UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
1595 Wynkoop Street
DENVER, CO 80202-1129
Phone 800-227-8917
http://www.epa.gov/region08

DEC 20 2012

Ref: 8EPR-EP

Mr. George Mathieus
Administrator
Planning, Prevention and Assistance Division
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

Re: TMDL Approvals for the Boulder-Elkhorn Metals TMDLs and Framework Water Quality Improvement Plan

Dear Mr. Mathieus:

We have completed our review of the total maximum daily loads (TMDLs) as submitted by your office for the waterbodies listed in the enclosure to this letter. In accordance with the Clean Water Act (33 U.S.C. 1251 *et. seq.*), we approve all aspects of the TMDLs referenced above as developed for the water quality limited waterbodies as described in Section 303(d)(1). Based on our review, we feel the separate elements of the TMDLs listed in the enclosed table adequately address the pollutants of concern as given in the table, taking into consideration seasonal variation and a margin of safety.

Thank you for submitting these TMDLs for our review and approval. If you have any questions, the most knowledgeable person on my staff is Jason Gildea and he may be reached at 406-457-5028.

Sincerely,

Russell L
for

Martin Hestmark
Assistant Regional Administrator
Office of Ecosystems Protection
and Remediation

Enclosures

Printed on Recycled Paper

cc: Dean Yashan
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

Robert Ray
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

Michael Pipp
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

Carrie Greeley
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

Peter Ismert
U.S. Environmental Protection Agency
1595 Wynkoop Street
Denver, Colorado 80202

Waterbody & Location Description	Waterbody ID	Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action	TMDL End Points		Example Wasteload Allocations		Example Load Allocations		Example TMDL (lbs/day)	MOS
						Indicator	Threshold Values (µg/L)	WLA (lbs/day)	Permitted Facilities WLA (lbs/day)*	Source	LA (lbs/day)		
Basin Creek, headwaters to mouth (Boulder River)	MT41E002_030	> 2012	Aluminum	Aluminum	TMDL	Chronic aquatic life criteria	87	Mining Sources = 8.91	NA	Natural Background	26.33	35.24	Implicit
		1988	Arsenic	Arsenic	TMDL	Human health criteria	10	Mining Sources = 3.44	NA	Natural Background	0.61	4.05	Implicit
		> 2012	Cadmium	Cadmium	TMDL	Chronic aquatic life criteria at hardness = 25 mg/L $CaCO_3$	0.10	Mining Sources = 0.025	NA	Natural Background	0.016	0.041	Implicit
		1988	Copper	Copper	TMDL	Chronic aquatic life criteria at hardness = 25 mg/L $CaCO_3$	2.85	Mining Sources = 0.34	NA	Natural Background	0.81	1.15	Implicit
			Lead	Lead	TMDL	Chronic aquatic life criteria at hardness = 25 mg/L $CaCO_3$	0.54	Mining Sources = 0.12	NA	Natural Background	0.10	0.22	Implicit
			Mercury	NA	Data Assessed – Not Impaired	NA	NA	NA	NA	NA	NA	NA	NA
			Zinc	Zinc	TMDL	Chronic aquatic life criteria at hardness = 25 mg/L $CaCO_3$	37.02	Mining Sources = 12. 97	NA	Natural Background	2.03	15	Implicit
			Sedimentation/ Siltation	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
		NA	Alteration in streamside or littoral vegetative covers	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
Big Limber Gulch, headwaters to mouth (Cataract Cr – Boulder River)	MT41E002_140	2000	Lead	NA	Data Assessed – Not Impaired	NA	NA	NA	NA	NA	NA	NA	NA
		2000	Mercury	NA	Data Assessed – Not Impaired	NA	NA	NA	NA	NA	NA	NA	NA
Bison Creek, headwaters to mouth (Boulder River)	MT41E002_070	2000	Copper	Copper	TMDL	Chronic aquatic life criteria at hardness = 39 mg/L $CaCO_3$	4.17	Composite WLA to natural background plus mining sources in Bison Creek: ($WLA_{(BSN\ CR\ NB + BSN\ CR\ MS)}$) = 7.70 lbs/day = $TMDL_{BSN\ CR}$	NA	NA	NA	7.70	Implicit
		> 2012	Arsenic	Arsenic	TMDL	Human health criteria	10	Mining Sources = 8.31	NA	Natural Background	10.16	18.47	Implicit
		2000	Iron	Iron	TMDL	Chronic aquatic life criteria	1,000	Mining Sources = 665	NA	Natural Background	1,182	1,847	Implicit
			Nitrates	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
		NA	Alteration in streamside or littoral vegetative covers	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
Boulder River,	MT41E001_010	2000	Cadmium	NA	Data Assessed – Not Impaired	NA	NA	NA	NA	NA	NA	NA	NA

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						Indicator	Threshold Values (µg/L)	WLA (lbs/day)	Permitted Facilities WLA (lbs/day)*		Source	LA (lbs/day)		
headwaters to Basin Creek		2000	Copper	Copper	TMDL	Chronic aquatic life criteria at hardness = 27 mg/L $CaC0_3$	3.05	Mining Sources = 0.07	Permitted Aggregate Quarry (MTR103333) = 0.00		Natural Background	4.67	4.74	Implicit
		2000	Iron	NA	Data Assessed – Not Impaired	NA	NA	NA	NA		NA	NA	NA	NA
		2000	Lead	Lead	TMDL	Chronic aquatic life criteria at hardness = 27 mg/L $CaC0_3$	0.60	Mining Sources = 0.54	Permitted Aggregate Quarry (MTR103333) = 0.00		Natural Background	0.39	0.93	Implicit
		2000	Zinc	NA	Data Assessed – Not Impaired	NA	NA	NA	NA		NA	NA	NA	NA
Boulder River, Basin Creek to Town of Boulder	MT41E001_021	> 2012	Arsenic	Arsenic	TMDL	Human health criteria	10	Mining Sources = 18.22	Permitted Mill MTX000014 : LA = 0.00	Permitted Dredge MTG370322 = 0.00	Natural Background	3.22	21.44	Implicit
		1988	Cadmium	Cadmium	TMDL	Chronic aquatic life criteria at hardness = 25 mg/L $CaCO_3$	0.10	Mining Sources = 0.124	Permitted Mill MTX000014 : LA = 0.00	Permitted Dredge MTG370322 = 0.00	Natural Background	0.086	0.21	Implicit
		1988	Copper	Copper	TMDL	Chronic aquatic life criteria at hardness = 25 mg/L $CaCO_3$	2.85	Mining Sources = 1.83	Permitted Mill MTX000014 : LA = 0.00	Permitted Dredge MTG370322 = 0.00	Natural Background	4.29	6.12	Implicit
		1988	Iron	NA	Data Assessed – Not Impaired	NA	NA	NA	NA		NA	NA	NA	NA
		1988	Lead	Lead	TMDL	Chronic aquatic life criteria at hardness = 25 mg/L $CaCO_3$	0.54	Mining Sources = 0.62	Permitted Mill MTX000014 : LA = 0.00	Permitted Dredge MTG370322 0.00	Natural Background	0.54	1.16	Implicit
		1988	Silver	NA	Data Assessed – Not Impaired	NA	NA	NA	NA		NA	NA	NA	NA
		1988	Zinc	Zinc	TMDL	Chronic aquatic life criteria at hardness = 25 mg/L $CaCO_3$	37.02	Mining Sources = 68.64	Permitted Mill MTX000014 : LA = 0.00	Permitted Dredge = MTG370322 0.00	Natural Background	10.72	79.36	Implicit
		NA	Alteration in streamside or littoral vegetative covers	NA	No Action (Separate Project)	NA	NA	NA	NA		NA	NA	NA	NA
Boulder River, Town of Boulder to Cottonwood	MT41E001_022	> 2012	Arsenic	Arsenic	TMDL	Human health criteria	10	Mining Sources = 57.269	Town of Boulder WWTF (MT002307	Construction Stormwater (MTR10375	Natural Background	10.170	67.450	Implicit

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						Indicator	Threshold Values (µg/L)	WLA (lbs/day)	Permitted Facilities WLA (lbs/day)*		Source	LA (lbs/day)		
Creek									8) = 0.011	7) = 0.00				
		> 2012	Cadmium	Cadmium	TMDL	Chronic aquatic life criteria at hardness = 31 mg/L $CaCO_3$	0.11	Mining Sources = 0.4700	Town of Boulder WWTF (MT0023078) = 0.0001	Construction Stormwater (MTR103757) = 0.00	Natural Background	0.2700	0.7400	Implicit
		1988	Copper	Copper	TMDL	Chronic aquatic life criteria at hardness = 31 mg/L $CaCO_3$	3.43	Mining Sources = 9.6270	Town of Boulder WWTF (MT0023078) = 0.0034	Construction Stormwater (MTR103757) = 0.00	Natural Background	13.50	23.1300	Implicit
		1988	Iron	Iron	TMDL	Chronic aquatic life criteria	1,000	Mining Sources = 4,451	Town of Boulder WWTF (MT0023078) = 1	Construction Stormwater (MTR103757) = 0.00	Natural Background	2,293	6,745	Implicit
		1988	Lead	Lead	TMDL	Chronic aquatic life criteria at hardness = 31 mg/L $CaCO_3$	0.72	Mining Sources = 3.1693	Town of Boulder WWTF (MT0023078) = 0.0007	Construction Stormwater (MTR103757) = 0.00	Natural Background	1.6900	4.8600	Implicit
		1988	Silver	NA	Data Assessed – Not Impaired	NA	NA	NA	NA		NA	NA	NA	NA
		1988	Zinc	Zinc	TMDL	Chronic aquatic life criteria at hardness = 31 mg/L $CaCO_3$	44.42	Mining Sources = 265.836	Town of Boulder WWTF (MT0023078) = 0.044	Construction Stormwater (MTR103757) = 0.00	Natural Background	33.720	299.600	Implicit
		NA	Alteration in streamside or littoral vegetative covers	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA	NA
		NA	Low Flow Alterations	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA	NA
		1988	Sedimentation/Siltation	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA	NA
		1990	Temperature, Water	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boulder River, Cottonwood Creek to mouth	MT41E001_030	1988	Arsenic	Arsenic	TMDL	Human health criteria	10	Mining Sources = 10.92	NA		Natural Background	1.93	12.85	Implicit
		1988	Cadmium	Cadmium	TMDL	Chronic aquatic life criteria at hardness = 61 mg/L $CaCO_3$	0.19	Mining Sources = 0.19	NA		Natural Background	0.05	0.24	Implicit
		1988	Copper	Copper	TMDL	Chronic aquatic life criteria at	6.11	Mining Sources = 5.51	NA		Natural	2.57	8.08	Implicit

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						Indicator	Threshold Values (µg/L)	WLA (lbs/day)	Permitted Facilities WLA (lbs/day)*	Source	LA (lbs/day)		
						hardness = 61 mg/L $CaCO_3$				Background			
		> 2012	Iron	Iron	TMDL	Chronic aquatic life criteria	1,000	Mining Sources = 796.82	NA	Natural Background	488.38	1,285.20	Implicit
		1988	Lead	Lead	TMDL	Chronic aquatic life criteria at hardness = 61 mg/L $CaCO_3$	1.70	Mining Sources = 1.95	NA	Natural Background	0.32	2.27	Implicit
		1988	Zinc	Zinc	TMDL	Chronic aquatic life criteria at hardness = 61 mg/L $CaCO_3$	78.82	Mining Sources = 94.8	NA	Natural Background	6.40	101.20	Implicit
		NA	Alteration in streamside or littoral vegetative covers	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
		NA	Low Flow Alterations	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
		1988	Sedimentation/Siltation	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
		2000	Temperature, Water	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
Cataract Creek, headwaters to mouth (Boulder River)	MT41E002_020	> 2012	Aluminum	Aluminum	TMDL	Chronic aquatic life criteria	87	Composite WLA to natural background, mining, and permitted sources in Cataract Creek: ($WLA_{CAT\ CK\ NB} + _{CAT\ CR\ MS} + _{S.\ Dredge}$) = 204.36 lbs/day = TMDL	NA	NA	NA	204.36	Implicit
		1988	Arsenic	Arsenic	TMDL	Human health criteria	10	Mining Sources = 19.98	WLA_{Dredge} (lbs/day) (MTG370320) = 0.00	Natural Background	3.52	23.50	Implicit
		1988	Cadmium	Cadmium	TMDL	Chronic aquatic life criteria at hardness = 46 mg/L $CaCO_3$	0.15	Composite WLA to natural background, mining, and permitted sources in Cataract Creek: ($WLA_{CAT\ CK\ NB} + _{CAT\ CR\ MS} + _{S.\ Dredge}$) = 0.35 lbs/day = TMDL	NA	NA	NA	0.35	Implicit
		1988	Copper	Copper	TMDL	Chronic aquatic life criteria at hardness = 46 mg/L $CaCO_3$	4.80	Mining Sources = 3.06	WLA_{Dredge} (lbs/day) (MTG370320) = 0.00	Natural Background	8.22	11.28	Implicit
		1988	Lead	Lead	TMDL	Chronic aquatic life criteria at hardness = 46 mg/L $CaCO_3$	1.18	Mining Sources = 1.76	WLA_{Dredge} (lbs/day) (MTG370320) = 0.00	Natural Background	1.01	2.77	Implicit
		1988	Mercury	NA	Data Assessed – Not Impaired	NA	NA	NA	NA	NA	NA	NA	NA
		1988	Zinc	Zinc	TMDL	Chronic aquatic life criteria at hardness = 46 mg/L CaCO3	62.05	Mining Sources = 134.01	WLA_{Dredge} (lbs/day) (MTG370320) =	Natural Background	11.75	145.76	Implicit

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						Indicator	Threshold Values (µg/L)	WLA (lbs/day)	Permitted Facilities WLA (lbs/day)*		Source	LA (lbs/day)		
									0.00					
		2000	Nitrogen, Nitrate	NA	No Action (Separate Project)	NA	NA	NA	NA		NA	NA	NA	NA
		1988	Sedimentation/Siltation	NA	No Action (Separate Project)	NA	NA	NA	NA		NA	NA	NA	NA
Elkhorn Creek, headwaters to Wood Gulch	MT41E002_061	1988	Arsenic	Arsenic	TMDL	Human health criteria	10	Mining Sources = 0.65	Active Mine (Permit No. 000173): LA = 0.00	Mining Stormwater (MTR300264) = 0.00	Natural Background	0.43	1.08	Implicit
		1988	Cadmium	Cadmium	TMDL	Chronic aquatic life criteria at hardness = 38 mg/L $CaCO_3$	0.13	Mining Sources = 0.0097	Active Mine (Permit No. 000173): LA = 0.00	Mining Stormwater (MTR300264) = 0.00	Natural Background	0.0043	0.014	Implicit
		1988	Copper	Copper	TMDL	Chronic aquatic life criteria at hardness = 38 mg/L $CaCO_3$	4.08	Mining Sources = 0.386	Active Mine (Permit No. 000173): LA = 0.00	Mining Stormwater (MTR300264) = 0.00	Natural Background	0.054	0.44	Implicit
		> 2012	Iron	Iron	TMDL	Chronic aquatic life criteria	1,000	Mining Sources = 105.3	Active Mine (Permit No. 000173): LA = 0.00	Mining Stormwater (MTR300264) = 0.00	Natural Background	2.7	108	Implicit
		1988	Lead	Lead	TMDL	Chronic aquatic life criteria at hardness = 38 mg/L $CaCO_3$	0.93	Mining Sources = 0.073	Active Mine (Permit No. 000173): LA = 0.00	Mining Stormwater (MTR300264) 0.00	Natural Background	0.027	0.10	Implicit
		1988	Zinc	NA	Data Assessed – Not Impaired	NA	NA	NA	NA		NA	NA	NA	NA
		NA	Alteration in streamside or littoral vegetative covers	NA	No Action (Separate Project)	NA	NA	NA	NA		NA	NA	NA	NA
		NA	Low Flow Alteration	NA	No Action (Separate Project)	NA	NA	NA	NA		NA	NA	NA	NA
		2000	Sedimentation/Siltation	NA	No Action (Separate Project)	NA	NA	NA	NA		NA	NA	NA	NA
Elkhorn Creek, Wood Gulch to the mouth (Unnamed	MT41E002_062	> 2012	Arsenic	Arsenic	TMDL	Human health criteria	10	Mining Sources = 0.23	NA		Natural Background	0.15	0.38	Implicit
		1988	Cadmium	Cadmium	TMDL	Chronic aquatic life criteria at hardness = 46 mg/L $CaCO_3$	0.15	Mining Sources = 0.0045	NA		Natural Background	0.0015	0.006	Implicit

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						Indicator	Threshold Values (µg/L)	WLA (lbs/day)	Permitted Facilities WLA (lbs/day)*	Source	LA (lbs/day)		
Canal/Ditch)		1988	Copper	NA	Data Assessed – Not Impaired	NA	NA	NA	NA	NA	NA	NA	NA
		1988	Lead	Lead	TMDL	Chronic aquatic life criteria at hardness = 46 mg/L $CaCO_3$	1.18	Mining Sources = 0.0355	NA	Natural Background	0.0095	0.045	Implicit
		1988	Zinc	NA	Data Assessed – Not Impaired	NA	NA	NA	NA	NA	NA	NA	NA
		NA	Low Flow Alteration	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
		2000	Sedimentation/Siltation	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
High Ore Creek, headwaters to mouth (Boulder River)	MT41E002_040	1988	Arsenic	Arsenic	TMDL	Human health criteria	10	Mining Sources = 0.23	NA	Natural Background	0.04	0.27	Implicit
		1988	Cadmium	Cadmium	TMDL	Chronic aquatic life criteria at hardness = 104 mg/L $CaCO_3$	0.28	Mining Sources = 0.0069	NA	Natural Background	0.0011	0.008	Implicit
		1988	Copper	Copper	TMDL	Chronic aquatic life criteria at hardness = 104 mg/L $CaCO_3$	9.65	Mining Sources = 0.247	NA	Natural Background	0.013	0.26	Implicit
		1988	Lead	Lead	TMDL	Chronic aquatic life criteria at hardness = 104 mg/L $CaCO_3$	3.34	Mining Sources = 0.083	NA	Natural Background	0.007	0.09	Implicit
		1988	Mercury	NA	Data Assessed – Not Impaired	NA	NA	NA	NA	NA	NA	NA	NA
		1988	Zinc	Zinc	TMDL	Chronic aquatic life criteria at hardness = 104 mg/L $CaCO_3$	123.87	Mining Sources = 2.15	NA	Natural Background	1.19	3.34	Implicit
		NA	Alteration in streamside or littoral vegetative covers	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
		1988	Sedimentation/Siltation	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
		2000	Temperature, Water	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
		1988	Total Suspended Solids	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
Jack Creek, headwaters to mouth (Basin Creek)	MT41E003_010	> 2012	Aluminum	Aluminum	TMDL	Chronic aquatic life criteria	87	Composite WLA to natural background and mining sources in Jack Creek: ($WLA_{JACK\ CK\ NB}$ + $_{JACK\ CR\ MS}$) = 5.64 lbs/day = TMDL	NA	NA	NA	5.64	Implicit

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						Indicator	Threshold Values (µg/L)	WLA (lbs/day)	Permitted Facilities WLA (lbs/day)*		Source	LA (lbs/day)		
		> 2012	Arsenic	Arsenic	TMDL	Human health criteria	10	Mining Sources = 0.55	NA		Natural Background	0.10	0.65	Implicit
		> 2012	Cadmium	Cadmium	TMDL	Chronic aquatic life criteria at hardness = 25 mg/L $CaCO_3$	0.10	Mining Sources = 0.0039	NA		Natural Background	0.0026	0.0065	Implicit
		> 2012	Copper	Copper	TMDL	Chronic aquatic life criteria at hardness = 25 mg/L $CaCO_3$	2.85	Composite WLA to natural background and mining sources in Jack Creek: ($WLA_{JACK\ CK\ NB}$ + $_{JACK\ CR\ MS}$) = 0.185 lbs/day = TMDL	NA		NA	NA	0.185	Implicit
		> 2012	Iron	Iron	TMDL	Chronic aquatic life criteria	1,000	Mining Sources = 63.18	NA		Natural Background	1.62	64.80	Implicit
		> 2012	Lead	Lead	TMDL	Chronic aquatic life criteria at hardness = 25 mg/L $CaCO_3$	0.54	Mining Sources = 0.015	NA		Natural Background	0.020	0.035	Implicit
		> 2012	Zinc	Zinc	TMDL	Chronic aquatic life criteria at hardness = 25 mg/L $CaCO_3$	37.02	Mining Sources = 23.68	NA		Natural Background	0.32	24	Implicit
Little Boulder River, headwaters to mouth (Boulder River)	MT41E002_080	> 2012	Aluminum	Aluminum	TMDL	Chronic aquatic life criteria	87	Composite WLA to natural background and unpermitted mining sources in the Little Boulder River: ($WLA_{(LBLDR\ RV\ NB + LBLDR\ RV\ MS)}$) = TMDL = 170.493 (lbs/day)	Boulder Hot Springs WWTP (MT0023639) = 0.047	Construction Stormwater (MTR103698) = 0.00	NA	NA	170.54	Implicit
		1994	Copper	Copper	TMDL	Chronic aquatic life criteria at hardness = 31 mg/L $CaCO_3$	3.43	Composite WLA to natural background and unpermitted mining sources in the Little Boulder River: ($WLA_{(LBLDR\ RV\ NB + LBLDR\ RV\ MS)}$) = $TMDL_{LBLDR\ RV}$ = 6.718 (lbs/day)	Boulder Hot Springs WWTP (MT0023639) = 0.002	Construction Stormwater (MTR103698) = 0.00	NA	NA	6.72	Implicit
		> 2012	Iron	Iron	TMDL	Chronic aquatic life criteria	1,000	Mining Sources = 675.46	Boulder Hot Springs WWTP (MT0023639) = 0.54	Construction Stormwater (MTR103698) = 0.00	Natural Background	1,284	1,960	Implicit
		> 2012	Lead	Lead	TMDL	Chronic aquatic life criteria at hardness = 31 mg/L $CaCO_3$	0.72	Composite WLA to natural background and unpermitted mining sources in the Little Boulder River: ($WLA_{(LBLDR\ RV\ NB + LBLDR\ RV\ MS)}$) = $TMDL_{LBLDR\ RV}$ = 1.4096 (lbs/day)	Boulder Hot Springs WWTP (MT0023639) = 0.0004	Construction Stormwater (MTR103698) = 0.00	NA	NA	1.41	Implicit
		1994	Zinc	NA	Data Assessed – Not Impaired	NA	NA	NA	NA		NA	NA	NA	NA
		NA	Alteration in streamside or littoral vegetative covers	NA	No Action (Separate Project)	NA	NA	NA	NA		NA	NA	NA	NA
		NA	Physical	NA	No Action	NA	NA	NA	NA		NA	NA	NA	NA

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						Indicator	Threshold Values (µg/L)	WLA (lbs/day)	Permitted Facilities WLA (lbs/day)*	Source	LA (lbs/day)		
			Substrate Habitat Alterations		(Separate Project)								
		NA	Cause Unknown	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
Lowland Creek, headwaters to mouth (Boulder River)	MT41E002_050	2000	Aluminum	Aluminum	TMDL	Chronic aquatic life criteria	87	Composite WLA to natural background, permitted dredge source, and unpermitted mining sources in Lowland Creek: ($WLA_{(LWLND\ CR\ NB + LWLND\ CR\ MS)}$) = $TMDL_{LWLND\ CR}$ = 36.17 lbs/day	General permit for suction dredge (MTG370313) = 0.00	NA	NA	36.17	Implicit
		2000	Copper	Copper	TMDL	Chronic aquatic life criteria at hardness = 31 mg/L $CaCO_3$	3.34	Composite WLA to natural background and unpermitted mining sources in Lowland Creek: ($WLA_{(LWLND\ CR\ NB + LWLND\ CR\ MS)}$) = $TMDL_{LWLND\ CR}$ = 1.39 lbs/day	General permit for suction dredge (MTG370313) = 0.00	NA	NA	1.39	Implicit
		> 2012	Lead	Lead	TMDL	Chronic aquatic life criteria at hardness = 31 mg/L $CaCO_3$	0.72	Mining Sources 0.191	General permit for suction dredge (MTG370313) = 0.00	Natural Background	0.104	0.30	Implicit
		2000	Silver	NA	Data Assessed – Not Impaired	NA	NA	NA	NA	NA	NA	NA	NA
		NA	Alteration in streamside or littoral vegetative covers	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
		NA	Physical Substrate Habitat Alterations	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
McCarty Creek, headwaters to mouth (Boulder River)	MT41E002_110	NA	Alteration in streamside or littoral vegetative covers	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
		NA	Fish-Passage Barrier	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
		NA	Low flow alterations	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
		2006	Phosphorus, Total	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
		1992	Sedimentation/Siltation	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA

Waterbody & Location Description	Waterbody ID	Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action	TMDL End Points		Example Wasteload Allocations		Example Load Allocations		Example TMDL (lbs/day)	MOS
						Indicator	Threshold Values (µg/L)	WLA (lbs/day)	Permitted Facilities WLA (lbs/day)*	Source	LA (lbs/day)		
MUSKRAT CREEK, headwaters to mouth (Boulder River)	MT41E002_100	2000	Copper	NA	Data Assessed – Not Impaired	NA	NA	NA	NA	NA	NA	NA	NA
		> 2012	Iron	Iron	TMDL	Chronic aquatic life criteria	1,000	Mining Sources = 67.72	NA	Natural Background	34.88	102.60	Implicit
		2000	Lead	NA	Data Assessed – Not Impaired	NA	NA	NA	NA	NA	NA	NA	NA
		NA	Alteration in streamside or littoral vegetative covers	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
North Fork Little Boulder River, headwaters to mouth (Little Boulder)	MT41E002_090	> 2012	Aluminum	Aluminum	TMDL	Chronic aquatic life criteria	87	Composite WLA to natural background and unpermitted mining sources in North Fork Little Boulder River: (WLA $_{(NFLBLDR\ RV\ NB\ +NFLBLDR\ RV\ MS)}$ = $TMDL_{NFLBLDR\ RV}$ =15.03 (lbs/day)	NA	NA	NA	15.03	Implicit
		> 2012	Copper	Copper	TMDL	Chronic aquatic life criteria at hardness = 29 mg/L $CaCO_3$	3.24	Composite WLA to natural background and unpermitted mining sources in North Fork Little Boulder River: (WLA $_{(NFLBLDR\ RV\ NB\ +NFLBLDR\ RV\ MS)}$ = $TMDL_{NFLBLDR\ RV}$ =0.56 (lbs/day)	NA	NA	NA	0.56	Implicit
		2006	Nitrogen (Total)	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
		2006	Sedimentation/Siltation	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
		NA	Alteration in streamside or littoral vegetative covers	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
Nursery Creek, headwaters (east branch) to mouth (Muskrat Creek)	MT41E002_130	2006	Nitrogen (Total)	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
		2006	Nitrate/Nitrite (Nitrite + Nitrate as N)	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
		2006	Sedimentation/Siltation	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
Uncle Sam Gulch,	MT41E002_010	> 2012	Aluminum	Aluminum	TMDL	Chronic aquatic life criteria	87	Mining Sources = 0.8	NA	Natural Background	1.08	1.88	Implicit

Waterbody & Location Description	Waterbody ID	Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action	TMDL End Points		Example Wasteload Allocations		Example Load Allocations		Example TMDL (lbs/day)	MOS
						Indicator	Threshold Values (µg/L)	WLA (lbs/day)	Permitted Facilities WLA (lbs/day)*	Source	LA (lbs/day)		
headwaters to mouth (Cataract Creek)		1988	Arsenic	Arsenic	TMDL	Human health criteria	10	Mining Sources = 0.188	NA	Natural Background	0.0324	0.22	Implicit
		1988	Cadmium	Cadmium	TMDL	Chronic aquatic life criteria at hardness = 37 mg/L $CaCO_3$	0.13	Mining Sources = 0.00214	NA	Natural Background	0.00086	0.003	Implicit
		1988	Copper	Copper	TMDL	Chronic aquatic life criteria at hardness = 37 mg/L $CaCO_3$	3.99	Mining Sources = 0.0428	NA	Natural Background	0.0432	0.086	Implicit
		1988	Lead	Lead	TMDL	Chronic aquatic life criteria at hardness = 37 mg/L $CaCO_3$	0.90	Composite WLA to natural background and unpermitted mining sources in Uncle Sam Gulch: ($WLA_{(USG\ NB + USG\ MS)}$) = $TMDL_{USG}$ = 0.02 lbs/day	NA	NA	NA	0.02	Implicit
		1988	Zinc	Zinc	TMDL	Chronic aquatic life criteria at hardness = 37 mg/L $CaCO_3$	51.60	Mining Sources = 1.002	NA	Natural Background	0.108	1.11	Implicit
		NA	Alteration in streamside or littoral vegetative covers	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
		2000	Nitrogen, Nitrate	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
		NA	Other flow regimes	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
		1988	Sedimentation/Siltation	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA
		2006	Turbidity	NA	No Action (Separate Project)	NA	NA	NA	NA	NA	NA	NA	NA

NA = Not Applicable

*Expressed as LAs for Facilities with groundwater permits

ENCLOSURE 2

EPA REGION 8 TMDL REVIEW FORM AND DECISION DOCUMENT

TMDL Document Info:

Document Name:	Boulder-Elkhorn Metals TMDLs and Framework Water Quality Improvement Plan
Submitted by:	Montana Department of Environmental Quality
Date Received:	December 14, 2012
Review Date:	December 17, 2012
Reviewer:	Peter Brumm
Rough Draft / Public Notice / Final Draft?	Final Draft
Notes:	

Reviewers Final Recommendation(s) to EPA Administrator (used for final draft review only):

- ☒ Approve
- ☐ Partial Approval
- ☐ Disapprove
- ☐ Insufficient Information

Approval Notes to the Administrator: Based on the review presented below, I recommend approval of the TMDLs submitted in this document.

This document provides a standard format for EPA Region 8 to provide comments to state TMDL programs on TMDL documents submitted to EPA for either formal or informal review. All TMDL documents are evaluated against the TMDL review elements identified in the following 8 sections:

1. Problem Description
   - 1.1. TMDL Document Submittal
   - 1.2. Identification of the Waterbody, Impairments, and Study Boundaries
   - 1.3. Water Quality Standards
2. Water Quality Target
3. Pollutant Source Analysis
4. TMDL Technical Analysis
   - 4.1. Data Set Description
   - 4.2. Waste Load Allocations (WLA)
   - 4.3. Load Allocations (LA)
   - 4.4. Margin of Safety (MOS)
   - 4.5. Seasonality and variations in assimilative capacity
5. Public Participation
6. Monitoring Strategy
7. Restoration Strategy
8. Daily Loading Expression

Under Section 303(d) of the Clean Water Act, waterbodies that are not attaining one or more water quality standard (WQS) are considered "impaired." When the cause of the impairment is determined to be a pollutant, a TMDL analysis is required to assess the appropriate maximum allowable pollutant loading rate. A TMDL document consists of a technical analysis conducted to: (1) assess the maximum pollutant loading rate that a waterbody is able to assimilate while maintaining water quality standards; and (2) allocate that assimilative capacity among the known sources of that pollutant**.** A well written TMDL document will describe a path forward that may be used by those who implement the TMDL recommendations to attain and maintain WQS.

Each of the following eight sections describes the factors that EPA Region 8 staff considers when reviewing TMDL documents. Also included in each section is a list of EPA's review elements relative to that section, a brief summary of the EPA reviewer's findings, and the reviewer's comments and/or suggestions. Use of the verb "must" in this review form denotes information that is required to be submitted because it relates to elements of the TMDL required by the CWA and by regulation. Use of the term "should" below denotes information that is generally necessary for EPA to determine if a submitted TMDL is approvable.

This review form is intended to ensure compliance with the Clean Water Act and that the reviewed documents are technically sound and the conclusions are technically defensible.

1. Problem Description

A TMDL document needs to provide a clear explanation of the problem it is intended to address. Included in that description should be a definitive portrayal of the physical boundaries to which the TMDL applies, as well as a clear description of the impairments that the TMDL intends to address and the associated pollutant(s) causing those impairments. While the existence of one or more impairment and stressor may be known, it is important that a comprehensive evaluation of the water quality be conducted prior to development of the TMDL to ensure that all water quality problems and associated stressors are identified. Typically, this step is conducted prior to the 303(d) listing of a waterbody through the monitoring and assessment program. The designated uses and water quality criteria for the waterbody should be examined against available data to provide an evaluation of the water quality relative to all applicable water quality standards. If, as part of this exercise, additional WQS problems are discovered and additional stressor pollutants are identified, consideration should be given to concurrently evaluating TMDLs for those additional pollutants. If it is determined that insufficient data is available to make such an evaluation, this should be noted in the TMDL document.

1.1 TMDL Document Submittal

When a TMDL document is submitted to EPA requesting review or approval, the submittal package should include a notification identifying the document being submitted and the purpose of the submission.

Review Elements:

☒ Each TMDL document submitted to EPA should include a notification of the document status (e.g., pre-public notice, public notice, final), and a request for EPA review.

☒ Each TMDL document submitted to EPA for final review and approval should be accompanied by a submittal letter that explicitly states that the submittal is a final TMDL submitted under Section 303(d) of the Clean Water Act for EPA review and approval. This clearly establishes the State's/Tribe's intent to submit, and EPA's duty to review, the TMDL under the statute**.** The submittal letter should contain such identifying information as the name and location of the waterbody and the pollutant(s) of concern, which matches similar identifying information in the TMDL document for which a review is being requested.

Recommendation:

☒ Approve ☐ Partial Approval ☐ Disapprove ☐ Insufficient Information ☐ N/A

Summary: This document was submitted to EPA for review on December 14, 2012. An adequate cover letter was included.

Comments:

1.2 Identification of the Waterbody, Impairments, and Study Boundaries

The TMDL document should provide an unambiguous description of the waterbody to which the TMDL is intended to apply and the impairments the TMDL is intended to address. The document should also clearly delineate the physical boundaries of the waterbody and the geographical extent of the watershed area studied. Any additional information needed to tie the TMDL document back to a current 303(d) listing should also be included.

Review Elements:

☒ The TMDL document should clearly identify the pollutant and waterbody segment(s) for which the TMDL is being established. If the TMDL document is submitted to fulfill a TMDL development requirement for a waterbody on the state's current EPA approved 303(d) list, the TMDL document submittal should clearly identify the waterbody and associated impairment(s) as they appear on the State's/Tribe's current EPA approved 303(d) list, including a full waterbody description, assessment unit/waterbody ID, and the priority ranking of the waterbody. This information is necessary to ensure that the administrative record and the national TMDL tracking database properly link the TMDL document to the 303(d) listed waterbody and impairment(s).

☒ One or more maps should be included in the TMDL document showing the general location of the waterbody and, to the maximum extent practical, any other features necessary and/or relevant to the understanding of the TMDL analysis, including but not limited to: watershed boundaries, locations of major pollutant sources, major tributaries included in the analysis, location of sampling points, location of discharge gauges, land use patterns, and the location of nearby waterbodies used to provide surrogate information or reference conditions. Clear and concise descriptions of all key features and their relationship to the waterbody and water quality data should be provided for all key and/or relevant features not represented on the map

☒ If information is available, the waterbody segment to which the TMDL applies should be identified/geo-referenced using the National Hydrography Dataset (NHD). If the boundaries of the TMDL do not correspond to the Waterbody ID(s) (WBID), Entity_ID information or reach code (RCH_Code) information should be provided. If NHD data is not available for the waterbody, an alternative geographical referencing system that unambiguously identifies the physical boundaries to which the TMDL applies may be substituted.

Recommendation:

☒ Approve ☐ Partial Approval ☐ Disapprove ☐ Insufficient Information

Summary: Appendix A contains numerous maps showing stream locations and portraying other information useful to characterize the watershed. The waterbody/pollutant combinations addressed in the Boulder-Elkhorn TMDL document are summarized in Enclosure 1 and are clearly described in the document. The number of TMDLs developed and the pollutants for which they were developed are summarized below:

Boulder-Elkhorn Planning Area TMDLs

Number of TMDLs:	70
Number of Waterbody/Pollutant Combinations addressed by TMDLs:	70
Number of Metals TMDLs:	70

The waterbodies addressed by the metals TMDLs are listed in Table 1 appended to the end of this document.

At this time, TMDLs were not completed for 18 metals impairments in the Boulder-Elkhorn TMDL Planning Area. These 18 waterbody-pollutant combinations (WBPC) will be addressed by DEQ through the reassessment and delisting process. Nutrient, sediment and temperature impairments in the planning area will be addressed in a future document.

TMDLs were completed to address 45 WBPCs from the court ordered list of impairments (per the second amended judgment, dated September 27, 2011, referred to herein as the "2014 List"). Eighteen WBPCs from the 2014 List are proposed for reassessment and delisting. Twenty-five new impairments were identified during the TMDL process (i.e., do not currently appear on a 303d list), and TMDLs were completed for all of them. These are noted as a cycle first listed of ">2012" in Enclosure 1.

Comments:

1.3 Water Quality Standards

TMDL documents should provide a complete description of the water quality standards for the waterbodies addressed, including a listing of the designated uses and an indication of whether the uses are being met, not being met, or not assessed. If a designated use was not assessed as part of the TMDL analysis (or not otherwise recently assessed), the documents should provide a reason for the lack of assessment (e.g., sufficient data was not available at this time to assess whether or not this designated use was being met).

Water quality criteria (WQC) are established as a component of water quality standard at levels considered necessary to protect the designated uses assigned to that waterbody. WQC identify quantifiable targets and/or qualitative water quality goals which, if attained and maintained, are intended to ensure that the designated uses for the waterbody are protected. TMDLs result in maintaining and attaining water quality standards by determining the appropriate maximum pollutant loading rate to meet water quality criteria, either directly, or through a surrogate measurable target. The TMDL document should include a description of all applicable water quality criteria for the impaired designated uses and address whether or not the criteria are being attained, not attained, or not evaluated as part of the analysis. If the criteria were not evaluated as part of the analysis, a reason should be cited (e.g. insufficient data were available to determine if this water quality criterion is being attained).

Review Elements:

☒ The TMDL must include a description of the applicable State/Tribal water quality standard, including the designated use(s) of the waterbody, the applicable numeric or narrative water quality criterion, and the anti-degradation policy. (40 C.F.R. §130.7(c)(1)).

☒ The purpose of a TMDL analysis is to determine the assimilative capacity of the waterbody that corresponds to the existing water quality standards for that waterbody, and to allocate that assimilative capacity between the identified sources. Therefore, all TMDL documents must be written to meet the existing water quality standards for that waterbody (CWA §303(d)(1)(C)). *Note: In some circumstances, the load reductions determined to be necessary by the TMDL analysis may prove to be infeasible and may possibly indicate that the existing water quality standards and/or assessment methodologies may be erroneous. However, the TMDL must still be determined based on existing water quality standards. Adjustments to water quality standards and/or assessment methodologies may be evaluated separately, from the TMDL.*

☒ The TMDL document should describe the relationship between the pollutant of concern and the water quality standard the pollutant load is intended to meet. This information is necessary for EPA to evaluate whether or not attainment of the prescribed pollutant loadings will result in attainment of the water quality standard in question.

☒ If a standard includes multiple criteria for the pollutant of concern, the document should demonstrate that the TMDL value will result in attainment of all related criteria for the pollutant. For example, both acute and chronic values (if present in the WQS) should be addressed in the document, including consideration of magnitude, frequency and duration requirements.

Recommendation:
☒ Approve ☐ Partial Approval ☐ Disapprove ☐ Insufficient Information

Summary: The Boulder-Elkhorn TMDL document includes a description of all applicable water quality standards associated with metals as well as the designated use support status for each impaired waterbody and whether criteria are being attained, not attained, or not evaluated as part of the analysis. Standards are discussed in Section 3.0 and Appendix C.

Comments:

2. Water Quality Targets

TMDL analyses establish numeric targets that are used to determine whether water quality standards are being achieved. Quantified water quality targets or endpoints should be provided to evaluate each listed pollutant/water body combination addressed by the TMDL, and should represent achievement of applicable water quality standards and support of associated beneficial uses. For pollutants with numeric water quality standards, the numeric criteria are generally used as the water quality target. For pollutants with narrative standards, the narrative standard should be translated into a measurable value. At a minimum, one target is required for each pollutant/water body combination. It is generally desirable, however, to include several targets that represent achievement of the standard and support of beneficial uses (e.g., for a sediment impairment issue it may be appropriate to include a variety of targets representing water column sediment such as TSS, embeddedness, stream morphology, up-slope conditions and a measure of biota).

Review Elements:

☒ The TMDL should identify a numeric water quality target(s) for each waterbody pollutant combination. The TMDL target is a quantitative value used to measure whether or not the applicable water quality standard is attained. *Generally, the pollutant of concern and the numeric water quality target are, respectively, the chemical causing the impairment and the numeric criteria for that chemical (e.g., chromium) contained in the water quality standard. Occasionally, the pollutant of concern is different from the parameter that is the subject of the numeric water quality target (e.g., when the pollutant of concern is phosphorus and the numeric water quality target is expressed as a numerical dissolved oxygen criterion). In such cases, the TMDL should explain the linkage between the pollutant(s) of concern, and express the quantitative relationship between the TMDL target and pollutant of concern. In all cases, TMDL targets must represent the attainment of current water quality standards.*

☒ When a numeric TMDL target is established to ensure the attainment of a narrative water quality criterion, the numeric target, the methodology used to determine the numeric target, and the link between the pollutant of concern and the narrative water quality criterion should all be described in the TMDL document. Any additional information supporting the numeric target and linkage should also be included in the document.

Recommendation:
☒ Approve ☐ Partial Approval ☐ Disapprove ☐ Insufficient Information

Summary:
Surface water quality standards for metals were directly applied as water quality targets (Section 5.4). Sediment metals concentrations were used as supplemental indicators based on NOAA PEL values. Narrative criteria related to metals are mentioned in Section 3.2 and described fully in Appendix C.

Comments:

3. Pollutant Source Analysis

A TMDL analysis is conducted when a pollutant load is known or suspected to be exceeding the loading capacity of the waterbody. Logically then, a TMDL analysis should consider all sources of the pollutant of concern in some manner. The detail provided in the source assessment step drives the rigor of the pollutant load allocation. In other words, it is only possible to specifically allocate quantifiable loads or load reductions to each identified source (or source category) when the relative load contribution from each source has been estimated. Therefore, the pollutant load from each identified source (or source category) should be specified and quantified. This may be accomplished using site-specific monitoring data, modeling, or application of other assessment techniques. If insufficient time or resources are available to accomplish this step, a phased/adaptive management approach may be appropriate. The approach should be clearly defined in the document.

Review Elements:

☒ The TMDL should include an identification of the point and nonpoint sources of the pollutant of concern, including the geographical location of the source(s) and the quantity of the loading, e.g., lbs/per day. This information is necessary for EPA to evaluate the WLA, LA and MOS components of the TMDL.

☒ The level of detail provided in the source assessment should be commensurate with the nature of the watershed and the nature of the pollutant being studied. Where it is possible to separate natural background from nonpoint sources, the TMDL should include a description of both the natural background loads and the nonpoint source loads.

☒ Natural background loads should not be assumed to be the difference between the sum of known and quantified anthropogenic sources and the existing *in situ* loads (e.g. measured in stream) unless it can be demonstrated that the anthropogenic sources of the pollutant of concern have been identified, characterized, and quantified.

☒ The sampling data relied upon to discover, characterize, and quantify the pollutant sources should be included in the document (e.g. a data appendix) along with a description of how the data were analyzed to characterize and quantify the pollutant sources. A discussion of the known deficiencies and/or gaps in the data set and their potential implications should also be included.

Recommendation:
☒ Approve ☐ Partial Approval ☐ Disapprove ☐ Insufficient Information

Summary:
Abandoned mines are the predominant metals pollutant source in the Boulder-Elkhorn watershed. The document provides a history of mining operations in the region, and summarizes the known and suspected mining related sources. A summary of available metals data and sources per stream is provided in Section 5.7 and more detail is provided in Appendix F.

Insufficient data were available to provide separate wasteload allocations to non-permitted mining sources, thus a composite wasteload allocation was established in each basin for non-permitted mining sources. In instances where natural background loads were uncertain, future monitoring and adaptive management was recommended, and a composite WLA was established for non-permitted mining sources and natural background.

There are 12 permitted point sources in the project area, most are stormwater construction or suction dredge operations that have permit requirements which when met, are not expected to be a source of metals loading. Loading quantification from two wastewater treatment plants are described in the individual stream loading summaries found in Section 5.7 and summarized with all other permitted dischargers in Section 2.2.5. Two mining corporations hold permits for groundwater discharge, although neither operation is currently active. These two permits are treated as load allocations in their respective stream segment TMDLs because any potential metals loading to surface water would be via diffuse groundwater pathways. See Section 5.3.3 for more detail on groundwater permits.

Comments:

4. TMDL Technical Analysis

TMDL determinations should be supported by an analysis of the available data, discussion of the known deficiencies and/or gaps in the data set, and an appropriate level of technical analysis**.** This applies to **all** of the components of a TMDL document. It is vitally important that the technical basis for **all** conclusions be articulated in a manner that is easily understandable and readily apparent to the reader.

A TMDL analysis determines the maximum pollutant loading rate that may be allowed to a waterbody without violating water quality standards. The TMDL analysis should demonstrate an understanding of the relationship between the rate of pollutant loading into the waterbody and the resultant water quality impacts. This stressor → response relationship between the pollutant and impairment and between the selected targets, sources, TMDLs, and load allocations needs to be clearly articulated and supported by an appropriate level of technical analysis. Every effort should be made to be as detailed as possible, and to base all conclusions on the best available scientific principles.

The pollutant loading allocation is at the heart of the TMDL analysis. TMDLs apportion responsibility for taking actions by allocating the available assimilative capacity among the various point, nonpoint,

and natural pollutant sources. Allocations may be expressed in a variety of ways, such as by individual discharger, by tributary watershed, by source or land use category, by land parcel, or other appropriate scale or division of responsibility.

The pollutant loading allocation that will result in achievement of the water quality target is expressed in the form of the standard TMDL equation:

$$TMDL = \sum WLAs + \sum LAs + MOS$$

Where:

TMDL	=	Total Maximum Daily Load (also called the Loading Capacity)
LAs	=	Load Allocations
WLAs	=	Wasteload Allocations
MOS	=	Margin Of Safety

Review Elements:

☒ A TMDL must identify the loading capacity of a waterbody for the applicable pollutant, taking into consideration temporal variations in that capacity. EPA regulations define loading capacity as the greatest amount of a pollutant that a water can receive without violating water quality standards (40 C.F.R. §130.2(f)).

☒ The total loading capacity of the waterbody should be clearly demonstrated to equate back to the pollutant load allocations through a balanced TMDL equation. In instances where numerous LA, WLA and seasonal TMDL capacities make expression in the form of an equation cumbersome, a table may be substituted as long as it is clear that the total TMDL capacity equates to the sum of the allocations.

☒ The TMDL document should describe the methodology and technical analysis used to establish and quantify the cause-and-effect relationship between the numeric target and the identified pollutant sources. In many instances, this method will be a water quality model.

☒ It is necessary for EPA staff to be aware of any assumptions used in the technical analysis to understand and evaluate the methodology used to derive the TMDL value and associated loading allocations. Therefore, the TMDL document should contain a description of any important assumptions (including the basis for those assumptions) made in developing the TMDL, including but not limited to:

- the spatial extent of the watershed in which the impaired waterbody is located and the spatial extent of the TMDL technical analysis;
- the distribution of land use in the watershed (e.g., urban, forested, agriculture);
- a presentation of relevant information affecting the characterization of the pollutant of concern and its allocation to sources such as population characteristics, wildlife resources, industrial activities etc…;
- present and future growth trends, if taken into consideration in determining the TMDL and preparing the TMDL document (e.g., the TMDL could include the design capacity of an existing or planned wastewater treatment facility);
- an explanation and analytical basis for expressing the TMDL through surrogate measures, if applicable. Surrogate measures are parameters such as percent fines and turbidity for sediment impairments; chlorophyll *a* and phosphorus loadings for excess algae; length of riparian buffer; or number of acres of best management practices.

☒ The TMDL document should contain documentation supporting the TMDL analysis, including an inventory of the data set used, a description of the methodology used to analyze the data, a discussion of strengths and weaknesses in the analytical process, and the results from any water quality modeling used. This information is necessary for EPA to review the loading capacity determination, and the associated load, wasteload, and margin of safety allocations.

☒ TMDLs must take critical conditions (e.g., steam flow, loading, and water quality parameters, seasonality, etc…) into account as part of the analysis of loading capacity (40 C.F.R. §130.7(c)(1)). TMDLs should define applicable critical conditions and describe the approach used to determine both point and nonpoint source loadings under such critical conditions. In particular, the document

should discuss the approach used to compute and allocate nonpoint source loadings, e.g., meteorological conditions and land use distribution.

☐ Where both nonpoint sources and NPDES permitted point sources are included in the TMDL loading allocation, and attainment of the TMDL target depends on reductions in the nonpoint source loads, the TMDL document must include a demonstration that nonpoint source loading reductions needed to implement the load allocations are actually practicable [40 CFR 130.2(i) and 122.44(d)].

Recommendation:
☒ Approve ☐ Partial Approval ☐ Disapprove ☐ Insufficient Information

Summary: An adequate technical analysis has been completed. TMDLs are established for both high and low flow conditions. All surface water and metals sediment data are contained in Appendix D. Table 5-24 includes all components used to calculate each TMDL (such as water hardness, discharge and target concentration). Additionally, Section 5.7 clearly explains how allocations were derived and provides TMDL equations for each stream segment.

Comments:

4.1 Data Set Description

TMDL documents should include a thorough description and summary of all available water quality data that are relevant to the water quality assessment and TMDL analysis. An inventory of the data used for the TMDL analysis should be provided to document, for the record, the data used in decision making. This also provides the reader with the opportunity to independently review the data. The TMDL analysis should make use of all readily available data for the waterbody under analysis unless the TMDL writer determines that the data are not relevant or appropriate. For relevant data that were known but rejected, an explanation of why the data were not utilized should be provided (e.g., samples exceeded holding times, data collected prior to a specific date were not considered timely, etc…).

Review Elements:

☒ TMDL documents should include a thorough description and summary of all available water quality data that are relevant to the water quality assessment and TMDL analysis such that the water quality impairments are clearly defined and linked to the impaired beneficial uses and appropriate water quality criteria.

☒ The TMDL document submitted should be accompanied by the data set utilized during the TMDL analysis. If possible, it is preferred that the data set be provided in an electronic format and referenced in the document. If electronic submission of the data is not possible, the data set may be included as an appendix to the document.

Recommendation:
☒ Approve ☐ Partial Approval ☐ Disapprove ☐ Insufficient Information

Summary: The technical analysis is summarized in the main body of the document and in Appendix F while the complete water quality and sediment dataset is presented in Appendix D. Section 5.3 includes a discussion of all sources of information that were utilized.

Comments:

4.2 Waste Load Allocations (WLA):

Waste Load Allocations represent point source pollutant loads to the waterbody. Point source loads are typically better understood and more easily monitored and quantified than nonpoint source loads. Whenever practical, each point source should be given a separate waste load allocation. All NPDES permitted dischargers that discharge the pollutant under analysis directly to the waterbody should be identified and given separate waste load allocations. The finalized WLAs are required to be incorporated into future NPDES permit renewals.

Review Elements:

☒ EPA regulations require that a TMDL include WLAs, which identify the portion of the loading capacity allocated to individual existing and future point source(s) (40 C.F.R. §130.2(h), 40 C.F.R. §130.2(i)). In some cases, WLAs may cover more than one discharger, e.g., if the source is contained within a general permit. If no allocations are to be made to point sources, then the TMDL should include a value of zero for the WLA.

☒ All NPDES permitted dischargers given WLA as part of the TMDL should be identified in the TMDL, including the specific NPDES permit numbers, their geographical locations, and their associated waste load allocations.

Recommendation:

☒ Approve ☐ Partial Approval ☐ Disapprove ☐ Insufficient Information

Summary:

Abandoned mining loads were given wasteload allocations per USEPA guidance and WLAs are individually provided for all permitted point sources. The geographic location of the point sources and their permit numbers are included in the document.

Comments:

4.3 Load Allocations (LA):

Load allocations include the nonpoint source, natural, and background loads. These types of loads are typically more difficult to quantify than point source loads, and may include a significant degree of uncertainty. Often it is necessary to group these loads into larger categories and estimate the loading rates based on limited monitoring data and/or modeling results. The background load represents a composite of all upstream pollutant loads into the waterbody. In addition to the upstream nonpoint and upstream natural load, the background load often includes upstream point source loads that are not given specific waste load allocations in this particular TMDL analysis. In instances where nonpoint source loading rates are particularly difficult to quantify, a performance-based allocation approach, in which a detailed monitoring plan and adaptive management strategy are employed for the application of BMPs, may be appropriate.

Review Elements:

☒ EPA regulations require that TMDL expressions include LAs which identify the portion of the loading capacity attributed to nonpoint sources and to natural background. Load allocations may range from reasonably accurate estimates to gross allotments (40 C.F.R. §130.2(g)). Load allocations may be included for both existing and future nonpoint source loads. Where possible, load allocations should be described separately for natural background and nonpoint sources.

☒ Load allocations assigned to natural background loads should not be assumed to be the difference between the sum of known and quantified anthropogenic sources and the existing *in situ* loads (e.g., measured in stream) unless it can be demonstrated that the anthropogenic sources of the pollutant of concern have been identified and given proper load or waste load allocations.

Recommendation:
☒ Approve ☐ Partial Approval ☐ Disapprove ☐ Insufficient Information

Summary
DEQ presents load allocations to background/natural conditions based on monitoring data obtained upstream of known mining sources throughout the watershed. Section 5.3.1 provides summary information for all sites intended to represent background. The median concentrations from background sites in or near the watershed of concern were used to quantify background loads. For waterbody-pollutant combinations where background conditions were less certain, a composite WLA to natural background and non-permitted mining sources was established and a strategy of adaptive management was described.

Two groundwater discharge permits were given load instead of wasteload allocations under the rationale that any potential metals loading to surface water would be via diffuse groundwater pathways. Section 8.3 highlights uncertainties and identifies areas where source assessment could be strengthened.

Comments:

4.4 Margin of Safety (MOS):

Natural systems are inherently complex. Any mathematical relationship used to quantify the stressor → response relationship between pollutant loading rates and the resultant water quality impacts, no matter how rigorous, will include some level of uncertainty and error. To compensate for this uncertainty and ensure water quality standards will be attained, a margin of safety is required as a component of each TMDL. The MOS may take the form of a explicit load allocation (e.g., 10 lbs/day), or may be implicitly built into the TMDL analysis through the use of conservative assumptions and values for the various factors that determine the TMDL pollutant load → water quality effect relationship. Whether explicit or implicit, the MOS should be supported by an appropriate level of discussion that addresses the level of uncertainty in the various components of the TMDL technical analysis, the assumptions used in that analysis, and the relative effect of those assumptions on the final TMDL. The discussion should demonstrate that the MOS used is sufficient to ensure that the water quality standards would be attained if the TMDL pollutant loading rates are met. In cases where there is substantial uncertainty regarding the linkage between the proposed allocations and achievement of water quality standards, it may be necessary to employ a phased or adaptive management approach (e.g., establish a monitoring plan to determine if the proposed allocations are, in fact, leading to the desired water quality improvements).

Review Elements:

☒ TMDLs must include a margin of safety (MOS) to account for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality (CWA §303(d) (1) (C), 40 C.F.R. §130.7(c)(1)). EPA's 1991 TMDL Guidance explains that the MOS may be implicit (i.e., incorporated into the TMDL through conservative assumptions in the analysis) or explicit (i.e., expressed in the TMDL as loadings set aside for the MOS).

☒ If the MOS is implicit, the conservative assumptions in the analysis that account for the MOS should be identified and described. The document should discuss why the assumptions are considered conservative and the effect of the assumption on the final TMDL value determined.

☐ If the MOS is explicit, the loading set aside for the MOS should be identified. The document should discuss how the explicit MOS chosen is related to the uncertainty and/or potential error in the linkage analysis between the WQS, the TMDL target, and the TMDL loading rate.

☐ If, rather than an explicit or implicit MOS, the TMDL relies upon a phased approach to deal with large and/or unquantifiable uncertainties in the linkage analysis, the document should include a description of the planned phases for the TMDL as well as a monitoring plan and adaptive management strategy.

Recommendation:

☒ Approve ☐ Partial Approval ☐ Disapprove ☐ Insufficient Information

Summary: For metals TMDLs, DEQ uses an implicit margin of safety through conservative assumptions and the use of an adaptive management strategy. The margin of safety strategy is described in Sections 5.8 and adaptive management is discussed in Section 5.9.

Comments:

4.5 Seasonality and variations in assimilative capacity:

The TMDL relationship is a factor of both the loading rate of the pollutant to the waterbody and the amount of pollutant the waterbody can assimilate and still attain water quality standards. Water quality standards often vary based on seasonal considerations. Therefore, it is appropriate that the TMDL analysis consider seasonal variations, such as critical flow periods (high flow, low flow), when establishing TMDLs, targets, and allocations.

Review Elements:

☒ The statute and regulations require that a TMDL be established with consideration of seasonal variations. The TMDL must describe the method chosen for including seasonal variability as a factor. (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)).

Recommendation:
☒ Approve ☐ Partial Approval ☐ Disapprove ☐ Insufficient Information

Summary:
Seasonality considerations are adequately discussed in Section 5.8. Metals TMDLs are presented as equations that take into account flow and seasonality.

Comments:

5. Public Participation

EPA regulations require that the establishment of TMDLs be conducted in a process open to the public, and that the public be afforded an opportunity to participate. To meaningfully participate in the TMDL process it is necessary that stakeholders, including members of the general public, be able to understand the problem and the proposed solution. TMDL documents should include language that explains the issues to the general public in understandable terms, as well as provides additional detailed technical information for the scientific community. Notifications or solicitations for comments regarding the TMDL should be made available to the general public, widely circulated, and clearly identify the product as a TMDL and the fact that it will be submitted to EPA for review. When the final TMDL is submitted to EPA for approval, a copy of the comments received by the state and the state responses to those comments should be included with the document.

Review Elements:

☒ The TMDL must include a description of the public participation process used during the development of the TMDL (40 C.F.R. §130.7(c)(1)(ii)).

☒ TMDLs submitted to EPA for review and approval should include a summary of significant comments and the State's/Tribe's responses to those comments.

Recommendation:

☒ Approve ☐ Partial Approval ☐ Disapprove ☐ Insufficient Information

Summary: The public participation process is summarized in Section 9.0. The document was sent out for public comment on November 9, 2012 and the public comment period lasted until December 6, 2012. DEQ received comments from Montana Fish, Wildlife and Parks and two private citizens. The responses to these comments are documented in Appendix G.

Comments:

6. Monitoring Strategy

TMDLs may have significant uncertainty associated with the selection of appropriate numeric targets and estimates of source loadings and assimilative capacity. In these cases, a phased TMDL approach may be necessary. For Phased TMDLs, it is EPA's expectation that a monitoring plan will be included as a component of the TMDL document to articulate the means by which the TMDL will be evaluated in the field, and to provide for future supplemental data that will address any uncertainties that may exist when the document is prepared.

Review Elements:

☐ When a TMDL involves both NPDES permitted point source(s) and nonpoint source(s) allocations, and attainment of the TMDL target depends on reductions in the nonpoint source loads, the TMDL document should include a monitoring plan that describes the additional data to be collected to determine if the load reductions provided for in the TMDL are occurring.

☐ Under certain circumstances, a phased TMDL approach may be utilized when limited existing data are relied upon to develop a TMDL, and the State believes that the use of additional data or data based on better analytical techniques would likely increase the accuracy of the TMDL load calculation and merit development of a second phase TMDL. EPA recommends that a phased TMDL document or its implementation plan include a monitoring plan and a scheduled timeframe for revision of the TMDL. These elements would not be an intrinsic part of the TMDL and would not be approved by EPA, but may be necessary to support a rationale for approving the TMDL. http://www.epa.gov/owow/tmdl/tmdl_clarification_letter.pdf

Recommendation:

☒ Approve ☐ Partial Approval ☐ Disapprove ☐ Insufficient Information

Summary: DEQ recognizes that there is uncertainty in the TMDL process, and has presented a conceptual monitoring strategy (Section 8.0) to address the uncertainties in the document.

Comments:

7. Restoration Strategy

The overall purpose of the TMDL analysis is to determine what actions are necessary to ensure that the pollutant load in a waterbody does not result in water quality impairment. Adding additional detail regarding the proposed approach for the restoration of water quality is not currently a regulatory requirement, but is considered a value added component of a TMDL document. During the TMDL analytical process, information is often gained that may serve to point restoration efforts in the right direction and help ensure that resources are spent in the most efficient manner possible. For example, watershed models used to analyze the linkage between the pollutant loading rates and resultant water quality impacts might also be used to conduct "what if" scenarios to help direct BMP installations to locations that provide the greatest pollutant reductions. Once a TMDL has been written and approved, it is often the responsibility of other water quality programs to see that it is implemented. The level of quality and detail provided in the restoration strategy will greatly influence the future success in achieving the needed pollutant load reductions.

Review Elements:

☐ EPA is not required to and does not approve TMDL implementation plans. However, in cases where a WLA is dependent upon the achievement of a LA, "reasonable assurance" is required to demonstrate the necessary LA called for in the document is practicable). A discussion of the BMPs (or other load reduction measures) that are to be relied upon to achieve the LA(s), and programs and funding sources that will be relied upon to implement the load reductions called for in the document, may be included in the implementation/restoration section of the TMDL document to support a demonstration of "reasonable assurance".

Recommendation:

☒ Approve ☐ Partial Approval ☐ Disapprove ☐ Insufficient Information

Summary: A conceptual restoration strategy is presented in Section 7.0. This is presented to facilitate implementation with watershed stakeholders, and is not part of any regulatory requirement. Reasonable assurance considerations are discussed in Section 4.4.

Comments:

8. Daily Loading Expression

The goal of a TMDL analysis is to determine what actions are necessary to attain and maintain WQS. The appropriate averaging period that corresponds to this goal will vary depending on the pollutant and the nature of the waterbody under analysis. When selecting an appropriate averaging period for a TMDL analysis, primary concern should be given to the nature of the pollutant in question and the achievement of the underlying WQS. However, recent federal appeals court decisions have pointed out that the title TMDL implies a "daily" loading rate. While the most appropriate averaging period to be used for developing a TMDL analysis may vary according to the pollutant, a daily loading rate can provide a more practical indication of whether or not the overall needed load reductions are being achieved. When limited monitoring resources are available, a daily loading target that takes into account the natural variability of the system can serve as a useful indicator for whether or not the overall load reductions are likely to be met. Therefore, a daily expression of the required pollutant loading rate is a required element in all TMDLs, in addition to any other load averaging periods that may have been used to conduct the TMDL analysis. The level of effort spent to develop the daily load indicator should be based on the overall utility it can provide as an indicator for the total load reductions needed.

Review Elements:

☒ The document should include an expression of the TMDL in terms of a daily load. However, the TMDL may also be expressed in temporal terms other than daily (e.g., an annual or monthly load). If the document expresses the TMDL in additional "non-daily" terms the document should explain why it is appropriate or advantageous to express the TMDL in the additional unit of measurement chosen.

Recommendation:

☒ Approve ☐ Partial Approval ☐ Disapprove ☐ Insufficient Information

Summary:

Metals TMDLs are presented as an equation using the target times flow, which results in a daily load in pounds per day.

Comments:

Table 1. Waterbody segments addressed by metals TMDLs.

Waterbody Name	Segment ID
Basin Creek, headwaters to mouth (Boulder River)	MT41E002_030
Bison Creek, headwaters to mouth (Boulder River)	MT41E002_070
Boulder River, headwaters to Basin Creek	MT41E001_010
Boulder River, Basin Creek to Town of Boulder	MT41E001_021
Boulder River, Town of Boulder to Cottonwood Creek	MT41E001_022
Boulder River, Cottonwood Creek to the mouth (Jefferson Slough), T1N R3W S2	MT41E001_030
Cataract Creek, headwaters to mouth (Boulder River)	MT41E002_020
Elkhorn Creek, headwaters to Wood Gulch	MT41E002_061
Elkhorn Creek, Wood Gulch to the mouth (Unnamed Canal/Ditch), T5N T3W S21	MT41E002_062
High Ore Creek, headwaters to mouth (Boulder River)	MT41E002_040
Jack Creek, headwaters to mouth (Basin Creek)	MT41E003_010
Little Boulder River, headwaters to mouth (Boulder River)	MT41E002_080
Lowland Creek, headwaters to mouth (Boulder River)	MT41E002_050
Muskrat Creek, headwaters to mouth (Boulder River)	MT41E002_100
North Fork Little Boulder River, headwaters to mouth (Little Boulder)	MT41E002_090
Uncle Sam Gulch, headwaters to mouth (Cataract Creek)	MT41E002_010