, sale, and use of the compound will be allowed. A subcommittee of the PREC holds a hearing, evaluates information, and makes recommendations to the Director of DPR who then makes a determination regarding continued use of the compound in California.

The pesticide detection is removed from the PDRP and referred to the SWRCB if the pesticide is (1) not currently registered for use, (2) registered for other than agricultural, outdoor industrial, or outdoor institutional use, and (3) detected in ground water not as a result of agricultural use. If a currently registered pesticide is found in ground water due to legal non-agricultural use, DPR would review the detection using its other regulatory authorities, including reevaluation.

ACTIONS TAKEN BY DPR ON PESTICIDE DETECTIONS

A total of 15 pesticide active ingredients and breakdown products were detected and reported during the period from July 1, 2000 to June 30, 2001. EHAP did not initiate investigations for 7 of the 15 detected chemicals (1,2-dichloropropane, benzene, chloromethane, DBCP, ethylene dibromide, heptachlor and xylene) because the chemicals are not currently registered for agricultural use in California and are not breakdown products of chemicals currently registered for agricultural use in California. These detections were referred to the SWRCB.

Monitoring for pesticides not previously reviewed by the PREC subcommittee

CDHS has reported a detection of 2,4-D in Santa Clara County. DPR is currently investigating this detection.

Monitoring for pesticides previously reviewed through the PDRP and by the PREC subcommittee where additional well monitoring was conducted

CDHS has reported a detection of simazine in Sonoma County and the aldicarb metabolite, aldicarb sulfoxide, in Sacramento County. Both detections are currently under investigation by DPR.

Norflurazon regulations adopted

Norflurazon was previously found in ground water and determined to be due to legal agricultural use. The registrant was subsequently notified and requested a hearing of the Pesticide Registration and Evaluation Committee (PREC) subcommittee, as prescribed by law. The PREC subcommittee held a hearing and made findings and recommendations to the DPR Director regarding the continued use of norflurazon. After reviewing these findings and recommendations, the Director issued a final decision in April of 1999. The Director concurred with the PREC subcommittee that the use of norflurazon can be modified in such a way that there would be a high probability that no norflurazon residues other than those already present in ground water would migrate to ground water.

DPR has adopted regulations effective March 23, 2001 to add norflurazon to the list of pesticides found in ground water due to legal agricultural use (section 6800(a) of Title 3 of the California Code of Regulations), establish norflurazon PMZs, and establish norflurazon use requirements. These use requirements prohibit use of norflurazon inside canal and ditch banks and in recharge areas within norflurazon PMZs. In addition, norflurazon is subject to all other regulations that apply to pesticides listed in section 6800(a) and regulated in PMZs.

AGRICULTURAL USE DETERMINATIONS AND RECOMMENDATIONS FOR PESTICIDE MANAGEMENT ZONES

As a result of investigations concluded between July 1, 2000 and June 30, 2001, pesticide residues of three pesticides and their breakdown products in a total of 15 sections were determined, pursuant to Food and Agricultural Code section 13149, to be present in ground water as the result of nonpoint source, legal agricultural use. DPR recommended 15 sections as new PMZs (Table IV-1). Recommended PMZs must be adopted in regulation before they are subject to regulatory controls. Appendix B gives a more detailed description of the section number and chemical.

Table III-1. Number of sections recommended as pesticide management zones by the Department of Pesticide Regulation from July 1, 2000 through June 30, 2001.

County	Chemical(s)	Sections
Contra Costa	diuron	1
Kern	diuron	3
Merced	atrazine, simazine	6
Solano	atrazine simazine	4 1
Total Sections	atrazine 10, diuron 4, simazine 7	15

GROUND WATER PROTECTION LIST MONITORING

The Ground Water Protection List (GWPL) is a list of pesticides having the potential to pollute ground water. It is established by FAC section 13145(d) and placed in section 6800 (3CCR). The GWPL is divided into sub-lists (a) and (b). Sub-list (a) is comprised of chemicals detected in soil or ground water as a result of legal, agricultural use. Sub-list (b) includes chemicals that meet the conditions specified in FAC section 13145(d). These are pesticide active ingredients whose physicochemical properties exceed certain values (called specific numerical values or

SNVs, [Johnson, 1991]) and that are labeled for use under any of the following conditions: (1) application to or injection into the soil; or (2) for application to or injection into soil by chemigation; or (3) application to be followed, within 72 hours, by flood or furrow irrigation. In order to determine whether these economic poisons have migrated to ground water, DPR is required to conduct monitoring for materials on the GWPL.

From 1992 to 1998, a monitoring protocol was used to determine in which order and to what extent the compounds should be monitored in California. First priority was given to pesticide active ingredients that had been detected in ground water due to nonpoint sources in other states or which were given a high priority for risk assessment on the list of pesticide active ingredients created for implementing the Birth Defect Prevention Act (SB950). For chemicals given first priority, between 25 and 40 wells were sampled. Second priority pesticides were selected based on pounds of active ingredient sold per year and on a combination of physicochemical factors; 15 to 25 wells were to be sampled for this group. Remaining compounds on the list were given third priority for monitoring, and 10 to 15 wells were to be sampled.

In 1992, 45 pesticide active ingredients (AI's) were placed on the GWPL and prioritized. Monitoring was completed for 18 of those AI's between 1992 and 1998. A regulation package that became effective on May 13, 1999 added 15 new AI's to the GWPL.

The GWPL monitoring protocol was revised in April 1997 to improve the process for selecting chemicals for monitoring. Active ingredients on the GWPL are no longer ranked according to priority for monitoring. Instead, all active ingredients on the list are evaluated for their potential to contaminate ground water based on the factors previously used to rank them along with any current information on recent detections, agricultural production practices for crops treated with the pesticide, or any other pertinent information. Each year, one or more active ingredients on the GWPL are selected for monitoring.

In summer 2001, wells were sampled for alachlor (including the metabolites alachlor ethanesulfonic acid and alachlor oxanilic acid) and for metolachlor (including the metabolites metolachlor ethanesulfonic acid and metolachlor oxanilic acid). Well sampling was not completed in time to be detailed in this report; sampling details and analytical results will be included in the next report.

ADJACENT SECTION MONITORING

DPR samples wells located in land sections adjacent to PMZs to determine whether they are also vulnerable to pesticides reaching ground water. EHAP uses the results of this sampling, in conjunction with information EHAP gathers during land use surveys, to determine whether an adjacent section should also be declared a PMZ.

Adjacent section monitoring has been conducted annually from 1988 through 1995. However, in 1996 this monitoring was suspended because resources were reallocated to special studies designed to obtain information on mitigation of pesticide movement to ground water. Adjacent section monitoring was resumed in May 2000. By June 30, 2000, EHAP had sampled 29 wells in 16 previously unmonitored sections adjacent to PMZs in Butte, Colusa, Contra Costa and Mendocino Counties. Wells were sampled in five sections in Butte County, six sections in Contra Costa County, and in three sections in Colusa County. Complete analytical results were not ready in time for inclusion in the 2000 Update of the Well Inventory Database Report. Those results are presented below.

In the four counties sampled, verified pesticide detections were made in 5 of 29 wells (17%) in 5 of 15 sections (33%). Diuron and norflurazon were each detected in two wells. Atrazine, DEA, prometon and simazine were each detected in one well. One well in Butte County had verified detections of three chemicals. As a result of adjacent section monitoring conducted during May-July 2000, four new sections were recommended as PMZs.

Additional adjacent section monitoring was also conducted during the period July 1, 2000 through June 30, 2001. EHAP sampled wells in three previously unmonitored sections in Kern County, 12 sections in Merced County and six sections in Solano County. Verified pesticide detections were made in 12 of 37 wells (32%) in 11 of 21 sections (52%). Atrazine was detected in six wells, simazine in two wells and diuron in one well. DEA, ACET and DACT were each detected in five wells. Five wells had at least three herbicide residues present in samples. Table II-1 summarizes the number of PMZ recommendations made for each county.

BENTAZON MONITORING

Historically, approximately 98% of all bentazon used in California was for post-emergence weed control in rice fields. In 1989, confirmed detections of bentazon were made in 64 wells in 10 counties where rice was a major crop. As a result of those detections, DPR suspended the registration of bentazon until a full review could be conducted through the PDRP. The review resulted in DPR adopting regulations in January 1992 which added bentazon to section 6800(a)

of the Ground Water Protection List (GWPL), and established use modifications that prohibited the use of bentazon (1) in Del Norte and Humboldt counties, (2) in the production of rice, (3) before April 1 or after July 31, and (4) in fields where irrigation applied through December of the application year would not be by sprinklers (Title 3 CCR 6486.6). In the PDRP findings, DPR's Director stated that the Department would continue to monitor for the presence of bentazon in ground water in areas where it was applied after the establishment of the use modifications.

Well monitoring for bentazon was conducted annually from 1993 to 1996. During those surveys only 7-12 wells were sampled because of the small quantities of bentazon applied in any one county or area within a county. In all, 21 different wells were sampled during the four surveys but no bentazon residues were detected. As a result of the low number of wells available for sampling in treated areas, bentazon monitoring was changed from an annual survey to a biennial survey as of September 1996. The next survey was conducted in August 1998 and no bentazon or other herbicide residues were detected in eight wells sampled in three counties.

The most recent survey for bentazon was conducted in November 2000. Bentazon use information was obtained from the Annual Pesticide Use Report for 1994-1998. Sixteen wells were sampled in sections of Kern, Lassen, Monterey, San Mateo, Santa Barbara, Shasta and Ventura Counties where bentazon had been applied. These sections were not near rice-growing areas with historical uses of bentazon. Well samples were also analyzed for atrazine, cyanazine, hexazinone, metribuzin, norflurazon, prometryn, simazine, prometon, diuron, bromacil, DEA, ACET, and DACT. ACET and DACT are degradates of both atrazine and simazine and DEA is a degradate of atrazine.

No bentazon residues were detected in any of the wells. One well in Kern County contained residues of atrazine, DEA, ACET and diuron; one well in Shasta County contained ACET and DACT. No other wells contained herbicide residues. The next bentazon survey will be conducted in fall/winter 2002.

SECTION III SUMMARY

From July 1, 2000 to June 30, 2001, EHAP sampled 90 wells in 12 counties. The samples were analyzed for 14 pesticide active ingredients and breakdown products. EHAP verified detections in 16 wells in five counties for six compounds—atrazine, diuron, simazine, DEA, DACT, and ACET.

DPR determined that residues of atrazine, diuron, simazine, DEA, DACT, and ACET reached ground water through legal agricultural use of these pesticides. Fifteen sections in four counties were recommended as PMZs.

The PREC subcommittee made findings and recommendations to the Director regarding the continued use of norflurazon. The Director concurred with the PREC subcommittee that the use of norflurazon can be modified in such a way that there would be a high probability that no norflurazon residues other than those already present in ground water would migrate to ground water. Regulations were adopted in March 2001 to make norflurazon a restricted material, add norflurazon use requirements, and establish norflurazon PMZs.

REFERENCES

Biermann, H. 1989. Definition of a second analytical method for the purposes of AB 2021 (memorandum). California Department of Food and Agriculture, Environmental Hazards Assessment Program. Sacramento, California.

Biermann, H. 1996. Definition of 'unequivocal detection methods' for the purposes of SB810 (memorandum). California Environmental Protection Agency, Department of Pesticide Regulation, Environmental Monitoring and Pest Management Branch, Environmental Hazards Assessment Program, Sacramento, California.

Department of Pesticide Regulation. 2000. Summary of pesticide use report data. Sacramento, California.

Department of Pesticide Regulation. January, 1996. Environmental Monitoring and Pest Management Branch. Revised protocol for selecting sampling areas and wells in a four-section survey to locate a second positive well site.

Department of Pesticide Regulation. March, 1996. Environmental Monitoring and Pest Management Branch. Protocol to determine whether a pesticide may have been used in a section where it has been detected in ground water (establish legal agricultural use).

Garretson, C. 1999. Protocol for monitoring the concentration of detected pesticides in wells located in highly sensitive areas.

Garretson, C. 1999. Protocol for Monitoring the Concentration of Detected Pesticides in Wells Located in Highly Sensitive Areas. Posted at: www.cdpr.ca.gov/docs/empm/pubs/protocol.htm

Maes, C., M. Pepple, J. Troiano, D. Weaver, W. Kimaru, and SWRCB staff. 1993. Sampling for pesticide residues in California well water: 1992 well inventory database, cumulative report 1986-1992. California Environmental Protection Agency, Department of Pesticide Regulation, Environmental Monitoring and Pest Management Branch, Environmental Hazards Assessment Program, Sacramento, California. EH 93-02.

Marshack, J.B. 2000. A compilation of water quality goals. California Regional Water Quality Control Board, Central Valley Region. Sacramento, California.

Troiano, J., F. Spurlock, and J. Marade. 2000. Update of the California vulnerability soil analysis for movement of pesticides to ground water: EH 00-05.

Troiano, J., Johnson, B.R., Powell, S. and S. Schoenig. 1994, Use of cluster and principal component analyses to profile areas in California where ground water has been contaminated by pesticides. Environmental Monitoring and Assessment 32:269-288.

Troiano, J., D. Weaver, J. Marade, F. Spurlock, M. Pepple, C. Nordmark, D. Bartkowiak. 2001. Summary of Well Water Sampling in California to Detect Pesticide Residues Resulting from Nonpoint-Source Applications. Journal of Environmental Quality 30:448-459.

Appendix A

Number of wells sampled and positive detections, by county and pesticide for data reported to DPR between July 1, 2000 and June 30, 2001

This appendix is presented in two parts. The first part (part 1) summarizes information from the following counties where **pesticide residues were not detected**:

Alameda	Mariposa	Santa Barbara
Amador	Monterey	Santa Cruz
Colusa	Nevada	Sierra
Del Norte	Orange	Siskiyou
Glenn	Placer	Trinity
Lake	Plumas	Tuolumne
Lassen	San Benito	Yolo
Marin	San Luis Obispo	

The second part (part 2) summarizes information from the following counties where **pesticide residues were detected**:

Butte	Merced	Shasta
Contra Costa	Napa	Solano
El Dorado	Riverside	Sonoma
Fresno	Sacramento	Stanislaus
Kern	San Bernardin	Sutter
Kings	San Diego	Tulare
Los Angeles	San Joaquin	Ventura
Madera	San Mateo	Yuba
Mendocino	Santa Clara	

Appendix A part 1. Counties without detections by chemical and number of wells sampled.

ALAMEDA

1,1,2,2-Tetrachloroethane	26	Dinoseb	13
1,2,4-Trichlorobenzene	26	Diquat Dibromide	13
1,2-D + 1,3-D + C-3 Compounds	26	Diuron	13
1,2-Dichloropropane	26	Endosulfan	4
2,3,7,8-Tcdd (Dioxin)	13	Endosulfan Sulfate	4
2,4,5-Tp (Silvex)	13	Endothall	13
2,4-D	13	Endrin	17
3-Hydroxycarbofuran	12	Endrin Aldehyde	4
Acenapthene	4	Ethylene Dibromide	17
Alachlor	17	Glyphosate, Isopropylamine Salt	13
Aldicarb	12	Heptachlor	17
Aldicarb Sulfone	12	Heptachlor Epoxide	17
Aldicarb Sulfoxide	12	Hexachlorobenzene	17
Aldrin	17	Lindane (Gamma-Bhc)	17
Atrazine	17	Methomyl	12
Bentazon, Sodium Salt	13	Methoxychlor	17
Benzene (Benzol)	26	Methyl Bromide (Bromomethane)	26
Bromacil	13	Metolachlor	17
Butachlor	17	Metribuzin	17
Carbaryl	12	Molinate	17
Carbofuran	12	Naphthalene	26
Chlordane	13	Ortho-Dichlorobenzene	26
Chloromethane	26	Oxamyl	12
Chlorothalonil	17	Picloram	13
Dalapon	13	Prometryn	13
DBCP	17	Propachlor	17
DDD	4	Simazine	17
DDE	4	Thiobencarb	17
DDT	4	Toxaphene	13
Diazinon	13	Trichlorobenzenes	26
Dicamba	13	Xylene	26
Dieldrin	17		
Dimethoate	13		

AMADOR

1,1,2,2-Tetrachloroethane	3	Bentazon, Sodium Salt	1
1,2,4-Trichlorobenzene	3	Benzene (Benzol)	3
1,2-D + 1,3-D + C-3 Compounds	3	Bromacil	1
1,2-Dichloropropane	3	Butachlor	1
2,4,5-Tp (Silvex)	1	Chloromethane	3
2,4-D	1	Dicamba	1
Alachlor	1	Dimethoate	1
Atrazine	1	Dinoseb	1

AMADOR Cont

		Picloram	1
Methyl Bromide (Bromomethane)	3	Prometryn	1
Metolachlor	1	Simazine	1
Metribuzin	1	Thiobencarb	1
Molinate	1	Trichlorobenzenes	3
Naphthalene	3	Xylene	3
Ortho-Dichlorobenzene	3		

COLUSA

1,1,2,2-Tetrachloroethane	2	Diuron	4
1,2,4-Trichlorobenzene	2	Hexazinone	4
1,2-D + 1,3-D + C-3 Compounds	2	Methyl Bromide (Bromomethane)	2
1,2-Dichloropropane	2	Metribuzin	4
ACET	4	Naphthalene	2
Atrazine	4	Norflurazon	4
Benzene (Benzol)	2	Ortho-Dichlorobenzene	2
Bromacil	4	Prometon	4
Chloromethane	2	Prometryn	4
Cyanazine	4	Simazine	4
Deethyl-Atrazine	4	Trichlorobenzenes	2
Diaminochlorotriazine (DACT)	4	Xylene	2

DEL NORTE

1,1,2,2-Tetrachloroethane	7	Methyl Bromide	7
1,2,4-Trichlorobenzene	7	Naphthalene	7
1,2-D + 1,3-D + C-3 Compounds	7	Ortho-Dichlorobenzene	7
1,2-Dichloropropane	7	Trichlorobenzenes	7
Benzene (Benzol)	7	Xylene	7
Chloromethane	7		

GLENN

1,1,2,2-Tetrachloroethane	1	Methyl Bromide (Bromomethane)	1
1,2,4-Trichlorobenzene	1	Naphthalene	1
1,2-D + 1,3-D + C-3 Compounds	1	Ortho-Dichlorobenzene	1
1,2-Dichloropropane	1	Trichlorobenzenes	1
Benzene (Benzol)	1	Xylene	1
Chloromethane (Methyl Chloride)	1		

LAKE

1,1,2,2-Tetrachloroethane	10	2,4,5-Tp (Silvex)	10
1,2,4-Trichlorobenzene	10	2,4-D	10
1,2-D + 1,3-D + C-3 Compounds	10	3-Hydroxycarbofuran	7
1,2-Dichloropropane	10	Alachlor	2

LAKE Cont

Aldicarb	6
Aldicarb Sulfone	6
Aldicarb Sulfoxide	6
Aldrin	5
Atrazine	13
Bentazon, Sodium Salt	10
Benzene (Benzol)	10
Bromacil	5
Butachlor	5
Carbaryl	6
Carbofuran	10
Chlordane	4
Chloromethane	10
Chlorothalonil	3
Dalapon	10
DBCP	3
Diazinon	5
Dicamba	10
Dieldrin	5
Dimethoate	5
Dinoseb	10
Diquat Dibromide	10
Diuron	1
Endothall	11
Endrin	4
Ethylene Dibromide	6
Heptachlor	4
Heptachlor Epoxide	4
Hexachlorobenzene	4
Lindane (Gamma-Bhc)	4
Methomyl	7
Methoxychlor	4
Methyl Bromide (Bromomethane)	10
Metolachlor	5
Metribuzin	5
Molinate	5
Naphthalene	10
Ortho-Dichlorobenzene	10
Oxamyl	12
Picloram	10
Prometryn	5
Propachlor	5
Simazine	13
Thiobencarb	5
Toxaphene	4
Trichlorobenzenes	10
Xylene	10

LASSEN

1,1,2,2-Tetrachloroethane	6
1,2,4-Trichlorobenzene	6
1,2-D + 1,3-D + C-3 Compounds	6
1,2-Dichloropropane	6
ACET	2
Atrazine	2
Bentazon, Sodium Salt	2
Benzene (Benzol)	6
Bromacil	2
Chloromethane	6
Cyanazine	2
Deethyl-Atrazine	2
Diaminochlorotriazine (DACT)	2
Diuron	2
Hexazinone	2
Methyl Bromide (Bromomethane)	6
Metribuzin	2
Naphthalene	6
Norflurazon	2
Ortho-Dichlorobenzene	6
Prometon	2
Prometryn	2
Simazine	2
Trichlorobenzenes	6
Xylene	6

MARIN

1,1,2,2-Tetrachloroethane	1
1,2,4-Trichlorobenzene	1
1,2-D + 1,3-D + C-3 Compounds	1
1,2-Dichloropropane	1
2,4,5-Tp (Silvex)	1
2,4-D	1
Alachlor	1
Aldrin	1

MARIN Cont

		Heptachlor Epoxide	1
Atrazine	1	Hexachlorobenzene	1
Bentazon, Sodium Salt	1	Lindane (Gamma-Bhc)	1
Benzene (Benzol)	1	Methoxychlor	1
Chlordane	1	Methyl Bromide (Bromomethane)	1
Chloromethane	1	Naphthalene	1
Dalapon	1	Ortho-Dichlorobenzene	1
Dicamba	1	Picloram	1
Dieldrin	1	Simazine	1
Dinoseb	1	Toxaphene	1
Endrin	1	Trichlorobenzenes	1
Glyphosate, Isopropylamine Salt	1	Xylene	1
Heptachlor	1		

MARIPOSA

1,3-Dichloropropene	6	Chloromethane	6
1,1,2,2-Tetrachloroethane	6	Dimethoate	2
1,2,4-Trichlorobenzene	6	Ethylene Dibromide	6
1,2-D + 1,3-D + C-3 Compounds	6	Methyl Bromide (Bromomethane)	6
1,2-Dichloropropane	6	Naphthalene	6
Atrazine	2	Ortho-Dichlorobenzene	6
Benzene (Benzol)	6	Simazine	2
Bromacil	2	Trichlorobenzenes	6
Butachlor	2	Xylene	6

MONTEREY

1,1,2,2-Tetrachloroethane	38	Benzene (Benzol)	38
1,2,4-Trichlorobenzene	38	Bromacil	37
1,2-D + 1,3-D + C-3 Compounds	35	Butachlor	36
1,2-Dichloropropane	38	Carbaryl	35
2,3,7,8-Tcdd (Dioxin)	1	Carbofuran	36
2,4,5-T	28	Chlordane	36
2,4,5-Tp (Silvex)	38	Chloromethane	36
2,4-D	38	Chlorothalonil	30
3-Hydroxycarbofuran	35	Cyanazine	6
4(2,4-Db), Dimethylamine Salt	2	Dalapon	38
Acenapthene	5	DBCP	40
ACET	1	DDT	5
Alachlor	36	Deethyl-Atrazine	1
Aldicarb	36	Diaminochlorotriazine (DACT)	1
Aldicarb Sulfone	36	Diazinon	30
Aldicarb Sulfoxide	36	Dicamba	37
Aldrin	36	Dieldrin	35
Atrazine	37	Dimethoate	30
Bentazon, Sodium Salt	39	Dinoseb	38

MONTEREY Cont

Diquat Dibromide	36
Diuron	2
Endothall	36
Endrin	36
Endrin Aldehyde	3
Ethylene Dibromide	40
Glyphosate, Isopropylamine Salt	36
Heptachlor	36
Heptachlor Epoxide	36
Hexachlorobenzene	36
Hexazinone	1
Lindane (Gamma-Bhc)	36
Methiocarb	3
Methomyl	37
Methoxychlor	36
Methyl Bromide (Bromomethane)	35
Metolachlor	36
Metribuzin	37
Molinate	36
Naphthalene	36
Norflurazon	1
Ortho-Dichlorobenzene	38
Oxamyl	36
Picloram	38
Prometon	6
Prometryn	34
Propachlor	41
Propazine	5
Simazine	37
Thiobencarb	36
Toxaphene	36
Trichlorobenzenes	35
Trifluralin	5
Xylene	34

NEVADA

1,1,2,2-Tetrachloroethane	3
1,2,4-Trichlorobenzene	3
1,2-D + 1,3-D + C-3 Compounds	3
1,2-Dichloropropane	3
2,3,7,8-Tcdd (Dioxin)	2
2,4,5-Tp (Silvex)	2
2,4-D	2
3-Hydroxycarbofuran	2
Alachlor	2
Aldicarb	2
Aldicarb Sulfone	2
Aldicarb Sulfoxide	2
Aldrin	2
Atrazine	2
Bentazon, Sodium Salt	2
Benzene (Benzol)	3
Bromacil	2
Butachlor	2
Carbaryl	2
Carbofuran	2
Chlordane	2
Chloromethane	3
Chlorothalonil	2
Dalapon	2
DBCP	2
Diazinon	2
Dicamba	2
Dieldrin	2
Dimethoate	2
Dinoseb	2
Diquat Dibromide	2
Diuron	2
Endothall	2
Endrin	2
Ethylene Dibromide	2
Glyphosate, Isopropylamine Salt	2
Heptachlor	2
Heptachlor Epoxide	2
Hexachlorobenzene	2
Lindane (Gamma-Bhc)	2
Methomyl	2
Methoxychlor	2
Methyl Bromide (Bromomethane)	3
Metolachlor	2
Metribuzin	2
Molinate	2
Naphthalene	2
Ortho-Dichlorobenzene	3
Oxamyl	2
Picloram	2
Prometryn	2
Propachlor	2

NEVADA Cont

Simazine	2
Thiobencarb	2
Toxaphene	2
Trichlorobenzenes	3
Xylene	3

ORANGE

1,3-Dichloropropene	187
1,1,2,2-Tetrachloroethane	193
1,2,4-Trichlorobenzene	193
1,2-D + 1,3-D + C-3 Compounds	193
1,2-Dichloropropane	193
2,4,5-Tp (Silvex)	13
2,4-D	13
3-Hydroxycarbofuran	11
Acenapthene	12
Alachlor	22
Aldicarb	11
Aldicarb Sulfone	11
Aldicarb Sulfoxide	11
Aldrin	12
Atrazine	24
Bentazon, Sodium Salt	13
Benzene (Benzol)	193
Bhc (Other Than Gamma Isomer)	12
Bromacil	21
Butachlor	21
Carbaryl	11
Carbofuran	11
Chlordane	12
Chloromethane	193
Chlorothalonil	12
Dalapon	13
DBCP	188
DDD	12
DDE	12
DDT	12
Diazinon	21
Dicamba	13
Dieldrin	12
Dimethoate	21
Dinoseb	13
Diquat Dibromide	12
Diuron	12
Endosulfan	12
Endosulfan Sulfate	12
Endothall	12
Endrin	12
Endrin Aldehyde	12
Ethylene Dibromide	188
Glyphosate, Isopropylamine Salt	12
Heptachlor	12
Heptachlor Epoxide	12
Hexachlorobenzene	12
Lindane (Gamma-Bhc)	12
Malathion	21
Methiocarb	11
Methomyl	11
Methoxychlor	12
Methyl Bromide (Bromomethane)	193
Methyl Parathion	21
Metolachlor	21
Metribuzin	21
Molinate	21
Naphthalene	194
Ortho-Dichlorobenzene	193
Oxamyl	11
Paraquat Dichloride	12
Parathion Or Ethyl Parathion	21
Picloram	13
Prometryn	21
Propachlor	22
Propoxur	11
Simazine	24
Thiobencarb	21
Toxaphene	12
Trichlorobenzenes	193
Xylene	193

PLACER

1,1,2,2-Tetrachloroethane	9
1,2,4-Trichlorobenzene	9
1,2-D + 1,3-D + C-3 Compounds	9
1,2-Dichloropropane	9

PLACER Cont

2,4,5-Tp (Silvex)	4
2,4-D	4
3-Hydroxycarbofuran	3
Alachlor	5
Aldicarb	3
Aldicarb Sulfone	3
Aldicarb Sulfoxide	3
Aldrin	3
Atrazine	5
Bentazon, Sodium Salt	4
Benzene (Benzol)	9
Bromacil	4
Butachlor	5
Carbaryl	3
Carbofuran	3
Chlordane	3
Chloromethane	9
Chlorothalonil	2
Dalapon	4
DBCP	3
Diazinon	4
Dicamba	4
Dieldrin	3
Dimethoate	4
Dinoseb	4
Diquat Dibromide	3
Diuron	2
Endothall	3
Endrin	3
Ethylene Dibromide	3
Glyphosate, Isopropylamine Salt	3
Heptachlor	3
Heptachlor Epoxide	3
Hexachlorobenzene	3
Lindane (Gamma-Bhc)	3
Methomyl	3
Methoxychlor	3
Methyl Bromide (Bromomethane)	9
Metolachlor	5
Metribuzin	5
Molinate	5
Naphthalene	5
Ortho-Dichlorobenzene	9
Oxamyl	3
Picloram	4
Prometryn	4
Propachlor	5
Simazine	5
Thiobencarb	6
Toxaphene	3
Trichlorobenzenes	9
Xylene	9

PLUMAS

1,1,2,2-Tetrachloroethane	5
1,2,4-Trichlorobenzene	5
1,2-D + 1,3-D + C-3 Compounds	5
1,2-Dichloropropane	5
Benzene (Benzol)	5
Chloromethane	5
Methyl Bromide (Bromomethane)	5
Naphthalene	5
Ortho-Dichlorobenzene	5
Trichlorobenzenes	6
Xylene	5

SAN BENITO

1,1,2,2-Tetrachloroethane	5
1,2,4-Trichlorobenzene	5
1,2-D + 1,3-D + C-3 Compounds	5
1,2-Dichloropropane	5
2,4,5-T	2
2,4,5-Tp (Silvex)	2
2,4-D	2
3-Hydroxycarbofuran	2
Alachlor	2
Aldicarb	2
Aldicarb Sulfone	2
Aldicarb Sulfoxide	2
Aldrin	2
Atrazine	3
Bentazon, Sodium Salt	2
Benzene (Benzol)	5

SAN BENITO Cont

Bromacil	2
Butachlor	3
Carbaryl	2
Carbofuran	2
Chlordane	2
Chloromethane	5
Chlorothalonil	2
Dalapon	2
Diazinon	3
Dicamba	2
Dieldrin	2
Dimethoate	3
Dinoseb	2
Diuron	2
Endrin	2
Glyphosate, Isopropylamine Salt	2
Heptachlor	2
Heptachlor Epoxide	2
Hexachlorobenzene	2
Lindane (Gamma-Bhc)	2
Methomyl	2
Methoxychlor	1
Methyl Bromide (Bromomethane)	5
Metolachlor	3
Metribuzin	3
Molinate	3
Naphthalene	5
Ortho-Dichlorobenzene	5
Oxamyl	2
Picloram	2
Prometryn	3
Propachlor	3
Simazine	3
Thiobencarb	3
Toxaphene	2
Trichlorobenzenes	5
Xylene	5

SAN LUIS OBISPO

1,1,2,2-Tetrachloroethane	22
1,2,4-Trichlorobenzene	22
1,2-D + 1,3-D + C-3 Compounds	22
1,2-Dichloropropane	22
2,4,5-Tp (Silvex)	10
2,4-D	11
3-Hydroxycarbofuran	10
Alachlor	12
Aldicarb	10
Aldicarb Sulfone	10
Aldicarb Sulfoxide	10
Aldrin	14
Atrazine	33
Bentazon, Sodium Salt	10
Benzene (Benzol)	23
Bromacil	12
Butachlor	12
Carbaryl	10
Carbofuran	10
Chlordane	14
Chloromethane	22
Chlorothalonil	14
Dalapon	10
DBCP	37
Diazinon	12
Dicamba	10
Dieldrin	14
Dimethoate	12
Dinoseb	10
Diquat Dibromide	11
Diuron	9
Endrin	14
Ethylene Dibromide	37
Heptachlor	14
Heptachlor Epoxide	14
Hexachlorobenzene	13
Lindane (Gamma-Bhc)	14
Methomyl	10
Methoxychlor	14
Methyl Bromide (Bromomethane)	22
Metolachlor	12
Metribuzin	12
Molinate	12
Naphthalene	22
Ortho-Dichlorobenzene	22
Oxamyl	10
Picloram	11
Prometryn	12

SAN LUIS OBISPO Cont

Propachlor	15
Simazine	33
Thiobencarb	12
Toxaphene	14
Trichlorobenzenes	22
Xylene	23

SANTA BARBARA

1,1,2,2-Tetrachloroethane	27
1,2-D + 1,3-D + C-3 Compounds	27
1,2-Dichloropropane	27
2,3,7,8-Tcdd (Dioxin)	1
2,4,5-Tp (Silvex)	16
2,4-D	16
3-Hydroxycarbofuran	17
1,2,4-Trichlorobenzene	27
ACET	5
Alachlor	23
Aldicarb	17
Aldicarb Sulfone	17
Aldicarb Sulfoxide	17
Aldrin	18
Atrazine	31
Bentazon, Sodium Salt	21
Benzene (Benzol)	27
Bromacil	24
Butachlor	19
Carbaryl	17
Carbofuran	19
Chlordane	20
Chloromethane	27
Chlorothalonil	18
Cyanazine	5
Dalapon	16
DBCP	30
Deethyl-Atrazine	5
Diaminochlorotriazine (DACT)	5
Diazinon	19
Dicamba	16
Dieldrin	18
Dimethoate	19
Dinoseb	16
Diquat Dibromide	19
Diuron	24
Endothall	1
Endrin	19
Ethylene Dibromide	30
Glyphosate, Isopropylamine Salt	4
Heptachlor	20
Heptachlor Epoxide	20
Hexachlorobenzene	18
Hexazinone	5
Lindane (Gamma-Bhc)	18
Methomyl	17
Methoxychlor	20
Methyl Bromide (Bromomethane)	27
Metolachlor	19
Metribuzin	24
Molinate	19
Naphthalene	27
Norflurazon	5
Ortho-Dichlorobenzene	27
Oxamyl	17
Picloram	19
Prometon	5
Prometryn	24
Propachlor	18
Simazine	31
Thiobencarb	19
Toxaphene	18
Trichlorobenzenes	27
Xylene	27

SANTA CRUZ

1,1,2,2-Tetrachloroethane	14
1,2,4-Trichlorobenzene	14
1,2-D + 1,3-D + C-3 Compounds	14
1,2-Dichloropropane	14
2,3,7,8-Tcdd (Dioxin)	2
2,4,5-T	4

SANTA CRUZ Cont

2,4,5-Tp (Silvex)	4
2,4-D	4
3-Hydroxycarbofuran	6
Alachlor	6
Aldicarb	6
Aldicarb Sulfone	6
Aldicarb Sulfoxide	6
Aldrin	6
Atrazine	6
Bentazon, Sodium Salt	4
Benzene (Benzol)	14
Bromacil	6
Butachlor	6
Carbaryl	6
Carbofuran	6
Chlordane	6
Chloromethane	14
Chlorothalonil	5
Dalapon	4
DBCP	6
Diazinon	6
Dicamba	4
Dieldrin	6
Dimethoate	6
Dinoseb	4
Diquat Dibromide	6
Diuron	6
Endothall	6
Endrin	6
Ethylene Dibromide	6
Glyphosate, Isopropylamine Salt	6
Heptachlor	6
Heptachlor Epoxide	6
Hexachlorobenzene	6
Lindane (Gamma-Bhc)	6
Methomyl	6
Methoxychlor	6
Methyl Bromide (Bromomethane)	14
Metolachlor	6
Metribuzin	6
Molinate	6
Naphthalene	14
Ortho-Dichlorobenzene	14
Oxamyl	6
Picloram	4
Prometryn	6
Propachlor	6
Simazine	6
Thiobencarb	6
Toxaphene	6
Trichlorobenzenes	14
Xylene	13

SIERRA

1,1,2,2-Tetrachloroethane	4
1,2,4-Trichlorobenzene	4
1,2-D + 1,3-D + C-3 Compounds	4
1,2-Dichloropropane	4
Benzene (Benzol)	4
Chloromethane	4
Methyl Bromide (Bromomethane)	4
Naphthalene	4
Ortho-Dichlorobenzene	4
Trichlorobenzenes	4
Xylene	4

SISKIYOU

1,1,2,2-Tetrachloroethane	1
1,2,4-Trichlorobenzene	1
1,2-D + 1,3-D + C-3 Compounds	1
1,2-Dichloropropane	1
Benzene (Benzol)	1
Chloromethane	1
Methyl Bromide (Bromomethane)	1
Ortho-Dichlorobenzene	1
Trichlorobenzenes	1
Xylene	1

TRINITY

1,1,2,2-Tetrachloroethane	1	Chloromethane	1
1,2,4-Trichlorobenzene	1	Methyl Bromide (Bromomethane)	1
1,2-D + 1,3-D + C-3 Compounds	1	Ortho-Dichlorobenzene	1
1,2-Dichloropropane	1	Trichlorobenzenes	1
Benzene (Benzol)	1	Xylene	1

TUOLUMNE

1,1,2,2-Tetrachloroethane	1	1,2-Dichloropropane	1
1,2,4-Trichlorobenzene	1	Alachlor	1
1,2-D + 1,3-D + C-3 Compounds	1	Atrazine	1
TUOLUMNE Cont			
		Metolachlor	1
Benzene (Benzol)	1	Metribuzin	1
Bromacil	1	Ortho-Dichlorobenzene	1
Butachlor	1	Prometryn	1
Chloromethane	1	Propachlor	1
Diazinon	1	Simazine	1
Dimethoate	1	Trichlorobenzenes	1
Methyl Bromide (Bromomethane)	1	Xylene	1

YOLO

1,1,2,2-Tetrachloroethane	14	Ethylene Dibromide	8
1,2,4-Trichlorobenzene	14	Heptachlor	1
1,2-D + 1,3-D + C-3 Compounds	14	Heptachlor Epoxide	1
1,2-Dichloropropane	14	Hexachlorobenzene	1
3-Hydroxycarbofuran	1	Lindane (Gamma-Bhc)	1
Alachlor	11	Methomyl	1
Aldicarb	1	Methoxychlor	1
Aldicarb Sulfone	1	Methyl Bromide (Bromomethane)	14
Aldicarb Sulfoxide	1	Metolachlor	11
Aldrin	1	Metribuzin	11
Atrazine	11	Molinate	11
Benzene (Benzol)	15	Naphthalene	14
Bromacil	11	Ortho-Dichlorobenzene	14
Butachlor	11	Oxamyl	1
Carbaryl	1	Prometryn	11
Carbofuran	1	Propachlor	11
Chlordane	1	Simazine	11
Chloromethane	14	Thiobencarb	11
DBCP	8	Toxaphene	1
Diazinon	11	Trichlorobenzenes	14
Dieldrin	1	Xylene	15
Dimethoate	11		
Diquat Dibromide	1		
Diuron	1		
Endrin	1		

Appendix A part 2: Counties with Pos detections by chemical, number of wells sampled, and number of Pos wells.

BUTTE

Chemical	Sampled	Pos
1,1,2,2-Tetrachloroethane	28	
1,2,4-Trichlorobenzene	28	
1,2-D + 1,3-D + C-3 Compounds	28	
1,2-Dichloropropane	28	
Benzene (Benzol)	28	
Chloromethane	28	
DBCP	50	
Diuron	2	
Ethylene Dibromide	50	
Methyl Bromide (Bromomethane)	28	
Naphthalene	28	
Ortho-Dichlorobenzene	28	
Trichlorobenzenes	28	
Xylene	28	2

CONTRA COSTA

Chemical	Sampled	Pos
1,1,2,2-Tetrachloroethane	6	
1,2,4-Trichlorobenzene	6	
1,2-D + 1,3-D + C-3 Compounds	6	
1,2-Dichloropropane	6	
2,4,5-T	2	
2,4,5-Tp (Silvex)	5	
2,4-D	5	
3-Hydroxycarbofuran	5	
ACET	12	
Alachlor	5	
Aldicarb	5	
Aldicarb Sulfone	5	
Aldicarb Sulfoxide	5	
Aldrin	5	
Atrazine	17	
Bentazon, Sodium Salt	5	
Benzene (Benzol)	6	
Bromacil	17	
Butachlor	5	
Carbaryl	5	
Carbofuran	5	
Chlordane	5	
Chloromethane	6	
Chlorothalonil	5	
Cyanazine	12	
Dalapon	5	
DBCP	5	1
Deethyl-Atrazine	12	
Diaminochlorotriazine (DACT)	12	
Diazinon	5	
Dicamba	5	
Dieldrin	5	
Dimethoate	5	
Dinoseb	5	
Diquat Dibromide	5	
Diuron	15	1
Endothall	5	
Endrin	5	
Ethylene Dibromide	5	
Glyphosate, Isopropylamine Salt	5	
Heptachlor	5	
Heptachlor Epoxide	5	
Hexachlorobenzene	5	
Hexazinone	12	
Lindane (Gamma-Bhc)	5	
Methomyl	5	
Methoxychlor	5	
Methyl Bromide (Bromomethane)	6	
Metolachlor	5	
Metribuzin	17	
Molinate	5	
Naphthalene	6	
Norflurazon	12	
Ortho-Dichlorobenzene	6	
Oxamyl	5	
Picloram	5	
Prometon	12	
Prometryn	17	
Propachlor	5	
Simazine	17	
Thiobencarb	5	

CONTRA COSTA Cont

Chemical	Sampled	Pos
Toxaphene	5	
Trichlorobenzenes	6	
Xylene	4	

EL DORADO

Chemical	Sampled	Pos
1,1,2,2-Tetrachloroethane	26	
1,2,4-Trichlorobenzene	26	
1,2-D + 1,3-D + C-3 Compounds	26	
1,2-Dichloropropane	26	
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	
Atrazine	1	
Bentazon, Sodium Salt	1	
Benzene (Benzol)	26	
Bromacil	1	
Butachlor	1	
Carbaryl	1	
Carbofuran	1	
Chlordane	1	
Chloromethane	26	1
Chlorothalonil	1	
Dalapon	1	
DBCP	1	
Diazinon	1	
Dicamba	1	
Dieldrin	1	
Dimethoate	1	
Dinoseb	1	
Diquat Dibromide	1	
Diuron	1	
Endothall	1	
Endrin	1	
Ethylene Dibromide	1	
Glyphosate, Isopropylamine Salt	1	
Heptachlor	1	
Heptachlor Epoxide	1	
Hexachlorobenzene	1	
Lindane (Gamma-Bhc)	1	
Methomyl	1	
Methoxychlor	1	
Methyl Bromide (Bromomethane)	26	
Metolachlor	1	
Metribuzin	1	
Molinate	1	
Naphthalene	1	
Ortho-Dichlorobenzene	26	
Oxamyl	1	
Picloram	1	
Prometryn	1	
Propachlor	1	
Simazine	1	
Thiobencarb	1	
Toxaphene	1	
Trichlorobenzenes	26	
Xylene	26	

FRESNO

Chemical	Sampled	Pos
1,1,2,2-Tetrachloroethane	136	
1,2,4-Trichlorobenzene	136	
1,2-D + 1,3-D + C-3 Compounds	137	
1,2-Dichloropropane	136	1
2,4,5-T	13	
2,4,5-Tp (Silvex)	13	
2,4-D	13	
3-Hydroxycarbofuran	5	
Alachlor	43	
Aldicarb	5	
Aldicarb Sulfone	5	
Aldicarb Sulfoxide	5	
Aldrin	18	
Atrazine	42	
Bentazon, Sodium Salt	13	
Benzene (Benzol)	136	
Bromacil	39	
Butachlor	42	
Carbaryl	5	

FRESNO Cont

Chemical	Sampled	Pos
Carbofuran	5	
Chlordane	17	
Chloromethane	137	1
Chlorothalonil	16	
Dalapon	13	
DBCP	116	79
Demeton	1	
Diazinon	42	
Dicamba	13	
Dieldrin	18	
Dimethoate	42	
Dinoseb	13	
Diquat Dibromide	5	
Disulfoton	1	
Diuron	5	
Endothall	5	
Endrin	17	
Ethylene Dibromide	114	7
Glyphosate, Isopropylamine Salt	1	
Heptachlor	18	
Heptachlor Epoxide	18	
Hexachlorobenzene	18	
Lindane (Gamma-Bhc)	17	
Methomyl	5	
Methoxychlor	17	
Methyl Bromide (Bromomethane)	137	
Metolachlor	42	
Metribuzin	42	
Molinate	42	
Naphthalene	137	
Ortho-Dichlorobenzene	136	
Oxamyl	5	
Picloram	13	
Prometryn	42	
Propachlor	42	
Simazine	42	
Thiobencarb	42	
Toxaphene	17	
Trichlorobenzenes	137	
Xylene	113	

KERN

Chemical	Sampled	Pos
1,1,2,2-Tetrachloroethane	105	
1,2,4-Trichlorobenzene	92	
1,2-D + 1,3-D + C-3 Compounds	92	
1,2-Dichloropropane	105	
2,3,7,8-Tcdd (Dioxin)	12	
2,4,5-T	1	
2,4,5-Tp (Silvex)	14	
2,4-D	15	
3-Hydroxycarbofuran	16	
ACET	25	1
Alachlor	56	
Aldicarb	17	
Aldicarb Sulfone	17	
Aldicarb Sulfoxide	17	
Aldrin	15	
Atrazine	95	1
Benefin (Benfluralin)	1	
Bentazon, Sodium Salt	17	
Benzene (Benzol)	106	2
Bromacil	74	
Butachlor	47	
Carbaryl	16	
Carbofuran	16	
Chlordane	15	
Chloromethane	105	
Chlorothalonil	14	
Cyanazine	25	
Dalapon	14	
DBCP	70	11
DDD	1	
DDE	1	
DDT	1	
Deethyl-Atrazine	25	1
Diaminochlorotriazine (DACT)	25	
Diazinon	50	
Dicamba	14	
Dieldrin	15	
Dimethoate	47	
Dinoseb	15	
Diquat Dibromide	16	
Diuron	64	3
Endothall	16	
Endrin	15	

KERN Cont

Chemical	Sampled	Pos
Ethylene Dibromide	70	3
Glyphosate, Isopropylamine Salt	16	
Heptachlor	15	
Heptachlor Epoxide	15	
Hexachlorobenzene	23	
Hexazinone	25	
Lindane (Gamma-Bhc)	15	
Methomyl	16	
Methoxychlor	23	
Methyl Bromide (Bromomethane)	105	
Metolachlor	50	
Metribuzin	75	
Molinate	50	
Naphthalene	91	
Norflurazon	25	
Ortho-Dichlorobenzene	104	
Oxamyl	16	
Paraquat Dichloride	1	
Pendimethalin	1	
Pentachloronitrobenzene (Pcnb)	1	
Picloram	14	
Prometon	25	
Prometryn	75	
Propachlor	44	
Simazine	96	
Thiobencarb	50	
Toxaphene	15	
Trichlorobenzenes	92	
Xylene	103	

KINGS

Chemical	Sampled	Pos
Benzene (Benzol)	2	2

LOS ANGELES

Chemical	Sampled	Pos
1,3-Dichloropropene	3	
1,1,2,2-Tetrachloroethane	657	
1,2,4-Trichlorobenzene	657	
1,2-D + 1,3-D + C-3 Compounds	657	
1,2-Dichloropropane	657	4
2,3,7,8-Tcdd (Dioxin)	22	
2,4,5-T	11	
2,4,5-Tp (Silvex)	39	
2,4-D	39	
3-Hydroxycarbofuran	33	
Alachlor	103	
Aldicarb	33	
Aldicarb Sulfone	33	
Aldicarb Sulfoxide	33	
Aldrin	42	
Atrazine	111	
Bentazon, Sodium Salt	39	
Benzene (Benzol)	657	
Bhc (Other Than Gamma Isomer)	15	
Bromacil	79	
Butachlor	63	
Carbaryl	41	
Carbofuran	34	
Chlordane	71	
Chloromethane	657	1
Chlorothalonil	42	
Dalapon	39	
DBCP	130	6
DDD	15	
DDE	15	
DDT	15	
Diazinon	74	
Dicamba	38	
Dieldrin	45	
Dimethoate	65	
Dinoseb	39	
Diquat Dibromide	34	
Diuron	43	
Endosulfan	15	
Endosulfan Sulfate	15	
Endothall	22	
Endrin	75	
Endrin Aldehyde	15	
Ethylene Dibromide	124	
Glyphosate, Isopropylamine Salt	35	

LOS ANGELES Cont

Chemical	Sampled	Pos
Heptachlor	72	
Heptachlor Epoxide	75	
Hexachlorobenzene	75	
Lindane (Gamma-Bhc)	75	
Methiocarb	11	
Methomyl	33	
Methoxychlor	75	
Methyl Bromide (Bromomethane)	657	
Metolachlor	63	
Metribuzin	63	
Molinate	80	
Naphthalene	551	
Ortho-Dichlorobenzene	657	
Oxamyl	34	
Paraquat Dichloride	11	
Picloram	38	
Prometon	15	
Prometryn	67	
Propachlor	46	
Propazine	11	
Propoxur	11	
Simazine	113	
Thiobencarb	289	
Toxaphene	72	
Trichlorobenzenes	657	
Trifluralin	15	
Xylene	656	4

MADERA

Chemical	Sampled	Pos
1,1,2,2-Tetrachloroethane	5	
1,2,4-Trichlorobenzene	5	
1,2-D + 1,3-D + C-3 Compounds	5	
1,2-Dichloropropane	5	
Alachlor	5	
Aldrin	11	
Atrazine	5	
Benzene (Benzol)	5	
Bromacil	3	
Butachlor	3	
Chlordane	13	
Chloromethane	5	
Chlorothalonil	11	
DBCP	14	2
Diazinon	3	
Dieldrin	11	
Dimethoate	3	
Endrin	13	
Ethylene Dibromide	14	1
Heptachlor	13	
Heptachlor Epoxide	13	
Hexachlorobenzene	13	
Lindane (Gamma-Bhc)	13	
Methoxychlor	13	
Methyl Bromide (Bromomethane)	5	
Metolachlor	3	
Metribuzin	3	
Molinate	3	
Naphthalene	5	
Ortho-Dichlorobenzene	5	
Prometryn	3	
Propachlor	3	
Simazine	5	
Thiobencarb	3	
Toxaphene	13	
Trichlorobenzenes	5	
Xylene	2	

MENDOCINO

Chemical	Sampled	Pos
1,1,2,2-Tetrachloroethane	8	
1,2,4-Trichlorobenzene	8	
1,2-D + 1,3-D + C-3 Compounds	9	
1,2-Dichloropropane	8	
2,4,5-Tp (Silvex)	5	
2,4-D	5	
3-Hydroxycarbofuran	3	
ACET	3	
Aldicarb	3	
Aldicarb Sulfone	3	
Aldicarb Sulfoxide	3	
Aldrin	1	
Atrazine	15	

MENDOCINO Cont

Chemical	Sampled	Pos
Bentazon, Sodium Salt	4	
Benzene (Benzol)	8	
Bromacil	14	
Butachlor	11	
Carbaryl	3	
Carbofuran	4	
Chlordane	1	
Chloromethane	8	1
Chlorothalonil	1	
Cyanazine	3	
Dalapon	5	
DBCP	1	
Deethyl-Atrazine	3	
Diaminochlorotriazine (DACT)	3	
Diazinon	11	
Dicamba	4	
Dieldrin	1	
Dimethoate	11	
Dinoseb	4	
Diquat Dibromide	3	
Diuron	3	
Endothall	3	
Endrin	1	
Ethylene Dibromide	1	
Heptachlor	1	
Heptachlor Epoxide	1	
Hexachlorobenzene	1	
Hexazinone	3	
Lindane (Gamma-Bhc)	1	
Methomyl	3	
Methoxychlor	1	
Methyl Bromide (Bromomethane)	8	
Metolachlor	11	
Metribuzin	14	
Molinate	11	
Naphthalene	9	
Norflurazon	3	
Ortho-Dichlorobenzene	8	
Oxamyl	3	
Picloram	4	
Prometon	3	
Prometryn	14	
Propachlor	11	
Simazine	15	
Thiobencarb	11	
Toxaphene	1	
Trichlorobenzenes	9	
Xylene	8	

MERCED

Chemical	Sampled	Pos
1,1,2,2-Tetrachloroethane	21	
1,2,4-Trichlorobenzene	21	
1,2-D + 1,3-D + C-3 Compounds	21	
1,2-Dichloropropane	21	
2,4,5-T	16	
2,4,5-Tp (Silvex)	16	
2,4-D	16	
3-Hydroxycarbofuran	16	
ACET	23	4
Alachlor	16	
Aldicarb	16	
Aldicarb Sulfone	16	
Aldicarb Sulfoxide	16	
Aldrin	16	
Atrazine	42	2
Bentazon, Sodium Salt	16	
Benzene (Benzol)	21	
Bromacil	39	
Butachlor	16	
Carbaryl	16	
Carbofuran	16	
Chlordane	16	
Chloromethane	21	
Chlorothalonil	16	
Cyanazine	23	
Dalapon	16	
DBCP	23	4
Deethyl-Atrazine	23	2
Diaminochlorotriazine (DACT)	23	7
Diazinon	16	
Dicamba	16	
Dieldrin	16	
Dimethoate	16	
Dinoseb	16	
Diquat Dibromide	16	
Diuron	39	
Endothall	16	

MERCED Cont

Chemical	Sampled	Pos
Endrin	16	
Ethylene Dibromide	23	
Glyphosate, Isopropylamine Salt	16	
Heptachlor	16	
Heptachlor Epoxide	16	
Hexachlorobenzene	16	
Hexazinone	23	
Lindane (Gamma-Bhc)	16	
Methomyl	16	
Methoxychlor	16	
Methyl Bromide (Bromomethane)	21	
Metolachlor	16	
Metribuzin	39	
Molinate	16	
Naphthalene	21	
Norflurazon	23	
Ortho-Dichlorobenzene	21	
Oxamyl	16	
Picloram	16	
Prometon	23	
Prometryn	39	
Propachlor	16	
Simazine	42	1
Thiobencarb	16	
Toxaphene	16	
Trichlorobenzenes	21	
Xylene	11	

NAPA

Chemical	Sampled	Pos
1,1,2,2-Tetrachloroethane	2	
1,2,4-Trichlorobenzene	2	
1,2-D + 1,3-D + C-3 Compounds	2	
1,2-Dichloropropane	2	
2,4,5-Tp (Silvex)	2	
2,4-D	3	
3-Hydroxycarbofuran	1	
Aldicarb	1	
Aldicarb Sulfone	1	
Aldicarb Sulfoxide	1	
Aldrin	1	
Atrazine	3	
Bentazon, Sodium Salt	3	
Benzene (Benzol)	2	1
Bromacil	1	
Butachlor	1	
Carbaryl	1	
Carbofuran	3	
Chlordane	1	
Chloromethane	2	
Chlorothalonil	1	
Dalapon	3	
DBCP	1	
Diazinon	1	
Dicamba	3	
Dieldrin	1	
Dimethoate	1	
Dinoseb	3	
Diquat Dibromide	3	
Endothall	3	
Endrin	1	
Ethylene Dibromide	2	
Heptachlor	1	
Heptachlor Epoxide	1	
Hexachlorobenzene	1	
Lindane (Gamma-Bhc)	1	
Methomyl	1	
Methoxychlor	1	
Methyl Bromide (Bromomethane)	2	
Metolachlor	1	
Metribuzin	1	
Molinate	1	
Naphthalene	2	
Ortho-Dichlorobenzene	2	
Oxamyl	3	
Picloram	3	
Prometryn	1	
Propachlor	1	
Simazine	3	
Thiobencarb	1	
Toxaphene	1	
Trichlorobenzenes	2	
Xylene	2	1

RIVERSIDE

Chemical	Sampled	Pos
1,1,2,2-Tetrachloroethane	119	
1,2,4-Trichlorobenzene	119	
1,2-D + 1,3-D + C-3 Compounds	119	
1,2-Dichloropropane	119	
2,3,7,8-Tcdd (Dioxin)	30	
2,4,5-Tp (Silvex)	38	
2,4-D	38	
3-Hydroxycarbofuran	43	
Alachlor	52	
Aldicarb	43	
Aldicarb Sulfone	43	
Aldicarb Sulfoxide	43	
Aldrin	41	
Atrazine	51	
Bentazon, Sodium Salt	38	
Benzene (Benzol)	119	
Bromacil	51	
Butachlor	49	
Carbaryl	43	
Carbofuran	43	
Chlordane	41	
Chloromethane	119	
Chlorothalonil	41	
Dalapon	38	
DBCP	96	11
Diazinon	51	
Dicamba	38	
Dieldrin	41	
Dimethoate	51	
Dinoseb	38	
Diquat Dibromide	83	
Diuron	48	
Endothall	24	
Endrin	41	
Ethylene Dibromide	92	1
Glyphosate, Isopropylamine Salt	94	
Heptachlor	41	
Heptachlor Epoxide	41	
Hexachlorobenzene	38	
Lindane (Gamma-Bhc)	41	
Methomyl	43	
Methoxychlor	41	
Methyl Bromide (Bromomethane)	119	
Metolachlor	49	
Metribuzin	49	
Molinate	51	
Naphthalene	103	
Ortho-Dichlorobenzene	119	
Oxamyl	43	
Picloram	38	
Prometryn	51	
Propachlor	38	
Simazine	51	
Thiobencarb	51	
Toxaphene	41	
Trichlorobenzenes	119	
Xylene	118	

SACRAMENTO

Chemical	Sampled	Pos
1,1,2,2-Tetrachloroethane	108	
1,2,4-Trichlorobenzene	108	
1,2-D + 1,3-D + C-3 Compounds	107	
1,2-Dichloropropane	108	
2,3,7,8-Tcdd (Dioxin)	1	
2,4,5-T	51	
2,4,5-Tp (Silvex)	63	
2,4-D	63	
3-Hydroxycarbofuran	31	
Alachlor	62	
Aldicarb	31	
Aldicarb Sulfone	31	
Aldicarb Sulfoxide	31	1
Aldrin	62	
Atrazine	62	
Barban	1	
Bentazon, Sodium Salt	63	
Benzene (Benzol)	108	
Bromacil	62	
Butachlor	62	
Carbaryl	31	
Carbofuran	31	
Chlordane	62	

SACRAMENTO Cont

Chemical	Sampled	Pos
Chloromethane	108	
Chlorothalonil	62	
Chlorpropham	1	
Dalapon	63	
DBCP	34	
Diazinon	62	
Dicamba	63	
Dieldrin	62	
Dimethoate	62	
Dinoseb	63	
Diquat Dibromide	4	
Diuron	20	
Endothall	4	
Endrin	62	
Ethylene Dibromide	34	
Fenuron	1	
Fenuron Trichloroacetate (Tca)	1	
Fluchloralin	1	
Glyphosate, Isopropylamine Salt	23	
Heptachlor	62	
Heptachlor Epoxide	60	
Hexachlorobenzene	62	
Lindane (Gamma-Bhc)	62	
Linuron	1	
Methiocarb	1	
Methomyl	31	
Methoxychlor	62	
Methyl Bromide (Bromomethane)	108	
Metolachlor	62	
Metribuzin	62	
Mexacarbate	1	
Molinate	62	
Monuron	1	
Monuron-Tca	1	
Naphthalene	107	
Napropamide	1	
Ortho-Dichlorobenzene	108	
Oxamyl	31	
Picloram	63	
Prometryn	62	
Propachlor	62	
Propham	1	
Propoxur	1	
Siduron	1	
Simazine	61	
Thiobencarb	62	
Toxaphene	62	
Trichlorobenzenes	107	
Xylene	76	

SAN BERNARDINO

Chemical	Sampled	Pos
1,1,2,2-Tetrachloroethane	348	
1,2,4-Trichlorobenzene	348	
1,2-D + 1,3-D + C-3 Compounds	348	
1,2-Dichloropropane	348	
2,3,7,8-Tcdd (Dioxin)	108	
2,4,5-Tp (Silvex)	144	
2,4-D	144	
3-Hydroxycarbofuran	148	
Alachlor	161	
Aldicarb	148	
Aldicarb Sulfone	148	
Aldicarb Sulfoxide	148	
Aldrin	146	
Atrazine	161	
Bentazon, Sodium Salt	144	
Benzene (Benzol)	348	
Bromacil	161	
Butachlor	161	
Carbaryl	148	
Carbofuran	148	
Chlordane	146	
Chloromethane	348	
Chlorothalonil	146	
Dalapon	144	
DBCP	273	55
Diazinon	161	
Dicamba	144	
Dieldrin	146	
Dimethoate	161	
Dinoseb	144	
Diquat Dibromide	92	
Diuron	140	
Endothall	95	
Endrin	146	
Ethylene Dibromide	217	

SAN BERNARDINO Cont

Chemical	Sampled	Pos
Glyphosate, Isopropylamine Salt	127	
Heptachlor	145	
Heptachlor Epoxide	146	
Hexachlorobenzene	146	
Lindane (Gamma-Bhc)	146	
Methomyl	148	
Methoxychlor	146	
Methyl Bromide (Bromomethane)	348	
Metolachlor	161	
Metribuzin	161	
Molinate	161	
Naphthalene	328	
Ortho-Dichlorobenzene	348	
Oxamyl	148	
Picloram	144	
Prometryn	161	
Propachlor	146	
Simazine	166	
Thiobencarb	161	
Toxaphene	146	
Trichlorobenzenes	348	
Xylene	348	

SAN DIEGO

Chemical	Sampled	Pos
1,1,2,2-Tetrachloroethane	44	
1,2,4-Trichlorobenzene	44	
1,2-D + 1,3-D + C-3 Compounds	44	
1,2-Dichloropropane	44	2
2,3,7,8-Tcdd (Dioxin)	24	
2,4,5-Tp (Silvex)	29	
2,4-D	29	
3-Hydroxycarbofuran	26	
Acenapthene	16	
Alachlor	28	
Aldicarb	26	
Aldicarb Sulfone	26	
Aldicarb Sulfoxide	26	
Aldrin	27	
Atrazine	28	
Bentazon, Sodium Salt	29	
Benzene (Benzol)	44	
Bromacil	28	
Butachlor	28	
Carbaryl	27	
Carbofuran	26	
Chlordane	27	
Chloromethane	44	
Chlorothalonil	27	
Dalapon	28	
DBCP	25	
Diazinon	28	
Dicamba	29	
Dieldrin	28	
Dimethoate	28	
Dinoseb	29	
Diquat Dibromide	18	
Diuron	23	
Endothall	15	
Endrin	25	
Ethylene Dibromide	25	
Glyphosate, Isopropylamine Salt	26	
Heptachlor	27	
Heptachlor Epoxide	28	
Hexachlorobenzene	28	
Lindane (Gamma-Bhc)	28	
Methomyl	26	
Methoxychlor	28	
Methyl Bromide (Bromomethane)	44	
Metolachlor	23	
Metribuzin	23	
Molinate	28	
Naphthalene	39	
Ortho-Dichlorobenzene	44	
Oxamyl	26	
Picloram	29	
Prometryn	28	
Propachlor	28	
Simazine	28	
Thiobencarb	28	
Toxaphene	27	
Trichlorobenzenes	44	
Xylene	44	

SAN JOAQUIN

Chemical	Sampled	Pos
1,1,2,2-Tetrachloroethane	43	
1,2,4-Trichlorobenzene	43	
1,2-D + 1,3-D + C-3 Compounds	43	
1,2-Dichloropropane	43	
Alachlor	13	
Aldrin	6	
Atrazine	17	
Benzene (Benzol)	43	
Bromacil	25	
Butachlor	11	
Chlordane	6	
Chloromethane	43	
Chlorothalonil	6	
DBCP	43	22
Diazinon	11	
Dieldrin	6	
Dimethoate	11	
Endrin	10	
Ethylene Dibromide	40	
Heptachlor	6	
Heptachlor Epoxide	6	
Hexachlorobenzene	6	
Lindane (Gamma-Bhc)	6	
Methoxychlor	6	
Methyl Bromide Bromomethane)	43	
Metolachlor	11	
Metribuzin	11	
Molinate	11	
Naphthalene	43	
Ortho-Dichlorobenzene	43	
Prometryn	11	
Propachlor	11	
Simazine	17	
Thiobencarb	11	
Toxaphene	6	
Trichlorobenzenes	43	
Xylene	42	

SAN MATEO

Chemical	Sampled	Pos
1,1,2,2-Tetrachloroethane	16	
1,2,4-Trichlorobenzene	16	
1,2-D + 1,3-D + C-3 Compounds	16	
1,2-Dichloropropane	16	1
2,3,7,8-Tcdd (Dioxin)	2	
2,4,5-T	1	
2,4,5-Tp (Silvex)	3	
2,4,6-Trichlorophenol	2	
2,4-D	3	
3-Hydroxycarbofuran	3	
Acenapthene	2	
ACET	2	
Alachlor	9	
Aldicarb	3	
Aldicarb Sulfone	3	
Aldicarb Sulfoxide	3	
Aldrin	3	
Atrazine	11	
Bentazon, Sodium Salt	5	
Benzene (Benzol)	16	
Bromacil	11	
Butachlor	9	
Carbaryl	3	
Carbofuran	3	
Chlordane	3	
Chloromethane	16	
Chlorothalonil	3	
Cyanazine	2	
Dalapon	3	
DBCP	2	
Deethyl-Atrazine	2	
Diaminochlorotriazine (DACT)	2	
Diazinon	9	
Dicamba	3	
Dieldrin	3	
Dimethoate	9	
Dinoseb	3	
Diquat Dibromide	3	
Diuron	3	
Endothall	2	
Endrin	3	
Ethylene Dibromide	2	
Glyphosate, Isopropylamine Salt	2	
Heptachlor	3	
Heptachlor Epoxide	3	
Hexachlorobenzene	3	

SAN MATEO Cont

Chemical	Sampled	Pos
Hexazinone	2	
Lindane (Gamma-Bhc)	3	
Methomyl	3	
Methoxychlor	3	
Methyl Bromide Bromomethane)	16	
Metolachlor	9	
Metribuzin	11	
Molinate	9	
Naphthalene	16	
Norflurazon	2	
Ortho-Dichlorobenzene	16	
Oxamyl	3	
Picloram	3	
Prometon	2	
Prometryn	11	
Propachlor	5	
Simazine	11	
Thiobencarb	9	
Toxaphene	3	
Trichlorobenzenes	16	
Xylene	15	

SANTA CLARA

Chemical	Sampled	Pos
1,1,2,2-Tetrachloroethane	71	
1,2,4-Trichlorobenzene	74	
1,2-D + 1,3-D + C-3 Compounds	71	
1,2-Dichloropropane	71	
2,3,7,8-Tcdd (Dioxin)	29	
2,4,5-T	4	
2,4,5-Tp (Silvex)	42	
2,4,6-Trichlorophenol	9	
2,4-D	42	1
2,4-Dinitrophenol	2	
3-Hydroxycarbofuran	40	
Acenapthene	7	
Alachlor	40	
Aldicarb	40	
Aldicarb Sulfone	40	
Aldicarb Sulfoxide	40	
Aldrin	39	
Atrazine	36	
Bentazon, Sodium Salt	42	
Benzene (Benzol)	71	
Bromacil	34	
Butachlor	36	
Carbaryl	40	
Carbofuran	40	
Chlordane	39	
Chloromethane	71	
Chlorothalonil	34	
Dalapon	42	
DBCP	45	
Diazinon	36	
Dicamba	42	
Dieldrin	40	
Dimethoate	36	
Dinoseb	42	
Diquat Dibromide	40	
Endothall	40	
Endrin	40	
Ethylene Dibromide	45	
Glyphosate, Isopropylamine Salt	42	
Heptachlor	40	4
Heptachlor Epoxide	40	
Hexachlorobenzene	41	
Lindane (Gamma-Bhc)	40	
Methiocarb	1	
Methomyl	40	
Methoxychlor	40	
Methyl Bromide (Bromomethane)	70	
Metolachlor	36	
Metribuzin	36	
Molinate	36	
Naphthalene	74	
Ortho-Dichlorobenzene	74	
Oxamyl	40	
Paraquat Dichloride	2	
Picloram	42	
Prometryn	36	
Propachlor	40	
Propoxur	1	
Simazine	36	
Thiobencarb	36	

SANTA CLARA Cont

Chemical	Sampled	Pos
Toxaphene	39	
Trichlorobenzenes	70	
Xylene	70	

SHASTA

Chemical	Sampled	Pos
1,1,2,2-Tetrachloroethane	2	
1,2,4-Trichlorobenzene	2	
1,2-D + 1,3-D + C-3 Compounds	2	
1,2-Dichloropropane	2	
3-Hydroxycarbofuran	1	
ACET	2	1
Aldicarb	1	
Aldicarb Sulfone	1	
Aldicarb Sulfoxide	1	
Atrazine	2	
Bentazon, Sodium Salt	2	
Benzene (Benzol)	2	
Bromacil	2	
Carbaryl	1	
Carbofuran	1	
Chloromethane	2	
Cyanazine	2	
Deethyl-Atrazine	2	
Diaminochlorotriazine (DACT)	2	1
Diquat Dibromide	1	
Diuron	2	
Endothall	1	
Glyphosate, Isopropylamine Salt	1	
Hexazinone	2	
Methomyl	1	
Methyl Bromide Bromomethane)	2	
Metribuzin	2	
Norflurazon	2	
Ortho-Dichlorobenzene	2	
Oxamyl	1	
Prometon	2	
Prometryn	2	
Simazine	2	
Trichlorobenzenes	2	
Xylene	2	

SOLANO

Chemical	Sampled	Pos
1,1,2,2-Tetrachloroethane	16	
1,2,4-Trichlorobenzene	16	
1,2-D + 1,3-D + C-3 Compounds	15	
1,2-Dichloropropane	16	
2,3,7,8-Tcdd (Dioxin)	1	
2,4,5-Tp (Silvex)	3	
2,4-D	3	
3-Hydroxycarbofuran	1	
ACET	10	2
Alachlor	3	
Aldicarb	1	
Aldicarb Sulfone	1	
Aldicarb Sulfoxide	1	
Aldrin	2	
Atrazine	13	4
Bentazon, Sodium Salt	3	
Benzene (Benzol)	16	1
Bromacil	12	
Butachlor	2	
Carbaryl	1	
Carbofuran	2	
Chlordane	3	
Chloromethane	15	
Chlorothalonil	2	
Cyanazine	10	
Dalapon	3	
DBCP	3	
Deethyl-Atrazine	10	3
Diaminochlorotriazine (DACT)	10	1
Diazinon	2	
Dicamba	2	
Dieldrin	2	
Dimethoate	2	
Dinoseb	3	
Diquat Dibromide	2	
Diuron	11	
Endothall	2	
Endrin	3	
Ethylene Dibromide	3	

SOLANO Cont

Chemical	Sampled	Pos
Glyphosate, Isopropylamine Salt	2	
Heptachlor	3	
Heptachlor Epoxide	3	
Hexachlorobenzene	3	
Hexazinone	10	
Lindane (Gamma-Bhc)	3	
Methomyl	1	
Methoxychlor	3	
Methyl Bromide Bromomethane)	15	
Metolachlor	2	
Metribuzin	12	
Molinate	3	
Naphthalene	15	
Norflurazon	10	
Ortho-Dichlorobenzene	16	
Oxamyl	2	
Picloram	3	
Prometon	10	
Prometryn	12	
Propachlor	2	
Simazine	13	1
Thiobencarb	3	
Toxaphene	3	
Trichlorobenzenes	15	
Xylene	16	

SONOMA

Chemical	Sampled	Pos
1,1,2,2-Tetrachloroethane	43	
1,2,4-Trichlorobenzene	43	
1,2-D + 1,3-D + C-3 Compounds	43	
1,2-Dichloropropane	43	
2,3,7,8-Tcdd (Dioxin)	6	
2,4,5-Tp (Silvex)	48	
2,4-D	47	
3-Hydroxycarbofuran	11	
Acenapthene	6	
Alachlor	26	
Aldicarb	11	
Aldicarb Sulfone	11	
Aldicarb Sulfoxide	11	
Aldrin	27	
Atrazine	54	
Bentazon, Sodium Salt	47	
Benzene (Benzol)	43	
Bromacil	13	
Butachlor	13	
Carbaryl	11	
Carbofuran	30	
Chlordane	30	
Chlorobenzilate	6	
Chloromethane	43	
Chloroneb	6	
Chlorothalonil	10	
Chlorpyrifos	6	
Dalapon	48	
DBCP	9	
DDD	6	
DDE	6	
DDT	6	
Ddvp (Dichlorvos)	6	
Diazinon	13	
Dicamba	46	
Dieldrin	25	
Dimethoate	14	
Dinoseb	47	
Diquat Dibromide	45	
Diuron	8	
Endothall	46	
Endrin	30	
Eptc	6	
Ethylene Dibromide	29	
Glyphosate, Isopropylamine Salt	6	
Heptachlor	29	
Heptachlor Epoxide	29	
Hexachlorobenzene	30	
Lindane (Gamma-Bhc)	30	
Malathion	6	
Methomyl	10	
Methoxychlor	30	
Methyl Bromide (Bromomethane)	43	
Metolachlor	13	
Metribuzin	13	
Molinate	13	
Naphthalene	43	
Ortho-Dichlorobenzene	43	

SONOMA Cont

Chemical	Sampled	Pos
Oxamyl	44	
Parathion Or Ethyl Parathion	6	
Picloram	49	
Prometryn	13	
Propachlor	13	
Simazine	54	1
Thiobencarb	13	
Toxaphene	29	
Trichlorobenzenes	43	1
Trifluralin	6	
Xylene	43	

STANISLAUS

Chemical	Sampled	Pos
1,1,2,2-Tetrachloroethane	88	
1,2,4-Trichlorobenzene	88	
1,2-D + 1,3-D + C-3 Compounds	88	
1,2-Dichloropropane	88	
Alachlor	11	
Aldrin	2	
Atrazine	10	
Benzene (Benzol)	89	
Bromacil	14	
Butachlor	10	
Chlordane	2	
Chloromethane	88	
DBCP	44	16
Diazinon	10	
Dieldrin	2	
Dimethoate	8	
Endrin	2	
Ethylene Dibromide	43	
Heptachlor	2	
Heptachlor Epoxide	2	
Hexachlorobenzene	2	
Lindane (Gamma-Bhc)	2	
Methoxychlor	2	
Methyl Bromide Bromomethane)	88	
Metolachlor	10	
Metribuzin	5	
Molinate	10	
Naphthalene	88	
Ortho-Dichlorobenzene	88	
Prometryn	10	
Propachlor	8	
Simazine	10	
Thiobencarb	10	
Toxaphene	2	
Trichlorobenzenes	88	
Xylene	88	

SUTTER

Chemical	Sampled	Pos
1,1,2,2-Tetrachloroethane	5	
1,2,4-Trichlorobenzene	5	
1,2-D + 1,3-D + C-3 Compounds	5	
1,2-Dichloropropane	5	
Benzene (Benzol)	5	
Chloromethane	5	
DBCP	1	1
Ethylene Dibromide	1	
Methyl Bromide Bromomethane)	5	
Naphthalene	1	
Ortho-Dichlorobenzene	5	
Trichlorobenzenes	5	
Xylene	5	

TULARE

Chemical	Sampled	Pos
1,1,2,2-Tetrachloroethane	27	
1,2,4-Trichlorobenzene	27	
1,2-D + 1,3-D + C-3 Compounds	27	
1,2-Dichloropropane	27	
2,4,5-Tp (Silvex)	5	
2,4-D	5	
Alachlor	12	
Aldrin	4	
Atrazine	12	

TULARE Cont

Chemical	Sampled	Pos
Bentazon, Sodium Salt	5	
Benzene (Benzol)	27	
Bromacil	8	
Butachlor	12	
Carbofuran	1	
Chlordane	5	
Chloromethane	27	
Dalapon	5	
DBCP	33	12
Diazinon	12	
Dicamba	4	
Dieldrin	4	
Dimethoate	12	
Dinoseb	5	
Diuron	12	
Endrin	5	
Ethylene Dibromide	33	
Heptachlor	5	
Heptachlor Epoxide	5	
Hexachlorobenzene	5	
Lindane (Gamma-Bhc)	5	
Methoxychlor	5	
Methyl Bromide Bromomethane)	27	
Metolachlor	12	
Metribuzin	12	
Molinate	12	
Naphthalene	26	
Ortho-Dichlorobenzene	27	
Oxamyl	1	
Picloram	5	
Prometryn	12	
Propachlor	12	
Simazine	12	
Thiobencarb	12	
Toxaphene	5	
Trichlorobenzenes	27	
Xylene	27	

VENTURA

Chemical	Sampled	Pos
1,1,2,2-Tetrachloroethane	23	
1,2,4-Trichlorobenzene	23	
1,2-D + 1,3-D + C-3 Compounds	23	
1,2-Dichloropropane	23	
2,4,5-Tp (Silvex)	15	
2,4-D	15	
3-Hydroxycarbofuran	11	
ACET	1	
Alachlor	12	
Aldicarb	11	
Aldicarb Sulfone	11	
Aldicarb Sulfoxide	11	
Aldrin	9	
Atrazine	24	
Bentazon, Sodium Salt	16	
Benzene (Benzol)	23	
Bromacil	13	
Butachlor	21	
Carbaryl	11	
Carbofuran	12	
Chlordane	9	
Chloromethane	23	
Chlorothalonil	4	
Cyanazine	1	
Dalapon	15	
DBCP	23	1
Deethyl-Atrazine	1	
Diaminochlorotriazine (DACT)	1	
Diazinon	21	
Dicamba	14	
Dieldrin	9	
Dimethoate	21	
Dinoseb	15	
Diquat Dibromide	11	
Diuron	10	
Endothall	2	
Endrin	9	
Ethylene Dibromide	23	
Glyphosate, Isopropylamine Salt	2	
Heptachlor	9	
Heptachlor Epoxide	9	
Hexachlorobenzene	9	
Hexazinone	1	
Lindane (Gamma-Bhc)	9	
Methomyl	11	

VENTURA Cont

Chemical	Sampled	Pos
Methoxychlor	9	
Methyl Bromide Bromomethane)	23	
Metolachlor	21	
Metribuzin	22	
Molinate	22	
Naphthalene	22	
Norflurazon	1	
Ortho-Dichlorobenzene	23	
Oxamyl	12	
Paraquat Dichloride	9	
Picloram	15	
Prometon	1	
Prometryn	22	
Propachlor	18	
Propoxur	2	
Simazine	24	
Thiobencarb	22	
Toxaphene	9	
Trichlorobenzenes	22	
Xylene	24	

YUBA

Chemical	Sampled	Pos
1,1,2,2-Tetrachloroethane	25	
1,2,4-Trichlorobenzene	25	
1,2-D + 1,3-D + C-3 Compounds	25	
1,2-Dichloropropane	25	
2,3,7,8-Tcdd (Dioxin)	7	
2,4,5-Tp (Silvex)	7	
2,4-D	7	
3-Hydroxycarbofuran	7	
Alachlor	7	
Aldicarb	7	
Aldicarb Sulfone	7	
Aldicarb Sulfoxide	7	
Aldrin	7	
Atrazine	7	
Barban	7	
Bentazon, Sodium Salt	7	
Benzene (Benzol)	26	
Bromacil	7	
Butachlor	7	
Carbaryl	7	
Carbofuran	7	
Chlordane	7	
Chloromethane	25	
Chlorothalonil	7	
Chlorpropham	7	
Dalapon	7	
DBCP	7	
Diazinon	7	
Dicamba	7	
Dieldrin	7	
Dimethoate	7	
Dinoseb	7	
Diquat Dibromide	7	
Diuron	7	
Endothall	7	
Endrin	7	
Ethylene Dibromide	7	
Fenuron	7	
Fenuron Trichloroacetate (Tca)	7	
Fluometuron	7	
Glyphosate, Isopropylamine Salt	7	
Heptachlor	7	
Heptachlor Epoxide	7	
Hexachlorobenzene	7	
Lindane (Gamma-Bhc)	7	
Linuron	7	
Methiocarb	7	
Methomyl	7	
Methoxychlor	7	
Methyl Bromide (Bromomethane)	25	
Metolachlor	7	
Metribuzin	7	
Mexacarbate	6	
Mirex	1	
Molinate	7	
Monuron	7	
Monuron-Tca	7	
Naphthalene	23	
Neburon	7	
Ortho-Dichlorobenzene	25	
Oxamyl	7	
Picloram	7	
Prometryn	7	
Propachlor	7	

YUBA Cont

Chemical	Sampled	Pos
Propham	6	
Propoxur	7	
Siduron	7	
Simazine	7	
Thiobencarb	7	
Toxaphene	7	
Trichlorobenzenes	25	
Xylene	25	

Appendix B

Studies Included in the 2001 Update Report

This appendix summarizes the well sampling surveys that were added to the Well Inventory Database from July 1, 2000 to June 30, 2001. The study number assigned by DPR is shown to the left.

CALIFORNIA DEPARTMENT OF HEALTH SERVICES (Sanitary Engineering Branch)

0023 Sampled 110 chemicals in 49 counties; January 2000 through December 2000; 2,938 wells sampled.

DEPARTMENT OF PESTICIDE REGULATION (EHAP)

STUDY	**COUNTY** ***STUDY TYPE***	**WELLS SAMPLED**	**SAMPLING DATES**	**CHEMICALS SAMPLED (UNDERLINE INDICATES A VERIFIED DETECTION)**
441	Colusa Contra Costa Kern Mendocino Merced Solano *Adjacent Section Monitoring*	4 12 18 3 23 10	MAY-00 JUN-00 AUG-00 JUL-00	atrazine, bromacil, simazine, diuron, prometon, prometryn, hexazinone, cyanazine, metribuzin, norflurazon, DEA, ACET, DACT
442	Shasta Lassen Kern Monterey San Mateo Santa Barbara Ventura *Bentazon Survey*	2 2 3 1 2 5 1	NOV-00	atrazine, bromacil, simazine, diuron, prometon, prometryn, hexazinone, cyanazine, metribuzin, norflurazon, DEA, ACET, DACT Bentazon
443	Kern *Four-Section Survey*	4	JUL-00	atrazine, bromacil, simazine, diuron, prometon, prometryn, hexazinone, cyanazine, metribuzin, norflurazon, DEA, ACET, DACT

Appendix C

Methods Used for Data Collection

Data Collection

Section 13152, subdivision (c) of the PCPA requires all government agencies that sample wells for pesticides to submit their sampling data to DPR for inclusion in the well inventory database. DPR has notified agencies of this law and requested them to submit required information. DPR has also contacted private companies that conduct well sampling for pesticides to request sampling results.

Data were reviewed to determine if they met the criteria for inclusion in the database:

- -Results were for the analyses of pesticides or pesticide breakdown products;
- -Samples were taken from a well;
- -Samples were obtained from an untreated and unfiltered system;
- -Location of each well was identified by at least township/range/section according to the U.S. Geological Survey's Public Lands Survey Coordinate system;
- -Data had not previously been entered into the database.

The PCPA also requires DPR, the SWRCB, and CDHS to jointly establish minimum requirements for well sampling that will help insure data integrity. The agencies agreed upon the following minimum reporting requirements, effective December 1, 1986: state well number, county, date of sample, chemical analyzed for, chemical concentration, minimum detectable limit, sampling agency, analyzing laboratory, street address of well location, well type, and sample type (initial or confirmation).

Information included in the database when it is available includes method of analysis and analysis date, well depth and depths of top and bottom perforations of the well casing, depth of standing water in the well at time of sampling, and year the well was drilled.

Data Verification

Each laboratory analysis of a well water sample for the presence of a pesticide active ingredient or breakdown product comprises one record in the database. This record of sampling information can be supplemented with any available well location and construction information. Before being added to the permanent well inventory database, each record undergoes verification by programs developed by DPR staff.

Appendix D

Glossary of Terms

AB 1803 – (1983) A law that required the California Department of Health Services (CDHS) 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 to the CDHS. Monitoring required by AB 1803 was completed in June 1989. Based on sampling results, the CDHS may require a system to conduct periodic water analyses and to report to the CDHS the results of the analyses.

AB 2021 – See Pesticide Contamination Prevention Act.

active ingredient – The chemical or chemicals in a pesticide formulation that are in themselves, or are transformed to chemicals that are, capable of preventing, destroying, repelling or mitigating pests.

Agricultural Commissioner – For each county in California, under the supervision of DPR, the Commissioner enforces the laws and regulations pertaining to agricultural and structural pest control and all other pesticide uses.

agricultural use – (See also legal agricultural use and legal agricultural use determination.) The use of any pesticide or method or device for the control of any pests, or the use of any pesticide for the regulation of plant growth or defoliation of plants. It excludes the sale or use of pesticides in properly labeled packages or containers which are intended only for any of the following: home use, use in structural pest control, industrial or institutional use, the control of an animal pest under the written prescription of a veterinarian, local districts, or other public agencies which have entered into and operate under a cooperative agreement with the Department of Health Services pursuant to section 2426 of the Health and Safety Code (Food and Agricultural Code, section 11408).

analysis – The determination of the composition of a substance by analytical methods. For example, the separation and measurement of a pesticide or its degradation product from the sample matrix.

aquifer – A geologic formation that is water bearing and which transmits water in sufficient quantity to supply springs and pumping wells.

Birth Defect Prevention Act (BDPA) – (SB 950, 1984) A law requiring DPR to acquire certain toxicological data for registered pesticides in order to make a scientific determination that their uses will not cause significant adverse health effects. The BDPA prohibits the registration of any new pesticide active ingredient if required mandatory health effects studies are missing, incomplete, or invalid. Pesticide active ingredients already registered that are identified as

having the potential to cause significant adverse health effects following a thorough review by DPR scientific staff will be canceled.

breakdown product – See degradation product.

Cal/EPA - California Environmental Protection Agency. Comprised of the Department of Pesticide Regulation, the Department of Toxic Substances Control, the Integrated Waste Management Board, the Water Resources Control Board, the Air Resources Board, and the Office of Environmental Health Hazard Assessment.

CCR (3CCR) - California Code of Regulations. Title 3, California Code of Regulations (3CCR). California Code of Regulations contains enforceable regulations that provide the specific means for implementation of laws. Title 3 CCR contains regulations pertaining to food and agriculture, including sale and use of pesticides.

chemigation – The application of pesticides through irrigation water, using irrigation equipment.

confirmed detection – For purposes of the well inventory database, the detection of a compound in two discrete samples taken from the same well during the time period of a single monitoring survey.

database record – The results of each chemical analysis of a well water sample for a pesticide residue and other corresponding sampling information constitutes one record in the database.

degradation product – A substance resulting from the transformation of a pesticide active ingredient by physical or chemical processes (e.g., oxidation, reduction, hydrolysis, photolysis).

direct streaming – A pathway by which agricultural chemicals may reach ground water; the movement of pesticide residue in runoff surface water to subsurface soil and, ultimately, ground water, through dry wells, soil cracks, or other direct pathways.

discrete sample – Samples taken separately from a well; not one sample split into smaller samples.

dry well – A small-diameter hole or pit dug into the ground and filled with gravel or other material for the disposal of surface water by infiltration into soil.

economic poison – see pesticide.

established PMZ – A pesticide management zone (PMZ) listed in section 6802, Title 3 of the California Code of Regulations (3CCR).

FAC - Food and Agricultural Code. The laws pertaining to food and agriculture, including the registration, sale, and use of pesticides. Specific regulations for implementation of law are in the California Code of Regulations.

formulation – The way in which a pesticide product, containing the active ingredient, the carrier, and other additives, is prepared for use. Includes wettable powder, emulsifiable concentrate, etc.

fumigant – A chemical used in the form of a volatile liquid or a gas. Its vapors kill insects, nematodes, fungi, bacteria, seeds, roots, or entire plants; usually applied in an enclosure or in the soil.

ground water – Water beneath the surface that can be collected with wells, tunnels, or drainage galleries, or that flows naturally to the earth's surface via seeps or springs.

ground water protection advisories (GWPA) – Written information given by a licensed pest control adviser, who has successfully completed the Ground Water Protection Training Program given by DPR, that must be submitted by permit applicants before the county agricultural commissioner can issue a use permit for allowed uses of a regulated pesticide in a pesticide management zone (PMZ). The GWPA contains specific information for applying the regulated pesticide in a sensitive area (PMZ) in order to prevent or minimize the movement of pesticide residues to ground water.

Ground Water Protection List (GWPL) – A list of pesticides having the potential to pollute ground water. It is required by the PCPA and established in section 6800 (3CCR). The GWPL is divided into two sublists. Sublist (a) is comprised of chemicals that have been detected in ground water as a result of legal, agricultural use. Sublist (b) contains pesticide active ingredients whose physico-chemical properties exceed or are less than the specific numerical values and that are labeled for soil application under certain conditions. Chemicals placed on the GWPL are subject to certain restrictions and reporting requirements.

herbicide – A pesticide used to control unwanted vegetation.

historical agricultural use – The documented use of a chemical, no longer registered for such use, that has been applied over time in a specific area for the production of an agricultural commodity.

hydrolysis – The chemical alteration of a pesticide by water.

initial detection sample – For a single study and a particular well, the initial detection sample for a chemical is the positive sample with the earliest sampling date and/or time. Subsequent samples are coded in relation to the initial detection sample.

insecticide – A pesticide used to kill insects.

institutional use – Use within the confines of, or on property necessary for the operation of, buildings such as hospitals, factories, schools, libraries, auditoriums and office complexes.

law – State laws and statutes are the result of action by the California legislature.

leaching – A pathway by which agricultural chemicals may reach ground water; the process by which pesticides carried by water, either in the dissolved or suspended state, through the soil matrix as it recharges a ground water aquifer.

legal agricultural use – The application of a pesticide, according to label directions and in accordance with federal and state laws and regulations, for agricultural use as defined in Food and Agricultural Code, section 11408. (*See agricultural use*.)

legal agricultural use determination – A determination required by Food and Agricultural Code (FAC) section 13149 and based upon the following criteria: (1) the detection of a pesticide ingredient or its degradation product that has been verified according to DPR criteria; (2) a detection of the same pesticide ingredient or its degradation product in ground water, verified at a second site in either an adjacent section or within one-half mile radius of the original, verified detection; (3) the detected pesticide ingredient must be formulated in a product which has listed on its label one or more agricultural uses; (4) the application of the agricultural use product(s) in the vicinity of the reported detections should either be documented historically, confirmed by local interviews, or presumed by the identification of a target pest or commodity; (5) the Director may consider a preponderance of evidence as meeting these criteria.

maximum contaminant level (MCL) – MCLs are part of the drinking water quality standards adopted by CDHS and by U.S. EPA under the Safe Drinking Water Act. MCLs are formally established in regulation and are enforceable by the CDHS on water suppliers. Primary MCLs take into consideration both health-based criteria and technologic and economic factors relating to the ability to achieve and monitor these concentrations in drinking water supply systems.

metabolite – In the case of a pesticide, a compound derived from the action upon the pesticide by a living organism (bacteria, plant, insect, higher animal, etc.). The chemical transformation varies (oxidation, reduction, conjugation) and the metabolite may be more toxic or less toxic than the parent compound. The same derivative may, in some cases, develop through exposure of the pesticide in the environment. (*See also degradation product*.)

minimum detection limit (MDL) – The lowest concentration of analyte that a method of analysis can reliably quantify. The MDL is established in protocol for a study either as a result of a method validation study or by using accepted proven analytical methods (e.g., U.S. EPA methods).

model – Mathematical equations that represent certain processes. These equations can be implemented in a computer program in order to facilitate calculations and test model predictions against measured data.

monitoring study – *See survey*.

monitoring well – Any artificial excavation by any method for the purpose of monitoring fluctuations in ground water levels, quality of underground waters, or the concentration of contaminants in underground waters.

non-crop areas – These areas include rights-of-way, golf courses, and cemeteries. There may be agricultural use of pesticides in non-crop areas, for example weed control around buildings on any of the areas described above.

nonpoint source – Contamination which cannot be traced to a small, definable location (compare with point source), e.g., applications of agricultural chemical to crops.

parts per billion (ppb) – A way to express the concentration of a chemical. One microgram of a chemical in one liter of water is equal to one ppb.

permit – Permits are issued by County Agricultural Commissioners for the use of chemicals that have been designated as restricted pesticides. Restricted pesticides, for various reasons, are potentially more hazardous than other pesticides.

pest – Any of the following that is, or is liable to become, dangerous or detrimental to the agricultural or nonagricultural environment of the State: any insect, predatory animal, rodent, nematode, or weed; any form of terrestrial, aquatic, or aerial plant or animal, virus, fungus, bacteria, or other microorganisms on or in living humans or other living animals; anything that the Director of the California Department of Food and Agriculture or Director of the Department of Pesticide Regulation declares, by regulation, to be a pest.

pest control adviser (PCA) – A person licensed by DPR and registered with the county agricultural commissioner who makes pest control recommendations. All agricultural use recommendations must be in writing and contain certain information. A PCA must complete continuing education requirements before his/her license may be renewed.

pesticide – In California, any of the following: any spray adjuvant, any substance, or mixture of substances which is intended to be used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling, or mitigating any pest which may infest or be detrimental to vegetation, man, animals, or households, or be present in any agricultural or nonagricultural environment. Includes fungicides, herbicides, insecticides, nematicides, rodenticides, desiccants, defoliants, plant growth regulators.

Pesticide Contamination Prevention Act (PCPA) – (AB 2021) A law, effective January 1, 1986, which added sections 13141 through 13152 to Division 7 of the FAC. The PCPA requires each registrant of an economic poison to submit specified information to the Director of DPR, provides for the establishment of the Groundwater Protection List, requires the Director to perform soil and water monitoring, provides for a specific response to the detection of pesticides in soil and ground water, and requires the Director to maintain a specified well sampling database and to report certain information annually to the Legislature, CDHS, and the State Water Resources Control Board.

Pesticide Detection Response Process (PDRP) – A process, established in sections 13149 through 13151 (FAC) by the PCPA, in which the detection of a pesticide residue in soil (at

specific depths) or ground water, is investigated, evaluated, and, when necessary, mitigated. As part of the process, a determination must be made that the detection probably resulted from a legal agricultural use application of the pesticide. As a result of this process, the use of a pesticide in California may be modified or canceled.

pesticide management zone (PMZ) – A geographic surveying unit of approximately one square mile (a section) that is designated in regulation as sensitive to ground water pollution. The use of a pesticide inside its PMZ is subject to certain ground water protection restrictions and requirements.

pesticide residue – The amount of a pesticide active ingredient remaining in a soil or ground water sample at the time of analysis.

physicochemical properties – The types of behavior that a substance exhibits in chemical reactions are called its chemical properties; other characteristics that are typical of a substance are called its physical properties. Taken together, the chemical and physical properties of a substance are called its physicochemical properties.

point source – 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. The contamination can be traced to its point of origin by locating a specifically shaped pattern in the ground water called a plume.

positive detection – A well water sample in which the presence of a pesticide chemical is detected at or above the minimum detection limit of the analytical method used for analysis of the compound under investigation. A positive analysis may be designated as confirmed or unconfirmed.

range – 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. (*See well numbering system.*)

recommended PMZ – A section of land (one square mile) identified by DPR as sensitive to ground water pollution by specific pesticides, not yet adopted into regulation in section 6802 (3CCR).

registered pesticide – A pesticide product approved by U.S. EPA and DPR for use in California.

registrant – A person or corporation that has registered a pesticide for use in California and has obtained a certificate of registration from the Department.

regulation – 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.

related compounds – *See degradation product and metabolite*.

restricted material – Compounds designated as "restricted materials" in section 6400 (3CCR) that, for various reasons, are potentially more hazardous to people, animals, or the environment

than other pesticides. As a result, the use of these materials is regulated more closely and use is permitted only by trained personnel when additional precautionary measures are taken.

right-of-way – The strip of land over which facilities such as highways or railroads are built.

section – A land unit of 640 acres (one square mile) equal to 1/36 of a township. (*See well numbering system.*)

soil adsorption coefficient (Koc) – A measure of the tendency of compounds such as pesticide active ingredients to adhere to the surfaces of soil particles.

specific numerical values (SNVs) – Certain numeric threshold values set 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 PCPA associates these properties with the longevity and mobility of a chemical in the soil and requires the establishment of SNVs in regulation as a means of identifying pesticides with the potential to pollute ground water.

state well number – *See well numbering system.*

survey – In the context of this report, well monitoring conducted by an agency or private firm for a specified length of time in a designated area. A survey typically involves well water sampling and chemical analysis.

township – A public land surveying unit which 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"; *see also, well numbering system*).

triazines – A class of chemical compounds derived from any of three isomeric compounds, each having three carbon and three nitrogen atoms in a six–membered ring. Triazines are strong inhibitors of photosynthesis. Atrazine, prometon, and simazine are triazines.

unconfirmed detection – For a particular well, the detection of a pesticide in a single sample during the time period of an individual monitoring study. Confirmation of the initial detection by a second positive sample was not possible because either (1) only a single sample was taken from the well or (2) analyses of all other samples taken from the well during the study were negative.

use requirement – Restrictions established in regulation for the use of certain pesticides. For example, section 6484.1 (3CCR) states that agricultural, outdoor institutional, and outdoor industrial uses of pesticides containing atrazine are prohibited in the pesticide management zones listed in 6802(c) (3CCR).

vapor pressure – A physical property that indicates the rate of evaporation of a compound. The higher the vapor pressure, the more volatile the compound.

verified detection (DPR study) – The unequivocal detection of a pesticide or a pesticide breakdown product, or the detection of a chemical in two discrete samples taken from a single well during a 30–day time period, and analyzed either by the same laboratory using different analytical methods or by two laboratories using the same method. The analytical methods used must be approved by DPR. Verification of the presence of a compound in ground water by this criteria fulfills section 13149(d) (FAC) of the PCPA and may be used for regulatory purposes.

water solubility – The property of a substance to dissolve in water.

water well - any artificial excavation constructed by any method for the purpose of extracting water from, or injecting water into, the underground.

well head – The immediate area surrounding the top of a well.

well numbering system– The California well numbering system is based on a grid system commonly referred to as the Public Lands Survey. Under this system, all tracts of lands are tied to an initial point and identified as being in a township. A township is a square parcel of land six miles on each side. Its location is established as being so many six–mile units east or west of a north–south line running through the initial point (called the "principal meridian") and so many six–mile units north or south of an east–west line running through the point (called the "baseline"). The meridian lines parallel to, and east or west of, the principal meridian are called range lines. Every township is further divided into 36 parts called sections. A section is a square parcel of land one mile on a side, each containing 640 acres. Each section of land is divided into sixteen 40–acre tracts. Once the township, range, section, and tract are known, each well is assigned a unique sequence number (in chronological order) by Department of Water Resources personnel. This number is known as the State well number.

IV. PESTICIDE CONTAMINATION PREVENTION ACT ANNUAL REPORT TO THE LEGISLATURE STATE WATER RESOURCES CONTROL BOARD DECEMBER 2001

Actions taken by the State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCBs) to prevent economic poisons from migrating to groundwaters of the State are as follows:

A. SWRCB

SWRCB staff participated in the following activities:

- Reviewed Department of Pesticide Regulations' (DPR's) proposed amendments to the AB 2021 regulations.

- Regularly attended DPR sponsored meetings of the interagency Pesticide Registration and Evaluation Committee, and the Pest Management Advisory Committee.

- Reviewed on an ongoing basis DPR Notices of Materials Entering Evaluation, and advised DPR staff on potential ground 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.

- Participated in discussions with U.S. Geological Survey scientists on studies dealing with pesticides and water quality.

- Implemented Groundwater Ambient Monitoring and Assessment Program (GAMA) which samples public supply wells for low-level VOCs (including agricultural VOCs, such as DBCP and EDB) and groundwater age-dating parameters to help assess public supply well vulnerability.

- Per AB 599, assembled Interagency Task Force to aid in the development of a comprehensive groundwater monitoring plan for California.

B. RWQCB

Information on actions to prevent economic poisons from migrating to the ground waters of the State by each of the nine RWQCBs is listed in Tables 1 through 10.

Table IV-1. Actions taken by the Regional Water Quality Control Board, North Coast (Region 1), In FY 2000-2001.

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Del Norte	Smith River Plains	Aldicarb, 1,2-D	Ongoing monitoring program.
	Smith River Plains 533 Fred Haight Drive	1,2,dichloropropane	Ongoing monitoring program.
Humboldt	U.S. Forest Service Nursery McKinleyville	Chlorothalonil	USFS monitoring and assessment to prevent discharges to surface water and ground water with RWQCB support.
	Sierra Pacific, Arcata	Pentachlorophenol, Tetrachlorophenol,	Ongoing contamination assessment and cleanup.
	Carlotta Lumber Company	Pentachlorophenol, Tetrachlorophenol	Ongoing contamination assessment and cleanup.
	Beaver Lumber Company, Arcata	Pentachlorophenol, Tetrachlorophenol	Ongoing contamination assessment and cleanup.
	Sun Valley Bulb Farms	Chlorothalonil, Dithiocarbamate, Oxamyl	Ongoing monitoring and assessment to prevent discharges to surface water and ground water under RWQCB direction.
	Pacific Lumber Co. Carlotta	Pentachlorophenol Tetrachlorophenol	Ongoing contamination assessment to prevent discharges to surface water
	Schmidbauer, Arcata	Pentachlorophenol, Tetrachlorophenol	Ongoing contamination assessment and cleanup.
	Schmidbauer, Eureka	Pentachlorophenol, Tetrachlorophenol	Ongoing contamination assessment and cleanup.
	Simpson Plywood Mill (Old), Eureka	Pentachlorophenol, Tetrachlorophenol	Ongoing contamination assessment and cleanup.
	Simpson Mill, Samoa	Pentachlorophenol, Tetrachlorophenol	Ongoing contamination assessment and cleanup.
Siskiyou	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 assessment and cleanup.
	J.H. Baxter	Pentachlorophenol, Tetrachlorophenol	Ongoing contamination assessment and cleanup.

Table IV-1. (cont) North Coast (Region 1)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Sonoma	Klein Foods	Fenamiphos	Ongoing contamination assessment

Table IV-2. Actions Taken by the Regional Water Quality Control Board, San Francisco Bay (Region 2), In FY 2000-2001

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Alameda	Parker & Amchem	2,4-D	No monitoring for 2,4-D is required after many years of non-detect levels of 2,4-D.
	Jones-Hamilton	Pentachlorophenol	RWQCB Order No. 89-110 specified time schedule for investigation/cleanup. Ground water cleanup underway. No sampling of ground water for pesticides.
	Port of Oakland (Embarcadero Cove)	Chlordane, Pentachlorophenol, DDT, Endosulfan, 2,3,7,8-TCDD, DDD	Department of Toxic Substances Control (DTSC) has lead and has approved a Remedial Action Plan including continuous ground water monitoring.
	Lincoln Properties (Orsetti Site)	DDE, 2,4-D	DDE and 2,4-D were non-detect in monitoring wells and are no longer monitored.
	Peerless Southern Pacific Railroad	Pentachlorophenol	City of Berkeley Health Department has lead. Additional soil and ground water investigations required.
	FMC, Newark	EDB	RWQCB Order No. 89-055 specified time schedule for investigation and cleanup. Ground water cleanup underway.
	3830 Old Santa Rita Road, Pleasanton	Dicamba, Dichloroprop, 2,4-D, 2,4,5-T	Pesticide found in grab water samples. One monitoring well installed on-site. Alameda County Department of Environmental Health lead on this site. Site closed October 1990.
Contra Costa	Chevron	Endrin, Lindane, Dieldrin, DDT, Arsenic	Submitted closure plan for Class I impoundment. 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	U.S. Environmental Protection Agency (U.S. EPA) lead on-site cleanup. Awaiting report of completion for remedial dredging project.

Table IV-2. (cont) San Francisco Bay (Region 2)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
	FMC, Richmond	DDT, DDD, DDE, Dieldrin, Chlordane, Tedion, Endosulfan, Ethion, Carbophenothion, Heptachlor	California Department of Health Services (DHS) lead on-site cleanup. Cleanup completed. Monitor to assure remaining pollutants do not migrate.
Marin	Former Sonoma Mosquito Abatement District, San Rafael	DDD, DDE, DDT, Dieldrin	DTSC is lead agency. Some soil removal has already taken place (approximately 3000 yd^3 in 1992). Old monitoring wells destroyed. Seven new wells were installed in 1996. DTSC has mailed out draft deed restriction and draft O&M Agreement for site.

Table IV-3. Actions Taken By the Regional Water Quality Control Board, Central Coast (Region 3), In FY 2000-2001

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Monterey	Monterey SoilService, King City	EDB, 1,2-D, DDT, DBCP, Toxaphene	Monitored natural attenuation used for low-level residual concentration of EDB and DBCP. 1,2-D,DDT, and toxaphene are no longer detected in monitoring wells.
	Castlerock Estates	Toxaphene, beta-BHC, delta- BHC, 4,4'-DDE, 4,4'-DDT, 4,4-DDE, 4,4-DDT, 4,4-DDD	Soil remediation completed. Monitored natural attenuation used for low-level residual toxaphene concentrations in groundwater. Only toxaphene was detedted in groundwater.
Santa Clara	Castle-Veg-Tech, Morgan Hill	Toxaphene, Endrin, Lindane, Endosulfan	Site is being actively remediated.
Santa Cruz	WFS-Greengro, Watsonville	1,2-DCP, Endosulfan	Site is being actively remediated.
	WFS, Watsonville	DDT, DDD, Toxaphene	Monitored natural attenuation used for low-level residual concentrations of DDD and dieldren. Removal of pesticide-contaminated soil scheduled to start in early 2002.

Table IV-4. Actions Taken by the Regional Water Quality Control Board, Los Angeles (Region 4), In FY2000-2001

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Los Angeles	Dominquez Park Landfill, Redondo Beach	Bis (2-ethylhexyl) phthalate	Phthalates are thought to be from PVC well casing.
	Bixby Village Sanitary Landfill (City Dump Salvage No. 1), Long Beach	Aldrin, Beta-BHC, Alpha-BHC, Bis (2-ethlhexyl) phthalate, Delta-BHC, 4,4'-DDE, 4,4'-DDT, 1,4-Dichlorobenzene, Dieldrin, 2,4-Dinitrophenol, Endosulfan I, Endrin, Endrin aldehyde, Lindane, Heptachlor	Additional analyses did not detect any pesticides.
	Market Place Sanitary Landfill (City Dump Salvage No. 2), Long Beach	Alpha-BHC, Bis (2-ethylhexyl) phthalate, Delta-BHC, 4,4'-DDE, 4,4'-DDT, Endosulfan I, Lindane, Heptachlor	Additional analyses did not detect any pesticides.
	Studebaker-Loynes Sanitary Landfill (City Dump Salvage No. 3), Long Beach	Alpha-BHC, Bis (2-ethylhexyl) phthalate, 4,4'-DDD, 4,4'-DDE, Di-n-octyl-phthalate, Endosulfan I, Endosulfan II, Endrin, Lindane, Heptachlor	Additional analyses did not detect any pesticides.
	Peter Pitchess Honor Rancho Landfill, Castaic Junction	Bis (2-ethylhexyl) phthalate	Phthalates are thought to be from PVC well casing. Monitoring continues at site.
	Royal Boulevard Land Reclamation Site, Torrance	Lindane, 1,3-Dichloropropene	Site is closed and capped.

Table IV-4. (cont) Los Angeles (Region 4)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
	Port Disposal Landfill, Wilmington	Bis (2-ethylhexyl) phthalate, Di-n-Octyl-phthalate	Phthalates are thought to be from PVC well casing. Monitoring continues at site.
	Port Disposal Banning Pit and Macco Pit, Wilmington	Bis (2-ethylhexyl) phthalate, Napthalene, Di-n-Butyl phathalate, 2-Methyl-naphthalene	Phthalates are thought to be from PVC well casing. Monitoring continues at site.
	City of Compton Landfill	Di(2-ethylhexyl) phthalate (DEHP), Di-n-Octyl-phthalate	Phthalates are thought to be from PVC well casing. Monitoring continues at site.
Ventura	Simi Valley landfill	Aldrin, Alpha-BHC, Gamma-BHC, 4,4- DDD, 4,4-DDT, Dieldren, Endosulfan III, Endrin, Heptachlor Dpoxide, Methoxychlor	These wells are located closed to the landfill. The operator will implement an evaluation monitoring program to determine the source, nature, and extent of a possible release.

Table IV-5. Actions Taken By The Regional Water Quality Control Board, Central Valley (Region 5, Sacramento),In FY 2000-2001.

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Colusa	Moore Aviation	Atrazine,	Ground water remediation ongoing. Soils bioremediation complete for most constituents.
Colusa	Barber Cashew Supply Corporation, Maxwell	DDT, nitrate	Bioremediation of soil unsuccessful. Disposal under consideration. Phytoremediation for remediation of groundwater nitrates underway.
Glenn	Barber Cashew Supply Corporation, Willows	Nitrate, ammonia, 1,2-DCE, PCE, TCE, toluene, carbon tetrachloride, chloroform, chlorobenzene	Cleanup and Abatement Order (CAO) issued. Administrative Civil Liability Issued.

Table IV-5. (cont) Central Valley (Region 5, Sacramento)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Merced	Merced Municipal Airport	1,2 Dichlorobenzene, 1,2 Dichloroethane, 1,2 Dichlorothane (cis), 1,2 Dichlorothane (trans), 1,3 Dichloropropane (cis), Alachlor, Benzene, Captan, Carbophenothion (trithion), Chloroform, DDT (total), Dicofol (Kethane), Dieldrin, Endosulfan I, II, Endosulfan sulfate, Endrin, Endrin aldehyde, Endrin ketone, Ethylbenzene, Heptachlor epoxide, Methoxychlor, Tetrachloroethylene (PCE), Toluene, Toxaphene, TPH-diesel, TPH-gasoline, Trichloroethylene (TCE), Vinyl chloride, Xylenes	Health Assessment completed. Feasibility study submitted.
	J.R. Simplot, Winton	1,2-DCP, Dieldrin, Benefin, 1,2,3-TCP, DBCM, DBCP, Endrin, Alachlor	Soil cleanup underway. Ground water remediation continues.
	BAC, Inc.	Hexavalent Chromium, Arsenic, Copper	RWQCB Lead Agency. Ground water extraction and treatment system in pilot study phase. Plume spreading due to lack of hydraulic containment by system. Implementing well reinjection, infiltration gallery. No discharges re: NPDES permit.
	Western Farm Service, Merced	1,2-DCP, DBCP, dinoseb, dalapon, nitrate, ammonia	Downgradient extent being defined.
Sacramento	Sacramento Army Depot	Diazinon, Dursban	Assessment report requested. Federal Superfund work in progress. Cleanup of pesticides completed.

Table IV-5. (cont) Central Valley (Region 5, Sacramento)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
	Natomas Air Park	Dicofol, DDE, DDT, Endosulfan, Toxaphene, Dieldrin Endrin	Monitoring wells have been installed and sampled. Investigation underway.
	Franklin Field Airport	Toxaphene	Requested feasibility study for soil cleanup and additional ground water sampling.
	McClellan Air Force Base	Aldrin, Alpha-BHC, Beta-BHC, Delta-BHC, Gamma-BHC, (Lindane), 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Dieldrin, Alpha Endosulfan, Endosulfan Sulfate, Heptachlor, Heptachlor Epoxide, 2,4-D, 2,4,5-T, 2,4,5-TP	Ground water cleanup underway. For the last 4-5 years, no pesticides found in ground water.
	Bureau of Land Management, Fitzerald Ranch	Toxaphene	Buried empty pesticide containers found on land purchased by Bureau of Land Management (BLM). Soil containing toxaphene excavated and stockpiled onsite. BLM has proposed a pilot study for bioremediation of the stockpiled soils. No pesticides detected in three monitoring wells.
	Western Farm Service, Walnut Grove	Nitrate, ammonia, aldrin, beta-BHC, gamma-BHC, DDD, DDE, dieldrin, heptachlor epoxide, endosulfan, disultoton, TPH-diesel.	Investigation continuing. Regional Board is lead agency.
San Joaquin	Occidental Chemical	EDB, DBCP, Sulfolane	Site remediation occurring pursuant to stipulation and judgement approving settlement (1981).
	John Taylor Fertilizers, Stockton	Dinosed, I,2,3-TCP, bromicil	Investigation underway, monitoring wells installed
	Defense Depot, Tracy	Dieldrin, Simazine	A Record of Decision (ROD) was finalized in February 1998; it includes soil cleanup levels for simazine and dieldrin, and a ground water cleanup level for dieldrin. Remedial design phase was initiated in July 1998.
	Sharpe Army Depot, Stockton	Bromacil	Assessment ongoing.

Table IV-5 (cont.) Central Valley (Region 5, Sacramento)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
	Marley Cooling	Arsenic, Copper, Chromium	Ground water cleanup underway.
	U.S. Navy Computer and telecommunications Station, San Diego Detachment	DDD, DDE	Assessment ongoing. Soil removal actions have occurred and more are planned. Groundwater assessment underway.
	Triple "E" Produce	Chloroform	Triple "E" is not a pesticide site. The chloroform is a by-product of chlorine disinfection.
	Western Farm Service, Stockton (former Pure Gro/Brea)	1,2-DCP, Chloroform, PCE, Bromoform, 1,1-DCA, Dibromochloromethane, bromochloromethane, bromodichloromethane	Soil and ground water investigation ongoing. Off-site plume definition continuing. Two soil areas capped. MRP issued for semi-annual ground water monitoring and long-term cap maintenance. Auqifer test completed.
	Former Oxychem/ Simplot/ PureGro	DBCP, 1,2-DCP, 1,1-DCE, 1,2-DCA, Chlorobenzene, 1,1,2-TCA, Mevinphos, Fensulfothion, Dinoseb, Dicamba, 2,4,5-T, Atrazine, Monuron, Carbaryl, Carbofuran, Propham, Diuron, Propoxur, 1,1,2,2-TCA, atraton, 2,4-DB, bromocil, chloromethane, tebuthiuron, simazine, methiocarb, MCPP, fenuron, chloroform, chloroxuron, dichloroprop, EDB, oxamyl	Health risk assessment completed. Target cleanup level calculations underway. Soil remediation with thermal destruction and phytoremediation in progress.
	Cal Farm Supply	b-BHC, Dieldrin, Prometon, Simazine, Atrazine, 2,4,5-TP, Dinoseb	Soils cleaned up. Ground water investigation continues.

Table IV-5 (cont.) Central Valley (Region 5, Sacramento)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
	Western Farm Service, Vernalis	DBCP, EDB, diuron, methiocarb, diazinon, aldrin, nitrate, ammonia, 1,2-DCP	Remedial options for groundwater under consideration. MRP issued for quarterly ground water monitoring. Pilot project using hydrogen release compound for insitu remediation underway.
Solano	Wickes Forest Industries	Chromium (Cr^{3+} and Cr^{6+}), Arsenic, Copper	Ground water cleanup ongoing.
	John Taylor Fertilizer, Dixon	Dinoseb, dichlorprop, 2,4-D dicamba, DDT, chlordane, diuron, bromocil, tebuthiuron	Investigation underway, monitoring wells installed.
	Rio Vista Army Reserve Center	Chlorodane, 4,4-DDE, 4,4-DDT, dieldrin	Site investigation is underway to determine threat to water quality.
Stanislaus	Chemurgic Agricultural Chemicals	BHC, DDT	1993 CAO rescinded. Waste Discharge Requirements adopted in June 1997 for a ground water extraction and treatment system. Excavation of areas with elevated BHC in soil completed by December 1995. Ground water remediation and monitoring ongoing.
	Geer Road Landfill	1,1-DCA, 1,1,1-TCA, TCE, Chloridazon, Freons	Ground water cleanup underway.
	Western Farm Service, Modesto	DBCP, EDB, nitrate, ammonia	Soil and groundwater investigation underway. Issued MRP for quarterly ground water monitoring.
	Rhone-Poulenc (formerly Union Carbide) Test Plots	Aldicarb	Monitoring has ended and wells were abandoned under the oversight of Stanislaus County Department of Environmental Resources. Site was closed in the spring of 1995.
	Shell Agricultural Research Facility	Cyanazine, Atrazine, Chloroform, Planavin, 1,1-DCE, DBCP, Nitrate	Groundwater remediation plan approved
	Valley Wood	Copper, Chromium, Arsenic	Out-of-court settlement. Federal Superfund site. Interim cleanup in progress.
Sutter	Bowles Flying Service	2,4-D, Thiobencarb, Diuron, Metalaxyl, Molinate, Simazine	Cease and Desist Order issued under the TPCA program. On DTSC's list as needing a Preliminary Endangerment Assessment. Monitoring wells installed.

Table IV-5 (cont.) Central Valley (Region 5, Sacramento)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
	PureGro, Robbins	alachlor, aldrin, dicofol, monuron, 1,2-DCA, 1,2-DCP, diphenamid	MRP issued for quarterly ground water monitoring. Additional ground water characterization requested.
	John Taylor Fertilizers, Yuba City	1,2-DCP, 1,2,3-TCP, !,2-DCB, chlorobenzene, DBCP	Soil excavation completed, pilot study underway using hydrogen release compound for insitu groundwater remediation.
Yolo	Frontier Fertilizer Company, Davis	EDB, DCP, DBCP, Carbon tetrachloride	DTSC installed interim ground water treatment system. U.S. EPA expanded the system and is conducting an investigation to determine extent of plume.
	DowElanco, Davis	1,2,DCP	Air sparging successful to reduce concentrations in groundwater, hydrogen release compound injected to remove last traces. Monitoring underway.
	U.C. Davis	Chlorpyrifos, Dicamba, Atrazine, Aldrin, Simazine, Dieldrin, Endrin, DDT	New CAO and MRP issued.
	J.R. Simplot, Courtland	EDB, 2,4-DB, Dicofol, Dicamba, 2,4,5-TP, Carbophenthion, DDT, Dieldrin, Dinoseb, Picloram	Health risk assessment completed. Phytoremediation underway for soil & groundwater remediation.
Yuba	Beale Air Force Base	Lindane	Ground water investigation underway. Investigation complete no further action required.

TableIV-6. Actions Taken By The Regional Water Quality Control Board, Central Valley (Region 5, Fresno), in FY 2000-01.

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Fresno	Blue Hills Disposal Site County of Fresno	Dicamba, 2,4-D, Silvex	Corrective action underway.
	Thompson Hayward Agriculture & Nutrition	Alpha-BHC, Beta-BHC, Gamma-BHC, Dieldrin, DBCP, Diphenamid, Heptachlor, Heptachlor Epoxide	State Superfund site. Contamination assessment ongoing.
	Occidental Chemical/ J.R. Simplot, Helm Facility	Dieldrin	Monitoring of ground water continues.

TableIV-6. (cont) Central Valley (Region 5, Fresno)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
	FMC Corporation, Fresno Facility	Aldrin, Dieldrin, DDT, DDD, DDE, Heptachlor, Lindane, Toxaphene, Ethyl Parathion, Malathion, Ethion, Endosulfan, Dimethoate, Furadan, Dinitrocresol, Dinoseb (DNBP)	Discharge area capped and undergoing remediation using SVE. Off-site groundwater extraction system construction on schedule. Enhanced reductive dechlorination groundwater pilot test completed.
Fresno	Britz, Inc., Five Points	Toxaphene, DDT, DNBP	State Superfund site. Remedial investigation and health assessment report submitted. Ground water remediation feasibility study submitted. Additional contamination assessment completed. Deed restriction in place.
	Fresno County Wells	DBCP, EDB, 1,2-D	Pesticides detected in 146 wells (AB 1803 sampling). San Joaquin Valley DBCP Advisory Committee is overseeing studies on remedial alternatives for DBCP problems.
	Coalinga Airport	DDT, Chlorpyrifos, DEF, Ethion, Disyston	Contamination assessment needed.
	Spain Air	Ethion, DEF, Parathion, Trithion, Dinoseb, Paraquat, DDE, DDT, Endosulfan II	Assessment needed.
	PureGro, Oxalis	1,2-Dichloropropane, nitrate	On-site and off-site plume definition of eastern rinsewater pond groundwater plume complete. Soil and groundwater plume definition at recently discovered former western rinsewater pond contamination site complete. Workplan for soil remediation at western pond to be sub. Dec 2001.
Kern	Brown & Bryant, Inc., Arvin	1,2-D, 1,3-D, DBCP, Dinoseb, EDB, carbaryl	Federal Superfund site. U.S. EPA has prepared Remedial Information Feasibility Study Report.
	Puregro Company, Bakersfield	DBCP	State Superfund site. Further assessment conducted. The waste discharge requirements for closure of a former dry well were issued March 1994 and amended March 1996.

TableIV-6. (cont) Central Valley (Region 5, Fresno)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
	Western Farm Service, Delano Facility	DDT, Toxaphene, Dinoseb, Dicamba	Assessment on-going, impacted soils are in process of being capped.
	Dick Garriott Crop Dusting, Bakersfield	Chlordane, DDE, DDT, PCNB, Endosulfan I & II, Methoxychlor, Carbofuran, Carbaryl, Bufencarb, DEF, Tedion, Diazinon, Chlorpyrifos, Ethyl Parathion, Diuron, Dinoseb, Dicamba	CAO issued in 1993. TPCA site. Hydrogeological Assessment Report completed in 1993. Work in progress to determine extent of groundwater degradation. Additional groundwater monitoring wells proposed to determine extent of degradation. Title 27 cap also proposed.
	USDA, Shafter	Dichlobenil, EPTC, Prometryne, DDT, DDE, DDD, Dieldrin, Toxaphene, Silvex, PCP, Chlorpropham, Ametryn, Atrazine	Developing a closure plan. Soil remediation and dry well abandonment were requested in 1996 but have not been completed.
	Brown and Bryant, Inc., Shafter	EDB, DBCP, Chlordane, DDD, DDE, DDT, Dieldrin, Endrin, Heptachlor, Toxaphene	State Superfund site. Contamination assessment ongoing.
	Kern County Wells	DBCP, 1,2-D, EDB	Pesticides detected in 57 wells (AB 1803 sampling). No assessment underway.
Madera	Chowchilla Municipal Airport	Dieldrin, Alpha-BHC, Endosulfan, PCNB, DDT, DDE, Lindane	Contamination assessment needed.
	Madera County Wells	DBCP, 1,2-D, EDB	DBCP detected in two wells (AB 1803 sampling). No assessment underway.
	Western Farm Service, Inc., Madera Facility	Dinoseb, DBCP, Dieldrin	Assessment ongoing. Impoundment closed. Impacted soils have been capped.
	Madera Municipal Airport	DDT, DDE, Toxaphene, Dicofol, Endrin	Soil and ground water investigation underway. Impacted soils have been capped.
Kings	Lemoore N.A.S.	Unspecified	Investigation ongoing.
	Blair Field	2,4-D, Dicofol,Diazinon,Propargite	Assessment needed.
	Blair Aviation	Trifluralin, Mevinphos, Phorate	Contamination assessment needed.
	Lakeland Dusters	DDT, Toxaphene	Contaminated soils excavated and stockpiled on site. Remediation underway.
Tulare	Mefford Field, City of Tulare	p,p'-DDT, p,p'-DDE, 2,4,5-TCP, Dicamba, DNBP, Diuron	Contamination assessment and mitigation reports needed.
	Tulare Airport	2,4-D, DNBP	Assessment needed.

TableIV-6. (cont) Central Valley (Region 5, Fresno)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
	Kaweah Crop Dusters	DDT, 2,4-D, 2,4,5-T, Methoxychlor	DHS Remedial Action Order issued January 1984. Cleanup ongoing.
	Tulare County Wells	1,2-D	Detected in wells through AB 1803 sampling. No assessment underway.

Table IV-7. Actions Taken By the Regional Water Quality Control Board, Lahontan (Region 6), FY 2000-2001

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
El Dorado	Tahoe Paradise Golf Course	PCNB	Last tested on 5/23/97 and was non-detect at a detection limit of 0.02 mcg/l.
	Lake Valley State Recreation Area Golf Course	2,4 D, Dicamba, MCPP	All were tested, last on 11/5/97, and all were non-detect at detection limits of 1.6, 0.32, and 150 mcg/l respectively.
	Tahoe Keys Lagoon and Marina	Endothall, Floridone, Triclopyr	The Tahoe Keys Property Owners Association (TKPOA) intends to use these aquatic pesticides for the control of Eurasian watermilfoil in the lagoon and marina. As application is currently proposed, staff will recommend at the January 2002 regular Lahontan Regional Board meeting that the TKPOA request be denied.
Inyo	Haiwee Reservoir	Copper sulfate	In response to fish kills that may be related to the algaecide application, potential for ground and surface water contamination will be evaluated through a chronic toxicity study as required by a Cleanup and Abatement Order. Most recent fish kill occurred in June 1998. A TMDL is under development for copper in this reservoir, scheduled for completion in 2002.
Placer	Resort at Squaw Creek	Triclopyr	One time test application of triclopyr currently is underway. Monitoring will assess effectiveness of product and any potential impact on ground water.

Table IV-7. (cont) Lahontan (Region 6)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
San Bernardino	George Air Force Base	Dieldrin	Of the three wells sampled at the base, two wells tested positive for dieldrin (0.10 mcg/l, 0.62 mcg/l). The Air Force was asked to conduct a PA/SI to include surface soil sampling to evaluate potential sources and reasons for the continued low levels found in the ground water. Additional site assessment, including the installation of two new wells, confirmed dieldrin in ground water. Sampling continues. The Air Force is requesting additional funds. Board staff have not concurred with parcel transfer of sites with dieldrin.

Table IV-8. Actions Taken By the Regional Water Quality Control Board, Colorado River Basin (Region 7), In FY 2000-2001

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Imperial	Central Brave Agricultural Service	4,4'-DDE, Endosulfan	Recalcitrant Discharger. Referred to Attorney General for nonpayment of fees.
	City of Brawley	4,4'-DDE, Dieldrin	Contaminated soil excavated and transported to Class I facility. Site closed.
	Visco Flying Service	4,4'-DDE, 4,4'-DDD, 4,4'-DDT, Endosulfan I & II	Impoundment remediated, capped, and closed in place.
	J.R. Simplot Company, Sandin Siding Facility	Dieldrin, 4,4'-DDT, Endrin	CAO issued. Site in remediation. Risk base corrective action in-progress (site closed in 2001)
	Stoker Company	Endosulfan I & II, Dinoseb, 2,4-DB	Land treatment facility undergoing closure.
	Ross Flying Service	4,4'-DDD, 4,4'-DDE 4,4'-DDT, Dieldrin	Closure of surface impoundment.
Riverside	West Coast Flying	Endosulfan I & II, Disulfoton	Recalcitrant discharger. Referred to Attorney General for nonpayment of fees.
	Woten Aviation Services	Disyston, DEF, Ethyl Parathion, Methyl Parathion	CAO issued. U.S. EPA has lead in cleanup.
	Foster Gardner, Inc., Coachella Facility	1,2-Dichloroethane, 1,2-D, Ethylene Dibromide	CAO issued October 1991 by RWQCB. Imminent and Substantial Endangerment Order issued by DTSC on August 21, 1992. Cleanup on going.

Table IV-8. Colorado River Basin (Region 7)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
	Farmers Aerial Service, Inc.	4,4'-DDE, Endosulfan I	Closure of disposal area.
	Coachella Valley Mosquito Abatement District	DDT	Under investigation. Pesticide contamination insignificant, UST Cleanup only. (site closed in 2001)
	Crop Production Services, Blythe (Formerly Pure Gro MW-24)	1,2-Dichloropropane	Undergoing cleanup.

Table IV-9. Actions Taken By the Regional Water Quality Control Board, Santa Ana (Region 8), In FY 2000-2001.

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Orange	Great Lakes Chemical Corporation (formerly Great Western Savings), Irvine	1,2-D, EDB, 1,2-DCE	A new NPDES permit was issued August 25, 2000. On-site full-scale multi-phase vacuum extraction system is continuing. GLCC was issued a CAO by RWQCB on 4/17/97 for off-site remediation of impacted groundwater. GLCC is operating an off-site groundwater extraction and treatment system since February 2000
Riverside	Sunnymead Mutual Water Company (North and South Well)	DBCP	Both wells were sold to Eastern Municipal Water District in February 1991. Customers are being served by the new District from other supply sources. North Well has been completely rehabilitated. South Well will be used for emergency purposes only.
	Arlington Basin	DBCP	Construction of a 7-MGD reverse osmosis plant with partial flow through a GAC unit for treatment of TDS, NO_3 and DBCP was completed in September 1990. About 1.0 MGD of groundwater is treated and 0.5 MGD is bypassed. Treated water is mixed with the bypassed water and discharged to the Arlington Channel for ground water recharge purposes by the Orange County Water District. Salt brine (0.2 MGD) is discharged to the Santa Ana Regional Interceptor, which discharges to the ocean via the Orange County Sanitation District. A second parallel transmission line has been completed to bring extracted groundwater from three wells to the reverse osmosis unit. Possible sale of this water to Cities of Norco and Jurupa in near future.
	City of Corona (Well 8, mun.)	Simazine	Well has been completely rehabilitated. Simazine was not detected in the sampling after rehabilitation work. No further action being taken. Trace of TCE has been detected in recent sampling. No further action being taken.

Table IV-9. (cont) Santa Ana (Region 8)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
	Home Gardens County Water District (Wells 2 & 3, mun.)	DBCP, Simazine	Water purveyor has closed these wells and is now purchasing water from the City of Riverside.
	City of Riverside, Twin Spring, mun.	DBCP	Well is out of service. Mitigation measures are being considered.
	City of Corona (Well 17, mun.)	Simazine, DBCP	Well is being used. Trace of DBCP was detected in March 1991 sampling. Trace of TCE has been detected in recent sampling.
	City of Riverside (Russell "B", mun.)	Simazine, DBCP	Water is being blended with other supply wells in the area. Mitigation measures are being considered for summer of 2002
	City of Riverside (Garner "B", mun.)	DBCP	Water is being blended with other supply wells in the area. Mitigation measures are being considered for summer of 2002
	City of Riverside (Russell "C", mun)	DBCP	Water is being blended with other supply wells in the area Mitigation measures are being considered for summer of 2002
	City of Riverside (1st Street)	DBCP	Well is not being used due to high concentrations of DBCP. No mitigation measures in effect.
	City of Riverside (Electric Street, mun.)	DBCP	Well water is being blended with water from other supply wells. Mitigation measures are being considered for summer of 2002
	City of Riverside (Palmyrita, mun.)	DBCP	Well is not being used due to high concentrations of DBCP. Mitigation measures are being considered. for summer of 2002
	City of Riverside (3 wells, mun.)	DBCP	Water from Hunt Wells No. 6, 10, and 11 is being blended with other wells in the area.
	City of Riverside (3 wells, emergency, Downtown Riverside)	DBCP	No mitigation measures in effect. These three wells are also contaminated with industrial organic solvents.
	Riverside County Hall Of Records, (pr)	DBCP	No mitigation measures in effect. Volatile organic chemicals such as TCE and PCE have also been found. Well is used for emergency purposes only.
	Loma Linda University, Arlington, (Wells 1 & 2, mun.)	DBCP	The University water supply system is tied into the City of Riverside domestic water supply distribution system. These two wells are used for irrigation purposes at the school.
Riverside	City of Riverside (Moor-Griffith, mun.)	DBCP	Well is out of service. Mitigation measures are being considered. Mitigation measures are being considered for summer of 2002
	Lake Hemet MWD (Wells A and B, mun.)	DBCP	Well "A" is being used for irrigation purposes by the District. Well "B" is being used by a local farmer for irrigation purposes.

Table IV-9. (cont) Santa Ana (Region 8)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
San Bernardino	Victoria Farms MWC (Well 01 & 03, mun.)	DBCP	Water purveyor has closed these wells and is now purchasing water from the City of San Bernardino.
	Gage System Wells (16 wells, mun.)	DBCP	The City of Riverside and the Gage Canal Company operate the Gage System, which consists of fifteen wells located along the Santa Ana River. These wells are being blended for domestic use. Trace amounts of radon have been detected in some of these wells. The City installed three deep wells in the area to increase blending capacity. Two GAC treatment systems (total of six wells) have been in operation since February 2000 for removal of VOCs and DBCP. Additional GAC system have been designed for treatment of groundwater (total of three wells). These units are located at the leading edge of an existing TCE plume.
	Bunker Hill Basin: Crafton/Redlands area (36 wells)	DBCP	The City of Redlands started construction of a 8.5-MGD granular activated carbon (GAC) treatment system in September 1991. This GAC system treats ground water from two wells. Treated water is being put into the local water supply distribution system. Funding for this system is from the SWRCB ($2.8 million) and bond money through the State Expenditure Plan ($1.9 million) which is managed by DTSC. The system has been off line since July 1997 due to presence of perchlorate above provisional Action Level in both production wells. Lockheed Martin has agreed to pay $3.7 million for the cleanup of groundwater supplies that the City has been conducting since 1985.
	South San Bernardino Company Water District (4 wells, mun.)	DBCP	All four wells are out of service. The City of San Bernardino Water Department purchased the water district in July 1991. The City now supplies all the customers in the area.
	Cucamonga CWD (4 wells, mun.)	DBCP	Well No. 13 has not been used since 1991. The other three wells are standby wells and are used on a limited basis. Water is being purchased from Metropolitan Water District (MWD).
	Monte Vista CWD (3 wells, mun.)	DBCP	All three wells are on standby status. Water is being purchased from MWD.
	City of Upland (14 wells)	DBCP	Seven wells are out of operation. Three wells are currently on standby. Four wells are being used and are being blended with other supply wells.
	City of Loma Linda (6 wells, mun.)	DBCP	Two wells have been abandoned. One well is out of operation due to high nitrates. The City also purchases treated water from the City of San Bernardino. Three new deep wells have been on line this year.

Table IV-10. Actions Taken By The Regional Water Quality Control Board, San Diego (Region 9), In FY 2000-2001

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)	This backup drinking water well is located in the San Luis Rey River Valley. Up to 2.3 ppm has been detected in this well. The City of Oceanside is continuing monitoring of this well and reports to the State's DHS.
	Truly Nolen Exterminating, Inc.	Aldrin, Dieldrin, Chlordane	This is an on-site abandoned well which allegedly received pesticide wastes several years ago. Contaminated soil has been removed. Trace levels still exist in ground water. No further monitoring required. (RWQCB lead)