Table 3–1. Detailed water-quality trend results (not flow adjusted) for the adit sites in the Boulder River watershed, Montana, based on analysis of data collected during water years 1999–2013.

[Water year is the 12-month period from October 1 through September 30 and is designated by the year in which it ends. Values in parentheses indicate *p*-values for associated percent change. Gray shading indicates statistical significance (*p*-value less than 0.01 for trends). *p*-value, statistical probability level; SEE, standard error of estimate; <, less than]

Constituent or property	Number of samples	Percent censored values	Trend-analysis period, decimal years	Trend, percent change in trend-analysis period	Trend, percent change per year	SEE
Bullion Mine adit (site 2, fig. 1, table 1)						
Specific conductance	52	0.0	2003.5–2013.75	-16 (0.086)	-1.6	21.5
Cadmium, filtered	54	0.0	2003.5–2013.75	-15 (0.178)	-1.6	28.5
Cadmium, unfiltered-recoverable	24	0.0	2008.3–2013.75	-41 (0.034)	-9.2	39.9
Copper, filtered	54	0.0	2003.5–2013.75	-33 (0.068)	-3.9	53.2
Copper, unfiltered-recoverable	24	0.0	2008.3–2013.75	-51 (0.057)	-12	64.7
Lead, filtered	54	0.0	2003.5–2013.75	-20 (0.100)	-2.1	30.9
Lead, unfiltered-recoverable	24	0.0	2008.3–2013.75	-32 (0.014)	-6.7	23.9
Zinc, filtered	54	0.0	2003.5–2013.75	-14 (0.328)	-1.4	34.8
Zinc, unfiltered-recoverable	24	0.0	2008.3–2013.75	-41 (0.040)	-9.3	42.2
Arsenic, filtered	54	0.0	2003.5–2013.75	36 (0.352)	3.1	88.3
Arsenic, unfiltered-recoverable	24	0.0	2008.3–2013.75	-49 (0.044)	-12	55.5
Crystal Mine adit (site 6, fig. 1, table 1)						
Specific conductance	46	0.0	2003.5–2013.75	-23 (<0.001)	-2.5	12.3
Cadmium, filtered	47	0.0	2003.5–2013.75	-25 (<0.001)	-2.8	13.6
Cadmium, unfiltered-recoverable	22	0.0	2008.3–2013.75	-1 (0.719)	-0.6	13.1
Copper, filtered	47	0.0	2003.5–2013.75	19 (0.180)	1.7	26.4
Copper, unfiltered-recoverable	22	0.0	2008.3–2013.75	5 (0.374)	3.5	31.1
Lead, filtered	41	0.0	2003.5–2013.75	114 (0.007)	7.7	58.6
Lead, unfiltered-recoverable	22	0.0	2008.3–2013.75	29 (0.032)	19	66.9
Zinc, filtered	47	0.0	2003.5–2013.75	-16 (0.032)	-1.6	15.6
Zinc, unfiltered-recoverable	22	0.0	2008.3–2013.75	-1 (0.538)	-1.0	12.9
Arsenic, filtered	41	0.0	2003.5–2013.75	12 (0.704)	1.1	66.6
Arsenic, unfiltered-recoverable	22	0.0	2008.3–2013.75	13 (0.462)	9.0	114.0

Table 3–2. Detailed flow-adjusted water-quality trend results for the stream sites in the Boulder River and Tenmile Creek watersheds, Montana, based on analysis of data collected during water years 1997–2013.

[Water year is the 12-month period from October 1 through September 30 and is designated by the year in which it ends. Values in parentheses indicate *p*-values for associated percent change. Gray shading indicates statistical significance (*p*-value less than 0.01 for trends; *p*-value less than 0.05 for streamflow coefficient). *p*-value, statistical probability level; SEE, standard error of estimate; ND, not determined; <, less than]

Constituent or property	Number of samples	Percent censored values	Trend-analysis period, decimal years	Trend, percent change in trend-analysis period	Trend, percent change per year	*p*-value for streamflow coefficient	SEE
Boulder River above Kleinsmith Gulch (site 1, fig. 1, table 1)							
Specific conductance	40	0.0	1996.75–2013.75	-21 (0.010)	-1.3	<0.001	15
Cadmium, filtered	39	92.5	ND[1]	ND[1]	ND[1]	ND[1]	ND[1]
Cadmium, unfiltered-recoverable	40	67.5	ND[1]	ND[1]	ND[1]	ND[1]	ND[1]
Copper, filtered	40	5.0	1996.75–2013.75	-33 (0.035)	-2.3	0.024	34
Copper, unfiltered-recoverable	40	2.5	1996.75–2013.75	-42 (0.039)	-3.2	0.005	48
Lead, filtered	40	57.5	ND[1]	ND[1]	ND[1]	ND[1]	ND[1]
Lead, unfiltered-recoverable	40	52.5	ND[1]	ND[1]	ND[1]	ND[1]	ND[1]
Zinc, filtered	40	5.0	1996.75–2013.75	-18 (0.485)	-1.1	0.590	52
Zinc, unfiltered-recoverable	40	42.5	1996.75–2013.75	-44 (0.043)	-3.4	0.074	47
Arsenic, filtered	40	0.0	1996.75–2013.75	-17 (0.029)	-1.1	0.963	15
Arsenic, unfiltered-recoverable	39	0.0	1996.75–2013.75	-29 (0.047)	-2.0	0.319	31
Suspended sediment	40	0.0	1996.75–2013.75	-23 (0.330)	-1.6	<0.001	51
Bullion Mine tributary at mouth (site 3, fig. 1, table 1)							
Specific conductance	69	0.0	1996.75–2013.75	-40 (<0.001)	-2.9	<0.001	21
Cadmium, filtered	71	0.0	1996.75–2013.75	-76 (<0.001)	-8.1	<0.001	33
Cadmium, unfiltered-recoverable	70	0.0	1996.75–2013.75	-76 (<0.001)	-8.0	<0.001	32
Copper, filtered	71	0.0	1996.75–2013.75	-80 (<0.001)	-9.1	<0.001	81
Copper, unfiltered-recoverable	70	0.0	1996.75–2013.75	-76 (<0.001)	-8.2	<0.001	46
Lead, filtered	70	11.4	1996.75–2013.75	-59 (0.165)	-5.1	0.987	250
Lead, unfiltered-recoverable	70	0.0	1996.75–2013.75	-83 (<0.001)	-9.9	0.001	70
Zinc, filtered	71	0.0	1996.75–2013.75	-72 (<0.001)	-7.3	<0.001	41
Zinc, unfiltered-recoverable	70	0.0	1996.75–2013.75	-74 (<0.001)	-7.6	<0.001	36
Arsenic, filtered	71	5.6	1996.75–2013.75	78 (0.058)	3.5	<0.001	77
Arsenic, unfiltered-recoverable	71	0.0	1996.75–2013.75	-78 (<0.001)	-8.5	<0.001	68
Suspended sediment	68	0.0	1996.75–2013.75	-67 (0.003)	-6.3	0.014	99
Jack Creek at mouth (site 4, fig. 1, table 1)							
Specific conductance	54	0.0	1996.75–2013.75	-4 (0.346)	-0.3	<0.001	9.5
Cadmium, filtered	55	0.0	1996.75–2013.75	-58 (<0.001)	-6.2	<0.001	28

Table 3–2. Detailed flow-adjusted water-quality trend results for the stream sites in the Boulder River and Tenmile Creek watersheds, Montana, based on analysis of data collected during water years 1997–2013.—Continued

[Water year is the 12-month period from October 1 through September 30 and is designated by the year in which it ends. Values in parentheses indicate *p*-values for associated percent change. Gray shading indicates statistical significance (*p*-value less than 0.01 for trends; *p*-value less than 0.05 for streamflow coefficient). *p*-value, statistical probability level; SEE, standard error of estimate; ND, not determined; <, less than]

Constituent or property	Number of samples	Percent censored values	Trend-analysis period, decimal years	Trend, percent change in trend-analysis period	Trend, percent change per year	*p*-value for streamflow coefficient	SEE
Jack Creek at mouth (site 4, fig. 1, table 1)—Continued							
Cadmium, unfiltered-recoverable	55	0.0	1996.75–2013.75	-62 (<0.001)	-6.8	0.016	35
Copper, filtered	54	0.0	1996.75–2013.75	-58 (<0.001)	-6.1	0.022	34
Copper, unfiltered-recoverable	55	0.0	1996.75–2013.75	-63 (<0.001)	-6.9	0.034	54
Lead, filtered	54	7.4	1996.75–2013.75	-2 (0.903)	-0.2	<0.001	40
Lead, unfiltered-recoverable	54	1.9	1996.75–2013.75	-64 (<0.001)	-7.3	<0.001	60
Zinc, filtered	55	0.0	1996.75–2013.75	-46 (<0.001)	-4.5	<0.001	28
Zinc, unfiltered-recoverable	55	0.0	1996.75–2013.75	-52 (<0.001)	-5.3	0.001	32
Arsenic, filtered	55	0.0	1996.75–2013.75	-7 (0.496)	-0.5	0.297	23
Arsenic, unfiltered-recoverable	54	0.0	1996.75–2013.75	-49 (0.001)	-4.8	<0.001	45
Suspended sediment	55	0.0	1996.75–2013.75	-65 (0.006)	-7.4	<0.001	100
Basin Creek at Basin (site 5, fig. 1, table 1)							
Specific conductance	70	0.0	1996.75–2013.75	-5 (0.223)	-0.3	<0.001	10
Cadmium, filtered	72	2.8	1996.75–2013.75	-49 (<0.001)	-3.8	0.033	22
Cadmium, unfiltered-recoverable	72	22.2	1996.75–2013.75	-44 (<0.001)	-3.3	<0.001	25
Copper, filtered	72	0.0	1996.75–2013.75	-32 (<0.001)	-2.3	<0.001	24
Copper, unfiltered-recoverable	71	0.0	1996.75–2013.75	-35 (<0.001)	-2.5	<0.001	27
Lead, filtered	72	27.8	1996.75–2013.75	2 (0.858)	0.1	<0.001	31
Lead, unfiltered-recoverable	72	16.7	1996.75–2013.75	-37 (0.062)	-2.7	<0.001	60
Zinc, filtered	72	0.0	1996.75–2013.75	-38 (<0.001)	-2.8	0.202	22
Zinc, unfiltered-recoverable	72	0.0	1996.75–2013.75	-44 (<0.001)	-3.4	<0.001	22
Arsenic, filtered	72	0.0	1996.75–2013.75	-27 (<0.001)	-1.8	0.088	16
Arsenic, unfiltered-recoverable	71	0.0	1996.75–2013.75	-42 (<0.001)	-3.2	<0.001	35
Suspended sediment	72	0.0	1996.75–2013.75	-36 (0.057)	-2.6	<0.001	67
Cataract Creek above Uncle Sam Gulch (site 7, fig. 1, table 1)							
Specific conductance	44	0.0	1996.75–2013.75	-8 (0.068)	-0.5	<0.001	9.9
Cadmium, filtered	44	13.6	1996.75–2013.75	-25 (0.021)	-1.7	0.441	25
Cadmium, unfiltered-recoverable	44	22.7	1996.75–2013.75	-18 (0.206)	-1.2	0.166	28

Table 3–2. Detailed flow-adjusted water-quality trend results for the stream sites in the Boulder River and Tenmile Creek watersheds, Montana, based on analysis of data collected during water years 1997–2013.—Continued

[Water year is the 12-month period from October 1 through September 30 and is designated by the year in which it ends. Values in parentheses indicate *p*-values for associated percent change. Gray shading indicates statistical significance (*p*-value less than 0.01 for trends; *p*-value less than 0.05 for streamflow coefficient). *p*-value, statistical probability level; SEE, standard error of estimate; ND, not determined; <, less than]

Constituent or property	Number of samples	Percent censored values	Trend-analysis period, decimal years	Trend, percent change in trend-analysis period	Trend, percent change per year	*p*-value for streamflow coefficient	SEE
Cataract Creek above Uncle Sam Gulch (site 7, fig. 1, table 1)—Continued							
Copper, filtered	44	0.0	1996.75–2013.75	-31 (<0.001)	-2.2	0.004	15
Copper, unfiltered-recoverable	44	0.0	1996.75–2013.75	-29 (<0.001)	-2.1	<0.001	16
Lead, filtered	44	29.5	1996.75–2013.75	-9 (0.601)	-0.6	0.003	29
Lead, unfiltered-recoverable	44	22.7	1996.75–2013.75	-20 (0.420)	-1.3	<0.001	50
Zinc, filtered	44	0.0	1996.75–2013.75	-15 (0.052)	-1.0	0.843	19
Zinc, unfiltered-recoverable	46	0.0	1996.75–2013.75	-23 (0.001)	-1.6	0.004	18
Arsenic, filtered	44	0.0	1996.75–2013.75	0 (0.965)	-0.0	0.299	16
Arsenic, unfiltered-recoverable	44	0.0	1996.75–2013.75	2 (0.877)	0.1	0.016	24
Suspended sediment	43	0.0	1996.75–2013.75	-30 (0.241)	-2.1	<0.001	75
Cataract Creek at Basin (site 8, fig. 1, table 1)							
Specific conductance	70	0.0	1996.75–2013.75	0 (0.984)	-0.0	<0.001	13
Cadmium, filtered	73	0.0	1996.75–2013.75	-71 (<0.001)	-7.1	<0.001	25
Cadmium, unfiltered-recoverable	73	0.0	1996.75–2013.75	-71 (<0.001)	-7.1	<0.001	28
Copper, filtered	73	0.0	1996.75–2013.75	-75 (<0.001)	-7.8	<0.001	29
Copper, unfiltered-recoverable	73	0.0	1996.75–2013.75	-76 (<0.001)	-8.0	<0.001	34
Lead, filtered	73	30.1	1996.75–2013.75	14 (0.509)	0.8	<0.001	44
Lead, unfiltered-recoverable	73	15.1	1996.75–2013.75	-6 (0.819)	-0.3	<0.001	68
Zinc, filtered	73	0.0	1996.75–2013.75	-62 (<0.001)	-5.5	<0.001	25
Zinc, unfiltered-recoverable	73	0.0	1996.75–2013.75	-66 (<0.001)	-6.1	0.025	25
Arsenic, filtered	73	0.0	1996.75–2013.75	27 (0.001)	1.4	0.008	19
Arsenic, unfiltered-recoverable	72	0.0	1996.75–2013.75	-25 (0.052)	-1.7	<0.001	41
Suspended sediment	72	0.0	1996.75–2013.75	-48 (0.014)	-3.7	<0.001	76
High Ore Creek near Basin (site 9, fig. 1, table 1)							
Specific conductance	43	0.0	1996.75–2013.75	-20 (<0.001)	-1.3	<0.001	13
Cadmium, filtered	42	0.0	1996.75–2013.75	-57 (<0.001)	-4.9	0.683	32
Cadmium, unfiltered-recoverable	43	0.0	1996.75–2013.75	-47 (<0.001)	-3.6	<0.001	38
Copper, filtered	43	2.3	1996.75–2013.75	-54 (<0.001)	-4.5	0.010	23

Table 3–2. Detailed flow-adjusted water-quality trend results for the stream sites in the Boulder River and Tenmile Creek watersheds, Montana, based on analysis of data collected during water years 1997–2013.—Continued

[Water year is the 12-month period from October 1 through September 30 and is designated by the year in which it ends. Values in parentheses indicate *p*-values for associated percent change. Gray shading indicates statistical significance (*p*-value less than 0.01 for trends; *p*-value less than 0.05 for streamflow coefficient). *p*-value, statistical probability level; SEE, standard error of estimate; ND, not determined; <, less than]

Constituent or property	Number of samples	Percent censored values	Trend-analysis period, decimal years	Trend, percent change in trend-analysis period	Trend, percent change per year	*p*-value for streamflow coefficient	SEE
High Ore Creek near Basin (site 9, fig. 1, table 1)—Continued							
Copper, unfiltered-recoverable	43	0.0	1996.75–2013.75	-40 (0.031)	-3.0	<0.001	61
Lead, filtered	42	50.0	1996.75–2013.75	-18 (0.553)	-1.2	0.002	80
Lead, unfiltered-recoverable	42	0.0	1996.75–2013.75	-36 (0.205)	-2.6	<0.001	100
Zinc, filtered	43	0.0	1996.75–2013.75	-53 (<0.001)	-4.4	0.011	38
Zinc, unfiltered-recoverable	43	0.0	1996.75–2013.75	-49 (<0.001)	-3.9	<0.001	35
Arsenic, filtered	43	0.0	1996.75–2013.75	42 (0.002)	2.1	0.010	26
Arsenic, unfiltered-recoverable	42	0.0	1996.75–2013.75	-11 (0.635)	-0.7	0.009	67
Suspended sediment	40	0.0	1996.75–2013.75	-18 (0.592)	-1.2	<0.001	110
Boulder River below Little Galena Gulch (site 10, fig. 1, table 1)							
Specific conductance	73	0.0	1996.75–2013.75	-1 (0.846)	-0.1	<0.001	13
Cadmium, filtered	74	2.7	1996.75–2013.75	-60 (<0.001)	-5.2	0.238	30
Cadmium, unfiltered-recoverable	74	21.6	1996.75–2013.75	-53 (<0.001)	-4.3	0.003	48
Copper, filtered	74	0.0	1996.75–2013.75	-47 (<0.001)	-3.6	0.039	19
Copper, unfiltered-recoverable	74	0.0	1996.75–2013.75	-44 (<0.001)	-3.3	<0.001	43
Lead, filtered	74	31.1	1996.75–2013.75	42 (0.176)	2.1	<0.001	47
Lead, unfiltered-recoverable	74	12.2	1996.75–2013.75	-16 (0.497)	-1.0	<0.001	72
Zinc, filtered	74	0.0	1996.75–2013.75	-55 (<0.001)	-4.6	0.692	30
Zinc, unfiltered-recoverable	74	0.0	1996.75–2013.75	-53 (<0.001)	-4.3	0.002	41
Arsenic, filtered	74	0.0	1996.75–2013.75	7 (0.353)	0.4	0.005	19
Arsenic, unfiltered-recoverable	73	0.0	1996.75–2013.75	-18 (0.257)	-1.2	<0.001	50
Suspended sediment	74	0.0	1996.75–2013.75	-40 (0.041)	-3.0	<0.001	73
Tenmile Creek above City Diversion (site 11, fig. 1, table 1)							
Specific conductance	57	0.0	1996.75–2013.75	1 (0.867)	0.1	<0.001	14
Cadmium, filtered	57	5.3	1996.75–2013.75	-23 (0.070)	-1.8	<0.001	30
Cadmium, unfiltered-recoverable	57	5.3	1996.75–2013.75	-21 (0.117)	-1.6	0.002	32
Copper, filtered	56	0.0	1996.75–2013.75	-41 (<0.001)	-3.6	<0.001	14
Copper, unfiltered-recoverable	57	0.0	1996.75–2013.75	-42 (<0.001)	-3.7	<0.001	19

Table 3–2. Detailed flow-adjusted water-quality trend results for the stream sites in the Boulder River and Tenmile Creek watersheds, Montana, based on analysis of data collected during water years 1997–2013.—Continued

[Water year is the 12-month period from October 1 through September 30 and is designated by the year in which it ends. Values in parentheses indicate *p*-values for associated percent change. Gray shading indicates statistical significance (*p*-value less than 0.01 for trends; *p*-value less than 0.05 for streamflow coefficient). *p*-value, statistical probability level; SEE, standard error of estimate; ND, not determined; <, less than]

Constituent or property	Number of samples	Percent censored values	Trend-analysis period, decimal years	Trend, percent change in trend-analysis period	Trend, percent change per year	*p*-value for streamflow coefficient	SEE
Tenmile Creek above City Diversion (site 11, fig. 1, table 1)—Continued							
Lead, filtered	57	7.0	1996.75–2013.75	12 (0.548)	0.8	0.240	42
Lead, unfiltered-recoverable	57	0.0	1996.75–2013.75	-40 (0.023)	-3.5	<0.001	52
Zinc, filtered	57	0.0	1996.75–2013.75	-2 (0.853)	-0.2	<0.001	27
Zinc, unfiltered-recoverable	57	0.0	1996.75–2013.75	-11 (0.398)	-0.8	<0.001	30
Arsenic, filtered	54	0.0	1996.75–2013.75	39 (0.001)	2.3	<0.001	20
Arsenic, unfiltered-recoverable	57	0.0	1996.75–2013.75	1 (0.951)	0.1	0.479	36
Suspended sediment	57	0.0	1996.75–2013.75	-29 (0.258)	-2.4	<0.001	75
Minnehaha Creek near Rimini (site 12, fig. 1, table 1)							
Specific conductance	64	0.0	1996.75–2013.75	-9 (0.005)	-0.6	<0.001	7.9
Cadmium, filtered	61	0.0	1996.75–2013.75	-53 (<0.001)	-4.5	<0.001	14
Cadmium, unfiltered-recoverable	61	0.0	1996.75–2013.75	-49 (<0.001)	-4.0	0.233	15
Copper, filtered	63	0.0	1996.75–2013.75	-32 (<0.001)	-2.4	<0.001	14
Copper, unfiltered-recoverable	65	0.0	1996.75–2013.75	-43 (<0.001)	-3.4	<0.001	33
Lead, filtered	65	27.7	1996.75–2013.75	137 (<0.001)	5.4	<0.001	36
Lead, unfiltered-recoverable	63	17.5	1996.75–2013.75	20 (0.485)	1.1	<0.001	56
Zinc, filtered	65	0.0	1996.75–2013.75	-48 (<0.001)	-3.9	<0.001	15
Zinc, unfiltered-recoverable	65	0.0	1996.75–2013.75	-52 (<0.001)	-4.3	0.011	15
Arsenic, filtered	55	0.0	1996.75–2013.75	-3 (0.643)	-0.2	0.270	16
Arsenic, unfiltered-recoverable	65	3.1	1996.75–2013.75	2 (0.780)	0.1	<0.001	21
Suspended sediment	64	0.0	1996.75–2013.75	-14 (0.572)	-0.9	<0.001	73
Tenmile Creek near Rimini (site 13, fig. 1, table 1)							
Specific conductance	33	0.0	1996.75–2013.75	0 (0.975)	0.0	<0.001	16
Cadmium, filtered	33	0.0	1996.75–2013.75	75 (0.049)	6.7	0.125	46
Cadmium, unfiltered-recoverable	33	0.0	1996.75–2013.75	60 (0.101)	5.7	0.523	48
Copper, filtered	33	0.0	1996.75–2013.75	20 (0.382)	2.1	<0.001	34
Copper, unfiltered-recoverable	33	0.0	1996.75–2013.75	18 (0.555)	1.9	<0.001	47
Lead, filtered	33	9.1	1996.75–2013.75	182 (0.003)	13	<0.001	56

Table 3–2. Detailed flow-adjusted water-quality trend results for the stream sites in the Boulder River and Tenmile Creek watersheds, Montana, based on analysis of data collected during water years 1997–2013.—Continued

[Water year is the 12-month period from October 1 through September 30 and is designated by the year in which it ends. Values in parentheses indicate *p*-values for associated percent change. Gray shading indicates statistical significance (*p*-value less than 0.01 for trends; *p*-value less than 0.05 for streamflow coefficient). *p*-value, statistical probability level; SEE, standard error of estimate; ND, not determined; <, less than]

Constituent or property	Number of samples	Percent censored values	Trend-analysis period, decimal years	Trend, percent change in trend-analysis period	Trend, percent change per year	*p*-value for streamflow coefficient	SEE
Tenmile Creek near Rimini (site 13, fig. 1, table 1)—Continued							
Lead, unfiltered-recoverable	33	0.0	1996.75–2013.75	79 (0.145)	7.1	<0.001	70
Zinc, filtered	33	0.0	1996.75–2013.75	83 (0.025)	7.3	0.012	43
Zinc, unfiltered-recoverable	33	0.0	1996.75–2013.75	67 (0.056)	6.1	0.334	43
Arsenic, filtered	33	0.0	1996.75–2013.75	12 (0.602)	1.3	<0.001	35
Arsenic, unfiltered-recoverable	33	0.0	1996.75–2013.75	-3 (0.946)	-0.3	0.543	70
Suspended sediment	32	0.0	1996.75–2013.75	-70 (0.044)	-13	<0.001	120

[1]Not determined because of an excessive number of censored values (that is, greater than 50 percent of values were reported as less than the laboratory reporting level).