



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
3310 El Camino Avenue, Suite 130
Sacramento, California 95821-6340

IN REPLY REFER TO:

FWS/EC-98-013

December 19, 1997

Mr. Gary Carlson
California Regional Water Quality Control Board
Central Valley Region
3443 Routier Road, Suite A
Sacramento, California 95827-3098

Subject: Exceedence of Selenium Criterion in Water Supply Channels in the San Luis National Wildlife Refuge Complex, Merced County

Dear Mr. Carlson:

The U. S. Fish and Wildlife Service is concerned that concentrations of selenium in the water supply of the San Luis National Wildlife Refuge Complex (Refuges) have exceeded the 2 $\mu\text{g/l}$ monthly mean standard a number of times since February of this year. Impounded wetland systems like those on the Refuges are very susceptible to adverse effects from moderately elevated concentrations of selenium in their water supply. Monthly mean concentrations of selenium above 2 $\mu\text{g/l}$ pose a threat to fish and wildlife on the refuges.

The site-specific aquatic life selenium chronic criterion of 2 $\mu\text{g/l}$ (monthly mean) was adopted by the Regional Water Quality Control Board (Regional Board) and approved by the U. S. Environmental Protection Agency for the Refuges, the Grassland Water District and the Los Banos State Wildlife Refuge by letter dated April 13, 1990. The importance of improving and maintaining water quality in the Grasslands area has also been reinforced by the Regional Board in a recently approved Basin Plan amendment. However, data provided by your agency to the Grassland Bypass Project monitoring program show that monthly mean selenium concentrations in water in Camp 13 Ditch, Agatha Canal, San Luis Canal, and Santa Fe Canal exceeded the 2 $\mu\text{g/l}$ standard during a number of months between February and August (see enclosed excerpts from draft Grassland Bypass Project Apr - Jun Quarterly Summary, October 9, 1997; Grassland Bypass Project Jan - Feb - Mar Quarterly Data Report; Grassland Bypass Project Monthly Data Report, June 1997; and draft Grassland Bypass Project Monthly Data Report, August 1997).

In the Camp 13 Ditch, monthly mean selenium concentrations were 3.43, 2.68, 4.12, and 2.25 $\mu\text{g/l}$ in March, April, May, and August respectively; in Agatha Canal the monthly mean in April was 2.28 $\mu\text{g/l}$; in the San Luis Canal, monthly means were 3.2, 2.14, and 2.25 $\mu\text{g/l}$ in April, May, and June respectively; and in the Santa Fe Canal, the monthly means were 2.5, 2.24, and 2.23 $\mu\text{g/l}$ in March, July and August respectively.

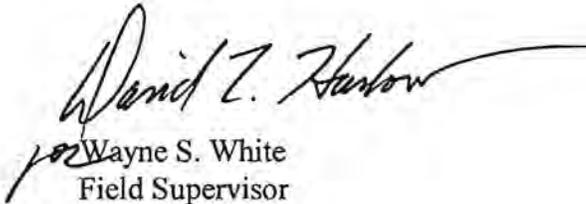
Mr. Gary Carlson

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Selenium concentrations in February far exceeded the 2 µg/l standard in Refuges water supply channels due to diversions of storm flows during the late January storm event. However, as you know, we are addressing that issue through another forum.

To avert adverse effects on fish and wildlife in the area and to fully realize the benefits of the Grassland Bypass Project, the sources of selenium causing exceedences need to be identified, and measures need to be taken to control those sources. I hope our agencies can continue to work together cooperatively towards these ends, with real results. If you have any questions, please contact Dr. Steve Schwarzbach, Mr. Tom Maurer, or Dr. Bill Beckon of my Environmental Contaminants Division at (916) 979-2110.

Sincerely,


Wayne S. White
Field Supervisor

Enclosure

cc: Gary Zahm, Manager, San Luis National Wildlife Refuge
Roger Patterson, U. S. Bureau of Reclamation
Tom Hagler, U. S. Environmental Protection Agency
Dan Nelson, California Department of Fish and Game
George Nokes, California Department of Fish and Game
Terry Young, Environmental Defense Fund

Table 12. Weekly water quality monitoring at Station H (San Joaquin River at Hills Ferry), 1997.

See Table 26 for explanation of footnotes and agency abbreviations.

PARAMETER	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	CYRWQCB	CYRWQCB	CYRWQCB	CYRWQCB	CYRWQCB
UNITS	°C		µS/cm	µg/l	mg/l
Jul-02-1997	22.7	8.1	1,741	10.0	P
Jul-10-1997	24.3	8.2	1,881	11.1	P
Jul-17-1997	25.4	7.7	1,820	7.5	P
Jul-24-1997	24.9	7.8	1,708	9.2	P
Jul-31-1997	23.2	6.6	1,408	5.4	P
Aug-07-1997	26.0	7.9	1,716	7.5	P
Aug-14-1997	25.4	7.5	1,584	8.0	P
Aug-21-1997	26.0	7.6	1,300	5.8	P
Aug-27-1997	27.7	8.0	1,376	4.9	P

Table 13. Weekly water quality monitoring at Station J (Camp 13 Ditch), 1997.

See Table 26 for explanation of footnotes and agency abbreviations.

PARAMETER	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	CYRWQCB	CYRWQCB	CYRWQCB	CYRWQCB	CYRWQCB
UNITS	°C		µS/cm	µg/l	mg/l
Jul-02-1997	NA	NA	563	1.1	P
Jul-09-1997	NA	NA	460	1.1	P
Jul-16-1997	NA	NA	614	1.6	P
Jul-23-1997	NA	NA	614	1.2	P
Jul-30-1997	NA	NA	1,110	2.2	P
Aug-06-1997	NA	NA	1,399	2.2	P
Aug-13-1997	NA	NA	815	3.5	P
Aug-20-1997	NA	NA	352	1.0	P
Aug-27-1997	NA	NA	459	2.3	P

Table 14. Weekly water quality monitoring at Station K (Agatha Canal), 1997.

See Table 26 for explanation of footnotes and agency abbreviations.

PARAMETER	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	CYRWQCB	CYRWQCB	CYRWQCB	CYRWQCB	CYRWQCB
UNITS	°C		µS/cm	µg/l	mg/l
Jul-02-1997	NA	NA	436	1.1	P
Jul-09-1997	NA	NA	396	1.0	P
Jul-16-1997	NA	NA	406	1.6	P
Jul-23-1997	NA	NA	419	1.6	P
Jul-30-1997	NA	NA	419	1.2	P
Aug-06-1997	NA	NA	373	1.5	P
Aug-13-1997	NA	NA	354	1.0	P
Aug-20-1997	NA	NA	368	1.5	P
Aug-27-1997	NA	NA	442	2.3	P

Table 15. Weekly water quality monitoring at Station L (San Luis Canal at Henry Miller Road), 1997.

See Table 26 for explanation of footnotes and agency abbreviations.

PARAMETER	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	CYRWQCB	CYRWQCB	CYRWQCB	CYRWQCB	CYRWQCB
UNITS	°C		µS/cm	µg/l	mg/l
Jul-02-1997	NA	NA	698	1.9	P
Jul-09-1997	NA	NA	917	2.5	P
Jul-16-1997	NA	NA	628	1.8	P
Jul-23-1997	NA	NA	762	2.1	P
Jul-30-1997	NA	NA	750	1.8	P
Aug-06-1997	NA	NA	886	2.0	P
Aug-13-1997	NA	NA	619	1.5	P
Aug-20-1997	NA	NA	781	2.0	P
Aug-27-1997	NA	NA	708	2.7	P

Table 16. Weekly water quality monitoring at Station M (Santa Fe Canal at Henry Miller Road), 1997.

See Table 26 for explanation of footnotes and agency abbreviations.

PARAMETER	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	CYRWQCB	CYRWQCB	CYRWQCB	CYRWQCB	CYRWQCB
UNITS	°C		µS/cm	µg/l	mg/l
Jul-02-1997	NA	NA	799	2.2	P
Jul-09-1997	NA	NA	946	2.6	P
Jul-16-1997	NA	NA	841	2.2	P
Jul-23-1997	NA	NA	797	2.1	P
Jul-30-1997	NA	NA	938	2.1	P
Aug-06-1997	NA	NA	976	2.2	P
Aug-13-1997	NA	NA	776	1.9	P
Aug-20-1997	NA	NA	825	2.1	P
Aug-27-1997	NA	NA	682	2.7	P

Table 17. Weekly water quality monitoring at Station N (San Joaquin River at Crow's Landing), 1997.

See Table 26 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	USGS	CYRWQCB	CYRWQCB	CYRWQCB	CYRWQCB	CYRWQCB
UNITS	cfs	°C		µS/cm	µg/l	mg/l
Jul-02-1997	618	21.0	7.9	1,247	4.8	P
Jul-10-1997	541	23.8	8.1	1,354	5.0	P
Jul-17-1997	541	24.3	7.6	1,230	4.0	P
Jul-24-1997	599	23.8	7.7	1,080	3.9	P
Jul-31-1997	620	23.2	6.9	1,281	4.8	P
Aug-07-1997	503	26.0	7.9	1,161	2.8	P
Aug-14-1997	581	25.4	7.3	1,085	4.5	P
Aug-21-1997	650	26.0	7.4	990	3.3	P
Aug-28-1997	NP	23.2	7.2	1,073	2.9	P

Table 12. Weekly water quality monitoring at Station H (San Joaquin River at Hills Ferry), 1997.

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	°C		µS/cm	µg/l	mg/l
Jan-09-1997	NA	NA	NA	NA	P
Jan-24-1997	11.0	7.6	548	1.1	P
Feb-07-1997	11.1	7.7	79	0.1	P
Feb-13-1997	13.2	8.2	76	0.2	P
Feb-21-1997	14.3	7.6	506	1.6	P
Feb-26-1997	12.1	7.7	473	1.4	P
Mar-05-1997	12.1	8.0	507	1.9	P
Mar-12-1997	16.0	7.3	968	3.9	P
Mar-20-1997	19.3	7.9	1,569	7.5	P
Mar-27-1997	21.0	7.3	1,831	7.0	P

Table 13. Weekly water quality monitoring at Station J (Camp 13 Ditch), 1997.

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	°C		µS/cm	µg/l	mg/l
Jan-09-1997	9.9	8.5	224	NA	P
Jan-21-1997	NA	NA	178	NA	P
Jan-27-1997	NA	NA	1,985	19.2	P
Feb-04-1997	14.3	7.6	1,600	23.4	P
Feb-12-1997	NA	NA	467	0.5	P
Feb-18-1997	13.2	7.9	172	0.3	P
Feb-27-1997	NA	NA	158	0.5	P
Mar-05-1997	14.3	6.6	1,380	2.0	P
Mar-12-1997	NA	NA	NA	2.8	P
Mar-19-1997	NA	NA	1,878	5.2	P
Mar-26-1997	NA	NA	3,760	3.7	P

Ave = 3.13

Table 14. Weekly water quality monitoring at Station K (Agatha Canal), 1997.

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	°C		µS/cm	µg/l	mg/l
Jan-09-1997	11.0	8.0	305	NA	P
Jan-21-1997	13.2	8.1	231	NA	P
Feb-04-1997	13.2	6.1	4,240	61.2	P
Feb-12-1997	NA	NA	295	0.5	P
Feb-18-1997	12.7	8.4	193	NA	P
Feb-21-1997	NA	NA	323	1.5	P
Mar-05-1997	NA	NA	187	0.8	P
Mar-12-1997	NA	NA	NA	0.5	P
Mar-19-1997	NA	NA	235	1.8	P
Mar-26-1997	NA	NA	317	1.0	P

Table 12. Weekly water quality monitoring at Station H (San Joaquin River at Hills Ferry), 1997.

See Table 26 for explanation of footnotes and agency abbreviations.

PARAMETER	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	°C		µS/cm	µg/l	mg/l
Apr-03-1997	13.8	7.9	2,270	11.4	1.7
Apr-10-1997	14.3	7.8	2,500	15.0	2.0
Apr-17-1997	20.4	7.6	2,670	18.0	2.1
Apr-24-1997	16.6	7.5	2,590	16.0	2.1
May-02-1997	18.8	8.2	2,340	15.8	2.0
May-08-1997	20.4	6.5	2,240	9.7	1.6
May-15-1997	27.1	8.2	2,700	15.3	2.1
May-23-1997	21.0	7.6	2,040	10.2	1.7
May-29-1997	26.6	8.1	1,984	13.0	P
Jun-05-1997	20.4	8.1	2,390	13.2	P
Jun-12-1997	24.3	8.3	2,410	11.3	P
Jun-19-1997	NA	NA	NA	NA	NA
Jun-25-1997	23.2	8.3	2,400	16.3	P

Table 13. Weekly water quality monitoring at Station J (Camp 13 Ditch), 1997.

See Table 26 for explanation of footnotes and agency abbreviations.

PARAMETER	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	°C		µS/cm	µg/l	mg/l
Apr-02-1997	NA	NA	3,750	4.7	6.5
Apr-09-1997	NA	NA	560	1.7	0.3
Apr-16-1997	NA	NA	1,288	2.7	1.6
Apr-23-1997	NA	NA	480	1.6	0.3
May-01-1997	NA	NA	955	2.6	1.0
May-07-1997	NA	NA	1,207	13.5	1.1
May-14-1997	NA	NA	520	1.0	0.3
May-21-1997	NA	NA	496	1.0	0.3
May-28-1997	NA	NA	715	2.5	P
Jun-04-1997	NA	NA	1,186	2.3	P
Jun-11-1997	NA	NA	703	1.5	P
Jun-18-1997	NA	NA	519	1.4	P
Jun-25-1997	NA	NA	1,392	2.3	P

Table 14. Weekly water quality monitoring at Station K (Agatha Canal), 1997.

See Table 26 for explanation of footnotes and agency abbreviations.

PARAMETER	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	°C		µS/cm	µg/l	mg/l
Apr-02-1997	NA	NA	457	3.0	0.3
Apr-09-1997	NA	NA	661	2.0	0.4
Apr-16-1997	NA	NA	559	2.6	0.3
Apr-23-1997	NA	NA	481	1.5	0.3
May-01-1997	NA	NA	520	1.5	0.3
May-07-1997	NA	NA	547	1.1	0.3
May-14-1997	NA	NA	497	1.3	0.3
May-21-1997	NA	NA	486	1.0	0.3
May-28-1997	NA	NA	504	1.1	P
Jun-04-1997	NA	NA	481	1.7	P
Jun-11-1997	NA	NA	476	1.3	P
Jun-18-1997	NA	NA	484	1.2	P
Jun-25-1997	NA	NA	423	1.1	P

Table 15. Weekly water quality monitoring at Station L (San Luis Canal at Henry Miller Road), 1997.

See Table 26 for explanation of footnotes and agency abbreviations.

PARAMETER	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	°C		µS/cm	µg/l	mg/l
Apr-02-1997	NA	NA	1,820	3.6	2.3
Apr-09-1997	NA	NA	1,550	2.7	1.8
Apr-16-1997	NA	NA	1,114	3.2	0.9
Apr-23-1997	NA	NA	1,122	3.3	1.1
May-01-1997	NA	NA	860	3.0	0.8
May-07-1997	NA	NA	775	2.3	0.6
May-14-1997	NA	NA	803	1.6	0.6
May-21-1997	NA	NA	908	1.9	0.9
May-28-1997	NA	NA	848	1.9	P
Jun-04-1997	NA	NA	909	2.6	P
Jun-11-1997	NA	NA	798	2.1	P
Jun-18-1997	NA	NA	813	2.2	P
Jun-25-1997	NA	NA	860	2.1	P

Figure 7. Selenium concentrations (ug/l) at station F (Salt Slough) and in the wetland water supply channels at station J, station K, station L, and station M. Data from weekly grab samples.

