UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Water Resources Division

WATER-QUALITY DATA FOR SELECTED SITES TRIBUTARY TO THE SALTON SEA, CALIFORNIA AUGUST 1969-JUNE 1970

By

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Prepared in cooperation with the
Imperial Irrigation District

OPEN-FILE REPORT

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CONTENTS

ILLUSTRATIONS

TABLES

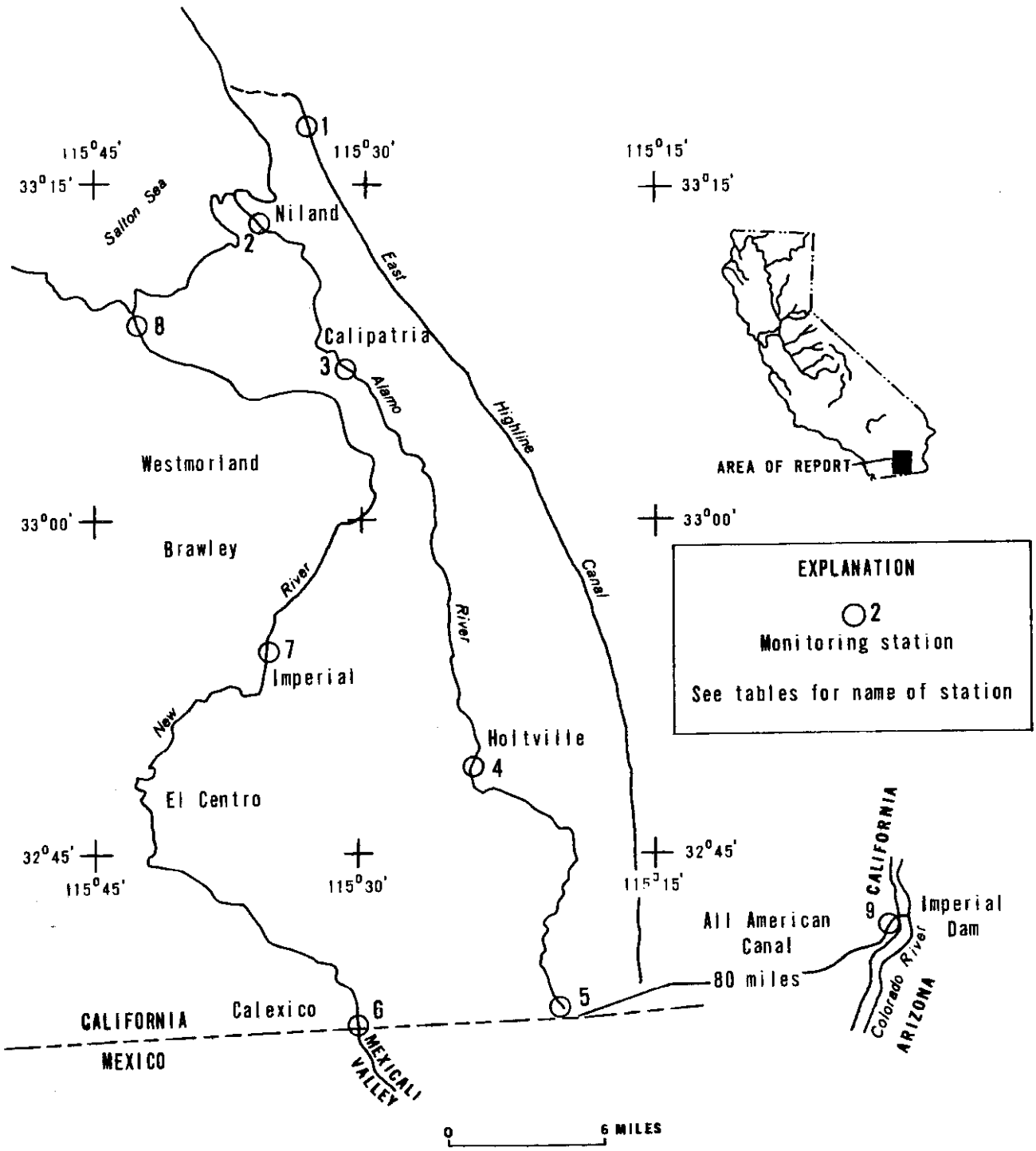

FIGURE 1.—Monitoring stations in the Salton Sea basin, California.

WATER-QUALITY DATA FOR SELECTED SITES TRIBUTARY TO THE SALTON SEA, CALIFORNIA, AUGUST 1969-JUNE 1970

By George A. Irwin

INTRODUCTION

In August 1969 the U.S. Geological Survey, at the request of the Imperial Irrigation District, initiated a water-quality monitoring program at nine sites on three tributaries to the Salton Sea (fig. 1). The program consisted of determining concentrations of dissolved solids, several forms of nitrogen, phosphorus, and selected pesticides at eight sites on the Imperial Irrigation District drainage system, and at one site on the All American Canal. The sampling site on the All American Canal was selected as a reference station to measure the levels of these variables in the water prior to its use for irrigation.

The constituents determined were chosen for several reasons. Waste water discharged from the Imperial Irrigation District drainage system ultimately reaches the Salton Sea, and nitrogen and phosphorus concentrations in this waste water might stimulate excessive plant growth in the sea. Pesticide levels were of concern because of their toxic effect on the aquatic biota. Dissolved solids were monitored to determine the total salt load entering the sea from the three tributaries.

The scope of the program included the monthly collection of two water samples at each site beginning in August 1969. On one sample specific conductance, dissolved solids, nitrite, nitrate, ammonia, organic nitrogen, orthophosphate, total dissolved phosphate, and total phosphate concentrations were determined. The second sample was collected for pesticide analyses. Pesticide analyses were made at the U.S. Geological Survey pesticide laboratory in Austin, Tex., using the techniques described by Lamar, Goerlitz, and Law (1965) and Goerlitz and Lamar (1967). Analyses for the other constituents were made at the U.S. Geological Survey laboratory in Sacramento, Calif., using the methods described by Rainwater and Thatcher (1960). The samples were sent to the appropriate laboratories by airmail on the day they were collected. Tables 1-18 show the results of the analyses.

ACKNOWLEDGMENTS

This report was prepared by the Geological Survey in cooperation with the Imperial Irrigation District. The monitoring program was under the general supervision of R. Stanley Lord, district chief in charge of water-resources investigations in California, and was directed by James L. Cook, chief of the Garden Grove subdistrict. Fieldwork was supervised by Donald F. Thoreson, technician-in-charge of the field headquarters at Escondido, Calif.

DESCRIPTION OF THE AREA

The Imperial Irrigation District lies within the Imperial Valley in southeastern California. The district extends from the Mexican border northward about 45 miles to the Salton Sea. The average width of the district is about 25 miles.

The irrigated acreage of the Imperial Irrigation District is about 500,000 acres, most of which is below mean sea level. The main source of irrigation water to the district is from the Colorado River through the All American Canal. The canal originates at the Imperial Dam near Yuma, Ariz., and flows westward near the Mexican border to the southeastern end of the Imperial Valley.

HYDROLOGY

The mean annual rainfall in the Imperial Valley is 3 inches, necessitating the importation of large quanitities of water for irrigation. Upon arrival to the Imperial Irrigation District water is diverted into about 1,600 miles of distribution canals and laterals for irrigation.

Waste water from the farmlands is returned by about 1,400 miles of deep and surface drains, most of which discharge into the New or the Alamo Rivers. The remainder is discharged directly into the Salton Sea. Treated waste water from communities in the Imperial Valley, and agricultural drainage and sewage from Mexicali Valley, located upstream, are also transported to the Salton Sea by the Alamo and New Rivers. Ninety percent of the inflow from Imperial Valley, including drainage from Mexicali Valley, reaches Salton Sea through the Alamo and New Rivers. The remaining 10 percent enters the Salton Sea through more than 30 minor channels and drains. The U.S. Geological Survey gaging stations recorded a total discharge in acre-feet during the period August 1969 to June 1970 of 359,000 for the New River and 558,000 for the Alamo River.

PROGRAM PLANS FOR THE 1971 FISCAL YEAR

The Alamo River at drop 3 near Calipatria (station 3), the Alamo River at drop 9 near Holtville (station 4), and the New River at Niland (station 7) were discontinued as part of the monitoring program in July 1970 because of financial limitations. The sampling program for the remaining six monitoring sites will be continued.

REFERENCES CITED

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Lamar, W. L., Goerlitz, D. F., and Law, L. M., 1965, Identification and measurement of chlorinated organic pesticides in water by electron-capture gas chromatography: U.S. Geol. Survey Water-Supply Paper 1817-B, 12 p.

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TABLE 1.--*Pesticide analyses of water, East Highline Canal near Niland, California (station 1)*

Date	Results in micrograms per liter													
	Insecticides											Herbicides		
	Aldrin	DDD	DDE	DDT	Dieldrin	Endrin	Heptachlor	Heptachlor epoxide	Lindane	Parathion	Methyl parathion	2,4-D	Silvex	2,4,5-T
8-13-69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	--	0.00	0.00	0.00
9-16-69	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	0.00	.00	.00	.00
10-22-69	.00	.00	.01	.04	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11-19-69	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00	.00	.16	.00	.00
12-17-69	.00	.01	.02	.02	.00	.00	.00	.00	.00	.00	.00	.05	.00	.00
1-19-70	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2-17-70	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01
3-16-70	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.55	.00	.00
4-21-70	.00	.00	.01	.02	.00	.00	.00	.00	.00	.00	.00	.11	.00	.00
5-18-70	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6-15-70	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

TABLE 2.--*Pesticide analyses of water, Alamo River at outlet near Niland, California (station 2)*

Date	Results in micrograms per liter													
	Insecticides											Herbicides		
	Aldrin	DDD	DDE	DDT	Dieldrin	Endrin	Heptachlor	Heptachlor epoxide	Lindane	Parathion	Methyl parathion	2,4-D	Silvex	2,4,5-T
8-13-69	0.00	0.05	0.07	0.12	0.03	0.02	0.00	0.00	0.01	0.35	0.16	0.00	0.00	0.00
9-16-69	.00	.05	.05	.04	.03	.00	.00	.00	.00	.62	.28	1.1	.35	.00
10-22-69	--	.03	.07	.12	.03	.00	.00	.00	.01	.84	.65	19	.07	.00
11-19-69	.00	.04	.10	.54	.01	.00	.00	.00	.00	.27	.15	.42	.05	.00
12-17-69	.00	.42	.20	.81	.02	.00	.00	.00	.01	.36	.18	.05	.00	.00
1-19-70	.00	.06	.07	.09	.01	.03	.00	.00	.00	.00	.11	.04	.12	.00
2-17-70	.00	.04	.06	.06	.01	.04	.00	.00	.01	.08	.10	1.1	1.7	.00
3-16-70	.00	.08	.07	.10	.02	.00	.00	.00	.00	.00	.39	.45	.58	.00
4-21-70	.00	.10	.08	.08	.02	.07	.00	.00	.00	.00	.12	.15	.17	.00
5-18-70	.00	.08	.12	.06	.02	.02	.00	.00	.00	--	.04	.23	.09	.00
6-15-70	.00	.03	.05	.03	.01	.02	.00	.00	.00	.00	.00	--	.01	.00

TABLE 3.--*Pesticide analyses of water, Alamo River at drop 3 near Calipatria, California (station 3)*

Date	Results in micrograms per liter													
	Insecticides											Herbicides		
	Aldrin	DDD	DDE	DDT	Dieldrin	Endrin	Heptachlor	Heptachlor epoxide	Lindane	Parathion	Methyl parathion	2,4-D	Silvex	2,4,5-T
8-13-69	0.00	0.04	0.06	0.05	0.03	0.02	0.00	0.00	0.01	0.28	0.12	0.00	0.01	0.00
9-16-69	.00	.04	.05	.08	.03	.03	.00	.00	.00	.63	.35	3.6	.72	.00
10-22-69	--	.03	.05	.04	.02	.00	.00	.00	.00	.71	.49	1.3	.03	.00
11-19-69	.00	.03	.03	.03	.01	.00	.00	.00	.00	.21	.26	1.8	.02	.00
12-17-69	.00	.17	.11	.24	.00	.03	.00	.00	.01	--	.07	.08	.00	.00
1-19-70	.00	.02	.03	.03	.01	.01	.00	.00	.00	.10	.07	.00	.00	.00
2-17-70	.00	.02	.03	.02	.00	.00	.00	.00	.00	.00	.00	1.5	15	.03
3-16-70	.00	.03	.05	.03	.02	.00	.00	.00	.00	--	.28	.34	.31	.00
4-21-70	.00	.07	.06	.04	.04	.01	.00	.00	.00	.00	.00	.19	.17	.00
5-18-70	.00	.02	.07	.02	.02	.00	.00	.00	.00	--	.13	--	--	--
6-15-70	.00	.02	.04	.02	.01	.00	.00	.00	.00	.00	.00	.02	.10	.00

TABLE 4.--*Pesticide analyses of water, Alamo River at drop 9 near Holtville, California (station 4)*

Date	Results in micrograms per liter													
	Insecticides											Herbicides		
	Aldrin	DDD	DDE	DDT	Dieldrin	Endrin	Heptachlor	Heptachlor epoxide	Lindane	Parathion	Methyl parathion	2,4-D	Silvex	2,4,5-T
8-13-69	0.00	0.04	0.11	0.07	0.06	0.02	0.00	0.00	0.01	0.31	0.06	0.17	0.00	0.00
9-16-69	.00	.02	.04	.02	.03	.02	.00	.00	.00	.40	.10	1.8	.17	.00
10-22-69	--	.03	.04	.05	.03	.00	.00	.00	.00	.77	.45	1.1	.03	.00
11-19-69	.00	.01	.02	.01	.01	.00	.00	.00	.01	.04	--	.25	.04	.00
12-17-69	.00	.01	.03	.02	.02	.00	.00	.00	.00	.23	.07	.03	.00	.00
1-20-70	.00	.02	.02	.02	.01	.00	.00	.00	.01	.22	.21	2.7	.86	.00
2-18-70	.00	.00	.03	.01	.00	.00	.00	.00	.00	.11	.23	.23	2.2	.00
3-17-70	.00	.02	.04	.02	.02	.00	.00	.00	.00	--	.17	.29	.56	.00
4-22-70	.00	.02	.05	.02	.02	.01	.00	.00	.00	.00	.00	.40	.18	.00
5-19-70	.00	.02	.06	.01	.02	.00	.00	.00	.00	.00	.00	2.0	.28	.00
6-16-70	.00	.02	.07	.02	.01	.00	.00	.00	.00	.00	.00	.90	.00	.00

TABLE 5.--*Pesticide analyses of water, Alamo River at Mexican border near Calexico, California (station 5)*

Date	Results in micrograms per liter													
	Insecticides											Herbicides		
	Aldrin	DDD	DDE	DDT	Dieldrin	Endrin	Heptachlor	Heptachlor epoxide	Lindane	Parathion	Methyl parathion	2,4-D	Silvex	2,4,5-T
8-13-69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	--	0.00	0.00	0.00
9-16-69	.00	.01	.01	.02	.00	.00	.00	.00	.00	.09	--	.00	.00	.00
10-22-69	.00	.01	.01	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11-19-69	.00	.01	.01	.00	.00	.00	.00	.00	.00	.00	.00	.07	.02	.00
12-17-69	.00	.00	.00	.00	.00	.00	.00	.00	.00	.82	.00	.03	.00	.00
1-20-70	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03	.00	.00
2-18-70	.00	.01	.00	.01	.00	.00	.00	.00	.00	.00	.00	.14	.00	.00
3-17-70	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4-22-70	.00	.01	.01	.00	.00	.00	.00	.00	.00	.00	.00	.04	.00	.00
5-19-70	.00	.04	.02	.05	.01	.00	.00	.00	.00	.00	.00	.07	.00	.00
6-16-70	.00	.01	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

TABLE 6.--*Pesticide analyses of water, New River at Mexican border at Calexico, California (station 6)*

Date	Results in micrograms per liter													
	Insecticides											Herbicides		
	Aldrin	DDD	DDE	DDT	Dieldrin	Endrin	Heptachlor	Heptachlor epoxide	Lindane	Parathion	Methyl parathion	2,4-D	Silvex	2,4,5-T
8-13-69	0.00	0.06	0.01	0.12	0.02	0.00	0.00	0.00	0.03	0.07	0.01	0.00	0.00	0.00
9-16-69	.00	.07	.01	.24	.03	.02	.00	.00	.20	.00	.00	.00	.00	.00
10-22-69	--	.45	.18	1.2	.02	.01	--	.00	--	.00	.00	.00	.00	.00
11-19-69	--	--	--	--	--	--	--	--	--	--	--	.00	.00	.00
12-17-69	.00	.40	.11	.36	.02	.00	.00	.00	.01	.00	.00	.00	.00	.00
1-20-70	.00	.07	.04	.13	.01	.00	.00	.00	.01	.00	.00	.00	.00	.00
2-18-70	.00	.03	.02	.07	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
3-17-70	.00	.04	.02	.15	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
4-22-70	.00	.09	.03	.20	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
5-19-70	.00	.01	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6-16-70	.00	.05	.03	.03	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

TABLE 7.--*Pesticide analyses of water, New River near Imperial, California (station 7)*

Date	Results in micrograms per liter													
	Insecticides											Herbicides		
	Aldrin	DDD	DDE	DDT	Dieldrin	Endrin	Heptachlor	Heptachlor epoxide	Lindane	Parathion	Methyl parathion	2,4-D	Silvex	2,4,5-T
8-13-69	0.00	0.06	0.02	0.06	0.03	0.01	0.00	0.00	0.02	0.29	0.13	0.24	0.01	0.00
9-16-69	.00	.05	.03	.06	.03	.01	.00	.00	.04	.14	.05	.19	.13	.00
10-22-69	.00	.04	.00	.03	.02	.00	.00	.00	.03	.62	.51	.70	.01	.00
11-19-69	.00	.16	.08	.23	.02	.00	.00	.00	.02	.06	.04	.13	.02	.00
12-17-69	.00	.04	.02	.05	.01	.00	.00	.00	.00	.07	.06	.11	.01	.00
1-20-70	.00	.04	.02	.03	.01	.00	.00	.00	.01	.00	.00	--	--	--
2-18-70	.00	.06	.03	.06	.01	.00	.00	.00	.00	.19	.11	.75	.51	.00
3-17-70	.00	.05	.03	.04	.03	.00	.00	.00	.00	--	.10	.26	.21	.00
4-22-70	.00	.04	.04	.04	.02	.00	.00	.00	.00	.00	.00	.21	.10	.00
5-19-70	.00	.03	.02	.02	.01	.00	.00	.00	.00	.00	.00	.62	.03	.00
6-15-70	.00	.04	.03	.03	.01	.00	.00	.00	.00	.00	.00	.23	.02	.00

TABLE 8.--*Pesticide analyses of water, New River at outlet near Westmorland, California (station 8)*

Date	Results in micrograms per liter													
	Insecticides											Herbicides		
	Aldrin	DDD	DDE	DDT	Dieldrin	Endrin	Heptachlor	Heptachlor epoxide	Lindane	Parathion	Methyl parathion	2,4-D	Silvex	2,4,5-T
8-13-69	0.00	0.04	0.02	0.11	0.03	0.01	0.00	0.00	0.02	0.21	0.25	0.32	0.03	0.00
9-16-69	0.00	.09	.04	.04	.03	.02	.00	.00	.04	.46	.19	.09	.55	.00
10-22-69	--	.04	.02	.04	.01	.00	.00	.00	.02	.37	.07	1.6	.02	.00
11-19-69	.00	.06	.04	.05	.02	.00	.00	.00	.01	.08	.06	.14	.05	.00
12-17-69	.00	.05	.02	.06	.02	.00	.00	.00	.00	.00	.00	.05	.00	.00
1-19-70	.00	.03	.02	.04	.01	.00	.00	.00	.00	.08	.02	.10	.01	.03
2-17-70	.00	.03	.03	.05	.01	.00	.00	.00	.00	.00	.00	.16	.60	.01
3-16-70	.00	.05	.04	.04	.01	.00	.00	.00	.00	--	.08	.77	.84	.00
4-21-70	.00	.05	.04	.22	.02	.01	.00	.00	.00	.00	.09	.46	.10	.00
5-18-70	.00	.04	.04	.04	.02	.01	.00	.00	.00	--	.03	.70	.06	.00
6-15-70	.00	.04	.04	.02	.01	.00	.00	.00	.00	.00	.00	.29	.02	.00

TABLE 9.--*Pesticide analyses of water, All American Canal near Imperial Dam, Arizona-California (station 9)*

Date	Results in micrograms per liter													
	Insecticides											Herbicides		
	Aldrin	DDD	DDE	DDT	Dieldrin	Endrin	Heptachlor	Heptachlor epoxide	Lindane	Parathion	Methyl parathion	2,4-D	Silvex	2,4,5-T
8-12-69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	--	0.00	0.00	0.00
9-16-69	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10-22-69	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11-19-69	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12-17-69	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
1-20-70	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2-18-70	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3-17-70	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4-22-70	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5-19-70	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	.00	.00
6-16-70	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

TABLE 10.--*Chemical analyses of water, East Highline Canal near Niland, California (station 1)*

Date	Results in milligrams per liter								
	Specific conductance (micromhos at 25°C)	Dissolved solids	Nitrite (NO_2)	Nitrate (NO_3)	Ammonia (NH_4-N)	Organic nitrogen (N)	Ortho-phosphate (PO_4)	Total dissolved phosphate (PO_4)	Total phosphate (PO_4)
8-13-69	1,300	850	--	0.7	0.00	1.1	0.00	0.00	0.17
9-16-69	1,480	984	--	.6	.19	.13	.02	.02	.19
10-22-69	1,450	952	--	1.4	.09	.19	.00	.06	.19
11-19-69	1,610	1,030	--	1.6	.00	.00	.05	.10	.18
12-17-69	1,550	1,020	--	1.9	.00	.30	.03	.03	.11
1-19-70	1,540	998	--	1.4	.00	.32	.05	.05	.06
2-17-70	1,570	1,050	0.02	2.6	.12	.42	.00	.00	.16
3-16-70	1,320	--	.03	2.6	.32	.17	.02	.13	.53
4-21-70	1,450	976	.01	1.3	.29	.58	.05	.07	.23
5-18-70	1,400	914	.02	1.4	.00	1.1	.05	.40	.78
6-15-70	1,370	914	.01	2.5	.11	.83	.07	.07	.10

TABLE 11.--*Chemical analyses of water, Alamo River at outlet near Niland, California (station 2)*

Date	Results in milligrams per liter								
	Specific conductance (micromhos at 25°C)	Dissolved solids	Nitrite (NO_2)	Nitrate (NO_3)	Ammonia (NH_4-N)	Organic nitrogen (N)	Ortho-phosphate (PO_4)	Total dissolved phosphate (PO_4)	Total phosphate (PO_4)
8-13-69	3,670	2,610	--	96	0.00	0.59	0.21	0.54	1.6
9-16-69	4,200	2,850	--	25	.16	1.1	.05	.37	1.3
10-22-69	3,560	2,430	--	28	1.6	.99	1.1	1.1	1.7
11-19-69	5,300	3,600	--	34	3.5	5.5	.35	.43	1.6
12-17-69	4,010	2,710	--	37	2.9	3.3	1.3	1.8	3.0
1-19-70	3,930	2,580	--	33	4.7	.50	.36	1.2	2.0
2-17-70	4,670	3,240	3.7	30	2.0	.00	1.5	1.6	2.2
3-16-70	3,250	--	4.7	9.0	--	a6.5	.88	.88	2.2
4-21-70	3,460	2,360	2.0	20	2.5	1.8	1.0	2.4	4.1
5-18-70	3,560	2,400	4.6	20	.44	1.7	.68	1.2	7.3
6-15-70	3,330	2,240	2.9	31	2.1	2.2	.15	.64	1.6

a. Ammonia plus organic nitrogen.

TABLE 12.--*Chemical analyses of water, Alamo River at drop 3 near Calipatria, California (station 3)*

Date	Results in milligrams per liter								
	Specific conductance (micromhos at 25°C)	Dissolved solids	Nitrite (NO_2)	Nitrate (NO_3)	Ammonia (NH_4-N)	Organic nitrogen (N)	Ortho-phosphate (PO_4)	Total dissolved phosphate (PO_4)	Total phosphate (PO_4)
8-13-69	3,960	2,660	--	95	0.01	1.3	0.01	0.57	1.5
9-16-69	4,140	2,780	--	26	.29	1.4	.06	.42	1.4
10-22-69	3,690	2,520	--	27	2.1	1.4	.92	.93	1.3
11-19-69	5,300	3,640	--	29	2.0	3.0	.34	.43	1.1
12-17-69	4,110	2,760	--	36	3.6	3.7	1.4	1.6	2.5
1-19-70	4,310	2,880	--	32	7.6	.80	.59	1.8	2.6
2-17-70	5,120	3,660	4.9	30	--	a6.4	.57	.64	1.2
3-16-70	3,500	--	3.4	9.0	--	a4.6	1.1	1.1	2.5
4-22-70	3,570	2,450	2.0	20	2.0	2.3	1.0	2.4	3.8
5-18-70	3,640	2,460	4.7	21	.85	1.0	1.2	1.8	6.7
6-15-70	3,350	2,240	2.8	28	2.3	2.6	.21	.74	1.9

a. Ammonia plus organic nitrogen.

TABLE 13.--*Chemical analyses of water, Alamo River at drop 9 near Holtville, California (station 4)*

Date	Results in milligrams per liter								
	Specific conductance (micromhos at 25°C)	Dissolved solids	Nitrite (NO_2)	Nitrate (NO_3)	Ammonia (NH_4-N)	Organic nitrogen (N)	Ortho-phosphate (PO_4)	Total dissolved phosphate (PO_4)	Total phosphate (PO_4)
8-13-69	2,920	1,980	--	57	0.01	0.97	0.29	0.78	1.5
9-16-69	3,640	2,370	--	23	22	.69	.47	.92	1.6
10-22-69	3,140	2,090	--	26	18	.68	2.0	2.0	3.5
11-19-69	5,300	3,700	--	41	17	.00	1.4	1.4	1.6
12-17-69	3,650	2,490	--	38	4.6	4.5	1.8	4.2	5.7
1-20-70	3,570	2,390	--	30	10	.10	1.3	2.7	3.2
2-18-70	4,280	2,970	2.9	18	--	a18	.82	.87	.90
3-17-70	3,250	--	3.2	8.0	--	a11	2.4	2.7	4.6
4-22-70	3,070	2,100	1.2	21	8.1	2.0	1.1	2.5	2.8
5-19-70	3,200	2,220	3.3	20	6.5	2.3	2.0	3.1	7.2
6-16-70	3,060	2,020	1.8	29	6.2	2.0	.17	.84	1.8

a. Ammonia plus organic nitrogen.

TABLE 14.--*Chemical analyses of water, Alamo River at Mexican border near Calexico, California (station 5)*

Date	Results in milligrams per liter								
	Specific conductance (micromhos at 25°C)	Dissolved solids	Nitrite (NO_2)	Nitrate (NO_3)	Ammonia (NH_4-N)	Organic nitrogen (N)	Ortho-phosphate (PO_4)	Total dissolved phosphate (PO_4)	Total phosphate (PO_4)
8-13-69	3,080	2,010	--	1.7	0.01	0.56	0.05	0.12	0.24
9-16-69	3,630	2,450	--	.1	.14	.87	.05	.05	.38
10-22-69	3,860	2,580	--	1.6	.09	.67	.09	.18	.37
11-19-69	4,380	2,940	--	2.9	.18	.36	.04	.17	.26
12-17-69	3,690	2,480	--	3.6	.32	.25	.13	.24	1.7
1-20-70	4,240	2,840	--	2.5	.05	.57	.14	.14	.32
2-18-70	3,860	2,630	0.11	2.7	.18	.49	.09	.09	.28
3-17-70	4,000	--	.11	20	.34	.42	.13	.20	.55
4-22-70	4,720	3,220	.11	2.6	.32	.36	.18	.24	.65
5-19-70	3,450	2,260	.12	1.4	.02	1.4	.22	.80	1.9
6-16-70	4,370	2,880	.07	2.1	.14	1.0	.07	.26	.37

TABLE 15.--*Chemical analyses of water, New River at Mexican border at Calexico, California (station 6)*

Date	Results in milligrams per liter								
	Specific conductance (micromhos at 25°C)	Dissolved solids	Nitrite (NO_2)	Nitrate (NO_3)	Ammonia (NH_4-N)	Organic nitrogen (N)	Ortho-phosphate (PO_4)	Total dissolved phosphate (PO_4)	Total phosphate (PO_4)
8-13-69	6,970	5,240	--	6.9	0.24	0.30	0.47	0.98	1.6
9-16-69	8,500	5,350	--	.8	1.8	1.6	.90	1.6	2.0
10-22-69	7,480	4,740	--	.4	3.5	2.1	3.2	3.4	4.2
11-19-69	10,300	6,380	--	.8	3.3	2.6	2.2	2.2	12
12-17-69	8,340	5,220	--	2.5	2.5	7.4	.76	6.3	6.3
1-20-70	7,510	4,750	--	2.3	2.0	1.2	.82	1.4	2.0
2-18-70	9,640	6,190	1.3	2.4	--	a5.0	1.3	1.4	2.1
3-17-70	7,000	--	.87	3.7	--	a4.0	.94	1.1	2.1
4-22-70	6,660	4,390	.42	1.3	3.4	2.6	1.6	1.9	3.6
5-19-70	7,140	4,410	.17	.3	1.0	1.7	1.5	2.3	4.3
6-16-70	6,890	4,350	.35	.8	2.0	2.5	.46	.89	1.8

a. Ammonia plus organic nitrogen.

TABLE 16.--*Chemical analyses of water, New River near Imperial, California (station 7)*

Date	Results in milligrams per liter								
	Specific conductance (micromhos at 25°C)	Dissolved solids	Nitrite (NO_2)	Nitrate (NO_3)	Ammonia (NH_4-N)	Organic nitrogen (N)	Ortho-phosphate (PO_4)	Total dissolved phosphate (PO_4)	Total phosphate (PO_4)
8-13-69	6,740	4,220	--	14	0.01	0.78	0.66	1.3	2.0
9-16-69	6,680	4,290	--	3.0	.30	1.9	.28	.58	2.0
10-22-69	6,090	3,840	--	9.5	.96	.94	.86	.86	1.7
11-19-69	8,000	5,090	--	5.8	1.3	1.8	.25	.64	1.7
12-17-69	7,080	4,490	--	18	4.6	2.5	1.3	2.6	3.4
1-20-70	7,600	4,820	--	8.7	1.7	.60	.57	1.3	2.0
2-18-70	8,710	5,610	2.6	8.2	--	a7.0	1.5	1.5	2.2
3-17-70	5,600	--	2.6	13	--	a1.6	1.0	1.1	2.6
4-22-70	5,950	3,880	1.3	7.7	2.2	1.8	1.2	2.7	3.5
5-19-70	6,090	3,930	2.0	2.7	1.6	.50	.79	1.3	5.0
6-15-70	5,950	3,540	.68	7.0	1.8	1.4	.35	.78	1.6

a. Ammonia plus organic nitrogen.

TABLE 17.--*Chemical analyses of water, New River at outlet near Westmorland, California (station 8)*

Date	Results in milligrams per liter								
	Specific conductance (micromhos at 25°C)	Dissolved solids	Nitrite (NO_2)	Nitrate (NO_3)	Ammonia (NH_4-N)	Organic nitrogen (N)	Ortho-phosphate (PO_4)	Total dissolved phosphate (PO_4)	Total phosphate (PO_4)
8-13-69	5,700	3,650	--	11	0.01	0.63	0.49	0.98	2.2
9-16-69	5,940	3,810	--	21	.29	2.1	.37	.77	1.0
10-22-69	4,620	2,940	--	13	.43	.93	.64	.69	1.9
11-19-69	7,520	4,760	--	11	.75	.66	.22	.79	2.2
12-17-69	5,870	3,780	--	22	1.7	2.9	1.8	2.3	3.9
1-19-70	6,020	3,850	--	19	1.0	.50	.63	1.0	2.0
2-17-70	7,090	4,520	0.02	15	.84	.76	.71	.75	.89
3-16-70	6,000	--	1.54	9.0	--	a2.9	1.4	1.6	1.7
4-21-70	5,140	3,380	.90	14	2.1	2.0	.93	2.1	3.5
5-18-70	4,970	3,230	1.8	11	1.0	1.3	.76	1.5	6.1
6-15-70	4,840	3,150	.29	15	1.6	2.4	.74	.80	2.0

a. Ammonia plus organic nitrogen.

TABLE 18.--*Chemical analyses of water, All American Canal near Imperial Dam, Arizona-California (station 9)*

Date	Results in milligrams per liter								
	Specific conductance (micromhos at 25°C)	Dissolved solids	Nitrite (NO_2)	Nitrate (NO_3)	Ammonia (NH_4-N)	Organic nitrogen (N)	Ortho-phosphate (PO_4)	Total dissolved phosphate (PO_4)	Total phosphate (PO_4)
8-12-69	1,320	862	--	1.2	0.01	0.37	0.06	0.06	0.06
9-16-69	1,350	898	--	.5	.00	.74	.02	.02	.30
10-22-69	1,360	896	--	1.2	.03	.31	.00	.04	.17
11-19-69	1,700	1,120	--	1.2	2.6	.00	.05	.08	.19
12-17-69	1,420	944	--	1.9	.14	.24	.04	.08	.20
1-20-70	1,400	938	--	1.8	.00	.27	.04	.04	.09
2-18-70	1,470	1,000	0.10	2.4	.10	.76	.05	.06	.17
3-17-70	1,250	--	.02	2.5	.24	.31	.04	.11	.49
4-22-70	1,320	868	.01	1.9	.27	.14	.07	.08	.34
5-19-70	1,340	902	.02	1.7	.02	.72	.07	.33	.70
6-16-70	1,380	904	.03	1.8	.03	.51	.05	.07	.07

GPO 980-705