

### **Appendix 3. Data for Field Parameters, Anions, Nutrients, Organic Carbon, and Sampling Sites**

Table A3-1. Field measurements and concentrations of anions, nutrients, and organic carbon.

Table A3-2. Sampling site numbers, names, and locations.

**Table A3-1.** Field measurements and concentrations of anions, nutrients, and organic carbon

[Br., bridge; C, carbon, °C, degrees Celsius; CaCO<sub>3</sub>, calcium carbonate; Cr., creek; N, nitrogen; P, phosphorus; R., River; Sac., Sacramento; SO<sub>4</sub>, sulfate; est, estimated value. mm/dd/yy, month/day/year; ft<sup>3</sup>/s, cubic foot per second; mg/L, milligram per liter; µS/cm, microsiemen per centimeter at 25 degrees Celsius; <, less than; —, no data available]

Site	Date (mm/dd/yy)	Time	Stream discharge, daily mean (ft <sup>3</sup> /s)	Water temper- ature (°C)	Specific conduct- ance, unfiltered (µS/cm)	Dissolved oxygen (mg/L)	pH, standarad units	Alkalinity, filtered (mg/L as CaCO <sub>3</sub> )	Chloride, filtered (mg/L)	Sulfate, filtered (mg/L)	Fluoride, filtered (mg/L)	Nitrogen, ammonia, filtered (mg/L as N)
Sac. R.–Shasta	07/12/96	1130	12,085	11	110	12.1	7.8	52	1.7	3.2	<0.10	<0.015
Sac. R.–Shasta	09/19/96	1100	6,946	12	112	12.5	7.7	49	1.5	3.4	<0.10	<0.015
Sac. R.–Shasta	11/19/96	1030	4,297	13	120	7.6	7.4	5.5	1.8	3.1	<0.10	<0.015
Sac. R.–Shasta	12/12/96	1030	31,632	12.5	124	11.8	7.3	56	—	—	—	—
Sac. R.–Shasta	05/29/97	1030	6,513	8.5	107	12.4	7.7	—	1.6	3.4	<0.10	<0.015
Sac. R.–Keswick	07/11/96	900	14,815	11	100	10.8	7.7	46	1.4	2.6	<0.10	0.04
Sac. R.–Keswick	09/19/96	1800	9,503	12.5	98	11.9	7.6	43	1.2	2.8	<0.10	0.02
Sac. R.–Keswick	11/21/96	1200	5,294	13	108	8.7	7.4	49	1.6	3.9	<0.10	0.11
Sac. R.–Keswick	12/11/96	1730	35,269	—	111	—	7.8	—	—	—	—	—
Sac. R.–Keswick	01/02/97	1900	42,161	10	111	13.2	7.6	19	—	—	—	<0.015
Sac. R.–Keswick	05/28/97	1730	9,938	9.5	99	10.6	7.7	—	—	—	—	<0.015
Sac. R.–Bend Br.	07/11/96	1430	15,100	13.5	106	11.5	7.9	47	1.8	2.8	<0.10	0.02
Sac. R.–Bend Br.	09/20/96	1300	9,500	13	106	10.7	7.8	46	1.7	3.3	<0.10	<0.015
Sac. R.–Bend Br.	11/22/96	1330	7,660	13	129	9.7	7.8	52	4.4	5.4	<0.10	0.09
Sac. R.–Bend Br.	12/12/96	1700	43,900	12	111	11	7.8	50	2.2	4.6	<0.10	0.02
Sac. R.–Bend Br.	01/03/97	1230	91,000	10.5	104	11.4	7.9	43	1.7	4	<0.10	<0.015
Sac. R.–Bend Br.	05/30/97	1200	10,200	12.5	111	10.4	7.7	46	1.9	3.2	<0.10	<0.015
Sac. R.–Colusa	07/16/96	1300	11,300	19	117	9.3	8.1	52	2.2	3.3	<0.10	0.03
Sac. R.–Colusa	09/25/96	1300	9,240	17.5	123	9.4	7.8	54	2.5	4	<0.10	<0.015
Sac. R.–Colusa	11/14/96	1120	5,810	13.5	144	10.3	7.8	58	4.2	5.3	<0.10	<0.015
Sac. R.–Colusa	12/16/96	1330	33,400	11	130	10.6	7.9	55	3.4	4.8	<0.10	0.03
Sac. R.–Colusa	01/04/97	1300	50,200	11	100	9.5	7.7	42	1.9	4.2	<0.10	<0.015
Sac. R.–Colusa	06/03/97	1250	8,180	18	121	9.4	7.9	48	2.8	4.6	<0.10	<0.015
Sac. R.–Verona	07/18/96	1240	16,400	20.5	112	9.3	8	47	2.2	3.2	<0.10	0.03
Sac. R.–Verona	09/26/96	1200	12,300	19	147	9	7.8	63	4.1	5.9	<0.10	<0.015
Sac. R.–Verona	11/13/96	1030	9,990	13.5	146	10.8	7.8	57	5.8	5.3	<0.10	0.05
Sac. R.–Verona	12/18/96	1100	58,900	10.5	117	10.4	7.9	50	3	4.2	<0.10	<0.015
Sac. R.–Verona	01/28/97	1230	71,200	10	62	11	7.5	24	1.4	2.6	<0.10	0.03

**Table A3-1.** Field measurements and concentrations of anions, nutrients, and organic carbon—*Continued*

Site	Date (mm/dd/yy)	Time	Stream discharge, daily mean (ft <sup>3</sup> /s)	Water temper- ature (°C)	Specific conduct- ance, unfiltered (µS/cm)	Dissolved oxygen (mg/L)	pH, standarad units	Alkalinity, filtered (mg/L as CaCO <sub>3</sub> )	Chloride, filtered (mg/L)	Sulfate, filtered (mg/L)	Fluoride, filtered (mg/L)	Nitrogen, ammonia,, filtered (mg/L as N)
Sac. R.–Verona	06/04/97	1130	10,800	20	138	8.2	7.9	54	4.4	5.9	<0.10	<0.015
Sac. R.–Freeport	07/17/96	1100	20,200	20	101	9.2	7.8	—	2.3	3	<0.10	0.03
Sac. R.–Freeport	09/24/96	1130	14,900	19.5	149	8.8	7.8	62	5.9	6	<0.10	<0.015
Sac. R.–Freeport	11/15/96	1030	12,800	13	128	10.4	7.9	49	4.2	4.8	<0.10	<0.015
Sac. R.–Freeport	12/17/96	1130	75,400	11	98	10.5	7.6	42	2.4	3.4	<0.10	0.03
Sac. R.–Freeport	01/06/97	1100	93,700	9.5	51	7.7	7	21	1.1	1.7	<0.10	0.02
Sac. R.–Freeport	06/05/97	1030	13,200	20	115	8.6	8	46	3.9	4.3	<0.10	<0.015
Flat Cr.	12/11/96	1530	11	—	40	—	—	69	0.49	9.2	<0.10	<0.015
Flat Cr.	05/29/97	1600	1	25.5	175	6.4	6.7	—	1.5	55	0.11	<0.015
Spring Cr.–Weir	12/11/96	1400	200	11.5	129	10	4.4	—	0.5	57	<0.10	0.032
Spring Cr.–Weir	05/28/97	1100	10	20.5	495	8.7	4	—	0.57	230	<0.10	0.069
Spring Cr.–Road	01/02/97	1730	850	13	237	—	3.7	—	0.14	15	<0.10	0.048
Whiskeytown	12/11/96	1330	3,900	—	—	—	—	—	—	—	—	—
Whiskeytown	05/29/97	1410	2,720	—	—	—	—	—	—	—	—	—
Spring Cr. arm	07/12/96	1730	2,690	12	74	—	7.5	38	1	1.4	<0.10	<0.015
Spring Cr. arm	09/18/96	1500	2,460	11.5	75	10.2	7.6	35	1	1.6	<0.10	<0.015
Spring Cr. arm	11/20/96	1200	1,450	11.5	92	9.7	7.3	36	1.2	4.7	<0.10	0.02
Spring Cr. arm	12/11/96	1635	4,100	10.5	22	10.2	7.4	30	—	—	—	—
Spring Cr. arm	05/28/97	1400	2,725	11	81	9.6	7.5	—	1.1	2.8	<0.10	<0.015
Colusa Basin Drain	06/06/97	1110	500 (est)	23	712	6	8.1	200	37	92	0.4	—
Yolo Bypass	01/07/97	1400	160,000	9.5	93	—	7.2	41	2.2	3.5	<0.10	<0.015

**Table A3-1.** Field measurements and concentrations of anions, nutrients, and organic carbon—*Continued*

Site	Date (mm/dd/yy)	Time	Stream discharge, daily mean (ft <sup>3</sup> /s)	Nitrogen, ammonia plus organic, unfiltered (mg/L as N)	Nitrogen, ammonia plus organic, filtered (mg/L as N)	Nitrogen, nitrite, filtered (mg/L as N)	Nitrogen, nitrate plus nitrite, filtered (mg/L as N)	Phosphorus, unfiltered (mg/L as P)	Phosphorus, filtered (mg/L as P)	Phosphorus, ortho, filtered (mg/L as P)	Carbon, organic, filtered (mg/L as C)	Carbon, organic, suspended (mg/L as C)
Sac. R.—Shasta	07/12/96	1130	12,085	<0.20	<0.20	<0.01	0.13	0.03	0.02	0.03	1.2	0.4
Sac. R.—Shasta	09/19/96	1100	6,946	<0.20	<0.20	<0.01	0.13	0.02	0.02	0.03	1.1	0.2
Sac. R.—Shasta	11/19/96	1030	4,297	<0.20	<0.20	<0.01	0.1	0.03	0.01	0.02	0.9	0.2
Sac. R.—Shasta	12/12/96	1030	31,632	—	—	—	—	—	—	—	—	—
Sac. R.—Shasta	05/29/97	1030	6,513	<0.20	<0.20	<0.01	0.094	<0.010	<0.01	0.025	—	—
Sac. R.—Keswick	07/11/96	900	14,815	<0.20	<0.20	<0.01	0.12	<0.010	0.02	0.02	1.3	0.2
Sac. R.—Keswick	09/19/96	1800	9,503	<0.20	<0.20	<0.01	0.1	0.010	<0.01	0.02	1.1	<0.10
Sac. R.—Keswick	11/21/96	1200	5,294	<0.20	<0.20	0.01	0.1	0.020	<0.01	0.02	1.2	0.1
Sac. R.—Keswick	12/11/96	1730	35,269	—	—	—	—	—	—	—	—	—
Sac. R.—Keswick	01/02/97	1900	42,161	<0.20	<0.20	<0.01	0.09	<0.010	<0.01	<0.010	2.4	2.4
Sac. R.—Keswick	05/28/97	1730	9,938	<0.20	0.21	<0.01	0.079	<0.010	<0.01	0.016	—	—
Sac. R.—Bend Br.	07/11/96	1430	15,100	<0.20	<0.20	<0.01	0.12	0.130	<0.01	0.02	1.4	0.8
Sac. R.—Bend Br.	09/20/96	1300	9,500	<0.20	<0.20	<0.01	0.1	0.04	0.01	0.02	1.2	0.3
Sac. R.—Bend Br.	11/22/96	1330	7,660	<0.20	<0.20	0.02	0.25	0.03	0.03	0.03	1.6	0.3
Sac. R.—Bend Br.	12/12/96	1700	43,900	<0.20	<0.20	0.02	0.14	0.050	<0.01	0.02	1.5	0.4
Sac. R.—Bend Br.	01/03/97	1230	91,000	0.3	<0.20	<0.01	0.1	0.230	<0.01	<0.010	1.5	1.0
Sac. R.—Bend Br.	05/30/97	1200	10,200	<0.20	<0.20	<0.01	0.098	0.062	0.018	0.02	—	—
Sac. R.—Colusa	07/16/96	1300	11,300	<0.20	<0.20	<0.01	0.13	0.02	0.02	0.03	1.3	—
Sac. R.—Colusa	09/25/96	1300	9,240	<0.20	<0.20	0.02	0.13	0.040	<0.01	0.02	1.2	0.4
Sac. R.—Colusa	11/14/96	1120	5,810	<0.20	<0.20	<0.01	0.16	0.03	0.02	0.02	1.3	0.2
Sac. R.—Colusa	12/16/96	1330	33,400	<0.20	<0.20	<0.01	0.15	0.070	<0.01	0.02	1.4	—
Sac. R.—Colusa	01/14/97	1300	50,200	0.5	<0.20	<0.01	0.13	0.25	0.02	0.02	1.2	0.3
Sac. R.—Colusa	06/03/97	1250	8,180	<0.20	<0.20	<0.01	0.094	0.045	0.01	0.019	—	—
Sac. R.—Verona	07/18/96	1240	16,400	<0.20	<0.20	<0.01	0.11	0.020	<0.01	0.02	1.4	0.2
Sac. R.—Verona	09/26/96	1200	12,300	<0.20	<0.20	<0.01	0.1	0.04	0.02	0.02	1.4	0.4
Sac. R.—Verona	11/13/96	1030	9,990	<0.20	<0.20	0.03	0.17	0.04	0.04	0.03	1.9	0.4
Sac. R.—Verona	123/18/96	1100	58,900	<0.20	<0.20	0.01	0.13	0.050	<0.01	0.02	2	0.4
Sac. R.—Verona	01/28/97	1230	71,200	0.4	<0.20	<0.01	0.14	0.17	0.11	0.02	2.6	—
Sac. R.—Verona	06/04/97	1130	10,800	<0.20	<0.20	<0.01	0.12	0.040	<0.01	0.029	—	—

**Table A3-1.** Field measurements and concentrations of anions, nutrients, and organic carbon—*Continued*

Site	Date (mm/dd/yy)	Time	Stream discharge, daily mean (ft <sup>3</sup> /s)	Nitrogen, ammonia plus organic, unfiltered (mg/L as N)	Nitrogen, ammonia plus organic, filtered (mg/L as N)	Nitrogen, nitrite, filtered (mg/L as N)	Nitrogen, nitrate plus nitrite, filtered (mg/L as N)	Phosphorus, unfiltered (mg/L as P)	Phosphorus, filtered (mg/L as P)	Phosphorus, ortho, filtered (mg/L as P)	Carbon, organic, filtered (mg/L as C)	Carbon, organic, suspended (mg/L as C)
Sac. R.–Freeport	07/17/96	1100	20,200	<0.20	<0.20	<0.01	0.11	0.02	0.01	0.02	1.3	0.3
Sac. R.–Freeport	09/24/96	1130	14,900	<0.20	<0.20	0.02	0.14	0.040	<0.01	0.03	1.5	0.6
Sac. R.–Freeport	11/15/96	1030	12,800	<0.20	<0.20	<0.01	0.1	0.03	0.04	0.02	1.7	0.2
Sac. R.–Freeport	12/17/96	1130	75,400	<0.20	<0.20	<0.01	0.14	0.030	<0.01	0.01	2.2	0.6
Sac. R.–Freeport	01/06/97	1100	93,700	0.2	<0.20	<0.01	0.12	0.21	0.01	<0.010	2.1	1.4
Sac. R.–Freeport	06/05/97	1030	13,200	<0.20	<0.20	<0.01	0.23	0.033	<0.01	0.028	1.4	0.2
Flat Cr.	12/11/96	1530	11	<0.20	<0.20	0.014	0.063	<0.010	<0.01	<0.010	1.2	—
Flat Cr.	05/29/97	1600	1	<0.20	<0.20	<0.01	<0.05	<0.010	<0.01	<0.010	1.0	<0.10
Spring Cr.–Weir	12/11/96	1400	200	<0.20	<0.20	0.011	0.06	<0.010	<0.01	<0.010	1.2	—
Spring Cr.–Weir	12/18/96	1100	10	<0.20	<0.20	<0.01	<0.05	<0.010	<0.01	<0.010	0.4	—
Spring Cr.–Road	01/02/97	1730	850	<0.20	<0.20	<0.01	0.087	<0.010	<0.01	<0.010	0.9	0.2
Whiskeytown	12/11/96	1330	3,900	—	—	—	—	—	—	—	—	—
Whiskeytown	05/29/97	1410	2,720	—	—	—	—	—	—	—	—	—
Spring Cr. arm	07/12/96	1730	2,690	<0.20	<0.20	<0.01	<0.05	<0.010	<0.01	<0.010	1.4	0.2
Spring Cr. arm	09/18/96	1500	2,460	<0.20	<0.20	<0.01	0.07	<0.010	<0.01	0.01	1.2	0.2
Spring Cr. arm	11/20/96	1200	1,450	<0.20	<0.20	<0.01	<0.05	<0.010	<0.01	<0.010	1.1	0.3
Spring Cr. arm	12/11/96	1635	4,100	—	—	—	—	—	—	—	—	—
Spring Cr. arm	05/28/97	1400	2,725	<0.20	<0.20	<0.01	<0.05	<0.010	<0.01	<0.010	—	—
Colusa Basin Drain	06/06/97	1110	500 (est)	—	—	—	—	—	—	—	4.8	1.2
Yolo Bypass	01/07/97	1400	160,000	<0.20	<0.20	<0.01	0.13	0.070	<0.01	0.02	2.0	1.3

**Table A3-2.** Sampling site numbers, names, and locations

[Report site numbers refer to figure 8 and table 1; deg, degrees; min, minutes; sec, seconds; latitude and longitude referenced to NAD27; NAD27, North American Datum 1927; USGS, U.S. Geological Survey. All latitude values are N of the equator and all longitude values W of the central meridian]

Report site number	Site Name	USGS site identification number	Site latitude (deg min sec)	Site longitude (deg min sec)
1	Sacramento River below Shasta Dam, California	404259122252501	40°42'59"	122°25'25"
2	Sacramento River below Keswick Dam, California	403633122264301	40°36'33"	122°26'43"
3	Sacramento River at Rodeo Park, near Redding, California	403528122224301	40°35'28"	122°22'43"
4	Sacramento River above Churn Creek, near Anderson, California	402827122185801	40°28'27"	122°18'58"
5	Sacramento River at Balls Ferry	402507122113201	40°25'07"	122°11'32"
6	Sacramento River above Bend Bridge near Red Bluff, California	11377100	40°17'19"	122°11'08"
7	Sacramento River at Tehama, California	400139122070301	40°01'39"	122°07'03"
8	Sacramento River at Colusa, California	11389500	39°12'51"	121°59'57"
9	Sacramento River at Verona, California	11425500	38°46'28"	121°35'50"
10	Sacramento River at Tower Bridge at Sacramento, California	383430121302001	38°34'30"	121°30'20"
11	Sacramento River at Freeport, California	11447650	38°27'20"	121°30'07"
12	Flat Creek near Keswick, California	403824122264601	40°38'24"	122°26'46"
13	Spring Creek below Spring Creek Debris Dam near Keswick, California	403746122281201	40°37'46"	122°28'12"
14	Spring Creek below Iron Mountain Road near Keswick, California	403746122280301	40°37'46"	122°28'03"
15	Whiskeytown Lake at Spring Creek Power Plant near Keswick, California	403741122275901	40°37'41"	122°27'59"
16	Keswick Reservoir, Spring Creek arm, near Keswick, California	403750122272301	40°37'50"	122°27'23"
17	Cottonwood Creek near Cottonwood, California	11376000	40°23'14"	122°14'15"
18	Colusa Basin Drain at Road 99E near Knights Landing, California	11390890	38°48'45"	121°46'23"
19	Yolo Bypass at Interstate 80 near West Sacramento, California	11453120	38°34'01"	121°36'51"