UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
1595 WYNKOOP STREET
DENVER, COLORADO 80202
http://www.epa.gov/region8

JUN 30 2009

Ref: 8EPR-EP

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

Re: TMDL Approvals Upper and
North Fork Big Hole TPA

Dear Mr. Mathieus:

We have completed our review of the total maximum daily loads (TMDLs) as submitted by your office for the Upper and North Fork Big Hole TMDL Planning Area (TPA). The TMDLs are included in the document entitled *Upper and North Fork Big Hole River Planning Area TMDLs and Framework Water Quality Restoration Approach* transmitted to us for review and approval on April 1, 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 and North Fork Big Hole 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 he may be reached at (406) 457-5024.

Sincerely,

Bill Murray

for Carol L. Campbell
Assistant Regional Administrator
Office of Ecosystems Protection
and Remediation

Enclosures

cc: Claudia Massman, Attorney
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

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

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

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

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

Enclosure 1 – Upper and North Fork Big Hole TMDL Planning Area Summary

Water Body Name	Water Body ID	Impaired Beneficial Uses							Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for which TMDL prepared	DEQ Action	TMDL End Points		Wasteload Allocations[1]		Load Allocations[1]			TMDL[1,4]	MOS
		Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry					Indicator	Threshold Values[3]	WLA	WLA Permitted Facilities (Permit Number)	Source		Load		
Big Hole River	MT41D001-030	P	P	NA	F	P	F	F	>2008[2]	Sedimentation/Siltation	Sediment	TMDL	Pebble Counts (<6mm in riffles)	≤ 10	NA	NA	Roads		1,664	98,175	Implicit
													Pebble Counts (<2mm in riffles)	≤ 10			Eroding Banks		60,617		
													Fines Grid (<6mm pool tailout	Median ≤ 22			Silviculture		459		
													W/D ratio	75th percentile ≤ 26 Median ≤ 22			Grazing/Hay		25,178		
													Understory shrub cover along the green line	25th percentile ≥ 31 Median ≥ 50			Natural Upland		10,258		
													Pool Frequency (# of Bankfull Widths between pools)	Median ≤ 4.7							
									2000	Temperature	Temperature	TMDL	Montana Temperature Standard for A-1 Streams	< 0.5°F above naturally occuring	NA	NA	Natural Background		4.86*10[11] kilocal/day 65,905 kilocal/sec	4.92*10[11] kilocal/day 66,700 kilocal/second	Implicit
													Canopy Density Over the Big Hole River	25th percentile ≥ 31%, median ≥ 49%. No localized effects.							
													Canopy Density Over the Tributaries in the Valley	25th percentile > 36% median > 64%			Human caused sources (combined allocation)	Hay Production in Riparian Areas	6.68*10[7] kilocal/day 795 kilocal/sec		
													W/D ratio	75th percentile ≤ 26 Median ≤ 22							
													Irrigation Return Flows	65% reduction in warmed irrigaiton water entering stream				Riparian Grazing			
										Alteration in streamside or littoral vegetative covers	NA	Addressed by sediment and temperature TMDLs	NA	NA	NA	NA		NA	NA	NA	NA
										Low flow alteration	NA	Addressed by temperature TMDL	NA	NA	NA	NA	NA		NA	NA	NA
Doolittle Creek	MT41D004-220	P	P	NA	F	P	F	P	1992	Sedimentation/Siltation	Sediment	TMDL	Pebble Counts (<6mm in riffles)	≤ 22	NA	NA	Roads		62	957	Implicit
													Pebble Counts (<2mm in riffles)	≤ 18			Eroding Banks		358		
													Fines Grid (<6mm pool tailout	Median ≤ 80 25th percentile ≤27			Silviculture		0		
													W/D ratio	75th percentile ≤ 20 Median ≤ 14			Grazing/Hay		291		
													Understory shrub cover along the green line	25th percentile ≥ 32 Median ≥ 58			Natural Upland		246		

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		Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry					Indicator	Threshold Value	WLA	WLA Permitted Facilities (Permit Number)	Source		Load		
													Pool Frequency (# of Bankfull Widths between pools)	Median ≤ 8							
										Alteration in streamside or littoral vegetative covers	NA	Addressed by sediment and temperature TMDLs	NA	NA	NA	NA	NA		NA	NA	NA
										Low flow alteration	NA	Addressed by temperature TMDL	NA	NA	NA	NA	NA		NA	NA	NA
Fox Creek	MT41D004-170	P	P	NA	F	F	F	F	>2008	Sedimentation/Siltation	Sediment	TMDL	Pebble Counts (<6mm in riffles)	≤ 22	NA	NA	Roads		21	1,843	Implicit
													Pebble Counts (<2mm in riffles)	≤ 18			Eroding Banks		752		
													Fines Grid (<6mm pool tailout	Median ≤ 80 25th percentile ≤27			Silviculture		0		
													W/D ratio	75th percentile ≤ 20 Median ≤ 14			Grazing/Hay		679		
													Understory shrub cover along the green line	25th percentile ≥ 32 Median ≥ 58			Natural Upland		191		
													Pool Frequency (# of Bankfull Widths between pools)	Median ≤ 8							
									2006	Total Phosphorus	NA	No Action	NA	NA	NA	NA	NA		NA	NA	NA
Francis Creek	MT41D004-200	P	P	NA	F	F	F	F	1990	Sedimentation/Siltation	Sediment	TMDL	Pebble Counts (<6mm in riffles)	≤ 22	NA	NA	Roads		51	1,755	Implicit
													Pebble Counts (<2mm in riffles)	≤ 18			Eroding Banks		1,203		
													Fines Grid (<6mm pool tailout	Median ≤ 80 25th percentile ≤27			Silviculture		0		
													W/D ratio	75th percentile ≤ 20 Median ≤ 14			Grazing/Hay		309		
													Understory shrub cover along the green line	25th percentile ≥ 32 Median ≥ 58			Natural Upland		1,868		
													Pool Frequency (# of Bankfull Widths between pools)	Median ≤ 8							
									2006	Total Nitrogen	Nitrogen	TMDL	Total Nitrogen (mg/L) 20% exceedance rate cap	0.32	NA	NA	Hay/Pasture	Grazing, Hay, Fertilizer, Natural	101	3,045	Implicit
													Chlorophyll a (mg/m²)	150			Shrub and Dry Grassland	Grazing, Natural	593		
																	Forest	Grazing, Natural	1,920		
																	Stream Banks	Grazing, Hay, Natural	408		
																	Developed	Suburban	25		
									2006	Total Phosphorus	Phosphorus	TMDL	Total Phosphorus (mg/L) 20% exceedance rate cap	0.049	NA	NA	Hay/Pasture	Grazing, Hay,	4	557	Implicit

Water Body Name	Water Body ID	Impaired Beneficial Uses							Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for which TMDL prepared	DEQ Action	TMDL End Points		Wasteload Allocations[1]		Load Allocations[1]			TMDL[1,4]	MOS
		Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry					Indicator	Threshold Values[3]	WLA	WLA Permitted Facilities (Permit Number)	Source		Load		
																		Fertilizer, Natural			
																	Shrub and Dry Grassland	Grazing, Natural	124		
																	Forest	Grazing, Natural	256		
																	Stream Banks	Grazing, Hay, Natural	168		
													Chlorophyll a (mg/m^2)	150			Developed	Suburban	5		
										Alteration in streamside or littoral vegetative covers	NA	Addressed by sediment and nutrient TMDLs	NA	NA	NA	NA	NA		NA	NA	NA
Governor Creek	MT41D004-150	N	N	NA	F	P	F	F	>2008[2]	Sedimentation/Siltation	Sediment	TMDL	Pebble Counts (<6mm in riffles)	≤ 22	NA	NA	Roads		232	15,082	Implicit
													Pebble Counts (<2mm in riffles)	≤ 18			Eroding Banks		6,727		
													Fines Grid (<6mm pool tailout	Median ≤ 50 25th percentile ≤27			Silviculture		72		
													W/D ratio	75th percentile ≤ 20 Median ≤ 14			Grazing/Hay		5,157		
													Understory shrub cover along the green line	25th percentile ≥ 32 Median ≥ 58			Natural Upland		894		
													Pool Frequency (# of Bankfull Widths between pools)	Median ≤ 8							
									2000	Copper	NA	Investigated No Action	NA	NA	NA	NA	NA		NA	NA	NA
										Low flow alteration	NA	No Action	NA	NA	NA	NA	NA		NA	NA	NA
										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
Johnson Creek	MT41D004-030	P	P	NA	F	P	F	F	1998	Sedimentation/Siltation	Sediment	TMDL	Pebble Counts (<6mm in riffles)	≤13	NA	NA	Roads		55	2,002	Implicit
													Pebble Counts (<2mm in riffles)	≤ 13			Eroding Banks		840		
													Fines Grid (<6mm pool tailout	Median ≤ 50 25th percentile ≤42			Silviculture		68		
													W/D ratio	75th percentile ≤ 13 Median ≤ 10			Grazing/Hay		316		
													Understory shrub cover along the green line	25th percentile ≥ 58 Median ≥ 59			Natural Upland		723		
													Pool Frequency (# of Bankfull Widths between pools)	Median ≤ 6							
									2008	TKN	NA	No Action	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 prepared	DEQ Action	TMDL End Points		Wasteload Allocations		Load Allocations[1]		TMDL[2,4]	MOS
		Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry					Indicator	Threshold Values[3]	WLA	WLA Permitted Facilities (Permit Number)	Source	Load		
										Alteration in streamside or littoral vegetative covers	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA	NA	NA	NA
										Low flow alteration	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
Joseph Creek	MT41D004-090	P	P	NA	N	F	F	F	1990	Sedimentation/Siltation	Sediment	TMDL	Pebble Counts (<6mm in riffles)	≤13	NA	NA	Unpaved Roads	5	793	Implicit
													Pebble Counts (<2mm in riffles)	≤ 13			Hwy 41 sanding	1		
													Fines Grid (<6mm pool tailout	Median ≤ 80 25th percentile ≤27			Eroding Banks	470		
																	Silviculture	6		
													W/D ratio	75th percentile ≤ 20 Median ≤ 14			Grazing/Hay	82		
													Understory shrub cover along the green line	25th percentile ≥ 32 Median ≥ 58			Natural Upland	234		
													Pool Frequency (# of Bankfull Widths between pools)	Median ≤ 8						
									2002	Copper	NA	Investigated No Action	NA	NA	NA	NA	NA	NA	NA	NA
									2002	Lead	NA	Investigated No Action	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
McVey	MT41D004-210	P	P	NA	F	F	F	F	1992	Sedimentation/Siltation	Sediment	TMDL	Pebble Counts (<6mm in riffles)	≤ 22	NA	NA	Roads	33	1,213	Implicit
													Pebble Counts (<2mm in riffles)	≤ 18			Eroding Banks	870		
													Fines Grid (<6mm pool tailout	Median ≤ 80 25th percentile ≤27			Silviculture	0		
													W/D ratio	75th percentile ≤ 20 Median ≤ 14			Grazing/Hay	210		
													Understory shrub cover along the green line	25th percentile ≥ 32 Median ≥ 58			Natural Upland	100		
													Pool Frequency (# of Bankfull Widths between pools)	Median ≤ 8						
									2008	Total Nitrogen	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									2008	Total Phosphorus	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
										Alteration in streamside or littoral vegetative covers	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA	NA	NA	NA
Miner Creek	MT41D004-140	P	P	NA	X	F	X	F	1990	Sedimentation/Siltation	Sediment	TMDL	Pebble Counts (<6mm in riffles)	≤22	NA	NA	Unpaved Roads	30	3,083	Implicit
													Pebble Counts (<2mm in riffles)	≤ 18			Eroding Banks	1,154		
													Fines Grid (<6mm pool tailout	Median ≤ 50 25th percentile ≤42			Silviculture	0		

Water Body Name	Water Body ID	Impaired Beneficial Uses							Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for which TMDL prepared	DEQ Action	TMDL End Points		Wasteload Allocations[1]		Load Allocations[1]		TMDL[3,4]	MOS
		Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry					Indicator	Threshold Values[1]	WLA	WLA Permitted Facilities (Permit Number)	Source	Load		
													W/D ratio	75th percentile ≤ 13 Median ≤ 10			Grazing/Hay	1,629		
													Understory shrub cover along the green line	25th percentile ≥ 58 Median ≥ 59			Natural Upland	270		
													Pool Frequency (# of Bankfull Widths between pools)	Median ≤ 6						
Mussigbrod Creek	MT41D004-020	N	N	NA	N	P	F	F	>2008 [2]	Sedimentation/Siltation	Sediment	TMDL	Pebble Counts (<6mm in riffles)	≤ 22	NA	NA	Roads	19	1,832	Implicit
													Pebble Counts (<2mm in riffles)	≤ 18			Eroding Banks	857		
													Fines Grid (<6mm pool tailout	Median ≤ 80 25th percentile ≤27			Silviculture	5		
													W/D ratio	75th percentile ≤ 20 Median ≤ 14			Grazing/Hay	331		
													Understory shrub cover along the green line	25th percentile ≥ 32 Median ≥ 58			Natural Upland	820		
													Pool Frequency (# of Bankfull Widths between pools)	Median ≤ 8						
									2000	Lead	NA	Investigated No Action	NA	NA	NA	NA	NA	NA	NA	NA
										Low flow alteration	NA	No Action	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
										Other anthropogenic substrate alterations	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA	NA	NA	NA
										Alteration in streamside or littoral vegetative covers	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA	NA	NA	NA
North Fork Big Hole River	MT41D004-010	P	P	NA	X	P	X	X	1990	Sedimentation/Siltation	Sediment	TMDL	Pebble Counts (<6mm in riffles)	≤12	NA	NA	Roads	405	22,928	Implicit
													Pebble Counts (<2mm in riffles)	≤ 9			Eroding Banks	14,400		
													Fines Grid (<6mm pool tailout	Median ≤ 25 25th percentile ≤11			Silviculture	245		
													W/D ratio	75th percentile ≤ 28 Median ≤ 24			Grazing/Hay	3,377		
													Understory shrub cover along the green line	25th percentile ≥ 36 Median ≥ 43			Natural Upland	4,507		
													Pool Frequency (# of Bankfull Widths between pools)	Median ≤ 8						
										Alteration in streamside or littoral vegetative covers	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA	NA	NA	NA
										Low flow alteration	NA	No Action	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 Addressed by TMDL Project	TMDL Action	TMDL End Points		Wasteload Allocations		Load Allocations		TMDL	MOS
		Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry					Indicator	Threshold Value	WLA	WLA Permitted Facilities (Permit Number)	Source	Load		
Pine Creek	MT41D004-150	P	P	NA	F	P	F	F	>2008	Sedimentation/Siltation	Sediment	TMDL	Pebble Counts (<6mm in riffles)	≤12	NA	NA	Roads	5	523	Implicit
													Pebble Counts (<2mm in riffles)	≤ 9			Eroding Banks	230		
													Fines Grid (<6mm pool tailout	Median ≤ 25 25th percentile ≤11			Silviculture	0		
													W/D ratio	75th percentile ≤ 28 Median ≤ 24			Grazing/Hay	148		
													Understory shrub cover along the green line	25th percentile ≥ 36 Median ≥ 43			Natural Upland	141		
													Pool Frequency (# of Bankfull Widths between pools)	Median ≤ 6						
									2006	Total Phosphorus	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
										Alteration in streamside or littoral vegetative covers	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA	NA	NA	NA
Pintlar Creek	MT41D003-170	P	P	NA	F	P	F	F	2006	Temperature	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
										Habitat Alterations	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
										Low Flow Alterations	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Rock Creek	MT41D004-120	P	P	NA	P	F	F	F	2002	Sedimentation/Siltation	Sediment	TMDL	Pebble Counts (<6mm in riffles)	≤ 22	NA	NA	Roads	78	4,911	Implicit
													Pebble Counts (<2mm in riffles)	≤ 18			Eroding Banks	3,142		
													Fines Grid (<6mm pool tailout	Median ≤ 80 25th percentile ≤27			Silviculture	21		
													W/D ratio	75th percentile ≤ 20 Median ≤ 14			Grazing/Hay	1,479		
													Understory shrub cover along the green line	25th percentile ≥ 32 Median ≥ 58			Natural Upland	193		
													Pool Frequency (# of Bankfull Widths between pools)	Median ≤ 8						
									2002	Total Nitrogen	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									2002	Total Phosphorus	NA	No Action	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
										Low flow alteration	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
										Alteration in streamside or littoral vegetative covers	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA	NA	NA	NA
Ruby Creek	MT41D004-100	P	P	NA	F	P	F	F	2000	Sedimentation/Siltation	Sediment	TMDL	Pebble Counts (<6mm in riffles)	≤ 22	NA	NA	Roads	129	4,332	Implicit
													Pebble Counts (<2mm in riffles)	≤ 18			Eroding Banks	2,437		
													Fines Grid (<6mm pool tailout	Median ≤ 80 25th percentile ≤27			Silviculture	21		

Water Body Name	Water Body ID	Impaired Beneficial Uses							Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for which TMDL prepared	DEQ Action	TMDL End Points		Wasteload Allocations[2]		Load Allocations[3]			TMDL[14]	MOS
		Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry					Indicator	Threshold Values[4]	WLA	WLA Permitted Facilities (Permit Number)	Source		Load		
													W/D ratio	75th percentile ≤ 20 Median ≤ 14			Grazing/Hay		901		
													Understory shrub cover along the green line	25th percentile ≥ 32 Median ≥ 58			Natural Upland		844		
													Pool Frequency (# of Bankfull Widths between pools)	Median ≤ 8							
										Alteration in streamside or littoral vegetative covers	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA		NA	NA	NA
										Low flow alteration	NA	No Action	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
Schultz Creek	MT41D004-040	P	P	NA	F	F	F	F	1992	Sediment	NA	Investigated No Action	NA	NA	NA	NA	NA		NA	NA	NA
Steel Creek	MT41D004-120	N	N	NA	N	P	F	F	>2008	Sedimentation/Siltation	Sediment	TMDL	Pebble Counts (<6mm in riffles)	≤ 22	NA	NA	Roads		134	5,351	Implicit
													Pebble Counts (<2mm in riffles)	≤ 18			Eroding Banks		3,797		
													Fines Grid (<6mm pool tailout	Median ≤ 80 25th percentile ≤27			Silviculture		8		
													WD ratio	75th percentile ≤ 20 Median ≤ 14			Grazing/Hay		860		
													Understory shrub cover along the green line	25th percentile ≥ 32 Median ≥ 58			Natural Upland		552		
													Pool Frequency (# of Bankfull Widths between pools)	Median ≤ 8							
									>2008	Total Nitrogen	Nitrogen	TMDL	Total Nitrogen (mg/L) 20% exceedance rate cap	0.32	NA	NA	Hay/Pasture	Grazing, Hay, Fertilizer, Natural	329	7,586	Implicit
													Chlorophyll a (mg/m^2)	150			Shrub and Dry Grassland	Grazing, Natural	1,549		
																	Forest	Grazing, Natural	4,834		
																	Stream Banks	Grazing, Hay, Natural	747		
																	Developed	Suburban	127		
									2000	Total Phosphorus	Phosphorus	TMDL	Total Phosphorus (mg/L) 20% exceedance rate cap	0.049	NA	NA	Hay/Pasture	Grazing, Hay, Fertilizer, Natural	17	1,310	Implicit
													Chlorophyll a (mg/m^2)	150			Shrub and Dry Grassland	Grazing, Natural	310		
																	Forest	Grazing, Natural	653		
																	Stream	Grazing,	329		

Water Body Name	Water Body ID	Impaired Beneficial Uses							Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for which TMDL prepared	DEQ Action	TMDL End Points		Wasteload Allocations[1]		Load Allocations[1]			TMDL[2]	MOS
		Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry					Indicator	Threshold Values[3]	WLA	WLA Permitted Facilities (Permit Number)	Source		Load		
																	Banks	Hay, Natural			
																	Developed	Suburban	21		
									2000	Cadmium	NA	Investigated No Action	NA	NA	NA	NA	NA		NA	NA	NA
									2000	Copper	NA	Investigated No Action	NA	NA	NA	NA	NA		NA	NA	NA
										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
										Low flow alteration	NA	No Action	NA	NA	NA	NA	NA		NA	NA	NA
										Alteration in streamside or littoral vegetative covers	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA		NA	NA	NA
Swamp Creek	MT41D004-110	P	P	NA	F	N	F	P	1990	Sedimentation/Siltation	Sediment	TMDL	Pebble Counts (<6mm in riffles)	≤ 22	NA	NA	Roads		45	4,237	Implicit
													Pebble Counts (<2mm in riffles)	≤ 18			Eroding Banks		2,886		
													Fines Grid (<6mm pool tailout	Median ≤ 80 25th percentile ≤27			Silviculture		21		
													W/D ratio	75th percentile ≤ 20 Median ≤ 14			Grazing/Hay		1,096		
													Understory shrub cover along the green line	25th percentile ≥ 32 Median ≥ 58			Natural Upland		204		
													Pool Frequency (# of Bankfull Widths between pools)	Median ≤ 8							
									2006	Total Nitrogen	NA	No Action	NA	NA	NA	NA	NA		NA	NA	NA
									2006	Total Phosphorus	NA	No Action	NA	NA	NA	NA	NA		NA	NA	NA
										Low flow alteration	NA	No Action	NA	NA	NA	NA	NA		NA	NA	NA
										Alteration in streamside or littoral vegetative covers	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA		NA	NA	NA
Tie Creek	MT41D004-060	P	P	NA	F	F	F	F	1992	Sedimentation/Siltation	Sediment	TMDL	Pebble Counts (<6mm in riffles)	≤ 13	NA	NA	Roads		33	1,461	Implicit
													Pebble Counts (<2mm in riffles)	≤ 13			Eroding Banks		657		
													Fines Grid (<6mm pool tailout	Median ≤ 80 25th percentile ≤27			Silviculture		79		
													W/D ratio	75th percentile ≤ 20 Median ≤ 14			Grazing/Hay		228		
													Understory shrub cover along the green line	25th percentile ≥ 32 Median ≥ 58			Natural Upland		464		
													Pool Frequency (# of Bankfull Widths between pools)	Median ≤ 8							
									2006	Total Nitrogen	NA	No Action	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 prepared	DEQ Action	TMDL End Points		Wasteload Allocations[1]		Load Allocations[1]		TMDL[1,2]	MOS
		Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry					Indicator	Threshold Values[3]	WLA	WLA Permitted Facilities (Permit Number)	Source	Load		
										Alteration in streamside or littoral vegetative covers	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA	NA	NA	NA
Trail Creek (upper segment)	MT41D004-070	P	P	NA	F	F	F	F	1998	Sedimentation/Siltation	Sediment	TMDL	Pebble Counts (<6mm in riffles)	≤ 13	NA	NA	Roads	27	1,702	Implicit
													Pebble Counts (<2mm in riffles)	≤ 13			Eroding Banks	975		
													Fines Grid (<6mm pool tailout	Median ≤ 80 25th percentile ≤27			Silviculture	4		
													W/D ratio	75th percentile ≤ 20 Median ≤ 14			Grazing/Hay	325		
													Understory shrub cover along the green line	25th percentile ≥ 32 Median ≥ 58			Natural Upland	731		
													Pool Frequency (# of Bankfull Widths between pools)	Median ≤ 8						
										Physical substrate habitat alterations	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA	NA	NA	NA
Trail Creek (lower segment)	MT41D004-080	P	P	NA	F	F	F	F	1998	Sedimentation/Siltation	Sediment	TMDL	Pebble Counts (<6mm in riffles)	≤ 13	NA	NA	Roads	72	4,243	Implicit
																	Hwy 43 Road Sanding	2		
													Pebble Counts (<2mm in riffles)	≤ 13			Eroding Banks	2,595		
													Fines Grid (<6mm pool tailout	Median ≤ 80 25th percentile ≤27			Silviculture	65		
													W/D ratio	75th percentile ≤ 20 Median ≤ 14			Grazing/Hay	268		
													Understory shrub cover along the green line	25th percentile ≥ 32 Median ≥ 58			Natural Upland	1,313		
													Pool Frequency (# of Bankfull Widths between pools)	Median ≤ 8						
										Physical substrate habitat alterations	NA	Addressed by sediment TMDL	NA	NA	NA	NA	NA	NA	NA	NA
Warm Springs Creek	MT41D004-180	P	P	NA	F	P	F	P		Habitat Alterations	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									2006	Sedimentation/Siltation	NA	Investigated No Action	NA	NA	NA	NA	NA	NA	NA	NA
										Low Flow Alterations	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									2004	Total Kjehldahl Nitrogen	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
									2004	Phosphorus	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA

Footnote 1 - Sediment TMDLs and allocations are reported as tons/yr in the table above and are calculated from % reduction allocations in the document. Daily sediment TMDLs (tons/day) are reported in Appendix F. Temperature TMDLs/allocations reported in table avove as Kcal/day and Kcal/sec for an example discharge and weather condition. Temperature TMDLs in main document provided as changes needed from all influencing factors. Daily and instantaneous TMDLs and allocations presented in Appendix E as equations. Nutrient TMDLs reported as lbs/yr in table above based on average yearly allocations. Nutrient TMDLs in document are provided as a daily time step based upon average daily discharge dependant equation.

Footnote 2 - TMDL completed for a waterbody/pollutant combination which was not identified on 2006 integrated report category 5.

Footnote 3 - All tributary sediment target thresholds vary by landscape. The most prominent landscape target #s are provided for tributaries. The Big Hole River has its unique set of target thresholds.

Enclosure 2

EPA REGION VIII TMDL REVIEW

TMDL Document Info:

Document Name:	**Upper and North Fork Big Hole River Planning Area TMDLs and Framework**
Submitted by:	**Montana Department of Environmental Quality**
Date Received:	**April 1, 2009**
Review Date:	**June 3, 2009**
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. As shown in Table 1 below, 24 TMDLs will be approved for sediment (19), nitrogen (2), phosphorus (2), and temperature (1).

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 originally submitted to EPA for review on April 1, 2009. An adequate cover letter has been 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: Forty-five waterbody-pollutant combinations in the Upper and North Fork Big Hole TPA appeared on Montana's 2006 303(d) list for the following parameters: sedimentation/siltation, temperature, total phosphorus, total nitrogen, copper, TKN, lead, cadmium, and copper. Of those, DEQ completed TMDLs for 24 waterbody-pollutant combinations, including 7 waterbody pollutant combinations that did not appear on the 2006 303(d) list. TMDLs were completed

for sediment (19), nitrogen (2), phosphorus (2), and temperature (1). TMDLs were not completed for 21 of the 2006 303(d) listings. Further explanation is provided in the following paragraphs and in Table 1.

Metals

No metals TMDLs were completed in the Upper and North Fork Big Hole TPA.

Governor Creek was listed as impaired because of copper. Mussigbrod Creek was listed as impaired because of lead. Steel Creek was listed as impaired because of copper and cadmium. These listings were based on historic data (1980s), and subsequent sampling in 2004 indicated that both water column and sediment metals concentrations were below standards and threshold values (respectively). Because of this and a lack of anthropogenic sources, no metals TMDLs were completed for Governor Creek, Mussigbrod Creek, or Steel Creek (4 waterbody-pollutant combinations)

In Joseph Creek, copper and lead were listed as impairing beneficial uses. Further investigation found no anthropogenic sources in Joseph Creek, although elevated concentrations were present in the 2004 sampling. The elevated metals concentrations are likely due to natural sources, and no TMDLs were completed (2 waterbody pollutant combinations).

Nutrients

Nitrogen and phosphorus TMDLs were completed for both Francis Creek and Steel Creek (4 TMDLs).

Fox Creek was listed as impaired because of total phosphorus. Johnson Creek was listed as impaired because of TKN. McVey Creek was listed as impaired because of total phosphorus and total nitrogen. Pine Creek was listed as impaired because of total phosphorus. Swamp Creek was listed as impaired because of total phosphorus and total nitrogen. Tie Creek was listed as impaired because of total nitrogen. Warm Springs Creek was listed as impaired because of TKN and total phosphorus. All of these waterbody-pollutant combinations first appeared on the 2006 303(d) list after this project was initiated, and because of that, DEQ did not have enough time to complete TMDLs. Rock Creek, although first listed in 2002 for total nitrogen and total phosphorus, will also be addressed at a later point in time because of this issue (12 waterbody-pollutant combinations).

Temperature

A temperature TMDL was completed for the Big Hole River (1 TMDL). A temperature TMDL was not completed for Pintlar Creek because of difficulties in differentiating natural versus anthropogenic sources (1 waterbody-pollutant combination).

Sediment

Sediment TMDLs were completed for the Big Hole River, Doolittle Creek, Fox Creek, Francis Creek, Governor Creek, Johnson Creek, Joseph Creek, McVey Creek, Miner Creek, Mussigbrod Creek, North Fork Big Hole River, Pine Creek, Rock Creek, Ruby Creek, Steel Creek, Swamp Creek, Tie Creek, Trail Creek (upper), Trail Creek (lower) (19 TMDLs).

DEQ determined that Schultz Creek and Warm Springs Creek (listed as impaired for sediment) were meeting all targets and does not require sediment TMDLs (2 waterbody-pollutant combinations).

Table 1. Stream Segments in the Upper and North Fork Big Hole TPA and associated causes of impairment, beneficial use status, and DEQ actions.

Water Body Name	Water Body ID	Impaired Beneficial Uses[1]							Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for which TMDL prepared	DEQ Action
		Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry				
Big Hole River	MT41D001-030	P	P	NA	F	P	F	F	Not Listed	Sedimentation/Siltation	Sediment	**TMDL**
									2000	Temperature	Temperature	**TMDL**
										Alteration in streamside or littoral vegetative covers	*NA*	*Addressed by sediment and temperature TMDLs*
										Low flow alteration	*NA*	*Addressed by temperature TMDL*
Doolittle Creek	MT41D004-220	P	P	NA	F	P	F	P	1992	Sedimentation/Siltation	Sediment	**TMDL**
										Alteration in streamside or littoral vegetative covers	*NA*	*Addressed by sediment and temperature TMDLs*
										Low flow alteration	*NA*	*Addressed by temperature TMDL*
Fox Creek	MT41D004-170	P	P	NA	F	F	F	F	Not Listed	Sedimentation/Siltation	Sediment	**TMDL**
									2006	Total Phosphorus	NA	No Action
Francis Creek	MT41D004-200	P	P	NA	F	F	F	F	1990	Sedimentation/Siltation	Sediment	**TMDL**
									2006	Total Nitrogen	Nitrogen	**TMDL**
									2006	Total Phosphorus	Phosphorus	**TMDL**
										Alteration in streamside or littoral vegetative covers	*NA*	*Addressed by sediment and nutrient TMDLs*
Governor Creek	MT41D004-150	N	N	NA	F	P	F	F	Not Listed	Sedimentation/Siltation	Sediment	**TMDL**
									2000	Copper	NA	Investigated; No Action
										Low flow alteration	*NA*	*No Action*
										Other anthropogenic sustrate alterations	*NA*	*Addressed by sediment TMDL*
										Physical substrate habitat alterations	*NA*	*Addressed by sediment TMDL*
Johnson Creek	MT41D004-030	P	P	NA	F	P	F	F	1990	Sedimentation/Siltation	Sediment	**TMDL**
									2006	TKN	NA	No Action

Water Body Name	Water Body ID	Impaired Beneficial Uses[1]							Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for which TMDL prepared	DEQ Action
		Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry				
										Alteration in streamside or littoral vegetative covers	*NA*	*Addresed by sediment TMDL*
										Low flow alteration	*NA*	*No Action*
Joseph Creek	MT41D004-090	P	P	NA	N	F	F	F	1990	Sedimentation/Siltation	Sediment	**TMDL**
									2002	Copper	NA	Investigated; No Action
									2002	Lead	NA	Investigated; No Action
										Physical substrate habitat alterations	*NA*	*Addressed by sediment TMDL*
McVey	MT41D004-210	P	P	NA	F	F	F	F	1992	Sedimentation/Siltation	Sediment	**TMDL**
									2006	Total Nitrogen	NA	No Action
									2006	Total Phosphorus	NA	No Action
										Alteration in streamside or littoral vegetative covers	*NA*	*Addressed by sediment TMDL*
Miner Creek	MT41D004-140	P	P	NA	X	F	X	F	1990	Sedimentation/Siltation	Sediment	**TMDL**
Mussigbrod Creek	MT41D004-020	N	N	NA	N	P	F	F	Not Listed	Sedimentation/Siltation	Sediment	**TMDL**
									2000	Lead	NA	Investigated; No Action
										Low flow alteration	*NA*	*No Action*
										Physical substrate habitat alterations	*NA*	*Addressed by sediment TMDL*
										Other anthropogenic sustrate alterations	*NA*	*Addressed by sediment TMDL*
										Alteration in streamside or littoral vegetative covers	*NA*	*Addressed by sediment TMDL*
North Fork Big Hole River	MT41D004-010	P	P	NA	X	P	X	X	1990	Sedimentation/Siltation	Sediment	**TMDL**
										Alteration in streamside or littoral vegetative covers	*NA*	*Addresed by sediment TMDL*
										Low flow alteration	*NA*	*No Action*
Pine Creek	MT41D004-160	P	P	NA	F	P	F	F	Not Listed	Sedimentation/Siltation	Sediment	**TMDL**
									2006	Total Phosphorus	NA	No Action

Water Body Name	Water Body ID	Impaired Beneficial Uses[1]							Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for which TMDL prepared	DEQ Action
		Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry				
										Alteration in streamside or littoral vegetative covers	*NA*	*Addresed by sediment TMDL*
Pintlar Creek	MT41D003-170	P	P	NA	F	P	F	F	2000	Temperature	NA	No Action
										Habitat Alterations	NA	*No Action*
										Low Flow Alterations	NA	*No Action*
Rock Creek	MT41D004-120	P	P	NA	F	F	F	F	2002	Sedimentation/Siltation	Sediment	**TMDL**
									2002	Total Nitrogen	NA	No Action
									2002	Total Phosphorus	NA	No Action
										Physical substrate habitat alterations	*NA*	*Addressed by sediment TMDL*
										Low flow alteration	*NA*	*No Action*
										Alteration in streamside or littoral vegetative covers	*NA*	*Addressed by sediment TMDL*
Ruby Creek	MT41D004-100	P	P	NA	F	P	F	F	2000	Sedimentation/Siltation	Sediment	**TMDL**
										Alteration in streamside or littoral vegetative covers	*NA*	*Addressed by sediment TMDL*
										Low flow alteration	*NA*	*No Action*
										Physical substrate habitat alterations	*NA*	*Addressed by sediment TMDL*
Schultz Creek	MT41D004-040	P	P	NA	F	F	F	F	1992	Sediment	NA	Investigated; No Action
Steel Creek	MT41D004-120	N	N	NA	N	P	F	F	Not Listed	Sedimentation/Siltation	Sediment	**TMDL**
									Not Listed	Total Nitrogen	Nitrogen	**TMDL**
									2000	Total Phosphorus	Phosphorus	**TMDL**
									2000	Cadmium	NA	Investigated No Action
									2000	Copper	NA	Investigated No Action
										Other anthropogenic substrate alterations	*NA*	*Addressed by sediment TMDL*
										Physical substrate habitat alterations	*NA*	*Addressed by sediment TMDL*
										Low flow alteration	*NA*	*No Action*

Water Body Name	Water Body ID	Impaired Beneficial Uses[1]							Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for which TMDL prepared	DEQ Action
		Aquatic Life	Cold Water Fishery	Warm Water Fishery	Drinking Water	Recreation	Agriculture	Industry				
										Alteration in streamside or littoral vegetative covers	*NA*	*Addressed by sediment TMDL*
Swamp Creek	MT41D004-110	P	P	NA	F	N	F	P	1990	Sedimentation/Siltation	Sediment	**TMDL**
									2006	Total Nitrogen	NA	No Action
									2006	Total Phosphorus	NA	No Action
										Low flow alteration	*NA*	*No Action*
										Alteration in streamside or littoral vegetative covers	*NA*	*Addressed by sediment TMDL*
Tie Creek	MT41D004-060	P	P	NA	F	F	F	F	1992	Sedimentation/Siltation	Sediment	**TMDL**
									2006	Total Nitrogen	NA	No Action
										Alteration in streamside or littoral vegetative covers	*NA*	*Addressed by sediment TMDL*
Trail Creek (upper segment)	MT41D004-070	P	P	NA	F	F	F	F	1990	Sedimentation/Siltation	Sediment	**TMDL**
										Physical substrate habitat alterations	*NA*	*Addressed by sediment TMDL*
Trail Creek (lower segment)	MT41D004-080	P	P	NA	F	F	F	F	1990	Sedimentation/Siltation	Sediment	**TMDL**
										Physical substrate habitat alterations	*NA*	*Addressed by sediment TMDL*
Warm Springs Creek	MT41D004-180	P	P	NA	F	P	F	P		*Habitat Alterations*	*NA*	No Action
									2006	Sedimentation/Siltation	*NA*	Investigated; No Action
										Low Flow Alterations		No Action
									2004	Total Kjehldahl Nitrogen		No Action
									2004	Phosphorus		No Action

[1]P=Partial Support; F=Full Support; N=Not Supported; T=Threatened; X=Not Assessed; NA=Not Applicable

1.3 Water Quality Standards

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

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

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 applicable water quality standards are summarized in Section 3.3.2.

For all of the metals considered in this document (i.e., copper, lead, and cadmium), Montana's standards for aquatic life include acute, chronic aquatic life, and human health criteria, where the chronic criteria are the most protective values. All of these criteria are also hardness dependant. The acute criteria are a maximum allowable concentration. The chronic criteria are based on a 4-day (96-hour) average concentration. The applicable water quality standards for metals are summarized in Section 3.3.2

Montana's standards for sediment and nutrients are narrative. The narrative text is presented in Section 3.2.2. The way in which these standards have been applied in the context of the TMDLs is discussed in the "Water Quality Targets" section of this review form.

Montana's numeric temperature standards are presented in Section 3.3.2.

1.4 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 4.1. The temperature standard was directly applied as a target, and evaluated in the Big Hole River using SSTEMP. However, because of uncertainties in the modeling, additional targets were set including width-to-depth ratios, canopy density, understory shrub along Green Line, and stream flow. Target values were derived from reference reaches and "least impacted" segments of the Big Hole River.

Sediment

Sediment targets are described in Section 4.2. Streams in the TPA were stratified according to the Rosgen Level I classification. Targets were then developed for each classification based on reference conditions. Primary targets include width-to-depth ratios, percent fines (pebble counts), percent fines (viewing bucket), pool frequency, understory shrub cover along the Green Line. Secondary indicators include eroding banks and macroinvertebrate bioassessment score. A weight of evidence approach is applied to the primary indicators in combination with the supplemental indicators.

Nutrients

Nutrient targets are based on DEQ's interim nutrient targets for wadable streams. These include target values for total phosphorus, total nitrogen, and benthic chlorophyll-a. Several supplemental targets are also proposed including biological indicators, riparian vegetation, and percent shrub cover along line transects. DEQ's dissolved oxygen standards are also proposed as targets for nutrients in the TPA.

Metals

Surface water quality standards for metals were directly applied as water quality targets. Targets for metals concentrations in sediment are also proposed. These were derived from literature values. Biological metrics are proposed as supplemental indicators for metals.

1.5 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

DEQ used an aerial photo analysis combined with field investigations to identify riparian vegetation, channel geometry, and flow modifications in the upper Big Hole River. The SSTEMP model was then used to link these "thermally influencing factors" and in-stream temperatures.

Sediment

DEQ inventoried roads and computed sediment loads using WARSEM. Loading from winter road traction sanding was estimated based on known highway application rates. DEQ calculated upland sediment loads by using the USLE. Bank erosion loads were estimated by using BEHI.

Note: the USLE sediment loads in Table A-5, A-6, and the sediment TMDL tables do not always match. There appears to be a minor rounding error (eg., 1061 tons/yr are reported for upland sediment in Fox Creek TMDL Table 8-7, whereas Table A-5 reports 1062 tons/yr.)

Nutrients

Nutrient sources were identified through aerial photo analysis and interviews with local land managers. Sources were quantified using the GWLF model.

Metals

No TMDLs were completed for metals, and therefore a source assessment was not needed.

1.6 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.

Nutrients

An adequate technical analysis has been performed. Uncertainties associated with the analysis are likely high but have been acknowledged and an adaptive management strategy is presented in Section10.0 to address these uncertainties.

Temperature

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. The SSTEMP and HEATSOURCE models were 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 10.0 to address them.

1.6.1 *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: An adequate summary and description of the water quality data relevant to the water quality impairment has been provided.

1.6.2 *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: There are no permitted point source discharges in the watershed.

1.6.3 *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 in daily loads as tons per day (daily loads are presented in Appendix F).

As presented, it is difficult to compare the loads and allocations in the TMDL tables to the loads reported in the source assessment graphs and tables. This is because the source assessment tables present loads for individual tributaries, while the TMDL tables present the entire load for the listed segment and its associated watershed (which may include multiple tributaries).

Nutrients

Load allocations are provided for each of the significant sources. They are presented as pounds per year.

Temperature

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

1.6.4 *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

Uncertainties and assumptions are acknowledged throughout the document and a monitoring strategy and adaptive management strategy is provided that will provide an adequate margin of safety. The adaptive management strategy addresses uncertainties associated with the targets, TMDLs, and allocations.

Nutrients

Uncertainties and assumptions are acknowledged throughout the document and a monitoring strategy and adaptive management strategy is provided that will provide an adequate margin of safety. The adaptive management strategy addresses uncertainties associated with the targets, TMDLs, and allocations.

Temperature

A margin of safety has been provided by basing the analysis on reference conditions. A MOS was also 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.

1.6.5 *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

Sediment loads are entirely nonpoint source and are primarily introduced during spring runoff and episodic extreme storm events. The potential nonpoint source BMPs that would be employed to reduce sediment loading would function anytime surface runoff is produced. As a result, seasonality is not an important consideration for the TMDL or allocations. The impairments to the aquatic life and coldwater fishery beneficial uses, however, are a result of the deposition of fine sediment and are potentially realized for the entire year. The suite of targets established in the Upper & North Fork Big Hole TMDL document adequately address the seasonality associated with impairments to the beneficial uses.

Nutrients

The nutrient TMDLs are flow-based. In other words, they vary based on flow. Also, to be conservative given the limited data, lower summer (i.e., growing season) nutrient targets are applied for the entire year.

Temperature

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

1.7 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 monitoring strategy is provided in Section 11.0.

1.8 Restoration Strategy

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

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: Although not required, a conceptual restoration strategy is provided in Section 10.0.

1.9 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:

Sediment

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

Nutrients

The nutrient TMDLs are flow-based, which address the daily loading expression.

Temperature

Daily temperature loadings are presented in Appendix E.

4.0 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 12.0 and comments and responses associated with the Draft TMDL document are included in Appendix L.