

GRASSLAND BYPASS PROJECT

MONTHLY DATA REPORT

June 2003

September, 2003

Preliminary Results

A cooperative effort of:

U.S. Bureau of Reclamation
Central Valley Regional Water Quality Control Board
U.S. Fish and Wildlife Service
California Department of Fish and Game
San Luis & Delta-Mendota Water Authority
U.S. Environmental Protection Agency
U.S. Geological Survey

compiled by San Francisco Estuary Institute





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Table 1. Continuous water monitoring at Station A (inflow to San Luis Drain), June 2003.

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Specific Conductance
DATA SOURCE	SLDMWA	SLDMWA
UNITS	cfs	µS/cm
Jun-01-2003	40	4,410
Jun-02-2003	41	4,530
Jun-03-2003	43	4,480
Jun-04-2003	40	4,380
Jun-05-2003	41	4,490
Jun-06-2003	42	4,400
Jun-07-2003	47	4,190
Jun-08-2003	47	4,070
Jun-09-2003	42	4,510
Jun-10-2003	46	4,510
Jun-11-2003	41	4,430
Jun-12-2003	38	4,500
Jun-13-2003	39	4,510
Jun-14-2003	50	4,460
Jun-15-2003	52	4,340
Jun-16-2003	51	4,330
Jun-17-2003	50	4,190
Jun-18-2003	47	4,130
Jun-19-2003	48	4,160
Jun-20-2003	47	4,270
Jun-21-2003	50	4,180
Jun-22-2003	52	4,220
Jun-23-2003	56	4,400
Jun-24-2003	59	4,430
Jun-25-2003	59	4,370
Jun-26-2003	52	4,230
Jun-27-2003	48	4,240
Jun-28-2003	54	4,300
Jun-29-2003	55	4,420
Jun-30-2003	55	4,430
.	.	.
Mean	48	4,350

Table 2a. Continuous water monitoring at Station B (discharge from San Luis Drain), June 2003.

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	Boron	Specific Conductance	Selenium (total)	Selenium (total) Load
DATA SOURCE	USGS	USGS	CVRWQCB	CVRWQCB	CVRWQCB	Computed
UNITS	cfs	°C	mg/L	µS/cm	µg/L	lbs
Jun-01-2003	43	25.1	7.3	4,130	35.1	8.1
Jun-02-2003	42	25.5	7.3	4,260	37.0	8.4
Jun-03-2003	42	26.3	7.9	4,430	39.0	8.8
Jun-04-2003	43	26.4	7.9	4,550	41.8	9.7
Jun-05-2003	42	26.1	8.1	4,450	41.3	9.4
Jun-06-2003	44	25.4	8.4	4,930	41.8	9.9
Jun-07-2003	45	25.1	8.6	4,850	39.3	9.5
Jun-08-2003	49	24.9	8.4	4,740	35.6	9.4
Jun-09-2003	48	25.1	8.9	4,840	34.4	8.9
Jun-10-2003	43	24.3	8.6	4,720	32.9	7.6
Jun-11-2003	45	23.1	8.0	4,500	31.7	7.7
Jun-12-2003	43	22.4	7.8	4,420	34.6	8.0
Jun-13-2003	40	22.6	8.3	4,560	34.7	7.5
Jun-14-2003	42	22.9	8.6	4,760	40.8	9.2
Jun-15-2003	50	23.5	8.6	4,650	32.7	8.8
Jun-16-2003	52	24.6	8.5	4,720	31.2	8.8
Jun-17-2003	52	25.8	8.0	4,640	39.2	11.0
Jun-18-2003	51	25.8	7.8	4,630	45.2	12.4
Jun-19-2003	47	24.3	7.6	4,530	38.8	9.8
Jun-20-2003	48	22.7	8.8	4,740	50.2	13.0
Jun-21-2003	47	22.5	8.7	4,650	48.1	12.2
Jun-22-2003	49	22.8	8.3	4,590	45.3	12.0
Jun-23-2003	51	23.0	8.3	4,690	55.4	15.2
Jun-24-2003	57	23.0	8.3	4,760	51.7	15.9
Jun-25-2003	58	24.1	8.4	4,710	45.4	14.2
Jun-26-2003	56	25.6	8.0	4,580	49.1	14.8
Jun-27-2003	51	26.9	7.7	4,470	46.6	12.8
Jun-28-2003	48	27.5	7.8	4,430	47.6	12.3
Jun-29-2003	52	27.4	7.8	4,400	48.8	13.7
Jun-30-2003	53	27.0	7.9	4,360	42.4	12.1
Mean	48	24.7	8.2	4,590	41.3	10.7
Total Acre-feet	2,840					
Total (lbs)						321

Load Limitation for June 2003 (lbs)	397
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Table 2b. Continuous water monitoring at San Luis Drain Outlet, June 2003.

Note: This is unofficial data reported for comparison with Station B.

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	San Luis Drain Outlet Flow	Selenium (total) *	Selenium (total) Load
DATA SOURCE	SLDMWA	CVRWQCB	Computed
UNITS	cfs	µg/L	lbs
Jun-01-2003	42	35.1	8.0
Jun-02-2003	42	37.0	8.5
Jun-03-2003	44	39.0	9.2
Jun-04-2003	44	41.8	9.9
Jun-05-2003	43	41.3	9.5
Jun-06-2003	44	41.8	9.9
Jun-07-2003	45	39.3	9.6
Jun-08-2003	51	35.6	9.8
Jun-09-2003	50	34.4	9.2
Jun-10-2003	44	32.9	7.8
Jun-11-2003	46	31.7	7.9
Jun-12-2003	43	34.6	8.1
Jun-13-2003	42	34.7	7.8
Jun-14-2003	44	40.8	9.6
Jun-15-2003	53	32.7	9.4
Jun-16-2003	56	31.2	9.4
Jun-17-2003	55	39.2	11.6
Jun-18-2003	54	45.2	13.2
Jun-19-2003	50	38.8	10.4
Jun-20-2003	51	50.2	13.7
Jun-21-2003	50	48.1	12.9
Jun-22-2003	53	45.3	12.9
Jun-23-2003	55	55.4	16.4
Jun-24-2003	59	51.7	16.5
Jun-25-2003	62	45.4	15.3
Jun-26-2003	61	49.1	16.2
Jun-27-2003	54	46.6	13.6
Jun-28-2003	52	47.6	13.2
Jun-29-2003	55	48.8	14.5
Jun-30-2003	57	42.4	13.0
Mean	50	41.3	11.2
Total Acre-feet	2,980		
Total (lbs)			337

The US Geological Survey determines flow at Station B through continuous measurements of stage that is rated for a known cross-section. These flow data, listed in Table 2a, are verified with frequent current meter measurements.

Monitoring and Reporting Program No. 5-101-234 states:

"Samples representative of the discharge shall be collected from the San Luis Drain at the footbridge between Gun Club Road and the terminus (Site B)."

Accurate flow measurements are necessary to determine compliance with selenium load limits specified in Waste Discharge Requirement Order No. 5-101-234.

The accumulation of sediments, as documented in the 2001 Annual Report, have caused irregularities in flow measurements at Station B, resulting in "shifts" in the relationship between stage and discharge.

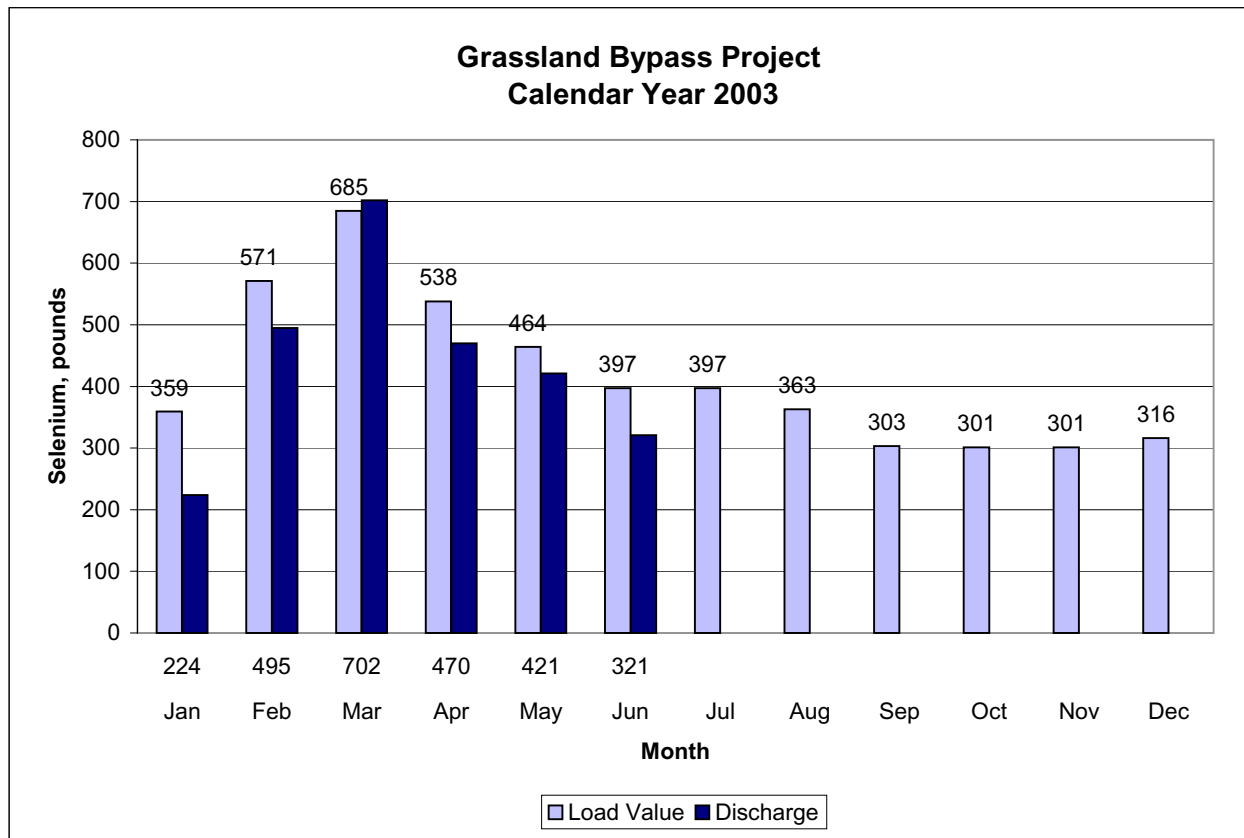
To improve the accuracy of flow measurements, Reclamation and the San Luis & Delta-Mendota Water Authority, with technical assistance from the USGS, propose to measure flow at the San Luis Drain Outlet. The Outlet is located two miles from Station B. Discharge will be measured as stage over a sharp-crested weir, identical to Station A. This is a simpler and more accurate method that will not be altered by sediment accumulation.

This change is subject to approval by the California Regional Water Quality Board and modification of the Waste Discharge Requirement Order and Monitoring and Reporting Program. It is anticipated that as of October 1, 2003, flow will be measured solely at the Outlet works for determination of GBP flow discharge.

Unofficial flow data for the Outlet works are presented in Table 2b for comparison and are not used to determine compliance with the Waste Discharge Requirement Order.

*Selenium (total) concentrations from Site B (San Luis Drain)
 Note: SLD Terminus weir under construction, flows are estimated.

Figure 2c. Monthly selenium discharges from the terminus of the San Luis Drain into Mud Slough compared to load values.



**Table 3. Continuous water monitoring at Station D
(Mud Slough North downstream of drainage discharges), June 2003.**

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	Specific Conductance
DATA SOURCE	usgs	usgs	usgs
UNITS	cfs	°C	µS/cm
Jun-01-2003	74	25.0	2,700
Jun-02-2003	84	25.5	2,590
Jun-03-2003	104	26.6	2,310
Jun-04-2003	107	26.6	2,390
Jun-05-2003	109	26.5	2,380
Jun-06-2003	108	25.8	2,450
Jun-07-2003	98	25.4	2,740
Jun-08-2003	82	25.4	3,140
Jun-09-2003	85	25.3	3,100
Jun-10-2003	81	24.4	2,880
Jun-11-2003	84	23.3	2,790
Jun-12-2003	85	22.9	2,620
Jun-13-2003	69	23.0	2,930
Jun-14-2003	64	23.4	3,310
Jun-15-2003	74	23.9	3,400
Jun-16-2003	88	25.0	3,200
Jun-17-2003	63	26.0	3,960
Jun-18-2003	59	25.9	4,080
Jun-19-2003	58	24.7	3,780
Jun-20-2003	53	23.2	4,080
Jun-21-2003	54	23.0	3,910
Jun-22-2003	62	23.2	3,610
Jun-23-2003	69	23.0	3,500
Jun-24-2003	94	22.6	3,070
Jun-25-2003	90	23.7	3,370
Jun-26-2003	83	25.5	3,390
Jun-27-2003	73	26.7	3,280
Jun-28-2003	76	27.2	3,100
Jun-29-2003	78	27.0	3,130
Jun-30-2003	71	26.7	3,310
.	.	.	.
Mean	79	24.9	3,150

Table 4. Continuous water monitoring at Station F (Salt Slough at Highway 165), June 2003.

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	Specific Conductance
DATA SOURCE	usgs	usgs	usgs
UNITS	cfs	°C	µS/cm
Jun-01-2003	110	24.9	1,220
Jun-02-2003	113	25.6	1,200
Jun-03-2003	120	26.7	1,190
Jun-04-2003	122	26.0	1,150
Jun-05-2003	123	25.6	1,150
Jun-06-2003	112	24.9	1,190
Jun-07-2003	90	24.9	1,340
Jun-08-2003	86	25.3	1,460
Jun-09-2003	102	25.4	1,300
Jun-10-2003	96	23.9	1,250
Jun-11-2003	101	22.2	1,240
Jun-12-2003	107	22.2	1,190
Jun-13-2003	115	22.7	1,120
Jun-14-2003	126	23.3	1,110
Jun-15-2003	126	23.8	1,090
Jun-16-2003	126	25.1	1,100
Jun-17-2003	127	26.3	1,040
Jun-18-2003	108	25.4	1,170
Jun-19-2003	99	23.2	1,220
Jun-20-2003	112	21.7	1,200
Jun-21-2003	133	22.1	1,110
Jun-22-2003	157	22.6	938
Jun-23-2003	171	22.3	960
Jun-24-2003	182	22.0	934
Jun-25-2003	174	23.7	956
Jun-26-2003	151	26.0	1,070
Jun-27-2003	121	27.3	1,110
Jun-28-2003	117 e	NA	NA
Jun-29-2003	125 e	NA	NA
Jun-30-2003	134 e	NA	NA
.	.	.	.
Mean	123	24.3	1,150

Table 5. Continuous water monitoring at Station N (San Joaquin River at Crow's Landing), June 2003.

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	Specific Conductance	Selenium (total)
DATA SOURCE	USGS	USGS	CVRWQCB	CVRWQCB
UNITS	cfs	°C	µS/cm	µg/L
Jun-01-2003	449	24.9	1,650	4.3
Jun-02-2003	532	25.2	1,430	3.1
Jun-03-2003	489	26.6	1,380	2.8
Jun-04-2003	508	26.4	1,380	3.0
Jun-05-2003	519	26.2	1,360	2.9
Jun-06-2003	502	25.8	1,370	3.1
Jun-07-2003	506	25.1	1,380	3.1
Jun-08-2003	499	25.3	1,420	3.6
Jun-09-2003	511	25.5	1,460	3.4
Jun-10-2003	516	25.4	1,470	3.2
Jun-11-2003	459	24.5	1,430	2.9
Jun-12-2003	466	24.0	1,410	2.8
Jun-13-2003	442	23.6	1,490	3.1
Jun-14-2003	438	23.7	1,490	3.0
Jun-15-2003	476	24.0	1,430	2.8
Jun-16-2003	527	25.4	1,430	3.5
Jun-17-2003	517	26.3	1,390	3.3
Jun-18-2003	442	26.0	1,490	3.4
Jun-19-2003	415	25.3	1,560	4.6
Jun-20-2003	404	24.7	1,650	5.4
Jun-21-2003	442	24.4	1,450	4.1
Jun-22-2003	477	24.4	1,420	4.7
Jun-23-2003	530	24.0	1,260	4.0
Jun-24-2003	516	23.6	1,220	4.1
Jun-25-2003	526	24.6	1,270	4.7
Jun-26-2003	508	26.1	1,280	4.7
Jun-27-2003	470	27.3	1,400	4.9
Jun-28-2003	438	27.2	1,440	5.0
Jun-29-2003	438	26.3	1,500	5.2
Jun-30-2003	485	25.6	1,420	4.6
.
Mean	482	25.2	1,420	3.8

Table 6a. Weekly water quality monitoring at Station A (inflow to San Luis Drain), taken from grab samples.

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	.	.	Specific Conductance	Total Suspended Solids	.	.	.
DATA SOURCE	SLDMWA	.	.	CVRWQCB	CVRWQCB	.	.	.
UNITS	cfs	.	.	µS/cm	mg/L	.	.	.
Apr-02-2003	43	.	.	5,770	50	.	.	.
Apr-09-2003	45	.	.	5,160	NA	.	.	.
Apr-16-2003	41	.	.	4,850	86	.	.	.
Apr-23-2003	42	.	.	5,570	110	.	.	.
Apr-30-2003	46	.	.	5,110	NA	.	.	.
May-07-2003	44	.	.	4,680	130	.	.	.
May-14-2003	34	.	.	5,380	NA	.	.	.
May-21-2003	39	.	.	5,270	140	.	.	.
May-28-2003	48	.	.	4,360	130	.	.	.
Jun-04-2003	40	.	.	4,810	110	.	.	.
Jun-11-2003	41	.	.	4,550	90	.	.	.
Jun-18-2003	47	.	.	4,200	140	.	.	.
Jun-25-2003	59	.	.	4,350	100	.	.	.

Table 6b. Weekly water quality monitoring at Station A (inflow to San Luis Drain), taken from composite samples.

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	.	.	Specific Conductance	.	Selenium (total)	.	Boron
DATA SOURCE	SLDMWA	.	.	CVRWQCB	.	CVRWQCB	.	CVRWQCB
UNITS	cfs	.	.	µS/cm	.	µg/L	.	mg/L
Apr-01-2003	36	.	.	5,590	.	62.9	.	9.1
Apr-08-2003	44	.	.	5,400	.	73.6	.	8.7
Apr-15-2003	44	.	.	5,220	.	64.5	.	8.3
Apr-22-2003	44	.	.	5,300	.	74.6	.	8.5
Apr-29-2003	45	.	.	5,230	.	68.1	.	8.8
May-06-2003	48	.	.	4,720	.	54.9	.	8.3
May-13-2003	32	.	.	5,270	.	56.5	.	8.7
May-20-2003	36	.	.	5,200	.	61.9	.	8.8
May-27-2003	46	.	.	4,650	.	50.5	.	7.9
Jun-03-2003	43	.	.	4,480	.	38.8	.	8.2
Jun-10-2003	46	.	.	4,590	.	38.1	.	8.5
Jun-17-2003	50	.	.	4,610	.	41.3	.	8.1
Jun-24-2003	59	.	.	4,540	.	45.5	.	7.6

Table 7. Weekly water quality monitoring at Station B (discharge from San Luis Drain), taken from grab samples.

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	pH	Specific Conductance	Total Suspended Solids	Selenium (total)	Boron
DATA SOURCE	USGS	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	°C	.	µS/cm	mg/L	µg/L	mg/L
Apr-03-2003	45	16.6	8.3	5,430	41	54.2	8.8
Apr-10-2003	47	18.7	8.2	5,190	28	67.0	8.2
Apr-17-2003	43	16.4	8.1	5,250	53	52.6	8.3
Apr-24-2003	40	17.1	8.3	5,130	60	66.9	8.1
May-01-2003	47	18.5	8.1	5,110	53	70.7	8.6
May-08-2003	41	17.5	8.3	4,300	64	46.2	7.1
May-15-2003	32	19.8	8.7	5,190	46	60.9	9.3
May-22-2003	41	22.8	8.2	4,810	37	58.8	8.2
May-29-2003	52	25.3	8.2	4,740	40	45.8	7.7
Jun-05-2003	42	25.1	8.3	4,660	37	39.5	8.1
Jun-12-2003	43	21.5	8.3	4,330	54	38.1	7.8
Jun-19-2003	47	22.7	8.5	4,510	57	38.8	7.9
Jun-26-2003	56	24.2	8.6	4,400	85	45.7	7.6

Table 8. Weekly water quality monitoring at Station C (Mud Slough North upstream of drainage discharges).

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	pH	Specific Conductance	.	Selenium (total)	Boron
DATA SOURCE	calculated **	CVRWQCB	CVRWQCB	CVRWQCB	.	CVRWQCB	CVRWQCB
UNITS	cfs	°C	.	µS/cm	.	µg/L	mg/L
Apr-03-2003	49	17.5	7.7	2,180	.	0.7	2.1
Apr-10-2003	5	19.7	8.2	2,790	.	0.9	2.6
Apr-17-2003	15	16.5	8.0	3,300	.	0.6	2.9
Apr-24-2003	32	16.5	8.4	1,880	.	1.0	1.6
May-01-2003	29	17.4	8.2	2,020	.	1.1	1.9
May-08-2003	33	16.0	7.9	2,820	.	0.5	3.1
May-15-2003	16	18.3	7.9	2,220	.	0.8	1.8
May-22-2003	12	23.9	8.1	2,190	.	0.8	1.9
May-29-2003	20	25.4	7.9	1,650	.	1.2	1.4
Jun-05-2003	65	25.0	8.1	1,130	.	1.2	1.0
Jun-12-2003	40	21.6	8.2	1,210	.	1.3	1.2
Jun-19-2003	11	23.9	8.4	1,650	.	1.1	1.8
Jun-26-2003	27	24.5	8.1	1,210	.	1.0	1.1

** Calculated flow value. Flow at Station C = flow at Station D - flow at Station B.

Table 9. Weekly water quality monitoring at Station D (Mud Slough North downstream of drainage discharges).

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	USGS	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	°C	.	µS/cm	µg/L	mg/L
Apr-03-2003	94	17.2	7.8	3,640	22.4	4.9
Apr-10-2003	52	18.9	8.2	4,510	45.9	6.1
Apr-17-2003	58	16.6	8.2	4,830	38.9	6.8
Apr-24-2003	72	17.7	8.3	3,680	34.0	4.9
May-01-2003	76 e	17.8	8.2	3,930	41.7	5.8
May-08-2003	74 e	17.4	8.1	4,350	35.1	6.6
May-15-2003	48	18.9	8.5	4,430	39.9	7.1
May-22-2003	53	22.9	8.2	4,300	41.6	6.7
May-29-2003	72	25.0	8.1	3,360	24.6	4.8
Jun-05-2003	109	25.0	8.1	2,520	15.4	3.6
Jun-12-2003	85	21.4	8.3	2,730	16.8	4.4
Jun-19-2003	58	23.5	8.5	3,710	26.1	6.1
Jun-26-2003	83	23.8	8.5	3,500	31.4	5.6

Table 10. Weekly water quality monitoring at Station I2 (Mud Slough backwater downstream of Station D).

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER		pH	Specific Conductance	Turbidity	Selenium	Boron
DATA SOURCE		USBR	USBR	USBR	USBR	USBR
UNITS		.	µS/cm	NTU	µg/L	mg/L
Apr-02-2003	.	8.0	3,080	40	15.0	3.6
Apr-08-2003	.	7.8	5,200	26	36.1	5.7
Apr-14-2003	.	7.9	4,050	25	39.6	6.4
Apr-21-2003	.	8.3	4,650	19	44.8	6.1
Apr-28-2003	.	8.5	4,200	21	41.7	5.8
May-06-2003	.	8.3	3,060	46	32.9	4.8
May-14-2003	.	9.4	1,680	24	14.4	6.3
May-22-2003	.	8.6	5,870	15	37.8	6.7
May-27-2003	.	8.7	4,950	13	26.6	5.3
Jun-04-2003	.	8.4	2,711	44	15.6	4.0
Jun-11-2003	.	8.5	3,570	39	16.2	5.3
Jun-17-2003	.	8.5	4,200	31	23.3	7.2
Jun-23-2003	.	9.0	3,000	59	27.2	5.2
Jun-30-2003	.	7.0	4,600	49	33.4	7.5

Table 11. Weekly water quality monitoring at Station F (Salt Slough at Lander Avenue).

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	USGS	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	°C	.	µS/cm	µg/L	mg/L
Apr-03-2003	211	18.7	7.3	1,780	0.7	1.2
Apr-10-2003	156	18.2	7.8	1,840	0.9	1.0
Apr-17-2003	175	16.0	7.7	1,590	0.8	0.7
Apr-24-2003	116	16.5	7.6	1,850	0.4	0.8
May-01-2003	130	17.2	7.7	1,650	<0.4	0.7
May-08-2003	116	15.8	7.7	1,770	0.5	0.9
May-15-2003	101	17.1	7.7	1,820	0.5	0.9
May-22-2003	119	22.6	7.7	1,270	0.7	0.6
May-29-2003	119	24.8	7.6	1,250	0.7	0.6
Jun-05-2003	123	23.4	7.6	1,140	0.7	0.5
Jun-12-2003	107	19.8	8.0	1,240	0.6	0.6
Jun-19-2003	99	21.1	7.7	1,220	0.5	0.5
Jun-26-2003	151	23.8	7.7	1,050	0.6	0.5

Table 12. Weekly water quality monitoring at Station J (Camp 13 Ditch).

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	.	.	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	SLDMWA ^{††}	.	.	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	.	.	µS/cm	µg/L	mg/L
Apr-02-2003	0	.	.	692	<0.4	0.6
Apr-09-2003	0	.	.	740	1.8	0.5
Apr-16-2003	10	.	.	727	1.2	0.4
Apr-23-2003	0	.	.	1,640	1.4	2.3
Apr-30-2003	10	.	.	847	1.8	0.8
May-07-2003	10	.	.	2,910	1.2	4.7
May-14-2003	20	.	.	1,110	1.7	1.3
May-21-2003	10	.	.	1,030	1.6	1.1
May-28-2003	35	.	.	693	1.9	0.6
Jun-04-2003	30	.	.	518	1.2	0.4
Jun-11-2003	10	.	.	821	1.9	0.7
Jun-18-2003	5	.	.	728	1.4	0.9
Jun-25-2003	5	.	.	614	1.1	0.6

Table 13. Weekly water quality monitoring at Station K (Agatha Canal).

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	.	.	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	SLDMWA ^{††}	.	.	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	.	.	µS/cm	µg/L	mg/L
Apr-02-2003	0	.	.	1,220	2.1	1.1
Apr-09-2003	0	.	.	1,790	1.3	2.1
Apr-16-2003	20	.	.	765	1.2	0.6
Apr-23-2003	30	.	.	605	1.4	0.4
Apr-30-2003	30	.	.	594	1.1	0.3
May-07-2003	45	.	.	589	1.2	0.3
May-14-2003	65	.	.	607	1.4	0.3
May-21-2003	80	.	.	590	1.0	0.3
May-28-2003	80	.	.	588	1.0	0.3
Jun-04-2003	80	.	.	452	1.0	0.3
Jun-11-2003	46	.	.	312	0.7	0.2
Jun-18-2003	26	.	.	343	0.8	0.2
Jun-25-2003	26	.	.	310	0.7	0.2

Table 14. Weekly water quality monitoring at Station L2 (San Luis Canal at splits).

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	.	.	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	SLDMWA ^{††}	.	.	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	.	.	µS/cm	µg/L	mg/L
Apr-02-2003	50	.	.	1,100	1.9	1.1
Apr-09-2003	25	.	.	1,260	2.1	1.2
Apr-16-2003	40	.	.	905	1.6	0.6
Apr-23-2003	40	.	.	1,050	2.0	0.8
Apr-30-2003	40	.	.	1,010	1.6	1.0
May-07-2003	40	.	.	575	1.1	0.4
May-14-2003	80	.	.	616	1.5	0.4
May-21-2003	120	.	.	765	1.3	0.4
May-28-2003	150	.	.	616	1.2	0.4
Jun-04-2003	80	.	.	617	1.3	0.4
Jun-11-2003	20	.	.	688	1.4	0.5
Jun-18-2003	30	.	.	1,010	1.5	0.9
Jun-25-2003	60	.	.	527	1.0	0.4

Table 15. Weekly water quality monitoring at Station M2 (Santa Fe Canal at weir).

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	.	.	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	SLDMWA ^{††}	.	.	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	.	.	µS/cm	µg/L	mg/L
Apr-02-2003	66	.	.	2,060	1.8	2.3
Apr-09-2003	40	.	.	2,310	2.4	2.5
Apr-16-2003	30	.	.	2,080	1.5	2.0
Apr-23-2003	14	.	.	2,150	1.5	2.3
Apr-30-2003	40	.	.	1,600	1.5	2.0
May-07-2003	55	.	.	1,620	1.4	2.0
May-14-2003	60	.	.	1,150	1.5	1.3
May-21-2003	71	.	.	1,380	1.7	1.4
May-28-2003	43	.	.	1,140	1.4	1.4
Jun-04-2003	57	.	.	1,060	1.8	1.0
Jun-11-2003	129	.	.	1,160	1.8	1.6
Jun-18-2003	28	.	.	1,640	2.1	2.8
Jun-25-2003	32	.	.	1,150	1.3	1.7

Table 16. Weekly water quality monitoring at Central California Irrigation District Main Canal at Russell Avenue (MER510).

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	.	.	.	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	.	.	.	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	.	.	.	µS/cm	µg/L	mg/L
Apr-02-2003	.	.	.	1,060	2.4	0.7
Apr-09-2003	.	.	.	477	1.7	0.3
Apr-16-2003	.	.	.	1,010	1.6	0.6
Apr-23-2003	.	.	.	625	1.4	0.3
Apr-30-2003	.	.	.	565	1.2	0.3
May-07-2003	.	.	.	568	1.3	0.3
May-14-2003	.	.	.	568	1.1	0.3
May-21-2003	.	.	.	601	1.1	0.3
May-28-2003	.	.	.	570	1.0	0.3
Jun-04-2003	.	.	.	670	1.4	0.4
Jun-11-2003	.	.	.	330	0.8	0.2
Jun-18-2003	.	.	.	298	0.7	0.2
Jun-25-2003	.	.	.	417	0.5	0.3

Table 16a. Weekly water quality monitoring at Central California Irrigation District Main Canal at Russell Avenue (MER510).

Historic Overview.

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	.	.	.	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	.	.	.	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	.	.	.	µS/cm	µg/L	mg/L
Oct-02-2002	.	.	.	695	0.5	0.2
Oct-09-2002	.	.	.	695	0.6	0.2
Oct-16-2002	.	.	.	692	0.7	0.3
Oct-23-2002	.	.	.	647	0.6	0.2
Oct-30-2002	.	.	.	620	0.7	0.2
Nov-06-2002	.	.	.	680	0.8	0.3
Nov-13-2002	.	.	.	658	1.3	0.2
Nov-20-2002	.	.	.	566	0.7	0.2
Nov-26-2002	.	.	.	626	1.0	0.3
Dec-04-2002	.	.	.	607	0.6	0.3
Dec-11-2002	.	.	.	633	0.9	0.3
Dec-18-2002	.	.	.	744	1.1	0.3
Dec-23-2002	.	.	.	815	1.3	0.4
Jan-02-2003	.	.	.	720	1.9	0.4
Jan-08-2003	.	.	.	733	1.4	0.4
Jan-15-2003	.	.	.	675	1.3	0.4
Jan-22-2003	.	.	.	695	1.1	0.4
Jan-29-2003	.	.	.	675	1.5	0.4
Feb-05-2003	.	.	.	660	2.4	0.4
Feb-12-2003	.	.	.	1,060	2.1	0.7
Feb-19-2003	.	.	.	405	1.0	0.2
Feb-26-2003	.	.	.	840	2.1	0.6
Mar-05-2003	.	.	.	520	3.5	0.3
Mar-12-2003	.	.	.	723	1.7	0.4
Mar-19-2003	.	.	.	577	1.7	0.4
Mar-26-2003	.	.	.	589	1.6	0.4
Apr-02-2003	.	.	.	1,060	2.4	0.7
Apr-09-2003	.	.	.	477	1.7	0.3
Apr-16-2003	.	.	.	1,010	1.6	0.6
Apr-23-2003	.	.	.	625	1.4	0.3
Apr-30-2003	.	.	.	565	1.2	0.3
May-07-2003	.	.	.	568	1.3	0.3
May-14-2003	.	.	.	568	1.1	0.3
May-21-2003	.	.	.	601	1.1	0.3
May-28-2003	.	.	.	570	1.0	0.3
Jun-04-2003	.	.	.	670	1.4	0.4
Jun-11-2003	.	.	.	330	0.8	0.2
Jun-18-2003	.	.	.	298	0.7	0.2
Jun-25-2003	.	.	.	417	0.5	0.3

Table 17. Weekly water quality monitoring at Station G (San Joaquin River at Fremont Ford).

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	USGS	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	°C	.	µS/cm	µg/L	mg/L
Apr-03-2003	267	16.0	7.3	2,020	0.7	1.1
Apr-10-2003	220	19.2	7.7	2,170	0.8	0.9
Apr-17-2003	212	16.7	7.5	1,780	0.5	0.8
Apr-24-2003	154	17.3	7.8	2,090	0.4	0.8
May-01-2003	162	17.9	7.6	1,910	<0.4	0.7
May-08-2003	146	16.8	7.2	1,920	0.5	0.9
May-15-2003	121	19.4	7.7	2,460	<0.4	0.9
May-22-2003	151	23.6	7.7	1,520	0.6	0.6
May-29-2003	142	24.9	7.7	1,440	0.7	0.6
Jun-05-2003	139	25.2	7.9	1,440	0.6	0.6
Jun-12-2003	132	20.7	7.6	1,570	0.6	0.6
Jun-19-2003	138	23.5	7.9	1,550	0.6	0.5
Jun-26-2003	181	24.1	7.7	1,060	P	0.4

Table 18. Weekly water quality monitoring at Station H (San Joaquin River at Hills Ferry).

(Collected data intended for use with biological monitoring.)

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	.	.	.	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	.	.	.	SLDMWA	SLDMWA	SLDMWA
UNITS	.	.	.	µS/cm	µg/L	mg/L
Apr-01-2003	.	.	.	2,210	3.5	1.5
Apr-08-2003	.	.	.	2,580	7.6	2.1
Apr-15-2003	.	.	.	2,700	6.1	1.9
Apr-22-2003	.	.	.	2,290	8.3	1.9
Apr-29-2003	.	.	.	2,680	11.3	2.3
May-06-2003	.	.	.	2,000	8.1	1.7
May-13-2003	.	.	.	2,300	5.5	1.8
May-20-2003	.	.	.	2,100	7.4	P
May-28-2003	.	.	.	2,560	10.8	2.3
Jun-03-2003	.	.	.	2,170	5.8	2.0
Jun-10-2003	.	.	.	2,100	5.9	2.1
Jun-17-2003	.	.	.	2,130	5.8	2.2
Jun-24-2003	.	.	.	1,890	7.6	1.9

Table 19. Weekly water quality monitoring at Station N (San Joaquin River at Crow's Landing).

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	USGS	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	°C	.	µS/cm	µg/L	mg/L
Apr-03-2003	817	15.6	7.4	1,730	3.0	1.3
Apr-10-2003	744	19.3	8.0	1,770	4.7	1.2
Apr-17-2003	1,050	16.2	7.8	1,050	2.9	0.7
Apr-24-2003	991	16.7	7.9	1,080	3.5	0.7
May-01-2003	962	17.7	7.9	1,070	2.8	0.8
May-08-2003	1,660	15.9	7.5	580	1.6	0.4
May-15-2003	943	19.3	7.8	1,000	2.0	0.7
May-22-2003	613	23.7	7.9	1,340	3.9	1.0
May-29-2003	556	25.7	7.8	1,350	4.5	1.1
Jun-05-2003	519	25.4	8.0	1,370	3.2	1.0
Jun-12-2003	466	22.6	7.9	1,400	2.7	1.1
Jun-19-2003	415	24.4	8.2	1,540	4.1	1.2
Jun-26-2003	508	24.7	8.0	1,280	4.4	1.2

Table 20. Summary of fathead minnow (*Pimephales promelas*) larvae survival in 7-day tests using water samples collected from July 2002 to June 2003. Each value is the mean of 4 replicates with 10 fish in each replicate.

See Table 27 for explanation of footnotes and agency abbreviations.

LOCATION	Station B	Station C	Station D	Station F	Delta Mendota Canal	Laboratory Control
DATA SOURCE	SLDMWA	SLDMWA	SLDMWA	SLDMWA	SLDMWA	SLDMWA
UNITS	%	%	%	%	%	%
Jul-2002	100	95	98	93	90	100
Aug-2002	85	88	95	90	95	98
Sep-2002	100	98	98	95	95	93
Oct-2002	93	98	100	93	98	100
Nov-2002	98	55*	83	65*	100	100
Dec-2002	100	88	78*	98	98	100
Jan-2003	98	65*	80	95	88	80
Feb-2003	98	78	73	88	98	100
Mar-2003	93	85*	100	95	100	100
Apr-2003	90	100	100	75*	88	100
May-2003	98	100	100	95	100	100
Jun-2003	95	93	98	93	65†	100

Table 21. Summary of fathead minnow (*Pimephales promelas*) larvae growth in 7-day tests using water samples collected from July 2002 to June 2003. Each value is the mean of 4 replicates with 10 fish in each replicate.

See Table 27 for explanation of footnotes and agency abbreviations.

LOCATION	Station B	Station C	Station D	Station F	Delta Mendota Canal	Laboratory Control
DATA SOURCE	SLDMWA	SLDMWA	SLDMWA	SLDMWA	SLDMWA	SLDMWA
UNITS	mg	mg	mg	mg	mg	mg
Jul-2002	0.31	0.33	0.34	0.35	0.31	0.34
Aug-2002	0.49*	0.49	0.49	0.58	0.57	0.55
Sep-2002	0.38	0.38	0.29	0.33	0.31	0.30
Oct-2002	0.66	0.66	0.71	0.62	0.67	0.61
Nov-2002	0.41	0.22*	0.41	0.27*	0.38	0.33
Dec-2002	0.55	0.48*	0.49*	0.60	0.57	0.52
Jan-2003	0.37	0.32	0.33	0.32	0.40	0.35
Feb-2003	0.27	0.24	0.22	0.25	0.26	0.30
Mar-2003	0.33	0.36	0.34	0.28	0.30	0.35
Apr-2003	0.34	0.50	0.47	0.31	0.30	0.24
May-2003	0.37*	0.46*	0.40*	0.46	0.50	0.30
Jun-2003	0.47	0.43	0.40	0.40	0.47	0.37

Table 22. Summary of *Daphnia magna* survival in 7-day tests using water samples collected from July 2002 to June 2003. Each value is the mean of 10 replicates with 1 animal in each replicate.

See Table 27 for explanation of footnotes and agency abbreviations.

LOCATION	Station B	Station C	Station D	Station F	Delta Mendota Canal	Laboratory Control
DATA SOURCE	SLDMWA	SLDMWA	SLDMWA	SLDMWA	SLDMWA	SLDMWA
UNITS	%	%	%	%	%	%
Jul-2002	90	100	100	100	100	100
Aug-2002	100	90	100	60*	100	90
Sep-2002	90	100	90	100	90	90
Oct-2002	100	89	90	100	100	89
Nov-2002	60*†† D	100	100	100	100	100
Dec-2002	100	100	100	90	100	90
Jan-2003	90	90	100	90	100	100
Feb-2003	100	100	100	100	100	100
Mar-2003	100	100	90	90	100	90
Apr-2003	90	100	100	100	80	100
May-2003	100	100	100	80	100	100
Jun-2003	90	100	90	100	80	90

Table 23. Summary of *Daphnia magna* reproduction in 7-day tests using water samples collected from July 2002 to June 2003. Each value is the mean of 10 replicates with 1 animal in each replicate.

See Table 27 for explanation of footnotes and agency abbreviations.

LOCATION	Station B	Station C	Station D	Station F	Delta Mendota Canal	Laboratory Control
DATA SOURCE	SLDMWA	SLDMWA	SLDMWA	SLDMWA	SLDMWA	SLDMWA
UNITS	neonates per female	neonates per female	neonates per female	neonates per female	neonates per female	neonates per female
Jul-2002	28.3	29.7	34.6	29.6	33.1	29.1
Aug-2002	40.8	26.6	34.1	20.4	25.6	22.9
Sep-2002	24.4	28.0	28.7	31.1	23.7	16.6
Oct-2002	70.4	30.2	29.6	27.9	29.9	21.1
Nov-2002	7.9* D	30.3	33.5	29.5	18.4	20.3
Dec-2002	22.8	26.3	36.7	29.9	26.7	21.4
Jan-2003	30.1	37.0	38.8	26.3*	38.6	43.0
Feb-2003	36.1	38.0	32.9	37.0	35.0	28.7
Mar-2003	50.9	43.2	46.6	44.4	44.0	41.5
Apr-2003	38.5	42.0	43.3	34.6	31.1	35.1
May-2003	31.7	29.2	34.6	19.0*	30.4	23.7
Jun-2003	28.5	23.0	24.3	29.7	19.5	27.4

Table 24. Summary of *Selenastrum capricornutum* growth in 4-day tests using water samples collected from July 2002 to June 2003. Each value is the mean of 4 replicates.

See Table 27 for explanation of footnotes and agency abbreviations.

LOCATION	Station B	Station C	Station D	Station F	Delta Mendota Canal	Laboratory Control
DATA SOURCE	SLDMWA	SLDMWA	SLDMWA	SLDMWA	SLDMWA	SLDMWA
UNITS	10 ⁵ cells/mL	10 ⁵ cells/mL	10 ⁵ cells/mL	10 ⁵ cells/mL	10 ⁵ cells/mL	10 ⁵ cells/mL
Jul-2002	6.0	10.2	10.3	10.5	6.8	8.7
Aug-2002	NA	NA	NA	NA	NA	NA
Sep-2002	10.9	8.2	7.4	7.6	11.9	12.0
Oct-2002	8.9	5.9*	6.4*	6.4*	7.8	9.5
Nov-2002	10.8*	15.7	11.9*	10.8*	15.7	14.2
Dec-2002	7.3‡	9.7	10.0	6.8‡	2.4 † † † †	7.7 † † †
Jan-2003	3.9*	11.7	10.2	5.7*	7.7‡	7.7‡
Feb-2003	0.6*	2.0*‡	1.0*‡	1.5*	3.0 † † † †	1.2 † † † †
Mar-2003	12.4*	18.4	14.6	20.3	17.4	22.2
Apr-2003	11.1*	15.4	13.3	8.9*	15.7	27.6
May-2003	8.4*	12.9	10.4	10.9	12.1	13.2
Jun-2003	16.2*	15.8*	13.2*	22.8*	31.6	35.2

Table 25. Summary of selenium concentrations in grab water samples collected at study stations for use in laboratory toxicity tests, April 2003 to June 2003.

See Table 27 for explanation of footnotes and agency abbreviations.

LOCATION	Station B	Station C	Station D	Station F	Delta Mendota Canal
DATA SOURCE #	SLDMWA/USBR	SLDMWA/USBR	SLDMWA/USBR	SLDMWA/USBR	SLDMWA/USBR
UNITS	µg/L	µg/L	µg/L	µg/L	µg/L
Apr-14-2003	75	1.2	35	1.2	<0.4
Apr-16-2003	62	0.8	47	0.6	<0.4
Apr-18-2003	62	0.9	35	0.8	<0.4
May-12-2003	45	1.4	22	0.7	<0.4
May-14-2003	57	1.0	34	1.1	<0.4
May-16-2003	58	1.1	35	0.7	0.5
Jun-23-2003	45	1.2	34	0.6	<0.4
Jun-25-2003	41	1.1	28	0.5	<0.4
Jun-27-2003	44	0.9	31	0.6	<0.4

Table 26. Summary of total suspended solids concentrations in grab water samples collected from April 2003 to June 2003.

See Table 27 for explanation of footnotes and agency abbreviations.

LOCATION	Station B	Station C	Station D	Station F	Delta Mendota Canal
DATA SOURCE	SLDMWA	SLDMWA	SLDMWA	SLDMWA	SLDMWA
UNITS	mg/L	mg/L	mg/L	mg/L	mg/L
Apr-14-2003	60	155	84	110	24
Apr-16-2003	76	145	115	97	9
Apr-18-2003	97	334	112	205	14
May-12-2003	108	61	100	101	31
May-14-2003	52	62	84	71	22
May-16-2003	88	177	162	105	19
Jun-23-2003	54	110	79	152	36
Jun-25-2003	78	146	115	202	49
Jun-27-2003	102	164	159	222	32

Table 27. Explanations of footnotes and agency abbreviations.

Footnote	Explanation
CVRWQCB	California Regional Water Quality Control Board, Central Valley Region
SLDMWA	San Luis & Delta-Mendota Water Authority
USBR	U.S. Bureau of Reclamation
USGS	U.S. Geological Survey
e	Estimated value
.	Not applicable
<	Less than MDL. If needed in calculation, use 1/2 MDL
NA	Not analyzed - operator error, data will not be available in the future
NP	Not Provided. Data may be available in the future.
NT	Not tested
P	Pending, data not available at this time but will be available in the future
*	Significantly reduced from Delta Mendota Canal (p<0.05)
**	Sample re-analyzed and result confirmed.
†	DMC water failed to meet the survival (>80%) acceptability criteria.
††	Data from records of the Grassland Water District. Data is not subjected to the criteria documented in the Compliance Monitoring Program for the Use and Operation of the Grassland Bypass Project (1996) nor the Quality Assurance Project Plan for the GBP.
†††	DMC water failed to meet the reproduction (>10 neonates/adult) acceptability criteria.
††††	DMC water failed to meet minimum growth (10 ⁶ cell/mL) acceptability criteria.
‡	Control value exceeds suggested maximum variance (20%) acceptability criteria.
‡‡	Fungal growth observed on test organisms.
‡‡‡	Failed cell density requirement of 1E6 cells.
#	New testing laboratory with reporting limit of 0.4 µg/L as of June 1998.
√	Based on definitive bioassay, NOEC is 50 percent
D	Sample was dechlorinated