GRASSLAND BYPASS PROJECT

MONTHLY DATA REPORT

July 2009

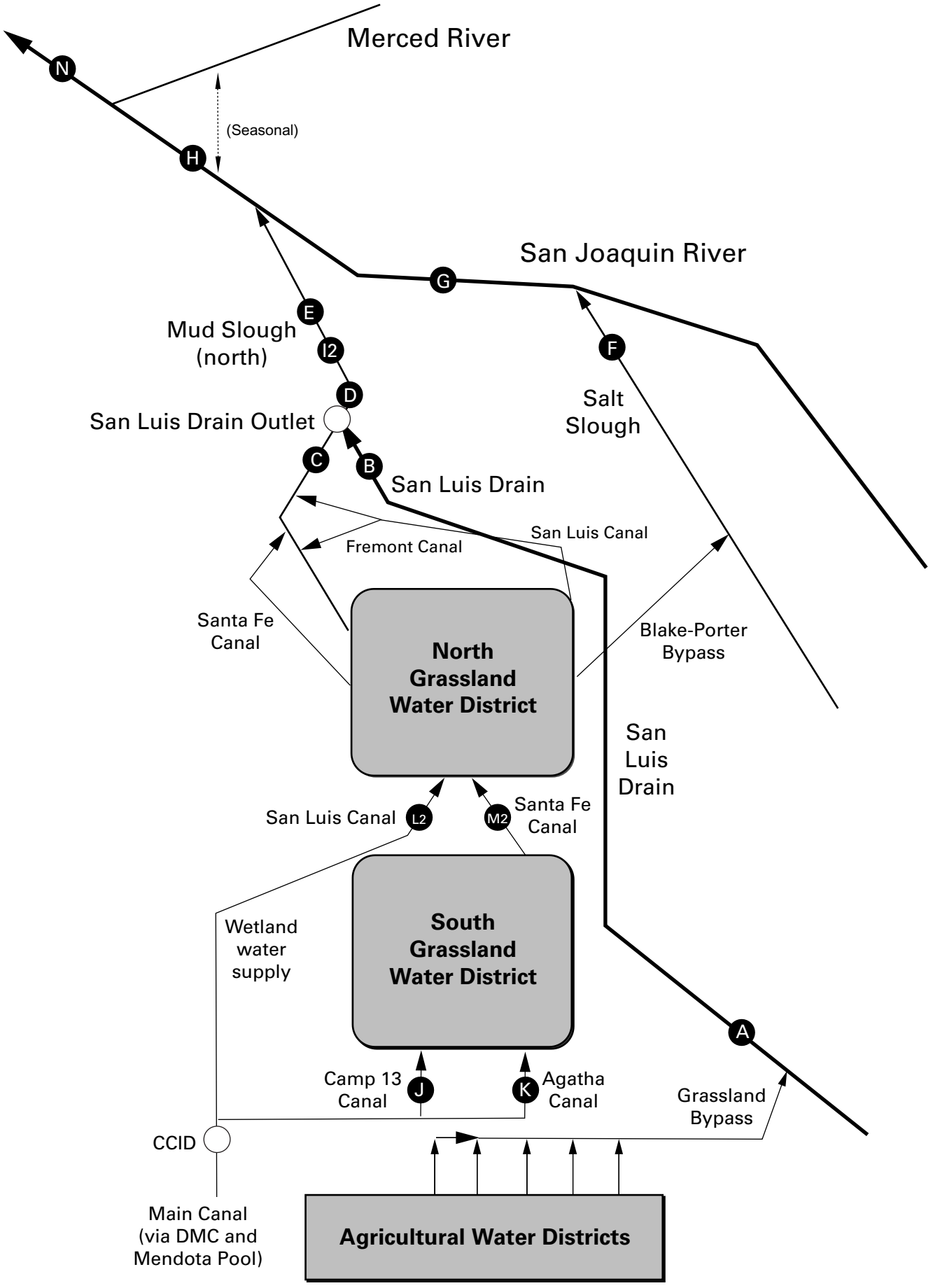
February 2, 2010

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


Merced River
N
(Seasonal)
H
San Joaquin River
G
E
Mud Slough
(north)
I2
F
D
San Luis Drain Outlet
Salt
Slough
C
B
San Luis Drain
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Santa Fe
Canal
North
Grassland
Water District
Blake-Porter
Bypass
San
Luis
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L2
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supply
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Water District
A
Camp 13
Canal
J
K
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Canal
Grassland
Bypass
CCID
Main Canal
(via DMC and
Mendota Pool)
Agricultural Water Districts

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MONTHLY DATA REPORT

LIST OF TABLES FOR MONTHLY REPORT

Table 1. Continuous water monitoring at Station A (inflow to San Luis Drain), July 2009.

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Specific Conductance
DATA SOURCE	SLDMWA	SLDMWA
UNITS	cfs	µS/cm
Jul-01-2009	17	3,220
Jul-02-2009	20	3,330
Jul-03-2009	17	3,840
Jul-04-2009	18	3,990
Jul-05-2009	16	3,490
Jul-06-2009	14	4,190
Jul-07-2009	15	4,610
Jul-08-2009	12	4,340
Jul-09-2009	12	4,230
Jul-10-2009	11	3,820
Jul-11-2009	12	3,600
Jul-12-2009	10	4,500
Jul-13-2009	7	4,520
Jul-14-2009	7	4,540
Jul-15-2009	7	4,520
Jul-16-2009	10	4,300
Jul-17-2009	11	3,860
Jul-18-2009	12	3,390
Jul-19-2009	11	2,740
Jul-20-2009	9	2,890
Jul-21-2009	11	2,350
Jul-22-2009	15	2,640
Jul-23-2009	14	2,700
Jul-24-2009	13	2,380
Jul-25-2009	18	2,990
Jul-26-2009	14	3,470
Jul-27-2009	14	3,300
Jul-28-2009	13	3,070
Jul-29-2009	9	3,550
Jul-30-2009	7	4,260
Jul-31-2009	9	4,260
Mean	12	3,640

Table 2a. Continuous water monitoring at Stations B and B2 (San Luis Drain Terminus), July 2009.

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	San Luis Drain Outlet Flow	Temperature	Boron	Specific Conductance	Selenium (total)	Selenium (total) Load
DATA SOURCE	SLDMWA♦	SLDMWA	CVRWQCB	SLDMWA	CVRWQCB	Computed
UNITS	cfs	°C	mg/L	µS/cm	µg/L	lbs
Jul-01-2009	16	27.2	7.8	4,280	23.3	2.1
Jul-02-2009	15	27.1	7.4	4,360	21.8	1.7
Jul-03-2009	17	26.8	8.1	4,240	36.8	3.5
Jul-04-2009	16	26.7	7.2	4,480	33.3	2.8
Jul-05-2009	16	26.2	6.7	3,840	21.2	1.8
Jul-06-2009	14	25.6	6.9	3,590	20.5	1.5
Jul-07-2009	13	24.9	6.8	3,770	24.0	1.6
Jul-08-2009	12	24.9	6.8	3,540	18.7	1.3
Jul-09-2009	11	25.4	8.0	4,080	22.0	1.3
Jul-10-2009	10	25.1	8.9	4,150	23.8	1.3
Jul-11-2009	10	25.3	9.9	4,810	23.1	1.2
Jul-12-2009	10	25.2	9.9	4,960	25.4	1.4
Jul-13-2009	8	25.0	8.6	4,910	24.8	1.1
Jul-14-2009	7	24.5	8.4	4,560	25.6	0.9
Jul-15-2009	6	26.1	9.5	4,570	27.7	0.9
Jul-16-2009	6	27.1	9.7	4,880	26.9	0.8
Jul-17-2009	7	27.8	10.6	5,170	25.6	0.9
Jul-18-2009	8	27.7	11.0	5,460	27.0	1.1
Jul-19-2009	9	28.0	9.3	5,490	29.7	1.5
Jul-20-2009	8	28.5	8.6	5,270	27.2	1.2
Jul-21-2009	7	28.2	8.0	5,160	21.8	0.9
Jul-22-2009	8	27.8	8.7	4,850	20.6	0.8
Jul-23-2009	11	27.3	10.3	4,910	25.1	1.5
Jul-24-2009	12	27.0	10.7	5,730	29.5	1.9
Jul-25-2009	12	26.6	10.1	5,730	24.2	1.5
Jul-26-2009	15	27.1	8.6	5,140	21.1	1.7
Jul-27-2009	12	27.5	6.1	4,140	19.0	1.3
Jul-28-2009	11	27.7	4.9	3,550	18.2	1.1
Jul-29-2009	10	27.5	5.1	3,200	17.0	1.0
Jul-30-2009	8	27.7	5.2	3,370	18.3	0.8
Jul-31-2009	6	27.3	4.8	3,410	16.7	0.6
Mean	11	26.7	8.3	4,500	23.9	1.4
Total Acre-feet	**650**					
Total (lbs)						**43**

Load Limitation for July 2009 (lbs)	**171**

♦To improve the accuracy of flow measurements, Reclamation and the San Luis & Delta-Mendota Water Authority, with technical assistance from the USGS, are measuring flow at the San Luis Drain Outlet. The Outlet is located two miles from Station B. Discharge is 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. Water quality data are still collected at the old Site B.

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

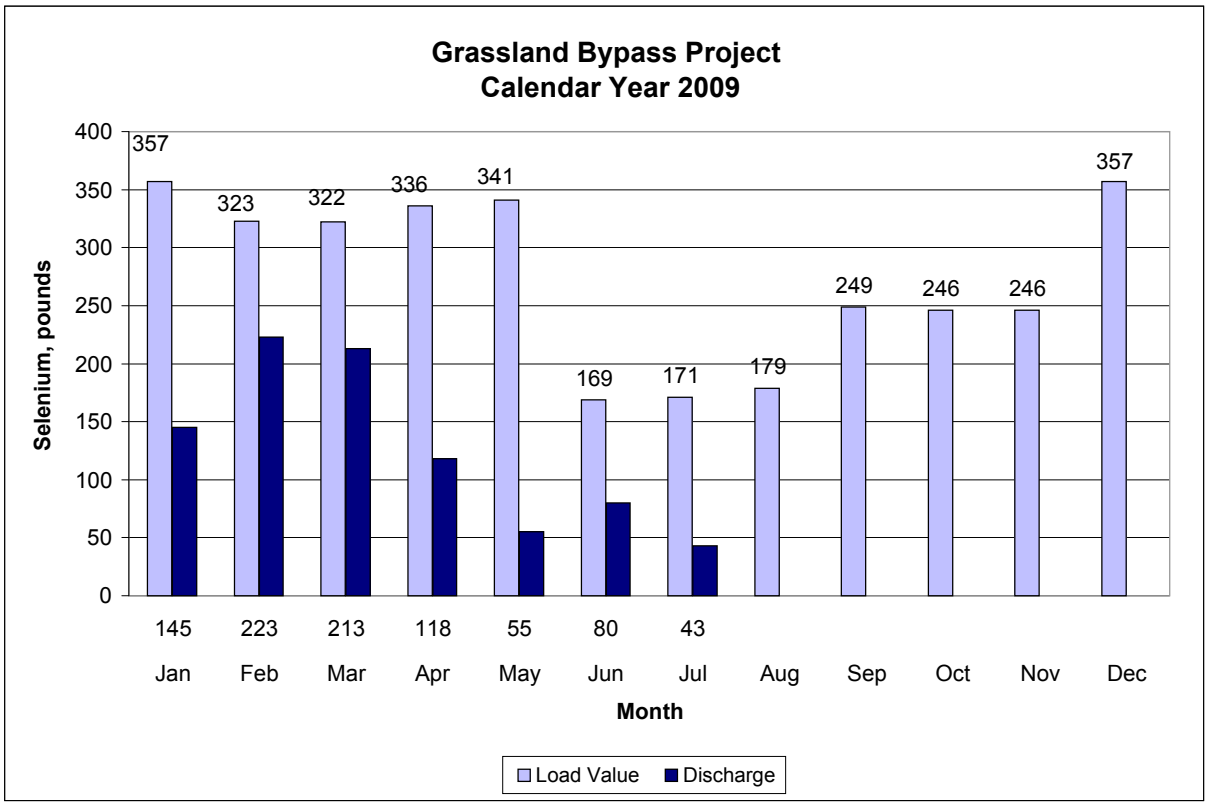

Table 3. Continuous water monitoring at Station D (Mud Slough North downstream of drainage discharges), July 2009.

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
Jul-01-2009	e29	27.1	3,890
Jul-02-2009	e23	27.0	3,920
Jul-03-2009	e19	26.7	3,990
Jul-04-2009	e17	26.9	4,330
Jul-05-2009	e22	26.2	3,230
Jul-06-2009	e25	25.4	3,000
Jul-07-2009	23	25.1	3,190
Jul-08-2009	18	24.8	3,500
Jul-09-2009	15	25.1	4,010
Jul-10-2009	14	24.9	4,240
Jul-11-2009	15	24.9	4,710
Jul-12-2009	16	24.7	4,580
Jul-13-2009	22	24.2	3,620
Jul-14-2009	25	25.4	2,720
Jul-15-2009	21	27.0	2,760
Jul-16-2009	16	27.1	3,070
Jul-17-2009	16	27.3	3,680
Jul-18-2009	17	27.6	3,960
Jul-19-2009	18	28.3	4,300
Jul-20-2009	18	28.4	3,910
Jul-21-2009	12	27.5	4,800
Jul-22-2009	12	27.1	4,720
Jul-23-2009	15	26.9	4,800
Jul-24-2009	16	26.8	5,410
Jul-25-2009	16	26.5	5,320
Jul-26-2009	21	26.7	4,540
Jul-27-2009	17	27.3	3,990
Jul-28-2009	15	27.8	3,590
Jul-29-2009	14	27.5	3,490
Jul-30-2009	12	27.4	3,480
Jul-31-2009	10	27.0	3,470
Mean	17	26.5	3,940

Table 4. Continuous water monitoring at Station F (Salt Slough at Highway 165), July 2009.

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
Jul-01-2009	92	26.5	1,270
Jul-02-2009	102	26.6	1,280
Jul-03-2009	106	26.3	1,280
Jul-04-2009	103	26.1	1,290
Jul-05-2009	110	25.7	1,250
Jul-06-2009	120	24.5	1,170
Jul-07-2009	140	24.1	1,110
Jul-08-2009	157	24.3	1,010
Jul-09-2009	124	24.3	1,090
Jul-10-2009	117	24.2	1,090
Jul-11-2009	131	24.3	1,060
Jul-12-2009	136	24.2	1,070
Jul-13-2009	147	24.0	1,010
Jul-14-2009	151	25.0	1,030
Jul-15-2009	132	26.8	1,120
Jul-16-2009	110	27.2	1,150
Jul-17-2009	103	27.2	1,130
Jul-18-2009	97	27.4	1,180
Jul-19-2009	114	28.1	1,160
Jul-20-2009	128	28.1	1,050
Jul-21-2009	125	27.2	1,010
Jul-22-2009	109	26.6	982
Jul-23-2009	99	26.4	1,010
Jul-24-2009	103	25.9	1,010
Jul-25-2009	98	25.4	1,010
Jul-26-2009	108	25.9	984
Jul-27-2009	119	26.9	970
Jul-28-2009	130	27.3	939
Jul-29-2009	127	27.0	928
Jul-30-2009	123	26.4	949
Jul-31-2009	124	26.2	988
Mean	119	26.0	1,080

Table 5. Continuous water monitoring at Station N (San Joaquin River at Crow's Landing), July 2009.

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
Jul-01-2009	276	27.1	1,320	1.4
Jul-02-2009	274	26.9	1,450	1.5
Jul-03-2009	261	26.7	1,530	1.4
Jul-04-2009	255	26.4	1,470	1.6
Jul-05-2009	282	25.9	1,370	1.9
Jul-06-2009	276	24.9	1,480	2.5
Jul-07-2009	296	24.4	1,270	1.5
Jul-08-2009	296	24.6	1,270	1.3
Jul-09-2009	297	24.7	1,210	1.2
Jul-10-2009	273	24.6	1,250	1.1
Jul-11-2009	253	24.3	1,380	1.1
Jul-12-2009	263	24.2	1,370	1.1
Jul-13-2009	266	24.4	1,280	1.1
Jul-14-2009	273	25.4	1,300	1.2
Jul-15-2009	262	27.2	1,330	1.5
Jul-16-2009	250	27.4	1,320	1.1
Jul-17-2009	209	27.1	1,470	1.3
Jul-18-2009	201	27.2	1,560	1.0
Jul-19-2009	208	27.8	1,560	1.1
Jul-20-2009	214	27.8	1,510	1.4
Jul-21-2009	201	26.9	1,500	1.2
Jul-22-2009	223	26.1	1,400	1.3
Jul-23-2009	223	25.7	1,250	0.9
Jul-24-2009	207	25.4	1,390	1.0
Jul-25-2009	195	25.0	1,480	1.3
Jul-26-2009	201	25.8	1,360	1.2
Jul-27-2009	192	26.7	1,530	1.6
Jul-28-2009	188	27.0	1,530	1.6
Jul-29-2009	193	26.6	NA	NA
Jul-30-2009	208	26.3	NA	NA
Jul-31-2009	198	26.2	1,290	1.0
Mean	239	26.0	1,390	1.3

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	.	.	.
May-06-2009	15	.	.	4,630	11	.	.	.
May-13-2009	9	.	.	5,220	21	.	.	.
May-20-2009	12	.	.	3,270	103	.	.	.
May-27-2009	25			4,960	136	.	.	.
Jun-03-2009	18	.	.	4,180	91	.	.	.
Jun-10-2009	11	.	.	4,610	47	.	.	.
Jun-17-2009	12	.	.	4,540	30	.	.	.
Jun-24-2009	17			4,070	51	.	.	.
Jun-30-2009	19	.	.	3,870	103	.	.	.
Jul-06-2009	14	.	.	4,650	46	.	.	.
Jul-13-2009	7	.	.	5,050	19	.	.	.
Jul-20-2009	9	.	.	3,470	133	.	.	.
Jul-27-2009	14			4,060	150			

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
May-05-2009	17	.	.	3,980	.	27.8	.	6.8
May-12-2009	11	.	.	5,130	.	37.6	.	7.8
May-19-2009	12	.	.	4,790	.	29.6	.	10.0
May-26-2009	15	.	.	4,610	.	20.8	.	7.1
Jun-02-2009	25	.	.	3,740	.	37.8	.	6.5
Jun-09-2009	17	.	.	4,690	.	40.6	.	8.8
Jun-16-2009	13	.	.	4,670	.	29.2	.	7.9
Jun-23-2009	16	.	.	4,080	.	24.9	.	6.4
Jun-30-2009	19	.	.	3,670	.	27.7	.	6.7
Jul-05-2009	16	.	.	4,230	.	26.1	.	7.5
Jul-12-2009	10	.	.	5,170	.	30.6	.	8.8
Jul-19-2009	11	.	.	4,570	.	28.3	.	7.8
Jul-26-2009	14	.	.	3,260	.	21.2	.	4.7

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
May-07-2009	12	21.4	7.7	3,640	49	21.6	6.5
May-14-2009	7	19.8	8.4	4,250	43	30.4	7.1
May-21-2009	10	23.9	8.2	5,280	35	42.2	9.4
May-28-2009	22	25.4	7.8	4,600	18	15.3	8.4
Jun-04-2009	16	21.9	8.3	4,170	86	46.0	6.6
Jun-11-2009	11	22.6	7.7	4,580	52	38.2	8.2
Jun-18-2009	10	23.6	7.4	4,860	37	34.4	7.7
Jun-25-2009	14	26.7	8.8	4,810	35	28.2	8.4
Jul-01-2009	16	26.4	8.0	4,080	69	22.1	6.5
Jul-07-2009	13	24.3	9.0	3,810	71	25.0	6.2
Jul-14-2009	7	23.5	8.4	4,430	39	26.0	7.6
Jul-21-2009	7	26.5	8.3	4,560	34	21.5	8.1
Jul-28-2009	11	26.4	7.3	3,230	40	19.8	5.2

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
May-07-2009	13	18.7	8.1	3,200	.	NA	2.7
May-14-2009	20	19.0	8.1	2,310	.	0.5	1.9
May-21-2009	18	21.4	8.0	1,780	.	0.5	1.8
May-28-2009	22	24.5	8.1	1,470	.	NA	1.1
Jun-04-2009	22	21.2	8.1	1,910	.	0.8	1.5
Jun-11-2009	14	22.3	7.9	1,120	.	0.7	1.8
Jun-18-2009	8	22.2	8.0	2,550	.	0.5	1.8
Jun-25-2009	13	24.8	8.0	1,100	.	0.6	1.6
Jul-01-2009	13	23.5	8.3	2,410	.	0.6	2.0
Jul-07-2009	10	24.0	8.3	1,970	.	0.5	1.9
Jul-14-2009	18	23.7	8.2	1,740	.	0.5	1.7
Jul-21-2009	5	23.3	8.3	2,450	.	0.5	2.2
Jul-28-2009	4	22.1	7.4	3,540	.	0.4	3.0

++ 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
May-07-2009	25	19.8	8.0	4,100	14.0	5.4
May-14-2009	27 e	18.7	8.1	3,350	10.2	4.4
May-21-2009	28	21.8	7.9	3,440	15.4	4.2
May-28-2009	44	24.4	8.0	3,100	7.6	4.6
Jun-04-2009	38	21.4	8.1	2,890	19.7	3.8
Jun-11-2009	25	22.2	7.7	3,510	18.1	5.1
Jun-18-2009	18	22.4	7.9	4,140	18.2	5.4
Jun-25-2009	27	24.0	8.0	3,440	12.2	4.9
Jul-01-2009	e29	24.9	8.4	3,730	16.9	5.5
Jul-07-2009	23	23.4	8.4	2,990	12.8	4.1
Jul-14-2009	25	23.0	8.2	2,750	7.6	3.5
Jul-21-2009	12	25.8	8.6	4,690	19.0	8.2
Jul-28-2009	15	25.4	7.5	3,550	16.9	5.9

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
May-06-2009	.	8.4	3,860	34	11.9	4.7
May-12-2009	.	8.1	3,110	NA	6.8	3.3
May-19-2009	.	8.7	2,800	38	8.0	2.9
May-29-2009	.	8.4	3,380	37	6.8	4.7
Jun-03-2009	.	8.4	3,390	45	23.8	4.6
Jun-09-2009	.	8.8	4,200	35	18.8	5.5
Jun-15-2009	.	8.4	3,740	23	14.4	5.1
Jun-23-2009	.	8.4	3,580	29	12.7	5.0
Jun-29-2009	.	9.0	3,130	23	11.6	4.6
Jul-7-2009	.	8.5	3,210	24	10.8	4.1
Jul-15-2009	.	8.7	2,840	28	6.8	3.4
Jul-21-2009	.	8.6	4,860	29	17.5	7.5
Jul-29-2009	.	8.6	3,530	24	14.0	4.6

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
May-07-2009	105	20.2	7.6	1,530	NA	0.7
May-14-2009	56	17.8	7.6	1,660	0.4	0.8
May-21-2009	120	21.2	7.8	1,330	0.6	0.5
May-28-2009	62	23.7	7.4	1,510	NA	0.6
Jun-04-2009	80	20.2	7.6	1,350	<0.4	0.5
Jun-11-2009	105	20.2	7.5	1,340	0.5	0.5
Jun-18-2009	107	21.8	7.9	1,250	0.6	0.5
Jun-25-2009	100	22.8	7.8	1,300	P	0.5
Jul-01-2009	92	23.7	7.2	1,270	<0.4	0.5
Jul-07-2009	140	21.6	7.9	1,110	0.5	0.4
Jul-14-2009	151	22.6	7.5	968	0.8	0.4
Jul-21-2009	125	24.7	7.8	1,020	<0.4	0.4
Jul-28-2009	130	24.9	7.1	899	<0.4	0.4

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
May-06-2009	30	.	.	667	0.9	0.4
May-13-2009	55	.	.	677	0.9	0.4
May-20-2009	55	.	.	549	0.9	0.3
May-27-2009	45	.	.	642	0.6	0.3
Jun-03-2009	25	.	.	691	1.0	0.3
Jun-10-2009	55	.	.	656	1.2	0.4
Jun-17-2009	20	.	.	675	0.9	0.4
Jun-24-2009	20	.	.	656	1.0	0.4
Jun-30-2009	20	.	.	1,040	0.7	0.8
Jul-06-2009	10	.	.	476	0.7	0.3
Jul-13-2009	0	.	.	432	0.9	0.3
Jul-20-2009	0	.	.	930	1.4	0.9
Jul-27-2009	0	.	.	2,770	1.0	4.2

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
May-06-2009	40	.	.	677	1.0	0.4
May-13-2009	60	.	.	652	1.2	0.4
May-20-2009	50	.	.	528	0.7	0.3
May-27-2009	30	.	.	1,150	1.4	1.5
Jun-03-2009	20	.	.	848	2.6	0.6
Jun-10-2009	20	.	.	780	1.8	0.6
Jun-17-2009	30	.	.	699	1.1	0.4
Jun-24-2009	25	.	.	787	1.4	0.5
Jun-30-2009	25	.	.	777	1.6	0.5
Jul-06-2009	15	.	.	716	1.9	0.7
Jul-13-2009	0	.	.	528	1.1	0.4
Jul-20-2009	0	.	.	621	1.1	0.5
Jul-27-2009	0	.	.	1,030	1.9	1.1

Note: The peak in selenium is caused by no flow conditions at this site.

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
May-06-2009	NA	.	.	1,570	1.6	1.5
May-13-2009	NA	.	.	893	1.1	0.7
May-20-2009	NA	.	.	833	1.2	0.6
May-27-2009	NA	.	.	978	1.1	0.6
Jun-03-2009	NA	.	.	985	1.0	0.7
Jun-10-2009	NA	.	.	1,060	1.7	0.8
Jun-17-2009	NA	.	.	2,830	3.6	3.1
Jun-24-2009	NA	.	.	1,050	1.0	0.9
Jun-30-2009	NA	.	.	1,330	1.1	1.1
Jul-06-2009	NA	.	.	1,430	1.4	1.4
Jul-13-2009	NA	.	.	1,590	1.7	1.9
Jul-20-2009	NA	.	.	2,240	3.4	2.2
Jul-27-2009	NA	.	.	1,370	1.5	1.3
Jul-27-2009	NA	.	.	1,370	1.5	1.3

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
May-06-2009	NA	.	.	951	0.9	0.7
May-13-2009	NA	.	.	883	1.1	0.7
May-20-2009	NA	.	.	1,080	1.0	1.1
May-27-2009	NA	.	.	838	0.7	0.6
Jun-03-2009	NA	.	.	1,040	1.2	1.1
Jun-10-2009	NA	.	.	992	1.4	1.0
Jun-17-2009	NA	.	.	968	1.5	1.0
Jun-24-2009	NA	.	.	1,040	1.0	0.9
Jun-30-2009	NA	.	.	1,080	1.1	1.5
Jul-06-2009	NA	.	.	1,200	1.3	1.7
Jul-13-2009	NA	.	.	1,010	1.0	1.3
Jul-20-2009	NA	.	.	1,020	0.7	1.1
Jul-27-2009	NA	.	.	884	1.1	1.2

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
May-06-2009	.	.	.	642	0.7	0.3
May-13-2009	.	.	.	656	0.9	0.4
May-20-2009	.	.	.	532	0.7	0.3
May-27-2009	.	.	.	693	0.6	0.3
Jun-03-2009	.	.	.	686	0.6	0.3
Jun-10-2009	.	.	.	672	0.8	0.3
Jun-17-2009	.	.	.	657	0.8	0.3
Jun-24-2009	.	.	.	682	0.5	0.4
Jun-30-2009	.	.	.	634	0.6	0.3
Jul-06-2009	.	.	.	462	0.7	0.3
Jul-13-2009	.	.	.	373	0.6	0.2
Jul-20-2009	.	.	.	454	0.4	0.2
Jul-27-2009	.	.	.	391	0.4	0.2

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
May-07-2009	187	21.1	7.9	1,530	NA	0.5
May-14-2009	85	19.5	7.7	2,440	NA	0.8
May-21-2009	122	22.5	7.1	1,390	0.6	0.5
May-28-2009	92	24.5	7.6	1,840	NA	0.6
Jun-04-2009	92	21.8	7.7	1,740	<0.4	0.5
Jun-11-2009	158	22.5	7.0	1,050	0.4	0.4
Jun-18-2009	132	23.3	7.1	1,510	0.5	0.5
Jun-25-2009	136	24.4	7.1	1,440	<0.4	0.6
Jul-01-2009	111	24.6	6.9	1,460	<0.4	0.5
Jul-07-2009	128	22.7	7.5	1,240	0.5	0.5
Jul-14-2009	152	23.6	7.6	1,020	0.5	0.4
Jul-21-2009	122	25.6	7.4	1,130	<0.4	0.4
Jul-28-2009	116	25.2	7.1	1,110	<0.4	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
May-05-2009	.	.	.	1,890	3.1	1.2
May-12-2009	.	.	.	2,550	1.6	1.3
May-19-2009	.	.	.	957	1.9	0.7
Jun-02-2009	.	.	.	1,120	1.1	1.1
Jun-09-2009	.	.	.	1,800	2.0	0.9
Jun-16-2009	.	.	.	2,020	3.7	1.4
Jun-23-2009	.	.	.	931	0.4	0.1
Jun-30-2009	.	.	.	1,200	0.7	1.7
Jul-07-2009	.	.	.	1,720	1.9	1.1
Jul-14-2009	.	.	.	1,180	1.7	1.5
Jul-21-2009	.	.	.	1,550	2.1	0.8

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
May-07-2009	581	21.3	8.0	1,230	1.2	0.7
May-14-2009	505	19.5	7.9	1,020	0.7	0.5
May-21-2009	364	22.4	7.7	1,340	1.2	0.7
May-28-2009	349	24.5	7.9	1,390	1.2	0.8
Jun-04-2009	371	22.7	8.2	1,400	3.0	1.0
Jun-11-2009	416	22.6	7.7	1,070	1.5	0.7
Jun-18-2009	339	23.5	7.6	1,250	1.4	0.7
Jun-25-2009	337	25.3	8.2	1,240	1.2	0.7
Jul-01-2009	276	25.0	7.9	1,370	1.4	0.8
Jul-07-2009	296	22.5	8.0	1,290	1.5	0.7
Jul-14-2009	273	22.9	7.7	1,310	1.3	0.8
Jul-21-2009	201	24.6	7.8	1,550	1.2	0.9
Jul-28-2009	188	24.7	7.4	1,590	1.6	1.1

Table 20. Summary of fathead minnow (*Pimephales promelas*) larvae survival in 7-day tests using water samples collected from August 2008 to July 2009. 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	%	%	%	%	%	%
Aug-2008	98	93	95	98	100	100
Sep-2008	90	95	93	98	95	98
Oct-2008	100	98	95	100	93	98
Nov-2008	93	95	98	100	95	98
Dec-2008	100	100	100	95	100	100
Jan-2009	95	95	93	93	93	95
Feb-2009	98	95	100	98	100	95
Mar-2009	98	100	100	100	98	95
Apr-2009	100	93	95	95	73	98
May-2009	98	98	98	100	93	95
Jun-2009	95	95	95	93	93	95
Jul-2009	95	98	93	98	98	100

Table 21. Summary of fathead minnow (*Pimephales promelas*) larvae growth in 7-day tests using water samples collected from August 2008 to July 2009. 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
Aug-2008	0.36	0.33	0.37	0.33	0.34	0.32
Sep-2008	0.30	0.36	0.30	0.33	0.33	0.28
Oct-2008	0.43	0.44	0.38	0.41	0.37	0.38
Nov-2008	0.32*	0.35	0.31	0.32*	0.38	0.35
Dec-2008	0.34	0.35	0.35	0.34	0.34	0.32
Jan-2009	0.35	0.37	0.36	0.33	0.30	0.36
Feb-2009	0.51	0.53	0.49	0.46	0.50	0.35
Mar-2009	0.50	0.50	0.45	0.50	0.44	0.44
Apr-2009	0.33	0.43	0.35	0.40	0.30	0.38
May-2009	0.48	0.41	0.41	0.42	0.42	0.42
Jun-2009	0.42	0.40	0.46	0.44	0.43	0.45
Jul-2009	0.46	0.49	0.50	0.52	0.44	0.47

Table 22. Summary of *Daphnia magna* survival in 7-day tests using water samples collected from August 2008 to July 2009. 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	%	%	%	%	%	%
Aug-2008	100	70	70	100	100	100
Sep-2008	90	90	100	90	100	100
Oct-2008	90	100	90	90	100	100
Nov-2008	100	100	100	100	90	90
Dec-2008	100	100	100	100	100	90
Dec-2009	90	100	100	100	100	100
Feb-2009	100	80	90	70	90	80
Mar-2009	100	100	100	100	90	90
Apr-2009	100	100	80	90	90	100
May-2009	80	100	90	100	100	100
Jun-2009	100	0*	30*	90	100	100
Jul-2009	90	70	100	100	90	90

Table 23. Summary of *Daphnia magna* reproduction in 7-day tests using water samples collected from August 2008 to July 2009. 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
Aug-2008	26.5	15.3*	23.3	30.2	24.1	29.5
Sep-2008	27.3	24.9	36.6	22.3	27.3	23.8
Oct-2008	24.4	28.2	25.6	22.3	24.9	26.3
Nov-2008	57.7	43.0	50.1	41.2	46.6	30.1
Dec-2008	32.6	26.0	26.3	22.6	30.3	21.2
Jan-2009	19.7	22.4	21.0	24.1	19.0	19.3
Feb-2009	24.0	19.1	23.9	19.0	21.9	18.9
Mar-2009	43.9	34.5	41.2	35.6	37.5	27.2
Apr-2009	45.4	52.3	23.1	30.2	30.2	31.6
May-2009	22.1	31.8	36.3	29.3	29.9	23.6
Jun-2009	42.9	4.8*	13.6*	35.9	28.2	28.6
Jul-2009	34.2	21.6	38.5	32.1	26.4	22.4

Table 24. Summary of *Selenastrum capricornutum* growth in 4-day tests using water samples collected from August 2008 to July 2009. 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
Aug-2008	16.8*	23.3	18.2*	19.5	20.9	20.8
Sep-2008	24.7	18.2*	10.0*	17.5*	26.5	17.1
Oct-2008	25.8	33.9	30.6	30.7	24.3	22.5
Nov-2008	15.8*	23.7	25.3	24.0	20.5	21.6
Dec-2008	17.5	23.9	21.0	20.0	20.3	18.4
Jan-2009	2.5*	27.9	20.2	25.1	3.2††††	22.6
Feb-2009	14.4*	36.5	42.9	33.8	34.9	29.4
Mar-2009	12.9*	32.9	31.3	34.0	27.4	29.9
Apr-2009	20.9*	22.2	27.0	24.3	25.0	19.3
May-2009	21.6	33.2	25.2	11.4*	21.4	22.8
Jun-2009	19.8	20.2	24.4	21.7	20.1	17.0
Jul-2009	22.5	28.4	28.2	26.8	22.9	19.7

Table 25. Summary of selenium concentrations in grab water samples collected at study stations for use in laboratory toxicity tests, May 2009 to July 2009.

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
May-04-2009	43	0.5	24	0.5	<0.4
May-06-2009	26	<0.4	14	<0.4	<0.4
May-08-2009	29	0.5	7.1	<0.4	<0.4
Jun-15-2009	34	0.6	25	0.4	<0.4
Jun-17-2009	35	0.5	17	0.4	<0.4
Jun-19-2009	26	0.6	13	<0.4	<0.4
Jul-13-2009	22	<0.4	15	<0.4	<0.4
Jul-15-2009	27	0.4	7.0	<0.4	<0.4
Jul-17-2009	23	0.5	13	<0.4	<0.4

Table 26. Summary of total suspended solids concentrations in grab water samples collected at study stations for use in laboratory toxicity tests, May 2009 to July 2009.

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
May-04-2009	60	108	79	31	11
May-06-2009	55	51	74	68	8
May-08-2009	105	149	89	109	13
Jun-15-2009	21	12	30	62	5
Jun-17-2009	28	10	21	67	4
Jun-19-2009	30	20	38	70	16
Jul-13-2009	33	19	19	51	25
Jul-15-2009	31	19	22	50	24
Jul-17-2009	34	37	39	48	24

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.
L	Result may be biased low. Sample was not preserved in the field
†	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 (10^6cell/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