

**Department of Pesticide Regulation
Environmental Monitoring Branch
1001 I Street
Sacramento, California 95814
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**Study GW07: Protocol For Conducting Ground Water Protection List Monitoring For
Fiscal Year 2006/07**

I. INTRODUCTION

The Department of Pesticide Regulation's (DPR's) Ground Water Protection List (GWPL) is a list of pesticides having the potential to pollute ground water. Pursuant to California Food and Agricultural Code (FAC) section 13143, companies seeking to register an agricultural use pesticide containing a new active ingredient (AI) must send DPR certain chemical and environmental fate data. If these data exceed certain key values and the pesticide label specifies certain application methods, FAC section 13144 requires DPR to add the pesticide to GWPL. GWPL is contained in the Title 3, California Code of Regulations (3CCR) section 6800. FAC section 13148 requires DPR to monitor pesticides on GWPL to "more accurately determine the mobility and persistence of the pesticides" and "determine if these pesticides have migrated to groundwaters of the state." Since 1990, DPR has sampled approximately 1200 wells for 81 pesticides and pesticide breakdown products as part of GWPL monitoring.

II. OBJECTIVE

The purpose of this study is to determine whether oryzalin and napropamide have contaminated ground water in areas of California with high agricultural use and vulnerable soils.

III. PERSONNEL

GWPL well sampling will be conducted by Environmental Monitoring Branch. Project personnel include:

Project Supervisor: Lisa Quagliaroli
Research Scientist III: John Troiano
Project Team: Matt Fossen, Joe Marade, Craig Nordmark, and Aron Lindgren
Lab Liaison/Quality Control: Carissa Ganapathy
Agency and Public Contact: Mark Pepple

All questions concerning this protocol should be directed to Mark Pepple at (916) 324-4086, e-mail at: <mpepple@cdpr.ca.gov>.

IV. STUDY PLAN

- a. **Active Ingredient Selection.** DPR chose pesticide AIs for monitoring based on guidelines outlined in Troiano (1997): for fiscal year 2006/07, oryzalin (3,5-dinitro-N4,N4-dipropylsulfanilamide) and napropamide ((R,S)-N,N-diethyl-2-(1-naphthoxy) propionamide) were selected. DPR sampled for both AIs in a previous study (Weaver, 1999), with no detections reported. Data obtained from DPR's pesticide use reports (PURs) indicated a peak in oryzalin use in several counties in 1998, with a trend of increasing use after 2001 (Figure 1); this led us to determine that this was an appropriate AI to resample (CDPR, 2007). The presence of a combined analytical method for oryzalin and napropamide added to the desirability of sampling for both AIs.

We will also sample the selected wells for the presence of known ground water contaminants (3CCR section 6800[a]), hexazinone, and several important degradates of these parent AIs. DPR can use this information in the creation of new ground water protection areas (GWPA) or as a comparison in investigations for the presence of new AIs in established GWPA.

- b. **Study Area Selection.** Potential study sections were chosen based on soil vulnerability and pounds of active ingredient applied as reported in PUR. All selected sections were in the 80th percentile or higher for total pounds of target pesticide applied for reporting years 1992–2003. Additionally, most sections had a depth to ground water of 70 feet or less, with soil types classified as vulnerable (Troiano et al., 2000). The selected sections are located in Butte, Colusa, Fresno, Merced, San Joaquin, Santa Clara, Stanislaus, Tulare, and Yolo counties: a list of potential study sections and their properties can be found in Table 1. A study goal of 80 sampled wells was set: 40 to be sampled for triazines and oryzalin, and 40 for triazines and napropamide.

V. SAMPLING AND ANALYTICAL METHODS

Domestic wells will be selected according to procedures in SOP FSWA006.00 (Marade, 1998). Samples will be collected using the methods described in SOP FSWA001.00 (Marade, 1996). The California Department of Food and Agriculture's (CDFA's) Center for Analytical Chemistry will analyze primary samples for oryzalin/napropamide and triazines. Samples containing known amounts of oryzalin and napropamide and disguised as actual samples (blind spikes) will be prepared and analyzed in accordance with SOP QAQC001.00 (Segawa, 1995). Samples containing deionized water (field blanks) will be collected at the same time as field samples and analyzed to confirm the validity of positive results. The reporting limit for all analytes is 0.05 parts per billion (ppb). The reporting limit is the smallest amount that can be reliably detected and is set by the testing laboratory for each compound.

VI. DATA ANALYSIS

Detection data obtained from CDFA laboratory will be used to notify participating property owners of the sampling results for their respective wells. These data will also be used to generate a study memorandum detailing the analysis findings.

VII. TIMETABLE

- March-May 2007: Conduct well sampling for oryzalin, napropamide, and triazines.
- August 2007: Obtain analysis results from CDFA laboratory, mail results to property owners.
- November 2007: Write study memorandum.

VIII. BUDGET

Budget Component	Units	Expense per Unit	Total Component Expense
Pesticide sample analysis	100	\$1420	\$142000
Travel	1	\$8320	\$8320
PY	0.3	\$100000	\$30000
Total			\$180320

VI. REFERENCES

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<http://www.cdpr.ca.gov/docs/emon/pubs/ehapreps/eh0005.pdf>. (verified 11 December 2007). California Department of Pesticide Regulation, Sacramento, California.
- Weaver, D. and J. Marade. 1999. Memorandum to K. Goh: Summary of Results for FY 1998/99 Ground Water Protection List Monitoring. Available at:
http://www.cdpr.ca.gov/docs/emon/grndwtr/rpts/gwpl_9899.pdf. California Department of Pesticide Regulation, Sacramento, California.

X. TABLES AND FIGURES

Table 1. Potential study sections grouped by county. Total pounds of applied AI are for reporting years 1992-2003 (CDPR, 2007).

COMTRS	Depth to Water	AI	Total Pounds Applied
04M21N01E01*	51	Oryzalin	4072
04M21N01E04	25	Oryzalin	1879
04M21N01E12	52	Oryzalin	1985
04M21N01E16	19	Oryzalin	2489
04M21N01E21	21	Oryzalin	2279
04M21N01E24	35	Oryzalin	1713
04M21N01E26	30	Oryzalin	5681
04M21N01E28	20	Oryzalin	2162
04M21N01E34	20	Oryzalin	2074
06M14N02W08	34	Napropamide	1284
06M14N02W14	22	Napropamide	957
06M14N02W16	34	Napropamide	1484
06M14N02W20	75	Napropamide	911
06M14N02W21	43	Napropamide	1302
06M14N02W23	32	Napropamide	1142
06M14N02W28	54	Napropamide	1545
06M15N02W06	21	Napropamide	1719
06M15N02W31	13	Napropamide	930
06M15N02W34	10	Napropamide	1086
06M15N03W01	36	Napropamide	971
06M15N03W02	59	Napropamide	1047
06M15N03W05	3	Napropamide	1291
06M15N03W06	3	Napropamide	910
06M15N03W07	3	Napropamide	1097
06M15N03W19	9	Napropamide	1922
06M15N03W25	17	Napropamide	1286
06M15N03W27	25	Napropamide	925
06M15N03W28	13	Napropamide	1586
06M15N03W29	13	Napropamide	1483
06M15N03W30	15	Napropamide	1128
06M15N03W34	45	Napropamide	1445
06M15N03W35	40	Napropamide	1414
06M15N04W11	5	Napropamide	980
06M15N04W26	15	Napropamide	965
10M14S23E21*	52	Oryzalin	4120
10M14S23E22*	57	Oryzalin	3063
10M14S23E26*	54	Oryzalin	1707
10M14S23E27*	49	Oryzalin	7702
10M14S23E28*	44	Oryzalin	4390
10M14S23E32*	39	Oryzalin	2436
10M14S23E33*	36	Oryzalin	7110
10M15S23E13*	66	Oryzalin	2840
10M15S23E18*	40	Oryzalin	2117
10M15S23E24*	67	Oryzalin	3177
10M15S24E07*	60	Oryzalin	3240
10M15S24E09*	46	Oryzalin	2050
10M16S15E25*	10	Napropamide	4277
10M16S15E26*	13	Napropamide	2630
10M16S16E29*	33	Napropamide	2560

COMTRS	Depth to Water	AI	Total Pounds Applied
10M16S16E30*	14	Napropamide	3355
10M16S16E31*	9	Napropamide	3730
24M04S10E11*	60	Oryzalin	1682
24M04S10E12*	64	Oryzalin	1845
24M05S11E33*	41	Oryzalin	2364
24M05S13E20*	109	Oryzalin	2825
24M05S13E21*	115	Oryzalin	4970
24M05S13E28*	104	Oryzalin	2079
24M05S13E29*	92	Oryzalin	4416
24M05S13E33*	93	Oryzalin	5132
24M06S10E25*	20	Oryzalin	1787
24M06S10E35*	14	Oryzalin	1742
24M06S10E36*	17	Oryzalin	3816
24M06S11E04*	35	Oryzalin	1683
24M06S11E20*	31	Oryzalin	2328
24M06S11E31*	25	Oryzalin	3655
24M06S11E32*	34	Oryzalin	2600
24M07S10E03*	12	Oryzalin	2092
39M02S07E01*	26	Oryzalin	3032
39M02S07E02*	21	Oryzalin	2124
39M02S07E10*	20	Oryzalin	1779
39M02S07E12*	20	Oryzalin	1973
39M02S07E13*	18	Oryzalin	3077
39M02S07E15*	15	Oryzalin	2095
39M02S07E16*	14	Oryzalin	3925
39M02S07E17*	9	Oryzalin	2799
39M02S07E20*	8	Oryzalin	1987
39M02S07E21*	12	Oryzalin	4128
39M02S07E22*	12	Oryzalin	4256
39M02S07E23*	14	Oryzalin	1980
39M02S07E24*	18	Oryzalin	3009
39M02S07E27*	12	Oryzalin	1808
39M02S07E35*	15	Oryzalin	1927
39M02S08E01*	53	Oryzalin	2090
39M02S08E02*	49	Oryzalin	7805
39M02S08E03*	46	Oryzalin	2435
39M02S08E04*	44	Oryzalin	1876
39M02S08E07*	28	Oryzalin	3217
39M02S08E09*	34	Oryzalin	5184
39M02S08E11*	37	Oryzalin	3254
39M02S08E12*	43	Oryzalin	2275
39M02S08E13*	35	Oryzalin	2861
39M02S08E14*	33	Oryzalin	2437
39M02S08E15*	30	Oryzalin	5670
39M02S08E16*	29	Oryzalin	2217
39M02S08E17*	28	Oryzalin	4467
39M02S08E18*	24	Oryzalin	4487
39M02S08E24*	32	Oryzalin	2462
39M02S08E27*	28	Oryzalin	2674
39M02S08E32*	21	Oryzalin	2003
39M02S09E05*	57	Oryzalin	2079
39M02S09E06*	56	Oryzalin	2708
39M02S09E07*	48	Oryzalin	2263
39M02S09E08*	52	Oryzalin	1709
39M02S09E09*	56	Oryzalin	2567

COMTRS	Depth to Water	AI	Total Pounds Applied
39M02S09E16*	51	Oryzalin	1807
39M02S09E17*	46	Oryzalin	2711
39M02S09E19*	36	Oryzalin	2059
43M10S04E29*	48	Napropamide	1444
43M10S04E33*	42	Napropamide	5853
43M11S04E04*	29	Napropamide	2391
43M11S04E10*	19	Napropamide	5557
43M11S04E21*	15	Napropamide	3854
43M11S04E22*	10	Napropamide	1814
50M03S08E33*	19	Napropamide	2294
50M04S08E03*	22	Napropamide	300
50M04S08E10*	20	Napropamide	337
50M04S08E14*	19	Napropamide	1111
50M04S08E23*	16	Napropamide	2892
50M04S08E27*	13	Napropamide	850
54M19S26E13*	44	Oryzalin	1580
54M19S26E16*	39	Oryzalin	2295
54M19S26E17*	38	Oryzalin	4178
54M19S26E21*	39	Oryzalin	2993
54M19S26E24*	34	Oryzalin	2065
54M19S27E19*	37	Oryzalin	1662
57M10N01W15*	26	Napropamide	1980
57M10N01W20*	27	Napropamide	973
57M10N01W21*	27	Napropamide	995
57M10N01W08*	35	Napropamide	877
57M10N02E01*	14	Napropamide	1169
57M10N02E02*	17	Napropamide	950
57M10N02E04*	24	Napropamide	981
57M10N02E25*	8	Napropamide	889
57M10N03E07*	13	Napropamide	970
57M12N01E03*	12	Napropamide	1200
57M12N01E14*	10	Napropamide	1491
57M12N01E17*	14	Napropamide	1415
57M12N01E21*	13	Napropamide	1509
57M13N01E34*	13	Napropamide	1267
57M10N01W03*	21	Napropamide	891

* Section is a GWPA

Figure 1. Oryzalin use in nine counties for reporting years 1992-2003 (CDPR, 2007).

