UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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Ref: 8EPR-EP

MAR 12 2012

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 Landusky Metals Total Maximum Daily Loads and Framework Water Quality Improvement Plan

Dear Mr. Mathieus:

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

In addition to the TMDL review contained in the enclosure, EPA would like to provide the following comments regarding the Landusky TMDL Planning Area document:

- A multi-report aquatic study prepared in 2005 for the Fort Belknap Indian Community (FBIC) as a Supplemental Environmental Project for the 1996 Consent Decree was not available during the development of the Landusky TMDL document or during the public comment period. The Tribe recently provided this information to EPA, and copies of the reports have been provided to DEQ. EPA encourages DEQ to incorporate the FBIC data and information into future TMDL reviews, and also consider the information when making future remediation decisions.

- The area covered by the TMDL project is historically and culturally important to the FBIC, and as expressed in their comments, the FBIC has concerns about the effectiveness and extent of the remediation efforts. Additional context for the scope of its importance is detailed in the report "Ethnographic Overview of the Little Rocky Mountains, Montana," which was prepared for Pegasus Gold Corporation in 1992; the Tribe recently provided this study to EPA and a copy will be given to DEQ. EPA encourages DEQ to continue to work with the FBIC on all remediation efforts to ensure that the needs of the community are being met, including all uses of the streams, their riparian areas, and riparian plant communities.

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

Sincerely,

Martin Hestmark
Acting Assistant Regional Administrator
Office of Ecosystems Protection
and Remediation

Enclosures

cc: Claudia Massman, Attorney
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ERRATA SHEET

July 27, 2012

"Landusky Metals Total Maximum Daily Loads and Framework Water Quality Improvement Plan"

The Landusky TMDL package was submitted to EPA on December 5, 2011 and approved on March 12, 2012. After approval, minor errors were identified and Montana DEQ submitted corrected documents and an errata sheet for changes in the main document and the enclosure 1 summary table. A final EPA review of these corrections identified outstanding errors in the two enclosure documents which make up the TMDL submittal package. Because these enclosures are not a Clean Act requirement, rather they are summaries to assist the EPA review, EPA has corrected the enclosures and noted changes on this errata sheet below.

Enclosure #1 and 2:

Rock Creek was missing its *E. coli* pollutant listing for which no action was taken. This waterbody-pollutant combination (WBPC) was added to both enclosures tables.

Ruby Creek is not associated with the pollution cause "Alteration in stream-side or littoral vegetative covers," therefore it was removed from both enclosure tables.

Enclosure #2:

On page four of enclosure 2, several of the summary statistics were miscalculated. The correct numbers are: no TMDLs were written for **nine** WBPCs in the planning area including **seven** metals, one nutrient and one *E. coli* impairment. Additionally, **55** WBPC addressed are per the court order and **15** new impairments were identified.

Water Body Name	Water Body ID	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 (LBS/day)	MOS
						Indicator	Threshold Values (µg/L)	WLA (LBS/day)		LA	(LBS/day)		
Alder Gulch	MT40E002_050	1994	Cadmium	Cadmium	TMDL	Chronic aquatic life criteria (ug/L) at hardness = 140 mg/L CaCO3	0.35	Mining Sources 0.0022	NA	Natural Background	0.0008	0.003	Implicit
		1994	Copper	Copper	TMDL	Chronic aquatic life criteria (ug/L) at hardness = 140 mg/L CaCO3	12.44	Composite of Mining Sources plus Natural Background 0.10 ~~0.01~~	NA	NA	NA	0.1	Implicit
		1994	Lead	Lead	TMDL	Chronic aquatic life criteria (ug/L) at hardness = 140 mg/L CaCO3	4.88	Mining Sources 0.028	NA	Natural Background	0.012	0.04	Implicit
		1994	Mercury	Mercury	TMDL	Human Health criteria (ug/L)	0.05	Composite of Mining Sources plus Natural Background 0.0004	NA	NA	NA	0.0004	Implicit
		1996 ~~1994~~	pH	Cadmium	Addressed by cadmium TMDL	See above for cadmium							
		1994	Selenium	Selenium	TMDL	Chronic aquatic life criteria (ug/L)	5	Mining Sources 0.037	NA	Natural Background	0.0041	0.041	Implicit
		1994	Zinc	Zinc	TMDL	Chronic aquatic life criteria (ug/L) at hardness = 140 mg/L CaCO3	159.34	Mining Sources 1.128	NA	Natural Background	0.162	1.29	Implicit
		NA ~~1994~~	Alteration in stream-side or littoral vegetative covers	Non-pollutant	No Action	NA	NA	NA	NA	NA	NA	NA	NA
Beaver Creek	MT40M001_011	2006	Cadmium	NA	Data Assessment-No TMDL Needed	NA	NA	NA	NA	NA	NA	NA	NA
			Iron	NA	Data Assessment-No TMDL Needed	NA	NA	NA	NA	NA	NA	NA	NA
			Lead	Lead	TMDL	Chronic aquatic life criteria (ug/L) at hardness = 83 mg/L CaCO3	2.51	Composite of Mining Sources plus Natural Background 0.0057	NA	NA	NA	0.0057	Implicit
South Big Horn Creek	MT40I001-030	1994	Aluminum	Aluminum	TMDL	Chronic aquatic life criteria (ug/L)	87	Mining Sources 0.098	NA	Natural Background	0.132	0.230	Implicit
			Arsenic	Arsenic	TMDL	Human Health criteria (ug/L)	5	Mining Sources 0.022	NA	Natural Background	0.004	0.026	
			Cadmium	Cadmium	TMDL	Chronic aquatic life criteria (ug/L) at hardness = 227 mg/L CaCO3	0.5	Mining Sources 0.00074	NA	Natural Background	0.00026	0.001	
		> 2012 ~~2011~~	Iron	Iron	TMDL	Aquatic Life Criterion	1,000	Mining Sources 2.31	NA	Natural Background	0.340	2.65	
		1994	Nickel	Nickel	TMDL	Chronic aquatic life criteria (ug/L) at hardness = 227 mg/L CaCO3	104.37	Mining Sources 0.254	NA	Natural Background	0.0265	0.280	
			Zinc	Zinc	TMDL	Aquatic life criteria (ug/L) at hardness = 227 mg/L CaCO3	239.98	Mining Sources 0.622	NA	Natural Background	0.013	0.635	
King Creek	MT40I001-040	> 2012 ~~2011~~	Arsenic	Arsenic	TMDL	Human Health criteria (ug/L)	5	Mining Sources 0.0008	NA	Natural Background	0.0003	0.0011	Implicit
		> 2012 ~~2011~~	Cadmium	Cadmium	TMDL	Chronic aquatic life criteria (ug/L) at hardness = 364 mg/L CaCO3	0.70	Mining Sources 0.00006	NA	Natural Background	0.00004	0.0001	Implicit
		1994	Selenium	Selenium	TMDL	Chronic aquatic life criteria (ug/L)	5	Mining Sources 0.0002	NA	Natural Background	0.0003	0.0005	Implicit
		NA ~~1994~~	Alteration in stream-side or littoral vegetative covers	Non-pollutant	No Action	NA	NA	NA	NA	NA	NA	NA	NA
			Physical substrate habitat alterations	Non-pollutant	No Action	NA	NA	NA	NA	NA	NA	NA	NA
Lodge Pole Creek	MT40I001-050	2004	Cadmium	Cadmium	TMDL	Chronic aquatic life criteria (ug/L) at hardness = 149 mg/L CaCO3	0.36	Mining Sources 0.0078	NA	Natural Background	0.00124	0.009	Implicit
			Mercury	Mercury	TMDL	Human Health criteria (ug/L)	0.05	Composite of Mining Sources plus Natural Background 0.001	NA	NA	NA	0.001	Implicit
		NA ~~2004~~	Alteration in stream-side or littoral vegetative covers	Non-pollutant	No Action	NA	NA	NA	NA	NA	NA	NA	NA
			Cause Unknown	Non-pollutant	Addressed by	NA	NA	NA	NA	NA	NA	NA	NA

Water Body Name	Water Body ID	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 (LBS/day)	MOS
						Indicator	Threshold Values (µg/L)	WLA (LBS/day)		LA	(LBS/day)		
					cadmium TMDL								
Mill Gulch	MT40E002_100	1996	Copper	Copper	TMDL	Chronic aquatic life criteria (ug/L) at hardness = 387 mg/L CaCO3	29.65	Mining Sources 0.0075	NA	Natural Background	0.0015	0.009	Implicit
		1996	Lead	NA	Data Assessment-No TMDL Needed	NA	NA	NA	NA	NA	NA	NA	NA
		1996	Mercury	Mercury	TMDL	Human Health criteria (ug/L)	0.05	Composite of Mining Sources plus Natural Background 0.000015	NA	NA	NA	0.000015	Implicit
		2000	Nitrates	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
		1996	pH	Copper	Addressed by copper TMDL	See above for copper	See above for copper	See above for copper	NA	See above for copper	See above for copper	See above for copper	See above for copper
		1996	Selenium	Selenium	TMDL	Chronic aquatic life criteria (ug/L)	5	Mining Sources 0.0012	NA	Natural Background	0.0008	0.002	Implicit
		NA ~~1996~~	Alteration in stream-side or littoral vegetative covers	Non-pollutant	No Action	NA	NA	NA	NA	NA	NA	NA	NA
Montana Gulch	MT40E002_010	> 2012 ~~2012~~	Aluminum	Aluminum	TMDL	Chronic aquatic life criteria (ug/L)	87	Composite of Mining Sources plus Natural Background 0.134	Landusky Wastewater Treatment Plant (LWWTP) 0.402	NA	NA	0.536	Implicit
		1990	Arsenic	Arsenic	TMDL	Human Health criteria (ug/L)	10	Composite of Mining Sources plus Natural Background 0.016	Landusky Wastewater Treatment Plant (LWWTP) 0.046	NA	NA	0.062	Implicit
		1990	Cadmium	Cadmium	TMDL	Chronic aquatic life criteria (ug/L) at hardness = 383 mg/L CaCO3	0.73	Composite of Mining Sources plus Natural Background 0.001	Landusky Wastewater Treatment Plant (LWWTP) 0.003	NA	NA	0.004	Implicit
		1990	Copper	NA	Data Assessment-No TMDL Needed	NA	NA	NA	NA	NA	NA	NA	NA
		> 2012 ~~2012~~	Cyanide	Cyanide	TMDL	Chronic aquatic life criteria (ug/L)	5.2	Composite of Mining Sources plus Natural Background 0.008	Landusky Wastewater Treatment Plant (LWWTP) 0.024	NA	NA	0.032	Implicit
		> 2012 ~~2012~~	Nickel	Nickel	TMDL	Chronic aquatic life criteria (ug/L) at hardness = 383 mg/L CaCO3	162.46	Composite of Mining Sources plus Natural Background 0.26	Landusky Wastewater Treatment Plant (LWWTP) 0.74	NA	NA	1.0	Implicit
		2000	pH	Cadmium	Addressed by cadmium TMDL	See above for cadmium	See above for cadmium	See above for cadmium	See above for cadmium	NA	NA	See above for cadmium	See above for cadmium
		> 2012 ~~2011~~	Selenium	Selenium	TMDL	Chronic aquatic life criteria (ug/L)	5	Composite of Mining Sources plus Natural Background 0.008	Landusky Wastewater Treatment Plant (LWWTP) 0.023	NA	NA	0.031	Implicit
		> 2012 ~~2011~~	Zinc	Zinc	TMDL	Aquatic life criteria (ug/L) at hardness = 383 mg/L CaCO3	373.82	Composite of Mining Sources plus Natural Background 0.6	Landusky Wastewater Treatment Plant (LWWTP) 1.70	NA	NA	2.3	Implicit

Water Body Name	Water Body ID	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 (LBS/day)	MOS
						Indicator	Threshold Values (µg/L)	WLA (LBS/day)	WLA (LBS/day)	LA	(LBS/day)		
Rock Creek	MT40E002_090	1994	Cadmium	Cadmium	TMDL	Chronic Aquatic life criteria (ug/L) at hardness = 142 mg/L CaCO3	0.35	Mining Sources 0.00075	NA	Natural Background	0.00005	0.0008	Implicit
			Copper	Copper	TMDL	Chronic Aquatic life criteria (ug/L) at hardness = 142 mg/L CaCO3	12.59	Composite of Mining Sources plus Natural Background 0.030	NA	NA	NA	0.03	Implicit
			Lead	Lead	TMDL	Chronic Aquatic life criteria (ug/L) at hardness = 142 mg/L CaCO3	4.97	Composite of Mining Sources plus Natural Background 0.012	NA	NA	NA	0.012	Implicit
			Mercury	Mercury	TMDL	Human Health criteria (ug/L)	0.05	Composite of Mining Sources plus Natural Background 0.0001	NA	NA	NA	0.0001	Implicit
		2000 ~~1994~~	pH	Cadmium	Addressed by cadmium TMDL	See above for cadmium	See above for cadmium	See above for cadmium	See above for cadmium	NA	NA	See above for cadmium	See above for cadmium
		1994	Selenium	Selenium	TMDL	Chronic aquatic life criteria (ug/L)	5	Mining Sources 0.01	NA	Natural Background	0.002	0.012	Implicit
			Zinc	Zinc	TMDL	Aquatic life criteria (ug/L) at hardness = 142 mg/L CaCO3	161.27	Mining Sources 0.34	NA	Natural Background	0.048	0.388	Implicit
		NA ~~1994~~	Alteration in stream-side or littoral vegetative covers	Non-pollutant	No Action	NA	NA	NA	NA	NA	NA	NA	NA
		2000	Escherichia coli	NA	No Action	NA	NA	NA	NA	NA	NA	NA	NA
Ruby Creek	MT40E002_060	2000	Aluminum	Aluminum	TMDL	Chronic aquatic life criteria (ug/L)	87	Composite of Mining Sources plus Natural Background 0.111	Zortman Wastewater Treatment Plant (ZWWTP) 0.063	NA	NA	0.174	Implicit
			Cadmium	Cadmium	TMDL	Chronic aquatic life criteria (ug/L) at hardness = 400 mg/L CaCO3	0.76	Untreated Ruby Gulch mining sources - 0.0004 Alder Gulch mining sources - 0.0004	ZWWTP 0.00055	Natural Background	0.00016	0.00151	Implicit
			Copper	Copper	TMDL	Chronic aquatic life criteria (ug/L) at hardness = 400 mg/L CaCO3	30.5	Composite of Mining Sources plus Natural Background 0.039	Zortman Wastewater Treatment Plant (ZWWTP) 0.022	NA	NA	0.061	Implicit
			Lead	Lead	TMDL	Human Health criteria (ug/L) ~~Chronic aquatic life criteria (ug/L) at hardness = 400 mg/L CaCO3~~	15 ~~18.58~~	Untreated Ruby Gulch mining sources - 0.011 Alder Gulch mining sources - 0.011	ZWWTP 0.012	Natural Background	0.003	0.037	Implicit
			Mercury	Mercury	TMDL	Human Health criteria (ug/L)	0.05 ~~0.91~~	Composite of Mining Sources plus Natural Background 0.00114	Zortman Wastewater Treatment Plant (ZWWTP) 0.00067	NA	NA	0.0018	Implicit
			pH	Cadmium	Addressed by cadmium TMDL	See above for cadmium	See above for cadmium	See above for cadmium	See above for cadmium	See above for cadmium	See above for cadmium	See above for cadmium	See above for cadmium
			Selenium	Selenium	TMDL	Chronic aquatic life criteria (ug/L)	5	Untreated Ruby Gulch mining sources - 0.0027 Alder Gulch mining sources - 0.0027	ZWWTP 0.004	Natural Background	0.001	0.01	Implicit
			Zinc	Zinc	TMDL	Aquatic life criteria (ug/L) at hardness = 400 mg/L CaCO3	387.83	Untreated Ruby Gulch mining sources - 0.23 Alder Gulch mining sources - 0.23	ZWWTP 0.28	Natural Background	0.03	0.77	Implicit
		~~2000~~	~~Alteration in stream-side or littoral vegetative covers~~	~~Non-pollutant~~	~~No Action~~	~~NA~~	~~NA~~	~~NA~~	~~NA~~	~~NA~~	~~NA~~	~~NA~~	~~NA~~

Water Body Name	Water Body ID	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 (LBS/day)	MOS
						Indicator	Threshold Values (µg/L)	WLA (LBS/day)	WLA (LBS/day)	LA	(LBS/day)		
Ruby Gulch	MT40E002_070	> 2012 ~~2012~~	Aluminum	Aluminum	TMDL	Chronic aquatic life criteria (ug/L)	87	Composite of Mining Sources plus Natural Background 0.011	ZWWTP 0.179	NA	NA	0.19	Implicit
		1994	Cadmium	Cadmium	TMDL	Chronic aquatic life criteria (ug/L) at hardness = 387 mg/L CaCO3	0.74	Untreated Mining Sources 0.000095	ZWWTP 0.0015	Natural Background	0.0000015	0.0016	Implicit
		1994	Chromium	Chromium	TMDL	Chronic aquatic life criteria (ug/L) at hardness = 387 mg/L CaCO3	261.06	Untreated Mining Sources 0.034	ZWWTP 0.53	Natural Background	0.000045	0.564	Implicit
		1994	Copper	NA	Data Assessment-No TMDL Needed	NA	NA	NA	NA	NA	NA	NA	NA
		> 2012 ~~2012~~	Cyanide	Cyanide	TMDL	Chronic aquatic life criteria (ug/L)	5.2	Untreated Mining Sources 0.00054	ZWWTP 0.0105	Natural Background	0.00016	0.0112	Implicit
		1994	Lead	NA	TMDL	Human Health criteria (ug/L)	15	Untreated Mining Sources 0.00132	ZWWTP 0.031	Natural Background	0.000081	0.0324	Implicit
		1994	Mercury	Mercury	TMDL	Human Health criteria (ug/L)	0.05	Composite of Mining Sources plus Natural Background 0.0002	ZWWTP 0.0018	NA	NA	0.002	Implicit
		1994	pH	Cadmium	Addressed by cadmium TMDL	See above for cadmium	See above for cadmium	See above for cadmium	See above for cadmium	See above for cadmium	See above for cadmium	See above for cadmium	See above for cadmium
		1994	Selenium	Selenium	TMDL	Chronic aquatic life criteria (ug/L)	5	Untreated Mining Sources 0.00067	ZWWTP 0.0103	Natural Background	0.000032	0.011	Implicit
		1994	Zinc	NA	TMDL	Chronic aquatic life criteria (ug/L) at hardness = 387 mg/L CaCO3	377.12	Untreated Mining Sources 0.0394	ZWWTP 0.774	Natural Background	0.00162	0.815	Implicit
Sullivan Creek ~~Sullivan Gulch (Sullivan Creek)~~	MT40E002_110	> 2012 ~~2012~~	Cadmium	Cadmium	TMDL	Chronic aquatic life criteria (ug/L) at hardness = 191 mg/L CaCO3	0.44	Mining Sources 0.00016	NA	Natural Background	0.000045	0.0002	Implicit
			Iron	Iron	TMDL	Aquatic life criteria (ug/L)	1,000	Mining Sources 0.28	NA	Natural Background	0.17	0.45	Implicit
			Lead	Lead	TMDL	Chronic aquatic life criteria (ug/L) at hardness = 191 mg/L CaCO3	7.25	Mining Sources 0.00076	NA	Natural Background	0.00224	0.003	Implicit
			Selenium	Selenium	TMDL	Chronic aquatic life criteria (ug/L)	5	Mining Sources 0.0018	NA	Natural Background	0.0002	0.002	Implicit
			Zinc	Zinc	TMDL	Aquatic life criteria (ug/L) at hardness = 191 mg/L CaCO3	207.32	Mining Sources 0.0885	NA	Natural Background	0.0045	0.093	Implicit
		NA ~~1994~~	Alteration in stream-side or littoral vegetative covers	Non-pollutant	No Action	NA	NA	NA	NA	NA	NA	NA	NA
			Fish-Passage Barrier	Non-pollutant	No Action	NA	NA	NA	NA	NA	NA	NA	NA
			Other flow regime alterations	Non-pollutant	No Action	NA	NA	NA	NA	NA	NA	NA	NA
			Physical substrate habitat alterations	Non-pollutant	No Action	NA	NA	NA	NA	NA	NA	NA	NA

Water Body Name	Water Body ID	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 (LBS/day)	MOS
						Indicator	Threshold Values (µg/L)	WLA (LBS/day)	WLA (LBS/day)	LA	(LBS/day)		
Swift Gulch Creek	MT40I002_010	2008	Aluminum	Aluminum	TMDL	Chronic aquatic life criteria (ug/L)	87	Mining Sources 0.086	NA	Natural Background	0.116	0.202	Implicit
			Arsenic	Arsenic	TMDL	Human Health criteria (ug/L)	10	Mining Sources 0.0195	NA	Natural Background	0.0035	0.023	Implicit
			Cadmium	Cadmium	TMDL	Chronic aquatic life criteria (ug/L) at hardness = 242 mg/L CaCO3	0.52 ~~0.56~~	Mining Sources 0.0012	NA	Natural Background	0.0001	0.0013	Implicit
			Copper	Copper	TMDL	Aquatic life criteria (ug/L) at hardness = 242 mg/L CaCO3	19.85 ~~21.73~~	Mining Sources 0.0465	NA	Natural Background	0.0035	0.05	Implicit
			Cyanide	Cyanide	TMDL	Chronic aquatic life criteria (ug/L)	5.2	Mining Sources 0.0062	NA	Natural Background	0.0058	0.012	Implicit
			Iron	Iron	TMDL	Aquatic life criteria (ug/L)	1,000	Mining Sources 2.23	NA	Natural Background	0.09	2.32	Implicit
			Lead	Lead	Data Assessment-No TMDL Needed	NA	NA	NA	NA	NA	NA	NA	NA
			Nickel	Nickel	TMDL	Chronic aquatic life criteria (ug/L) at hardness = 242 mg/L CaCO3	110.17 ~~120~~	Mining Sources 0.256	NA	Natural Background	0.023	0.279	Implicit
			pH	Cadmium	Addressed by cadmium TMDL	See above for cadmium	See above for cadmium	See above for cadmium	NA	See above for cadmium	See above for cadmium	See above for cadmium	See above for cadmium
			Selenium	NA	Data Assessment-No TMDL Needed	NA	NA	NA	NA	NA	NA	NA	NA
			Thallium	Thallium	TMDL	Human Health criteria (ug/L) ~~Aquatic Life Criteria (ug/L)~~	0.24	Composite of Mining Sources plus Natural Background 0.0006	NA	NA	NA	0.0006	Implicit
			Zinc	Zinc	TMDL	Aquatic life criteria (ug/L) at hardness = 242 mg/L CaCO3	253.35 ~~277.11~~	Mining Sources 0.631	NA	Natural Background	0.012	0.643	Implicit

ENCLOSURE 2

EPA REGION VIII TMDL REVIEW

TMDL Document Info:

Document Name:	**Landusky Metals Total Maximum Daily Loads and Framework Water Quality Improvement Plan**
Submitted by:	**Montana Department of Environmental Quality**
Date Received:	**December 5, 2011**
Review Date:	**December 19, 2011**
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 5, 2011. 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 Landusky document are summarized in Table 1 (appended to the end of this document) and are clearly described in the subject document. TMDLs were developed for metals pollutants (including cyanide and selenium). The number of TMDLs developed and the pollutants for which they were developed are summarized below:

Landusky metals TMDLs

Number of metals TMDLs:	63
Number of Stream Segments:	12
Number of Waterbody/Pollutant Combinations addressed by TMDLs:	70

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, TMDLs were not completed for 12 waterbody-pollutant combinations (WBPCs) in the Landusky TMDL Planning Area. These include metals (~~10~~ 7), nutrients (1), and fecal coliform (1) impairments. The ~~10~~ 7 metals impairments will be addressed by DEQ through the reassessment and delisting process. The document states that future TMDL work will be required to address the nutrient impairment in Mill Gulch and the fecal coliform impairment in Rock Creek, but does not provide a timeframe.

TM DLs were completed to address ~~53~~ 55 WBPCs from the court ordered list of impairments (per the second amended judgment, dated September 27, 2011, referred to herein as the "2014 List"). Seven WBPCs from the 2014 List are proposed for reassessment and delisting. ~~Seventeen~~ Fifteen new impairments were identified during the TMDL process (i.e., do not currently appear on a 303d list), and TMDLs were completed for all ~~17~~ 15. These are noted as a cycle first listed of ~~"2012"~~ "> 2012" in Table 1.

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 Landusky document includes a description of all applicable water quality standards in Section 3.3 and a thorough discussion of water quality targets as well as an explanation of how the TMDLs are written to meet water quality standards in Section 5.4.

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:

Metals targets and supplemental indicators are presented in Section 5.4 of the document. TMDLs were written to the most restrictive metals standard, usually either the chronic aquatic life or human health criteria (Section 5.6).

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:

Mining is the predominant pollutant source in the Landusky watershed. The document provides a history of mining operations in the region, and summarizes the known and suspected mining related sources. A summary of sources per stream is provided in Section 5. Upstream and downstream data are presented for each stream to identify background pollutant loading. Point sources related to mining operations are summarized and considered in the TMDL analyses. It should be noted that the four point sources in the watershed are not required to have MPDES permits due to the fact that they are operated with CERLA funds. Sampling data used to characterize the streams and develop TMDLs are summarized in the report and provided in Appendix B.

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:

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.

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 are summarized in the main body of the document and presented in the appendices (Appendix B).

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:

Wasteload allocations are provided for each of the four point sources, and for all other mine related sources. Where both are present, they are presented separately. Where possible, DEQ separated out natural background conditions from untreated mine influenced conditions. It should be noted that the four point sources are operated under the CERCLA program and do not have MPDES discharge 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:

Where possible, DEQ presents load allocations to background/natural conditions based on monitoring data obtained upstream of known mining sources. However, background conditions could not be obtained for all streams because of the pervasive nature of mining in the basin.

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:

The document provides an implicit margin of safety through conservative assumptions and the use of an adaptive management strategy. The TMDL targets are also based on the chronic criteria, providing an implicit margin of safety.

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:

Seasonality considerations are incorporated into the data collection timeframe as well as the source assessments. Data were collected for both low and high flow conditions, and TMDLs are presented for both conditions as well.

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 and monitoring recommendations are presented in Section 7.3.

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 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: Most of the metals pollutant sources in the Landusky planning area are related to abandoned mining, and there are few other nonpoint sources.

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:

The metals TMDLs are presented in the form of an equation to calculate daily allowable loads.

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: An extensive public participation process was conducted, including multiple meetings with local stakeholders during the TMDL process and after document completion. The draft document was available for public comment between August 17 and October 12, 2011. Responses to comments are provided in Section 8.3.

Table 1. Stream Segments in the Landusky TMDL Planning Area Addressed in this Document and Causes of Impairment.

Water Body Name	Water Body ID	Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action
Alder Gulch	MT40E002_050	1994	Cadmium	Cadmium	TMDL
		1994	Copper	Copper	TMDL
		1994	Lead	Lead	TMDL
		1994	Mercury	Mercury	TMDL
		~~1994~~ 1996	pH	Cadmium	Addressed by cadmium TMDL
		1994	Selenium	Selenium	TMDL
		1994	Zinc	Zinc	TMDL
		~~1994~~ NA	Alteration in stream-side or littoral vegetative covers	Non-pollutant	No Action
Beaver Creek	MT40M001_011	2006	Cadmium	NA	Data Assessment-No TMDL Needed
			Iron	NA	Data Assessment-No TMDL Needed
			Lead	Lead	TMDL
South Big Horn Creek	MT40I001-030	1994	Aluminum	Aluminum	TMDL
		1994	Arsenic	Arsenic	TMDL
		1994	Cadmium	Cadmium	TMDL
		> 2012	Iron	Iron	TMDL
		1994	Nickel	Nickel	TMDL
		1994	Zinc	Zinc	TMDL
King Creek	MT40I001-040	> 2012	Arsenic	Arsenic	TMDL
		> 2012	Cadmium	Cadmium	TMDL
		1994	Selenium	Selenium	TMDL
		~~1994~~ NA	Alteration in stream-side or littoral vegetative covers	Non-pollutant	No Action
		~~1994~~ NA	Physical substrate habitat alterations	Non-pollutant	No Action
Lodge Pole Creek	MT40I001-050	2004	Cadmium	Cadmium	TMDL
			Mercury	Mercury	TMDL
		NA	Alteration in stream-side or littoral vegetative covers	Non-pollutant	No Action
			Cause Unknown	Non-pollutant	Addressed by cadmium TMDL
Mill Gulch	MT40E002_100	1996	Copper	Copper	TMDL
		1996	Lead	NA	Data Assessment-No TMDL Needed
		1996	Mercury	Mercury	TMDL
		2000	Nitrates	NA	No Action
		1996	pH	Copper	Addressed by copper TMDL
		1996	Selenium	Selenium	TMDL
		~~1996~~ NA	Alteration in stream-side or littoral vegetative covers	Non-pollutant	No Action
Montana Gulch	MT40E002_010	> 2012	Aluminum	Aluminum	TMDL
		1990	Arsenic	Arsenic	TMDL

Water Body Name	Water Body ID	Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action
		1990	Cadmium	Cadmium	TMDL
		1990	Copper	NA	Data Assessment-No TMDL Needed
		> 2012	Cyanide	Cyanide	TMDL
		> 2012	Nickel	Nickel	TMDL
		2000	Ph	Cadmium	Addressed by cadmium TMDL
		~~2011~~ > 2012	Selenium	Selenium	TMDL
		~~2011~~ > 2012	Zinc	Zinc	TMDL
Rock Creek	MT40E002_090	1994	Cadmium	Cadmium	TMDL
			Copper	Copper	TMDL
			Lead	Lead	TMDL
			Mercury	Mercury	TMDL
		2000	pH	Cadmium	Addressed by cadmium TMDL
		1994	Selenium	Selenium	TMDL
			Zinc	Zinc	TMDL
		NA	Alteration in stream-side or littoral vegetative covers	Non-pollutant	No Action
Ruby Creek	MT40E002_060	2000	Aluminum	Aluminum	TMDL
			Cadmium	Cadmium	TMDL
			Copper	Copper	TMDL
			Lead	Lead	TMDL
			Mercury	Mercury	TMDL
			pH	Cadmium	Addressed by cadmium TMDL
			Selenium	Selenium	TMDL
			Zinc	Zinc	TMDL
		NA	Alteration in stream-side or littoral vegetative covers	Non-pollutant	No Action

Water Body Name	Water Body ID	Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action
Ruby Gulch	MT40E002_070	> 2012	Aluminum	Aluminum	TMDL
		1994	Cadmium	Cadmium	TMDL
		1994	Chromium	Chromium	TMDL
		1994	Copper	NA	Data Assessment-No TMDL Needed
		> 2012	Cyanide	Cyanide	TMDL
		1994	Lead	NA	TMDL
		1994	Mercury	Mercury	TMDL
		1994	pH	Cadmium	Addressed by cadmium TMDL
		1994	Selenium	Selenium	TMDL
		1994	Zinc	NA	TMDL
Sullivan Creek	MT40E002_110	> 2012	Cadmium	Cadmium	TMDL
			Iron	Iron	TMDL
			Lead	Lead	TMDL
			Selenium	Selenium	TMDL
			Zinc	Zinc	TMDL
		~~1994~~ NA	Alteration in stream-side or littoral vegetative covers	Non-pollutant	No Action
			Fish-Passage Barrier	Non-pollutant	No Action
			Other flow regime alterations	Non-pollutant	No Action
			Physical substrate habitat alterations	Non-pollutant	No Action

Water Body Name	Water Body ID	Cycle First Listed (Pollutants Only)	Cause of Impairment	Pollutant for Which TMDL has been prepared	DEQ Action
Swift Gulch Creek	MT40I002_010	2008	Aluminum	Aluminum	TMDL
			Arsenic	Arsenic	TMDL
			Cadmium	Cadmium	TMDL
			Copper	Copper	TMDL
			Cyanide	Cyanide	TMDL
			Iron	Iron	TMDL
			Lead	Lead	Data Assessment- No TMDL Needed
			Nickel	Nickel	TMDL
			pH	Cadmium	Addressed by cadmium TMDL
			Selenium	NA	Data Assessment- No TMDL Needed
			Thallium	Thallium	TMDL
			Zinc	Zinc	TMDL