SAMPLING FOR PESTICIDE RESIDUES IN CALIFORNIA WELL WATER

2004 Update of the Well Inventory Database

For Sampling Results Reported From July 1, 2003 through June 30, 2004

Nineteenth Annual Report to
the Legislature,
Department of Health Services,
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 2004

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California Department of Pesticide Regulation

Arnold Schwarzenegger, Governor

Alan Lloyd, Ph.D., Secretary
California Environmental Protection Agency

Mary-Ann Warmerdam, Director
Department of Pesticide Regulation

For additional copies contact:
California Department of Pesticide Regulation
Environmental Monitoring Branch
P.O. Box 4015
Sacramento, California 95812
(916) 324-4100
It is also available on DPR's web site
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by
DPR portion:
J. Schuette, J. Troiano, M. Pepple and J. Dias
SWRCB Portion: Staff

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

EH04-04

EXECUTIVE SUMMARY

The Pesticide Contamination Prevention Act

The Pesticide Contamination Prevention Act (PCPA), enacted in 1985, provides mechanisms that strengthen the Department of Pesticide Regulation's (DPR's) regulatory authority to prevent ground water contamination and to respond to detections of pesticide residues in ground water. The PCPA requires:

1. DPR to maintain a statewide database of wells sampled for pesticide active ingredients (AIs).
2. State and local agencies to submit results of well sampling for AIs to DPR.
3. DPR, in consultation with the California Department of Health Services (DHS) and the State Water Resources Control Board (SWRCB), to provide an annual report of the data contained in the database and actions taken to prevent pesticide contamination to the Legislature, SWRCB, DHS, and the Office of Environmental Health Hazard Assessment (OEHHA).

The Well Inventory Database

This is the nineteenth annual report, which summarizes data collected from July 1, 2003, to June 30, 2004. Data in these reports are used to:

1. Display geographic distribution of well sampling.
2. Display geographic distribution of pesticides in sampled wells.
3. Identify areas potentially vulnerable to contamination by the legal, agricultural use of pesticides
4. Design studies for future sampling.

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.

Data Summary

1. Data in this report are the result of five well sampling surveys
2. Data represent 3,757 wells in 53 counties that were sampled for 136 pesticide active ingredients and metabolites. Ninety-nine percent of the wells sampled were municipal or domestic drinking water wells.
3. Twenty-one compounds were reported with detections. Seven detections were verified in subsequent sampling.

Tables 1a and 1b provide an annual and cumulative summary of the number of wells and the number of pesticides sampled throughout California for data submitted to DPR by June 30, 2004.

Table 1a. Annual and cumulative summary of the number of wells sampled and their detection status, and the number of counties where samples were collected.

Category	Year 2004	Total[b] 1985-2004
Total **wells** sampled	3,757	22,150
Wells with no detections	3,357	17,241
Wells with detections [(a)]	400	4,909
Wells with verified detections	9	1,005
Total **counties** sampled	53	58
Counties with no detections	31	8
Counties with detections [(a)]	22	50
Counties with verified detections	2	33

(a) Includes both verified and unverified detections. Detections of pesticide residues are verified if the method of detection was unequivocal (see appendix D: verified detection) or the residues were detected in two discrete samples taken from the same well and reported within 30 days of each other using a laboratory and analytical method approved by DPR.

(b) The total represents unique wells sampled in a county where a single well with sampling data reported in more than one year is counted only once.

Table 1b. Annual and cumulative summary of the number of pesticide related compounds analyzed, the number of compounds with detections and the number of compounds where DPR determined that detections were the result of non-point source pesticide applications.

Category	Year 2004	Total[(b)] 1985-2004
Total **pesticide** related compounds analyzed	136	336
Compounds with no detections	115	228
Compounds with detections [(a)]	21	108
Compounds with verified detections	8	29
Compounds with detections in ground water as a result of non-point source pesticide applications	8 [(c)]	19 [(d)]

(a) Includes both verified and unverified detections. Detections of pesticide residues are verified if the method of detection was unequivocal (see appendix D: verified detection) or the residues were detected in two discrete samples taken from the same well and reported within 30 days of each other using a laboratory and analytical method approved by DPR.

(b) The total represents unique compounds analyzed where a single compound that had sampling data reported in more than one year is counted only once.

(c) The eight compounds are ACET, atrazine, deethyl-atrazine (DEA), diaminochlorotriazine (DACT), diuron, norflurazon, demethylnorflurazon and simazine.

(d) The 19 compounds are 1,2-D, ACET, aldicarb sulfone, aldicarb sulfoxide, atrazine, bentazon, bromacil, DBCP, DEA, DACT, diuron, EDB, norflurazon, demethylnorflurazon, prometon, simazine, metolachlor oxanilic acid metolachlor ethanesulfonic acid, alachlor oxanilic acid, alachlor ethanesulfonic acid and 2,3,5,6-trachloroterephthalic acid (TPA). See Appendix C for more information on individual compounds.

Verified Detections

Detections were verified in nine wells in two counties. Table 2 summarizes, by county and pesticide, the number of wells with verified detections. Four wells with verified detections were in Fresno County in leaching ground water protection areas (GWPAs) where residues move to ground water with water that percolates at the application site. The remaining two wells in Fresno and three wells in Tulare County were in runoff GWPAs where residues first move offsite in runoff water and then move to ground water.

Table 2. Summary of wells with verified detections of pesticide residues, by county and chemical. Results are for data reported from July 1, 2003, to June 30, 2004.

County	demethylnorflurazon	Atrazine	simazine	ACET	DACT	DEA	Norflurazon	diuron	**Total Wells**
Fresno	3[(a)]		6	5	3		3	4	6
Tulare	2[(a)]	1	3	3	1	1	2	3	3
Total Detections	5	1	9	8	4	1	5	7	9

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

Pesticide Movement to Ground Water

DPR scientists have developed the California vulnerablity model (CALVUL) to predict where pesticide contamination of ground water due to agricultural use is likely to occur. CALVUL is based on the soil types associated with sections of land where pesticides have been found in ground water. Using these soil types and depth to ground water of 70 feet or less, DPR identified one-square mile sections of land, called ground water protection areas (GWPAs), that are vulnerable to pesticide contamination. Sections of land where pesticides have already been found in ground water were also identified as GWPAs. GWPAs are classified as either runoff or leaching based on the pathway by which pesticides migrate to ground water in either hardpan or coarse soils, respectively. DPR has also developed runoff management practices and leaching management practices that can be used to minimize the migration in runoff and leaching GWPAs. The GWPAs and management practices were adopted in regulations that became effective May 27, 2004. These regulations are designed to stop movement of pesticides in areas already contaminated, and prevent contamination in other areas before it occurs.

Ground Water Protection List

The Ground Water Protection List (GWPL) is a list of pesticides having the potential to pollute ground water. It was established according to Food and Agriculture Code (FAC)

section 13145(d) and placed in section 6800 of Title 3 of the California Code of Regulations (3CCR). The GWPL is divided into sub-lists (a) and (b). Section 6800(a) is comprised of chemicals detected in soil or ground water as a result of legal, agricultural use. Section 6800(b) includes chemicals that exceed certain specific numerical values and (1) are intended to be applied to or injected into the soil by ground-based application equipment or by chemigation; or (2) where the pesticide labels recommend or require their application to be followed, within 72 hours, by flood or furrow irrigation. To determine whether the pesticides listed in 6800(b) have migrated to ground water, DPR is required to monitor ground water for them.

In 2003, DPR completed a GWPL monitoring survey for imidacloprid, including three metabolites (the urea degradate, the guanidine-olefin degradate and the guanidine degradate). Thirty-three wells were sampled in six counties during October and November 2003. No residues of imidacloprid or its metabolites were detected in any of the wells.

Monitoring Temporal Changes in Concentrations of Detected Herbicides and Their Degradates

DPR has established a network of wells containing herbicide residues. These wells are being monitored to determine whether concentrations change over time.

Chemigation Initiative

Chemigation is the application of pesticides through irrigation systems. As part of the U.S. EPA's Label Improvement Program, the labels of pesticides that are chemigated must include specific instructions for use of backflow prevention devices to protect a water source injected with pesticides. In fiscal year (FY) 1999-2000, DPR staff analyzed state regulations as they pertain to label language. From that analysis, DPR issued policy letters to the County Agricultural Commissioners (CACs) clarifying the enforcement of the label instructions, which supersede DPR's backflow regulations.

Since 2001, the Center for Irrigation Technology, California State University Fresno (CIT) and DPR have provided 88 training sessions (seven of which were field inspections) in 27 counties to growers, irrigation dealers, pest control applicators, CAC and DPR Enforcement staff. Additionally, DPR has worked with CIT to form a task force to evaluate the need for further educational and regulatory action on chemigation applications.

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 IV of this report.

PREFACE

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

This report presents data reported to DPR from July 1, 2003, to June 30, 2004. This is the nineteenth annual report.

The PCPA requires that the annual report give the location of wells for which sampling results were reported. Privacy and security concerns and the large number of wells sampled prevent DPR from listing exact well locations. Instead their 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 product.

TABLE OF ACRONYMS AND ABBREVIATIONS

1,2-D	1,2-Dichloropropane (Propylene Dichloride)
3CCR	Title 3 or the California Code of Regulations
ACET	(Deethyl-Simazine Or Deisopropyl-Atrazine)
AI(s)	active ingredient (s)
CAC	County Agricultural Commissioner
CALVUL	California Vulnerability Model
DHS	California Department of Health Services
CIT	Center for Irrigation Technology
DACT	diaminochlorotriazine
DBCP	1,2-dibromo-3-chloropropane
DEA	deethyl-atrazine
DPR	Department of Pesticide Regulation
EDB	ethylene dibromide
EM	Environmental Monitoring Branch
ETo	evapotranspiration
FAC	Food and Agriculture Code
GIS	geographical information systems
GWPA	ground water protection areas
GWPL	Ground Water Protection List
IRIS	integrated risk information system as a drinking water level
MCL	maximum contamination limit
MDL	minimum detection limit
OEHHA	Office of Environmental Health Hazard Assessment
PCPA	Pesticide Contamination Prevention Act
PDRP	Pesticide Detection Response Process
PMZ	Pesticide Management Zone
ppb	parts per billion
PREC	Pesticide Registration and Evaluation Committee
PUR	Pesticide Use Report
RWQCB	Regional Water Quality Control Board
SNARL	suggested no-adverse-response levels
SNV	specific numerical values
SWRCB	State Water Resources Control Board
TPA	2,3,5,6-tetrachloroterephthalic acid
USGS	United States Geological Survey

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I. WELL INVENTORY DATABASE

Introduction

In 1983, the Environmental Hazards Assessment Program of the California Department of Food and Agriculture, now the Environmental Monitoring Branch (EM) of the Department of Pesticide Regulation (DPR), initiated a project to collect and store data in a database called the well inventory database. The purpose was to (1) compile reliable information on the occurrence of non-point source contamination of ground water and (2) to facilitate graphical and numerical analysis of the data.

Enacted in 1985, the Pesticide Contamination Prevention Act (PCPA) required DPR to take specific actions to prevent further pesticide pollution of the ground water aquifers of the State. One action was to develop and maintain a database of wells sampled for pesticides throughout the State. State and local agencies were required to submit ground water pesticide sampling data to DPR from both point and non-point sources for inclusion in the well inventory database. Additionally, the PCPA mandated DPR to determine if ground water detections of pesticides were due to legal agricultural use, formally review the agricultural use detections to determine if continued use could be allowed, and if so, adopt regulations to modify use of the pesticide. The PCPA also requires DPR to produce an annual report for the Legislature, the Department of Health Services (DHS), the Office of Environmental Health Hazard Assessment (OEHHA) and the State Water Resources Control Board (SWRCB) of pesticide data collected and actions taken by the Director of DPR and the SWRCB to prevent pesticides from migrating to ground water [Food and Agricultural Code (FAC) section 13152(e)].

This is the nineteenth annual report, which summarizes data collected from July 1, 2003, to June 30, 2004. Two of these annual reports, one in 1992 and the other in 2003, are cumulative reports, summarizing the entire contents of the database. The data in the well inventory database that has been summarized in these reports are used to:

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

The first section of the report describes specific criteria that DPR requires before data can be entered into the database and the limitations of how the data can be interpreted, and provides a summary of the well inventory data collected from July 1, 2003, to June 30, 2004. The summary tables are organized to highlight verified detections, which are the only detections that serve a regulatory purpose (memo from Weaver D. to Goh K., January 1995). The second section provides a summary of the factors involved in the movement of pesticides to ground water and

describes specific management practices that help to prevent ground water contamination. The third section summarizes the actions DPR has taken to prevent movement of pesticides to ground water. The fourth section is a summary of the SWRCB's and the Regional Water Quality Control Board's (RWQCB) monitoring activities.

Criteria for Evaluating Data

Minimum Data Requirements

Effective December 1, 1986, DPR, SWRCB and DHS jointly agreed on the following minimum requirements to be included as part of any pesticide data submitted to DPR:

- State well number(township/range/section/tract/sequence number/base/meridian)
- County
- Date of sample (month/day/year)
- Chemical analyzed
- Individual sample concentration, in parts per billion
- Sampling agency
- Analyzing laboratory
- Street address of well location
- Well type
- Sample type (e.g., initial or confirmation)

Interpretation Limitations

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

1. The data indicate specific pesticides and metabolites detected in well water among those pesticides for which analyses were conducted. They do not represent a complete survey of groundwater quality throughout the state nor do they represent sampling for all pesticides used.

2. Sampling by agencies other than DPR is not necessarily related to suspected agricultural non-point sources of contamination. It should not be assumed that results submitted by those agencies are an indication of which pesticides are more or less likely to reach groundwater as a result of non-point source agricultural use.

Classifying Analytical Results

Each record in the database represents a single well water sample analyzed for pesticide residue. The analytical result is classified according to the following criteria:

(1) A pesticide analysis of a well water sample is designated as a non-detection with the number zero in the concentration field, if the pesticide residue is not detected at or above the minimum detection limit (MDL) of the analytical method.

(2) Samples in which pesticide residues are detected at or above the MDL are classified into one of three categories:

a. ***Unconfirmed:*** pesticide residues detected in only one sample during a single monitoring survey.
b. ***Confirmed, unverified:*** pesticide residues detected in two discrete samples taken from a single well during a single monitoring survey.
c. ***Verified:*** confirmed and unconfirmed detections are verified if they meet the criteria specified in (FAC section 13149[d]), which requires that either the analytical method provides unequivocal identification of a chemical as approved by DPR or that the detection is verified within 30 days by a second analytical method or a second analytical laboratory approved by DPR. Criteria have been set by DPR (Biermann, 1989, 1996) for determining if the detection of a pesticide or its degradation product(s) meets the standards of section 13149[d]. A confirmed or unconfirmed detection may not be verified for the following reasons:
    i. "Follow-up sampling has not yet been completed by DPR." This means that at the cutoff date for the preparation of the well inventory report (usually 6-10 months before the release of the report) verification had not yet been completed for the active ingredient.
    ii. "Sampling was not conducted by DPR" because the detection occurred in a GWPA and the compound detected was on the 6800(a) list of known ground water contaminants. Regulations for 6800(a) compounds already exists in these areas making it unnecessary to verify additional reported detections.
    iii. "The detection may have been referred to SWRCB" because the pesticide is not registered for agricultural use, or for any use in California or may have been due to a point source and thus under the jurisdiction of a local regional water quality control board.
    iv. "There may be no wells available for sampling." The original well is not available for sampling because it has been destroyed (the standard term for sealing and closing a well), or is no longer functioning as a well. In addition, the original well may have been a monitoring well, usually reported by the U.S. Geological Survey (USGS), and there are no other wells within a four-section area available for sampling. Since monitoring wells require special equipment for sampling, they are not sampled by DPR unless there are other wells within a four-section area that can be sampled to help determine whether residues are due to legal agricultural use.
    v. "Permission to sample could not be obtained from the well owner or manager." Historically, DPR has only sampled wells with the permission of the well owner. Therefore, if a well has been sampled and the owner decides not to permit additional sampling, DPR would

not be able to verify any reported detection in that well. Well owners rarely deny DPR permission to sample a well.

vi. "The detection reported by another agency was below 80 percent of the current MDL established by the California Department of Food and Agriculture (CDFA) laboratory ." Some reports of pesticide residue detections are at levels far below the MDL obtainable by laboratories approved by DPR. Any attempt to verify these detections by DPR would be futile. Verifying these detections would be reconsidered if the CDFA laboratory's MDL is set lower.

vii. "DPR conducted sampling in response to a detection and did not detect the compound under investigation." This means that DPR was unable to verify the presence of the pesticide in the well as a result of analysis of a back-up sample or a subsequent sample taken.

A verified detection is the only type of detection that DPR uses for the basis of regulatory action.

Summary of Data

(1) Data are the result of five well sampling surveys
(2) Data represent 3,757 wells in 53 counties that were sampled for 136 pesticide active ingredients and metabolites. Ninety-nine percent of the wells sampled were municipal or domestic drinking water wells.
(3) Twenty-one compounds were reported with detections. eight of these were verified detections.

Table I-1a and I-1b provide an annual and cumulative summary of the number of wells and the number of pesticides sampled throughout California for data submitted to DPR by June 30, 2004.

Table I-1a. Annual and cumulative summary of the number of wells sampled and their detection status, and the number of counties where samples were collected.

Category	Year 2004	Total[(b)] 1985-2004
Total **wells** sampled	3,757	22,150
Wells with no detections	3,357	17,241
Wells with detections [(a)]	400	4,909
Wells with verified detections	9	1,005
Total **counties** sampled	53	58
Counties with no detections	31	8
Counties with detections [(a)]	22	50
Counties with verified detections	2	33

(a) Includes both verified and unverified detections. Detections of pesticide residues are verified if the method of detection was unequivocal (see appendix D: verified detection) or the residues were detected in two discrete samples taken from the same well and reported within 30 days of each other using a laboratory and analytical method approved by DPR.

(b) The total represents unique wells sampled in a county where a single well with sampling data reported in more than one year is counted only once.

Table I-1b. Annual and cumulative summary of the number of pesticide related compounds analyzed, the number of compounds with detections and the number of compounds where DPR determined that detections were the result of non-point source pesticide applications.

Category	Year 2004	Total[(b)] 1985-2004
Total **pesticide** related compounds analyzed	136	336
Compounds with no detections	115	228
Compounds with detections [(a)]	21	108
Compounds with verified detections	8	29
Compounds with detections in ground water as a result of non-point source pesticide applications	8 [(c)]	19 [(d)]

(a) Includes both verified and unverified detections. Detections of pesticide residues are verified if the method of detection was unequivocal (see appendix D: verified detection) or the residues were detected in two discrete samples taken from the same well and reported within 30 days of each other using a laboratory and analytical method approved by DPR.

(b) The total represents unique compounds analyzed where a single compound that had sampling data reported in more than one year is counted only once.

(c) The eight compounds are ACET, atrazine, deethyl-atrazine (DEA), diaminochlorotriazine (DACT), diuron, norflurazon, demethylnorflurazon and simazine.

(d) The 19 compounds are 1,2-D, ACET, aldicarb sulfone, aldicarb sulfoxide, atrazine, bentazon, bromacil, DBCP, DEA, DACT, diuron, EDB, norflurazon, demethylnorflurazon, prometon, simazine, metolachlor oxanilic acid metolachlor ethanesulfonic acid, alachlor oxanilic acid, alachlor ethanesulfonic acid and 2,3,5,6-trachloroterephthalic acid (TPA). See Appendix C for more information on individual compounds.

Results by Reporting Agency

The results of five well sampling surveys were reported to DPR and added to the well inventory database from July 1, 2003, to June 30, 2004. Four of the surveys were conducted in 2003. The fifth survey, reported by USGS, was conducted in October, 2001. The data represent 3,757 wells in 53 counties that were sampled for 136 pesticide active ingredients and metabolites. Table I-2 summarizes the data added to the database by sampling agency. Appendix B provides greater detail of the five studies.

Ninety-nine percent of these wells were public or private drinking water wells. The other wells were non-drinking water or unused, or the well type was unknown.

Table I-2. Summary of records in the well inventory database, by agency, for the reporting period July 1, 2003, to June 30, 2004.

Sampling Agency	Wells	Counties	Chemicals Analyzed	Samples with Detections	Wells with Detections	Records Added to Database
DHS	3,714	53	122	1,891	391	149,337
USGS	5	2	20	26	5	100
DPR	39	7	16	14	4	561

Results by County

The number of wells sampled in each county varied widely, from 670 wells in Los Angeles County to one well in Sierra, Trinity, Modoc and Del Norte counties. There were no data reported for five counties, Alpine, Lassen, Plumas, San Francisco and Tehama. Table I-3 summarizes, by county, the number of pesticide active ingredients or metabolites analyzed, the number of wells sampled, and the number of wells with verified and unverified detections. Appendix A lists specific compounds that were sampled in each county and identifies the number of wells sampled and the number of wells with reported detections for each compound reported from July 1, 2003, to June 30, 2004.

Table I-3. Summary, by county, of the number of pesticide active ingredients or metabolites analyzed, the number of wells sampled, and the number of wells with unverified and verified detections. Wells may have both unverified and verified detections. Results are for data reported from July 1, 2003, to June 30, 2004.

County	Number of Pesticides Sampled	Number of Wells Sampled	Wells with Unverified Detections	Wells with Verified Detections
Fresno	65	202	92	6
Tulare	64	199	51	3
Kern	81	376	70	0
San Bernardino	63	371	56	0
Stanislaus	66	115	31	0

County	Number of Pesticides Sampled	Number of Wells Sampled	Wells with Unverified Detections	Wells with Verified Detections
Riverside	63	200	22	0
San Joaquin	67	90	20	0
Los Angeles	88	670	16	0
Merced	30	49	14	0
Monterey	73	122	4	0
Sacramento	74	183	3	0
Sonoma	85	88	2	0
Butte	27	66	2	0
San Diego	81	55	2	0
Madera	78	29	2	0
Sutter	24	13	2	0
Kings	17	12	2	0
Orange	82	229	1	0
Santa Clara	67	152	1	0
Yuba	27	22	1	0
San Mateo	72	21	1	0
Contra Costa	85	9	1	0
Santa Cruz	74	26	0	0
Mendocino	73	22	0	0
Lake	72	17	0	0
Solano	67	24	0	0
Yolo	66	38	0	0
Alameda	65	28	0	0
Placer	65	10	0	0
Nevada	61	9	0	0
Ventura	61	37	0	0
San Luis Obispo	59	69	0	0
Santa Barbara	59	66	0	0
El Dorado	58	28	0	0
Humboldt	57	4	0	0
Mono	56	3	0	0
San Benito	56	13	0	0
Mariposa	47	9	0	0
Tuolumne	45	25	0	0
Napa	43	8	0	0
Calaveras	24	3	0	0
Inyo	20	3	0	0
Amador	19	3	0	0
Shasta	13	8	0	0
Sierra	12	1	0	0
Colusa	11	4	0	0
Glenn	11	12	0	0
Imperial	11	5	0	0
Marin	11	4	0	0

County	Number of Pesticides Sampled	Number of Wells Sampled	Wells with Unverified Detections	Wells with Verified Detections
Siskiyou	10	2	0	0
Trinity	10	1	0	0
Modoc	6	1	0	0
Del Norte	1	1	0	0

Results by Pesticide

Sampling results from July 1, 2003, to June 30, 2004, were reported for 136 pesticide active ingredients (AIs) and the metabolites of AIs. Among the 21 detected compounds, eight were verified detections. All verified detections were of AIs on the 6800(a) list of pesticides that contaminate ground water, or their metabolites. Verified detections were the result of sampling conducted by the USGS and DPR (see Appendix B for a detailed summary of these studies). Table I-4 provides a summary by pesticide active ingredients or metabolites of the number of counties where wells were sampled, the number of wells sampled, and the number of wells that had verified and unverified detections. Most wells were sampled for more than one compound.

Table I-4. Summary, by pesticide active ingredients or their metabolites, of the number of counties where wells were sampled, the number of wells sampled and the 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, 2003, to June 30, 2004

Chemical	Number of Counties Sampled	Number of Wells Sampled	Wells with Unverified Detections	Wells with Verified Detections
Simazine	42	1,650	0	9
ACET	7	44	0	8
Diuron	22	231	2	7
Norflurazon	7	44	0	5
DACT	7	39	0	4
Deethyl-Atrazine	7	44	0	1
Atrazine	41	1,647	0	1
DBCP	34	1,774	315	0
Acenaphthene	9	153	25	0
Aldrin	34	870	23	0
Aldicarb Sulfone	33	645	17	0
Ethylene Dibromide	35	1,705	17	0
Chloromethane (Methyl Chloride)	50	2,762	14	0
Dacthal Acid Metabolites	4	32	13	0
1,2-Dichloropropane	51	2,779	9	0
Demethylnorflurazon	2	5	5	0
Benzene (Benzol)	51	2,781	4	0
Naphthalene	48	2,158	1	0
Xylene	51	2,668	1	0

Chemical	Number of Counties Sampled	Number of Wells Sampled	Wells with Unverified Detections	Wells with Verified Detections
1,1,2,2-Tetrachloroethane	51	2,718	1	0
Methyl Bromide (Bromomethane)	50	2,763	1	0
Ortho-Dichlorobenzene	51	2,771	0	0
Trichlorobenzenes	50	2,762	0	0
1,2,4-Trichlorobenzene	51	2,753	0	0
1,2-D + 1,3-D + C-3 Compounds	50	2,749	0	0
Molinate	41	1,762	0	0
Thiobencarb	39	1,417	0	0
Alachlor	37	1,350	0	0
Bromacil	39	1,310	0	0
Metolachlor	39	1,242	0	0
Butachlor	39	1,228	0	0
Prometryn	39	1,166	0	0
Propachlor	38	1,160	0	0
Metribuzin	39	1,087	0	0
Dimethoate	39	995	0	0
Hexachlorobenzene	34	927	0	0
Methoxychlor	34	925	0	0
Lindan (Gamma-Bhc)	34	922	0	0
Endrin	34	919	0	0
DDE	34	918	0	0
Heptachlor Epoxide	34	907	0	0
Heptachlor	34	891	0	0
Picloram	34	891	0	0
Dalapon	34	888	0	0
Dinoseb	34	887	0	0
2,4,5-TP	34	885	0	0
Bentazon, Sodium Salt	34	883	0	0
2,4-D	35	881	0	0
Dicamba	34	851	0	0
Dieldrin	34	840	0	0
Glyphosate, Isopropylamine Salt	29	804	0	0
Diazinon	37	785	0	0
Diquat Dibromide	33	778	0	0
Acetochlor	28	735	0	0
Oxamyl	33	703	0	0
EPTC	34	699	0	0
Chlordane	34	690	0	0
Toxaphene	34	690	0	0
Carbofuran	34	686	0	0
Endothall	31	655	0	0
Chlorothalonil	31	640	0	0
Aldicarb Sulfoxide	33	631	0	0
Aldicarb	33	630	0	0
Carbaryl	33	625	0	0

Chemical	Number of Counties Sampled	Number of Wells Sampled	Wells with Unverified Detections	Wells with Verified Detections
Methomyl	33	621	0	0
3-Hydroxycarbofuran	33	613	0	0
Chlorthal-Dimethyl Acid Metabolites	29	567	0	0
1,3-Dichloropropene (1,3-D, Telone)	18	549	0	0
Terbacil	28	519	0	0
DDT	12	347	0	0
2,4,5-T	28	337	0	0
2,3,7,8-TCDD (Dioxin)	25	332	0	0
BHC (Other Than Gamma Isomer)	6	258	0	0
DDD	7	241	0	0
Endosulfan	7	240	0	0
Endosulfan Sulfate	7	239	0	0
Endrin Aldehyde	6	236	0	0
4(2,4-DB), Dimethylamine Salt	17	163	0	0
Methiocarb	16	161	0	0
Prometon	15	148	0	0
Trifluralin	14	139	0	0
Carbon Disulfide	11	133	0	0
Propazine	11	128	0	0
Acifluorfen, Sodium Salt	9	125	0	0
Paraquat Dichloride	3	122	0	0
Dichlorprop, Butoxyethanol Ester	7	98	0	0
Propoxur	13	64	0	0
Malathion	2	60	0	0
Parathion or Ethyl Parathion	2	60	0	0
Methyl Parathion	1	59	0	0
Hexazinone	10	52	0	0
Imidacloprid	6	33	0	0
Imidacloprid Guanidine	6	33	0	0
Imidacloprid Olefin	6	33	0	0
Imidacloprid Olefinic-Guanidine	6	33	0	0
Imidacloprid Urea	6	33	0	0
Disulfoton	6	32	0	0
Terbutryn	5	32	0	0
2,4,6-Trichlorophenol	3	19	0	0
Atraton	2	19	0	0
Fonofos (Dyfonate)	2	18	0	0
Secbumeton	1	18	0	0
Chlorobenzilate	5	17	0	0
Chloroneb	5	17	0	0
Permethrin	4	16	0	0
Permethrin, Other Related	3	15	0	0
Ametryne	4	14	0	0
Butylate	4	14	0	0

Chemical	Number of Counties Sampled	Number of Wells Sampled	Wells with Unverified Detections	Wells with Verified Detections
Chlorpropham	4	14	0	0
Cycloate	4	14	0	0
DDVP (Dichlorvos)	4	14	0	0
Diphenamid	4	14	0	0
Napropamide	4	14	0	0
Simetryn	4	14	0	0
Triadimefon	4	14	0	0
Vernolate	4	14	0	0
Demeton	3	13	0	0
Fenamiphos	3	13	0	0
Merphos	3	13	0	0
Tebuthiuron	3	13	0	0
Tetrachlorvinphos (Stirofos)	3	13	0	0
Acrolein	2	9	0	0
Linuron	4	8	0	0
Chloramben	3	6	0	0
Cyanazine	3	6	0	0
Pendimethalin	3	6	0	0
(S)-Metolachlor	2	5	0	0
Fluometuron	2	5	0	0
Glufosinate-Ammonium	2	5	0	0
Propanil	2	5	0	0
2,4-Dinitrophenol	2	3	0	0
Acrylonitrile	2	3	0	0
Chlorpyrifos	2	2	0	0
Benefin (Benfluralin)	1	1	0	0
Oryzalin	1	1	0	0
Pentachloronitrobenzene (PCNB)	1	1	0	0

Status of Pesticides with Verified Detections

Detections were verified in nine wells in two counties. Table I-5 summarizes, by county and pesticide, the number of wells with verified detections. Four wells with verified detections were located in Fresno County in leaching ground water protection areas (GWPA) where residues move to ground water with water that percolates at the application site. The remaining two wells in Fresno County and three wells in Tulare County were in runoff GWPAs where residues first move offsite in runoff water and then move to ground water.

Residues of demethylnorflurazon, a metabolite of norflurazon, were detected for the first time in Fresno and Tulare counties. These detections occurred during a USGS survey where DPR requested USGS to sample five wells with known norflurazon contamination. These wells were part of a 70-well network sampled annually by DPR. DPR's laboratory has since developed a

method to analyze for demethlynorflurazon and will do so for future samples collected during DPR's ground water surveys.

Table I-5. Summary, by county and pesticide, of the number of wells with verified detections. Results are for data reported from July 1, 2003, to June 30, 2004.

County	demethylnorflurazon	Atrazine	simazine	ACET	DACT	DEA	Norflurazon	diuron	**Total Wells**
Fresno	3[(a)]		6	5	3		3	4	6
Tulare	2[(a)]	1	3	3	1	1	2	3	3
Total Detections	5	1	9	8	4	1	5	7	9

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

The tables below are a summary of the year's major uses and total pounds applied in California for the AI of the pesticide which had verified detections of the parent compound or its metabolite. The 2003 pesticide use information was not available when this report was written. The pesticide use information presented in the following tables was obtained from the 2002 pesticide use report (PUR).

Atrazine

Atrazine is a selective herbicide. Atrazine was reviewed through the Pesticide Detection Response Process (PDRP), including review by a subcommittee of the Pesticide Registration and Evaluation Committee (PREC), pursuant to FAC sections 13149 through 13151.

The following sites represent the major uses of atrazine reported in 2002.

Site	Pounds
Forest trees, Forest lands	32,103
Corn (forage - fodder)	9,456
Sudangrass (forage - fodder)	6,811
Corn, human consumption	6,690
Lettuce, leaf (all or unspecified)	2,050
All other	6,188

Atrazine residue was detected at 0.13 ppb. DHS and U. S. EPA have established an MCL for atrazine at 1 ppb.

Simazine

Simazine is a selective herbicide. Simazine was reviewed through the PDRP, including review by a subcommittee of the PREC.

The following sites represent the major uses of simazine reported in 2002.

Site	Pounds
Orange (all or unspecified)	194,523
Grapes	126,599
Grapes, wine	121,299
Almond	58,257
Walnut	41,018
Olive (all or unspecified)	19,718
Avocado (all or unspecified)	14,956
Lemon	13,278
Peach	10,913
Nectarine	10,247
All other	26,221

Concentrations of verified detections of simazine ranged from 0.09 to 0.135, respectively. DHS and U. S. EPA have established an MCL for simazine at 4 ppb.

Diuron

Diuron is a selective herbicide and has been reviewed through the PDRP, including review by a subcommittee of the PREC.

The following sites represent the major uses of diuron reported in 2002.

Site	Pounds
Rights of Way	624,490
Alfalfa (forage - fodder)	237,849
Orange (all or unspecified)	182,805
Landscape maintenance	48,077
Walnut	34,373
Grapes, wine	28,534
Grapes	27,610
Cotton, general	21,697
Lemon	20,364
Asparagus (spears, ferns, etc.)	17,594
Olive (all or unspecified)	16,186
All other	45,348

The range of concentrations of diuron was 0.071 to 0.199 ppb. No MCL has been established for diuron. The U.S. EPA health advisory level (HAL) is 10 ppb.

Norflurazon

Norflurazon, an herbicide, was reviewed through the PDRP, including review by a subcommittee of the PREC. Norflurazon residues were verified in three wells in Fresno County and two wells in Tulare County. Concentrations of verified detections ranged from 0.05 to 0.65 ppb. There are no drinking water quality criteria for norflurazon.

The following sites represent the major uses of norflurazon reported in 2002

Site	Pounds
Almond	40,456
Alfalfa (forage - fodder)	38,310
Rights of way	24,027
Grapes	17,445
Orange (all or Unspecified)	17,354
Grapes, wine	10,278
Peach	6,472
Plum	5,979
Walnut	5,940
Nectarine	4,409
Tangerine	4,161
All Other	13,217

Status of Unverified Detections

Samples with unverified detections were either referred to SWRCB or investigated by DPR. They were referred to SWRCB for the following reasons: the pesticides were not currently registered for use; the pesticides were registered for other than agricultural, outdoor industrial, or outdoor institutional uses; or the pesticides were found in ground water, but were 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. Most detections that were reported to DPR where the pesticide product containing the AI detected was currently registered for agricultural, outdoor industrial, or outdoor institutional uses in California, would be investigated by DPR. However, there are two exceptions to this rule. DPR will not further investigate a report of a detection if the detected residue is from a compound that is listed on the 6800(a) list of known ground water contaminates and the detection occurred in a GWPA or if the detection is below 80 percent of the MDL established by a lab approved by DPR.

The status of all positive samples (verified and unverified) added to the database is summarized in Appendix C. It includes the historical range of concentrations for compounds detected in ground water and the detection levels reported during this fiscal year, from July 1, 2003, to June 30, 2004. Of the 149,998 records added to the well inventory database this year, there were 1,896 (1.3%) unverified detections from 400 wells in 22 counties for a total of 15 pesticide active ingredients or metabolites. Over 97 percent of these detections were of ten chemicals not

registered in California or not registered for agricultural use. The chemicals were 1,1,2,2,-tetrachloroethane, 1,2-dichloropropane, acenapthene, aldrin, benzene, chloromethane, DBCP, ethylene dibromide, naphthalene and xylene. These detections have been reported to SWRCB.

DHS reported detections of diuron, aldicarb sulfone and dacthal acid metabolites. DPR's investigation into these detections determine that they were either reporting errors or that follow up sampling by DHS resulted in non detections. Two additional detections reported by DHS, one of diuron in Riverside County and one of methyl bromide in Fresno County are currently being investigated by DPR.

II. PREVENTION OF PESTICIDE MOVEMENT TO GROUND WATER AS A RESULT OF LEGAL AGRICULTUAL APPLICATIONS

Discussion

Pesticides in soil gradually disappear from the site of deposition in a number of ways including photolysis; volatilization; microbial degradation; chemical degradation, such as hydrolysis; leaching; or runoff. In the event of runoff or leaching, some pesticides, usually those applied directly to soil, can move to ground water. Once ground water contamination occurs there are no known economically feasible methods to remove the pesticide residue. Therefore, the best way to protect ground water is to regulate pesticide use before contamination can occur.

The Pesticide Contamination Prevention Act requires DPR to take regulatory action to protect ground water only after a pesticide has been first detected in ground water due to legal, agricultural use. However, once a pesticide is found in ground water, the director may determine that use can be modified so that there is a high probability that the pesticide will not pollute the ground waters of the state. Initially, DPR adopted use modifications that applied only where pesticides were found in ground water because vulnerability was only associated with detections. In some cases, the detected pesticide was prohibited in vulnerable areas. The problem with prohibiting use is that users often substitute other pesticides with the same environmental fate characteristics. As a result, eventually the substituted pesticide can also move to ground water.

Over time, DPR and other agencies have sampled many wells under a variety of soil, depth-to-ground water, and climatic conditions. As this monitoring data accumulated in the well inventory database, DPR was able to begin analyzing the relationship between detections and these other factors to determine if vulnerability could be determined before contamination actually occurred. In the 1990's, DPR scientists were able to develop the California vulnerability modeling (CALVUL) approach, which was used to determine vulnerable areas in California based on soil characteristics and depth-to-ground water data. Information on the CALVUL modeling approach can be found at http://www.cdpr.ca.gov/docs/gwp/index.htm. This approach related geographical factors to areas with known ground water contamination (Troiano, et al., 1994). Each section of land for which soil and depth-to-ground water data was available was screened to determine if it fit any of the profiles that characterize vulnerable areas; in coarse, permeable soils, residues leach with water during normal percolation processes and in less permeable soils with a hardpan layer, residues are moved offsite in runoff water to sensitive sites (Braun and Hawkins, 1991). Pesticide application management practices were developed based on the predominant soils in these vulnerable areas (Troiano et al., 2000). Sections of land meeting the vulnerable profiles and for which mitigation measures were available were designated as a GWPA (Troiano, et al., 1997). DPR has identified 3,718 GWPAs as sections in coarse or hardpan soil clusters that have depth-to-ground water at 70 feet or shallower. In addition, all previous PMZs not classified by CALVUL were designated GWPAs. Effective

May 27, 2004, DPR's new regulations allow continued use of ground water contaminants if users can comply with new use restrictions (management practices) that apply inside canal and ditch banks and artificial recharge basins and GWPAs.

The following section summarizes the factors that contribute to pesticide movement to ground water and provides details of the pesticide application management practices found in regulation that will help to prevent contamination of ground water.

Factors that Contribute to Pesticide Movement to Ground Water

Pesticide Factors

The physical and chemical characteristics thought to be important in movement through soil are water solubility, soil adsorption coefficient, anaerobic and aerobic soil metabolism, hydrolysis and field dissipation. Under FAC section 13144, DPR is required to establish SNVs for these characteristics. To date, the SNVs have been established for water solubility, soil adsorption (Koc), and ½-lives for hydrolysis, aerobic and anaerobic soil metabolism by comparing the values for pesticides found in ground water to values for pesticides sampled for but not detected in ground water (Johnson 1991). When a value exceeds the SNV for water solubility or it is less than the SNV for Koc, the pesticide is considered mobile. When a value exceeds the ½-life SNVs for hydrolysis or soil metabolism, the pesticide is considered persistent. Pesticides that are both mobile and persistent are determined to have the potential to pollute ground water when they are applied directly to soil, or whose application is recommended by the label to be followed by flood or furrow irrigation within 72 hours.

Soil Characteristics

Soil characteristics that affect the movement of pesticides and subsequently the potential to contaminate ground water are:

1. The soil's water-holding and water retention properties.
2. Potential for compaction of the surface soil.
3. Soil components that bind with and retard movement of pesticide residues.
4. Presence of soil microbes that degrade pesticide residues.

Two soil properties that affect water-holding capacity are soil texture and organic carbon content. With respect to texture, water percolates to ground water much quicker in coarse-textured sandy soils than in clayey soils (Vereecken, et al., 1988). Coarse-textured soils have larger pore sizes, which allow for greater effect of gravitational forces to pull water down through the soil profile, as compared to clayey soils where the smaller pore sizes allow greater binding of water to soil particles, causing greater water retention. The organic carbon component of soil retains a large amount of water when wetted, so soils with higher organic carbon content will also have greater retention of water. Organic carbon content has been

included as a variable in equations to describe water-holding capacity of soils (Rawls and Brankensiek, 1985)

Surface soil compaction is another property that affects pesticide movement to ground water. Soils that are prone to compaction will shed water as runoff. Runoff water can contain residues of pesticides that eventually contaminate California's ground water (Braun and Hawkins, 1991). In areas prone to surface soil compaction, surface water is often collected and diverted to more porous subsurface soil to relieve potential flooding that could damage crops. In this situation, the potential for ground water contamination is high because water shunted to subsurface soil bypasses the principal soil microbial zone where most degradation of pesticide residues occurs.

Reaction of soil components with pesticide residues also affects pesticide movement through soil. Although the physical-chemical nature of a pesticide determines how likely it will interact with soil components, the amount of pesticide that reacts with soil is determined by the organic carbon content, and to a lesser extent the clay content, present in a soil (Mingelgrin and Gerstl, 1983). Numerous studies have indicated the importance of organic carbon content in sorption of pesticide residues where the amount of pesticide adsorbed per unit of soil directly increases as organic carbon content increases. Greater adsorption of pesticide residues results in less available for downward movement through the soil profile. Many soils in California are vulnerable to leaching because they are low in organic carbon content. Clay particles can be important because they react with pesticides that contain ionic charges. For example, paraquat is very polar and is highly reactive with the negative sites on the clay particles.

For pesticides that are incorporated into soil, the predominant pathway for degradation is metabolism by soil micro-flora, primarily bacteria and fungi. Thus, conditions that favor the presence and activity of soil micro-flora will also enhance degradation. For example, biological activity generally increases with increasing temperature so pesticides applied in cooler winter months will persist longer than pesticides applied in hotter summer months. Often, the soil micro-flora adapts to pesticide applications as indicated by faster rates of degradation measured after successive applications of pesticides (Suett and Jukes, 1988). Maintaining soil conditions that nurture soil microbial populations is important in ensuring fastest rates of biological degradation.

Irrigation Practices

Pesticide residues move with water that percolates into soil and eventually recharges ground water. The source of recharge water is either from natural rainfall or from irrigation used in crop production. Most areas of California experience a Mediterranean climate where significant rainfall occurs during the late fall and winter months and with very little rainfall during the rest of the year. The relative potential for downward movement of pesticide residues caused by rainfall and then by irrigation was investigated by DPR scientists in the 1980's. First, the effect

of rainfall on the movement of simazine was studied on a sandy soil in Fresno (Troiano and Garretson, 1988). Simazine was applied in November of 1987, exposed to the winter rains, and the soil cored to 10 feet in May of 1988. During that period, the site received 10 inches of natural rainfall, which also is the average rainfall in that area. Most simazine residues were confined to the first six inches of soil, indicating that the amount of percolating water produced during the winter months was not sufficient to cause significant downward movement of the residues. This is due to the pattern of rainfall where the 10 inches of water received by the experimental site was spread out over a number of months and with many rainfall events of one inch and below. In coarse textured soils, this pattern of water deposition allows for greater loss of water to evaporation rather than to percolation and thus results in limited downward movement of water and consequently pesticide residues. Similar results were observed in a rainfall study conducted in Riverside (Neal, et al., 1991).

Pesticide residues have been detected in ground water in areas with coarse-textured soils, indicating movement with water that recharges the ground water aquifer. The pattern of irrigation water applications is in stark contrast to precipitation events. Large amounts of water can be applied during each irrigation event, resulting in much larger potential losses of water to percolation. In a follow-up study, the influence of method and amount of irrigation water application was investigated on the movement of atrazine, a pre-emergent herbicide detected in ground water (Troiano, et al., 1993). This study demonstrated the effect that percolating water produced by irrigation has on downward movement of pesticide residues. Water treatments were based on a proportional measurement of reference crop evapotranspiration so that the smallest proportion produced the least amount of percolating water. There was a positive relationship between the proportioned water treatments and downward movement of atrazine; the smallest proportion produced the least amount of percolating water and the least downward movement of atrazine residues whereas the largest proportion produced the greatest downward movement of water and atrazine. Although this relationship was similar for different methods of irrigation water, the exact method of irrigation further affected the magnitude of atrazine leaching. For example, sprinkler irrigation was more effective than basin-flooding irrigation in limiting the downward movement of water and, subsequently, atrazine residues. Leaching was less in sprinkler applications because water could be applied more frequently in smaller applications than for the basin-flooding method. For basin-flooding treatments, a large amount of water application was required for each irrigation in order to provide application across the plot. Although irrigations were less frequent, the larger water volume caused greater downward movement of water and atrazine residues.

Climate

Another important contributing factor is regional climate, such as precipitation. In Del Norte County, the average annual rainfall is about 75 inches. One study, conducted in this region to determine downward movement of the pesticide fenamiphos attributed heavy rainfall to

fenamiphos residue moving well below the zone of application (Weaver, et al., 1988). Forty-two inches of rain fell between the time fenamiphos was applied in October and the first soil cores were collected in March. Another study used parameters from the Smith River Plains area in Del Norte County to input information into a computer model to simulate subsurface migration of a number of pesticides (Warner, et al., 1989). Concentrations of fenamiphos measured in the field study were compared with simulated concentrations generated from the computer model. Graphs of the measured and simulated values matched closely. In one particular simulation, staggering the application date of the pesticide by fifteen days resulted in the pesticide migrating deeper for all three years of the simulation. The difference in simulations was attributed to how closely the application date coincided with precipitation.

In another region, an opposite effect was observed in a study of the effect of winter rainfall on the movement of simazine in Fresno (Troiano and Garretson, 1988). In that study, the amount of winter rainfall was 10 inches, which was insufficient to move the major portion of simazine beyond the first six inches of sandy soil.

Pesticide Application Management Practices

The new ground water regulations include application management practices, which are specific to runoff and leaching GWPAs, engineered rights-of-ways within GWPAs, and inside canals and ditch banks and artificial recharge basins statewide. A runoff GWPA is associated with low infiltration rate soils that facilitate runoff and a leaching GWPA is associated with sandy soils where leaching can occur. Application management practices in hardpan soil (runoff) areas are as follows:

Runoff GWPAs

Use of 6800(a) pesticides is prohibited in runoff GWPAs unless one of the following management practices can be met and is designated by the commissioner on the permit.

(a) Soil disturbance. Within seven days before the pesticide is applied, the soil to be treated shall be disturbed by using a disc, harrow, rotary tiller, or other mechanical method. This practice does not apply to bentazon, and does not apply to the area to be treated that is immediately adjacent to the crop row and that does not exceed 33 percent of the distance between crop rows; or

(b) Incorporation of the pesticide. Within 48 hours after the day the pesticide is applied, the pesticide shall be incorporated on at least 90 percent of the area treated, using a disc, harrow, rotary tiller, or other mechanical method, or by sprinkler or low flow irrigation, including chemigation if allowed by the label. The irrigation should be applied using a minimum of ¼ inch of irrigation water and a maximum of either one inch or the maximum amount of irrigation water specified on the label, at application rates that do not cause surface water runoff from the treated property or to wells on the treated property. This practice does not apply to bentazon, and does not apply to the

area treated with other pesticides listed in section 6800(a) that is immediately adjacent to the crop row and that does not exceed 33 percent of the distance between crop rows; or

(c) The pesticide shall be applied as a band treatment immediately adjacent to the crop row so that not more than 33 percent of the distance between rows is treated; or

(d) The pesticide shall be applied between April 1 and July 31; or

(e) For six months following the application, the field shall be designed, by berms, levees, or non-draining circulation systems, to retain all irrigation runoff and all precipitation on, and drainage through, the field. The retention area on the field shall not have a percolation rate of more than 0.2 inches per hour (five inches per 24 hours); or

(f) For six months following the application, runoff shall be channeled to a holding area off the application site, under the control of the property operator, that is designed to retain all irrigation runoff and all precipitation on, and drainage through, the treated field and all other areas draining into that holding area. The holding area shall not have a percolation rate of more than 0.2 inches per hour (five inches per 24 hours); or

(g) Runoff onto a fallow field. For six months following application, runoff shall be managed so that it runs off onto an adjacent unenclosed fallow field at least 300 feet long that is not irrigated for six months after application, with full consideration of any plant back restrictions; or

(h) An alternative management practice or pesticide approved by the Director as follows:

i. Upon written request, the Director may evaluate and approve use of alternative management practices that are based on scientific data demonstrating their effectiveness in reducing movement of pesticides to ground water; or

ii. Upon written request, the Director may make a determination to allow the interim use of a pesticide containing a chemical listed in section 6800(a) in a runoff GWPA, for a period not to exceed three years, while the requestor is documenting an alternate management practice according to a protocol approved by the director. This option is only available if none of the existing management practices are feasible for a given crop or site.

<u>Leaching GWPAs</u>

Use of 6800(a) pesticides is prohibited in leaching GWPAs unless any one of the following management practices can be met and is designated by the commissioner on the permit:

(a) The permittee shall not apply any irrigation water for six months following application of the pesticide; or

(b) The permittee shall apply the pesticide to the planting bed or the berm above the level of irrigation water in the furrow or basin for six months following application of the pesticide; or

(c) Irrigation shall be managed so that the ratio of the amount of irrigation water applied divided by the net irrigation requirement is 1.33 or less for six months following application of the pesticide; or

(d) An alternative management practice or pesticide approved by the Director

Artificial Recharge Basins

Use of pesticides registered for agricultural, outdoor industrial, and outdoor institutional use containing chemicals listed in section 6800(a) shall be prohibited below the high water line inside artificial recharge basins, unless the pesticide is applied six months or more before the basin is used to recharge ground water.

Inside Canals and Ditch Banks

Use of pesticides registered for agricultural, outdoor industrial, and outdoor institutional use containing chemicals listed in section 6800(a) shall be prohibited below the high water line inside unlined canals and ditches, unless at least one of the following applies:
(a) the pesticide user can document that the percolation rate of the canal or ditch is equal to or less than 0.2 inches per hour (0.002 gallons per minute per square foot); or
(b) the pesticide is applied six months before water is run in the canal or ditch.

Engineered Rights-of-Ways Within GWPAs

Use of pesticides registered for agricultural, outdoor industrial, and outdoor institutional use containing chemicals listed in section 6800(a) shall be prohibited on engineered rights-of-way in leaching or runoff ground water protection areas unless one of the following management options can be met and is designated by the commissioner on the permit:
(a) The property operator complies with section 6487.4; or
(b) Any runoff from the treated right-of-way shall pass through a noncrop fully vegetated area adjacent, and equal in area, to the treated area.
(c) The property operator complies with any permit issued pursuant to the storm water provisions of the federal Clean Water Act pertaining to the treated area; or
(d) An alternative management practice or pesticide approved by the Director.

III. ACTIONS TAKEN BY DPR TO PREVENT MOVEMENT OF PESTICIDES TO GROUND WATER

Pesticide Detection Response Process (PDRP)

The PDRP is a process where detections of pesticide active ingredients currently registered for agricultural use or their metabolites are investigated, evaluated and mitigated, when necessary. Historically, DPR responded to any reported detection in ground water if the detected pesticide was currently registered for agricultural use. The response to many of these detections was to sample five or six wells in a four-section area around the contaminated well. However, due to shrinking resources, DPR has established policies that allow for greater scrutiny of the detection before it is entered into the PDRP.

Each year DPR receives reports of detections from various agencies. For the first time, MDLs for some pesticides from submitted studies are below the MDLs obtainable by DPR laboratories. DPR's policy (memo from John Sanders to EM, July 2002) is not to respond to a detection if the concentration is below 80 percent of the current MDL established by the CDFA laboratory. DPR will also not respond to a detection of a pesticide listed in 6800(a) or its metabolite and found in a GWPA. DPR has already adopted regulations that control the use of 3CCR section 6800(a) compounds in ground water protection areas. As in the past, all detections will be entered into the well inventory database so that the data can be included in future analysis of the database.

For detections entered into the PDRP, the investigative phase includes verification of the reported detection and an agricultural use determination. Some of the investigative activities include determining whether:

- the application of the pesticide in the vicinity of the detection was reasonably likely;
- a point source was not a likely cause;
- a non-agricultural use of the pesticide was not a likely source; or
- a non-pesticide source was not a likely cause.

DPR combines an analysis of pesticide use in the area where the detection occurred with land use and a four-section survey (see below) to help determine if the detection is due to legal agricultural use.

<u>Four-Section Survey</u>

The four-section survey is a well monitoring survey which is conducted to determine if there is a second contaminated well in the same area as the reported positive well. This helps to determine that the residue did not result from a point source. Samples are taken from the five or six wells in the section of land of the original detection or one or more of the three most adjacent sections and analyzed in order to verify the initial detection. The location of a second positive well is an

indication that the detected residue may be the result of legal agricultural use and thus subject to the formal review process specified in FAC section 13149.

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.

DPR conducted two four-section surveys between July 1, 2003, and June 30, 2004, in response to reported detections of molinate. Both of the molinate surveys resulted in no detected residues. Appendix B provides additional details for these studies. Several reported detections (Table III-1) did not require a four-section survey because they occurred in a GWPA and were from pesticides listed in 6800(a) list or their metabolites. A detection in Sutter County could not be further investigated because there were no wells available to sample in the area.

Table III-1. Detections that did not require a four-section survey

County	Chemical	Comments
Sutter	Molinate	No wells available therefore could not conduct sampling.
Tulare	Norflurazon	norflurazon is on the 6800(a) list and the detection was in a GWPA
Tulare	Norflurazon	norflurazon is on the 6800(a) list and the detection was in a GWPA
Tulare	Norflurazon	norflurazon is on the 6800(a) list and the detection was in a GWPA
Fresno	ACET	ACET is a metabolite of a compound on the 6800(a) list and the detection was in a GWPA
Fresno	Atrazine	atrazine is on the 6800(a) list and the detection was in a GWPA

Ground Water Protection List Monitoring

The Ground Water Protection List (GWPL) is a list of pesticides having the potential to pollute ground water. It was established according to FAC section 13145(d) and placed in section 6800 of Title 3 of the California Code of regulations (3CCR). The GWPL is divided into sub-lists (a) and (b). Section 6800(a) is comprised of chemicals detected in soil or ground water as a result of legal, agricultural use. Section 6800(b) includes chemicals that exceed the SNVs and (1) are intended to be applied to or injected into the soil by ground-based application equipment or by chemigation; or (2) where the pesticide labels recommend or require their application to be followed, within 72 hours, by flood or furrow irrigation. To determine whether the pesticides

listed in 6800(b) have migrated to ground water, DPR is required to conduct ground water monitoring for them.

In 1992, 47 pesticide AIs were placed in section 6800(b). Regulations that became effective on May 13, 1999, added 15 new AIs to section 6800(b), bringing the total number of AIs on the list to 62. Since it was not possible to monitor for all 62 pesticides at once, DPR developed a protocol for selecting AIs for monitoring each year as resources allow. AIs on the list are evaluated for their potential to contaminate ground water based on their physicochemical characteristics, agricultural production practices for crops on which they are applied, target of application (soil versus foliar), information on recent detections in ground water or any other pertinent information. As of June 30, 2004, monitoring has been completed for 25 (40%) of the 62 AIs.

In 2003, DPR completed a GWPL monitoring survey for imidacloprid, including three metabolites (the urea degradate, the guanidine-olefin degradate and the guanidine degradate). Thirty-three wells were sampled in six counties during October and November 2003. No residues of imidacloprid or its metabolites were detected in any of the wells. However, four wells contained residues of one or more other herbicides or herbicide metabolites. No further action was taken because these detections occurred in a GWPA and the herbicides were already on the 6800(a) list. Three of the contaminated wells were in Fresno County and one was in Tulare County. The total number of wells that were sampled in each county is presented in Table III-2.

Table III-2. Number of wells sampled in each county during the Ground Water Protection List monitoring survey for imidacloprid

County	**Wells Sampled**
Fresno	3
Monterey	15
San Luis Obispo	4
Santa Barbara	7
Tulare	1
Ventura	3
Total	33

Monitoring Temporal Changes in Concentrations of Detected Herbicides and Their Degradates—Well Network Monitoring

The new regulations are more preventative than the past program because application management practices will be implemented in areas determined to be vulnerable to pesticide contamination but where pesticide residues have not yet been detected in ground water. One measure of success of the program will be to observe temporal changes in pesticide concentrations in wells that are known to contain residues. Beginning in 1999, DPR has sampled

a group of 70 domestic wells in Fresno and Tulare counties. These wells were selected because previous sampling resulted in verified detections of one or more of the following pesticides—atrazine, simazine, bromacil, diuron, prometon and norflurazon—and because they are located in one of the two soil conditions identified as vulnerable to pesticide contamination, either coarse textured, sandy soil or hardpan soil.

The data gathered before the new regulations went into effect will be background data used to compare detected concentrations with concentrations after the new regulations were adopted. However, the effects of changing application management practices may not be discernible for at least a decade (Spurlock et al., 2000).

Chemigation Initiative

Chemigation is the application of pesticides through irrigation systems. As part of the U.S. EPA's Label Improvement Program, the labels of pesticides that are chemigated must include specific instructions for use of backflow prevention devices to protect a water source injected with pesticides. With the support of a US EPA consolidated grant, in fiscal year (FY) 1999-2000, DPR staff analyzed state regulations as they pertain to label language and issued policy letters to the County Agricultural Commissioners (CACs) clarifying the enforcement of the label instructions, which supersede DPR's backflow regulations. DPR also instituted the Chemigation Initiative, which seeks to increase awareness of the current chemigation requirements through education and to determine the suitability of these requirements through the formation of a chemigation task force.

Chemigation Training

DPR is continuing to contract with the Center for Irrigation Technology, California State University Fresno (CIT) to provide chemigation training to the regulated community. Since 2001, CIT and DPR have provided 88 training sessions, seven of which were field inspections, in 27 counties to an audience including growers, irrigation dealers, pest control applicators, CAC and DPR Enforcement staff. From July 1, 2003, to June 30, 2004, staff have provided 29 training sessions. The sessions focus on backflow prevention devices, and their alternatives, which are required installations on any chemigation system. The sessions include a manual to help growers understand and comply with the requirements, and a demonstration trailer that included an irrigation supply line equipped with the required backflow prevention devices and some of their alternatives. The manual can be accessed at http://www.cdpr.ca.gov/docs/gwp/chem/grower_manual.pdf. These training sessions will continue to be offered throughout the state in an effort to bring chemigation applications into compliance with the pesticide label requirements.

Chemigation Task Force

DPR worked with CIT to form a task force to evaluate the need for further educational and regulatory action on chemigation applications. The task force is composed of irrigation specialists, representatives from the agricultural community, engineers with expertise in backflow prevention, representatives from the CAC, and other interested parties. The task force has met four times and has discussed a variety of topics including how to best reach the target audiences, the field observations of the task force members, the current requirements for chemigation, and a proposal for changing California chemigation rules and regulations. The task force will continue to meet to finalize the recommended draft of rules and regulations and to discuss other pertinent issues regarding chemigation.

Chemigation Websites

Information about the Chemigation Initiative and chemigation requirements has recently been added to the official DPR website, http://www.cdpr.ca.gov/docs/gwp/chem.htm. These web pages include an overview of chemigation regulations, and provide descriptions and diagrams of the required devices and their alternatives for use during chemigation applications. California Polytechnic State University, San Luis Obispo also has a website providing backflow prevention information, www.itrc.org/chemigation.html. This site includes links to several documents pertaining to chemigation, including an article written by Dr. Charles M. Burt, "Chemigation and Fertigation Basics for California," which addresses some questions about chemigation and irrigation management.

Ground Water Protection Training

In June 2004, DPR conducted five training sessions for the County Agricultural Commissioner (CAC) staff who will be enforcing the new regulations. The training provided the technical basis for the regulations, reviewed the regulations themselves, and asked and answered questions about planned enforcement of the regulations.

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IV. ACTIONS TAKEN BY SWRCB AND IT'S REGIONAL BOARDS TO PREVENT PESTICIDES FROM ENTERING GROUND WATER NOVEMBER 20004

SWRCB staff participated in the following activities:

- Regularly attended meetings sponsored by the DPR, including the interagency Pesticide Registration and Evaluation Committee (PREC) and Pest Management Advisory Committee (PMAC).
- Participated in ongoing consultations with DPR staff, UC scientists, and pesticide manufacturers to design monitoring studies and BMPs.
- Participated in discussions with U.S. Geological Survey scientists on studies dealing with pesticides and water quality.
- Reviewed, on an ongoing basis, DPR Notices of "Materials Entering Evaluation" and advised DPR on potential water quality impacts of pesticide registration and use decisions.

Reviewed and commented on DPR's proposed studies on pesticide and water quality pursuant to the Management Agency Agreement (MAA) with DPR.

Table IV-1. Actions taken by the Regional Water Quality Control Board, North Coast (Region 1), in fiscal year 2003-2004

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Del Norte	Smith River Plains	1,2,dichloropropane	No monitoring this year.
	Smith River Plains, 533 Fred Haight Dr.	1,2,dichloropropane	No monitoring this year.
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	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.
Sonoma	Klein Foods	Fenamiphos	No further action.

Table IV-2. Actions Taken by the Regional Water Quality Control Board, San Francisco Bay (Region 2) in fiscal year 2003-2004.

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 Cov e)	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.
	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.
Solano	Travis Air Force Base	Aldrin, Heptachlor, Alpha-Chlordane, Heptachlor Epoxide	U.S. EPA lead on site cleanup. Groundwater extraction and treatment and monitoring has been ongoing since 2001.

Table IV-3. Actions taken by the Regional Water Quality Control Board, Central Coast (Region 3), in fiscal year 2003-2004

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Monterey	Monterey SoilService, King City	EDB and DBCP	Monitored natural attenuation is used at the site for low-level residual concentrations of EDB and DBCP in groundwater.
	Castlerock Estates, Salinas	Toxaphene	Soil and groundwater remediation have been completed this fiscal year. Final case closure will be granted upon receipt of a Well Destruction Report confirming the appropriate destruction of all monitoring wells.
Santa Clara	Castle-Veg-Tech, Morgan Hill	Toxaphene, Endrin, Lindane, Endosulfan	Previous Responsible Party (RP) was unable to resume removal of pesticide-contaminated soil and extraction and treatment of contaminated groundwater for this fiscal year due to lack of funds. Newly identified RP(s) is taking action to resume remediation.
Santa Cruz	WFS-Greengro, Watsonville	1,2-DCP and Endosulfan	Active site remediation has been discontinued due to low contaminant levels. Monitored natural attenuation is used for low-level residual 1,2-DCP in groundwater.
	WFS, Watsonville	DDT, DDD, Toxaphene	Soil and groundwater cleanup have been completed this fiscal year. Final case closure will be granted upon receipt of a Well Destruction Report confirming the appropriate destruction of all monitoring wells.

Table IV-4. Actions taken by the Regional Water Quality Control Board, Los Angeles (Region 4), in fiscal year 2003-2004

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. No further monitoring.
	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. No further monitoring.

Table IV-4 (cont.)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
	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. No further monitoring.
	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. No further monitoring.
	Peter Pitchess Honor Rancho Landfill, Castaic Junction	Bis (2-ethylhexyl) phthalate	Phthalates are thought to be from PVC well casing. Monitoring continues at site. Most recent analyses did not detect any pesticides.
	Royal Boulevard Land Reclamation Site, Torrance	Lindane, 1,3-Dichloropropene	Site is closed and capped. Pesticide contamination was from an upgradient source.
	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. Additional analyses did not detect any pesticides
	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. Additional analyses did not detect any pesticides
	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. Additiojnal analyses did not detect any pesticides. No further monitoring. Permit rescinded.
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. Additional analyses did not detect any pesticides.

Table IV-5. Actions taken by the Regional Water Quality Control Board, Central Valley (Region 5, Sacramento), in fiscal year 2003-2004.

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Colusa	Moore Aviation	Atrazine	Ground water remediation ongoing. Plume contracted to less than 100 square feet. Soils have been remediated.
Glenn	Former Barber Cashew Supply Corporation, Willows	Nitrate, ammonia, 1,2-DCE, PCE, TCE, toluene, carbon tetrachloride, chloroform, chlorobenzene	New property owner is remediating nitrate and ammonium in soils with bioremediation and proposing to evaluate groundwater for other constituents.
Merced	Merced Municipal Airport	Alachlor, Captan, Carbophenothion (trithion), DDT (total), Dicofol (Kethane), Dieldrin, Endosulfan I, II, Endosulfan sulfate, Endrin, Endrin aldehyde, Endrin ketone, Heptachlor epoxide, Methoxychlor, Toxaphene,	Health Assessment completed. Feasibility study submitted.
	J.R. Simplot, Winton	1,2-DCP, 1,2,3-TCP,DBCP, nitrate	Organo-chlorine contaminated soil removed, soil vapor extraction is removing volatile compounds, and sugar injection is underway to remediate nitrate in groundwater.
	Western Farm Service, Merced	1,2-DCP, DBCP, dinoseb, dalapon, nitrate, ammonia	A pilot study for in-situ remediation of groundwater using Hydrogen Releasing Compound (HRC) is in progress. HRC is being tested for nitrate removal in soil, organochlorine contaminated soils were removed.
Sacramento	Sacramento Army Depot	Diazinon, Dursban	Assessment report requested. Federal Superfund work in progress. Cleanup of pesticides completed.
	Natomas Air Park	Dicofol, DDE, DDT, Endosulfan, Toxaphene, Dieldrin Endrin	Investigation is underway
	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.

Table IV-5 (cont.)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
San Joaquin	Occidental Chemical, Lathrop	EDB, DBCP, Sulfolane	Groundwater cleanup underway pursuant to stipulation and judgement approving settlement (1981). Currently reviewing remedial system optimization workplan and monitoring and reporting program.
	John Taylor Fertilizers, Stockton	Dinoseb, I,2,3-TCP, bromacil	Investigation underway
	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. Pump and treat has been implemented for main dieldrin plume. Currently, investigating small dieldrin plume in NW corner of Depot that may also require remedial actions.
	Sharpe Army Depot, Stockton	Bromacil	Limited monitoring continues. Remedial actions may not be warranted..
	U.S. Navy Computer and telecommunicatio ns Station, San Diego Detachment	DDD, DDE	Assessment ongoing. Soil removal actions have occurred and more are planned. Groundwater assessment underway.
	Western Farm Service, Stockton (former Pure Gro/Brea)	1,2-DCP, Chloroform, PCE, Bromoform, 1,1-DCA, Dibromochloromethane, bromochloromethane, bromodichloromethane	Two soil areas are capped. Semi-annual groundwater monitoring and long-term cap maintenance is continuing. Health risk assessment is complete. Treatability studies are beginning for soil and groundwater remediation as part of the feasibility study.

Table IV-5 (cont.)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
	Former Oxychem/ Simplot/ PureGro, Stockton	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	Primary soil source area remediated with thermal destruction. Phytoremediation in progress to treat trace constituents in soil and nitrate in groundwater
	Cal Farm Supply	b-BHC, nitrate	Soils were remediated. Nitrate uptake by safflower cropping ongoing.
	Western Farm Service, Vernalis	DBCP, EDB, diuron, methiocarb, diazinon, aldrin, nitrate, ammonia, 1,2-DCP	Pilot project using hydrogen release compound for insitu remediation underway.
Solano	John Taylor Fertilizer, Dixon	Dinoseb, dichlorprop, 2,4-D dicamba, DDT, chlordane, diuron, bromocil, tebuthiuron	Investigation underway
	TSI, Dixon	DDT, DDE, 1,2-DCP, nitrate, ammonium	Some contaminated soil was removed. Crop uptake is remediating nitrate and ammonium off-site. Investigation underway.
Stanislaus	Chemurgic Agricultural Chemicals	BHC	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	Remedial work to excavate areas with elevated pollutant concentrations in soil followed by placing an engineered cap over a majority of the site are underway.
	Shell Agricultural Research Facility	Cyanazine, Atrazine, Chloroform, DBCP, Nitrate	Groundwater being treated with carbon absorption for organic compounds, followed by phytoremediation for nitrate. Soil has been remediated.

Table IV-5 (cont.)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
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.
	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, insitu groundwater remediation using hydrogen releasing compound is underway
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.
	U.C. Davis, Pesticide applicator site	Chlorpyrifos, Dicamba, Atrazine, Aldrin, Simazine, Dieldrin, Endrin, DDT	Contaminated soil removed, groundwater being extracted and discharged under permit to sanitary sewer.
	J.R. Simplot, Courtland	EDB, 2,4-DB, Dicofol, Dicamba, 2,4,5-TP, Carbophenthion, DDT, Dieldrin, Dinoseb, Picloram	Phytoremediation underway for soil & groundwater remediation

Table IV-6. Actions taken by the Regional Water Quality Control Board, Central Valley (Region 5, Fresno), in fiscal year 2003-2004.

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Fresno	Blue Hills Disposal Site, County of Fresno	Dicamba, 2,4-D, Silvex	DTSC lead. Corrective action underway.
	Thompson Hayward Agriculture & Nutrition	Alpha-BHC, Beta-BHC, Gamma-BHC, Dieldrin, DBCP, Diphenamid, Heptachlor, Heptachlor Epoxide	State Superfund site (DTSC lead). Implementation of the Remedial Action Plan. On going Operation, Maintenance, and Monitoring Plan and Agreement development. Finalized Preliminary Close-out report by DTSC. Submittal of Draft Remedial Action Completion Report by DTSC to EPA. Continued evaluation of domestic well connection status and alternative water supply options.
	J.R. Simplot, Helm Facility	Dieldrin	Long-term groundwater monitoring.

Table IV-6 (cont.)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
	FMC Corporation, Fresno Facility	1,2,3-TCP, Aldrin, Dieldrin, DDT, DDD, DDE, Heptachlor, Lindane, Toxaphene, Ethyl Parathion, Malathion, Ethion, Endosulfan, Dimethoate, Furadan, Dinitrocresol, Dinoseb (DNBP)	DTSC lead. Discharge area capped and undergoing remediation using SVE. 1,2,3-TCP in groundwater is driving new off-site extraction well installation, expanding the original two-well extraction system. Groundwater pilot test results show enhanced reductive dechlorination is cost prohibitive – will continue using SVE and pump & treat as primary plume control tool.
	Britz, Inc., Five Points	Toxaphene, DDT, DNBP	State Superfund site (DTSC lead). Investigation and health assessment report submitted. Groundwater 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).
	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	Soil and groundwater plume definition 95% complete. Detailed soil vapor (SV) survey and supplemental soil sampling at western pond completed. Workplan for soil remediation at western pond to be finalized after additional deep soil sampling.
	Eagle Field (FUDS)	2,4-D, Pentachlorophenol,	Pesticides detected from groundwater grab samples. Additional assessment is needed.
	Broadview Water District – Bullard Avenue Air Strip	DDT Toxaphene	Pesticides detected from groundwater grab samples. Additional assessment is needed
	Broadview Water District – Bullard Avenue Air Strip	DDT Toxaphene	Pesticides detected from groundwater grab samples. Additional assessment is needed
	Baptiste Property	DDT Toxaphene	Pesticides detected in soil samples. Additional assessment needed to determine if shallow groundwater has been impacted.
	Mike Perez Property	DDT Toxaphene	Pesticides detected from groundwater grab samples. Additional assessment is needed.

Table IV-6 (cont.)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Kern	Brown & Bryant, Inc., Arvin	1,2-D, 1,3-D, DBCP, Dinoseb, EDB, carbaryl	Federal Superfund site (DTSC lead). U.S. EPA has prepared Remedial Information Feasibility Study Report.
	Brown and Bryant, Inc., Shafter	EDB, DBCP, Chlordane, DDD, DDE, DDT, Dieldrin, Endrin, Heptachlor, Toxaphene	State Superfund site (DTSC lead). Contamination assessment ongoing.
	Western Farm Service, Delano Facility	DDT, Toxaphene, Dinoseb, Dicamba	Assessment on-going, long-term monitoring on-going, impacted soils have been capped.
	Puregro Company, Bakersfield	DBCP, Toxaphene	DTSC lead. Further assessment conducted. Pilot study for reductive dechlorination of pesticides in soil conducted 2002-03. The RWQCB issued WDRs for closure of a former dry well in March 1994 and amended them in March 1996.
	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. 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	USEPA lead. Developing a closure plan. Soil remediation and dry well abandonment were requested in 1996 but have not been completed.
	Kern County Wells	DBCP, 1,2-D, EDB	Pesticides detected in 57 wells (AB 1803 sampling). No assessment underway.
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.

Table IV-6 (cont.)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Madera	Chowchilla Municipal Airport	Dieldrin, Alpha-BHC, Endosulfan, PCNB, DDT, DDE, Lindane	Contamination assessment needed.
	Madera Municipal Airport	DDT, DDE, Toxaphene, Dicofol, Endrin	Impacted soils have been capped. Long-term monitoring on-going.
	Madera County Wells	DBCP	DBCP detected in two wells (AB 1803 sampling). No assessment underway.
	Western Farm Service, Inc., Madera Facility	Dinoseb, DBCP, Dieldrin	Impoundment closed. Impacted soils have been capped. Long-term monitoring on-going.
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.
	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, Central Valley (Region 5, Redding), in fiscal year 2003-2004.

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Butte	L.P, Remanufacturing Facility, Chico	Pentachlorophenol Tetrachlorophenol	DTSC is lead agency. Waste Discharge Requirements adopted in 1996 for groundwater treatment and reinjection. Groundwater extraction and treatment ceased in Feb 03. Verification groundwater monitoring underway to determine effectiveness of natural attenuation. Deed restriction in place prohibiting groundwater use without DTSC approval.
Tehama	L.P, Sawmill, Red Bluff	Pentachlorophenol	Bioremediation of excavated soil stockpile and groundwater monitoring continues.
	L.P, VG Mill & Jamb, Red Bluff	Pentachlorophenol Tetrachlorophenol Stoddard Solvent	CAO Order 98-712. Soils cleaned up. Pilot project using ozone for insitu groundwater remediation underway.

Table IV-8. Actions taken by the Regional Water Quality Control Board, Lahontan (Region 6), in fiscal year 2003-2004

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) proposed to use these aquatic pesticides for the control of Eurasian watermilfoil in the lagoon and marina. In February 2002, the Regional Board issued a notice excluding the TKPOA from coverage under the statewide Aquatic Pesticides General NPDES Permit. A scientist from the USDA Agricultural Research Service at UC Davis submitted a formal proposal in May 2003 and requested that the Regional Board consider modifying or withdrawing the Notice of Exclusion to allow pilot-scale experimental application of aquatic herbicides. The Regional Board considered but denied the request in June 2003.
Inyo	Tinemaha Reservoir	Copper sulfate	In response to former algaecide applications, no detectable copper in 2002/2003.
	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 2004.
Placer	Resort at Squaw Creek	Triclopyr	The tryclopyr test application at the Resort at Squaw Creek is still ongoing. The herbicide has not been detected in any of the groundwater monitoring wells. The location of the monitoring wells and the timing of the sampling was purposely designed to detect the chemical if it might later show up in ground water below detectable concentrations. The test application has so far demonstrated that the herbicide can be applied and it will not persist long enough to make it to ground water.

Table IV-8 (cont.)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
San Bernardino	George Air Force Base	Dieldrin	A number of groundwater wells (about 6) in the vicinity of the Westwinds Golf Course test positive with low levels of dieldrin. At least 4 wells are above the CA State Action Level for dieldrin. The Air Force is conducting a PA/SI, including surface soil sampling to evaluate potential sources and new groundwater monitoring wells. Additional site assessment is pending Air Force funding that has been requested This site is adjacent to large municipal supply wells for the City of Adelanto. Those wells have been tested and do not have dieldrin. Board staff has not concurred with parcel transfer of sites with dieldrin.
	China Lake Naval Weapons Center	4,4' DDD 4,4' DDE 4,4' DDT Dieldrin Chlordane	Sites 31 and 32 Pesticide Storage area and Golf Course Pesticide Handling area at China Lake contained pesticides in soil and low concentrations in ground water. Area was cleaned up, contaminated soil source was removed and disposed appropriately. Ground water is monitored, and is not used for drinking water in the area east of China Lake Playa.
All counties in Region 6 (includes all or parts of Modoc, Lassen, Plumas, Sierra, Nevada, Placer, El Dorado, Alpine, Mono, Inyo, San Bernardino, Kern, Los Angeles Counties)	Region wide	Herbicides	To qualify for the waiver under the Timber Harvest Activities Waiver Policy (adopted in January 2003), applicants must notify the Regional Board at least 90 days in advance of any proposed herbicide application, and provide specific information about the proposed herbicide use. They must also adhere to any monitoring program prescribed by the Executive Officer.

Table IV-9. Actions taken by the Regional Water Quality Control Board, Colorado River Basin (Region 7), in fiscal year 2003-2004

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.
	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-10. Actions taken by the Regional Water Quality Control Board, Santa Ana (Region 8), in fiscal year 2003-2004

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
Orange	Great Lakes Chemical Corporation (formerly Great Western Savings), Irvine	1,2-D, EDB, 1,2-DCE	On-site full-scale multi-phase vacuum extraction system is continuing. GLCC now discharges to County Sanitation District of Orange County under Special Purpose Discharge Permit as of 12/2001. GLCC was issued a CAO by RWQCB on 4/17/97 for off-site remediation of impacted groundwater. GLCC is operating an on-and off-site groundwater extraction and treatment system. The full treatment system has been operating continuously since December 2001. Waste Discharge Requirements (Order No. 0025) was rescinded in April 2002.
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. 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.
	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

Table IV-10 (cont.)

COUNTY	SITE	PESTICIDE	PREVENTION ACTION
	City of Corona (Well 17, mun.)	Simazine, DBCP	Well has been abandoned. A new well (17A) has been drilled and is in use. Trace of DBCP was detected in March 1991 sampling. Trace of TCE has been detected in recent sampling of the new well.
	City of Riverside (Russell "B", mun.)	Simazine, DBCP	Well has been abandoned and replaced with a new well. (Russell "C")
	City of Riverside (Garner "B", mun.)	DBCP	A 3,200 gpm GAC treatment system has been installed (Garner B Treatment Plant)
	City of Riverside (Russell "C", mun)	DBCP	A 3,200 gpm GAC treatment system has been installed (Garner B Treatment Plant)
	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	A 9,000 gpm GAC treatment system has been installed (Palmyrita Treatment Plant)
	City of Riverside (Palmyrita, mun.)	DBCP	A 9,000 gpm GAC treatment system has been installed (Palmyrita Treatment Plant)
	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.
	City of Riverside (Moor-Griffith, mun.)	DBCP	A 9,000 gpm GAC treatment system has been installed (Palmyrita Treatment Plant)
	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-10 (cont.)

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 groundwater 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 Action Level in both production wells. Lockheed Martin has provided $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 VWD (15 wells, mun.)	DBCP	Five wells are inactive. Ten wells are active and water is being blended with other supply wells. Water is being purchased from Metropolitan Water District (MWD).
	Monte Vista CWD (3 wells, mun.)	DBCP	One well has been abandoned. Two wells are active and water is being blended with other supply wells. Water is being purchased from MWD.
	City of Upland (13wells)	DBCP	Five wells have been abandoned. Four wells are currently on standby. Four wells are active and water is 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. Four new deep wells have been on line since 2002.

Table IV-11. Actions taken by the Regional Water Quality Control Board, San Diego (Region 9), in fiscal year 2003-2004

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 ppb has been detected in this well. The City of Oceanside is continuing monitoring of this well and reports to the State's DHS.
	San Diego Naval Station	Installation Restoration Site 1	GW1-3 - 4,4'-DDT=0.019 ug/l; Endrin=0.015 ug/l; Methoxychlor=0.032 ug/l GW1-4 - 4,4'-DDT=0.012 ug/l; Endrin=0.017 ug/l; Methoxychlor=0.016 ug/l MW5 – Endrin=0.01 ug/l Currently under investigation by DTSC and RWQCB. Possible ecological threat to San Diego Bay.
	San Diego Naval Station	Installation Restoration Site 2	Pesticides have been detected at IR Site 2 Mole Pier at detection limits. Detections are indicative of surface application rather than disposal practices. Currently under evaluate by DTSC and RWQCB. Possible ecological threat to San Diego Bay

APPENDIX A

Number of Wells Sampled and Positive Detections, by County and Chemical

This appendix is presented in four parts. The first lists the counties without pesticide detections. The second lists the counties with pesticide detections. The third lists the pesticides sampled, by counties without detections and the number of wells sampled for each pesticide. The fourth lists the pesticides sampled, by county with detections, the number of wells sampled for each pesticide and the number of positive wells. Sampling results are reported for the period July 1, 2003 through June 30, 2004.

Part 1. Counties Sampled Without Detections

Alameda
Amador
Calaveras
Colusa
Del Norte
El Dorado
Glenn
Humboldt
Imperial
Inyo
Lake
Marin
Mariposa
Mendocino
Modoc
Mono
Napa
Nevada
Placer
San Benito
San Luis Obispo
Santa Barbara
Santa Cruz
Shasta
Sierra
Siskiyou
Solano
Trinity
Tuolumne
Ventura
Yolo

Part 2. Counties Sampled with Detections

Butte
Contra Costa
Fresno
Kern
Kings
Los Angeles
Madera
Merced
Monterey
Orange
Riverside
Sacramento
San Bernardino
San Diego
San Joaquin
San Mateo
Santa Clara
Sonoma
Stanislaus
Sutter
Tulare
Yuba

Part 3. Pesticides sampled, by county without detections and the number of wells sampled from July 1, 2003 to June 30, 2004

Alameda

Chemical	Wells
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
2,3,7,8-TCDD (Dioxin)	14
2,4,5-TP	14
2,4-D	14
3-Hydroxycarbofuran	14
Acetochlor	8
Alachlor	17
Aldicarb	14
Aldicarb Sulfone	14
Aldicarb Sulfoxide	14
Aldrin	14
Atrazine	17
Bentazon, Sodium Salt	14
Benzene (Benzol)	28
Bromacil	17
Butachlor	17
Carbaryl	14
Carbofuran	14
Chlordane	2
Chloromethane (Methyl Chloride)	28
Dacthal Acid Metabolites	21
Dalapon	14
DBCP	17
DDD	3
DDE	11
DDT	3
Diazinon	17
Dicamba	14
Dieldrin	17
Dimethoate	17
Dinoseb	14
Diquat Dibromide	14
Diuron	14
Endosulfan	3
Endosulfan Sulfate	3
Endothall	14
Endrin	17

Alameda (cont)

Chemical	Wells
Endrin	17
EPTC	8
Ethylene Dibromide	17
Glyphosate, Isopropylamine Salt	14
Heptachlor	5
Heptachlor Epoxide	17
Hexachlorobenzene	17
Lindane (Gamma-BHC)	17
Methomyl	14
Methoxychlor	17
Methyl Bromide (Bromomethane)	28
Metolachlor	17
Metribuzin	17
Molinate	17
Naphthalene	25
Ortho-Dichlorobenzene	28
Oxamyl	14
Picloram	14
Prometryn	17
Propachlor	17
Simazine	17
Terbacil	8
Thiobencarb	17
Toxaphene	2
Trichlorobenzenes	28
Xylene	28

Amador

1,1,2,2-Tetrachloroethane	2
1,2,4-Trichlorobenzene	2
1,2-Dichloropropane	2
Alachlor	2
Atrazine	2
Benzene (Benzol)	2
Bromacil	1
Butachlor	1
Diazinon	1
Dimethoate	1
Metolachlor	1
Metribuzin	1

Amador (cont)

Chemical	Wells
Molinate	2
Ortho-Dichlorobenzene	2
Prometryn	1
Propachlor	1
Simazine	2
Thiobencarb	2
Xylene	2

Calaveras

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
Alachlor	1
Atrazine	1
Benzene (Benzol)	2
Bromacil	1
Butachlor	1
Chloromethane (Methyl Chloride)	2
Diazinon	1
Dimethoate	1
Methyl Bromide (Bromomethane)	2
Metolachlor	1
Metribuzin	1
Molinate	1
Naphthalene	1
Ortho-Dichlorobenzene	2
Prometryn	1
Propachlor	1
Simazine	1
Thiobencarb	1
Trichlorobenzenes	2
Xylene	2

Colusa

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
ACET	2

Colusa (cont)

Chemical	Wells
Atrazine	2
Benzene (Benzol)	2
Bromacil	2
Chloromethane (Methyl Chloride)	2
Deethyl-Atrazine	2
DACT	2
Diuron	2
Hexazinone	2
Methyl Bromide (Bromomethane)	2
Molinate	2
Naphthalene	2
Norflurazon	2
Ortho-Dichlorobenzene	2
Prometon	2
Simazine	2
Trichlorobenzenes	2
Xylene	2

Del Norte

2,3,7,8-TCDD (Dioxin)	1

El Dorado

1,1,2,2-Tetrachloroethane	27
1,2,4-Trichlorobenzene	27
1,2-D + 1,3-D + C-3 Compounds	23
1,2-Dichloropropane	27
2,4,5-T	24
2,4,5-TP	24
2,4-D	24
3-Hydroxycarbofuran	24
Alachlor	25
Aldicarb	24
Aldicarb Sulfone	24
Aldicarb Sulfoxide	24
Aldrin	24
Atrazine	25
Bentazon, Sodium Salt	24
Benzene (Benzol)	27
Bromacil	25
Butachlor	25

El Dorado (cont)

Chemical	Wells
Carbaryl	24
Carbofuran	24
Chlordane	24
Chloromethane (Methyl Chloride)	23
Chlorothalonil	24
Dalapon	24
DBCP	24
DDE	12
Diazinon	25
Dicamba	24
Dieldrin	24
Dimethoate	25
Dinoseb	24
Diquat Dibromide	24
Endothall	24
Endrin	24
EPTC	12
Ethylene Dibromide	24
Glyphosate, Isopropylamine Salt	24
Heptachlor	24
Heptachlor Epoxide	24
Hexachlorobenzene	24
Lindane (Gamma-BHC)	24
Methomyl	24
Methoxychlor	24
Methyl Bromide (Bromomethane)	23
Metolachlor	25
Metribuzin	25
Molinate	25
Naphthalene	1
Ortho-Dichlorobenzene	27
Oxamyl	24
Picloram	24
Prometryn	25
Propachlor	25
Simazine	25
Thiobencarb	26
Toxaphene	24
Trichlorobenzenes	23
Xylene	27

Humboldt

Chemical	Wells
1,1,2,2-Tetrachloroethane	3
1,2,4-Trichlorobenzene	3
1,2-D + 1,3-D + C-3 Compounds	2
1,2-Dichloropropane	3
2,3,7,8-TCDD (Dioxin)	1
2,4,5-T	1
2,4,5-TP	1
2,4-D	1
3-Hydroxycarbofuran	1
4(2,4-DB), Dimethylamine Salt	1
Alachlor	1
Aldicarb	1
Aldicarb Sulfone	1
Aldicarb Sulfoxide	1
Aldrin	1
Atrazine	1
Bentazon, Sodium Salt	1
Benzene (Benzol)	3
Bromacil	1
Butachlor	1
Carbaryl	1
Carbofuran	1
Chlordane	1
Chloromethane (Methyl Chloride)	2
Dalapon	1
DBCP	1
Diazinon	1
Dicamba	1
Dieldrin	1
Dimethoate	1
Dinoseb	1
Diquat Dibromide	1
Endothall	1
Endrin	1
Ethylene Dibromide	1
Glyphosate, Isopropylamine Salt	1
Heptachlor	1
Heptachlor Epoxide	1
Hexachlorobenzene	1

Humboldt (cont)

Chemical	Wells
Lindane (Gamma-BHC)	1
Methomyl	1
Methoxychlor	1
Methyl Bromide (Bromomethane)	2
Metolachlor	1
Metribuzin	1
Molinate	1
Naphthalene	2
Ortho-Dichlorobenzene	3
Oxamyl	1
Picloram	1
Prometryn	1
Propachlor	1
Simazine	1
Thiobencarb	1
Toxaphene	1
Trichlorobenzenes	2
Xylene	2

Imperial

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 (Methyl Chloride)	5
Methyl Bromide (Bromomethane)	5
Naphthalene	5
Ortho-Dichlorobenzene	5
Trichlorobenzenes	5
Xylene	5

Inyo

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	1
2,4-D	1
Bentazon, Sodium Salt	1
Benzene (Benzol)	1

Inyo (cont)

Chemical	Wells
Chloromethane (Methyl Chloride)	1
Dalapon	1
DBCP	2
Dicamba	1
Dinoseb	1
Ethylene Dibromide	1
Methyl Bromide (Bromomethane)	1
Naphthalene	1
Ortho-Dichlorobenzene	1
Picloram	1
Trichlorobenzenes	1
Xylene	1

Lake

1,1,2,2-Tetrachloroethane	7
1,2,4-Trichlorobenzene	7
1,2-D + 1,3-D + C-3 Compounds	7
1,2-Dichloropropane	8
2,4,5-T	6
2,4,5-TP	9
2,4-D	9
3-Hydroxycarbofuran	3
4(2,4-DB), Dimethylamine Salt	6
Acifluorfen, Sodium Salt	3
Alachlor	5
Aldicarb	3
Aldicarb Sulfone	3
Aldicarb Sulfoxide	3
Aldrin	4
Atrazine	13
Bentazon, Sodium Salt	9
Benzene (Benzol)	7
BHC (Other Than Gamma Isomer)	2
Bromacil	3
Butachlor	3
Carbaryl	3
Carbofuran	8
Chloramben	1
Chlordane	4
Chlorobenzilate	2

Lake (cont)

Chemical	Wells
Chloromethane (Methyl Chloride)	7
Chloroneb	2
Chlorothalonil	2
Dacthal Acid Metabolites	3
Dalapon	10
DDD	2
DDE	2
DDT	2
Diazinon	4
Dicamba	10
Dieldrin	4
Dimethoate	3
Dinoseb	10
Diquat Dibromide	11
Endosulfan	2
Endosulfan Sulfate	2
Endothall	9
Endrin	4
Endrin Aldehyde	2
Ethylene Dibromide	2
Heptachlor	4
Heptachlor Epoxide	4
Hexachlorobenzene	4
Lindane (Gamma-BHC)	4
Methiocarb	3
Methomyl	3
Methoxychlor	4
Methyl Bromide (Bromomethane)	7
Metolachlor	3
Metribuzin	3
Molinate	3
Naphthalene	7
Ortho-Dichlorobenzene	7
Oxamyl	10
Permethrin	2
Permethrin, Other Related	2
Picloram	11
Prometryn	4
Propachlor	6

Lake (cont)

Chemical	Wells
Propoxur	3
Simazine	13
Thiobencarb	3
Toxaphene	4
Trichlorobenzenes	7
Trifluralin	2
Xylene	7

Marin

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
Benzene (Benzol)	4
Chloromethane (Methyl Chloride)	3
Methyl Bromide (Bromomethane)	3
Naphthalene	3
Ortho-Dichlorobenzene	3
Trichlorobenzenes	3
Xylene	4

Mariposa

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
Alachlor	6
Ametryne	3
Atrazine	6
Benzene (Benzol)	4
Bromacil	6
Butachlor	3
Butylate	3
Chloromethane (Methyl Chloride)	4
Chlorpropham	3
Cycloate	3
DBCP	1
DDVP (Dichlorvos)	3
Demeton	3

Mariposa (cont)

Chemical	Wells
Diazinon	6
Dimethoate	3
Diphenamid	3
Disulfoton	3
EPTC	3
Ethylene Dibromide	1
Fenamiphos	3
Hexazinone	3
Merphos	3
Methyl Bromide (Bromomethane)	4
Metolachlor	3
Metribuzin	3
Molinate	3
Naphthalene	3
Napropamide	3
Ortho-Dichlorobenzene	4
Prometon	3
Prometryn	6
Propachlor	3
Propazine	3
Simazine	6
Simetryn	3
Tebuthiuron	3
Terbutryn	3
Tetrachlorvinphos (Stirofos)	3
Thiobencarb	3
Triadimefon	3
Trichlorobenzenes	4
Vernolate	3
Xylene	4

Mendocino

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
2,4,5-T	6
2,4,5-TP	6
2,4-D	6
3-Hydroxycarbofuran	6

Mendocino (cont)

Chemical	Wells
4(2,4-DB), Dimethylamine Salt	6
Acifluorfen, Sodium Salt	6
Acrolein	2
Acrylonitrile	2
Alachlor	12
Aldicarb	6
Aldicarb Sulfone	6
Aldicarb Sulfoxide	6
Aldrin	7
Atrazine	12
Bentazon, Sodium Salt	6
Benzene (Benzol)	5
BHC (Other Than Gamma Isomer)	7
Bromacil	12
Butachlor	12
Carbaryl	6
Carbofuran	6
Chloramben	4
Chlordane	6
Chlorobenzilate	6
Chloromethane (Methyl Chloride)	4
Chloroneb	6
Chlorothalonil	7
Dacthal Acid Metabolites	6
Dalapon	6
DDD	6
DDE	6
DDT	6
Diazinon	12
Dicamba	6
Dieldrin	6
Dimethoate	12
Dinoseb	6
Diquat Dibromide	5
Endosulfan	7
Endosulfan Sulfate	6
Endothall	5
Endrin	7
Endrin Aldehyde	6

Mendocino (cont)

Chemical	Wells
Heptachlor	8
Heptachlor Epoxide	6
Hexachlorobenzene	7
Lindane (Gamma-BHC)	9
Methiocarb	6
Methomyl	6
Methoxychlor	9
Methyl Bromide (Bromomethane)	4
Metolachlor	12
Metribuzin	12
Molinate	12
Naphthalene	4
Ortho-Dichlorobenzene	4
Oxamyl	6
Permethrin	6
Permethrin, Other Related	6
Picloram	6
Prometryn	12
Propachlor	16
Propoxur	6
Simazine	12
Thiobencarb	12
Toxaphene	8
Trichlorobenzenes	4
Trifluralin	6
Xylene	5

Modoc

2,4-D	1
Atrazine	1
Carbofuran	1
Diquat Dibromide	1
Glyphosate, Isopropylamine Salt	1
Simazine	1

Mono

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

Mono (cont)

Chemical	Wells
2,4,5-TP	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
Butachlor	2
Carbaryl	2
Carbofuran	2
Chlordane	2
Chloromethane (Methyl Chloride)	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

Mono (cont)

Chemical	Wells
Molinate	2
Naphthalene	3
Ortho-Dichlorobenzene	3
Oxamyl	2
Picloram	2
Prometryn	2
Propachlor	2
Simazine	2
Thiobencarb	2
Toxaphene	2
Trichlorobenzenes	3
Xylene	3

Napa

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
2,4,5-T	5
2,4,5-TP	5
2,4-D	5
3-Hydroxycarbofuran	2
4(2,4-DB), Dimethylamine Salt	3
Aldicarb	2
Aldicarb Sulfone	2
Aldicarb Sulfoxide	2
Atrazine	4
Bentazon, Sodium Salt	5
Benzene (Benzol)	3
Bromacil	2
Butachlor	2
Carbaryl	2
Carbofuran	5
Chloromethane (Methyl Chloride)	3
Dalapon	5
Diazinon	2
Dicamba	5
Dimethoate	2
Dinoseb	5

Napa (cont)

Chemical	Wells
Diquat Dibromide	5
Endothall	4
Methomyl	2
Methyl Bromide (Bromomethane)	3
Metolachlor	2
Metribuzin	2
Molinate	2
Naphthalene	3
Ortho-Dichlorobenzene	3
Oxamyl	5
Picloram	5
Prometryn	2
Propachlor	2
Simazine	4
Thiobencarb	2
Trichlorobenzenes	3
Trifluralin	2
Xylene	3

Nevada

1,1,2,2-Tetrachloroethane	7
1,2,4-Trichlorobenzene	7
1,2-D + 1,3-D + C-3 Compounds	7
1,2-Dichloropropane	7
2,3,7,8-TCDD (Dioxin)	3
2,4,5-TP	3
2,4-D	3
3-Hydroxycarbofuran	3
Acetochlor	8
Alachlor	3
Aldicarb	3
Aldicarb Sulfone	3
Aldicarb Sulfoxide	3
Aldrin	3
Atrazine	3
Bentazon, Sodium Salt	3
Benzene (Benzol)	7
Bromacil	3
Butachlor	3

Nevada (cont)

Chemical	Wells
Carbaryl	3
Carbofuran	3
Chlordane	3
Chloromethane (Methyl Chloride)	7
Dacthal Acid Metabolites	8
Dalapon	3
DBCP	3
DDE	8
Diazinon	3
Dicamba	3
Dieldrin	3
Dimethoate	3
Dinoseb	3
Diquat Dibromide	3
Diuron	3
Endothall	3
Endrin	3
EPTC	8
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)	7
Metolachlor	3
Metribuzin	3
Molinate	3
Naphthalene	7
Ortho-Dichlorobenzene	7
Oxamyl	3
Picloram	3
Prometryn	3
Propachlor	3
Simazine	3
Terbacil	8
Thiobencarb	3
Toxaphene	3
Trichlorobenzenes	7
Xylene	7

Nevada (cont)

Chemical	Wells
Placer	
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
2,4,5-T	1
2,4,5-TP	7
2,4-D	7
3-Hydroxycarbofuran	7
4(2,4-DB), Dimethylamine Salt	1
Acetochlor	1
Alachlor	7
Aldicarb	7
Aldicarb Sulfone	7
Aldicarb Sulfoxide	7
Aldrin	7
Atrazine	7
Bentazon, Sodium Salt	7
Benzene (Benzol)	4
Bromacil	7
Butachlor	7
Carbaryl	7
Carbofuran	7
Chlordane	7
Chloromethane (Methyl Chloride)	4
Chlorothalonil	4
Dacthal Acid Metabolites	1
Dalapon	7
DBCP	8
DDE	1
Diazinon	7
Dicamba	7
Dieldrin	7
Dimethoate	7
Dinoseb	7

Placer (cont)

Chemical	Wells
Diquat Dibromide	4
Diuron	1
Endothall	7
Endrin	7
EPTC	1
Ethylene Dibromide	8
Glyphosate, Isopropylamine Salt	7
Heptachlor	7
Heptachlor Epoxide	7
Hexachlorobenzene	4
Lindane (Gamma-BHC)	7
Methiocarb	1
Methomyl	7
Methoxychlor	7
Methyl Bromide (Bromomethane)	4
Metolachlor	7
Metribuzin	7
Molinate	7
Naphthalene	4
Ortho-Dichlorobenzene	4
Oxamyl	7
Picloram	7
Prometryn	7
Propachlor	7
Propoxur	1
Simazine	7
Terbacil	1
Thiobencarb	7
Toxaphene	7
Trichlorobenzenes	4
Xylene	4

San Benito

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-T	6
2,4,5-TP	6
2,4-D	5
3-Hydroxycarbofuran	4

San Benito (cont)

Chemical	Wells
3-Hydroxycarbofuran	4
Acetochlor	6
Alachlor	4
Aldicarb	4
Aldicarb Sulfone	4
Aldicarb Sulfoxide	4
Aldrin	1
Atrazine	4
Bentazon, Sodium Salt	6
Benzene (Benzol)	2
Bromacil	4
Butachlor	4
Carbaryl	4
Carbofuran	4
Chlordane	1
Chloromethane (Methyl Chloride)	2
Chlorothalonil	1
Dacthal Acid Metabolites	6
Dalapon	6
DDE	6
Dicamba	6
Dieldrin	1
Dimethoate	4
Dinoseb	6
Diquat Dibromide	5
Endrin	1
EPTC	6
Heptachlor	1
Heptachlor Epoxide	1
Hexachlorobenzene	1
Lindane (Gamma-BHC)	1
Methomyl	4
Methoxychlor	1
Methyl Bromide (Bromomethane)	2
Metolachlor	4
Metribuzin	4
Molinate	10
Naphthalene	2
Ortho-Dichlorobenzene	2

San Benito (cont)

Chemical	Wells
Oxamyl	4
Picloram	6
Prometryn	4
Propachlor	4
Simazine	4
Terbacil	6
Thiobencarb	4
Toxaphene	1
Trichlorobenzenes	2
Xylene	2

San Luis Obispo

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
2,4,5-T	1
2,4,5-TP	2
2,4-D	2
3-Hydroxycarbofuran	2
ACET	4
Alachlor	28
Aldicarb	2
Aldicarb Sulfone	2
Aldicarb Sulfoxide	2
Aldrin	2
Atrazine	42
Bentazon, Sodium Salt	2
Benzene (Benzol)	17
Bromacil	32
Butachlor	28
Carbaryl	2
Carbofuran	2
Chlordane	2
Chloromethane (Methyl Chloride)	16
Chlorothalonil	2
Dalapon	2
DBCP	35
DDE	11

San Luis Obispo (cont)

Chemical	Wells
DDE	11
Deethyl-Atrazine	4
DACT	4
Diazinon	28
Dicamba	2
Dieldrin	2
Dimethoate	28
Dinoseb	2
Diquat Dibromide	2
Diuron	15
Endothall	1
Endrin	2
EPTC	11
Ethylene Dibromide	35
Glyphosate, Isopropylamine Salt	1
Heptachlor	2
Heptachlor Epoxide	2
Hexachlorobenzene	2
Hexazinone	4
Imidacloprid	4
Imidacloprid Guanidine	4
Imidacloprid Olefin	4
Imidacloprid Olefinic-Guanidine	4
Imidacloprid Urea	4
Lindane (Gamma-BHC)	2
Methomyl	2
Methoxychlor	2
Methyl Bromide (Bromomethane)	16
Metolachlor	28
Metribuzin	28
Molinate	52
Naphthalene	16
Norflurazon	4
Ortho-Dichlorobenzene	16
Oxamyl	2
Picloram	2
Prometon	4
Prometryn	28
Propachlor	6

San Luis Obispo (cont)

Chemical	Wells
Simazine	42
Thiobencarb	28
Toxaphene	2
Trichlorobenzenes	16
Xylene	17

Santa Barbara

Chemical	Wells
1,3-Dichloropropene	4
1,1,2,2-Tetrachloroethane	36
1,2,4-Trichlorobenzene	36
1,2-D + 1,3-D + C-3 Compounds	31
1,2-Dichloropropane	36
2,4,5-T	1
2,4,5-TP	2
2,4-D	2
3-Hydroxycarbofuran	2
ACET	7
Alachlor	13
Aldicarb	2
Aldicarb Sulfone	2
Aldicarb Sulfoxide	2
Aldrin	2
Atrazine	33
Bentazon, Sodium Salt	2
Benzene (Benzol)	36
Bromacil	20
Butachlor	13
Carbaryl	2
Carbofuran	2
Chlordane	2
Chloromethane (Methyl Chloride)	31
Chlorothalonil	1
Dalapon	2
DBCP	26
DDE	7
Deethyl-Atrazine	7
DACT	7
Diazinon	13
Dicamba	2

Santa Barbara (cont)

Chemical	Wells
Dieldrin	2
Dimethoate	13
Dinoseb	2
Diquat Dibromide	2
Diuron	7
Endothall	1
Endrin	2
EPTC	7
Ethylene Dibromide	26
Glyphosate, Isopropylamine Salt	1
Heptachlor	2
Heptachlor Epoxide	2
Hexachlorobenzene	2
Hexazinone	7
Imidacloprid	7
Imidacloprid Guanidine	7
Imidacloprid Olefin	7
Imidacloprid Olefinic-Guanidine	7
Imidacloprid Urea	7
Lindane (Gamma-BHC)	2
Methomyl	2
Methoxychlor	2
Methyl Bromide (Bromomethane)	31
Metolachlor	13
Metribuzin	13
Molinate	38
Naphthalene	30
Norflurazon	7
Ortho-Dichlorobenzene	36
Oxamyl	2
Picloram	2
Prometon	7
Prometryn	13
Propachlor	2
Simazine	33
Thiobencarb	13
Toxaphene	2
Trichlorobenzenes	31
Xylene	36

Santa Cruz

Chemical	Wells
1,3-Dichloropropene	4
1,1,2,2-Tetrachloroethane	13
1,2,4-Trichlorobenzene	13
1,2-D + 1,3-D + C-3 Compounds	13
1,2-Dichloropropane	13
2,3,7,8-TCDD (Dioxin)	1
2,4,5-T	5
2,4,5-TP	16
2,4-D	19
3-Hydroxycarbofuran	5
4(2,4-DB), Dimethylamine Salt	3
Acenapthene	3
Acetochlor	1
Acifluorfen, Sodium Salt	3
Alachlor	5
Aldicarb	5
Aldicarb Sulfone	5
Aldicarb Sulfoxide	5
Aldrin	5
Atrazine	7
Bentazon, Sodium Salt	16
Benzene (Benzol)	13
Bromacil	5
Butachlor	5
Carbaryl	5
Carbofuran	5
Carbon Disulfide	8
Chlordane	4
Chloromethane (Methyl Chloride)	13
Chlorothalonil	1
Dacthal	11
Dacthal Acid Metabolites	2
Dalapon	16
DBCP	5
DDE	4
DDT	3
Diazinon	2
Dicamba	16
Dichlorprop, Butoxyethanol Ester	3

Santa Cruz (cont)

Chemical	Wells
Dieldrin	5
Dimethoate	2
Dinoseb	16
Diquat Dibromide	19
Diuron	1
Endothall	5
Endrin	5
EPTC	4
Ethylene Dibromide	5
Glyphosate, Isopropylamine Salt	5
Heptachlor	4
Heptachlor Epoxide	5
Hexachlorobenzene	5
Lindane (Gamma-BHC)	5
Methiocarb	3
Methomyl	5
Methoxychlor	5
Methyl Bromide (Bromomethane)	13
Metolachlor	5
Metribuzin	5
Molinate	6
Naphthalene	13
Ortho-Dichlorobenzene	13
Oxamyl	5
Picloram	16
Prometryn	2
Propachlor	5
Propazine	3
Simazine	7
Terbacil	1
Thiobencarb	5
Toxaphene	4
Trichlorobenzenes	13
Trifluralin	3
Xylene	13

Shasta

Chemical	Wells
1,1,2,2-Tetrachloroethane	8
1,2,4-Trichlorobenzene	8
1,2-D + 1,3-D + C-3 Compounds	8
1,2-Dichloropropane	8
Benzene (Benzol)	8
Chloromethane (Methyl Chloride)	8
DBCP	3
Ethylene Dibromide	3
Methyl Bromide (Bromomethane)	8
Naphthalene	3
Ortho-Dichlorobenzene	8
Trichlorobenzenes	8
Xylene	8

Sierra

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 (Methyl Chloride)	1
Methyl Bromide (Bromomethane)	1
Naphthalene	1
Ortho-Dichlorobenzene	1
Simazine	1
Trichlorobenzenes	1
Xylene	1

Siskiyou

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

Solano

Chemical	Wells
1,1,2,2-Tetrachloroethane	20
1,2,4-Trichlorobenzene	20
1,2-D + 1,3-D + C-3 Compounds	20
1,2-Dichloropropane	20
2,3,7,8-TCDD (Dioxin)	1
2,4,5-T	2
2,4,5-TP	2
2,4-D	2
3-Hydroxycarbofuran	6
Acetochlor	1
Alachlor	2
Aldicarb	6
Aldicarb Sulfone	6
Aldicarb Sulfoxide	6
Aldrin	2
Atrazine	2
Bentazon, Sodium Salt	2
Benzene (Benzol)	21
Bromacil	2
Butachlor	2
Carbaryl	6
Carbofuran	6
Chlordane	2
Chloromethane (Methyl Chloride)	20
Chlorothalonil	2
Dacthal Acid Metabolites	1
Dalapon	2
DBCP	3
DDE	1
Diazinon	2
Dicamba	2
Dieldrin	2
Dimethoate	2
Dinoseb	2
Diquat Dibromide	1
Diuron	1
Endothall	2
Endrin	2
EPTC	1

Solano (cont)

Chemical	Wells
Ethylene Dibromide	3
Glyphosate, Isopropylamine Salt	5
Heptachlor	2
Heptachlor Epoxide	2
Hexachlorobenzene	2
Lindane (Gamma-BHC)	2
Methiocarb	1
Methomyl	6
Methoxychlor	2
Methyl Bromide (Bromomethane)	20
Metolachlor	2
Metribuzin	2
Molinate	1
Naphthalene	20
Ortho-Dichlorobenzene	20
Oryzalin	1
Oxamyl	6
Picloram	2
Prometryn	2
Propachlor	2
Propoxur	1
Simazine	2
Terbacil	1
Thiobencarb	2
Toxaphene	2
Trichlorobenzenes	20
Trifluralin	1
Xylene	20

Trinity

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 (Methyl Chloride)	1
Methyl Bromide (Bromomethane)	1
Ortho-Dichlorobenzene	1
Trichlorobenzenes	1
Xylene	1

Tuolumne

Chemical	Wells
1,1,2,2-Tetrachloroethane	18
1,2,4-Trichlorobenzene	18
1,2-D + 1,3-D + C-3 Compounds	18
1,2-Dichloropropane	18
Alachlor	16
Ametryne	9
Atrazine	16
Benzene (Benzol)	18
Bromacil	16
Butachlor	7
Butylate	9
Chloromethane (Methyl Chloride)	18
Chlorpropham	9
Cycloate	9
DDVP (Dichlorvos)	9
Demeton	9
Diazinon	16
Dimethoate	7
Diphenamid	9
Disulfoton	9
EPTC	9
Fenamiphos	9
Hexazinone	9
Merphos	9
Methyl Bromide (Bromomethane)	18
Metolachlor	7
Metribuzin	7
Molinate	7
Naphthalene	9
Napropamide	9
Ortho-Dichlorobenzene	18
Prometon	9
Prometryn	16
Propachlor	7
Propazine	9
Simazine	16
Simetryn	9
Tebuthiuron	9
Terbutryn	9

Tuolumne (cont)

Chemical	Wells
Tetrachlorvinphos (Stirofos)	9
Thiobencarb	7
Triadimefon	9
Trichlorobenzenes	18
Vernolate	9
Xylene	18

Ventura

1,3-Dichloropropene	23
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
2,3,7,8-TCDD (Dioxin)	1
2,4,5-T	4
2,4,5-TP	7
2,4-D	7
3-Hydroxycarbofuran	8
ACET	3
Alachlor	15
Aldicarb	8
Aldicarb Sulfone	8
Aldicarb Sulfoxide	8
Aldrin	9
Atrazine	23
Bentazon, Sodium Salt	7
Benzene (Benzol)	28
Bromacil	17
Butachlor	14
Carbaryl	8
Carbofuran	8
Chlordane	10
Chloromethane (Methyl Chloride)	27
Chlorothalonil	4
Dalapon	7
DBCP	17
DDE	4
Deethyl-Atrazine	3
DACT	3
Diazinon	14

Ventura (cont)

Chemical	Wells
Dicamba	7
Dieldrin	9
Dimethoate	14
Dinoseb	7
Diquat Dibromide	8
Diuron	7
Endothall	2
Endrin	10
EPTC	4
Ethylene Dibromide	18
Glyphosate, Isopropylamine Salt	2
Heptachlor	10
Heptachlor Epoxide	10
Hexachlorobenzene	9
Hexazinone	3
Imidacloprid	3
Imidacloprid Guanidine	3
Imidacloprid Olefin	3
Imidacloprid Olefinic-Guanidine	3
Imidacloprid Urea	3
Lindane (Gamma-BHC)	9
Methomyl	8
Methoxychlor	10
Methyl Bromide (Bromomethane)	27
Metolachlor	14
Metribuzin	14
Molinate	20
Naphthalene	26
Norflurazon	3
Ortho-Dichlorobenzene	27
Oxamyl	9
Picloram	7
Prometon	3
Prometryn	14
Propachlor	13
Simazine	23
Thiobencarb	14
Toxaphene	9
Trichlorobenzenes	27
Xylene	28

Yolo

Chemical	Wells
1,1,2,2-Tetrachloroethane	30
1,2,4-Trichlorobenzene	30
1,2-D + 1,3-D + C-3 Compounds	27
1,2-Dichloropropane	30
2,3,7,8-TCDD (Dioxin)	16
2,4,5-T	5
2,4,5-TP	21
2,4-D	21
3-Hydroxycarbofuran	6
4(2,4-DB), Dimethylamine Salt	2
Acetochlor	17
Alachlor	17
Aldicarb	6
Aldicarb Sulfone	6
Aldicarb Sulfoxide	6
Aldrin	6
Atrazine	21
Bentazon, Sodium Salt	21
Benzene (Benzol)	30
Bromacil	14
Butachlor	14
Carbaryl	6
Carbofuran	21
Chlordane	11
Chloromethane (Methyl Chloride)	27
Chlorothalonil	3
Dacthal Acid Metabolites	33
Dalapon	21
DBCP	21
DDE	18
Diazinon	6
Dicamba	6
Dieldrin	6
Dimethoate	14
Dinoseb	21
Diquat Dibromide	20
Diuron	1
Endothall	18
Endrin	11

Yolo (cont)

Chemical	Wells
EPTC	18
Ethylene Dibromide	21
Glyphosate, Isopropylamine Salt	16
Heptachlor	11
Heptachlor Epoxide	11
Hexachlorobenzene	21
Lindane (Gamma-BHC)	11
Methiocarb	5
Methomyl	6
Methoxychlor	11
Methyl Bromide (Bromomethane)	27
Metolachlor	14
Metribuzin	14
Molinate	38
Naphthalene	26
Ortho-Dichlorobenzene	30
Oxamyl	21
Picloram	21
Prometryn	14
Propachlor	14
Propoxur	5
Simazine	21
Terbacil	17
Thiobencarb	21
Toxaphene	11
Trichlorobenzenes	27
Xylene	30

Part 4. Pesticides sampled by county with detections, number of wells sampled, and number of positive wells from July 1, 2003 to June 30, 2003

Butte

Chemical	Wells	Pos
1,1,2,2-Tetrachloroethane	66	
1,2,4-Trichlorobenzene	66	
1,2-D + 1,3-D + C-3 Compounds	66	
1,2-Dichloropropane	66	
Acetochlor	24	
Aldrin	1	
Benzene (Benzol)	66	
Chlordane	1	
Chloromethane (Methyl Chloride)	66	
Chlorothalonil	1	
Dachthal Acid Metabolites	25	2
DDE	24	
Dieldrin	1	
Endrin	1	
EPTC	24	
Heptachlor	1	
Heptachlor Epoxide	1	
Hexachlorobenzene	1	
Lindane (Gamma-BHC)	1	
Methoxychlor	1	
Methyl Bromide (Bromomethane)	66	
Naphthalene	58	
Ortho-Dichlorobenzene	66	
Terbacil	24	
Toxaphene	1	
Trichlorobenzenes	66	
Xylene	66	

Contra Costa

Chemical	Wells	Pos
1,3-Dichloropropene	3	
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	
2,3,7,8-TCDD (Dioxin)	6	
2,4,5-T	4	
2,4,5-TP (Silvex)	4	
2,4-D	4	
3-Hydroxycarbofuran	3	
4(2,4-DB), Dimethylamine Salt	1	

Contra Costa (cont)

Chemical	Wells	Pos
Acetochlor	1	
Alachlor	4	
Aldicarb	3	
Aldicarb Sulfone	3	
Aldicarb Sulfoxide	4	
Aldrin	4	
Ametryne	1	
Atraton	1	
Atrazine	4	
Bentazon, Sodium Salt	3	
Benzene (Benzol)	4	
Bromacil	4	
Butachlor	4	
Butylate	1	
Carbaryl	4	
Carbofuran	4	
Carbon Disulfide	1	
Chlordane	4	
Chlorobenzilate	1	
Chloromethane (Methyl Chloride)	4	
Chloroneb	1	
Chlorothalonil	1	
Chlorpropham	1	
Chlorpyrifos	1	
Cyanazine	1	
Cycloate	1	
Dalapon	3	
DBCP	3	1
DDE	2	
DDVP (Dichlorvos)	1	
Diazinon	4	
Dicamba	4	
Dieldrin	4	
Dimethoate	3	
Dinoseb	4	
Diphenamid	1	
Diquat Dibromide	4	
Disulfoton	1	
Diuron	3	
Endothall	4	

Contra Costa (cont)

Chemical	Wells	Pos
Endrin	4	
EPTC	2	
Ethylene Dibromide	3	
Glyphosate, Isopropylamine Salt	4	
Heptachlor	4	
Heptachlor Epoxide	4	
Hexachlorobenzene	4	
Lindane (Gamma-BHC)	4	
Methomyl	4	
Methoxychlor	4	
Methyl Bromide (Bromomethane)	4	
Metolachlor	4	
Metribuzin	4	
Molinate	5	
Naphthalene	4	
Napropamide	1	
Ortho-Dichlorobenzene	4	
Oxamyl	4	
Picloram	3	
Prometon	1	
Prometryn	4	
Propachlor	4	
Propazine	1	
Simazine	4	
Simetryn	1	
Terbacil	1	
Terbutryn	1	
Thiobencarb	4	
Toxaphene	4	
Triadimefon	1	
Trichlorobenzenes	4	
Trifluralin	1	
Vernolate	1	
Xylene	1	

Fresno

1,3-Dichloropropene	1	
(S)-Metolachlor	3	
1,1,2,2-Tetrachloroethane	80	

Fresno (cont)

Chemical	Wells	Pos
1,2,4-Trichlorobenzene	80	
1,2-D + 1,3-D + C-3 Compounds	80	
1,2-Dichloropropane	80	1
2,3,7,8-TCDD (Dioxin)	3	
2,4,5-T	35	
2,4,5-TP (Silvex)	35	
2,4-D	35	
3-Hydroxycarbofuran	35	
ACET	10	5
Acetochlor	31	
Alachlor	76	
Aldicarb	35	
Aldicarb Sulfone	35	
Aldicarb Sulfoxide	35	
Aldrin	35	
Atrazine	82	
Bentazon, Sodium Salt	35	
Benzene (Benzol)	80	
Bromacil	75	
Butachlor	69	
Carbaryl	35	
Carbofuran	35	
Carbon Disulfide	2	
Chlordane	36	
Chloromethane (Methyl Chloride)	80	
Chlorothalonil	35	
Dachthal Acid Metabolites	28	
Cyanazine	3	
Dalapon	35	
DBCP	142	89
DDE	28	
Deethyl-Atrazine	10	
Demethylnorflurazon	3	3
DACT	7	3
Diazinon	49	
Dicamba	35	
Dieldrin	35	
Dimethoate	69	
Dinoseb	35	

Fresno (cont)

Chemical	Wells	Pos
Diquat Dibromide	6	
Diuron	17	4
Endothall	5	
Endrin	36	
EPTC	28	
Ethylene Dibromide	135	4
Fluometuron	3	
Glufosinate-Ammonium	3	
Glyphosate, Isopropylamine Salt	9	
Heptachlor	36	
Heptachlor Epoxide	36	
Hexachlorobenzene	36	
Hexazinone	7	
Imidacloprid	3	
Imidacloprid Guanidine	3	
Imidacloprid Olefin	3	
Imidacloprid Olefinic-Guanidine	3	
Imidacloprid Urea	3	
Lindane (Gamma-BHC)	36	
Linuron	3	
Methomyl	35	
Methoxychlor	36	
Methyl Bromide (Bromomethane)	80	1
Metolachlor	69	
Metribuzin	72	
Molinate	100	
Naphthalene	64	
Norflurazon	10	3
Ortho-Dichlorobenzene	80	
Oxamyl	35	
Pendimethalin	3	
Picloram	35	
Prometon	7	
Prometryn	69	
Propachlor	69	
Propanil	3	
Simazine	82	6
Terbacil	28	
Thiobencarb	69	

Fresno (cont)

Chemical	Wells	Pos
Toxaphene	36	
Trichlorobenzenes	80	
Trifluralin	3	
Xylene	80	

Kern

Chemical	Wells	Pos
1,3-Dichloropropene	15	
1,1,2,2-Tetrachloroethane	286	
1,2,4-Trichlorobenzene	284	
1,2-D + 1,3-D + C-3 Compounds	271	
1,2-Dichloropropane	285	4
2,3,7,8-TCDD (Dioxin)	10	
2,4,5-T	12	
2,4,5-TP (Silvex)	23	
2,4,6-Trichlorophenol	1	
2,4-D	22	
3-Hydroxycarbofuran	21	
Acenapthene	25	25
Acetochlor	87	
Alachlor	140	
Aldicarb	22	
Aldicarb Sulfone	38	17
Aldicarb Sulfoxide	21	
Aldrin	56	23
Atraton	18	
Atrazine	152	
Benefin (Benfluralin)	1	
Bentazon, Sodium Salt	22	
Benzene (Benzol)	276	1
BHC (Other Than Gamma Isomer)	22	
Bromacil	130	
Butachlor	115	
Carbaryl	22	
Carbofuran	21	
Carbon Disulfide	11	
Chlordane	33	
Chloromethane (Methyl Chloride)	285	1
Chlorothalonil	27	
Dacthal	6	

Kern (cont)

Chemical	Wells	Pos
Dachthal Acid Metabolites	79	5
Dalapon	23	
DBCP	146	25
DDD	3	
DDE	83	
DDT	6	
Diazinon	57	
Dicamba	22	
Dieldrin	29	
Dimethoate	134	
Dinoseb	24	
Diquat Dibromide	12	
Diuron	5	
Endosulfan	1	
Endosulfan Sulfate	1	
Endothall	12	
Endrin	33	
Endrin Aldehyde	1	
EPTC	82	
Ethylene Dibromide	144	6
Glyphosate, Isopropylamine Salt	12	
Heptachlor	34	
Heptachlor Epoxide	33	
Hexachlorobenzene	50	
Lindane (Gamma-BHC)	47	
Methomyl	21	
Methoxychlor	47	
Methyl Bromide (Bromomethane)	286	
Metolachlor	130	
Metribuzin	130	
Molinate	169	
Naphthalene	254	
Ortho-Dichlorobenzene	277	
Oxamyl	21	
Pendimethalin	1	
Pentachloronitrobenzene (PCNB)	1	
Picloram	21	
Prometon	18	
Prometryn	130	

Kern (cont)

Chemical	Wells	Pos
Propachlor	114	
Secbumeton	18	
Simazine	152	
Terbacil	87	
Terbutryn	18	
Thiobencarb	129	
Toxaphene	33	
Trichlorobenzenes	284	
Xylene	287	1

Kings

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	
Acetochlor	3	
Benzene (Benzol)	6	2
Chloromethane (Methyl Chloride)	4	
Dachthal Acid Metabolites	3	
DDE	6	
EPTC	6	
Methyl Bromide (Bromomethane)	4	
Molinate	6	
Naphthalene	4	
Ortho-Dichlorobenzene	4	
Terbacil	3	
Trichlorobenzenes	4	
Xylene	4	

Los Angeles

1,3-Dichloropropene	139	
1,1,2,2-Tetrachloroethane	578	
1,2,4-Trichlorobenzene	626	
1,2-D + 1,3-D + C-3 Compounds	637	
1,2-Dichloropropane	637	2
2,3,7,8-TCDD (Dioxin)	65	
2,4,5-T	22	
2,4,5-TP (Silvex)	91	
2,4-D	89	

Los Angeles (cont)

Chemical	Wells	Pos
3-Hydroxycarbofuran	63	
4(2,4-DB), Dimethylamine Salt	8	
Acenapthene	18	
Acetochlor	55	
Acifluorfen, Sodium Salt	19	
Alachlor	159	
Aldicarb	78	
Aldicarb Sulfone	78	
Aldicarb Sulfoxide	78	
Aldrin	66	
Atrazine	302	
Bentazon, Sodium Salt	91	
Benzene (Benzol)	638	
BHC (Other Than Gamma Isomer)	12	
Bromacil	132	
Butachlor	125	
Carbaryl	66	
Carbofuran	79	
Carbon Disulfide	10	
Chlordane	97	
Chlorobenzilate	1	
Chloromethane (Methyl Chloride)	637	6
Chloroneb	1	
Chlorothalonil	52	
Chlorpyrifos	1	
Dacthal	13	
Dachthal Acid Metabolites	51	
Dalapon	91	
DBCP	287	7
DDD	12	
DDE	60	
DDT	20	
Diazinon	105	
Dicamba	74	
Dichlorprop, Butoxyethanol Ester	8	
Dieldrin	66	
Dimethoate	116	
Dinoseb	91	
Diquat Dibromide	79	

Los Angeles (cont)

Chemical	Wells	Pos
Diuron	26	
Endosulfan	12	
Endosulfan Sulfate	12	
Endothall	67	
Endrin	110	
Endrin Aldehyde	12	
EPTC	49	
Ethylene Dibromide	276	2
Glyphosate, Isopropylamine Salt	81	
Heptachlor	98	
Heptachlor Epoxide	100	
Hexachlorobenzene	94	
Lindane (Gamma-BHC)	100	
Malathion	1	
Methiocarb	18	
Methomyl	63	
Methoxychlor	100	
Methyl Bromide (Bromomethane)	637	
Metolachlor	125	
Metribuzin	124	
Molinate	210	
Naphthalene	261	
Ortho-Dichlorobenzene	638	
Oxamyl	79	
Paraquat Dichloride	12	
Parathion Or Ethyl Parathion	1	
Permethrin	1	
Picloram	91	
Prometon	11	
Prometryn	118	
Propachlor	94	
Propazine	19	
Propoxur	10	
Simazine	300	
Terbacil	53	
Thiobencarb	255	
Toxaphene	94	
Trichlorobenzenes	637	
Trifluralin	19	
Xylene	527	

Madera

Chemical	Wells	Pos
1,1,2,2-Tetrachloroethane	13	
1,2,4-Trichlorobenzene	13	
1,2-D + 1,3-D + C-3 Compounds	13	
1,2-Dichloropropane	13	
2,4,5-T	2	
2,4,5-TP (Silvex)	2	
2,4-D	2	
3-Hydroxycarbofuran	2	
Acetochlor	13	
Alachlor	11	
Aldicarb	2	
Aldicarb Sulfone	2	
Aldicarb Sulfoxide	2	
Aldrin	2	
Ametryne	1	
Atrazine	11	
Bentazon, Sodium Salt	2	
Benzene (Benzol)	13	
Bromacil	7	
Butachlor	6	
Butylate	1	
Carbaryl	2	
Carbofuran	2	
Chlordane	6	
Chloromethane (Methyl Chloride)	13	
Chlorothalonil	2	
Chlorpropham	1	
Dachthal Acid Metabolites	13	
Cycloate	1	
Dalapon	2	
DBCP	12	2
DDE	13	
DDVP (Dichlorvos)	1	
Demeton	1	
Diazinon	7	
Dicamba	2	
Dieldrin	2	
Dimethoate	7	
Dinoseb	2	
Diphenamid	1	

Madera (cont)

Chemical	Wells	Pos
Disulfoton	1	
Endrin	6	
EPTC	14	
Ethylene Dibromide	11	1
Fenamiphos	1	
Heptachlor	6	
Heptachlor Epoxide	6	
Hexachlorobenzene	6	
Hexazinone	1	
Lindane (Gamma-BHC)	6	
Merphos	1	
Methomyl	2	
Methoxychlor	6	
Methyl Bromide (Bromomethane)	13	
Metolachlor	6	
Metribuzin	6	
Molinate	18	
Naphthalene	13	
Napropamide	1	
Ortho-Dichlorobenzene	13	
Oxamyl	2	
Picloram	2	
Prometon	1	
Prometryn	7	
Propachlor	2	
Propazine	1	
Simazine	11	
Simetryn	1	
Tebuthiuron	1	
Terbacil	13	
Terbutryn	1	
Tetrachlorvinphos (Stirofos)	1	
Thiobencarb	7	
Toxaphene	6	
Triadimefon	1	
Trichlorobenzenes	13	
Vernolate	1	
Xylene	13	

Merced

Chemical	Wells	Pos
1,1,2,2-Tetrachloroethane	29	
1,2,4-Trichlorobenzene	29	
1,2-D + 1,3-D + C-3 Compounds	29	
1,2-Dichloropropane	29	
Acetochlor	9	
Alachlor	10	
Atrazine	10	
Benzene (Benzol)	29	
Bromacil	8	
Butachlor	8	
Chloromethane (Methyl Chloride)	29	
Dachthal Acid Metabolites	9	
DBCP	33	14
DDE	9	
Dimethoate	8	
EPTC	9	
Ethylene Dibromide	28	1
Methyl Bromide (Bromomethane)	29	
Metolachlor	8	
Metribuzin	8	
Molinate	17	
Naphthalene	24	
Ortho-Dichlorobenzene	29	
Prometryn	8	
Propachlor	8	
Simazine	10	
Terbacil	9	
Thiobencarb	8	
Trichlorobenzenes	29	
Xylene	29	

Monterey

Chemical	Wells	Pos
1,3-Dichloropropene	16	
1,1,2,2-Tetrachloroethane	85	
1,2,4-Trichlorobenzene	87	
1,2-D + 1,3-D + C-3 Compounds	87	
1,2-Dichloropropane	87	
2,3,7,8-TCDD (Dioxin)	3	
2,4,5-T	11	

Monterey (cont)

Chemical	Wells	Pos
2,4,5-TP (Silvex)	12	
2,4-D	8	
3-Hydroxycarbofuran	6	
4(2,4-DB), Dimethylamine Salt	1	
Acenapthene	6	
ACET	15	
Acetochlor	15	
Acifluorfen, Sodium Salt	1	
Alachlor	31	
Aldicarb	6	
Aldicarb Sulfone	6	
Aldicarb Sulfoxide	6	
Aldrin	11	
Atrazine	46	
Bentazon, Sodium Salt	12	
Benzene (Benzol)	87	
Bromacil	45	
Butachlor	30	
Carbaryl	6	
Carbofuran	6	
Carbon Disulfide	14	
Chlordane	12	
Chloromethane (Methyl Chloride)	87	
Chlorothalonil	5	
Dachthal Acid Metabolites	16	3
Dalapon	12	
DBCP	43	
DDE	40	
DDT	6	
Deethyl-Atrazine	15	
DACT	15	
Diazinon	8	
Dicamba	12	
Dichlorprop, Butoxyethanol Ester	1	
Dieldrin	11	
Dimethoate	24	
Dinoseb	12	
Diquat Dibromide	9	
Diuron	19	

Monterey (cont)

Chemical	Wells	Pos
Endothall	7	
Endrin	12	
EPTC	40	
Ethylene Dibromide	40	
Glyphosate, Isopropylamine Salt	7	
Heptachlor	12	
Heptachlor Epoxide	12	
Hexachlorobenzene	12	
Hexazinone	15	
Imidacloprid	15	
Imidacloprid Guanidine	15	
Imidacloprid Olefin	15	
Imidacloprid Olefinic-Guanidine	15	
Imidacloprid Urea	15	
Lindane (Gamma-BHC)	12	
Methiocarb	1	
Methomyl	6	
Methoxychlor	12	
Methyl Bromide (Bromomethane)	87	
Metolachlor	30	
Metribuzin	30	
Molinate	53	
Naphthalene	84	1
Norflurazon	15	
Ortho-Dichlorobenzene	87	
Oxamyl	6	
Picloram	12	
Prometon	15	
Prometryn	24	
Propachlor	30	
Propazine	6	
Simazine	46	
Terbacil	15	
Thiobencarb	31	
Toxaphene	12	
Trichlorobenzenes	87	
Trifluralin	6	
Xylene	85	

Orange

Chemical	Wells	Pos
1,3-Dichloropropene	221	
1,1,2,2-Tetrachloroethane	225	
1,2,4-Trichlorobenzene	225	
1,2-D + 1,3-D + C-3 Compounds	225	
1,2-Dichloropropane	225	
2,3,7,8-TCDD (Dioxin)	3	
2,4,5-TP (Silvex)	195	
2,4,6-Trichlorophenol	17	
2,4-D	195	
2,4-Dinitrophenol	2	
3-Hydroxycarbofuran	18	
Acenapthene	15	
Acetochlor	209	
Alachlor	224	
Aldicarb	18	
Aldicarb Sulfone	18	
Aldicarb Sulfoxide	18	
Aldrin	212	
Atrazine	224	
Bentazon, Sodium Salt	194	
Benzene (Benzol)	225	
BHC (Other Than Gamma Isomer)	208	
Bromacil	224	
Butachlor	224	
Carbaryl	18	
Carbofuran	19	
Chlordane	19	
Chloromethane (Methyl Chloride)	225	
Chlorothalonil	211	
Dachthal Acid Metabolites	1	
Dalapon	194	
DBCP	225	
DDD	208	
DDE	209	
DDT	208	
Diazinon	68	
Dicamba	194	
Dieldrin	212	
Dimethoate	63	

Orange (cont)

Chemical	Wells	Pos
Dinoseb	195	
Diquat Dibromide	112	
Disulfoton	17	
Diuron	17	1
Endosulfan	208	
Endosulfan Sulfate	208	
Endothall	98	
Endrin	213	
Endrin Aldehyde	208	
EPTC	1	
Ethylene Dibromide	225	
Fonofos (Dyfonate)	17	
Glyphosate, Isopropylamine Salt	219	
Heptachlor	213	
Heptachlor Epoxide	213	
Hexachlorobenzene	212	
Lindane (Gamma-BHC)	211	
Linuron	2	
Malathion	59	
Methiocarb	15	
Methomyl	18	
Methoxychlor	213	
Methyl Bromide (Bromomethane)	225	
Methyl Parathion	59	
Metolachlor	224	
Metribuzin	63	
Molinate	224	
Naphthalene	225	
Ortho-Dichlorobenzene	225	
Oxamyl	18	
Paraquat Dichloride	108	
Parathion Or Ethyl Parathion	59	
Picloram	195	
Prometon	65	
Prometryn	224	
Propachlor	224	
Propoxur	15	
Simazine	224	

Orange (cont)

Chemical	Wells	Pos
Terbacil	1	
Thiobencarb	224	
Toxaphene	20	
Trichlorobenzenes	225	
Xylene	225	

Riverside

Chemical	Wells	Pos
1,3-Dichloropropene	1	
1,1,2,2-Tetrachloroethane	96	
1,2,4-Trichlorobenzene	95	
1,2-D + 1,3-D + C-3 Compounds	96	
1,2-Dichloropropane	96	
2,3,7,8-TCDD (Dioxin)	39	
2,4,5-TP (Silvex)	57	
2,4-D	57	
3-Hydroxycarbofuran	53	
Acetochlor	4	
Alachlor	54	
Aldicarb	53	
Aldicarb Sulfone	53	
Aldicarb Sulfoxide	53	
Aldrin	50	
Atrazine	72	
Bentazon, Sodium Salt	57	
Benzene (Benzol)	96	
Bromacil	62	
Butachlor	51	
Carbaryl	53	
Carbofuran	53	
Chlordane	50	
Chloromethane (Methyl Chloride)	96	
Chlorothalonil	50	
Dachthal Acid Metabolites	13	
Dalapon	57	
DBCP	88	21
DDE	4	
Diazinon	62	
Dicamba	57	

Riverside (cont)

Chemical	Wells	Pos
Dieldrin	50	
Dimethoate	62	
Dinoseb	57	
Diquat Dibromide	102	
Diuron	30	1
Endothall	46	
Endrin	50	
EPTC	4	
Ethylene Dibromide	88	
Glyphosate, Isopropylamine Salt	108	
Heptachlor	50	
Heptachlor Epoxide	50	
Hexachlorobenzene	47	
Lindane (Gamma-BHC)	50	
Methomyl	53	
Methoxychlor	50	
Methyl Bromide (Bromomethane)	96	
Metolachlor	51	
Metribuzin	51	
Molinate	82	
Naphthalene	95	
Ortho-Dichlorobenzene	96	
Oxamyl	53	
Picloram	57	
Prometryn	62	
Propachlor	47	
Simazine	72	
Terbacil	4	
Thiobencarb	62	
Toxaphene	50	
Trichlorobenzenes	96	
Xylene	96	

Sacramento

Chemical	Wells	Pos
1,3-Dichloropropene	79	
1,1,2,2-Tetrachloroethane	170	
1,2,4-Trichlorobenzene	170	
1,2-D + 1,3-D + C-3 Compounds	169	
1,2-Dichloropropane	170	
2,3,7,8-TCDD (Dioxin)	2	

Sacramento (cont)

Chemical	Wells	Pos
2,4,5-T	84	
2,4,5-TP (Silvex)	86	
2,4-D	86	
3-Hydroxycarbofuran	95	
4(2,4-DB), Dimethylamine Salt	79	
Acenapthene	79	
Acetochlor	23	
Acifluorfen, Sodium Salt	79	
Alachlor	95	
Aldicarb	95	
Aldicarb Sulfone	95	
Aldicarb Sulfoxide	95	
Aldrin	85	
Atrazine	95	
Bentazon, Sodium Salt	86	
Benzene (Benzol)	170	
Bromacil	95	
Butachlor	95	
Carbaryl	95	
Carbofuran	95	
Carbon Disulfide	81	
Chlordane	85	
Chloromethane (Methyl Chloride)	169	
Chlorothalonil	6	
Dacthal	2	
Dachthal Acid Metabolites	22	
Dalapon	86	
DBCP	85	2
DDE	102	
DDT	79	
Diazinon	6	
Dicamba	86	
Dichlorprop, Butoxyethanol Ester	79	
Dieldrin	85	
Dimethoate	16	
Dinoseb	86	
Diquat Dibromide	85	1
Endothall	85	
Endrin	85	
EPTC	102	

Sacramento (cont)

Chemical	Wells	Pos
Ethylene Dibromide	85	
Glyphosate, Isopropylamine Salt	85	
Heptachlor	85	
Heptachlor Epoxide	85	
Hexachlorobenzene	85	
Lindane (Gamma-BHC)	85	
Methiocarb	80	
Methomyl	95	
Methoxychlor	85	
Methyl Bromide (Bromomethane)	170	
Metolachlor	95	
Metribuzin	95	
Molinate	115	
Naphthalene	158	
Ortho-Dichlorobenzene	170	
Oxamyl	95	
Picloram	86	
Prometryn	16	
Propachlor	94	
Propazine	79	
Propoxur	1	
Simazine	95	
Terbacil	23	
Thiobencarb	99	
Toxaphene	85	
Trichlorobenzenes	169	
Trifluralin	79	
Xylene	170	

San Bernardino

Chemical	Wells	Pos
1,1,2,2-Tetrachloroethane	274	
1,2,4-Trichlorobenzene	269	
1,2-D + 1,3-D + C-3 Compounds	274	
1,2-Dichloropropane	274	
2,3,7,8-TCDD (Dioxin)	83	
2,4,5-T	1	
2,4,5-TP (Silvex)	87	
2,4-D	87	
3-Hydroxycarbofuran	96	

San Bernardino (cont)

Chemical	Wells	Pos
Acetochlor	10	
Alachlor	85	
Aldicarb	96	
Aldicarb Sulfone	96	
Aldicarb Sulfoxide	96	
Aldrin	87	
Atrazine	86	
Bentazon, Sodium Salt	87	
Benzene (Benzol)	274	
Bromacil	85	
Butachlor	85	
Carbaryl	96	
Carbofuran	96	
Chlordane	87	
Chloromethane (Methyl Chloride)	274	
Chlorothalonil	87	
Dachthal Acid Metabolites	24	
Dalapon	87	
DBCP	188	56
DDE	10	
Diazinon	85	
Dicamba	87	
Dieldrin	87	
Dimethoate	85	
Dinoseb	87	
Diquat Dibromide	95	
Diuron	33	
Endothall	92	
Endrin	87	
EPTC	10	
Ethylene Dibromide	157	
Glyphosate, Isopropylamine Salt	86	
Heptachlor	87	
Heptachlor Epoxide	87	
Hexachlorobenzene	87	
Lindane (Gamma-BHC)	87	
Methomyl	96	
Methoxychlor	87	
Methyl Bromide (Bromomethane)	274	

San Bernardino (cont)

Chemical	Wells	Pos
Metolachlor	85	
Metribuzin	85	
Molinate	155	
Naphthalene	240	
Ortho-Dichlorobenzene	274	
Oxamyl	96	
Picloram	87	
Prometryn	85	
Propachlor	87	
Simazine	90	
Terbacil	10	
Thiobencarb	86	
Toxaphene	87	
Trichlorobenzenes	274	
Xylene	274	

San Diego

Chemical	Wells	Pos
1,3-Dichloropropene	2	
1,1,2,2-Tetrachloroethane	49	1
1,2,4-Trichlorobenzene	49	
1,2-D + 1,3-D + C-3 Compounds	49	
1,2-Dichloropropane	49	1
2,3,7,8-TCDD (Dioxin)	12	
2,4,5-T	6	
2,4,5-TP (Silvex)	10	
2,4,6-Trichlorophenol	1	
2,4-D	11	
2,4-Dinitrophenol	1	
3-Hydroxycarbofuran	18	
4(2,4-DB), Dimethylamine Salt	3	
Acenapthene	1	
Acetochlor	1	
Acifluorfen, Sodium Salt	1	
Alachlor	13	
Aldicarb	19	
Aldicarb Sulfone	19	
Aldicarb Sulfoxide	19	
Aldrin	21	
Atrazine	13	
Bentazon, Sodium Salt	11	

San Diego (cont)

Chemical	Wells	Pos
Benzene (Benzol)	49	
Bromacil	13	
Butachlor	13	
Carbaryl	19	
Carbofuran	18	
Carbon Disulfide	2	
Chlordane	20	
Chloromethane (Methyl Chloride)	49	
Chlorothalonil	19	
Dachthal Acid Metabolites	1	
Dalapon	10	
DBCP	18	
DDE	2	
DDT	1	
Diazinon	11	
Dicamba	12	
Dichlorprop, Butoxyethanol Ester	1	
Dieldrin	21	
Dimethoate	12	
Dinoseb	11	
Diquat Dibromide	9	
Disulfoton	1	
Diuron	8	
Endothall	8	
Endrin	20	
EPTC	2	
Ethylene Dibromide	18	
Fonofos (Dyfonate)	1	
Glyphosate, Isopropylamine Salt	9	
Heptachlor	20	
Heptachlor Epoxide	20	
Hexachlorobenzene	19	
Lindane (Gamma-BHC)	20	
Linuron	1	
Methiocarb	3	
Methomyl	18	
Methoxychlor	20	
Methyl Bromide (Bromomethane)	49	
Metolachlor	11	
Metribuzin	12	

San Diego (cont)

Chemical	Wells	Pos
Molinate	14	
Naphthalene	29	
Ortho-Dichlorobenzene	49	
Oxamyl	17	
Paraquat Dichloride	2	
Picloram	11	
Prometon	1	
Prometryn	11	
Propachlor	13	
Propazine	1	
Propoxur	2	
Simazine	13	
Terbacil	1	
Thiobencarb	13	
Toxaphene	20	
Trichlorobenzenes	49	
Trifluralin	1	
Xylene	49	

San Joaquin

1,3-Dichloropropene	9	
1,1,2,2-Tetrachloroethane	74	
1,2,4-Trichlorobenzene	73	
1,2-D + 1,3-D + C-3 Compounds	74	
1,2-Dichloropropane	74	
2,3,7,8-TCDD (Dioxin)	1	
2,4,5-T	4	
2,4,5-TP (Silvex)	8	
2,4-D	8	
3-Hydroxycarbofuran	9	
4(2,4-DB), Dimethylamine Salt	1	
Acetochlor	39	
Alachlor	49	
Aldicarb	9	
Aldicarb Sulfone	9	
Aldicarb Sulfoxide	9	
Aldrin	14	
Atrazine	49	
Bentazon, Sodium Salt	8	

San Joaquin (cont)

Chemical	Wells	Pos
Benzene (Benzol)	74	
Bromacil	49	
Butachlor	49	
Carbaryl	9	
Carbofuran	11	
Chlordane	14	
Chloromethane (Methyl Chloride)	74	6
Chlorothalonil	12	
Dachthal Acid Metabolites	39	1
Dalapon	8	
DBCP	51	17
DDE	39	
Diazinon	20	
Dicamba	8	
Dieldrin	14	
Dimethoate	49	
Dinoseb	8	
Diquat Dibromide	11	
Diuron	2	
Endothall	9	
Endrin	14	
EPTC	39	
Ethylene Dibromide	50	1
Glyphosate, Isopropylamine Salt	14	
Heptachlor	14	
Heptachlor Epoxide	14	
Hexachlorobenzene	14	
Lindane (Gamma-BHC)	14	
Methiocarb	2	
Methomyl	9	
Methoxychlor	14	
Methyl Bromide (Bromomethane)	74	
Metolachlor	49	
Metribuzin	49	
Molinate	63	
Naphthalene	66	
Ortho-Dichlorobenzene	74	
Oxamyl	11	
Picloram	8	

San Joaquin (cont)

Chemical	Wells	Pos
Prometryn	49	
Propachlor	49	
Propoxur	2	
Simazine	49	
Terbacil	39	
Thiobencarb	49	
Toxaphene	14	
Trichlorobenzenes	74	
Xylene	74	

San Mateo

Chemical	Wells	Pos
1,3-Dichloropropene	4	
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	1
2,3,7,8-TCDD (Dioxin)	7	
2,4,5-T	7	
2,4,5-TP (Silvex)	8	
2,4-D	8	
3-Hydroxycarbofuran	7	
4(2,4-DB), Dimethylamine Salt	5	
Acenapthene	5	
Acetochlor	3	
Acifluorfen, Sodium Salt	5	
Alachlor	12	
Aldicarb	7	
Aldicarb Sulfone	7	
Aldicarb Sulfoxide	9	
Aldrin	7	
Atrazine	12	
Bentazon, Sodium Salt	8	
Benzene (Benzol)	14	
Bromacil	7	
Butachlor	7	
Carbaryl	9	
Carbofuran	12	
Carbon Disulfide	2	
Chlordane	12	
Chloromethane (Methyl Chloride)	14	

San Mateo (cont)

Chemical	Wells	Pos
Chlorothalonil	3	
Dachthal Acid Metabolites	3	
Dalapon	8	
DBCP	8	
DDE	13	
DDT	5	
Diazinon	3	
Dicamba	8	
Dichlorprop, Butoxyethanol Ester	5	
Dieldrin	7	
Dimethoate	3	
Dinoseb	8	
Diquat Dibromide	13	
Endothall	12	
Endrin	12	
EPTC	13	
Ethylene Dibromide	8	
Glyphosate, Isopropylamine Salt	9	
Heptachlor	12	
Heptachlor Epoxide	12	
Hexachlorobenzene	12	
Lindane (Gamma-BHC)	12	
Methiocarb	5	
Methomyl	9	
Methoxychlor	12	
Methyl Bromide (Bromomethane)	14	
Metolachlor	7	
Metribuzin	7	
Molinate	15	
Naphthalene	12	
Ortho-Dichlorobenzene	14	
Oxamyl	12	
Picloram	8	
Prometryn	3	
Propachlor	7	
Propazine	5	
Simazine	12	
Terbacil	3	
Thiobencarb	12	

San Mateo (cont)

Chemical	Wells	Pos
Toxaphene	12	
Trichlorobenzenes	14	
Trifluralin	5	
Xylene	14	

Santa Clara

1,3-Dichloropropene	1	
1,1,2,2-Tetrachloroethane	132	
1,2,4-Trichlorobenzene	127	
1,2-D + 1,3-D + C-3 Compounds	132	
1,2-Dichloropropane	132	
2,3,7,8-TCDD (Dioxin)	50	
2,4,5-T	12	
2,4,5-TP (Silvex)	49	
2,4-D	49	
3-Hydroxycarbofuran	37	
4(2,4-DB), Dimethylamine Salt	2	
Acetochlor	51	
Alachlor	55	
Aldicarb	37	
Aldicarb Sulfone	37	
Aldicarb Sulfoxide	37	
Aldrin	48	
Atrazine	55	
Bentazon, Sodium Salt	49	
Benzene (Benzol)	132	
Bromacil	44	
Butachlor	44	
Carbaryl	42	
Carbofuran	49	
Carbon Disulfide	1	
Chlordane	50	
Chloromethane (Methyl Chloride)	132	
Chlorothalonil	35	
Dachthal Acid Metabolites	50	1
Dalapon	49	
DBCP	60	
DDE	51	
Diazinon	42	

Santa Clara (cont)

Chemical	Wells	Pos
Dicamba	47	
Dieldrin	43	
Dimethoate	44	
Dinoseb	49	
Diquat Dibromide	49	
Endothall	49	
Endrin	54	
EPTC	51	
Ethylene Dibromide	52	
Glyphosate, Isopropylamine Salt	51	
Heptachlor	50	
Heptachlor Epoxide	54	
Hexachlorobenzene	60	
Lindane (Gamma-BHC)	54	
Methiocarb	1	
Methomyl	42	
Methoxychlor	54	
Methyl Bromide (Bromomethane)	132	
Metolachlor	44	
Metribuzin	44	
Molinate	66	
Naphthalene	122	
Ortho-Dichlorobenzene	132	
Oxamyl	49	
Picloram	49	
Prometryn	43	
Propachlor	43	
Propoxur	1	
Simazine	55	
Terbacil	51	
Thiobencarb	55	
Toxaphene	50	
Trichlorobenzenes	132	
Xylene	132	

Sonoma

1,3-Dichloropropene	7	
1,1,2,2-Tetrachloroethane	53	
1,2,4-Trichlorobenzene	53	

Sonoma (cont)

Chemical	Wells	Pos
1,2-D + 1,3-D + C-3 Compounds	54	
1,2-Dichloropropane	53	
2,3,7,8-TCDD (Dioxin)	6	
2,4,5-T	41	
2,4,5-TP (Silvex)	52	
2,4-D	52	
3-Hydroxycarbofuran	18	
4(2,4-DB), Dimethylamine Salt	40	
Acenapthene	1	
Acetochlor	13	
Acifluorfen, Sodium Salt	8	
Acrolein	7	
Acrylonitrile	1	
Alachlor	23	
Aldicarb	18	
Aldicarb Sulfone	17	
Aldicarb Sulfoxide	17	
Aldrin	24	
Atrazine	61	
Bentazon, Sodium Salt	52	
Benzene (Benzol)	53	
BHC (Other Than Gamma Isomer)	7	
Bromacil	14	
Butachlor	14	
Carbaryl	17	
Carbofuran	28	
Carbon Disulfide	1	
Chloramben	1	
Chlordane	23	
Chlorobenzilate	7	
Chloromethane (Methyl Chloride)	53	
Chloroneb	7	
Chlorothalonil	7	
Dachthal Acid Metabolites	13	
Dalapon	56	
DBCP	11	1
DDD	7	
DDE	14	
DDT	8	

Sonoma (cont)

Chemical	Wells	Pos
Diazinon	13	
Dicamba	51	
Dichlorprop, Butoxyethanol Ester	1	
Dieldrin	24	
Dimethoate	14	
Dinoseb	51	
Diquat Dibromide	47	
Endosulfan	7	
Endosulfan Sulfate	7	
Endothall	47	
Endrin	24	
Endrin Aldehyde	7	
EPTC	13	
Ethylene Dibromide	21	1
Glyphosate, Isopropylamine Salt	7	
Heptachlor	23	
Heptachlor Epoxide	23	
Hexachlorobenzene	24	
Lindane (Gamma-BHC)	24	
Methiocarb	15	
Methomyl	18	
Methoxychlor	24	
Methyl Bromide (Bromomethane)	53	
Metolachlor	15	
Metribuzin	15	
Molinate	19	
Naphthalene	51	
Ortho-Dichlorobenzene	53	
Oxamyl	47	
Permethrin	7	
Permethrin, Other Related	7	
Picloram	58	
Prometryn	14	
Propachlor	15	
Propazine	1	
Propoxur	15	
Simazine	61	
Terbacil	12	
Thiobencarb	14	
Toxaphene	24	

Sonoma (cont)

Chemical	Wells	Pos
Trichlorobenzenes	54	
Trifluralin	9	
Xylene	53	

Stanislaus

Chemical	Wells	Pos
1,3-Dichloropropene	1	
1,1,2,2-Tetrachloroethane	70	
1,2,4-Trichlorobenzene	70	
1,2-D + 1,3-D + C-3 Compounds	70	
1,2-Dichloropropane	70	
2,3,7,8-TCDD (Dioxin)	1	
2,4,5-T	12	
2,4,5-TP (Silvex)	19	
2,4-D	19	
3-Hydroxycarbofuran	18	
4(2,4-DB), Dimethylamine Salt	1	
Acetochlor	19	
Alachlor	42	
Aldicarb	18	
Aldicarb Sulfone	18	
Aldicarb Sulfoxide	18	
Aldrin	18	
Atrazine	42	
Bentazon, Sodium Salt	19	
Benzene (Benzol)	70	
Bromacil	42	
Butachlor	42	
Carbaryl	18	
Carbofuran	20	
Chlordane	18	
Chloromethane (Methyl Chloride)	70	
Chlorothalonil	18	
Dachthal Acid Metabolites	19	
Dalapon	19	
DBCP	74	31
DDE	30	
Diazinon	42	
Dicamba	19	
Dieldrin	18	
Dimethoate	42	

Stanislaus (cont)

Chemical	Wells	Pos
Dinoseb	19	
Diquat Dibromide	13	
Endothall	10	
Endrin	18	
EPTC	30	
Ethylene Dibromide	66	
Glyphosate, Isopropylamine Salt	17	
Heptachlor	18	
Heptachlor Epoxide	18	
Hexachlorobenzene	18	
Lindane (Gamma-BHC)	18	
Methiocarb	2	
Methomyl	18	
Methoxychlor	18	
Methyl Bromide (Bromomethane)	69	
Metolachlor	43	
Metribuzin	43	
Molinate	61	
Naphthalene	47	
Ortho-Dichlorobenzene	70	
Oxamyl	18	
Picloram	19	
Prometryn	42	
Propachlor	42	
Propoxur	2	
Simazine	42	
Terbacil	19	
Thiobencarb	43	
Toxaphene	18	
Trichlorobenzenes	70	
Xylene	71	

Sutter

Chemical	Wells	Pos
1,1,2,2-Tetrachloroethane	13	
1,2,4-Trichlorobenzene	13	
1,2-D + 1,3-D + C-3 Compounds	13	
1,2-Dichloropropane	13	
Atrazine	2	
Benzene (Benzol)	13	
Bromacil	2	

Sutter (cont)

Chemical	Wells	Pos
Butachlor	2	
Chloromethane (Methyl Chloride)	13	1
DBCP	1	1
Diazinon	2	
Dimethoate	2	
Ethylene Dibromide	1	
Methyl Bromide (Bromomethane)	13	
Metolachlor	2	
Metribuzin	2	
Molinate	2	
Naphthalene	13	
Ortho-Dichlorobenzene	13	
Prometryn	2	
Simazine	2	
Thiobencarb	2	
Trichlorobenzenes	13	
Xylene	13	

Tulare

Chemical	Wells	Pos
1,3-Dichloropropene	19	
(S)-Metolachlor	2	
1,1,2,2-Tetrachloroethane	92	
1,2,4-Trichlorobenzene	92	
1,2-D + 1,3-D + C-3 Compounds	92	
1,2-Dichloropropane	92	
2,3,7,8-TCDD (Dioxin)	1	
2,4,5-T	17	
2,4,5-TP (Silvex)	19	
2,4-D	18	
3-Hydroxycarbofuran	19	
ACET	3	3
Acetochlor	78	
Alachlor	86	
Aldicarb	19	
Aldicarb Sulfone	19	
Aldicarb Sulfoxide	19	
Aldrin	39	
Atrazine	85	1
Bentazon, Sodium Salt	19	

Tulare (cont)

Chemical	Wells	Pos
Benzene (Benzol)	94	
Bromacil	82	
Butachlor	81	
Carbaryl	19	
Carbofuran	19	
Chlordane	41	
Chloromethane (Methyl Chloride)	92	1
Chlorothalonil	15	
Dachthal Acid Metabolites	73	
Cyanazine	2	
Dalapon	19	
DBCP	131	48
DDE	83	
Deethyl-Atrazine	3	1
Demethylnorflurazon	2	2
DACT	1	1
Diazinon	39	
Dicamba	19	
Dieldrin	39	
Dimethoate	81	
Dinoseb	19	
Diquat Dibromide	5	
Diuron	17	3
Endothall	6	
Endrin	41	
EPTC	83	
Ethylene Dibromide	127	
Fluometuron	2	
Glufosinate-Ammonium	2	
Glyphosate, Isopropylamine Salt	4	
Heptachlor	41	
Heptachlor Epoxide	41	
Hexachlorobenzene	41	
Hexazinone	1	
Imidacloprid	1	
Imidacloprid Guanidine	1	
Imidacloprid Olefin	1	
Imidacloprid Olefinic-Guanidine	1	
Imidacloprid Urea	1	

Tulare (cont)

Chemical	Wells	Pos
Lindane (Gamma-BHC)	41	
Linuron	2	
Methomyl	19	
Methoxychlor	41	
Methyl Bromide (Bromomethane)	92	
Metolachlor	80	
Metribuzin	83	
Molinate	116	
Naphthalene	88	
Norflurazon	3	2
Ortho-Dichlorobenzene	92	
Oxamyl	19	
Pendimethalin	2	
Picloram	19	
Prometon	1	
Prometryn	81	
Propachlor	81	
Propanil	2	
Simazine	85	3
Terbacil	76	
Thiobencarb	82	
Toxaphene	41	
Trichlorobenzenes	92	
Trifluralin	2	
Xylene	91	

Yuba

1,1,2,2-Tetrachloroethane	20	
1,2,4-Trichlorobenzene	20	
1,2-D + 1,3-D + C-3 Compounds	20	
1,2-Dichloropropane	20	
Acetochlor	5	
Aldrin	1	
Benzene (Benzol)	22	1
Chlordane	1	
Chloromethane (Methyl Chloride)	20	
Chlorothalonil	1	
Dachthal Acid Metabolites	4	
DDE	5	

Yuba (cont)

Chemical	Wells	Pos
Dieldrin	1	
Endrin	1	
EPTC	5	
Heptachlor	1	
Heptachlor Epoxide	1	
Hexachlorobenzene	1	
Lindane (Gamma-BHC)	1	
Methoxychlor	1	
Methyl Bromide (Bromomethane)	20	
Naphthalene	18	
Ortho-Dichlorobenzene	20	
Terbacil	5	
Toxaphene	1	
Trichlorobenzenes	20	
Xylene	20	

APPENDIX B

Studies Included in the 2004 Update Report

A summary of the well sampling surveys that were added to the well inventory database during the period July 1, 2003 through June 30, 2004. The study number assigned by DPR is shown to the left.

DEPARTMENT OF HEALTH SERVICES (Sanitary Engineering Branch)
0023 Sampled 122 chemicals in 53 counties; January 2003 through December 2003; 3,714 wells sampled.

US GEOLOGICAL SURVEY

STUDY	COUNTY *Study type (italics)*	WELLS SAMPLED	SAMPLING DATES	CHEMICALS SAMPLED (UNDERLINE INDICATES A VERIFIED DETECTION)
0459	Fresno/Tulare *Demethylnorflurazon survey*	5 wells	October-01	atrazine, propanil, simazine, alachlor, cyanazine, glyphosate, isopropylamin, norflurazon, ACET fluometuron, diuron, linuron, molinate, trifluralin, metribuzin, pendimethalin, acetochlor, (s)-metolachlor, glufosinate-ammonium, demethylnorflurazon

DEPARTMENT OF PESTICIDE REGULATION

STUDY	COUNTY *Study type (italics)*	WELLS SAMPLED	SAMPLING DATES	CHEMICALS SAMPLED (UNDERLINE INDICATES A VERIFIED DETECTION)
0457	Colusa *Four-section survey for molinate*	2 wells	June-03	atrazine, simazine, diuron, prometon, bromacil, hexazinone, 2-hydroxycyclohexyl hexazinone, decyclohexyl-4-hydroxy hexazinone, monomethyl hexazinone, norflurazon, DEA, ACET, DACT molinate
0458	Fresno *Four-section survey for molinate*	4 wells	September-03	Atrazine, simazine, diuron, prometon, bromacil, hexazinone, norflurazon, DEA, ACET, DACT molinate
0460	Fresno, Monterey, San Luis Obispo, Santa Barbara, Tulare, Ventura *Ground Water Protection List Survey for Imidacloprid*	33 wells	October-03 November-03	Imidacloprid, imidacloprid guanidine, imidacloprid urea, imidacloprid guanidine-olefin, diuron, prometon, bromacil, norflurazon, atrazine and its metabolites and simazine and its metabolites

APPENDIX C

Summary of Compounds Detected and Reported to DPR

The following table provides updated information, as of June 30, 2004, of all reported pesticide detections in ground water. It includes the historical range of residue concentrations for all compounds detected and the range of residue concentrations for compounds detected during this fiscal year, from July 1, 2003, to June 30, 2004.

Compound Detected	Number of Counties and Wells Sampled since June, 2004	Historical Range of Residue Concentrations (ppb)	Fiscal Year 2003/2004: Range of Residue Concentrations (ppb)	Water Quality Criteria (ppb)[(a)]	Type of Compound, Registration Status, Comments
1,1,2,2-Tetrachloroethane	57 counties 8,017 wells	0.83 - 51.4	7.4	CDHS- 1 PHG- 0.1	Herbicide. Not registered for agricultural use (NR). Detections referred to SWRCB.
1,2,4-Trichlorobenzene	58 counties 7,236 wells	0.53 - 21		CDHS- 5 PHG- 0.5	Herbicide. NR. Detections referred to SWRCB.
1,2-D + 1,3-D + C-3 Compounds	57 counties 6,727 wells	1.2		See 1,2-D and 1,3-D criteria below	Fumigant. NR. Source of residue was determined by DPR to be due to historical non-point source, legal, agricultural use. 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. Detection referred to SWRCB.
1,2-Dichloropropane (1,2-D)	58 counties 11,675 wells	0.1 - 160	0.5 – 3.7	CDHS- 5 USEPA- 5 PHG- 0.5	Fumigant. NR. Source of residues were determined by DPR to be due to historical non-point source, legal, agricultural use. 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. Detections referred to SWRCB.
1,3-Dichloropropene (1,3-D)	56 counties 9,017 wells	0.84 - 1.9		CDHS- 0.5 PHG- 0.2	Fumigant. Active registration in California (AR). DPR monitoring did not confirm detections.

Compound Detected	Number of Counties and Wells Sampled since June, 2004	Historical Range of Residue Concentrations (ppb)	Fiscal Year 2003/2004: Range of Residue Concentrations (ppb)	Water Quality Criteria (ppb)[(a)]	Type of Compound, Registration Status, Comments
2,4,5-T	41 counties 1,385 wells	0.02 - 0.21		USEPA IRIS- 70 USEPA SNARL- 70	Herbicide. NR. Detections referred to SWRCB.
2,4,5-TP (Silvex)	58 counties 5,962 wells	0.15 - 1.4		CDHS- 50 USEPA- 50 PHG- 25	Herbicide. NR. Detections referred to SWRCB.
2,4-D	58 counties 6,664 wells	0.3 - 46		CDHS- 70 USEPA- 70 PHG- 70	Selective postemergence herbicide. AR. DPR conducted 8 follow up monitoring surveys and did not confirm detections.
2,4-DP, Isooctyl Ester	9 counties 106 wells	0.01 - 0.06		No criteria established	Systemic herbicide. AR. DPR conducted 3 follow up monitoring surveys and did not confirm detections
2-Hydroxycyclohexyl Hexazinone	8 counties 69 wells	0.126		No criteria established	Metabolite of hexazinone. No other detection found during the monitoring survey. No further action required.
Acenaphthene	24 counties 793 wells	98-117	98-117	U.S. EPA IRIS Rfd 420	Fungicide. NR. Referred to SWRCB.

Compound Detected	Number of Counties and Wells Sampled since June, 2004	Historical Range of Residue Concentrations (ppb)	Fiscal Year 2003/2004: Range of Residue Concentrations (ppb)	Water Quality Criteria (ppb)[(a)]	Type of Compound, Registration Status, Comments
ACET	35 counties 1,080 wells	0.032 - 6	0.127-1.12	No criteria established	Metabolite of atrazine and simazine. This compound has contaminated ground water due to legal agricultural use (LAU) of atrazine or simazine. It is considered as toxic as atrazine and simazine and detections of the compound have been used in regulating the use of both compounds. Note: this fiscal year's detection were determined to be LAU.
Alachlor	55 counties 6,938 wells	0.1 - 9		CDHS- 2 USEPA- 2 PHG- 4	Preemergence herbicide. AR. Detections were determined to be due to poor well construction.
Alachlor ESA	9 counties 88 wells	0.05 - 1.38		No criteria established	Metabolite of alachlor. Alachlor is AR. DPR determined that contamination of ground water occurred from non-point source pesticide applications. A review of the compound by DPR's Medical Toxicology Branch personnel determined that toxicological data are equivocal and require further consultation with other agencies.
Alachlor OXA	9 counties 88 wells	0.05 - 0.051		No criteria established	Metabolite of alachlor. Alachlor is AR. DPR determined that contamination of ground water occurred from non-point source pesticide applications. A review of the compound by DPR's Medical Toxicology Branch personnel determined that toxicological data are equivocal and require further consultation with other agencies.

Compound Detected	Number of Counties and Wells Sampled since June, 2004	Historical Range of Residue Concentrations (ppb)	Fiscal Year 2003/2004: Range of Residue Concentrations (ppb)	Water Quality Criteria (ppb)[(a)]	Type of Compound, Registration Status, Comments
Aldicarb	54 counties 5,278 wells	1.1 - 7.2		USEPA- 3 CDHS AL- 7	Systemic insecticide. AR. Follow up DPR sampling did not confirm detections.
Aldicarb Sulfone	50 counties 4,021 wells	0.05 - 1281	77-97	USEPA- 3 USEPA SNARL- 10 (10-day)	Metabolite of aldicarb. Aldicarb is AR. This compound has contaminated ground water due to LAU of aldicarb. Based, in part, on detections of aldicarb sulfone, aldicarb became a restricted material. Note: this fiscal year's detections were detemined to be the result of a reporting error.
Aldicarb Sulfoxide	50 counties 4,025 wells	0.06 - 13.2		USEPA- 4 USEPA SNARL- 10 (10-day)	Metabolite of aldicarb. Aldicarb is AR. This compound has contaminated ground water due to LAU of aldicarb. Based, in part, on detections of aldicarb sulfoxide, aldicarb became a restricted material.
Aldrin	54 counties 4,940 wells	21		CDHS AL- 0.002 USEPA IRIS- 0.21 USEPA SNARL-0.3 (10-day)	Insecticide. NR. Detection determined to be a point source.

Compound Detected	Number of Counties and Wells Sampled since June, 2004	Historical Range of Residue Concentrations (ppb)	Fiscal Year 2003/2004: Range of Residue Concentrations (ppb)	Water Quality Criteria (ppb)[(a)]	Type of Compound, Registration Status, Comments
Atrazine	57 counties 11,502 wells	0.001 - 8.5	0.13	CDHS- 1 USEPA- 3 PHG- 0.15	Herbicide. AR. This compound has contaminated ground water due to LAU. It has been through DPR's pesticide detection response process (PDRP) which has resulted in it's being labeled a restricted material. Note: this fiscal year's detection was determined to be due to LAU.
Azinphos-Methyl	43 counties 1,292 wells	0.014		No criteria established	Insecticide. AR. Detection from monitoring well is below the MDL obtainable by laboratories approved by DPR. No further action is required.
Benomyl	38 counties 1,090 wells	190 - 500		USEPA IRIS- 350	Systemic fungicide. AR. Follow up DPR monitoring studies did not confirm detections.
Bentazon, Sodium Salt	55 counties 5,089 wells	0.02 - 20		CDHS- 18 PHG- 200	Herbicide. AR. This compound has contaminated ground water due to LAU. It has been through the PDRP which has resulted in it's being labeled a restricted material.
Benzene (Benzol)	57 counties 6,749 wells	0.2 - 36.2	0.82-102	CDHS- 1 USEPA- 5 PHG- 0.15	Benzene was an ingredient in some early grain fumigants. NR. Non-agricultural uses of industrial chemicals may contribute to these findings. Detection referred to SWRCB.
BHC	46 counties 2,043 wells	0.08		No criteria established	Insecticide. NR. Detection referred to SWRCB.

Compound Detected	Number of Counties and Wells Sampled since June, 2004	Historical Range of Residue Concentrations (ppb)	Fiscal Year 2003/2004: Range of Residue Concentrations (ppb)	Water Quality Criteria (ppb)[(a)]	Type of Compound, Registration Status, Comments
Bromacil	56 counties 9,281 wells	0.025 - 23		USEPA SNARL- 90	Herbicide. AR. This compound has contaminated ground water due to LAU. It has been through the PDRP which has resulted in it's being labeled a restricted material.
Butachlor	52 counties 4,582 wells	0.39		No criteria established	Selective herbicide. NR. Detection referred to SWRCB.
Captan	38 counties 1,468 wells	0.1 - 0.5		CDHS AL- 1.5 USEPA IRIS- 910	Protectant-eradicant insecticide. AR. Follow up DPR monitoring studies did not confirm detections.
Carbaryl	52 counties 5,332 wells	20-121		CDHS AL- 700 USEPA IRIS- 700 USEPA SNARL- 700	Broad-spectrum insecticide. AR. Follow up DPR monitoring studies did not confirm detections.
Carbofuran	53 counties 5,952 wells	0.016 - 0.686		CDHS- 18 USEPA- 40 PHG- 1.7	Broad spectrum insecticide. AR. Detections are CUI.
Carbon Disulfide	15 counties 196 wells	0.2 - 5		CDHS AL- 160 USEPA IRIS- 700	Fumigant. NR. Follow up DPR monitoring studies did not confirm detections.
Chlordane	56 counties 6,304 wells	20		CDHS- 0.1 USEPA- 2 PHG- 0.03	Contact insecticide. NR. Detection referred to SWRCB.

Compound Detected	Number of Counties and Wells Sampled since June, 2004	Historical Range of Residue Concentrations (ppb)	Fiscal Year 2003/2004: Range of Residue Concentrations (ppb)	Water Quality Criteria (ppb)[(a)]	Type of Compound, Registration Status, Comments
Chloromethane	57 counties 6,717 wells	0.5 - 37	0.50-5.5	USEPA SNARL- 3	Fumigant. NR. Non-pesticidal uses of industrial chemicals may contribute to these findings. Detections referred to SWRCB.
Chlorothalonil	50 counties 4,011 wells	0.8 - 1.1		USEPA IRIS- 110 USEPA SNARL- 200 (10-day)	Fungicide. AR. The two detections were due to poor well construction.
Chlorpyrifos	38 counties 1,403 wells	0.02 - 0.06		USEPA IRIS- 21 USEPA SNARL- 20	Insecticide. AR. Follow up DPR monitoring study did not confirm detections.
Chlorthal-Dimethyl	33 counties 1,468 wells	0.03 - 300		USEPA IRIS- 70 USEPA SNARL- 70	Selective herbicide. AR. Follow up DPR monitoring studies resulted in no confirmed detections and identified reported detections as probable point sources.
Chlorthal-Dimethyl Acid Metabolites	37 counties 1,065 wells	0.03 - 10.9	1-8.8	No criteria established	Metabolite of chlorthal-dimethy. DPR determined that this compound contaminated ground water due to non-point source applications of the parent, chlorthal-dimethyl. DPR reviewed toxicological studies and determined that at detection levels that were reported, this compound did not pose a threat to public health; so no further action required.

Compound Detected	Number of Counties and Wells Sampled since June, 2004	Historical Range of Residue Concentrations (ppb)	Fiscal Year 2003/2004: Range of Residue Concentrations (ppb)	Water Quality Criteria (ppb)[(a)]	Type of Compound, Registration Status, Comments
Coumaphos	10 counties 130 wells	1		No criteria established	Insecticide. AR. At the time of the detection, use of this compound was suspended. Detection referred to SWRCB.
Dalapon	48 counties 4,378 wells	1-13		CDHS- 200 USEPA- 200 PHG- 790	Selective herbicide. NR. Detections referred to SWRCB.
DBCP	54 counties 11,834 wells	0.001 - 8000	0.01 - 4	CDHS- 0.2 USEPA- 0.2 PHG- 0.0017	Soil fumagant. NR. Source of residues considered by DPR to be from historical non-point source, LAU. Detections referred to SWRCB.
DDD	41 counties 1,805 wells	1.04		No criteria established	Insecticide. NR. Identified reported detections as probable point sources.
DDE	43 counties 3,210 wells	0.01 - 0.09		No criteria established	Metabolite of DDT. Detections classified as point sources.
DDT	41 counties 2,006 wells	0.02 - 0.12		USEPA IRIS- 3.5	Insecticide. NR. All detections classified as point sources.
Deethyl-Atrazine (DEA)	36 counties 1,126 wells	0.001 - 2	0.25	No criteria established	Metabolite of atrazine. This compound has contaminated ground water due to LAU of atrazine. It is considered as toxic as atrazine and detections of the compound have been used in regulating the use of both compounds. Note: this fiscal year's detection were determined to be LAU.

Compound Detected	Number of Counties and Wells Sampled since June, 2004	Historical Range of Residue Concentrations (ppb)	Fiscal Year 2003/2004: Range of Residue Concentrations (ppb)	Water Quality Criteria (ppb)[(a)]	Type of Compound, Registration Status, Comments
demethylnorflurazon	2 counties 5 wells	0.24-0.57	0.24-0.57	No criteria established	Metabolite of norflurazon, which is AR. DPR assumes that this compound contaminated ground water due to non-point source applications of the parent, norflurazon. The detections were the result of sampling by USGS in wells known to be contaminated by norflurazon.
Demeton	46 counties 1,773 wells	1		USEPA IRIS- 0.3	Systemic-insecticide. NR. Detection referred to SWRCB.
DACT	24 counties 494 wells	0.05 - 6.9	0.367 - 0.588	No criteria established	Metabolite of atrazine and simazine. This compound has contaminated ground water due to LAU of atrazine or simazine. It is considered as toxic as atrazine and simazine and detections of the compound have been used in regulating the use of both compounds. Note: this fiscal year's detection were determined to be LAU.
Diazinon	56 counties 6,599 wells	0.01 - 3.2		CDHS AL- 6 USEPA SNARL- 0.6	Insecticide. AR. Follow up monitoring surveys by DPR did not confirm these detections. Note: There is one detection that is CUI.
Dicamba	52 counties 4,165 wells	0.01 - 5		USEPA IRIS- 210 USEPA SNARL- 200	Herbicide. AR. Follow up monitoring surveys by DPR did not confirm these detections.

Compound Detected	Number of Counties and Wells Sampled since June, 2004	Historical Range of Residue Concentrations (ppb)	Fiscal Year 2003/2004: Range of Residue Concentrations (ppb)	Water Quality Criteria (ppb)[(a)]	Type of Compound, Registration Status, Comments
Dichlorprop	3 counties 49 wells	6.8		No criteria established	Hormone-systemic type herbicide. NR. Detection referred to SWRCB.
Dichlorprop, Butooxyethanol Ester	24 counties 333 wells	0.1 - 6.8		No criteria established	Hormone-systemic type herbicide. NR. Detections referred to SWRCB.
Dieldrin	56 counties 5,013 wells	0.05 - 7		CDHS AL-0.002	Insecticide. NR. Detections referred to SWRCB.
Dimethoate	54 counties 5,866 wells	0.38 - 24		CDHS AL- 1 USEPA IRIS- 1.4	Systemic-insecticide. AR. Follow up monitoring surveys by DPR did not confirm detections.
Diquat Dibromide	45 counties 3,984 wells	2 - 549.1		CDHS- 20 USEPA- 20 PHG- 15	Herbicide. AR. Follow up sampling by CDHS was negative; no further sampling was needed. Note: One detection is still CUI.
Diuron	54 counties 7,615 wells	0.023 - 5.2	0.071 - 2.9	USEPA IRIS- 14 USEPA SNARL- 10	Herbicide. AR. This compound has contaminated ground water due to LAU. It has been through the PDRP which has resulted in it's being labeled a restricted material. Note: the detection reported this fiscal year from Riverside County is CUI. The seven other detections reported this year were determined to be due to LAU.
Endosulfan	48 counties 2,772 wells	0.01 - 34.7		USEPA IRIS- 42	Insecticide. AR. Follow up sampling by CDHS was negative; no further sampling was needed.
Endosulfan Sulfate	47 counties 2,125 wells	0.15 - 0.48		No criteria established	Metabolite of endosulfan. Endosulfan is AR. Follow up sampling by CDHS was negative; no further sampling was needed.

Compound Detected	Number of Counties and Wells Sampled since June, 2004	Historical Range of Residue Concentrations (ppb)	Fiscal Year 2003/2004: Range of Residue Concentrations (ppb)	Water Quality Criteria (ppb)[(a)]	Type of Compound, Registration Status, Comments
Endothal, Disodium Salt	48 counties 3,376 wells	100 - 48.1		CDHS- 100 USEPA- 100 PHG- 580	Pre, post-emergent herbicide. NR. Early 1989 detections were not confirmed by DPR monitoring. Inactive in 1992. Note: 2003 detection referred to SWRCB
Endrin	58 counties 6,649 wells	0.03 - 0.21		CDHS- 2 USEPA- 2 PHG- 2	Insecticide. NR. Detections referred to SWRCB.
EPTC	38 counties 2,087 wells	5.6 - 170		USEPA IRIS-180	Herbicide. AR. Detections classified as point sources.
Ethylene Dibromide	55 counties 7,807 wells	0.006 - 4.7	0.02 - 0.75	CDHS- 0.05 USEPA- 0.05 PHG- 0.01	Fumigant, insecticide, nematicide. NR since January, 1987. Source of residues considered by DPR to be from historical non-point source, LAU. Detections referred to SWRCB
Ethylene Dichloride	11 counties 197 wells	2.9		CDHS- 0.5 USEPA- 5 PHG- 0.4	Fumigant. NR. Detection referred to SWRCB.
Ethylene Thiourea	8 counties 67 wells	0.725		USEPA IRIS- 0.6 USEPA SNARL-300 (10-day)	Fumigant. NR. Follow up DPR sampling did not confirm detection.

Compound Detected	Number of Counties and Wells Sampled since June, 2004	Historical Range of Residue Concentrations (ppb)	Fiscal Year 2003/2004: Range of Residue Concentrations (ppb)	Water Quality Criteria (ppb)[(a)]	Type of Compound, Registration Status, Comments
Glyphosate, Isopropylamine Salt	51 counties 4,172 wells	20		CDHS- 700 USEPA- 700 PHG- 1,000	Nonselective, postemergence herbicide. AR. Follow up DPR sampling did not confirm detection.
Heptachlor	56 counties 6,050 wells	0.01 - 0.25		CDHS- 0.01 USEPA- 0.4 PHG- 0.008	Insecticide. NR. Detections referred to SWRCB.
Heptachlor Epoxide	56 counties 6,044 wells	0.01 - 0.08		No criteria established	Metabolite of heptachlor. Heptachlor is not registered, no further action is taken.
Hexazinone	46 counties 2,002 wells	0.05 - 0.55		USEPA IRIS- 230 USEPA SNARL-400	Herbicide. AR. Detections have been determined to be transient, not due to LAU.
Lindane (Gamma-BHC)	58 counties 6,728 wells	0.05 - 180		CDHS- 0.2 USEPA- 0.2 PHG- 0.032	Insecticide. AR. Follow up DPR sampling did not confirm detections.
Malathion	37 counties 1,216 wells	0.32		CDHS AL-160 USEPA IRIS- 140 USEPA SNARL-100	Insecticide. AR. Follow up DPR sampling did not confirm the detection.

Compound Detected	Number of Counties and Wells Sampled since June, 2004	Historical Range of Residue Concentrations (ppb)	Fiscal Year 2003/2004: Range of Residue Concentrations (ppb)	Water Quality Criteria (ppb)[(a)]	Type of Compound, Registration Status, Comments
Merphos	21 counties 417 wells	1		USEPA IRIS- 0.2	Defoliant. NR. Detection referred to SWRCB.
Methomyl	51 counties 4,861 wells	0.8 - 1		USEPA IRIS- 180 USEPA SNARL-200	Carbamate Insecticide. AR. Follow up sampling did not confirm detections.
Methoxychlor	57 counties 6,231 wells	0.5		CDHS- 30 USEPA- 40 PHG- 30	Insecticide. NR. Detection referred to SWRCB.
Methyl Bromide	58 counties 11,346 wells	0.5 - 6.4	1	USEPA IRIS- 9.8 USEPA SNARL-10	Fumigant. AR. Follow up DPR sampling did not confirm any of these detections. Note: this fiscal year's detection is CUI.
Methylene Chloride	6 counties 61 wells	3-6		PHG-4	Fumigant. NR. Detections referred to SWRCB.
Metolachlor ESA	9 counties 88 wells	0.05 - 24		No criteria established	Metabolite of metolachlor. Metolachlor is AR. DPR determined that contamination of metolachlor in ground water occurred from non-point source pesticide applications. A review of the compound by DPR's Medical Toxicology Branch's personnel determined that toxicological data are equivocal and require further consultation with other agencies.

Compound Detected	Number of Counties and Wells Sampled since June, 2004	Historical Range of Residue Concentrations (ppb)	Fiscal Year 2003/2004: Range of Residue Concentrations (ppb)	Water Quality Criteria (ppb)[(a)]	Type of Compound, Registration Status, Comments
Metolachlor OXA	9 counties 88 wells	0.05 - 2.65		No criteria established	Metabolite of metolachlor. Metolachlor is AR. DPR determined that contamination of metolachlor in ground water occurred from non-point source pesticide applications. A review of the compound by DPR's Medical Toxicology Branch's personnel determined that toxicological data are equivocal and require further consultation with other agencies.
Mexacarbate	22 counties 426 wells	22		No criteria established	Insecticide. NR. Detection referred to SWRCB.
Molinate	55 counties 6,636 wells	0.002 - 29		CDHS- 20 USEPA IRIS- 14	Selective herbicide. AR. Detections reported in 1984-1991 were determined to be due to poor well construction. Note: detections reported by USGS that were below 80 percent of the MDL obtainable by laboratories approved by DPR required no further action. This year, follow up sampling for molinate detections above 80 percent of the MDL resulted in no detections.
Molinate Sulfoxide	17 counties 210 wells	0.8		No criteria established	Metabolite of molinate. Molinate is AR. Detection due to poor well construction.
Monuron	25 counties 503 wells	0.04 - 2		No criteria established	Herbicide. NR. Detections referred to SWRCB.
MTP	10 counties 274 wells	2.41 - 2.55		No criteria established	Metabolite of chlorthal-dimethyl. AR. Follow up sampling did not confirm detections.

Compound Detected	Number of Counties and Wells Sampled since June, 2004	Historical Range of Residue Concentrations (ppb)	Fiscal Year 2003/2004: Range of Residue Concentrations (ppb)	Water Quality Criteria (ppb)[(a)]	Type of Compound, Registration Status, Comments
Naled	15 counties 219 wells	5		USEPA IRIS- 14	Insecticide. AR. Follow up DPR sampling did not confirm the detection.
Naphthalene	57 counties 7,025 wells	0.5 - 66	0.61	CDHS AL-170 USEPA IRIS- 14 USEPA SNARL-100	Fumigant. NR in California since 1991. Detections referred to SWRCB.
Norflurazon	31 counties 744 wells	0.022 - 0.79	0.05-0.65	USEPA IRIS- 280	Selective herbicide. AR. This compound has contaminated ground water due to LAU. It has been through the PDRP which has resulted in it's being labeled a restricted material. Note: the detections reported this fiscal year were determined to be due to LAU.
Ortho-Dichlorobenzene	58 counties 10,463 wells	0.56 - 12		CDHS- 600 USEPA- 600 PHG- 600	Herbicide. NR. Detections referred to SWRCB.
Paraquat Dichloride	26 counties 736 wells	0.91 - 16		USEPA IRIS- 3.2 USEPA SNARL-30	Herbicide. AR. Follow up DPR sampling did not confirm these detections.

Compound Detected	Number of Counties and Wells Sampled since June, 2004	Historical Range of Residue Concentrations (ppb)	Fiscal Year 2003/2004: Range of Residue Concentrations (ppb)	Water Quality Criteria (ppb)[(a)]	Type of Compound, Registration Status, Comments
Picloram	51 counties 4,449 wells	0.1 - 5		CDHS- 500 USEPA- 500 PHG- 500	Systemic herbicide. NR. Detections referred to SWRCB.
Prometon	49 counties 4,713 wells	0.05 - 80		USEPA IRIS- 110 USEPA SNARL-100	Nonselective herbicide. AR. This compound has contaminated ground water due to LAU. It has been through the PDRP which has resulted in it's being labeled a restricted material.
Prometryn	57 counties 7,776 wells	0.1 - 0.5		USEPA IRIS- 28	Selective herbicide. AR. Follow up monitoring did not confirm detections.
Propachlor	52 counties 4,463 wells	1.1		USEPA IRIS- 91 USEPA SNARL- 90	Selective herbicide. NR. Detection referred to SWRCB.
Propazine	41 counties 1,085 wells	0.2		USEPA IRIS- 14 USEPA SNARL-10	Selective herbicide. NR. Detection referred to SWRCB.
Propham	35 counties 1,062 wells	6		USEPA IRIS- 140 USEPA SNARL-100	Herbicide. NR. Detection classified as a point source. Detections referred to SWRCB.

Compound Detected	Number of Counties and Wells Sampled since June, 2004	Historical Range of Residue Concentrations (ppb)	Fiscal Year 2003/2004: Range of Residue Concentrations (ppb)	Water Quality Criteria (ppb)[(a)]	Type of Compound, Registration Status, Comments
Propoxur	44 counties 1,196 wells	4-5		CDHS AL-30 USEPA IRIS- 2.8 USEPA SNARL- 3	Insecticide. AR. Follow up DPR sampling did not confirm detection. Note: a detection reported in 2003 is CUI.
Simazine	57 counties 12,068 wells	0.002 - 49.2	0.07 - 0.26	CDHS- 4 USEPA- 4 PHG- 4	Herbicide. AR. This compound has contaminated ground water due to LAU. It has been through the PDRP which has resulted in it's being labeled a restricted material. Note: this fiscal year's detections were determined to be due to LAU.
Tebuthiuron	24 counties 162 wells	0.005 - 22.1		USEPA IRIS- 490 USEPA SNARL- 500	Herbicide. AR. Follow up DPR sampling did not confirm early detections. Note: detections reported in 2003 by USGS are below 80 percent of the MDL obtainable by laboratories approved by DPR; no further action is required.
Tetrachloroethylene	9 counties 193 wells	0.2 - 2.5		CDHS- 5 USEPA- 5 PHG- 0.06	Insecticide. NR. Detections referred to SWRCB.
Tetrachlorovinphos	21 counties 186 wells	1		USEPA IRIS- 210	Insecticide. AR. Follow up DPR sampling did not confirm the detection.
Thiobencarb	55 counties 6,270 wells	0.006 - 8.7		PHG-70 USEPA IRIS- 70	Preemergent herbicide. AR. Follow up DPR sampling did not confirm early detections.

Compound Detected	Number of Counties and Wells Sampled since June, 2004	Historical Range of Residue Concentrations (ppb)	Fiscal Year 2003/2004: Range of Residue Concentrations (ppb)	Water Quality Criteria (ppb)[a]	Type of Compound, Registration Status, Comments
Thiram	2 counties 18 wells	5-17		USEPA IRIS- 35	Fungicide. AR. Follow up DPR sampling did not confirm the detections.
Toxaphene	58 counties 6,778 wells	1-57		CDHS- 3 USEPA- 3 PHG- 0.03	Insecticide. NR. 1990 Detections classified as point sources. Detections referred to SWRCB.
TPA	10 counties 274 wells	0.1 - 15		No criteria established	Metabolite of chlorthal-dimethy. DPR determined that this compound contaminated ground water due to non-point source applications of the parent, chlorthal-dimethyl. DPR reviewed toxicological studies and determined that detections did not pose a threat to public health; so no further action required.
Trifluralin	34 counties 917 wells	0.01 - 0.9		USEPA SNARL- 5	Preemergent herbicide. AR. Follow up DPR sampling did not confirm detections.
Xylene	58 counties 10,295 wells	0.3 - 1100	1.2	CDHS- 1,750 USEPA- 10,000 PHG- 1,800	Solvent. NR. Non-peticidal uses of industrial chemicals may contribute to these findings. Detections referred to SWRCB.

[a] CDHS= California Department of Health's drinking water standards, maximum contamination level (MCL); CDHS-AL = California Department of Health's action level; USEPA= U.S. Environmental Protection Agency's MCL; PHG= Office of Environmental Health Hazard Assessment's California public health goal; USEPA IRIS= U.S. EPA integrated risk information system reference dose as a drinking water level; USEPA SNARL= U.S EPA suggested no-adverse-response level for toxicity other than cancer risk Marshack, J.B. 2003. A Compilation of Water Quality Goals. Definitions of the various Water Quality Criteria are given below.
NR: Not registered
AR: Actively registered in California
CUI: Currently under investigation by DPR
LAU: Legal agricultural use

APPENDIX D

Glossary of Terms

AB 1803 - (1983) (Chapter 881, Statutes of 1983) A law that required the California Department of Health Services (DHS) to evaluate each public water system to determine its potential for contamination. The systems were required to conduct specified water analyses and to report those results. Monitoring required by AB 1803 was completed in June 1989.

AB 2021 - See "Pesticide Contamination Prevention Act."

action level (AL) - Published by DHS's Office of Drinking Water, ALs are based mainly on health affects. ALs are advisory to water suppliers. Although not legally enforceable, the majority of water suppliers have complied with action levels as though they were maximum contaminant levels.

active ingredient - The chemical or chemicals in a pesticide formulation that are biologically active and which are capable, in themselves, of preventing, destroying, repelling or mitigating insects, fungi, rodents, weeds, or other pests.

Agricultural Commissioner - For each county in California, the person in charge of the County Department of Agriculture. Under 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 plant or animal pests, or any other 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 Dept. of Public Health pursuant to section 2426 of the Health and Safety Code. (Food and Agr. Code, section 11408)

analysis - The determination of the composition of a substance by laboratory methods. In this case, it includes the separation and measurement of a pesticide or its degradation product from the sample matrix.

aquifer - A geologic formation, group of formations, or part of a formation, that is water bearing and which transmits water in sufficient quantity to supply springs and pumping wells.

basin irrigation - A method of watering by confining irrigation water around the plant stem or trunk by means of a soil dam. Also called flood irrigation.

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.

chemigation - The application of pesticides through irrigation water, using irrigation techniques and 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 - Each chemical analysis of a well water sample for a pesticide residue or related chemical constitutes one record in the database. Each record may contain up to 149 columns of data.

degradation - The breakdown of a chemical by the action of microbes, water, air, sunlight, or other agents.

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 instruments used for analysis of the compound under investigation. A detection may be designated as confirmed or unconfirmed.

discrete sample - Samples taken separately from a well; not a single sample split into smaller samples.

established PMZ - A Pesticide Management Zone (PMZ) (see def.) formally listed in section 6802, Title 3 of the California Code of Regulations (3CCR).

ground water protection areas (GWPA) - Areas of the state identified by DPR that are vulnerable to pesticide movement to ground water. GWPAs are identified by base meridian, township, range and section. Currently, there are leaching GWPAs and runoff GWPAs. GWPAs include all sections of land where pesticides have been found in ground water due to legal agricultural

use (see Pesticide Management Zones*)* and additional sections of land that contain similar characteristics of areas where pesticides have been found in ground water.

Ground Water Protection List (GWPL) - A list, required by the PCPA and established in section 6800 (3CCR), of pesticides having the potential to pollute ground water. 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. Pesticide active ingredients whose physicochemical properties exceed the specific numerical values (see def.) and that are labeled for soil application under certain conditions or are required or recommended to be followed by flood or furrow irrigation within 72 hours are placed on sublist (b) of the GWPL. Chemicals placed on the GWPL sublist (a) are subject to certain restrictions.

health advisory level (HAL) - An advisory number published by U.S. EPA's Office of Drinking Water and Office of Water Regulations and Standards. Short-term (10 days or less), long-term (7 years or less), and lifetime exposure health advisories for non-carcinogens and suspected human carcinogens are included where data sufficient for derivation of the advisories exist. HALs are a guideline which include a margin of safety to protect human health. For lifetime HALs, water containing pesticides at or below the HAL is acceptable for drinking every day over the course of one's lifetime.

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

large water system well - A well supplying 200 or more service connections.

leaching - A pathway by which agricultural chemicals may reach ground water; the process by which residues are dissolved in soil water and follow the movement of water through the soil matrix as it recharges a ground water aquifer.

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

legal agricultural use determination - A determination required by section 13149 (FAC) 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 within a four-section area of the original 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; and (5) the detected pesticide is not exclusively due to illegal use or a point source. The director may consider a preponderance of evidence as meeting these criteria.

maximum contaminant levels (MCLs) - MCLs are part of the drinking water quality standards adopted by DHS and by USEPA under the Safe Drinking Water Act. MCLs are formally established in regulation and are enforceable by DHS on water suppliers.

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

mitigation measure - An activity to substantially reduce any adverse impact of a given condition.

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 well - A well used principally for any of the follow purposes: (1) observing ground water levels and flow conditions, (2) obtaining samples for determining ground water quality, or (3) evaluating hydraulic properties of water-bearing strata.

non-crop areas - These areas include rights-of-way, golf courses, cemeteries, and industrial and institutional sites. Agricultural use of pesticides in non-crop areas include weed control around buildings on a farm and/or rights-of-way, golf courses and cemeteries..

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

organic matter - Plant and animal debris or remains found in the soil in all stages of decay. The major elements in organic matter are oxygen, hydrogen, and carbon.

parts per billion (ppb) - A way to express the concentration of a chemical in a liquid, solid, or in air. Since one liter of water weighs one billion micrograms, one microgram of a chemical in one liter of water is equal to one ppb.

permit - Permits are issued by County Agricultural Commissioners for a specific site 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 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 Contamination Prevention Act (PCPA, AB 2021) A law, effective January 1, 1986, which added agricultural use sections 13141 through 13152 to Division 7 of the FAC. The PCPA requires the following: (1) each registrant of an pesticide to submit environmental fate data to DPR; (2) the director to use those data to establish a list of pesticides with the potential to pollute ground water (Ground Water Protection List); (3) the director to monitor ground water for these pesticides; (4) all local, county and state agencies to report to DPR the results of pesticides sampled in ground water; and (5) the director to maintain a specified well sampling database and to report certain information annually to the Legislature, DHS, OEHHA, and SWRCB on well sampling. If pesticides are detected in ground water due to legal agricultural use, the PCPA requires a formal review of the pesticides to determine if its continued use can be allowed.

Pesticide Detection Response Process (PDRP) – A process, established pursuant to sections 13149 through 13151 (FAC), in which the detection of a pesticide residue in ground water is investigated, evaluated, and, when necessary, mitigated. As part of the process, a determination must be made that the detection 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 cancelled.

Pesticide Management Zone (PMZ) - A former geographic surveying unit of approximately one square mile, which is vulnerable to ground water contamination based on detections of a pesticide chemical in ground water due to legal, agricultural use. PMZs were pesticide specific. The use of a pesticide inside its PMZs was subject to certain ground water protection restrictions and requirements. PMZs were renamed GWPAs in May 2004.

physicochemical - 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 of residues in the ground water called a plume.

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 that had been identified as sensitive to ground water pollution by specific pesticides base on detections in ground water but not formally adopted into section 6802 (3CCR).

registered pesticide - A pesticide product approved by the USEPA and DPR for use in California.

regulations - 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.

replicate sample - A discrete sample taken from a well at the same time as the initial detection sample; not a single sample split into multiple samples.

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 is permitted only when additional precautionary measures are taken where applicable. Certain reporting requirements and dealer responsibilities apply to the use of restricted materials.

section - A land unit of 640 acres or one square mile, equal to l/36 of a township. (See well numbering system.)

small public water system well - A well serving fewer than 200 connections.

specific numerical values (SNV) - Certain numeric threshold values that the PCPA requires to be established for the following physical and chemical properties of pesticide active ingredients: water solubility, soil adsorption coefficient, hydrolysis, aerobic and anaerobic soil metabolism, and field dissipation (the field dissipation SNV has not yet been established). 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 predicting which pesticides are likely to pollute ground water.

State Well Number - See “well numbering system.”

survey - In this report, well monitoring conducted by an agency or private firm for a specified length of time in a designated area.

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 “well numbering system.”)

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

verified detection - confirmed and unconfirmed detections are verified if they meet the criteria specified in (FAC section 13149[d]) which requires that either the analytical method provides unequivocal identification of a chemical and is approved by DPR or that the detection is verified within 30 days by a second analytical method or a second analytical laboratory approved by DPR. Criteria have been set by DPR (Biermann, 1989, 1996) for determining if the detection of a pesticide or its degradation product(s) meets the standards of section 13149[d].

water solubility - The ability of a substance to go into solution with water.

well inventory database- a statewide database, required by the PCPA, of wells sampled for pesticide active ingredients.

well numbering system - The California well numbering system is based on a rectangular 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 also described as a square parcel of land one mile on a side, each containing 640 acres. Each well in California is assigned a unique number (referred to as the State Well Number) by the Department of Water Resources (DWR). For well numbering purposes, each section of land is divided into sixteen 40-acre tracts. Once the well location is established in the 40 acre tract it is assigned a sequence number which is assigned in chronological order by DWR personnel. The DWR maintains an index of state well numbers to prevent duplication