

State of California

# Memorandum

To : Clare Berryhill  
Director

Date : May 14, 1987

Place : Sacramento

Phone: 2-2395

From : Department of Food and Agriculture - Lyndon S. Hawkins, Chair  
Subcommittee of the Pesticide Registration  
and Evaluation Committee

Subject: Atrazine

Attached is the Findings and Recommendations regarding atrazine. This report is pursuant to the requirements of the Pesticide Contamination and Prevention Act and is submitted on behalf of the Subcommittee of the Pesticide Registration and Evaluation Committee.

Attachment

cc: Don Mengle  
Syed Ali  
Tobi Jones

May 12, 1987

**SUBCOMMITTEE OF THE  
PESTICIDE REGISTRATION AND EVALUATION COMMITTEE**

**IMPLEMENTATION OF THE PESTICIDE CONTAMINATION PREVENTION ACT  
ATRAZINE: FINDINGS AND RECOMMENDATIONS**

**Introduction**

Pursuant to California Notice 86-6, Notice of Atrazine Finds in California Ground Water, and the Notice of Hearing Pertaining to Atrazine (September 22, 1986), the subcommittee of the Pesticide Registration and Evaluation Committee held a hearing to review registrant reports, public comment, and other appropriate information regarding the presence of atrazine in California ground water. After review of this information, the subcommittee offers the following findings and recommendations to the Director of the Department of Food and Agriculture:

**Findings**

1. The subcommittee does not concur with the registrant's interpretation of the pollution data for atrazine and does not recommend Finding One in the Food and Agricultural Code (FAC) Section 13150(c)(1).
2. The subcommittee finds that geographic modification of use<sup>1</sup> of atrazine in specific areas would create a high probability that ground water pollution by atrazine will not occur in these areas. The subcommittee notes, however, that this modification of use may not necessarily reduce the concentrations being detected in ground water in the short term because of possible presence of atrazine in the soil.
3. The subcommittee finds that there are alternative pesticides and practices for atrazine that are reasonably effective and practicable, and demonstrably less destructive to the environment. These alternatives may be substituted for the principal uses of atrazine in the Atrazine Prohibited Areas. Therefore, the subcommittee cannot find that a ban would result in economic hardship and cannot recommend Finding Three in FAC Section 13150(c)(3).

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<sup>1</sup> Geographic modification of use means a ban in use.

4. The subcommittee finds that sampling of ground water and soil for atrazine in California has not been extensive.

#### Recommendations

1. The subcommittee recommends that the Director adopt Finding Two in FAC Section 13150 (c)(2) and establish and enforce Atrazine Prohibited Areas according to the following criteria:
  - a. Glenn and Colusa Counties. All townships with positive detections of atrazine and townships that contain soils classified as vertisols by the USDA Soil Conservation Service. In addition, a buffer of one township<sup>2</sup> should surround townships with positive detections. This buffer will extend into Colusa County.
  - b. Los Angeles County. All townships with positive detections of atrazine, including a buffer of one township.
  - c. Tulare and Fresno Counties. All townships with positive detections of atrazine, including a buffer of one township. This buffer will extend into Fresno County.
  - d. Statewide. All percolation ponds or other artificial ground water recharge areas in California, including those identified in the attached Department of Water Resources draft documents, "Ground Water Recharge Projects within the USBR Mid-Pacific Region (10/19/83)" and "Ground Water Recharge Projects within the USBR Lower Colorado River Region (10/18/83)." For this recommendation, these areas shall be defined as any man-made structure which receives water or waste water for replenishing ground water .

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<sup>2</sup> Townships with at least two sides bordering a buffer are included in the buffer.

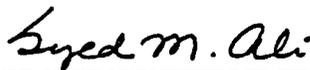
2. To insure that there is a high probability that pollution will not occur in areas where atrazine will be used outside the Atrazine Prohibited Areas, the subcommittee further recommends that the Director require soil and ground water monitoring and take the following actions:

- a. Atrazine be banned in areas where it is detected in the soil at depths at or below eight feet or in ground water.
- b. Atrazine be considered for banning if detected at depths above eight feet depending upon site characteristics.

The subcommittee further recommends that the Director in cooperation with the California Department of Health Services, the State Water Resources Control Board, registrants and users of atrazine design and conduct this monitoring program. Sources of funding for sampling should be identified jointly by the Director, and registrants and users of atrazine.



Lyndon S. Hawkins  
Chair of Subcommittee  
Pest Management Specialist IV  
California Department of Food  
and Agriculture



Syed M. Ali, Ph.D.  
Environmental Specialist  
State Water Resources Control Board



Donald C. Mengle  
Research Scientist  
Department of Health Services

# Memorandum

Date : May 8, 1987

To : G-8

Frantz  
State Water Resources Control Board  
901 P Street  
Sacramento, CA

From : Department of Water Resources

Subject: Artificial Recharge Projects in California

In response to your telephone request today, I am sending to you two documents which may be of help in understanding the extent of ground water artificial recharge projects in California. As I indicated on the telephone, some agencies drop or add projects as the need arises while others have more permanent facilities in place.

The documents attached are: Ground Water Recharge Projects within the USBR Mid-Pacific Region and Ground Water Recharge Projects within the USBR Lower Colorado River Region. These drafts are considered to be complete as of the preparation data of October 1983 according to John Fielden who prepared them.

For further information, you may wish to contact me at (916) 445-2182 or Mr. Fielden at 322-1570.

Helen J. Peters

Attachments

cc: John Fielden, Rm 252  
Carlos Madrid, Southern District

Ground Water Recharge Facilities Within USBR  
Lower Colorado River Region

Recharge Facilities

1. Orange County Coastal Plain.

Two agencies, Orange County Water District (OCWD) and Orange County Environmental Management Agency (OCEMA), operate ground water recharge programs in Orange County. The facilities include several recharge basins, the natural channel of the Santa Ana River, and injection wells operated to form seawater intrusion barriers. The water supply for the river and basins consists of local runoff and purchased imported water. The water supply for the injection wells is reclaimed wastewater, imported water, and local ground water.

<u>Facility</u>	<u>Agency</u>	<u>Acreage</u>	<u>Recharge</u>
Santa Ana River	OCWD	6 miles of channel 320 feet wide	-
Santa Ana River Basins	OCWD	730	-
Warner Basin	OCWD	90	-
Burris Pit	OCWC	100	40,000 AF since 1977
Anaheim Lake	OCWD	70	-
Kraemer Basin	OCWD	45	Expected Operation in 19
Miller Basin <sup>1/</sup>	OCEMA	-	153,575 AF through 1981
Placentia Basin <sup>1/</sup>	OCEMA	-	52,673 AF through 1981
Raymond Basin <sup>1/</sup>	OCEMA	-	37,582 AF through 1981
Crescent Basin <sup>1/</sup>	OCEMA	-	-
Gilbert Basin <sup>1/</sup>	OCEMA	-	-

Alamitos Barrier <sup>2/</sup>	LACFCD <sup>2/</sup>	17 injection wells <sup>2/</sup>	5,000 AF/yr <sup>3/</sup>
Orange County Coastal Barrier	OCWD	23 multipoint injection wells	22,000 AF/yr

- 1/ Constitute the Carbon Creek System. Total recharge through 1981, including connecting channels was 271,873 acre-feet.
- 2/ Located in Orange and Los Angeles Counties and operated by the Los Angeles County Flood Control District (LACFCD). Four wells are located in Orange County. The 5,000 acre-foot/year is purchased by OCWD.

OCWD is evaluating the feasibility of developing recharge facilities in Santiago Creek.

2. Central and West Basins of Los Angeles Coastal Plain.

The sources of water for recharge to these basins consists of local runoff in the San Gabriel River, reclaimed waste water from the Whittier Narrows and San Jose Creek Water Reclamation Plants, and purchased imported water. The recharge facilities consist of basins located at Whittier Narrows on the San Gabriel River and three lines of injection wells forming seawater intrusion barriers. Operations at Whittier Narrows are partially controlled by the decree in the case of Board of Water Commissions of the City of Long Beach, et. al. v. San Gabriel Valley Water Company. The agencies provide water for recharge at Whittier Narrows are Los Angeles County Flood Control District (LACFCD), Central and West Basin Water Replenishment District (C&WBWRD), Upper San Gabriel Valley Municipal Water District (USGVMWD), San Gabriel Valley Municipal Water District (SGVMWD), and Central Basin Municipal Water District (CBMWD).

<u>Facility</u>	<u>Agency</u>	<u>Acreage</u>	<u>Recharge</u>
Rio Hondo Coastal Basins <sup>1/</sup>	LACFCD	-	} Estimated to be about 184,000 AF in 1982-83
San Gabriel Coastal Basins <sup>1/</sup>	LACFCD	-	
West Coast Basin Barrier	LACFCD	Injection wells	35,300 AF in 1982-83
Dominiquez Gap Barrier	LACFCD	Injection wells	6,600 AF in 1982-83
Alamitos Barrier <sup>2/</sup>	LACFCD <sup>2/</sup>	17 Injection wells <sup>2/</sup>	4,500 AF in 1982-83 <sup>2/</sup>

1/ These constitute the recharge facilities for the Montebello Forebay. Some recharge of partially controlled local runoff also occurs in the channel of the San Gabriel River.

2/ Located in Los Angeles and Orange Counties and operated by LACFCD. Thirteen wells are located in Los Angeles County with the recharge figure applying to these wells.

The LACFCD is studying the effectiveness of the southern end of the West Coast Basin Barrier. The study, being conducted by Bookman-Edmonston, should be completed in 1983.

### 3. San Gabriel Valley.

The recharge facilities in this basin consist of 14 percolation projects and the natural channel of the San Gabriel River. The recharge facilities are operated by the Los Angeles County Flood Control District (LACFCD) and San Gabriel River Water Committee (SGRWC). The primary source of recharge water is local runoff. The percolation facilities consist of percolation ponds, flood retention basins, ditches, and old gravel extraction pits.

<u>Facility</u>	<u>Agency</u>	<u>Acreage</u> <sup>1/</sup>	<u>Recharge</u> <sup>2/</sup>
Eaton	LACFCD	23	15 CFS, 2,701 AF in
Sawpit Wash	LACFCD	4	12 CFS, 24,947 AF in 1982-83

Little Dalton	LACFCD	-	10 CFS, 1,422 AF in 1982-83
Big Dalton	LACFCD	13	15 CFS, 2,754 AF in 1982-83
Peck Road	LACFCD	85	50 CFS, 25,278 AF in 1982-83
Buena Vista	LACFCD	-	30 CFS, 1,019 AF in 1982-83
Santa Fe Reservoir	LACFCD	133	220 CFS, 106,080 AF in 1982-83
Irwindale	LACFCD	-	20 CFS, 2,844 AF in 1982-83
Citrus	LACFCD	15	20 CFS
Ben Lomond	LACFCD	17	20 CFS, 4,366 AF in 1982-83
East San Gabriel Canyon	SCRWC	-	100 CFS
West San Gabriel Canyon	SCRWC	4	7 CFS
Walnut Creek	SCRWC	8	-
San Dimas Spreading Development	SCRWC	-	-

1/ Wetted area.

2/ 1982-83 recharge is for partial years only.

Until 1960 the San Gabriel Spreading Corporation operated the Main Basin.

#### 4. San Fernando Basin.

Two agencies operate ground water recharge facilities in this basin, the Los Angeles County Flood Control District (LACFCD) and the Los Angeles Department of Water and Power (LADWP). The sources of recharge water are

local runoff and water imported through the Los Angeles Aqueduct.

<u>Facility</u>	<u>Agency</u>	<u>Acreege</u>	<u>Recharge</u> <sup>1/</sup>
Lopez Spreading Ground	LACFCD	13	7 CFS, 243 AF in 1981-82
Pacoima Spreading Ground	LACFCD	117	40 CFS, 5,495 AF in 1981-82
Branford Spreading Ground	LACFCD	7	1 CFS, 345 AF in 1981-82
Hansen Spreading Ground	LACFCD	110	60 CFS, 14,317 AF in 1981-82
Tujunga Spreading Ground	LADWP	130	100 CFS <sup>2/</sup>
Headworks Spreading Ground	LADWP	30	30 CFS <sup>2/</sup>

1/ Recharge rate is for long-term operation

2/ In 1981-82 the combined recharge for these facilities was 3,853 AF.

The potential for conjunctive use in this basin was reported in DWR Bulletin 186, "A Ground Water Storage Program for the State Water Project: San Fernando Basin Theoretical Model".

#### 5. Raymond Basin.

The following agencies recharge water through basins and abandoned gravel pits: Los Angeles County Flood Control District (LACFCD); Kinaloa Irrigation District (KID); Los Flores Water Company (LFWC); Lincoln Avenue Water Company (LAWC); City of Pasadena (COP); Rubio Cañon Land and Water Association (RCLWA); and City of Sierra Madre (SM). The primary sources of recharge is local runoff.

<u>Facility</u>	<u>Agency</u>	<u>Acreage</u>	<u>Recharge</u>
Arroyo Seco Spreading Grounds	LACFCD <sup>1/</sup>	13	15 CFS, 8,106 AF in 1982-83 <sup>2/</sup>
Eaton Wash Spreading Grounds	LACFCD <sup>1/</sup>	24	10 CFS, 6,791 AF in 1982-83 <sup>2/</sup>
Santa Anita Spreading Grounds	LACFCD <sup>1/</sup>	8.5	7 CFS, 831 AF in 1982-83
Rubio Canyon Debris Basin	LEWC&RCLWA	-	695 AF in 1982-83 <sup>2/</sup>
Millard Canyon Spreading Grounds	LAWC	-	302 AF in 1982-83 <sup>2/</sup>
Sierra Madre Spreading Grounds	SM	-	2,058 AF in 1982-83

1/ All agencies except the City of Sierra Madre recharge through these facilities.

2/ 1982-83 recharge totals include significant percolation in natural stream channels.

6. Chino, Cucamonga and Claremont Heights Basins.

The following agencies operate recharge facilities in these basins: Pomona Valley Protective Association (PVPA); Etiwanda Water Company (EWC); and San Bernardino County Flood Control District (SBCFCD). The water supply for recharge using these facilities is primarily local runoff and imported water. The facilities involved in recharge include percolation ponds, flood retention basins, ditches, and natural stream channels.

<u>Facility</u>	<u>Agency</u>	<u>Acreage</u>	<u>Recharge</u> <sup>1/</sup>
Thompson Creek	PVPA	Ditches and abandoned gravel pits	-
San Antonio	PVPA	-	More than 28,000 AF in one year

Alta Loma Basins	SBCFCD	25	-
Banana Basin	SBCFCD	11	270 AF
Cactus Basins	SBCFCD	20	-
Church St. Basin	SBCFCD	10	120 AF
College Heights Basins	SBCFCD	26	{ 510 AF
College Heights Spreading Grounds	SBCFCD	20	{ 510 AF
Cucamonga Basins	SBCFCD	58	{ 12,370 AF
Cucamonga Spreading Grounds	SBCFCD	250	{ 12,370 AF
Lower Cucamonga Spreading Grounds	SBCFCD	-	-
Day Canyon Spreading Grounds	EWC	20	{ 13,390 AF
Lower Day Creek Basins	SBCFCD	25	{ 2/
Upper Day Creek Basins	SBCFCD	-	2/
Day Creek Spreading Grounds	SBCFCD	200	-
Deer Creek Basins	SBCFCD	Proposed	Never used
Deer Creek Spreading Grounds	SBCFCD	200	8,130 AF
East Avenue Spreading Grounds	EWC	10	220 AF
8th Street Basins	SBCFCD	42	820 AF
Ely Basins	SBCFCD	39	420 AF
Etiwanda Basins	SBCFCD	-	-
Etiwanda Conservation Basins	SBCFCD	25	340 AF
Etiwanda Spreading Grounds	SBCFCD	130	730 AF <sup>2/</sup>
15th Street Basin	SBCFCD	20	-

Fourth Street Rock Crusher Pit	-	160 (Proposed)	Never Used
Hickory Basin	SBCFCD	-	-
Jurupa Basin	SBCFCD	-	-
Linden Basin	SBCFCD	14	276 AF
Merrill Basin	SBCFCD	7	-
Mill Basin	SBCFCD	7	80 AF
Montclair Basins	SBCFCD	35	15,880 AF
19th Street Basin	SBCFCD	-	810 AF
Pepper Basin	SBCFCD	3	3,030 AF
Randall Basin	SBCFCD	14	-
Red Hill Basin	SBCFCD	8	-
Riverside Basin	SBCFCD	-	-
San Antonio Basins	SBCFCD	250	30,150 AF
San Sevaine Basins	SBCFCD	-	120 AF
San Sevaine Spreading Grounds	SBCFCD	115	660 AF <sup>2/</sup>
Turner Basins	SBCFCD	50	-
Victoria Basin	SBCFCD	-	Never used
Wineville Basin	SBCFCD	75	-

1/ Maximum historical annual recharge. Records are very poor.

2/ Recharge to these basins was performed as part of the joint DWR-MWD Chino Basin Study.

The Department of Water Resources and The Metropolitan Water District of Southern California (MWD) funded a recently completed study of the feasibility of using the Chino Basin to store additional imported water. The

study recommendations included directly recharging the basin by means of improved spreading grounds and injection wells and indirectly recharging the basin by constructing treatment facilities and delivering surface water in lieu of extracting ground water. MWD is proceeding to implement the study recommendations. MWD also provides imported water to recharge the basin under its cyclic storage program.

7. San Bernardino-San Gorgonio Pass Area Basins.

The recharge facilities in this basin are operated by the San Bernardino County Flood Control District (SBCFCD) and the San Bernardino Valley Water Conservation District (SBVWCD). The Riverside County Flood Control and Water Conservation District (RCFCWCD), Fontana Union Water Company (FUWC), and the Bear Valley Mutual Water Company (BVMW) also recharge the ground water basin. The primary source of recharge is local runoff with some imported water. Some reclaimed waste water precolates in natural stream channels. The City of Redlands (CR) and East Lugonia Mutual Water Company (ELMWC) operate injection wells.

<u>Facility</u>	<u>Agency</u>	<u>Acreage</u>	<u>Recharge</u>
Lytle Creek	FUWC	Natural Stream Channel	-
Devil Canyon	SBCFCD	70	2 FT/Day
Badger Canyon	SBCFCD	18	1 FT/Day
Waterman Canyon	SBCFCD	165	1 FT/Day
East Twin Creek	SBCFCD	144	3 FT/Day
Patton	SBCFCD	8	0.5 FT/Day
City Creek	SBCFCD	75	3 FT/Day

Santa Ana River	SBVWCD	1,200	3 FT/Day
Wilson	SBCFCD	34	1 FT/Day
Mill Creek	SBVWCD	-	-
Little San Gorgonio Creek	RCFCWCD	13	3 FT/Day
Noble Creek	RCFCWCD	-	-

The Department of Water Resources is currently conducting a feasibility investigation of using these basins to store additional imported water. The Bunker Hill Basin is presently experiencing water logging problems in the pressure area adjacent to the San Jacinto Fault.

8. Coachella Valley-Whitewater River Area.

The Coachella Valley Water District (CVWD) operates spreading basins to recharge imported water that it obtains by exchange with MWD. The Banning Water Company (BWC) once operated, and may continue to do so, recharge facilities using local runoff.

<u>Facility</u>	<u>Agency</u>	<u>Acreage</u>	<u>Recharge</u>
Whitewater River Spreading Grounds	CVWD	Several thousand acres (?)	-
Deep Canyon <sup>1/</sup>	CVWD	-	-
San Gorgonio River <sup>1/</sup>	BWC	-	-

<sup>1/</sup> May no longer exist.

9. Coldwater, Lee Lake, and San Jacinto Basins.

Historically, two agencies have operated recharge facilities in these basins. They are the Temescal Water Company (TWC) and the Riverside

County Flood Control and Water Conservation District (RCFCWCD). The information available is quite old and the facilities listed may no longer be in use. Recharge was accomplished by means of ditches and basins.

<u>Facility</u>	<u>Agency</u>	<u>Acreage</u>	<u>Recharge</u>
Lower Coldwater Creek	TWC	-	-
Coldwater Creek	TWC	-	-
Mayhew Wash	TWC	-	-
Indian Creek	TWC	-	-
Horsethief Creek	TWC	-	-
San Jacinto	RCFCWCD	-	-

Department of Water Resources Current Investigations

1. Ground Water Conditions in the San Diego Area. This is a cooperative project with San Diego County and the San Diego County Water Authority. The project is evaluating the impact of proposed waste water reuse projects on ground water resources in the San Diego Region.
2. Conditions of Ground Water Supplies in Twentynine Palms. This is an investigation of ground water quality, especially fluorides, and quantity in the Twentynine Palms area.
3. Evaluation of Patton State Hospital Water Supply Wells. This short study is to evaluate the efficiency of four water supply wells for Patton State Hospital. The wells are located in the Bunker Hill Basin.
4. Ground Water Recharge Quality Improvement by Soil Chelation - Chino and Montebello Basins. This study will assess the fate of organic and heavy

metal complexes as they percolate through the upper segment of various representative and specially treated soils, and how chelation may effect the mobility of organics and heavy metals.

5. Ground Water Recharge of Reclaimed Waste Water - Irvine. This is a three-year research program to determine the feasibility of injecting tertiary effluent into a ground water basin designated for exclusive use as a source of irrigation water. The Irvine Ranch Water District is conducting this investigation with DWR providing a minor portion of the funding.

Ground Water Recharge Projects within the  
USBR Mid Pacific Region

Ground Water Recharge Projects

This inventory of recharge activities includes artificial recharge facilities and, to some extent, the use of natural channels for recharge. It does not include recharge through unlined canals, over irrigation, or flooding of fallow land, or recharge that is incidental to other water operations. However, it should be noted that substantial amounts of water are recharged by these means.

1. Sacramento Valley, Northcoast, and North Lahonton Hydrologic Basins.

There are no known artificial recharge facilities active at this time.

However, four potential projects are under varying degrees of consideration.

- o The Surprise Valley Resource Conservation District is constructing two pilot recharge facilities in Surprise Valley.
- o The Soil Conservation Service and the Honey Lake Resource Conservation District have expressed interest in developing recharge facilities similar to those in Surprise Valley.
- o The Humboldt Bay Municipal Utilities District has been considering a ground water development project in the Blue Lake area on the Mad River. This would involve summer extractions and construction of facilities for winter recharge.
- o The Glenn-Colusa Irrigation District is considering a conjunctive use operation to take advantage of their ground water resources. They are looking at pumping ground water during dry years and selling a portion of their surface water to the SWP and/or CVP. They would then recharge

their ground water supplies during wet periods. They are moving very slowly and cautiously.

2. Santa Clara Valley Water District (SCVWD).

SCVWD operates an extensive series of reservoirs, natural stream channels (about 68 miles) and percolation basins to recharge ground water in the Santa Clara Valley. Recharge water is from local runoff and imports from the SWP. In the future SCVWD will import water from the USBR's Central Valley Project. SCVWD also has a cooperative, with Stanford University, experimental program evaluating the injection of reclaimed waste water through a well in the Palo Alto Baylands.

<u>Facility</u>	<u>Acreage</u>	<u>Recharge</u> <sup>1/</sup>
McClellan Road Pond	2.5	4 AF/Day
Budd Avenue Ponds	9	24 AF/Day
Camden Ponds	62	20 AF/Day
McDlincey Ponds	7	20 AF/Day
Oka Ponds	17	8-10 AF/Day
Page Ponds	14	20 AF/Day
Sunnyoaks Ponds	3	5 AF/Day
Alamitos Ponds	15	8-13 AF/Day
Guadalupe Ponds	48	21 AF/Day
Kooser Ponds	2	7 AF/Day
Los-Capitancillos Ponds	63	30 AF/Day
Coyote Pond	30	56 AF/Day
Ford Road Ponds	34	16-30 AF/Day
Main Avenue Ponds	6	10 AF/Day

<u>Facility</u>	<u>Acreage</u>	<u>Recharge</u>
Overfelt Gardens	4	4 AF/Day
Penetancia Ponds	14	15-17 AF/Day

1/ Represents maximum sustainable rates under present conditions.

3. South Santa Clara Valley Water District (SSCVWD).

SSCVWD operates reservoirs on Uvas and Llagas Creeks to recharge the Gilroy ground water basin.

<u>Facility</u>	<u>Acreage</u>	<u>Recharge</u>
Llagas Creek	8 miles of channel	5.8 AF/MI/Day
Uvas Creek	7 miles of channel	4.1 AF/MI/Day
Borrow Pits	37	-
Ball Pond	17	1.76 FT/Day

4. Pacheco Pass Water District (PPWD).

PPWD operates a small reservoir to conserve local runoff for recharge through natural channels and a percolation basin. The projects are in the Gilroy Subbasin.

<u>Facility</u>	<u>Acreage</u>	<u>Recharge</u>
North Fork Pacheco Creek	.7 miles of channel	-
Arroyo de las Viboras	Ditch, channel, and 8.4 acre basin	-

5. Zone 7, Alameda County Flood Control District (Zone 7).

Zone 7 uses local and imported water supplies to recharge the Livermore Valley Basin by means of percolation from natural channels. In the past Zone 7 operated a small recharge pit.

6. Alameda County Water District (ACWD).

ACWD recharges the Niles Cone aquifer system through the use of abandoned gravel pits. The sources of water supply are local runoff and imports from the SWP and the Hetch Hetchy System.

<u>Facility</u>	<u>Acreage</u>	<u>Recharge</u>
Bunting Pit	12	-
Gorman Pond	3	-
Grau Pit	8	-
Kaiser Pits	23.5	-
Shinn Pit	22	-
Pits A, B, C, G, H	65	-
Pits J, N, O, P, Q, R, S, T	116.5	-

7. Arcade County Water District (ACWD).

ACWD in the later 1970's ran an experimental program to evaluate using extraction wells for recharging ground water during idle periods. Whether such a program was ever implemented is unknown.

8. San Joaquin County (SJC).

SJC is proceeding with a cooperative program with the U. S. Geological Survey to assess the recharge potential of eastern San Joaquin County. Data review, drilling programs, and selection of sites for one or two experimental recharge pits have been concluded. The recharge pits are expected to be constructed in the spring of 1984.

9. Monterey County Flood Control and Water Conservation District (MCFCWCD).  
 MCFCWCD operates two large reservoirs on tributaries to the Salinas River to make controlled releases for recharging the Salinas Basin. Recharge occurs through 21 miles of the Salinas River Channel at a rate of up to 28 AF/MI/Day.

10. San Benito County Flood Control and Water Conservation District (SCFCWCD).  
 SBCFCWCD uses local runoff, partially controlled, to recharge the Hollister subbasin. The recharge is accomplished through the natural channels of the San Benito River (12 miles) and Tres Pinos Creek (3 miles). Rates are as high as 11 AF/MI/Day.

11. Santa Maria Valley Water Conservation District (SMVWCD).  
 SMVWCD, in cooperation with the Santa Maria Soil Conservation District, has historically constructed basins in the channel of the Santa Maria River for the purpose of ground water recharge.

12. Ventura County Flood Control District (VCFCD).  
 VCFCD historically operated Matilija Dam to supply recharge basins in the Ojai Valley. This project is probably no longer operative.

13. United Water Conservation District (UWCD).  
 UWCD operates Piru Dam and Reservoir to control local runoff and SWP imports for use in recharging the Santa Clara River Valley and Oxnard Plain Forebay aquifers.

<u>Facility</u>	<u>Acreage</u>	<u>Recharge</u>
Piru Spreading Basin	44	150 AF/Day 5,098 AF in 1981-82

<u>Facility</u>	<u>Acreage</u>	<u>Recharge</u>
Saticoy Spreading Basin	132.6	450 AF/Day 32,122 AF in 1981-82
El Rio Spreading Basin	84.3	350 AF/Day 27,954 AF in 1981-82

14. San Joaquin Valley.

There are approximately 65 entities (irrigation districts, water districts, canal companies, etc.) in the southern San Joaquin Valley currently engaged in ground water management, spanning from Madera County in the north to Kern County in the south. Artificial recharge is accomplished by more than 15,000 acres of spreading basins, 3,500 miles of unlined canals, stream channels, and an indeterminable amount of agricultural land.

<u>Agency</u>	<u>Facility</u>	<u>Acreage</u>	<u>Recharge</u>
Alpaugh ID	Reservoirs (2)	10	Occasionally intentional
Alta ID	Wahtoke Creek	6 miles of channel	6.6 AF/MI/Day
Alta ID	Sand Creek	9 miles of channel	5.0 AF/MI/Day
Alta ID	Cottonwood Creek	3.5 miles of channel	2.3 AF/MI/Day
Alta ID	Section 36 Basin	10	-
Alta ID	Section 1 Basin	4	-
Alta ID	Meyers Basin	60.6	-
Arvin-Edison WSD	Sycamore Basin	370	0.9 FT/Day
Arvin-Edison WSD	Tejon Basins	450	2 FT/Day
Berenda Mesa WSD	Kern River Basins <sup>1/</sup>	Up to 600 <sup>1/</sup>	-
Buena Vista WSD	Kern River Channel	7 miles	54 AF/MI/Day
Buena Vista WSD	Unlined Canals	Varies	Up to 70,000 AF/YR
Chowchilla WD	Ash Slough	17 miles of channel	9.3 AF/MI/Day

<u>Agency</u>	<u>Facility</u>	<u>Acreage</u>	<u>Recharge</u>
Chowchilla WD	Berenda Slough	13 miles of channel	9.3 AF/MI/Day
Chowchilla WD	Townsend Basin	19	0.4 FT/Day
Chowchilla WD	Road 11 Basin	6	-
Chowchilla WD	Rutherford Basin	-	-
Chowchilla WD	Chowchilla River	10 miles of channel	4 AF/MI/Day
Consolidated ID	Cole's Slough	5 miles of channel	-
Consolidated ID	Ward's Drain	9.5 miles of channel	-
Consolidated ID	Willow Lake Basin	60	-
Consolidated ID	Rockwell Pond	130	-
Consolidated ID	Other Ponds (44)	1,110	-
Corcoran ID	Reservoir No. 1	1,000	-
Corcoran ID	Reservoir No. 2	320	-
Corcoran ID	Reservoir No. 3	466	0.2 FT/Day
Corcoran ID	Cross Creek	3 miles of channel	3.7 AF/MI/Day
Corcoran ID	Tule River	6 miles of channel	3.7 AF/MI/Day
Delano-Earlimart ID	Office Basin	5	0.7 FT/Day
Delano-Earlimart ID	Swanson Basin	0.5	-
Delano-Earlimart ID	White River	7 miles of channel	3.9 AF/MI/Day
Delano-Earlimart ID	Injection Wells (Inactive?)	-	Up to 2.1 AF/Day/Well
El Nido ID	Section 28 Basin	20	0.3 FT/Day
El Nido ID	Section 21 Basin	40	0.12 FT/Day
El Nido ID	Section 22 Basin	60	0.12 FT/Day
El Nido ID	Main Reservoir	40	-
El Nido ID	Injection Wells	-	3-4 AF/Day/Well
Exeter ID	Yokohl Creek	2 miles of channel	3.2 AF/MI/Day
Fresno City	Leaky Acres <sup>2/</sup>	117	0.6 FT/Day

<u>Agency</u>	<u>Facility</u>	<u>Acreage</u>	<u>Recharge</u>
Fresno ID	Ponds (19)	201	-
Fresno ID	Creeks (4)	19 miles of channel	-
Fresno Metropolitan FCD	Ponds (4)	40	-
Hacienda WD	Kern River	8 miles of channel	Rarely gets water
Henry Miller WD	Kern River	1 mile of channel	-
Henry Miller WD	Santiago Creek	2 miles of channel	-
International WD	Pond	-	-
Ivanhoe ID	Cottonwood Creek	0.75 miles of channel	13.3 AF/MI/Day
Ivanhoe ID	Wutchma Basin	2	1 FT/Day
Ivanhoe ID	Office Basin	7	1.5 FT/Day
Ivanhoe ID	68 "bath tub"	0.1	-
Ivanhoe ID	69-50 South Basin	4.5	0.45 FT/Day
Ivanhoe ID	Injection Wells (16)	-	Average 0.5 AF/Day
Kaweah Delta WCD	No. 24 Basin	147	0.14 FT/Day
Kaweah Delta WCD	No. 27 Basin	3	1.33 FT/Day
Kaweah Delta WCD	Other Ponds (15)	489	0.52 FT/Day
Kaweah Delta WCD	Cross Creek	5 miles of channel	-
Kaweah Delta WCD	St. Johns	14 miles of channel	-
Kaweah Delta WCD	Mill Creek	14 miles of channel	-
Kaweah Delta WCD	Packwood Creek	9 miles of channel	-
Kaweah Delta WCD	Cameron Creek	10 miles of channel	-
Kaweah Delta WCD	Deep Creek	4 miles of channel	-
Kaweah Delta WCD	Elk Bayou	13 miles of channel	-
Kern County Water Agency ID #4	Kern River	6 miles of channel	1.1 FT/Dry
Kern County Water Agency ID #4	Calloway Canal	8 miles of channel	3.3 FT/Day

<u>Agency</u>	<u>Facility</u>	<u>Acreage</u>	<u>Recharge</u>
Kern County Water Agency ID #4	Carrier Canals	11 miles of channel	-
Kern County Water Agency ID #4	Carrier Basin	100	0.4 FT/Day
Kern County Water Agency ID #4	PG&E Basin	15	0.97 FT/Day
Kings County WD	Kings River	11 miles of channel	-
Kings County WD	Cross Creek	6 miles of channel	-
Kings County WD	Ponds (14)	1,016	-
Laguna ID	Borrow Pits	70	-
Lakeside ID	Cross Creek	11 miles of channel	-
Lakeside ID	Guernsey Slough	1.75 miles of channel	-
Lakeside ID	No. 10 Basin	187	0.8 FT/Day
Lakeside ID	No. 15 Basin	52.5	0.3 FT/Day
Lakeside ID	No. 23 Basin	4	0.3 FT/Day
Lakeside ID	Reservoir No. 1	320	0.2 FT/Day
Lakeside ID	Reservoir No. 2	64	0.5 FT/Day
Lakeside ID	Other Basins	20+	-
Lower Tule River ID	Tule River	36.5 miles of channel	10 AF/MI/Day
Lower Tule River ID	Ponds (14)	847	-
Madera ID	Lake Madera	400	-
Madera ID	Burgess Pit	3	-
Madera ID	Road 16 Basin	4	-
Madera ID	Creeks (4)	57 miles of channel	2.4 AF/MI/Day
North Kern WSD	Poso Creek	9 miles of channel	11.8 AF/MI/Day
North Kern WSD	Poso Basin	390	-
North Kern WSD	Switchfield Basin	210	-
North Kern WSD	Minter Basin	425	-
North Kern WSD	Rosedale Basin	580	-

<u>Agency</u>	<u>Facility</u>	<u>Acreage</u>	<u>Recharge</u>
North Kern WSD	Minter Pit	1.5	-
North Kern WSD	Famoso Pit	2	-
Pixley ID	Deer Creek	11.5 miles of channel	0.7 FT/Day
Pixley ID	Ponds (3)	26	0.6 FT/Day
Porterville ID	Tule River	12 miles of channel	7.6 AF/MI/Day
Porterville ID	Porter Slough	4.5 miles of channel	10.5 AF/MI/Day
Porterville ID	City Basin	3	2.7 Ft/Day
Porterville ID	Sewer Basin	1	3 FT/Day
Porterville State Hospital	Ponds (2)	8	-
Riverdale ID	Murphy Slough	-	-
Rosedale-Rio Bravo WSD	Jerry Slough	15 miles of channel	4.1 FT/Day
Rosedale-Rio Bravo WSD	Enos Lane Basin	55	-
Rosedale-Rio Bravo WSD	Houghton Basin	65	-
Rosedale-Rio Bravo WSD	Terminal Basin	239	0.4 FT/Day
Rosedale-Rio Bravo WSD	Camp Basin	2.5	-
Saucelito ID	Deer Creek	5.5 miles of channel	8.2 AF/MI/Day
Saucelito ID	County Pit	1.5	3.7 FT/Day
Terra Bella ID	Main Canal	7 miles of channel	7.3 AF/MI/Day
Tulare ID	Bates Slough	2 miles of channel	-
Tulare ID	Cameron Creek	18 miles of channel	-
Tulare ID	Deep Creek	3 miles of channel	-
Tulare ID	Packwood Creek	8 miles of channel	-

<u>Agency</u>	<u>Facility</u>	<u>Acreage</u>	<u>Recharge</u>
Tulare ID	Ponds (17)	1,170	.2 to 3.8 FT/Day
Vandalia ID	Main Basin	20	-
Vandalia ID	West Basin	40	-
West Kern County WD	Kern River	2 miles of channel	30 AF/MI/Day

- 1/ Benenda Mesa WSD has purchased 600 acres of land adjacent to the Kern River for development of recharge basins.
- 2/ Leaky Acres is an experimental facility operated by the U. S. Department of Agriculture.

Plans have been developed for expansion of spreading and percolating capability of the City of Bakersfield's 2,800-acre spreading facility. The planned expansion area includes utilizing land adjoining the river for percolation purposes. Percolation activity for the City of Bakersfield is currently limited to 300 to 500 acres of river channel area. Wheeler Ridge-Maricopa WSD also apparently has about 20 acres of recharge ponds and uses local creek channels for recharge occasionally.

Department of Water Resources Ground Water Investigations.

1. Honey Lake Ground Water Study. This is a four-year study to update data on ground water conditions in the Honey Lake Valley.
2. Eastern Shasta County Ground Water Study. The purpose of this study is to do a ground water resource evaluation of the eastern part of the County. This evaluation will be used by the County to update its General Plan.
3. Sacramento Valley Ground Water Study. This is a multi-year study to obtain ground water and surface data to incorporate into a Hydrologic-Economic

Model. Part of this study will be to determine areas of ground water recharge.

4. Northeast Counties Update. Final year of a study to update the ground water quantity and quality data for five basins.
5. Sierra Valley Ground Water Study. Perform ground water monitoring and construct semi-annual ground water level contour maps for the Sierra Valley Ground Water Management District.
6. Chico Nitrate Study. This study for the State Water Resources Control Board evaluated the nature and extent of nitrate pollution in the ground water under Chico.
7. City of Mendocino Ground Water Study. This study will be a ground water resource inventory for the City of Mendocino. Ground water is their sole water supply.
8. Mendocino County Ground Water Study. This investigation will cover water quality, well inventory and canvass, delineation of recharge areas, pump tests on selected wells, depth of water yielding sediments, long range supply and demand, and guidelines for the regulation of septic tank-leach line disposal systems.
9. Santa Rosa Plain Ground Water Model. In cooperation with the City of Rohnert Park and the Sonoma County Water Agency, continue to develop a model of the Santa Rosa Plain ground water basin from its existing unverified status to

a fully predictive simulation device, for evaluating ground water management options.

10. Sacramento Valley Ground Water. U. S. Geological Survey will complete an interpretive report for Sacramento County.
11. East San Joaquin County Ground Water Study. This study is being performed by Brown and Caldwell for San Joaquin County. DWR provides partial funding and advise on objectives and study emphasis.
12. Santa Clara Valley Ground Water Investigation. This investigation scheduled for completion in December 1983, is evaluating the potential for using available storage capacity in the Santa Clara Valley basin in conjunction with SWP imports to develop yield for the SWP.
13. San Joaquin Valley Hydrologic-Economic Model. Work involves updating and extending this model.
14. Ground Water Occurrence and Quality, Central Coastal Drainage Province. Phase one of this study will include review of existing studies, data collection, field measurements, sampling and laboratory analysis. In this investigation, the geohydrochemical approach will be used to evaluate existing conditions. The study area includes most of San Luis Obispo and Santa Barbara Counties and a limited portion of Ventura County.
15. San Luis Obispo and Santa Barbara Counties Local Projects. These are total water management studies for the Counties.

## Local Ground Water Studies

1. Hornbrook Community Services District. Developing ground water supplies to augment their surface water supply. They are only able to do this using State Safe Drinking Water loans and grants.
2. Del Norte County. The County is working with the Water Resources Control Board in determining the nature and extent of pesticide pollution of the ground water in the Crescent City area.
3. Humboldt County. The County and the Water Resources Control Board are evaluating ground water pollution in the Eureka Plain.