Grassland Bypass Project
Interim Baseline Monitoring Program

Monthly Data Report

February 2014

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

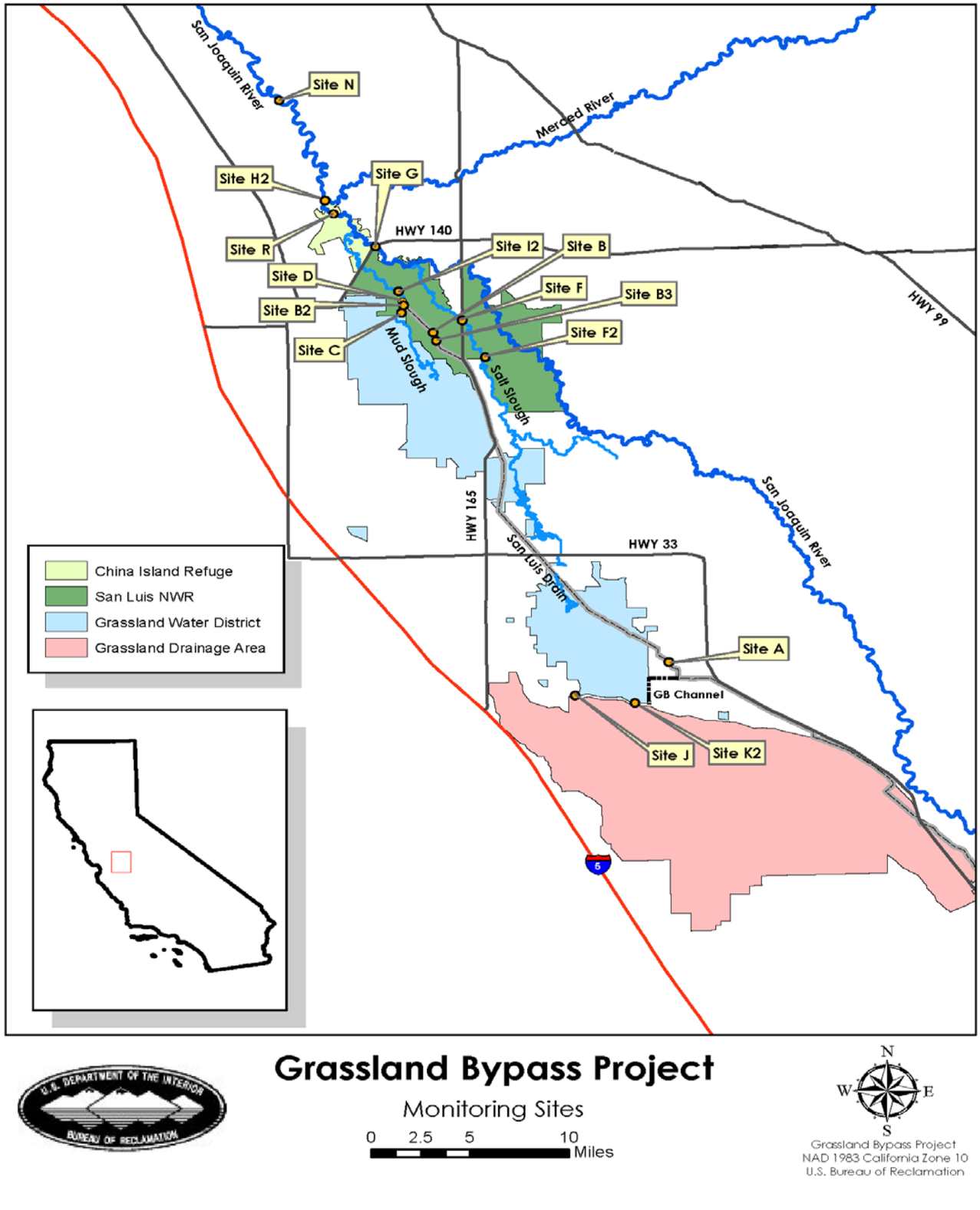
San Luis & Delta-Mendota Water Authority

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
MONTHLY DATA REPORT

LIST OF TABLES FOR MONTHLY REPORT

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

PARAMETER	Flow	Temperature	Specific Conductance	Total Dissolved Solids	Total Suspended Solids	Total Selenium	Daily Salt Load
DATA SOURCE	SLDMWA	SLDMWA	SLDMWA	Calculated	SLDMWA	SLDMWA/USBR	Calculated
UNITS	cfs	°C	µS/cm	mg/L	mg/L	µg/L	tons
Feb-01-2014	10	10.9	7,310	5,411		26	144
Feb-02-2014	9	9.1	7,400	5,477		25	137
Feb-03-2014	19	10.1	6,800	5,035		28	251
Feb-04-2014	21	10.7	6,010	4,449		28	252
Feb-05-2014	15	11.0	6,390	4,729		29	188
Feb-06-2014	17	11.1	6,820	5,050		29	237
Feb-07-2014	32	10.8	6,550	4,844		29	417
Feb-08-2014	35	11.7	6,400	4,734		29	448
Feb-09-2014	36	13.3	6,360	4,703		31	454
Feb-10-2014	22	15.0	6,880	5,091	136	34	299
Feb-11-2014	20	15.2	6,940	5,139		34	276
Feb-12-2014	17	15.1	7,180	5,313		34	241
Feb-13-2014	18	15.4	7,020	5,194		30	255
Feb-14-2014	19	15.7	6,710	4,968		30	252
Feb-15-2014	19	15.2	6,630	4,906		30	254
Feb-16-2014	20	15.2	6,750	4,992		30	267
Feb-17-2014	19	14.5	6,940	5,137		32	266
Feb-18-2014	28	13.4	6,530	4,831		32	365
Feb-19-2014	23	13.6	5,850	4,331		32	265
Feb-20-2014	13	13.2	6,760	4,999		34	169
Feb-21-2014	9	13.8	7,230	5,352		32	134
Feb-22-2014	6	14.9	7,230	5,350		28	82
Feb-23-2014	5	15.3	7,800	5,774		29	72
Feb-24-2014	6	16.1	8,000	5,920		32	94
Feb-25-2014	7	16.4	7,590	5,615		30	111
Feb-26-2014	9	15.6	7,600	5,621		30	135
Feb-27-2014	28	15.3	6,590	4,875		35	371
Feb-28-2014	44	14.5	5,700	4,220		33	495

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

Table 1b. Monthly Averages and Totals

	Average Flow (A)	Average Temperature	Average Specific Conducantce	Average Total Dissolved Solids	Average Total Suspended Solids	Average Selenium	Salt Load	Salt Load Objective
	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	UA3
	cfs	°C	µS/cm	mg/L	mg/L	µg/L	tons	tons
Jan-2014	11	9.8	7,320	5,418	46	26	4,615	4,283
Feb-2014	19	14	6,860	5,074	136	31	6,930	6,779
Cumulative Total							11,550	11,060

Notes:
Salt load objective based on 2014 critical year type

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)	Total Suspended Solids (B2)	Boron (B3)	Total Selenium (B3)	Daily Selenium Load
DATA SOURCE	SLDMWA♦	SLDMWA	SLDMWA	SLDMWA/USBR	USBR	USBR	Calculated
UNITS	cfs	°C	µS/cm	mg/L	mg/L	µg/L	lbs
Feb-01-2014	22	8.2	5,940		12.0	20.0	2.3
Feb-02-2014	17	5.7	5,780		12.0	24.0	2.2
Feb-03-2014	13	8.4	5,960		12.0	22.0	1.6
Feb-04-2014	22	8.0	6,060		12.0	23.0	2.8
Feb-05-2014	27	9.8	5,840		12.0	22.0	3.1
Feb-06-2014	22	9.2	6,350		13.0	21.0	2.5
Feb-07-2014	23	10.1	6,040		13.0	20.0	2.5
Feb-08-2014	39	12.8	5,640		11.0	20.0	4.2
Feb-09-2014	42	15.2	5,950		13.0	22.0	4.9
Feb-10-2014	40	14.7	6,200	139	13.0	25.0	5.4
Feb-11-2014	28	13.3	6,220		13.0	32.0	4.9
Feb-12-2014	25	13.8	6,050		12.0	31.0	4.1
Feb-13-2014	22	16.3	6,180		13.0	30.0	3.5
Feb-14-2014	23	14.9	6,310		13.0	28.0	3.4
Feb-15-2014	24	13.2	6,550		14.0	25.0	3.2
Feb-16-2014	23	15.1	6,520		14.0	24.0	3.0
Feb-17-2014	24	11.6	6,680		15.0	26.0	3.4
Feb-18-2014	24	11.4	6,590		14.0	27.0	3.5
Feb-19-2014	32	13.3	6,420		14.0	30.0	5.1
Feb-20-2014	28	12.3	6,610		14.0	32.0	4.9
Feb-21-2014	18	12.8	6,390		13.0	33.0	3.1
Feb-22-2014	13	13.9	6,360		12.0	30.0	2.0
Feb-23-2014	10	14.8	6,090		12.0	29.0	1.6
Feb-24-2014	9	15.8	5,860		12.0	29.0	1.4
Feb-25-2014	9	15.9	5,770		12.0	28.0	1.3
Feb-26-2014	11	13.7	5,660		11.0	27.0	1.6
Feb-27-2014	14	15.1	5,300		9.9	24.0	1.7
Feb-28-2014	39	13.6	5,340		12.0	23.0	4.8

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

Table 2b. Monthly Averages and Totals

	Average Flow (B2)	Average Temperature (B2)	Average Specific Conducantce (B2)	Average Total Supspended Solids	Average Boron (B3)	Average Selenium	Selenium Load	Selenium Load Objective
	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	UA3
	cfs	°C	µS/cm	mg/L	mg/L	µg/L	lbs	lbs
Jan-2014	16	10.1	5,290	13	10.2	14.0	39	151
Feb-2014	23	12.6	6,100	139	12.6	26.0	88	93
Cumulative Load Totals							127	244

Notes:
Selenium load objective based on 2014 critical year type

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

	Physicals					Total Selenium
PARAMETER	Dissolved Oxygen	pH	Specific Conductance	Temperature	Turbidity	
DATA SOURCE	USBR	USBR	USBR	USBR	USBR	USBR
UNITS	mg/L	units	µS/cm	°C	NTU	ug/L
Jan-03-2014	14.5	7.5	4,390	8.1	13.4	12
Jan-09-2014	14.4	7.6	4,630	10.0	13.7	10
Jan-14-2014	18.5	7.8	4,860	8.3	12.9	11
Jan-23-2014	15.8	7.9	5,700	9.0	14.8	16
Feb-07-2014	10.0	8.0	5,820	10.1	12.8	19
Feb-14-2014	9.1	7.9	6,340	15.9	19.5	27
Feb-21-2014	12.7	8.3	6,350	13.5	21.6	33
Feb-27-2014	11.1	8.4	5,140	16.3	17.6	26

Notes:

	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
Jan-09-2014	0.5	0.1	1.4	0.094 V	0.015 T
Feb-27-2014	3.7 T	0.2 L	1.7	0.095 T	<0.010

Notes:

Results of the Interim Monitoring Program Oct 2013 - Feb 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
Jan-09-2014	270	110	6.8	620	670	1,400	NA
Feb-27-2014	220	100	4.0	880	750	1,500	9

Notes:

	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
Jan-09-2014	5.5	9,000	<1.0	41	<2.5	100	31.0	17.0	<5.0
Feb-27-2014	<10		<1.0	<50	<2.5	<100	24.0	23.0	<10

Notes:

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

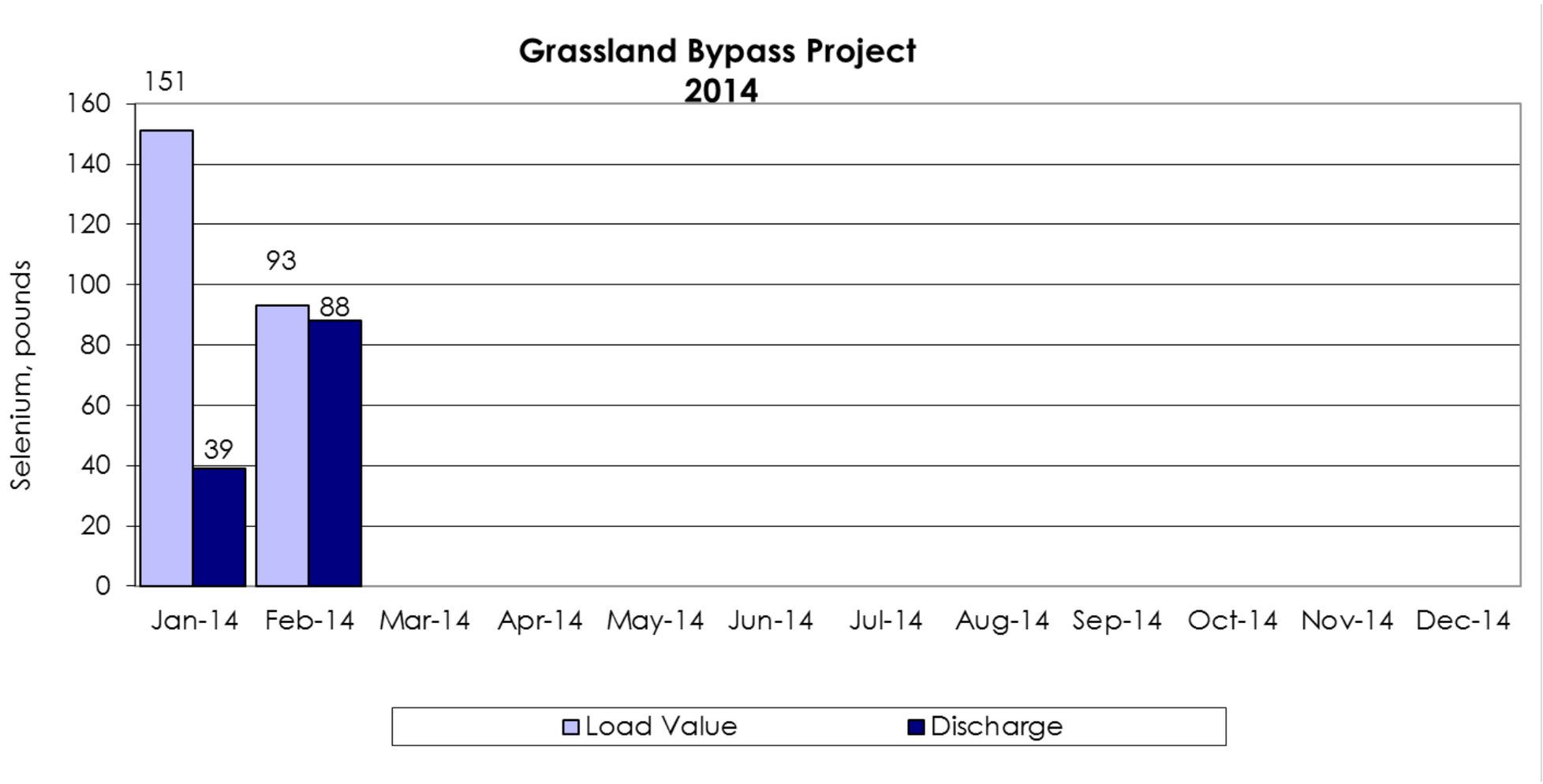


Table 3a. Water monitoring in Mud Slough (north) below San Luis Drain Discharge Station D

PARAMETER	Flow	Temperature	Specific Conductance
DATA SOURCE	USGS	USGS	USGS
UNITS	cfs	°C	µS/cm
Feb-01-2014	68	12.1	3,570
Feb-02-2014	72	10.4	3,250
Feb-03-2014	67	10.3	3,260
Feb-04-2014	70	10.8	3,700
Feb-05-2014	70	11.3	3,860
Feb-06-2014	68	11.6	3,810
Feb-07-2014	75	11.3	3,650
Feb-08-2014	95	11.9	3,720
Feb-09-2014	114	13.0	3,630
Feb-10-2014	114	14.3	3,720
Feb-11-2014	98	14.8	3,420
Feb-12-2014	90	15.3	3,380
Feb-13-2014	83	15.8	3,410
Feb-14-2014	81	16.2	3,510
Feb-15-2014	80	15.5	3,690
Feb-16-2014	74	15.6	3,830
Feb-17-2014	73	14.7	3,960
Feb-18-2014	72	14.0	3,970
Feb-19-2014	84	14.3	4,090
Feb-20-2014	83	13.5	3,970
Feb-21-2014	71	13.7	3,580
Feb-22-2014	64	14.6	3,430
Feb-23-2014	62	15.2	3,230
Feb-24-2014	54	15.7	3,270
Feb-25-2014	51	16.3	3,350
Feb-26-2014	51	15.7	3,430
Feb-27-2014	62	15.4	3,340
Feb-28-2014	95	14.7	3,720

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

Table 3b. Monthly Averages

PARAMETER	Average Flow (D)	Temperature	Specific Conductance
DATA SOURCE	USGS	USGS	USGS
UNITS	cfs	°C	µS/cm
January	55	11	3,120
February	76	14	3,600
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

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

	Physicals					Total Selenium	Total Boron	Total Molybdenum
PARAMETER	Dissolved Oxygen	pH	Specific Conductance	Temperature	Turbidity			
DATA SOURCE	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR
UNITS	mg/L	units	µS/cm	°C	NTU	ug/L	mg/L	ug/L
Jan-03-2014	12.1	7.8	3,180	9.0	10.7	3.2		
Jan-09-2014	11.2	7.8	3,080	9.5	12.9	2.4	3.4 H	16
Jan-14-2014	15.2	7.8	3,180	8.2	10.7	2.7		
Jan-23-2014	12.4	7.8	3,460	9.2	16.1	4.4		
Feb-07-2014	8.7	7.9	3,710	10.7	22.3	5.4		16
Feb-14-2014	9.3	7.8	3,570	14.8	33.5	8.0		16
Feb-21-2014	9.8	8.0	3,680	13.4	26.8	7.9		15
Feb-27-2014	9.9	7.4	3,320	16.4	35.9	5.2		16

Notes:

	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
Jan-09-2014	0.2	0.2	<5.0	0.12 V	0.046 T
Feb-27-2014	1.0 T	0.2 L	1.5	0.33 T	0.026

Notes:

Results of the Interim Monitoring Program Oct 2013 - Feb 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
Jan-09-2014	120	76	6.5	400	470	650	NA
Feb-27-2014	110	75	6.0	480	480	670	11.0

Notes:

	Total Metals						
	Arsenic	Cadmium	Copper	Lead	Mercury	Nickel	Zinc
	USBR	USBR	USBR	USBR	USBR	USBR	USBR
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Jan-09-2014	5.3	<1.0	29 L	<2.5	110	10.0	<5.0
Feb-27-2014	<5.0	<1.0	<50	<2.5	<100	16.0	<10

Notes:

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

	Physicals				
PARAMETER	**Dissolved Oxygen**	**Specific Conductance**	**Turbidity**	**Boron**	**Total Selenium**
DATA SOURCE	**WSJRWC**	**WSJRWC**	**WSJRWC**	**WSJRWC**	**WSJRWC**
UNITS	**mg/L**	**µS/cm**	**NTU**	**mg/L**	**µg/L**
Jan-14-2014	10.2	2,480	7.6		
Feb-10-2014	5.2	2,870	65	2.0	0.3

Notes:

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

	Physicals					
PARAMETER	**Dissolved Oxygen**	**pH**	**Specific Conductance**	**Temperature**	**Turbidity**	**Total Selenium**
DATA SOURCE	**USBR**	**USBR**	**USBR**	**USBR**	**USBR**	**USBR**
UNITS	**mg/L**	**units**	**µS/cm**	**°C**	**NTU**	**µg/L**
Jan-03-2014						
Jan-09-2014						
Jan-14-2014						
Jan-23-2014						
Feb-07-2014						
Feb-14-2014						
Feb-21-2014						
Feb-27-2014						

Notes:
Samples collected only when site is flooded
Site was dry during January and February (no sample collected)

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
Feb-01-2014	71	11.8	1,730
Feb-02-2014	64	10.2	1,810
Feb-03-2014	66	10.5	1,790
Feb-04-2014	66	11.1	1,810
Feb-05-2014	54	11.8	1,970
Feb-06-2014	59	12.1	1,860
Feb-07-2014	69	11.6	1,790
Feb-08-2014	85	12.2	1,700
Feb-09-2014	79	13.6	1,840
Feb-10-2014	86	15.1	1,820
Feb-11-2014	74	15.2	1,840
Feb-12-2014	71	15.2	1,900
Feb-13-2014	62	15.8	2,020
Feb-14-2014	66	16.2	2,110
Feb-15-2014	65	15.1	2,100
Feb-16-2014	69	15.4	2,080
Feb-17-2014	68	14.5	2,070
Feb-18-2014	67	13.7	2,020
Feb-19-2014	65	14.1	1,990
Feb-20-2014	58	13.4	2,030
Feb-21-2014	64	13.8	2,080
Feb-22-2014	58	14.9	2,110
Feb-23-2014	71	15.3	2,090
Feb-24-2014	64	15.8	2,120
Feb-25-2014	73	16.2	2,110
Feb-26-2014	64	15.6	2,020
Feb-27-2014	75	15.5	2,100
Feb-28-2014	85	14.7	2,020

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

Table 6b. Monthly Averages

PARAMETER	Average Flow (G)	Temperature	Specific Conductance
DATA SOURCE	USGS	USGS	USGS
UNITS	cfs	°C	µS/cm
January	68	14	1,760
February	69	14	1,960
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

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

	Physicals					Total Selenium	Total Boron	Total Molybdenum
PARAMETER	Dissolved Oxygen	pH	Specific Conductance	Temperature	Turbidity			
DATA SOURCE	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR
UNITS	mg/L	units	µS/cm	°C	NTU	ug/L	mg/L	ug/L
Jan-03-2014	11.4	7.1	1,660	7.9	22.1	<0.4		
Jan-09-2014	10.8	6.9	1,690	10.4	25.0	<0.4	0.96	
Jan-14-2014	14.4	6.6	1,710	7.6	17.2	<0.4		
Jan-23-2014	12.8	7.3	1,770	8.9	21.8	<0.4		
Feb-07-2014	8.4	7.3	1,940	10.5	23.3	<0.4		10
Feb-14-2014	8.7	8.0	2,140	15.1	41.4	<0.4		13
Feb-21-2014	9.8	7.7	1,380	12.2	35.7	<0.4		13
Feb-27-2014	9.9	7.7	2,070	15.3	47.5	<0.4		12

Notes:

	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
Jan-09-2014	<10	0.3	0.8	0.095 L,V	0.050 T
Feb-27-2014	1.3 T	0.3 L	1.0	0.320 T	<0.010

Notes:

Results of the Interim Monitoring Program Oct 2013 - Feb 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
Jan-09-2014	68	40	4.2	220	290	230	NA
Feb-27-2014	85	53	4.6	310	360	280	5.4

Notes:

	Total Metals							
	Arsenic	Cadmium	Copper	Lead	Mercury	Molybdenum	Nickel	Zinc
	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Jan-09-2014	<5.0	<1.0	18	<2.5	110	9.4	<10	5.3
Feb-27-2014	<5.0	<1.0	<50	<2.5	<100	12.0	11	<10

Notes:

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	GWD	USBR	GWD	USBR
UNITS	cfs	µS/cm	°C	µg/L
Jan-06-2014	17	504	8.4	0.8
Jan-13-2014	14	467	9.1	1.0
Jan-21-2014	39	510	9.6	1.0
Jan-27-2014	23	434	10.5	1.0
Feb-03-2014	32	533	10.4	1.0
Feb-10-2014	32	790	12.8	1.4
Feb-18-2014	34	1,010	14.3	1.2
Feb-24-2014	24	1,140	15.3	1.0

Notes:
Samples only collected when flow is passing site

Table 7b. Water quality monitoring in Grasslands Wetlands Water Supply Channels
Station K2 Agatha Canal headworks

PARAMETER	Flow	Specific Conductance	Temperature	Total Selenium
DATA SOURCE	GWD	USBR	GWD	USBR
UNITS	cfs	µS/cm	°C	µg/L
Jan-06-2014	53	496	8.3	0.8
Jan-13-2014	42	467	9.0	0.9
Jan-21-2014	41	514	9.6	0.9
Jan-27-2014	40	463	10.5	1.0
Feb-03-2014				
Feb-10-2014				
Feb-18-2014				
Feb-24-2014				

Notes:
Samples only collected when flow is passing site

Table 8a. 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
Feb-01-2014	220	11.8	2,350
Feb-02-2014	223	10.4	2,420
Feb-03-2014	222	10.2	2,420
Feb-04-2014	214	11.0	2,680
Feb-05-2014	213	11.1	2,670
Feb-06-2014	211	11.7	2,700
Feb-07-2014	221	11.5	2,680
Feb-08-2014	238	12.1	2,480
Feb-09-2014	257	13.0	2,390
Feb-10-2014	266	14.3	2,470
Feb-11-2014	269	14.6	2,490
Feb-12-2014	254	15.1	2,430
Feb-13-2014	239	15.5	2,500
Feb-14-2014	225	16.0	2,610
Feb-15-2014	218	15.3	2,640
Feb-16-2014	215	15.2	2,690
Feb-17-2014	205	14.5	2,680
Feb-18-2014	201	13.9	2,710
Feb-19-2014	205	14.0	2,690
Feb-20-2014	209	13.5	2,790
Feb-21-2014	201	13.7	2,840
Feb-22-2014	198	14.5	2,680
Feb-23-2014	192	15.0	2,590
Feb-24-2014	195	15.6	2,450
Feb-25-2014	178	16.1	2,670
Feb-26-2014	182	15.6	2,550
Feb-27-2014	199	15.4	2,500
Feb-28-2014	231	14.8	2,490

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

Table 8b. Monthly Averages

PARAMETER	Average Flow (H2)	Temperature	Specific Conductance
DATA SOURCE	USGS	USGS	USGS
UNITS	cfs	°C	µS/cm
January	209	13	2,600
February	218	14	2,580
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

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

	Physicals					Total Selenium	Total Boron	Total Molybdenum
PARAMETER	Dissolved Oxygen	pH	Specific Conductance	Temperature	Turbidity			
DATA SOURCE	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR
UNITS	mg/L	units	µS/cm	°C	NTU	ug/L	mg/L	ug/L
Jan-03-2014	12.2	8.0	2,340	8.3	17.0	0.9	1.8	
Jan-09-2014	14.0	7.9	2,510	9.8	17.7	0.8		
Jan-14-2014	16.0	7.9	2,500	8.5	15.5	0.9		
Jan-23-2014	13.0	8.0	2,870	8.7	19.9	1.4		
Feb-07-2014	8.4	7.6	3,030	10.7	34.5	2.1 U		13
Feb-14-2014	8.6	7.7	2,950	14.3	50.9	2.8 U		14
Feb-21-2014	9.5	7.9	3,250	13.2	26.8	4.0 U		15

Notes: No nutrients, general minerals or total minerals collected at Site R in February due to unsafe site conditions

	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
Jan-09-2014	0.16	0.098	0.85	0.16V	0.054 T
Feb-27-2014					

Notes: No nutrients, general minerals or total minerals collected at Site R in February due to unsafe site conditions

Results of the Interim Monitoring Program Oct 2013 - Feb 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
Jan-09-2014	91	59	5.1	310	430	430	NA	NA
Feb-27-2014								

Notes: No nutrients, general ginerals or total minerals collected at Site R in February due to unsafe site conditions

	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
Jan-09-2014	<5.0	1,800	<1.0	23	<2.5	<100	12	<10	<5.0
Feb-27-2014									

Notes: No nutrients, general minerals or total minerals collected at Site R in February due to unsafe site conditions

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

PARAMETER	Flow	Temperature	Specific Conductance
DATA SOURCE	USGS	USGS	USGS
UNITS	cfs	°C	µS/cm
Feb-01-2014	114	11.5	1,950
Feb-02-2014	105	10.1	2,060
Feb-03-2014	107	10.0	2,020
Feb-04-2014	103	10.5	2,060
Feb-05-2014	102	11.0	2,070
Feb-06-2014	93	11.6	2,270
Feb-07-2014	103	11.3	2,090
Feb-08-2014	114	12.0	1,940
Feb-09-2014	121	13.2	1,940
Feb-10-2014	121	14.3	2,030
Feb-11-2014	121	14.6	2,030
Feb-12-2014	113	15.0	2,090
Feb-13-2014	106	15.4	2,190
Feb-14-2014	106	16.0	2,230
Feb-15-2014	105	15.0	2,300
Feb-16-2014	110	15.3	2,190
Feb-17-2014	109	14.3	2,210
Feb-18-2014	114	13.6	2,140
Feb-19-2014	107	14.1	2,220
Feb-20-2014	107	13.4	2,220
Feb-21-2014	100	13.6	2,330
Feb-22-2014	105	14.4	2,280
Feb-23-2014	104	14.9	2,300
Feb-24-2014	108	15.4	2,190
Feb-25-2014	104	15.9	2,290
Feb-26-2014	111	15.6	2,230
Feb-27-2014	112	15.3	2,210
Feb-28-2014	125	14.7	2,150

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

Table 10b. Monthly Averages

PARAMETER	Average Flow (G)	Temperature	Specific Conductance
DATA SOURCE	USGS	USGS	USGS
UNITS	cfs	°C	µS/cm
January	105	10	1,990
February	109	14	2,150
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

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
Feb-01-2014	406	11.9	1,600	1.0
Feb-02-2014	415	10.4	1,580	1.0
Feb-03-2014	422	9.9	1,550	1.0
Feb-04-2014	415	10.4		0.8
Feb-05-2014	403	10.7	1,530	0.7
Feb-06-2014	408	11.2	1,600	1.2
Feb-07-2014	414	10.9	1,650	1.1
Feb-08-2014	432	11.4	1,630	0.9
Feb-09-2014	455	12.5	1,660	1.1
Feb-10-2014	474	13.7	1,680	1.7
Feb-11-2014	482	14.0	1,700	1.8
Feb-12-2014	475	14.2	1,660	1.8
Feb-13-2014	459	14.6	1,660	1.6
Feb-14-2014	438	15.5	1,660	1.5
Feb-15-2014	426	15.1	1,710	1.4
Feb-16-2014	417	14.9	1,740	1.4
Feb-17-2014	400	14.5	1,800	1.3
Feb-18-2014	382	13.9	1,830	1.4
Feb-19-2014	377	14.0	1,940	1.5
Feb-20-2014	370	13.6	1,980	1.7
Feb-21-2014	366	13.4	2,060	2.3
Feb-22-2014	357	14.2	2,060	2.2
Feb-23-2014	349	14.7	1,960	1.6
Feb-24-2014	348	15.3	1,950	1.3
Feb-25-2014	341	15.8	1,880	1.1
Feb-26-2014	339	15.8	1,910	0.9
Feb-27-2014	357	15.3	1,840	0.8
Feb-28-2014	392	15.2	1,830	1.0

Notes:
Preliminary Data

11b. Monthly Averages

PARAMETER	Average Flow (N)	Temperature	Specific Conductance	Selenium
DATA SOURCE	Calculated	Calculated	Calculated	Calculated
UNITS	cfs	°C	µS/cm	µg/L
January	361	10	1,620	0.7
February	404	13	1,760	1.3
March				
April				
May				
June				
July				
August				
September				
October				
November				
December				

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

	Physicals					Selenium	Boron
PARAMETER	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	mg/L
Jan-03-2014	12.7	8.1	1,500	7.6	11.3	0.6	
Jan-09-2014	12.1	8.0	1,610	9.4	11.9	0.5	
Jan-14-2014	15.9	8.0	1,640	7.8	9.0	0.4	
Jan-23-2014	13.4	8.0	1,840	8.5	12.1	0.8	
Feb-07-2014	9.2	7.5	1,180	10.0	19.3	1.1	1.3
Feb-14-2014	9.1	8.0	1,730	14.0	27.8	1.5	1.3
Feb-21-2014	10.2	7.9	2,210	13.0	18.5	2.4 U	1.8
Feb-27-2014	10.0	7.9	1,900	15.3	21.3	1.0	1.1

Notes:

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
GWD	Grasslands Water District
SLDMWA	San Luis & Delta-Mendota Water Authority
USBR	U.S. Bureau of Reclamation
USGS	U.S. Geological Survey
WSJRWC	Westside San Joaquin River Watershed Coalition (WSJRWC)

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
	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
UA3	Use Agreement for Continued Use of the San Luis Drain January 2010 - December 2019

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 (10^6cell/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.
v	Based on definitive bioassay, NOEC is 50 percent