UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
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MAR 04 2010

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 Upper Clark Fork TPA

Dear Mr. Mathieus:

We have completed our review of the total maximum daily loads (TMDLs) as submitted by your office for the Upper Clark Fork TMDL Planning Area (TPA). The TMDLs are included in the document entitled *Upper Clark Fork Tributaries Sediment, Metals, and Temperature TMDLs and Framework for Water Quality Restoration* transmitted to us for review and approval on December 31, 2009. In accordance with the Clean Water Act (33 U.S.C. 1251 *et. seq.*), we approve all aspects of the TMDLs as developed for the Upper Clark Fork TPA. Enclosure 1 to this letter provides a summary of the elements of the TMDLs and Enclosure 2 provides details of our review of the TMDLs.

Based on our review, we feel the separate TMDL elements listed in Enclosure 2 adequately address the pollutants of concern, taking into consideration seasonal variation and a margin of safety. In approving these TMDLs, EPA affirms that the TMDLs have been established at levels necessary to attain and maintain the applicable water quality standards and have the necessary components of approvable TMDLs.

Thank you for submitting these TMDLs for our review and approval. If you have any questions, the most knowledgeable person on my staff is Ron Steg and may be reached at (406) 457-5024.

Sincerely,

for Eddie A. Sierra
Acting Assistant Regional Administrator
Office of Ecosystems Protection
and Remediation

Enclosure

cc: Claudia Massman, Attorney
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Enclosure 1 – Upper Clark Fork TMDL Summary

Water Body Name	Water Body ID	Impaired Beneficial Uses: Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry	Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action	TMDL End Points: Indicator	Threshold Values	Wasteload Allocations: WLA (Tons/ year)	WLA Permitted Facilities (Permit Number)	Load Allocations: LA	(Tons/ Year)	TMDL (Tons/ Year)	MOS
Antelope Creek	MT76G002_140	X	X	NA	F	F	F	P		Low Flow Alterations	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									>2006	Sedimentation /Siltation	Sediment	TMDL	High Gradient - Bankfull width to depth ratio	≤15	NA	NA	Roads	9	200	Implicit
													High Gradient - Entrenchment ratio	1.4-2.2						
													High Gradient - % Surface fines <2mm	≤7						
													High Gradient - % subsurface fines <6mm	≤18			Anthropogenic Bank Erosion	157		Implicit
													High Gradient - Residual Pool Depth (feet)	≥0.8						
													High Gradient - Pool Frequency (per 1000')	≥15						
													Low Gradient - Bankfull width to depth ratio	≥12-<22			Natural Bank Erosion	-		Implicit
													Low Gradient - Entrenchment ratio	≥2.2						
													Low Gradient - % Surface fines <2mm	≤10						
													Low Gradient - % subsurface fines <6mm	≤23			Upland Erosion	34		Implicit
													Low Gradient - Residual Pool Depth (feet)	≥1.0						
													Low Gradient - Pool Frequency (per 1000')	≥12						
Beef-straight Creek	MT76G003_031	N	N	NA	X	X	X	X	2004	Cyanide	Cyanide	TMDL	Chronic aquatic life standard (ug/L)	5.2	Beef-straight: 0.437	NA	Naturally occurring sources	0.405	0.842	Implicit
Brock Creek	MT76G005_100	X	X	NA	F	P	F	F	1988	Sedimentation /Siltation	Sediment	TMDL	High Gradient - Bankfull width to depth ratio	≤15	NA	NA	Roads	24	2581	Implicit
													High Gradient - Entrenchment ratio	1.4-2.2						
													High Gradient - % Surface fines <2mm	≤7						
													High Gradient - % subsurface fines <6mm	≤18			Anthropogenic Bank Erosion	223		Implicit
													High Gradient - Residual Pool Depth (feet)	≥0.8						
													High Gradient - Pool Frequency (per 1000')	≥15						
													Low Gradient - Bankfull width to depth ratio	≥12-<22			Natural Bank Erosion	100		Implicit
													Low Gradient - Entrenchment ratio	≥2.2						
													Low Gradient - % Surface fines <2mm	≤10						
													Low Gradient - % subsurface fines <6mm	≤23			Upland Erosion	2234		Implicit
													Low Gradient - Residual Pool Depth (feet)	≥1.0						
													Low Gradient - Pool Frequency (per 1000')	≥12						
Cable Creek	MT76G002_030	P	P	NA	F	P	F	F	1988	Sedimentation/ Siltation	Sediment	TMDL	High Gradient - Bankfull width to depth ratio	≤15	NA	NA	Roads	8	317	Implicit
													High Gradient - Entrenchment ratio	1.4-2.2						
													High Gradient - % Surface fines <2mm	≤7						
													High Gradient - % subsurface fines <6mm	≤18			Anthropogenic Bank Erosion	82		Implicit
													High Gradient - Residual Pool Depth (feet)	≥0.8						
													High Gradient - Pool Frequency (per 1000')	≥15						
													Low Gradient - Bankfull width to depth ratio	≥12-<22			Natural Bank Erosion	82		Implicit
													Low Gradient - Entrenchment ratio	≥2.2						
													Low Gradient - % Surface fines <2mm	≤10						
													Low Gradient - % subsurface fines <6mm	≤23			Upland Erosion	145		Implicit
													Low Gradient - Residual Pool Depth (feet)	≥1.0						
													Low Gradient - Pool Frequency (per 1000')	≥12						
										Other Anthropogenic substrate alterations	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA	NA	NA	NA
										Physical Substrate Habitat Alterations	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA	NA	NA	NA
										Chlorophyll a	NA	Data collected during 2007/2008 field seasons	NA	NA	NA	NA	NA	NA	NA	NA
Clark Fork River	MT76G001_010	P	P	NA	N	P	F	F		Alteration in stream-side or littoral vegetation covers	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA

Water Body Name	Water Body ID	Impaired Beneficial Uses: Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry	Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action	TMDL End Points: Indicator	Threshold Values	Wasteload Allocations: WLA (Tons/ year)	WLA Permitted Facilities (Permit Number)	Load Allocations: LA	(Tons/ Year)	TMDL (Tons/ Year)	MOS
									1996	Arsenic	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									1996	Copper	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									1996	Lead	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
										Low Flow Alterations	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									1996	Nitrogen (Total)	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									1996	Phosphorus (Total)	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
										Physical Substrate Habitat Alterations	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									1996	Sedimentation/Siltation	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									1996	Zinc	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
Clark Fork River	MT76G001_030	N	N	NA	NA	P	F	F		Alteration in stream-side or littoral vegetation covers	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									1990	Copper	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									1990	Lead	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
										Low Flow Alterations	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									1990	Nitrogen (Total)	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									1990	Phosphorus (Total)	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
										Physical Substrate Habitat Alterations	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									1996	Sedimentation/Siltation	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									1990	Zinc	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
Clark Fork River	MT76G001_040	P	P	NA	NA	P	F	F		Alteration in stream-side or littoral vegetation covers	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									1990	Arsenic	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									1990	Cadmium	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									1990	Copper	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									1990	Lead	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
										Low Flow Alterations	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									1990	Nitrogen (Total)	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									1990	Phosphorus (Total)	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									1996	Sedimentation/Siltation	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
Dempsey Creek	MT76G002_100	P	P	NA	F	P	F	F	1988	Sedimentation/Siltation	Sediment	TMDL	High Gradient - Bankfull width to depth ratio	≤15	NA	NA	Roads	21	6149	Implicit
													High Gradient - Entrenchment ratio	1.4-2.2						
													High Gradient - % Surface fines <2mm	≤7						
													High Gradient - % subsurface fines <6mm	≤18			Anthropogenic Bank Erosion	239		Implicit
													High Gradient - Residual Pool Depth (feet)	≥0.8						
													High Gradient - Pool Frequency (per 1000')	≥15						
													Low Gradient - Bankfull width to depth ratio	≥12-≤22			Natural Bank Erosion	209		Implicit
													Low Gradient - Entrenchment ratio	≥2.2						
													Low Gradient - % Surface fines <2mm	≤10						
													Low Gradient - % subsurface fines <6mm	≤23			Upland Erosion	5680		Implicit
													Low Gradient - Residual Pool Depth (feet)	≥1.0						
													Low Gradient - Pool Frequency (per 1000')	≥12						

		Impaired Beneficial Uses											TMDL End Points		Wasteload Allocations		Load Allocations			
Water Body Name	Water Body ID	Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry	Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action	Indicator	Threshold Values	WLA (Tons/ year)	WLA Permitted Facilities (Permit Number)	LA	(Tons/ Year)	TMDL (Tons/ Year)	MOS
									2000	Nitrate/Nitrite (Nitrite+Nitrate as N)	NA	Data collected during 2007/2008 field seasons	NA	NA	NA	NA	NA	NA	NA	NA
										Low Flow Alterations	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
										Alteration in stream-side or littoral vegetation covers	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA	NA	NA	NA
Dunkle-berg Creek	MT76G005_071	N	N	NA	F	F	N	P	1990	Cadmium	Cadmium	TMDL	Chronic aquatic life (ug/L) at hardness = 131 mg/L $CaCO_3$	0.33	JP: 0.001 FR: 0.003 **Total:** 0.004	NA	Naturally occurring	0.002	0.006	Implicit
									1990	Lead	Lead	TMDL	Chronic aquatic life (ug/L) at hardness = 131 mg/L $CaCO_3$	4.49	JP: 0.019 FR: 0.057 **Total:** 0.076	NA	Naturally occurring	0.012	0.088	Implicit
									1990	Zinc	Zinc	TMDL	Chronic aquatic life (ug/L) at hardness = 131 mg/L $CaCO_3$	150.62	JP: 0.643 FR: 2.099 **Total:** 2.741	NA	Naturally occurring	0.195	2.936	Implicit
									>2008	Arsenic	Arsenic	TMDL	Human health standard (ug/L)	10	JP: 0.043 FR: 0.094 **Total:** 0.137	NA	Naturally occurring	0.058	0.195	Implicit
									>2008	Copper	Copper	TMDL	Chronic aquatic life (ug/L) at hardness = 131 mg/L $CaCO_3$	11.75	JP: 0.050 FR: 0.159 **Total:** 0.209	NA	Naturally occurring	0.019	0.229	Implicit
									>2008	Iron	Iron	TMDL	Chronic aquatic life standard (ug/L)	1000	JP: 4.266 FR: 9.575 **Total:** 13.841	NA	Naturally occurring	5.653	19.494	Implicit
										Alteration in stream-side or littoral vegetation covers	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dunkle-berg Creek	MT76G005_072	P	P	NA	F	F	F	F	1990	Lead	Lead	TMDL	Chronic aquatic life (ug/L) at hardness = 119 mg/L $CaCO_3$	3.97	DunkDitch: 0.070 JP: 0.019 FR: 0.057 **Total:** 0.146	NA	Naturally occurring	0.026	0.172	Implicit
									>2008	Arsenic	Arsenic	TMDL	Human health standard (ug/L)	10	DunkDitch: 0.166 JP: 0.043 FR: 0.094 **Total:** 0.302	NA	Naturally occurring	0.13	0.432	Implicit
									>2008	Cadmium	Cadmium	TMDL	Chronic aquatic life (ug/L) at hardness = 119 mg/L $CaCO_3$	0.31	DunkDitch: 0.005 JP: 0.001 FR: 0.003 **Total:** 0.010	NA	Naturally occurring	0.003	0.013	Implicit
									>2008	Copper	Copper	TMDL	Chronic aquatic life (ug/L) at hardness = 119 mg/L $CaCO_3$	10.82	DunkDitch: 0.215 JP: 0.050 FR: 0.159 **Total:** 0.424	NA	Naturally occurring	0.043	0.467	Implicit
									>2008	Iron	Iron	TMDL	Chronic aquatic life standard (ug/L)	1000	DunkDitch: 16.831 JP: 4.266 FR: 9.575 **Total:** 30.672	NA	Naturally occurring	12.528	43.2	Implicit
									>2008	Zinc	Zinc	TMDL	Chronic aquatic life (ug/L) at hardness = 119 mg/L $CaCO_3$	138.84	DunkDitch: 2.825	NA	Naturally occurring	0.432	5.998	Implicit

Water Body Name	Water Body ID	Impaired Beneficial Uses: Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry	Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action	TMDL End Points: Indicator	Threshold Values	Wasteload Allocations: WLA (Tons/ year)	WLA Permitted Facilities (Permit Number)	Load Allocations: LA	(Tons/ Year)	TMDL (Tons/ Year)	MOS
															JP: 0.643 FR: 2.099 **Total**: 5.566					
									1990	Nitrogen (Total)	NA	Data collected during 2007/2008 field seasons	NA	NA	NA	NA	NA	NA	NA	NA
										Alteration in stream-side or littoral vegetation covers	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
German Gulch	MT76G003_030	N	N	NA	F	F	F	F	2002	Selenium	Selenium	TMDL	Chronic aquatic life standard (ug/L)	5	German: 0.013	NA	Naturally occurring	0.019	0.032	Implicit
									<2008	Arsenic	Arsenic	TMDL	Human health standard (ug/L)	10	German: 0.039	NA	Naturally occurring	0.026	0.065	Implicit
									<2008	Cyanide	Cyanide	TMDL	Chronic aquatic life standard (ug/L)	5.2	German: 0.175	NA	Naturally occurring Beefstraight TMDL **Total**	0.162 0.842 1.004	1.179	Implicit
Gold Creek	MT76G005_091	N	N	NA	F	F	N	F	2000	Lead	Lead	TMDL	Chronic aquatic life (ug/L) at hardness = 42 mg/L $CaCO_3$	1.05	UppGold: 0.118	NA	Naturally occurring	0.107	0.224	Implicit
										Alteration in stream-side or littoral vegetation covers	NA	NA								
Gold Creek	MT76G005_092	P	P	NA	F	F	F	P	>2008	Iron	Iron	TMDL	Chronic aquatic life standard (ug/L)	1000	Blum: 26.69 PPeak: 156.325 UppGold: 102.946 LowGold: 95.320 **Total**: 381.282	NA	Naturally occurring	89.436	470.718	Implicit
									>2008	Lead	Lead	TMDL	Chronic aquatic life (ug/L) at hardness = 99 mg/L $CaCO_3$	3.14	Blum: 0.087 PPeak: 0.510 UppGold: 0.336 LowGold: 0.311 **Total**: 1.243	NA	Naturally occurring	0.235	1.478	Implicit
									1990	Nitrogen (Total)	NA	Data collected during 2007/2008 field seasons	NA	NA	NA	NA	NA	NA	NA	NA
										Low Flow Alterations	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hoover Creek	MT76G005_081	X	X	NA	X	P	X	X	2000	Turbidity	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA	NA	NA	NA
									>2008	Sedimentation/Siltation	Sediment	TMDL	High Gradient - Bankfull width to depth ratio	≤15	NA	NA			310	Implicit
													High Gradient - Entrenchment ratio	1.4-2.2						
													High Gradient - % Surface fines <2mm	≤7			Roads	31		
													High Gradient - % subsurface fines <6mm	≤18			Anthropogenic Bank Erosion	125		Implicit
													High Gradient - Residual Pool Depth (feet)	≥0.8						
													High Gradient - Pool Frequency (per 1000')	≥15						
													Low Gradient - Bankfull width to depth ratio	≥12-≤22			Natural Bank	18		Implicit

Water Body Name	Water Body ID	Impaired Beneficial Uses: Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry	Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action	TMDL End Points: Indicator	Threshold Values	Wasteload Allocations: WLA (Tons/ year)	WLA Permitted Facilities (Permit Number)	Load Allocations: LA	(Tons/ Year)	TMDL (Tons/ Year)	MOS
													Low Gradient - Entrenchment ratio	≥2.2			Erosion			
													Low Gradient - % Surface fines <2mm	≤10						
													Low Gradient - % subsurface fines <6mm	≤23			Upland Erosion	136		Implicit
													Low Gradient - Residual Pool Depth (feet)	≥1.0						
													Low Gradient - Pool Frequency (per 1000')	≥12						
Hoover Creek	MT76G005_082	N	N	NA	X	N	X	X	1988	Sedimentation/Siltation	Sediment	TMDL	High Gradient - Bankfull width to depth ratio	≤15	NA	NA	Roads	14	433	Implicit
													High Gradient - Entrenchment ratio	1.4-2.2						
													High Gradient - % Surface fines <2mm	≤7						
													High Gradient - % subsurface fines <6mm	≤18			Anthropogenic Bank Erosion	144		Implicit
													High Gradient - Residual Pool Depth (feet)	≥0.8						
													High Gradient - Pool Frequency (per 1000')	≥15						
													Low Gradient - Bankfull width to depth ratio	≥12-<22			Natural Bank Erosion	15		Implicit
													Low Gradient - Entrenchment ratio	≥2.2						
													Low Gradient - % Surface fines <2mm	≤10						
													Low Gradient - % subsurface fines <6mm	≤23			Upland Erosion	260		Implicit
													Low Gradient - Residual Pool Depth (feet)	≥1.0						
													Low Gradient - Pool Frequency (per 1000')	≥12						
									1990	Nitrogen (Total)	NA	Data collected during 2007/2008 field seasons	NA	NA	NA	NA	NA	NA	NA	NA
										Low Flow Alterations	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
										Physical Substrate Habitat Alterations	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA	NA	NA	NA
Lost Creek	MT76G002_072	N	N	NA	F	F	N	P	2000	Arsenic	Arsenic	TMDL	Human health standard (ug/L)	10	NA	NA	Naturally occurring Historical mining Total	0.178 0.416 0.594	0.594	Implicit
									>2008	Copper	Copper	TMDL	Chronic aquatic life (ug/L) at hardness = 32 mg/L $CaCO_3$	3.52	NA	NA	Naturally occurring Historical mining Total	0.162 0.489 0.651	0.651	Implicit
									>2008	Lead	Lead	TMDL	Chronic aquatic life (ug/L) at hardness = 32 mg/L $CaCO_3$	0.75	NA	NA	Naturally occurring Historical mining Total	0.041 0.166 0.207	0.207	Implicit
									1990	Nitrate/Nitrite (Nitrite+Nitrate as N)	NA	Data collected during 2007/2008 field seasons	NA	NA	NA	NA	NA	NA	NA	NA
										Low Flow Alterations	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									2000	Iron	NA	Investigated - No Action	NA	NA	NA	NA	NA	NA	NA	NA
									2000	Manganese	NA	Investigated - No Action	NA	NA	NA	NA	NA	NA	NA	NA
									1996	Sulfates	NA	Investigated - No Action	NA	NA	NA	NA	NA	NA	NA	NA
										Alteration in stream-side or littoral vegetation covers	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Water Body Name	Water Body ID	Impaired Beneficial Uses							Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action	TMDL End Points		Wasteload Allocations		Load Allocations		TMDL (Tons/ Year)	MOS
		Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry					Indicator	Threshold Values	WLA (Tons/ year)	WLA Permitted Facilities (Permit Number)	LA	(Tons/ Year)		
										Physical Substrate Habitat Alterations	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mill Creek	MT76G002_051	N	N	NA	F	F	N	P	1988	Lead	Lead	TMDL	Chronic aquatic life (ug/L) at hardness = 29 mg/L $CaCO_3$	0.68	NA	NA	Naturally occurring Historical mining **Total**	0.186 0.060 0.246	0.246	Implicit
									1988	Zinc	Zinc	TMDL	Chronic aquatic life (ug/L) at hardness = 29 mg/L $CaCO_3$	41.85	NA	NA	Naturally occurring Historical mining **Total**	3.722 11.855 15.577	15.577	Implicit
									1988	Arsenic	Arsenic	TMDL	Human health standard (ug/L)	10	NA	NA	Naturally occurring Historical mining **Total**	1.117 2.606 3.722	3.722	Implicit
									1988	Copper	Copper	TMDL	Chronic aquatic life (ug/L) at hardness = 29 mg/L $CaCO_3$	3.23	NA	NA	Naturally occurring Historical mining **Total**	0.372 0.830 1.202	1.202	Implicit
									1988	Chromium (Total)	NA	Investigated - No Action	NA	NA	NA	NA	NA	NA	NA	NA
									1988	Cadmium	Cadmium	TMDL	Chronic aquatic life (ug/L) at hardness = 29 mg/L $CaCO_3$	0.11	NA	NA	Naturally occurring Historical mining **Total**	0.037 0.004 0.041	0.041	Implicit
Mill Creek	MT76G002_052	N	N	NA	P	F	N	P	1988	Aluminum	NA	Investigated - No Action	NA	NA	NA	NA	NA	NA	NA	NA
									1988	Arsenic	Arsenic	TMDL	Human health standard (ug/L)	10	NA	NA	Naturally occurring Historical mining **Total**	1.782 4.158 5.940	5.940	Implicit
									1988	Cadmium	Cadmium	TMDL	Chronic aquatic life (ug/L) at hardness = 32 mg/L $CaCO_3$	0.12	NA	NA	Naturally occurring Historical mining **Total**	0.059 0.012 0.071	0.071	Implicit
									1988	Copper	Copper	TMDL	Chronic aquatic life (ug/L) at hardness = 32 mg/L $CaCO_3$	3.52	NA	NA	Naturally occurring Historical mining **Total**	0.594 1.497 2.091	2.091	Implicit
									1988	Iron	Iron	TMDL	Chronic aquatic life standard (ug/L)	1000	NA	NA	Naturally occurring Historical mining **Total**	5.94 588.06 594.00	594.00	Implicit
									1988	Lead	Lead	TMDL	Chronic aquatic life (ug/L) at hardness = 32 mg/L $CaCO_3$	0.75	NA	NA	Naturally occurring Historical mining **Total**	0.297 0.149 0.446	0.446	Implicit
									1988	Zinc	Zinc	TMDL	Chronic aquatic life (ug/L) at hardness = 32 mg/L $CaCO_3$	45.83	NA	NA	Naturally occurring Historical mining	5.940 21.164 27.104	27.104	Implicit

Water Body Name	Water Body ID	Impaired Beneficial Uses							Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action	TMDL End Points		Wasteload Allocations		Load Allocations		TMDL (Tons/ Year)	MOS
		Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry					Indicator	Threshold Values	WLA (Tons/ year)	WLA Permitted Facilities (Permit Number)	LA	(Tons/ Year)		
																	Total			
										Low Flow Alterations	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
										Alteration in stream-side or littoral vegetation covers	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
Mill-Willow Bypass	MT76G002_120	P	P	NA	F	F	N	F	1996	Arsenic	Arsenic	TMDL	Human health standard (ug/L)	10	NA	NA	historic/naturally occurring Mill TMDL Willow TMDL Total	1.609 5.940 4.007 11.556	11.556	Implicit
									1996	Copper	Copper	TMDL	Chronic aquatic life (ug/L) at hardness = 95 mg/L $CaCO_3$	8.93	NA	NA	historic/naturally occurring Mill TMDL Willow TMDL Total	5.039 2.091 3.190 10.320	10.320	Implicit
									1996	Lead	Lead	TMDL	Chronic aquatic life (ug/L) at hardness = 95 mg/L $CaCO_3$	2.98	NA	NA	historic/naturally occurring Mill TMDL Willow TMDL Total	1.992 0.446 1.006 3.444	3.444	Implicit
									>2008	Cadmium	Cadmium	TMDL	Chronic aquatic life (ug/L) at hardness = 95 mg/L $CaCO_3$	0.26	NA	NA	historic/naturally occurring Mill TMDL Willow TMDL Total	0.133 0.071 0.096 0.300	0.300	Implicit
									>2008	Zinc	Zinc	TMDL	Chronic aquatic life (ug/L) at hardness = 95 mg/L $CaCO_3$	114.72	NA	NA	historic/naturally occurring Mill TMDL Willow TMDL Total	64.463 27.104 41.003 132.570	132.570	Implicit
Modesty Creek	MT76G002_080	X	X	NA	F	F	N	P	2000	Arsenic	Arsenic	TMDL	Human health standard (ug/L)	10	NA	NA	Historic/naturally occurring	0.199	0.199	Implicit
									>2008	Cadmium	Cadmium	TMDL	Chronic aquatic life (ug/L) at hardness = 319 mg/L $CaCO_3$	0.72	NA	NA	Historic/naturally occurring	0.014	0.014	Implicit
									>2008	Copper	Copper	TMDL	Chronic aquatic life (ug/L) at hardness = 319 mg/L $CaCO_3$	29.06	NA	NA	Historic/naturally occurring	0.579	0.579	Implicit
									>2008	Lead	Lead	TMDL	Chronic aquatic life (ug/L) at hardness = 319 mg/L $CaCO_3$	17.29	NA	NA	Historic/naturally occurring	0.345	0.345	Implicit
										Low Flow Alterations	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
Peterson Creek	MT76G002_131	N	N	NA	F	F	F	P	1988	Sedimentation/Siltation	Sediment	TMDL	High Gradient - Bankfull width to depth ratio	≤15	NA	NA	Roads	12	1528	Implicit
													High Gradient - Entrenchment ratio	1.4-2.2						
													High Gradient - % Surface fines <2mm	≤7						
													High Gradient - % subsurface fines <6mm	≤18			Anthropogenic Bank Erosion	131		Implicit
													High Gradient - Residual Pool Depth (feet)	≥0.8						
													High Gradient - Pool Frequency (per 1000')	≥15						
													Low Gradient - Bankfull width to depth ratio	≥12-≤22			Natural Bank Erosion	46		Implicit
													Low Gradient - Entrenchment ratio	≥2.2						
													Low Gradient - % Surface fines <2mm	≤10						
													Low Gradient - % subsurface fines <6mm	≤23			Upland Erosion	1339		Implicit
													Low Gradient - Residual Pool Depth (feet)	≥1.0						
													Low Gradient - Pool Frequency (per 1000')	≥12						
									2006	Copper	Copper	TMDL	Chronic aquatic life (ug/L) at hardness = 39 mg/L $CaCO_3$	4.17	NA	NA	Historic/naturally occurring	0.462	0.462	Implicit
									>2008	Iron	Iron	TMDL	Chronic aquatic life standard (ug/L)	1000	NA	NA	Historic/naturally occurring	110.808	110.808	Implicit
									>2008	Lead	Lead	TMDL	Chronic aquatic life (ug/L) at hardness = 39 mg/L $CaCO_3$	0.96	NA	NA	Historic/naturally occurring	0.106	0.106	Implicit

Water Body Name	Water Body ID	Impaired Beneficial Uses: Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry	Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action	TMDL End Points: Indicator	Threshold Values	Wasteload Allocations: WLA (Tons/year)	WLA Permitted Facilities (Permit Number)	Load Allocations: LA	(Tons/Year)	TMDL (Tons/Year)	MOS
									2006	Nitrogen (Total)	NA	Data collected during 2007/2008 field seasons	NA	NA	NA	NA	NA	NA	NA	NA
									2006	Phosphorus (Total)	NA	Data collected during 2007/2008 field seasons	NA	NA	NA	NA	NA	NA	NA	NA
									2006	Total Kjehldahl Nitrogen (TKN)	NA	Data collected during 2007/2008 field seasons	NA	NA	NA	NA	NA	NA	NA	NA
										Low Flow Alterations	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
										Alteration in stream-side or littoral vegetation covers	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA	NA	NA	NA
Peterson Creek	MT76G002_132	N	N	NA	X	X	X	N	2000	Temperature	Temperature	TMDL	Montana temperature standard for B-1 streams	Temperature Range 32-66F: 1F max increase 66-66.5F: ≤1F max increase >66.5F: ≤0.5 max increase	NA	NA	The TMDL equals the resultant thermal load associated with stream temperatures when the following conditions are met: Peterson Creek between Jack Creek and mouth: the thermal load that can reach the stream when there is an average daily shade of 85% using a Solar Pathfinder, with specific focus from Jack Creek to Burnt Hollow Creek, and Boulder Road to the mouth. No measurable increase in thermal loading to the stream from preventable human caused increases in width/depth ratios throughout Peterson Creek Equations to determine instantaneous thermal loads and daily loads in kiloCalories can be found in Section 6.7 and Appendix C of the document			Implicit
													Riparian Shade	85% avg daily shade; with focus areas from Jack Creek to Burnt Hollow Creek, and Boulder Road to mouth	NA	NA				
													Channel width/depth ratio	No preventable human increases in width/	NA	NA				
													Irrigation water management	15% improvement in irrigation efficiency during the warmest months (mid-June - August)	NA	NA				
													Inflows to stream	No human caused surface water inflow, in single or in combination, will increase	NA	NA				

Water Body Name	Water Body ID	Impaired Beneficial Uses: Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry	Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action	TMDL End Points: Indicator	Threshold Values	Wasteload Allocations: WLA (Tons/year)	WLA Permitted Facilities (Permit Number)	Load Allocations: LA	(Tons/Year)	TMDL (Tons/Year)	MOS
														temperatures more than the allowable standard						
									>2008	Iron	Iron	TMDL	Chronic aquatic life standard (ug/L)	1000	NA	NA	Historic/naturally occurring	62.370	62.370	Implicit
										Low Flow Alterations	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
										Alteration in stream-side or littoral vegetation covers	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA	NA	NA	NA
										Physical Substrate Habitat Alterations	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA	NA	NA	NA
									>2008	Sedimentation/Siltation	Sediment	TMDL	High Gradient - Bankfull width to depth ratio	≤15	NA	NA				
													High Gradient - Entrenchment ratio	1.4-2.2						Implicit
													High Gradient - % Surface fines <2mm	≤7			Roads	12		
													High Gradient - % subsurface fines <6mm	≤18			Anthropogenic Bank Erosion			
													High Gradient - Residual Pool Depth (feet)	≥0.8						Implicit
													High Gradient - Pool Frequency (per 1000')	≥15				195		
													Low Gradient - Bankfull width to depth ratio	≥12-≤22			Natural Bank Erosion			
													Low Gradient - Entrenchment ratio	≥2.2						Implicit
													Low Gradient - % Surface fines <2mm	≤10				5		
													Low Gradient - % subsurface fines <6mm	≤23			Upland Erosion			
													Low Gradient - Residual Pool Depth (feet)	≥1.0						Implicit
													Low Gradient - Pool Frequency (per 1000')	≥12				1236	1448	
Racetrack Creek	MT76G002_090	P	P	NA	F	P	F	F		Low Flow Alterations	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
										Alteration in stream-side or littoral vegetation covers	NA	NA	NA	NA	NA	NA	NA	NA	NA	Implicit
									2006	Sedimentation/Siltation	Sediment	TMDL	High Gradient - Bankfull width to depth ratio	≤15	NA	NA				
													High Gradient - Entrenchment ratio	1.4-2.2						Implicit
													High Gradient - % Surface fines <2mm	≤7			Roads	9		
													High Gradient - % subsurface fines <6mm	≤18			Anthropogenic Bank Erosion			
													High Gradient - Residual Pool Depth (feet)	≥0.8						Implicit
													High Gradient - Pool Frequency (per 1000')	≥15				175		
													Low Gradient - Bankfull width to depth ratio	>12-<22			Natural Bank Erosion			
													Low Gradient - Entrenchment ratio	≥2.2						Implicit
													Low Gradient - % Surface fines <2mm	≤10				102		
													Low Gradient - % subsurface fines <6mm	≤23			Upland Erosion			
													Low Gradient - Residual Pool Depth (feet)	≥1.0						Implicit
Storm Lake Creek	MT76G002_040	P	P	NA	F	P	F	F					Low Gradient - Pool Frequency (per 1000')	≥12				225	511	
										Low Flow Alterations	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA	NA	NA	NA
										Alteration in stream-side or littoral vegetation covers	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA	NA	NA	NA
										Chlorophyll a	NA	Data collected during 2007/2008 field seasons	NA	NA	NA	NA	NA	NA	NA	NA
Tin Cup Joe Creek	MT76G002_110	N	N	NA	F	N	F	F		Low Flow Alterations	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Water Body Name	Water Body ID	Impaired Beneficial Uses: Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry	Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action	TMDL End Points: Indicator	Threshold Values	Wasteload Allocations: WLA (Tons/ year)	WLA Permitted Facilities (Permit Number)	Load Allocations: LA	(Tons/ Year)	TMDL (Tons/ Year)	MOS
									>2008	Sedimentation/Siltation	Sediment	TMDL	High Gradient - Bankfull width to depth ratio	≤15	0	MTG010151	Roads	22		Implicit
													High Gradient - Entrenchment ratio	1.4-2.2						
													High Gradient - % Surface fines <2mm	≤7						
													High Gradient - % subsurface fines <6mm	≤18			Anthropogenic Bank Erosion	166		Implicit
													High Gradient - Residual Pool Depth (feet)	≥0.8						
													High Gradient - Pool Frequency (per 1000')	≥15						
													Low Gradient - Bankfull width to depth ratio	≥12-≤22	5	MTR000296	Natural Bank Erosion	220		Implicit
													Low Gradient - Entrenchment ratio	≥2.2						
													Low Gradient - % Surface fines <2mm	≤10						
													Low Gradient - % subsurface fines <6mm	≤23			Upland Erosion	1327	1740	Implicit
													Low Gradient - Residual Pool Depth (feet)	≥1.0						
													Low Gradient - Pool Frequency (per 1000')	≥12						
Warm Springs Creek	MT76G005_111	P	P	NA	F	F	F	F	1988	Sedimentation/Siltation	NA	Data review - suggest delisting	NA	NA	NA	NA	NA	NA	NA	NA
										Alteration in stream-side or littoral vegetation covers	NA	Data review - suggest delisting	NA	NA	NA	NA	NA	NA	NA	NA
Warm Springs Creek	MT76G005_112	P	P	NA	F	P	F	F	1988	Sedimentation/Siltation	Sediment	TMDL	High Gradient - Bankfull width to depth ratio	≤15	NA	NA	Roads	22		Implicit
													High Gradient - Entrenchment ratio	1.4-2.2						
													High Gradient - % Surface fines <2mm	≤7						
													High Gradient - % subsurface fines <6mm	≤18			Anthropogenic Bank Erosion	147		Implicit
													High Gradient - Residual Pool Depth (feet)	≥0.8						
													High Gradient - Pool Frequency (per 1000')	≥15						
													Low Gradient - Bankfull width to depth ratio	≥12-≤22			Natural Bank Erosion	15		Implicit
													Low Gradient - Entrenchment ratio	≥2.2						
													Low Gradient - % Surface fines <2mm	≤10						
													Low Gradient - % subsurface fines <6mm	≤23			Upland Erosion	538	722	Implicit
													Low Gradient - Residual Pool Depth (feet)	≥1.0						
													Low Gradient - Pool Frequency (per 1000')	≥12						
										Low Flow Alterations	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
										Alteration in stream-side or littoral vegetation covers	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA	NA	NA	NA
										Physical Substrate Habitat Alterations	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA	NA	NA	NA
Warm Springs Creek	MT76G002_011	P	P	NA	X	F	F	F		Physical Substrate Habitat Alterations	NA	Data collected during 2007/2008 field seasons	NA	NA	NA	NA	NA	NA	NA	NA
Warm Springs Creek	MT76G002_012	N	N	NA	N	P	F	F	1996	Arsenic	Arsenic	TMDL	Human health standard (ug/L)	10	Precip<0.86" : WLA=0 >=0.86: WLA varies with precip Intent is to meet permit requiremts	AFFCO: MTR000068	Historical mining Naturally occurring **Total**	3.553 1.523 5.076	5.076	Implicit
									1996	Copper	Copper	TMDL	Chronic aquatic life (ug/L) at hardness = 130 mg/L $CaCO_3$	11.67	Precip<0.86" : WLA=0 >=0.86: WLA varies with precip Intent is to	AFFCO: MTR000068	Historical mining Naturally occurring **Total**	5.416 0.508 5.924	5.924	Implicit

Water Body Name	Water Body ID	Impaired Beneficial Uses: Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry	Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action	TMDL End Points: Indicator	Threshold Values	Wasteload Allocations: WLA (Tons/ year)	WLA Permitted Facilities (Permit Number)	Load Allocations: LA	(Tons/ Year)	TMDL (Tons/ Year)	MOS
															meet permit requiremts					
									1996	Lead	Lead	TMDL	Chronic aquatic life (ug/L) at hardness = 130 mg/L $CaCO_3$	4.44	Precip<0.86" : WLA=0 >=0.86: WLA varies with precip Intent is to meet permit requiremts	AFFCO: MTR000068	Historical mining Naturally occurring **Total**	2.000 0.254 2.254	2.254	Implicit
									>2008	Cadmium	Cadmium	TMDL	Chronic aquatic life (ug/L) at hardness = 130 mg/L $CaCO_3$	0.33	Precip<0.86" : WLA=0 >=0.86: WLA varies with precip Intent is to meet permit requiremts	AFFCO: MTR000068	Historical mining Naturally occurring **Total**	0.127 0.041 0.168	0.168	Implicit
									>2008	Iron	Iron	TMDL	Chronic aquatic life standard (ug/L)	1000	Precip<0.86" : WLA=0 >=0.86: WLA varies with precip Intent is to meet permit requiremts	AFFCO: MTR000068	Historical mining Naturally occurring **Total**	441.612 65.988 507.600	507.600	Implicit
									>2008	Zinc	Zinc	TMDL	Chronic aquatic life (ug/L) at hardness = 130 mg/L $CaCO_3$	149.64	Precip<0.86" : WLA=0 >=0.86: WLA varies with precip Intent is to meet permit requiremts	AFFCO: MTR000068	Historical mining Naturally occurring **Total**	70.881 5.076 75.957	75.957	Implicit
										Low Flow Alterations	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
										Alteration in stream-side or littoral vegetation covers	NA	Data collected during 2007/2008 field seasons	NA	NA	NA	NA	NA	NA	NA	NA
										Physical Substrate Habitat Alterations	NA	Data collected during 2007/2008 field seasons	NA	NA	NA	NA	NA	NA	NA	NA
Willow Creek	MT76G002_061	N	N	NA	N	P	F	F	2006	Arsenic	Arsenic	TMDL	Human health standard (ug/L)	10	NA	NA	Naturally occurring Historical mining **Total**	1.588 3.704 5.292	5.292	Implicit
									2006	Cadmium	Cadmium	TMDL	Chronic aquatic life (ug/L) at hardness = 31 mg/L $CaCO_3$	0.11	NA	NA	Naturally occurring Historical mining **Total**	0.0529 0.0053 0.058	0.058	Implicit
									2006	Copper	Copper	TMDL	Chronic aquatic life (ug/L) at hardness = 31 mg/L $CaCO_3$	3.43	NA	NA	Naturally occurring Historical mining **Total**	0.529 1.288 1.815	1.815	Implicit
									2006	Lead	Lead	TMDL	Chronic aquatic life (ug/L) at hardness = 31 mg/L $CaCO_3$	0.72	NA	NA	Naturally	0.265	0.281	Implicit

Water Body Name	Water Body ID	Impaired Beneficial Uses: Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry	Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action	TMDL End Points: Indicator	Threshold Values	Wasteload Allocations: WLA (Tons/ year)	WLA Permitted Facilities (Permit Number)	Load Allocations: LA	(Tons/ Year)	TMDL (Tons/ Year)	MOS
																	occurring Historical mining **Total**	0.116 0.381		
									>2008	Iron	Iron	TMDL	Chronic aquatic life standard (ug/L)	1000	NA	NA	Naturally occurring Historical mining **Total**	5.292 523.908 529.200	529.200	Implicit
									>2008	Zinc	Zinc	TMDL	Chronic aquatic life (ug/L) at hardness = 31 mg/L $CaCO_3$	44.42	NA	NA	Naturally occurring Historical mining **Total**	5.292 18.215 23.507	23.507	Implicit
									2006	Phosphorus (Total)	NA	Data collected during 2007/2008 field seasons	NA	NA	NA	NA	NA	NA	NA	NA
									1988	Sedimentation/Siltation	Sediment	TMDL	High Gradient - Bankfull width to depth ratio High Gradient - Entrenchment ratio High Gradient - % Surface fines <2mm High Gradient - % subsurface fines <6mm High Gradient - Residual Pool Depth (feet) High Gradient - Pool Frequency (per 1000') Low Gradient - Bankfull width to depth ratio Low Gradient - Entrenchment ratio Low Gradient - % Surface fines <2mm Low Gradient - % subsurface fines <6mm Low Gradient - Residual Pool Depth (feet) Low Gradient - Pool Frequency (per 1000')	<15 1.4-2.2 ≤7 ≤18 ≥0.8 ≥15 ≥12-≤22 ≥2.2 ≤10 ≤23 ≥1.0 ≥12	NA	NA	Roads Anthropogenic Bank Erosion Natural Bank Erosion Upland Erosion	11 43 95 197	346	Implicit Implicit Implicit Implicit
										Alteration in stream-side or littoral vegetation covers	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA	NA	NA	NA
Willow Creek	MT76G002_062	N	N	NA	N	F	F	F	2000	Arsenic	Arsenic	TMDL	Human health standard (ug/L)	10	NA	NA	Naturally occurring Historical mining **Total**	1.202 2.805 4.007	4.007	Implicit
									2000	Cadmium	Cadmium	TMDL	Chronic aquatic life (ug/L) at hardness = 83 mg/L $CaCO_3$	0.27	NA	NA	Naturally occurring Historical mining **Total**	0.040 0.056 0.096	0.096	Implicit
									2000	Copper	Copper	TMDL	Chronic aquatic life (ug/L) at hardness = 83 mg/L $CaCO_3$	7.96	NA	NA	Naturally occurring Historical mining **Total**	0.401 2.789 3.190	3.190	Implicit
									2000	Lead	Lead	TMDL	Chronic aquatic life (ug/L) at hardness = 83 mg/L $CaCO_3$	2.51	NA	NA	Naturally occurring Historical mining **Total**	0.200 0.805 1.006	1.006	Implicit
									>2008	Iron	Iron	TMDL	Chronic aquatic life standard (ug/L)	1000	NA	NA	Naturally occurring Historical mining **Total**	4.007 396.727 400.734	400.734	Implicit
									>2008	Zinc	Zinc	TMDL	Chronic aquatic life (ug/L) at hardness = 83 mg/L $CaCO_3$	102.32	NA	NA	Naturally	4.007	41.003	Implicit

Water Body Name	Water Body ID	Impaired Beneficial Uses: Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry	Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action	TMDL End Points: Indicator	Threshold Values	Wasteload Allocations: WLA (Tons/ year)	WLA Permitted Facilities (Permit Number)	Load Allocations: LA	(Tons/ Year)	TMDL (Tons/ Year)	MOS
																	occurring Historical mining **Total**	36.996 41.003		
									>2008	Sedimentation/Siltation	Sediment	TMDL	High Gradient - Bankfull width to depth ratio	<15	NA	NA	Roads	22	386	Implicit
													High Gradient - Entrenchment ratio	1.4-2.2						
													High Gradient - % Surface fines <2mm	≤7						
													High Gradient - % subsurface fines <6mm	≤18			Anthropogenic Bank Erosion	200		Implicit
													High Gradient - Residual Pool Depth (feet)	≥0.8						
													High Gradient - Pool Frequency (per 1000')	≥15						
													Low Gradient - Bankfull width to depth ratio	≥12-≤22			Natural Bank Erosion	5		Implicit
													Low Gradient - Entrenchment ratio	≥2.2						
													Low Gradient - % Surface fines <2mm	≤10						
													Low Gradient - % subsurface fines <6mm	≤23			Upland Erosion	159		Implicit
													Low Gradient - Residual Pool Depth (feet)	≥1.0						
													Low Gradient - Pool Frequency (per 1000')	≥12						
										Low Flow Alterations	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
										Alteration in stream-side or littoral vegetation covers	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA	NA	NA	NA

1 - The waterbody name as reported in the Integrated Report
2 - The Montana waterbody ID number
3 - 9 - Beneficial use support status - F= Full Support; P= Partial Support; N= Not Supported; T= Threatened; X= Not Assessed (Insufficient Credible Data)
10 - The year the waterbody/pollutant combination was first listed
11 - The cause of impairment (as reported in the Integrated Report)
12 - Literally, the specific pollutant for which the TMDL was prepared
13 - TMDL = a TMDL was prepared; Addressed by X TMDLs = no TMDL was prepared, but the listed cause of impairment will be addressed by X TMDL; No-Action = no official action was taken
14 - The targets (just list the "primary indicators", not secondary and supplemental)
15 - Insert a single threshold value. If the values vary by Rosgen Type, etc., then just indicate that is the case
16 - Insert the total wasteload allocation in consistent units (your choice - ideally daily). If there is more than one WLA, report them all and total them.
17 - Insert the Discharger name and Permit ID number
18 - Insert an identifying name for each of the individual load allocations and a total
19 - Insert the individual and total load allocations in consistent units (your choice - ideally daily)
20 - Insert the total maximum daily load in consistent units (your choice - ideally daily)
21 - Insert the MOS. If implicit indicate "implicit". If explicit insert the value in consistent units.

ENCLOSURE 2

EPA REGION VIII TMDL REVIEW

TMDL Document Info:

Document Name:	**Upper Clark Fork River Tributaries Sediment, Metals, and Temperature TMDLs and Framework for Water Quality Restoration**
Submitted by:	**Montana Department of Environmental Quality**
Date Received:	**December 31, 2009**
Review Date:	**February 12, 2010**
Reviewer:	**Jason Gildea**
Rough Draft / Public Notice / Final Draft?	**Final**
Notes:	

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

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

Approval Notes to 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 minimum submission requirements and TMDL elements identified in the following 8 sections:

1. Problem Description
   - 1.1. TMDL Document Submittal Letter
   - 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 describe the rationale that EPA Region 8 staff uses when reviewing TMDL documents. Also included in each section is a list of EPA's minimum submission requirements 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 the minimum submission requirements 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 template is intended to ensure compliance with the Clean Water Act and that the reviewed documents are technically sound and the conclusions are technically defensible.

1.0 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 Letter

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

Minimum Submission Requirements.

☒ A TMDL submittal letter should be included with each TMDL document submitted to EPA requesting a formal review.

☒ The submittal letter should specify whether the TMDL document is being submitted for initial review and comments, public review and comments, or final review and approval.

☒ 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

Summary and Comments: This document was submitted to EPA for review on December 31, 2009. An adequate cover letter was included.

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.

Minimum Submission Requirements:

☒ 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 and Comments: The waterbody/pollutant combinations addressed in the Upper Clark Fork TMDL document are summarized in Table 1 (appended to the end of this document) and are clearly described in the subject document. The number of TMDLs developed and the pollutants for which they were developed are summarized below:

Upper Clark Fork TMDL Count

Number of TMDLs:	78
Number of Waterbody/Pollutant Combinations addressed by TMDLs:	79
Number of Sediment TMDLs:	13
Number of Metals TMDLs:	64
Number of Temperature TMDLs:	1

The waterbodies addressed by the sediment, temperature, and metals TMDLS are listed in Tables 2, 3, and 4, respectively (these tables are appended to the end of this document). It should be noted that the sediment TMDL for Hoover Creek (MT76G005_081) addresses two listed waterbody-pollutant combinations (WBPCs) (sediment/siltation and turbidity).

The waterbody segments are not referenced to the NHD within the subject document. However, MTDEQ's internal databases do link between their waterbody ID and NHD.

At this time, no TMDLs were completed for the main stem Clark Fork River. TMDLs were also not completed for 14 WBPCs because of either lack of sufficient credible data or the segments are recommended for reassessment – these segments are also summarized in Table 1. EPA assumes that these WBPCs will be addressed at a later point in time.

During the TMDL process, DEQ identified 34 new WBPCs that were impaired because of metals and/or sediment – denoted as a cycle first listed of ">2008" in Table 1. These WBPCs do not currently appear on any 303(d) list. TMDLs were completed for all 34 WBPCs.

The TMDL document addresses 28 WBPCs that originally appeared on Montana's 1996 303(d) list and fall under the Court Order. The remaining 51 WBPCs were listed post 1996 and are not subject to the Court Order.

2.0 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).

Minimum Submission Requirements:

☒ 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 significant 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, after the completion of 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 and Comments:

The Upper Clark Fork TMDL document includes a description of all applicable water quality standards associated with sediment, temperature, and metals (i.e., arsenic, cadmium, copper, and iron) and addresses whether or not the criteria are being attained, not attained, or not evaluated. Standards are discussed in Section 3.3.

3.0 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, embeddeness, stream morphology, up-slope conditions and a measure of biota).

Minimum Submission Requirements:

☒ 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 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 and Comments:

Temperature Targets

Temperature targets are described in Section 6.6. The temperature standard was directly applied as a target, and evaluated using the QUAL2K model. Using the model and numeric temperature standard, numeric targets were also developed for the sources that contributed most to the cause of impairment. These include riparian shade, width to depth ratio, irrigation water management, and stream inflows.

Sediment

Sediment targets are presented in Section 5.4 of the Upper Clark Fork TMDL document, and the rationale behind the targets is presented in Appendix B. A suite of targets have been established to represent Montana's narrative sediment standards. Streams were stratified by high and low gradient reaches, and targets were developed for each category based on a reference streams. The targets include width/depth ratio, entrenchment ratio, pebble count < 2mm, pebble count < 6mm, residual pool depth, and pool frequency.

Metals

Surface water quality standards for metals were directly applied as water quality targets (Section 7.4).

4.0 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 significant source (or source category) when the relative load contribution from each source has been estimated. Therefore, the pollutant load from each significant source (or source category) should be identified and quantified to the maximum practical extent. 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 can be employed so long as the approach is clearly defined in the document.

Minimum Submission Requirements:

☒ The TMDL should include an identification of all potentially significant 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 all significant anthropogenic sources of the pollutant of concern have been identified, characterized, and properly 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 and Comments:

Temperature

Assessment of thermal conditions of Peterson Creek consisted of:

- Analysis of temperature monitoring data collected by DEQ and MFWP from 2007-2008.
- Assessment of shade from aerial photography and field measurements.
- Flow monitoring and assessment.
- Temperature modeling using QUAL2K (Section 6.4 and Appendix G).

Temperature source assessment is presented in Section 6.4. The following sources were considered: shade and flow alterations.

Sediment

Potentially significant sediment sources considered in the Upper Clark Fork TPA include upland erosion, stream bank erosion, and erosion from roads. Hill slope erosion was quantified using SWAT in combination with a post processing methodology where sediment delivery was run through riparian buffers (determined from an aerial assessment) and an assumed filtering capacity.

Stream bank erosion was quantified through direct measurements on selected streams. The measurements and loading estimates from the selected streams were then extrapolated to all streams. Appendix I provides further details.

Sediment loading from roads was derived from measured data that were then applied to all known road crossings in the watersheds.

Metals

The metals source assessment is presented in Section 7.3. Metals source assessment consisted of a review of the available GIS layers of active and inactive mines, surface water permitting records for discharge permits located in the planning area, synoptic stream sampling during both high and low flow events, and a field assessment of channel conditions. Sources of metals included natural background, atmospheric deposition, abandoned mines, historic deposits from mining/smelter operations, inter-basin transfers, and permitted point sources.

4.1 TMDL Technical Analysis

TMDL determinations should be supported by a robust 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:

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

Where:

TMDL = Total Pollutant Loading Capacity of the waterbody

LAs = Pollutant Load Allocations

WLAs = Pollutant Wasteload Allocations

MOS = The portion of the Load Capacity allocated to the Margin of safety.

Minimum Submission Requirements:

- ☒ 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:

(1) the spatial extent of the watershed in which the impaired waterbody is located and the spatial extent of the TMDL technical analysis;
(2) the distribution of land use in the watershed (e.g., urban, forested, agriculture);
(3) 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…;
(4) 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);
(5) 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 and Comments:

Sediment

An adequate technical analysis has been completed. Summary information is presented in the main body of the document and supporting analyses/data are presented in appendices.

Temperature

An adequate technical analysis has been performed. The QUAL2K model was applied to evaluate a variety of scenarios in consideration of the sources that exist, the naturally occurring condition, and the applicable water quality standards. Further, uncertainties are acknowledged and an adaptive management strategy is provided in Section 8.3.4 to address them.

Metals

An adequate technical analysis for metals has been performed. The TMDL is presented as the standard times flow. TMDLs are presented in the document for storm event, high, and low flow events.

4.1.1 *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…).

Minimum Submission Requirements:

☒ 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 and Comments: The data and technical analyses for all three pollutants addressed are summarized in the main body of the document and presented in the appendices.

4.1.2 *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.

Minimum Submission Requirements:

☒ EPA regulations require that a TMDL include WLAs for all significant and/or NPDES permitted point sources of the pollutant. TMDLs must identify the portion of the loading capacity allocated to individual existing and/or 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 ☐ No-action

Summary and Comments:

Metals

Abandoned mines are prevalent throughout the Upper Clark Fork TPA, and where data are available, individual WLAs have been given to specific abandoned mines. Loads from other abandoned mines were then assigned to a composite WLA. WLAs are presented for high and low flow conditions.

Temperature

There are no point sources in the temperature impaired segments.

Sediment

There are only two sediment point sources, and both are in the Tin Cup Joe Creek watershed – Montana State Prison Ranch (CAFO) and Sun Mountain Lumber Company (industrial stormwater). Wasteloads from both facilities are a very small percentage of the total load (<1%), and therefore WLAs were set based on the respective permits.

4.1.3 *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.

Minimum Submission Requirements:

☒ 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 all significant 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 and Comments:

Sediment

Load allocations are provided for each of the significant anthropogenic sources and natural background. They are presented as % reductions and as daily loads in tons per day (daily loads are presented in Appendix C).

Temperature

The temperature TMDLs have been allocated to the significant sources of thermal loading and/or surrogates that affect thermal loading.

Metals

An adequate analysis has been provided. DEQ presents load allocations as a combination of both natural background loads and anthropogenic nonpoint sources.

4.1.4 *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).

Minimum Submission Requirements:

☒ 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 and Comments:

Sediment

The document provides an implicit margin of safety through conservative assumptions and the use of an adaptive management strategy.

Temperature

A margin of safety has been provided by focusing the analysis on, and establishing allocations based on the warmest period of the year. Additionally, an adaptive management strategy is provided to address uncertainties.

Metals

The document provides an implicit margin of safety through conservative assumptions and the use of an adaptive management strategy.

4.1.5 *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.

Minimum Submission Requirements:

☒ 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 and Comments:

Sediment

The annual approach is appropriate for the situation, and, the daily approach that is presented in Section Appendix C addresses natural variations that occur throughout the year.

Temperature

Seasonality was addressed conservatively by focusing the analysis on, and establishing allocations based on the warmest period of the year

Metals

Seasonality for metals is addressed as follows:

- Metals concentrations and loading conditions are presented for high flow, low flow, and storm event conditions.
- Metals TMDLs incorporate stream flow as part of the TMDL equation.
- Metals targets apply year round, with monitoring criteria for target attainment developed to address seasonal water quality extremes associated with loading and hardness variations.

5.0 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.

Minimum Submission Requirements:

☒ 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 and Comments: A conceptual monitoring strategy is provided in Section 10.0.

6.0 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 <u>is not</u> 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.

Minimum Submission Requirements:

☒ 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 ☐ No-action

Summary and Comments: There are both point sources and nonpoint sources in the Tin Cup Joe Creek watershed (requiring both a WLA and LA). However, the two point sources are small (a small CAFO and an industrial facility with a stormwater runoff permit) and only discharge during storm events. Also, both facilities have BMPs in place to capture stormwater, and it is unlikely that a stormwater runoff event (0 to 25 year event) will ever reach a perennial stream. The cumulative sediment loads from these two facilities are less than 1% of the total load to Tin Cup Joe Creek. Because of this, a demonstration of reasonable assurance is not required. Regardless of this fact, a conceptual restoration strategy is provided in Section 9.0.

7.0 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.

Minimum Submission Requirements:

☒ 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 and Comments:

<u>Sediment</u>

The sediment TMDLs are presented as tons/day in Appendix C.

<u>Temperature</u>

Daily temperature loadings are presented in Appendix C.

<u>Metals</u>

Flow based TMDLs are presented for each of the metals waterbody-pollutant combinations, which addresses daily loading.

8.0 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.

Minimum Submission Requirements:

☒ 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 and Comments: The public participation process is summarized in Section 11.0.

Table 1. Stream Segments in the Upper Clark Fork TMDL Planning Area that Appear On Montana's 2006 303(D) List of Impaired Waters, their Associated Levels of Beneficial Use-Support, and Causes of Impairment.

Water Body Name	Water Body ID	Impaired Beneficial Uses							Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action
		Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry				
Antelope Creek	MT76G002_140	X	X	NA	F	F	F	P		Low Flow Alterations	NA	No Action
									>2008	Sedimentation /Siltation	Sediment	TMDL
Beef-straight Creek	MT76G003_031	N	N	NA	X	X	X	X	2004	Cyanide	Cyanide	TMDL
Brock Creek	MT76G005_100	X	X	NA	F	P	F	F	1988	Sedimentation /Siltation	Sediment	TMDL
Cable Creek	MT76G002_030	P	P	NA	F	P	F	F	1988	Sedimentation/ Siltation	Sediment	TMDL
										Other Anthropogenic substrate alterations	NA	Addressed by sediment TMDL
										Physical Substrate Habitat Alterations	NA	Addressed by sediment TMDL
										Chlorophyll a	NA	Data collected during 2007/2008 field seasons
Clark Fork River	MT76G001_010	P	P	NA	N	P	F	F		Alteration in stream-side or littoral vegetation covers	NA	No Action
									1996	Arsenic	NA	No Action
									1996	Copper	NA	No Action
									1996	Lead	NA	No Action
										Low Flow Alterations	NA	No Action
									1996	Nitrogen (Total)	NA	No Action
									1996	Phosphorus (Total)	NA	No Action
										Physical Substrate Habitat Alterations	NA	No Action
									1996	Sedimentation/Siltation	NA	No Action
									1996	Zinc	NA	No Action
Clark Fork River	MT76G001_030	N	N	NA	NA	P	F	F		Alteration in stream-side or littoral vegetation covers	NA	No Action
									1990	Copper	NA	No Action
									1990	Lead	NA	No Action
										Low Flow Alterations	NA	No Action
									1990	Nitrogen (Total)	NA	No Action
									1990	Phosphorus (Total)	NA	No Action
										Physical Substrate Habitat Alterations	NA	No Action
									1996	Sedimentation/Siltation	NA	No Action
									1990	Zinc	NA	No Action
Clark Fork River	MT76G001_040	P	P	NA	NA	P	F	F		Alteration in stream-side or littoral vegetation covers	NA	No Action
									1990	Arsenic	NA	No Action

Water Body Name	Water Body ID	Impaired Beneficial Uses							Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action
		Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry				
									1990	Cadmium	NA	No Action
									1990	Copper	NA	No Action
									1990	Lead	NA	No Action
										Low Flow Alterations	NA	No Action
									1990	Nitrogen (Total)	NA	No Action
									1990	Phosphorus (Total)	NA	No Action
									1996	Sedimentation/Siltation	NA	No Action
Dempsey Creek	MT76G002_100	P	P	NA	F	P	F	F	1988	Sedimentation/Siltation	Sediment	TMDL
									2000	Nitrate/Nitrite (Nitrite+Nitrate as N)	NA	Data collected during 2007/2008 field seasons
										Low Flow Alterations	NA	NA
										Alteration in stream-side or littoral vegetation covers	NA	Addressed by sediment TMDL
Dunkleberg Creek	MT76G005_071	N	N	NA	F	F	N	P	1990	Cadmium	Cadmium	TMDL
									1990	Lead	Lead	TMDL
									1990	Zinc	Zinc	TMDL
									>2008	Arsenic	Arsenic	TMDL
									>2008	Copper	Copper	TMDL
									>2008	Iron	Iron	TMDL
										Alteration in stream-side or littoral vegetation covers	NA	NA
Dunkleberg Creek	MT76G005_072	P	P	NA	F	F	F	F	1990	Lead	Lead	TMDL
									>2008	Arsenic	Arsenic	TMDL
									>2008	Cadmium	Cadmium	TMDL
									>2008	Copper	Copper	TMDL
									>2008	Iron	Iron	TMDL
									>2008	Zinc	Zinc	TMDL
									1990	Nitrogen (Total)	NA	Data collected during 2007/2008 field seasons
										Alteration in stream-side or littoral vegetation covers	NA	NA
German Gulch	MT76G003_030	N	N	NA	F	F	F	F	2002	Selenium	Selenium	TMDL
									<2008	Arsenic	Arsenic	TMDL
									<2008	Cyanide	Cyanide	TMDL
Gold Creek	MT76G005_091	N	N	NA	F	F	N	F	2000	Lead	Lead	TMDL
										Alteration in stream-side or littoral vegetation covers	NA	NA
Gold Creek	MT76G005_092	P	P	NA	F	F	F	P	>2008	Iron	Iron	TMDL
									>2008	Lead	Lead	TMDL
									~~1990~~	~~Nitrogen (Total)~~	~~NA~~	~~Data collected during 2007/2008~~

Water Body Name	Water Body ID	Impaired Beneficial Uses							Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action
		Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry				
												field seasons
										Low Flow Alterations	NA	NA
Hoover Creek	MT76G005_081	X	X	NA	X	P	X	X	2000	Turbidity	NA	Addressed by sediment TMDL
									>2008	Sedimentation/Siltation	Sediment	TMDL
Hoover Creek	MT76G005_082	N	N	NA	X	N	X	X	1988	Sedimentation/Siltation	Sediment	TMDL
									1990	Nitrogen (Total)	NA	Data collected during 2007/2008 field seasons
										Low Flow Alterations	NA	NA
										Physical Substrate Habitat Alterations	NA	Addressed by sediment TMDL
Lost Creek	MT76G002_072	N	N	NA	F	F	N	P	2000	Arsenic	Arsenic	TMDL
									>2008	Copper	Copper	TMDL
									>2008	Lead	Lead	TMDL
									1990	Nitrate/Nitrite (Nitrite+Nitrate as N)	NA	Data collected during 2007/2008 field seasons
										Low Flow Alterations	NA	No Action
									2000	Iron	NA	Investigated - No Action
									2000	Manganese	NA	Investigated - No Action
									1996	Sulfates	NA	Investigated - No Action
										Alteration in stream-side or littoral vegetation covers	NA	NA
										Physical Substrate Habitat Alterations	NA	NA
Mill Creek	MT76G002_051	N	N	NA	F	F	N	P	1988	Lead	Lead	TMDL
									1988	Zinc	Zinc	TMDL
									1988	Arsenic	Arsenic	TMDL
									1988	Copper	Copper	TMDL
									1988	Chromium (Total)	NA	Investigated - No Action
									1988	Cadmium	Cadmium	TMDL
Mill Creek	MT76G002_052	N	N	NA	P	F	N	P	1988	Aluminum	NA	Investigated - No Action
									1988	Arsenic	Arsenic	TMDL
									1988	Cadmium	Cadmium	TMDL
									1988	Copper	Copper	TMDL
									1988	Iron	Iron	TMDL
									1988	Lead	Lead	TMDL
									1988	Zinc	Zinc	TMDL
										Low Flow Alterations	NA	No Action
										Alteration in stream-side or littoral vegetation covers	NA	No Action
Mill-Willow	MT76G002_120	P	P	NA	F	F	N	F	1996	Arsenic	Arsenic	TMDL

Water Body Name	Water Body ID	Impaired Beneficial Uses							Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action
		Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry				
Bypass									1996	Copper	Copper	TMDL
									1996	Lead	Lead	TMDL
									>2008	Cadmium	Cadmium	TMDL
									>2008	Zinc	Zinc	TMDL
Modesty Creek	MT76G002_080	X	X	NA	F	F	N	P	2000	Arsenic	Arsenic	TMDL
									>2008	Cadmium	Cadmium	TMDL
									>2008	Copper	Copper	TMDL
									>2008	Lead	Lead	TMDL
										Low Flow Alterations	NA	No Action
Peterson Creek	MT76G002_131	N	N	NA	F	F	F	P	1988	Sedimentation/Siltation	Sediment	TMDL
									2006	Copper	Copper	TMDL
									>2008	Iron	Iron	TMDL
									>2008	Lead	Lead	TMDL
									2006	Nitrogen (Total)	NA	Data collected during 2007/2008 field seasons
									2006	Phosphorus (Total)	NA	Data collected during 2007/2008 field seasons
									2006	Total Kjehldahl Nitrogen (TKN)	NA	Data collected during 2007/2008 field seasons
										Low Flow Alterations	NA	No Action
										Alteration in stream-side or littoral vegetation covers	NA	Addressed by sediment TMDL
Peterson Creek	MT76G002_132	N	N	NA	X	X	X	N	2000	Temperature	Temperature	TMDL
									>2008	Iron	Iron	TMDL
										Low Flow Alterations	NA	No Action
										Alteration in stream-side or littoral vegetation covers	NA	Addressed by sediment TMDL
										Physical Substrate Habitat Alterations	NA	Addressed by sediment TMDL
									>2008	Sedimentation/Siltation	Sediment	TMDL
Racetrack Creek	MT76G002_090	P	P	NA	F	P	F	F		Low Flow Alterations	NA	NA
										Alteration in stream-side or littoral vegetation covers	NA	NA
Storm Lake Creek	MT76G002_040	P	P	NA	F	P	F	F	2006	Sedimentation/Siltation	Sediment	TMDL
										Low Flow Alterations	NA	Addressed by sediment TMDL
										Alteration in stream-side or littoral vegetation covers	NA	Addressed by sediment TMDL
										Chlorophyll a	NA	Data collected during 2007/2008 field seasons
Tin Cup Joe Creek	MT76G002_110	N	N	NA	F	N	F	F		Low Flow Alterations	NA	NA
									>2008	Sedimentation/Siltation	Sediment	TMDL

Water Body Name	Water Body ID	Impaired Beneficial Uses							Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action
		Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry				
Warm Springs Creek	MT76G005_111	P	P	NA	F	F	F	F	1988	Sedimentation/Siltation	NA	Data review - suggest delisting
										Alteration in stream-side or littoral vegetation covers	NA	Data review - suggest delisting
Warm Springs Creek	MT76G005_112	P	P	NA	F	P	F	F	1988	Sedimentation/Siltation	Sediment	TMDL
										Low Flow Alterations	NA	NA
										Alteration in stream-side or littoral vegetation covers	NA	Addressed by sediment TMDL
										Physical Substrate Habitat Alterations	NA	Addressed by sediment TMDL
Warm Springs Creek	MT76G002_011	P	P	NA	X	F	F	F		Physical Substrate Habitat Alterations	NA	Data collected during 2007/2008 field seasons
Warm Springs Creek	MT76G002_012	N	N	NA	N	P	F	F	1996	Arsenic	Arsenic	TMDL
									1996	Copper	Copper	TMDL
									1996	Lead	Lead	TMDL
									>2008	Cadmium	Cadmium	TMDL
									>2008	Iron	Iron	TMDL
									>2008	Zinc	Zinc	TMDL
										Low Flow Alterations	NA	NA
										Alteration in stream-side or littoral vegetation covers	NA	Data collected during 2007/2008 field seasons
										Physical Substrate Habitat Alterations	NA	Data collected during 2007/2008 field seasons
Willow Creek	MT76G002_061	N	N	NA	N	P	F	F	2006	Arsenic	Arsenic	TMDL
									2006	Cadmium	Cadmium	TMDL
									2006	Copper	Copper	TMDL
									2006	Lead	Lead	TMDL
									>2008	Iron	Iron	TMDL
									>2008	Zinc	Zinc	TMDL
									2006	Phosphorus (Total)	NA	Data collected during 2007/2008 field seasons
									1988	Sedimentation/Siltation	Sediment	TMDL
										Alteration in stream-side or littoral vegetation covers	NA	Addressed by sediment TMDL
Willow Creek	MT76G002_062	N	N	NA	N	F	F	F	2000	Arsenic	Arsenic	TMDL
									2000	Cadmium	Cadmium	TMDL
									2000	Copper	Copper	TMDL
									2000	Lead	Lead	TMDL
									>2008	Iron	Iron	TMDL
									>2008	Zinc	Zinc	TMDL
									>2008	Sedimentation/Siltation	Sediment	TMDL

Water Body Name	Water Body ID	Impaired Beneficial Uses: Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry	Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action
										Low Flow Alterations	NA	NA
										Alteration in stream-side or littoral vegetation covers	NA	Addressed by sediment TMDL

Legend: F= Full Support; P= Partial Support; N= Not Supported; T= Threatened; X= Not Assessed (Insufficient Credible Data)

Table 2. Waterbody segments addressed by sediment TMDLs.

Waterbody	Segment ID
Antelope Creek, headwaters to mouth (Gardner Gulch)	MT76G003_031
Brock Creek, headwaters to mouth (Clark Fork River)	MT76G005_100
Cable Creek, the headwaters to the mouth (Warm Springs Creek)	MT76G002_030
Dempsey Creek, the national forest boundary to the mouth (Clark Fork River)	MT76G002_100
Hoover Creek, headwaters to Miller Lake	MT76G005_081
Hoover Creek, Miller Lake to mouth (Clark Fork)	MT76G005_082
Peterson Creek, headwaters to Jack Creek	MT76G002_131
Peterson Creek, Jack Creek to the mouth (Clark Fork River)	MT76G002_132
Storm Lake Creek, headwaters to mouth (Warm Springs Creek)	MT76G002_040
Tin Cup Joe Creek, Tin Cup Lake to mouth (Clark Fork River)	MT76G002_110
Warm Springs Creek, (Near Phosphate) from line between R9W and R10W to mouth (Clark Fork River)	MT76G005_112
Willow Creek, headwaters to T4N, R10W, Sec30 (DABC)	MT76G002_061
Willow Creek, T4N, R10W, Sec30 (DABC) to mouth (Silver Bow Creek)	MT76G002_062

Table 3. Waterbody segments addressed by temperature TMDLs.

Waterbody Name	Segment ID
Peterson Creek, Jack Creek to the mouth (Clark Fork River)	MT76G002_132

Table 4. Waterbody segments addressed by metals TMDLs.

Waterbody Name	Segment ID
Beefstraight Creek, Minnesota Gulch to mouth (German Gulch)	MT76G003_031
Dunkleberg Creek, headwaters SW corner Sec 2, T9N, R12W	MT76G005_071
Dunkleberg Creek, SW corner Sec 2, T9N, R12W to mouth (Clark Fork River)	MT76G005_072
German Gulch, headwaters to mouth (Silver Bow Creek)	MT76G003_030
Gold Creek, headwaters to the Natl. Forest boundary	MT76G005_091
Gold Creek,,the forest boundary to the mouth (Clark Fork River)	MT76G005_092
Lost Creek, the south State Park boundary to the mouth (Clark Fork River)	MT76G002_072
Mill Creek, headwaters to the section line between Sec 27 & 28, T4N, R11W	MT76G002_051
Mill Creek, section line between Sec 27 & 28, T4N, R11W to the mouth (Silver Bow Creek)	MT76G002_052
Mill-Willow Bypass, from Silver Bow Creek to the Clark Fork River	MT76G002_120
Modesty Creek, headwaters to the mouth (Clark Fork River)	MT76G002_080
Peterson Creek, headwaters to Jack Creek	MT76G002_131
Peterson Creek, Jack Creek to the mouth (Clark Fork River)	MT76G002_132
Warm Springs Creek, (*near* Warm Springs), Meyers Dam (T5N, R12W, SEC 25) to mouth (Clark Fork)	MT76G002_012
Willow Creek, headwaters to T4N, R10W, Sec30 (DABC)	MT76G002_061
Willow Creek, T4N, R10W, Sec30 (DABC) to mouth (Silver Bow Creek)	MT76G002_062