

**Grassland Bypass Project
Interim Baseline Monitoring Program**

Monthly Data Report

November 2013

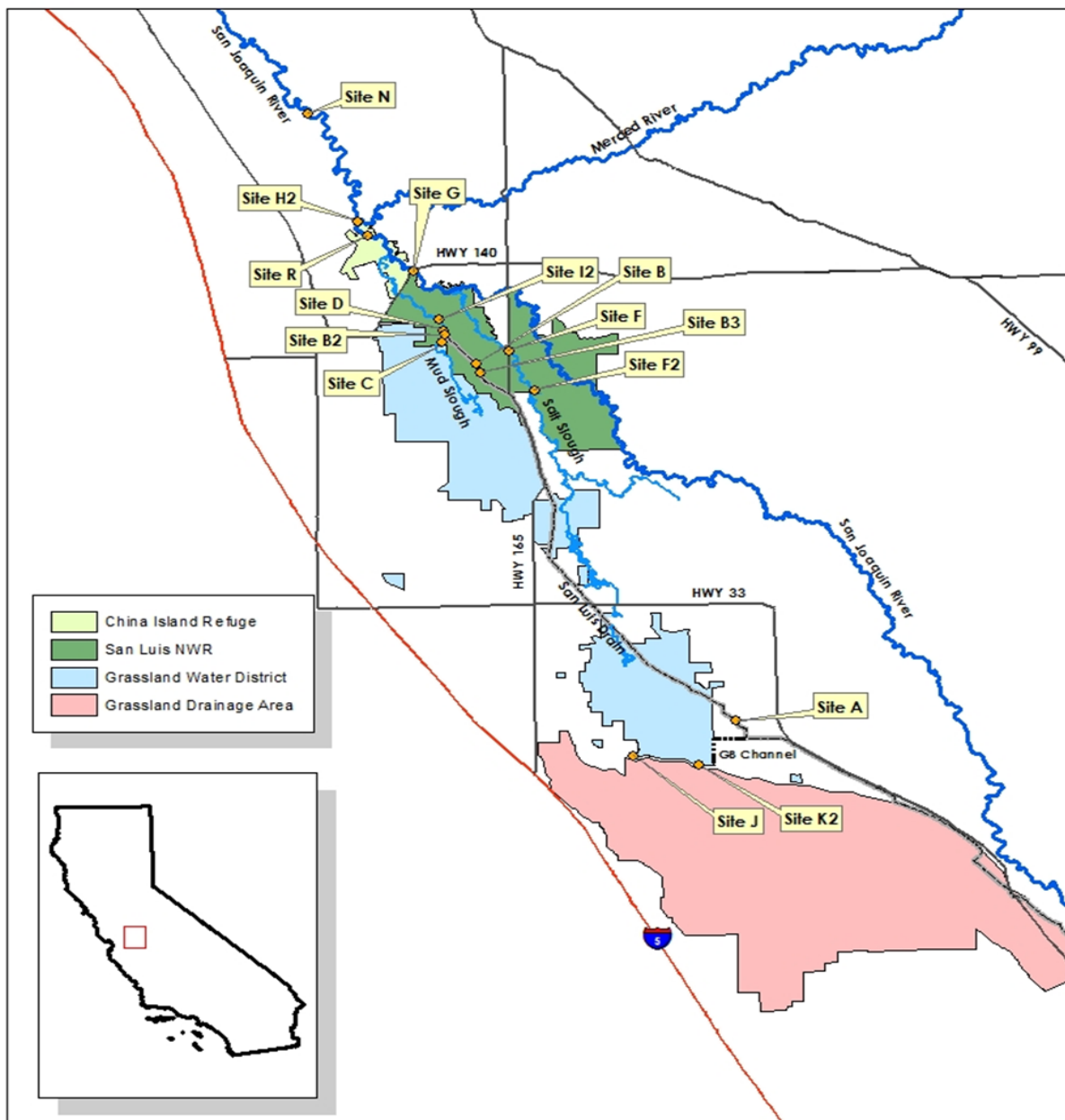


A Cooperative Effort Of:

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

Compiled by San Francisco Estuary Institute

Figure 1. Map of the Grassland Bypass Project area



Grassland Bypass Project

2013 Monitoring Plan Sites

0 2.5 5 10 Miles



Grassland Bypass Project
NAD 1983 California Zone 10
U.S. Bureau of Reclamation

**GRASSLAND BYPASS PROJECT
MONTHLY DATA REPORT**

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Table 1. Water monitoring of inflow to the San Luis Drain (Station A)

PARAMETER	Flow	Temperature	Specific Conductance	Total Dissolved Solids	Salt Load	Total Suspended Solids	Total Selenium
DATA SOURCE	SLDMWA	SLDMWA	SLDMWA	Calculated	Calculated	SLDMWA	SLDMWA/USBR
UNITS	cfs	°C	µS/cm	mg/L	tons	mg/L	ug/L
Nov-01-2013	8	15.3	6,770	5,010	102		8.1
Nov-02-2013	7	15.7	6,070	4,492	91		6.9
Nov-03-2013	8	13.7	5,840	4,322	93		9.3
Nov-04-2013	8	12.3	6,290	4,655	97	89	13
Nov-05-2013	7	12.5	7,130	5,276	94		13
Nov-06-2013	4	13.2	7,680	5,683	62		12
Nov-07-2013	4	13.4	8,460	6,260	64		12
Nov-08-2013	4	13.7	8,210	6,075	63		10
Nov-09-2013	4	13.9	8,420	6,231	73		10
Nov-10-2013	5	14.2	8,810	6,519	85		11
Nov-11-2013	5	14.6	8,410	6,223	81	72	14
Nov-12-2013	5	15.1	8,000	5,920	86		14
Nov-13-2013	5	14.7	8,000	5,920	84		14
Nov-14-2013	6	14.9	8,240	6,098	96		14
Nov-15-2013	7	14.2	8,290	6,135	108		14
Nov-16-2013	6	13.2	7,940	5,876	88		14
Nov-17-2013	5	13.1	7,810	5,779	75		14
Nov-18-2013	5	13.0	7,980	5,905	74	69	15
Nov-19-2013	5	13.7	8,190	6,061	74		17
Nov-20-2013	5	15.4	8,680	6,423	91		18
Nov-21-2013	9	14.2	8,440	6,246	147		19
Nov-22-2013	9	11.9	7,840	5,802	147		14
Nov-23-2013	7	11.4	7,410	5,483	100		15
Nov-24-2013	6	11.6	7,430	5,498	87		15
Nov-25-2013	5	11.6	7,700	5,698	84	NA	NA
Nov-26-2013	5	11.5	8,350	6,179	81		17
Nov-27-2013	6	11.7	8,690	6,431	104		16
Nov-28-2013	5	11.9	8,400	6,216	89		23
Nov-29-2013	5	11.8	8,210	6,075	79		24
Nov-30-2013	5	11.8	8,210	6,075	79		20
Mean	6	13.3	7,860				14
Total acre-feet	343						
Total (tons)					2,678		
Salt Load Objective (tons)					2,265		

Notes:

See Table 19 for explanation of footnotes and agency abbreviations.
Preliminary Results

Table 2a. Water monitoring of San Luis Drain Discharge into Mud Slough (north)
 Station B2 (Terminus at Mud Slough) and Station B3 (Gun Club Road)

PARAMETER	Flow (B2)	Temperature (B2)	Specific Conductance (B2)	Boron (B3)	Total Selenium (B3)	Total Selenium Load
DATA SOURCE	SLDMWA♦	SLDMWA	SLDMWA	USBR	USBR	Computed
UNITS	cfs	°C	µS/cm	mg/L	µg/L	lbs
Nov-01-2013	11	14.9	5,530	14.0	7.3	0.4
Nov-02-2013	13	15.3	5,520	13.0	6.3	0.4
Nov-03-2013	12	14.5	5,210	11.0	6.1	0.4
Nov-04-2013	13	14.8	5,010	12.0	5.1	0.4
Nov-05-2013	15	13.8	5,480	12.0	5.7	0.4
Nov-06-2013	13	13.5	5,720	10.0	4.3 U	0.3
Nov-07-2013	11	14.5	5,050	12.0	3.9	0.2
Nov-08-2013	11	15.1	5,590	14.0	5.3	0.3
Nov-09-2013	11	14.5	5,700	13.0	6.8	0.4
Nov-10-2013	11	14.3	5,490	13.0	6.8	0.4
Nov-11-2013	12	14.2	5,330	11.0	6.6	0.4
Nov-12-2013	12	15.9	4,900	10.0	7.0	0.4
Nov-13-2013	12	15.0	4,630	11.0	6.8	0.4
Nov-14-2013	12	15.6	4,680	10.0	5.6	0.4
Nov-15-2013	12	12.4	4,450	9.7	4.9	0.3
Nov-16-2013	13	12.0	4,640	10.0	5.2	0.4
Nov-17-2013	12	12.1	4,640	10.0	5.6	0.4
Nov-18-2013	12	12.0	5,000	11.0	5.8	0.4
Nov-19-2013	12	14.2	5,040	11.0	5.8	0.4
Nov-20-2013	12	14.9	4,970	11.0	6.0	0.4
Nov-21-2013	11	11.4	4,800	9.8	6.2	0.4
Nov-22-2013	15	8.6	4,720	11.0	6.7	0.6
Nov-23-2013	16	8.5	5,050	11.0	6.5	0.6
Nov-24-2013	14	9.5	4,860	10.0	6.1	0.4
Nov-25-2013	13	10.4	4,860	10.0	6.3	0.4
Nov-26-2013	13	9.7	5,080	10.0	5.8	0.4
Nov-27-2013	12	12.0	4,860	10.0	6.6	0.4
Nov-28-2013	13	11.9	5,020	12.0	7.2	0.5
Nov-29-2013	13	11.8	5,550	11.0	10.0	0.7
Nov-30-2013	12	10.8	5,050	9.6	8.4	0.5
Mean	12	12.9	5,080	11.1	6.3	0.4
Total Acre-feet	737					
Total (lbs)						13
Selenium Load Value (lbs)						55

Notes:

See Table 19 for explanation of footnotes and agency abbreviations.

Preliminary Data

Table 2b. Water quality monitoring at Station B3 (discharge from San Luis Drain)

PARAMETER	Physicals					Total Selenium	Total Suspended Solids (Site B2)
	Dissolved Oxygen	pH	Specific Conductance	Temperature	Turbidity		
DATA SOURCE	USBR	USBR	USBR	USBR	USBR	USBR	USBR
UNITS	mg/L	units	µS/cm	°C	NTU	ug/L	mg/L
Oct-01-2013	NA	NA	NA	NA	NA	NA	NA
Oct-08-2013	NA	NA	NA	NA	NA	NA	42
Oct-15-2013	NA	NA	NA	NA	NA	NA	29
Oct-21-2013	10.3	7.5	5,200	18.2	10.3	9.9	31
Oct-28-2013	11.8	7.7	6,560	15.3	11.8	8.9	45
Nov-04-2013	14.0	8.2	5,880	11.5	14.0	5.5	67
Nov-15-2013	11.3	7.7	4,710	15.7	11.3	4.9	34
Nov-22-2013	12.1	7.9	4,620	11.1	12.1	6.2	34
Nov-25-2013	18.6	8.2	5,000	10.4	18.6	6	NA
Dec-06-2013	16.0	7.9	4,940	7.0	16.0	10	10
Dec-10-2013	16.8	7.9	6,650	5.1	16.8	9.8	NA
Dec-17-2013	21.8	7.9	4,620	7.8	21.8	12.0	NA
Dec-27-2013	13.7	7.6	5,540	8.5	13.7	13.0	NA

Notes:

No samples collected early October due to federal furlough
 TSS samples collected once a month starting in December

	General Minerals							
	Calcium	Magnesium	Potassium	Sodium	Chloride (Dissolved)	Sulfate (Dissolved)	Total Organic Carbon	Total Dissolved Solids
	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
October 2013	NA	NA	NA	NA	NA	NA	NA	NA
Nov-04-2013	340	150	<10	970	900	1,600	11	NA
Dec-10-2013	280	120	5.0	930	960	1,800	9	NA

Notes:

No samples collected in October due to federal furlough

	Nutrients				
	Nitrates as N (Dissolved)	Ammonia as N	Total Kjeldahl Nitrogen	Total Phosphorous as P	Ortho-phosphate as P
	USBR	USBR	USBR	USBR	USBR
	mg/L	mg/L	mg/L	mg/L	mg/L
October 2013	NA	NA	NA	NA	NA
Nov-04-2013	0.2	0.1	<0.20	0.2	<0.010
Dec-10-2013	0.3	0.1	1.4	0.1	<0.010

Notes:

No samples collected in October due to federal furlough

	Total Metals								
	Arsenic	Boron	Cadmium	Copper	Lead	Mercury	Molybdenum	Nickel	Zinc
	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
October 2013	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nov-04-2013	6.4	14000	<1.0	26	<2.5	<100	21.0	11.0	6.2
Dec-1-2013	3.3	12000	<0.2	1.0	<0.2	<200	22.0	3.60	<20

Notes:

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

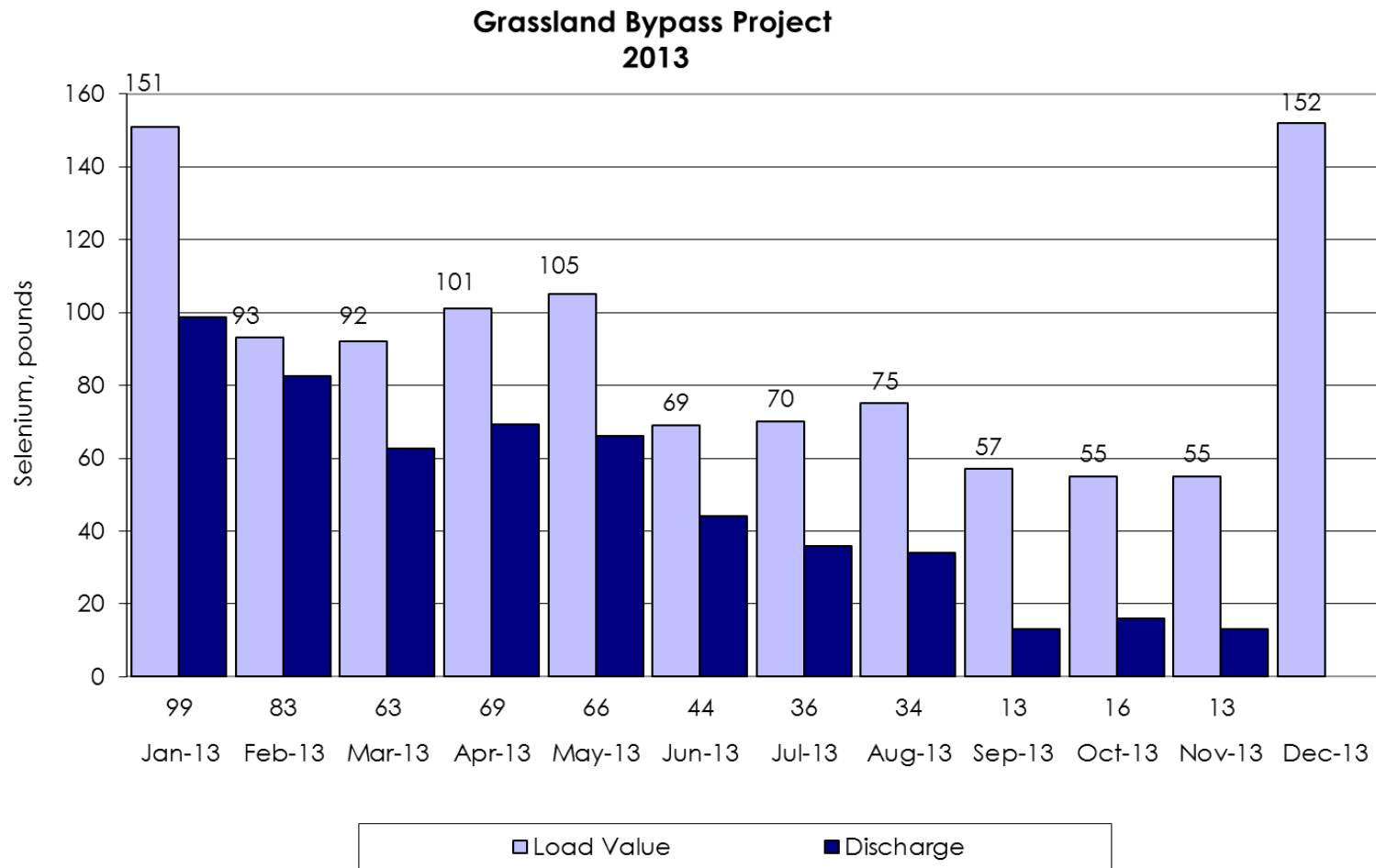


Table 3a. Water monitoring in Mud Slough (north) below San Luis Drain Discharge Station D

PARAMETER	Flow	Temperature	Specific Conductance
DATA SOURCE	USGS	USGS	USGS
UNITS	cfs	°C	µS/cm
Nov-01-2013	88	15.7	1,910
Nov-02-2013	95	15.9	1,990
Nov-03-2013	86	14.4	1,990
Nov-04-2013	83	12.6	2,060
Nov-05-2013	83	12.5	2,210
Nov-06-2013	82	13.2	2,190
Nov-07-2013	77	13.8	2,130
Nov-08-2013	70	14.2	2,280
Nov-09-2013	70	14.6	2,330
Nov-10-2013	75	14.8	2,200
Nov-11-2013	81	14.9	2,160
Nov-12-2013	79	15.3	2,150
Nov-13-2013	76	15.1	2,150
Nov-14-2013	76	15.3	2,150
Nov-15-2013	78	14.7	2,080
Nov-16-2013	80	13.9	2,150
Nov-17-2013	80	13.8	2,090
Nov-18-2013	79	13.7	2,130
Nov-19-2013	80	14.1	2,130
Nov-20-2013	88	15.2	2,100
Nov-21-2013	97	14.1	2,020
Nov-22-2013	107	12.0	2,100
Nov-23-2013	118	11.5	2,120
Nov-24-2013	115	11.4	2,070
Nov-25-2013	113	11.6	2,030
Nov-26-2013	109	11.6	2,090
Nov-27-2013	106	12.2	2,090
Nov-28-2013	102	12.6	2,170
Nov-29-2013	98	12.6	2,260
Nov-30-2013	98	12.5	2,170
Mean	89	13.7	2,120
Total Acre-feet	5,294		

Notes:

See Table 19 for explanation of footnotes and agency abbreviations.

Preliminary Data

Table 3b. Water quality monitoring in Mud Slough (north) below San Luis Drain discharge (Station D)

PARAMETER	Physicals					Total Selenium	Total Molybdenum
	Dissolved Oxygen	pH	Specific Conductance	Temperature	Turbidity		
	USBR	USBR	USBR	USBR	USBR		
DATA SOURCE	USBR	USBR	USBR	USBR	USBR	USBR	USBR
UNITS	mg/L	units	µS/cm	°C	NTU	ug/L	ug/L
Oct-01-2013	NA	NA	NA	NA	NA	NA	NA
Oct-08-2013	NA	NA	NA	NA	NA	NA	NA
Oct-15-2013	NA	NA	NA	NA	NA	NA	NA
Oct-21-2013	6.2	8.0	1,600	17.6	16.8	1.3	NA
Oct-28-2013	8.3	7.9	1,750	15.0	14.8	0.8	NA
Nov-04-2013	10.7	7.9	2,060	12.0	10.4	1.1	NA
Nov-15-2013	8.7	7.8	2,010	13.7	25.4	0.8	NA
Nov-22-2013	9.3	7.4	2,040	11.2	12.3	1.0	NA
Nov-25-2013	9.8	7.9	2,070	11.2	11.5	0.9	NA
Dec-06-2013	14.0	8.0	2,450	6.2	9.5	1.2	NA
Dec-10-2013	12.6	7.8	2,650	5.1	7.4	1.5	NA
Dec-17-2013	12.3	8.0	2,460	7.7	7.0	1.9	NA
Dec-27-2013	11.2	7.8	2,780	8.2	9.2	1.9	NA

Notes:

No samples collected early October due to federal furlough
 Weekly Molybdenum sampling started in February 2014

	General Minerals							
	Calcium	Magnesium	Potassium	Sodium	Chloride (dissolved)	Sulfate (dissolved)	Total Organic Carbon	Total Dissolved Solids
	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
October 2013	NA	NA	NA	NA	NA	NA	NA	NA
Nov-04-2013	85.0	53.0	7.0	290.0	300.0	310.0	16.0	NA
Dec-10-2013	97	62.0	6.1	360.0	380	500.0	12.00	NA

Notes:

No samples collected in October due to federal furlough

	Nutrients				
	Nitrates as N (dissolved)	Ammonia as N	Total Kjeldahl Nitrogen	Total phosphorous as P	Ortho-phosphate as P
	USBR	USBR	USBR	USBR	USBR
	mg/L	mg/L	mg/L	mg/L	mg/L
October 2013	NA	NA	NA	NA	NA
Nov-04-2013	0.2	0.2	1.5	0.2	0.2
Dec-10-2013	0.1	0.2	1.2	0.2	0.1

Notes:

No samples collected in October due to federal furlough

	Total Metals								
	Arsenic	Boron	Cadmium	Copper	Lead	Mercury	Molybdenum	Nickel	Zinc
	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
October 2013	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nov-04-2013	5.7	2500	<1.0	8.3	<2.5	<100	NA	<10	<5.0
Dec-10-2013	3.5	2300.0	<0.2	1.1	<0.1	<200	8.70	3.30	<20

Notes:

No samples collected in October due to federal furlough

Table 4. Water quality monitoring in Mud Slough (north) above the San Luis Drain (Site C)

PARAMETER	Physicals						Total Selenium
	Dissolved Oxygen	pH	Specific Conductance	Turbidity	Temperature	Boron	
DATA SOURCE	Westside San Joaquin River Watershed Coalition	GWD	GWD/Westside San Joaquin River Watershed Coalition	Westside San Joaquin River Watershed Coalition	GWD	GWD	GWD
UNITS	mg/L	units	µS/cm	NTU	°C	mg/L	µg/L
Oct-08-2013	6.2	7.6	1,160	10	18.9	NA	NA
Oct-28-2013	NA	NA	1,310	NA	NA	0.8	<20
Nov-12-2013	6.9	7.6	1,630	11	15.6	NA	NA
Nov-25-2013	NA	NA	1,600	NA	NA	1.0	<20
Dec-10-2013	7.2	7.8	1,800	27	6.1	NA	NA
Dec-20-2013	NA	NA	2,180	NA	NA	1.5	<20

Notes:

Samples collected by GWD and Westside San Joaquin River Watershed Coalition Engineering

Table 5. Water quality monitoring in Mud Slough (north) backwater below San Luis Drain discharge Station I2

PARAMETER	Physicals					Total Selenium
	Dissolved Oxygen	pH	Specific Conductance	Temperature	Turbidity	
DATA SOURCE	USBR	USBR	USBR	USBR	USBR	USBR
UNITS	mg/L	units	µS/cm	°C	NTU	µg/L
Oct-01-2013	NA	NA	NA	NA	NA	NA
Oct-08-2013	NA	NA	NA	NA	NA	NA
Oct-15-2013	NA	NA	NA	NA	NA	NA
Oct-21-2013	NA	NA	NA	NA	NA	NA
Oct-28-2013	7.1	8.0	2,050	14.1	14.3	0.9
Nov-04-2013	10.5	8.2	2,360	12.6	19.0	1.0
Nov-15-2013	8.7	8.0	2,640	12.8	10.0	0.9
Nov-22-2013	10.2	7.9	2,120	10.8	9.5	1.0
Nov-25-2013	9.8	8.0	2,760	11.0	16.7	1.2
Dec-06-2013	13.3	8.2	2,570	6.0	5.3	1.2
Dec-10-2013	10.4	7.8	4,490	4.8	7.4	1.7
Dec-17-2013	11.1	7.8	5,630	8.2	6.0	2.2
Dec-27-2013	8.6	7.3	11,500	7.5	19.8	2.3

Notes:

Samples collected only when site is flooded

**Table 6a. Water monitoring in Salt Slough at Highway 165
Station F**

PARAMETER	Flow	Temperature	Specific Conductance
DATA SOURCE	USGS	USGS	USGS
UNITS	cfs	°C	µS/cm
Nov-01-2013	115	15.0	1,350
Nov-02-2013	114	15.1	1,280
Nov-03-2013	103	13.5	1,270
Nov-04-2013	90	12.5	1,340
Nov-05-2013	87	12.5	1,410
Nov-06-2013	83	13.1	1,410
Nov-07-2013	83	13.6	1,450
Nov-08-2013	81	13.6	1,470
Nov-09-2013	83	14.4	1,500
Nov-10-2013	90	14.3	1,420
Nov-11-2013	106	14.4	1,370
Nov-12-2013	115	14.5	1,270
Nov-13-2013	121	14.5	1,190
Nov-14-2013	129	14.5	1,130
Nov-15-2013	123	13.9	1,200
Nov-16-2013	116	13.2	1,300
Nov-17-2013	115	13.1	1,310
Nov-18-2013	116	13.0	1,310
Nov-19-2013	118	13.6	1,350
Nov-20-2013	126	14.9	1,310
Nov-21-2013	128	13.8	1,340
Nov-22-2013	135	11.9	1,310
Nov-23-2013	131	11.5	1,350
Nov-24-2013	128	11.4	1,360
Nov-25-2013	125	11.5	1,370
Nov-26-2013	123	11.6	1,390
Nov-27-2013	124	11.9	1,390
Nov-28-2013	125	12.4	1,410
Nov-29-2013	121	12.3	1,400
Nov-30-2013	116	12.2	1,440
.	.	.	.
Mean	112	13.3	1,350
Total Acre-feet	6,684		

Notes:

See Table 19 for explanation of footnotes and agency abbreviations.
Preliminary Data

Table 6b. Water quality monitoring in Salt Slough at Highway 165 (Station F)

PARAMETER	Physicals					Total Selenium	Total Molybdenum
	Dissolved Oxygen	pH	Specific Conductance	Temperature	Turbidity		
DATA SOURCE	USBR	USBR	USBR	USBR	USBR	USBR	USBR
UNITS	mg/L	units	µS/cm	°C	NTU	ug/L	ug/L
Oct-01-2013	NA	NA	NA	NA	NA	NA	NA
Oct-08-2013	NA	NA	NA	NA	NA	NA	NA
Oct-15-2013	NA	NA	NA	NA	NA	NA	NA
Oct-21-2013	9.1	6.8	1,160	16.7	75.5	<0.4	NA
Oct-28-2013	10.5	7.5	1,470	13.7	64.3	<0.4	NA
Nov-04-2013	10.4	7.4	1,440	11.9	36.9	<0.4	NA
Nov-15-2013	9.6	6.9	1,240	14.5	49.3	<0.4	NA
Nov-22-2013	11.3	8.0	1,310	11.0	81.3	<0.4	NA
Nov-25-2013	12.7	7.1	1,430	11.0	39.9	<0.4	NA
Dec-06-2013	12.3	7.3	1,520	6.7	25.7	<0.4	NA
Dec-10-2013	NA	NA	NA	NA	NA	NA	NA
Dec-17-2013	12.2	7.0	1610	7.3	35.0	<0.4	NA
Dec-27-2013	11.9	7.5	1570	7.9	39.4	<0.4	NA

Notes:

No samples collected in early October due to federal furlough
 Site F Inaccessible 12/10/2013 (No samples collected)
 Weekly Molybdenum sampling starting in February 2014

	General Minerals						
	Calcium	Magnesium	Potassium	Sodium	Chloride (dissolved)	Sulfate (dissolved)	Total Organic Carbon
	USBR	USBR	USBR	USBR	USBR	USBR	USBR
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
October 2013	NA	NA	NA	NA	NA	NA	NA
Nov-04-2013	59	36	4.6	190	220	170	5.8
Dec-10-2013	NA	NA	NA	NA	NA	NA	NA

Notes:

No samples collected in October due to federal furlough
 Site F Inaccessible 12/10/2013 (No samples collected)

	Nutrients				
	Nitrates as N (dissolved)	Ammonia as N	Total Kjeldahl Nitrogen	Total phosphorous	Ortho-phosphate as P
	USBR	USBR	USBR	USBR	USBR
	mg/L	mg/L	mg/L	mg/L	mg/L
October 2013	NA	NA	NA	NA	NA
Nov-04-2013	0.5	0.2	0.8	0.1	0.1
Dec-10-2013	NA	NA	NA	NA	NA

Notes:

No samples collected in October due to federal furlough
 Site F Inaccessible 12/10/2013 (No samples collected)

	Total Metals								
	Arsenic	Boron	Cadmium	Copper	Lead	Mercury	Molybdenum	Nickel	Zinc
	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
October 2013	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nov-04-2013	<0.5	720	<1.0	7.6	<2.5	<100	7.9	<10	9.9
Dec-10-2013	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

No samples collected in October due to federal furlough
 Site F Inaccessible 12/10/2013 (No samples collected)

**Table 7a. Water quality monitoring in Grasslands Wetlands Water Supply Channels
Station J Camp 13 Ditch headworks**

PARAMETER	Flow *		Specific Conductance	Temperature	Total Selenium
DATA SOURCE	Grasslands WD		Grasslands WD	Grasslands WD	USBR
UNITS	cfs		µS/cm	°C	µg/L
Oct-01-2013	175		770	18.9	NA
Oct-08-2013	132		773	18.6	NA
Oct-15-2013	94		777	18.2	NA
Oct-21-2013	62		774	18.2	0.6
Oct-28-2013	57		821	16.9	0.5
Nov-04-2013	65		1,020	14.1	2.4
Nov-11-2013	59		594	14.1	< 0.4
Nov-18-2013	61		722	13.7	< 0.4
Nov-25-2013	46		663	12.1	0.7
Dec-02-2013	45		738	12.1	0.9
Dec-09-2013	66		699	6.6	0.6
Dec-16-2013	56		733	7.3	0.7
Dec-23-2013	39		949	7.8	1.0
Dec-30-2013	39		963	8.0	0.8

Notes:

Samples only collected when flow is passing site

No samples collected in early October due to federal furlough

**Table 7b. Water quality monitoring in Grasslands Wetlands Water Supply Channels
Station K Agatha Canal headworks**

PARAMETER	Flow *	pH	Specific Conductance	Temperature	Total Selenium
DATA SOURCE	Grasslands WD	Grasslands WD	Grasslands WD	Grasslands WD	USBR
UNITS	cfs	units	µS/cm	°C	µg/L
Oct-01-2013	240	8.1	540	18.8	NA
Oct-08-2013	204	8.2	545	18.3	NA
Oct-15-2013	169	8.3	550	17.7	NA
Oct-21-2013	153	8.3	568	17.9	0.5
Oct-28-2013	99	8.4	551	16.6	<0.8
Nov-04-2013	123	8.4	394	13.5	0.6
Nov-11-2013	99	8.1	300	14.1	<0.4
Nov-18-2013	89	8.1	543	13.7	0.7
Nov-25-2013	70	7.9	479	12.1	0.6
Dec-02-2013	70	8.0	505	12.1	0.8
Dec-09-2013	69	8.6	418	6.3	0.6
Dec-16-2013	68	8.9	436	7.1	0.7
Dec-23-2013	55	9.0	450	7.3	0.9
Dec-30-2013	67	9.5	413	7.7	0.8

Notes:

Samples only collected when flow is passing site

No samples collected in early October due to federal furlough

Table 8. Water monitoring in the San Joaquin River above Merced River Station H2

PARAMETER	Flow	Temperature	Specific Conductance
DATA SOURCE	USGS	USGS	USGS
UNITS	cfs	°C	µS/cm
Nov-01-2013	246	NA	1,680
Nov-02-2013	246	NA	1,670
Nov-03-2013	245	NA	1,740
Nov-04-2013	245	NA	1,810
Nov-05-2013	244	NA	1,990
Nov-06-2013	234	NA	2,100
Nov-07-2013	236	17.4	2,060
Nov-08-2013	228	16.7	1,990
Nov-09-2013	224	15.1	2,050
Nov-10-2013	224	13.8	2,060
Nov-11-2013	224	12.6	1,960
Nov-12-2013	225	12.1	1,820
Nov-13-2013	229	11.9	1,720
Nov-14-2013	233	12.2	1,630
Nov-15-2013	227	12.1	1,550
Nov-16-2013	219	12.7	1,560
Nov-17-2013	223	13.9	1,680
Nov-18-2013	236	14.5	1,700
Nov-19-2013	254	14.4	1,730
Nov-20-2013	266	14.2	1,700
Nov-21-2013	263	14.6	1,670
Nov-22-2013	258	13.9	1,710
Nov-23-2013	258	13.2	1,720
Nov-24-2013	264	13.1	1,760
Nov-25-2013	258	12.8	1,770
Nov-26-2013	247	12.5	1,800
Nov-27-2013	243	12.2	1,890
Nov-28-2013	251	12.5	1,930
Nov-29-2013	263	12.8	1,980
Nov-30-2013	282	13.8	2,020
Mean			1,820
Total Acre-feet	14,470		

Notes:

See Table 19 for explanation of footnotes and agency abbreviations.
Preliminary Data

Table 9. Water quality monitoring in the San Joaquin River above Merced River at China Island Refuge Station R

PARAMETER	Physicals					Total Selenium	Total Molybdenum
	Dissolved Oxygen	pH	Specific Conductance	Temperature	Turbidity		
	USBR	USBR	USBR	USBR	USBR		
DATA SOURCE	USBR	USBR	USBR	USBR	USBR	USBR	
UNITS	mg/L	units	µS/cm	°C	NTU	ug/L	ug/L
Oct-02-2013	NA	NA	1,695	NA	NA	0.90	NA
Oct-09-2013	NA	NA	NA	NA	NA	NA	NA
Oct-16-2013	NA	NA	NA	NA	NA	NA	NA
Oct-23-2013	NA	NA	1,650	NA	NA	< 0.8	NA
Oct-29-2013	NA	NA	1,760	NA	NA	< 0.8	NA
Nov-04-2013	11.9	8.0	1,900	12.0	23.1	< 0.8	NA
Nov-15-2013	11.1	8.0	1,700	13.2	36.9	0.5	NA
Nov-22-2013	10.4	7.9	1,700	11.3	29.0	0.5	NA
Nov-25-2013	11.4	8.0	1,740	10.9	41.6	0.4	NA
Dec-06-2013	12.8	8.1	2,000	6.0	15.1	0.6	NA
Dec-10-2013	13.0	8.0	2,200	5.2	14.5	0.8	NA
Dec-17-2013	12.7	8.0	2,150	8.0	19.4	0.9	NA
Dec-27-2013	12.3	8.6	2,590	8.6	15.3	0.8	NA

Notes:

No samples collected mid October due to federal furlough
 Reclamation sampling this site starting 11/04/2013
 Weekly Molybdenum sampling starting in February 2014

	General Minerals							
	Calcium	Magnesium	Potassium	Sodium	Chloride (Dissolved)	Sulfate (Dissolved)	Total Organic Carbon	Total Dissolved Solids
	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Units	mg/L
Oct-01-2013	NA	NA	NA	NA	NA	NA	NA	NA
Nov-04-2013	76.0	47.0	5.6	260.0	280.0	250.0	NA	NA
Dec-01-2013	78.0	50.0	4.8	290.0	340.0	360.0	8.8	NA

Notes:

No samples collected in October due to federal furlough

	Nutrients				
	Nitrates as N (Dissolved)	Total ammonia	Total Kjeldahl Nitrogen	Total phosphorous	Ortho-phosphate as P
	USBR	USBR	USBR	USBR	USBR
	mg/L	mg/L	mg/L	mg/L	mg/L
Oct-01-2013	NA	NA	NA	NA	NA
Nov-04-2013	0.3	0.1	1.2	0.2	0.1
Dec-01-2013	0.2	0.1	0.9	0.2	0.1

Notes:

No samples collected in October due to federal furlough

	Total Metals								
	Arsenic	Boron	Cadmium	Copper	Lead	Mercury	Molybdenum	Nickel	Zinc
	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Oct-01-2013	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nov-01-2013	<5.0	1500.0	<1.0	9.4	<2.5	<100	9.2	<10	8.7
Dec-01-2013	3.1	1400.0	<0.2	1.4	0.3	<200	8.7	2.9	<20

Notes:

No samples collected in October due to federal furlough

Table 10. Water monitoring in the San Joaquin River at Fremont Ford (Station G)

PARAMETER	Flow	Temperature	Specific Conductance
DATA SOURCE	USGS	USGS	USGS
UNITS	cfs	°C	µS/cm
Nov-01-2013	119	14.7	1,480
Nov-02-2013	122	14.8	1,520
Nov-03-2013	125	13.6	1,530
Nov-04-2013	108	12.3	1,650
Nov-05-2013	87	12.5	1,840
Nov-06-2013	84	12.9	1,840
Nov-07-2013	84	13.5	1,820
Nov-08-2013	94	13.8	1,790
Nov-09-2013	96	14.0	1,840
Nov-10-2013	101	14.0	1,810
Nov-11-2013	109	14.1	1,670
Nov-12-2013	123	14.3	1,550
Nov-13-2013	134	14.3	1,430
Nov-14-2013	137	14.5	1,370
Nov-15-2013	138	13.8	1,300
Nov-16-2013	137	12.9	1,410
Nov-17-2013	134	12.8	1,470
Nov-18-2013	131	12.9	1,480
Nov-19-2013	132	13.4	1,490
Nov-20-2013	142	14.8	1,430
Nov-21-2013	149	13.9	1,350
Nov-22-2013	156	11.7	1,340
Nov-23-2013	164	11.2	1,280
Nov-24-2013	164	11.2	1,290
Nov-25-2013	169	11.1	1,290
Nov-26-2013	163	11.2	1,310
Nov-27-2013	156	11.8	1,350
Nov-28-2013	154	12.0	1,380
Nov-29-2013	153	11.9	1,390
Nov-30-2013	147	11.8	1,410
Mean	130	13.1	1,504
Total Acre-feet	7,759		

Notes:

See Table 19 for explanation of footnotes and agency abbreviations.

Preliminary Data

Table 11a. Water monitoring in the San Joaquin River at Crows Landing (Station N)

PARAMETER	Flow	Temperature	Specific Conductance	Total Selenium
DATA SOURCE	USGS	USGS	USGS	USBR
UNITS	cfs	°C	µS/cm	µg/L
Nov-01-2013	530	17.7	869	< 0.4
Nov-02-2013	536	17.3	877	0.4
Nov-03-2013	539	17.3	896	0.5
Nov-04-2013	544	17.2	904	< 0.4
Nov-05-2013	549	17.4	926	< 0.4
Nov-06-2013	542	17.5	939	0.4
Nov-07-2013	545	17.6	942	< 0.4
Nov-08-2013	528	17.0	948	< 0.4
Nov-09-2013	516	15.7	973	< 0.4
Nov-10-2013	519	14.4	986	< 0.4
Nov-11-2013	523	13.3	984	< 0.4
Nov-12-2013	541	12.7	968	< 0.4
Nov-13-2013	551	12.5	955	< 0.4
Nov-14-2013	571	12.6	922	< 0.4
Nov-15-2013	575	12.4	878	< 0.4
Nov-16-2013	568	12.8	909	< 0.4
Nov-17-2013	572	13.9	924	< 0.4
Nov-18-2013	591	14.6	908	< 0.4
Nov-19-2013	610	14.7	885	< 0.4
Nov-20-2013	627	14.5	856	< 0.4
Nov-21-2013	634	14.8	858	< 0.4
Nov-22-2013	627	14.3	880	< 0.4
Nov-23-2013	620	13.5	911	< 0.4
Nov-24-2013	630	13.3	957	< 0.4
Nov-25-2013	622	13.1	1,000	< 0.4
Nov-26-2013	607	12.7	1,010	< 0.4
Nov-27-2013	602	12.5	1,010	< 0.4
Nov-28-2013	611	12.7	982	< 0.4
Nov-29-2013	626	13.0	949	< 0.4
Nov-30-2013	653	13.9	936	0.7
Mean	577	14.6	930	0.5
Total Acre-feet	34,332			

Notes:

See Table 19 for explanation of footnotes and agency abbreviations.

Preliminary Data

Table 11b. Water quality monitoring in the San Joaquin River at Crows Landing (Station N)

PARAMETER	Physicals					Selenium	Boron
	Dissolved Oxygen	pH	Specific Conductance	Temperature	Turbidity		
DATA SOURCE	USBR	USBR	USBR	USBR	USBR	USBR	USBR
UNITS	mg/L	units	µS/cm	°C	NTU	µg/L	µg/L
Oct-01-2013	NA	NA	NA	NA	NA	NA	NA
Oct-08-2013	NA	NA	NA	NA	NA	NA	NA
Oct-15-2013	NA	NA	NA	NA	NA	NA	NA
Oct-21-2013	9.3	7.9	940	16.2	20.0	0.5	720
Oct-28-2013	10.0	8.1	517	14.2	18.0	< 0.4	330
Nov-04-2013	11.3	8.1	1,040	11.9	16.5	< 0.4	650
Nov-15-2013	11.0	8.1	1,100	13.0	12.7	< 0.4	730
Nov-22-2013	10.6	8.0	1,060	11.8	13.1	< 0.4	720
Nov-25-2013	11.4	8.2	1,180	11.2	14.8	< 0.4	780
Dec-06-2013	13.4	8.2	1,340	5.9	8.6	< 0.4	880
Dec-10-2013	14.1	8.2	1,400	5.2	8.3	0.4	980
Dec-17-2013	13.1	8.1	1,440	7.0	9.8	0.5	P
Dec-27-2013	13.3	7.8	1,450	7.8	9.9	0.5	P

Table 12. Summary of fathead minnow (*Pimephales promelas*) larvae survival in 7-day tests using water samples collected from March 2014 to March 2016. Each value is the mean of 4 replicates with 10 fish in each replicate.

See Table 19 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	%	%	%	%	%	%
Mar-2014						
Jun-2014						
Sep-2014						
Nov-2014						
Mar-2015						
Jun-2015						
Sep-2015						
Mar-2016						

Table 13. Summary of fathead minnow (*Pimephales promelas*) larvae growth in 7-day tests using water samples collected from March 2014 to March 2016. Each value is the mean of 4 replicates with 10 fish in each replicate.

See Table 19 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
Mar-2014						
Jun-2014						
Sep-2014						
Nov-2014						
Mar-2015						
Jun-2015						
Sep-2015						
Mar-2016						

Table 14. Summary of *Daphnia magna* survival in 7-day tests using water samples collected from March 2014 to March 2016. Each value is the mean of 10 replicates with 1 animal in each replicate.

See Table 19 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	%	%	%	%	%	%
Mar-2014						
Jun-2014						
Sep-2014						
Nov-2014						
Mar-2015						
Jun-2015						
Sep-2015						
Mar-2016						

Table 15. Summary of *Daphnia magna* reproduction in 7-day tests using water samples collected from March 2014 to March 2016. Each value is the mean of 10 replicates with 1 animal in each replicate.

See Table 19 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-2013						
Mar-2014						
Jun-2014						
Sep-2014						
Nov-2014						
Mar-2015						
Jun-2015						
Sep-2015						
Mar-2016						

Table 16. Summary of *Selenastrum capricornutum* growth in 4-day tests using water samples collected from March 2014 to March 2016. Each value is the mean of 4 replicates.

See Table 19 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
Nov-2013						
Mar-2014						
Jun-2014						
Sep-2014						
Nov-2014						
Mar-2015						
Jun-2015						
Sep-2015						
Mar-2016						

Table 17. Summary of selenium concentrations in grab water samples collected at study stations for use in laboratory toxicity tests

See Table 19 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
Mar-2014					
Jun-2014					
Sep-2014					
Nov-2014					
Mar-2015					
Jun-2015					
Sep-2015					
Mar-2016					

Table 18. Summary of total suspended solids concentrations in grab water samples collected at study stations for use in laboratory toxicity tests

See Table 19 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
Mar-2014					
Jun-2014					
Sep-2014					
Nov-2014					
Mar-2015					
Jun-2015					
Sep-2015					
Mar-2016					

Table 19. Explanations of footnotes and agency abbreviations.

Agency	
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
Water Quality Monitoring	
e	Estimated value
.	Not applicable
<	Less than MDL
D	Sample was dechlorinated
G	Data from records of the Grassland Water District.
H	Result may have high bias
J	Result is between the MDL and RL
L	Result may have low bias,
MDL	Minimum detection level
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
RL	Reporting level
T	Result obtained past the holding time
U	Result determined to be an outlier at the time of data validation
V	Result may vary excessively from the true value
Toxicity	
*	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.
††	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.
v	Based on definitive bioassay, NOEC is 50 percent