

# GRASSLAND BYPASS PROJECT

## MONTHLY DATA REPORT

**October 2009**

May 18, 2010

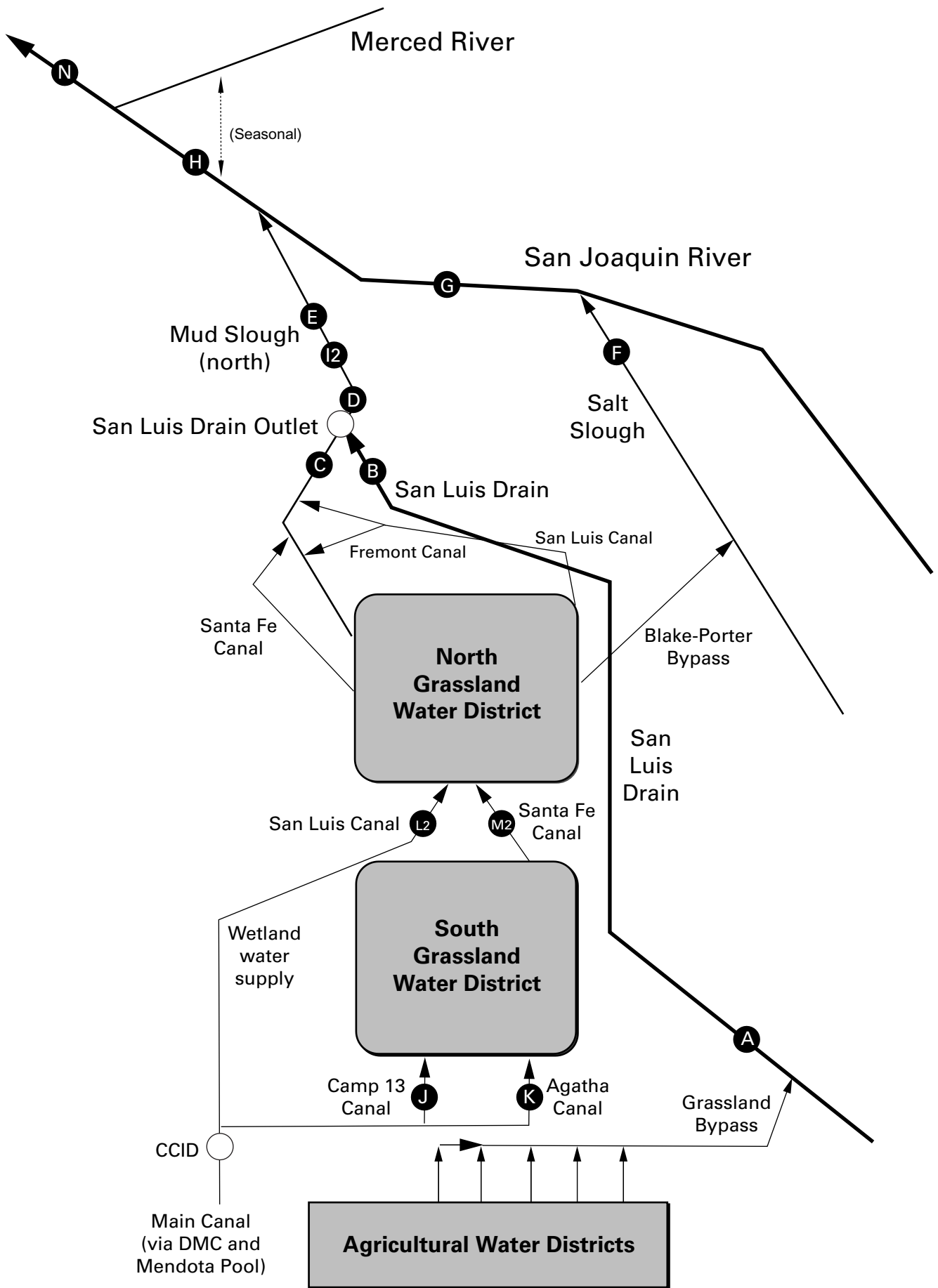
### **Preliminary Results**

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





## GRASSLAND BYPASS PROJECT

## MONTHLY DATA REPORT

---

**LIST OF TABLES FOR MONTHLY REPORT****Continuous Monitoring**

1. Continuous water monitoring at Station A (inflow to San Luis Drain), October 2009.
- 2a. Continuous water monitoring at Stations B and B2 (San Luis Drain Terminus), October 2009.
- 2b. Monthly selenium discharges from the terminus of the San Luis Drain into Mud Slough compared to load values.
3. Continuous water monitoring at Station D (Mud Slough North downstream of drainage discharges), October 2009.
4. Continuous water monitoring at Station F (Salt Slough at Highway 165), October 2009.
5. Continuous water monitoring at Station N (San Joaquin River at Crow's Landing), October 2009.

**Weekly Monitoring**

- 6a. Weekly water quality monitoring at Station A (inflow to San Luis Drain), taken from grab samples.
- 6b. Weekly water quality monitoring at Station A (inflow to San Luis Drain), taken from composite samples.
7. Weekly water quality monitoring at Station B (discharge from San Luis Drain).
8. Weekly water quality monitoring at Station C (Mud Slough North upstream of drainage discharge).
9. Weekly water quality monitoring at Station D (Mud Slough North downstream of drainage discharge).
10. Weekly water quality monitoring at Station I2 (Mud Slough backwater downstream of Station D).
11. Weekly water quality monitoring at Station F (Salt Slough at Lander Avenue).
12. Weekly water quality monitoring at Station J (Camp 13 Ditch).
13. Weekly water quality monitoring at Station K (Agatha Canal).
14. Weekly water quality monitoring at Station L2 (San Luis Canal at splits).
15. Weekly water quality monitoring at Station M2 (Santa Fe Canal at weir).
16. Weekly water quality monitoring at Central California Irrigation District Main Canal at Russell Avenue (MER510).
17. Weekly water quality monitoring at Station G (San Joaquin River at Fremont Ford).
18. Weekly water quality monitoring at Station H (San Joaquin River at Hills Ferry).
19. Weekly water quality monitoring at Station N (San Joaquin River at Crow's Landing).

**Monthly Monitoring**

20. Summary of fathead minnow (*Pimephales promelas*) larvae survival in 7-day tests using water samples collected from November 2008 to October 2009.
21. Summary of fathead minnow (*Pimephales promelas*) larvae growth in 7-day tests using water samples collected from November 2008 to October 2009.
22. Summary of *Daphnia magna* survival in 7-day tests using water samples collected from November 2008 to October 2009.
23. Summary of *Daphnia magna* reproduction in 7-day tests using water samples collected from November 2008 to October 2009.
24. Summary of *Selenastrum capricornutum* growth in 4-day tests using water samples collected from November 2008 to October 2009.
25. Summary of selenium concentrations in grab water samples collected at study stations for use in laboratory toxicity tests, August 2009 to October 2009.
26. Summary of total suspended solids concentrations in grab water samples collected from August 2009 to October 2009.
27. Explanations of footnotes and agency abbreviations.

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

See Table 27 for explanation of footnotes and agency abbreviations.

<b>PARAMETER</b>	<b>Flow</b>	<b>Specific Conductance</b>
<b>DATA SOURCE</b>	<b>SLDMWA</b>	<b>SLDMWA</b>
<b>UNITS</b>	<b>cfs</b>	<b>µS/cm</b>
Oct-01-2009	8	3,810
Oct-02-2009	5	3,950
Oct-03-2009	6	3,850
Oct-04-2009	4	3,890
Oct-05-2009	4	3,860
Oct-06-2009	5	4,000
Oct-07-2009	6	4,010
Oct-08-2009	7	4,000
Oct-09-2009	12	3,300
Oct-10-2009	10	2,440
Oct-11-2009	10	2,560
Oct-12-2009	9	3,210
Oct-13-2009	9	3,030
Oct-14-2009	14	3,600
Oct-15-2009	10	3,860
Oct-16-2009	10	3,780
Oct-17-2009	10	3,930
Oct-18-2009	11	3,790
Oct-19-2009	11	3,740
Oct-20-2009	15	3,670
Oct-21-2009	19	3,870
Oct-22-2009	19	3,620
Oct-23-2009	20	3,580
Oct-24-2009	22	3,500
Oct-25-2009	23	3,580
Oct-26-2009	19	3,920
Oct-27-2009	16	3,910
Oct-28-2009	15	3,960
Oct-29-2009	13	4,050
Oct-30-2009	12	3,860
Oct-31-2009	13	3,830
Mean	12	3,680

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

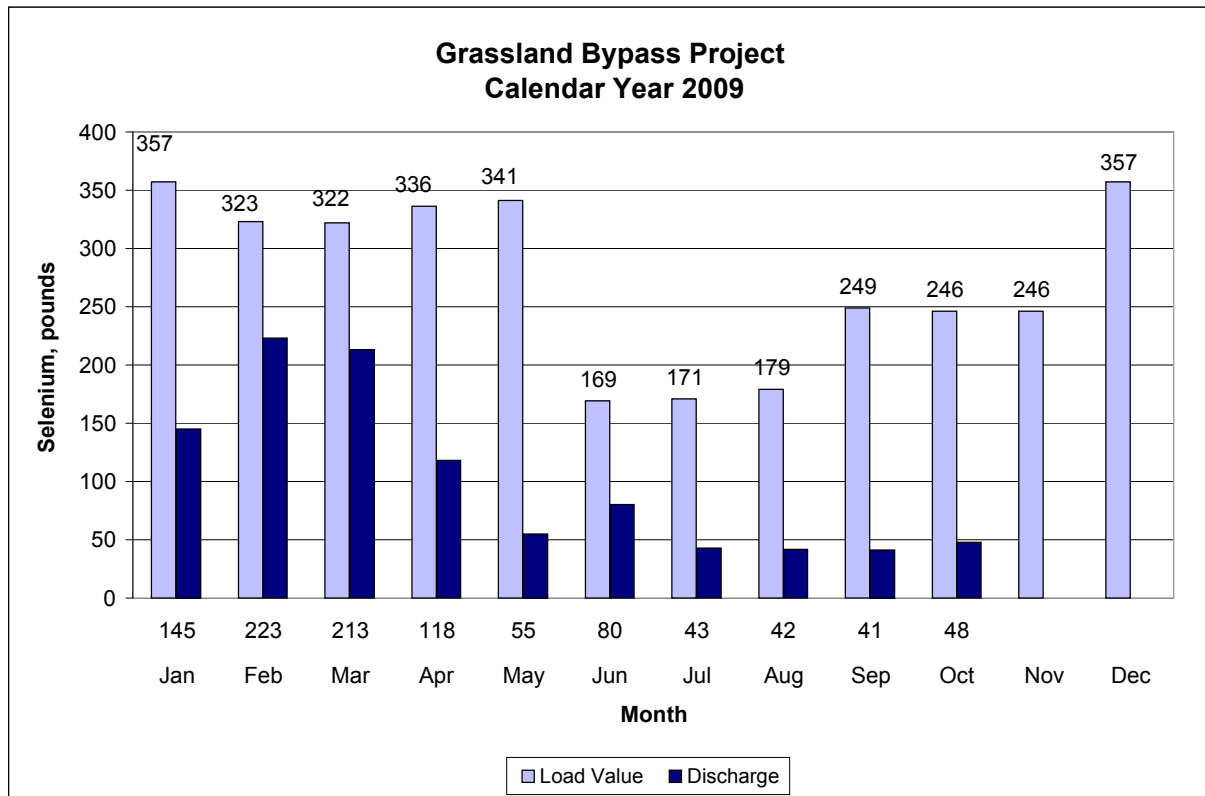
See Table 27 for explanation of footnotes and agency abbreviations.

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
Oct-01-2009	12	18.9	6.9	4,250	16.3	1.0
Oct-02-2009	10	18.6	6.6	3,930	14.5	0.8
Oct-03-2009	9	19.0	6.1	3,820	12.1	0.6
Oct-04-2009	8	18.2	6.6	3,600	10.5	0.4
Oct-05-2009	8	17.9	7.2	3,530	11.9	0.5
Oct-06-2009	7	17.5	6.9	3,740	12.1	0.5
Oct-07-2009	8	17.7	7.0	3,860	12.2	0.5
Oct-08-2009	8	18.2	6.6	3,660	11.8	0.5
Oct-09-2009	9	18.6	6.8	3,630	10.5	0.5
Oct-10-2009	13	18.9	6.8	3,550	11.7	0.8
Oct-11-2009	13	19.3	7.0	3,650	12.8	0.9
Oct-12-2009	13	18.9	7.0	3,840	11.9	0.8
Oct-13-2009	18	17.0	6.6	3,660	10.3	1.0
Oct-14-2009	16	17.2	6.6	3,410	9.4	0.8
Oct-15-2009	17	19.2	7.4	3,640	12.0	1.1
Oct-16-2009	15	21.0	5.6	3,870	11.2	0.9
Oct-17-2009	15	21.5	4.3	3,020	9.2	0.7
Oct-18-2009	15	22.1	4.6	2,810	11.9	0.9
Oct-19-2009	15	21.1	5.0	3,270	13.6	1.1
Oct-20-2009	15	19.9	5.7	3,220	16.5	1.4
Oct-21-2009	19	19.1	6.4	3,810	21.6	2.2
Oct-22-2009	22	19.5	6.7	3,890	16.3	1.9
Oct-23-2009	23	19.8	6.8	3,920	16.0	2.0
Oct-24-2009	24	20.0	6.9	3,890	19.4	2.5
Oct-25-2009	25	19.8	6.9	3,970	26.9	3.7
Oct-26-2009	27	19.5	6.9	4,320	31.6	4.5
Oct-27-2009	19	16.7	6.5	4,140	28.2	2.9
Oct-28-2009	20	12.4	6.8	4,200	34.4	3.6
Oct-29-2009	21	11.5	6.6	4,150	31.2	3.6
Oct-30-2009	18	12.3	6.7	4,200	31.4	3.1
Oct-31-2009	17	13.2	6.6	4,270	30.5	2.7
<b>Mean</b>	<b>15</b>	<b>18.2</b>	<b>6.5</b>	<b>3,770</b>	<b>17.1</b>	<b>1.6</b>
<b>Total Acre-feet</b>	<b>940</b>					
<b>Total (lbs)</b>						<b>48</b>

<b>Load Limitation for October 2009 (lbs)</b>	<b>246</b>
---	------------

◆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), October 2009.**

See Table 27 for explanation of footnotes and agency abbreviations.

<b>PARAMETER</b>	<b>Flow</b>	<b>Temperature</b>	<b>Specific Conductance</b>
<b>DATA SOURCE</b>	<b>usgs</b>	<b>usgs</b>	<b>usgs</b>
<b>UNITS</b>	<b>cfs</b>	<b>°C</b>	<b>µS/cm</b>
Oct-01-2009	44	18.2	2,100
Oct-02-2009	38	18.7	2,070
Oct-03-2009	43	19.1	1,740
Oct-04-2009	52	17.6	1,480
Oct-05-2009	52	16.9	1,530
Oct-06-2009	48	17.0	1,590
Oct-07-2009	49	17.6	1,650
Oct-08-2009	61	18.0	1,480
Oct-09-2009	66	18.3	1,510
Oct-10-2009	86	18.8	1,520
Oct-11-2009	86	18.9	1,560
Oct-12-2009	99	17.9	1,530
Oct-13-2009	167	16.3	1,350
Oct-14-2009	304	17.2	1,080
Oct-15-2009	370	20.1	1,100
Oct-16-2009	334	21.3	1,140
Oct-17-2009	335	21.8	1,110
Oct-18-2009	339	22.2	1,110
Oct-19-2009	300	20.3	1,210
Oct-20-2009	235	18.6	1,300
Oct-21-2009	214	18.5	1,360
Oct-22-2009	199	18.9	1,530
Oct-23-2009	181	19.3	1,660
Oct-24-2009	170	19.6	1,740
Oct-25-2009	352	19.2	1,350
Oct-26-2009	257	19.0	1,810
Oct-27-2009	156	16.3	1,880
Oct-28-2009	157	11.8	1,720
Oct-29-2009	155	11.3	1,810
Oct-30-2009	115	12.7	2,010
Oct-31-2009	102	14.2	2,100
Mean	167	17.9	1,550

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

See Table 27 for explanation of footnotes and agency abbreviations.

<b>PARAMETER</b>	<b>Flow</b>	<b>Temperature</b>	<b>Specific Conductance</b>
<b>DATA SOURCE</b>	<b>usgs</b>	<b>usgs</b>	<b>usgs</b>
<b>UNITS</b>	<b>cfs</b>	<b>°C</b>	<b>µS/cm</b>
Oct-01-2009	48	17.5	1,500
Oct-02-2009	55	18.2	1,440
Oct-03-2009	57	18.6	1,390
Oct-04-2009	64	16.8	1,340
Oct-05-2009	68	16.2	1,280
Oct-06-2009	63	16.3	1,290
Oct-07-2009	73	16.9	1,250
Oct-08-2009	71	17.4	1,260
Oct-09-2009	64	17.7	1,300
Oct-10-2009	62	18.1	1,310
Oct-11-2009	67	18.1	1,280
Oct-12-2009	75	17.2	1,260
Oct-13-2009	93	16.0	1,170
Oct-14-2009	138	17.2	1,130
Oct-15-2009	184	19.1	1,030
Oct-16-2009	187	20.2	1,020
Oct-17-2009	168	20.6	1,150
Oct-18-2009	144	20.9	1,280
Oct-19-2009	131	19.3	1,230
Oct-20-2009	134	18.1	1,210
Oct-21-2009	119	17.7	1,230
Oct-22-2009	105	18.0	1,310
Oct-23-2009	92	18.4	1,340
Oct-24-2009	104	18.7	1,310
Oct-25-2009	113	18.4	1,180
Oct-26-2009	123	18.3	1,150
Oct-27-2009	130	16.0	1,120
Oct-28-2009	123	12.4	1,220
Oct-29-2009	115	11.8	1,250
Oct-30-2009	107	12.8	1,320
Oct-31-2009	112	13.7	1,330
Mean	103	17.3	1,250



Table 5. Continuous water monitoring at Station N (San Joaquin River at Crow's Landing), October 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
Oct-01-2009	272	18.2	1,160	0.9
Oct-02-2009	282	18.8	1,240	0.9
Oct-03-2009	290	19.3	1,180	1.0
Oct-04-2009	291	18.1	1,130	0.9
Oct-05-2009	300	17.6	1,140	0.7
Oct-06-2009	310	17.2	1,050	0.6
Oct-07-2009	297	17.7	1,050	0.4
Oct-08-2009	305	17.9	1,130	0.4
Oct-09-2009	321	17.8	1,040	0.6
Oct-10-2009	326	18.0	1,050	0.5
Oct-11-2009	377	18.0	1,000	0.5
Oct-12-2009	395	17.3	990	0.5
Oct-13-2009	431	16.1	1,010	0.5
Oct-14-2009	600	16.5	890	0.6
Oct-15-2009	712	19.3	830	0.7
Oct-16-2009	828	20.3	740	0.7
Oct-17-2009	853	20.7	820	0.6
Oct-18-2009	879	20.9	840	0.5
Oct-19-2009	850	19.9	870	<0.4
Oct-20-2009	844	18.6	920	0.6
Oct-21-2009	787	18.1	920	0.6
Oct-22-2009	737	18.3	970	0.7
Oct-23-2009	749	18.6	1,000	0.9
Oct-24-2009	866	18.7	790	0.6
Oct-25-2009	886	18.0	730	0.6
Oct-26-2009	988	17.7	720	0.6
Oct-27-2009	1,070	16.5	700	0.9
Oct-28-2009	1,020	13.3	700	1.0
Oct-29-2009	987	12.6	630	0.8
Oct-30-2009	992	12.9	630	1.0
Oct-31-2009	950	13.5	640	1.0
Mean	639	17.6	920	0.7

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	.	.	.
Aug-03-2009	17	.	.	4,250	119	.	.	.
Aug-10-2009	14	.	.	4,930	123	.	.	.
Aug-17-2009	9	.	.	4,730	40	.	.	.
Aug-24-2009	22	.	.	3,760	277	.	.	.
Aug-17-2009	9	.	.	4,760	124	.	.	.
Sep-08-2009	16	.	.	4,800	120	.	.	.
Sep-14-2009	11	.	.	4,190	108	.	.	.
Sep-21-2009	12	.	.	4,510	111	.	.	.
Sep-28-2009	10	.	.	3,890	53	.	.	.
Oct-05-2009	4	.	.	4,640	19	.	.	.
Oct-12-2009	9	.	.	4,090	64	.	.	.
Oct-19-2009	11	.	.	4,360	81	.	.	.
Oct-26-2009	19	.	.	4,880	193	.	.	.

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
Aug-02-2009	12	.	.	4,430	.	33.5	.	7.1
Aug-09-2009	12	.	.	5,460	.	40.2	.	8.4
Aug-16-2009	6	.	.	4,730	.	33.8	.	8.5
Aug-23-2009	21	.	.	3,260	.	21.2	.	5.6
Aug-30-2009	9	.	.	4,850	.	32.3	.	6.9
Sep-06-2009	8	.	.	5,820	.	39.3	.	9.1
Sep-13-2009	10	.	.	4,500	.	38.1	.	6.9
Sep-20-2009	14	.	.	4,240	.	30.8	.	7.0
Sep-27-2009	11	.	.	3,700	.	22.0	.	7.3
Oct-04-2009	4	.	.	4,700	.	21.7	.	8.8
Oct-11-2009	10	.	.	4,180	.	21.6	.	8.5
Oct-18-2009	11	.	.	4,360	.	28.9	.	8.2
Oct-25-2009	23	.	.	4,380	.	35.4	.	7.8

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
Aug-04-2009	14	25.4	8.8	3,770	32	18.0	6.4
Aug-11-2009	11	25.4	8.0	4,050	36	32.7	6.2
Aug-18-2009	6	24.5	8.6	5,360	35	36.5	9.5
Aug-25-2009	20	23.5	8.3	3,650	36	19.6	6.7
Sep-01-2009	7	24.1	8.6	3,700	38	17.6	6.3
Sep-08-2009	8	22.9	7.9	4,240	12	14.8	7.3
Sep-15-2009	11	22.4	8.7	5,010	32	25.6	9.6
Sep-22-2009	12	23.8	8.5	3,420	31	19.7	5.4
Sep-29-2009	10	23.2	8.4	3,930	43	16.8	6.7
Oct-06-2009	7	15.9	8.3	3,710	30	12.2	6.5
Oct-13-2009	18	16.7	8.5	3,530	45	10.2	6.8
Oct-20-2009	15	18.6	8.2	3,390	41	16.6	5.5
Oct-27-2009	19	17.2	7.2	3,930	74	27.9	6.4

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
Aug-04-2009	10	25.2	8.6	1,500	.	0.5	1.3
Aug-11-2009	15	24.3	8.0	1,210	.	0.8	1.0
Aug-18-2009	4	23.3	8.1	2,220	.	0.6	1.8
Aug-25-2009	5	19.9	8.2	1,130	.	0.7	0.8
Sep-01-2009	9	26.0	8.4	1,100	.	0.8	0.7
Sep-08-2009	11	22.1	8.0	640	.	1.0	0.4
Sep-15-2009	23	20.5	7.9	860	.	0.4	0.4
Sep-22-2009	13	21.0	7.8	1,280	.	0.4	0.8
Sep-29-2009	41	20.9	7.6	980	.	<0.4	0.6
Oct-06-2009	41	14.5	7.6	1,130	.	<0.4	0.6
Oct-13-2009	149	15.7	7.7	1,010	.	0.7	0.7
Oct-20-2009	220	17.1	7.5	1,040	.	<0.4	0.7
Oct-27-2009	137	15.9	7.2	1,340	.	0.6	0.9

\*\* 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
Aug-04-2009	24	24.5	8.6	3,040	11.2	4.6
Aug-11-2009	26	24.2	8.0	2,430	12.5	3.2
Aug-18-2009	10	24.1	8.5	4,890	24.6	7.9
Aug-25-2009	25	22.2	8.5	3,170	17.8	6.7
Sep-01-2009	16	24.3	8.4	2,100	8.3	2.9
Sep-08-2009	e19	21.9	7.8	2,010	5.4	3.0
Sep-15-2009	34	21.1	8.3	2,670	11.8	4.2
Sep-22-2009	25	22.5	8.0	2,910	13.0	4.2
Sep-29-2009	51	21.3	7.6	1,660	4.6	1.8
Oct-06-2009	48	14.8	7.7	1,550	1.9	1.5
Oct-13-2009	167	16.1	7.7	1,470	2.2	1.6
Oct-20-2009	235	17.5	7.5	1,280	2.0	1.2
Oct-27-2009	156	16.2	7.1	1,750	4.9	1.8

**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
Aug-5-2009	.	8.8	3,090	12	11.8	4.6
Aug-11-2009	.	8.1	2,360	15	12.4	3.4
Aug-18-2009	.	8.6	5,090	37	22.7	8.3
Aug-25-2009	.	8.6	3,730	12	18.2	6.6
Sep-03-2009	.	8.6	2,520	35	7.7	3.5
Sep-10-2009	.	8.7	3,770	29	18.2	6.6
Sep-15-2009	.	8.6	2,790	18	12.4	4.7
Sep-22-2009	.	8.8	2,300	29	13.0	4.4
Sep-29-2009	.	8.2	3,150	26	4.5	1.9
Oct-07-2009	.	7.8	1,742	21	2.1	2.0
Oct-22-2009	.	7.6	1,584	26	2.3	1.9
Oct-27-2009	.	8.3	1,953	42	4.6	2.1

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
Aug-04-2009	122	23.3	7.8	900	0.4	0.3
Aug-11-2009	123	23.7	7.1	950	<0.4	0.3
Aug-18-2009	92	22.6	7.8	820	<0.4	0.4
Aug-25-2009	NA	20.9	7.6	1,100	<0.4	0.4
Sep-01-2009	117	22.3	7.8	970	<0.4	0.3
Sep-08-2009	86	21.8	7.8	940	0.6	0.4
Sep-15-2009	82	20.0	7.7	1,060	<0.4	0.5
Sep-22-2009	61	21.8	7.7	1,200	<0.4	0.5
Sep-29-2009	48	20.1	7.9	860	0.5	0.8
Oct-06-2009	63	13.7	7.9	1,060	<0.4	0.6
Oct-13-2009	93	15.8	7.9	420	0.7	0.6
Oct-20-2009	134	16.9	7.6	1,260	0.4	0.6
Oct-27-2009	130	16.3	7.1	1,190	0.5	0.6

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 <sup>††</sup>	.	.	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	.	.	µS/cm	µg/L	mg/L
Aug-03-2009	10	.	.	2,220	0.8	3.3
Aug-10-2009	30	.	.	500	0.6	0.2
Aug-17-2009	35	.	.	550	0.7	0.2
Aug-24-2009	45	.	.	1,240	0.8	1.6
Aug-31-2009	85	.	.	640	<0.4	0.2
Sep-08-2009	125	.	.	570	0.4	0.2
Sep-14-2009	125	.	.	610	<0.4	0.2
Sep-21-2009	170	.	.	620	0.7	0.2
Sep-28-2009	210	.	.	590	<0.4	0.2
Oct-05-2009	210	.	.	620	0.7	0.2
Oct-12-2009	135	.	.	600	<0.4	0.2
Oct-19-2009	135	.	.	640	<0.4	0.3
Oct-26-2009	85	.	.	530	0.6	0.3

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 <sup>††</sup>	.	.	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	.	.	µS/cm	µg/L	mg/L
Aug-03-2009	0	.	.	2,480	4.8	3.8
Aug-10-2009	0	.	.	4,150	26.4	6.7
Aug-17-2009	0	.	.	1,560	2.7	2.7
Aug-24-2009	0	.	.	1,080	1.5	1.6
Aug-31-2009	80	.	.	970	2.3	0.9
Sep-08-2009	125	.	.	570	0.6	0.2
Sep-14-2009	165	.	.	570	<0.4	0.2
Sep-21-2009	175	.	.	610	0.6	0.2
Sep-28-2009	175	.	.	580	0.5	0.2
Oct-05-2009	175	.	.	590	0.6	0.3
Oct-12-2009	85	.	.	600	0.5	0.2
Oct-19-2009	70	.	.	610	<0.4	0.2
Oct-26-2009	70	.	.	540	0.4	0.3

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 <sup>††</sup>	.	.	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	.	.	µS/cm	µg/L	mg/L
Aug-03-2009	NA	.	.	780	0.6	0.5
Aug-10-2009	NA	.	.	880	1.0	0.6
Aug-17-2009	NA	.	.	900	1.2	0.7
Aug-24-2009	NA	.	.	690	0.6	0.4
Aug-31-2009	NA	.	.	1,440	1.7	1.2
Sep-08-2009	NA	.	.	630	0.7	0.3
Sep-14-2009	NA	.	.	610	0.5	0.2
Sep-21-2009	NA	.	.	780	0.9	0.4
Sep-28-2009	NA	.	.	640	0.5	0.2
Oct-05-2009	NA	.	.	610	0.5	0.3
Oct-12-2009	NA	.	.	610	0.4	0.2
Oct-19-2009	NA	.	.	680	0.5	0.4
Oct-26-2009	NA	.	.	810	0.7	0.6

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 <sup>††</sup>	.	.	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	.	.	µS/cm	µg/L	mg/L
Aug-03-2009	NA	.	.	860	0.6	0.7
Aug-10-2009	NA	.	.	750	0.9	0.8
Aug-17-2009	NA	.	.	770	0.8	0.6
Aug-24-2009	NA	.	.	720	0.5	0.4
Aug-31-2009	NA	.	.	660	<0.4	0.3
Sep-08-2009	NA	.	.	640	0.7	0.3
Sep-14-2009	NA	.	.	670	<0.4	0.3
Sep-21-2009	NA	.	.	670	0.5	0.3
Sep-28-2009	NA	.	.	740	0.6	0.3
Oct-05-2009	NA	.	.	730	0.7	0.4
Oct-12-2009	NA	.	.	730	0.5	0.4
Oct-19-2009	NA	.	.	780	0.5	0.5
Oct-26-2009	NA	.	.	790	0.5	0.6

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
Aug-03-2009	.	.	.	440	0.6	0.2
Aug-10-2009	.	.	.	580	0.5	0.3
Aug-17-2009	.	.	.	550	0.4	0.2
Aug-24-2009	.	.	.	560	0.4	0.2
Aug-31-2009	.	.	.	600	0.4	0.2
Sep-08-2009	.	.	.	550	0.6	0.2
Sep-14-2009	.	.	.	570	0.6	0.2
Sep-21-2009	.	.	.	550	0.5	0.2
Sep-28-2009	.	.	.	580	0.7	0.2
Oct-05-2009	.	.	.	570	0.6	0.2
Oct-12-2009	.	.	.	600	<0.4	0.2
Oct-19-2009	.	.	.	560	0.4	0.2
Oct-26-2009	.	.	.	540	<0.4	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
Aug-04-2009	134	24.7	8.0	920	<0.4	0.3
Aug-11-2009	124	24.6	7.2	1,070	<0.4	0.4
Aug-18-2009	90	24.0	7.8	670	0.4	0.5
Aug-25-2009	108	21.6	7.3	1,270	<0.4	0.5
Sep-01-2009	126	24.4	7.8	1,010	<0.4	0.4
Sep-08-2009	95	20.5	7.9	1,260	0.4	0.4
Sep-15-2009	91	20.6	7.4	890	<0.4	0.5
Sep-22-2009	66	22.3	7.7	1,620	<0.4	0.7
Sep-29-2009	47	20.5	7.7	2,120	<0.4	0.8
Oct-06-2009	71	14.2	7.8	1,410	<0.4	0.6
Oct-13-2009	98	15.6	7.3	1,430	0.5	0.7
Oct-20-2009	178	17.3	7.8	1,300	<0.4	0.6
Oct-27-2009	172	15.8	7.7	1,360	<0.4	0.6

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
Aug-04-2009	.	.	.	1,280	1.0	0.7
Aug-11-2009	.	.	.	2,420	20.3	2.8
Aug-18-2009	.	.	.	1,270	10.5	1.0
Aug-25-2009	.	.	.	1,840	2.7	1.5
Sep-01-2009	.	.	.	1,380	1.7	0.8
Sep-08-2009	.	.	.	1,730	13.6	1.7
Sep-15-2009	.	.	.	2,910	29.0	3.0
Sep-22-2009	.	.	.	1,960	8.3	2.4
Sep-29-2009	.	.	.	1,970	2.6	1.4
Oct-06-2009	.	.	.	1,920	20.6	1.5
Oct-21-2009	.	.	.	2,810	32.2	1.9
Oct-27-2009	.	.	.	1,610	2.6	1.2

Outside of normal range.



**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.

<b>PARAMETER</b>	<b>Flow</b>	<b>Temperature</b>	<b>pH</b>	<b>Specific Conductance</b>	<b>Selenium (total)</b>	<b>Boron</b>
<b>DATA SOURCE</b>	<b>usgs</b>	<b>CVRWQCB</b>	<b>CVRWQCB</b>	<b>CVRWQCB</b>	<b>CVRWQCB</b>	<b>CVRWQCB</b>
<b>UNITS</b>	<b>cfs</b>	<b>°C</b>	<b>.</b>	<b>µS/cm</b>	<b>µg/L</b>	<b>mg/L</b>
Aug-04-2009	232	23.7	7.4	1,180	0.8	0.6
Aug-11-2009	220	24.3	7.6	1,320	1.6	0.8
Aug-18-2009	210	22.9	7.8	1,230	0.8	0.6
Aug-25-2009	240	21.7	7.7	1,330	1.3	0.9
Sep-01-2009	247	23.9	7.8	1,150	0.8	0.5
Sep-08-2009	218	20.6	7.8	1,230	0.8	0.5
Sep-15-2009	280	21.2	7.8	1,070	1.2	0.6
Sep-22-2009	240	22.5	7.8	1,310	1.5	0.8
Sep-29-2009	275	21.1	7.8	1,170	0.6	0.6
Oct-06-2009	310	15.5	7.8	1,040	0.6	0.5
Oct-13-2009	431	16.2	7.7	1,000	0.8	0.6
Oct-20-2009	844	18.0	7.7	910	0.5	0.6
Oct-27-2009	1,070	16.5	7.7	740	1.1	0.5

**Table 20. Summary of fathead minnow (*Pimephales promelas*) larvae survival in 7-day tests using water samples collected from November 2008 to October 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	%	%	%	%	%	%
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
Aug-2010	98	98	88	93	100	100
Sep-2010	100	98	98	100	100	98
Oct-2010	100	100	95	95	95	100

**Table 21. Summary of fathead minnow (*Pimephales promelas*) larvae growth in 7-day tests using water samples collected from November 2008 to October 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
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
Aug-2010	0.42	0.40	0.41	0.38	0.43	0.52
Sep-2010	0.43	0.41	0.42	0.45	0.39	0.43
Oct-2010	0.51	0.52	0.49	0.50	0.41	0.44

**Table 22. Summary of *Daphnia magna* survival in 7-day tests using water samples collected from November 2008 to October 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	%	%	%	%	%	%
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
Aug-2010	100	100	100	100	100	100
Sep-2010	100	100	80	90	100	100
Oct-2010	80	90	100	90	90	100

**Table 23. Summary of *Daphnia magna* reproduction in 7-day tests using water samples collected from November 2008 to October 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
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
Aug-2010	42.6	40.9	38.5	37.8	30.6	24.7
Sep-2010	34.8	43.3	26.8	25.1	28.7	22.7
Oct-2010	36.7	32.8	42.2	33.5	31.1	28.8

**Table 24. Summary of *Selenastrum capricornutum* growth in 4-day tests using water samples collected from November 2008 to October 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 <sup>5</sup> cells/mL	10 <sup>5</sup> cells/mL	10 <sup>5</sup> cells/mL	10 <sup>5</sup> cells/mL	10 <sup>5</sup> cells/mL	10 <sup>5</sup> cells/mL
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
Aug-2010	21.7	26.4	24.6	26.6	22.0	23.0
Sep-2010	31.6	32.6	25.6	28.9	27.6	22.3
Oct-2010	35.3	30.5	32.2	26.8	20.4	19.2

**Table 25. Summary of selenium concentrations in grab water samples collected at study stations for use in laboratory toxicity tests, August 2009 to October 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
Aug-10-2009	31	0.6	13	<0.4	<0.4
Aug-12-2009	27	0.6	15	<0.4	<0.4
Aug-14-2009	27	0.4	14	<0.4	<0.4
Sep-21-2009	24	<0.4	14	<0.4	<0.4
Sep-23-2009	24	<0.4	9.3	<0.4	<0.4
Sep-25-2009	23	<0.4	5.1	<0.4	<0.4
Oct-05-2009	10	<0.4	1.9	<0.4	<0.4
Oct-07-2009	12	<0.4	2.1	<0.4	<0.4
Oct-09-2009	11	<0.4	2.0	<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, August 2009 to October 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
Aug-10-2009	21	12	30	62	5
Aug-12-2009	28	10	21	67	4
Aug-14-2009	30	20	38	70	16
Sep-21-2009	13	62	65	40	17
Sep-23-2009	17	28	38	22	20
Sep-25-2009	42	18	21	23	11
Oct-05-2009	32	82	54	34	8
Oct-07-2009	20	56	48	39	12
Oct-09-2009	31	77	56	30	10

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 <sup>6</sup> 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