Water Quality Appendix

USE ATTAINABILITY ANALYSIS
West Squaw Creek Watershed
Shasta County, California

Water Quality Appendix

VES MEMORANDUM

Date: October 21, 2003

To: Scott Miller
Norm Johnson

From: John Andrews

Re: Metal Loading
West Squaw Creek
Shasta Mining District

BACKGROUND

The following analysis was conducted to estimate metal loading to West Squaw Creek. The analysis was conducted using historic data collected between 1939 and 2003.

Surface water data collected within the West Squaw Creek watershed is maintained in an ACCESS database. Through August 2003, the database includes more than 10,000 records from more than 70 sample locations. The majority of the records represents pH, copper, zinc, cadmium and flow data collected from 11 sample locations identified in discharge permits issued by the RWQCB since 1978. A visual representation of the database records is presented in Figures 1 through 4.

The number of pH, copper, zinc, cadmium and flow records from the surface water sample locations within the West Squaw Creek watershed are summarized by year in Figure 1. In general, the annual distribution of samples reflects the occurrence of one time studies or RWQCB permit requirements. This distribution includes:

- 1940 to 1941 — DFG study by Shaw (1941)
- 1968 to 1969 — DWR (1969) and Hansen and Weidlein (1974)
- 1982 to 1983 — DWR (1983)
- 1986 to 1990 — 1986 NPDES Permit
- 1991 to 1995 — 1991 NPDES Permit
- 1996 to 2002 — 1996 NPDES Permit

Overall, 75 percent of the database records represent results from 11 locations sampled for regulatory compliance. The annual distribution of data from these sites is shown in Figure 2.

The annual distribution of data from the West Squaw Creek bridge, one of the locations sampled for regulatory compliance, is shown in Figure 3. The West Squaw Creek bridge is located at the confluence of West Squaw Creek and Shasta Lake. Overall, more than 10 percent of the database records represent results from this location.

A more detailed breakdown of data from the West Squaw Creek bridge is shown in Figure 4. Between January and August 2003, 10 surface water samples from this location were analyzed for copper, pH was recorded seven times, and flow was recorded three times.

Surface water locations sampled for regulatory compliance generally include portal discharge and receiving water locations such as the West Squaw Creek bridge. Regulatory compliance locations are summarized in Table 1.

MASS LOADING SUMMARY

Bulkhead seals have been installed in three Keystone portals, Upper Windy Camp portal, Balaklala portal, Shasta King portal, Early Bird portal and Weil portal. Discharge from the Upper Windy Camp portal is collected in an anoxic limestone drain. MRRC is in the process of designing an additional system to further treat this discharge. Additionally, when the Keystone bulkhead seal was installed, a blowout occurred upslope. To control flow from the blowout, water is allowed to exit the bulkhead seal through a pipe. This water is treated in the Keystone wetlands. Residual discharge from the anoxic limestone drain and Keystone blowout is scheduled to be treated.

In accordance with the current NPDES permit, the success of a bulkhead seal is determined by comparing pre-seal mass loading with post-seal mass loading. The success of the bulkhead seals installed in the West Squaw Creek watershed is summarized in Tables 2 through 4. Data and assumptions used to develop these tables are attached. In general, mass loading was estimated using paired concentration and flow data.

As measured at the portals, copper loading has decreased 97 percent, zinc loading has decreased 93 percent, and cadmium loading has decreased 95 percent. The corresponding reductions observed in the receiving waters at the West Squaw Creek bridge are 92 percent for copper, 68 percent for zinc, and 81 percent for cadmium.

Additional reduction will be realized when discharge from the blowout and the Upper Windy Camp portal are routed through a treatment unit.

CONCENTRATION SUMMARY

Average annual dissolved copper, cadmium and zinc concentrations for the West Squaw Creek bridge sampling location are presented in Figures 5 through 7. The results show a consistent downward trend since the initial Waste Discharge Requirements were issued by the RWQCB 25 years ago, in 1978.

Based on the regression equation shown on each figure, dissolved copper has decreased from an average of 1,600 ug/l in 1978 to 140 ug/l in 2003. Similarly, dissolved zinc has decreased from 2,300 ug/l in 1978 to 360 ug/l in 2003, and dissolved cadmium has decreased from 15 ug/l in 1978 to 2.5 ug/l in 2003. These values represent a 92 percent decrease in copper, 84 percent decrease in zinc, and 83 percent decrease in cadmium.

REFERENCES

DWR. 1969. *Squaw Creek copper investigation: Memorandum report.* California Department of Water Resources.

DWR. 1983. *Quantification of acid mine discharges from mine portals and dumps at Balaklala, Keystone and Shasta King Mines.* California Department of Water Resources.

Hansen, R.J. and W.D. Weidlein. 1974. *Investigation of mine drainage related to fish kills in the Little Squaw Creek Arm of Shasta Lake, Shasta County, California.* California Department of Fish and Game, Administrative Report 74-2.

Shaw, P. 1941. *Mine tunnel drainage in the Shasta Reservoir area.* California Division of Fish and Game.

Table 1
REGULATORY SAMPLE LOCATIONS
WEST SQUAW CREEK WATERSHED

Permit ID[1]	Database ID	Location	Permit
004	Key 3.4	Main Keystone Portal	NPDES
010	Windy 5.1	Lower Windy Camp (Balaklala 11) Portal	NPDES
011	Squaw 8.1	Lower Shasta King Portal	NPDES
012	Early 1.1	Early Bird Portal	NPDES
013	Weil 2.1	Main Weil Portal	NPDES
015	Windy 2	Left Branch Windy Creek	RWQCB Request
016	Windy 2.1	Right Branch Windy Creek	RWQCB Request
017	Windy 9	Windy Creek Downstream	RWQCB Request
018	Windy 5	Upper Windy Camp Portal	RWQCB Request
R-5	Squaw 1	West Squaw Creek Upstream	NPDES
R-6	Squaw 15	West Squaw Creek at Bridge	NPDES

Notes:
[1] Permit ID sample designations are not sequential because the West Squaw Creek watershed is included in a NPDES permit that includes other MRRC properties outside the watershed.

Table 2
DISSOLVED COPPER LOADING SUMMARY
WEST SQUAW CREEK WATERSHED[1]

Location	Pre-Plug Loading[2] (lb/day)	Current Loading[3] (lb/day)	Current Percent Reduction	Anticipated 2004 Loading[4] (lb/day)	Anticipated 2004 Percent Reduction
Early Bird Portal	4.90	0.00	100	0.00	100
Main Keystone Portal	8.80	0.04	100	0.04	100
Keystone Blowout	0.00	2.24	---	0.02	99
Upper Windy Camp Portal	3.30	3.30	0	0.03	99
Lower Windy Camp (Balaklala 11) Portal	30.60	0.40	99	0.40	99
Main Weil Portal	227.00	0.00	100	0.00	100
Lower Shasta King Portal	5.36	2.68	50	1.34	75
Portal Total	280	9	97	2	99
Portal Percent	92	38	—	11	---
Non-Portal Total	25	14	43	14	43
Non-Portal Percent	8	62	---	89	---
West Squaw Total	305	23	92	16	95

Notes:
[1] See data summaries for additional details such as number of samples, etc.
[2] Pre-Plug Loading represents mass loading prior to the installation of the bulkhead seals.
[3] Current Loading represents mass loading between 2000 and August 2003, except in the case of the Keystone portal where the treatment unit did not come online until 2001.
[4] Anticipated 2004 Loading represents estimated mass loading after treatment facilities for the Keystone blowout and Upper Windy Camp portal come online.

Table 3
DISSOLVED ZINC LOADING SUMMARY
WEST SQUAW CREEK WATERSHED[1]

Location	Pre-Plug Loading[2] (lb/day)	Current Loading[3] (lb/day)	Current Percent Reduction	Anticipated 2004 Loading[4] (lb/day)	Anticipated 2004 Percent Reduction
Early Bird Portal	2.70	0.00	100	0.00	100
Main Keystone Portal	11.30	7.52	33	2.63	77
Keystone Blowout	0.00	2.44	---	0.85	65
Upper Windy Camp Portal	6.42	6.42	0	2.25	65
Lower Windy Camp (Balaklala 11) Portal	41.10	0.70	98	0.70	98
Main Weil Portal	211.00	0.00	100	0.00	100
Lower Shasta King Portal	5.06	2.53	50	1.27	75
Portal Total	278	20	93	8	97
Portal Percent	68	15	---	6	—
Non-Portal Total	131	111	15	111	15
Non-Portal Percent	32	85	---	94	—
West Squaw Total	409	131	68	119	71

Notes:
[1] See data summaries for additional details such as number of samples, etc.
[2] Pre-Plug Loading represents mass loading prior to the installation of the bulkhead seals.
[3] Current Loading represents mass loading between 2000 and August 2003, except in the case of the Keystone portal where the treatment unit did not come online until 2001.
[4] Anticipated 2004 Loading represents estimated mass loading after treatment facilities for the Keystone blowout and Upper Windy Camp portal come online.

Table 4
DISSOLVED CADMIUM LOADING SUMMARY
WEST SQUAW CREEK WATERSHED[1]

Location	Pre-Plug Loading[2] (lb/day)	Current Loading[3] (lb/day)	Current Percent Reduction	Anticipated 2004 Loading[4] (lb/day)	Anticipated 2004 Percent Reduction
Early Bird Portal	0.02	0.00	100	0.00	100
Main Keystone Portal	0.11	0.01	94	0.01	94
Keystone Blowout	0.00	0.02	---	0.00	99
Upper Windy Camp Portal	0.04	0.04	0	0.00	99
Lower Windy Camp (Balaklala 11) Portal	0.21	0.00	98	0.00	98
Main Well Portal	1.20	0.00	100	0.00	100
Lower Shasta King Portal	0.03	0.02	50	0.01	75
Portal Total	1.60	0.09	95	0.02	99
Portal Percent	47	14	---	3	---
Non-Portal Total	1.80	0.55	69	0.55	69
Non-Portal Percent	53	86	---	97	---
West Squaw Total	3.40	0.64	81	0.57	83

Notes:
[1] See data summaries for additional details such as number of samples, etc.
[2] Pre-Plug Loading represents mass loading prior to the installation of the bulkhead seals.
[3] Current Loading represents mass loading between 2000 and August 2003, except in the case of the Keystone portal where the treatment unit did not come online until 2001.
[4] Anticipated 2004 Loading represents estimated mass loading after treatment facilities for the Keystone blowout and Upper Windy Camp portal come online.

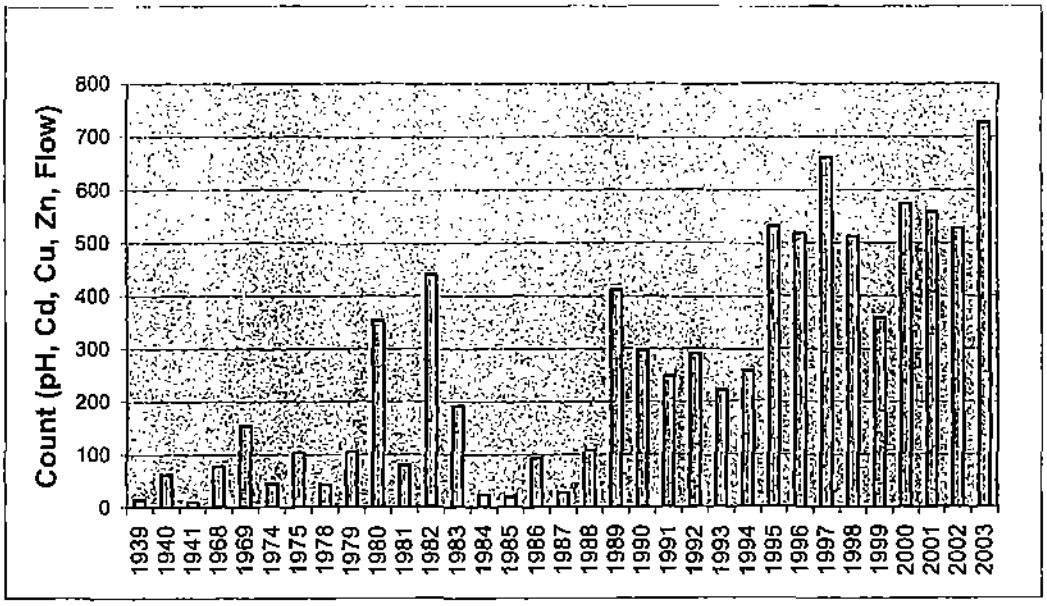


Figure 1 – Annual Number of pH, Cd, Cu, Zn and Flow Samples
All Sample Locations

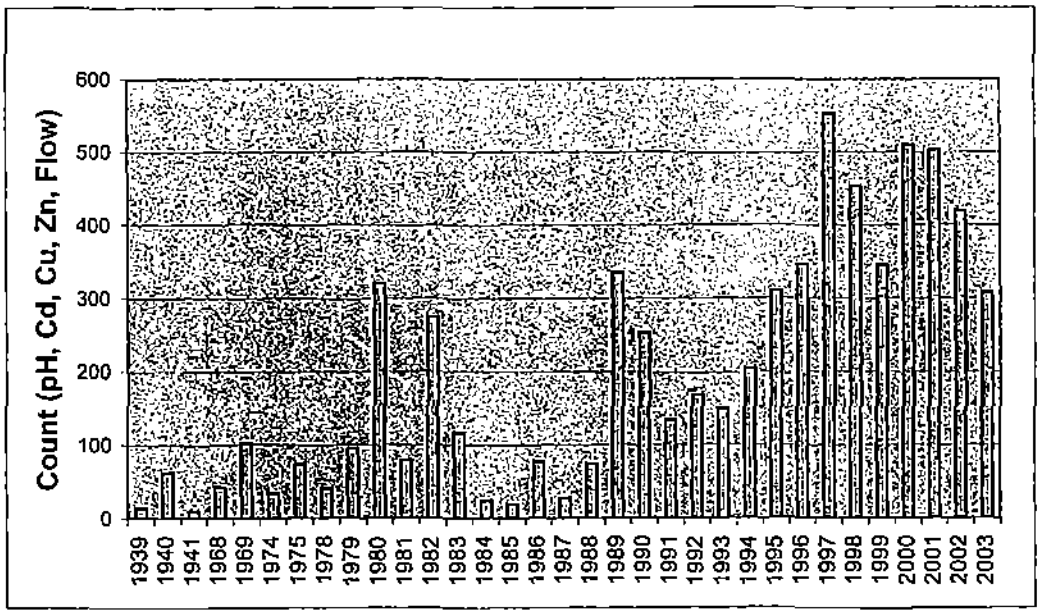


Figure 2 – Annual Number of pH, Cd, Cu, Zn and Flow Samples
NPDES Sample Locations

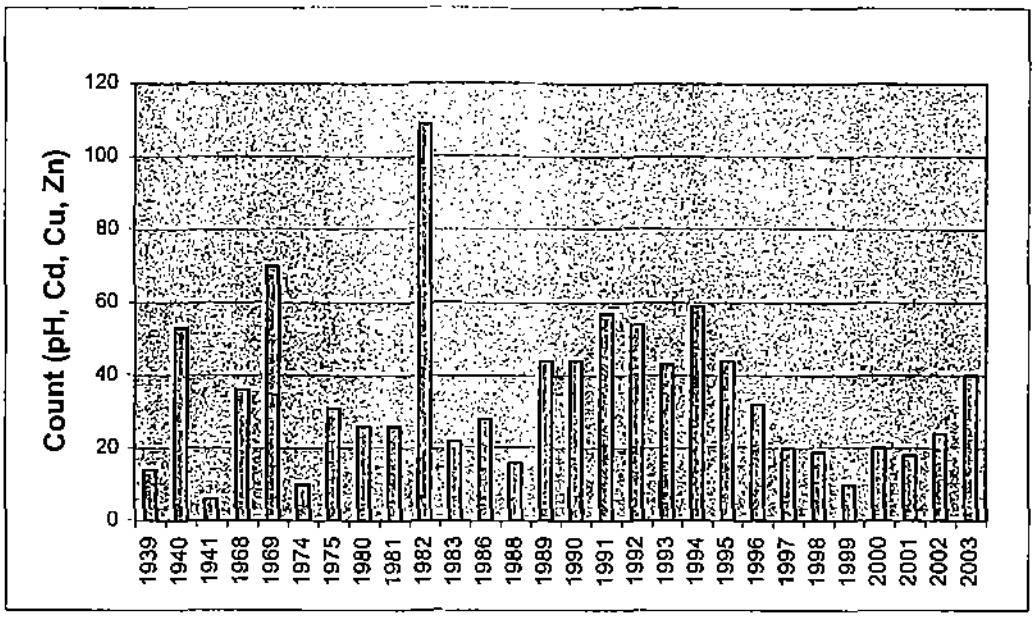


Figure 3 – Annual Number of pH, Cd, Cu, Zn and Flow Samples
West Squaw Creek Bridge

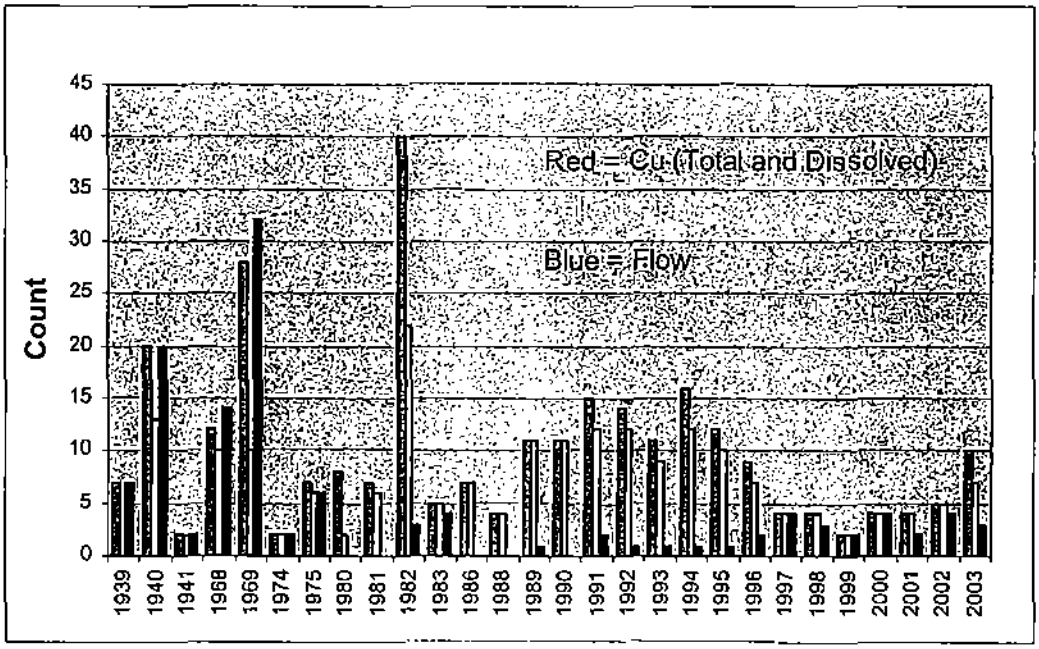


Figure 4 – Annual Number of pH, Cu and Flow Samples
West Squaw Creek Bridge

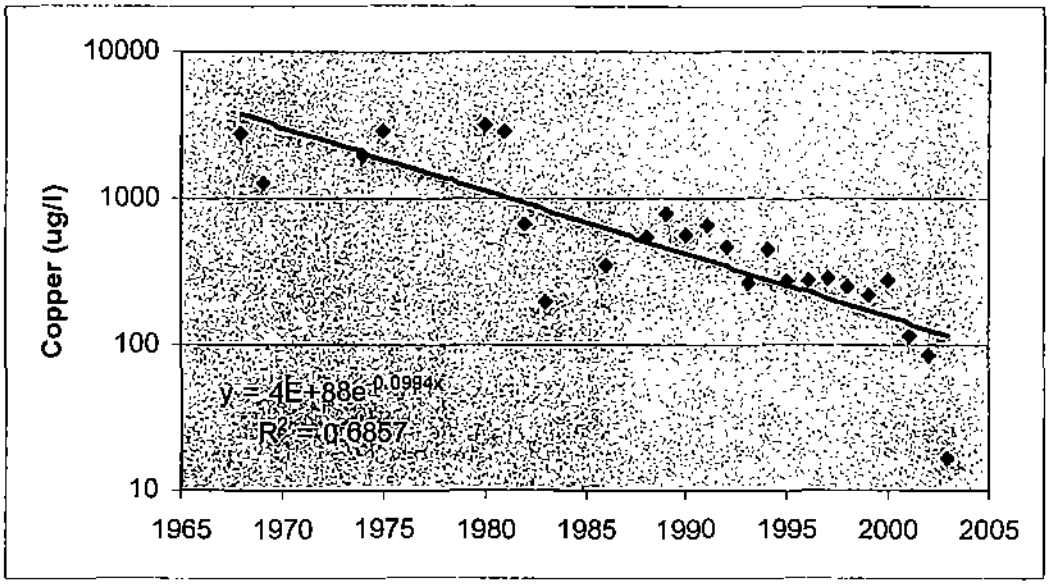


Figure 5 – Annual Dissolved Cu Concentration
West Squaw Creek Bridge

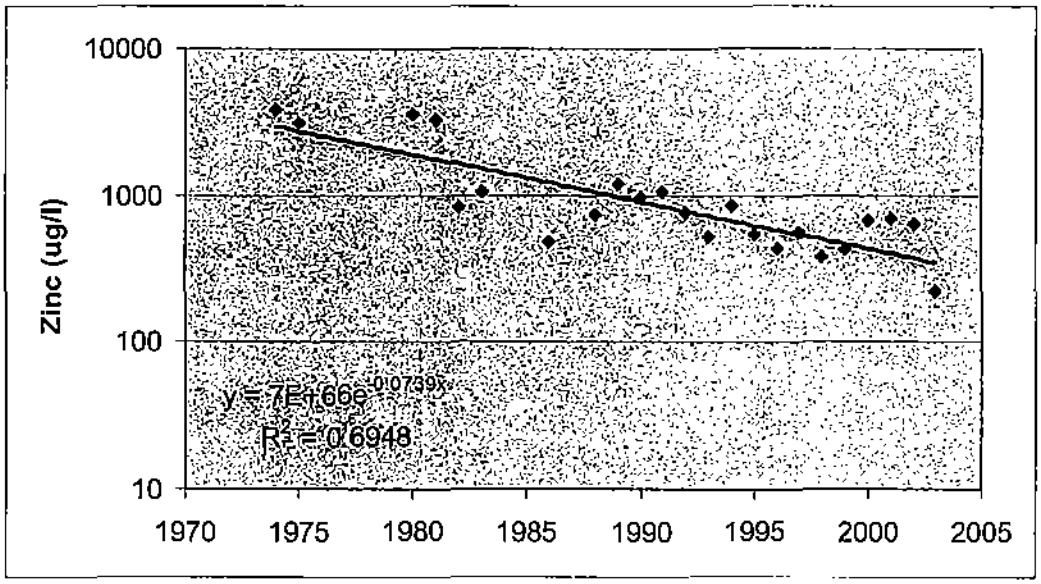


Figure 6 – Annual Dissolved Zn Concentration
West Squaw Creek Bridge

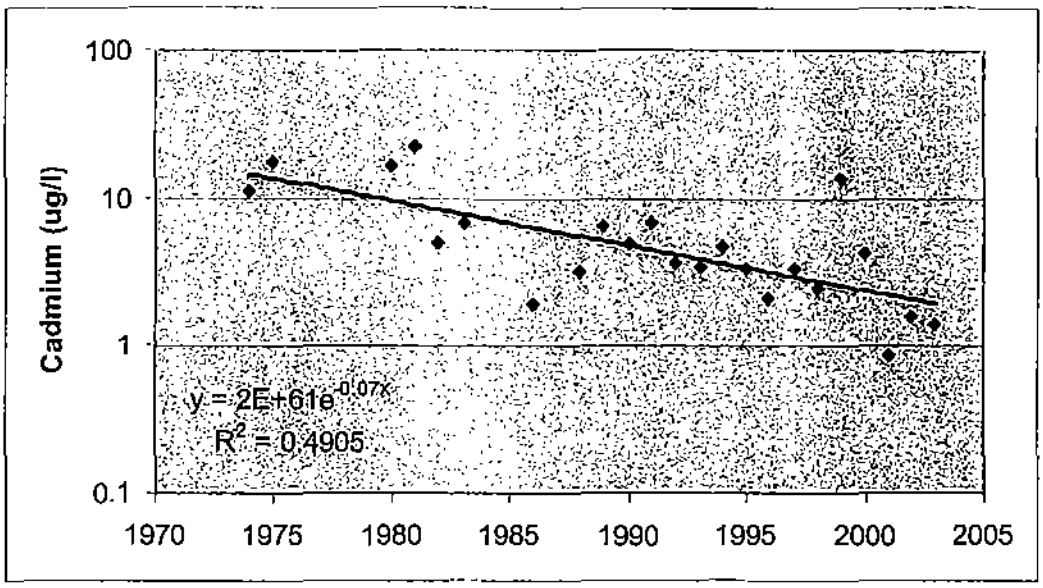


Figure 7 – Annual Dissolved Cd Concentration
West Squaw Creek Bridge

West Squaw Creek Bridge
Dissolved Metal and Flow Data

West Squaw Creek Bridge Concentration = ug/l

Dissolved Metal Data 1968 to 2003 Flow = gpm

Well ID	Date	Wel Reg ID	pH	Cd Diss	Cu Diss	Zn Diss	Flow
Squaw-15	20-Sep-68	R-6	2.8		6460		4439
Squaw-15	11-Oct-68	R-6			2360		4439
Squaw-15	14-Oct-68	R-6	2.7		3920		4439
Squaw-15	15-Oct-68	R-6	2.8		3800		4439
Squaw-15	31-Oct-68	R-6	2.8		3790		4439
Squaw-15	12-Nov-68	R-6	3.1		2100		5073
Squaw-15	14-Nov-68	R-6					3994
Squaw-15	18-Nov-68	R-6	3.1		1760		7926
Squaw-15	22-Nov-68	R-6	2.9		3320		3329
Squaw-15	09-Dec-68	R-6	3		1920		7926
Squaw-15	11-Dec-68	R-6			1820		26631
Squaw-15	16-Dec-68	R-6	3.5		960		57701
Squaw-15	19-Dec-68	R-6					23339
Squaw-15	30-Dec-68	R-6	3.1		1310		16011
Squaw-15	06-Jan-69	R-6	3.3		900		25680
Squaw-15	13-Jan-69	R-6	3.2		930		466049
Squaw-15	14-Jan-69	R-6	3.1		1400		76724
Squaw-15	16-Jan-69	R-6					58344
Squaw-15	24-Jan-69	R-6					94248
Squaw-15	29-Jan-69	R-6					66422
Squaw-15	09-Feb-69	R-6	3.5		530		144253
Squaw-15	24-Feb-69	R-6	3.6		860		57701
Squaw-15	25-Feb-69	R-6	3.2		800		55482
Squaw-15	13-Mar-69	R-6	3.6		1030		33289
Squaw-15	19-Mar-69	R-6			900		46129
Squaw-15	21-Mar-69	R-6	3		1000		44378
Squaw-15	03-Apr-69	R-6	2.9		710		59921
Squaw-15	08-Apr-69	R-6			180		54214
Squaw-15	21-Apr-69	R-6					32314
Squaw-15	23-Apr-69	R-6			820		8402
Squaw-15	24-Apr-69	R-6			710		26631
Squaw-15	26-Apr-69	R-6			1120		72761
Squaw-15	01-May-69	R-6					17952
Squaw-15	02-May-69	R-6					18042
Squaw-15	06-May-69	R-6			1080		14584
Squaw-15	09-May-69	R-6					14362
Squaw-15	23-May-69	R-6					8393
Squaw-15	06-Jun-69	R-6			1680		6182
Squaw-15	09-Jun-69	R-6					6283
Squaw-15	13-Jun-69	R-6			1690		5390
Squaw-15	20-Jun-69	R-6			2050		4439
Squaw-15	23-Jun-69	R-6	3.2				6732
Squaw-15	27-Jun-69	R-6			2220		40423
Squaw-15	09-Jul-69	R-6			2320		4439
Squaw-15	28-Jul-69	R-6			3780		4439
Squaw-15	06-Nov-69	R-6					4039
Squaw-15	21-Oct-74	R-6	3				3150
Squaw-15	05-Nov-74	R-6	3.82	11	2000	3800	216
Squaw-15	11-Jan-75	R-6	3.52				22000

West Squaw Creek Bridge Concentration = ug/l

Dissolved Metal Data 1968 to 2003 Flow = gpm

Well ID	Date	Well Reg ID	pH	Cd_Diss	Cu_Diss	Zn_Diss	Flow
Squaw-15	07-Feb-75	R-6	4.11				60000
Squaw-15	11-Mar-75	R-6	4.37				50000
Squaw-15	10-Apr-75	R-6	4.02	4.7	650	630	55206
Squaw-15	30-Jun-75	R-6	3.2				6000
Squaw-15	18-Sep-75	R-6	3	30	5100	5600	2693
Squaw-15	01-May-80	R-6	3.5	8	1700	1800	
Squaw-15	07-May-80	R-6	3.51	5	1370	1430	
Squaw-15	16-May-80	R-6		20	4260	4950	
Squaw-15	27-Jun-80	R-6		10	2360	2650	
Squaw-15	16-Jul-80	R-6		20	3170	3450	
Squaw-15	19-Aug-80	R-6		20	4200	4800	
Squaw-15	20-Oct-80	R-6		20	4090	4420	
Squaw-15	01-Nov-80	R-6		30	4400	4600	
Squaw-15	29-Apr-81	R-6	3.51	5	1260	1320	
Squaw-15	01-Jun-81	R-6	3	20	3400	3800	
Squaw-15	01-Jul-81	R-6	3.1	30	4200	5000	
Squaw-15	01-Aug-81	R-6	3.1	30	4200	5000	
Squaw-15	01-Sep-81	R-6	3	40	4800	5600	
Squaw-15	01-Nov-81	R-6			1270	1030	
Squaw-15	01-Dec-81	R-6	3.5	10	920	900	
Squaw-15	15-Jan-82	R-6	3.5	5	920	1000	
Squaw-15	29-Jan-82	R-6	3.84	1.5	780	756	
Squaw-15	18-Feb-82	R-6	3.87	2.5	590	600	
Squaw-15	25-Feb-82	R-6	3.71	2.5	860	860	
Squaw-15	02-Mar-82	R-6	4.8	3.4	350	370	
Squaw-15	08-Mar-82	R-6	6.2	5	160	200	
Squaw-15	11-Mar-82	R-6	6.2	5	160	200	
Squaw-15	19-Mar-82	R-6	7.1	2.5	220	250	
Squaw-15	08-Apr-82	R-6	5.6	2.5	176	239	
Squaw-15	23-Apr-82	R-6	5.8	7	97	316	
Squaw-15	10-May-82	R-6	6.2	5	185	342	
Squaw-15	20-May-82	R-6	6.1	2.5	233	484	
Squaw-15	26-May-82	R-6	6.2	2.5	160	450	
Squaw-15	04-Jun-82	R-6	6.2		140	400	
Squaw-15	15-Jun-82	R-6	5.8	2.5	200	530	
Squaw-15	13-Jul-82	R-6	5	5	480	670	
Squaw-15	01-Sep-82	R-6	2.95		5100	5900	
Squaw-15	20-Sep-82	R-6	4.2	10	815	1178	
Squaw-15	29-Oct-82	R-6	4.4	10	820	1100	3393
Squaw-15	05-Nov-82	R-6		5	800	1100	
Squaw-15	23-Nov-82	R-6	4.86	10	560	630	10502
Squaw-15	29-Dec-82	R-6	5.15	5	480	540	22171
Squaw-15	30-Dec-82	R-6	3.5	10	920	900	
Squaw-15	27-Jan-83	R-6	6.33	5	160	120	493680
Squaw-15	28-Feb-83	R-6	4.52	5	160	860	897600
Squaw-15	01-Mar-83	R-6	4.58	10	250	2400	700128
Squaw-15	21-Apr-83	R-6	5.7				35814
Squaw-15	14-Jun-83	R-6	5	8	210	860	
Squaw-15	25-Mar-86	R-6	6.9	0.1	180	190	

West Squaw Creek Bridge Concentration = ug/l

Dissolved Metal Data 1968 to 2003 Flow = gpm

Well ID	Date	Well Reg ID	pH	Cd_Diss	Cu_Diss	Zn_Diss	Flow
Squaw-15	03-Apr-86	R-6	6.9	2.1	210	250	
Squaw-15	13-May-86	R-6	5.3	3	440	750	
Squaw-15	20-May-86	R-6	7.1	1.2	190	280	
Squaw-15	29-May-86	R-6	6.9	1.2	260	350	
Squaw-15	04-Jun-86	R-6	5.3	3.3	650	740	
Squaw-15	19-Jun-86	R-6	5	2.2	490	810	
Squaw-15	27-Jan-88	R-6	5.87	0.5	270	360	
Squaw-15	26-May-88	R-6	5.17	2.7	520	670	
Squaw-15	10-Jun-88	R-6	5.33	3.3	510	680	
Squaw-15	27-Jun-88	R-6	4.05	6	878	1200	
Squaw-15	13-Mar-89	R-6	5.07	4	591	648	
Squaw-15	09-Apr-89	R-6	6.26	1	287	391	
Squaw-15	16-Apr-89	R-6	5.5				
Squaw-15	28-Apr-89	R-6			800	1340	3092
Squaw-15	04-May-89	R-6	6.37	4	305	452	
Squaw-15	31-May-89	R-6	4.8	4	419	770	
Squaw-15	09-Jul-89	R-6	4.7	5	539	1020	
Squaw-15	31-Jul-89	R-6	4.37	6	1290	620	
Squaw-15	01-Sep-89	R-6	4.35	8	665	1370	
Squaw-15	02-Oct-89	R-6	5.33	5	565	1120	
Squaw-15	01-Nov-89	R-6	3.51	24	2660	4520	
Squaw-15	04-Dec-89	R-6	4.58	5	568	949	
Squaw-15	02-Jan-90	R-6	4.59	6	582	999	
Squaw-15	05-Feb-90	R-6	5.02	4	476	624	
Squaw-15	06-Mar-90	R-6	5.75	3	368	518	
Squaw-15	04-Apr-90	R-6	5.31	4	415	691	
Squaw-15	02-May-90	R-6	5.06	5	466	813	
Squaw-15	05-Jun-90	R-6	6.26	1	243	331	
Squaw-15	05-Jul-90	R-6	5.82	3	337	563	
Squaw-15	06-Aug-90	R-6	4.78	5	510	942	
Squaw-15	01-Oct-90	R-6	4.7	6	565	1170	
Squaw-15	01-Nov-90	R-6	4.08	11	1490	2540	
Squaw-15	04-Dec-90	R-6	4.93	6	662	1230	
Squaw-15	03-Jan-91	R-6	4.9	5	545	1010	
Squaw-15	06-Feb-91	R-6	4.83	4	556	818	
Squaw-15	06-Mar-91	R-6	4.74	3	445	513	
Squaw-15	01-Apr-91	R-6			1000	1300	4488
Squaw-15	03-Apr-91	R-6	5.08	18	390	470	
Squaw-15	17-Apr-91	R-6	3.7	5	1000	1300	4436
Squaw-15	01-May-91	R-6	6.36	4	356	563	
Squaw-15	01-Jun-91	R-6	5.5	4	460	757	
Squaw-15	01-Jul-91	R-6	4.67	5	575	1000	
Squaw-15	01-Aug-91	R-6	4.39	7	696	1360	
Squaw-15	01-Sep-91	R-6	4.28	9	768	1560	
Squaw-15	09-Sep-91	R-6		10	730		
Squaw-15	01-Oct-91	R-6	4.2	7	727	1500	
Squaw-15	14-Oct-91	R-6		8	660	1400	
Squaw-15	04-Nov-91	R-6	4.66	8	698	1390	
Squaw-15	02-Jan-92	R-6	4.73	5	585	860	

West Squaw Creek Bridge Concentration = ug/l

Dissolved Metal Data 1968 to 2003 Flow = gpm

Well ID	Date	Well Reg ID	pH	Cd Diss	Cu Diss	Zn Diss	Flow
Squaw-15	17-Jan-92	R-6		5	700	870	2046
Squaw-15	01-Feb-92	R-6	4.79	4	615	854	
Squaw-15	02-Mar-92	R-6	6.91	1	231	292	
Squaw-15	01-Apr-92	R-6	6.81	1	214	283	
Squaw-15	01-May-92	R-6	6.96	1	280	392	
Squaw-15	15-May-92	R-6			250	430	
Squaw-15	01-Jun-92	R-6	6.74	3	315	540	
Squaw-15	01-Jul-92	R-6	5.8	1	305	431	
Squaw-15	10-Aug-92	R-6	4.84	4	498	998	
Squaw-15	15-Sep-92	R-6	4.81	7	650	1390	
Squaw-15	12-Oct-92	R-6	4.72	7	674	1420	
Squaw-15	12-Nov-92	R-6	4.89	6.1	599	1120	
Squaw-15	16-Dec-92	R-6	4.83	3.2	516	617	
Squaw-15	30-Apr-93	R-6	6.66	1	182	304	
Squaw-15	04-May-93	R-6		5	190	390	12663
Squaw-15	14-May-93	R-6	6.99	2.7	157	274	
Squaw-15	11-Jun-93	R-6	6.93	2.2	174	292	
Squaw-15	23-Jun-93	R-6		5	190	360	
Squaw-15	14-Jul-93	R-6	6.92	2.9	242	487	
Squaw-15	16-Aug-93	R-6	6.26	3.8	295	610	
Squaw-15	16-Sep-93	R-6	5.25	5.1	355	797	
Squaw-15	01-Oct-93	R-6	5.71	4.4	404	846	
Squaw-15	16-Nov-93	R-6	6.03	4.3	364	810	
Squaw-15	16-Dec-93	R-6	5.41	1.7	346	495	
Squaw-15	14-Jan-94	R-6	6.52	3.5	382	624	
Squaw-15	14-Feb-94	R-6	5.94	2.3	344	482	
Squaw-15	01-Mar-94	R-6	6.66	2.1	276	436	
Squaw-15	31-Mar-94	R-6		5	290	500	
Squaw-15	14-Apr-94	R-6	6.56	3.4	312	586	
Squaw-15	04-May-94	R-6			290	500	5024
Squaw-15	11-May-94	R-6			260	500	
Squaw-15	16-May-94	R-6	6.58	3.5	301	567	
Squaw-15	14-Jun-94	R-6	5.87	4.6	425	769	
Squaw-15	14-Jul-94	R-6	4.78	5.2	478	978	
Squaw-15	27-Jul-94	R-6		5	640	1400	
Squaw-15	01-Aug-94	R-6	4.58	7.1	639	1340	
Squaw-15	01-Sep-94	R-6	4.51	7.8	687	1490	
Squaw-15	14-Oct-94	R-6	4.7	6.6	655	1410	
Squaw-15	14-Nov-94	R-6	4.9	5.9	619	1120	
Squaw-15	08-Dec-94	R-6	5.2	4.3	453	769	
Squaw-15	17-Jan-95	R-6	6.45	1.4	194	251	
Squaw-15	16-Feb-95	R-6	6.69	2.4	159	248	
Squaw-15	14-Mar-95	R-6	6.66	2.1	276	436	
Squaw-15	17-Mar-95	R-6	6.39	1.4	130	225	
Squaw-15	15-Apr-95	R-6	6.7	0.5	110	196	
Squaw-15	12-May-95	R-6	6.9	1.3	128	233	
Squaw-15	02-Jun-95	R-6			130	280	11914
Squaw-15	15-Jun-95	R-6	6.99	1.7	142	299	
Squaw-15	15-Aug-95	R-6	4.58	7.1	639	1340	

West Squaw Creek Bridge Concentration = ug/l

Dissolved Metal Data 1968 to 2003 Flow = gpm

WellID	Date	WellRegID	pH	Cd_Diss	Cu_Diss	Zn_Diss	Flow
Squaw-15	14-Sep-95	R-6	4.51	7.8	687	1490	
Squaw-15	07-Nov-95	R-6	5.2	7.5	459	1030	
Squaw-15	15-Jan-96	R-6	6.38	2.9	299	427	
Squaw-15	16-Feb-96	R-6	6.29	1.6	214	290	
Squaw-15	19-Feb-96	R-6	3.87	2.5	590	600	
Squaw-15	07-Mar-96	R-6	6.82	1.2	69	306	
Squaw-15	14-Mar-96	R-6	6.93	1.3	178	298	
Squaw-15	16-Aug-96	R-6	4.77	2.5	291	697	1352
Squaw-15	23-Nov-96	R-6	6.32	2.5	304	373	14090
Squaw-15	20-Mar-97	R-6	7.24	2.5	136	309	26136
Squaw-15	24-Jun-97	R-6	6.83	2.5	225	532	3200
Squaw-15	11-Sep-97	R-6	5.01	6	476	1010	1600
Squaw-15	17-Dec-97	R-6	6.05	2.5	300	370	27000
Squaw-15	17-Mar-98	R-6	6.87	2.5	130	290	100000
Squaw-15	12-Jun-98	R-6	7.16	2.5	300	300	15000
Squaw-15	15-Sep-98	R-6	4.89	2.5	200	480	
Squaw-15	10-Dec-98	R-6	5.75	2.5	380	430	10000
Squaw-15	24-Mar-99	R-6	6.3	2.5	230	260	12000
Squaw-15	23-Sep-99	R-6	7.07	25	200	600	1000
Squaw-15	03-Feb-00	R-6	6.33	5.9	837	696	5000
Squaw-15	10-May-00	R-6	7.13	2.5	57.1	338	13000
Squaw-15	08-Sep-00	R-6	6.74	6.1	147	1010	1920
Squaw-15	20-Nov-00	R-6	6.91	2.5	58.9	601	4459
Squaw-15	06-Feb-01	R-6	6.16	2	109	543	48822
Squaw-15	15-May-01	R-6	6.68	0.5	97	706	
Squaw-15	07-Aug-01	R-6	5.97	0.5	116	596	
Squaw-15	01-Nov-01	R-6	5.89	0.5	132	915	3208
Squaw-15	05-Feb-02	R-6	6.05	0.5	101	464	59364
Squaw-15	02-May-02	R-6	6.42	0.5	36	356	20423
Squaw-15	06-Aug-02	R-6	6.9	0.5	85	722	7846
Squaw-15	05-Nov-02	R-6	6.66	6.5	107	696	27335
Squaw-15	05-Nov-02	R-6	6.81	0	100	893	
Squaw-15	05-Feb-03	R-6	5.8	0	30	100	30157
Squaw-15	04-Apr-03	R-6		0	0	200	
Squaw-15	17-Apr-03	R-6	6.3	0	0	70	
Squaw-15	21-Apr-03	R-6		0	0	150	
Squaw-15	01-May-03	R-6	5.97	0.5	19	160	
Squaw-15	01-May-03	R-6	6.5	0	10	150	
Squaw-15	02-Jun-03	R-6	6.6	10	10	260	15681
Squaw-15	04-Aug-03	R-6	7.38	2	22	290	
Squaw-15	04-Aug-03	R-6	7	0	10	610	4589

West Squaw Creek Bridge
Dissolved Copper Loading
Pre-Remediation (uncorrected)

West Squaw Creek Bridge
Copper Loading Pre Remediation (uncorrected)

Concentration = ug/l
Flow = gpm
Loading = lb/day

Well ID	Date	Well Reg ID	Cu Diss	Flow	Loading
Squaw-15	20-Sep-68	R-6	6460	4439	344
Squaw-15	11-Oct-68	R-6	2360	4439	125
Squaw-15	14-Oct-68	R-6	3920	4439	208
Squaw-15	15-Oct-68	R-6	3800	4439	202
Squaw-15	31-Oct-68	R-6	3790	4439	202
Squaw-15	12-Nov-68	R-6	2100	5073	128
Squaw-15	18-Nov-68	R-6	1760	7926	167
Squaw-15	22-Nov-68	R-6	3320	3329	132
Squaw-15	09-Dec-68	R-6	1920	7926	182
Squaw-15	11-Dec-68	R-6	1820	26631	581
Squaw-15	16-Dec-68	R-6	960	57701	664
Squaw-15	30-Dec-68	R-6	1310	16011	251
Squaw-15	06-Jan-69	R-6	900	25680	277
Squaw-15	13-Jan-69	R-6	930	466049	5192
Squaw-15	14-Jan-69	R-6	1400	76724	1287
Squaw-15	09-Feb-69	R-6	530	144253	916
Squaw-15	24-Feb-69	R-6	860	57701	594
Squaw-15	25-Feb-69	R-6	800	55482	532
Squaw-15	13-Mar-69	R-6	1030	33289	411
Squaw-15	19-Mar-69	R-6	900	46129	497
Squaw-15	21-Mar-69	R-6	1000	44378	532
Squaw-15	03-Apr-69	R-6	710	59921	510
Squaw-15	08-Apr-69	R-6	180	54214	117
Squaw-15	23-Apr-69	R-6	820	8402	83
Squaw-15	24-Apr-69	R-6	710	26631	227
Squaw-15	26-Apr-69	R-6	1120	72761	976
Squaw-15	06-May-69	R-6	1080	14584	189
Squaw-15	06-Jun-69	R-6	1680	6182	124
Squaw-15	13-Jun-69	R-6	1690	5390	109
Squaw-15	20-Jun-69	R-6	2050	4439	109
Squaw-15	27-Jun-69	R-6	2220	40423	1075
Squaw-15	09-Jul-69	R-6	2320	4439	123
Squaw-15	28-Jul-69	R-6	3780	4439	201
Squaw-15	05-Nov-74	R-6	2000	216	5
Squaw-15	10-Apr-75	R-6	650	55206	430
Squaw-15	18-Sep-75	R-6	5100	2693	165
Squaw-15	29-Oct-82	R-6	820	3393	33
Squaw-15	23-Nov-82	R-6	560	10502	70
Squaw-15	29-Dec-82	R-6	480	22171	127
Average			1791	38269	464

West Squaw Creek Bridge
Dissolved Copper Loading
Pre-Remediation (corrected)

The uncorrected average annual pre-remediation copper loading was 464 lb/day, based on an average annual flow of 38,300 gpm. In contrast, the average annual post-remediation flow rate (24,200 gpm) and average annual flow rate estimated using a simple soil moisture-evapotranspiration model (25,100 gpm) were significantly less. The discrepancy between the pre-remediation and post-remediation flow estimates suggest the 1) pre-remediation loading estimate may be too high, and 2) pre-remediation flow measurements were skewed toward the winter months.

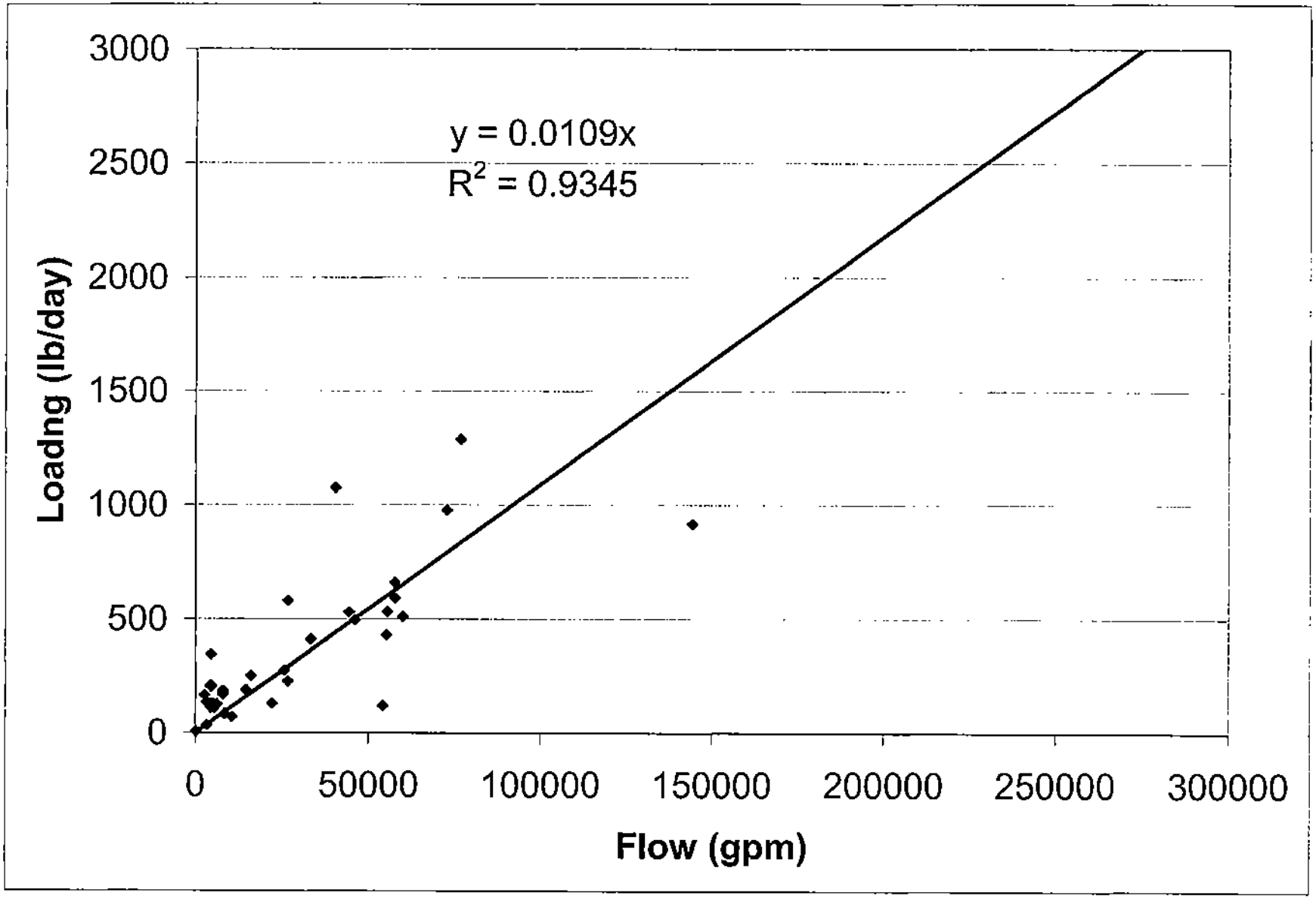
Based on the observed correlation between average annual flow in gpm and average annual loading in lb/day (R^2 = 0.9345), the estimated pre-remediation copper loading of 464 lb/day was adjusted downward.

The revised estimate using the linear relationship between flow and loading is 322 lb/day, and the revised estimate using the ratio (24,200 gpm / 38,300 gpm) is 305 lb/day (rounded). The value of 305 lb/day was used to be conservative (i.e., calculated reductions between pre-remediation and current conditions are lower)

West Squaw Creek - Moderately Steep, Assume Soil Profile = 4 feet

Month	Measured Precip Shasta Dam MP(in)	Precip Correction Factor CFP	Estimated Precip MP*CFP P (in)	Pan Evap Whiskeytown Reservoir RE (in)	Pan Correction Factor CFE	Potential Evap RE*CFE PE (in)	P-PE	Soil Storage S (in) 6.0	Available Water P + S TAW (in)	Actual Evap AE (in)
Jan	12.02	1.25	15.03	0.90	0.8	0.72	14.3	6.0	21.0	0.7
Feb	10.09	1.25	12.61	1.27	0.8	1.02	11.6	6.0	18.6	1.0
Mar	8.84	1.25	11.05	2.50	0.8	2.00	9.1	6.0	17.1	2.0
Apr	4.22	1.25	5.28	4.00	0.8	3.20	2.1	6.0	11.3	3.2
May	2.4	1.25	3.00	6.40	0.8	5.12	-2.1	3.9	9.0	5.1
Jun	1.19	1.25	1.49	8.00	0.8	6.40	-4.9	0.0	5.4	5.4
Jul	0.18	1.25	0.23	10.10	0.8	8.08	-7.9	0.0	0.2	0.2
Aug	0.45	1.25	0.56	8.80	0.8	7.04	-6.5	0.0	0.6	0.6
Sept	1.29	1.25	1.61	6.20	0.8	4.96	-3.3	0.0	1.6	1.6
Oct	2.98	1.25	3.73	3.40	0.8	2.72	1.0	1.0	3.7	2.7
Nov	8.41	1.25	10.51	1.60	0.8	1.28	9.2	6.0	11.5	1.3
Dec	10.74	1.25	13.43	0.81	0.8	0.65	12.8	6.0	19.4	0.6
Average	**5.23**		**6.54**	**4.50**		**3.60**				**2.04**
Sum	**62.81**		**78.51**	**53.98**		**43.18**				**24.47**
Evap as Precent of Precipitation										**31.17**
GW + SW as Percent of Precipitation										**68.83**

Area (acres)	Annual Precip (inches)	Annual Precip (gpm)	Annual AE (inches	Annual AE (gpm)	Annual P-AE (inches)	**Annual P-AE (gpm)**
9000	79	36504	24	11378	54	**25126**


y = 0.0109x
R² = 0.9345
Loadng (lb/day)
3000
2500
2000
1500
1000
500
0
0
50000
100000
150000
200000
250000
300000
Flow (gpm)

West Squaw Creek Bridge
Dissolved Zinc and Cadmium Loading
Pre-Remediation

Because very few zinc and cadmium analyses were collected in conjunction with flow measurements prior to the onset of remediation, it was not possible to calculate pre-remediation dissolved zinc and cadmium loading directly. Instead, paired concentration data were used to develop copper/zinc and copper/cadmium ratios. The estimated ratios were:

Cu/Zn = 1.34

Cu/Cd = 0.011

Pre-remediation loading was estimated by multiplying these ratios by the corrected pre-remediation dissolved copper loading of 305 lb/day.

Zn (pre-remediation loading) = 1.34 * 305 lb/day = 409 lb/day

Cd (pre-remediation loading) = 0.011 * 305 lb/day = 3.4 lb/day

West Squaw Creek Bridge
Correlations between Cu and Cd, Zn

WellID	Date	WellRegID	Cd_Diss	Cu_Diss	Zn_Diss	Zn/Cu	Cd/Cu
Squaw-15	05-Nov-74	R-6	11	2000	3800	1.90	0.006
Squaw-15	10-Apr-75	R-6	4.7	650	630	0.97	0.007
Squaw-15	18-Sep-75	R-6	30	5100	5600	1.10	0.006
Squaw-15	01-May-80	R-6	8	1700	1800	1.06	0.005
Squaw-15	07-May-80	R-6	5	1370	1430	1.04	0.004
Squaw-15	16-May-80	R-6	20	4260	4950	1.16	0.005
Squaw-15	27-Jun-80	R-6	10	2360	2650	1.12	0.004
Squaw-15	16-Jul-80	R-6	20	3170	3450	1.09	0.006
Squaw-15	19-Aug-80	R-6	20	4200	4800	1.14	0.005
Squaw-15	20-Oct-80	R-6	20	4090	4420	1.08	0.005
Squaw-15	01-Nov-80	R-6	30	4400	4600	1.05	0.007
Squaw-15	29-Apr-81	R-6	5	1260	1320	1.05	0.004
Squaw-15	01-Jun-81	R-6	20	3400	3800	1.12	0.006
Squaw-15	01-Jul-81	R-6	30	4200	5000	1.19	0.007
Squaw-15	01-Aug-81	R-6	30	4200	5000	1.19	0.007
Squaw-15	01-Sep-81	R-6	40	4800	5600	1.17	0.008
Squaw-15	01-Dec-81	R-6	10	920	900	0.98	0.011
Squaw-15	15-Jan-82	R-6	5	920	1000	1.09	0.005
Squaw-15	29-Jan-82	R-6	1.5	780	756	0.97	0.002
Squaw-15	18-Feb-82	R-6	2.5	590	600	1.02	0.004
Squaw-15	25-Feb-82	R-6	2.5	860	860	1.00	0.003
Squaw-15	02-Mar-82	R-6	3.4	350	370	1.06	0.010
Squaw-15	08-Mar-82	R-6	5	160	200	1.25	0.031
Squaw-15	11-Mar-82	R-6	5	160	200	1.25	0.031
Squaw-15	19-Mar-82	R-6	2.5	220	250	1.14	0.011
Squaw-15	08-Apr-82	R-6	2.5	176	239	1.36	0.014
Squaw-15	23-Apr-82	R-6	7	97	316	3.26	0.072
Squaw-15	10-May-82	R-6	5	185	342	1.85	0.027
Squaw-15	20-May-82	R-6	2.5	233	484	2.08	0.011
Squaw-15	26-May-82	R-6	2.5	160	450	2.81	0.016
Squaw-15	15-Jun-82	R-6	2.5	200	530	2.65	0.013
Squaw-15	13-Jul-82	R-6	5	480	670	1.40	0.010
Squaw-15	20-Sep-82	R-6	10	815	1178	1.45	0.012
Squaw-15	29-Oct-82	R-6	10	820	1100	1.34	0.012
Squaw-15	05-Nov-82	R-6	5	800	1100	1.38	0.006
Squaw-15	23-Nov-82	R-6	10	560	630	1.13	0.018
Squaw-15	29-Dec-82	R-6	5	480	540	1.13	0.010
Squaw-15	30-Dec-82	R-6	10	920	900	0.98	0.011
Average						1.34	0.011

Concentration = ug/l
Flow = gpm

West Squaw Creek Bridge
Dissolved Metal Loading
2001 thru 2003

West Squaw Creek Bridge
Metal Loading 2001 to 2003

WellID	Date	WellRegID	Cu_Diss	Flow	Loading
Squaw-15	06-Feb-01	R-6	109	48822	63.75
Squaw-15	01-Nov-01	R-6	132	3208	5.07
Squaw-15	05-Feb-02	R-6	101	59364	71.83
Squaw-15	02-May-02	R-6	36	20423	8.81
Squaw-15	06-Aug-02	R-6	85	7846	7.99
Squaw-15	05-Nov-02	R-6	107	27335	35.04
Squaw-15	05-Feb-03	R-6	30	30157	10.84
Squaw-15	02-Jun-03	R-6	10	15681	1.88
Squaw-15	04-Aug-03	R-6	10	4589	0.55
Average			68.89	24158.27	22.86
WellID	Date	WellRegID	Cd_Diss	Flow	Loading
Squaw-15	06-Feb-01	R-6	2	48822	1.17
Squaw-15	01-Nov-01	R-6	0.5	3208	0.02
Squaw-15	05-Feb-02	R-6	0.5	59364	0.36
Squaw-15	02-May-02	R-6	0.5	20423	0.12
Squaw-15	06-Aug-02	R-6	0.5	7846	0.05
Squaw-15	05-Nov-02	R-6	6.5	27335	2.13
Squaw-15	05-Feb-03	R-6	0	30157	0.00
Squaw-15	02-Jun-03	R-6	10	15681	1.88
Squaw-15	04-Aug-03	R-6	0	4589	0.00
Average			2.28	24158.27	0.64
WellID	Date	WellRegID	Zn_Diss	Flow	Loading
Squaw-15	06-Feb-01	R-6	543	48822	317.59
Squaw-15	01-Nov-01	R-6	915	3208	35.16
Squaw-15	05-Feb-02	R-6	464	59364	329.99
Squaw-15	02-May-02	R-6	356	20423	87.10
Squaw-15	06-Aug-02	R-6	722	7846	67.86
Squaw-15	05-Nov-02	R-6	696	27335	227.92
Squaw-15	05-Feb-03	R-6	100	30157	36.13
Squaw-15	02-Jun-03	R-6	260	15681	48.84
Squaw-15	04-Aug-03	R-6	610	4589	33.54
Average			518.44	24158.27	131.57

Concentration = ug/l
Flow = gpm
Loading = lb/day

West Squaw Creek Bridge
Average Annual
Dissolved Metal Concentrations

West Squaw Creek Bridge

Data for Pivot Tables to Estimate Average Annual Concentrations Concentrations = ug/l

WellID	Date	Year	WellRegID	Cd_Diss	Cu_Diss	Zn_Diss
Squaw-15	20-Sep-68	1968	R-6		6460	
Squaw-15	11-Oct-68	1968	R-6		2360	
Squaw-15	14-Oct-68	1968	R-6		3920	
Squaw-15	15-Oct-68	1968	R-6		3800	
Squaw-15	31-Oct-68	1968	R-6		3790	
Squaw-15	12-Nov-68	1968	R-6		2100	
Squaw-15	18-Nov-68	1968	R-6		1760	
Squaw-15	22-Nov-68	1968	R-6		3320	
Squaw-15	09-Dec-68	1968	R-6		1920	
Squaw-15	11-Dec-68	1968	R-6		1820	
Squaw-15	16-Dec-68	1968	R-6		960	
Squaw-15	30-Dec-68	1968	R-6		1310	
Squaw-15	06-Jan-69	1969	R-6		900	
Squaw-15	13-Jan-69	1969	R-6		930	
Squaw-15	14-Jan-69	1969	R-6		1400	
Squaw-15	09-Feb-69	1969	R-6		530	
Squaw-15	24-Feb-69	1969	R-6		860	
Squaw-15	25-Feb-69	1969	R-6		800	
Squaw-15	13-Mar-69	1969	R-6		1030	
Squaw-15	19-Mar-69	1969	R-6		900	
Squaw-15	21-Mar-69	1969	R-6		1000	
Squaw-15	03-Apr-69	1969	R-6		710	
Squaw-15	08-Apr-69	1969	R-6		180	
Squaw-15	23-Apr-69	1969	R-6		820	
Squaw-15	24-Apr-69	1969	R-6		710	
Squaw-15	26-Apr-69	1969	R-6		1120	
Squaw-15	06-May-69	1969	R-6		1080	
Squaw-15	06-Jun-69	1969	R-6		1680	
Squaw-15	13-Jun-69	1969	R-6		1690	
Squaw-15	20-Jun-69	1969	R-6		2050	
Squaw-15	27-Jun-69	1969	R-6		2220	
Squaw-15	09-Jul-69	1969	R-6		2320	
Squaw-15	28-Jul-69	1969	R-6		3780	
Squaw-15	05-Nov-74	1974	R-6	11	2000	3800
Squaw-15	10-Apr-75	1975	R-6	4.7	650	630
Squaw-15	18-Sep-75	1975	R-6	30	5100	5600
Squaw-15	01-May-80	1980	R-6	8	1700	1800
Squaw-15	07-May-80	1980	R-6	5	1370	1430
Squaw-15	16-May-80	1980	R-6	20	4260	4950
Squaw-15	27-Jun-80	1980	R-6	10	2360	2650
Squaw-15	16-Jul-80	1980	R-6	20	3170	3450
Squaw-15	19-Aug-80	1980	R-6	20	4200	4800
Squaw-15	20-Oct-80	1980	R-6	20	4090	4420
Squaw-15	01-Nov-80	1980	R-6	30	4400	4600
Squaw-15	29-Apr-81	1981	R-6	5	1260	1320
Squaw-15	01-Jun-81	1981	R-6	20	3400	3800
Squaw-15	01-Jul-81	1981	R-6	30	4200	5000
Squaw-15	01-Aug-81	1981	R-6	30	4200	5000
Squaw-15	01-Sep-81	1981	R-6	40	4800	5600

West Squaw Creek Bridge

Data for Pivot Tables to Estimate Average Annual Concentrations Concentrations = ug/l

WellID	Date	Year	WellRegID	Cd_Diss	Cu_Diss	Zn_Diss
Squaw-15	01-Nov-81	1981	R-6		1270	1030
Squaw-15	01-Dec-81	1981	R-6	10	920	900
Squaw-15	15-Jan-82	1982	R-6	5	920	1000
Squaw-15	29-Jan-82	1982	R-6	1.5	780	756
Squaw-15	18-Feb-82	1982	R-6	2.5	590	600
Squaw-15	25-Feb-82	1982	R-6	2.5	860	860
Squaw-15	02-Mar-82	1982	R-6	3.4	350	370
Squaw-15	08-Mar-82	1982	R-6	5	160	200
Squaw-15	11-Mar-82	1982	R-6	5	160	200
Squaw-15	19-Mar-82	1982	R-6	2.5	220	250
Squaw-15	08-Apr-82	1982	R-6	2.5	176	239
Squaw-15	23-Apr-82	1982	R-6	7	97	316
Squaw-15	10-May-82	1982	R-6	5	185	342
Squaw-15	20-May-82	1982	R-6	2.5	233	484
Squaw-15	26-May-82	1982	R-6	2.5	160	450
Squaw-15	04-Jun-82	1982	R-6		140	400
Squaw-15	15-Jun-82	1982	R-6	2.5	200	530
Squaw-15	13-Jul-82	1982	R-6	5	480	670
Squaw-15	01-Sep-82	1982	R-6		5100	5900
Squaw-15	20-Sep-82	1982	R-6	10	815	1178
Squaw-15	29-Oct-82	1982	R-6	10	820	1100
Squaw-15	05-Nov-82	1982	R-6	5	800	1100
Squaw-15	23-Nov-82	1982	R-6	10	560	630
Squaw-15	29-Dec-82	1982	R-6	5	480	540
Squaw-15	30-Dec-82	1982	R-6	10	920	900
Squaw-15	27-Jan-83	1983	R-6	5	160	120
Squaw-15	28-Feb-83	1983	R-6	5	160	860
Squaw-15	01-Mar-83	1983	R-6	10	250	2400
Squaw-15	14-Jun-83	1983	R-6	8	210	860
Squaw-15	25-Mar-86	1986	R-6	0.1	180	190
Squaw-15	03-Apr-86	1986	R-6	2.1	210	250
Squaw-15	13-May-86	1986	R-6	3	440	750
Squaw-15	20-May-86	1986	R-6	1.2	190	280
Squaw-15	29-May-86	1986	R-6	1.2	260	350
Squaw-15	04-Jun-86	1986	R-6	3.3	650	740
Squaw-15	19-Jun-86	1986	R-6	2.2	490	810
Squaw-15	27-Jan-88	1988	R-6	0.5	270	360
Squaw-15	26-May-88	1988	R-6	2.7	520	670
Squaw-15	10-Jun-88	1988	R-6	3.3	510	680
Squaw-15	27-Jun-88	1988	R-6	6	878	1200
Squaw-15	13-Mar-89	1989	R-6	4	591	648
Squaw-15	09-Apr-89	1989	R-6	1	287	391
Squaw-15	28-Apr-89	1989	R-6		800	1340
Squaw-15	04-May-89	1989	R-6	4	305	452
Squaw-15	31-May-89	1989	R-6	4	419	770
Squaw-15	09-Jul-89	1989	R-6	5	539	1020
Squaw-15	31-Jul-89	1989	R-6	6	1290	620
Squaw-15	01-Sep-89	1989	R-6	8	665	1370
Squaw-15	02-Oct-89	1989	R-6	5	565	1120

West Squaw Creek Bridge

Data for Pivot Tables to Estimate Average Annual Concentrations Concentrations = ug/l

Well ID	Date	Year	Well Reg ID	Cd_Diss	Cu_Diss	Zn_Diss
Squaw-15	01-Nov-89	1989	R-6	24	2660	4520
Squaw-15	04-Dec-89	1989	R-6	5	568	949
Squaw-15	02-Jan-90	1990	R-6	6	582	999
Squaw-15	05-Feb-90	1990	R-6	4	476	624
Squaw-15	06-Mar-90	1990	R-6	3	368	518
Squaw-15	04-Apr-90	1990	R-6	4	415	691
Squaw-15	02-May-90	1990	R-6	5	466	813
Squaw-15	05-Jun-90	1990	R-6	1	243	331
Squaw-15	05-Jul-90	1990	R-6	3	337	563
Squaw-15	06-Aug-90	1990	R-6	5	510	942
Squaw-15	01-Oct-90	1990	R-6	6	565	1170
Squaw-15	01-Nov-90	1990	R-6	11	1490	2540
Squaw-15	04-Dec-90	1990	R-6	6	662	1230
Squaw-15	03-Jan-91	1991	R-6	5	545	1010
Squaw-15	06-Feb-91	1991	R-6	4	556	818
Squaw-15	06-Mar-91	1991	R-6	3	445	513
Squaw-15	01-Apr-91	1991	R-6		1000	1300
Squaw-15	03-Apr-91	1991	R-6	18	390	470
Squaw-15	17-Apr-91	1991	R-6	5	1000	1300
Squaw-15	01-May-91	1991	R-6	4	356	563
Squaw-15	01-Jun-91	1991	R-6	4	460	757
Squaw-15	01-Jul-91	1991	R-6	5	575	1000
Squaw-15	01-Aug-91	1991	R-6	7	696	1360
Squaw-15	01-Sep-91	1991	R-6	9	768	1560
Squaw-15	09-Sep-91	1991	R-6	10	730	
Squaw-15	01-Oct-91	1991	R-6	7	727	1500
Squaw-15	14-Oct-91	1991	R-6	8	660	1400
Squaw-15	04-Nov-91	1991	R-6	8	698	1390
Squaw-15	02-Jan-92	1992	R-6	5	585	860
Squaw-15	17-Jan-92	1992	R-6	5	700	870
Squaw-15	01-Feb-92	1992	R-6	4	615	854
Squaw-15	02-Mar-92	1992	R-6	1	231	292
Squaw-15	01-Apr-92	1992	R-6	1	214	283
Squaw-15	01-May-92	1992	R-6	1	280	392
Squaw-15	15-May-92	1992	R-6		250	430
Squaw-15	01-Jun-92	1992	R-6	3	315	540
Squaw-15	01-Jul-92	1992	R-6	1	305	431
Squaw-15	10-Aug-92	1992	R-6	4	498	998
Squaw-15	15-Sep-92	1992	R-6	7	650	1390
Squaw-15	12-Oct-92	1992	R-6	7	674	1420
Squaw-15	12-Nov-92	1992	R-6	6.1	599	1120
Squaw-15	16-Dec-92	1992	R-6	3.2	516	617
Squaw-15	30-Apr-93	1993	R-6	1	182	304
Squaw-15	04-May-93	1993	R-6	5	190	390
Squaw-15	14-May-93	1993	R-6	2.7	157	274
Squaw-15	11-Jun-93	1993	R-6	2.2	174	292
Squaw-15	23-Jun-93	1993	R-6	5	190	360
Squaw-15	14-Jul-93	1993	R-6	2.9	242	487
Squaw-15	16-Aug-93	1993	R-6	3.8	295	610

West Squaw Creek Bridge

Data for Pivot Tables to Estimate Average Annual Concentrations Concentrations = ug/l

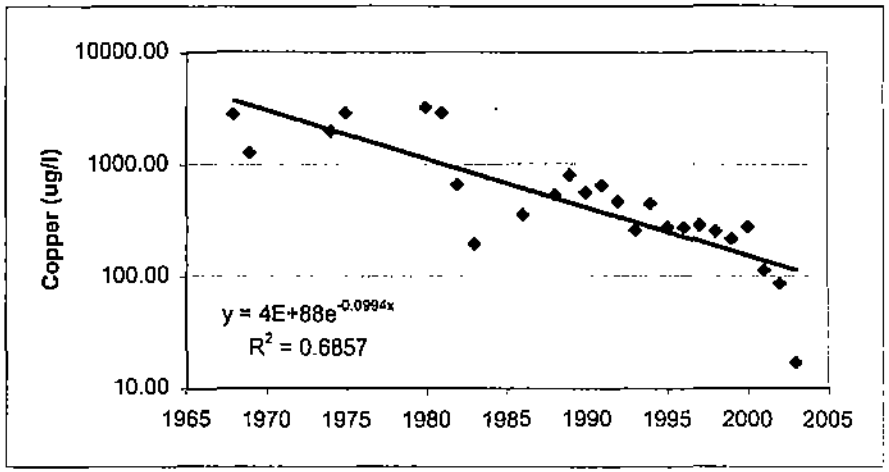
WellID	Date	Year	WellRegID	Cd_Diss	Cu_Diss	Zn_Diss
Squaw-15	16-Sep-93	1993	R-6	5.1	355	797
Squaw-15	01-Oct-93	1993	R-6	4.4	404	846
Squaw-15	16-Nov-93	1993	R-6	4.3	364	810
Squaw-15	16-Dec-93	1993	R-6	1.7	346	495
Squaw-15	14-Jan-94	1994	R-6	3.5	382	624
Squaw-15	14-Feb-94	1994	R-6	2.3	344	482
Squaw-15	01-Mar-94	1994	R-6	2.1	276	436
Squaw-15	31-Mar-94	1994	R-6	5	290	500
Squaw-15	14-Apr-94	1994	R-6	3.4	312	586
Squaw-15	04-May-94	1994	R-6		290	500
Squaw-15	11-May-94	1994	R-6		260	500
Squaw-15	16-May-94	1994	R-6	3.5	301	567
Squaw-15	14-Jun-94	1994	R-6	4.6	425	769
Squaw-15	14-Jul-94	1994	R-6	5.2	478	978
Squaw-15	27-Jul-94	1994	R-6	5	640	1400
Squaw-15	01-Aug-94	1994	R-6	7.1	639	1340
Squaw-15	01-Sep-94	1994	R-6	7.8	687	1490
Squaw-15	14-Oct-94	1994	R-6	6.6	655	1410
Squaw-15	14-Nov-94	1994	R-6	5.9	619	1120
Squaw-15	08-Dec-94	1994	R-6	4.3	453	769
Squaw-15	17-Jan-95	1995	R-6	1.4	194	251
Squaw-15	16-Feb-95	1995	R-6	2.4	159	248
Squaw-15	14-Mar-95	1995	R-6	2.1	276	436
Squaw-15	17-Mar-95	1995	R-6	1.4	130	225
Squaw-15	15-Apr-95	1995	R-6	0.5	110	196
Squaw-15	12-May-95	1995	R-6	1.3	128	233
Squaw-15	02-Jun-95	1995	R-6		130	280
Squaw-15	15-Jun-95	1995	R-6	1.7	142	299
Squaw-15	15-Aug-95	1995	R-6	7.1	639	1340
Squaw-15	14-Sep-95	1995	R-6	7.8	687	1490
Squaw-15	07-Nov-95	1995	R-6	7.5	459	1030
Squaw-15	15-Jan-96	1996	R-6	2.9	299	427
Squaw-15	16-Feb-96	1996	R-6	1.6	214	290
Squaw-15	19-Feb-96	1996	R-6	2.5	590	600
Squaw-15	07-Mar-96	1996	R-6	1.2	69	306
Squaw-15	14-Mar-96	1996	R-6	1.3	178	298
Squaw-15	16-Aug-96	1996	R-6	2.5	291	697
Squaw-15	23-Nov-96	1996	R-6	2.5	304	373
Squaw-15	20-Mar-97	1997	R-6	2.5	136	309
Squaw-15	24-Jun-97	1997	R-6	2.5	225	532
Squaw-15	11-Sep-97	1997	R-6	6	476	1010
Squaw-15	17-Dec-97	1997	R-6	2.5	300	370
Squaw-15	17-Mar-98	1998	R-6	2.5	130	290
Squaw-15	12-Jun-98	1998	R-6	2.5	300	300
Squaw-15	15-Sep-98	1998	R-6	2.5	200	480
Squaw-15	10-Dec-98	1998	R-6	2.5	380	430
Squaw-15	24-Mar-99	1999	R-6	2.5	230	260
Squaw-15	23-Sep-99	1999	R-6	25	200	600
Squaw-15	03-Feb-00	2000	R-6	5.9	837	696

West Squaw Creek Bridge

Data for Pivot Tables to Estimate Average Annual Concentrations Concentrations = ug/l

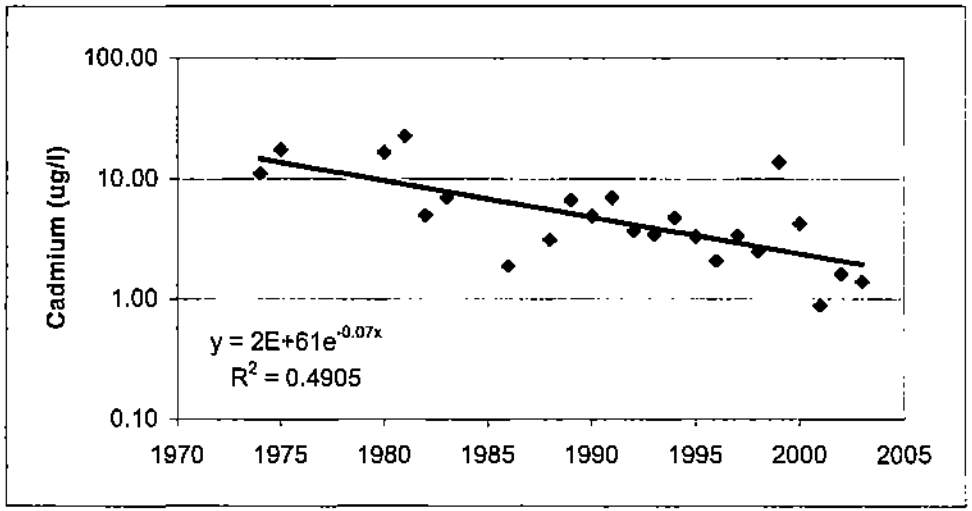
Well ID	Date	Year	Well Reg ID	Cd Diss	Cu Diss	Zn Diss
Squaw-15	10-May-00	2000	R-6	2.5	57.1	338
Squaw-15	08-Sep-00	2000	R-6	6.1	147	1010
Squaw-15	20-Nov-00	2000	R-6	2.5	58.9	601
Squaw-15	06-Feb-01	2001	R-6	2	109	543
Squaw-15	15-May-01	2001	R-6	0.5	97	706
Squaw-15	07-Aug-01	2001	R-6	0.5	116	596
Squaw-15	01-Nov-01	2001	R-6	0.5	132	915
Squaw-15	05-Feb-02	2002	R-6	0.5	101	464
Squaw-15	02-May-02	2002	R-6	0.5	36	356
Squaw-15	06-Aug-02	2002	R-6	0.5	85	722
Squaw-15	05-Nov-02	2002	R-6	6.5	107	696
Squaw-15	05-Nov-02	2002	R-6	0	100	893
Squaw-15	05-Feb-03	2003	R-6	0	30	100
Squaw-15	04-Apr-03	2003	R-6	0	0	200
Squaw-15	17-Apr-03	2003	R-6	0	0	70
Squaw-15	21-Apr-03	2003	R-6	0	0	150
Squaw-15	01-May-03	2003	R-6	0.5	19	160
Squaw-15	01-May-03	2003	R-6	0	10	150
Squaw-15	02-Jun-03	2003	R-6	10	10	260
Squaw-15	04-Aug-03	2003	R-6	2	22	290
Squaw-15	04-Aug-03	2003	R-6	0	10	610

Average of Cu_Diss	Year	Total
	1968	2793.33
	1969	1271.90
	1974	2000.00
	1975	2875.00
	1980	3193.75
	1981	2864.29
	1982	661.13
	1983	195.00
	1986	345.71
	1988	544.50
	1989	789.91
	1990	555.82
	1991	640.40
	1992	459.43
	1993	263.55
	1994	440.69
	1995	277.64
	1996	277.86
	1997	284.25
	1998	252.50
	1999	215.00
	2000	275.00
	2001	113.50
	2002	85.80
	2003	16.83

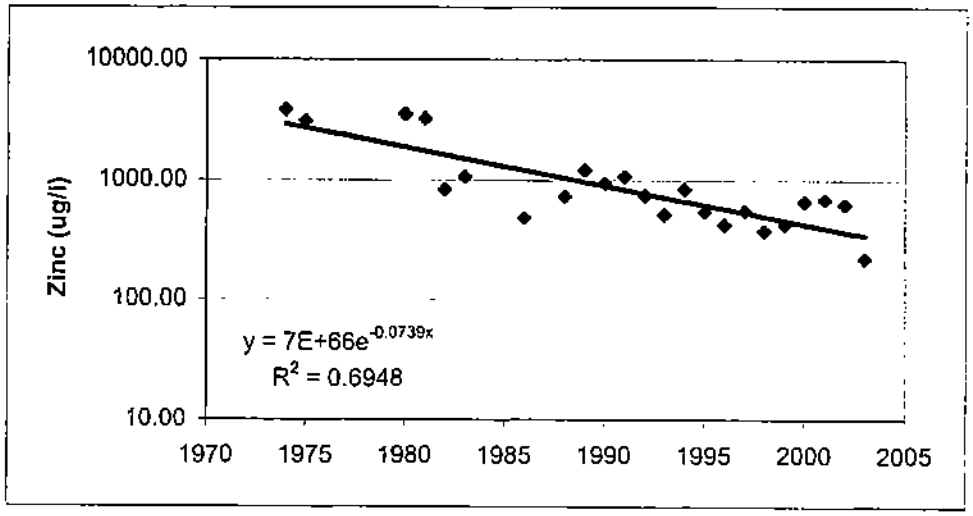


Actual number from pivot table was 11 ug/l. This included average dissolved copper for 9 samples. Three of these samples were non detect by MRRC's lab (Value = 0). These were not included in average of 16.83 ug/l.

Average of Cd_Diss	Year	Total
	1974	11.00
	1975	17.35
	1980	16.63
	1981	22.50
	1982	4.97
	1983	7.00
	1986	1.87
	1988	3.13
	1989	6.60
	1990	4.91
	1991	6.93
	1992	3.72
	1993	3.46
	1994	4.74
	1995	3.32
	1996	2.07
	1997	3.38
	1998	2.50
	1999	13.75
	2000	4.25
	2001	0.88
	2002	1.60
	2003	1.39



Average of Zn_Diss	Year	Total
	1974	3800.00
	1975	3115.00
	1980	3512.50
	1981	3235.71
	1982	826.74
	1983	1060.00
	1986	481.43
	1988	727.50
	1989	1200.00
	1990	947.36
	1991	1067.21
	1992	749.79
	1993	515.00
	1994	841.94
	1995	548.00
	1996	427.29
	1997	555.25
	1998	375.00
	1999	430.00
	2000	661.25
	2001	690.00
	2002	626.20
	2003	221.11



Weil Portal
Dissolved Metal and Flow Data

Weil Portal

Dissolved Metals Data 1969 to 2003

Concentration = ug/l
Flow = gpm

Well ID	Date	Wel Reg ID	Cd_Diss	Cu_Diss	Zn_Diss	Flow
Weil-2.1	02-May-69	013		27800		439
Weil-2.1	23-Jun-69	013				450
Weil-2.1	21-Oct-74	013				30
Weil-2.1	17-Sep-75	013				36
Weil-2.1	19-Dec-78	013	1650	385000	300000	40
Weil-2.1	01-Aug-79	013	1600	380000	274000	20
Weil-2.1	23-Sep-79	013	2000	360000	280000	14
Weil-2.1	25-Oct-79	013	1660	388000	254000	20
Weil-2.1	01-Nov-79	013	1800	392000	276000	20
Weil-2.1	01-Jan-80	013	2400	500000	320000	60
Weil-2.1	17-Jan-80	013	1950	409000	345000	
Weil-2.1	01-Feb-80	013	1400	284000	300000	251
Weil-2.1	01-Mar-80	013	1580	300000	279000	75
Weil-2.1	31-Mar-80	013	1500	306000	292000	75
Weil-2.1	16-May-80	013	1590	308000	293000	
Weil-2.1	19-May-80	013		291000	291000	43
Weil-2.1	17-Jun-80	013	1620	304000	290000	
Weil-2.1	23-Jun-80	013		308000	310000	26
Weil-2.1	24-Jun-80	013		308000		26
Weil-2.1	27-Jun-80	013	1620	300000	309000	
Weil-2.1	02-Jul-80	013		310000	310000	26
Weil-2.1	16-Jul-80	013	1660	324000	306000	
Weil-2.1	19-Aug-80	013	1730	314000	308000	
Weil-2.1	25-Aug-80	013		327000	327000	19
Weil-2.1	25-Sep-80	013		297000	325000	19
Weil-2.1	20-Oct-80	013	1580	293000	325000	16
Weil-2.1	25-Nov-80	013		310000	294000	16
Weil-2.1	28-Dec-80	013		349000	338000	19
Weil-2.1	25-Jan-81	013		492000	465000	100
Weil-2.1	02-Feb-81	013		333000	272000	100
Weil-2.1	28-Mar-81	013		302000	303000	150
Weil-2.1	10-Apr-81	013		260000	236000	100
Weil-2.1	30-Apr-81	013		280000	305000	38
Weil-2.1	31-May-81	013				38
Weil-2.1	30-Jun-81	013				25
Weil-2.1	29-Jul-81	013				25
Weil-2.1	31-Aug-81	013				21
Weil-2.1	29-Sep-81	013				19
Weil-2.1	18-Feb-82	013	1390	243600	233900	100
Weil-2.1	15-Jun-82	013	846	121000	167000	0
Weil-2.1	26-Oct-82	013				0
Weil-2.1	23-Nov-82	013				0
Weil-2.1	28-Dec-82	013				1
Weil-2.1	27-Jan-83	013				0
Weil-2.1	28-Feb-83	013				1
Weil-2.1	21-Apr-83	013				1
Weil-2.1	09-Apr-84	013	4020	199000	1690000	1
Weil-2.1	10-Jan-85	013	5960	310000	1430000	1
Weil-2.1	07-Mar-86	013	700	120000	160000	0

Weil Portal Concentration = ug/l

Dissolved Metals Data 1969 to 2003 Flow = gpm

Well ID	Date	Wel Reg ID	Cd Diss	Cu Diss	Zn Diss	Flow
Weil-2.1	10-Jun-86	013	3000	490000	580000	0
Weil-2.1	23-Dec-86	013	1030	158000	190000	2
Weil-2.1	28-Jun-87	013		79000		
Weil-2.1	19-Oct-87	013				0
Weil-2.1	27-Jan-88	013	32	5820	6640	0
Weil-2.1	27-Jan-89	013	49	7610	8180	
Weil-2.1	28-Apr-89	013	34	5250	5430	6
Weil-2.1	01-Jun-89	013	2110	288000	394000	
Weil-2.1	17-Apr-91	013	50	7600	8800	3
Weil-2.1	21-May-91	013	2940	342000	522000	
Weil-2.1	17-Jan-92	013	110	14000	18000	1
Weil-2.1	04-May-93	013	700	114000	160000	2
Weil-2.1	04-May-94	013		59000	90000	1
Weil-2.1	02-Jun-95	013		5100	5600	4
Weil-2.1	08-Nov-95	013	175	23100	29500	1
Weil-2.1	16-Feb-96	013				0
Weil-2.1	09-Mar-96	013	13.1	2150	1990	8
Weil-2.1	17-Aug-96	013	63	9320	10100	1
Weil-2.1	18-Sep-96	013	80.5	11600	13300	1
Weil-2.1	14-Oct-96	013	69.7	9610	11000	0
Weil-2.1	25-Nov-96	013	338	39700	58200	1
Weil-2.1	17-Dec-96	013	940	103000	166000	1
Weil-2.1	14-Mar-97	013	23	3450	2940	1
Weil-2.1	14-Apr-97	013	40	6000	6360	0
Weil-2.1	16-May-97	013	51	7180	8190	1
Weil-2.1	23-Jun-97	013	39	6110	6090	1
Weil-2.1	22-Jul-97	013	375	37200	65600	0
Weil-2.1	14-Oct-97	013	66	9700	11000	0
Weil-2.1	12-Nov-97	013	81	10700	13600	1
Weil-2.1	16-Dec-97	013	30	4600	4130	3
Weil-2.1	10-Feb-98	013	10	1600	2100	3
Weil-2.1	11-Mar-98	013	15	2490	2070	3
Weil-2.1	16-Apr-98	013	20	4000	3300	2
Weil-2.1	21-May-98	013	68	7200	10000	2
Weil-2.1	22-Jun-98	013	50	7880	6580	3
Weil-2.1	16-Jul-98	013	80	11200	10600	1
Weil-2.1	19-Aug-98	013	85	12800	10800	1
Weil-2.1	17-Sep-98	013	85	12400	11500	1
Weil-2.1	12-Oct-98	013	90	12200	11800	2
Weil-2.1	11-Nov-98	013	100	12900	15600	1
Weil-2.1	15-Dec-98	013	55	7520	7270	2
Weil-2.1	13-Jan-99	013	80	10200	10900	1
Weil-2.1	15-Feb-99	013	40	6290	5650	2
Weil-2.1	30-Mar-99	013	31	4400	4200	5
Weil-2.1	14-Apr-99	013	30	5080	4130	2
Weil-2.1	17-May-99	013	52	8030	7300	1
Weil-2.1	14-Jun-99	013	70	10300	10700	1
Weil-2.1	13-Jul-99	013	75	10700	10700	0
Weil-2.1	13-Aug-99	013	80	12100	12400	1

Weil Portal

Dissolved Metals Data 1969 to 2003

Concentration = ug/l
Flow = gpm

Well ID	Date	Well Reg ID	Cd_Diss	Cu_Diss	Zn_Diss	Flow
Weil-2.1	22-Nov-99	013	160	16200	27300	1
Weil-2.1	20-Jan-00	013				0
Weil-2.1	03-Feb-00	013				0
Weil-2.1	16-Mar-00	013				0
Weil-2.1	09-Apr-00	013				0
Weil-2.1	08-May-00	013				0
Weil-2.1	05-Jun-00	013				0
Weil-2.1	14-Jul-00	013				0
Weil-2.1	01-Aug-00	013				0
Weil-2.1	06-Sep-00	013				0
Weil-2.1	04-Oct-00	013				0
Weil-2.1	06-Nov-00	013				0
Weil-2.1	11-Dec-00	013				0
Weil-2.1	09-Jan-01	013				0
Weil-2.1	22-Feb-01	013				0
Weil-2.1	02-Apr-01	013				0
Weil-2.1	03-May-01	013				0
Weil-2.1	05-Jun-01	013				0
Weil-2.1	03-Jul-01	013				0
Weil-2.1	03-Aug-01	013				0
Weil-2.1	06-Sep-01	013				0
Weil-2.1	02-Oct-01	013				0
Weil-2.1	02-Nov-01	013				0
Weil-2.1	10-Dec-01	013				0
Weil-2.1	03-Jan-02	013				0
Weil-2.1	06-Feb-02	013				0
Weil-2.1	05-Mar-02	013				0
Weil-2.1	02-Apr-02	013				0
Weil-2.1	01-May-02	013				0
Weil-2.1	04-Jun-02	013				0
Weil-2.1	02-Jul-02	013				0
Weil-2.1	01-Aug-02	013				0
Weil-2.1	04-Feb-03	013				0
Weil-2.1	04-Aug-03	013				0

Weil Portal
Dissolved Metal Loading
Pre-Remediation

Weil Portal

Copper Loading Pre Remediation

Concentration = ug/l
Flow = gpm
Loading = lb/day

Well ID	Date	Cu Diss	Flow	Loading
Weil-2.1	19-Dec-78	385000	40	184
Weil-2.1	01-Aug-79	380000	20	91
Weil-2.1	23-Sep-79	360000	14.3	62
Weil-2.1	25-Oct-79	388000	20	93
Weil-2.1	01-Nov-79	392000	20	94
Weil-2.1	01-Jan-80	500000	60	359
Weil-2.1	01-Feb-80	284000	251	854
Weil-2.1	01-Mar-80	300000	75	270
Weil-2.1	31-Mar-80	306000	75	275
Weil-2.1	19-May-80	291000	43	150
Weil-2.1	23-Jun-80	308000	26	96
Weil-2.1	02-Jul-80	310000	26	97
Weil-2.1	25-Aug-80	327000	19	74
Weil-2.1	25-Sep-80	297000	19	68
Weil-2.1	20-Oct-80	293000	16	56
Weil-2.1	25-Nov-80	310000	16	59
Weil-2.1	28-Dec-80	349000	19	79
Weil-2.1	25-Jan-81	492000	100	589
Weil-2.1	02-Feb-81	333000	100	399
Weil-2.1	28-Mar-81	302000	150	543
Weil-2.1	10-Apr-81	260000	100	311
Weil-2.1	30-Apr-81	280000	37.5	126
Weil-2.1	18-Feb-82	243600	100	292
Average		**334374**	**59**	**227**

Weil Portal

Cadmium Loading Pre Remediation

Concentration = ug/l
Flow = gpm
Loading = lb/day

Well ID	Date	Cd Diss	Flow	Loading
Weil-2.1	19-Dec-78	1650	40	0.79
Weil-2.1	01-Aug-79	1600	20	0.38
Weil-2.1	23-Sep-79	2000	14.3	0.34
Weil-2.1	25-Oct-79	1660	20	0.40
Weil-2.1	01-Nov-79	1800	20	0.43
Weil-2.1	01-Jan-80	2400	60	1.73
Weil-2.1	01-Feb-80	1400	251	4.21
Weil-2.1	01-Mar-80	1580	75	1.42
Weil-2.1	31-Mar-80	1500	75	1.35
Weil-2.1	20-Oct-80	1580	16	0.30
Weil-2.1	18-Feb-82	1390	100	1.67
Average		**1687.3**	**62.8**	**1.18**

Weil Portal

Zinc Loading Pre Remediation

Concentration = ug/l
Flow = gpm
Loading = lb/day

Well ID	Date	Zn Diss	Flow	Loading
Weil-2.1	19-Dec-78	300000	40	144
Weil-2.1	01-Aug-79	274000	20	66
Weil-2.1	23-Sep-79	280000	14.3	48
Weil-2.1	25-Oct-79	254000	20	61
Weil-2.1	01-Nov-79	276000	20	66
Weil-2.1	01-Jan-80	320000	60	230
Weil-2.1	01-Feb-80	300000	251	902
Weil-2.1	01-Mar-80	279000	75	251
Weil-2.1	31-Mar-80	292000	75	262
Weil-2.1	19-May-80	291000	43	150
Weil-2.1	23-Jun-80	310000	26	97
Weil-2.1	02-Jul-80	310000	26	97
Weil-2.1	25-Aug-80	327000	19	74
Weil-2.1	25-Sep-80	325000	19	74
Weil-2.1	20-Oct-80	325000	16	62
Weil-2.1	25-Nov-80	294000	16	56
Weil-2.1	28-Dec-80	338000	19	77
Weil-2.1	25-Jan-81	465000	100	557
Weil-2.1	02-Feb-81	272000	100	326
Weil-2.1	28-Mar-81	303000	150	544
Weil-2.1	10-Apr-81	236000	100	283
Weil-2.1	30-Apr-81	305000	37.5	137
Weil-2.1	18-Feb-82	233900	100	280
Average		**300430**	**59**	**211**

Weil Portal
Dissolved Metal Loading
2000 to 2003

Weil Portal
Flow Data 2000 to 2003

Concentration = ug/l
Flow = gpm

Well ID	Date	Wel Reg ID	Cd Diss	Cu Diss	Zn Diss	Flow
Weil-2.1	20-Jan-00	013				0
Weil-2.1	03-Feb-00	013				0
Weil-2.1	16-Mar-00	013				0
Weil-2.1	09-Apr-00	013				0
Weil-2.1	08-May-00	013				0
Weil-2.1	05-Jun-00	013				0
Weil-2.1	14-Jul-00	013				0
Weil-2.1	01-Aug-00	013				0
Weil-2.1	06-Sep-00	013				0
Weil-2.1	04-Oct-00	013				0
Weil-2.1	06-Nov-00	013				0
Weil-2.1	11-Dec-00	013				0
Weil-2.1	09-Jan-01	013				0
Weil-2.1	22-Feb-01	013				0
Weil-2.1	02-Apr-01	013				0
Weil-2.1	03-May-01	013				0
Weil-2.1	05-Jun-01	013				0
Weil-2.1	03-Jul-01	013				0
Weil-2.1	03-Aug-01	013				0
Weil-2.1	06-Sep-01	013				0
Weil-2.1	02-Oct-01	013				0
Weil-2.1	02-Nov-01	013				0
Weil-2.1	10-Dec-01	013				0
Weil-2.1	03-Jan-02	013				0
Weil-2.1	06-Feb-02	013				0
Weil-2.1	05-Mar-02	013				0
Weil-2.1	02-Apr-02	013				0
Weil-2.1	01-May-02	013				0
Weil-2.1	04-Jun-02	013				0
Weil-2.1	02-Jul-02	013				0
Weil-2.1	01-Aug-02	013				0
Weil-2.1	04-Feb-03	013				0
Weil-2.1	04-Aug-03	013				0

Weil Portal
Pressure 2000 to 2003

Well ID	Date	Well Reg ID	PSI
Weil-2.1	20-Jan-00	013	97
Weil-2.1	03-Feb-00	013	96
Weil-2.1	16-Mar-00	013	95
Weil-2.1	08-May-00	013	97
Weil-2.1	05-Jun-00	013	98
Weil-2.1	14-Jul-00	013	95
Weil-2.1	01-Aug-00	013	97
Weil-2.1	06-Sep-00	013	100
Weil-2.1	04-Oct-00	013	97
Weil-2.1	06-Nov-00	013	95
Weil-2.1	11-Dec-00	013	96
Weil-2.1	09-Jan-01	013	93
Weil-2.1	22-Feb-01	013	97
Weil-2.1	02-Apr-01	013	97
Weil-2.1	03-May-01	013	100
Weil-2.1	05-Jun-01	013	96
Weil-2.1	03-Jul-01	013	99
Weil-2.1	03-Aug-01	013	95
Weil-2.1	06-Sep-01	013	94
Weil-2.1	02-Oct-01	013	95
Weil-2.1	02-Nov-01	013	92
Weil-2.1	10-Dec-01	013	99
Weil-2.1	03-Jan-02	013	98
Weil-2.1	06-Feb-02	013	107
Weil-2.1	05-Mar-02	013	100
Weil-2.1	02-Apr-02	013	103
Weil-2.1	01-May-02	013	106
Weil-2.1	04-Jun-02	013	103
Weil-2.1	02-Jul-02	013	101
Weil-2.1	01-Aug-02	013	101
Weil-2.1	04-Feb-03	013	105
Weil-2.1	04-Aug-03	013	103
Average			**98.3**

Early Bird Portal
Dissolved Metal and Flow Data

Early Bird Portal Concentration = ug/l

Dissolved Metals Data 1978 to 2003 Flow = gpm

WellID	Date	WellRegID	Cd_Diss	Cu_Diss	Zn_Diss	Flow
Early-1.1	19-Dec-78	012	480	150000	78500	8
Early-1.1	01-Oct-79	012	5	6400	3300	35
Early-1.1	29-Apr-81	012	40	5060	7760	
Early-1.1	16-Sep-82	012		137000	80000	
Early-1.1	09-Apr-84	012	210	33700	19000	10
Early-1.1	10-Jan-85	012	160	51400	30000	3
Early-1.1	10-Jun-86	012	150	44000	29000	5
Early-1.1	23-Dec-86	012	250	80000	46000	
Early-1.1	06-Aug-87	012	460	130000	79000	2.5
Early-1.1	27-Jan-88	012	130	44900	29700	
Early-1.1	28-Jun-88	012	2320	370000	520000	
Early-1.1	30-Jul-88	012		299300		2
Early-1.1	07-Sep-88	012		212000		2
Early-1.1	01-Nov-88	012		164300	396000	2
Early-1.1	03-Dec-88	012				2
Early-1.1	13-Mar-89	012	200	14400	47100	2.5
Early-1.1	09-Apr-89	012	330	36700	79700	2.5
Early-1.1	28-Apr-89	012	480	55500	118000	2
Early-1.1	04-May-89	012	499	60200	114000	2
Early-1.1	31-May-89	012	640	67400	147000	2
Early-1.1	09-Jul-89	012	532	75800	115000	1
Early-1.1	31-Jul-89	012	549	73200	124000	1.1
Early-1.1	01-Sep-89	012	539	76600	120000	0.8
Early-1.1	02-Oct-89	012	502	69200	110000	0.8
Early-1.1	01-Nov-89	012	440	59000	98200	0.8
Early-1.1	04-Dec-89	012	440	54600	102000	0.8
Early-1.1	02-Jan-90	012	460	51800	10500	0.8
Early-1.1	06-Mar-90	012	228	11000	50900	1
Early-1.1	04-Apr-90	012	340	11800	81200	1
Early-1.1	02-May-90	012	390	8840	91400	1
Early-1.1	05-Jun-90	012	136	2590	30500	1
Early-1.1	05-Jul-90	012	290	6060	66400	2
Early-1.1	06-Aug-90	012	360	7790	84500	1.5
Early-1.1	01-Oct-90	012	370	6330	87100	1.5
Early-1.1	01-Nov-90	012	380	4860	86700	1.5
Early-1.1	04-Dec-90	012	360	4520	83100	1.5
Early-1.1	17-Apr-91	012	170	1400	44600	2
Early-1.1	21-May-91	012	186	1290	49200	
Early-1.1	01-Jun-91	012	200	1240	53500	1.5
Early-1.1	01-Jul-91	012	193	1180	50200	1.5
Early-1.1	01-Aug-91	012	197	1020	51000	1.5
Early-1.1	01-Sep-91	012	202	954	53000	1.5
Early-1.1	01-Oct-91	012	191	920	51600	1.5
Early-1.1	04-Nov-91	012	177	884	52600	1.5
Early-1.1	26-Dec-91	012	200	800	55000	3
Early-1.1	02-Jan-92	012	156	764	48000	
Early-1.1	17-Jan-92	012	180	680	50000	1.25
Early-1.1	01-Feb-92	012	127	593	41800	
Early-1.1	02-Mar-92	012	44	208	15800	

Early Bird Portal Concentration = ug/l

Dissolved Metals Data 1978 to 2003 Flow = gpm

Well ID	Date	Wel Reg P	Cd Diss	Cu Diss	Zn Diss	Flow
Early-1.1	01-Apr-92	012	46	198	18000	
Early-1.1	01-May-92	012	50	242	20000	
Early-1.1	01-Jun-92	012	63	272	25900	2
Early-1.1	01-Jul-92	012	67	319	27600	2
Early-1.1	10-Aug-92	012	68	362	27400	2
Early-1.1	15-Sep-92	012	71	467	27700	2
Early-1.1	12-Oct-92	012	68	296	26100	2
Early-1.1	12-Nov-92	012	65.3	290	25200	2
Early-1.1	16-Dec-92	012	56.1	263	21100	4
Early-1.1	30-Apr-93	012	23.6	133	12600	4
Early-1.1	04-May-93	012	20	140	14000	3
Early-1.1	14-May-93	012	27.1	168	13600	4
Early-1.1	11-Jun-93	012	27	114	10600	4
Early-1.1	14-Jul-93	012	22.2	139	12700	4
Early-1.1	16-Aug-93	012	22.6	134	12800	4
Early-1.1	16-Sep-93	012	23.4	146	12500	4
Early-1.1	01-Oct-93	012	26.3	816	13800	4
Early-1.1	16-Nov-93	012	22.7	165	12500	4
Early-1.1	16-Dec-93	012	21.4	177	11000	4
Early-1.1	14-Jan-94	012	18.8	118	10400	3
Early-1.1	14-Feb-94	012	15	90	7930	3
Early-1.1	01-Mar-94	012	10.2	75.2	7400	4
Early-1.1	14-Apr-94	012	9.1	65.4	7910	3
Early-1.1	04-May-94	012		60	8100	1.5
Early-1.1	16-May-94	012	9.1	60.8	7630	3
Early-1.1	14-Jun-94	012	9	64.5	7600	3
Early-1.1	14-Jul-94	012	9.6	65.5	7820	2
Early-1.1	01-Aug-94	012	9.6	63.2	7410	2
Early-1.1	01-Sep-94	012	11.6	67.2	7270	2
Early-1.1	14-Oct-94	012	9.8	70.2	6830	2
Early-1.1	14-Nov-94	012	9.8	56.8	6340	2
Early-1.1	08-Dec-94	012	10.4	79.7	6030	2
Early-1.1	17-Jan-95	012	4.8	71	1530	4
Early-1.1	16-Feb-95	012	8.1	120	3010	3
Early-1.1	14-Mar-95	012	10.2	75.2	7400	4
Early-1.1	17-Mar-95	012	5.7	161	2010	4
Early-1.1	15-Apr-95	012	7.3	130	2240	4
Early-1.1	12-May-95	012	7.1	205	2780	4
Early-1.1	02-Jun-95	012		100	2900	2.7
Early-1.1	15-Jun-95	012	4.6	110	3170	4
Early-1.1	15-Aug-95	012	9.6	63.2	7410	2
Early-1.1	14-Sep-95	012	11.6	67.2	7270	2
Early-1.1	08-Nov-95	012	3	58.9	1890	2
Early-1.1	15-Jan-96	012	4.1	57.9	1290	1
Early-1.1	16-Feb-96	012	3.2	47.1	1020	1.5
Early-1.1	11-Mar-96	012	1.2	15	483	3.1
Early-1.1	14-Mar-96	012	1.4	23.8	566	1
Early-1.1	15-Jul-96	012	25	517	906	1
Early-1.1	17-Aug-96	012	2.5	42	588	0.8

Early Bird Portal Concentration = ug/l

Dissolved Metals Data 1978 to 2003 Flow = gpm

Well ID	Date	Wel Reg ID	Cd Diss	Cu Diss	Zn Diss	Flow
Early-1.1	17-Sep-96	012	2.5	51	497	0.5
Early-1.1	14-Oct-96	012	2.5	41	475	
Early-1.1	23-Nov-96	012	2.5	32	510	2.3
Early-1.1	17-Dec-96	012	5	31	440	2.7
Early-1.1	16-Jan-97	012	2.5	45	340	2.3
Early-1.1	17-Feb-97	012	2.5	65	470	5
Early-1.1	13-Mar-97	012	3	36	520	2.3
Early-1.1	14-Apr-97	012	2.5	32	500	2.3
Early-1.1	16-May-97	012	0.25	72	460	2
Early-1.1	23-Jun-97	012	2.5	35	430	2.3
Early-1.1	22-Jul-97	012	2.5	27	430	1.4
Early-1.1	22-Aug-97	012	2.5	50	420	1
Early-1.1	19-Sep-97	012	2.5	24	410	5
Early-1.1	14-Oct-97	012	2.5	93	430	2
Early-1.1	12-Nov-97	012	13	400	580	2.3
Early-1.1	16-Dec-97	012	9	200	420	2
Early-1.1	12-Jan-98	012	2.5	19	210	2
Early-1.1	11-Mar-98	012	2.5	144	620	2.3
Early-1.1	16-Apr-98	012	2.5	140	560	2
Early-1.1	21-May-98	012	2.5	30	460	2
Early-1.1	19-Jun-98	012	2.5	32	440	2
Early-1.1	16-Jul-98	012	2.5	210	540	1
Early-1.1	19-Aug-98	012	2.5	96	540	0.5
Early-1.1	17-Sep-98	012	2.5	21	460	0.5
Early-1.1	12-Oct-98	012	2.5	135	460	0.5
Early-1.1	11-Nov-98	012	2.5	250	530	0.5
Early-1.1	15-Dec-98	012	2.5	450	670	0.5
Early-1.1	13-Jan-99	012	10	10	350	0.5
Early-1.1	15-Feb-99	012	2.5	30	270	2
Early-1.1	30-Mar-99	012	2.5	12	150	2
Early-1.1	14-Apr-99	012	2.5	41	170	1.5
Early-1.1	17-May-99	012	2.5	14	180	2
Early-1.1	18-Jun-99	012	2.5	70	210	2
Early-1.1	13-Jul-99	012	2.5	20	200	0.5
Early-1.1	13-Aug-99	012	2.5	80	270	0.5
Early-1.1	13-Sep-99	012	2.5	60	230	0.2
Early-1.1	22-Nov-99	012	2.5	320	520	2
Early-1.1	20-Jan-00	012	2.5	5	203	1.5
Early-1.1	03-Feb-00	012	2.5	17.2	196	1
Early-1.1	16-Mar-00	012	2.5	5	125	3
Early-1.1	08-Apr-00	012	2.5	5	313	1.5
Early-1.1	08-May-00	012	2.5	5	151	3
Early-1.1	05-Jun-00	012	2.5	5	162	1.6
Early-1.1	13-Jul-00	012	2.5	5	148	1.4
Early-1.1	01-Aug-00	012	2.5	12	164	1.6
Early-1.1	06-Sep-00	012	2.5	5	166	1.4
Early-1.1	04-Oct-00	012	2.5	10.2	194	1.3
Early-1.1	06-Nov-00	012	2.5	5	208	1.7
Early-1.1	11-Dec-00	012	2.5	14.8	184	1.7

Early Bird Portal Concentration = ug/l

Dissolved Metals Data 1978 to 2003 Flow = gpm

WellID	Date	WellRegID	Cd_Diss	Cu_Diss	Zn_Diss	Flow
Early-1.1	08-Jan-01	012	1.1	1	180	2.5
Early-1.1	22-Feb-01	012	0.5	1	68	2
Early-1.1	12-Mar-01	012	0.5	1	106	4
Early-1.1	02-Apr-01	012	0.5	1	130	2
Early-1.1	03-May-01	012	0.5	1	10	1.6
Early-1.1	05-Jun-01	012	0.5	1	10	2
Early-1.1	03-Jul-01	012	0.5	1	138	0.8
Early-1.1	03-Aug-01	012	0.5	1	10	1.3
Early-1.1	06-Sep-01	012	0.5	1	10	1.1
Early-1.1	02-Oct-01	012	0.5	23	10	1.1
Early-1.1	02-Nov-01	012	0.5	1	10	1
Early-1.1	10-Dec-01	012	0.5	1	138	1
Early-1.1	03-Jan-02	012	0.5	3	54	3
Early-1.1	06-Feb-02	012	0.5	88	946	1
Early-1.1	05-Mar-02	012	0.5	1	83	2.3
Early-1.1	02-Apr-02	012	0.5	1	10	2.2
Early-1.1	01-May-02	012	0.5	5	108	2.1
Early-1.1	04-Jun-02	012	2.4	18	140	1.5
Early-1.1	02-Jul-02	012	0.5	1	74	1.3
Early-1.1	01-Aug-02	012	0.5	8	104	1.5
Early-1.1	04-Feb-03	012	0	10	20	37.5
Early-1.1	04-Aug-03	012	0.5	0.5	58	
Early-1.1	04-Aug-03	012	0	10	40	22

Early Bird Portal
Dissolved Metal Loading
Pre-Remediation

Concentration = ug/l
Flow = gpm
Loading = lb/day

Early Bird Portal
Dissolved Metal Loading Pre Remediation

Well ID	Date	Cd Diss	Cu Diss	Zn Diss	Flow	Cd Load	Cu Load	Zn Load
Early-1.1	19-Dec-78	480	150000	78500	8	0.046	14.376	7.523
Early-1.1	01-Oct-79	5	6400	3300	35	0.002	2.684	1.384
Early-1.1	09-Apr-84	210	33700	19000	10	0.025	4.037	2.276
Early-1.1	10-Jan-85	160	51400	30000	3	0.006	1.847	1.078
Early-1.1	10-Jun-86	150	44000	29000	5	0.009	2.636	1.737
Early-1.1	06-Aug-87	460	130000	79000	2.5	0.014	3.894	2.366
Average		**244.1667**	**69250**	**39800**	**10.583**	**0.017**	**4.912**	**2.727**

Early Bird Portal
Dissolved Metal Loading
2000 to 2003

Concentration = ug/l
Flow = gpm
Loading = lb/day

Early Bird Portal
Metal Loading 2000 to 2003

Well ID	Date	Cd_Diss	Cu_Diss	Zn_Diss	Flow	Cd_Load	Cu_Load	Zn_Load
Early-1.1	20-Jan-00	2.5	5	203	1.5	0.00004	0.00009	0.00365
Early-1.1	03-Feb-00	2.5	17.2	196	1	0.00003	0.00021	0.00235
Early-1.1	16-Mar-00	2.5	5	125	3	0.00009	0.00018	0.00449
Early-1.1	08-Apr-00	2.5	5	313	1.5	0.00004	0.00009	0.00562
Early-1.1	08-May-00	2.5	5	151	3	0.00009	0.00018	0.00543
Early-1.1	05-Jun-00	2.5	5	162	1.6	0.00005	0.00010	0.00311
Early-1.1	13-Jul-00	2.5	5	148	1.4	0.00004	0.00008	0.00248
Early-1.1	01-Aug-00	2.5	12	164	1.6	0.00005	0.00023	0.00314
Early-1.1	06-Sep-00	2.5	5	166	1.4	0.00004	0.00008	0.00278
Early-1.1	04-Oct-00	2.5	10.2	194	1.3	0.00004	0.00016	0.00302
Early-1.1	06-Nov-00	2.5	5	208	1.7	0.00005	0.00010	0.00424
Early-1.1	11-Dec-00	2.5	14.8	184	1.7	0.00005	0.00030	0.00375
Early-1.1	08-Jan-01	1.1	1	180	2.5	0.00003	0.00003	0.00539
Early-1.1	22-Feb-01	0.5	1	68	2	0.00001	0.00002	0.00163
Early-1.1	12-Mar-01	0.5	1	106	4	0.00002	0.00005	0.00508
Early-1.1	02-Apr-01	0.5	1	130	2	0.00001	0.00002	0.00311
Early-1.1	03-May-01	0.5	1	10	1.6	0.00001	0.00002	0.00019
Early-1.1	05-Jun-01	0.5	1	10	2	0.00001	0.00002	0.00024
Early-1.1	03-Jul-01	0.5	1	138	0.8	0.00000	0.00001	0.00132
Early-1.1	03-Aug-01	0.5	1	10	1.3	0.00001	0.00002	0.00016
Early-1.1	06-Sep-01	0.5	1	10	1.1	0.00001	0.00001	0.00013
Early-1.1	02-Oct-01	0.5	23	10	1.1	0.00001	0.00030	0.00013
Early-1.1	02-Nov-01	0.5	1	10	1	0.00001	0.00001	0.00012
Early-1.1	10-Dec-01	0.5	1	138	1	0.00001	0.00001	0.00165
Early-1.1	03-Jan-02	0.5	3	54	3	0.00002	0.00011	0.00194
Early-1.1	06-Feb-02	0.5	88	946	1	0.00001	0.00105	0.01133
Early-1.1	05-Mar-02	0.5	1	83	2.3	0.00001	0.00003	0.00229
Early-1.1	02-Apr-02	0.5	1	10	2.2	0.00001	0.00003	0.00026
Early-1.1	01-May-02	0.5	5	108	2.1	0.00001	0.00013	0.00272
Early-1.1	04-Jun-02	2.4	18	140	1.5	0.00004	0.00032	0.00252
Early-1.1	02-Jul-02	0.5	1	74	1.3	0.00001	0.00002	0.00115
Early-1.1	01-Aug-02	0.5	8	104	1.5	0.00001	0.00014	0.00187
Early-1.1	04-Feb-03	0	10	20	37.5	0.00000	0.00449	0.00899
Early-1.1	04-Aug-03	0	10	40	22	0.00000	0.00264	0.01054
Average		**1.250**	**8.0**	**135.7**	**3.4**	**0.00003**	**0.00033**	**0.00314**

Early Bird Portal
Pressure 2000 to 2003

WellID	Date	WellRegID	PSI
Early-1.1	20-Jan-00	012	27
Early-1.1	03-Feb-00	012	27
Early-1.1	16-Mar-00	012	39
Early-1.1	08-May-00	012	29
Early-1.1	05-Jun-00	012	29
Early-1.1	13-Jul-00	012	29
Early-1.1	01-Aug-00	012	31
Early-1.1	06-Sep-00	012	30
Early-1.1	04-Oct-00	012	32
Early-1.1	06-Nov-00	012	31
Early-1.1	11-Dec-00	012	29
Early-1.1	08-Jan-01	012	30
Early-1.1	22-Feb-01	012	26
Early-1.1	03-Jul-01	012	25
Early-1.1	03-Aug-01	012	25
Early-1.1	06-Sep-01	012	26
Early-1.1	02-Oct-01	012	27
Early-1.1	02-Nov-01	012	26
Early-1.1	10-Dec-01	012	20
Early-1.1	03-Jan-02	012	25
Early-1.1	06-Feb-02	012	31
Early-1.1	05-Mar-02	012	38
Early-1.1	02-Apr-02	012	30
Early-1.1	01-May-02	012	28
Early-1.1	04-Jun-02	012	26
Early-1.1	02-Jul-02	012	25
Early-1.1	01-Aug-02	012	25
Early-1.1	04-Feb-03	012	27
Average			**28.3**

Shasta King Portal
Dissolved Metal and Flow Data

Shasta King Portal Concentration = ug/l

Dissolved Metals Data 1969 to 2003 Flow = gpm

Well ID	Date	Well Reg ID	Cd Diss	Cu Diss	Zn Diss	Flow
Squaw-8.1	04-Feb-69	011		108000		
Squaw-8.1	21-Oct-74	011				1
Squaw-8.1	11-Jan-75	011				2
Squaw-8.1	19-Dec-78	011	120	115000	100000	0.5
Squaw-8.1	16-Jul-80	011	410	66000	76200	
Squaw-8.1	01-Sep-82	011		190000	156000	
Squaw-8.1	27-Oct-82	011				0.34
Squaw-8.1	23-Nov-82	011				1.44
Squaw-8.1	28-Dec-82	011				11
Squaw-8.1	21-Apr-83	011				47.58
Squaw-8.1	09-Apr-89	011	277	50500	47600	2
Squaw-8.1	28-Apr-89	011	310	51700	63500	3.5
Squaw-8.1	04-May-89	011	295	56000	58000	2
Squaw-8.1	31-May-89	011	340	56300	70900	2
Squaw-8.1	09-Jul-89	011	421	71200	78600	2
Squaw-8.1	31-Jul-89	011	450	75900	87500	2
Squaw-8.1	01-Sep-89	011				0
Squaw-8.1	02-Oct-89	011				0
Squaw-8.1	01-Nov-89	011				0
Squaw-8.1	04-Dec-89	011				0
Squaw-8.1	02-Jan-90	011				0
Squaw-8.1	06-Mar-90	011				3
Squaw-8.1	04-Apr-90	011				0
Squaw-8.1	02-May-90	011				0
Squaw-8.1	01-Oct-90	011				0.5
Squaw-8.1	04-Dec-90	011				0.5
Squaw-8.1	17-Apr-91	011	350	85500	64900	3
Squaw-8.1	26-Dec-91	011	550	91000	120000	0.5
Squaw-8.1	17-Jan-92	011	730	130000	150000	10
Squaw-8.1	01-May-92	011	260	49400	45400	
Squaw-8.1	01-Jun-92	011	348	59500	64300	5
Squaw-8.1	01-Jul-92	011	381	64700	71000	5
Squaw-8.1	10-Aug-92	011	402	73100	77000	4
Squaw-8.1	15-Sep-92	011	442	80100	82700	4
Squaw-8.1	12-Oct-92	011	446	79400	85600	
Squaw-8.1	12-Nov-92	011	446	86400	87600	3
Squaw-8.1	16-Dec-92	011	458	93600	90600	5
Squaw-8.1	30-Apr-93	011	223	40000	42100	5
Squaw-8.1	04-May-93	011	230	45000	51100	6
Squaw-8.1	14-May-93	011	258	45800	49600	5
Squaw-8.1	11-Jun-93	011	200	37900	36900	5
Squaw-8.1	14-Jul-93	011	328	56900	63000	5
Squaw-8.1	16-Aug-93	011	370	66600	72300	3
Squaw-8.1	16-Sep-93	011	350	65300	68200	2
Squaw-8.1	01-Oct-93	011	404	69500	79700	2
Squaw-8.1	16-Nov-93	011	336	66200	65500	3
Squaw-8.1	16-Dec-93	011	368	69500	70700	3
Squaw-8.1	14-Jan-94	011	364	71900	69800	2
Squaw-8.1	14-Feb-94	011	402	77700	72600	2

Shasta King Portal Concentration = ug/l

Dissolved Metals Data 1969 to 2003 Flow = gpm

Tot WellID	Date	WellRegID	Cd Diss	Cu Diss	Zn Diss	Flow
Squaw-8.1	01-Mar-94	011	316	58200	58200	3
Squaw-8.1	14-Apr-94	011	356	65100	67100	2
Squaw-8.1	04-May-94	011		61000	65000	2
Squaw-8.1	16-May-94	011	391	70000	72800	2
Squaw-8.1	14-Jun-94	011	392	69600	77500	2
Squaw-8.1	14-Jul-94	011	372	70500	74100	1.5
Squaw-8.1	01-Aug-94	011	367	69200	75400	1
Squaw-8.1	01-Sep-94	011	403	67300	77800	1
Squaw-8.1	14-Oct-94	011	413	75400	84700	1
Squaw-8.1	14-Nov-94	011	371	63600	75400	
Squaw-8.1	16-Feb-95	011	223	49400	46800	2
Squaw-8.1	14-Mar-95	011	316	58200	58200	3
Squaw-8.1	15-Apr-95	011	163	35500	35200	2
Squaw-8.1	12-May-95	011	237	50700	50000	2
Squaw-8.1	02-Jun-95	011		99000	110000	0.25
Squaw-8.1	15-Jun-95	011	275	49700	59800	2
Squaw-8.1	15-Aug-95	011	367	69200	75400	1
Squaw-8.1	14-Sep-95	011	403	67300	77800	1
Squaw-8.1	07-Nov-95	011	598	92100	132000	1.1
Squaw-8.1	15-Jan-96	011	528	107000	97500	1
Squaw-8.1	16-Feb-96	011	266	59000	49500	1.5
Squaw-8.1	08-Mar-96	011	94	21100	17000	3.8
Squaw-8.1	14-Mar-96	011	135	25800	25000	1.5
Squaw-8.1	15-Jul-96	011	229	37700	43800	1
Squaw-8.1	15-Aug-96	011	384	67500	75800	2
Squaw-8.1	17-Sep-96	011	372	64600	73000	1.1
Squaw-8.1	14-Oct-96	011	414	70000	83200	0.8
Squaw-8.1	25-Nov-96	011	451	78900	89700	1
Squaw-8.1	17-Dec-96	011	267	68000	52200	5
Squaw-8.1	18-Feb-97	011	196	36300	34700	6
Squaw-8.1	15-Mar-97	011	256	44500	46500	8
Squaw-8.1	14-Apr-97	011	300	45900	52200	1
Squaw-8.1	16-May-97	011	315	52500	60100	2
Squaw-8.1	24-Jun-97	011	362	60700	72300	1
Squaw-8.1	22-Jul-97	011	345	55100	66100	1
Squaw-8.1	22-Aug-97	011	690	121000	149000	1
Squaw-8.1	12-Sep-97	011	316	51600	66400	0.9
Squaw-8.1	14-Oct-97	011	400	72000	83000	1
Squaw-8.1	12-Nov-97	011	382	72100	75500	2
Squaw-8.1	16-Dec-97	011	450	93200	83500	3
Squaw-8.1	21-May-98	011	140	25500	25500	5
Squaw-8.1	22-Jun-98	011	150	27200	27700	3
Squaw-8.1	16-Jul-98	011	220	36400	41000	2
Squaw-8.1	19-Aug-98	011	290	50200	55000	0.2
Squaw-8.1	17-Sep-98	011	300	53900	58900	0.2
Squaw-8.1	12-Oct-98	011	320	57400	61800	2
Squaw-8.1	11-Nov-98	011	300	58600	69100	1
Squaw-8.1	15-Feb-99	011	160	46500	29000	5
Squaw-8.1	30-Mar-99	011	110	29200	20900	5

Shasta King Portal
Dissolved Metals Data 1969 to 2003

Concentration = ug/l
Flow = gpm

Well ID	Date	Wel Reg D	Cd Diss	Cu Diss	Zn Diss	Flow
Squaw-8.1	14-Apr-99	011	110	29500	19900	7
Squaw-8.1	20-Jan-00	011	7.1	1440	1680	3
Squaw-8.1	03-Feb-00	011				5
Squaw-8.1	07-Feb-00	011	6.8	1050	1200	
Squaw-8.1	16-Mar-00	011	22.2	3510	4630	3
Squaw-8.1	07-Apr-00	011				0
Squaw-8.1	08-May-00	011	119	17700	25900	1
Squaw-8.1	05-Jun-00	011	387	61100	80700	1
Squaw-8.1	13-Jul-00	011	418	60400	81000	3.2
Squaw-8.1	01-Aug-00	011	439	62800	87200	2.5
Squaw-8.1	06-Sep-00	011	411	65200	79200	1.1
Squaw-8.1	04-Oct-00	011	446	66200	88200	1
Squaw-8.1	08-Nov-00	011	398	68000	77300	1.1
Squaw-8.1	11-Dec-00	011	312	56600	59100	5
Squaw-8.1	09-Jan-01	011	349	52300	59200	1.9
Squaw-8.1	09-Mar-01	011	154	34400	24700	11.5
Squaw-8.1	02-Apr-01	011	316	62000	52800	25.7
Squaw-8.1	03-May-01	011	387	69000	66300	4
Squaw-8.1	04-Jun-01	011	463	76200	76700	1.1
Squaw-8.1	03-Jul-01	011	485	77900	82500	1.5
Squaw-8.1	03-Aug-01	011				0
Squaw-8.1	06-Sep-01	011	497	79800	84100	5
Squaw-8.1	02-Oct-01	011	490	77900	89300	2
Squaw-8.1	02-Nov-01	011	524	86400	96300	1.1
Squaw-8.1	10-Dec-01	011	314	73400	49100	5
Squaw-8.1	03-Jan-02	011	128	318	21800	10
Squaw-8.1	06-Feb-02	011	303	53300	51300	4
Squaw-8.1	05-Mar-02	011	240	44100	38800	5
Squaw-8.1	02-Apr-02	011	217	42700	36800	6.7
Squaw-8.1	01-May-02	011	277	51400	49600	3
Squaw-8.1	04-Jun-02	011	315	47600	51900	2
Squaw-8.1	02-Jul-02	011	323	53000	56200	1.5
Squaw-8.1	01-Aug-02	011	369	62300	65700	1
Squaw-8.1	04-Feb-03	011	230	54290	35300	6
Squaw-8.1	18-Feb-03	011	260	43410	30660	7
Squaw-8.1	04-Aug-03	011	412	63100	72700	
Squaw-8.1	04-Aug-03	011	400	44780	34240	15

Shasta King Portal
Dissolved Metal Loading
2000 to 2003

Concentration = ug/l
Flow = gpm
Loading = lb/day

Shasta King Portal
Dissolved Copper Loading 2000 to 2003

Well ID	Date	Cu-Diss	Flow	Loading
Squaw-8.1	20-Jan-00	1440	3	0.05
Squaw-8.1	16-Mar-00	3510	3	0.13
Squaw-8.1	08-May-00	17700	1	0.21
Squaw-8.1	05-Jun-00	61100	1	0.73
Squaw-8.1	13-Jul-00	60400	3.2	2.32
Squaw-8.1	01-Aug-00	62800	2.5	1.88
Squaw-8.1	06-Sep-00	65200	1.1	0.86
Squaw-8.1	04-Oct-00	66200	1	0.79
Squaw-8.1	08-Nov-00	68000	1.1	0.90
Squaw-8.1	11-Dec-00	56600	5	3.39
Squaw-8.1	09-Jan-01	52300	1.9	1.19
Squaw-8.1	09-Mar-01	34400	11.5	4.74
Squaw-8.1	02-Apr-01	62000	25.7	19.09
Squaw-8.1	03-May-01	69000	4	3.31
Squaw-8.1	04-Jun-01	76200	1.1	1.00
Squaw-8.1	03-Jul-01	77900	1.5	1.40
Squaw-8.1	06-Sep-01	79800	5	4.78
Squaw-8.1	02-Oct-01	77900	2	1.87
Squaw-8.1	02-Nov-01	86400	1.1	1.14
Squaw-8.1	10-Dec-01	73400	5	4.40
Squaw-8.1	03-Jan-02	318	10	0.04
Squaw-8.1	06-Feb-02	53300	4	2.55
Squaw-8.1	05-Mar-02	44100	5	2.64
Squaw-8.1	02-Apr-02	42700	6.7	3.43
Squaw-8.1	01-May-02	51400	3	1.85
Squaw-8.1	04-Jun-02	47600	2	1.14
Squaw-8.1	02-Jul-02	53000	1.5	0.95
Squaw-8.1	01-Aug-02	62300	1	0.75
Squaw-8.1	04-Feb-03	54290	6	3.90
Squaw-8.1	18-Feb-03	43410	7	3.64
Squaw-8.1	04-Aug-03	44780	15	8.05
Average		**53208**	**4.6**	**2.68**

Concentration = ug/l
Flow = gpm
Loading = lb/day

Shasta King Portal
Dissolved Cadmium Loading 2000 to 2003

Well ID	Date	Cd Diss	Flow	Loading
Squaw-8.1	20-Jan-00	7.1	3	0.00026
Squaw-8.1	16-Mar-00	22.2	3	0.00080
Squaw-8.1	08-May-00	119	1	0.00143
Squaw-8.1	05-Jun-00	387	1	0.00464
Squaw-8.1	13-Jul-00	418	3.2	0.01602
Squaw-8.1	01-Aug-00	439	2.5	0.01315
Squaw-8.1	06-Sep-00	411	1.1	0.00542
Squaw-8.1	04-Oct-00	446	1	0.00534
Squaw-8.1	08-Nov-00	398	1.1	0.00524
Squaw-8.1	11-Dec-00	312	5	0.01869
Squaw-8.1	09-Jan-01	349	1.9	0.00794
Squaw-8.1	09-Mar-01	154	11.5	0.02122
Squaw-8.1	02-Apr-01	316	25.7	0.09729
Squaw-8.1	03-May-01	387	4	0.01855
Squaw-8.1	04-Jun-01	463	1.1	0.00610
Squaw-8.1	03-Jul-01	485	1.5	0.00872
Squaw-8.1	06-Sep-01	497	5	0.02977
Squaw-8.1	02-Oct-01	490	2	0.01174
Squaw-8.1	02-Nov-01	524	1.1	0.00691
Squaw-8.1	10-Dec-01	314	5	0.01881
Squaw-8.1	03-Jan-02	128	10	0.01533
Squaw-8.1	06-Feb-02	303	4	0.01452
Squaw-8.1	05-Mar-02	240	5	0.01438
Squaw-8.1	02-Apr-02	217	6.7	0.01742
Squaw-8.1	01-May-02	277	3	0.00996
Squaw-8.1	04-Jun-02	315	2	0.00755
Squaw-8.1	02-Jul-02	323	1.5	0.00580
Squaw-8.1	01-Aug-02	369	1	0.00442
Squaw-8.1	04-Feb-03	230	6	0.01653
Squaw-8.1	18-Feb-03	260	7	0.02180
Squaw-8.1	04-Aug-03	400	15	0.07188
Average		**322.6**	**4.6**	**0.01605**

Concentration = ug/l
Flow = gpm
Loading = lb/day

Shasta King Portal
Dissolved Zinc Loading 2000 to 2003

Well ID	Date	Zn Diss	Flow	Loading
Squaw-8.1	20-Jan-00	1680	3	0.06
Squaw-8.1	16-Mar-00	4630	3	0.17
Squaw-8.1	08-May-00	25900	1	0.31
Squaw-8.1	05-Jun-00	80700	1	0.97
Squaw-8.1	13-Jul-00	81000	3.2	3.11
Squaw-8.1	01-Aug-00	87200	2.5	2.61
Squaw-8.1	06-Sep-00	79200	1.1	1.04
Squaw-8.1	04-Oct-00	88200	1	1.06
Squaw-8.1	08-Nov-00	77300	1.1	1.02
Squaw-8.1	11-Dec-00	59100	5	3.54
Squaw-8.1	09-Jan-01	59200	1.9	1.35
Squaw-8.1	09-Mar-01	24700	11.5	3.40
Squaw-8.1	02-Apr-01	52800	25.7	16.26
Squaw-8.1	03-May-01	66300	4	3.18
Squaw-8.1	04-Jun-01	76700	1.1	1.01
Squaw-8.1	03-Jul-01	82500	1.5	1.48
Squaw-8.1	06-Sep-01	84100	5	5.04
Squaw-8.1	02-Oct-01	89300	2	2.14
Squaw-8.1	02-Nov-01	96300	1.1	1.27
Squaw-8.1	10-Dec-01	49100	5	2.94
Squaw-8.1	03-Jan-02	21800	10	2.61
Squaw-8.1	06-Feb-02	51300	4	2.46
Squaw-8.1	05-Mar-02	38800	5	2.32
Squaw-8.1	02-Apr-02	36800	6.7	2.95
Squaw-8.1	01-May-02	49600	3	1.78
Squaw-8.1	04-Jun-02	51900	2	1.24
Squaw-8.1	02-Jul-02	56200	1.5	1.01
Squaw-8.1	01-Aug-02	65700	1	0.79
Squaw-8.1	04-Feb-03	35300	6	2.54
Squaw-8.1	18-Feb-03	30660	7	2.57
Squaw-8.1	04-Aug-03	34240	15	6.15
Average		**56071**	**4.6**	**2.53**

Balaklala (Lower Windy Camp) Portal
Dissolved Metal and Flow Data

Balaklala Portal Concentration = ug/l

Dissolved Metal Data 1974 to 2003 Flow = gpm

WellID	Date	WellRegID	Cd Diss	Cu Diss	Zn Diss	Flow
Windy-5.1	21-Oct-74	010				150
Windy-5.1	10-Apr-75	010	40	6250	7000	1059
Windy-5.1	17-Sep-75	010				44.9
Windy-5.1	19-Dec-78	010	80	10500	15200	12
Windy-5.1	01-Aug-79	010	60	7300	11800	80
Windy-5.1	23-Sep-79	010	60	7500	12000	75
Windy-5.1	26-Oct-79	010	200	43800	33000	150
Windy-5.1	01-Nov-79	010	150	31100	25700	150
Windy-5.1	01-Jan-80	010	100	6700	14000	300
Windy-5.1	01-Feb-80	010	40	8500	9100	528
Windy-5.1	01-Mar-80	010	40	6700	9300	528
Windy-5.1	31-Mar-80	010	40	6600	9300	301
Windy-5.1	01-Apr-80	010	40	6600	9300	300
Windy-5.1	19-May-80	010		6300	10100	300
Windy-5.1	17-Jun-80	010	60	5870	11100	
Windy-5.1	23-Jun-80	010		6200	11400	187
Windy-5.1	24-Jun-80	010		12000	21400	45
Windy-5.1	27-Jun-80	010	120	12100	22000	
Windy-5.1	02-Jul-80	010		11900	23000	46
Windy-5.1	16-Jul-80	010	110	13300	21700	
Windy-5.1	08-Aug-80	010	110	13300	21700	
Windy-5.1	19-Aug-80	010	120	12000	24600	
Windy-5.1	25-Aug-80	010		12500	25000	33
Windy-5.1	25-Sep-80	010		12700	26000	30
Windy-5.1	20-Oct-80	010	130	13900	27000	25
Windy-5.1	25-Nov-80	010		9900	16000	59
Windy-5.1	25-Dec-80	010		45000	43000	25
Windy-5.1	25-Jan-81	010		76000	65000	148
Windy-5.1	02-Feb-81	010		32000	29000	297
Windy-5.1	28-Mar-81	010		21000	31000	148
Windy-5.1	10-Apr-81	010	80	12700	14500	200
Windy-5.1	30-Apr-81	010		14000	20500	99
Windy-5.1	31-May-81	010				59
Windy-5.1	30-Jun-81	010				37
Windy-5.1	29-Jul-81	010				30
Windy-5.1	31-Aug-81	010				33
Windy-5.1	29-Sep-81	010				33
Windy-5.1	10-Jan-82	010				175
Windy-5.1	18-Feb-82	010	10	6800	7700	600
Windy-5.1	01-Apr-82	010		7100		330
Windy-5.1	01-May-82	010		5200		330
Windy-5.1	06-May-82	010	55	6640	8080	400
Windy-5.1	01-Jun-82	010		5200		185
Windy-5.1	15-Jun-82	010	51	5450	9330	298
Windy-5.1	01-Jul-82	010		5860		196
Windy-5.1	01-Aug-82	010		6650		132
Windy-5.1	01-Sep-82	010		5570		106
Windy-5.1	01-Oct-82	010		14480		100
Windy-5.1	26-Oct-82	010				301

Balaklala Portal Concentration = ug/l

Dissolved Metal Data 1974 to 2003 Flow = gpm

WellID	Date	WellRegID	Cd_Diss	Cu_Diss	Zn_Diss	Flow
Windy-5.1	01-Nov-82	010		17500		151
Windy-5.1	23-Nov-82	010				251.8
Windy-5.1	01-Dec-82	010		13700		211
Windy-5.1	28-Dec-82	010				557
Windy-5.1	01-Jan-83	010		36100		175
Windy-5.1	27-Jan-83	010				4430
Windy-5.1	28-Feb-83	010				9650
Windy-5.1	01-Mar-83	010				9336
Windy-5.1	01-Apr-83	010		5400		343
Windy-5.1	21-Apr-83	010				597
Windy-5.1	01-May-83	010		5250		317
Windy-5.1	14-Sep-83	010	87	5670	23200	
Windy-5.1	04-Jan-84	010	56	6640	16500	
Windy-5.1	09-Apr-84	010	70	9430	45000	200
Windy-5.1	10-Jan-85	010	90	12600	17600	284
Windy-5.1	04-Apr-85	010	90	15500	20600	234
Windy-5.1	04-Oct-85	010	90	11500	19500	
Windy-5.1	07-Mar-86	010	50	6400	8000	400
Windy-5.1	10-Jun-86	010	120	15000	22500	50
Windy-5.1	06-Jul-86	010		11190		
Windy-5.1	05-Aug-86	010				30
Windy-5.1	23-Dec-86	010	108	12500	20000	40
Windy-5.1	07-Jan-87	010		36500		
Windy-5.1	07-Feb-87	010		17170		
Windy-5.1	07-Mar-87	010		30860		
Windy-5.1	29-Apr-87	010		11300		
Windy-5.1	08-May-87	010		10540		
Windy-5.1	07-Jun-87	010		8170		
Windy-5.1	28-Jun-87	010		7580		
Windy-5.1	06-Aug-87	010	270	23000	64000	38
Windy-5.1	19-Oct-87	010				6
Windy-5.1	31-Oct-87	010				10
Windy-5.1	10-Nov-87	010		18900	25000	10
Windy-5.1	29-Nov-87	010		56600	33500	25
Windy-5.1	27-Jan-88	010	60	10400	14500	450
Windy-5.1	03-Mar-88	010				300
Windy-5.1	09-Apr-88	010		8480		250
Windy-5.1	01-May-88	010		17190		250
Windy-5.1	08-Jun-88	010		12710		150
Windy-5.1	30-Jul-88	010		13500		18
Windy-5.1	07-Sep-88	010		12970		30
Windy-5.1	18-Nov-88	010				8
Windy-5.1	03-Dec-88	010				27
Windy-5.1	27-Jan-89	010	277	43800	49400	42
Windy-5.1	13-Mar-89	010	2240	37200	39100	25
Windy-5.1	09-Apr-89	010	171	26800	28700	37.5
Windy-5.1	28-Apr-89	010	138	18400	24500	28
Windy-5.1	04-May-89	010	137	18600	23500	25
Windy-5.1	31-May-89	010	149	16000	27600	23

Balaklala Portal Concentration = ug/l

Dissolved Metal Data 1974 to 2003 Flow = gpm

Well ID	Date	Well Reg ID	Cd Diss	Cu Diss	Zn Diss	Flow
Windy-5.1	09-Jul-89	010	148	14900	27500	23
Windy-5.1	31-Jul-89	010	132	13000	24500	12
Windy-5.1	01-Sep-89	010	160	15400	29600	6.6
Windy-5.1	02-Oct-89	010	177	16500	33400	8.8
Windy-5.1	01-Nov-89	010	231	25200	42100	7.5
Windy-5.1	04-Dec-89	010	233	22200	37800	10
Windy-5.1	02-Jan-90	010	189	18800	34100	8.5
Windy-5.1	05-Feb-90	010	257	31800	44100	8.5
Windy-5.1	06-Mar-90	010	202	24000	36000	9
Windy-5.1	04-Apr-90	010	179	20700	33000	9
Windy-5.1	02-May-90	010	173	18600	31500	10
Windy-5.1	26-Aug-96	010	54	5310	9040	5
Windy-5.1	17-Sep-96	010	59	5600	10600	6.5
Windy-5.1	10-Oct-96	010	56	4710	10200	6.5
Windy-5.1	25-Nov-96	010	83	8730	15100	2.3
Windy-5.1	17-Dec-96	010	120	21400	19300	2.3
Windy-5.1	16-Jan-97	010	73	11400	10900	1
Windy-5.1	18-Feb-97	010	46	7030	7010	5
Windy-5.1	13-Mar-97	010	34	4970	5160	2.3
Windy-5.1	14-Apr-97	010	31	3790	5070	9
Windy-5.1	16-May-97	010	54	5160	9000	6
Windy-5.1	23-Jun-97	010	47	4560	8300	17
Windy-5.1	22-Jul-97	010	49	4270	9270	7.3
Windy-5.1	22-Aug-97	010	52	4920	10100	6.5
Windy-5.1	19-Sep-97	010	61	5350	11700	6
Windy-5.1	14-Oct-97	010	62	6210	12300	10
Windy-5.1	12-Nov-97	010	71	7350	13900	2.5
Windy-5.1	16-Dec-97	010	208	37200	34100	10
Windy-5.1	10-Feb-98	010	54	8340	8090	6
Windy-5.1	11-Mar-98	010	36	5780	5230	9
Windy-5.1	16-Apr-98	010	22	3500	3300	5
Windy-5.1	21-May-98	010	25	2920	4120	5
Windy-5.1	19-Jun-98	010	24	2770	3660	5
Windy-5.1	16-Jul-98	010	31	3000	4990	5
Windy-5.1	19-Aug-98	010	42	4000	7290	5
Windy-5.1	17-Sep-98	010	44	4240	8050	3
Windy-5.1	12-Oct-98	010	46	4320	8400	6
Windy-5.1	11-Nov-98	010	57	5250	10600	4
Windy-5.1	15-Dec-98	010	161	28800	26500	3
Windy-5.1	13-Jan-99	010	83	11400	14500	4
Windy-5.1	15-Feb-99	010	98	14200	16200	5
Windy-5.1	30-Mar-99	010	42	5290	6030	6
Windy-5.1	14-Apr-99	010	35	4520	5030	6
Windy-5.1	17-May-99	010	26	2980	4040	4
Windy-5.1	14-Jun-99	010	24	2460	4550	2
Windy-5.1	13-Jul-99	010	39	3280	6860	0.5
Windy-5.1	13-Aug-99	010	43	3710	7820	1
Windy-5.1	13-Sep-99	010	44	3530	8310	4
Windy-5.1	19-Oct-99	010	58	5140	11300	5

Balaklala Portal Concentration = ug/l

Dissolved Metal Data 1974 to 2003 Flow = gpm

Wel ID	Date	Wel RegID	Cd Diss	Cu Diss	Zn Diss	Flow
Windy-5.1	22-Nov-99	010	68	8150	13400	4
Windy-5.1	14-Dec-99	010	106	17400	19700	0.5
Windy-5.1	20-Jan-00	010	195	35500	34300	2
Windy-5.1	03-Feb-00	010	254	60500	42500	2
Windy-5.1	08-May-00	010	27.9	3670	4100	4
Windy-5.1	05-Jun-00	010	25.7	3010	4110	1
Windy-5.1	13-Jul-00	010	41.8	3580	7000	1
Windy-5.1	01-Aug-00	010	45.5	4030	8000	1.5
Windy-5.1	06-Sep-00	010	52.3	5540	9740	3
Windy-5.1	04-Oct-00	010	58.2	5610	11400	5
Windy-5.1	06-Nov-00	010	64.1	6080	12600	1.5
Windy-5.1	11-Dec-00	010	74.9	8300	14300	2
Windy-5.1	09-Jan-01	010	93	9580	15700	1
Windy-5.1	22-Feb-01	010	126	25300	18800	3
Windy-5.1	12-Mar-01	010	61.2	8830	9910	2
Windy-5.1	02-Apr-01	010	62.4	6940	11700	2
Windy-5.1	03-May-01	010		4730	10200	2
Windy-5.1	05-Jun-01	010	67.8	4460	11700	2
Windy-5.1	03-Jul-01	010	61.8	4030	11200	2
Windy-5.1	03-Aug-01	010	65.1	4260	11200	2
Windy-5.1	06-Sep-01	010	57.3	3780	10500	2
Windy-5.1	02-Oct-01	010	60.5	4050	12200	2
Windy-5.1	02-Nov-01	010	65.2	4380	12200	2
Windy-5.1	10-Dec-01	010	134	23300	22100	2
Windy-5.1	14-Feb-02	010	36.8	4810	5600	17
Windy-5.1	05-Mar-02	010	32.9	4030	5400	7
Windy-5.1	02-Apr-02	010	31.6	3150	4880	10
Windy-5.1	01-May-02	010	27	2530	4970	20.7
Windy-5.1	04-Jun-02	010	39.5	2940	6720	18.8
Windy-5.1	02-Jul-02	010	49.2	3820	8780	17.6
Windy-5.1	01-Aug-02	010	55.5	4450	10600	17.1
Windy-5.1	04-Feb-03	010	70	7190	7830	22.75
Windy-5.1	04-Aug-03	010	44.1	3570	7380	
Windy-5.1	04-Aug-03	010	50	3730	7840	15

Balaklala (Lower Windy Camp) Portal

Dissolved Metal Loading

Pre-Remediation

Concentration = ug/l
Flow = gpm
Loading = lb/day

Balaklala Portal
Dissolved Copper Loading Pre Remediation

Well ID	Date	Cu Diss	Flow	Loading
Windy-5.1	10-Apr-75	6250	1059	79.3
Windy-5.1	19-Dec-78	10500	12	1.5
Windy-5.1	01-Aug-79	7300	80	7.0
Windy-5.1	23-Sep-79	7500	75	6.7
Windy-5.1	26-Oct-79	43800	150	78.7
Windy-5.1	01-Nov-79	31100	150	55.9
Windy-5.1	01-Jan-80	6700	300	24.1
Windy-5.1	01-Feb-80	8500	528	53.8
Windy-5.1	01-Mar-80	6700	528	42.4
Windy-5.1	31-Mar-80	6600	301	23.8
Windy-5.1	01-Apr-80	6600	300	23.7
Windy-5.1	19-May-80	6300	300	22.6
Windy-5.1	23-Jun-80	6200	187	13.9
Windy-5.1	24-Jun-80	12000	45	6.5
Windy-5.1	02-Jul-80	11900	46	6.6
Windy-5.1	25-Aug-80	12500	33	4.9
Windy-5.1	25-Sep-80	12700	30	4.6
Windy-5.1	20-Oct-80	13900	25	4.2
Windy-5.1	25-Nov-80	9900	59	7.0
Windy-5.1	25-Dec-80	45000	25	13.5
Windy-5.1	25-Jan-81	76000	148	134.8
Windy-5.1	02-Feb-81	32000	297	113.9
Windy-5.1	28-Mar-81	21000	148	37.2
Windy-5.1	10-Apr-81	12700	200	30.4
Windy-5.1	30-Apr-81	14000	99	16.6
Windy-5.1	18-Feb-82	6800	600	48.9
Windy-5.1	01-Apr-82	7100	330	28.1
Windy-5.1	01-May-82	5200	330	20.6
Windy-5.1	06-May-82	6640	400	31.8
Windy-5.1	01-Jun-82	5200	185	11.5
Windy-5.1	15-Jun-82	5450	298	19.5
Windy-5.1	01-Jul-82	5860	196	13.8
Windy-5.1	01-Aug-82	6650	132	10.5
Windy-5.1	01-Sep-82	5570	106	7.1
Windy-5.1	01-Oct-82	14480	100	17.3
Windy-5.1	01-Nov-82	17500	151	31.7
Windy-5.1	01-Dec-82	13700	211	34.6
Windy-5.1	01-Jan-83	36100	175	75.7
Windy-5.1	01-Apr-83	5400	343	22.2
Windy-5.1	01-May-83	5250	317	19.9
Windy-5.1	09-Apr-84	9430	200	22.6
Windy-5.1	10-Jan-85	12600	284	42.9
Windy-5.1	04-Apr-85	15500	234	43.5
Average		**14234.4**	**226.0**	**30.6**

Concentration = ug/l
Flow = gpm
Loading = lb/day

Balaklala Portal
Dissolved Cadmium Loading Pre Remediation

Well ID	Date	Cd Diss	Flow	Loading
Windy-5.1	10-Apr-75	40	1059	0.507
Windy-5.1	19-Dec-78	80	12	0.012
Windy-5.1	01-Aug-79	60	80	0.058
Windy-5.1	23-Sep-79	60	75	0.054
Windy-5.1	26-Oct-79	200	150	0.359
Windy-5.1	01-Nov-79	150	150	0.270
Windy-5.1	01-Jan-80	100	300	0.359
Windy-5.1	01-Feb-80	40	528	0.253
Windy-5.1	01-Mar-80	40	528	0.253
Windy-5.1	31-Mar-80	40	301	0.144
Windy-5.1	01-Apr-80	40	300	0.144
Windy-5.1	20-Oct-80	130	25	0.039
Windy-5.1	10-Apr-81	80	200	0.192
Windy-5.1	18-Feb-82	10	600	0.072
Windy-5.1	06-May-82	55	400	0.264
Windy-5.1	15-Jun-82	51	298	0.182
Windy-5.1	09-Apr-84	70	200	0.168
Windy-5.1	10-Jan-85	90	284	0.306
Windy-5.1	04-Apr-85	90	234	0.252
Average		**75**	**301**	**0.205**

Concentration = ug/l
Flow = gpm
Loading = lb/day

Balaklala Portal
Dissolved Zinc Loading Pre Remediation

Well ID	Date	Zn Diss	Flow	Loading
Windy-5.1	10-Apr-75	7000	1059	88.8
Windy-5.1	19-Dec-78	15200	12	2.2
Windy-5.1	01-Aug-79	11800	80	11.3
Windy-5.1	23-Sep-79	12000	75	10.8
Windy-5.1	26-Oct-79	33000	150	59.3
Windy-5.1	01-Nov-79	25700	150	46.2
Windy-5.1	01-Jan-80	14000	300	50.3
Windy-5.1	01-Feb-80	9100	528	57.6
Windy-5.1	01-Mar-80	9300	528	58.8
Windy-5.1	31-Mar-80	9300	301	33.5
Windy-5.1	01-Apr-80	9300	300	33.4
Windy-5.1	19-May-80	10100	300	36.3
Windy-5.1	23-Jun-80	11400	187	25.5
Windy-5.1	24-Jun-80	21400	45	11.5
Windy-5.1	02-Jul-80	23000	46	12.7
Windy-5.1	25-Aug-80	25000	33	9.9
Windy-5.1	25-Sep-80	26000	30	9.3
Windy-5.1	20-Oct-80	27000	25	8.1
Windy-5.1	25-Nov-80	16000	59	11.3
Windy-5.1	25-Dec-80	43000	25	12.9
Windy-5.1	25-Jan-81	65000	148	115.2
Windy-5.1	02-Feb-81	29000	297	103.2
Windy-5.1	28-Mar-81	31000	148	55.0
Windy-5.1	10-Apr-81	14500	200	34.7
Windy-5.1	30-Apr-81	20500	99	24.3
Windy-5.1	18-Feb-82	7700	600	55.3
Windy-5.1	06-May-82	8080	400	38.7
Windy-5.1	15-Jun-82	9330	298	33.3
Windy-5.1	09-Apr-84	45000	200	107.8
Windy-5.1	10-Jan-85	17600	284	59.9
Windy-5.1	04-Apr-85	20600	234	57.7
Average		**20222.9**	**230.4**	**41.1**

Balaklala (Lower Windy Camp) Portal
Dissolved Metal Loading
2000 thru 2003

Concentration = ug/l
Flow = gpm
Loading = lb/day

Balaklala Portal
Dissolved Copper Loading 2000 to 2003

Well ID	Date	Cu_Diss	Flow	Loading
Windy-5.1	20-Jan-00	35500	2	0.9
Windy-5.1	03-Feb-00	60500	2	1.4
Windy-5.1	08-May-00	3670	4	0.2
Windy-5.1	05-Jun-00	3010	1	0.0
Windy-5.1	13-Jul-00	3580	1	0.0
Windy-5.1	01-Aug-00	4030	1.5	0.1
Windy-5.1	06-Sep-00	5540	3	0.2
Windy-5.1	04-Oct-00	5610	5	0.3
Windy-5.1	06-Nov-00	6080	1.5	0.1
Windy-5.1	11-Dec-00	8300	2	0.2
Windy-5.1	09-Jan-01	9580	1	0.1
Windy-5.1	22-Feb-01	25300	3	0.9
Windy-5.1	12-Mar-01	8830	2	0.2
Windy-5.1	02-Apr-01	6940	2	0.2
Windy-5.1	03-May-01	4730	2	0.1
Windy-5.1	05-Jun-01	4460	2	0.1
Windy-5.1	03-Jul-01	4030	2	0.1
Windy-5.1	03-Aug-01	4260	2	0.1
Windy-5.1	06-Sep-01	3780	2	0.1
Windy-5.1	02-Oct-01	4050	2	0.1
Windy-5.1	02-Nov-01	4380	2	0.1
Windy-5.1	10-Dec-01	23300	2	0.6
Windy-5.1	14-Feb-02	4810	17	1.0
Windy-5.1	05-Mar-02	4030	7	0.3
Windy-5.1	02-Apr-02	3150	10	0.4
Windy-5.1	01-May-02	2530	20.7	0.6
Windy-5.1	04-Jun-02	2940	18.8	0.7
Windy-5.1	02-Jul-02	3820	17.6	0.8
Windy-5.1	01-Aug-02	4450	17.1	0.9
Windy-5.1	04-Feb-03	7190	22.75	2.0
Windy-5.1	04-Aug-03	3730	15	0.7
Average		**8907**	**6.22**	**0.43**

Concentration = ug/l
Flow = gpm
Loading = lb/day

Balaklala Portal
Dissolved Cadmium Loading 2000 to 2003

WellID	Date	Cd Diss	Flow	Loading
Windy-5.1	20-Jan-00	195	2	0.005
Windy-5.1	03-Feb-00	254	2	0.006
Windy-5.1	08-May-00	27.9	4	0.001
Windy-5.1	05-Jun-00	25.7	1	0.000
Windy-5.1	13-Jul-00	41.8	1	0.001
Windy-5.1	01-Aug-00	45.5	1.5	0.001
Windy-5.1	06-Sep-00	52.3	3	0.002
Windy-5.1	04-Oct-00	58.2	5	0.003
Windy-5.1	06-Nov-00	64.1	1.5	0.001
Windy-5.1	11-Dec-00	74.9	2	0.002
Windy-5.1	09-Jan-01	93	1	0.001
Windy-5.1	22-Feb-01	126	3	0.005
Windy-5.1	12-Mar-01	61.2	2	0.001
Windy-5.1	02-Apr-01	62.4	2	0.001
Windy-5.1	05-Jun-01	67.8	2	0.002
Windy-5.1	03-Jul-01	61.8	2	0.001
Windy-5.1	03-Aug-01	65.1	2	0.002
Windy-5.1	06-Sep-01	57.3	2	0.001
Windy-5.1	02-Oct-01	60.5	2	0.001
Windy-5.1	02-Nov-01	65.2	2	0.002
Windy-5.1	10-Dec-01	134	2	0.003
Windy-5.1	14-Feb-02	36.8	17	0.007
Windy-5.1	05-Mar-02	32.9	7	0.003
Windy-5.1	02-Apr-02	31.6	10	0.004
Windy-5.1	01-May-02	27	20.7	0.007
Windy-5.1	04-Jun-02	39.5	18.8	0.009
Windy-5.1	02-Jul-02	49.2	17.6	0.010
Windy-5.1	01-Aug-02	55.5	17.1	0.011
Windy-5.1	04-Feb-03	70	22.75	0.019
Windy-5.1	04-Aug-03	50	15	0.009
Average		**69.5**	**6.4**	**0.004**

Concentration = ug/l
Flow = gpm
Loading = lb/day

Balaklala Portal
Dissolved Zinc Loading 2000 to 2003

Well ID	Date	Zn Diss.	Flow	Loading
Windy-5.1	20-Jan-00	34300	2	0.8
Windy-5.1	03-Feb-00	42500	2	1.0
Windy-5.1	08-May-00	4100	4	0.2
Windy-5.1	05-Jun-00	4110	1	0.0
Windy-5.1	13-Jul-00	7000	1	0.1
Windy-5.1	01-Aug-00	8000	1.5	0.1
Windy-5.1	06-Sep-00	9740	3	0.4
Windy-5.1	04-Oct-00	11400	5	0.7
Windy-5.1	06-Nov-00	12600	1.5	0.2
Windy-5.1	11-Dec-00	14300	2	0.3
Windy-5.1	09-Jan-01	15700	1	0.2
Windy-5.1	22-Feb-01	18800	3	0.7
Windy-5.1	12-Mar-01	9910	2	0.2
Windy-5.1	02-Apr-01	11700	2	0.3
Windy-5.1	03-May-01	10200	2	0.2
Windy-5.1	05-Jun-01	11700	2	0.3
Windy-5.1	03-Jul-01	11200	2	0.3
Windy-5.1	03-Aug-01	11200	2	0.3
Windy-5.1	06-Sep-01	10500	2	0.3
Windy-5.1	02-Oct-01	12200	2	0.3
Windy-5.1	02-Nov-01	12200	2	0.3
Windy-5.1	10-Dec-01	22100	2	0.5
Windy-5.1	14-Feb-02	5600	17	1.1
Windy-5.1	05-Mar-02	5400	7	0.5
Windy-5.1	02-Apr-02	4880	10	0.6
Windy-5.1	01-May-02	4970	20.7	1.2
Windy-5.1	04-Jun-02	6720	18.8	1.5
Windy-5.1	02-Jul-02	8780	17.6	1.9
Windy-5.1	01-Aug-02	10600	17.1	2.2
Windy-5.1	04-Feb-03	7830	22.75	2.1
Windy-5.1	04-Aug-03	7840	15	1.4
Average		**11874**	**6.22**	**0.65**

Balaklala Portal
Pressure 2000 to 2003

Well ID	Date	PSI
Windy-5.1	20-Jan-00	22
Windy-5.1	06-Nov-00	26
Windy-5.1	11-Dec-00	25
Windy-5.1	09-Jan-01	23
Windy-5.1	22-Feb-01	26
Windy-5.1	14-Feb-02	25
Windy-5.1	05-Mar-02	26
Windy-5.1	02-Apr-02	21
Windy-5.1	01-May-02	28
Windy-5.1	04-Jun-02	20
Windy-5.1	02-Jul-02	18
Windy-5.1	01-Aug-02	18
Average		**23.2**

Upper Windy Camp Portal
Dissolved Metal and Flow Data

Upper Windy Camp Portal Concentration = ug/l

Dissolved Metals Data 1996 to 2003 Flow = gpm

Well ID	Date	Well Reg ID	Cd Diss	Cu Diss	Zn Diss	Flow
Windy-5	11-Mar-96	018	39	4430	9280	860
Windy-5	14-Aug-96	018				29.6
Windy-5	16-Jan-97	018	66	7040	15600	30
Windy-5	18-Feb-97	018	47	4790	9110	50
Windy-5	13-Mar-97	018	70	6190	13400	50
Windy-5	14-Apr-97	018	80	7700	15400	26
Windy-5	16-May-97	018	66	6520	12800	23
Windy-5	23-Jun-97	018	86	5840	17100	18
Windy-5	22-Jul-97	018	90	5050	18300	14.6
Windy-5	22-Aug-97	018	90	5300	19000	12
Windy-5	19-Sep-97	018	99	5440	20400	7
Windy-5	14-Oct-97	018	94	5470	19700	7
Windy-5	12-Nov-97	018	99	5540	20700	5
Windy-5	16-Dec-97	018	100	17600	18500	37
Windy-5	10-Feb-98	018	50	9500	8900	40
Windy-5	11-Mar-98	018	44	5000	7770	30
Windy-5	16-Apr-98	018	60	7000	10700	20
Windy-5	21-May-98	018	76	7910	15100	30
Windy-5	19-Jun-98	018	79	7600	15000	25
Windy-5	19-Aug-98	018	69	4190	14400	20
Windy-5	17-Sep-98	018	65	3530	14000	10
Windy-5	15-Dec-98	018	180	34800	32700	30
Windy-5	15-Feb-99	018	110	17700	22900	35
Windy-5	14-Apr-99	018	82	10700	14700	40
Windy-5	13-Jul-99	018	80	5200	16500	20
Windy-5	13-Aug-99	018	80	4300	15600	20
Windy-5	13-Sep-99	018	88	6480	17900	30
Windy-5	19-Oct-99	018	105	5830	22700	10
Windy-5	13-Dec-99	018	1610	17100	32100	6
Windy-5	20-Jan-00	018	203	36800	40600	
Windy-5	03-Feb-00	018	218	52300	41300	
Windy-5	16-Mar-00	018	63.6	8650	11400	60
Windy-5	13-Apr-00	018	72.7	6740	13100	68.5
Windy-5	08-May-00	018	76	6820	14100	40
Windy-5	05-Jun-00	018	72.5	5280	14300	10
Windy-5	13-Jul-00	018	84	5540	16600	30
Windy-5	01-Aug-00	018	96.5	7430	18600	25
Windy-5	06-Sep-00	018	103	8170	20100	30
Windy-5	04-Oct-00	018	111	7040	22400	10
Windy-5	06-Nov-00	018	113	6590	23400	12
Windy-5	11-Dec-00	018	127	6700	26000	10
Windy-5	08-Jan-01	018	141	7040	25700	5.1
Windy-5	22-Feb-01	018				40
Windy-5	12-Mar-01	018	129	17200	21100	40
Windy-5	02-Apr-01	018	110	10700	19300	39.5
Windy-5	03-May-01	018	90.5	7300	18700	37.5
Windy-5	05-Jun-01	018	118	7000	21400	36
Windy-5	03-Jul-01	018	119	6590	22000	25
Windy-5	03-Aug-01	018	118	5650	20200	15.5

Upper Windy Camp Portal Concentration = ug/l

Dissolved Metals Data 1996 to 2003 Flow = gpm

Well ID	Date	Well Reg ID	Cd Diss	Cu Diss	Zn Diss	Flow
Windy-5	06-Sep-01	018	112	6090	21000	14.1
Windy-5	02-Oct-01	018	106	4090	21000	9.7
Windy-5	02-Nov-01	018	120	4290	23500	7.3
Windy-5	10-Dec-01	018	147	23700	24900	30
Windy-5	03-Jan-02	018	169	26800	30900	60
Windy-5	06-Feb-02	018	82.9	6660	14000	42.9
Windy-5	05-Mar-02	018	117	11000	19600	42.9
Windy-5	02-Apr-02	018	108	9900	21000	37.5
Windy-5	01-May-02	018	84.4	5800	17100	34.5
Windy-5	04-Jun-02	018	95.4	4970	18200	27.3
Windy-5	02-Jul-02	018	93.7	4730	18800	19.4
Windy-5	01-Aug-02	018	91.7	4150	19200	15.8
Windy-5	04-Feb-03	018	110	9750	13440	35.7
Windy-5	04-Aug-03	018	70	3730	8680	21

Upper Windy Camp Portal
Dissolved Metal Loading
2000 to 2003

Concentration = ug/l
Flow = gpm
Loading = lb/day

Upper Windy Camp Portal
Dissolved Metals Loading 2000 to 2003

Well ID	Date	Cd Diss.	Cu Diss.	Zn Diss.	Flow	Cd Load	Cu Load	Zn Load
Windy-5	16-Mar-00	63.6	8650	11400	60	0.0457	6.2176	8.1943
Windy-5	13-Apr-00	72.7	6740	13100	68.5	0.0597	5.5310	10.7503
Windy-5	08-May-00	76	6820	14100	40	0.0364	3.2681	6.7567
Windy-5	05-Jun-00	72.5	5280	14300	10	0.0087	0.6325	1.7131
Windy-5	13-Jul-00	84	5540	16600	30	0.0302	1.9911	5.9660
Windy-5	01-Aug-00	96.5	7430	18600	25	0.0289	2.2253	5.5707
Windy-5	06-Sep-00	103	8170	20100	30	0.0370	2.9363	7.2239
Windy-5	04-Oct-00	111	7040	22400	10	0.0133	0.8434	2.6835
Windy-5	06-Nov-00	113	6590	23400	12	0.0162	0.9474	3.3640
Windy-5	11-Dec-00	127	6700	26000	10	0.0152	0.8027	3.1148
Windy-5	08-Jan-01	141	7040	25700	5.1	0.0086	0.4301	1.5702
Windy-5	12-Mar-01	129	17200	21100	40	0.0618	8.2422	10.1111
Windy-5	02-Apr-01	110	10700	19300	39.5	0.0521	5.0633	9.1330
Windy-5	03-May-01	90.5	7300	18700	37.5	0.0407	3.2795	8.4010
Windy-5	05-Jun-01	118	7000	21400	36	0.0509	3.0190	9.2294
Windy-5	03-Jul-01	119	6590	22000	25	0.0356	1.9737	6.5890
Windy-5	03-Aug-01	118	5650	20200	15.5	0.0219	1.0491	3.7509
Windy-5	06-Sep-01	112	6090	21000	14.1	0.0189	1.0287	3.5473
Windy-5	02-Oct-01	106	4090	21000	9.7	0.0123	0.4753	2.4403
Windy-5	02-Nov-01	120	4290	23500	7.3	0.0105	0.3752	2.0552
Windy-5	10-Dec-01	147	23700	24900	30	0.0528	8.5178	8.9491
Windy-5	03-Jan-02	169	26800	30900	60	0.1215	19.2638	22.2109
Windy-5	06-Feb-02	82.9	6660	14000	42.9	0.0426	3.4229	7.1952
Windy-5	05-Mar-02	117	11000	19600	42.9	0.0601	5.6534	10.0733
Windy-5	02-Apr-02	108	9900	21000	37.5	0.0485	4.4476	9.4343
Windy-5	01-May-02	84.4	5800	17100	34.5	0.0349	2.3972	7.0676
Windy-5	04-Jun-02	95.4	4970	18200	27.3	0.0312	1.6255	5.9524
Windy-5	02-Jul-02	93.7	4730	18800	19.4	0.0218	1.0993	4.3693
Windy-5	01-Aug-02	91.7	4150	19200	15.8	0.0174	0.7855	3.6343
Windy-5	04-Feb-03	110	9750	13440	35.7	0.0470	4.1699	5.7481
Windy-5	04-Aug-03	70	3730	8680	21	0.0176	0.9384	2.1837
Average		**104.90**	**8261**	**19346**	**28.8**	**0.0355**	**3.31**	**6.42**

Keystone Portal
Dissolved Metal and Flow Data

Keystone Portal Concentration = ug/l

Dissolved Metals Data 1969 to 2003 Flow = gpm

Well ID	Date	Well Reg ID	Cd, Diss	Cu, Diss	Zn, Diss	Flow
Key-3.4	07-Apr-69	004		14000		
Key-3.4	11-Mar-75	004				80
Key-3.4	27-Jun-75	004				73
Key-3.4	17-Sep-75	004	50	3800	8200	36
Key-3.4	05-May-78	004				160
Key-3.4	28-Jul-78	004				150
Key-3.4	14-Sep-78	004				130
Key-3.4	19-Dec-78	004	40	5500	11000	8
Key-3.4	01-Aug-79	004	5	4700	9800	25
Key-3.4	01-Sep-79	004	50	5800	11000	21
Key-3.4	01-Oct-79	004	30	6600	12200	20
Key-3.4	01-Nov-79	004	30	6100	12000	20
Key-3.4	01-Jan-80	004	220	54000	31000	43
Key-3.4	01-Feb-80	004	180	38000	42000	100
Key-3.4	01-Mar-80	004	700	9100	14600	100
Key-3.4	01-Apr-80	004	40	6300	11300	85
Key-3.4	01-May-80	004		4100	9300	60
Key-3.4	16-May-80	004	50	4110	9430	
Key-3.4	17-Jun-80	004	50	3090	8010	
Key-3.4	23-Jun-80	004		2900	8600	50
Key-3.4	01-Jul-80	004		2700	8600	50
Key-3.4	25-Aug-80	004		3500	9100	30
Key-3.4	25-Sep-80	004		3800	10000	27
Key-3.4	20-Oct-80	004		4700	11000	25
Key-3.4	01-Nov-80	004		4800	12000	17
Key-3.4	01-Dec-80	004		4600	12000	19
Key-3.4	18-Feb-82	004	40	5000	7500	48
Key-3.4	06-May-82	004	68	4840	7260	296
Key-3.4	15-Jun-82	004	33	3010	5910	256
Key-3.4	15-Sep-82	004		8700	17500	
Key-3.4	26-Oct-82	004	50	5200	8500	21.54
Key-3.4	23-Nov-82	004	60	5400	10000	64.63
Key-3.4	28-Dec-82	004	90	12000	14000	95.6
Key-3.4	27-Jan-83	004	80	13000	12000	128.81
Key-3.4	28-Feb-83	004	20	3300	3600	486.53
Key-3.4	21-Apr-83	004				196.14
Key-3.4	09-Apr-84	004	80	4100	7400	30
Key-3.4	07-Mar-86	004	120	18800	23000	200
Key-3.4	10-Jun-86	004	40	2800	8400	75
Key-3.4	23-Dec-86	004	50	4000	11000	8
Key-3.4	27-Jan-88	004	94	18600	19200	30
Key-3.4	01-Jul-88	004	78	6250	16500	
Key-3.4	28-Apr-89	004	87	11200	16400	69
Key-3.4	17-Apr-91	004	110	28500	23300	80
Key-3.4	17-Jan-92	004	110	14000	26000	54
Key-3.4	04-May-93	004	250	6600	10000	105
Key-3.4	04-May-94	004		4900	12000	6.7
Key-3.4	15-Apr-95	004	31.1	4850	6490	8
Key-3.4	11-May-95	004	23.4	3530	4920	8

Keystone Portal Concentration = ug/l

Dissolved Metals Data 1969 to 2003 Flow = gpm

WellID	Date	WellRegID	Cd_Diss	Cu_Diss	Zn_Diss	Flow
Key-3.4	02-Jun-95	004				8.6
Key-3.4	18-Dec-95	004	26.8	2250	5780	5
Key-3.4	10-Mar-96	004	45.5	5760	8160	10
Key-3.4	15-Jul-96	004	33.3	3240	6240	4
Key-3.4	18-Aug-96	004	29	2620	5850	4.25
Key-3.4	17-Sep-96	004	28.2	2700	6000	2.4
Key-3.4	14-Oct-96	004	25.9	2240	5410	2.3
Key-3.4	23-Nov-96	004	23.8	2000	5110	0.5
Key-3.4	17-Dec-96	004	23.5	2210	5270	3.8
Key-3.4	16-Jan-97	004	30.8	3970	6130	2.3
Key-3.4	17-Feb-97	004	20.2	2960	4400	4.4
Key-3.4	13-Mar-97	004	22.7	2600	4310	2.7
Key-3.4	14-Apr-97	004	19.5	2200	4000	5
Key-3.4	16-May-97	004	16.9	2060	3540	5
Key-3.4	23-Jun-97	004	15	1770	3330	4.5
Key-3.4	22-Jul-97	004	15	1510	3500	5.2
Key-3.4	22-Aug-97	004	15.3	1500	3400	5
Key-3.4	18-Sep-97	004	17.1	1510	3680	2.6
Key-3.4	14-Oct-97	004	16	1550	3720	3
Key-3.4	12-Nov-97	004	18	1590	4150	4
Key-3.4	12-Dec-97	004	20.5	1800	4500	5
Key-3.4	11-Mar-98	004	21.7	3440	4610	10
Key-3.4	16-Apr-98	004	19	3200	4200	5
Key-3.4	21-May-98	004	15.8	2440	3360	2
Key-3.4	19-Jun-98	004	22.9	2900	4220	4
Key-3.4	16-Jul-98	004	27.8	3200	4890	5
Key-3.4	19-Aug-98	004	22.2	2610	4110	5
Key-3.4	17-Sep-98	004	17.4	2040	3380	0.2
Key-3.4	12-Oct-98	004	22.7	1610	4390	2
Key-3.4	11-Nov-98	004	24.2	1700	4600	5
Key-3.4	18-Dec-98	004	54.8	3440	9600	4
Key-3.4	13-Jan-99	004	84.8	5790	13000	4
Key-3.4	15-Jan-99	004	5710	89.4	13400	
Key-3.4	19-Jan-99	004	80.7	5420	12500	
Key-3.4	15-Feb-99	004	83.6	8200	13200	5
Key-3.4	30-Mar-99	004	61.4	8260	9960	5
Key-3.4	14-Apr-99	004	52.7	6480	8250	5
Key-3.4	17-May-99	004	47.2	4860	7190	8
Key-3.4	18-Jun-99	004	122	7000	14400	20
Key-3.4	13-Jul-99	004	124	7500	16200	15
Key-3.4	13-Aug-99	004	54.9	5700	8400	5
Key-3.4	13-Sep-99	004	53.8	5250	8130	1
Key-3.4	22-Nov-99	004	33.7	4030	5560	4
Key-3.4	20-Jan-00	004	209	2250	52100	37
Key-3.4	03-Mar-00	004	167	17600	34400	1000
Key-3.4	16-Mar-00	004	64.3	5870	13400	18
Key-3.4	06-Apr-00	004	145	12400	20200	122.2
Key-3.4	08-May-00	004	130	7260	18000	103.1
Key-3.4	05-Jun-00	004	119	10800	17500	1

Keystone Portal Concentration = ug/l

Dissolved Metals Data 1969 to 2003 Flow = gpm

Well ID	Date	Well Reg ID	Cd Diss	Cu Diss	Zn Diss	Flow
Key-3.4	13-Jul-00	004	63.6	4300	10100	8.6
Key-3.4	01-Aug-00	004	40.3	3570	7570	9.1
Key-3.4	06-Sep-00	004	34.6	3340	6840	5
Key-3.4	04-Oct-00	004	15.7	1750	3280	25
Key-3.4	06-Nov-00	004	114	2610	26200	25
Key-3.4	11-Dec-00	004	93.3	2150	23700	0
Key-3.4	09-Jan-01	004				0
Key-3.4	27-Feb-01	004				0
Key-3.4	12-Mar-01	004	1.9	117	1150	10.4
Key-3.4	02-Apr-01	004	23.1	16	43800	30
Key-3.4	03-May-01	004	96.7	9770	16200	4.3
Key-3.4	05-Jun-01	004	122	2780	20400	15.8
Key-3.4	03-Jul-01	004	0.5	1	20200	
Key-3.4	14-Aug-01	004	19.8	1	38900	16.7
Key-3.4	06-Sep-01	004	0.5	1	31000	16.2
Key-3.4	02-Oct-01	004	0.5	1	31700	15.5
Key-3.4	02-Nov-01	004	0.5	1	8740	2
Key-3.4	10-Dec-01	004	36.9	1	79800	15
Key-3.4	03-Jan-02	004	181	488	170000	24
Key-3.4	06-Feb-02	004	14.2	290	14300	20.4
Key-3.4	05-Mar-02	004	2.7	1	7140	27.3
Key-3.4	02-Apr-02	004	0.5	1	5450	26
Key-3.4	01-May-02	004	1.5	1	5560	34.6
Key-3.4	04-Jun-02	004	2.3	8	4870	32.3
Key-3.4	02-Jul-02	004	0.5	1	4140	26.1
Key-3.4	01-Aug-02	004	0.5	1	3170	22.9
Key-3.4	15-Aug-02	004	0.5	1	3310	
Key-3.4	13-Sep-02	004		0	3340	
Key-3.4	02-Oct-02	004		0	2730	22.6
Key-3.4	04-Nov-02	004	2.4	1	3020	
Key-3.4	04-Nov-02	004	0	0	4495	22.2
Key-3.4	18-Nov-02	004	3	4	3621	21
Key-3.4	02-Dec-02	004	0.5	1	2860	
Key-3.4	02-Dec-02	004	8	8	6670	
Key-3.4	19-Dec-02	004	2.7	1	9740	
Key-3.4	19-Dec-02	004	0	0	34370	46.95
Key-3.4	19-Dec-02	004	0	10	34280	
Key-3.4	08-Jan-03	004	160	60	42170	37.5
Key-3.4	13-Jan-03	004	20	140	50260	42.85
Key-3.4	21-Jan-03	004	10	10	46590	34
Key-3.4	04-Feb-03	004	6.2	1	23300	31.8
Key-3.4	17-Feb-03	004	10	0	18740	30
Key-3.4	19-Feb-03	004	0	0	18110	32
Key-3.4	21-Feb-03	004				33
Key-3.4	24-Feb-03	004	10	0	18110	31
Key-3.4	25-Feb-03	004	10	0	18080	31
Key-3.4	27-Feb-03	004	10	0	17930	33.3
Key-3.4	04-Mar-03	004	0	0	17760	
Key-3.4	12-Mar-03	004	0	0	17850	50

Keystone Portal Concentration = ug/l

Dissolved Metals Data 1969 to 2003 Flow = gpm

Well ID	Date	Well Reg ID	Cd Diss	Cu Diss	Zn Diss	Flow
Key-3.4	19-Mar-03	004	10	0	17560	30
Key-3.4	01-Apr-03	004	4.1	1	12000	25
Key-3.4	01-Apr-03	004	10	10	13400	
Key-3.4	08-Apr-03	004				31.58
Key-3.4	23-Apr-03	004	0	0	12760	
Key-3.4	30-Apr-03	004	5.2	1	13400	
Key-3.4	01-May-03	004	5.1	7	11200	
Key-3.4	01-May-03	004	10	0	13600	
Key-3.4	19-May-03	004	20	0	6610	33
Key-3.4	02-Jun-03	004				31
Key-3.4	02-Jun-03	004	10	40	6410	
Key-3.4	13-Jun-03	004	10	20	7270	
Key-3.4	03-Jul-03	004	10	30	7950	30
Key-3.4	14-Jul-03	004	20	20	7700	
Key-3.4	01-Aug-03	004	28.5	29	9680	
Key-3.4	04-Aug-03	004	20	50	8340	25
Key-3.4	02-Sep-03	004	30	30	10210	25

Keystone Portal
Dissolved Metal Loading
Pre-Remediation

Concentration = ug/l
Flow = gpm
Loading = lb/day

Keystone Portal
Dissolved Copper Loading Pre Remediation

Well ID	Date	Cu Diss.	Flow	Loading
Key-3.4	17-Sep-75	3800	36	1.64
Key-3.4	19-Dec-78	5500	8	0.53
Key-3.4	01-Aug-79	4700	25	1.41
Key-3.4	01-Sep-79	5800	21	1.46
Key-3.4	01-Oct-79	6600	20	1.58
Key-3.4	01-Nov-79	6100	20	1.46
Key-3.4	01-Jan-80	54000	43	27.82
Key-3.4	01-Feb-80	38000	100	45.52
Key-3.4	01-Mar-80	9100	100	10.90
Key-3.4	01-Apr-80	6300	85	6.42
Key-3.4	01-May-80	4100	60	2.95
Key-3.4	23-Jun-80	2900	50	1.74
Key-3.4	01-Jul-80	2700	50	1.62
Key-3.4	25-Aug-80	3500	30	1.26
Key-3.4	25-Sep-80	3800	27	1.23
Key-3.4	20-Oct-80	4700	25	1.41
Key-3.4	01-Nov-80	4800	17	0.98
Key-3.4	01-Dec-80	4600	19	1.05
Key-3.4	18-Feb-82	5000	48	2.88
Key-3.4	06-May-82	4840	296	17.16
Key-3.4	15-Jun-82	3010	256	9.23
Key-3.4	26-Oct-82	5200	21.54	1.34
Key-3.4	23-Nov-82	5400	64.63	4.18
Key-3.4	28-Dec-82	12000	95.6	13.74
Key-3.4	27-Jan-83	13000	128.81	20.06
Key-3.4	28-Feb-83	3300	486.53	19.23
Key-3.4	09-Apr-84	4100	30	1.47
Key-3.4	07-Mar-86	18800	200	45.04
Key-3.4	10-Jun-86	2800	75	2.52
Key-3.4	23-Dec-86	4000	8	0.38
Key-3.4	27-Jan-88	18600	30	6.68
Key-3.4	28-Apr-89	11200	69	9.26
Key-3.4	17-Apr-91	28500	80	27.31
Key-3.4	17-Jan-92	14000	54	9.06
Key-3.4	04-May-93	6600	105	8.30
Average		**9467**	**79.55**	**8.82**

Concentration = ug/l
Flow = gpm
Loading = lb/day

Keystone Portal
Dissolved Cadmium Loading Pre Remediation

Well ID	Date	Cd Diss	Flow	Loading
Key-3.4	17-Sep-75	50	36	0.0216
Key-3.4	19-Dec-78	40	8	0.0038
Key-3.4	01-Aug-79	5	25	0.0015
Key-3.4	01-Sep-79	50	21	0.0126
Key-3.4	01-Oct-79	30	20	0.0072
Key-3.4	01-Nov-79	30	20	0.0072
Key-3.4	01-Jan-80	220	43	0.1133
Key-3.4	01-Feb-80	180	100	0.2156
Key-3.4	01-Mar-80	700	100	0.8386
Key-3.4	01-Apr-80	40	85	0.0407
Key-3.4	18-Feb-82	40	48	0.0230
Key-3.4	06-May-82	68	296	0.2411
Key-3.4	15-Jun-82	33	256	0.1012
Key-3.4	26-Oct-82	50	21.54	0.0129
Key-3.4	23-Nov-82	60	64.63	0.0465
Key-3.4	28-Dec-82	90	95.6	0.1031
Key-3.4	27-Jan-83	80	128.81	0.1235
Key-3.4	28-Feb-83	20	486.53	0.1166
Key-3.4	09-Apr-84	80	30	0.0288
Key-3.4	07-Mar-86	120	200	0.2875
Key-3.4	10-Jun-86	40	75	0.0359
Key-3.4	23-Dec-86	50	8	0.0048
Key-3.4	27-Jan-88	94	30	0.0338
Key-3.4	28-Apr-89	87	69	0.0719
Key-3.4	17-Apr-91	110	80	0.1054
Key-3.4	17-Jan-92	110	54	0.0712
Key-3.4	04-May-93	250	105	0.3145
Average		**101**	**92.82**	**0.111**

Concentration = ug/l
Flow = gpm
Loading = lb/day

Keystone Portal
Dissolved Zinc Loading Pre Remediation

Well ID	Date	Zn Diss	Flow	Loading
Key-3.4	17-Sep-75	8200	36	3.54
Key-3.4	19-Dec-78	11000	8	1.05
Key-3.4	01-Aug-79	9800	25	2.94
Key-3.4	01-Sep-79	11000	21	2.77
Key-3.4	01-Oct-79	12200	20	2.92
Key-3.4	01-Nov-79	12000	20	2.88
Key-3.4	01-Jan-80	31000	43	15.97
Key-3.4	01-Feb-80	42000	100	50.32
Key-3.4	01-Mar-80	14600	100	17.49
Key-3.4	01-Apr-80	11300	85	11.51
Key-3.4	01-May-80	9300	60	6.68
Key-3.4	23-Jun-80	8600	50	5.15
Key-3.4	01-Jul-80	8600	50	5.15
Key-3.4	25-Aug-80	9100	30	3.27
Key-3.4	25-Sep-80	10000	27	3.23
Key-3.4	20-Oct-80	11000	25	3.29
Key-3.4	01-Nov-80	12000	17	2.44
Key-3.4	01-Dec-80	12000	19	2.73
Key-3.4	18-Feb-82	7500	48	4.31
Key-3.4	06-May-82	7260	296	25.74
Key-3.4	15-Jun-82	5910	256	18.13
Key-3.4	26-Oct-82	8500	21.54	2.19
Key-3.4	23-Nov-82	10000	64.63	7.74
Key-3.4	28-Dec-82	14000	95.6	16.03
Key-3.4	27-Jan-83	12000	128.81	18.52
Key-3.4	28-Feb-83	3600	486.53	20.98
Key-3.4	09-Apr-84	7400	30	2.66
Key-3.4	07-Mar-86	23000	200	55.11
Key-3.4	10-Jun-86	8400	75	7.55
Key-3.4	23-Dec-86	11000	8	1.05
Key-3.4	27-Jan-88	19200	30	6.90
Key-3.4	28-Apr-89	16400	69	13.56
Key-3.4	17-Apr-91	23300	80	22.33
Key-3.4	17-Jan-92	26000	54	16.82
Key-3.4	04-May-93	10000	105	12.58
Average		**13062**	**80**	**11.30**

Keystone Portal
Dissolved Metal Loading
2001 to 2003

Concentration = ug/l
Flow = gpm
Loading = lb/day

Keystone Portal
Dissolved Copper Loading 2001 to 2003

Well ID	Date	Cu Diss	Flow	Loading
Key-3.4	12-Mar-01	117	10.4	0.01
Key-3.4	02-Apr-01	16	30	0.01
Key-3.4	03-May-01	9770	4.3	0.50
Key-3.4	05-Jun-01	2780	15.8	0.53
Key-3.4	14-Aug-01	1	16.7	0.00
Key-3.4	06-Sep-01	1	16.2	0.00
Key-3.4	02-Oct-01	1	15.5	0.00
Key-3.4	02-Nov-01	1	2	0.00
Key-3.4	10-Dec-01	1	15	0.00
Key-3.4	03-Jan-02	488	24	0.14
Key-3.4	06-Feb-02	290	20.4	0.07
Key-3.4	05-Mar-02	1	27.3	0.00
Key-3.4	02-Apr-02	1	26	0.00
Key-3.4	01-May-02	1	34.6	0.00
Key-3.4	04-Jun-02	8	32.3	0.00
Key-3.4	02-Jul-02	1	26.1	0.00
Key-3.4	01-Aug-02	1	22.9	0.00
Key-3.4	02-Oct-02	0	22.6	0.00
Key-3.4	04-Nov-02	0	22.2	0.00
Key-3.4	18-Nov-02	4	21	0.00
Key-3.4	19-Dec-02	0	46.95	0.00
Key-3.4	08-Jan-03	60	37.5	0.03
Key-3.4	13-Jan-03	140	42.85	0.07
Key-3.4	21-Jan-03	10	34	0.00
Key-3.4	04-Feb-03	1	31.8	0.00
Key-3.4	17-Feb-03	0	30	0.00
Key-3.4	19-Feb-03	0	32	0.00
Key-3.4	24-Feb-03	0	31	0.00
Key-3.4	25-Feb-03	0	31	0.00
Key-3.4	27-Feb-03	0	33.3	0.00
Key-3.4	12-Mar-03	0	50	0.00
Key-3.4	19-Mar-03	0	30	0.00
Key-3.4	01-Apr-03	1	25	0.00
Key-3.4	19-May-03	0	33	0.00
Key-3.4	03-Jul-03	30	30	0.01
Key-3.4	04-Aug-03	50	25	0.01
Key-3.4	02-Sep-03	30	25	0.01
Average		**373.1**	**26.3**	**0.04**

Concentration = ug/l
Flow = gpm
Loading = lb/day

Keystone Portal
Dissolved Cadmium Loading 2001 to 2003

Well ID	Date	Cd_Diss	Flow	Loading
Key-3.4	12-Mar-01	1.9	10.4	0.0002
Key-3.4	02-Apr-01	23.1	30	0.0083
Key-3.4	03-May-01	96.7	4.3	0.0050
Key-3.4	05-Jun-01	122	15.8	0.0231
Key-3.4	14-Aug-01	19.8	16.7	0.0040
Key-3.4	06-Sep-01	0.5	16.2	0.0001
Key-3.4	02-Oct-01	0.5	15.5	0.0001
Key-3.4	02-Nov-01	0.5	2	0.0000
Key-3.4	10-Dec-01	36.9	15	0.0066
Key-3.4	03-Jan-02	181	24	0.0520
Key-3.4	06-Feb-02	14.2	20.4	0.0035
Key-3.4	05-Mar-02	2.7	27.3	0.0009
Key-3.4	02-Apr-02	0.5	26	0.0002
Key-3.4	01-May-02	1.5	34.6	0.0006
Key-3.4	04-Jun-02	2.3	32.3	0.0009
Key-3.4	02-Jul-02	0.5	26.1	0.0002
Key-3.4	01-Aug-02	0.5	22.9	0.0001
Key-3.4	04-Nov-02	0	22.2	0.0000
Key-3.4	18-Nov-02	3	21	0.0008
Key-3.4	19-Dec-02	0	46.95	0.0000
Key-3.4	08-Jan-03	160	37.5	0.0719
Key-3.4	13-Jan-03	20	42.85	0.0103
Key-3.4	21-Jan-03	10	34	0.0041
Key-3.4	04-Feb-03	6.2	31.8	0.0024
Key-3.4	17-Feb-03	10	30	0.0036
Key-3.4	19-Feb-03	0	32	0.0000
Key-3.4	24-Feb-03	10	31	0.0037
Key-3.4	25-Feb-03	10	31	0.0037
Key-3.4	27-Feb-03	10	33.3	0.0040
Key-3.4	12-Mar-03	0	50	0.0000
Key-3.4	19-Mar-03	10	30	0.0036
Key-3.4	01-Apr-03	4.1	25	0.0012
Key-3.4	19-May-03	20	33	0.0079
Key-3.4	03-Jul-03	10	30	0.0036
Key-3.4	04-Aug-03	20	25	0.0060
Key-3.4	02-Sep-03	30	25	0.0090
Average		**23.29**	**26.42**	**0.0067**

Concentration = ug/l
Flow = gpm
Loading = lb/day

Keystone Portal
Dissolved Zinc Loading 2001 to 2003

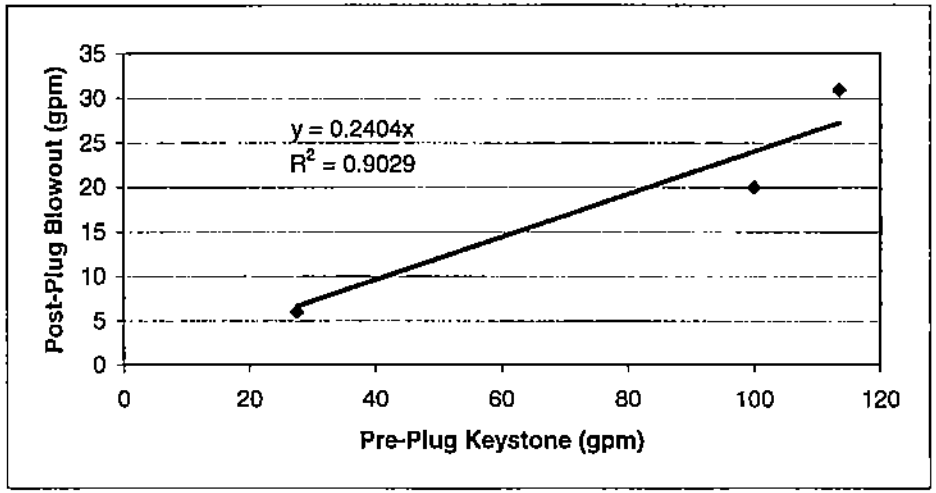
Well ID	Date	Zn Diss	Flow	Loading
Key-3.4	02-Nov-01	8740	2	0.21
Key-3.4	03-May-01	16200	4.3	0.83
Key-3.4	12-Mar-01	1150	10.4	0.14
Key-3.4	10-Dec-01	79800	15	14.34
Key-3.4	02-Oct-01	31700	15.5	5.89
Key-3.4	05-Jun-01	20400	15.8	3.86
Key-3.4	06-Sep-01	31000	16.2	6.02
Key-3.4	14-Aug-01	38900	16.7	7.78
Key-3.4	06-Feb-02	14300	20.4	3.49
Key-3.4	18-Nov-02	3621	21	0.91
Key-3.4	04-Nov-02	4495	22.2	1.20
Key-3.4	02-Oct-02	2730	22.6	0.74
Key-3.4	01-Aug-02	3170	22.9	0.87
Key-3.4	03-Jan-02	170000	24	48.88
Key-3.4	01-Apr-03	12000	25	3.59
Key-3.4	04-Aug-03	8340	25	2.50
Key-3.4	02-Sep-03	10210	25	3.06
Key-3.4	02-Apr-02	5450	26	1.70
Key-3.4	02-Jul-02	4140	26.1	1.29
Key-3.4	05-Mar-02	7140	27.3	2.34
Key-3.4	02-Apr-01	43800	30	15.74
Key-3.4	17-Feb-03	18740	30	6.74
Key-3.4	19-Mar-03	17560	30	6.31
Key-3.4	03-Jul-03	7950	30	2.86
Key-3.4	24-Feb-03	18110	31	6.73
Key-3.4	25-Feb-03	18080	31	6.71
Key-3.4	04-Feb-03	23300	31.8	8.88
Key-3.4	19-Feb-03	18110	32	6.94
Key-3.4	04-Jun-02	4870	32.3	1.88
Key-3.4	19-May-03	6610	33	2.61
Key-3.4	27-Feb-03	17930	33.3	7.15
Key-3.4	21-Jan-03	46590	34	18.98
Key-3.4	01-May-02	5560	34.6	2.30
Key-3.4	08-Jan-03	42170	37.5	18.94
Key-3.4	13-Jan-03	50260	42.85	25.80
Key-3.4	19-Dec-02	34370	46.95	19.33
Key-3.4	12-Mar-03	17850	50	10.69
Average		**23388**	**26.32**	**7.52**

Keystone Blowout
Dissolved Metal Loading
After Keystone Bulkhead Seal Installed

Although MRRC has noted flows from the blowout for several years, a flume was recently installed to measure the flows. Flow data are available for June, July, and August 2003. These data were compared to pre-bulkhead seal flows from the Keystone portal to estimate an annual flow from the blowout. The average annual estimated flow from the blowout is 21 gpm. This flow rate was combined with concentration data to estimate the average annual metal loading.

Post Keystone Plug Blowout Flows

	Keystone Pre-Plug Average Monthly Flows (gpm)	Blowout Average Monthly Flows (gpm)	Ratio Blowout Flows Pre Plug Flows	Blowout Estimated Monthly Flows (gpm)
Jan	64			15.4
Feb	212			50.8
Mar	127			30.5
Apr	92			22.1
May	155			37.3
Jun	114	31	0.27	27.3
Jul	100	20	0.20	24.0
Aug	28	6	0.22	6.6
Sep	54			12.9
Oct	22			5.3
Nov	34			8.1
Dec	33			7.8
Average	86		0.23	21



Concetrnation = ug/l
Flow = gpm
Loading = lb/day

Keystone Blowout
Estimated Dissolved Metals Loading

Date	Diss Cd	Diss Cu	Diss Zn
05/13/03	140	14710	23100
05/19/03	90	7930	7060
06/02/03	100	8240	7050
07/17/03	90	7640	8740
07/18/03	80	7470	8780
07/22/03	110	7700	8670
Average	**101.67**	**8948.33**	**10566.67**
Flow	**21**	**21**	**21**
Load	**0.026**	**2.251**	**2.658**

Wetlands Treatment and Test Cell

Dissolved Metal and Flow Data

Estimated Load Reductions

In order to estimate loading after discharge from the Keystone blowout and Upper Windy Camp portal is treated, ratios were developed by looking at the overall success of the wetlands treatment cell and the pilot cell MRRC operates.

Behind Keystone Bulkhead Concentral

Dissolved Metal Concentrations 2001 to 2003

Well ID	Date	Month	Cd_Diss	Cu_Diss	Zn_Diss
BH-004	12-Mar-01	3	223	10100	42200
BH-004	02-Apr-01	4	1210	191000	211000
BH-004	02-Jul-01	7	674	101000	98800
BH-004	14-Aug-01	8	579	42100	84700
BH-004	06-Sep-01	9	468	21900	63200
BH-004	02-Oct-01	10	424	13900	67200
BH-004	02-Nov-01	11	384	9660	64100
BH-004	10-Dec-01	12	839	183000	155000
BH-004	03-Jan-02	1	2070	405000	401000
BH-004	06-Feb-02	2	99.4	9370	21500
BH-004	05-Mar-02	3	75.8	4920	15300
BH-004	02-Apr-02	4	66.4	3140	14300
BH-004	04-Nov-02	11	96	1440	23600
BH-004	04-Nov-02	11	110	2400	17500
BH-004	18-Nov-02	11	105	2246	14864
BH-004	02-Dec-02	12	122	2330	17890
BH-004	19-Dec-02	12	950	46830	42200
BH-004	08-Jan-03	1	650	47980	42460
BH-004	13-Jan-03	1	520	56710	78570
BH-004	21-Jan-03	1	360	48840	64610
BH-004	04-Feb-03	2	240	27320	28750
BH-004	17-Feb-03	2	180	12820	25500
BH-004	19-Feb-03	2	190	12330	25210
BH-004	27-Feb-03	2	180	12160	25500
BH-004	04-Mar-03	3	170	10600	25370
BH-004	12-Mar-03	3	140	8540	25330
BH-004	19-Mar-03	3	180	15310	25310
BH-004	01-Apr-03	4	140	8790	21920
BH-004	01-May-03	5	181	23100	28300
BH-004	01-May-03	5	180	28490	32100
BH-004	19-May-03	5	40	1890	7630
BH-004	02-Jun-03	6	90	3390	7000
BH-004	03-Jul-03	7	10	1130	9150
BH-004	01-Aug-03	8	110	2490	17120
BH-004	02-Sep-03	9	160	3410	56450

Wetlands Treatment Cell Concentration = ug/l

Dissolved Metal Concentrations 2001 to 2003

Well ID	Date	Month	Cd Diss	Cu Diss	Zn Diss
Key-3.4	12-Mar-01	3	1.9	117	1150
Key-3.4	02-Apr-01	4	23.1	16	43800
Key-3.4	03-May-01	5	96.7	9770	16200
Key-3.4	05-Jun-01	6	122	2780	20400
Key-3.4	03-Jul-01	7	0.5	1	20200
Key-3.4	14-Aug-01	8	19.8	1	38900
Key-3.4	06-Sep-01	9	0.5	1	31000
Key-3.4	02-Oct-01	10	0.5	1	31700
Key-3.4	02-Nov-01	11	0.5	1	8740
Key-3.4	10-Dec-01	12	36.9	1	79800
Key-3.4	03-Jan-02	1	181	488	170000
Key-3.4	06-Feb-02	2	14.2	290	14300
Key-3.4	05-Mar-02	3	2.7	1	7140
Key-3.4	02-Apr-02	4	0.5	1	5450
Key-3.4	01-May-02	5	1.5	1	5560
Key-3.4	04-Jun-02	6	2.3	8	4870
Key-3.4	02-Jul-02	7	0.5	1	4140
Key-3.4	01-Aug-02	8	0.5	1	3170
Key-3.4	15-Aug-02	8	0.5	1	3310
Key-3.4	13-Sep-02	9		0	3340
Key-3.4	02-Oct-02	10		0	2730
Key-3.4	04-Nov-02	11	2.4	1	3020
Key-3.4	04-Nov-02	11	0	0	4495
Key-3.4	18-Nov-02	11	3	4	3621
Key-3.4	02-Dec-02	12	0.5	1	2860
Key-3.4	02-Dec-02	12	8	8	6670
Key-3.4	19-Dec-02	12	2.7	1	9740
Key-3.4	19-Dec-02	12	0	0	34370
Key-3.4	19-Dec-02	12	0	10	34280
Key-3.4	08-Jan-03	1	160	60	42170
Key-3.4	13-Jan-03	1	20	140	50260
Key-3.4	21-Jan-03	1	10	10	46590
Key-3.4	04-Feb-03	2	6.2	1	23300
Key-3.4	17-Feb-03	2	10	0	18740
Key-3.4	19-Feb-03	2	0	0	18110
Key-3.4	24-Feb-03	2	10	0	18110
Key-3.4	25-Feb-03	2	10	0	18080
Key-3.4	27-Feb-03	2	10	0	17930
Key-3.4	04-Mar-03	3	0	0	17760
Key-3.4	12-Mar-03	3	0	0	17850
Key-3.4	19-Mar-03	3	10	0	17560
Key-3.4	01-Apr-03	4	4.1	1	12000
Key-3.4	01-Apr-03	4	10	10	13400
Key-3.4	23-Apr-03	4	0	0	12760
Key-3.4	30-Apr-03	4	5.2	1	13400
Key-3.4	01-May-03	5	5.1	7	11200
Key-3.4	01-May-03	5	10	0	13600
Key-3.4	19-May-03	5	20	0	6610
Key-3.4	02-Jun-03	6	10	40	6410

Wetlands Treatment Cell Concentration = ug/l

Dissolved Metal Concentrations 2001 to 2003

Well ID	Date	Month	Cd_Diss	Cu_Diss	Zn_Diss
Key-3.4	13-Jun-03	6	10	20	7270
Key-3.4	03-Jul-03	7	10	30	7950
Key-3.4	14-Jul-03	7	20	20	7700
Key-3.4	01-Aug-03	8	28.5	29	9680
Key-3.4	04-Aug-03	8	20	50	8340
Key-3.4	02-Sep-03	9	30	30	10210

Pivot Table
Percent Reduction Between Bulkhead Inflow and Wetland Outflow

Month	Wetland Diss_Cd	Wetland Diss_Cu	Wetland Diss_Zn	Keystone Diss_Cd	Keystone Diss_Cu	Keystone Diss_Zn	Reduction Cd	Reduction Cu	Reduction Zn
1	93	175	77255	900	139633	146660	0.90	1.00	0.47
2	9	42	18367	178	14800	25292	0.95	1.00	0.27
3	3	24	12292	158	9894	26702	0.98	1.00	0.54
4	7	5	16802	472	67643	82407	0.98	1.00	0.80
5	27	1956	10634	134	17827	22677	0.80	0.89	0.53
6	36	712	9738	90	3390	7000	0.60	0.79	-0.39
7	8	13	9998	342	51065	53975	0.98	1.00	0.81
8	14	16	12680	345	22295	50910	0.96	1.00	0.75
9	15	10	14850	314	12655	59825	0.95	1.00	0.75
10	1	1	17215	424	13900	67200	1.00	1.00	0.74
11	1	2	4969	174	3937	30016	0.99	1.00	0.83
12	8	4	27953	637	77387	71697	0.99	1.00	0.61
Average	**18**	**246**	**19396**	**347**	**36202**	**53697**	**0.92**	**0.97**	**0.56**

Keystone Test Cell / Alcohol Amendment Test															
Date	Influent					Effluent					Percent Reduction			Flow	Alcohol
	pH	Ec	Cd	Cu	Zn	pH	Ec	Cd	Cu	Zn	Cd	Cu	Zn	gpm	Dose
		µS	µg/L				µS	µg/L			µg/L				ml/day
5-Jun			90	7930	7060			80	2700	6740	11%	66%	5%	0.5	1500
11-Jun	3	1054	70	15670	6990	5	697	40	1140	6190	43%	93%	11%	0.5	1500
13-Jun	2.9	947	50	6970	8110	5.3	641	20	1510	7220	60%	78%	11%	0.5	1500
16-Jun	2.9	861	80	7150	8050	5.8	623	20	490	7040	75%	93%	13%	0.5	1500
18-Jun	3	879	80	6960	7950	5.9	608	20	30	6720	75%	100%	15%	0.5	1500
20-Jun	3	816	90	7050	9000	5.7	596	20	0	7090	78%	100%	21%	0.5	1500
23-Jun	3	936	90	7180	8990	6	528	0	0	3330	100%	100%	63%	0.5	1500
24-Jun	3	833	80	7230	8990	5.8	446	0	0	2560	100%	100%	72%	0.5	350
26-Jun	3	868	80	7170	9020	5.4	586	0	0	1480	100%	100%	84%	0.5	350
30-Jun	3	801	70	7940	9060	5.7	627	0	0	990	100%	100%	89%	0.5	350
18-Jul	3	807	80	7470	8780	5.3	596	0	0	5520	100%	100%	37%	0.5	530
22-Jul	3.1	799	110	7700	8670	5.6	488	0	0	3140	100%	100%	64%	0.5	530
24-Jul	3.1	802	70	9170	7000	5.7	478	0	10	220	100%	100%	97%	0.5	1500
31-Jul	3.3	811	90	9680	7000	5.8	525	0	0	230	100%	100%	97%	0.5	500
1-Aug	3.5	760	90	9800	7000	6.1	443	0	20	80	100%	100%	99%	0.5	530
4-Aug	2.9	813	120	9610	7000	5.8	561	0	10	70	100%	100%	99%	0.5	530
8-Aug			90	7510	7150			0	30	1480	100%	100%	79%	5	750
11-Aug			100	7750	7910			30	2370	7080	70%	69%	10%	1.5	720
13-Aug			100	7540	7950			10	180	5130	90%	98%	35%	2.3	670
14-Aug			90	7780	8510			20	120	6290	78%	98%	26%	1.5	600
19-Aug			80	7820	8490			0	0	620	100%	100%	93%	1.5	630
22-Aug			90	7750	8440			0	0	1070	100%	100%	87%	1.5	575
26-Aug			90	7620	8410			0	0	1750	100%	100%	79%	1.5	540
29-Aug			90	7090	13310			0	0	40	100%	100%	100%	1.5	860
2-Sep			90	7440	13880			10	0	0	89%	100%	100%	0.3	720
9-Sep			90	6620	13230			0	10	150	100%	100%	99%	1.5	720
Average											87%	96%	61%		

Table 2
Database Input and Assumptions

Table 2
DISSOLVED COPPER LOADING SUMMARY
WEST SQUAW CREEK WATERSHED[1]

Location	Pre-Plug Loading[2] (lb/day)	Current Loading[3] (lb/day)	Current Percent Reduction	Anticipated 2004 Loading[4] (lb/day)	Anticipated 2004 Percent Reduction
Early Bird Portal	4.90	0.00	100	0.00	100
Main Keystone Portal	8.80	0.04	100	0.04	100
Keystone Blowout	0.00	2.24	—	0.02	99
Upper Windy Camp Portal	3.30	3.30	0	0.03	99
Lower Windy Camp (Balaklala 11) Portal	30.60	0.40	99	0.40	99
Main Weil Portal	227.00	0.00	100	0.00	100
Lower Shasta King Portal	5.36	2.68	50	1.34	75
Portal Total	280	9	97	2	99
Portal Percent	92	38	—	11	---
Non-Portal Total	25	14	43	14	43
Non-Portal Percent	8	62	—	89	---
West Squaw Total	305	23	92	16	95

Notes:
[1] See appendix for additional details such as number of samples, etc.
[2] Pre-Plug Loading represents mass loading prior to the installation of the bulkhead seals.
[3] Current Loading represents mass loading between 2000 and August 2003, except in the case of the Keystone portal where the treatment unit did not come online until 2001.
[4] Anticipated 2004 Loading represents estimated mass loading after treatment facilities for the Keystone blowout and Upper Windy Camp portal come online.

	CU LOADING		CU LOADING		CU LOADING		% REDUCTION	% REDUCTION
	Pre Plug		Current		2004		Current	2004
	(lb/day)		(lb/day)		(lb/day)			
Early Bird	4.90	A	0.00	K	0.00	U	100	100
Keystone	8.80	B	0.04	L	0.04	V	100	100
Blow Out	0.00	C	2.24	M	0.02	W	---	99
Windy Camp	3.30	D	3.30	N	0.03	X	0	99
Balaklala	30.60	E	0.40	O	0.40	Y	99	99
Weil	227.00	F	0.00	P	0.00	Z	100	100
Shasta King	5.36	G	2.68	Q	1.34	Aa	50	75
Portal	279.96	H	8.66	R	1.84	Ab	97	99
Non Point	25.04	I	14.34	S	14.34	Ac	43	43
Total	305.00	J	23.00	T	16.18	Ad	92	95
Portal %	92		38		11			
Non-Point %	8		62		89			

Copper Loading Assumptions

Letters refer to table

A Early Bird Portal, 1978 – 1987, number samples = 6.

B Keystone Portal, 1975 – 1993, number of samples = 27.

C Blow Out – There was no flow from the blowout prior to the installation of the Keystone bulkhead.

D Windy Camp (upper portal). Discharge is collected by an anoxic limestone drain. It has been assumed that the pre collection loading is equal to the current loading (see N).

E Balaklala Portal, 1975 – 1985, number of samples = 19.

F Weil Portal, 1978 – 1982, number of samples = 11.

G Shasta King Portal, It has been assumed that the pre plug loading was twice the current loading (although the initial plug leaked, the average pressure behind the bulkhead was 14 psi). This seal was repaired in October 2003.

H Pre plug portal loading = sum A through G.

I Pre plug non-point loading = J – H.

J West Squaw Bridge, 1968 – 1982, number of samples = 39. Calculated loading of 464 lb/day was based on an average flow of 38,000 gpm. Because average runoff from the watershed is estimated to be approximately 25,000 gpm, the calculated loading was multiplied by 25,000/38,000 to obtain a normalized loading of 305 lb/day. The relationship between flow and loading is linear with an R^2 of 0.93. Using this relationship, the normalized loading is 322 lb/day. The value of 305 lb/day was used because the calculation is more straight forward, and it leads to more conservative (i.e., lower) mass reduction values.

K Early Bird Portal, 2000 – 2003, number of samples 34.

L Keystone wetlands, 2001 – 2003 (did not include 2000 data because the cell did not come online until 2001), number of samples = 36.

M MRRC began monitoring the blowout in May 2003, number of samples = 11. In general, recently measured flows are approximately 25 percent of the pre-Keystone plug flows. The recent flows were normalized to an annual flow using the ratio between the recent flows and pre-portal plug flows. The annual average flow from the blow out is estimated to be 21 gpm. Loading is based on average concentration data collected during 2003.

N Windy Camp (upper portal), 2000 – 2003, number of samples = 31.

O Balaklala Portal, 2000 – 2003, number of samples = 30.

P Weil Portal, 2000 – 2003, number of samples = 33.

Q Shasta King, 2000 – 2003, number of samples = 31.

R Current portal loading = sum K through Q.

S Current non-point loading = T – R.

T West Squaw Bridge, 2001 – 2003, number of samples = 9. It was not necessary to normalized the calculated loading because the average flow was approximately equal to 25,000 gpm.

U Same as K.

V Same as L.

W Assume flow from blowout will be treated and final copper loading = 0.

X Assume flow from upper Windy Camp portal will be treated and final copper loading = 0.

Y Same as O.

Z Same as P.

Aa Assume plug rehabilitated in October 2003 will reduce loading an additional 50 percent.

Ac Same as S.

Ad Ab + Ac.

Background Concentrations
From Shepard Miller (1996a)

Water Quality Data
Areas Undisturbed by Mining Activities
Shepard Miller (1996a)

Sample Location	Sample Date	pH	Elec. Cond. uS/cm	Cu mg/1	Zn mg/1	Cd mg/1	Fe mg/l	Flow gpm	Cu load lb/day	Zn load lb/day	Cd load lb/day	Cu/Zn Ratio
West Squaw Creek above mines	Oct-79	6.9	n/a	0.01	0.01	0.01	0.04	400	n/a	0.048	n/a	n/a
West Squaw Creek above mine	6/27/80	n/a	n/a	<0.02	0.02	0.01	n/a	n/a	n/a	n/a	n/a	n/a
West Squaw Creek above mines	Sep-82	6.15	100	<0.01	0.012	n/a	0.008	n/a	n/a	n/a	n/a	n/a
Upper West Squaw Creek	3/13/89	6.39	360	0.004	0.035	0.002	n/a	n/a	n/a	n/a	n/a	0.11
Upper West Squaw Creek	4/9/89	6.86	46	0.004	0.031	0.002	n/a	n/a	n/a	n/a	n/a	0.13
Upper West Squaw Creek	4/15/89	6.2	100	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Upper West Squaw Creek	4/28/89	n/a	n/a	0.004	0.021	4E-04	n/a	1311	n/a	0.33	0.0063	n/a
Upper West Squaw Creek	5/4/89	7.04	71	0.031	0.054	0.002	n/a	n/a	n/a	n/a	n/a	0.57
Upper West Squaw Creek	5/31/89	6.67	73	0.004	0.028	0.002	n/a	n/a	n/a	n/a	n/a	0.14
Upper West Squaw Creek	7/9/89	5.96	82	<0.00	0.021	0.002	n/a	n/a	n/a	n/a	n/a	n/a
Upper West Squaw Creek	7/31/89	7.38	94	0.021	0.046	0.002	n/a	n/a	n/a	n/a	n/a	0.46
Upper West Squaw Creek	9/1/89	6.91	87	0.007	0.031	0.002	n/a	n/a	n/a	n/a	n/a	0.23
Upper West Squaw Creek	10/2/89	5.94	87	0.006	0.033	0.002	n/a	n/a	n/a	n/a	n/a	0.18
Upper West Squaw Creek	11/1/89	6.69	63	0.004	0.021	0.002	n/a	n/a	n/a	n/a	n/a	n/a
Upper West Squaw Creek	12/4/89	6.65	70	0.004	0.025	0.002	n/a	n/a	n/a	n/a	n/a	0.16
Upper West Squaw Creek	1/2/90	6.38	52	0.004	0.033	0.002	n/a	n/a	n/a	n/a	n/a	n/a
Upper West Squaw Creek	3/6/90	7.12	48	0.006	0.032	0.002	n/a	n/a	n/a	n/a	n/a	0.19
Upper West Squaw Creek	4/4/90	7.39	64	0.092	0.656	0.003	n/a	n/a	n/a	n/a	n/a	0.14
Upper West Squaw Creek	5/2/90	7.34	68	0.005	0.043	0.001	n/a	n/a	n/a	n/a	n/a	0.12
Upper West Squaw Creek	6/5/90	7.11	40	<0.00	0.03	0.001	n/a	n/a	n/a	n/a	n/a	n/a
Upper West Squaw Creek	7/5/90	7.33	59	0.004	0.029	0.001	n/a	n/a	n/a	n/a	n/a	0.14
Upper West Squaw Creek	8/6/90	7.2	78	0.003	0.034	0.001	n/a	n/a	n/a	n/a	n/a	n/a
Upper West Squaw Creek	10/1/90	7.15	80	0.003	0.014	0.001	n/a	n/a	n/a	n/a	n/a	n/a
Upper West Squaw Creek	11/1/90	7.38	85	0.003	0.023	0.001	n/a	n/a	n/a	n/a	n/a	n/a
Upper West Squaw Creek	12/4/90	6.81	105	0.038	0.727	0.003	n/a	n/a	n/a	n/a	n/a	0.05
Upper West Squaw Creek	1/17/92	n/a	n/a	0.020	0.03	0.01	n/a	673	n/a	0.24	n/a	n/a
Upper Squaw Creek above mines	6/2/95	n/a	n/a	n/a	0.03	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Upper West Squaw Creek	3/11/96	6.66	39	0.003	0.015	0.002	0.024	n/a	n/a	n/a	n/a	n/a
Tributary above Early Bird Portal	^Sep-82	5.25	35	0.01	0.014	n/a	0.01	n/a	n/a	n/a	n/a	n/a
Tributary above Early Bird Portal	1/27/88	6.89	n/a	0.012	0.01	0.000	n/a	n/a	n/a	n/a	n/a	1.2
Tributary Creek by Early Bird	4/15/89	6.0	100	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tributary above Early Bird Portal (SCT05)	11/8/95	6.57	130	0.007	0.033	0.001	0.034	1	n/a	n/a	n/a	0.22
Tributary above Early Bird Portal (SCT05)	3/11/96	6.52	69.3	0.004	0.012	0.002	0.024	n/a	n/a	n/a	n/a	0.33

Water Quality Data
Areas Undisturbed by Mining Activities
Shepard Miller (1996a)

Sample Location	Sample Date	PH	Elec. Cond. uS/cm	Cu mg/1	Zn mg/1	Cd mg/1	Fe mg/1	Flow gpm	Cu load lb/day	Zn load lb/day	Cd load lb/day	Cu/Zn Ratio
Tributary - SCT02	11/21/68	6.7	61	0.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tributary - SCT02	2/4/69	6.6	29	0.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tributary - SCT02	11/7/95	6.25	43	0.003	0.006	0.001	0.033	40	0.002	0.003	n/a	0.59
North Fork @ West Squaw Creek	2/4/69	6.5	47	0.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
North Fork @ West Squaw Creek	7/16/80	n/a	n/a	<0.02	0.02	0.01	n/a	n/a	n/a	n/a	n/a	n/a
North Fork @ West Squaw Creek	Sep-82	5.55	120	<0.01	0.004	n/a	0.006	n/a	n/a	n/a	n/a	n/a
North Fork @ West Squaw Creek	11/7/95	6.56	77	0.001	0.003	0.001	0.011	n/a	n/a	n/a	n/a	n/a
Tributary - between N fork and Shasta Lake (T-2)	1968	7.1	53	0.00	n/a	n/a	n/a	1	n/a	n/a	n/a	n/a
Tributary - Mary's Fork (T-I)	11/21/68	7.2	167	0.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tributary - Mary's Fork	Sep-82	6.1	150	0.01	0.003	n/a	0.019	n/a	n/a	n/a	n/a	n/a
Tributary Stream @ Bridge	4/16/89	6.3	400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tributary (West #2)	4/15/89	6.0	100	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tributary (West #1)	4/15/89	5.8	100	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tributary SCT06	Sep-82	6.3	25	<0.01	0.002	n/a	0.05	n/a	n/a	n/a	n/a	n/a
Trib SCT06? - Spring at Road above fork	4/15/89	5.8	100	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tributary SCT06	11/8/95	6.76	45	0.001	0.001	0.001	0.004	24	n/a	n/a	n/a	n/a
Tributary - SCT01	11/21/68	n/a	>50	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tributary - SCT01	2/4/69	7.1	23	0.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tributary river right SCT01 (?)	Sep-82	5.55	45	<0.01	0.016	n/a	0.24	n/a	n/a	n/a	n/a	n/a
Tributary SCT01	11/7/95	6.93	38	0.023	0.045	0.001	0.201	15	0.004	0.008	n/a	0.50
Tributary - SCT03	1968	6.0	46	0.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tributary - SCT03	Sep-82	5.25	60	<0.01	0.01	n/a	0.009	n/a	n/a	n/a	n/a	n/a
Tributary - SCT03	11/8/95	5.66	37	0.004	0.012	0.001	0.019	25	0.001	0.003	n/a	0.33
Tributary - between N fork and Shasta Lake (T-I)	1968	7.0	60	0.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

WellID	Date	Cd_Diss	Cu_Diss	Zn_Diss
Squaw-1	27-Jun-80	<10	<20	<20
Squaw-1	01-Sep-82		<10	<12
Squaw-1	13-Mar-89	<2	4	35
Squaw-1	08-Apr-89	<2	4	31
Squaw-1	28-Apr-89	0.4	<4	21
Squaw-1	04-May-89	<2	31	54
Squaw-1	31-May-89	<2	4	28
Squaw-1	09-Jul-89	<2	<4	21
Squaw-1	31-Jul-89	<2	21	46
Squaw-1	01-Sep-89	<2	7	31
Squaw-1	02-Oct-89	<2	6	33
Squaw-1	01-Nov-89	<2	<4	21
Squaw-1	04-Dec-89	<2	4	25
Squaw-1	02-Jan-90	<2	<4	33
Squaw-1	06-Mar-90	<2	6	32
Squaw-1	04-Apr-90	3	92	656
Squaw-1	02-May-90	<1	5	43
Squaw-1	05-Jun-90	<1	<3	30
Squaw-1	05-Jul-90	<1	4	29
Squaw-1	06-Aug-90	<1	<3	34
Squaw-1	01-Oct-90	<1	<3	14
Squaw-1	01-Nov-90	<1	<3	23
Squaw-1	04-Dec-90	3	38	727
Squaw-1	17-Jan-92	<10	<20	30
Squaw-1	02-Jun-95		<3	30
Squaw-1	11-Mar-96	<2.4	<3	15
Squaw-1	18-Aug-96	<5	<10	<20
Squaw-1	23-Nov-96	<5	<10	21.7
Squaw-1	12-Mar-97	<5	<10	<20
Squaw-1	23-Jun-97	<5	<10	25
Squaw-1	19-Sep-97	<5	<10	<20
Squaw-1	16-Dec-97	<5	<10	20
Squaw-1	11-Mar-98	<5	<10	<20
Squaw-1	19-Jun-98	<5	<10	<20
Squaw-1	17-Sep-98	<5	<10	<20
Squaw-1	15-Dec-98	<5	<10	<20
Squaw-1	30-Mar-99	<5	<10	<20
Squaw-1	27-Sep-99	<50	<10	<20
Squaw-1	20-Jan-00	<5	<10	<20
Squaw-1	09-May-00	<5	<10	<20
Squaw-1	07-Sep-00	<5	<10	<20
Squaw-1	21-Nov-00	<5	<10	<20
Squaw-1	05-Feb-01	<1	5	<10
Squaw-1	14-May-01	<1	5	<20
Squaw-1	06-Aug-01	<1	<2	<20
Squaw-1	01-Nov-01	<1	<2	<20
Squaw-1	04-Feb-02	<1	5	42
Squaw-1	01-May-02	<1	6	30
Squaw-1	06-Aug-02	<1.0	<2	<20
Squaw-1	04-Nov-02	<1.0	<2	<20
Squaw-1	05-Nov-02	0	100	893
Squaw-1	17-Apr-03	0	10	
Squaw-1	01-May-03	<1.0	<2	<20
Squaw-1	04-Aug-03	<1.0	<1	29
Squaw-1	04-Nov-03	<1.0	<1	28
Squaw-1	10-Feb-04	<1.0	6	30

Squaw 1 is NPDES background location R-1

Concentration = ug/l

Insert as last page
Water Quality Appendix

WellID	Date	pH	Cd_Diss (ug/l)	Cu_Diss (ug/l)	Zn_Diss (ug/l)	Hardness (mg/l)
West Squaw Bridge	24-Jun-97	6.83	2.5	225	532	34
West Squaw Bridge	11-Sep-97	5.01	6	476	1010	52
West Squaw Bridge	17-Dec-97	6.05	2.5	300	370	32
West Squaw Bridge	17-Mar-98	6.87	2.5	130	290	17
West Squaw Bridge	12-Jun-98	7.16	2.5	300	300	19
West Squaw Bridge	15-Sep-98	4.89	2.5	200	480	31
West Squaw Bridge	10-Dec-98	5.75	2.5	380	430	24
West Squaw Bridge	24-Mar-99	6.3	2.5	230	260	15
West Squaw Bridge	23-Sep-99	7.07	25	200	600	39
West Squaw Bridge	06-Feb-01	6.16	2	109	543	78
West Squaw Bridge	15-May-01	6.68	0.5	97	706	120
West Squaw Bridge	07-Aug-01	5.97	0.5	116	596	36
West Squaw Bridge	01-Nov-01	5.89	0.5	132	915	51
West Squaw Bridge	05-Feb-02	6.05	0.5	101	464	33
West Squaw Bridge	02-May-02	6.42	0.5	36	356	27
West Squaw Bridge	06-Aug-02	6.9	0.5	85	722	43
West Squaw Bridge	05-Nov-02	6.66	6.5	107	696	61
West Squaw Bridge	05-Feb-03	6.49	0.5	32	325	27
West Squaw Bridge	01-May-03	6.39	0.5	19	160	26
West Squaw Bridge	04-Aug-03	7.38	2	22	290	27
West Squaw Bridge	05-Nov-03	6.89	3.6	36	621	69
West Squaw Bridge	11-Feb-04	6.58	1.8	35	321	50
West Squaw Bridge	04-May-04	6.94	1.6	13	264	22